EUR-18825
FZKA-6311
ISBN 92-894-2085-5
European Communities 2001

Probabilistic Accident Consequence Uncertainty Assessment Using COSYMA:

Uncertainty from the Dose Module

Prepared by:

J A Jones	National Radiological Protection Board	UK
J Ehrhardt	Forschungszentrum Karlsruhe GmbH	Germany
L H J Goossens	Delft University of Technology	The Netherlands
J Brown	National Radiological Protection Board	UK
R M Cooke	Delft University of Technology	The Netherlands
F Fischer	Forschungszentrum Karlsruhe GmbH	Germany
I Hasemann	Forschungszentrum Karlsruhe GmbH	Germany
B C P Kraan	Delft University of Technology	The Netherlands
A Khursheed	National Radiological Protection Board	UK
A Phipps	National Radiological Protection Board	UK

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FOREWORD

This is one of a series of reports describing an uncertainty analysis on the predictions of the accident consequence assessment code COSYMA. A complete list of the reports produced in this project is given in Appendix A, where the reports are divided into those describing the expert judgement study on the distributions of the input parameter values and those describing the results of the analysis. This report describes the results of the analysis of the uncertainty in the predicted consequences of accidental releases reflecting the uncertainty in the values of the input parameters of the models for calculating internal and external doses.

All of the reports describing the results of the analysis have common material in their introductory sections, so that any single report can be read without having to refer to background material in other reports of the series. This is one of four reports which describe the different module analyses. Section 1 (Background to the study) is identical in each of these reports. Sections 2.1and 2.4 are very similar in each of the module analysis reports. Those parts of section 2 describing the general approach, the methods for combining distributions and sampling from them are identical in these reports apart from a few sentences referring to particular features of the module in question. The opening part of section 3 is also the same in these reports.

Sections 1.1 and 1.2 of this report are almost identical to the first chapter of the "Methodology Report", with differences for references to material that is explained in more detail in that report. Section 1.2 of the Methodology Report includes a final paragraph that is not in the other reports.

Sections 1.1, 1.2 and 1.4 and the opening part of section 3 are very similar to the equivalent sections of the overall analysis report.

Appendices A (list of reports from the project) and B (description of the models in COSYMA) are included in each of the reports on the uncertainty analysis.

ABSTRACT

A study to perform an uncertainty analysis of the European accident consequence assessment system, COSYMA, has been carried out under contract to the European Commission. The study involved a series of analyses of the uncertainty in different sections of the system, followed by a final analysis of the uncertainty in the whole system.

The overall aims of the study can be summarised as:

1 to formulate a state-of-the-art expert judgement methodology which is capable of finding broad acceptance,
2 to apply the methodology to estimate uncertainties associated with the predictions of the probabilistic accident consequence assessment system COSYMA
3 to provide an input to identifying future R&D priorities.

This report describes the analysis of the uncertainty in the model predictions resulting from uncertainty in the values to be assigned to the input parameters describing internal and external dosimetry and consumption rates. The main aim of this part of the study was to identify the input parameters whose uncertainties make large contributions to the overall uncertainty; the parameters identified would then be included in the final analysis of the uncertainty in the whole system.

Uncertainty analysis involves specifying probability distributions for the values of each of the parameters involved, sampling sets of values from those distributions and propagating them through the model to derive information on the uncertainty in the model prediction. Those parameters whose uncertainties make major contributions to the overall uncertainty can then be identified using correlation coefficients between the input values and the model outputs. Earlier expert judgement studies have provided distributions on the values of the parameters describing the metabolic behaviour of those nuclides that make major contributions to the doses following reactor accidents, the external doses from deposited activity and the shielding properties of buildings.

The study evaluated the uncertainty on individual doses and risks, the extent of countermeasures and the numbers of health effects in the population. The calculations were undertaken for a number of situations with and without allowing for the effects of countermeasures. Some licensing procedures require estimates of the potential individual doses and risks at points near the reactor site. Potential doses are calculated assuming people are outdoors for the whole of the period of interest, and so make no allowance for countermeasures or shielding by normal occupation of buildings. The study evaluated such potential doses, and the associated risks of health effects. Consequences assuming normal living (ie allowing for shielding by buildings but no countermeasures) are considered in the licensing procedures of several countries. Hence calculations were also undertaken for individual and collective doses and risks for normal living.

The source terms chosen encompass a wide range of characteristics (eg magnitude and composition) of source terms that have been postulated for LWRs. They are taken from analyses of the pressurised water reactor proposed for the Hinkley Point site in the UK. UK1 is a very large

release; it is the risk-dominant source term for early health effects and a major contributor to the overall risk of late health effects from the reactor. CB2 is a smaller, but less unlikely, sequence that also makes a major contribution to the overall risk of late health effects from the reactor. DBA is a design basis accident.

The study showed that the uncertainty (expressed as the ratio of the 95th to the 5th percentile of the probability distribution on the expectation value of the consequence) on the extent of early countermeasures is more than a factor of 100 for the areas where sheltering or evacuation would be required and about a factor of 20 on the area where iodine tablets would be required. The parameters whose uncertainties make major contributions to the overall uncertainty for these endpoints are some of those describing the behaviour of material in the lung following inhalation and some of the parameters describing the metabolism of iodine.

The study showed that the uncertainty on the numbers of early fatalities is about 15 for the mean value of the distribution with similar values for the higher percentiles of the distribution. The parameters whose uncertainties make major contributions to the overall uncertainty for these endpoints are similar to those for the areas requiring countermeasures, together with some of the location factors and the residence time of material on skin.

The study showed that the uncertainty on the numbers of fatal cancers is between factors of about 10 and 15. The parameters whose uncertainties make major contributions to the overall uncertainty are some of the parameters in the metabolic models for iodine and caesium.

The parameters from this part of the analysis to be included in the final analysis were identified as some of those describing the behaviour of material in the lung following inhalation, parameters from the metabolic models for plutonium, caesium, iodine and tellurium, those describing the uncertainty on external dose from deposited caesium and ruthenium and some of the location factors.

ACKNOWLEDGEMENTS

The project team wishes to thank all those people who took part in the expert judgement elicitation process, as members or organisers of the expert panels. The project team also acknowledges a number of useful comments when papers describing the progress on this project have been presented at conferences.

The expert elicitation work and the derivation of distributions on the COSYMA input parameters was partially funded by the European Commission under contract number FI3P-CT92-0023. The module and overall uncertainty analyses were partially funded by the European Commission under contract number FI4P-CT95-0006.

1 BACKGROUND TO THE STUDY

1.1 Introduction

Despite the elaborate precautions taken in the design, construction and operation of nuclear facilities, there will always remain the possibility, however small, of accidental releases of radioactivity into the environment. There is a need to evaluate the risks arising from potential accidents, on a probabilistic basis, taking into account the spectrum of possible consequences of accidents and their associated probability of occurrence. Probabilistic risk assessment (PRA) or accident consequence assessment (ACA) is the process whereby the consequences of potential accidental releases are assessed, taking into account the range of conditions which may prevail at the time of the accident, and the associated probability of these conditions. Such assessments have applications in the design, siting, licensing and operating phases of a nuclear installation. They can be used to evaluate the risks posed by a specific or representative nuclear site, for example for comparison with safety criteria. They can be used for evaluating the effects of design changes or of plant modifications. They also have an input into emergency planning and to some aspects of siting studies.

A number of computer systems have been developed for use in such assessments. Such systems include models for describing the pathways by which people are irradiated following discharges of material, and for calculating the doses and the associated health risks. The models require values to be specified for a large number of input parameters. The predictions of such models are uncertain for two main reasons, which can be summarised as:

(a) *modelling uncertainties,* arising from a lack of knowledge about the most appropriate mathematical formulation to represent environmental processes,
(b) *parameter value uncertainties,* arising from inadequate knowledge about the most appropriate values to be assigned to the many parameters in the model.

The models adopted are not perfect as they contain idealisations and simplifying assumptions. They may not describe all features concerned; features which have been omitted because they make only a small contribution to the "best estimate" model prediction may make larger contributions to the uncertainty. The most appropriate values to be assigned to the many parameters involved in the model may not be known with certainty, leading to uncertainty in the final predictions of the model.

Two computer systems for use in probabilistic accident consequence assessments (COSYMA[1] in the European Union and MACCS[2] in the US) were developed around 1990, and made generally available. There has been an interest in quantifying the uncertainty in the predictions of such systems, and extensive analyses of the uncertainty on predecessors of both programs have been carried out [3,4,5]. An important feature of an uncertainty analysis is the derivation of a joint distribution* on the values of the many parameters involved. In the earlier

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* The joint distribution assigns a probability to each feasible set of values of the input parameters.

studies, the joint distribution was largely specified by the system developers, rather than experts in the many different fields involved in accident consequence modelling.

In 1991, both the European Commission (EC) and the United States Nuclear Regulatory Commission (USNRC) were considering initiating studies to better quantify the uncertainty in the input parameter values and in the predictions of the systems. An essential aspect of these studies was to obtain distributions and information on the dependencies between parameter values using formal expert judgement elicitation techniques. The studies were combined into a single EC/USNRC project intended to develop credible and traceable uncertainty distributions for the respective system input parameters. A further intention was for these distributions to be propagated through the two systems, and so quantify the uncertainty in the predictions.

The broad objectives of both the EC and USNRC for this study can be summarised as:

1 to formulate a state-of-the-art expert judgement methodology which is capable of finding broad acceptance;

2 to apply the methodology to estimate uncertainties associated with the predictions of the probabilistic accident consequence systems COSYMA and MACCS;

3 to provide an input to identifying future R&D priorities.

Within these broad objectives, small differences in emphasis exist between the EC and USNRC. This report concentrates on the analysis using COSYMA, and the EC aims and objectives.

The first objective was met in two ways. First, the collaboration between research teams from the US and Europe led to the development of agreed methods for the study, and in particular for the formal elicitation of expert judgement. Second, a protocol document describing the methods to be used for the final uncertainty analyses on COSYMA was distributed to a number of researchers in the field for comment. The views expressed on that document have been incorporated into the methods used for the analysis.

The second objective was met by using the joint distribution on the uncertain parameter values derived from the expert elicitation in an analysis of the uncertainty in the predictions of the consequences of accidental releases using COSYMA. Undertaking rigorous uncertainty analyses involves considerable computational costs and substantial effort. It is not possible to carry out such analyses on every occasion when accident consequence assessments are undertaken. It was intended that the levels of uncertainty obtained in this study would indicate the likely levels of uncertainty in other, similar, situations. Therefore, this analysis has been undertaken for several combinations of source term and types of population behaviour with the intention of deriving indicative levels of uncertainty should COSYMA be applied in other situations. For example, if the study shows that the uncertainty in a particular endpoint for a particular countermeasures strategy is a factor of 10, then it can be assumed that in similar situations the uncertainty is also a factor of 10, not 100.

There are several aspects to the third objective above. The uncertainty was better quantified because the distributions on the parameter values were determined from formal techniques of expert judgement. In addition to calculating the uncertainty on the model predictions, the study also identified the input parameters whose uncertainties make major contributions to the overall uncertainty. This can form an input into identifying research priorities.

Uncertainty analyses can be considered to consist of three broad stages, each of which could be further divided into smaller steps. The first step is to determine what types of uncertainty are present in the model being analysed, which types will be considered in the analysis and which of the model's input parameters will be considered to be uncertain. This step also includes identifying those model endpoints for which the uncertainty will be analysed. The second broad step is to determine the joint distribution on the values of the model input parameters that are being considered. This joint distribution includes not only the ranges of each of the parameter values, but also the probability distribution of the input parameter taking different values within that range and any dependencies between the values of the different parameters within their ranges. In this study, the joint distribution over the model input parameters has been obtained using formal techniques for eliciting expert judgement. These parts of the study have been described in a series of reports, as listed in Appendix A. The final broad step is to sample sets of input parameter values from the joint distribution, to propagate those values through the model, to determine the uncertainty on the model endpoints and identify those parameters whose uncertainties make large contributions to the overall uncertainty.

The models included in COSYMA are described in Appendix B. There are many hundreds of parameters involved in describing the transfer of radioactive material from its release through the environment to man and calculating the subsequent doses and risks. It would not be possible to consider all these parameters in a single analysis, because of the complexity of the analyses and amount of computation that would be required. Therefore, a series of analyses of parts of the complete COSYMA system have been carried out. These are described as "module analyses", although the parts of the code considered in these analyses do not necessarily correspond exactly to the defined modules of COSYMA(1). Throughout this report, the term "module" is used to refer to the part of the system under analysis, unless indicated otherwise. Each module includes a number of different models. Those parameters whose uncertainties make major contributions to the overall uncertainty for each module were identified and included in a final overall analysis. The following module analyses were carried out before the final analysis:

1) Dispersion and deposition
2) Foodchain transfer
3) Dosimetry - external, inhalation and ingestion doses
4) Early and late health effects.

The main aim of the module analyses was to identify the parameters which should be included in the final overall analysis, and the list of parameters constitutes the main conclusions of this report. A further part of the overall analysis is to explain the relative uncertainties on the different quantities considered. This report gives explanations for the relative uncertainties within this module, and so contributes to the process of understanding the results of the final analysis.

These explanations are also one of the conclusions of this section of the study. These explanations are included in section 3 of this report, where the endpoints are discussed in turn. This means that the main conclusions of this report are presented in section 3, rather than being drawn together in a separate "conclusions" section.

The module analysis reports do not include any discussions of the extent to which the results of the analysis might be applicable in other situations (e.g. other sites or source terms). The report on the overall analysis[6] does include a discussion on the extent to which the results of this study can be applied in other situations.

The analyses reported here calculated the uncertainty on the overall endpoints of COSYMA coming from the uncertainty in the input parameters for the particular module, rather than simply considering the uncertainty on the endpoints of that particular module. In this way, the importance of the parameter uncertainties can be judged in terms of their contribution to the overall uncertainty and not simply in terms of their contribution to some intermediate quantity in the calculation. Default values were allocated to the parameters of the other modules for which the uncertainty was not considered in the particular analysis. Thus the analysis of the uncertainty on the dispersion and deposition module assumed default values for the parameters describing food chain transfer, dose models and health effects models. This division into modules is such that no single parameter is input to more than one module, and there are no large correlations between the values of the input parameters for the different modules.

Since the study was intended to derive indicative levels for the uncertainty to be expected under normal applications of COSYMA, it was necessary to make as few changes as possible to COSYMA for this analysis. For this reason, the models used in COSYMA were not modified to give a better fit to the distributions provided by the experts. In some cases, the models included in COSYMA are complex and an uncertainty analysis of the full version of the system would have required excessive amounts of computer resources. In these cases, the models were simplified so that the uncertainty analysis could be carried out more easily. Simplifications were introduced in the calculation of the risk of late health effects, the models for transfer of some radionuclides to animal products, and the model for human metabolism of actinides. These simplifications will not have significantly altered the extent of the uncertainty on the predictions of COSYMA, though they may have altered slightly the central values about which the uncertainty is expressed. They have not affected the aims of the study, as the objective was to evaluate the extent of the uncertainty in the predictions for typical COSYMA calculations, rather than the absolute value of the consequences of particular accidental releases.

This is one of a series of reports describing the overall analysis of the uncertainty in the predictions of COSYMA. The starting point for this series of reports is taken as the end of the expert elicitation process. Appendix A gives a complete list of the reports relating to the project. The remainder of this chapter gives information relating to the study that is common to all the analyses, namely the source terms, endpoints, uncertainties and selection of atmospheric conditions adopted in the study. Further information on the methods adopted, and on the way in which the results are presented, is given in one of the companion reports[7].

1.2 Situations considered

Three source terms, encompassing a wide range of characteristics of source terms that have been postulated for LWRs (e.g. magnitude and composition), have been considered in this study. They were taken from analyses of the pressurised water reactor proposed for the Hinkley Point site in the UK. UK1 is a very large release; it was identified as the risk-dominant source term for early health effects and a major contributor to the overall risk of late health effects from the reactor(8). CB2 is a smaller, but less unlikely, sequence that also makes a major contribution to the overall risk of late health effects from the reactor(9). DBA is a design basis accident(10). This is a fault which the plant is designed to take or can be shown to withstand without unacceptable consequences, by virtue of the plant's inherent characteristics or safety systems. The amounts of material released for the UK1 and CB2 source terms were calculated from the reactor inventory and the release fractions which apply to groups of elements; the amount of each isotope released for the DBA source term was specified directly. The source terms are summarised in Table 1.1 to Table 1.3. Table 1.1 shows the assumed inventory of the reactor; Table 1.2 gives the release fractions used for the UK1 and CB2 source terms, and Table 1.3 gives the amount of each nuclide released in the DBA source term. Table 1.2 also gives approximate release fractions for the DBA source term, to enable easy comparisons of the magnitude of this and the other source terms.

The calculations were undertaken for a range of patterns of population behaviour. Some licensing procedures require estimates of the potential individual doses and risks at points near the reactor site. Potential doses are calculated assuming people are outdoors for the whole of the period of interest, and so make no allowance for countermeasures or shielding by normal occupation of buildings. The study evaluated such potential doses, and the associated risks of health effects. Consequences assuming normal living (i.e. allowing for shielding by buildings but no countermeasures) are considered in the licensing procedures of several countries. Hence calculations were also undertaken for individual and collective doses and risks for normal living.

There is also an interest in calculating the uncertainty on the predictions of COSYMA if allowance is made for the countermeasures that might be imposed following a reactor accident. International organisations have suggested ranges of criteria for implementing countermeasures, recognising that intervention levels might depend on the situation and scale of accident that occurs. A countermeasures strategy based on the IAEA(11) intervention levels for sheltering, evacuation, iodine tablets and relocation together with the EU levels for banning food(12,13,14) was used. The intervention levels and implementation times used for this study are given in Table 1.4 Doses and risks are calculated assuming normal living for those not subject to countermeasures, or not subject to countermeasures in a given time period.

COSYMA gives information on a wide variety of consequences of an accident. It was not possible to generate information on all of these endpoints in this study. Therefore, the study evaluated the uncertainty on a selection of endpoints; information on the uncertainty in other endpoints can be deduced from these results. A complete list of endpoints is given in Table 1.5; they can be summarised as follows:

- air concentration and deposition of ^{131}I and ^{137}Cs at selected distances.

- individual dose to 7 days in bone marrow, thyroid and skin at selected distances.
- individual and collective risks of early health effects (total risks of mortality, and of the haematopoietic syndrome, the total risks of morbidities and of lung morbidity and hypothyroidism).
- the areas with emergency actions for sheltering, evacuation and distribution of stable iodine tablets.
- individual and collective committed effective dose and doses in bone marrow and thyroid.
- individual and collective risks of the numbers of fatal cancers (total and from thyroid) and leukaemia.
- the areas and their time integrals affected by relocation and by food restrictions, for meat, milk, green vegetables and grain.

Different sub-sets of the complete list of endpoints are considered in the different module analyses, as some of the input parameter values for some of the modules do not influence all the endpoints. The endpoints considered in this module are identified in Section 3.

The collective health effects were evaluated for a hypothetical site in central Europe, as defined in a recent international intercomparison of reactor accident programs[15].

As stated earlier, the aim of the exercise was to derive indicative levels of uncertainty that should be appropriate for other, similar analyses using COSYMA. The size of uncertainty associated with the predictions may change for different magnitudes of the source term, and for calculations with and without countermeasures. The following set of situations was chosen for analysis, where NE and NL refer to the separate sub-systems of COSYMA relating to the calculation of early effects (NE sub-system) and late effects (NL sub-system):-

UK1 potential outdoor doses and risks, for those NE endpoints relating to individual doses and risks.
UK1 normal living with no countermeasures, for those NE endpoints relating to individual doses and risks, and to numbers of health effects.
UK1 with countermeasures, for those NE endpoints relating to individual doses and risks, and to numbers of health effects.
CB2 normal living with no countermeasures, for those NL endpoints relating to individual doses and risks, collective doses and numbers of late health effects.
CB2 with countermeasures, for all NE and NL endpoints.
DBA potential outdoor doses and risks, for those NL endpoints relating to individual doses and risks.
DBA with countermeasures, for all NL endpoints.

The following terminology is used when the results are presented in Section 3 for the three situations considered. “Potential doses” is used to refer to the calculation of doses outdoors and with no countermeasures; this is adopted as the calculations give the highest doses that could potentially be received after the accident. “Normal living” is used to refer to the situation with no countermeasures; these calculations include the effects of buildings in reducing exposure, allowing for average behaviour of the population and occupancy of buildings. “With countermeasures” is used for the final situation;

these calculations assume that all members of the population follow the adopted countermeasures strategy, but use the normal living assumptions for other aspects of the calculations.

The uncertainty on individual doses and risks for early effects (the NE endpoints) were evaluated at 0.875, 5 and 20 km, while the uncertainties on individual doses and risks for late effects (the NL endpoints) were evaluated at 5, 20 and 100 km. COSYMA calculates doses at discrete points on a spatial grid, and assumes that the dose at the centre of each grid area applies throughout that area. Thus the dose at 0.875 km is calculated as representing the doses over the distance band between 0.75 and 1 km.

This combination of conditions means that information on the uncertainty of the numbers of early health effects in the population was obtained mainly from the analyses for the UK1 source term. Little information on the uncertainty on these endpoints could be obtained from the analyses with the CB2 source term as doses from this source term were generally below the thresholds for producing early health effects. Information on the uncertainties in doses over short time periods and risks of early health effects for people who are outdoors at the time of the accident, for people who are living normally with no countermeasures taken, and if countermeasures are taken on the basis of doses in the exposed population were obtained from the analyses for the UK1 source term. The predicted risks of early health effects, and the associated uncertainties in the predictions, will not depend on the criteria used to invoke countermeasures unless they are such that some people who receive doses above the threshold for deterministic effects are not sheltered and evacuated. Although the analysis for the CB2 source term could not give much information on risks of early health effects, it did give results for the doses in short time periods, both for normal living and if countermeasures were taken.

Information on the uncertainty in the predicted extent of early countermeasures (sheltering, evacuation and distribution of stable iodine tablets) was obtained from the analyses for the CB2 source term. Information on the uncertainty on the late countermeasures (relocation and food restrictions) was obtained from the analyses for the CB2 and DBA source terms. Two source terms were selected for this part of the analysis as they have different relative contributions from the iodine and caesium isotopes.

Information on the predicted risks of late health effects was also obtained from the CB2 and DBA source terms, for both individual and collective risks. Again, the two source terms were used because of the different relative contributions of the iodine and caesium isotopes.

The extent of the uncertainty on the predicted air concentration and deposition does not depend on the size of the release. The endpoints relating to concentration and deposition were only considered in the analysis for the CB2 source term, as this is the only source term for which all four distances (from NE and NL) were considered.

The results from a single run of COSYMA are presented using the complementary cumulative frequency distribution function (ccdf), which gives the probability that the consequence is greater than a particular value. The distribution can be summarised using various characteristic quantities such as the expectation value (the mean or average of the distribution) and various percentiles. The *nth* percentile is the level of consequence that is exceeded with a probability of (100-n) percent. This study concentrates on the uncertainty on the mean value, the 95th and 99th percentiles.

The uncertainty analysis involved running COSYMA many times, so that many different values for the various endpoints were obtained. A probability distribution can be derived from these results, for each endpoint, and the uncertainty on the predicted consequence is then described by percentiles of that probability distribution. The general discussion of the extent of the uncertainty is presented using the ratio of the 95th to the 5th percentiles of the uncertainty distribution; the term "uncertainty factor" is used in this report to represent this factor. The same quantity is used in the reports describing the results of the expert elicitation, where it is termed "range factor". More detailed information is presented in Appendix C, where the 5th, 10th, 25th, 50th, 75th, 90th and 95th percentiles of the uncertainty distributions on the different parts of the ccdf considered are given. These descriptions of the uncertainty are evaluated for the mean value and the 95th and 99th percentiles of the ccdf. Some results are also presented in terms of the "mean curve", which is the average of the ccdfs from each of the COSYMA runs. The process is described in more detail in the "methodology report".[7] There is also an interest in the extent to which predictions obtained using the default value for each input parameter could underestimate the results. Therefore the ratio of the 95th percentile of the uncertainty distribution to the value obtained with the default values for the input parameters was also determined. This quantity is termed the "reference uncertainty coefficient".

One of the aims of the module analysis reports is to explain the relative magnitude of the uncertainty on different quantities, and to identify those parameters whose uncertainties make large contributions to the overall uncertainty. The explanations concentrate on the results for the mean value and the 99th percentile of the distribution, rather than on the 95th percentile. To some extent this reflects the difficulties in trying to explain the findings for the 95th percentile. The results for the 99th percentile reflect those for essentially the worst conditions that can arise. If individual doses or risks are being considered, this is on the plume centre line in adverse weather conditions. It is less clear, however, what conditions correspond to the 95th percentile. In general, this could occur in a variety of situations depending on values allocated to the many parameters involved in the analyses. In extreme cases of broad plumes, it could represent doses off the centre line. The mean value, representing the average across all conditions, is also easier to relate to the values of the parameters involved.

1.3 Items considered uncertain in the module analyses

The analyses look at the uncertainty on the COSYMA endpoints resulting from the uncertainty on the parameters for the particular module considered in the analysis, using default values for the parameters of the other modules. The doses calculated in each of the module analyses are those summed over all routes of exposure considered in COSYMA, even though the particular uncertainties considered may not affect the doses from some of the routes. Equally, the runs with countermeasures consider all the countermeasures considered in this analysis, even though the imposition of some of them may not be affected by the uncertainty on the parameters for the module being analysed.

1.4 Choice of sequences of atmospheric conditions for the analysis

Runs of COSYMA, when not considering uncertainty, assume that there is a single value for all parameters except the atmospheric conditions during the period of the release and the time taken for material to travel over the region of interest. Therefore, COSYMA predicts the probability distribution of consequences should an accident occur in any of the wide range of atmospheric conditions (including the changes of conditions during the travel of the plume) which might occur at the site of interest during the period in which the site operates. The sequences of conditions are obtained by using a data file giving atmospheric conditions every hour over a period of a few years, and assuming that the conditions during the future operation of the site will be similar to those observed in the past. It is not possible to undertake the calculations for every sequence of conditions over the operating period of the site, and even considering every sequence recorded over a one-year period would require excessive computer resources in an uncertainty analysis. Therefore a representative sample of starting times must be used. The predictions of COSYMA depend on the way in which these sequences are chosen. This source of uncertainty is not considered in the module analyses or in the overall analysis incorporating the parameters identified from the module analyses of this study. A separate study of the uncertainty from meteorological sampling was undertaken alongside the overall analysis and is described in reference 6.

The atmospheric conditions at the time of the release can affect the predictions of all the modules of COSYMA, not simply the dispersion and deposition module. Some radionuclides deposit at different rates relative to each other in wet and dry conditions. This can affect the relative mix of radionuclides contributing to doses from all pathways of exposure. The travel time of the plume to different distances can affect the extent to which countermeasures can reduce the doses received by the population, since countermeasures are modelled to require time for organisation and implementation before they are effective. Therefore the uncertainty analysis of all the modules must consider the possible range of atmospheric conditions that can occur.

Each of the module analyses was undertaken using runs of COSYMA considering 144 sequences of conditions selected using cyclic sampling. The reasons for this choice of sampling scheme are described in the "methodology report"(7) on this study.

1.5 Method of identifying important parameter uncertainties

The method of identifying the important uncertain parameters is described in the "methodology report"(7), which also describes the reasons for the choice of the particular method. It is summarised here to provide the background for the discussions in Section 3 of this report. Two indicators of importance were used in this project.

The first indicator is the partial rank correlation coefficients (PRCC) between the input parameter values and the COSYMA predictions. These measure the strength of monotonic relationships between values of an input parameter and a model prediction, when account has been taken of the simultaneous effects of monotonic relationships with all other parameters.

The second indicator is the contribution of each parameter to the overall uncertainty. The coefficient of determination (R^2) measures the fraction of the variation of the model output that can be explained by linear relationships between the model prediction and all of the input parameter values. The ratio of R^2 values from an analysis with only one parameter considered to be uncertain to that from an analysis with all parameters considered to be uncertain represents the fraction of the overall uncertainty caused by the particular parameter.

The important uncertain parameters were identified for the mean value, 95th and 99th percentiles of the ccdf, for each of the endpoints and source terms considered. Parameters were included in the overall analysis if they were placed in the first or second rank according to their PRCC or if they were identified as contributing more than 15% of the overall uncertainty according to their contribution to the value of R^2. The justification for these criteria are given in the "methodology report"(7).

1.6 References

1. KfK and NRPB. COSYMA - a new program package for accident consequence assessment. CEC Brussels, EUR 13028 (1991).
2. Chanin D I et al. MELCOR accident consequence code system (MACCS), User's Guide. NUREG/CR-4691. Albuquerque (1990).
3. Jones J A, Mansfield P A and Crick M J. An uncertainty analysis of the predicted consequences of nuclear accidents using the NRPB code MARC-2A. Chilton, NRPB-R274 (London HMSO) (1995).
4. Fischer F, Ehrhardt J and Hasemann I. Uncertainty and sensitivity analyses of the complete program system UFOMOD and of selected submodels. Karlsruhe KfK 4627 (1990).
5. Kocher D C, Ward R C, Killough G G et al. Sensitivity and uncertaitny studies of the CRAC2 computer code. NUREG/CR-4038 (1985).
6. J A Jones, J Ehrhardt, L H J. Goossens, F Fischer, I Hasemann, B C P Kraan, R M Cooke. Probabilistic accident consequence uncertainty assessment using COSYMA: Overall uncertainty analysis. EUR 18826 and FZKA 6312 (2000).
7. Jones J A, Kraan B C P, Cooke R M, Goossens L H J, Fischer F and Hasemann I. Probabilistic accident consiequence uncertainty assessments using COSYMA: Methodology and processing techniques. EUR 18827 and FZKA 6313 (2000).
8. Jones J A and J A Williams J A. An assessment of the radiological consequences of releases from degraded core accidents from a proposed PWR at Hinkley Point: Results using MARC-1. Chilton, NRPB-M152 (1988).
9. Jones J A and Williams J A. An assessment of the radiological consequences of releases from containment bypass accidents from a proposed PWR at Hinkley Point: Results using MARC-1. Chilton. NRPB-M154 (1988)
10. Jones J A and Williams J A. An assessment of the radiological consequences of releases from design basis accidents from a proposed PWR at Hinkley Point: Results using MARC-1. Chilton. NRPB-M153 (1988)
11. FAO, IAEA, ILO, OECD/NEA, PAHO, WHO. International basic safety standards for

protection against ionizing radiation and for the safety of radiation sources. Vienna, IAEA, Safety Series 115 (1996)

12. CEC. Council Regulation (Euratom) No 3954/87 laying down the maximum permitted levels of radioactive contamination of foodstuffs and feedingstuffs following a nuclear accident or any other case of radiological emergency. *Off. J. Eur. Commun.* L371/1/11 (1987), amended by Council Regulation 2218/89. *Off. J. Eur. Commun.* L211/1 (1989).
13. CEC. Council Regulation (Euratom) No 944/89 laying down the maximum permitted levels of radioactive contamination in minor foodstuffs following a nuclear accident or any other case of radiological emergency. *Off. J. Eur. Commun.* L101/17 1989.
14. CEC. Council Regulation (Euratom) No 770/90 laying down maximum permitted levels of radioactive contamination of feedingstuffs following a nuclear accident or any other case of radiological emergency. *Off. J. Eur. Commun.* L83/78 (1990).
15. Nuclear Energy Agency and Commission of the European Communities. Probabilistic accident consequence assessment codes. Second international comparison. Paris, OECD (1994).

Table 1.1 Reactor inventory considered

Radionuclide	Inventory (Bq)	Half-life	Radionuclide	Inventory (Bq)	Half-life
^{58}Co	$3.08\ 10^{16}$	70.8 d	^{131m}Te	$3.47\ 10^{17}$	30.0 h
^{60}Co	$1.14\ 10^{16}$	5.27 y	^{132}Te	$4.85\ 10^{18}$	78.2 h
^{85}Kr	$2.17\ 10^{16}$	10.7 y	^{131}I	$3.39\ 10^{18}$	8.04 d
^{85m}Kr	$9.25\ 10^{17}$	4.48 h	^{132}I	$4.96\ 10^{8}$	2.30 h
^{87}Kr	$1.70\ 10^{18}$	76.3 min	^{133}I	$6.81\ 10^{18}$	20.8 h
^{88}Kr	$2.34\ 10^{18}$	2.84 h	^{134}I	$7.84\ 10^{18}$	52.6 min
^{86}Rb	$7.96\ 10^{15}$	18.6 d	^{135}I	$6.40\ 10^{18}$	6.61 h
^{89}Sr	$3.37\ 10^{18}$	50.5 d	^{133}Xe	$6.85\ 10^{18}$	5.25 d
^{90}Sr	$1.75\ 10^{17}$	29.1 y	^{135}Xe	$1.67\ 10^{18}$	9.09 h
^{91}Sr	$4.37\ 10^{18}$	8.48 h	^{134}Cs	$3.85\ 10^{17}$	2.06 y
^{90}Y	$1.82\ 10^{17}$	2.67 d	^{136}Cs	$1.33\ 10^{17}$	13.2 d
^{91}Y	$4.51\ 10^{18}$	58.6 d	^{137}Cs	$2.29\ 10^{17}$	30.0 y
^{95}Zr	$5.88\ 10^{18}$	65.5 d	^{140}Ba	$6.14\ 10^{18}$	12.7 d
^{95}Nb	$5.81\ 10^{18}$	35.1 d	^{140}La	$6.32\ 10^{18}$	40.3 h
^{97}Zr	$5.88\ 10^{18}$	16.9 h	^{141}Ce	$5.92\ 10^{18}$	32.5 d
^{99}Mo	$6.44\ 10^{18}$	66.02 h	^{143}Ce	$5.44\ 10^{18}$	33.0 h
^{99m}Tc	$5.55\ 10^{18}$	6.02 h	^{144}Ce	$3.59\ 10^{18}$	285 d
^{103}Ru	$5.25\ 10^{18}$	39.4 d	^{143}Pr	$5.40\ 10^{18}$	13.6 d
^{105}Ru	$3.51\ 10^{18}$	4.44 h	^{147}Nd	$2.36\ 10^{18}$	11.0 d
^{106}Rh	$3.18\ 10^{18}$	1.47 d	^{239}Np	$7.32\ 10^{19}$	2.36 d
^{106}Ru	$1.30\ 10^{18}$	368 d	^{238}Pu	$3.17\ 10^{15}$	87.7 y
^{127}Sb	$2.93\ 10^{17}$	3.89 d	^{239}Pu	$1.11\ 10^{15}$	$2.41\ 10^{4}$ y
^{129}Sb	$9.95\ 10^{17}$	4.31 h	^{240}Pu	$1.06\ 10^{15}$	6550 y
^{127}Te	$2.85\ 10^{17}$	9.35 h	^{241}Pu	$3.12\ 10^{17}$	14.4 y
^{127m}Te	$4.37\ 10^{16}$	109 d	^{241}Am	$2.06\ 10^{14}$	432 y
^{129}Te	$9.40\ 10^{17}$	69.6 min	^{242}Cm	$6.62\ 10^{16}$	163 d
^{129m}Te	$1.67\ 10^{17}$	33.6 d	^{244}Cm	$2.75\ 10^{15}$	18.1 y

Table 1.2 Source terms considered for the assessment

Source term	Fraction of core inventory released to the environment								
	Xe-Kr	Organic iodine	Inorganic iodine	Cs-Rb	Te-Sb	Ba-Sr	Ru(a)	La(b)	Pu□
UK1	9 10^{-1}	7 10^{-3}	7 10^{-1}	5 10^{-1}	3 10^{-1}	6 10^{-2}	2 10^{-2}	4 10^{-3}	4 10^{-3}
CB2	1 10^{-2}	5 10^{-6}	2 10^{-3}	8 10^{-3}	8 10^{-6}	8 10^{-7}	8 10^{-7}	8 10^{-7}	3 10^{-7}
DBA(d)	1 10^{-7}	-	1 10^{-6}	1 10^{-6}	1 10^{-8}	1 10^{-8}	1 10^{-8}	1 10^{-8}	1 10^{-10}

Notes

a Includes Ru, Rh, Co, Mo, Tc.
b Includes Y, La, Zr, Nb, Ce, Pr, Nd.
c Includes Np, Pu, Am, Cm.
d This source term is defined in terms of the amount of each radionuclide released. The information has been converted into the form presented here for comparison with the other source terms. The release fractions for different isotopes of the same element and for different elements differ from the values given here by up to a factor of 3.

Table 1.3 Activity released in the DBA source term

Radionuclide	Release (Bq)	Radionuclide	Release (Bq)	Radionuclide	Release (Bq)
^{24}Na	$7.0\ 10^{10}$	^{51}Cr	$1.4\ 10^{11}$	^{54}Mn	$1.4\ 10^{11}$
^{55}Fe	$5.2\ 10^{9}$	^{59}Fe	$5.2\ 10^{9}$	^{58}Co	$3.4\ 10^{11}$
^{60}Co	$3.2\ 10^{10}$	^{63}Ni	$5.6\ 10^{9}$	^{65}Zn	$1.4\ 10^{11}$
^{83}Br	$9.3\ 10^{10}$	^{84}Br	$2.6\ 10^{12}$	^{85}Br$^{(a)}$	$4.8\ 10^{9}$
^{83m}Kr	$5.2\ 10^{9}$	^{85m}Kr	$1.1\ 10^{11}$	^{85}Kr	$2.3\ 10^{9}$
^{87}Kr	$9.3\ 10^{10}$	^{88}Kr	$1.1\ 10^{11}$	^{89}Kr	$8.1\ 10^{10}$
^{86}Rb	$4.4\ 10^{9}$	^{88}Rb	$3.5\ 10^{13}$	^{89}Rb	$8.1\ 10^{12}$
^{89}Sr	$4.4\ 10^{10}$	^{90}Sr	$3.7\ 10^{8}$	^{91}Sr	$2.3\ 10^{11}$
^{90}Y	$4.4\ 10^{8}$	^{91m}Y	$6.3\ 10^{10}$	^{91}Y	$4.8\ 10^{8}$
^{93}Y	$3.7\ 10^{11}$	^{95}Zr	$4.1\ 10^{10}$	^{95}Nb	$4.4\ 10^{10}$
^{99}Mo	$1.6\ 10^{11}$	^{99m}Tc	$3.7\ 10^{10}$	^{103}Ru	$2.7\ 10^{10}$
^{106}Ru	$1.6\ 10^{10}$	^{103m}Rh	$6.3\ 10^{10}$	^{106}Rh	$3.5\ 10^{10}$
^{110m}Ag	$5.6\ 10^{10}$	^{122}Sb	$1.0\ 10^{11}$	^{124}Sb	$2.5\ 10^{10}$
^{125m}Te	1.7 10	^{127m}Te	$1.8\ 10^{9}$	^{127}Te	$8.5\ 10^{9}$
^{129m}Te	$3.3\ 10^{10}$	^{129}Te	$8.9\ 10^{12}$	^{131m}Te	$1.2\ 10^{11}$
^{131}Te	$2.3\ 10^{12}$	^{132}Te	$1.8\ 10^{10}$	^{130}I	$1.9\ 10^{10}$
^{131}I	$1.9\ 10^{12}$	^{132}I	$5.2\ 10^{12}$	^{133}I	$8.1\ 10^{12}$
^{134}I	$6.3\ 10^{12}$	^{135}I	$3.6\ 10^{12}$	^{131m}Xe	$2.3\ 10^{10}$
^{133m}Xe	$2.8\ 10^{10}$	^{133}Xe	$1.5\ 10^{12}$	^{135m}Xe	$9.3\ 10^{10}$
^{135}Xe	$3.4\ 10^{11}$	^{137}Xe	$8.1\ 10^{11}$	^{138}Xe	$4.1\ 10^{11}$
^{134}Cs	$2.1\ 10^{11}$	^{136}Cs	$2.5\ 10^{10}$	^{137}Cs	$2.7\ 10^{11}$
^{138}Cs	$5.9\ 10^{12}$	^{139}Cs	$2.0\ 10^{13}$	^{137m}Ba	$8.9\ 10^{11}$
^{139}Ba	$4.4\ 10^{12}$	^{140}Ba	$6.7\ 10^{10}$	^{140}La	$3.5\ 10^{10}$
^{141}Ce	$1.0\ 10^{10}$	^{143}Ce	$3.7\ 10^{10}$	^{144}Ce	$3.7\ 10^{10}$
^{143}Pr	$3.6\ 10^{8}$	^{144}Pr	$3.7\ 10^{10}$	^{187}W	$2.2\ 10^{11}$
^{237}U	$2.5\ 10^{8}$	^{239}U	$1.0\ 10^{10}$	^{239}Np	$4.1\ 10^{9}$
^{236}Pu	$1.7\ 10^{5}$	^{238}Pu	$3.7\ 10^{5}$	^{239}Pu	$1.5\ 10^{5}$
^{240}Pu	$1.4\ 10^{5}$	^{241}Pu	$4.1\ 10^{7}$	^{242}Pu	$4.4\ 10^{2}$
^{243}Pu	$8.5\ 10^{7}$	^{241}Am	$7.0\ 10^{4}$	^{242m}Am	$2.4\ 10^{3}$
^{242}Am	$4.8\ 10^{7}$	^{243}Am	$8.1\ 10^{3}$	^{244}Am	$2.7\ 10^{6}$
^{242}Cm	$1.6\ 10^{6}$	^{243}Cm	$6.3\ 10^{2}$	^{244}Cm	$9.6\ 10^{4}$

Table 1.4 Countermeasures criteria and timings adopted in the study

Action	Criteria		
Sheltering	10 mSv effective dose, total of committed inhalation dose and external dose to 7 days to a person outdoors		
Evacuation	50 mSv effective dose, total of committed inhalation dose and external dose to 7 days to a person outdoors		
Iodine tablets	100 mSv committed inhalation dose to thyroid to a person outdoors		
Relocation	30 mSv external dose in 30 days to a person in normal living		
Return from relocation	10 mSv external dose in 30 days to a person in normal living		
Food restrictions	Activity concentration levels in food		
	Radionuclide	Milk (Bq l^{-1})	Other foods (Bq kg^{-1})
	Strontium	125	750
	Iodine	500	2000
	Caesium and other long-lived radionuclides	1000	1250
	α - emitters	20	80

Action	Time when action initiated	Time when action withdrawn
Sheltering	2 hours	8 hours
Evacuation	6 hours	2 days
Iodine tablets	4 hours	-[a]
Relocation	Depends on relocation area[b]	When dose rate drops below criterion
Food restrictions	Start of first time period in which concentrations are above the criterion	End of last time period in which concentrations are above the criterion

Notes:

a COSYMA assumes that iodine tablets are taken on a single occasion only.

b COSYMA calculates an average relocation time, assuming that the area affected can be relocated at a rate of 100 km^2 per day, and assumes that everyone is relocated at that time

Table 1.5 List of endpoints considered in the analysis

For COSYMA NE[a] runs

Activity concentrations, at 0.875, 5 and 20 km. in air and on the ground, for Cs-137 and I-131.
Individual doses, at 0.875, 5 and 20 km integrated to 7 days for both inhalation and external dose for bone marrow, thyroid and skin.
Individual risks of deterministic health effects, at 0.875, 5 and 20 km. for mortality, the sum and the risk of the haematopoietic syndrome, for morbidity, the sum and the risk of lung morbidity, hypothyroidism and skin burns.
Areas with emergency actions, for sheltering only, evacuation and distribution of stable iodine tablets.
Number of deterministic health effects for mortality, the sum and haematopoietic syndrome. for morbidity, the sum and numbers of cases of lung morbidity, hypothyroidism and of skin burns.

For COSYMA NL[b] runs

Activity concentrations, at 5, 20 and 100 km in air and on the ground, for Cs-137 and I-131.
Individual doses, at 5, 20 and 100 km integrated to 50 years for both inhalation and external dose effective dose and for bone marrow and thyroid.
Individual risk of fatal stochastic health effects, at 5, 20 and 100 km for total, and the risks of death from leukaemia and thyroid cancer.
Areas with countermeasures for relocation, the initial area and its time integral for restrictions of milk, grain, leafy vegetables and beef, the initial area and its time integral.
Collective doses effective dose and for bone marrow and thyroid.
Numbers of fatal stochastic health effects the sum, and numbers of deaths from leukaemia and thyroid cancer.

Notes:

a NE refers to the sub-system of COSYMA calculating short term doses, early health effects and the appropriate countermeasures.

b NL refers to the sub-system of COSYMA calculating long term doses, late health effects and the appropriate countermeasures.

2 DISTRIBUTIONS ON THE INPUT PARAMETER VALUES

2.5 Introduction

The main stages of an uncertainty analysis were summarised in Section 1 of this report. The first stage is to take information from expert panels, supplemented from other sources where necessary, and to generate marginal distributions* for those module input parameters considered to be uncertain, together with a correlation matrix describing the relationships between the marginal distributions for the different parameters. Sets of input parameter values are then sampled from these correlated marginal distributions for use in the uncertainty analysis. Section 2 describes this process for the dose module.

Code input parameters for which marginal distributions and a correlation matrix have to be specified are called target variables. Variables for which the experts have to give assessments are called elicitation variables. A fundamental aspect of the methodology of formal expert judgement elicitation is that experts should only be asked to provide assessments on elicitation variables that are physically observable, potentially measurable and with which the expert is familiar. Different experts may prefer different models for certain phenomena. An expert may be unwilling to give assessments on model dependent target variables. He may not relate to these target variables, if he does not agree with the model which is described by these target variables. Therefore it is better to have elicitation variables which are not related to a certain model, and so to have elicitation variables which can be considered as model independent. Some of the parameters in accident consequence models represent quantities that can, in principle, be measured and for which distributions can be obtained directly from expert judgement. Others cannot and so must be derived from distributions on the values of other measurable quantities.

This process yields distributions on the parameters for different models (or for different parts of the overall model) considered within the module analysis. These distributions must be then be combined into a single joint distribution** on all of the parameters considered in the module analysis. The program used for the sampling could only handle joint distributions when they are expressed as marginal distributions for each of the parameters and the correlations between them. Therefore the distribution has to be expressed in this form. The steps required to obtain samples of target variable values are summarised below, and described in more detail in the later parts of Section 2.

1. Identify the models comprising the module and the uncertain target variables in those models.
2. Identify suitable elicitation variables from which distributions on the target variables can be obtained. Construct joint distributions, expressed in terms of marginal distributions and correlations, on the elicitation variables for the different models. The distributions come directly from information provided by the experts supplemented, in some cases, by further information provided by project staff.

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* The marginal distribution assigns a probability to each feasible value of a single parameter.

** The joint distribution assigns a probability to each feasible set of values of the input parameters.

3. Obtain the joint distribution on the target variables for each model from the joint distribution on the elicitation variables obtained from step 2; this procedure is known as "probabilistic inversion". Express the joint distribution on the target variables in terms of marginal distributions for each of the target variables involved, together with a correlation matrix between those distributions, for each model, as required by the program used for the sampling.
4. Combine the distributions on the target variables for each of the models into a distribution over the whole set of target variables involved in this module analysis, allowing for correlations between the different sub-sets of parameters. This distribution is expressed in terms of marginal distributions on each of the variables and correlations between them, so that it can be input to the program used for the final sampling.
5. Finally, the input values for the COSYMA module analysis are sampled from the distribution resulting from step 4.

As a check on the inversion process, a sub-step 3a was added. In this, the COSYMA dose models and the joint distribution on the target variables are used to replicate the marginal distributions on the elicitation variables. The resulting distributions can then be compared with those obtained from the experts, as a check on the adequacy of the inversion process.

The summary above identified a number of steps which must be carried out for the parameters in each of the models considered in the module analysis. The later parts of this section are clearer if the whole process is described for each of the models separately. Therefore the structure of the remainder of Section 2 is as follows:

- Sections 2.6 and 2.7 describe step 1 above, namely the models used in COSYMA for internal and external doses, respectively, and the parameters that were considered to be uncertain.
- Sections 2.8 and 2.9 describe step 2 above, namely the identification of the elicitation variables for internal and external doses, respectively, and the derivation of distributions on them from information provided by the expert panels, supplemented where necessary by information from the project staff.
- Section 2.10 outlines the methods used for probabilistic inversion, which is step 3 above.
- Sections 2.11 and 2.12 (for internal and external dosimetry, respectively) provide more information for steps 3 and 3a above. These sections describe the derivation of distributions on the target variables and the comparison of the distributions on the elicitation variables as reconstructed from the target variables and as specified by the experts.
- Section 2.13 describes step 4 above, namely the construction of the overall distribution on the whole set of target variables, in a form which is suitable for input to the sampling program used.
- Section 2.14 describes step 5 above, namely the sampling from the overall distribution. The set of sample values obtained has also been used with the COSYMA models to construct distributions on the elicitation variables. This comparison differs from those undertaken as step 3a since the distributions on the parameter values are taken from different stages of the process of deriving sets of input parameters for the analysis. This process helps to check both the fitting and sampling procedures.

2.6 Calculation of inhalation and ingestion doses in COSYMA and uncertain target variables

This section describes the way in which inhalation and ingestion dose calculations are undertaken in COSYMA, and the parts of the calculations that were considered to be uncertain. Identifying the parameters that are regarded as uncertain is step 1 from Section 2.5. The parameters considered to be uncertain (the target variables) for internal dose calculations in this module analysis are summarised in the first column of Table 2.1.

COSYMA considers doses from internal exposure following inhalation of material in the cloud, inhalation of material that has been deposited and resuspended, and ingestion of contaminated food. Many of the calculations within COSYMA are undertaken using values taken from data libraries that are generated using other codes that are not part of COSYMA. However, for this analysis, the uncertainty in the quantities on the data libraries was assessed, and the contribution of this uncertainty to the overall uncertainty on the COSYMA predictions was evaluated.

COSYMA calculates the inhalation dose as the product of the time integral of the air concentration, the inhalation rate, and the dose coefficient (dose per unit intake). The time integral of the air concentration outdoors is calculated by the atmospheric dispersion module; the uncertainty on this part of the calculation was not considered in the module analysis described here. In this module analysis the uncertainty on the dose coefficients and breathing rate were considered.

COSYMA uses a library of information on internal dose coefficients, obtained from the NRPB computer code PLEIADES[1], which is based on the ICRP models for evaluating dose coefficients. PLEIADES uses first order differential equations to describe the rates at which material is transferred between, and retained in, the different organs of the body. The input parameters to the model are the transfer coefficients between the body organs considered. The calculations for this study require information on the uncertainty distributions on these transfer coefficients. The transfer coefficients (designated as k_{ij} in the following) represent the proportion of material in compartment *i* moved to compartment *j* in a unit time period. The target variables are the transfer coefficients.

The various COSYMA endpoints require the air concentration indoors (for use in calculating the dose received during sheltering periods), in cars (for calculating the dose while evacuating), outdoors (for calculating potential doses) and a value for use in calculating the dose received in average behaviour which takes account of the air concentration outdoors and indoors and the fraction of time that people spend inside and outside buildings. The dispersion model gives air concentrations outdoors; concentrations in other locations are derived in COSYMA using the outdoor air concentration and a location factor which represents the ratio between the concentration in the required location and that outdoors. Uncertainty on the location factors was included in this module analysis.

COSYMA calculates individual doses from ingestion as the product of the time integral of the concentration in food, the consumption rate and the dose coefficient. In this calculation, indicative individual doses were calculated assuming that all food is produced at the point of consumption. The uncertainty on the time integral of the concentration of material in food is not considered in this module analysis, but uncertainty on the dose coefficients and consumption rates is included.

The quantities considered to be uncertain in this module analysis were the dose coefficients for ingestion and inhalation, the breathing rate, the consumption rate of the different foods and the location factors for air concentration. The dose coefficients for those nuclides that were considered likely to make the most important contributions to the overall uncertainty were obtained by deriving distributions on the input parameters of PLEIADES, and for these nuclides the target variables are the transfer coefficients in the models adopted. The distributions on these quantities were derived from information provided by the experts. The uncertainties on the other nuclides were described simply using a factor to represent the uncertainty on the ICRP dose coefficients; these factors are the target variables for the other nuclides. The distributions for these parameters were provided by project staff.

2.6.1 Target variables that are independent of radionuclide

This includes some of the parameters of the lung model, the parameters describing the residence times in the GI tract, inhalation rate and the consumption rates of the different foods considered in the analysis. It also includes the location factors used to describe the differences between doses outdoors and in other locations.

The movement of material between the different regions of the lung was modelled using the box model shown in Figure 2.1, which is a simplified version of the ICRP lung model. The compartments AI1, AI2 and AI3 form the pulmonary regions of the lung, while the compartments BB1 and BB2 form the tracheobronchial region, ET1 and ET2 represent the extrathoracic region. ET1 represents the nasal region, from which material is cleared by nose blowing directly to the environment without uptake to the body. ET2 represents the part of the extrathoracic region beyond the nasal region; material deposited here clears to the GI tract. The target variables are the fractions of the inhaled material deposited in the different regions of the lung and the transfer coefficients between those regions.

2.6.2 Radionuclide dependent target variables for strontium, ruthenium, tellurium, iodine, caesium, cerium and plutonium

The model used to represent the transfer of material from the lungs to blood is illustrated in Figure 2.2; the same model is used for all nuclides with element dependent values for the parameters. The models for the subsequent metabolism of strontium, ruthenium, tellurium, iodine, caesium, cerium and plutonium in the body after they have reached blood are shown in Figure 2.3 to Figure 2.9 respectively. The model used for plutonium in this study represents a simplification of the full ICRP model for that element. The target variables are the transfer coefficients shown in the diagrams. In addition, the fraction of the amount of material ingested which is absorbed in the GI tract was also a target variable for calculating ingestion doses.

2.6.3 Radionuclide dependent target variables for other radionuclides

A simpler method was adopted for the other radionuclides considered in the study. The uncertainty was expressed using the standard ICRP dose coefficients and a simple (uncertain) multiplier. The same value for this factor was used for all organs and times for a particular nuclide, though different factors were used for inhalation and ingestion. The target variables are the multiplying factors for each of the nuclides considered.

2.7 Calculation of external doses and uncertain target variables

This section describes the parameters of the external dose model and identifies the quantities that were considered to be uncertain in the external dose calculations (step 1 from Section 2.5). COSYMA considers the external gamma irradiation from material in the cloud and deposited to the ground, and the beta dose from material deposited on the skin. The calculations allow for the shielding effects of buildings and the fraction of time that people spend inside and outside buildings, by using suitable location factors. Doses when countermeasures are taken also allow for the shielding provided by cars during the time taken to evacuate.

2.7.1 External γ dose from material in the cloud or deposited to the ground

The external γ dose from material in the plume in an idealised location outdoors is calculated in the atmospheric dispersion module. It was considered that the uncertainty on this dose outdoors, assuming that the size and shape of the plume are known, is small compared to the uncertainty on the plume size and shape, and so it was not considered in this study. The effects of the uncertainty on the plume size and shape were considered in the atmospheric dispersion module analysis.

The uncertainty on the external γ dose from deposited material to a person outdoors was included in this study; this uncertainty is considered to be larger than that on the cloud γ dose as it also includes the uncertainty on the relative deposition to different urban surfaces and on the behaviour of material following deposition (ie its transfer between surfaces in urban areas or the rate at which it penetrates into soil).

COSYMA uses a data library giving the external dose outdoors per unit deposit for each nuclide in a series of time periods. The uncertainty on the dose outdoors was specified using a multiplying factor that was applied to the values of doses contained in the normal COSYMA data libraries. The target variables are the multiplying factors. They were specified at a series of times for each nuclide, so including the possibility that the uncertainties vary with time after deposition.

2.7.2 Location factors for external dose

The basic calculation in COSYMA gives the external γ dose over an idealised surface outdoors. Location factors are used to determine the dose in other locations. For this study doses must be calculated for people who are outdoors, in normal living, indoors while sheltering or in cars while evacuating. The location factors for these situations are target variables for this module analysis. Different location factors are used for dose from the cloud and from deposited activity. Strictly, location factors should depend on the γ energy, and hence be nuclide dependent. However, this small variation is not considered in COSYMA.

2.7.3 β dose from material on skin

COSYMA also considers the β dose to skin from material deposited on the skin. The uncertainty on the rate at which material deposits to skin was considered in the atmospheric dispersion and deposition module analysis. The uncertainty on the dose rate per unit deposit on skin was considered to be small compared to the other uncertainties in the calculation of risks from skin exposure, and so was not included. The uncertainty on the retention time of material on skin was included in this module analysis; this is the only target variable for this route of exposure. This calculation gives the doses to people in idealised outdoor locations. As for the other pathways considered, the uncertainty on location factors was included in the analysis for the dose from material on skin. The location factors for this pathway were taken to be the same as those for inhalation, in effect assuming that the deposition velocity to skin indoors and outdoors is the same.

2.8 Distributions for the elicitation variables for inhalation and ingestion doses

Determining distributions on the elicitation variables is step 2 from Section 2.5. The distributions on the elicitation variables for this module analysis were expressed as marginal distributions for each parameter together with correlations between them. They were derived from information provided by two expert panels, supplemented by information from project staff. The expert judgement aspects of the study were undertaken jointly by the USNRC and EC. The method for undertaking expert judgement elicitations was based on methods used in earlier American(2) and European(3) studies. The method used in the project, together with some comments and suggestions for further improvements, is described in reference 4. The information used in this module analysis comes from two different panels of experts, one addressing the uncertainty on modelling internal dosimetry(5) and one addressing the uncertainty on modelling external dosimetry(6). In the remainder of this chapter, these panels are referred to as the “internal dosimetry” and “external dosimetry” panels, respectively. The expert judgement elicitation process is described in detail in the reports on the panels, which also present the distributions on the elicitation variables.

The internal dosimetry panel gave information which was used to obtain the uncertainty distributions of the parameters in the model for dose coefficients used to derive the COSYMA data libraries. The external dosimetry panel gave information mainly relating to the calculating of external dose, although it also provided information on the ratio of air concentration inside and outside buildings. The information obtained from the panels is summarised in Table 2.3 and Table 2.4. The panels provided information on some quantities that were not considered in this study; the information that was used to derive the distributions on the target variables is indicated in the final columns of Table 2.1 and Table 2.2, which summarise the elicitation variables used to derive each of the target variables. The information provided by the experts was supplemented by information from the project staff, as described in the later parts of this Section.

2.8.1 Conditions included in the uncertainty distributions

The experts were asked to provide uncertainty distributions as if the elicitation variables had been measured in defined conditions. However, the conditions were defined in a way that did not specify values for every quantity that each expert might feel could influence the value of the variable. The experts were asked to include any variation in the elicitation variables, reflecting the range of possible conditions, within the distributions they provided.

The distributions provided by the internal dosimetry panel include the uncertainty from effects of breathing rate and particle clearance from the lungs, chemical form of the material within the necessarily imprecise description available and are appropriate for a general population with different states of health and different age groups.

2.8.2 Elicitation variables that are independent of radionuclide

The experts gave information on the fraction of the material inhaled that is deposited in the lungs, and the fractions of the deposited material that are initially in the extrathoracic and tracheobronchial regions. They also gave information on the amounts of material retained in the tracheobronchial and pulmonary regions at a series of times after inhalation. Project staff provided information on the relative amounts of material deposited in the three parts of the pulmonary region and in the two parts of the tracheobronchial region; these fractions did not include any uncertainty. They also provided the uncertainty distribution on the inhalation rate.

The uncertainties on the consumption rates were provided by project staff, based on information on the average consumption rates in different European countries(7). Strictly, this gives information on the variation between habits in different countries, rather than information on the uncertainty on the average consumption rates in Europe. However there is no source of information on the uncertainty on consumption rates, and this information was used in the absence of anything better.

The "external dosimetry" panel gave information on the ratio of air concentration indoors and outdoors. This panel also gave information on the fraction of time people spend indoors, which was used in deriving the distributions on the location factor for normal living doses.

2.8.3 Elicitation variables for the strontium model

The experts gave information on the uncertainty for the total amount of strontium reaching blood by a series of times after inhalation, the total amount of strontium retained in skeleton and liver, as a fraction of the amount reaching blood, and on the amount of material in the skeleton, as a fraction of the total in skeleton plus liver, at various times. The information was obtained in terms of these fractions, rather than of the amount in each organ separately, to avoid any problems over ensuring that the resulting distributions do not imply more material in the two organs than has passed into blood. In addition the project staff specified the ratio of the transfer rates to urine and faeces (ie the ratio of the transfer coefficients k_{i5} to k_{i6}) and the ratio of the transfer coefficients from blood to trabecular bone and to cortical bone (ie the ratio of the transfer coefficients k_{12} to k_{13}).

2.8.4 Elicitation variables for the ruthenium model

The experts gave information on the uncertainty on the total amount of ruthenium reaching blood by a series of times after inhalation, and the amount of ruthenium remaining in the whole body at a series of times after intake. Project staff specified the ratio of the transfer coefficients k_{i4} to k_{i5}, with no uncertainty on this ratio.

2.8.5 Elicitation variables for the tellurium model

The experts gave information on the uncertainty on the total amount of tellurium reaching blood by a series of times after inhalation, the total amount of tellurium retained in skeleton and liver, as a fraction of the amount reaching blood, and on the amount of material in the skeleton as a fraction of the total in skeleton plus liver, at various times. The information was obtained in terms of these fractions, rather than the amount in each organ separately, to avoid any problems over ensuring that the resulting distributions do not imply more material in the two organs than has passed into blood. The project staff specified the uncertainty on the f_1 factor and also the ratio of the transfer rates to urine and faeces (ie the ratio of the transfer coefficients k_{i5} to k_{i6}) and information on the uptake to and retention in the thyroid.

2.8.6 Elicitation variables for the iodine model

The experts gave information on the uncertainty on the total amount of material reaching blood by a series of times after inhalation, on the amount of iodine in the thyroid at different times after intake, and on the f_1 value. The project staff specified the ratio of the transfer rates to urine and faeces (ie the ratio of the transfer coefficients k_{i5} to k_{i6}).

2.8.7 Elicitation variables for the caesium model

The experts gave information on the uncertainties on the total amount of material reaching blood by a series of times after inhalation, the amount of caesium retained in the body at different times after intake, and on the f_1 value. Project staff specified the ratio of the transfer rates to urine and faeces (ie the ratio of the transfer coefficients k_{i4} to k_{i5}).

2.8.8 Elicitation variables for the cerium model

The experts gave information on the uncertainties on the total amount of material reaching blood by a series of times after inhalation, and on the amounts of cerium in bone and liver, in the same way as for strontium. Project staff specified the ratio of the transfer rates to urine and faeces (ie the ratio of the transfer coefficients k_{i4} to k_{i5}).

2.8.9 Elicitation variables for the plutonium model

The experts gave information on the uncertainties on the total amount of material reaching blood by a series of times after inhalation and on the total amount of plutonium in the skeleton and liver at different times after its intake, together with information on the fraction of this amount in the skeleton and on the distribution of plutonium between endosteal surfaces, trabecular surfaces and bone marrow. Project staff specified the ratio of the transfer rates to urine and faeces (ie the ratio of the transfer coefficients k_{ib} to k_{if}).

2.8.10 Other radionuclides

The uncertainty on the dose coefficient was specified in terms of a single parameter for each of the other nuclides considered, by the project staff.

The radionuclides were assigned to one of four uncertainty classes on the basis of the f_1 value and the quality of physiological data on which their biokinetic models are based. The best known have high f_1 factors and models that are based on human data. The least known have low f_1 factors and no direct physiological data on the radionuclides - their biokinetics are inferred from analogous elements.

2.9 Distributions on the elicitation variables for external dosimetry

The expert panels were summarised at the start of Section 2.4. The distributions on the elicitation variables for external dosimetry were derived from information provided by the "external dosimetry" panel, supplemented by information from project staff. The target variables for the external dose models are such that they can all be used as elicitation variables or can be derived from the elicitation variables using only simple manipulations, rather than probabilistic inversion. Determining distributions on the elicitation variables is step 2 from Section 2.5. The elicitation variables are summarised in Table 2.4, and described in more detail in the following sections.

2.9.1 External γ dose from deposited material

COSYMA uses a data library giving the external dose per unit deposit for each nuclide in a series of time periods. The experts gave information on the effective dose up to a series of times and on the dose rate immediately after deposition for unit deposition of each of four radionuclides (^{95}Zr, ^{106}Ru, ^{131}I and ^{137}Cs). Some of the processes that modify the dose rate for one nuclide may also be effective in modifying the dose rate for other nuclides; for example, different nuclides may have the same transfer rate between surfaces in the urban area or the same migration rate in soil. These similarities are reflected in correlations between the values adopted for the different nuclides. Information on such correlations was obtained from the experts, and is included in the distributions.

The uncertainties for these four radionuclides were also used for the other radionuclides. The experts were asked which of these radionuclides was the most appropriate surrogate for the other radionuclides generally considered in accident consequence assessments.

2.9.2 Location factors

The basic calculation in COSYMA gives the external γ dose over an idealised surface outdoors. Location factors are used to determine the dose in other locations. For this study doses must be calculated for people who are outdoors, for people in normal living, indoors while sheltering or in cars while evacuating. The experts gave information on the location factors for dose from deposited activity for five different building types at each of three times after deposition (immediately after deposition and 1 and 10 years after deposition, for cars and for buses for different radionuclides.

The expert panel did not consider the uncertainty on the location factors for use in calculating the external dose from material in the cloud. Distributions on these parameters were specified by project staff from a review of information on location factors in the literature, as reviewed in reference 8.

The experts also gave information on the fraction of the population in the different locations, which was used in deriving the distributions on the location factor for normal living doses.

2.9.3 β dose from material on skin

The uncertainty on the residence time of material on skin was specified by project staff. At the time this analysis was undertaken, there were no measurements of the rate at which particulate material was removed from the skin by normal processes. The estimate of retention time was based on considerations of the time for which stains (such as paint) remain on the skin. Since then one experiment has measured this quantity, suggesting that the retention time is lower than the minimum value of the distribution adopted here.

2.9.4 Conditions included in the uncertainty distributions

The experts were asked to provide uncertainty distributions as if the elicitation variables had been measured in defined conditions. However, the conditions were defined in a way that did not specify values for every quantity that each expert might feel could influence the value of the variable. The experts were asked to include any variation in the elicitation variables, reflecting the range of possible conditions, within the distributions they provided.

The distributions provided by the external dosimetry panel were appropriate for conditions in the temperate regions of Europe and America. The uncertainty on external doses included variations in the types of buildings, and associated shielding levels, found in urban or rural areas. The distributions also assumed that the population behaviour is not modified as a result of the accident, other than to follow the adopted countermeasures. The effects of extreme events, such as snow or floods, were not considered in the distributions.

2.10 Probabilistic inversion

Step 3 from Section 2.5 is to generate joint distributions on the target variables (ie the model input parameters). This section outlines the methods used for this part of the analysis. The details for each model are given in Section 2.11 and 2.12, for the internal and external dosimetry models, and the calculation of external dose, respectively.

Some of the target variables are quantities which could be measured and so served as elicitation variables. In this case, the distribution derived from step 2 could be used directly. Some target variables, while not serving directly as elicitation variables, can be derived using only simple manipulations. In other cases, the target variables are quantities that cannot be measured and so they could not be used as elicitation variables. In this situation, it is the task of the uncertainty analyst to design the elicitation in such a way that, based on the information available on elicitation variables, a joint distribution on the target variables could be determined. Methods for fitting distributions on model parameters to distributions obtained from expert judgement is still an active research topic. This problem is called probabilistic inversion. The methods adopted for this process in this study are described in more detail in the "Methodology Report"[9], and may be characterized as follows.

For a given model, a set of observable quantities can be predicted by the model when suitable values are assigned to various model parameters. Starting with values for the observables, and inverting the model, gives model parameter values which, when used with the model, ideally yield the observed values. Such an inversion is not always possible; for example the model may not adequately represent the processes occurring in the environment. Furthermore, in probabilistic inversion, the starting point is a (joint) distribution (in this study, obtained from expert judgement) over possible values of the observables, rather than single values. A (joint) distribution over model parameters is sought which, when used with the model, returns the original distribution on the observables. Here again, it may not possible to find a joint distribution that accurately reproduces the original joint distribution for the values of the observed quantities. In such cases a distribution over model parameters is sought which reproduces 'as well as possible' the distributions over the input values.

The problems which arise are similar to other inversion problems, yet different enough to require different methods to be used. Techniques for performing probabilistic inversion in the context of expert judgement have been under development for some years. The methods are described in references 10 and 11, and the computer programs used to implement these methods in this project are described in reference 12.

2.11 Uncertainty on internal dose

The uncertainty distributions on the input parameters of PLEIADES were obtained, and used to generate a set of libraries of dose coefficients, which were then used in the uncertainty analysis of COSYMA. The ways in which the distributions on the parameter values were obtained are described in the following sub-sections (step 3 from Section 2.1).

The results for the complete set of target variables are shown in Table 2.5, which shows the marginal distributions for each parameter, and Table 2.6, which shows those pairs of parameters with large correlations. Note that the distributions on the parameters in the calculation of dose coefficients were derived for application in the PLEIADES models. They should only be used in other models if the parameters have the same meanings as in the models adopted here.

Table 2.5 also shows the default values for the parameters. In some cases no default value is shown; these are the instances where the PLEIADES model has been simplified slightly for this analysis, and so a default value cannot be given for those parameters.

The following sub-sections also compare the distributions on the elicitation variables as specified by the experts with those calculated using the distributions on the parameter values that are obtained from the processing procedure. This is step 3a from Section 2.5. There are a number of factors which can cause differences between these two distributions:

- The expert distributions themselves do not comply with the models in the sense that a probabilistic inverse does not exist.
- The number of variables in the inversion step is large and simplifying heuristics must be adopted in the mathematical processing.

2.11.1 Target variables that are independent of radionuclide

The uncertainty on the lung model parameter values was obtained by probabilistic inversion of the information on the initial deposition in the different regions of the lung and the amount of material remaining in the lung regions at different times after intake. The joint distributions on the parameter values obtained in this way are summarised in Table 2.5, which shows the marginal distributions on the parameter values, and in Table 2.6, which shows those pairs of parameters between which there is a correlation such that the magnitude of the rank correlation coefficient is 0.2 or greater. Table 2.5 also shows the default values for the parameters. The default values are near the middle of the uncertainty range other than for the transfer coefficient from the extrathoracic 2 compartment to the stomach, which is above the 95th percentile of the distribution.

The uncertainties on the consumption rates were provided by project staff, and no inversion processes were required for these variables. The distributions are shown in Table 2.5, which also includes the default values. The default values for the consumption rates for root vegetables, green vegetables and sheep meat are below the 5th percentile of the uncertainty distributions, while the other values are near the centre of the distributions used. The default value for the breathing rate is close to the 95th percentile of the distribution.

The uncertainty on the location factors for indoors and in cars was obtained directly as these target variables served as elicitation variables. The uncertainty on the location factor for normal living was derived from information on the uncertainty on the location factor for indoors and the fraction of time spent inside and outside houses.

The distributions on the quantities given by the experts have been reconstructed from the distributions obtained for the parameter values, and are compared with the experts' distributions in Table 2.7, for all elicitation variables that cannot serve as target variables (step 3a of Section 2.1).

It is seen that, in some cases, the inversion process did not give a good representation of the original distributions. This could be caused by several things, such as weaknesses in the inversion process itself, lack of consistency between the views of the different experts, and the inability of the simple compartment model used to represent the experts' views, either because the experts considered a different model or because the model cannot adequately represent the transfers within the lung. In general, the distributions generated are wider than those obtained from the experts, with the predicted 95th percentile being higher than the experts' value and the predicted 5th percentile being lower than the experts' value. The 5th percentile of the fitted distributions on the amounts retained at one and ten years are considerably lower than the values suggested by the experts.

2.11.2 Target variables for the strontium model

The distributions on the target variables were obtained by probabilistic inversion from the values of the elicitation variables, reflecting the amount of material reaching blood and the fraction of material in the different body organs at different times after intake. The joint distributions on the parameter values obtained from this information are summarised in Table 2.5, which shows the marginal distributions on the parameter values, and in Table 2.6, which shows those pairs of parameters between which there is a large correlation. The table shows that the default values of two of the parameters describing the transfer of strontium from the lungs to blood are outside the range derived from the experts' distributions.

A comparison of the distributions on the elicitation variables given by the experts with those obtained from the processing is shown in Table 2.8. The distributions obtained for the PLEIADES input parameters give a good representation of the experts' distributions for the amount of strontium absorbed into blood especially for the 50th and 95th percentiles at all times and for the 5th percentile at most times after inhalation, though the 5th percentile is underpredicted at some of the times considered. The distributions obtained for the PLEIADES input parameters give a good representation of the experts' distributions for the behaviour of strontium in the body for all quantities and times considered.

2.11.3 Target variables for the ruthenium model

The distributions on the target variables were obtained by probabilistic inversion from the values of the elicitation variables, reflecting the amount of material reaching blood and the fraction of material in the different body organs at different times after intake. The joint distributions on the parameter values obtained from this information are summarised in Table 2.5, which shows the marginal distributions on the parameter values, and in Table 2.6, which shows those pairs of parameters between which there is a large correlation. The table shows that the default values of the parameters describing the transfer of ruthenium from the lungs to blood are outside the range derived from the experts' distributions.

A comparison of the distributions on the elicitation variables given by the experts with those obtained from the processing is shown in Table 2.9. The distributions obtained for the PLEIADES input parameters give a good representation of the experts' distributions other than for the absorption into blood at short times after intake, where the fitted distributions tend to underestimate the uncertainty suggested by the experts. In many cases, the experts' distributions are reproduced within a few percent by the distributions derived for the PLEIADES parameters.

2.11.4 Target variables for the tellurium model

The distributions on the target variables were obtained by probabilistic inversion from the values of the elicitation variables, reflecting the amount of material reaching blood and the fraction of material in the different body organs at different times after intake. The joint distributions on the parameter values obtained from this information are summarised in Table 2.5, which shows the marginal distributions on the parameter values, and in Table 2.6, which shows those pairs of parameters between which there is a large correlation. The table shows that the default values of four of the parameters in the tellurium model are outside the range derived from the experts' distributions, these are the parameters describing the transfer from lungs to blood and the transfer coefficient between blood and thyroid.

A comparison of the distributions on the elicitation variables given by the experts with those obtained from the processing is shown in Table 2.10. This shows that the processing could not derive parameters for the model to fit the experts' views on absorption to blood at all times; good fits are obtained in some cases with poorer fits in others. The second part of the table shows that the distributions derived for the PLEIADES parameters give a good representation of the behaviour of tellurium in the body, other than for absorption to blood, at all times and for all the quantities considered, with the values generated in PLEIADES being within about 10% of those obtained from the experts at all parts of the distribution.

2.11.5 Target variables for the iodine model

The distributions on the target variables were obtained by probabilistic inversion from the values of the elicitation variables, reflecting the amount of material reaching blood and the fraction of material in the different body organs at different times after intake. The joint distributions on the parameter values obtained from this information are summarised in Table 2.5, which shows the marginal distributions on the parameter values, and in Table 2.6, which shows those pairs of parameters between which there is a large correlation. The default values generally lie near the centre of the distributions. The default value for the f_1 value is 1.0, the maximum of the uncertainty distribution.

A comparison of the distributions on the elicitation variables given by the experts with those obtained from the processing is given in Table 2.10. This shows that the distributions on the PLEIADES parameters reproduce the distributions given by the experts within about 10% for the absorption of iodine into blood at most times after intake. The table also shows the distributions on the amount of iodine retained in the thyroid, as given by the experts and as reproduced using PLEIADES. The experts' results are reproduced within about 1% at all times considered.

2.11.6 Target variables for the caesium model

The distributions on the target variables were obtained by probabilistic inversion from the values of the elicitation variables, reflecting the amount of material reaching blood and the fraction of material in the different body organs at different times after intake. The joint distributions on the parameter values obtained from this information are summarised in Table 2.5, which shows the marginal distributions on the parameter values, and in Table 2.6, which shows those pairs of parameters between which there is a large correlation. The table shows that the default values of some of the parameters in the caesium model describing the transfer from lungs to blood are outside the range derived from the experts' distributions, and the default value of f_1 is 1.0, the maximum value of the uncertainty range.

A comparison of the distributions on the elicitation variables given by the experts with those obtained from the processing is shown in Table 2.12. The distributions obtained using the PLEIADES input parameters give a good representation of the experts' distributions for most quantities except the amount of material absorbed into blood at the shortest time after intake considered and the median value for the amount of material retained in the body after 5 years.

Comments must be made on the distributions obtained for some of the parameters in the caesium model. If the distributions are processed using the model adopted for this study, the resulting distributions for the parameters representing the retention in the two compartments describing the whole body have a long tail, which was unexpected by the project staff. According to their rationales, some of the experts considered a simpler model than that shown in Figure 2.7, effectively assuming that the transfer from blood to whole body occurred instantaneously. If the distributions are processed using this simpler model, then the distributions for retention period in the body do not have long tails. The differences in the distributions on the parameter values reflect the differences between the two models.

2.11.7 Target variables for the cerium model

The distributions on the target variables were obtained by probabilistic inversion from the values of the elicitation variables, reflecting the amount of material reaching blood and the fraction of material in the different body organs at different times after intake. The joint distributions on the parameter values obtained from this information are summarised in Table 2.5, which shows the marginal distributions on the parameter values, and in Table 2.6, which shows those pairs of parameters between which there is a large correlation. The table shows that the default values of the parameters describing the transfer of cerium from the lungs to blood are outside the range derived from the experts' distributions.

A comparison of the distributions on the elicitation variables given by the experts with those obtained from the processing is shown in Table 2.13. The distributions obtained from the PLEIADES input parameters give a good representation of the amount of material in skeleton, liver and thyroid at all times after uptake to blood, but give a poor representation of the amount of material transferred to blood, particularly for the 5th percentile of the distribution at short times after intake.

2.11.8 Target variables for the plutonium model

The distributions on the target variables were obtained by probabilistic inversion from the values of the elicitation variables, reflecting the amount of material reaching blood and the fraction of material in the different body organs at different times after intake..

The experts gave information on the uncertainty distributions of 6 quantities at each of 6 times, so that information on a total of 36 distributions was available. The system adopted for deriving distributions on the PLEIADES input parameters for the other models could not be adopted here, as the amount of information to be handled is so large that the problem is beyond the current capabilities of the PREJUDICE program as it involves working in 36 dimensional space. The following procedure was adopted in this case. Each pair of the 6 quantities (at 6 times) was considered separately, giving 15 possible combinations, in 12 dimensional space. The method adopted for the other models was applied to each of these 15 combinations. Again a problem was encountered, in that the process failed in 10 of the 15 cases. In these cases, for at least one of the quantities and one of the times considered, there were no predicted values in part of the distribution obtained from the experts (eg the model cannot predict values on the calculated quantities which are lower than the 5^{th} percentile of the experts' distribution). This means that it is impossible to identify distributions on the input parameter values that can be used with the model to match the experts' views on the retention and distribution of plutonium. The final distributions on the model input parameters were obtained by combining, using equal weighting, the distributions from the 5 combinations of questions for which the processing was successful. The joint distributions on the parameter values obtained in this way are summarised in Table 2.5, which shows the marginal distributions on the parameter values, and in Table 2.6, which shows those pairs of parameters between which there is a large correlation. The table shows that the default values of the parameters describing the transfer of plutonium from the lungs to blood are near the extreme values of, or outside, the range derived from the experts' distributions. The default value for f_1 is also near the upper end of the range suggested by the experts.

A comparison of the distributions on the elicitation variables given by the experts with those obtained using the distributions on the input parameters obtained from the processing is given in Table 2.14. This shows that, in many instances, the fitted distributions give a poor representation of the uncertainty as specified by the experts. In many cases, the uncertainty distributions calculated using PREJUDICE are wider than those specified by the experts; in particular the fitted values of the 5^{th} percentile are well below the experts' value. The table also gives the value for each of the quantities calculated using the default values of the ICRP model for metabolism of plutonium. In general, the "ICRP values" are close to the median value of the experts' uncertainty distribution. However, the ICRP values lie outside the experts' 90 percent confidence interval for some quantities at 50 years after intake.

The distributions deduced for the retention parameters imply that there is a longer retention of plutonium in bone surfaces than in bone volume, in contradiction to the assumptions made by ICRP. This may reflect the simplifications that were made to the model for metabolism of plutonium in this study or the difficulties, described above, in determining distributions on the parameter values. The inability to find distributions for the target variables that fit all parts of the experts' distributions could be caused by several things, but suggests that the model used for this study is not consistent with the models considered by the experts when they derived their distributions on the amounts of plutonium in the different organs at the times of interest. The experts may have obtained their distributions on retention parameters by undertaking an uncertainty analysis of their own. If the experts used a different model to that adopted here, then the fitting process might be unable to reproduce the distributions originally used by the experts, as was found with the caesium model. The model adopted for this study (or any other model) may not be consistent with the experts' views if the experts did not use a model, but gave judgements on likely retention based on experimental data. In addition, the methods used for fitting distributions on parameter values to distributions on the elicitation variables is relatively new; improvements to the methods may enable better fits to be obtained in future. From a mathematical point of view, the discrepancies between the distributions obtained from the experts and from the fitted ranges are generally not large. From a radiation protection point of view, some aspects of the fit are unfortunate in that they overestimate the uncertainty on retention at long times as suggested by the experts, and predict a distribution of plutonium within the bone at long times that does not correspond to the generally accepted view on plutonium metabolism. Despite these problems, the distributions generated are used as being the best that can be obtained with the current methods and metabolic models.

2.11.9 Other radionuclides

The target variables used for calculating doses for the other nuclides were suitable for use as elicitation variables, and so no inversion processes were required for this part of the model.

2.12 Uncertainty on external dose quantities

The target variables for the external dose models are such that they can either be used as elicitation variables or can be derived from the elicitation variables with only simple manipulations. This section describes the simple manipulations required to derived the required information from that provided (step 3 from Section 2.1). The resulting distributions are summarised in Table 2.5, which shows the marginal distributions, and Table 2.6, which shows the correlations. Note that these distributions were derived for application in the models adopted in COSYMA. They should only be used in other models if the parameters have the same meanings as in the models adopted here.

2.12.1 External γ dose from deposited material

COSYMA uses a data library giving the external dose per unit deposit for each nuclide in a series of time periods. The experts gave information on the effective dose up to a series of times and on the dose rate immediately after deposition for unit deposition of each of four radionuclides (^{95}Zr, ^{106}Ru, ^{131}I and ^{137}Cs). The uncertainty on the external dose was represented by a multiplying factor used with the dose given in the COSYMA data library. The uncertainty on the multiplying factor was obtained by dividing the distributions specified by the experts by the value from the COSYMA library. Information on such correlations was obtained from the experts, and is included in the distributions. The distributions on these quantities are summarised in Table 2.5, with correlations between parameter values summarised in Table 2.6. The default values for all parameters lie between the 35th and 80th percentiles of the uncertainty distributions, and in most cases lie close to the median values.

2.12.2 Location factors for external dose

The experts gave information on the location factors for five different building types at each of three times after deposition (immediately after deposition and 1 and 10 years after deposition), and also for cars and for buses immediately after deposition for different radionuclides.

The values given for "immediately after deposition" were used in all the calculations relating to doses and risks for early health effects and for evacuation and sheltering, as these calculations are concerned with the dose mainly over a period of a few days after the initial deposit. Taking into account the γ energies of the radionuclides in the source terms considered that contributed significantly to doses at short times after deposition, the project staff decided that the location factors for ^{137}Cs should be used for all radionuclides.

The location factors for 1 and 10 years after deposition differed by less than 30%. COSYMA does not allow for possible time variation of location factors, and so project staff decided to use the location factors for 1 year after deposition in all calculations of late health effects and doses relating to relocation. The location factors for ^{137}Cs were used for all radionuclides, as this radionuclide was the major contributor to external dose over long periods for the source terms considered.

Distributions on the location factors for use in calculating the external dose from material in the cloud were specified directly by project staff.

The experts also gave information on the fraction of the population in the different locations. This was combined with the information on the location factors in the different locations to derive uncertainty distributions on the location factors for normal behaviour in this study, which therefore include both the uncertainty of the population behaviour and of the shielding properties of buildings. The distributions obtained are given in Table 2.5, with information on the correlations given in Table 2.6. In general the default values lie in the centre of the uncertainty distributions, though two of the values used in calculating the dose to compare to the intervention levels for sheltering and evacuation are at the extreme end of the distribution.

2.12.3 Doses from material on skin

The uncertainty on the residence time of material on skin was specified by project staff; the distribution used is given in Table 2.5. The default value is much higher than the maximum of the distribution adopted here.

2.13 Combining the distributions from the different parts of the model

The preceding sections have described the methods used to derive the joint distributions, expressed as marginal distributions and correlations, for the target variables for the models for the dose coefficients for each element considered and for calculating the doses from external irradiation. Step 4 of Section 2.5 is to combine the distributions on the target variables for the various models into a single distribution. In total, 165 parameters were considered to be uncertain in this module analysis. The preceding sections have described the methods used to derive the joint distributions for several groups of input parameters. The experts were also asked if they felt there would be any correlations between the elicitation variables they considered, and in some cases they specified correlations between elicitation variables relating to different nuclides. The joint distribution over the complete set of parameters was constructed using the simulation program UNICORN[13] in a way which maintained the correlations within each of the groups and introduced the further correlations between the groups specified by the experts. There may be several distributions which achieve this combination, and so the minimum information distribution was used. The marginal distributions for each of the parameters, and the correlations between them, were then extracted from the joint distribution. This process does not alter the marginal distributions on the different parameters, but can introduce correlations between groups of parameters.

The complete distribution is summarised in Table 2.5, which shows the marginal distribution for each parameter, and Table 2.6, which shows those pairs of parameters with large correlations. This table also shows the occasions where there are correlations between pairs of parameters from different models. Note that these distributions were derived for application in the models adopted in COSYMA. They should only be used in other models if the parameters have the same meanings as in the models adopted here.

The distribution as calculated using UNICORN includes the values for each percentiles (from 0 to 100) of the marginal distributions, which are thus described by 101 values. The sampling program used (the Sandia LHS program[14]) cannot use such a large number of points, and so the distributions were simplified slightly by describing them in terms of the values at the smaller number of percentiles given in Table 2.5.

2.14 Sampling from the distribution

The final step from Section 2.5 is to sample sets of input parameter values from the complete distribution. This was undertaken using the Sandia LHS code[14]; the input to this code is the joint distribution on the input parameters expressed as marginal distributions on the values for each of the parameters together with a correlation matrix between those values. This program ensures that the correlations specified between the input parameter values are reflected in the sets of input parameter values obtained. The input to this program is the marginal distribution of each parameter plus the rank correlation matrix between the different parameters.

Sections 2.7 and 2.8 described comparisons between the distributions on the elicitation variables as specified by the experts with ones derived using the fitted distributions for the target variables and the models used in COSYMA. The fitted distributions were derived using the PREJUDICE program, from the detailed distributions on the target variables available within that program. Further comparisons can be undertaken between the distributions from the earlier steps of the processing and those obtained using the sets of parameters values generated by the Sandia LHS program. In general, the fit between the distributions is less good using the sample from the LHS program than that obtained by the program used for the probabilistic inversion, PREJUDICE, reflecting the further simplifications necessary to represent the distributions as marginal distributions and rank correlations and to combine the various parts of the model. An example of this for some of the quantities in the plutonium model is given in Table 2.15. This table compares the distributions for some of the quantities as given by the experts with those reconstructed using the UNICORN program and using the LHS program. The two columns labelled "UNICORN" were obtained using 101 points on each of the marginal distributions, and 5000 and 400 samples respectively. The column labelled "lhs" was also obtained using UNICORN, but describes the distributions in terms of the nine percentiles used for the study. The column labelled "NRPB" gives distributions obtained with the PLEIADES program using 360 samples obtained from the LHS program, and corresponds to the samples for the parameters adopted in this study.

As a general rule, the probabilistic inversion process yields acceptable agreement between the original expert distributions and the those obtained using the fitted distributions on the parameter values when the number of variables is not too large, the box models roughly agree with the experts' own reasoning, and the proper elicitation variables were chosen – in some cases it became apparent after the expert elicitation was carried out that variables considered were not the most appropriate for use in the inversion process.

In cases where these conditions are not met, the disagreement between expert and distributions obtained with the fitted parameter values can be large enough to render their use discretionary. This is particularly true in the case of systemic retention of Pu, which was the most challenging mathematically. It is also true for some of the elicitation variables in the lung model, which affects the dose coefficients for all radionuclides. Thus, in the context of an overall uncertainty analysis these distributions might be judged acceptable, whereas for individual predications based on the Pu model they might be unsuitable. Given more time and effort, better distributions might be obtained in some of these cases. However, the distributions obtained here were used in this study as being the best that can be obtained at present.

2.15 Other points

One of the objectives of the study was to identify priorities for further research. Part of this study involved deriving distributions on the values of the model parameters which, when used with the models in COSYMA, would reconstruct the distributions on the elicitation variables.

The extent to which this was successful gives some indication of the robustness of the models adopted in COSYMA, the adequacy of the elicitation process with the choice of elicitation variables, and the effects of differences between models. The fitted distributions could only poorly reproduce the expert distributions for some aspects of the modelling of human metabolism, particularly the plutonium model. The methods adopted to extract uncertainty distributions on the parameter values are still being developed, and further work in this area is justified. The adequacy of the metabolic models used, particularly if they are used to represent uncertainty distributions rather than for calculations of the best estimates of retention using default parameter values, could also be examined.

2.16 References

1. Silk T J, Phipps A and Bailey M R. Effects on dose coefficients for workers of recent changes in internal dosimetry. Rad Prot Dosim 71/1 (1997)

2. US Nuclear Regulatory Commission. Severe accident risks; an assessment for five US nuclear power plants. Washington NUREG-1150 (1990)

3. Cooke R. Expert judgement study on atmospheric dispersion and deposition. Delft. TUD report 91-81 (1991)

4. R M Cooke, L H J Goossens, B C P Kraan. Probabilistic accident consequence uncertainty assessment - procedures guide using structured expert judgement. EUR 18820

5. Goossens L H J, Boardman J, Kraan B C P, Cooke R M, Jones J A, Harper F T, Young M L and Hora S C. Probabilistic accident consequence uncertainty analysis: Uncertainty assessment for deposited material and external doses. Report NUREG/CR-6526, EUR 16772, Washington, DC/USA, and Brussels-Luxembourg, (1997)

6. Goossens L.H.J., Harrison J.D, Kraan B.C.P, Cooke R.M, Harper F.T. and Hora S.C. Probabilistic accident consequence uncertainty analysis: Uncertainty assessment for internal dosimetry, Report NUREG/CR-6571, EUR 16773, Washington, DC/USA, and Brussels-Luxembourg, (1997)

7. Brenot J and Noordijk H. Food consumption. Chapter in Underlying Data for Derived Emergency Reference levels (Eds Sinnaeve J and Gerber G). EUR 12553 (1991)

8. Brown J and Jones J A. Location factors for modification of external radiation doses. Radiological Protection Bulletin 144 July 1993

9. J A. Jones, B C P Kraan, R M Cooke, L H J. Goossens, F Fischer and I Hasemann. Probabilistic accident consequence uncertainty assessment using COSYMA: Methodology and processing techniques. EUR 18827

10. Cooke R M. Parameter fitting for uncertain models: modelling uncertainty in small models. Reliability Engineering and system safety. 44 89-102 (1994)

11. Kraan B C P and Cooke R M. Post-processing techniques for the joint CEC-USNRC uncertainty analysis of accident consequence codes. Journal of Statistical Computation and Simulation 57 (1-4) 243-261, (1996)

12. Kraan B C P and Cooke R M. Uncertainty in compartmental models for hazardous materials – a case study. Journal of Hazardous Material 71 253-268 (2000)

13. Cooke R M. UNICORN: Methods and code for uncertainty analysis. AEA Technology Warrington, UK (1995)

14. Iman R L and Shortencarier M J. A Fortran 77 program and user's guide for the generation of Latin Hypercube and random samples for use with computer models. Sandia National Labs, Albuquerque, SAND 83-2365, NUREG/CR-3624 (1984)

Table 2.1 Summary of uncertain input parameters (target variables) for internal dosimetry, and the quantities from which they were derived

PLEIADES input parameters (ie target variables)	Distributions obtained from[(a)]
Breathing rate	1
Fraction of amount inhaled deposited in different regions of the lung	2
Clearance rates from lung, parameters not depending on radionuclide	3
Parameters for the GI Tract model which are radionuclide independent	Project staff
Model parameters for Sr: clearance from lung to blood f_1 factor parameters for uptake to and clearance from bone and liver	 2, 3, 4 for Sr 5 for Sr 6 and 7 for Sr, and project staff
Model parameters for Ru: clearance from lung to blood f_1 factor parameters for uptake to and clearance from whole body	 2, 3, 4 for Ru Project staff 9 for Ru
Model parameters for Te: clearance from lung to blood f_1 factor parameters for uptake to and clearance from bone and liver parameters for uptake to and clearance from thyroid	 2, 3, 4 for Te Project staff 6 and 7 for Te Project staff
Model parameters for I: clearance from lung to blood f_1 factor parameters for uptake to and clearance from thyroid	 2, 3, 4 for I 5 for I 10
Model parameters for Cs: clearance from lung to blood f_1 factor parameters for uptake to and clearance from whole body	 2, 3, 4 for Cs Project staff 9 for Cs
Model parameters for Ce: clearance from lung to blood f_1 factor parameters for uptake to and clearance from bone and liver	 2, 3, 4 for Ce Project staff 6 and 7 for Ce
Model parameters for Pu: clearance from lung to blood f_1 factor parameters for uptake to and clearance from bone and liver	2, 3, 4 for Pu 5 for Pu 6 to 8 for Pu
Dose coefficients for inhalation of Na, Mn, Fe, Co, Zn, Rb, Y, Zr, Nb, Mo, Rh, Sb, Ba, La, Pr, Nd, W, Np, Am, Cm	Project Staff
Dose coefficients for ingestion of Mn, Co, Zn, Ag	Project staff
Location factors for doses indoors, in cars and in normal living	4, 5[b]
consumption rates of grain products, potatoes, root vegetables, milk, cows' meat, cows' liver, sheep meat, sheep liver and pork	Project staff

Notes:
a The numbers in this column refer to the identifier in column 1 of Table 2.3
b Location factors for inhalation for normal living and for sheltering were obtained from items 4 and 5 given in Table 2.4

Table 2.2 Summary of uncertain input parameters (target variables) for external dosimetry, and the quantities from which they were derived

Input parameter (ie target variables)	Distributions obtained from[(a)]
Modifying factors for external γ dose from deposited material, to apply to the COSYMA data libraries, for ^{95}Zr, ^{106}Ru, ^{131}I and ^{137}Cs, for a series of times	2
Location factors for external γ dose from deposited material, for normal living, sheltering, in cars and outdoors	3, 5
Location factors for external γ dose from the cloud, for normal living, sheltering and outdoors	Project staff
Retention time of material on skin	Project staff

Note:

a The numbers in this column refer to the identifier in column 1 of Table 2.4.

Table 2.3 Summary of elicitation variables for which distributions were obtained from expert judgement for dose coefficients

Identifier	Quantities for which distributions were obtained (ie elicitation variables)
1	Breathing rate
2	Fraction of amount inhaled deposited in different regions of the lung
3	Fraction of initial lung deposit retained in different regions of the lung, at times after intake, for different ages
4	Fraction of initial lung deposit absorbed into blood, at times after intake, for Sr, Ru, I, Te, Cs, Ce and Pu, for different ages
5	Fraction of ingested material absorbed into blood, for different ages, for Sr, I, Cs and Pu
6	Fraction of material reaching blood that is retained in liver and skeleton at different times, for Sr, Te, Ce and Pu
7	Fraction of material retained in liver and skeleton at different times, for Sr, Te, Ce and Pu, for different ages
8	Retention of Pu in different parts of bone, at different times, for different ages
9	Total amount of Ru and Cs remaining in the body at different times, for different ages
10	Fraction of I retained in the thyroid at different times, for different ages
11	Dose coefficients for selected organs and radionuclides, for different ages
12	Number of cancer deaths from a specified intake of ^{90}Sr and ^{239}Pu

Table 2.4 Summary of elicitation variables which were obtained from expert judgement for external dosimetric quantities

Identifier	Quantities for which distributions were obtained (ie elicitation variables)
1	γ dose rates in air (Gy s^{-1}) above a lawn at a series of times following deposition of ^{95}Zr, ^{106}Ru, ^{131}I and ^{137}Cs in dry, wet and unspecified conditions.
2a	Effective dose rate (Sv s^{-1}) for an adult at a series of times and effective dose integrated to each time following deposition of ^{95}Zr, ^{106}Ru, ^{131}I and ^{137}Cs in dry, wet and unspecified conditions, in a typical urban area.
2b	Effective dose and dose rate following deposition of ^{137}Cs in dry, wet and unspecified conditions, in a rural area.
2c	Other radionuclides which behave in the same way as those considered in item 2a.
3	Location factors[(a)] for γ dose from deposited material at 3 times after deposition of ^{95}Zr, ^{106}Ru, ^{131}I, ^{137}Cs and ^{144}Ce, in dry, wet and unspecified conditions, for 5 building types, cars and buses.
4	Ratio of time integrated air concentrations indoors and outdoors for 1 and 10 µm particles, elemental iodine and methyl iodide, for normal ventilation and with doors and windows closed.
5	Fraction of population in different groups and the behaviour patterns of groups of people.

Note
a Location factor is the ratio of dose in the location of interest to that in a reference location

Table 2.5 Distributions on the input parameters to COSYMA and the PLEIADES dose model

Uncertain Parameter	**Units**	**Default**	**Percentiles of the distribution on the input parameter**								
			Minimum	**5%**	**20%**	**35%**	**50%**	**65%**	**80%**	**95%**	**Maximum**
Parameters of the lung model											
Total initial deposition in respiratory tract		0.486	1.18 10^{-1}	2.17 10^{-1}	3.02 10^{-1}	3.88 10^{-1}	4.73 10^{-1}	5.60 10^{-1}	6.46 10^{-1}	7.33 10^{-1}	8.62 10^{-1}
Initial deposition in extrathoracic region		0.698	4.60 10^{-3}	1.26 10^{-1}	2.86 10^{-1}	4.47 10^{-1}	6.07 10^{-1}	6.89 10^{-1}	7.70 10^{-1}	8.52 10^{-1}	9.81 10^{-1}
Initial deposition in tracheobronchial region		0.221	4.40 10^{-2}	1.14 10^{-1}	1.51 10^{-1}	1.88 10^{-1}	2.25 10^{-1}	3.46 10^{-1}	4.66 10^{-1}	5.86 10^{-1}	7.16 10^{-1}
Initial deposition in extrathoracic region beyond the nasal region		0.56	4.40 10^{-2}	8.93 10^{-2}	1.70 10^{-1}	0.3	0.43	0.56	0.66	0.76	0.86
Transfer coefficient: ET1region to environment	d^{-1}	1.0	0.142	0.35	0.58	0.78	0.99	1.26	1.68	2.77	6.87
Transfer coefficient: pulmonary 1 region to the tracheobronchial region (rapid clearance rate)	d^{-1}	0.02	7.62 10^{-4}	3.28 10^{-2}	1.48 10^{-1}	2.03 10^{-1}	2.71 10^{-1}	5.45 10^{-1}	1.28	7.53	1.65 10^{1}
Transfer coefficient: pulmonary 2 region to the tracheobronchial region (intermediate clearance rate)	d^{-1}	1.0 10^{-3}	6.55 10^{-8}	8.87 10^{-7}	3.56 10^{-6}	9.41 10^{-6}	4.96 10^{-5}	1.76 10^{-3}	3.24 10^{-1}	1.96	5.08
Transfer coefficient: pulmonary 3 region to the tracheobronchial region (slow clearance rate)	d^{-1}	1.0 10^{-4}	1.10 10^{-7}	2.96 10^{-6}	3.04 10^{-5}	6.14 10^{-5}	9.22 10^{-5}	1.24 10^{-4}	1.56 10^{-4}	3.43 10^{-4}	5.26 10^{-4}
Transfer coefficient: pulmonary 3 region to the tracheobronchial region (slow clearance rate)	d^{-1}	2.0 10^{-5}	5.88 10^{-6}	1.05 10^{-5}	1.45 10^{-5}	1.75 10^{-5}	2.04 10^{-5}	2.38 10^{-5}	2.86 10^{-5}	3.95 10^{-5}	7.07 10^{-5}
Fast transfer coefficient: bronchial to extrathoracic regions	d^{-1}	-	3.92 10^{-7}	2.01 10^{-5}	2.56 10^{-4}	1.76 10^{-2}	1.39 10^{-1}	3.38 10^{-1}	5.78 10^{-1}	1.14	2.67
Slow transfer coefficient: bronchial to extrathoracic regions	d^{-1}	-	4.61 10^{-3}	1.20 10^{-1}	7.23 10^{-1}	1.1	1.55	1.65	2.19	2.194	3.67 10^{1}
Transfer coefficient: extrathoracic 2 to stomach	d^{-1}	100	5.23 10^{-6}	9.68 10^{-5}	1.76 10^{-3}	1.16 10^{-2}	8.29 10^{-2}	8.84 10^{-1}	5.66	6.12 10^{1}	4.04 10^{2}
Breathing rate	$m^3\ d^{-1}$	23	6	8.3	9.96	1.16 10^{1}	1.33 10^{1}	1.67 10^{1}	2.01 10^{1}	2.35 10^{1}	3.00 10^{1}
Parameters of the GI tract model											
Transfer coefficient: stomach to small intestine	d^{-1}	24	1.08 10^{1}	16.20	20.30	23.1	25.7	28.7	32.6	40.30	6.12 10^{1}
Transfer coefficient: small intestine to U.L.I.	d^{-1}	6	2.31	3.61	4.62	5.32	5.99	6.75	7.77	9.95	15.54
Transfer coefficient: U.L.I. to L.L.I.	d^{-1}	1.8	6.80 10^{-1}	1.07	1.38	1.59	1.80	2.03	2.35	3.02	4.76
Transfer coefficient: L.L.I. to Faeces	d^{-1}	1.0	3.21 10^{-1}	0.55	7.34	0.87	1.00	1.15	1.36	1.83	3.12
Parameters of the Strontium model											
Transfer coefficient for Strontium: any lung compartment to blood	d^{-1}	10	1.63 10^{-3}	2.50 10^{-2}	3.22 10^{-1}	6.63 10^{-1}	2.35	9.66	2.06 10^{1}	3.30 10^{1}	6.20 10^{1}
Transfer coefficient for Strontium: any lung compartment to transformed state in lung	d^{-1}	90	1.00 10^{-1}	9.34 10^{-1}	2.08	4.35	6.38	1.33 10^{1}	2.77 10^{1}	3.54 10^{1}	3.86 10^{1}

Uncertain Parameter	Units	Default	Percentiles of the distribution on the input parameter								
			Minimum	5%	20%	35%	50%	65%	80%	95%	Maximum
Transfer coefficient for Strontium: transformed state in lung to blood	d^{-1}	$5.0\ 10^{-3}$	$1.30\ 10^{-6}$	$1.08\ 10^{-5}$	$4.50\ 10^{-5}$	$6.77\ 10^{-5}$	$9.20\ 10^{-5}$	$1.16\ 10^{-4}$	$1.44\ 10^{-4}$	$1.69\ 10^{-4}$	$2.81\ 10^{-4}$
Strontium: f1-factor		-	$1.00\ 10^{-14}$	$8.76\ 10^{-2}$	$1.39\ 10^{-1}$	$1.91\ 10^{-1}$	$2.42\ 10^{-1}$	$3.70\ 10^{-1}$	$4.98\ 10^{-1}$	$6.27\ 10^{-1}$	$8.75\ 10^{-1}$
Transfer coefficient for Strontium: blood to liver		-	$4.98\ 10^{-7}$	$7.70\ 10^{-4}$	$1.63\ 10^{-3}$	$3.40\ 10^{-3}$	$9.57\ 10^{-3}$	$3.17\ 10^{-2}$	$5.15\ 10^{-2}$	$7.25\ 10^{-2}$	1.82
Transfer coefficient for Strontium: blood to cortical bone		-	$2.37\ 10^{-6}$	$6.89\ 10^{-2}$	$2.15\ 10^{-1}$	$2.17\ 10^{-1}$	$2.18\ 10^{-1}$	$4.15\ 10^{-1}$	$5.82\ 10^{-1}$	$6.97\ 10^{-1}$	$8.56\ 10^{-1}$
Strontium: ratio of uptake to trabecular/cortical bone		-	$3.12\ 10^{-1}$	0.56	0.78	0.94	1.09	1.28	1.54	2.13	3.82
Transfer coefficient for Strontium: blood to U.L.I. (faeces)		-	$5.58\ 10^{-6}$	$5.54\ 10^{-2}$	$1.63\ 10^{-1}$	$1.80\ 10^{-1}$	$2.68\ 10^{-1}$	$2.71\ 10^{-1}$	$2.72\ 10^{-1}$	$3.53\ 10^{-1}$	$4.35\ 10^{-1}$
Transfer coefficient for Strontium: trabecular bone to U.L.I. (faeces)		-	$8.81\ 10^{-7}$	$1.45\ 10^{-5}$	$3.11\ 10^{-5}$	$7.51\ 10^{-5}$	$2.74\ 10^{-2}$	$4.97\ 10^{-2}$	$8.40\ 10^{-2}$	$1.22\ 10^{-1}$	$6.49\ 10^{-1}$
Transfer coefficient for Strontium: Cortical bone to U.L.I. (faeces)		-	$2.28\ 10^{-6}$	$2.63\ 10^{-5}$	$3.40\ 10^{-5}$	$4.01\ 10^{-5}$	$5.48\ 10^{-5}$	$1.75\ 10^{-2}$	$2.66\ 10^{-2}$	$7.41\ 10^{-2}$	$5.29\ 10^{-1}$
Transfer coefficient for Strontium: liver to U.L.I. (faeces)		-	$8.34\ 10^{-7}$	$7.33\ 10^{-6}$	$2.34\ 10^{-5}$	$3.89\ 10^{-5}$	$4.09\ 10^{-5}$	$4.16\ 10^{-5}$	$5.40\ 10^{-5}$	$9.58\ 10^{-5}$	$1.59\ 10^{-1}$
Parameters of the ruthenium model											
Transfer coefficient for Ruthenium: any lung compartment to blood	d^{-1}	10	$7.43\ 10^{-4}$	$1.76\ 10^{-3}$	$1.65\ 10^{-2}$	$4.24\ 10^{-2}$	$1.06\ 10^{-1}$	1.3	2.65	4.75	6.26
Transfer coefficient for Ruthenium: any lung compartment to transformed state in lung	d^{-1}	90	$1.71\ 10^{-2}$	$2.87\ 10^{-2}$	1.93	2.61	6.36	8.6	$1.28\ 10^{1}$	$1.58\ 10^{1}$	$1.67\ 10^{1}$
Transfer coefficient for Ruthenium: any lung compartment to transformed state in lung	d^{-1}	$5.0\ 10^{-3}$	$1.21\ 10^{-7}$	$5.99\ 10^{-7}$	$4.36\ 10^{-6}$	$9.30\ 10^{-6}$	$1.81\ 10^{-5}$	$4.89\ 10^{-5}$	$9.30\ 10^{-5}$	$1.70\ 10^{-4}$	$2.80\ 10^{-4}$
Ruthenium: f1 factor		$5.0\ 10^{-2}$	$2.50\ 10^{-3}$	$5.00\ 10^{-3}$	$1.67\ 10^{-2}$	$2.83\ 10^{-2}$	$4.00\ 10^{-2}$	$6.00\ 10^{-2}$	$8.00\ 10^{-2}$	$1.00\ 10^{-1}$	$2.00\ 10^{-1}$
Transfer coefficient for Ruthenium: blood to whole body		-	$8.85\ 10^{-2}$	$3.70\ 10^{-1}$	1.04	1.71	2.54	3.51	7.15	$2.73\ 10^{1}$	$3.32\ 10^{1}$
Transfer coefficient for Ruthenium: blood to whole body 2 compartment		-	$6.18\ 10^{-3}$	$4.79\ 10^{-1}$	1.15	1.71	2.79	4.35	8.74	$2.74\ 10^{1}$	$3.38\ 10^{1}$
Transfer coefficient for Ruthenium: blood to U.L.I.	d^{-1}	$6.9\ 10^{-2}$	$4.53\ 10^{-8}$	$9.53\ 10^{-7}$	$4.04\ 10^{-6}$	$5.67\ 10^{-4}$	$9.19\ 10^{-2}$	$2.74\ 10^{-1}$	$6.62\ 10^{-1}$	2.22	$1.02\ 10^{1}$
Transfer coefficient for Ruthenium: whole body to U.L.I.		-	$1.40\ 10^{-6}$	$6.49\ 10^{-5}$	$2.05\ 10^{-4}$	$6.01\ 10^{-4}$	$3.75\ 10^{-3}$	$1.32\ 10^{-2}$	$2.44\ 10^{-2}$	$4.50\ 10^{-2}$	$2.23\ 10^{-1}$
Transfer coefficient for Ruthenium: whole body 2 compartment to U.L.I.		-	$1.33\ 10^{-6}$	$6.97\ 10^{-5}$	$1.61\ 10^{-4}$	$3.03\ 10^{-4}$	$8.19\ 10^{-4}$	$6.49\ 10^{-3}$	$2.01\ 10^{-2}$	$4.60\ 10^{-2}$	$2.86\ 10^{-1}$
Parameters of the tellurium model											
Transfer coefficient for Tellurium: any lung compartment to blood	d^{-1}	10	$3.52\ 10^{-3}$	$3.60\ 10^{-3}$	$1.58\ 10^{-1}$	$4.96\ 10^{-1}$	$8.47\ 10^{-1}$	$1.03\ 10^{1}$	$1.80\ 10^{1}$	$2.84\ 10^{1}$	$4.05\ 10^{1}$
Transfer coefficient for Tellurium: any lung compartment to transformed state in lung	d^{-1}	90	$2.47\ 10^{-1}$	1.23	2.97	3.51	3.95	4.04	$1.23\ 10^{1}$	$1.96\ 10^{1}$	$2.15\ 10^{1}$

Uncertain Parameter	Units	Default	Percentiles of the distribution on the input parameter								
			Minimum	**5%**	**20%**	**35%**	**50%**	**65%**	**80%**	**95%**	**Maximum**
Transfer coefficient for Tellurium: transformed state in lung to blood	d^{-1}	5.0 10^{-3}	6.00 10^{-8}	8.88 10^{-7}	1.29 10^{-5}	3.66 10^{-5}	6.17 10^{-5}	8.52 10^{-5}	1.79 10^{-4}	3.17 10^{-4}	6.61 10^{-4}
Tellurium: f1 factor		0.3	2.50 10^{-2}	5.00 10^{-2}	133 10^{-1}	2.17 10^{-1}	3.00 10^{-1}	4.00 10^{-1}	5.00 10^{-1}	6.00 10^{-1}	1.00
Transfer coefficient for Tellurium: blood to bone	d^{-1}	0.108	1.27 10^{-4}	1.76 10^{-2}	1.20 10^{-1}	1.86 10^{-1}	5.50 10^{-1}	1.67	5.39	8.54	2.00 10^{1}
Transfer coefficient for Tellurium: blood to thyroid	d^{-1}	1.7 10^{-3}	5.10 10^{-3}	3.36 10^{-2}	1.44 10^{-1}	3.32 10^{-1}	6.77 10^{-1}	1.38	11.15	18.66	19.48
Transfer coefficient for Tellurium: blood to liver		-	5.40 10^{-4}	5.50 10^{-3}	2.37 10^{-2}	4.66 10^{-2}	9.66 10^{-2}	2.23 10^{-1}	9.71	13.69	14.09
Transfer coefficient for Tellurium: blood to U.L.I.	d^{-1}	8.7 10^{-2}	3.93 10^{-4}	3.92 10^{-3}	1.71 10^{-2}	5.04 10^{-2}	1.09 10^{-1}	2.15 10^{-1}	3.99 10^{-1}	2.21	3.03
Transfer coefficient for Tellurium: bone to U.L.I.	d^{-1}	1.4 10^{-5}	9.84 10^{-5}	3.00 10^{-4}	9.72 10^{-4}	3.52 10^{-3}	6.75 10^{-3}	1.02 10^{-2}	2.60 10^{-2}	9.38 10^{-2}	1.31 10^{-1}
Transfer coefficient for Tellurium: thyroid to U.L.I.	d^{-1}	6.9 10^{-3}	4.76 10^{-6}	5.52 10^{-4}	2.78 10^{-3}	5.36 10^{-3}	8.02 10^{-3}	1.08 10^{-2}	1.35 10^{-2}	2.38 10^{-2}	1.47 10^{-1}
Transfer coefficient for Tellurium: liver to U.L.I.		-	3.96 10^{-5}	8.12 10^{-5}	1.54 10^{-3}	3.53 10^{-3}	5.61 10^{-3}	9.66 10^{-3}	1.18 10^{-2}	5.79 10^{-2}	2.16
Parameters of the Iodine model											
Transfer coefficient for iodine: any lung compartment to blood	d^{-1}	100	1.56 10^{-1}	6.65 10^{-1}	3.74	2.41 10^{1}	3.34 10^{1}	4.25 10^{1}	5.56 10^{1}	6.83 10^{1}	1.10 10^{2}
Transfer coefficient for iodine: any lung compartment to transformed state in lung	d^{-1}	0	2.69 10^{-2}	4.61 10^{-1}	1.89	3.31	4.65	5.69	1.07 10^{1}	1.27 10^{1}	1.31 10^{1}
Transfer coefficient for iodine: transformed state in lung to blood	d^{-1}	-	1.54 10^{-7}	6.84 10^{-7}	3.23 10^{-6}	5.49 10^{-6}	8.49 10^{-6}	1.29 10^{-5}	1.90 10^{-5}	9.86 10^{-4}	1.82 10^{-2}
Iodine: f1-factor		1.0	7.80 10^{-1}	8.22 10^{-1}	8.68 10^{-1}	9.14 10^{-1}	9.61 10^{-1}	9.74 10^{-1}	9.87 10^{-1}	9.98 10^{-1}	1
Transfer coefficient for Iodine: blood to thyroid		-	4.00 10^{-2}	6.68 10^{-1}	1.32	1.7	2.2	2.28	2.84	4.22	8.92
Transfer coefficient for Iodine: blood to Bladder		-	1.42 10^{-1}	1.18	2.08	2.92	4.89	7.0858	7.16	7.7	1.07 10^{1}
Transfer coefficient for Iodine: thyroid to U.L.I		-	5.81 10^{-6}	1.45 10^{-4}	5.13 10^{-4}	1.20 10^{-3}	2.00 10^{-3}	2.61 10^{-3}	3.39 10^{-3}	4.25 10^{-3}	6.52 10^{-3}
Parameters of the Caesium model											
Transfer coefficient for Caesium: any lung compartment to blood	d^{-1}	100	4.62 10^{-3}	5.14 10^{-1}	4.68	6.49	8.81	1.64 10^{1}	1.97 10^{1}	2.79 10^{1}	5.95 10^{1}
Transfer coefficient for Caesium: any lung compartment to transformed state in lung	d^{-1}	0	2.14 10^{-1}	1.23	3.72	4.24	5.12	6.01	7.28	8.27	8.57
Transfer coefficient for Caesium: transformed state in lung to blood	d^{-1}	-	1.26 10^{-7}	1.21 10^{-6}	6.45 10^{-6}	9.83 10^{-6}	1.50 10^{-5}	1.82 10^{-5}	2.20 10^{-5}	2.98 10^{-4}	1.22 10^{-3}
Caesium: f1-factor		1.0	3.40 10^{-1}	5.43 10^{-1}	6.59 10^{-1}	7.76 10^{-1}	8.93 10^{-1}	9.28 10^{-1}	9.64 10^{-1}	9.99 10^{-1}	1
Transfer coefficient for Caesium: blood to whole body	d^{-1}	2.5	7.34 10^{-4}	4.26 10^{-2}	4.38 10^{-1}	4.61 10^{-1}	6.06 10^{-1}	1.56	2.08	7.33	2.10 10^{1}
Transfer coefficient for Caesium: blood to whole body 2 compartment	d^{-1}	0.277	1.53 10^{-2}	2.64 10^{-1}	1	1.94	2.8	4.12	4.15	4.19	7.04

Uncertain Parameter	Units	Default	Percentiles of the distribution on the input parameter								
			Minimum	**5%**	**20%**	**35%**	**50%**	**65%**	**80%**	**95%**	**Maximum**
Transfer coefficient for Caesium: whole body to U.L.I.	d^{-1}	$1.3\ 10^{-3}$	$3.02\ 10^{-4}$	$3.04\ 10^{-4}$	$3.54\ 10^{-4}$	$8.20\ 10^{-4}$	$1.17\ 10^{-3}$	$1.22\ 10^{-3}$	$2.22\ 10^{-3}$	$2.34\ 10^{-3}$	$3.30\ 10^{-3}$
Transfer coefficient for Caesium: whole body 2 compartment to U.L.I	d^{-1}	$1.1\ 10^{-5}$	$1.09\ 10^{-5}$	$7.82\ 10^{-5}$	$2.51\ 10^{-3}$	$3.29\ 10^{-3}$	$7.83\ 10^{-3}$	$8.45\ 10^{-3}$	$1.38\ 10^{-2}$	$2.19\ 10^{-2}$	$3.39\ 10^{-2}$
Parameters of the Cerium model											
Transfer coefficient for Cerium: any lung compartment to blood	d^{-1}	0.1	$2.64\ 10^{-7}$	$8.82\ 10^{-7}$	$9.81\ 10^{-4}$	$1.58\ 10^{-3}$	$4.49\ 10^{-3}$	$3.95\ 10^{-1}$	$4.34\ 10^{-1}$	2.02	4.1
Transfer coefficient for Cerium: any lung compartment to transformed state in lung	d^{-1}	100	$5.77\ 10^{-7}$	$1.24\ 10^{-3}$	$9.17\ 10^{-3}$	$3.42\ 10^{-2}$	$1.68\ 10^{-1}$	3.68	5.35	7.16	$1.66\ 10^{1}$
Transfer coefficient for Cerium: transformed state in lung to blood	d^{-1}	$1.0\ 10^{-4}$	$6.86\ 10^{-8}$	$1.70\ 10^{-6}$	$7.21\ 10^{-6}$	$1.43\ 10^{-5}$	$2.20\ 10^{-5}$	$4.79\ 10^{-5}$	$7.18\ 10^{-5}$	$8.05\ 10^{-5}$	$9.54\ 10^{-5}$
Cerium: f1 factor		$5.0\ 10^{-4}$	$5.00\ 10^{-5}$	$1.00\ 10^{-4}$	$1.67\ 10^{-4}$	$2.33\ 10^{-4}$	$3.00\ 10^{-4}$	$5.33\ 10^{-4}$	$7.70\ 10^{-4}$	$1.00\ 10^{-3}$	$2.00\ 10^{-3}$
Transfer coefficient for Cerium: blood to bone	d^{-1}	0.83	$5.76\ 10^{-2}$	$1.12\ 10^{-1}$	$2.42\ 10^{-1}$	$4.11\ 10^{-1}$	$6.51\ 10^{-1}$	$7.87\ 10^{-1}$	1.7	8.35	8.67
Transfer coefficient for Cerium: blood to liver		-	$1.93\ 10^{-2}$	$1.22\ 10^{-1}$	$4.53\ 10^{-1}$	$7.60\ 10^{-1}$	1.12	1.35	1.86	6.27	7.73
Transfer coefficient for Cerium: blood to U.L.I.		-	$9.35\ 10^{-5}$	$2.09\ 10^{-2}$	$1.24\ 10^{-1}$	$2.49\ 10^{-1}$	$3.39\ 10^{-1}$	$8.31\ 10^{-1}$	$9.80\ 10^{-1}$	1.34	1.7
Transfer coefficient for Cerium: bone to U.L.I.	d^{-1}	$1.78\ 10^{-4}$	$2.62\ 10^{-7}$	$5.65\ 10^{-6}$	$2.83\ 10^{-5}$	$5.78\ 10^{-5}$	$8.46\ 10^{-5}$	$1.32\ 10^{-4}$	$1.94\ 10^{-4}$	$4.07\ 10^{-4}$	$5.38\ 10^{-3}$
Transfer coefficient for Cerium: liver to U.L.I		-	$4.34\ 10^{-7}$	$3.44\ 10^{-6}$	$3.83\ 10^{-5}$	$7.93\ 10^{-5}$	$1.25\ 10^{-4}$	$1.81\ 10^{-4}$	$2.30\ 10^{-4}$	$6.05\ 10^{-4}$	$5.89\ 10^{-3}$
Parameters of the Plutonium model											
Transfer coefficient for Plutonium: any lung compartment to blood	d^{-1}	10	$8.98\ 10^{-5}$	$7.58\ 10^{-4}$	$2.06\ 10^{-2}$	$2.62\ 10^{-2}$	$4.99\ 10^{-2}$	1.21	1.28	1.68	$1.02\ 10^{1}$
Transfer coefficient for Plutonium: any lung compartment to transformed state in lung	d^{-1}	90	$8.31\ 10^{-2}$	$5.52\ 10^{-1}$	$2.74\ 10^{1}$	$2.74\ 10^{1}$	$2.74\ 10^{1}$	$2.74\ 10^{1}$	$2.74\ 10^{1}$	$2.74\ 10^{1}$	$4.05\ 10^{1}$
Transfer coefficient for Plutonium: transformed state in lung to blood	d^{-1}	$5.0\ 10^{-3}$	$4.80\ 10^{-7}$	$1.41\ 10^{-6}$	$7.98\ 10^{-6}$	$9.74\ 10^{-6}$	$1.16\ 10^{-5}$	$2.11\ 10^{-5}$	$4.40\ 10^{-5}$	$5.18\ 10^{-5}$	$8.99\ 10^{-4}$
Plutonium: f1 factor for plutonium biologically incorporated		$5.0\ 10^{-4}$	$1.00\ 10^{-13}$	$1.70\ 10^{-7}$	$3.95\ 10^{-6}$	$7.73\ 10^{-6}$	$1.15\ 10^{-5}$	$1.01\ 10^{-4}$	$1.91\ 10^{-4}$	$2.81\ 10^{-4}$	$5.50\ 10^{-4}$
Transfer coefficient for Plutonium: R.B.M. to U.L.I.		-	$1.95\ 10^{-4}$	$1.63\ 10^{-3}$	$4.31\ 10^{-3}$	$7.13\ 10^{-3}$	$1.05\ 10^{-2}$	$1.40\ 10^{-2}$	$4.96\ 10^{-2}$	$4.39\ 10^{-1}$	1.42
Transfer coefficient for Plutonium: cortical marrow to U.L.I.		-	$1.29\ 10^{-4}$	$2.31\ 10^{-3}$	$7.17\ 10^{-3}$	$1.18\ 10^{-2}$	$3.46\ 10^{-2}$	$7.21\ 10^{-2}$	$1.13\ 10^{-1}$	$3.33\ 10^{-1}$	2.43
Transfer coefficient for Plutonium: blood to trabecular surface		-	$2.38\ 10^{-2}$	$6.64\ 10^{-2}$	$9.25\ 10^{-2}$	$2.06\ 10^{-1}$	$3.37\ 10^{-1}$	$5.67\ 10^{-1}$	$7.82\ 10^{-1}$	1.21	5.35
Transfer coefficient for Plutonium: blood to cortical surface		-	$1.06\ 10^{-2}$	$1.09\ 10^{-1}$	$2.73\ 10^{-1}$	$4.58\ 10^{-1}$	$4.99\ 10^{-1}$	$6.54\ 10^{-1}$	$8.59\ 10^{-1}$	1.59	4.57
Transfer coefficient for Plutonium: trabecular surface to trabecular volume	d^{-1}	$2.47\ 10^{-4}$	$1.73\ 10^{-7}$	$1.10\ 10^{-6}$	$5.98\ 10^{-6}$	$1.19\ 10^{-5}$	$3.50\ 10^{-5}$	$8.28\ 10^{-5}$	$1.62\ 10^{-4}$	$3.57\ 10^{-3}$	1.5

Uncertain Parameter	Units	Default	Percentiles of the distribution on the input parameter								
			Minimum	**5%**	**20%**	**35%**	**50%**	**65%**	**80%**	**95%**	**Maximum**
Transfer coefficient for Plutonium: cortical surface to cortical volume	d^{-1}	$4.11\ 10^{-5}$	$2.20\ 10^{-7}$	$1.62\ 10^{-6}$	$9.01\ 10^{-6}$	$1.61\ 10^{-5}$	$2.67\ 10^{-5}$	$1.11\ 10^{-4}$	$1.10\ 10^{-3}$	$7.64\ 10^{-3}$	2.41
Transfer coefficient for Plutonium: trabecular surface to R.B.M.	d^{-1}	$4.93\ 10^{-4}$	$1.36\ 10^{-7}$	$4.51\ 10^{-6}$	$2.89\ 10^{-5}$	$1.08\ 10^{-4}$	$1.60\ 10^{-4}$	$2.30\ 10^{-4}$	$1.03\ 10^{-3}$	$7.35\ 10^{-3}$	1.65
Transfer coefficient for Plutonium: trabecular volume to R.B.M.	d^{-1}	$4.93\ 10^{-4}$	$3.94\ 10^{-5}$	$1.32\ 10^{-3}$	$4.79\ 10^{-3}$	$8.23\ 10^{-3}$	$1.17\ 10^{-2}$	$3.49\ 10^{-2}$	$8.35\ 10^{-2}$	$2.89\ 10^{-1}$	1.61
Transfer coefficient for Plutonium: cortical surface to cortical marrow	d^{-1}	$8.21\ 10^{-5}$	$5.59\ 10^{-8}$	$9.12\ 10^{-7}$	$2.78\ 10^{-6}$	$7.14\ 10^{-6}$	$1.28\ 10^{-5}$	$3.86\ 10^{-5}$	$1.89\ 10^{-4}$	$3.19\ 10^{-3}$	1.58
Transfer coefficient for Plutonium: cortical volume to cortical marrow	d^{-1}	$8.21\ 10^{-5}$	$2.41\ 10^{-5}$	$7.87\ 10^{-4}$	$3.15\ 10^{-3}$	$6.35\ 10^{-3}$	$9.24\ 10^{-3}$	$1.23\ 10^{-2}$	$3.34\ 10^{-2}$	$6.24\ 10^{-1}$	1.57
Transfer coefficient for Plutonium: blood to liver		-	$5.11\ 10^{-4}$	$3.94\ 10^{-2}$	$2.23\ 10^{-1}$	$4.36\ 10^{-1}$	$6.26\ 10^{-1}$	$8.33\ 10^{-1}$	1.15	1.77	3.12
Transfer coefficient for Plutonium: liver to U.L.I.		-	$1.88\ 10^{-7}$	$1.28\ 10^{-6}$	$6.71\ 10^{-6}$	$1.26\ 10^{-5}$	$3.80\ 10^{-5}$	$9.58\ 10^{-5}$	$7.63\ 10^{-4}$	$1.26\ 10^{-2}$	$5.93\ 10^{-1}$
Transfer coefficient for Plutonium: blood to U.L.I.		-	$2.95\ 10^{-4}$	$4.49\ 10^{-3}$	$2.30\ 10^{-2}$	$4.50\ 10^{-2}$	$1.67\ 10^{-1}$	$3.44\ 10^{-1}$	1.31	1.44	$1.40\ 10^{1}$
Transfer coefficient for bladder to urine	d^{-1}	12	4.278	6.93	9.06	10.55	12.00	13.65	15.89	20.78	33.66
Parameters for dose coefficients of radionuclides not considered by the experts											
Na-Inhalation dose coefficient		1.0	0.3564	0.59	0.77	0.89	1.01	1.15	1.34	1.74	2.806
Mn-Ingestion dose coefficient		1.0	0.115	0.32	0.55	0.76	1.00	1.31	1.80	3.16	8.6938
Mn-Inhalation dose coefficient		1.0	0.115	0.32	0.55	0.76	1.00	1.31	1.80	3.16	8.6938
Fe-Inhalation dose coefficient		1.0	0.3564	0.59	0.77	0.89	1.01	1.15	1.34	1.74	2.806
Co-Ingestion dose coefficient		1.0	0.115	0.32	0.55	0.76	1.00	1.31	1.80	3.16	8.6938
Co-Inhalation dose coefficient		1.0	0.115	0.32	0.55	0.76	1.00	1.31	1.80	3.16	8.6938
Zn-Ingestion dose coefficient		1.0	0.115	0.32	0.55	0.76	1.00	1.31	1.80	3.16	8.6938
Zn-Inhalation dose coefficient		1.0	0.115	0.32	0.55	0.76	1.00	1.31	1.80	3.16	8.6938
Rb-Inhalation dose coefficient		1.0	0.115	0.32	0.55	0.76	1.00	1.31	1.80	3.16	8.6938
Y-Inhalation dose coefficient		1.0	0.0254	0.14	0.37	0.63	1.00	1.58	2.72	7.07	39.418
Zr-Inhalation dose coefficient		1.0	0.115	0.32	0.55	0.76	1.00	1.31	1.80	3.16	8.6938
Nb-Inhalation dose coefficient		1.0	0.0254	0.14	0.37	0.63	1.00	1.58	2.72	7.07	39.418
Mo-Inhalation dose coefficient		1.0	0.115	0.32	0.55	0.76	1.00	1.31	1.80	3.16	8.6938
Rh-Inhalation dose coefficient		1.0	0.0254	0.14	0.37	0.63	1.00	1.58	2.72	7.07	39.418
Ag-Ingestion dose coefficient		1.0	0.0254	0.14	0.37	0.63	1.00	1.58	2.72	7.07	39.418
Ag-Inhalation dose coefficient		1.0	0.0254	0.14	0.37	0.63	1.00	1.58	2.72	7.07	39.418

Uncertain Parameter	Units	Default	Percentiles of the distribution on the input parameter								
			Minimum	**5%**	**20%**	**35%**	**50%**	**65%**	**80%**	**95%**	**Maximum**
Sb-Inhalation dose coefficient		1.0	0.115	0.32	0.55	0.76	1.00	1.31	1.80	3.16	8.6938
Ba-Inhalation dose coefficient		1.0	0.3564	0.59	0.77	0.89	1.01	1.15	1.34	1.74	2.806
La-Inhalation dose coefficient		1.0	0.115	0.32	0.55	0.76	1.00	1.31	1.80	3.16	8.694
Pr-Inhalation dose coefficient		1.0	0.0254	0.14	0.37	0.63	1.00	1.58	2.72	7.07	39.418
Nd-Inhalation dose coefficient		1.0	0.0254	0.14	0.37	0.63	1.00	1.58	2.72	7.07	39.418
W-Inhalation dose coefficient		1.0	0.0254	0.14	0.37	0.63	1.00	1.58	2.72	7.07	39.418
Np-Inhalation dose coefficient		1.0	0.3564	0.59	0.77	0.89	1.01	1.15	1.34	1.74	2.806
Am-Inhalation dose coefficient		1.0	0.3564	0.59	0.77	0.89	1.01	1.15	1.34	1.74	2.806
Cm-Inhalation dose coefficient		1.0	0.3564	0.59	0.77	0.89	1.01	1.15	1.34	1.74	2.806
B dose to skin											
Skin residence time	d	30	0.5	2	2.17	2.33	2.5	2.67	2.84	3	15
Parameters for external γ dose from deposited material											
Zr-95 initial dose rate: deposited activity		1.0	$2.57\ 10^{-1}$	$4.10\ 10^{-1}$	$6.45\ 10^{-1}$	$8.79\ 10^{-1}$	1.11	1.95	2.79	3.63	5.8
Zr-95 dose to 10 days: deposited activity		1.0	$2.58\ 10^{-1}$	$3.66\ 10^{-1}$	$5.99\ 10^{-1}$	$8.32\ 10^{-1}$	1.06	1.84	2.61	3.38	5.39
Zr-95 dose to 30 days: deposited activity		1.0	$2.08\ 10^{-1}$	$3.27\ 10^{-1}$	$5.61\ 10^{-1}$	$7.95\ 10^{-1}$	1.03	1.71	2.39	3.06	4.81
Zr-95 dose to 100 days: deposited activity		1.0	$1.70\ 10^{-1}$	$2.62\ 10^{-1}$	$4.88\ 10^{-1}$	$7.14\ 10^{-1}$	$9.40\ 10^{-1}$	1.5	2.06	2.63	4.06
Zr-95 dose to 1 year: deposited activity		1.0	$9.35\ 10^{-2}$	$1.56\ 10^{-1}$	$3.61\ 10^{-1}$	$5.65\ 10^{-1}$	$7.70\ 10^{-1}$	1.17	1.56	1.96	3.27
Ru-106 initial dose rate: deposited activity		1.0	$8.52\ 10^{-2}$	$1.67\ 10^{-1}$	$3.93\ 10^{-1}$	$6.18\ 10^{-1}$	$8.44\ 10^{-1}$	1.62	2.4	3.17	6.21
Ru-106 dose to 30 days: deposited activity		1.0	$8.48\ 10^{-2}$	$1.66\ 10^{-1}$	$4.02\ 10^{-1}$	$6.38\ 10^{-1}$	$8.75\ 10^{-1}$	1.68	2.49	3.29	6.44
Ru-106 dose to 100 days: deposited activity		1.0	$7.40\ 10^{-2}$	$1.53\ 10^{-1}$	$3.73\ 10^{-1}$	$5.94\ 10^{-1}$	$8.14\ 10^{-1}$	1.64	2.46	3.29	6.8
Ru-106 dose to 1 year: deposited activity		1.0	$6.05\ 10^{-2}$	$1.30\ 10^{-1}$	$3.26\ 10^{-1}$	$5.21\ 10^{-1}$	$7.17\ 10^{-1}$	1.52	2.33	3.14	6.75
Ru-106 dose to 3 years: deposited activity		1.0	$5.32\ 10^{-2}$	$1.14\ 10^{-1}$	$2.88\ 10^{-1}$	$4.61\ 10^{-1}$	$6.34\ 10^{-1}$	1.38	2.12	2.86	6.13
I-131 initial dose rate: deposited activity		1.0	$1.79\ 10^{-1}$	$2.06\ 10^{-1}$	$3.75\ 10^{-1}$	$5.44\ 10^{-1}$	$7.14\ 10^{-1}$	$9.40\ 10^{-1}$	1.17	1.39	1.6
I-131 dose to 1 day: deposited activity		1.0	$1.72\ 10^{-1}$	$2.12\ 10^{-1}$	$3.85\ 10^{-1}$	$5.57\ 10^{-1}$	$7.30\ 10^{-1}$	$9.72\ 10^{-1}$	1.21	1.46	1.8
I-131 dose to 3 days: deposited activity		1.0	$1.40\ 10^{-1}$	$1.77\ 10^{-1}$	$3.58\ 10^{-1}$	$5.39\ 10^{-1}$	$7.19\ 10^{-1}$	$9.91\ 10^{-1}$	1.26	1.53	1.94
I-131 dose to 10 days: deposited activity		1.0	$1.45\ 10^{-1}$	$1.87\ 10^{-1}$	$3.75\ 10^{-1}$	$5.63\ 10^{-1}$	$7.51\ 10^{-1}$	1.02	1.3	1.57	2.02
I-131 dose to 30 days: deposited activity		1.0	$1.41\ 10^{-1}$	$1.88\ 10^{-1}$	$3.72\ 10^{-1}$	$5.56\ 10^{-1}$	$7.40\ 10^{-1}$	1.06	1.37	1.69	2.26
I-131 dose to 100 days: deposited activity		1.0	$1.40\ 10^{-1}$	$1.83\ 10^{-1}$	$3.69\ 10^{-1}$	$5.55\ 10^{-1}$	$7.41\ 10^{-1}$	1.03	1.31	1.6	2.09
Cs-137 initial dose rate: deposited activity		1.0	$1.93\ 10^{-1}$	$2.27\ 10^{-1}$	$4.31\ 10^{-1}$	$6.35\ 10^{-1}$	$8.38\ 10^{-1}$	1.06	1.28	1.5	1.76

Uncertain Parameter	Units	Default	Percentiles of the distribution on the input parameter								
			Minimum	**5%**	**20%**	**35%**	**50%**	**65%**	**80%**	**95%**	**Maximum**
Cs-137 dose to 100 days: deposited activity		1.0	1.71 10^{-1}	2.01 10^{-1}	3.95 10^{-1}	5.89 10^{-1}	7.83 10^{-1}	1.05	1.31	1.58	1.86
Cs-137 dose to 1 year: deposited activity		1.0	1.37 10^{-1}	1.64 10^{-1}	3.41 10^{-1}	5.18 10^{-1}	6.95 10^{-1}	9.42 10^{-1}	1.19	1.44	1.72
Cs-137 dose to 3 years: deposited activity		1.0	1.03 10^{-1}	1.34 10^{-1}	2.79 10^{-1}	4.23 10^{-1}	5.68 10^{-1}	8.77 10^{-1}	1.19	1.5	1.96
Cs-137 dose to 10 years: deposited activity		1.0	5.76 10^{-2}	8.44 10^{-2}	2.05 10^{-1}	3.26 10^{-1}	4.47 10^{-1}	8.22 10^{-1}	1.2	1.57	2.3
Cs-137 dose to 30 years: deposited activity		1.0	4.12 10^{-2}	7.20 10^{-2}	2.06 10^{-1}	3.40 10^{-1}	4.74 10^{-1}	1.09	1.71	2.33	4.07
Cs-137 dose to 100 years: deposited activity		1.0	4.35 10^{-2}	7.42 10^{-2}	2.51 10^{-1}	4.27 10^{-1}	6.04 10^{-1}	1.77	2.93	4.09	6.98
Location factors											
Location factor for normal living (NE), groundshine		0.14	4.10 10^{-2}	1.20 10^{-1}	1.69 10^{-1}	1.99 10^{-1}	2.26 10^{-1}	2.59 10^{-1}	3.09 10^{-1}	4.18 10^{-1}	7.50 10^{-1}
Location factor for sheltering (NE), groundshine		0.04	3.87 10^{-3}	4.41 10^{-2}	7.30 10^{-2}	9.69 10^{-2}	1.22 10^{-1}	1.55 10^{-1}	2.05 10^{-1}	3.27 10^{-1}	6.81 10^{-1}
Location factor for intervention dose (NE), groundshine		1.0	1	1.03	1.11	1.15	1.19	1.22	1.28	1.318	1.32
Location factor for being in cars (NE), groundshine		0.7	8.60 10^{-2}	1.00 10^{-1}	2.53 10^{-1}	3.97 10^{-1}	5.31 10^{-1}	6.69 10^{-1}	7.90 10^{-1}	9.20 10^{-1}	1.07
Location factor for norm.liv & interv.(NL), groundshine		0.14	4.12 10^{-2}	1.28 10^{-1}	1.90 10^{-1}	2.31 10^{-1}	2.64 10^{-1}	3.00 10^{-1}	3.53 10^{-1}	4.70 10^{-1}	8.22 10^{-1}
Location factor for normal living (NE&NL), cloudshine		0.16	8.41 10^{-2}	1.53 10^{-1}	1.97 10^{-1}	2.31 10^{-1}	2.78 10^{-1}	3.38 10^{-1}	4.18 10^{-1}	5.33 10^{-1}	7.84 10^{-1}
Location factor for sheltering (NE), cloudshine		0.1	4.98 10^{-2}	9.59 10^{-2}	1.27 10^{-1}	1.60 10^{-1}	2.12 10^{-1}	2.82 10^{-1}	3.68 10^{-1}	4.94 10^{-1}	7.77 10^{-1}
Location factor for intervention (NE), cloudshine		1.0	3.27 10^{-1}	7.01 10^{-1}	7.97 10^{-1}	8.40 10^{-1}	8.74 10^{-1}	9.15 10^{-1}	9.63 10^{-1}	9.99 10^{-1}	1
Location factor for normal living (NE&NL), inhalation		0.5	1.24 10^{-1}	3.09 10^{-1}	4.47 10^{-1}	5.68 10^{-1}	6.86 10^{-1}	8.49 10^{-1}	9.38 10^{-1}	1.01	1.1
Location factor for sheltering (NE), inhalation		0.5	1.05 10^{-1}	2.40 10^{-1}	3.93 10^{-1}	5.24 10^{-1}	6.56 10^{-1}	8.35 10^{-1}	9.33 10^{-1}	1.01	1.11
Consumption rates											
Consumption rate for grain products	kg y^{-1}	85	58	60.85	69.4	77.95	86.5	95.05	103.6	112.15	115
Consumption rate for potatoes	kg y^{-1}	59	35	39.55	53.2	66.85	80.5	94.15	107.8	121.45	126
Consumption rate for root vegetables	kg y^{-1}	14	13	14.2	17.8	21.4	25	28.6	32.2	35.8	37
Consumption rate for green vegetables	kg y^{-1}	43	48	52.75	67	81.25	95.5	109.75	124	138.25	143
Consumption rate for milk (including milk products)	kg y^{-1}	111	49	56.85	80.4	103.95	127.5	151.05	174.6	198.15	206
Consumption rate for cows meat (including veal)	kg y^{-1}	22	11	12.05	15.2	18.35	21.5	24.65	27.8	30.95	32
Consumption rate for cows liver	kg y^{-1}	2	1.3	1.56	2.34	3.12	3.9	4.68	5.46	6.24	6.5
Consumption rate for sheep meat	kg y^{-1}	1	0.5	1.075	2.8	4.525	6.25	7.975	9.7	11.425	12
Consumption rate for sheep liver	kg y^{-1}	0.2	0	0.07	0.28	0.49	0.7	0.91	1.12	1.33	1.4
Consumption rate for pork	kg y^{-1}	46	19	21.25	28	34.75	41.5	48.25	55	61.75	64

Note:

These distributions were derived for application in the models adopted in COSYMA. They should only be used in other models if the parameters have the same meanings as in the models adopted here.

Table 2.6 Correlations between input parameters

Pairs of correlated parameters		Correlation coefficient
A. Parameters that are independent of nuclide		
Transfer coefficient: small intestine to U.L.I.	Transfer coefficient: L.L.I. to Faeces	0.21
Initial deposition in extrathoracic region	Slow transfer coefficient: bronchial to extrathoracic regions	-0.27
Initial deposition in extrathoracic region	Transfer coefficient: extrathoracic 2 to stomach	-0.29
Transfer coefficient: pulmonary 2 region to the tracheobronchial region (intermediate clearance rate)	Slow transfer coefficient: bronchial to extrathoracic regions	0.31
Initial deposition in extrathoracic region	Fast transfer coefficient: bronchial to extrathoracic regions	-0.33
Breathing rate	Total initial deposition in respiratory tract	0.38
Transfer coefficient: pulmonary 2 region to the tracheobronchial region (intermediate clearance rate)	Fast transfer coefficient: bronchial to extrathoracic regions	0.39
ULI-LLI	Transfer coefficient: L.L.I. to Faeces	0.45
Transfer coefficient: small intestine to U.L.I.	ULI-LLI	0.46
Fast transfer coefficient: bronchial to extrathoracic regions	Slow transfer coefficient: bronchial to extrathoracic regions	0.79
B. Parameters for the Strontium dose model		
Transfer coefficient for Strontium: liver to U.L.I. (faeces)	Strontium: ratio of uptake to trabecular/cortical bone	0.20
Transfer coefficient for Strontium: blood to liver	Transfer coefficient for Strontium: trabecular bone to U.L.I. (faeces)	0.21
Transfer coefficient for Strontium: blood to liver	Strontium: ratio of uptake to trabecular/cortical bone	0.22
Transfer coefficient for Strontium: Cortical bone to U.L.I. (faeces)	Transfer coefficient for Strontium: liver to U.L.I. (faeces)	-0.23
Transfer coefficient for Strontium: blood to liver	Transfer coefficient for Strontium: Cortical bone to U.L.I. (faeces)	-0.25
Transfer coefficient for Strontium: trabecular bone to U.L.I. (faeces)	Transfer coefficient for Strontium: liver to U.L.I. (faeces)	0.27
Transfer coefficient for Strontium: blood to cortical bone	Strontium: ratio of uptake to trabecular/cortical bone	-0.33
Transfer coefficient for Strontium: blood to cortical bone	Transfer coefficient for Strontium: Cortical bone to U.L.I. (faeces)	0.38
Transfer coefficient for Strontium: blood to liver	Transfer coefficient for Strontium: blood to U.L.I. (faeces)	-0.44
Transfer coefficient for Strontium: blood to cortical bone	Transfer coefficient for Strontium: trabecular bone to U.L.I. (faeces)	-0.45
Transfer coefficient for Strontium: blood to cortical bone	Transfer coefficient for Strontium: liver to U.L.I. (faeces)	-0.61
Transfer coefficient for Strontium: trabecular bone to U.L.I. (faeces)	Strontium: ratio of uptake to trabecular/cortical bone	0.74
Transfer coefficient for Strontium: any lung compartment to transformed state in lung	Transfer coefficient for Strontium: transformed state in lung to blood	0.78
Transfer coefficient for Strontium: trabecular bone to U.L.I. (faeces)	Transfer coefficient for Strontium: Cortical bone to U.L.I. (faeces)	-0.85
Transfer coefficient for Strontium: Cortical bone to U.L.I. (faeces)	Strontium: ratio of uptake to trabecular/cortical bone	-0.87
C. Parameters for the Ruthenium dose model		
Transfer coefficient for Ruthenium: blood to U.L.I.	Transfer coefficient for Ruthenium: whole body to U.L.I.	-0.20
Transfer coefficient for Ruthenium: blood to whole body	Transfer coefficient for Ruthenium: whole body to U.L.I.	0.23
Transfer coefficient for Ruthenium: blood to whole body 2 compartment	Transfer coefficient for Ruthenium: whole body 2 compartment to U.L.I.	-0.26
Transfer coefficient for Ruthenium: blood to whole body	Transfer coefficient for Ruthenium: whole body 2 compartment to U.L.I.	-0.36
Transfer coefficient for Ruthenium: whole body to U.L.I.	Transfer coefficient for Ruthenium: whole body 2 compartment to U.L.I.	-0.65

Pairs of correlated parameters		Correlation coefficient
Transfer coefficient for Ruthenium: blood to whole body	Transfer coefficient for Ruthenium: blood to whole body 2 compartment	0.72
Transfer coefficient for Ruthenium: any lung compartment to transformed state in lung	Transfer coefficient for Ruthenium: transformed state in lung to blood	0.78
Transfer coefficient for Ruthenium: any lung compartment to transformed state in lung	Transfer coefficient for Ruthenium: any lung compartment to blood	0.84
Transfer coefficient for Ruthenium: any lung compartment to blood	Transfer coefficient for Ruthenium: any lung compartment to transformed state in lung	0.93
D. Parameters for the Tellurium dose model		
Transfer coefficient for Tellurium: blood to bone	Transfer coefficient for Tellurium: liver to U.L.I.	-0.20
Transfer coefficient for Tellurium: blood to thyroid	Transfer coefficient for Tellurium: thyroid to U.L.I.	-0.23
Transfer coefficient for Tellurium: blood to liver	Transfer coefficient for Tellurium: blood to U.L.I.	0.24
Transfer coefficient for Tellurium: blood to thyroid	Transfer coefficient for Tellurium: blood to U.L.I.	0.36
Transfer coefficient for Tellurium: blood to liver	Transfer coefficient for Tellurium: liver to U.L.I.	-0.37
Transfer coefficient for Tellurium: blood to liver	Transfer coefficient for Tellurium: blood to thyroid	0.38
Transfer coefficient for Tellurium: bone to U.L.I.	Transfer coefficient for Tellurium: liver to U.L.I.	-0.44
Transfer coefficient for Tellurium: blood to bone	Transfer coefficient for Tellurium: blood to U.L.I.	0.47
Transfer coefficient for Tellurium: blood to bone	Transfer coefficient for Tellurium: blood to liver	0.51
Transfer coefficient for Tellurium: blood to bone	Transfer coefficient for Tellurium: blood to thyroid	0.73
Transfer coefficient for Tellurium: any lung compartment to transformed state in lung	Transfer coefficient for Tellurium: transformed state in lung to blood	0.76
Transfer coefficient for Tellurium: any lung compartment to transformed state in lung	Transfer coefficient for Tellurium: any lung compartment to blood	0.80
Transfer coefficient for Tellurium: any lung compartment to blood	Transfer coefficient for Tellurium: transformed state in lung to blood	0.95
E. Parameters for the Iodine dose model		
Transfer coefficient for Iodine: blood to thyroid	Transfer coefficient for Iodine: blood to Bladder	0.20
Transfer coefficient for Iodine: any lung compartment to blood	Transfer coefficient: L.L.I. to Faeces	0.26
Transfer coefficient for Iodine: blood to Bladder	Transfer coefficient for Iodine: thyroid to U.L.I	-0.28
Transfer coefficient for Iodine: any lung compartment to transformed state in lung	Transfer coefficient for iodine: transformed state in lung to blood	-0.31
Transfer coefficient for Iodine: any lung compartment to blood	Transfer coefficient for Iodine: transformed state in lung to blood	0.57
F. Parameters for the Caesium dose model		
Transfer coefficient for Caesium: blood to whole body 2 compartment	Transfer coefficient for Caesium: whole body 2 compartment to U.L.I	-0.27
Transfer coefficient for Caesium: any lung compartment to transformed state in lung	Transfer coefficient for Caesium: transformed state in lung to blood	-0.33
Transfer coefficient for Caesium: blood to whole body	Transfer coefficient for Caesium: whole body to U.L.I.	0.39
Transfer coefficient for Caesium: blood to whole body	Transfer coefficient for Caesium: whole body 2 compartment to U.L.I	0.41
Transfer coefficient for Caesium: any lung compartment to transformed state in lung	Transfer coefficient for Caesium: any lung compartment to blood	-0.42
Transfer coefficient for Caesium: blood to whole body 2 compartment	Transfer coefficient for Caesium: whole body to U.L.I.	-0.59
Transfer coefficient for Caesium: blood to whole body	Transfer coefficient for Caesium: blood to whole body 2 compartment	-0.64
Transfer coefficient for Caesium: any lung compartment to blood	Transfer coefficient for Caesium: transformed state in lung to blood	0.77
G. Parameters for the Cerium dose model		
Transfer coefficient for Cerium: blood to liver	Transfer coefficient for Cerium: liver to U.L.I	-0.23
Transfer coefficient for Cerium: blood to bone	Transfer coefficient for Cerium: liver to U.L.I	-0.29
Transfer coefficient for Cerium: blood to liver	Transfer coefficient for Cerium: blood to U.L.I.	0.36
Transfer coefficient for Cerium: bone to U.L.I.	Transfer coefficient for Cerium: liver to U.L.I	0.38

Pairs of correlated parameters		Correlation coefficient
Transfer coefficient for Cerium: any lung compartment to transformed state in lung	Transfer coefficient for Cerium: transformed state in lung to blood	0.45
Transfer coefficient for Cerium: blood to bone	Transfer coefficient for Cerium: blood to U.L.I.	0.45
Transfer coefficient for Cerium: any lung compartment to blood	Transfer coefficient for Cerium: transformed state in lung to blood	0.49
Transfer coefficient for Cerium: blood to bone	Transfer coefficient for Cerium: blood to liver	0.79
Transfer coefficient for Cerium: any lung compartment to transformed state in lung	Transfer coefficient for Cerium: any lung compartment to blood	0.92
H. Parameters for the Plutonium dose model		
Transfer coefficient for Plutonium: any lung compartment to transformed state in lung	Transfer coefficient for Plutonium: any lung compartment to blood	0.23
Transfer coefficient for Plutonium: blood to trabecular surface	Transfer coefficient for Plutonium: blood to U.L.I.	0.24
Transfer coefficient for Plutonium: blood to trabecular surface	Transfer coefficient for Plutonium: trabecular surface to trabecular volume	0.25
Transfer coefficient for Plutonium: blood to U.L.I.	Transfer coefficient for Plutonium: trabecular volume to R.B.M.	-0.27
Transfer coefficient for Plutonium: cortical volume to cortical marrow	Transfer coefficient for Plutonium: R.B.M. to U.L.I.	0.28
Transfer coefficient for Plutonium: blood to trabecular surface	Transfer coefficient for Plutonium: blood to cortical surface	0.30
Transfer coefficient for Plutonium: trabecular surface to trabecular volume	Transfer coefficient for Plutonium: liver to U.L.I.	0.31
Transfer coefficient for Plutonium: cortical surface to cortical marrow	Transfer coefficient for Plutonium: cortical surface to cortical volume	0.33
Transfer coefficient for Plutonium: any lung compartment to blood	Transfer coefficient for Plutonium: transformed state in lung to blood	0.35
Transfer coefficient for Plutonium: cortical marrow to U.L.I.	Transfer coefficient for Plutonium: R.B.M. to U.L.I.	0.37
Transfer coefficient for Plutonium: trabecular volume to R.B.M.	Transfer coefficient for Plutonium: cortical marrow to U.L.I.	0.37
Transfer coefficient for Plutonium: blood to red bone marrow	Transfer coefficient for Plutonium: cortical surface to cortical marrow	0.55
Transfer coefficient for Plutonium: blood to red bone marrow	Transfer coefficient for Plutonium: cortical surface to cortical volume	0.61
Transfer coefficient for Plutonium: any lung compartment to transformed state in lung	Transfer coefficient for Plutonium: transformed state in lung to blood	0.66
I. Parameters for the external dose model		
I-131 dose to 100 days: deposited activity	Cs-137 initial dose rate: deposited activity	0.20
Cs-137 initial dose rate: deposited activity	Cs-137 dose to 3 years: deposited activity	0.20
Zr-95 initial dose rate: deposited activity	Ru-106 dose to 100 days: deposited activity	0.21
I-131 dose to 10 days: deposited activity	Cs-137 dose to 100 days: deposited activity	0.21
Zr-95 dose to 10 days: deposited activity	Zr-95 dose to 1 year: deposited activity	0.22
Ru-106 initial dose rate: deposited activity	Cs-137 initial dose rate: deposited activity	0.22
Ru-106 initial dose rate: deposited activity	I-131 dose to 3 days: deposited activity	0.23
Ru-106 dose to 30 days: deposited activity	Ru-106 dose to 1 year: deposited activity	0.23
I-131 dose to 1 day: deposited activity	Cs-137 dose to 1 year: deposited activity	0.23
Ru-106 dose to 30 days: deposited activity	I-131 initial dose rate: deposited activity	0.24
Zr-95 initial dose rate: deposited activity	I-131 initial dose rate: deposited activity	0.25
Ru-106 dose to 30 days: deposited activity	Zr-95 dose to 30 days: deposited activity	0.25
I-131 dose to 3 days: deposited activity	Cs-137 dose to 100 days: deposited activity	0.25
Zr-95 dose to 100 days: deposited activity	Ru-106 initial dose rate: deposited activity	0.26
I-131 dose to 30 days: deposited activity	Cs-137 initial dose rate: deposited activity	0.27
Ru-106 initial dose rate: deposited activity	I-131 dose to 1 day: deposited activity	0.28
Zr-95 dose to 1 year: deposited activity	Zr-95 dose to 30 days: deposited activity	0.29
Cs-137 dose to 100 days: deposited activity	Cs-137 dose to 3 years: deposited activity	0.29
Ru-106 initial dose rate: deposited activity	Ru-106 dose to 100 days: deposited activity	0.31

Pairs of correlated parameters		Correlation coefficient
I-131 initial dose rate: deposited activity	I-131 dose to 100 days: deposited activity	0.31
I-131 initial dose rate: deposited activity	Cs-137 dose to 1 year: deposited activity	0.31
I-131 dose to 10 days: deposited activity	Cs-137 initial dose rate: deposited activity	0.31
Zr-95 dose to 10 days: deposited activity	Ru-106 dose to 30 days: deposited activity	0.32
I-131 dose to 1 day: deposited activity	Cs-137 dose to 100 days: deposited activity	0.33
Cs-137 dose to 10 years: deposited activity	Cs-137 dose to 30 years: deposited activity	0.35
Zr-95 initial dose rate: deposited activity	Zr-95 dose to 100 days: deposited activity	0.37
Ru-106 initial dose rate: deposited activity	I-131 initial dose rate: deposited activity	0.37
I-131 dose to 3 days: deposited activity	Cs-137 initial dose rate: deposited activity	0.37
Ru-106 initial dose rate: deposited activity	Zr-95 dose to 30 days: deposited activity	0.38
Cs-137 dose to 3 years: deposited activity	Cs-137 dose to 10 years: deposited activity	0.39
Zr-95 dose to 100 days: deposited activity	Zr-95 dose to 1 year: deposited activity	0.40
Ru-106 dose to 1 year: deposited activity	Ru-106 dose to 3 years: deposited activity	0.40
Cs-137 dose to 1 year: deposited activity	Cs-137 dose to 3 years: deposited activity	0.40
I-131 dose to 1 day: deposited activity	I-131 dose to 100 days: deposited activity	0.41
Zr-95 initial dose rate: deposited activity	Ru-106 dose to 30 days: deposited activity	0.42
I-131 initial dose rate: deposited activity	I-131 dose to 30 days: deposited activity	0.42
I-131 initial dose rate: deposited activity	Cs-137 dose to 100 days: deposited activity	0.44
Ru-106 dose to 100 days: deposited activity	Ru-106 dose to 1 year: deposited activity	0.45
Cs-137 dose to 30 years: deposited activity	Cs-137 dose to 100 years: deposited activity	0.46
I-131 dose to 1 day: deposited activity	Cs-137 initial dose rate: deposited activity	0.47
Zr-95 dose to 10 days: deposited activity	Ru-106 initial dose rate: deposited activity	0.48
Ru-106 dose to 30 days: deposited activity	Ru-106 dose to 100 days: deposited activity	0.48
Cs-137 initial dose rate: deposited activity	Cs-137 dose to 1 year: deposited activity	0.49
I-131 initial dose rate: deposited activity	I-131 dose to 10 days: deposited activity	0.51
Zr-95 dose to 10 days: deposited activity	Zr-95 dose to 100 days: deposited activity	0.52
I-131 dose to 3 days: deposited activity	I-131 dose to 100 days: deposited activity	0.52
Zr-95 initial dose rate: deposited activity	Zr-95 dose to 30 days: deposited activity	0.55
I-131 dose to 1 day: deposited activity	I-131 dose to 30 days: deposited activity	0.56
I-131 initial dose rate: deposited activity	I-131 dose to 3 days: deposited activity	0.60
I-131 dose to 10 days: deposited activity	I-131 dose to 100 days: deposited activity	0.61
I-131 initial dose rate: deposited activity	Cs-137 initial dose rate: deposited activity	0.62
Ru-106 initial dose rate: deposited activity	Ru-106 dose to 30 days: deposited activity	0.64
Zr-95 initial dose rate: deposited activity	Ru-106 initial dose rate: deposited activity	0.66
I-131 dose to 1 day: deposited activity	I-131 dose to 10 days: deposited activity	0.67
Zr-95 dose to 100 days: deposited activity	Zr-95 dose to 30 days: deposited activity	0.69
Cs-137 dose to 100 days: deposited activity	Cs-137 dose to 1 year: deposited activity	0.70
Zr-95 initial dose rate: deposited activity	Zr-95 dose to 10 days: deposited activity	0.71
I-131 dose to 3 days: deposited activity	I-131 dose to 30 days: deposited activity	0.71
Cs-137 initial dose rate: deposited activity	Cs-137 dose to 100 days: deposited activity	0.71
I-131 dose to 30 days: deposited activity	I-131 dose to 100 days: deposited activity	0.72
Zr-95 dose to 10 days: deposited activity	Zr-95 dose to 30 days: deposited activity	0.75
I-131 initial dose rate: deposited activity	I-131 dose to 1 day: deposited activity	0.75
I-131 dose to 1 day: deposited activity	I-131 dose to 3 days: deposited activity	0.79
I-131 dose to 10 days: deposited activity	I-131 dose to 30 days: deposited activity	0.83
I-131 dose to 3 days: deposited activity	I-131 dose to 10 days: deposited activity	0.84
J. Location factors		
Location factor for intervention dose (NE), groundshine	Location factor for normal living (NE&NL), cloudshine	0.21
Location factor for normal living (NE&NL), cloudshine	Location factor for normal living and interv. (NL), groundshine	0.21
Location factor for normal living (NE), groundshine	Location factor for being in cars (NE), groundshine	0.22
Location factor for sheltering(NE), groundshine	Location factor for being in cars (NE), groundshine	0.26

Pairs of correlated parameters		Correlation coefficient
Location factor for normal living (NE), groundshine	Location factor for normal living and interv. (NL), groundshine	0.35
Location factor for normal living (NE), groundshine	Location factor for intervention dose (NE), groundshine	0.37
Location factor for normal living and interv. (NL) groundshine	Location factor for sheltering (NE), cloudshine	0.47
Location factor for normal living and interv. (NL) groundshine	Location factor for intervention dose (NE), groundshine	0.51
Location factor for normal living (NE), groundshine	Location factor for sheltering (NE), cloudshine	0.55
Location factor for normal living and interv. (NL) groundshine	Location factor for intervention dose (NE), groundshine	0.55
Location factor for sheltering(NE), groundshine	Location factor for normal living (NE&NL), cloudshine	0.61
Location factor for normal living and interv. (NL) groundshine	Location factor for normal living (NE&NL), cloudshine	0.61
Location factor for sheltering(NE), groundshine	Location factor for sheltering (NE), cloudshine	0.63
Location factor for normal living (NE), groundshine	Location factor for normal living (NE&NL), cloudshine	0.65
Location factor for sheltering(NE), groundshine	Location factor for normal living and interv. (NL) groundshine	0.76
Location factor for sheltering(NE), groundshine	Location factor for normal living (NE), groundshine	0.88
Location factor for intervention dose (NE), groundshine	Location factor for normal living and interv. (NL), groundshine	0.90
Location factor for sheltering (NE), cloudshine	Location factor for normal living (NE&NL), cloudshine	0.96
Location factor for normal living (NE), groundshine	Location factor for normal living and interv. (NL) groundshine	0.97
Location factor for normal living (NE&NL), inhalation	Location factor for sheltering (NE), inhalation	0.99
K. Correlations between parameters in different modes		
Transfer coefficient for Strontium: any lung compartment to transformed state in lung	Transfer coefficient for Cerium: any lung compartment to blood	-0.20
Transfer coefficient for Cerium: liver to U.L.I	Transfer coefficient for Strontium: blood to cortical bone	-0.20
Transfer coefficient for Ruthenium: blood to whole body	Transfer coefficient for Caesium: whole body 2 compartment to U.L.I	0.20
Transfer coefficient for Cerium: blood to liver	Transfer coefficient for Strontium: Cortical bone to U.L.I. (faeces)	0.20
Transfer coefficient for Cerium: blood to liver	Transfer coefficient for Tellurium: blood to liver	0.20
Transfer coefficient for Cerium: blood to liver	Transfer coefficient for Tellurium: blood to U.L.I.	0.20
Transfer coefficient for Plutonium: blood to cortical surface	Transfer coefficient for Strontium: blood to cortical bone	0.20
Transfer coefficient for Strontium: any lung compartment to transformed state in lung	Transfer coefficient for Ruthenium: any lung compartment to transformed state in lung	-0.21
Transfer coefficient for Strontium: Cortical bone to U.L.I. (faeces)	Transfer coefficient for Tellurium: blood to thyroid	0.21
Transfer coefficient for Plutonium: blood to trabecular surface	Transfer coefficient for Cerium: blood to U.L.I.	0.21
Transfer coefficient for Cerium: blood to bone	Strontium: ratio of uptake to trabecular/cortical bone	-0.22
Transfer coefficient for Strontium: any lung compartment to transformed state in lung	Transfer coefficient for Ruthenium: any lung compartment to transformed state in lung	-0.23
Transfer coefficient for Strontium: liver to U.L.I. (faeces)	Transfer coefficient for Tellurium: blood to U.L.I.	-0.23
Transfer coefficient for Iodine: any lung compartment to blood	Transfer coefficient for Strontium: transformed state in lung to blood	0.23
Transfer coefficient for Cerium: blood to liver	Transfer coefficient for Strontium: trabecular bone to U.L.I. (faeces)	-0.23
Transfer coefficient for Strontium: transformed state in lung to blood	Transfer coefficient for Cerium: any lung compartment to transformed state in lung	-0.24
Transfer coefficient for Ruthenium: whole body 2 compartment to U.L.I.	Transfer coefficient for Caesium: blood to whole body 2 compartment	0.24
Transfer coefficient for Strontium: any lung compartment to transformed state in lung	Transfer coefficient for Ruthenium: any lung compartment to blood	-0.25

Pairs of correlated parameters		Correlation coefficient
Transfer coefficient for Strontium: transformed state in lung to blood	Transfer coefficient for Plutonium: any lung compartment to blood	0.25
Strontium: ratio of uptake to trabecular/cortical bone	Transfer coefficient for Tellurium: blood to bone	-0.25
Transfer coefficient for Strontium: trabecular bone to U.L.I. (faeces)	Transfer coefficient for Tellurium: blood to thyroid	-0.25
Transfer coefficient for Strontium: liver to U.L.I. (faeces)	Transfer coefficient for Tellurium: blood to liver	-0.25
Transfer coefficient for Ruthenium: blood to whole body 2 compartment	Transfer coefficient for Caesium: whole body 2 compartment to U.L.I	0.25
Transfer coefficient for Cerium: blood to bone	Transfer coefficient for Tellurium: blood to U.L.I.	0.25
Transfer coefficient for Cerium: blood to U.L.I.	Transfer coefficient for Tellurium: blood to bone	0.25
Transfer coefficient for Plutonium: blood to trabecular surface	Strontium: ratio of uptake to trabecular/cortical bone	-0.25
Transfer coefficient for Strontium: transformed state in lung to blood	Transfer coefficient for Ruthenium: any lung compartment to transformed state in lung	-0.26
Transfer coefficient for Strontium: transformed state in lung to blood	Transfer coefficient for Cerium: any lung compartment to blood	-0.26
Transfer coefficient for Cerium: blood to bone	Transfer coefficient for Strontium: Cortical bone to U.L.I. (faeces)	0.26
Transfer coefficient for Cerium: blood to bone	Transfer coefficient for Tellurium: blood to liver	0.26
Transfer coefficient for Plutonium: blood to trabecular surface	Transfer coefficient for Tellurium: blood to U.L.I.	0.26
Transfer coefficient: L.L.I. to Faeces	Transfer coefficient for Cerium: any lung compartment to transformed state in lung	-0.27
Transfer coefficient: L.L.I. to Faeces	Transfer coefficient for Plutonium: any lung compartment to blood	0.28
Transfer coefficient: L.L.I. to Faeces	Transfer coefficient for Cerium: any lung compartment to blood	-0.29
Transfer coefficient for Strontium: transformed state in lung to blood	Transfer coefficient for Ruthenium: any lung compartment to transformed state in lung	-0.29
Transfer coefficient for Strontium: Cortical bone to U.L.I. (faeces)	Transfer coefficient for Tellurium: blood to bone	0.29
Transfer coefficient for Plutonium: blood to trabecular surface	Transfer coefficient for Strontium: Cortical bone to U.L.I. (faeces)	0.29
Transfer coefficient: L.L.I. to Faeces	Transfer coefficient for Ruthenium: any lung compartment to transformed state in lung	-0.30
Transfer coefficient for Cerium: blood to bone	Transfer coefficient for Strontium: trabecular bone to U.L.I. (faeces)	-0.30
Transfer coefficient for Plutonium: blood to trabecular surface	Transfer coefficient for Tellurium: blood to liver	0.30
Transfer coefficient for Cerium: blood to liver	Transfer coefficient for Tellurium: blood to thyroid	0.31
Transfer coefficient for Cerium: blood to U.L.I.	Transfer coefficient for Strontium: blood to cortical bone	0.31
Transfer coefficient for Strontium: transformed state in lung to blood	Transfer coefficient for Ruthenium: any lung compartment to blood	-0.32
Transfer coefficient: L.L.I. to Faeces	Transfer coefficient for Ruthenium: any lung compartment to transformed state in lung	-0.33
Transfer coefficient for Cerium: blood to liver	Transfer coefficient for Strontium: liver to U.L.I. (faeces)	-0.33
Transfer coefficient for Plutonium: blood to trabecular surface	Transfer coefficient for Strontium: trabecular bone to U.L.I. (faeces)	-0.33
Transfer coefficient for Strontium: trabecular bone to U.L.I. (faeces)	Transfer coefficient for Tellurium: blood to bone	-0.34
Transfer coefficient: L.L.I. to Faeces	Transfer coefficient for Ruthenium: any lung compartment to blood	-0.36
Transfer coefficient for Strontium: blood to cortical bone	Transfer coefficient for Tellurium: blood to U.L.I.	0.36
Transfer coefficient for Strontium: liver to U.L.I. (faeces)	Transfer coefficient for Tellurium: blood to thyroid	-0.36

Pairs of correlated parameters		Correlation coefficient
Transfer coefficient for Plutonium: blood to trabecular surface	Transfer coefficient for Cerium: blood to liver	0.38
Transfer coefficient for Ruthenium: blood to whole body	Transfer coefficient for Caesium: whole body to U.L.I.	0.39
Transfer coefficient for Cerium: blood to bone	Transfer coefficient for Tellurium: blood to thyroid	0.39
Transfer coefficient for Strontium: blood to cortical bone	Transfer coefficient for Tellurium: blood to liver	0.40
Transfer coefficient for Plutonium: blood to trabecular surface	Transfer coefficient for Tellurium: blood to thyroid	0.41
Transfer coefficient for Cerium: blood to bone	Transfer coefficient for Strontium: liver to U.L.I. (faeces)	-0.42
Transfer coefficient for Cerium: blood to liver	Transfer coefficient for Tellurium: blood to bone	0.43
Transfer coefficient for Plutonium: blood to trabecular surface	Transfer coefficient for Strontium: liver to U.L.I. (faeces)	-0.43
Transfer coefficient for Ruthenium: blood to whole body	Transfer coefficient for Caesium: blood to whole body	0.45
Transfer coefficient for Strontium: liver to U.L.I. (faeces)	Transfer coefficient for Tellurium: blood to bone	-0.47
Transfer coefficient for Plutonium: blood to trabecular surface	Transfer coefficient for Cerium: blood to bone	0.48
Plutonium: f1 factor for plutonium biologically incorporated	Cerium: f1 factor	0.50
Transfer coefficient for Ruthenium: blood to whole body 2 compartment	Transfer coefficient for Caesium: whole body to U.L.I.	0.53
Transfer coefficient for Cerium: blood to bone	Transfer coefficient for Tellurium: blood to bone	0.54
Transfer coefficient for Cerium: blood to liver	Transfer coefficient for Strontium: blood to cortical bone	0.55
Transfer coefficient for Plutonium: blood to trabecular surface	Transfer coefficient for Tellurium: blood to bone	0.55
Transfer coefficient for Strontium: blood to cortical bone	Transfer coefficient for Tellurium: blood to thyroid	0.56
Transfer coefficient for Ruthenium: blood to whole body 2 compartment	Transfer coefficient for Caesium: blood to whole body	0.59
Transfer coefficient for Ruthenium: blood to whole body	Transfer coefficient for Caesium: blood to whole body 2 compartment	-0.66
Transfer coefficient for Strontium: any lung compartment to transformed state in lung	Transfer coefficient: L.L.I. to Faeces	0.68
Transfer coefficient for Cerium: blood to bone	Transfer coefficient for Strontium: blood to cortical bone	0.70
Transfer coefficient for Plutonium: blood to trabecular surface	Transfer coefficient for Strontium: blood to cortical bone	0.71
Transfer coefficient for Strontium: blood to cortical bone	Transfer coefficient for Tellurium: blood to bone	0.77
Transfer coefficient: L.L.I. to Faeces	Transfer coefficient for Strontium: transformed state in lung to blood	0.87
Transfer coefficient for Ruthenium: blood to whole body 2 compartment	Transfer coefficient for Caesium: blood to whole body 2 compartment	-0.90

Table 2.7 Comparison between marginal distributions of elicitation variables obtained from the experts and from the distributions on target variables, for lung deposition and retention

Quantity[(a)]	5%		50%		95%	
	DM[(b)]	Pred.[(c)]	DM[(b)]	Pred.[(c)]	DM[(b)]	Pred.[(c)]
Id_ET	$1.26\ 10^{-1}$	$3.72\ 10^{-2}$	$6.07\ 10^{-1}$	$3.88\ 10^{-1}$	$8.52\ 10^{-1}$	$8.55\ 10^{-1}$
Id_TB	$1.14\ 10^{-1}$	$2.41\ 10^{-2}$	$2.25\ 10^{-1}$	$2.26\ 10^{-1}$	$5.89\ 10^{-1}$	$6.85\ 10^{-1}$
Id_ET2	$1.68\ 10^{-1}$	$2.89\ 10^{-2}$	$5.32\ 10^{-1}$	$4.91\ 10^{-1}$	$8.61\ 10^{-1}$	$9.45\ 10^{-1}$
ret-ai-10 min	$7.74\ 10^{-2}$	$6.44\ 10^{-2}$	$2.43\ 10^{-1}$	$2.27\ 10^{-1}$	$4.83\ 10^{-1}$	$6.79\ 10^{-1}$
ret-ai-1 hour	$7.65\ 10^{-2}$	$3.09\ 10^{-2}$	$2.42\ 10^{-1}$	$1.59\ 10^{-1}$	$4.83\ 10^{-1}$	$5.76\ 10^{-1}$
ret-ai-1 day	$7.49\ 10^{-2}$	$2.32\ 10^{-2}$	$2.43\ 10^{-1}$	$1.23\ 10^{-1}$	$4.53\ 10^{-1}$	$5.02\ 10^{-1}$
ret-ai-1 month	$6.22\ 10^{-2}$	$4.67\ 10^{-3}$	$2.11\ 10^{-1}$	$6.65\ 10^{-2}$	$4.12\ 10^{-1}$	$4.30\ 10^{-1}$
ret-ai-1 year	$1.10\ 10^{-2}$	$3.04\ 10^{-11}$	$1.25\ 10^{-1}$	$1.13\ 10^{-2}$	$2.48\ 10^{-1}$	$2.71\ 10^{-1}$
ret-ai-10 years	$1.05\ 10^{-3}$	0	$2.02\ 10^{-2}$	$1.03\ 10^{-8}$	$1.16\ 10^{-1}$	$7.16\ 10^{-2}$
ret-tb-10 min	$2.46\ 10^{-2}$	$2.59\ 10^{-2}$	$7.21\ 10^{-2}$	$9.55\ 10^{-2}$	$2.30\ 10^{-1}$	$3.09\ 10^{-1}$
ret-tb-1 hour	$1.03\ 10^{-2}$	$3.85\ 10^{-5}$	$6.58\ 10^{-2}$	$3.00\ 10^{-2}$	$1.90\ 10^{-1}$	$2.72\ 10^{-1}$
ret-tb-1 day	$2.30\ 10^{-3}$	$1.39\ 10^{-6}$	$3.96\ 10^{-2}$	$4.66\ 10^{-5}$	$1.29\ 10^{-1}$	$2.27\ 10^{-1}$
ret-tb-1 month	$1.51\ 10^{-4}$	$6.76\ 10^{-7}$	$1.66\ 10^{-2}$	$1.25\ 10^{-5}$	$8.00\ 10^{-2}$	$1.44\ 10^{-1}$
ret-tb-1 year	$4.29\ 10^{-7}$	$2.00\ 10^{-14}$	$1.50\ 10^{-4}$	$1.12\ 10^{-6}$	$9.27\ 10^{-3}$	$2.77\ 10^{-2}$
ret-tb-10 years	$2.68\ 10^{-1}$	0	$5.14\ 10^{-6}$	$8.28\ 10^{-12}$	$3.59\ 10^{-3}$	$3.79\ 10^{-4}$
ret-et2-10 min	$1.48\ 10^{-1}$	$1.98\ 10^{-3}$	$5.26\ 10^{-1}$	1.03	$9.47\ 10^{-1}$	$1.92\ 10^{+1}$
ret-et2-1 hour	$1.11\ 10^{-3}$	$2.69\ 10^{-5}$	$3.68\ 10^{-2}$	$9.07\ 10^{-1}$	$4.01\ 10^{-1}$	$1.83\ 10^{+1}$
ret-et2-1 day	$1.10\ 10^{-5}$	$1.24\ 10^{-6}$	$6.45\ 10^{-4}$	$2.59\ 10^{-3}$	$4.27\ 10^{-2}$	6.13
ret-et2-1 month	$6.85\ 10^{-9}$	$4.32\ 10^{-7}$	$3.75\ 10^{-4}$	$2.74\ 10^{-4}$	$7.61\ 10^{-3}$	$7.08\ 10^{-1}$
ret-et2-1 year	$6.26\ 10^{-9}$	$1.80\ 10^{-13}$	$2.70\ 10^{-4}$	$2.45\ 10^{-6}$	$7.59\ 10^{-3}$	$1.14\ 10^{-2}$
ret-et2-10 years	$3.26\ 10^{-9}$	0	$9.10\ 10^{-5}$	$1.28\ 10^{-11}$	$7.52\ 10^{-3}$	$3.86\ 10^{-4}$

Notes

a The short names describing the quantities have the following interpretation:
Id is the fraction of the inhaled material deposited in different regions
Ret is the fraction of the deposit retained to the time specified
ET is the extrathoracic region
ET2 is the extrathoracic 2 region
TB is the brionchial region
AI is the pulmonary region

b DM gives the aggregated distributions as specified by the experts.

c Pred gives the distributions obtained using the fitted parameter values.

Table 2.8 Comparison between marginal distributions of elicitation variables obtained from the experts and from the distributions on target variables, for the strontium internal dose model

Fraction of Sr reaching blood by time	5%		50%		95%	
	DM[(a)]	Pred.[(b)]	DM[(a)]	Pred.[(b)]	DM[(a)]	Pred.[(b)]
1hour	$1.11\ 10^{-3}$	$1.04\ 10^{-3}$	$8.48\ 10^{-2}$	$6.83\ 10^{-2}$	$5.18\ 10^{-1}$	$5.20\ 10^{-1}$
1 day	$3.62\ 10^{-2}$	$2.40\ 10^{-2}$	$1.83\ 10^{-1}$	$1.80\ 10^{-1}$	$6.32\ 10^{-1}$	$6.29\ 10^{-1}$
1 week	$3.98\ 10^{-2}$	$3.97\ 10^{-2}$	$2.01\ 10^{-1}$	$2.00\ 10^{-1}$	$6.42\ 10^{-1}$	$6.30\ 10^{-1}$
1 month	$5.65\ 10^{-2}$	$4.15\ 10^{-2}$	$2.45\ 10^{-1}$	$2.35\ 10^{-1}$	$6.73\ 10^{-1}$	$6.30\ 10^{-1}$
1 year	$1.08\ 10^{-1}$	$5.86\ 10^{-2}$	$3.41\ 10^{-1}$	$2.98\ 10^{-1}$	$6.86\ 10^{-1}$	$6.45\ 10^{-1}$
10 years	$1.37\ 10^{-1}$	$1.40\ 10^{-1}$	$3.85\ 10^{-1}$	$3.80\ 10^{-1}$	$7.89\ 10^{-1}$	$7.89\ 10^{-1}$

Time		Fraction of amount reaching blood retained in skeleton and liver		Fraction of total amount in skeletom and liver that is in the skeleton	
		DM[(a)]	Pred.[(b)]	DM[(a)]	Pred.[(b)]
1 day	5%	$1.70\ 10^{-1}$	$1.70\ 10^{-1}$	$8.46\ 10^{-1}$	$8.46\ 10^{-1}$
	50%	$3.24\ 10^{-1}$	$3.24\ 10^{-1}$	$9.56\ 10^{-1}$	$9.56\ 10^{-1}$
	95%	$5.76\ 10^{-1}$	$5.76\ 10^{-1}$	$9.98\ 10^{-1}$	$9.98\ 10^{-1}$
1 week	5%	$1.17\ 10^{-1}$	$1.17\ 10^{-1}$	$8.22\ 10^{-1}$	$8.20\ 10^{-1}$
	50%	$2.29\ 10^{-1}$	$2.29\ 10^{-1}$	$9.57\ 10^{-1}$	$9.58\ 10^{-1}$
	95%	$4.76\ 10^{-1}$	$4.76\ 10^{-1}$	$9.98\ 10^{-1}$	$9.98\ 10^{-1}$
1 month	5%	$1.04\ 10^{-1}$	$1.04\ 10^{-1}$	$8.51\ 10^{-1}$	$8.50\ 10^{-1}$
	50%	$2.11\ 10^{-1}$	$2.11\ 10^{-1}$	$9.84\ 10^{-1}$	$9.80\ 10^{-1}$
	95%	$3.51\ 10^{-1}$	$3.51\ 10^{-1}$	$9.99\ 10^{-1}$	$9.99\ 10^{-1}$
1 year	5%	$6.74\ 10^{-2}$	$6.74\ 10^{-2}$	$7.70\ 10^{-1}$	$7.77\ 10^{-1}$
	50%	$1.38\ 10^{-1}$	$1.38\ 10^{-1}$	$9.94\ 10^{-1}$	$9.90\ 10^{-1}$
	95%	$2.43\ 10^{-1}$	$2.43\ 10^{-1}$	$9.99\ 10^{-1}$	$9.99\ 10^{-1}$
10 years	5%	$1.81\ 10^{-2}$	$1.80\ 10^{-2}$	$6.79\ 10^{-1}$	$6.80\ 10^{-1}$
	50%	$6.45\ 10^{-2}$	$6.45\ 10^{-2}$	$9.95\ 10^{-1}$	$9.90\ 10^{-1}$
	95%	$1.37\ 10^{-1}$	$1.37\ 10^{-1}$	$9.99\ 10^{-1}$	$9.99\ 10^{-1}$
50 years	5%	$1.11\ 10^{-3}$	$1.10\ 10^{-3}$	$6.39\ 10^{-1}$	$6.40\ 10^{-1}$
	50%	$1.85\ 10^{-2}$	$1.85\ 10^{-2}$	$9.96\ 10^{-1}$	$9.90\ 10^{-1}$
	95%	$8.88\ 10^{-2}$	$8.86\ 10^{-2}$	$9.99\ 10^{-1}$	$9.99\ 10^{-1}$

Notes
- a DM gives the aggregated distributions as specified by the experts.
- b Pred gives the distributions obtained using the fitted parameter values.

Table 2.9 Comparison between marginal distributions of elicitation variables obtained from the experts and from the distributions on target variables, for the ruthenium internal dose model

Fraction of Ru reaching blood by time	5%		50%		95%	
	DM	Pred.	DM	Pred.	DM	Pred.
1 hour	$4.57\ 10^{-5}$	$7.07\ 10^{-5}$	$1.91\ 10^{-2}$	$3.91\ 10^{-3}$	$2.47\ 10^{-1}$	$1.34\ 10^{-1}$
1 day	$1.42\ 10^{-3}$	$8.42\ 10^{-4}$	$3.29\ 10^{-2}$	$2.39\ 10^{-2}$	$2.69\ 10^{-1}$	$2.39\ 10^{-1}$
1 week	$1.06\ 10^{-3}$	$1.03\ 10^{-3}$	$2.43\ 10^{-2}$	$2.40\ 10^{-2}$	$2.37\ 10^{-1}$	$2.40\ 10^{-1}$
1 month	$1.09\ 10^{-3}$	$1.10\ 10^{-3}$	$3.60\ 10^{-2}$	$3.60\ 10^{-2}$	$3.47\ 10^{-1}$	$3.50\ 10^{-1}$
1 year	$3.20\ 10^{-3}$	$3.19\ 10^{-3}$	$8.20\ 10^{-2}$	$7.88\ 10^{-2}$	$4.77\ 10^{-1}$	$4.08\ 10^{-1}$
10 years	$5.43\ 10^{-3}$	$5.39\ 10^{-3}$	$1.25\ 10^{-1}$	$1.25\ 10^{-1}$	$6.21\ 10^{-1}$	$6.20\ 10^{-1}$

Time		Fraction of amount reaching blood retained in the whole body	
		DM	Pred.
1 day	5%	$4.38\ 10^{-1}$	$4.40\ 10^{-1}$
	50%	$8.30\ 10^{-1}$	$8.30\ 10^{-1}$
	95%	$9.70\ 10^{-1}$	$9.70\ 10^{-1}$
1 week	5%	$2.96\ 10^{-1}$	$3.00\ 10^{-1}$
	50%	$6.57\ 10^{-1}$	$6.60\ 10^{-1}$
	95%	$8.50\ 10^{-1}$	$8.49\ 10^{-1}$
1 month	5%	$1.23\ 10^{-1}$	$1.20\ 10^{-1}$
	50%	$3.91\ 10^{-1}$	$3.90\ 10^{-1}$
	95%	$7.02\ 10^{-1}$	$6.97\ 10^{-1}$
1 year	5%	$5.94\ 10^{-3}$	$5.50\ 10^{-3}$
	50%	$1.59\ 10^{-1}$	$1.30\ 10^{-1}$
	95%	$4.93\ 10^{-1}$	$4.90\ 10^{-1}$
5 years	5%	$1.30\ 10^{-4}$	$1.29\ 10^{-4}$
	50%	$5.73\ 10^{-2}$	$3.60\ 10^{-2}$
	95%	$2.78\ 10^{-1}$	$2.69\ 10^{-1}$

Notes

a DM gives the aggregated distributions as specified by the experts.

b Pred gives the distributions obtained using the fitted parameter values.

Table 2.10 Comparison between marginal distributions of elicitation variables obtained from the experts and from the distributions on target variables, for the tellurium internal dose model

Fraction of Te reaching blood by time	5%		50%		95%	
	DM	Pred.	DM	Pred.	DM	Pred.
1 hour	$3.03\ 10^{-4}$	$1.41\ 10^{-4}$	$5.08\ 10^{-2}$	$3.21\ 10^{-2}$	$7.87\ 10^{-1}$	$5.78\ 10^{-1}$
1 day	$1.41\ 10^{-3}$	$1.30\ 10^{-3}$	$2.07\ 10^{-1}$	$1.82\ 10^{-1}$	$8.21\ 10^{-1}$	$7.96\ 10^{-1}$
1 week	$1.42\ 10^{-3}$	$1.39\ 10^{-3}$	$1.90\ 10^{-1}$	$1.90\ 10^{-1}$	$8.29\ 10^{-1}$	$7.96\ 10^{-1}$
1 month	$1.47\ 10^{-3}$	$1.48\ 10^{-3}$	$2.32\ 10^{-1}$	$2.29\ 10^{-1}$	$8.39\ 10^{-1}$	$7.97\ 10^{-1}$
1 year	$3.99\ 10^{-3}$	$1.48\ 10^{-3}$	$3.33\ 10^{-1}$	$2.29\ 10^{-1}$	$8.64\ 10^{-1}$	$7.97\ 10^{-1}$
10 years	$6.43\ 10^{-3}$	$6.36\ 10^{-3}$	$3.55\ 10^{-1}$	$3.59\ 10^{-1}$	$9.07\ 10^{-1}$	$9.06\ 10^{-1}$

Time		Fraction of amount reaching blood retained in skeleton and liver		Fraction of total amount in skeleton and liver that is in the skeleton		Fraction of amount reaching blood that is retained in thyroid	
		DM	Pred.	DM	Pred.	DM	Pred.
1 day	5%	$3.90\ 10^{-2}$	$3.60\ 10^{-2}$	$1.57\ 10^{-1}$	$1.60\ 10^{-1}$	$2.00\ 10^{-2}$	$2.00\ 10^{-2}$
	50%	$1.77\ 10^{-1}$	$1.80\ 10^{-1}$	$8.00\ 10^{-1}$	$8.00\ 10^{-1}$	$2.00\ 10^{-1}$	$2.00\ 10^{-1}$
	95%	$6.81\ 10^{-1}$	$6.90\ 10^{-1}$	$9.93\ 10^{-1}$	$9.90\ 10^{-1}$	$6.00\ 10^{-2}$	$6.00\ 10^{-1}$
1 week	5%	$5.16\ 10^{-2}$	$4.70\ 10^{-2}$	$1.31\ 10^{-1}$	$1.30\ 10^{-1}$	$1.00\ 10^{-2}$	$1.00\ 10^{-2}$
	50%	$2.51\ 10^{-1}$	$2.50\ 10^{-1}$	$8.41\ 10^{-1}$	$8.40\ 10^{-1}$	$1.60\ 10^{-1}$	$1.60\ 10^{-1}$
	95%	$7.07\ 10^{-1}$	$6.50\ 10^{-1}$	$9.97\ 10^{-1}$	$9.96\ 10^{-1}$	$5.00\ 10^{-1}$	$5.00\ 10^{-1}$
1 month	5%	$3.95\ 10^{-2}$	$3.50\ 10^{-2}$	$1.03\ 10^{-6}$	$1.00\ 10^{-6}$	$5.00\ 10^{-3}$	$5.00\ 10^{-3}$
	50%	$2.50\ 10^{-1}$	$2.50\ 10^{-1}$	$8.98\ 10^{-1}$	$9.00\ 10^{-1}$	$8.00\ 10^{-2}$	$8.00\ 10^{-2}$
	95%	$7.00\ 10^{-1}$	$6.35\ 10^{-1}$	$9.99\ 10^{-1}$	$9.99\ 10^{-1}$	$4.00\ 10^{-1}$	$4.00\ 10^{-1}$

Notes
a DM gives the aggregated distributions as specified by the experts.
b Pred gives the distributions obtained using the fitted parameter values.

Table 2.11 Comparison between marginal distributions of elicitation variables obtained from the experts and from the distributions on target variables, for the iodine internal dose model

Fraction of I reaching blood by time	5%		50%		95%	
	DM	Pred.	DM	Pred.	DM	Pred.
1 hour	$3.09\ 10^{-2}$	$2.70\ 10^{-2}$	$6.34\ 10^{-1}$	$6.30\ 10^{-1}$	$9.83\ 10^{-1}$	$9.07\ 10^{-1}$
1 day	$4.24\ 10^{-1}$	$3.88\ 10^{-1}$	$7.44\ 10^{-1}$	$7.40\ 10^{-1}$	$9.96\ 10^{-1}$	$9.56\ 10^{-1}$
1 week	$4.87\ 10^{-1}$	$4.87\ 10^{-1}$	$7.61\ 10^{-1}$	$7.58\ 10^{-1}$	$9.96\ 10^{-1}$	$9.56\ 10^{-1}$
1 month	$4.87\ 10^{-1}$	$4.87\ 10^{-1}$	$7.61\ 10^{-1}$	$7.59\ 10^{-1}$	$9.96\ 10^{-1}$	$9.56\ 10^{-1}$
1 year	$4.88\ 10^{-1}$	$4.87\ 10^{-1}$	$7.62\ 10^{-1}$	$7.59\ 10^{-1}$	$9.96\ 10^{-1}$	$9.56\ 10^{-1}$
10 years	$4.88\ 10^{-1}$	$4.88\ 10^{-1}$	$7.62\ 10^{-1}$	$7.60\ 10^{-1}$	$9.96\ 10^{-1}$	$9.94\ 10^{-1}$

	Fraction of activity reaching blood retained in the thyroid at times							
	1 day		1 week		1 month		3 months	
	DM	Pred.	DM	Pred.	DM	Pred.	DM	Pred.
5%	$1.16\ 10^{-1}$	$1.18\ 10^{-1}$	$1.12\ 10^{-1}$	$1.10\ 10^{-1}$	$8.54\ 10^{-2}$	$8.54\ 10^{-2}$	$4.15\ 10^{-2}$	$4.15\ 10^{-2}$
50%	$2.87\ 10^{-1}$	$2.89\ 10^{-1}$	$2.86\ 10^{-1}$	$2.52\ 10^{-1}$	$2.36\ 10^{-1}$	$2.37\ 10^{-1}$	$1.54\ 10^{-1}$	$1.50\ 10^{-1}$
95%	$5.63\ 10^{-1}$	$5.60\ 10^{-1}$	$5.48\ 10^{-1}$	$5.50\ 10^{-1}$	$4.57\ 10^{-1}$	$4.60\ 10^{-1}$	$3.66\ 10^{-1}$	$3.70\ 10^{-1}$

Notes
a DM gives the aggregated distributions as specified by the experts.
b Pred gives the distributions obtained using the fitted parameter values.

Table 2.12 Comparison between marginal distributions of elicitation variables obtained from the experts and from the distributions on target variables, for the caesium internal dose model

Fraction of Cs reaching blood by time	5%		50%		95%	
	DM	Pred.	DM	Pred.	DM	Pred.
1 hour	$3.09\ 10^{-2}$	$2.70\ 10^{-2}$	$6.34\ 10^{-1}$	$6.30\ 10^{-1}$	$9.83\ 10^{-1}$	$9.07\ 10^{-1}$
1 day	$4.24\ 10^{-1}$	$3.88\ 10^{-1}$	$7.44\ 10^{-1}$	$7.40\ 10^{-1}$	$9.96\ 10^{-1}$	$9.56\ 10^{-1}$
1 week	$4.87\ 10^{-1}$	$4.87\ 10^{-1}$	$7.61\ 10^{-1}$	$7.58\ 10^{-1}$	$9.96\ 10^{-1}$	$9.56\ 10^{-1}$
1 month	$4.87\ 10^{-1}$	$4.87\ 10^{-1}$	$7.61\ 10^{-1}$	$7.59\ 10^{-1}$	$9.96\ 10^{-1}$	$9.56\ 10^{-1}$
1 year	$4.88\ 10^{-1}$	$4.87\ 10^{-1}$	$7.62\ 10^{-1}$	$7.59\ 10^{-1}$	$9.96\ 10^{-1}$	$9.56\ 10^{-1}$
10 years	$4.88\ 10^{-1}$	$4.88\ 10^{-1}$	$7.62\ 10^{-1}$	$7.60\ 10^{-1}$	$9.96\ 10^{-1}$	$9.94\ 10^{-1}$

Time		Fraction of amount reaching blood retained in whole body	
		DM	Pred.
1 day	5%	$8.70\ 10^{-1}$	$8.70\ 10^{-1}$
	50%	$9.62\ 10^{-1}$	$9.60\ 10^{-1}$
	95%	$9.92\ 10^{-1}$	$9.90\ 10^{-1}$
1 week	5%	$7.45\ 10^{-1}$	$7.04\ 10^{-1}$
	50%	$8.59\ 10^{-1}$	$8.30\ 10^{-1}$
	95%	$9.43\ 10^{-1}$	$9.36\ 10^{-1}$
1 month	5%	$5.45\ 10^{-1}$	$5.40\ 10^{-1}$
	50%	$7.24\ 10^{-1}$	$7.20\ 10^{-1}$
	95%	$8.93\ 10^{-1}$	$8.90\ 10^{-1}$
1 year	5%	$2.38\ 10^{-3}$	$2.40\ 10^{-3}$
	50%	$6.48\ 10^{-2}$	$6.37\ 10^{-2}$
	95%	$2.64\ 10^{-1}$	$2.53\ 10^{-1}$
5 years	5%	$4.20\ 10^{-1}$	$4.19\ 10^{-1}$
	50%	$1.08\ 10^{-5}$	$6.89\ 10^{-6}$
	95%	$2.48\ 10^{-3}$	$2.48\ 10^{-3}$

Notes

a DM gives the aggregated distributions as specified by the experts.

b Pred gives the distributions obtained using the fitted parameter values.

Table 2.13 Comparison between marginal distributions of elicitation variables obtained from the experts and from the distributions on target variables, for the cerium internal dose model

Fraction of Cs reaching blood by time	5%		50%		95%	
	DM	Pred.	DM	Pred.	DM	Pred.
1 hour	$1.32\ 10^{-5}$	$1.10\ 10^{-8}$	$3.44\ 10^{-3}$	$1.87\ 10^{-4}$	$9.79\ 10^{-2}$	$5.81\ 10^{-2}$
1 day	$1.10\ 10^{-4}$	$2.68\ 10^{-7}$	$6.91\ 10^{-3}$	$4.25\ 10^{-3}$	$1.06\ 10^{-1}$	$1.10\ 10^{-1}$
1 week	$1.17\ 10^{-4}$	$2.04\ 10^{-6}$	$2.25\ 10^{-2}$	$2.18\ 10^{-2}$	$1.24\ 10^{-1}$	$1.20\ 10^{-1}$
1 month	$2.28\ 10^{-4}$	$1.16\ 10^{-5}$	$3.87\ 10^{-2}$	$3.90\ 10^{-2}$	$1.81\ 10^{-1}$	$1.22\ 10^{-1}$
1 year	$1.13\ 10^{-3}$	$4.77\ 10^{-4}$	$9.99\ 10^{-2}$	$1.00\ 10^{-1}$	$3.04\ 10^{-1}$	$2.44\ 10^{-1}$
10 years	$3.33\ 10^{-3}$	$7.51\ 10^{-3}$	$1.33\ 10^{-1}$	$1.30\ 10^{-1}$	$3.16\ 10^{-1}$	$3.20\ 10^{-1}$

Time		Fraction of amount reaching blood retained in skeleton and liver		Fraction of total amount in skeleton and liver that is in the skeleton	
		DM	Pred.	DM	Pred.
1 day	5%	$2.68\ 10^{-1}$	$2.70\ 10^{-1}$	$1.66\ 10^{-1}$	$1.70\ 10^{-1}$
	50%	$7.34\ 10^{-1}$	$7.26\ 10^{-1}$	$3.69\ 10^{-1}$	$3.70\ 10^{-1}$
	95%	$9.47\ 10^{-1}$	$9.50\ 10^{-1}$	$7.12\ 10^{-1}$	$6.79\ 10^{-1}$
1 week	5%	$4.44\ 10^{-1}$	$4.40\ 10^{-1}$	$1.67\ 10^{-1}$	$1.70\ 10^{-1}$
	50%	$7.95\ 10^{-1}$	$7.90\ 10^{-1}$	$3.72\ 10^{-1}$	$3.70\ 10^{-1}$
	95%	$9.49\ 10^{-1}$	$9.50\ 10^{-1}$	$6.81\ 10^{-1}$	$6.79\ 10^{-1}$
1 month	5%	$5.23\ 10^{-1}$	$4.40\ 10^{-1}$	$1.93\ 10^{-1}$	$1.87\ 10^{-1}$
	50%	$7.97\ 10^{-1}$	$8.00\ 10^{-1}$	$3.74\ 10^{-1}$	$3.70\ 10^{-1}$
	95%	$9.48\ 10^{-1}$	$9.50\ 10^{-1}$	$6.81\ 10^{-1}$	$6.79\ 10^{-1}$
1 year	5%	$3.99\ 10^{-1}$	$4.00\ 10^{-1}$	$2.10\ 10^{-1}$	$2.10\ 10^{-1}$
	50%	$7.56\ 10^{-1}$	$7.60\ 10^{-1}$	$3.96\ 10^{-1}$	$4.00\ 10^{-1}$
	95%	$9.37\ 10^{-1}$	$9.40\ 10^{-1}$	$7.13\ 10^{-1}$	$7.10\ 10^{-1}$
10 years	5%	$1.41\ 10^{-1}$	$1.40\ 10^{-1}$	$2.19\ 10^{-1}$	$2.20\ 10^{-1}$
	50%	$4.57\ 10^{-1}$	$4.60\ 10^{-1}$	$4.34\ 10^{-1}$	$4.30\ 10^{-1}$
	95%	$8.80\ 10^{-1}$	$8.79\ 10^{-1}$	$9.32\ 10^{-1}$	$9.30\ 10^{-1}$
50 years	5%	$5.32\ 10^{-3}$	$5.30\ 10^{-3}$	$1.39\ 10^{-1}$	$1.40\ 10^{-1}$
	50%	$1.32\ 10^{-1}$	$1.30\ 10^{-1}$	$5.13\ 10^{-1}$	$5.10\ 10^{-1}$
	95%	$7.41\ 10^{-1}$	$7.36\ 10^{-1}$	$9.75\ 10^{-1}$	$9.70\ 10^{-1}$

Notes
a DM gives the aggregated distributions as specified by the experts.
b Pred gives the distributions obtained using the fitted parameter values.

Table 2.14 Comparison between marginal distributions of elicitation variables obtained from the experts and from the distributions on target variables, for the plutonium internal dose model

Quantity[(a)]	5%		50%		95%	
	DM[(b)]	Pred. [(c)]	DM[(b)]	Pred. [(c)]	DM[(b)]	Pred.[(c)]
m_3, 1hour	$2.87\ 10^{-5}$	$2.87\ 10^{-5}$	$1.24\ 10^{-3}$	$1.24\ 10^{-3}$	$5.37\ 10^{-2}$	$3.92\ 10^{-2}$
m_3, 1day	$1.44\ 10^{-4}$	$1.42\ 10^{-4}$	$4.15\ 10^{-3}$	$4.14\ 10^{-3}$	$5.49\ 10^{-2}$	$5.49\ 10^{-2}$
m_3, 1 week	$2.40\ 10^{-4}$	$1.94\ 10^{-4}$	$9.27\ 10^{-3}$	$4.61\ 10^{-3}$	$6.34\ 10^{-2}$	$5.93\ 10^{-2}$
m_3, 1 month	$4.65\ 10^{-4}$	$3.42\ 10^{-4}$	$1.51\ 10^{-2}$	$1.11\ 10^{-2}$	$1.04\ 10^{-1}$	$7.82\ 10^{-2}$
m_3,1 year	$2.26\ 10^{-3}$	$1.15\ 10^{-3}$	$4.69\ 10^{-2}$	$1.93\ 10^{-2}$	$2.41\ 10^{-1}$	$2.40\ 10^{-1}$
m_3,10 years	$5.26\ 10^{-3}$	$5.25\ 10^{-3}$	$7.38\ 10^{-2}$	$7.40\ 10^{-2}$	$2.72\ 10^{-1}$	$2.70\ 10^{-1}$
Q1-1 day	$2.16\ 10^{-1}$	$2.24\ 10^{-1}$	$5.38\ 10^{-1}$	$6.04\ 10^{-1}$	$9.41\ 10^{-1}$	$8.99\ 10^{-1}$
Q1-1 week	$5.45\ 10^{-1}$	$2.21\ 10^{-1}$	$7.68\ 10^{-1}$	$7.60\ 10^{-1}$	$9.48\ 10^{-1}$	$9.91\ 10^{-1}$
Q1-1 month	$5.88\ 10^{-1}$	$2.04\ 10^{-1}$	$8.15\ 10^{-1}$	$7.54\ 10^{-1}$	$9.55\ 10^{-1}$	$9.88\ 10^{-1}$
Q1-1 year	$4.22\ 10^{-1}$	$4.54\ 10^{-2}$	$8.00\ 10^{-1}$	$6.52\ 10^{-1}$	$9.53\ 10^{-1}$	$9.60\ 10^{-1}$
Q1-10 years	$3.53\ 10^{-1}$	$2.16\ 10^{-8}$	$7.31\ 10^{-1}$	$4.56\ 10^{-1}$	$9.25\ 10^{-1}$	$8.28\ 10^{-1}$
Q1-50 years	$2.00\ 10^{-1}$	0	$5.05\ 10^{-1}$	$1.70\ 10^{-1}$	$8.52\ 10^{-1}$	$6.12\ 10^{-1}$
Q2-1 day	$2.69\ 10^{-1}$	$2.20\ 10^{-1}$	$5.97\ 10^{-1}$	$6.56\ 10^{-1}$	$9.26\ 10^{-1}$	$9.71\ 10^{-1}$
Q2-1 week	$2.21\ 10^{-1}$	$2.15\ 10^{-1}$	$6.00\ 10^{-1}$	$6.58\ 10^{-1}$	$9.22\ 10^{-1}$	$9.81\ 10^{-1}$
Q2-1 month	$2.08\ 10^{-1}$	$2.09\ 10^{-1}$	$6.02\ 10^{-1}$	$6.62\ 10^{-1}$	$9.17\ 10^{-1}$	$9.91\ 10^{-1}$
Q2-1 year	$2.24\ 10^{-1}$	$1.80\ 10^{-1}$	$5.80\ 10^{-1}$	$6.61\ 10^{-1}$	$8.11\ 10^{-1}$	1
Q2-10 years	$2.70\ 10^{-1}$	$1.96\ 10^{-3}$	$6.02\ 10^{-1}$	$6.58\ 10^{-1}$	$8.90\ 10^{-1}$	1
Q2-50 years	$2.88\ 10^{-1}$	$7.00\ 10^{-14}$	$6.69\ 10^{-1}$	$6.77\ 10^{-1}$	$9.75\ 10^{-1}$	1
Q3-1 day	$7.11\ 10^{-1}$	$9.90\ 10^{-1}$	$9.83\ 10^{-1}$	1	1	1
Q3-1 week	$6.62\ 10^{-1}$	$9.30\ 10^{-1}$	$9.88\ 10^{-1}$	$9.99\ 10^{-1}$	1	1
Q3-1 month	$6.83\ 10^{-1}$	$8.33\ 10^{-1}$	$9.80\ 10^{-1}$	$9.98\ 10^{-1}$	1	1
Q3-1 year	$4.94\ 10^{-1}$	$4.41\ 10^{-1}$	$8.91\ 10^{-1}$	$9.89\ 10^{-1}$	$9.78\ 10^{-1}$	$9.99\ 10^{-1}$
Q3-10 years	$1.84\ 10^{-1}$	$2.52\ 10^{-2}$	$7.06\ 10^{-1}$	$9.84\ 10^{-1}$	$8.84\ 10^{-1}$	$9.99\ 10^{-1}$
Q3-50 years	$3.21\ 10^{-2}$	0	$6.17\ 10^{-1}$	$9.88\ 10^{-1}$	$8.07\ 10^{-1}$	1
Q4-1 day	$4.19\ 10^{-1}$	$1.28\ 10^{-1}$	$6.05\ 10^{-1}$	$4.40\ 10^{-1}$	$8.24\ 10^{-1}$	$7.53\ 10^{-1}$
Q4-1 week	$4.23\ 10^{-1}$	$1.28\ 10^{-1}$	$6.06\ 10^{-1}$	$4.40\ 10^{-1}$	$8.30\ 10^{-1}$	$7.63\ 10^{-1}$
Q4-1 month	$4.11\ 10^{-1}$	$1.28\ 10^{-1}$	$6.01\ 10^{-1}$	$4.39\ 10^{-1}$	$8.00\ 10^{-1}$	$7.67\ 10^{-1}$
Q4-1 year	$3.21\ 10^{-1}$	$1.22\ 10^{-1}$	$5.37\ 10^{-1}$	$4.32\ 10^{-1}$	$7.23\ 10^{-1}$	$8.20\ 10^{-1}$
Q4-10 years	$4.15\ 10^{-2}$	$7.71\ 10^{-2}$	$2.63\ 10^{-1}$	$3.59\ 10^{-1}$	$5.16\ 10^{-1}$	$7.93\ 10^{-1}$
Q4-50 years	$2.08\ 10^{-2}$	$1.71\ 10^{-3}$	$1.69\ 10^{-1}$	$1.16\ 10^{-1}$	$4.24\ 10^{-1}$	$7.58\ 10^{-1}$
Q5-1 day	$4.34\ 10^{-5}$	$4.08\ 10^{-6}$	$4.12\ 10^{-4}$	$4.50\ 10^{-5}$	$9.79\ 10^{-2}$	$2.21\ 10^{-3}$
Q5-1 week	$3.09\ 10^{-4}$	$2.94\ 10^{-5}$	$1.91\ 10^{-3}$	$3.61\ 10^{-4}$	$1.94\ 10^{-2}$	$1.30\ 10^{-2}$
Q5-1month	$1.05\ 10^{-3}$	$4.12\ 10^{-5}$	$8.82\ 10^{-3}$	$1.12\ 10^{-3}$	$3.70\ 10^{-2}$	$3.37\ 10^{-2}$
Q5-1 year	$1.30\ 10^{-3}$	$8.86\ 10^{-5}$	$2.89\ 10^{-2}$	$3.42\ 10^{-3}$	$8.78\ 10^{-2}$	$6.83\ 10^{-2}$
Q5-10 years	$1.13\ 10^{-3}$	$7.30\ 10^{-5}$	$2.40\ 10^{-2}$	$3.07\ 10^{-3}$	$7.45\ 10^{-2}$	$6.19\ 10^{-2}$
Q5-50 years	$1.42\ 10^{-4}$	$3.08\ 10^{-5}$	$1.32\ 10^{-2}$	$1.63\ 10^{-3}$	$5.07\ 10^{-2}$	$4.64\ 10^{-2}$
Q6-1 day	$2.80\ 10^{-2}$	$2.60\ 10^{-2}$	$2.04\ 10^{-1}$	$1.62\ 10^{-1}$	$6.96\ 10^{-1}$	$7.93\ 10^{-1}$
Q6-1 week	$2.80\ 10^{-2}$	$1.64\ 10^{-2}$	$2.04\ 10^{-1}$	$1.46\ 10^{-1}$	$5.73\ 10^{-1}$	$8.13\ 10^{-1}$
Q6-1 month	$2.79\ 10^{-2}$	$1.78\ 10^{-2}$	$1.87\ 10^{-1}$	$1.73\ 10^{-1}$	$6.28\ 10^{-1}$	$8.80\ 10^{-1}$
Q6-1 year	$2.79\ 10^{-2}$	$2.36\ 10^{-2}$	$2.04\ 10^{-1}$	$2.52\ 10^{-1}$	$6.38\ 10^{-1}$	$9.11\ 10^{-1}$
Q6-10 years	$5.14\ 10^{-2}$	$5.00\ 10^{-2}$	$2.88\ 10^{-1}$	$5.00\ 10^{-1}$	$8.89\ 10^{-1}$	$9.50\ 10^{-1}$
Q6-50 years	$9.75\ 10^{-2}$	$3.47\ 10^{-6}$	$4.65\ 10^{-1}$	$5.53\ 10^{-1}$	$9.27\ 10^{-1}$	$9.71\ 10^{-1}$

Notes

a The codes in this column indicate the following quantities:
m_3 is the fraction of the initial deposition which is absorbed to blood.
Q1 is the fraction of the amount reaching blood which is retained in liver plus skeleton
Q2 is the ratio of the amount in the skeleton to that in liver plus skeleton
Q3 is the ratio of the amount on endosteal bone surfaces to that in skeleton
Q4 is the ratio of the amount on trabecular surfaces to that on total endosteal surfaces
Q5 is the ratio of the amount in bone marrow to that in the skeleton.
Q6 is the ratio of the amount in bone marrow associated with cortical bone to that in total bone marrow.

b DM gives the aggregated distributions as specified by the experts.

c Pred gives the distributions obtained using the fitted parameter values.

Table 2.15 Comparison of the distributions on the elicitation variables given by the experts with those from different sampling procedures

Data for retention of Plutonium

Quantity	Percentiles	1 week Experts	Unicorn(5000)	Unicorn(400)	Lhs	NRPB	1year Experts	Unicorn(5000)	Unicorn(400)	Lhs	NRPB
Fraction retained in liver and skeleton	5%	0.54	0.17	0.19	1.00E-01		0.42	9.60E-02	1.20E-01	6.46E-02	
	50%	0.76	0.75	0.76	0.75		0.8	0.55	0.56	0.55	
	95%	0.95	0.99	0.99	0.99		0.95	0.96	0.96	0.96	
Fraction of amount in liver and skeleton that is in liver	5%	0.22	0.22	0.2	0.22	0.208	0.22	0.14	0.11	0.14	9.00E-02
	50%	0.6	0.62	0.63	0.68	0.63	0.58	0.64	0.63	0.72	0.651
	95%	0.92	0.98	0.97	0.98	0.987	0.81	1	0.999	1	0.999
Fraction of material in skeleton that is on endosteal surfaces	5%	0.66	0.7	0.59	0.37	0.256	0.49	0.53	0.54	0.42	0.189
	50%	0.99	0.99	0.99	0.99	0.998	0.89	0.99	0.99	0.98	0.987
	95%	0.999	0.999	0.999	0.999	0.999	0.98	0.999	0.999	0.997	0.999
Fraction of material on endosteal surfaces that is on trabecular surfaces	5%	0.42	7.30E-02	8.44E-02	1.17E-03		0.32	2.10E-03	7.94E-04	0	
	50%	0.61	0.4	0.43	0.39		0.54	0.39	0.4	0.38	
	95%	0.83	0.88	0.88	0.98		0.72	1	1	1	
Fraction of material in skeleton that is in red bone marrow	5%	3.10E-04	2.60E-05	2.72E-05	2.79E-05	8.40E-06	1.30E-03	1.40E-04	1.37E-04	1.07E-04	1.34E-05
	50%	1.90E-03	6.14E-04	5.99E-04	6.48E-04	3.49E-04	2.90E-02	5.03E-02	4.96E-03	5.64E-03	2.24E-03
	95%	1.90E-02	0.1	0.13	0.33	3.40E-02	8.80E-02	0.16	0.15	0.15	0.11
Fraction of total deposit in respiratory tract that is in the extrathoracic region	5%	2.14E-02	2.60E-03	1.90E-03	9.47E-04		2.14E-02	1.40E-03	1.26E-03	1.11E-03	
	50%	0.12	0.2	0.19	0.15		0.13	0.21	0.18	0.26	
	95%	0.58	0.98	0.98	0.97		0.62	0.98	0.99	0.99	

Quantity	Percentiles	10 yrs Experts	Unicorn(5000)	Unicorn(400)	Lhs	NRPB
Fraction retained in liver and skeleton	5%	0.35	9.40E-03	9.90E-03	3.16E-03	
	50%	0.73	0.3	0.3	0.3	
	95%	0.92	0.82	0.84	0.81	
Fraction of amount in liver and skeleton that is in liver	5%	0.27	6.40E-04	3.64E-04	1.62E-04	5.40E-06
	50%	0.6	0.62	0.61	0.72	0.636
	95%	0.89	1	1	1	1
Fraction of material in skeleton that is on endosteal surfaces	5%	0.18	0.34	0.35	2.70E-01	0.64
	50%	0.71	0.99	0.99	0.99	0.999
	95%	0.88	0.999	0.999	0.999	0.999
Fraction of material on endosteal surfaces that is on trabecular surfaces	5%	0.041	0	0	0	
	50%	0.26	0.31	0.31	0.3	
	95%	0.52	1	1	1	
Fraction of material in skeleton that is in red bone marrow	5%	1.10E-03	9.50E-05	7.65E-05	8.42E-05	3.54E-09
	50%	2.40E-02	3.00E-03	2.61E-03	2.82E-03	3.29E-04
	95%	7.50E-02	0.11	9.20E-02	0.12	0.08
Fraction of total deposit in respiratory tract that is in the extrathoracic region	5%	4.20E-02	1.70E-10	1.90E-12	5.40E-08	
	50%	0.26	0.25	0.24	0.4	
	95%	0.74	1	1	1	

Data for retention of Iodine

Quantity	Percentiles	1 day Experts	Unicorn (400)	NRPB	1 week Experts	Unicorn (400)	NRPB	1 month Experts	Unicorn (400)	NRPB
Fraction retained in thyroid	5%	0.116	9.12E-02	9.86E-02	0.112	8.79E-02	9.53E-02	8.54E-02	8.31E-02	0.186
	50%	0.297	0.31	0.307	0.286	0.297	0.294	0.236	0.232	0.633
	95%	0.563	0.643	0.628	0.548	0.614	0.613	0.457	0.512	0.881

Data for retention of Strontium

Quantity	Percentiles	1 week Experts	Unicorn(400)	NRPB	1 year Experts	Unicorn(400)	NRPB	10 years Experts	Unicorn(400)	NRPB
Fraction retained in liver and skeleton	5%	0.444	0.452	0.21	0.399	3.98E-01	6.66E-02	0.141	1.53E-01	2.67E-06
	50%	0.795	0.81	0.67	0.756	0.77	0.24	0.457	0.491	2.99E-05
	95%		0.979	0.93	0.937	0.949	0.36	0.88	0.828	9.13E-02
Fraction of amount in liver and skeleton that is in liver	5%	0.822	0.63	0.485	0.77	5.30E-05	1.40E-09	0.679	0.00E+00	0.00E+00
	50%	0.958	0.96	0.97	0.994	0.93	0.94	0.995	0.93	0.93
	95%	0.998	0.999	0.999	1	0.999	0.999	1	0.999	0.999

Data for retention of Ruthenium

Quantity	Percentiles	1 week Experts	Unicorn(400)	NRPB	1 month Experts	Unicorn(400)	NRPB	1 year Experts	Unicorn(400)	NRPB
Fraction retained in whole body	5%	0.296	0.171	0.125	0.123	8.50E-02	6.70E-02	5.94E-03	2.43E-04	7.50E-06
	50%	0.657	0.678	0.626	0.391	0.473	0.41	0.159	0.217	0.17
	95%	0.85	0.974	0.96	0.702	0.9	0.88	0.493	0.578	0.559

Data for retention of Cerium

Quantity	**Percentiles**	**1 week Experts**	**Unicorn (400)**	**NRPB**	**1 month Experts**	**Unicorn (400)**	**NRPB**	**1 year Experts**	**Unicorn (400)**	**NRPB**
Fraction retained in liver and skeleton	5%	0.444	0.452	0.21	0.523	0.453	0.186	0.399	3.98E-01	6.66E-02
	50%	0.795	0.81	0.67	0.797	0.814	0.633	0.756	0.77	0.24
	95%	0.949	0.979	0.93	0.948	0.979	0.881	0.937	0.949	0.36
Fraction of amount in liver and skeleton that is in liver	5%	0.167	0.159	0.162	0.193	0.159	0.163	0.21	0.15	1.28E-01
	50%	0.372	0.408	0.409	0.374	0.408	0.409	0.396	0.417	0.43
	95%	0.681	0.857	0.903	0.681	0.858	0.904	0.713	0.863	0.997

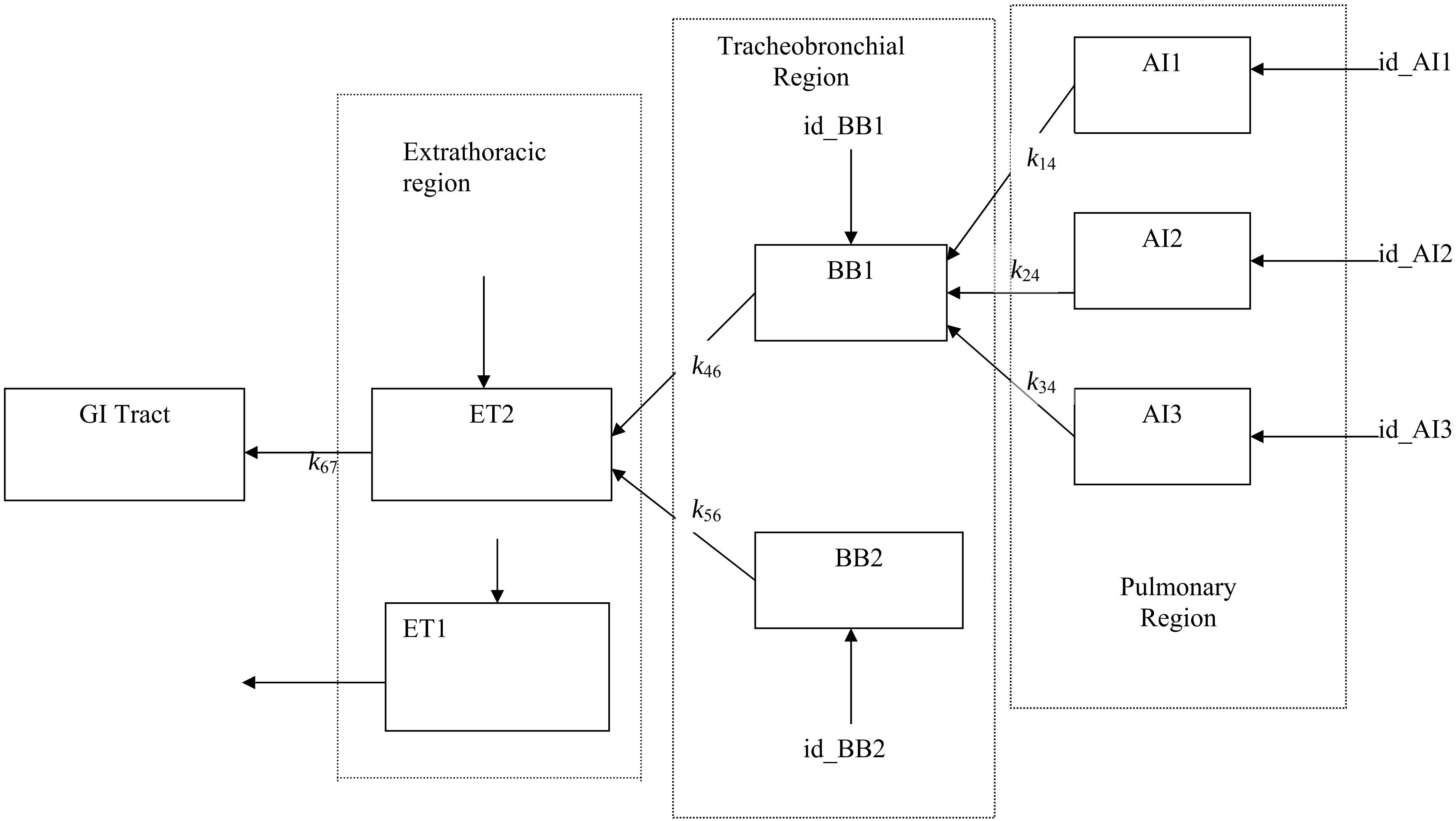


Figure 2.1 Box model used for retention of material in the lung

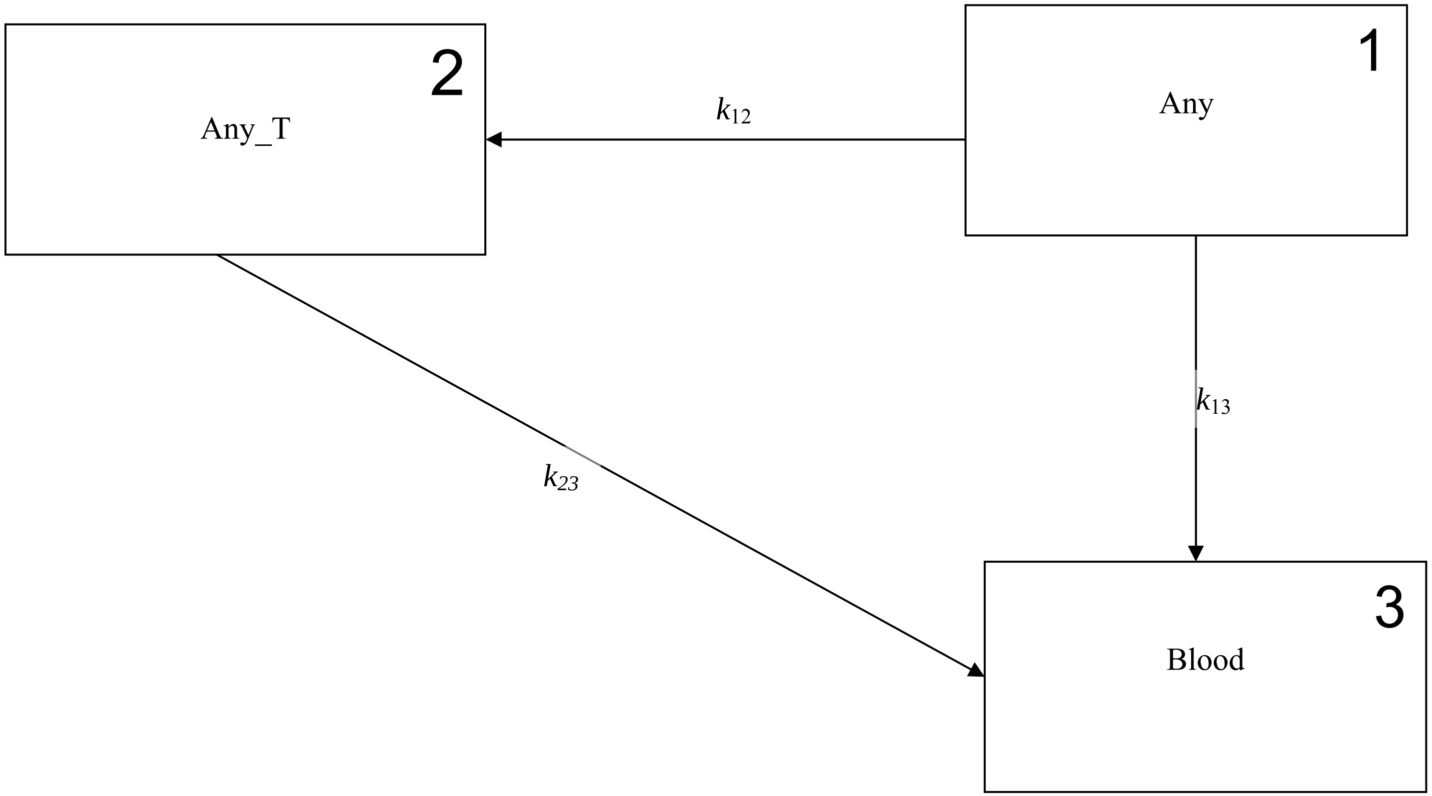


Figure 2.2 Box model used for the transfer of material from lungs to blood

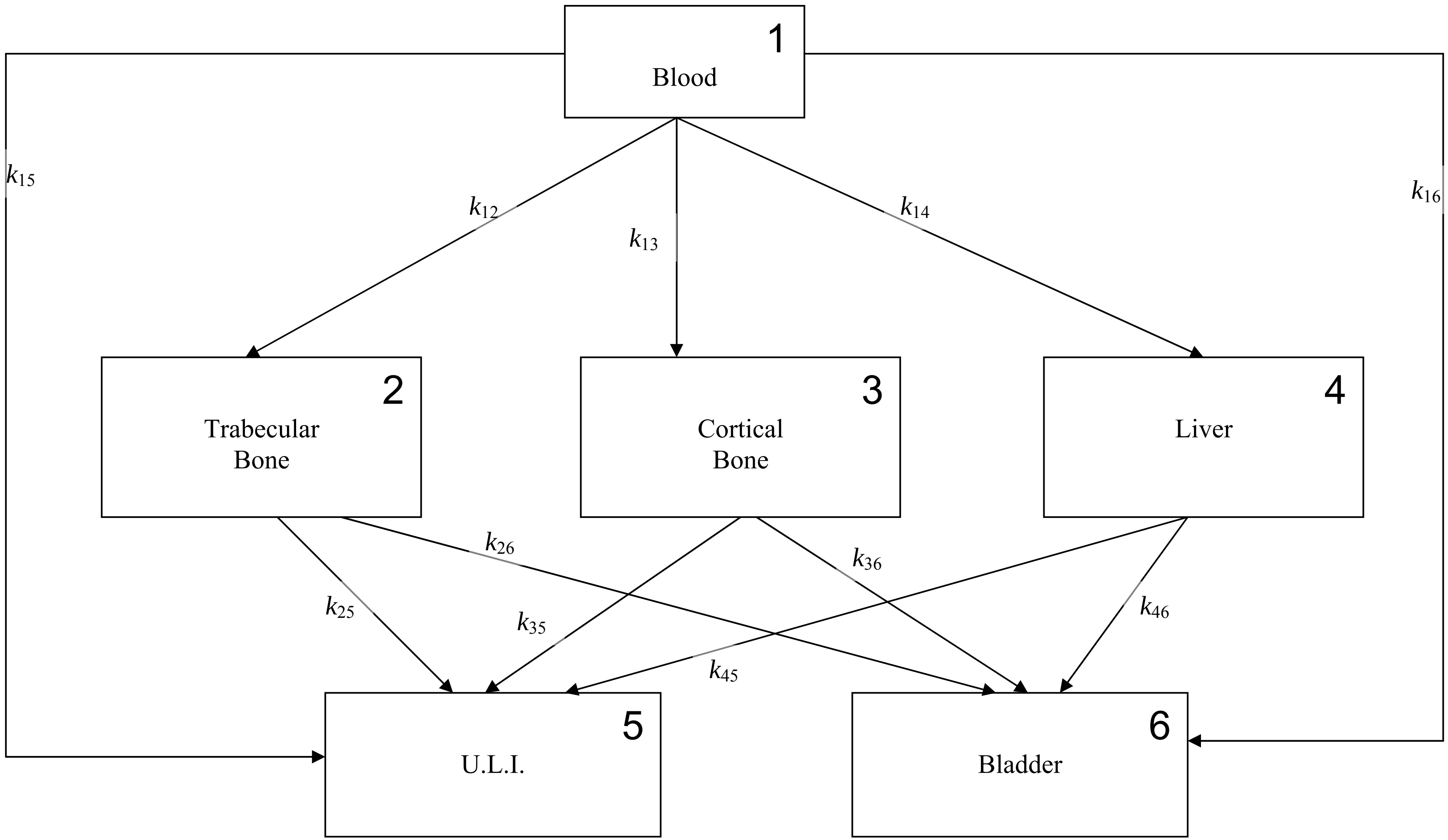


Figure 2.3 Box model for systemic retention of strontium

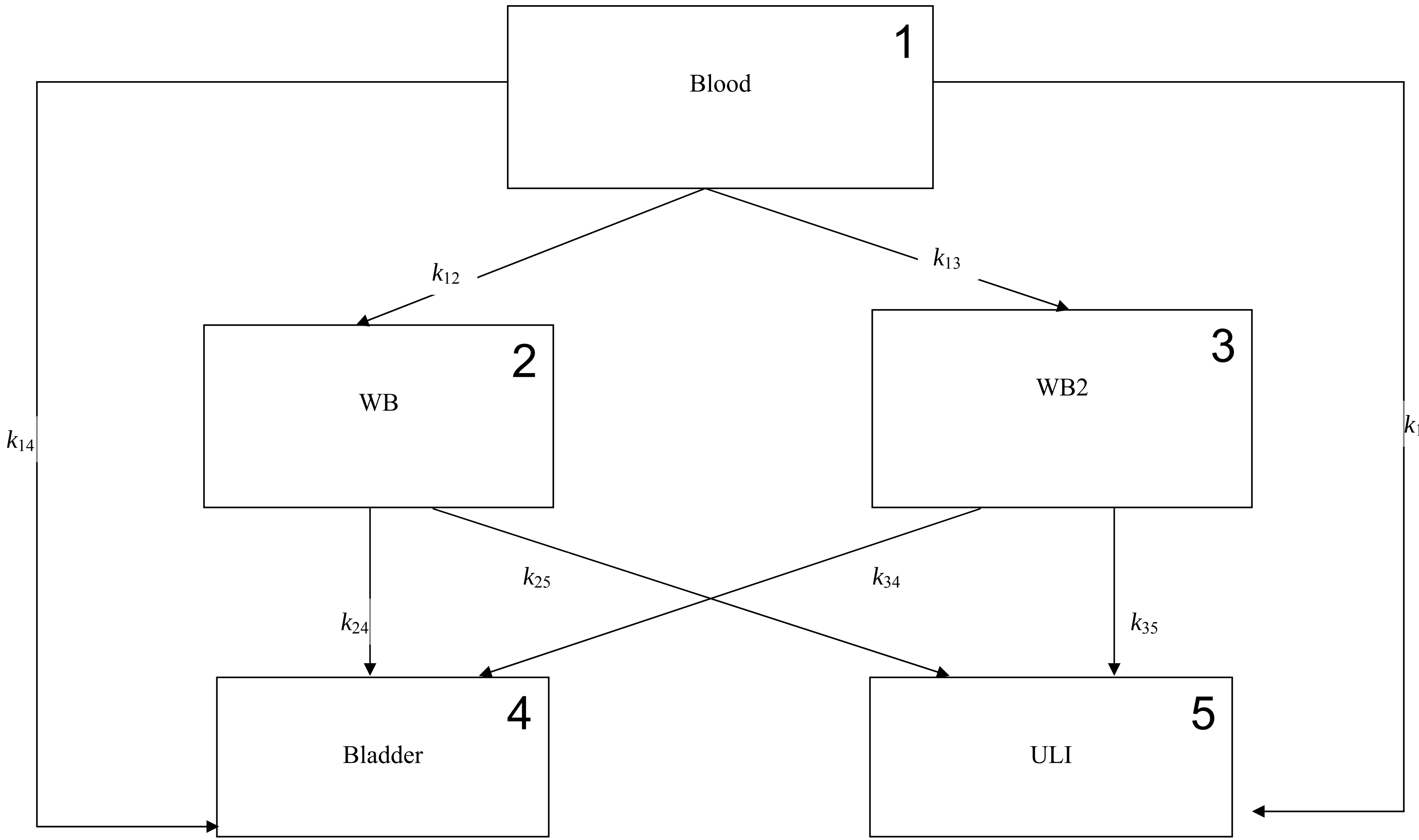


Figure 2.4 Box model for systemic retention of ruthenium

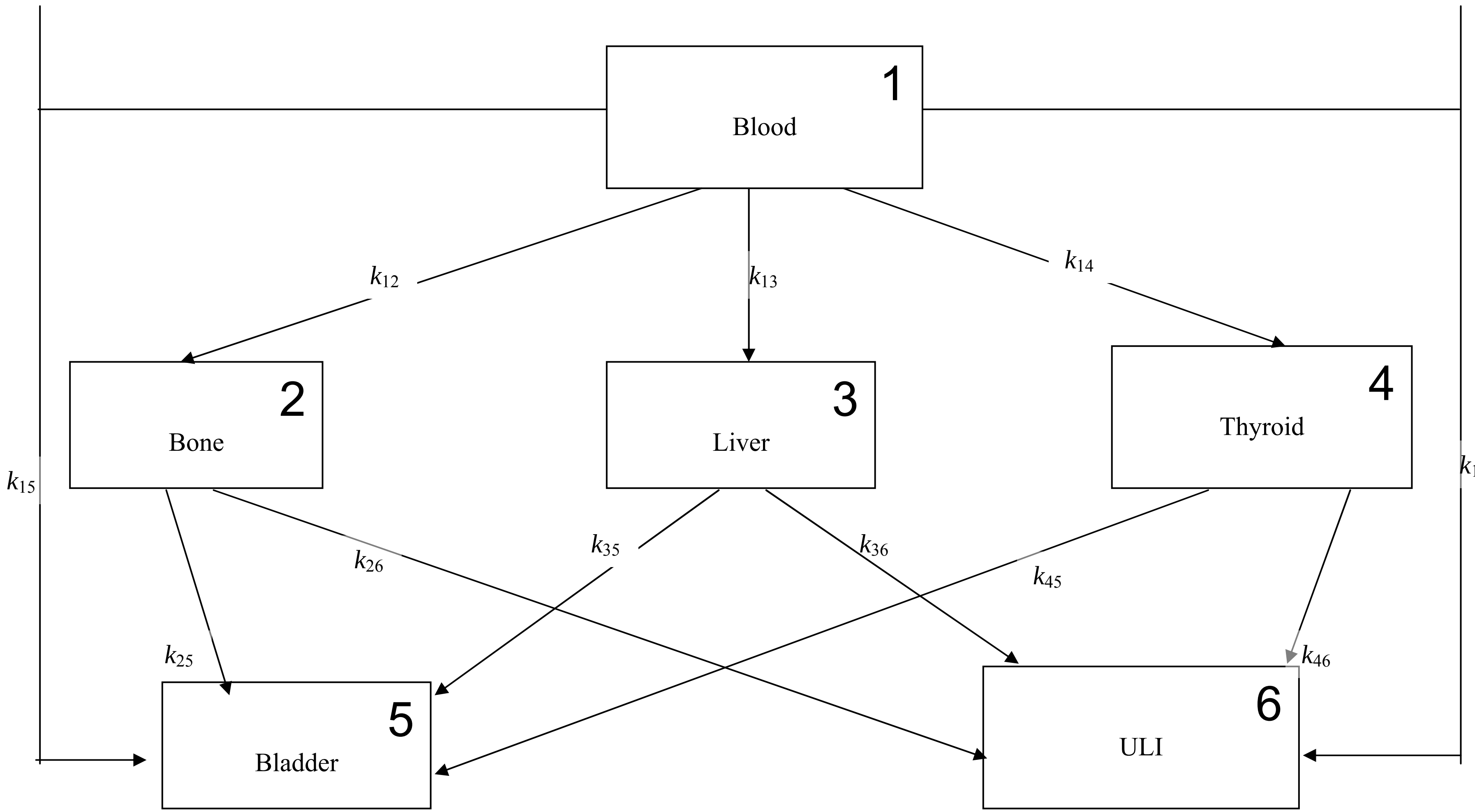


Figure 2.5 Box model for systemic retention of tellurium

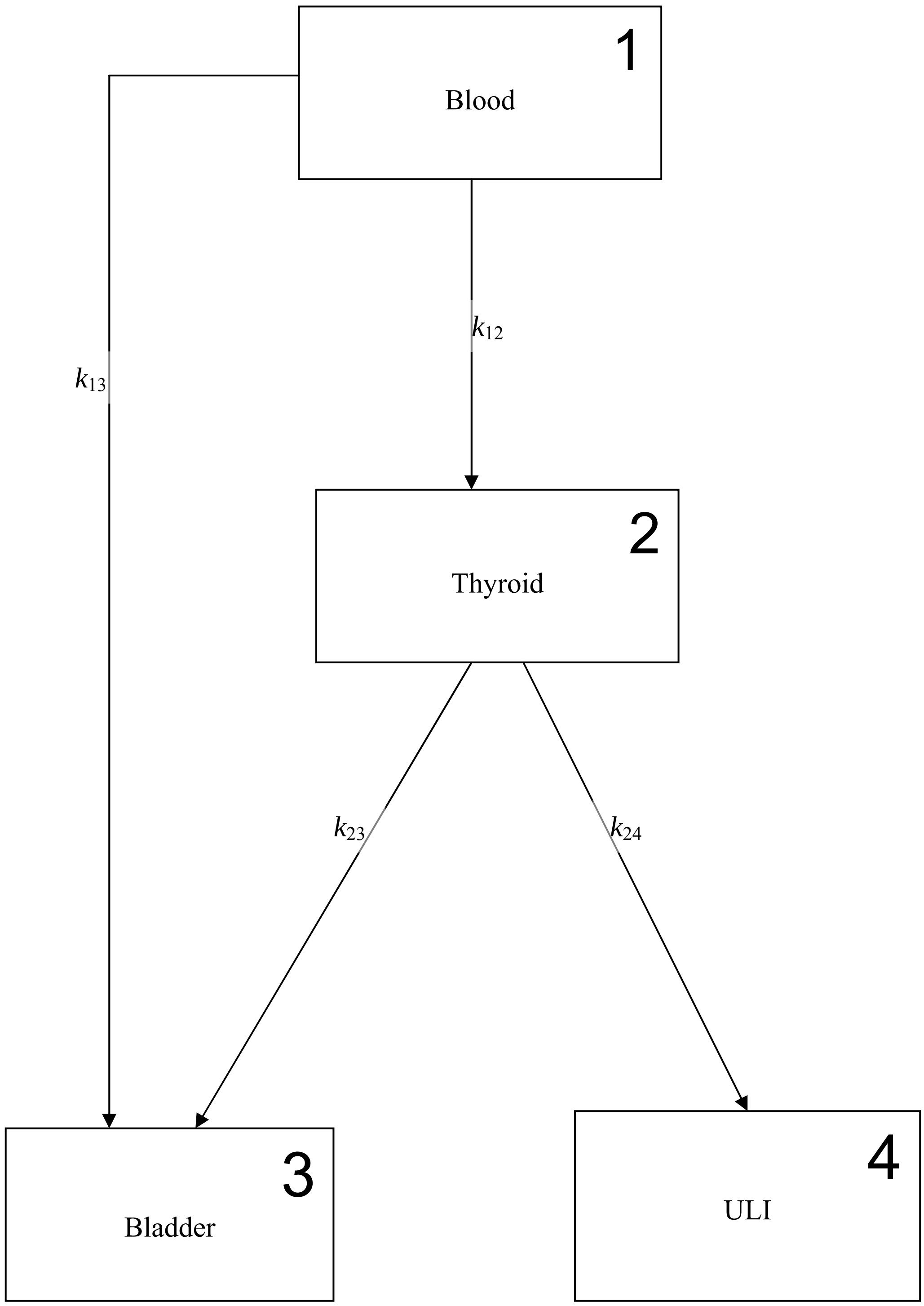


Figure 2.6 Box model for systemic retention of iodine

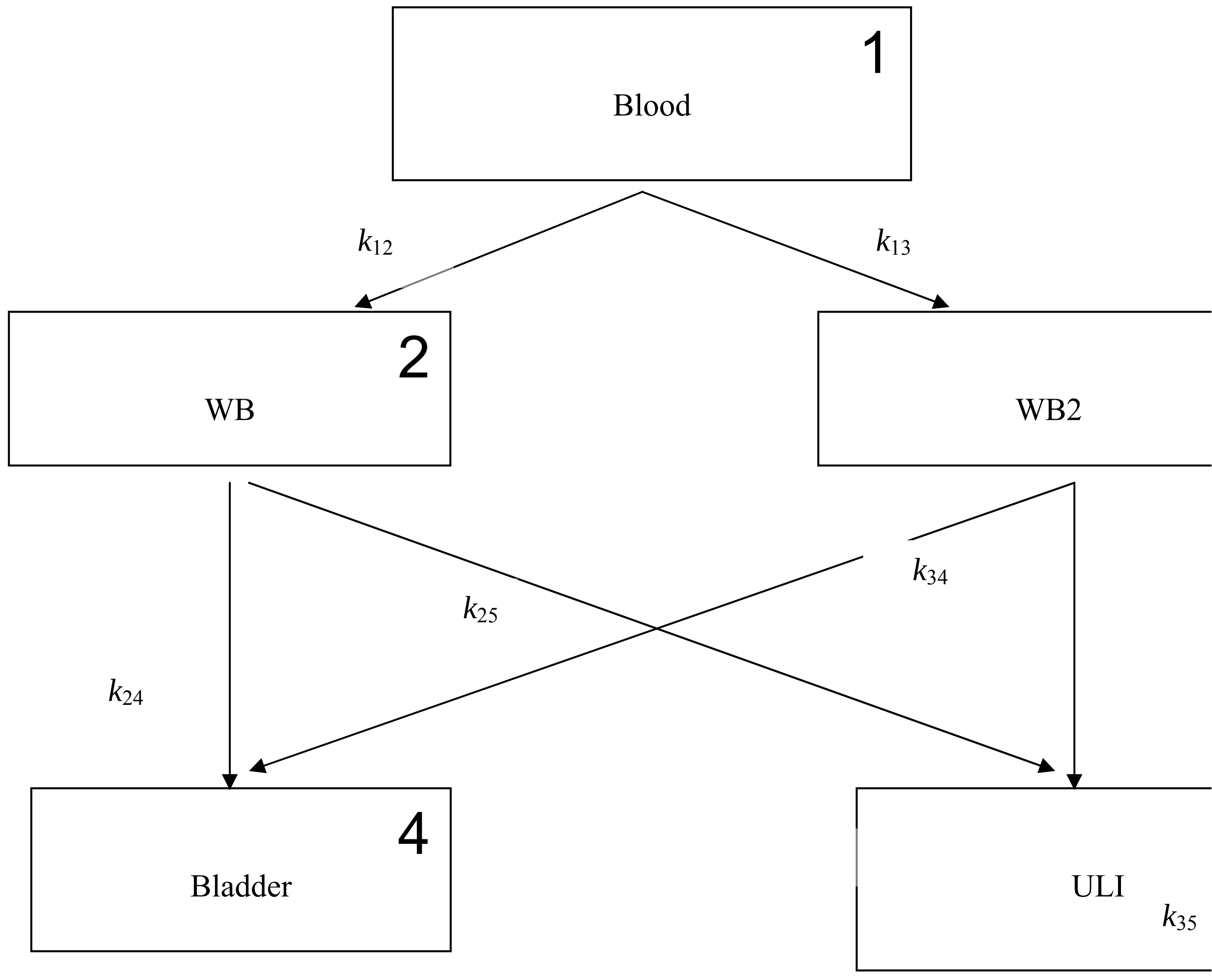


Figure 2.7 **Box model for systemic retention of caesium**

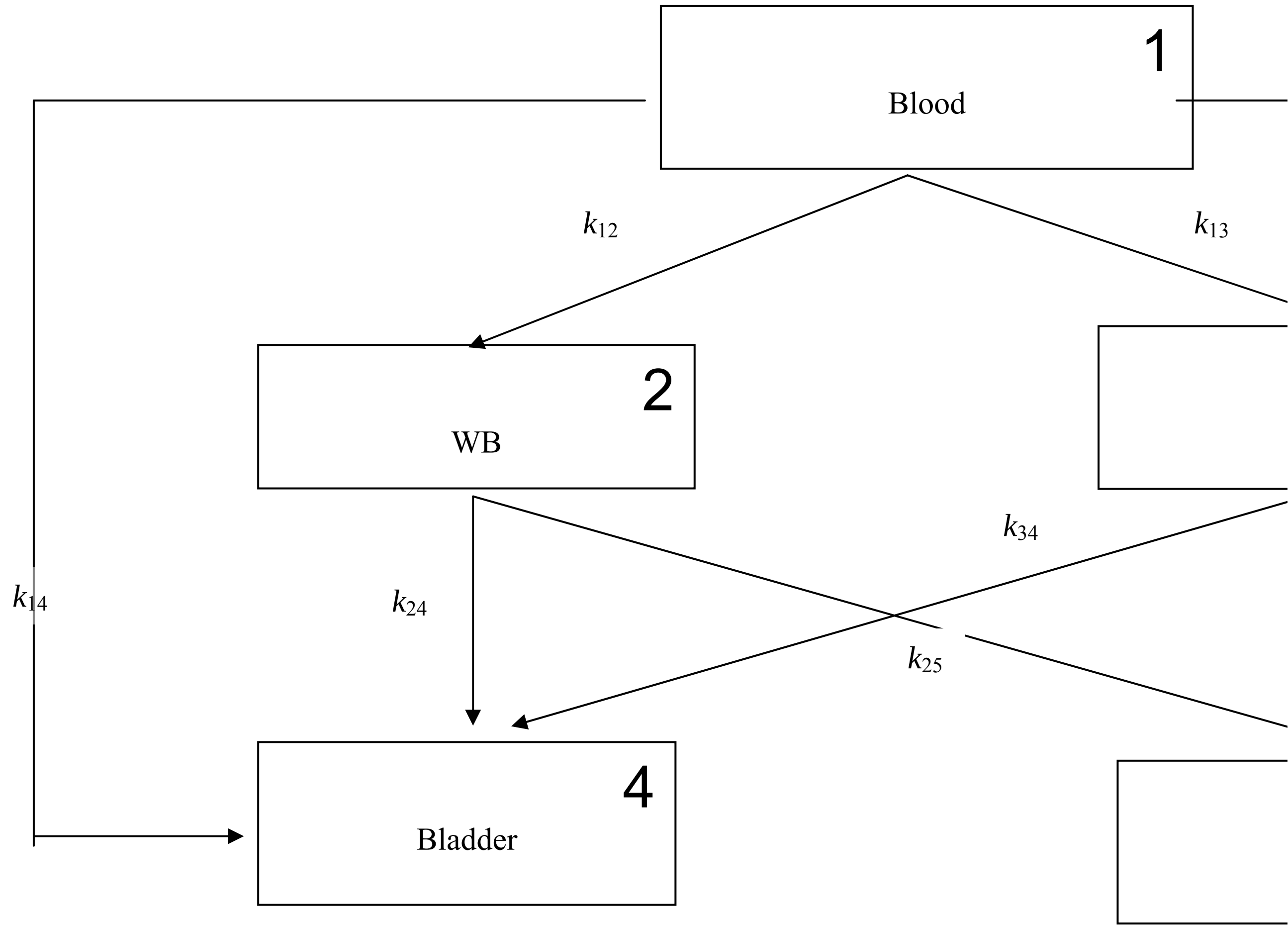
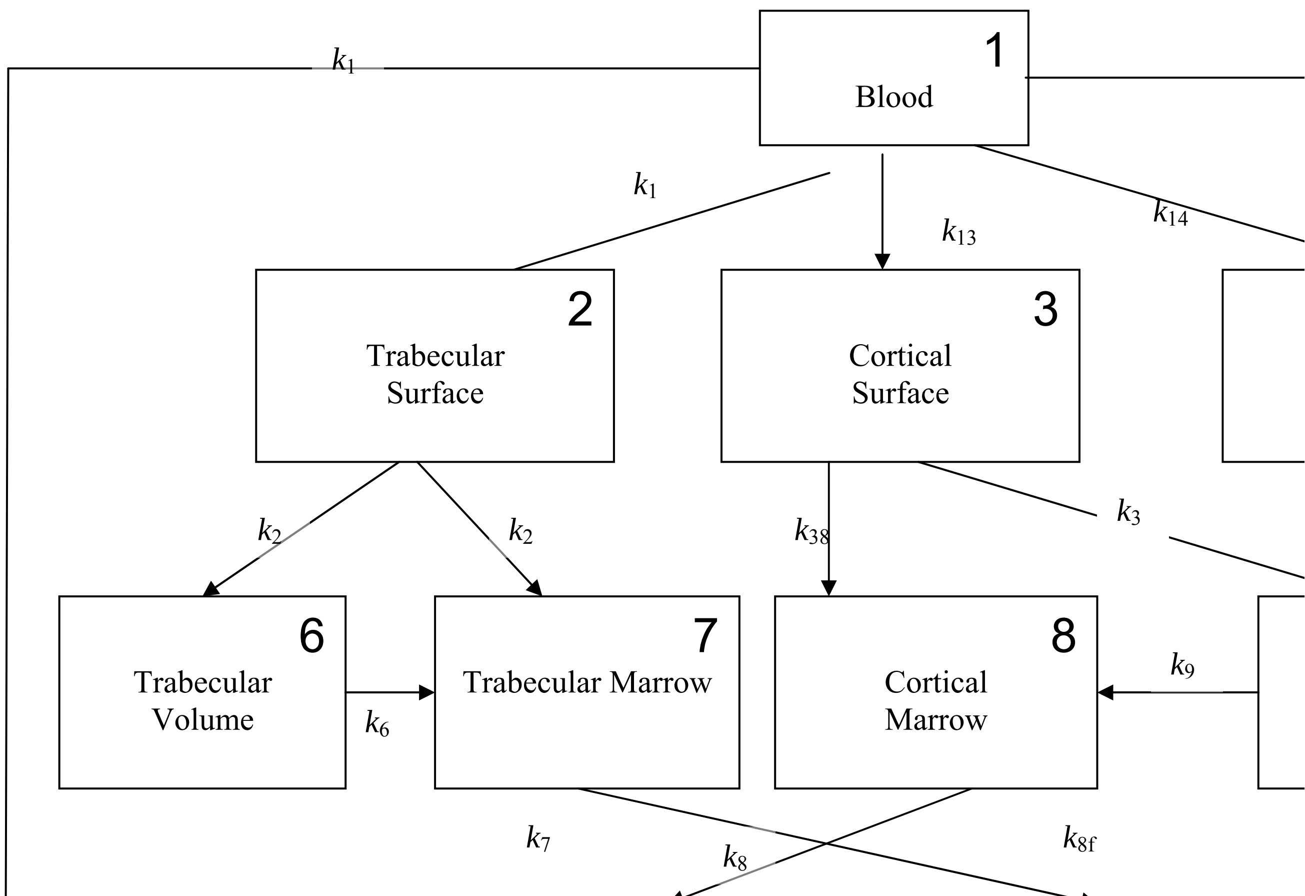


Figure 2.8 Box model for systemic retention of cerium



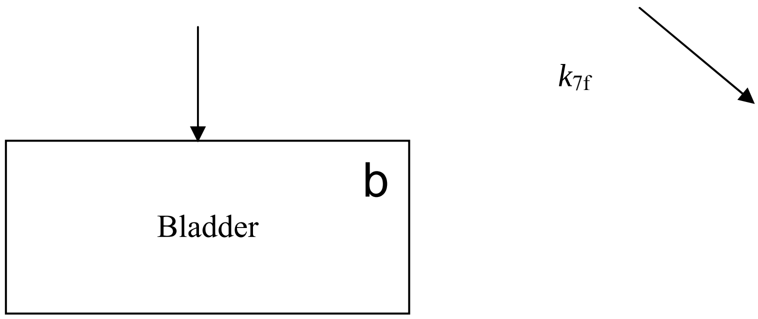


Figure 2.9 Box model for systemic retention of plutonium

RESULTS

This section presents the results of the analysis of the dose module, and describes the extent of the uncertainty on the predictions and also those parameters whose uncertainties make important contributions to the overall uncertainty. The extent of the uncertainty is described using "uncertainty factors" (the ratio of the 95th to 5th percentiles of the distribution on the endpoint) and "reference uncertainty coefficients" (the ratio of the 95th percentile of the uncertainty distribution to the value obtained using default values for all the input parameters). Appendix C contains more extensive results on the extent of the uncertainty, giving 7 percentiles of the distribution on each of the endpoints, together with the reference value. The important parameter uncertainties are summarised in this chapter, which gives those parameters that are identified as important for groups of endpoints (either different parts of the ccdf for one quantity, or for related quantities). The criteria adopted to decide which parameters to include in the tables in this section are rather subjective. Appendix D contains more information on the contributions of the different parameter uncertainties to the overall uncertainty on the model predictions, listing those parameters that are identified in the top 3 ranks using PRCC and those making more than 10% contribution to the uncertainty. This appendix therefore identifies more parameters than are included in the overall analysis, using the criteria described in Section 1 of this report.

In the absence of any uncertainty, the results of COSYMA are presented in terms of probability distributions of the various quantities, where the probability reflects the occurrence of different atmospheric conditions at the time of the release. In this study, the probability distribution is characterised by its mean value and the 95th and 99th percentiles of the distribution. The methods and quantities used in this study to describe the uncertainty are described in the "Methodology Report". The dose module analysis involved 360 runs of COSYMA and so generated 360 sets of ccdfs for each of the endpoints. One of the results of an uncertainty analysis is the uncertainty distribution on chosen percentiles and the mean value of the original probability distributions. This uncertainty is represented, in this study, by the "uncertainty factor" which is the ratio of the 95th and 5th percentiles of the uncertainty distribution on the chosen percentiles and mean value for the endpoints considered. COSYMA uses a binning system to derive its probability distributions. In some cases, the uncertainty range on a quantity includes values which are below the lower limit of the bottom bin used for the distribution; such values are reported as zero. In some cases the 5th (and higher) percentile is reported as zero, and the value of the uncertainty factor is infinite. The value of the 95th percentile is given in brackets in the results tables, in place of the uncertainty factor in these cases. Another quantity used is the "reference uncertainty coefficient", which is the ratio of the 95th percentile of the uncertainty distribution for the chosen percentiles or mean value of the original probability distribution to the value predicted using the default values for the parameters in the model. A further ccdf, designated the "mean curve" is also used to present some of the results. This curve is obtained as the average of all the ccdfs obtained from the COSYMA runs.

The endpoints of the analysis were described in Section 1 of this report. The uncertainties on the parameters of the dose models affect the uncertainty on the individual and collective risks of early and late health effects and the extent of those countermeasures which are imposed or withdrawn on the basis of dose, and this report only considers those endpoints.

The results presented here are specific to the situations and source terms considered in this analysis. The extent to which the results can be applied in other situations is considered in the report on the overall analysis.

Individual doses to 7 days and risks of early effects

Short term individual doses (integrated to 7 days) were considered for the UK1 source term, for potential outdoor doses, for normal activity and assuming that countermeasures were taken on the basis of dose. Short term individual doses were also considered for the CB2 source term assuming that countermeasures were taken. The results are presented in Table 3.1, which shows the uncertainty factors, Table 3.2 which shows the reference uncertainty coefficients and Table 3.3, which shows the important uncertain parameters.

The uncertainty factors for the organs considered for UK1 for potential and for normal living doses are similar for the different percentiles and for the different distances considered. The uncertainty factor on doses with countermeasures differs somewhat for the different distances considered being lower at the largest distance considered, though the uncertainty is similar at each of the percentiles of the ccdf considered. This reflects the different relative contributions of the different pathways to dose at the various distances when countermeasures are taken. The uncertainty factors differ for the different organs, reflecting the different contributions to dose in the various organs, and the different uncertainties for each. The uncertainty on skin dose is generally small; the uncertainty on the potential dose reflects uncertainty on the retention time of material on skin while that in the other situations considered also reflects the uncertainties on the location factor for inhalation which is used to calculate the air concentration and hence deposition rate indoors. The uncertainty on thyroid dose reflects mainly the amount of material reaching the thyroid within the time period considered. The uncertainty on the thyroid dose is somewhat larger than that on the other organ doses. The uncertainty on bone marrow dose reflects both the uncertainty on internal and external doses. The uncertainty on external doses is rather lower than that on internal doses and so the uncertainty on the bone marrow dose is lower than that on the thyroid dose. The uncertainty factors shown for the CB2 source term are similar to those for the UK1 source term.

The “reference uncertainty coefficient” values are generally lower than the “uncertainty factors”, particularly for the thyroid doses. The bone marrow and thyroid doses predicted using default parameter values are generally close to the median value of the uncertainty distribution. The “reference uncertainty coefficient” for the potential doses to skin for UK1 are less than 1.0, showing that the “default” COSYMA prediction is greater than the 95^{th} percentile of the uncertainty distribution on these doses. This reflects the rather high default value for the retention time of material on skin adopted in COSYMA, which is greater than the maximum of the range used here.

The parameters whose uncertainties make important contributions to the overall uncertainty were identified for the mean value and the 95^{th} and 99^{th} percentiles of the probability distribution for each of the three distances. Generally different parameter uncertainties are identified at the different distances and for the different parts of the ccdf considered. Table 3.3

gives those parameters that were identified for most of the cases considered, but does not include all of the parameters that were identified for each of the situations; the full list of parameters identified as important is given in Appendix D. The important parameter uncertainties are different for the cases with countermeasures, in normal living and for the potential doses, particularly for the important contributors to bone marrow dose. For bone marrow dose with countermeasures, the important parameters are the breathing rate and the location factor for a car for dose from deposited material. Other location factors are also identified for the 95th percentile of the distribution at the second and third distances considered. The parameter describing the amount of material deposited in the extrathoracic region is identified for some parts of the distribution for the second distance considered. The important parameter uncertainties for the bone marrow dose in normal living are different at the three distances considered. The important uncertainties for the first distance are those on the dose rate from deposited iodine 3 and 10 days after deposition. The uncertainty on the initial dose rate from deposited ruthenium and on the location factor for dose from deposited material are identified as important contributors for the second and third distances considered. The important parameter uncertainties identified for potential outdoor dose are similar to those identified for the dose in normal living, except that the location factor for dose from deposited material is not identified as making an important contribution. The important uncertainties identified for the potential thyroid doses are similar for each distance and for each of the situations considered, reflecting the fact that the thyroid dose is dominated by that from inhalation of iodine for all patterns of population behaviour. The uncertainty on the breathing rate and on the transfer of iodine or tellurium to the thyroid are identified for most of the distances and parts of the ccdf considered. The uncertainty on the location factors for inhalation during normal living and during sheltering are identified as important contributors for the doses with countermeasures and for normal living. The location factor for normal living can be important for the dose with countermeasures as it is used in calculating the doses during the period before countermeasures are taken. The important uncertainties for the dose in skin are those on the retention time of material on skin and the location factors for inhalation for normal living and for sheltering, other than for the potential outdoor doses where only the uncertainty on the residence time is identified as important. The location factors for inhalation are identified here as they are also used to give the ratio of deposition to skin indoors and outdoors. The uncertainty on the skin residence time is identified for the case with countermeasures from its PRCC only; its percentage contribution to the uncertainty is very low.

The parameters whose uncertainties make important contributions to the overall uncertainty for the CB2 source term are shown in Table 3.3 for the early doses with countermeasures, the only situation considered for this source term. The parameter uncertainties identified for bone marrow dose are different for the different distances. The breathing rate and initial dose rate from deposited iodine are identified only for the first two distances. The transfer rates between lung compartments and the stomach are identified only for the 95th percentile for the second distance and for all parts of the probability distribution for the third distance. The location factors are identified for the second distance and for the 95th percentile of the distribution at the first distance. The important parameter uncertainties for the skin and thyroid doses are similar at all distances; they are also similar to those identified for the UK1 source term. The differences may reflect differences in the countermeasures assumed at the various distances.

The results for the individual risk of early health effects are shown in Table 3.4 which shows the uncertainty factors and the reference uncertainty coefficients, and in Table 3.5 which shows the important uncertain parameters. Results are given for the mean value of risk at the three distances considered, for the UK1 source term. Values are not given for the uncertainty on the 95th and 99th percentiles, as the uncertainty factor is often infinite for these quantities, as the 5th percentile of the uncertainty distribution is zero. There are also some situations where the uncertainty factor on the mean value is also infinite. These cases are identified in the table, and the value for the 95th percentile of the uncertainty distribution is given in brackets instead of the uncertainty factor. The uncertainty is different at the various distances considered. The uncertainties on the risk of death, both the total risk and that for the haematopoietic syndrome, increase with distance. The uncertainty on the risk of morbidities does not vary consistently with distance. The uncertainty factors for individual risks are similar to those for doses, presented earlier, particularly at the shorter distances where the doses are sufficiently higher than the thresholds that risks do not become very small. At the larger distances, the uncertainty on the risk of death tends to be greater than that on the early doses. These features reflect the variation of risk with dose; at doses above the LD_{50} the risk increases less than linearly with dose while at doses below that value the risk increases more than linearly as dose increases. The uncertainty on the risk of morbidity includes the uncertainty of surviving early death, and therefore is large if the risk of early death is high. There is no consistent variation of the uncertainty factor with distance for the different morbidities considered.

As shown in Table 3.4, there are some situations for which the “reference uncertainty coefficient” is infinite because the reference value is zero. In these cases, the uncertainty factor is also infinite, and so the value of the 95th percentile can be obtained from the same table. For most of the cases considered for the risk of death, the reference uncertainty coefficient is less than the uncertainty factor, and the reference value lies near the centre of the uncertainty distribution. An exception to this is the risk of early death with countermeasures at the first two distances considered, where the reference value lies below the 5th percentile of the uncertainty distribution. The reference value for the risk of morbidity is towards the upper end of its distribution for these cases, reflecting the effect of the probability of surviving death on the risk of morbidities. In these cases the reference values of doses are towards the centre of their uncertainty bands, as described earlier. The different behaviour of doses and risks reflects the summation over different organs and the different time periods used in calculating risk. In several cases, the reference uncertainty coefficient is close to, or less than, unity and the reference value is near, or above, the 95th percentile of the uncertainty distribution. This frequently reflects the effects of skin exposure where the reference doses are high in the distribution because of the very high default value for the residence time on skin.

The extent of the uncertainty on the individual risks of early mortalities and early morbidities, when countermeasures are taken, for the UK1 source term are illustrated in Figure 0.1 and Figure 0.2. These show the 5th and 95th envelopes of the probability distributions, together with the reference curve and the mean curve. The extent of the uncertainty at different points of the ccfd can be seen from the figures. The reference curve for early death lies very near the 5% envelope over most of the distribution, while for early morbidities the reference curve lies very close to the 95% envelope. As noted earlier, the risk of morbidity calculated by COSYMA includes the probability of surviving early death. As the default values for the risk of early death are very low in the uncertainty band, the default values for the risk of early morbidities will be high in the uncertainty band.

The parameters whose uncertainties make large contributions to the individual risks of early health effects for the UK1 source term are given in Table 3.5. The results, given in Appendix C, show that many of the percentiles of the uncertainty distribution for the 95th and 99th percentiles of the individual risks are zero. In this case it is not possible to identify the important parameter uncertainties, and so important parameters are only identified for the mean value of the risk. The table gives those parameters that are identified at any of the three distances considered in this analysis, using PRCC or percentage contribution to the uncertainty. In many cases, different parameters are identified using the PRCC or the contribution to the overall uncertainty, as can be seen from the full results presented in Appendix D. The most important uncertainties for the risk of early death are those relating to the deposition of material in different regions of the lung, which are identified for each of the distances and for each of the cases (countermeasures, normal living and potential outdoor risks). The location factors for inhalation are identified for all distances for the risk in normal living and for two of the distances if countermeasures are taken. The parameter uncertainties identified as important for the risk of morbidities are similar to those identified for the risk of early deaths. The important parameter uncertainties identified for the individual risk of the haematopoietic syndrome are similar to those identified for the bone marrow dose. The most important parameter uncertainties for the risk of lung morbidity are those describing the initial deposition in the lungs, which are found for all situations considered except for the first distance if countermeasures are taken. The important parameter uncertainties identified for skin burns include some that were not identified for skin doses; the same is true to a lesser extent for the case of hypothyroidism and thyroid doses. The most important parameter uncertainties for skin burns are those describing the initial deposition of material in the lungs. These are identified because the risk of skin burns is expressed in those people who do not die from early health effects, and so the parameters that are important for the risk of early death are therefore also important for the risk of skin burns, but with opposite signs of the correlation coefficients.

Extent of early countermeasures

The uncertainty on the extent of early countermeasures, sheltering, evacuation and distribution of stable iodine tablets, is only considered for the CB2 source term. The “uncertainty factors” for the areas in which countermeasures would be taken are given in Table 3.6. The uncertainty for the evacuation and sheltering areas is large, the uncertainty factors for the mean values being 470 and 160 respectively. The uncertainty is lower for the 95th and 99th percentiles of the distributions than for the mean values. The uncertainty on the areas where sheltering or evacuation would be required are much larger than those on the individual doses, while the uncertainty on the area where iodine tablets would be distributed is comparable to that on the individual thyroid doses. This seems surprising, but cannot be explained at present. It may reflect the interactions between uncertainty on dose at a point and the uncertainty on the areas where doses are above a threshold. The “reference uncertainty coefficients” for the areas in which countermeasures would be taken are given in Table 3.7. All values for the evacuation and sheltering areas are larger than the “uncertainty factors”, showing that the COSYMA prediction obtained using default parameter values is lower than the 5th percentile of the uncertainty distribution on these quantities. The default value for the mean area in which iodine tablets would be distributed lies between the 25th and 50th percentiles of the uncertainty distribution. Remember that the analysis for early countermeasures was only carried out for one source term, and it is difficult to extrapolate these results to other situations.

The parameters whose uncertainties make major contributions to the overall uncertainty are shown in Table 3.8. In general, the same parameters are identified for the mean value and for the 95th and 99th percentiles for both sheltering and evacuation. There is a small exception to this in that some of the parameters make contributions for the different quantities considered which vary from just above to just below 15%, the criterion adopted as the dividing line between important and unimportant parameters. Strictly speaking, therefore, these parameters would only be identified for some of the situations of interest.

The important parameter uncertainties for the extent of the sheltering and evacuation areas are those on some of the parameters of the lung model. Section 2 showed that the default values for some of the lung model parameters are near one end of, or outside, the distributions used in this study. This could explain why the reference values for these areas are also outside their uncertainty distributions.

Numbers of early health effects

Uncertainties on the numbers of early health effects were evaluated for the UK1 source term, for the cases with no countermeasures and assuming that countermeasures were taken. They were also evaluated for the CB2 source term for the case when countermeasures are taken, but the values were generally sufficiently near zero that "uncertainty factors" are very large or infinite. Results are therefore only presented for the UK1 source term in this section. Results for the CB2 source term are presented in Appendices C and D.

The extent of the uncertainty is summarised in Table 3.9 which shows the "uncertainty factors" for the mean value and for the 95th and 99th percentiles of the numbers of early health effects. The uncertainty when countermeasures are taken is generally small. The uncertainty factors for numbers of mortalities is less than about 20 for all points on the probability distribution considered, while that for cases of lung morbidities is about 30. The greater uncertainty on this endpoint reflects the uncertainty on the parameters of the lung model which have been identified as important contributors to a number of effects. In the other cases the uncertainty factor is much less, with values frequently being below 5. The uncertainty on the numbers of effects for normal living is similar to that for the case with countermeasures for early death and for skin burns, but somewhat larger for the other effects considered. The reasons for this difference are not clear. The "reference uncertainty coefficients" are also summarised in Table 3.9. In many cases the "reference uncertainty coefficient" is lower than the "uncertainty factor" which shows that the result obtained with default parameter values is in the upper part of the uncertainty distribution for the particular endpoints. The "reference uncertainty coefficient" for the number of early deaths with countermeasures is similar to the "uncertainty factor", and so for this quantity, the result with default parameter values is near the 5th percentile of the uncertainty distribution. The "reference uncertainty coefficient" for the number of lung morbidities with countermeasures is greater than the “uncertainty factor”, and so for this quantity, the result with default parameter values is below the 5th percentile of the uncertainty distribution. This implies that the numbers of deaths from the pulmonary syndrome predicted using default parameter values would also be towards the lower end of the uncertainty distribution. The total numbers of early deaths, representing the sum of deaths from the haematopoietic syndrome, pulmonary syndrome and skin burns, predicted using default parameter values is below the 5th percentile of the uncertainty distribution. This probably reflects the contribution of deaths from the pulmonary syndrome and skin burns to the total. The contribution of lung morbidities to the total numbers of morbidities may also explain why the default prediction for this quantity is towards the lower end of the uncertainty distribution.

The uncertainty factors on the numbers of effects reflect the uncertainty factors on the risks over the distances of interest. The uncertainty on the number of cases of the haematopoietic syndrome is rather lower than that for the total number of cases of death for the case when countermeasures are taken, although the uncertainty on the risks, particularly at the first 2 distances, are similar. This reflects the contribution of deaths from skin burns. The doses for this effect remain above the threshold for larger distances than do those for other effects; the greater uncertainty on the total number of deaths reflects the uncertainty on the risks to a large number of people as the threshold distance increases.

The extent of the uncertainty is illustrated in Figure 0.3, which shows the 5% and 95% envelopes of the ccfds for the numbers of early deaths with countermeasures for the UK1 source term, together with the reference curve and the mean curve. The reference curve is seen to lie near the 5% envelope for much of the probability distribution.

The parameters whose uncertainties make large contributions to the overall uncertainty are summarised in Table 3.10, which gives those parameters that are identified for any one of the mean value, the 95th or the 99th percentiles of the distribution. In general, these are the same parameters that are identified as making the most important contributions to the uncertainty on the individual risks of early health effects. For most of the endpoints, the same parameters are identified for each of the three percentiles of the ccfd considered. The breathing rate and the amounts of material deposited in different regions of the lung are identified as important parameter uncertainties for several of the endpoints considered, particularly for the numbers of effects with countermeasures. The location factors for inhalation while in normal living and when sheltering are identified as important parameter uncertainties for skin effects and for the total number of morbidities. This is because these parameters are also used in calculating the amount of material depositing on skin for people indoors. The uncertainty on the parameters describing the uptake of iodine and tellurium to the thyroid are identified as important contributors to the overall numbers of cases of hypothyroidism. The uncertainties on the calculation of external dose from deposited activity for iodine and ruthenium are identified as important contributors to the overall uncertainty on the numbers of deaths from the haematopoietic syndrome in normal living; this is the situation where external exposure is likely to make the greatest contribution to the overall risk.

Committed individual doses and risks of late health effects

Uncertainties on committed individual doses and risks were calculated for the CB2 source term, for the case where countermeasures are taken and for normal living. They were also calculated for the DBA source term, considering uncertainty on the potential outdoor doses and on doses when countermeasures are taken.

The extent of the uncertainty on individual doses is summarised in Table 3.11 which shows the “uncertainty factors” for the mean value and for the 95th and 99th percentiles of the distributions at the three distances of interest for the different source terms and situations considered. The uncertainty on the effective dose decreases with increasing distance, other than for the 95th percentile of the ccdf. The uncertainty on the bone marrow dose does not vary much with distance. The uncertainty on the thyroid dose does not vary consistently with increasing distance. The uncertainty on effective dose at the first and second distance is greater than that on the other doses, though this is not always the case at the third distance. The “uncertainty factor” varies between about a factor of 4 for the potential thyroid dose for the DBA source term to about a factor of 20 for the effective dose with countermeasures at the first distance for the CB2 source term.

It is interesting to compare the uncertainties on the short term and long term doses. The uncertainty on the thyroid dose is somewhat less in the long term than the short term, while the reverse is true for the bone marrow dose. The comparison cannot be undertaken for other organs, as these are the only organs where both the long term and short term doses were considered. The uncertainty on the short term thyroid dose is mainly governed by the uncertainty on the amount of iodine reaching the thyroid, the time at which it does so and the retention time in the thyroid, while the uncertainty on the long term dose reflects the uncertainty on the total amount of iodine reaching the thyroid and its retention time. The uncertainty on the long term dose to bone marrow reflects the uncertainty in internal and external dosimetry over a period of years. The information presented in Section 2 shows that the uncertainty on both aspects increases with time.

The “reference uncertainty coefficients” on individual doses are summarised in Table 3.12. The “reference uncertainty coefficients” are generally similar to, or slightly larger than, the “uncertainty factors”. The effective doses predicted with default parameter values are generally below the 5th percentile of the uncertainty distribution. For the other organs considered, the value predicted using default values of the parameters is above the 5th percentile of the uncertainty distribution, but below its median value. The default values for some of the parameters of the lung model are near one end of, or outside, the range of values used in this study. This could mean that the reference lung dose is near one end of the range obtained in this study. It could also mean that reference values for doses in other organs such as thyroid, where inhalation is a major component, are also near one end of their range.

The parameters whose uncertainties make large contributions to the overall uncertainty on late individual dose are given in Table 3.13. The parameters are different for the different source terms and the different situations considered. For many of the organs and situations considered, the parameters are related to the caesium internal dose model or the external dose from deposited activity at long times. The rankings of the various parameters as given by correlation coefficients or percentage contribution to the uncertainty are different in some cases; some parameters given a high ranking using PRCC make only a small percentage contribution to the uncertainty. The most important parameter uncertainties for the overall uncertainty for CB2 with countermeasures are some of the parameters of the model used to calculate the caesium dose coefficient for most of the cases considered and the external dose from deposited caesium 30 and 100 years after deposition, with different parameters identified for the different distances and different parts of the ccdf considered. The uncertainties identified for the effective dose at the first distance when countermeasures are considered are those on some of the transfer rates between the lung compartments; these parameters are also identified as important contributors to the extent of relocation (see Section 3.5). Similar parameters are identified for each of the organs considered, and the uncertainty on the thyroid dose with countermeasures is dominated by the uncertainty on parameters of the caesium model, rather than the iodine model. It seems likely that the uncertainty on doses with countermeasures is at least partly governed by whether or not relocation is imposed. For CB2 in normal living the important parameter uncertainties for the bone marrow and effective doses are some of the parameters of the caesium dose model, with the f_1 factor and the retention times in the body identified as most important for all distances. The most important parameter uncertainties for the thyroid dose in normal living for CB2 are the transfer rates of iodine from blood to thyroid or to the bladder. The finding that the uncertainty on thyroid dose for normal living is governed by the uncertainties on parameters of the iodine model, while the uncertainty on the thyroid dose with countermeasures is governed by the uncertainties on parameters of the caesium model also supports the view that the uncertainties with countermeasures reflect whether or not relocation is imposed.

The important uncertainties for the DBA source term with countermeasures are similar to those for the CB2 source term in normal living. As noted in Section 3.5, relocation is not required for the DBA source term and so the conditions considered for CB2 with normal living and DBA with countermeasures are effectively the same. The important parameter uncertainties identified for the DBA source term for the potential outdoor dose and for the dose with countermeasures are the same for the thyroid and effective doses. However, the important parameter uncertainties for the potential bone marrow dose include those on the external dose from deposited caesium at 30 and 100 years after deposition.

Results are not presented here for the uncertainty on the individual risks of late health effects. The model used in COSYMA assumes that the risk of late health effects is directly proportional to the individual doses, and so the uncertainties on individual risks and individual doses are the same, in this module analysis. The uncertainty on the risk of fatal cancer differs slightly from that on the individual effective dose as the cancer risk is calculated from the doses and risks in each organ rather than from the effective dose.

Extent of late countermeasures

The extent of the uncertainty on late countermeasures is considered for both the CB2 and DBA source terms. The late countermeasures considered in this study are relocation and food restrictions. It was assumed that food restrictions would be imposed and withdrawn on the basis of the activity concentration of material in food, and so the extent of food restrictions is not affected by the uncertainty on the parameters of the dose module. The only late countermeasure considered in this module analysis is therefore relocation. COSYMA classes people who are evacuated but unable to return at the shortest time considered (a few days) as being relocated. The study showed that relocation would not be predicted for the DBA source term for any of the values of the dose module parameters considered, and so results are only presented here for the CB2 source term. The complete set of results is presented in the appendices.

The "uncertainty factors" for the initial extent of the relocation area and its time integral are given in Table 3.14, while the "reference uncertainty coefficients" are given in Table 3.15. For the parameters considered here, the relocation area and the evacuation area are almost identical, and comments made in Section 0 for the area evacuated are equally applicable here to the initial area relocated. In summary, these are that the uncertainty factor is very large (470 for the mean value), the value predicted using default parameter values is above the 95th percentile of the uncertainty distribution. The "uncertainty factor" for the time integral of the relocation area is much smaller than that for the initial size of the area, 33 for the mean value and slightly smaller for the other percentiles considered. The "reference uncertainty coefficient" for the time integral of the relocation area is somewhat lower than the "uncertainty factor", showing that the value obtained with default parameter values is nearer the middle of the uncertainty distribution in this case.

The parameters whose uncertainties make large contributions to the overall uncertainty on the extent of relocation are given in Table 3.16 – they are the same as those identified for evacuation. The same parameters are identified for each of the three parts of the probability distribution considered. The important parameter uncertainties for the extent of relocation relate to the clearance rates of material from different parts of the lung. The important parameter uncertainties for the time integral of the relocation area are those on the external dose rate from deposited caesium 1 and 3 years after deposition, and do not include those that are important in determining whether relocation is required. This demonstrates that, for this module analysis and the assumptions made by COSYMA, the extent of relocation is determined by doses over short periods while the duration of relocation is determined by long term doses.

Collective dose and numbers of late health effects

The uncertainty on the numbers of late health effects was analysed for the CB2 source term for normal living and for both CB2 and DBA assuming that countermeasures are taken. The results for collective dose, which are similar to those for numbers of late health effects, are not considered here; they are given in Appendix C and D.

The extent of the uncertainty is summarised in Table 3.17 which shows the "uncertainty factors" for the mean value and the 95th and 99th percentiles of the distributions for the different effects considered. The uncertainties reflect those on the individual doses at the longer distances considered, discussed above. The "uncertainty factors" range from about 5 to about 15, with the uncertainty on the total number of cancers being slightly larger than that on the numbers of leukaemias or thyroid cancers. The "reference uncertainty coefficients", given in Table 3.18, are similar to the "uncertainty factors", showing that the numbers of cancers predicted using default values for the parameters are similar to the 5th percentiles of the uncertainty distributions. This also reflects the situation for individual doses.

The extent of the uncertainty on the numbers of fatal cancers with countermeasures for the CB2 source term is presented in Figure 0.4, which shows the 5% and 95% envelopes, together with the reference curve and the mean curve. The reference curve lies towards the lower end of the uncertainty distribution for much of the ccdf.

The parameters whose uncertainties make large contributions to the overall uncertainty on the numbers of late health effects are summarised in Table 3.19. They reflect the important uncertainties, discussed above, for the late doses. The uncertainties on the numbers of late health effects for the CB2 source term are dominated by those on some of the parameters in the model for the caesium dose coefficient. The uncertainty on the external dose from deposited caesium 30 years after deposition is identified as important for the uncertainty on some of the numbers of leukaemias and thyroid cancers with countermeasures. The uncertainty on external dose from deposited caesium was also identified as an important contributor to the uncertainty on thyroid doses with countermeasures, in Section 3.4. It may reflect the effect of relocation on doses and the dose received after return from relocation. This suggests that, for the CB2 source term, the thyroid dose from external irradiation from deposited activity after return from relocation is comparable to the dose from inhalation in the period before countermeasures are taken. The uncertainty on one of the parameters for the iodine dose coefficient model is identified as an important contributor to the uncertainty on the number of thyroid cancers in normal living. However, no iodine parameter uncertainties are identified as important for the uncertainty on the number of thyroid cancers with countermeasures, for the CB2 source term. The uncertainties on the total number of fatal cancers and of leukaemias for the DBA source term is also dominated by the uncertainties on some of the parameters of the caesium dose coefficient model, while the uncertainty on the number of thyroid cancers for this source term is dominated by the uncertainty on two parameters of the iodine dose coefficient model.

Identification of important parameters for the overall analysis

The parameters included in the overall analysis are those that are assigned first or second rank using PRCC or those that make more than 15% contribution to the overall uncertainty, for at least one endpoint and one source term. The parameters identified by these criteria are shown in Table 3.20, which also shows whether the parameters were identified using PRCC or percentage contribution, and the source term for which they were identified. The table shows that many more parameter uncertainties are identified using PRCC than using percentage contributions to the uncertainty.

The models used to calculate the dose coefficients use a number of parameters for each element. Some, but not all, of the parameters for particular elements have been identified as having important uncertainties. If the overall analysis were carried out using only some of the parameters from a particular model, then the distribution on the outputs of that model would not reflect the distributions specified by the expert panel. Therefore, where some parameters from a model were identified as important, the remaining parameters for that model were also included in the overall analysis. The parameters that were included for this reason are also shown in the table. They can be identified as they are not shown as being important for any source term or for either method of selecting parameters.

The table shows that there are considerable differences between the parameter uncertainties that are identified as important for the different source terms. This is to be expected, as the endpoints considered for the UK1 source term relate to short term doses and early health effects, those for the DBA source term relate to long term doses and late health effects while those for CB2 cover both time periods. Some parameters relating to doses over short periods are identified for only one of the UK1 or CB2 source terms. For example the uncertainties on the external dose from deposited iodine are only identified as important for UK1, reflecting the different relative amounts of iodine in the two source terms.

Table 3.1 "Uncertainty factors" for individual doses to 7 days at the three distances considered

Quantity	For mean value[(a)]			For 95th percentile[(a)]			For 99th percentile[(a)]		
UK1									
Dose to bone marrow for normal living	5.5	5.0	5.3	5.8	5.3	4.9	5.6	5.1	4.8
Dose to thyroid for normal living	23	23	22	23	21	21	23	26	21
Dose to skin for normal living	3.7	3.7	3.7	3.6	3.6	3.7	3.6	3.8	3.7
Potential dose to bone marrow	4.3	4.2	4.4	4.3	3.9	4.0	4.6	4.1	4.0
Potential dose to thyroid	12	12	11	12	11	11	13	13	10
Potential dose to skin	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Dose to bone marrow with countermeasures	3.7	2.6	1.9	3.6	3.3	2.8	3.8	3.1	2.0
Dose to thyroid with countermeasures	31	29	20	30	28	17	30	30	22
Dose to skin with countermeasures	3.8	2.1	1.5	3.6	3.2	2.0	3.7	2.1	1.7
CB2									
Dose to bone marrow with countermeasures	3.2	3.2	6.1	3.2	4.6	8.1	3.4	3.2	6.5
Dose to thyroid with countermeasures	28	18	15	27	13	29	30	21	16
Dose to skin with countermeasures	3.4	3.6	7.6	3.6	4.0	18	3.4	3.6	7.6

Note:
a The three values are the uncertainty factors at 0.875, 5 and 20 km respectively

Table 3.2 "Reference uncertainty coefficients" for short term individual doses at the three distances considered

Quantity	For mean value[a]			For 95th percentile[a]			For 99th percentile[a]		
UK1									
Dose to bone marrow for normal living	3.4	3.4	3.6	3.4	3.3	3.2	3.5	3.4	3.4
Dose to thyroid for normal living	6.2	7.6	7.3	6.3	6.2	7.2	6.0	8.7	7.1
Dose to skin for normal living	1.2	1.2	1.2	1.9	1.9	1.9	1.2	1.2	1.2
Potential dose to bone marrow	1.6	1.7	1.7	1.6	1.6	1.6	1.6	1.6	1.7
Potential dose to thyroid	4.2	4.9	4.6	4.0	4.1	4.6	4.2	5.5	4.3
Potential dose to skin	0.67	0.67	0.66	0.68	0 .68	0.66	0.68	0.66	0.68
Dose to bone marrow with countermeasures	2.3	2.0	1.5	2.3	2.3	1.7	2.2	2.1	1.5
Dose to thyroid with countermeasures	9.2	13	9.0	8.9	8.7	9.3	8.5	12	9.3
Dose to skin with countermeasures	1.8	1.4	1.1	1.7	1.6	1.2	1.7	1.3	1.4
CB2									
Dose to bone marrow with countermeasures	2.3	2.1	2.4	2.4	2.2	2.5	2.2	2.4	2.2
Dose to thyroid with countermeasures	5.1	4.2	2.9	5.2	2.8	3.4	5.0	5.0	2.7
Dose to skin with countermeasures	1.7	1.3	0.95	1.8	1.2	1.0	1.7	1.7	0.91

Note:
a The three values are the reference uncertainty coefficients at 0.875, 5 and 20 km respectively

Table 3.3 Important parameters for early doses for UK1 and CB2

Results for UK1

Endpoint	With countermeasures	Normal living	Potential doses
Bone marrow doses	Breathing rate Location factor for being in cars (NE), groundshine	I-131 dose to 10 days: deposited activity I-131 dose to 3 days: deposited activity Ru-106 initial dose rate: deposited activity Location factor for normal living (NE), groundshine	I-131 dose to 10 days: deposited activity I-131 dose to 3 days: deposited activity Ru-106 initial dose rate: deposited activity
Thyroid doses	Breathing rate Location factor for normal living (NE&NL), inhalation Location factor for sheltering(NE), inhalation Transfer coefficient for Tellurium: blood to thyroid	Breathing rate Transfer coefficient for Iodine: blood to thyroid Location factor for normal living (NE&NL), inhalation Location factor for sheltering(NE), inhalation	Breathing rate Transfer coefficient for Iodine: blood to thyroid
Skin doses	Location factor for normal living (NE&NL), inhalation Location factor for sheltering(NE), inhalation Skin residence time	Location factor for normal living (NE&NL), inhalation Location factor for sheltering(NE), inhalation Skin residence time	Skin residence time

Results for CB2

Endpoint	Important parameters (with countermeasures)
Bone marrow doses	Breathing rate I-131 initial dose rate: deposited activity Location factor for normal living; cloudshine Location factor for sheltering(NE), cloudshine Transfer coefficient: extrathoracic 2 to stomach Fast transfer coefficient: bronchial to extrathoracic regions
Thyroid doses	Breathing rate Location factor for normal living (NE&NL), inhalation Location factor for sheltering(NE), inhalation Transfer coefficient for Iodine: blood to thyroid
Skin doses	Location factor for sheltering(NE), inhalation Location factor for normal living (NE&NL), inhalation

Table 3.4 Uncertainty factors and reference uncertainty coefficients for mean values of individual risks of early health effects for the UK1 source term at the three distances

Quantity	Uncertainty factor			Reference uncertainty coefficient		
Risk of early death with countermeasures	2.8	8.8	24	3.1	14	19
Risk of haematopoietic syndrome with countermeasures	2.4	16	(0.0)[(a)]	1.7	3.5	-[(c)]
Risk of early death for normal living	1.8	6.6	24	1.9	7.9	5.3
Risk of haematopoietic syndrome for normal living	2.0	40	($1.2\ 10^{-4}$)[(a)]	1.5	10	-[(c)]
Risk of early death for potential exposures	1.3	2.5	7.2	1.2	1.7	3.2
Risk of haematopoietic syndrome for potential exposures	1.3	2.4	3000[(b)]	1.1	1.3	3.3
Risk of early morbidities with countermeasures	9.9	4.6	1.6	1.0	1.4	1.3
Risk of lung morbidities with countermeasures	2.3	6.7	($1.2\ 10^{-3}$)[(a)]	2.5	11	-[(c)]
Risk of hypothyroidism with countermeasures	($3.4\ 10^{-2}$)[(a)]	($1.1\ 10^{-2}$)[(a)]	($2.2\ 10^{-4}$)[(a)]	1.7	11	-[(c)]
Risk of skin burns with countermeasures	12	18	5.7	0.87	1.1	0.96
Risk of early morbidities for normal living	4.9	2.8	8.4	1.0	1.1	1.4
Risk of lung morbidities for normal living	($1.2\ 10^{-2}$)[(a)]	82	($1.2\ 10^{-2}$)[(a)]	-[(c)]	2300	-[(c)]
Risk of hypothyroidism for normal living	($3.5\ 10^{-2}$)[(a)]	($2.1\ 10^{-2}$)[(a)]	($2.3\ 10^{-3}$)[(a)]	1.9	4.2	180
Risk of skin burns for normal living	4.4	3.4	10	0.89	0.89	1.2
Risk of early morbidities for potential exposures	3.5	2.5	1.9	1.2	1.0	0.87
Risk of lung morbidities for potential exposures	($1.1\ 10^{-2}$)[(a)]	($1.0\ 10^{-2}$)[(a)]	($3.4\ 10^{-3}$)[(a)]	-[(c)]	-[(c)]	-[(c)]
Risk of hypothyroidism for potential exposures	($1.8\ 10^{-2}$)[(a)]	($1.0\ 10^{-2}$)[(a)]	($3.7\ 10^{-3}$)[(a)]	9.5	12	22
Risk of skin burns for potential exposures	3.8	2.9	2.2	1.1	0.93	0.65

Notes

a In these cases the ratio is infinite, as the 5th percentile of the distribution is zero. The quantity given in brackets for the uncertainty factor is the value of the 95th percentile of the uncertainty distribution.

b The 5th and 95th percentiles are $1.1\ 10^{-6}$ and $3.3\ 10^{-3}$ respectively.

c In these cases the ratio is infinite, as the reference value is zero. The 95th percentile of the uncertainty distribution can be found in the columns giving the uncertainty factor.

Table 3.5 Important parameters for the mean value of individual risk of early health effects for UK1

Effect	With countermeasures	Normal living	Outdoor risks
Early mortality	Initial deposition in extrathoracic region Initial deposition in tracheobronchial region Location factor for normal living (NE&NL), inhalation Location factor for sheltering(NE), inhalation Breathing rate Skin residence time	Initial deposition in extrathoracic region Location factor for normal living (NE&NL), inhalation Location factor for sheltering(NE), inhalation Breathing rate	Initial deposition in extrathoracic region Breathing rate
Haematopoietic syndrome	Location factor for being in cars (NE), groundshine Breathing rate Initial deposition in extrathoracic region beyond the nasal region	I-131 dose to 30 days: deposited activity Ru-106 initial dose rate: deposited activity Ru-106 dose to 30 days: deposited activity Location factor for normal living (NE), groundshine Breathing rate	I-131 dose to 3 days: deposited activity I-131 dose to 10 days: deposited activity I-131 dose to 30 days: deposited activity Ru-106 initial dose rate: deposited activity Ru-106 dose to 30 days: deposited activity
Total morbidities	Initial deposition in extrathoracic region Initial deposition in tracheobronchial region Location factor for normal living (NE&NL), inhalation Location factor for sheltering(NE), inhalation Skin residence time	Initial deposition in extrathoracic region Initial deposition in tracheobronchial region Location factor for normal living (NE&NL), inhalation Location factor for sheltering(NE), inhalation Skin residence time	Initial deposition in extrathoracic region Transfer coefficient for Iodine: any lung compartment to blood Skin residence time Ru-106 dose to 30 days: deposited activity
Lung morbidity	Initial deposition in extrathoracic region Initial deposition in tracheobronchial region Location factor for normal living (NE&NL), inhalation Location factor for sheltering(NE), inhalation Transfer coefficient: ET1region to environment Fast transfer coefficient: bronchial to extrathoracic regions Breathing rate	Initial deposition in extrathoracic region Breathing rate Location factor for normal living (NE&NL), inhalation Location factor for sheltering(NE), inhalation	Initial deposition in extrathoracic region Initial deposition in tracheobronchial region Breathing rate
Skin burns	Initial deposition in extrathoracic region Initial deposition in tracheobronchial region Location factor for normal living (NE&NL), inhalation Location factor for sheltering(NE), inhalation Skin residence time	Initial deposition in extrathoracic region Breathing rate Location factor for normal living (NE&NL), inhalation Location factor for sheltering(NE), inhalation Skin residence time	Initial deposition in extrathoracic region Breathing rate Skin residence time
Hypothyroidism	Initial deposition in extrathoracic region Transfer coefficient for Iodine: any lung compartment to blood Transfer coefficient for Tellurium: blood to thyroid Transfer coefficient for Iodine: blood to thyroid	Transfer coefficient for Iodine: blood to thyroid Transfer coefficient for Iodine: any lung compartment to blood Initial deposition in extrathoracic region beyond the nasal region	Transfer coefficient for Iodine: blood to thyroid Transfer coefficient for Iodine: blood to Bladder Breathing rate

Table 3.6 Uncertainty factors for the extent of early countermeasures for the CB2 source term

Quantity	For mean value	For 95th percentile	For 99th percentile
Area evacuated	470	320	275
Area with sheltering	160	110	210
Area with iodine tablets	21	18	16

Table 3.7 Reference uncertainty coefficients for the extent of early countermeasures for the CB2 source term

Quantity	For mean value	For 95th percentile	For 99th percentile
Area evacuated	670	530	480
Area with sheltering	200	150	240
Area with iodine tablets	4.8	4.2	2.6

Table 3.8 Parameters whose uncertainties make major contributions to the overall uncertainty on extent of early countermeasures for the CB2 source term

Quantity	For mean value, 95th and 99th percentile
Area evacuated	Transfer coefficient: extrathoracic 2 to stomach Fast transfer coefficient: bronchial to extrathoracic regions
Area with sheltering	Transfer coefficient: extrathoracic 2 to stomach Fast transfer coefficient: bronchial to extrathoracic regions
Area with iodine tablets	Breathing rate Transfer coefficient for Iodine: blood to Bladder Initial deposition in extrathoracic region beyond the nasal region

Table 3.9 Uncertainty factors and reference uncertainty coefficients for the number of early health effects for the UK1 source term

Quantity	Uncertainty factors			Reference uncertainty coefficients		
	For mean value	For 95th percentile	For 99th percentile	For mean value	For 95th percentile	For 99th percentile
Number of early mortalities, with countermeasures	13	12	18	15	15	23
Number of cases of haematopoietic syndrome with countermeasures	3.4	4.0	1.7	2.2	3.2	1.2
Number of early morbidities with countermeasures	2.3	2.1	2.0	1.4	1.6	1.5
Number of cases of lung morbidity with countermeasures	31	30	34	110	72	110
Number of cases of hypothyroidism with countermeasures	(870)[(a)]	(4300)[(a)]	(6900)[(a)]	17	17	14
Number of cases of skin burns, with countermeasures	8.6	7.8	4.4	1.2	1.3	0.93
Number of early mortalities for normal living	14	15	17	4.7	5.9	7.9
Number of cases of haematopoietic syndrome for normal living	16	16	13	7.6	8.1	8.7
Number of early morbidities for normal living	5.3	4.9	2.9	1.4	1.5	1.5
Number of cases of lung morbidity for normal living	$1.1\ 10^{4}$[(b)]	$(2.0\ 10^{4})$[(a)]	4800[(c)]	$3.0\ 10^{6}$[(d)]	-[(d)]	-[(d)]
Number of cases of hypothyroidism for normal living	(4700)[(a)]	$(1.7\ 10^{4})$[(a)]	$(4.8\ 10^{4})$[(a)]	18	13	18
Number of cases of skin burns for normal living	6.2	4.9	3.6	1.1	1.2	1.2

Notes

(a) In these cases the ratio is infinite, as the 5th percentile of the distribution is zero. The quantity given in brackets for the uncertainty factor is the value of the 95th percentile of the uncertainty distribution.

(b) The 5th and 95th percentiles of the uncertainty distribution are 0.43 and 4900 respectively.

(c) The 5th and 95th percentiles of the uncertainty distribution are 14 and $6.5\ 10^{4}$ respectively.

(d) The 95th percentiles of the uncertainty distributions can be found from the results for the uncertainty factor.

Table 3.10 Parameters for whose uncertainties make important contributions to the overall uncertainty on numbers of early health effects for the UK1 source term

	Important parameters	
Quantity	**With countermeasures**	**For normal living**
Risk of early mortalities	Initial deposition in extrathoracic region Initial deposition in tracheobronchial region Breathing rate	Initial deposition in extrathoracic region Breathing rate Location factor for sheltering(NE), inhalation Location factor for normal living (NE&NL), inhalation Skin residence time
Risk of haematopoietic syndrome	Breathing rate Initial deposition in extrathoracic region beyond the nasal region	Ru-106 initial dose rate: deposited activity Ru-106 dose to 30 days: deposited activity I-131 dose to 30 days: deposited activity Breathing rate
Risk of early morbidity	Initial deposition in extrathoracic region Fast transfer coefficient: bronchial to extrathoracic regions Location factor for sheltering(NE), inhalation Location factor for normal living (NE&NL), inhalation Transfer coefficient for Tellurium: blood to thyroid Skin residence time	Location factor for sheltering(NE), inhalation Location factor for normal living (NE&NL), inhalation Initial deposition in extrathoracic region Initial deposition in tracheobronchial region Skin residence time
Risk of lung morbidity	Breathing rate Initial deposition in extrathoracic region beyond the nasal region	Location factor for sheltering(NE), inhalation Location factor for normal living (NE&NL), inhalation Initial deposition in extrathoracic region Initial deposition in tracheobronchial region Breathing rate
Risk of hypothyroidism	Transfer coefficient for Tellurium: blood to thyroid Transfer coefficient for Iodine: blood to thyroid Initial deposition in extrathoracic region beyond the nasal region	Transfer coefficient for Iodine: blood to thyroid Transfer coefficient for Iodine: blood to Bladder Initial deposition in extrathoracic region beyond the nasal region
Risk of skin burns	Initial deposition in extrathoracic region Initial deposition in tracheobronchial region Breathing rate Location factor for sheltering (NE), inhalation Location factor for normal living (NE&NL), inhalation	Location factor for sheltering(NE), inhalation Location factor for normal living (NE&NL), inhalation Skin residence time Initial deposition in extrathoracic region

Table 3.11 Uncertainty factors for long term individual doses

Quantity	For mean value[(a)]			For 95th percentile[(a)]			For 99th percentile[(a)]		
CB2									
Effective dose with countermeasures	21	12	7.6	22	9.8	8.7	37	13	6.9
Bone marrow dose with countermeasures	14	8.9	9.2	10	8.5	8.1	14	8.7	8.9
Thyroid dose with countermeasures	8.1	6.5	7.5	5.8	5.4	7.8	8.9	6.5	6.9
Effective dose in normal living	13	11	8.1	11	12	11	13	12	9.1
Bone marrow dose in normal living	9.2	9.2	9.2	8.3	8.3	8.7	9.6	9.6	9.1
Thyroid dose in normal living	5.0	5.2	6.0	4.8	4.9	6.2	5.0	5.0	5.6
DBA									
Effective dose with countermeasures	13	11	8.6	9.1	11	11	14	12	9.8
Bone marrow dose with countermeasures	9.1	9.0	9.0	7.9	8.5	7.9	9.6	9.1	8.5
Thyroid dose with countermeasures	4.9	4.9	5.2	5.1	5.3	4.7	5.3	5.3	5.0
Potential effective dose	9.8	8.5	7.5	8.5	9.6	8.7	11	9.3	8.1
Potential bone marrow dose	6.8	6.9	7.1	5.7	6.8	6.3	7.1	6.8	6.9
Potential thyroid dose	4.7	4.4	4.3	4.9	4.6	3.9	4.7	4.7	4.0

Note

a: The three values are the “uncertainty factors” at 5, 20 and 100 km respectively.

Table 3.12 Reference uncertainty coefficients for long term individual doses

Quantity	For mean value[a]			For 95th percentile[a]			For 99th percentile[a]		
CB2									
Effective dose with countermeasures	26	10	7.0	19	10	9.3	33	11	6.2
Bone marrow dose with countermeasures	5.5	5.7	6.8	5.3	5.6	7.2	6.0	5.5	5.9
Thyroid dose with countermeasures	4.9	4.7	6.1	4.2	4.3	7.1	5.4	4.6	5.3
Effective dose in normal living	13	11	8.1	13	13	11	13	12	9.1
Bone marrow dose in normal living	7.7	7.7	7.7	8.1	7.4	7.8	7.8	7.8	7.8
Thyroid dose in normal living	4.4	4.7	5.8	4.1	4.6	6.0	4.5	4.6	5.6
DBA									
Effective dose with countermeasures	15	13	9.3	12	13	13	16	14	11
Bone marrow dose with countermeasures	8.2	8.3	8.3	8.3	8.1	7.9	8.5	8.3	7.9
Thyroid dose with countermeasures	5.0	4.2	5.1	4.5	4.5	4.7	5.5	4.5	4.8
Potential effective dose	10	8.3	7.0	8.7	9.8	8.5	11	9.3	7.4
Potential bone marrow dose	5.4	5.4	5.5	4.4	5.3	4.7	5.6	5.4	5.4
Potential thyroid dose	3.9	3.7	3.9	3.7	3.8	3.6	4.1	4.0	3.6

Note
a: The three values are the “uncertainty factors” at 5, 20 and 100 km respectively.

Table 3.13 Important parameters for long term individual doses

Organ	Important parameters for CB2	Important parameters for DBA
Effective dose	Transfer coefficient: extrathoracic 2 to stomach[1] Fast transfer coefficient: bronchial to extrathoracic regions[1] Transfer coefficient for caesium: whole body 2 compartment to U.L.I. Transfer coefficient for caesium: blood to whole body Cs-137 dose to 30 years: deposited activity	Transfer coefficient for caesium: whole body 2 compartment to U.L.I. Transfer coefficient for caesium: blood to whole body Cs-137 dose to 30 years: deposited activity Transfer coefficient for caesium: whole body to U.L.I.
Bone marrow	Cs-137 dose to 30 years: deposited activity[2] Cs-137 dose to 100 years: deposited activity[2] Transfer coefficient for caesium: whole body 2 compartment to U.L.I. Transfer coefficient for caesium: blood to whole body Caesium: f1-factor	Transfer coefficient for caesium: whole body 2 compartment to U.L.I. Transfer coefficient for caesium: blood to whole body Caesium: f1-factor Cs-137 dose to 30 years: deposited activity[3] Cs-137 dose to 100 years: deposited activity[3]
Thyroid	Cs-137 dose to 30 years: deposited activity[4] Cs-137 dose to 100 years: deposited activity[4] Transfer coefficient for caesium: whole body 2 compartment to U.L.I. Transfer coefficient for Iodine: blood to Bladder[5] Transfer coefficient for Iodine: blood to thyroid[5]	Transfer coefficient for Iodine: blood to Bladder Transfer coefficient for Iodine: blood to thyroid

Notes
1 These parameters are only identified for the dose with countermeasures at the first distance
2 These parameters are only identified for doses with countermeasures
3 These parameters are only identified for potential outdoor doses
4 These parameters are only identified for the dose with countermeasures
5 These parameters are only identified for the dose in normal living

Table 3.14 Uncertainty factors for extent of late countermeasures for the CB2 source term

Quantity	For mean value	For 95th percentile	For 99th percentile
Relocation area	470	320	280
Time integral of relocation area	33	26	32

Table 3.15 Reference uncertainty coefficients for extent of late countermeasures for the CB2 source term

Quantity	For mean value	For 95th percentile	For 99th percentile
Relocation area	670	530	480
Time integral of relocation area	11	7.2	5.9

Table 3.16 Important parameters for extent of late countermeasures for the CB2 source term

Countermeasures	Important parameters for initial extent	Important parameters for time integral
Relocation	Transfer coefficient: extrathoracic 2 to stomach Fast transfer coefficient: bronchial to extrathoracic regions Slow transfer coefficient: bronchial to extrathoracic regions	Cs-137 dose to 3 years: deposited activity Cs-137 dose to 1 year: deposited activity

Table 3.17 Uncertainty factors for the numbers of late health effects

Quantity	For mean value	For 95th percentile	For 99th percentile
CB2			
Number of fatal cancers, with countermeasures	12	14	15
Number of deaths from leukaemia, with countermeasures	8.9	8.3	8.9
Number of deaths from thyroid cancer, with countermeasures	7.6	8.3	7.9
Number of fatal cancers, for normal living	11	9.8	13
Number of deaths from leukaemia, for normal living	9.0	10	10
Number of deaths from thyroid cancer, for normal living	6.0	6.2	5.9
DBA			
Number of fatal cancers, with countermeasures	13	13	13
Number of deaths from leukaemia, with countermeasures	8.7	9.8	10
Number of deaths from thyroid cancer, with countermeasures	4.9	5.3	5.4

Table 3.18 Reference uncertainty coefficients for the numbers of late health effects

Quantity	For mean value	For 95th percentile	For 99th percentile
CB2			
Number of fatal cancers, with countermeasures	12	14	14
Number of deaths from leukaemia, with countermeasures	6.8	7.4	6.8
Number of deaths from thyroid cancer, with countermeasures	6.2	7.1	6.3
Number of fatal cancers, for normal living	11	9.1	12
Number of deaths from leukaemia, for normal living	7.7	7.8	7.8
Number of deaths from thyroid cancer, for normal living	5.7	5.4	5.4
DBA			
Number of fatal cancers, with countermeasures	15	14	12
Number of deaths from leukaemia, with countermeasures	8.2	8.5	8.3
Number of deaths from thyroid cancer, with countermeasures	4.5	4.6	4.9

Table 3.19 Important parameters for numbers of late health effects

Effect	For CB2 source term	For DBA source term
Fatal cancers	Transfer coefficient for caesium: whole body 2 compartment to U.L.I. Transfer coefficient for caesium: blood to whole body	Transfer coefficient for caesium: whole body 2 compartment to U.L.I. Transfer coefficient for caesium: blood to whole body
Leukaemias	Transfer coefficient for caesium: whole body 2 compartment to U.L.I. Transfer coefficient for caesium: blood to whole body	Transfer coefficient for caesium: whole body 2 compartment to U.L.I. Transfer coefficient for caesium: blood to whole body Caesium: f1-factor
Thyroid cancers	Transfer coefficient for caesium: whole body 2 compartment to U.L.I. Transfer coefficient for caesium: blood to whole body Transfer coefficient for iodine: blood to Bladder	Transfer coefficient for iodine: blood to Bladder Transfer coefficient for iodine: blood to thyroid Transfer coefficient for caesium: whole body 2 compartment to U.L.I.

Table 3.20 Parameters whose uncertainties make large contributions to the overall uncertainty

Selected input parameter	Selected using: Ranks	Selected using: Percentage contributions	Selected for source term: UK1	Selected for source term: CB2	Selected for source term: DBA
Fast transfer coefficient: bronchial to extrathoracic regions	✓	✓	✓	✓	✓
Slow transfer coefficient: bronchial to extrathoracic regions	✓	✓	✓	✓	
Transfer coefficient: pulmonary 1 region to the tracheobronchial region (rapid clearance rate)					
Transfer coefficient: pulmonary 2 region to the tracheobronchial region (intermediate clearance rate)					
Transfer coefficient: pulmonary 3 region to the tracheobronchial region (slow clearance rate)					
Transfer coefficient: pulmonary 3 region to the thoracic lymph nodes					
Transfer coefficient: ET1region to environment	✓		✓		
Transfer coefficient: extrathoracic 2 to stomach	✓	✓	✓	✓	✓
Transfer coefficient: stomach to small intestine	✓			✓	
Initial deposition in extrathoracic region	✓	✓	✓	✓	
Initial deposition in extrathoracic region beyond the nasal region	✓	✓	✓	✓	
Total initial deposition in respiratory tract	✓		✓		
Initial deposition in tracheobronchial region	✓	✓	✓	✓	
Breathing rate	✓	✓	✓	✓	
Consumption rate for green vegetables		✓			✓
Consumption rate for milk (including milk products)	✓			✓	
Consumption rate for pork	✓			✓	
Consumption rate for sheep meat	✓			✓	
Cerium: f1 factor	✓		✓	✓	
Cs-137 initial dose rate: deposited activity	✓		✓	✓	
Cs-137 dose to 100 days: deposited activity					
Cs-137 dose to 1 year: deposited activity	✓	✓		✓	
Cs-137 dose to 3 years: deposited activity	✓	✓	✓	✓	
Cs-137 dose to 10 years: deposited activity	✓			✓	
Cs-137 dose to 30 years: deposited activity	✓	✓		✓	✓
Cs-137 dose to 100 years: deposited activity		✓		✓	✓
Transfer coefficient for caesium: any lung compartment to blood	✓		✓		
Transfer coefficient for caesium: transformed state in lung to Blood	✓		✓		
Caesium: f1-factor	✓	✓		✓	✓
Transfer coefficient for caesium: blood to whole body	✓			✓	✓
Transfer coefficient for caesium: whole body to U.L.I.	✓				✓
Transfer coefficient for caesium: whole body 2 compartment to U.L.I.	✓	✓		✓	✓
Transfer coefficient for caesium: any lung compartment to transformed state in lung					
Transfer coefficient for caesium: blood to whole body 2 compartment					
I-131 initial dose rate: deposited activity	✓		✓	✓	

Selected input parameter	Selected using: Ranks	Percentage contributions	Selected for source term: UK1	CB2	DBA
I-131 dose to 1 day: deposited activity	✓		✓		
I-131 dose to 3 days: deposited activity	✓	✓	✓		
I-131 dose to 10 days: deposited activity	✓	✓	✓		
I-131 dose to 30 days: deposited activity	✓	✓	✓		
Transfer coefficient for Iodine: any lung compartment to blood	✓	✓	✓		
Transfer coefficient for Iodine: blood to Bladder	✓	✓	✓	✓	✓
Transfer coefficient for Iodine: blood to thyroid	✓	✓	✓	✓	✓
Transfer coefficient for Iodine: any lung compartment to transformed state in lung					
Transfer coefficient for Iodine: transformed state in lung to blood					
Transfer coefficient for Iodine: thyroid to U.L.I.					
Location factor for normal living; cloudshine		✓	✓	✓	
Location factor for intervention (NE), cloudshine	✓		✓		
Location factor for sheltering(NE), cloudshine		✓	✓	✓	
Location factor for being in cars (NE), groundshine	✓		✓		
Location factor for normal living (NE), groundshine	✓	✓	✓		
Location factor for sheltering(NE), groundshine		✓	✓		
Location factor for normal living (NE&NL), inhalation	✓	✓	✓	✓	
Location factor for sheltering(NE), inhalation	✓	✓	✓	✓	
Np-Inhalation dose coefficient	✓			✓	
Transfer coefficient for Plutonium: any lung compartment to transformed state in lung	✓		✓		
Transfer coefficient for Plutonium: cortical surface to cortical marrow	✓		✓		
Transfer coefficient for Plutonium: trabecular surface to R.B.M.	✓		✓	✓	
Transfer coefficient for Plutonium: any lung compartment to blood					
Transfer coefficient for Plutonium: transformed state in lung to blood					
Transfer coefficient for Plutonium: R.B.M. to U.L.I.					
Transfer coefficient for Plutonium: cortical marrow to U.L.I					
Transfer coefficient for Plutonium: blood to trabecular surface					
Transfer coefficient for Plutonium: blood to cortical surface					
Transfer coefficient for Plutonium: trabecular surface to trabecular volume					
Transfer coefficient for Plutonium: cortical surface to cortical volume					
Transfer coefficient for Plutonium: trabecular volume to R.B.M.					
Transfer coefficient for Plutonium: cortical volume to cortical marrow					
Transfer coefficient for Plutonium: blood to liver					
Transfer coefficient for Plutonium: liver to U.L.I.					
Transfer coefficient for Plutonium: blood to U.L.I.					
Np-Inhalation dose coefficient					
Ru-106 initial dose rate: deposited activity	✓	✓	✓		
Ru-106 dose to 30 days: deposited activity	✓	✓	✓		

Selected input parameter	Selected using: Ranks	Selected using: Percentage contributions	Selected for source term: UK1	Selected for source term: CB2	Selected for source term: DBA
Ru-106 dose to 100 days: deposited activity					
Ru-106 dose to 1 year: deposited activity					
Ru-106 dose to 3 years: deposited activity	✓				✓
Transfer coefficient for Ruthenium: transformed state in lung to blood	✓			✓	
Transfer coefficient for Ruthenium: blood to whole body	✓		✓		
Transfer coefficient for Ruthenium: any lung compartment to transformed state in lung					
Transfer coefficient for Ruthenium: blood to whole body 2 compartment					
Transfer coefficient for Ruthenium: blood to U.L.I.					
Transfer coefficient for Ruthenium: whole body to U.L.I.					
Transfer coefficient for Ruthenium: whole body 2 compartment to U.L.I.					
Skin residence time	✓	✓	✓	✓	
Transfer coefficient for Strontium: any lung compartment to blood	✓		✓		
Transfer coefficient for Strontium: any lung compartment to transformed state in lung					
Transfer coefficient for Strontium: transformed state in lung to blood					
Transfer coefficient for Tellurium: any lung compartment to blood	✓			✓	
Transfer coefficient for Tellurium: BN-ULI	✓		✓	✓	
Transfer coefficient for Tellurium: liver to U.L.I.	✓		✓		
Transfer coefficient for Tellurium: blood to bone	✓		✓	✓	
Transfer coefficient for Tellurium: blood to th yroid	✓	✓	✓		
Transfer coefficient for Tellurium: any lung compartment to transformed state in lung					
Transfer coefficient for Tellurium: transformed state in lung to blood					
Transfer coefficient for Tellurium: blood to liver					
Transfer coefficient for Tellurium: blood to U.LI					
Transfer coefficient for Tellurium: thyroid to U.L.I					
Zr-95 initial dose rate: deposited activity					
Zr-95 dose to 10 days: deposited activity					
Zr-95 dose to 30 days: deposited activity	✓		✓		

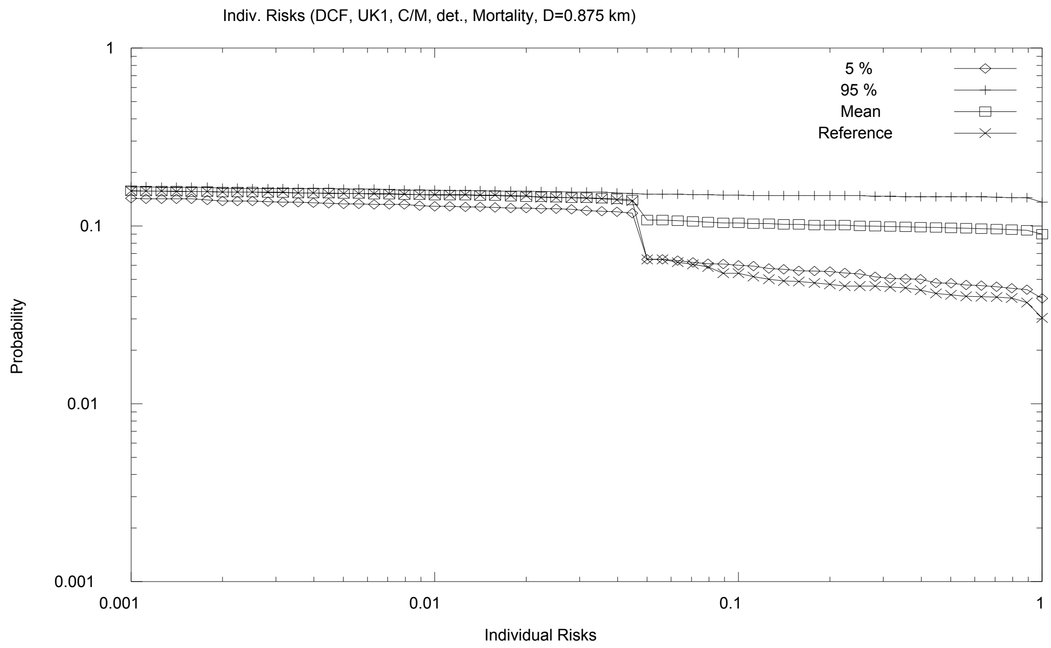


Figure 0.1 Extent of the uncertainty on the individual risk of early death with countermeasures for the UK1 source term at the first distance.

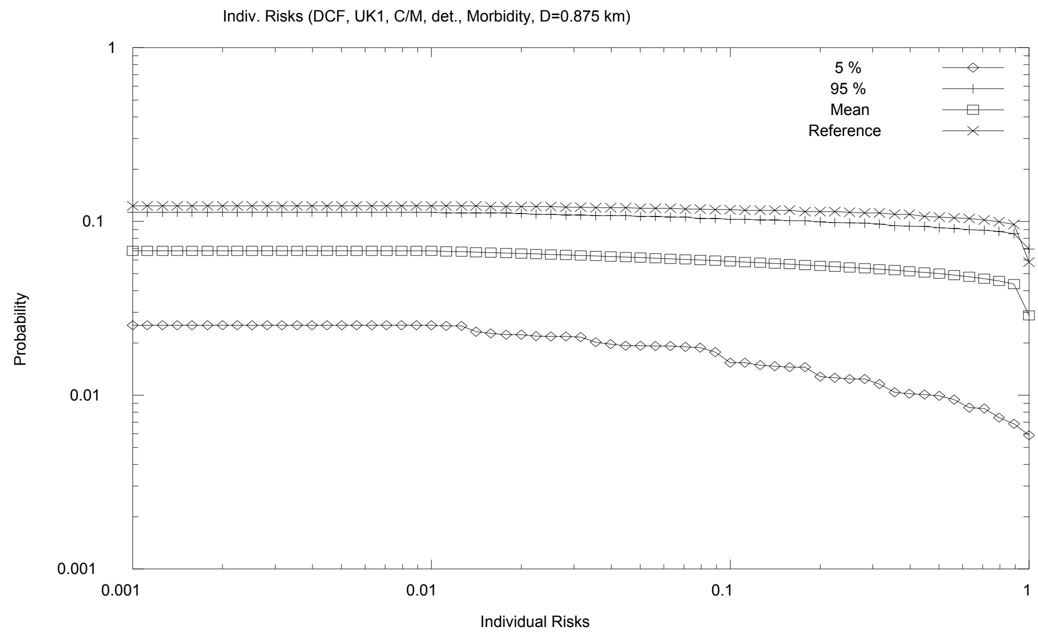


Figure 0.2 Extent of the uncertainty on the individual risk of early morbidities with countermeasures for the UK1 source term at the first distance

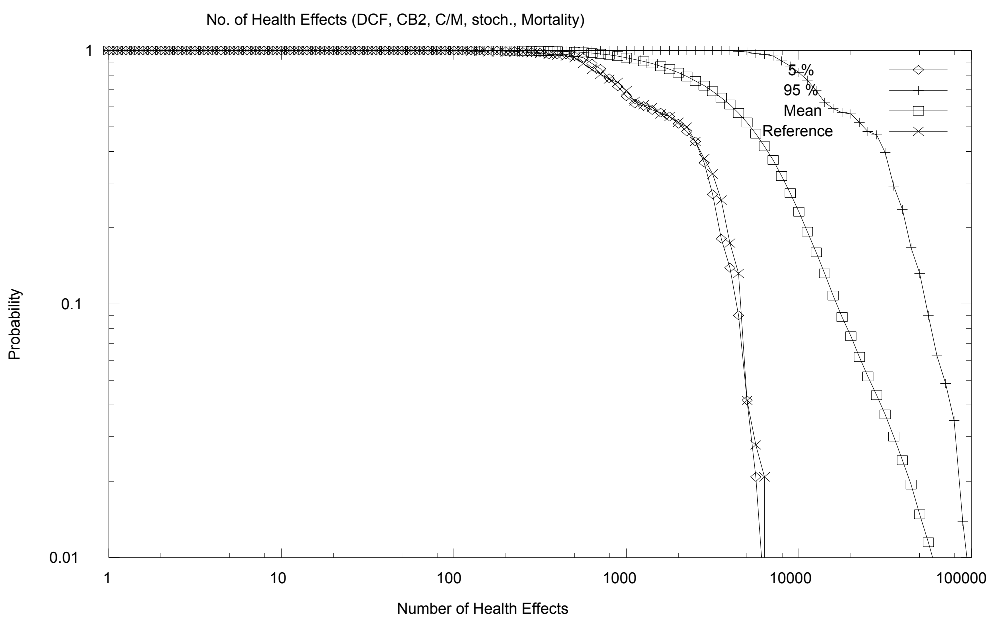


Figure 0.3 Extent of the uncertainty on the numbers of early deaths with countermeasures for the UK1 source term

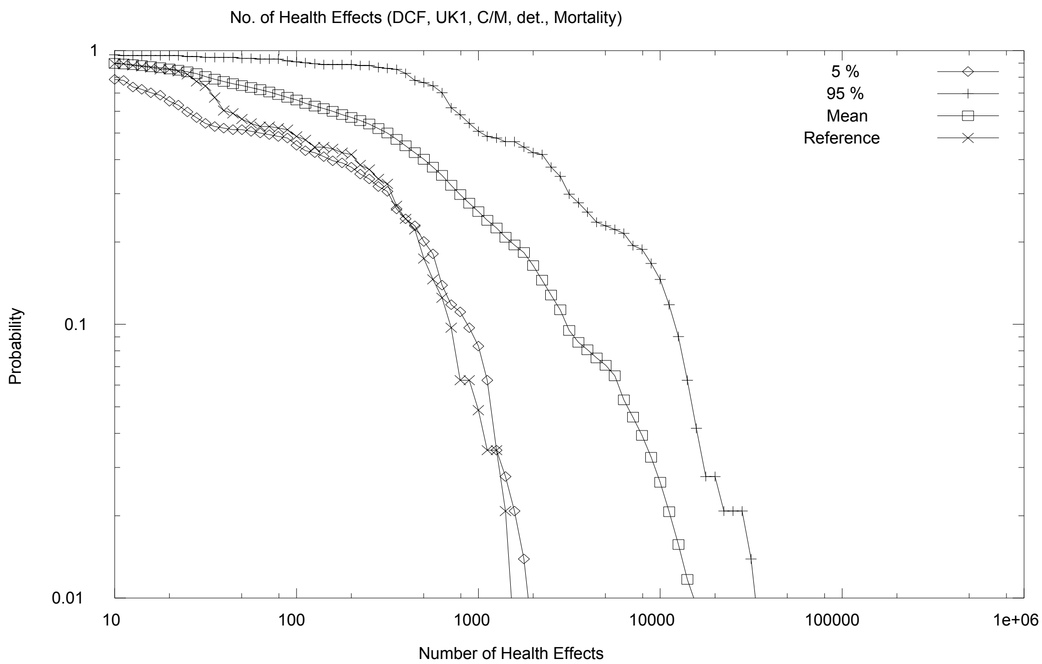


Figure 0.4 Extent of the uncertainty on the numbers of fatal cancers with countermeasures for the CB2 source term

APPENDIX A

Reports from the Project

Reports on the expert elicitation

Harper F T, Hora S C, Young M L, Miller L A, Lui C H, McKay M D, Helton J C, Goossens L H J, Cooke R M, Päsler-Sauer J, Kraan B and Jones J A. Probabilistic accident consequence uncertainty analysis. Dispersion and deposition uncertainty assessment. NUREG/CR-6244, EUR 15855, SAND94-1453, Washington, DC/USA, and Brussels-Luxembourg, (1995).

Brown J, Goossens L H J, Kraan B C P, Cooke R M, Jones J A, Harper F T, Haskin F E, Abbott M L, Young M L, Hora S C, Rood A. Probabilistic accident consequence uncertainty analysis. Food chain uncertainty assessment. NUREG/CR-6523, EUR 16771, SAND97-0335 Washington, DC/USA, and Brussels-Luxembourg, (1997).

Goossens L H J, Boardman J, Kraan B C P, Cooke R M, Jones J A, Harper F T, Young M L and Hora S C. Probabilistic accident consequence uncertainty analysis: Uncertainty assessment for deposited material and external doses. Report NUREG/CR-6526, EUR 16772, Washington, DC/USA, and Brussels-Luxembourg, (1997).

Goossens L H J., Harrison J.D, Kraan B.C.P, Cooke R.M, Harper F.T. and Hora S.C. Probabilistic accident consequence uncertainty analysis: Uncertainty assessment for internal dosimetry, Report NUREG/CR-6571, EUR 16773, Washington, DC/USA, and Brussels-Luxembourg, (1997).

Little M P, Muirhead C R, Goossens L H J, Kraan B C P, Cooke R M, Harper F T and Hora S C. Probabilistic accident consequence uncertainty analysis: Late health effects uncertainty assessment, Report NUREG/CR-6555, EUR 16774, Washington, DC/USA, and Brussels-Luxembourg, (1997).

Haskin F.E., Harper F.T, Goossens L H J, Randall J, Kraan B.C.P and Grupa J.B. Probabilistic accident consequence uncertainty analysis: Early health effects uncertainty assessment, Report NUREG/CR-6545, EUR 16775, Washington, DC/USA, and Brussels-Luxembourg, (1997).

Goossens L H J, Jones J A, Ehrhardt J, Kraan B C P. Probabilistic accident consequence uncertainty assessment: Countermeasures Uncertainty Assessments. EUR 18821 and FZKA 6307 (2000).

Reports on the COSYMA uncertainty analysis

Cooke R M, Goossens L H J, Kraan B C P. Probabilistic accident consequence uncertainty assessment - procedures guide using structured expert judgement. EUR 18820 (2000).

Jones J A, Ehrhardt J, Fischer F, Hasemann I, Goossens L H J, Kraan B C P, Cooke R M. Probabilistic accident consequence uncertainty assessment using COSYMA: Uncertainty from the Atmospheric Dispersion and Deposition Module. EUR 18822 and FZKA 6308 (2000).

Brown J, Jones J A, Fischer F, Hasemann I, Goossens L H J, Kraan B C P, Cooke R M. Probabilistic accident consequence uncertainty assessment using COSYMA: Uncertainty from the Food Chain Module. EUR 18823 and FZKA 6309 (2000).

Jones J A, Fischer F, Hasemann I, Goossens L H J, Kraan B C P, Cooke R M. Probabilistic accident consequence uncertainty assessment using COSYMA: Uncertainty from the Health Effects Module. EUR 18824 and FZKA 6310 (2000).

Jones J A, Fischer F, Hasemann I, Goossens L H J, Kraan B C P, Cooke R M. Phipps A, and Khursheed A. Probabilistic accident consequence uncertainty assessment using COSYMA: Uncertainty from the dose module. EUR18825 and FZKA 6311 (2000).

Jones J A, Ehrhardt J, Goossens L H J, Fischer F, Hasemann I, Kraan B C P, Cooke R M. Probabilistic accident consequence uncertainty assessment using COSYMA: Overall uncertainty analysis. EUR 18826 and FZKA 6312 (2000).

Jones J A, Kraan B C P, Cooke R M, Goossens L H J, Fischer F, and Hasemann I. Probabilistic accident consequence uncertainty assessment using COSYMA: Methodology and processing techniques. EUR 18827 and FZKA 6313 (2000).

APPENDIX B

Summary of the COSYMA Accident Consequence Code

COSYMA is intended for probabilistic calculations of the off-site consequences of hypothetical accidental releases of radioactive material to atmosphere at nuclear sites. It calculates the health effects, impact of countermeasures and economic costs of the releases. The processes considered in the calculations, and the routes of exposure following accidental releases to atmosphere, are illustrated in Figure B.1. The calculation is divided into a number of steps, as is also illustrated in Figure 1. COSYMA is a modular code, with different modules addressing the different stages of the calculation. However, while Figure 1 illustrates the steps in the calculation, the modules of the codes do not correspond exactly with the boxes shown in that figure. The following sections give brief descriptions of the models included in COSYMA. In some cases, COSYMA includes more than one model for a particular feature. This appendix also specifies which of the models was used for this uncertainty analysis.

COSYMA was developed by the National Radiological Protection Board (NRPB) of the UK and Forschungszentrum Karlsruhe (FZK) of Germany, as part of the European Commission's MARIA project[1]. It represents a fusion of ideas from the NRPB program MARC[2], the FZK program system UFOMOD[3] and input from other MARIA contractors. The program package was first made available in 1990 for use on mainframe computers, and several updates have been released since then. A PC version was first released in 1993 and has since been updated[4].*

COSYMA is a package of programs and data bases, rather than a single program. The mainframe version contains three main accident consequence assessment programs together with a number of preprocessing and evaluation programs. The three main sub-systems of COSYMA are known as the NE, NL and FL sub-systems. The NE (near, early) sub-system is limited to calculating early health effects and the influence of emergency actions to reduce those effects and is intended for use in the region near to the site. The NL (near, late) subsystem is limited to calculating late health effects and the associated countermeasures, and is intended mainly for use in the region near to the site. The FL (far, late) sub-system is concerned with calculating late health effects and appropriate countermeasures at larger distances from the site. Each of these programs is further sub-divided into a series of modules for the various steps in the calculation. PC COSYMA incorporates the NE and NL sub-systems of the mainframe version.

The main endpoints of COSYMA are the numbers of health effects, the impact of countermeasures and the economic costs resulting from an accidental release. A large number of intermediate results are obtained in the process of calculating the major endpoints; these results include activity concentrations, individual and collective doses and the countermeasures that would be imposed

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* The mainframe and PC versions of COSYMA are made available on behalf of the European Commission. People wishing to obtain the mainframe version of the system should contact Dr J Ehrhardt, FZK, Germany (e-mail RODOS@RODOS.FZK.DE; those wishing to obtain the PC version of the system should contact Dr J A Jones, NRPB, UK (e-mail Arthur.Jones@NRPB.ORG.UK).

at different locations. The package contains a series of evaluation programs that allow these results to be presented in a variety of ways.

Following an accidental release to atmosphere, people can be irradiated by a number of routes of exposure. The ones considered in COSYMA are:-

- external γ irradiation from material in the plume,
- external γ irradiation from material deposited on the ground
- external β irradiation of skin from material deposited on skin and clothes
- internal irradiation following the inhalation of material from the plume or of material that has been deposited and subsequently resuspended
- internal irradiation from the ingestion of contaminated foods.

COSYMA includes some models directly within the various modules or subsidiary programs, but in other cases it uses results of models taken from data libraries. Thus the atmospheric dispersion models are used directly. COSYMA does not however, include models for the contamination of food or dosimetric calculations, using instead data libraries giving the results of other models, which are not part of COSYMA, itself, but whose uncertainty is considered within the current study.

B.1 Atmospheric dispersion and deposition

Mainframe COSYMA contains five different models of atmospheric dispersion that are appropriate for different applications or are based on different assumptions and approximations[(5)].

The NE and NL sub-system include the MUSEMET[(6)] model, which was originally written at Forschungsanlage Julich but has been extensively modified at FZK for use with COSYMA. This is a segmented Gaussian plume model allowing for changes of atmospheric conditions and wind direction during plume travel. This model derives the sequences of atmospheric conditions affecting the plume from a data file giving hourly averages for wind speed and direction, stability category, precipitation intensity and mixing layer depth. It allows for the effects on the subsequent dispersion of plume rise and buildings near the release point. It also includes the effects of wet and dry deposition of the dispersing material. This model is also included in PC COSYMA.

The NE and NL sub-systems can also be used with the COSGAP or RIMPUFF dispersion models, which are provided as separate programs. COSGAP[(7)] is a Gaussian plume dispersion model, which is similar to MUSEMET but does not consider changes of wind direction during plume travel. It is based on the dispersion model in MARC. RIMPUFF[(8)], developed by Risø National Laboratory, Denmark, is a Gaussian puff trajectory model which derives the atmospheric conditions affecting the plume by interpolating between data from a number of meteorological stations in the region of interest.

The NL sub-system also contains the ISOLA[(9)] model for very long release durations. This uses statistics of atmospheric conditions and is only appropriate for releases that are sufficiently small that no countermeasures and no early health effects would be expected.

The FL sub-system is linked to the Mesos model[(10)], developed by Imperial College, UK. This is a trajectory model for dispersion over long distances that uses meteorological data for a large area, such as the whole of Europe.

Accident consequence assessment programs need to consider the consequences should the accident occur in any of a wide range of atmospheric conditions. It is not possible to calculate the consequences for every sequence of conditions that might arise, and so some method is required to sample a representative set of conditions from those possible. Both the mainframe and PC versions of COSYMA include a flexible program to undertake this sampling.

Only the MUSEMET dispersion model is included in this study, using the NE and NL sub-systems. The uncertainty in dispersion modelling includes both the uncertainty on the spread of the plume around its trajectory, and the uncertainty on the location of the plume trajectory. The other Gaussian models included in COSYMA (RIMPUFF, COSGAP and ISOLA) use similar descriptions of the growth of plumes and of the trajectory. Therefore the uncertainty on consequences predicted using MUSEMET should be similar to the uncertainties predicted using the other Gaussian models. However, MESOS uses a different method of calculating plume trajectories, and the uncertainties on calculations using MESOS may not be the same as those using Gaussian plume or puff models.

B.2 Dose calculations

As stated earlier, COSYMA does not include dosimetric models but uses information from data libraries which are calculated with these models. The libraries include information on the doses from 197 radionuclides.

The data library used for calculating external exposure from γ emitting material deposited on the ground contains outdoor doses per unit deposit integrated to a series of times. These doses are combined with location factors representing the reduction of external γ irradiation by the shielding effects of buildings and typical behaviour of the population. The library is drawn from a number of sources, using results of models developed at NRPB[11,12] and Forschungszentrum für Umwelt und Gesundheit (GSF)[13], Germany. The doses for those radionuclides making major contributions to the dose from fission reactor accidents are derived from a model describing the deposition patterns in urban areas and the subsequent transfer of material between the different surfaces. Location factors are used to describe the protection offered by buildings.

The doses from internal irradiation following ingestion or inhalation are calculated using data libraries of dose per unit intake derived using models which are consistent with those in ICRP publications 56, 67 and 69. COSYMA needs information on the dose received in different periods after the accident, and so this information is included in the data libraries. The method used for calculating doses and risks of health effects in the mainframe version of COSYMA allows for the variation of dose per unit intake with age at intake, and so the libraries contain information on doses for different age groups in the population. The PC version uses a simpler method which only considers the doses to adults.

B.3 Food chain models

COSYMA requires information on the concentration of material in foods as a function of time after the accident. It does not include a food chain model, but uses the results of such models through data libraries which give the activity concentration for a range of radionuclides in a number of foods at a series of times following unit deposition. The concentration of material in foods depends on the time of year at which the deposition occurs. COSYMA uses two data libraries, for deposition in summer and winter. Within a run of COSYMA, the "summer" or "winter" data library is used depending on the date in the year of the meteorological sequence being analysed.

COSYMA uses libraries derived from the NRPB model FARMLAND[(14)] and the GSF model ECOSYS[(15)]. The libraries were created using agreed values for the food chain parameters for application within the European Union, but there are differences because of other modelling assumptions made and because of the foods considered in each. The foods which can be considered with FARMLAND are milk, meat and liver from cattle, pork, meat and liver from sheep, green vegetables, grain products, potatoes and other root vegetables. The foods which can be considered with ECOSYS are milk, beef pork, grain products, potatoes and other root vegetables, and leafy and non-leafy green vegetables.

The intakes of these foods are calculated within COSYMA using one of two assumptions about the distribution of food between harvest and consumption. One method assumes that all food consumed is produced locally, and is used in calculating individual ingestion doses. The other method uses information on the amount of food produced in the area of interest, and calculates collective doses on the assumption that all food produced is consumed somewhere.

For this study, the FARMLAND food chain model was used to calculate the uncertainty on concentrations of activity in foods. Doses from ingestion of food were calculated on the assumption that all food consumed is produced locally.

B.4 Countermeasures

COSYMA allows the user to consider the effect of a wide range of countermeasures in reducing the exposure of the population, and gives the user considerable freedom in specifying the criteria at which the actions will be imposed or withdrawn[(16)].

Sheltering as the only action and sheltering combined with evacuation may be implemented automatically or on the basis of dose. The distribution of iodine tablets, automatically or on the basis of dose, can also be considered. These actions are assumed to be implemented sufficiently rapidly to reduce the risks of both early and late health effects. Relocation is considered as an action to reduce doses and risks over longer time periods. It can be implemented on a dose criterion. Return from evacuation or relocation is also considered on a dose criterion. The effects of decontamination in reducing the period of relocation can be considered. If these actions are initiated on the basis of dose, the user can specify the intervention levels, organs and pathways to be considered, and the time over which the dose is to be integrated. The behaviour of the population considered in the dose criteria can also be described using location factors.

Food restrictions can also be considered[(17)]. They can be implemented or withdrawn on the basis of doses received within specified time periods or on the basis of the instantaneous concentration of radionuclides in foods.

B.5 Health effects

COSYMA considers both early and late health effects in the population, using methods recommended by NRPB[18,19], the US Nuclear Regulatory Commission[20] and GSF[21].

The risk of early health effects is calculated using "hazard functions". The method allows for the variation of risk with the rate at which dose is accumulated over the first few days following the accident. Ten different fatal and non-fatal effects are considered by COSYMA, though not all are considered for this study.

The risk of late health effects is calculated using the linear dose response relationship. COSYMA considers the risk of fatal and non-fatal cancers in ten organs, and the risk of leukaemia. It also considers the risk of hereditary effects. The method adopted in the mainframe version of COSYMA allows for the variation of risk with age at exposure[22]. PC COSYMA uses a simpler method which only considers the doses and risks to adults, assuming that the risk is the product of committed dose and risk coefficient. The mainframe version of COSYMA can provide information on the numbers of cancers in the people alive at the time of the accident, and in their descendants. It also gives information on the times at which the cancers occur. For this study, the approximation used in PC COSYMA for calculating the risks of late health effects was adopted.

B.6 Economic effects

COSYMA can calculate the off-site economic cost of the accident, considering the costs arising from the countermeasures and the costs of health effects. The assumptions and models are described in references 23 and 24. The countermeasures for which costs are considered are movement of the population, food restrictions and decontamination. The costs arising from lost production in the area from which people are moved can be assessed in terms of the per capita contribution of the relocated population to gross domestic product (GDP) or in terms of the value of the land affected. For longer periods of relocation, the lost capital value of the land and its assets may be calculated. The costs of food restrictions include contributions to GDP as well as the lost capital value and the disposal costs of the food affected. The cost arising from health effects may be calculated in terms of the treatment costs and the lost economic productivity of the affected individuals or an estimation of the cost of health effects may be obtained using a more subjective approach to the valuation of life.

This study did not consider the uncertainty on economic effects.

B.7 References

1 KfK and NRPB. COSYMA: A new program package for accident consequence assessment. CEC. Brussels, EUR-13028 (1991).

2 Hill M D, Simmonds J R and Jones J A. NRPB methodology for assessing the radiological consequences of accidental releases of radionuclides to atmosphere - MARC-1. Chilton, NRPB-R224 (1988) (London HMSO).

3 Ehrhardt J, Burkart K, Hasemann I, Matzerath C, Panitz H-J and Steinhauer C. The program system UFOMOD for assessing the consequences of nuclear accidents. KfK-4330 (1988).

4 Jones J A, Mansfield P A , Haywood S M , Hasemann I, Steinhauer C, Ehrhardt J and Faude D. PC COSYMA (Version 2): an accident consequence assessment package for use on a PC. EUR report 16239 (1995).

5 Panitz H-J, Päsler-Sauer J and Matzerath C. UFOMOD: Atmospheric dispersion and deposition. KfK-4332 (1989).

6 Straka J, Geiβ H and Vogt K J. Diffusion of waste air puffs and plumes under changing weather conditions. Contr. Atmos. Phys. 54 207-221, (1981).

7 Jones J A and Charles D. AD-MARC: The atmospheric dispersion module in the methodology for assessing the radiological consequences of accidental releases. Chilton, NRPB-M72, (1982).

8 Mikkelsen T, Larsen S E and Thykier-Nielsen S. Description of the Riso puff model. Nuclear Technol 76 56-65 (1984).

9 Hübschmann W and Raskob W. ISOLA V: a Fortran-77 code for the calculation of the long-term concentration distribution in the environment of nuclear installations.

10 ApSimon H M and Goddard A J H. Atmospheric transport of radioisotopes and the assessment of population doses on a European scale. CEC Luxembourg EUR-9128 (1983).

11 Charles D, Crick M J, Fell T P and Greenhalgh J R. DOSE-MARC: The dosimetric module in the methodology for assessing the radiological consequences of accidental releases. Chilton NRPB-M74 (1982).

12 Crick M J and Brown J. EXPURT: A model for evaluating exposure from radioactive material deposited in the urban environment. Chilton NRPB-R235 (1990).

13 Jacob P, Paretzke H G, Rosenbaum H, Zankl M. Organ doses from radionuclides on the ground. Part 1: Simple time dependencies. Health Physics 54 617-633 (1988).

14 Brown J and Simmonds J R. FARMLAND a dynamic model for the transfer of radionuclides through terrestrial foodchains. Chilton. NRPB-R273 (1995).

15 Matthies M, Eisfeld K, Müller H, Paretzke H G, Pröhl G and Wirth G. Simulation des Transfers von Radionukliden in landwirtschaflichen Nahrungsketten. GSF Bericht S-882 (1982).

16 Hasemann I and Ehrhardt J. COSYMA: dose models and countermeasures for external exposure and inhalation. Karlsruhe KFK 4333, (1994).

17 Steinhauer C. COSYMA: ingestion pathways and foodbans. Karlsruhe. KfK 4334 (1992)

18 Edwards A A. Private communication (1995).

19 NRPB. Estimates of late radiation risks to the UK population. Documents of the NRPB 4 (4) 15-157 (1993).

20 Evans J S, Moeller D W and Cooper D W. Health effects models for nuclear power plant accident consequence analysis. NUREG/CR-4214 (1985), Rev 1, (1990).

21 Paretzke H G, Stather J W and Muirhead C R. Risk factors for late somatic effects. In Proceedings of the CEC Seminar on methods and codes for assessing the off-site consequences of nuclear accidents, Athens 1990, Luxembourg EUR 13013 (1991).

22 Ehrhardt J, Hasemann I, Matzerath-Boccaccini C, Steinhauer C and Raicevic J. COSYMA: health effects models. Karlsruhe FZKA 5567 (1995).

23 Haywood S M, Robinson C A and Heady C. COCO-1: model for assessing the cost of offsite consequences of accidental releases of radioactivity. Chilton NRPB-R243 (1991).

24 Faude D. COSYMA: Modelling of economic consequences. Karlsruhe, KfK Report 4336 (1992)

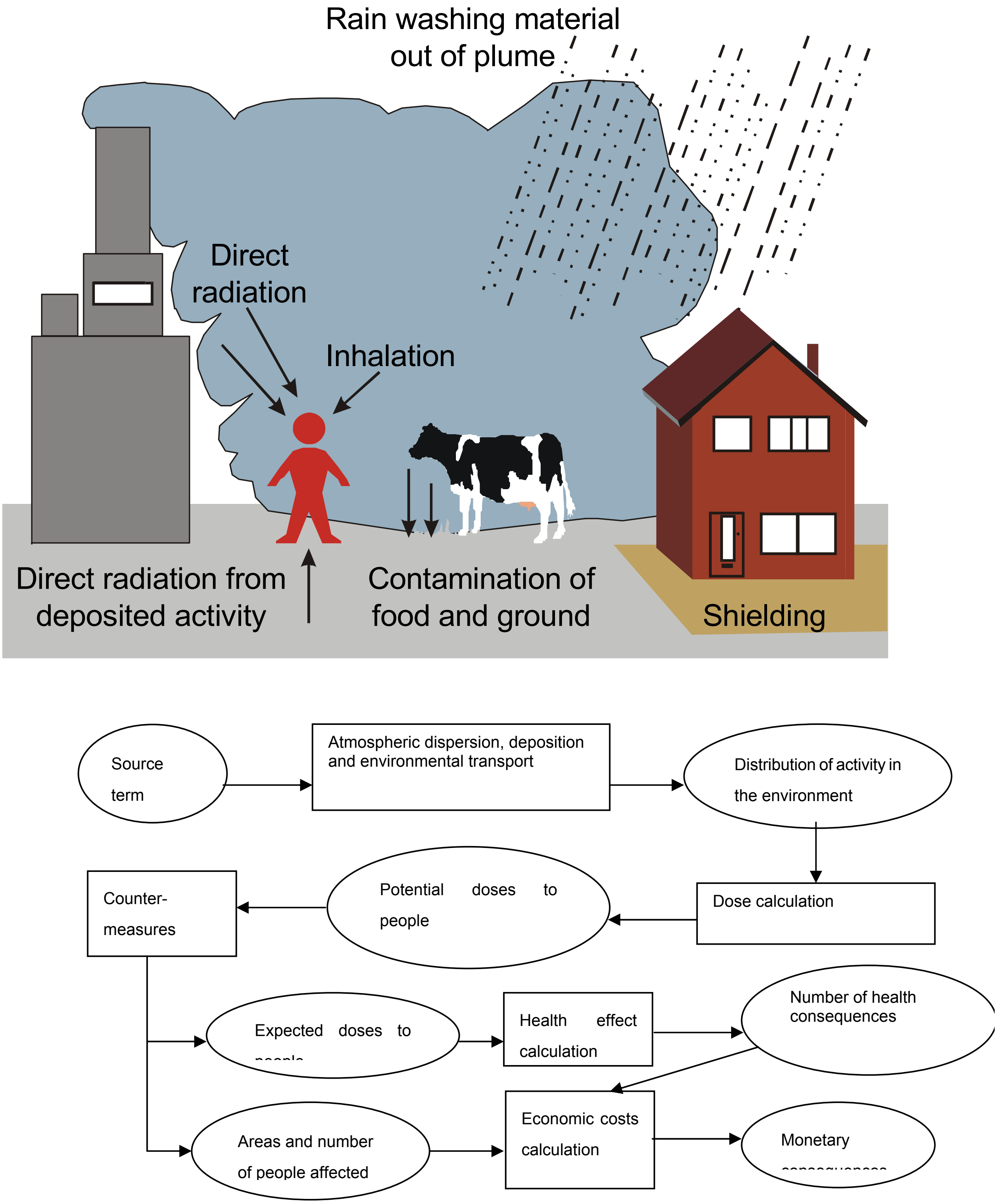

Figure B.1 Processes modelled in COSYMA

APPENDIX C

Extent of the uncertainty on the predicted consequences

This appendix includes tables giving various percentiles of the distribution of uncertainty on all of the model endpoints considered in the study. The endpoints are identified using a short code. The short codes for all of the endpoints considered are listed in Table C.1

The remaining tables give some of the percentiles of the uncertainty distributions on the mean value, the 95th and 99th percentiles and the probability of zero effects for each of the endpoints considered, for each of the three source terms. The table contains the following information:

REF	the value obtained in a single run of COSYMA using the default values for all of the input parameters (The reference curve)
MEDIAN	the median value from the uncertainty distribution on the quantity given.
5 % etc	the percentiles of the uncertainty distribution on the quantity given.
FAC1	the ratio of the 95th to 5th percentiles of the uncertainty distribution on the quantity given (the uncertainty factor).
FAC2	the ratio of the 90th to 10th percentiles of the uncertainty distribution on the quantity given.
FAC3	the ratio of the 75th to 25th percentiles of the uncertainty distribution on the quantity given.

The final column gives the ratio of the 95th percentile of the uncertainty distribution to the reference value (the reference uncertainty coefficient).

The analysis has resulted in sets of values for the each of the endpoints from each of the runs of COSYMA considered. The percentiles of the uncertainty distribution on each endpoint is evaluated from this set of values. The program used to evaluate the percentiles first specifies a series of bins. Each of the values for the endpoint are allocated to one of the bins, and the probability distribution on the endpoint constructed. The value assigned to a percentile of the distribution is the value of the lower end of the bin containing that percentile. The values allocated to the highest bin are 6 to 9 orders of magnitude greater than those allocated to the lowest bin, depending on the particular endpoint considered. There are some situations where percentiles of the uncertainty distribution for the quantities considered fall below the value that would be allocated to the lowest bin. In this case the value is reported as zero, and the ratio of the percentiles is reported as “9.99E+99”.

Table C.1 Description of the endpoint codes used in the following tables

Short code	Description of endpoint
AEVAC	Area with evacuation
AIOD	Area with stable iodine tablets
ARELIN	Area relocated
ARELTIM	Time integral of area relocated
ASHEL	Area with sheltering as the only action
CDCMBM	Collective dose to bone marrow, with countermeasures
CDCMED	Collective effective dose, with countermeasures
CDCMTH	Collective dose to thyroid, with countermeasures
CDLVBM	Collective dose to bone marrow, for normal living
CDLVED	Collective effective dose, for normal living
CDLVTH	Collective dose to thyroid, for normal living
DECMBM[a]	Individual dose to bone marrow in 7 days, with countermeasures
DECMSK[a]	Individual dose to skin in 7 days, with countermeasures
DECMTH[a]	Individual dose to thyroid in 7 days, with countermeasures
DELVBM[a]	Individual dose to bone marrow in 7 days, for normal living
DELVSK[a]	Individual dose to skin in 7 days, for normal living
DELVTH[a]	Individual dose to thyroid in 7 days, for normal living
DEOUBM[a]	Individual dose to bone marrow in 7 days, potential outdoor dose
DEOUSK[a]	Individual dose to skin in 7 days, potential outdoor dose
DEOUTH[a]	Individual dose to thyroid in 7 days, potential outdoor dose
DLCMBM[a]	Committed dose to bone marrow from inhalation and external exposure, with countermeasures
DLCMED[a]	Committed effective dose from inhalation and external exposure, with countermeasures
DLCMTH[a]	Committed dose to thyroid from inhalation and external exposure, with countermeasures
DLLVBM[a]	Committed dose to bone marrow from inhalation and external exposure, for normal living
DLLVED[a]	Committed effective dose from inhalation and external exposure, for normal living
DLLVTH[a]	Committed dose to thyroid from inhalation and external exposure, for normal living
DLOUBM[a]	Committed dose to bone marrow from inhalation and external exposure, potential outdoor dose
DLOUED[a]	Committed effective dose from inhalation and external exposure, potential outdoor dose
DLOUTH[a]	Committed dose to thyroid from inhalation and external exposure, potential outdoor dose
PECMBM	Number of cases of haematopoietic syndrome, with countermeasures
PECMLU	Number of cases of lung morbidity, with countermeasures
PECMMB	Number of cases of early morbidity, with countermeasures
PECMMT	Number of cases of early death, with countermeasures
PECMSK	Number of cases of skin burns, with countermeasures

PECMTH	Number of cases of hypothyroidism, with countermeasures
PELVBM	Number of cases of haematopoietic syndrome, for normal living
PELVLU	Number of cases of lung morbidity, for normal living
PELVMB	Number of cases of early morbidity, for normal living
PELVMT	Number of cases of early death, for normal living
PELVSK	Number of cases of skin burns, for normal living
PELVTH	Number of cases of hypothyroidism, for normal living
PLCMBM	Number of deaths from leukaemia, with countermeasures
PLCMMT	Number of fatal cancers, with countermeasures
PLCMTH	Number of cases of fatal thyroid cancer, with countermeasures
PLLVBM	Number of deaths from leukaemia, for normal living
PLLVMT	Number of fatal cancers, for normal living
PLLVTH	Number of cases of fatal thyroid cancer, for normal living
RECMBM[a]	Individual risk of haematopoietic syndrome, with countermeasures
RECMLU[a]	Individual risk of lung morbidity, with countermeasures
RECMMB[a]	Individual risk of early morbidity, with countermeasures
RECMMT[a]	Individual risk of early death, with countermeasures
RECMSK[a]	Individual risk of skin burns, with countermeasures
RECMTH[a]	Individual risk of hypothyroidism, with countermeasures
RELVBM[a]	Individual risk of haematopoietic syndrome, for normal living
RELVLU[a]	Individual risk of lung morbidity, for normal living
RELVMB[a]	Individual risk of early morbidity, for normal living
RELVMT[a]	Individual risk of early death, for normal living
RELVSK[a]	Individual risk of skin burns, for normal living
RELVTH[a]	Individual risk of hypothyroidism, for normal living
REOUBM[a]	Individual risk of haematopoietic syndrome, potential outdoor risk
REOULU[a]	Individual risk of lung morbidity, potential outdoor risk
REOUMB[a]	Individual risk of early morbidity, potential outdoor risk
REOUMT[a]	Individual risk of early death, potential outdoor risk
REOUSK[a]	Individual risk of skin burns, potential outdoor risk
REOUTH[a]	Individual risk of hypothyroidism, potential outdoor risk
RLCMBM[a]	Individual risk of death from leukaemia, with countermeasures
RLCMMT[a]	Individual risk of fatal cancer, with countermeasures
RLCMTH[a]	Individual risk of death from thyroid cancer, with countermeasures
RLLVBM[a]	Individual risk of death from leukaemia, for normal living
RLLVMT[a]	Individual risk of fatal cancer, for normal living
RLLVTH[a]	Individual risk of death from thyroid cancer, for normal living
RLOUBM[a]	Individual risk of death from leukaemia, for potential outdoor exposure
RLOUMT[a]	Individual risk of fatal cancer, for potential outdoor exposure
RLOUTH[a]	Individual risk of death from thyroid cancer, for potential outdoor exposure

Note:

a These endpoints are evaluated at a series of distances (0.875, 5, 20 and 100 km). The names include a number 1 to 4 to indicate which distance is considered. Note that the endpoints relating to early effects are only evaluated at distances from 0.875 to 20 km, while those relating to late effects are evaluated at distances from 5 to 100 km.

TABLE C.2 UNCERTAINTY DISTRIBUTIONS ON THE ENDPOINTS FOR EACH OF THE SOURCE TERMS

EXTENT OF THE UNCERTAINTY FOR THE MEAN VALUE OF THE ENDPOINTS FOR THE UK1 SOURCE TERM

	MEAN VAL	REF	MEDIAN	5 %	95 %	FAC1	10 %	90 %	FAC2	25 %	75 %	FAC3	95%/REF
DECMBM1	9.15E-01	1.06E+00		5.65E-01	2.12E+00	3.75E+00	6.40E-01	1.85E+00	2.89E+00	7.99E-01	1.43E+00	1.78E+00	2.32E+00
DECMBM2	5.13E-02	5.78E-02		3.86E-02	9.99E-02	2.59E+00	4.07E-02	8.74E-02	2.15E+00	4.77E-02	7.02E-02	1.47E+00	1.95E+00
DECMBM3	3.01E-03	3.01E-03		2.31E-03	4.43E-03	1.92E+00	2.41E-03	4.07E-03	1.69E+00	2.67E-03	3.50E-03	1.31E+00	1.48E+00
DECMTH1	3.12E+01	6.70E+01		9.36E+00	2.87E+02	3.06E+01	1.54E+01	1.97E+02	1.28E+01	2.90E+01	1.18E+02	4.06E+00	9.18E+00
DECMTH2	9.06E-01	2.35E+00		4.04E-01	1.17E+01	2.90E+01	5.69E-01	7.42E+00	1.30E+01	1.11E+00	4.37E+00	3.92E+00	1.29E+01
DECMTH3	4.13E-02	9.28E-02		1.87E-02	3.70E-01	1.97E+01	2.47E-02	2.45E-01	9.89E+00	4.57E-02	1.53E-01	3.35E+00	8.95E+00
DECMSK1	1.11E+02	1.28E+02		5.20E+01	1.95E+02	3.75E+00	6.32E+01	1.88E+02	2.97E+00	8.90E+01	1.72E+02	1.93E+00	1.75E+00
DECMSK2	3.59E+00	3.78E+00		2.37E+00	5.02E+00	2.12E+00	2.55E+00	4.90E+00	1.92E+00	3.04E+00	4.58E+00	1.50E+00	1.40E+00
DECMSK3	1.87E-01	1.80E-01		1.44E-01	2.12E-01	1.47E+00	1.49E-01	2.08E-01	1.40E+00	1.60E-01	1.99E-01	1.24E+00	1.13E+00
DELVBM1	2.40E+00	3.43E+00		1.48E+00	8.09E+00	5.48E+00	1.70E+00	6.44E+00	3.80E+00	2.31E+00	4.70E+00	2.04E+00	3.37E+00
DELVBM2	1.02E-01	1.54E-01		6.86E-02	3.46E-01	5.04E+00	8.13E-02	2.85E-01	3.51E+00	1.07E-01	2.14E-01	2.00E+00	3.40E+00
DELVBM3	1.08E-02	1.68E-02		7.25E-03	3.87E-02	5.34E+00	8.73E-03	3.18E-02	3.65E+00	1.16E-02	2.33E-02	2.00E+00	3.59E+00
DELVTH1	7.70E+01	1.37E+02		2.06E+01	4.79E+02	2.32E+01	3.48E+01	3.84E+02	1.10E+01	6.52E+01	2.37E+02	3.64E+00	6.22E+00
DELVTH2	2.36E+00	4.74E+00		7.69E-01	1.78E+01	2.32E+01	1.20E+00	1.24E+01	1.03E+01	2.24E+00	7.95E+00	3.55E+00	7.56E+00
DELVTH3	2.18E-01	4.35E-01		7.14E-02	1.58E+00	2.22E+01	1.14E-01	1.13E+00	9.97E+00	2.03E-01	7.23E-01	3.57E+00	7.26E+00
DELVSK1	6.11E+02	4.74E+02		2.02E+02	7.37E+02	3.65E+00	2.47E+02	7.11E+02	2.87E+00	3.29E+02	6.21E+02	1.89E+00	1.21E+00
DELVSK2	1.92E+01	1.47E+01		6.21E+00	2.29E+01	3.69E+00	7.67E+00	2.21E+01	2.88E+00	1.02E+01	1.92E+01	1.88E+00	1.19E+00
DELVSK3	1.76E+00	1.34E+00		5.61E-01	2.09E+00	3.73E+00	6.97E-01	2.01E+00	2.89E+00	9.28E-01	1.75E+00	1.88E+00	1.18E+00
DEOUBM1	1.53E+01	1.34E+01		5.65E+00	2.41E+01	4.27E+00	6.83E+00	2.16E+01	3.17E+00	9.57E+00	1.86E+01	1.94E+00	1.57E+00
DEOUBM2	6.36E-01	5.93E-01		2.54E-01	1.07E+00	4.22E+00	3.31E-01	9.55E-01	2.88E+00	4.37E-01	8.04E-01	1.84E+00	1.68E+00
DEOUBM3	6.90E-02	6.63E-02		2.72E-02	1.19E-01	4.36E+00	3.51E-02	1.06E-01	3.01E+00	4.76E-02	8.88E-02	1.87E+00	1.72E+00
DEOUTH1	1.53E+02	2.26E+02		5.19E+01	6.37E+02	1.23E+01	7.74E+01	4.95E+02	6.39E+00	1.29E+02	3.59E+02	2.79E+00	4.16E+00
DEOUTH2	4.82E+00	7.74E+00		1.93E+00	2.36E+01	1.22E+01	2.66E+00	1.77E+01	6.65E+00	4.31E+00	1.26E+01	2.92E+00	4.91E+00
DEOUTH3	4.55E-01	7.15E-01		1.86E-01	2.08E+00	1.12E+01	2.52E-01	1.57E+00	6.24E+00	4.03E-01	1.16E+00	2.87E+00	4.57E+00
DEOUSK1	1.11E+03	6.98E+02		6.32E+02	7.49E+02	1.19E+00	6.43E+02	7.44E+02	1.16E+00	6.65E+02	7.28E+02	1.10E+00	6.75E-01
DEOUSK2	3.49E+01	2.17E+01		1.95E+01	2.33E+01	1.19E+00	1.99E+01	2.31E+01	1.16E+00	2.06E+01	2.26E+01	1.10E+00	6.68E-01
DEOUSK3	3.21E+00	1.97E+00		1.77E+00	2.12E+00	1.20E+00	1.80E+00	2.11E+00	1.17E+00	1.87E+00	2.06E+00	1.10E+00	6.61E-01
AEVAC	2.82E+03	4.95E+03		3.28E+03	8.04E+03	2.45E+00	3.57E+03	7.32E+03	2.05E+00	4.13E+03	6.14E+03	1.49E+00	2.85E+00
ASHEL	2.41E+03	2.03E+03		1.30E+03	2.41E+03	1.85E+00	1.51E+03	2.37E+03	1.57E+00	1.65E+03	2.26E+03	1.37E+00	1.00E+00
AIOD	3.20E+03	4.29E+03		2.21E+03	6.04E+03	2.73E+00	2.55E+03	5.63E+03	2.21E+00	3.40E+03	4.98E+03	1.47E+00	1.89E+00
RECMMT1	4.78E-02	1.04E-01		5.32E-02	1.46E-01	2.75E+00	6.15E-02	1.34E-01	2.18E+00	8.07E-02	1.17E-01	1.46E+00	3.06E+00
RECMMT2	3.00E-03	1.60E-02		4.70E-03	4.12E-02	8.75E+00	6.47E-03	3.22E-02	4.98E+00	1.02E-02	2.29E-02	2.25E+00	1.37E+01
RECMMT3	7.71E-05	6.81E-05		6.11E-05	1.44E-03	2.36E+01	6.25E-05	8.21E-04	1.31E+01	6.47E-05	1.04E-04	1.61E+00	1.87E+01
RECMBM1	4.27E-02	4.63E-02		2.97E-02	7.14E-02	2.40E+00	3.27E-02	6.59E-02	2.02E+00	3.89E-02			

										5.61E-02	1.44E+00	1.67E+00
RECMBM2	9.92E-04	1.07E-03	2.19E-04	3.47E-03	1.59E+01	2.98E-04	2.69E-03	9.03E+00	5.01E-04	1.89E-03	3.77E+00	3.50E+00
RECMBM3	.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMMB1	1.31E-01	5.83E-02	1.37E-02	1.36E-01	9.92E+00	2.52E-02	1.15E-01	4.55E+00	3.99E-02	8.39E-02	2.10E+00	1.04E+00
RECMMB2	3.77E-02	2.89E-02	1.14E-02	5.25E-02	4.62E+00	1.47E-02	4.49E-02	3.06E+00	2.06E-02	3.74E-02	1.82E+00	1.39E+00
RECMMB3	1.49E-03	1.37E-03	1.19E-03	1.94E-03	1.63E+00	1.22E-03	1.73E-03	1.42E+00	1.27E-03	1.55E-03	1.22E+00	1.31E+00
RECMLU1	5.26E-04	9.76E-03	5.68E-03	1.30E-02	2.29E+00	6.63E-03	1.26E-02	1.91E+00	8.84E-03	1.20E-02	1.36E+00	2.47E+01
RECMLU2	8.62E-04	4.11E-03	1.42E-03	9.47E-03	6.66E+00	2.00E-03	8.65E-03	4.33E+00	3.08E-03	5.21E-03	1.69E+00	1.10E+01
RECMLU3	.00E+00	2.39E-06	0.00E+00	1.20E-03	9.99E+99	0.00E+00	1.04E-03	9.99E+99	0.00E+00	3.20E-04	9.99E+99	9.99E+99
RECMTH1	1.95E-02	2.21E-03	0.00E+00	3.37E-02	9.99E+99	0.00E+00	2.52E-02	9.99E+99	3.81E-04	9.46E-03	2.48E+01	1.73E+00
RECMTH2	9.75E-04	5.72E-04	0.00E+00	1.07E-02	9.99E+99	0.00E+00	6.22E-03	9.99E+99	5.99E-05	1.92E-03	3.21E+01	1.10E+01
RECMTH3	.00E+00	1.14E-06	0.00E+00	2.16E-04	9.99E+99	0.00E+00	9.11E-05	9.99E+99	0.00E+00	1.78E-05	9.99E+99	9.99E+99
RECMSK1	9.75E-02	4.40E-02	6.98E-03	8.48E-02	1.22E+01	1.35E-02	7.66E-02	5.65E+00	2.90E-02	6.08E-02	2.10E+00	8.70E-01
RECMSK2	3.50E-02	2.28E-02	3.11E-03	3.94E-02	1.27E+01	8.95E-03	3.68E-02	4.11E+00	1.48E-02	3.03E-02	2.05E+00	1.13E+00
RECMSK3	1.49E-03	1.24E-03	2.50E-04	1.42E-03	5.71E+00	6.07E-04	1.37E-03	2.26E+00	1.17E-03	1.30E-03	1.10E+00	9.58E-01
RELVMT1	7.75E-02	1.09E-01	8.04E-02	1.48E-01	1.84E+00	8.35E-02	1.35E-01	1.62E+00	9.43E-02	1.20E-01	1.27E+00	1.91E+00

MEAN VAL	REF	MEDIAN	5 %	95 %	FAC1	10 %	90 %	FAC2	25 %	75 %	FAC3	95%/REF
RELVMT2	6.14E-03	2.13E-02	7.36E-03	4.83E-02	6.56E+00	8.48E-03	3.72E-02	4.39E+00	1.45E-02	2.86E-02	1.98E+00	7.86E+00
RELVMT3	1.13E-03	9.94E-04	2.52E-04	6.02E-03	2.38E+01	3.75E-04	3.57E-03	9.53E+00	5.91E-04	1.38E-03	2.34E+00	5.33E+00
RELVBM1	7.24E-02	8.41E-02	5.51E-02	1.10E-01	1.99E+00	6.26E-02	1.05E-01	1.67E+00	7.30E-02	9.52E-02	1.30E+00	1.52E+00
RELVBM2	1.88E-03	5.94E-03	4.75E-04	1.88E-02	3.96E+01	9.01E-04	1.47E-02	1.63E+01	2.88E-03	1.14E-02	3.96E+00	1.00E+01
RELVBM3	.00E+00	0.00E+00	0.00E+00	1.22E-04	9.99E+99	0.00E+00	1.96E-05	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RELVMB1	1.30E-01	7.76E-02	2.66E-02	1.31E-01	4.92E+00	4.32E-02	1.19E-01	2.74E+00	5.82E-02	9.80E-02	1.68E+00	1.01E+00
RELVMB2	7.98E-02	5.64E-02	2.99E-02	8.46E-02	2.83E+00	3.52E-02	7.74E-02	2.20E+00	4.58E-02	6.79E-02	1.48E+00	1.06E+00
RELVMB3	1.28E-02	9.53E-03	2.09E-03	1.75E-02	8.41E+00	3.02E-03	1.62E-02	5.37E+00	6.10E-03	1.34E-02	2.20E+00	1.37E+00
RELVLU1	.00E+00	8.36E-03	0.00E+00	1.20E-02	9.99E+99	4.52E-06	1.13E-02	2.51E+03	6.03E-03	9.34E-03	1.55E+00	9.99E+99
RELVLU2	4.46E-06	4.30E-03	1.27E-05	1.04E-02	8.17E+02	3.38E-04	9.26E-03	2.74E+01	3.47E-03	5.31E-03	1.53E+00	2.33E+03
RELVLU3	.00E+00	4.40E-05	0.00E+00	3.15E-03	9.99E+99	0.00E+00	2.59E-03	9.99E+99	0.00E+00	5.50E-04	9.99E+99	9.99E+99
RELVTH1	1.87E-02	5.93E-03	0.00E+00	3.50E-02	9.99E+99	1.45E-04	2.72E-02	1.87E+02	1.39E-03	1.61E-02	1.16E+01	1.88E+00
RELVTH2	4.95E-03	2.70E-03	0.00E+00	2.06E-02	9.99E+99	9.26E-05	1.33E-02	1.44E+02	6.50E-04	7.43E-03	1.14E+01	4.16E+00
RELVTH3	1.28E-05	1.15E-04	0.00E+00	2.32E-03	9.99E+99	0.00E+00	1.41E-03	9.99E+99	7.19E-06	4.51E-04	6.28E+01	1.81E+02
RELVSK1	8.87E-02	5.18E-02	1.82E-02	7.93E-02	4.36E+00	2.72E-02	7.49E-02	2.75E+00	4.00E-02	6.22E-02	1.55E+00	8.94E-01
RELVSK2	6.65E-02	4.17E-02	1.76E-02	5.94E-02	3.38E+00	2.29E-02	5.65E-02	2.47E+00	3.32E-02	5.07E-02	1.53E+00	8.94E-01
RELVSK3	1.28E-02	8.30E-03	1.48E-03	1.50E-02	1.01E+01	2.57E-03	1.40E-02	5.44E+00	4.96E-03	1.16E-02	2.34E+00	1.17E+00
REOUMT1	1.31E-01	1.33E-01	1.15E-01	1.55E-01	1.34E+00	1.18E-01	1.49E-01	1.26E+00	1.24E-01	1.38E-01	1.11E+00	1.18E+00
REOUMT2	3.40E-02	3.63E-02	2.38E-02	5.89E-02	2.48E+00	2.68E-02	5.22E-02	1.95E+00	3.11E-02	4.02E-02	1.29E+00	1.73E+00
REOUMT3	2.84E-03	2.92E-03	1.28E-03	9.20E-03	7.17E+00	1.41E-03	7.22E-03	5.12E+00	1.96E-03	4.18E-03	2.14E+00	3.24E+00
REOUBM1	1.27E-01	1.25E-01	1.07E-01	1.38E-01	1.29E+00	1.10E-01	1.36E-01	1.23E+00	1.17E-01	1.32E-01	1.13E+00	1.08E+00
REOUBM2	3.03E-02	2.97E-02	1.61E-02	3.83E-02	2.38E+00	1.86E-02	3.69E-02	1.99E+00	2.37E-02	3.41E-02	1.44E+00	1.26E+00
REOUBM3	1.00E-03	1.02E-03	1.09E-06	3.32E-03	3.05E+03	4.48E-05	2.79E-03	6.24E+01	4.78E-04	2.05E-03	4.28E+00	3.31E+00
REOUMB1	7.35E-02	6.61E-02	2.58E-02	9.13E-02	3.53E+00	3.42E-02	8.55E-02	2.50E+00	5.63E-02	7.60E-02	1.35E+00	1.24E+00
REOUMB2	8.03E-02	6.72E-02	3.26E-02	8.20E-02	2.52E+00	4.35E-02	7.74E-02	1.78E+00	5.98E-02	7.23E-02	1.21E+00	1.02E+00
REOUMB3	2.87E-02	1.92E-02	1.30E-02	2.51E-02	1.94E+00	1.48E-02	2.27E-02	1.53E+00	1.67E-02	2.12E-02	1.27E+00	8.74E-01

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REOULU1   .00E+00  3.56E-03  | 0.00E+00  1.06E-02  9.99E+99  | 0.00E+00  9.52E-03  9.99E+99  | 0.00E+00
                                  7.33E-03  9.99E+99  ||  9.99E+99
REOULU2   .00E+00  3.39E-03  | 0.00E+00  1.00E-02  9.99E+99  | 0.00E+00  9.41E-03  9.99E+99  | 5.77E-04
                                  7.56E-03  1.31E+01  ||  9.99E+99
REOULU3   .00E+00  3.90E-04  | 0.00E+00  3.40E-03  9.99E+99  | 0.00E+00  3.02E-03  9.99E+99  | 7.70E-06
                                  2.00E-03  2.60E+02  ||  9.99E+99
REOUTH1  1.89E-03  3.00E-03  | 0.00E+00  1.78E-02  9.99E+99  | 1.30E-04  1.35E-02  1.04E+02  | 8.13E-04
                                  7.53E-03  9.26E+00  ||  9.45E+00
REOUTH2  1.39E-03  2.61E-03  | 0.00E+00  1.62E-02  9.99E+99  | 9.37E-05  1.14E-02  1.21E+02  | 6.57E-04
                                  5.95E-03  9.06E+00  ||  1.17E+01
REOUTH3  1.66E-04  3.85E-04  | 0.00E+00  3.70E-03  9.99E+99  | 8.96E-06  2.28E-03  2.55E+02  | 7.47E-05
                                  1.07E-03  1.44E+01  ||  2.22E+01
REOUSK1  4.77E-02  3.60E-02  | 1.41E-02  5.40E-02  3.82E+00  | 1.96E-02  5.07E-02  2.59E+00  | 3.00E-02
                                  4.42E-02  1.48E+00  ||  1.13E+00
REOUSK2  5.79E-02  4.11E-02  | 1.84E-02  5.40E-02  2.94E+00  | 2.59E-02  5.08E-02  1.96E+00  | 3.69E-02
                                  4.58E-02  1.24E+00  ||  9.32E-01
REOUSK3  2.35E-02  1.34E-02  | 6.84E-03  1.53E-02  2.23E+00  | 9.09E-03  1.49E-02  1.64E+00  | 1.20E-02
                                  1.43E-02  1.19E+00  ||  6.50E-01
PECMMT   2.60E+02  8.84E+02  | 2.90E+02  3.88E+03  1.34E+01  | 3.40E+02  2.89E+03  8.49E+00  | 5.22E+02
                                  1.55E+03  2.96E+00  ||  1.49E+01
PECMBM   6.62E+01  7.19E+01  | 4.27E+01  1.45E+02  3.39E+00  | 4.70E+01  1.25E+02  2.67E+00  | 5.70E+01
                                  9.18E+01  1.61E+00  ||  2.18E+00
PECMMB   3.77E+03  3.48E+03  | 2.26E+03  5.23E+03  2.31E+00  | 2.46E+03  4.87E+03  1.98E+00  | 2.89E+03
                                  4.26E+03  1.47E+00  ||  1.39E+00
PECMLU   1.77E+01  3.67E+02  | 5.96E+01  1.87E+03  3.14E+01  | 9.52E+01  1.39E+03  1.46E+01  | 2.15E+02
                                  7.42E+02  3.45E+00  ||  1.06E+02
PECMTH   5.14E+01  4.46E+01  | 0.00E+00  8.71E+02  9.99E+99  | 0.00E+00  4.65E+02  9.99E+99  | 3.41E+00
                                  1.60E+02  4.70E+01  ||  1.69E+01
PECMSK   3.67E+03  2.89E+03  | 5.31E+02  4.54E+03  8.56E+00  | 1.27E+03  4.26E+03  3.35E+00  | 2.20E+03
                                  3.60E+03  1.64E+00  ||  1.24E+00
PELVMT   2.32E+03  2.64E+03  | 8.12E+02  1.10E+04  1.35E+01  | 1.08E+03  8.05E+03  7.44E+00  | 1.71E+03
                                  4.35E+03  2.55E+00  ||  4.74E+00
PELVBM   1.61E+02  2.93E+02  | 7.79E+01  1.22E+03  1.57E+01  | 1.06E+02  8.15E+02  7.68E+00  | 1.85E+02
                                  5.45E+02  2.94E+00  ||  7.59E+00
PELVMB   2.32E+04  1.76E+04  | 6.16E+03  3.23E+04  5.25E+00  | 8.18E+03  2.92E+04  3.56E+00  | 1.15E+04
                                  2.40E+04  2.09E+00  ||  1.39E+00
PELVLU   1.62E-03  6.35E+02  | 4.30E-01  4.91E+03  1.14E+04  | 8.63E+00  3.06E+03  3.55E+02  | 1.56E+02
                                  1.74E+03  1.12E+01  ||  3.04E+06
PELVTH   2.64E+02  4.31E+02  | 0.00E+00  4.68E+03  9.99E+99  | 8.16E+00  3.06E+03  3.75E+02  | 7.30E+01
                                  1.21E+03  1.66E+01  ||  1.78E+01
PELVSK   2.26E+04  1.36E+04  | 4.22E+03  2.60E+04  6.17E+00  | 5.49E+03  2.37E+04  4.32E+00  | 8.33E+03
                                  1.97E+04  2.36E+00  ||  1.15E+00
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EXTENT OF THE UNCERTAINTY FOR THE 95TH PERCENTILE OF THE ENDPOINTS FOR THE UK1 SOURCE TERM

95 %-FRT	REF	MEDIAN	5 %	95 %	FAC1	10 %	90 %	FAC2	25 %	75 %	FAC3	95%/REF
DECMBM1	3.98E+00	4.68E+00	2.57E+00	9.12E+00	3.55E+00	2.82E+00	7.76E+00	2.75E+00	3.63E+00	6.17E+00	1.70E+00	2.29E+00
DECMBM2	1.55E-01	1.95E-01	1.07E-01	3.55E-01	3.31E+00	1.20E-01	3.09E-01	2.57E+00	1.51E-01	2.51E-01	1.66E+00	2.29E+00
DECMBM3	4.07E-03	4.17E-03	2.45E-03	6.92E-03	2.82E+00	2.75E-03	6.03E-03	2.19E+00	3.39E-03	5.13E-03	1.51E+00	1.70E+00
DECMTH1	1.29E+02	2.75E+02	3.80E+01	1.15E+03	3.02E+01	6.17E+01	7.59E+02	1.23E+01	1.17E+02	4.57E+02	3.89E+00	8.91E+00
DECMTH2	3.89E+00	7.94E+00	1.23E+00	3.39E+01	2.75E+01	1.91E+00	2.19E+01	1.15E+01	3.63E+00	1.38E+01	3.80E+00	8.71E+00
DECMTH3	4.27E-02	8.91E-02	2.34E-02	3.98E-01	1.70E+01	3.09E-02	2.51E-01	8.13E+00	4.79E-02	1.51E-01	3.16E+00	9.33E+00
DECMSK1	4.57E+02	5.13E+02	2.14E+02	7.76E+02	3.63E+00	2.63E+02	7.41E+02	2.82E+00	3.63E+02	6.92E+02	1.91E+00	1.70E+00
DECMSK2	1.38E+01	1.58E+01	6.76E+00	2.19E+01	3.24E+00	7.94E+00	2.14E+01	2.69E+00	1.12E+01	2.00E+01	1.78E+00	1.58E+00
DECMSK3	1.78E-01	1.91E-01	1.07E-01	2.19E-01	2.04E+00	1.23E-01	2.14E-01	1.74E+00	1.55E-01	2.09E-01	1.35E+00	1.23E+00
DELVBM1	1.07E+01	1.51E+01	6.31E+00	3.63E+01	5.75E+00	7.41E+00	2.82E+01	3.80E+00	1.02E+01	2.09E+01	2.04E+00	3.39E+00
DELVBM2	4.17E-01	6.03E-01	2.63E-01	1.38E+00	5.25E+00	3.16E-01	1.15E+00	3.63E+00	4.27E-01	8.32E-01	1.95E+00	3.31E+00
DELVBM3	4.90E-02	7.08E-02	3.24E-02	1.58E-01	4.90E+00	3.80E-02	1.35E-01	3.55E+00	5.01E-02	9.77E-02	1.95E+00	3.24E+00
DELVTH1	2.95E+02	5.25E+02	7.94E+01	1.86E+03	2.34E+01	1.38E+02	1.48E+03	1.07E+01	2.51E+02	9.12E+02	3.63E+00	6.31E+00
DELVTH2	1.05E+01	1.95E+01	3.02E+00	6.46E+01	2.14E+01	4.90E+00	5.13E+01	1.05E+01	8.91E+00	3.31E+01	3.72E+00	6.17E+00
DELVTH3	9.33E-01	1.91E+00	3.24E-01	6.76E+00	2.09E+01	5.13E-01	4.90E+00	9.55E+00	8.91E-01	3.16E+00	3.55E+00	7.24E+00
DELVSK1	2.34E+03	1.82E+03	7.76E+02	2.82E+03	3.63E+00	9.55E+02	2.69E+03	2.82E+00	1.26E+03	2.40E+03	1.91E+00	1.20E+00
DELVSK2	8.13E+01	6.31E+01	2.69E+01	9.77E+01	3.63E+00	3.31E+01	9.55E+01	2.88E+00	4.37E+01	8.32E+01	1.91E+00	1.20E+00
DELVSK3	7.59E+00	5.75E+00	2.40E+00	8.91E+00	3.72E+00	3.02E+00	8.51E+00	2.82E+00	3.98E+00	7.41E+00	1.86E+00	1.17E+00
DEOUBM1	6.92E+01	6.03E+01	2.51E+01	1.07E+02	4.27E+00	3.02E+01	9.55E+01	3.16E+00	4.27E+01	8.32E+01	1.95E+00	1.55E+00
DEOUBM2	2.63E+00	2.34E+00	1.07E+00	4.17E+00	3.89E+00	1.35E+00	3.80E+00	2.82E+00	1.74E+00	3.16E+00	1.82E+00	1.58E+00
DEOUBM3	3.02E-01	2.69E-01	1.23E-01	4.90E-01	3.98E+00	1.55E-01	4.37E-01	2.82E+00	2.04E-01	3.72E-01	1.82E+00	1.62E+00
DEOUTH1	6.31E+02	8.91E+02	2.09E+02	2.51E+03	1.20E+01	3.09E+02	1.91E+03	6.17E+00	5.01E+02	1.38E+03	2.75E+00	3.98E+00
DEOUTH2	2.19E+01	3.16E+01	8.13E+00	8.91E+01	1.10E+01	1.12E+01	6.92E+01	6.17E+00	1.86E+01	5.01E+01	2.69E+00	4.07E+00
DEOUTH3	1.95E+00	3.09E+00	8.51E-01	8.91E+00	1.05E+01	1.12E+00	6.92E+00	6.17E+00	1.78E+00	5.01E+00	2.82E+00	4.57E+00
DEOUSK1	4.27E+03	2.69E+03	2.40E+03	2.88E+03	1.20E+00	2.45E+03	2.82E+03	1.15E+00	2.57E+03	2.75E+03	1.07E+00	6.76E-01
DEOUSK2	1.48E+02	9.33E+01	8.51E+01	1.00E+02	1.17E+00	8.51E+01	1.00E+02	1.17E+00	8.91E+01	9.77E+01	1.10E+00	6.76E-01
DEOUSK3	1.38E+01	8.51E+00	7.59E+00	9.12E+00	1.20E+00	7.76E+00	8.91E+00	1.15E+00	7.94E+00	8.91E+00	1.12E+00	6.61E-01
AEVAC	6.76E+03	1.35E+04	8.13E+03	2.51E+04	3.09E+00	8.51E+03	2.34E+04	2.75E+00	1.07E+04	1.78E+04	1.66E+00	3.72E+00
ASHEL	8.32E+03	6.92E+03	4.07E+03	8.51E+03	2.09E+00	4.90E+03	8.32E+03	1.70E+00	6.03E+03	7.76E+03	1.29E+00	1.02E+00
AIOD	7.24E+03	1.00E+04	5.01E+03	1.66E+04	3.31E+00	5.62E+03	1.48E+04	2.63E+00	7.59E+03	1.23E+04	1.62E+00	2.29E+00
RECMMT1	1.29E-01	1.00E+00	4.07E-01	1.00E+00	2.45E+00	9.55E-01	1.00E+00	1.05E+00	1.00E+00	1.00E+00	1.00E+00	7.76E+00
RECMMT2	4.07E-03	7.94E-03	0.00E+00	4.17E-02	9.99E+99	0.00E+00	3.24E-02	9.99E+99	1.48E-03	2.40E-02	1.62E+01	1.02E+01
RECMMT3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMBM1	8.13E-02	2.00E-01	0.00E+00	1.00E+00	9.99E+99	0.00E+00	1.00E+00	9.99E+99	3.47E-02	7.59E-01	2.19E+01	1.23E+01
RECMBM2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMBM3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMMB1	1.07E+00	3.72E-01	0.00E+00	1.17E+00	9.99E+99	0.00E+00	1.07E+00	9.99E+99	0.00E+00	9.77E-01	9.99E+99	1.10E+00
RECMMB2	8.13E-02	0.00E+00	0.00E+00	1.66E-01	9.99E+99	0.00E+00	7.41E-02	9.99E+99	0.00E+00	2.04E-02	9.99E+99	2.04E+00
RECMMB3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMLU1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99

RECMLU2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMLU3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMTH1	1.20E-01	0.00E+00	0.00E+00	2.34E-01	9.99E+99	0.00E+00	1.23E-01	9.99E+99	0.00E+00	2.82E-02	9.99E+99	1.95E+00
RECMTH2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMTH3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMSK1	9.50E-01	3.02E-01	0.00E+00	9.50E-01	9.99E+99	0.00E+00	9.50E-01	9.99E+99	0.00E+00	8.91E-01	9.99E+99	1.00E+00
RECMSK2	8.13E-02	0.00E+00	0.00E+00	1.32E-01	9.99E+99	0.00E+00	5.89E-02	9.99E+99	0.00E+00	1.62E-02	9.99E+99	1.62E+00
RECMSK3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RELVMT1	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
RELVMT2	5.01E-02	5.01E-02	4.68E-02	1.62E-01	3.47E+00	5.01E-02	5.01E-02	1.00E+00	5.01E-02	5.01E-02	1.00E+00	3.24E+00
RELVMT3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RELVBM1	1.00E+00	1.00E+00	7.59E-01	1.00E+00	1.32E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00

95 %-FRT	REF	MEDIAN	5 %	95 %	FAC1	10 %	90 %	FAC2	25 %	75 %	FAC3	95%/REF
RELVBM2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RELVBM3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RELVMB1	1.02E+00	9.55E-01	0.00E+00	1.17E+00	9.99E+99	0.00E+00	1.07E+00	9.99E+99	1.15E-01	1.00E+00	8.71E+00	1.15E+00
RELVMB2	9.55E-01	2.57E-01	0.00E+00	9.77E-01	9.99E+99	0.00E+00	9.55E-01	9.99E+99	3.80E-02	8.13E-01	2.14E+01	1.02E+00
RELVMB3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RELVLU1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RELVLU2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RELVLU3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RELVTH1	8.13E-02	0.00E+00	0.00E+00	2.09E-01	9.99E+99	0.00E+00	1.29E-01	9.99E+99	0.00E+00	4.90E-02	9.99E+99	2.57E+00
RELVTH2	0.00E+00	0.00E+00	0.00E+00	5.50E-02	9.99E+99	0.00E+00	2.63E-02	9.99E+99	0.00E+00	1.15E-02	9.99E+99	9.99E+99
RELVTH3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RELVSK1	9.50E-01	7.24E-01	0.00E+00	9.50E-01	9.99E+99	0.00E+00	9.50E-01	9.99E+99	8.91E-02	9.50E-01	1.07E+01	1.00E+00
RELVSK2	9.50E-01	1.70E-01	0.00E+00	9.50E-01	9.99E+99	0.00E+00	9.33E-01	9.99E+99	2.29E-02	6.31E-01	2.75E+01	1.00E+00
RELVSK3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
REOUMT1	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
REOUMT2	5.01E-02	5.01E-02	5.01E-02	1.00E+00	2.00E+01	5.01E-02	5.01E-01	1.00E+01	5.01E-02	6.03E-02	1.20E+00	2.00E+01
REOUMT3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
REOUBM1	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
REOUBM2	0.00E+00	0.00E+00	0.00E+00	2.63E-02	9.99E+99	0.00E+00	1.45E-02	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
REOUBM3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
REOUMB1	6.61E-01	1.41E-01	0.00E+00	9.55E-01	9.99E+99	0.00E+00	9.55E-01	9.99E+99	3.16E-02	5.62E-01	1.78E+01	1.45E+00
REOUMB2	9.55E-01	3.31E-01	0.00E+00	9.55E-01	9.99E+99	2.51E-02	8.51E-01	3.39E+01	1.91E-01	5.50E-01	2.88E+00	1.00E+00
REOUMB3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
REOULU1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
REOULU2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
REOULU3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
REOUTH1	0.00E+00	0.00E+00	0.00E+00	4.17E-02	9.99E+99	0.00E+00	2.45E-02	9.99E+99	0.00E+00	1.02E-02	9.99E+99	9.99E+99
REOUTH2	0.00E+00	0.00E+00	0.00E+00	4.47E-02	9.99E+99	0.00E+00	2.24E-02	9.99E+99	0.00E+00	1.12E-02	9.99E+99	9.99E+99
REOUTH3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
REOUSK1	4.68E-01	3.55E-02	0.00E+00	8.13E-01	9.99E+99	0.00E+00	6.92E-01	9.99E+99	0.00E+00			

										3.09E-01	9.99E+99	1.74E+00
REOUSK2	9.33E-01	1.78E-01	0.00E+00	7.76E-01	9.99E+99	0.00E+00	6.03E-01	9.99E+99	9.12E-02	3.47E-01	3.80E+00	8.32E-01
REOUSK3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
PECMMT	1.00E+03	3.98E+03	1.23E+03	1.48E+04	1.20E+01	1.51E+03	1.26E+04	8.32E+00	2.34E+03	7.76E+03	3.31E+00	1.48E+01
PECMBM	3.31E+02	3.63E+02	2.63E+02	1.05E+03	3.98E+00	2.82E+02	8.51E+02	3.02E+00	3.16E+02	5.37E+02	1.70E+00	3.16E+00
PECMMB	1.38E+04	1.48E+04	1.05E+04	2.19E+04	2.09E+00	1.10E+04	2.00E+04	1.82E+00	1.26E+04	1.74E+04	1.38E+00	1.58E+00
PECMLU	1.23E+02	2.19E+03	3.02E+02	8.91E+03	2.95E+01	4.57E+02	6.76E+03	1.48E+01	1.17E+03	4.07E+03	3.47E+00	7.24E+01
PECMTH	2.57E+02	1.95E+02	0.00E+00	4.27E+03	9.99E+99	0.00E+00	2.00E+03	9.99E+99	1.20E+01	6.92E+02	5.75E+01	1.66E+01
PECMSK	1.38E+04	1.23E+04	2.29E+03	1.78E+04	7.76E+00	5.62E+03	1.66E+04	2.95E+00	1.05E+04	1.51E+04	1.45E+00	1.29E+00
PELVMT	6.76E+03	8.32E+03	2.69E+03	3.98E+04	1.48E+01	3.63E+03	3.02E+04	8.32E+00	5.50E+03	1.26E+04	2.29E+00	5.89E+00
PELVBM	7.59E+02	1.41E+03	3.98E+02	6.17E+03	1.55E+01	5.37E+02	3.98E+03	7.41E+00	9.55E+02	2.63E+03	2.75E+00	8.13E+00
PELVMB	6.76E+04	6.17E+04	2.09E+04	1.02E+05	4.90E+00	2.69E+04	8.91E+04	3.31E+00	4.17E+04	7.41E+04	1.78E+00	1.51E+00
PELVLU	0.00E+00	3.47E+03	0.00E+00	1.95E+04	9.99E+99	4.07E+01	1.41E+04	3.47E+02	8.13E+02	7.76E+03	9.55E+00	9.99E+99
PELVTH	1.32E+03	1.78E+03	0.00E+00	1.74E+04	9.99E+99	3.16E+01	1.07E+04	3.39E+02	3.47E+02	4.90E+03	1.41E+01	1.32E+01
PELVSK	6.76E+04	5.25E+04	1.62E+04	7.94E+04	4.90E+00	2.09E+04	7.41E+04	3.55E+00	3.39E+04	6.46E+04	1.91E+00	1.17E+00

RESULTS FOR THE 99TH PERCENTILES OF THE ENDPOINTS FOR THE UK1 SOURCE TERM

99 %-FRT	REF	MEDIAN	5 %	95 %	FAC1	10 %	90 %	FAC2	25 %	75 %	FAC3	95%/REF
DECMBM1	2.57E+01	2.82E+01	1.51E+01	5.75E+01	3.80E+00	1.70E+01	5.01E+01	2.95E+00	2.14E+01	3.98E+01	1.86E+00	2.24E+00
DECMBM2	1.29E+00	1.51E+00	8.91E-01	2.75E+00	3.09E+00	9.77E-01	2.45E+00	2.51E+00	1.17E+00	1.91E+00	1.62E+00	2.14E+00
DECMBM3	7.76E-02	7.76E-02	5.89E-02	1.17E-01	2.00E+00	6.17E-02	1.10E-01	1.78E+00	6.92E-02	9.33E-02	1.35E+00	1.51E+00
DECMTH1	9.55E+02	2.04E+03	2.75E+02	8.13E+03	2.95E+01	4.68E+02	5.89E+03	1.26E+01	8.71E+02	3.47E+03	3.98E+00	8.51E+00
DECMTH2	2.69E+01	6.61E+01	1.12E+01	3.31E+02	2.95E+01	1.51E+01	2.14E+02	1.41E+01	2.95E+01	1.20E+02	4.07E+00	1.23E+01
DECMTH3	1.15E+00	2.57E+00	4.90E-01	1.07E+01	2.19E+01	6.76E-01	7.08E+00	1.05E+01	1.29E+00	4.27E+00	3.31E+00	9.33E+00
DECMSK1	3.39E+03	3.89E+03	1.58E+03	5.89E+03	3.72E+00	1.95E+03	5.62E+03	2.88E+00	2.69E+03	5.25E+03	1.95E+00	1.74E+00
DECMSK2	1.05E+02	1.15E+02	6.46E+01	1.38E+02	2.14E+00	6.92E+01	1.32E+02	1.91E+00	8.91E+01	1.23E+02	1.38E+00	1.32E+00
DECMSK3	4.79E+00	5.13E+00	3.72E+00	6.46E+00	1.74E+00	3.89E+00	6.46E+00	1.66E+00	4.07E+00	6.17E+00	1.51E+00	1.35E+00
DELVBM1	6.61E+01	9.33E+01	4.07E+01	2.29E+02	5.62E+00	4.57E+01	1.78E+02	3.89E+00	6.31E+01	1.29E+02	2.04E+00	3.47E+00
DELVBM2	2.88E+00	4.37E+00	1.91E+00	9.77E+00	5.13E+00	2.29E+00	8.13E+00	3.55E+00	3.02E+00	6.03E+00	2.00E+00	3.39E+00
DELVBM3	2.69E-01	4.17E-01	1.91E-01	9.12E-01	4.79E+00	2.24E-01	7.59E-01	3.39E+00	2.88E-01	5.62E-01	1.95E+00	3.39E+00
DELVTH1	2.29E+03	3.98E+03	6.03E+02	1.38E+04	2.29E+01	1.00E+03	1.15E+04	1.15E+01	1.91E+03	6.92E+03	3.63E+00	6.03E+00
DELVTH2	6.03E+01	1.32E+02	2.04E+01	5.25E+02	2.57E+01	3.39E+01	3.63E+02	1.07E+01	5.89E+01	2.24E+02	3.80E+00	8.71E+00
DELVTH3	5.37E+00	1.07E+01	1.82E+00	3.80E+01	2.09E+01	3.02E+00	2.75E+01	9.12E+00	5.01E+00	1.78E+01	3.55E+00	7.08E+00
DELVSK1	1.82E+04	1.41E+04	6.03E+03	2.19E+04	3.63E+00	7.41E+03	2.09E+04	2.82E+00	9.77E+03	1.86E+04	1.91E+00	1.20E+00
DELVSK2	5.13E+02	3.89E+02	1.62E+02	6.17E+02	3.80E+00	2.04E+02	5.89E+02	2.88E+00	2.69E+02	5.13E+02	1.91E+00	1.20E+00
DELVSK3	4.27E+01	3.31E+01	1.38E+01	5.13E+01	3.72E+00	1.70E+01	4.90E+01	2.88E+00	2.29E+01	4.27E+01	1.86E+00	1.20E+00
DEOUBM1	4.27E+02	3.72E+02	1.48E+02	6.76E+02	4.57E+00	1.86E+02	6.03E+02	3.24E+00	2.63E+02	5.13E+02	1.95E+00	1.58E+00
DEOUBM2	1.86E+01	1.62E+01	7.24E+00	2.95E+01	4.07E+00	9.33E+00	2.63E+01	2.82E+00	1.20E+01	2.29E+01	1.91E+00	1.58E+00
DEOUBM3	1.66E+00	1.58E+00	6.92E-01	2.75E+00	3.98E+00	8.91E-01	2.51E+00	2.82E+00	1.15E+00	2.14E+00	1.86E+00	1.66E+00
DEOUTH1	4.47E+03	6.61E+03	1.45E+03	1.86E+04	1.29E+01	2.29E+03	1.45E+04	6.31E+00	3.72E+03	1.05E+04	2.82E+00	4.17E+00
DEOUTH2	1.20E+02	2.09E+02	5.13E+01	6.61E+02	1.29E+01	7.08E+01	5.01E+02	7.08E+00	1.15E+02	3.47E+02	3.02E+00	5.50E+00
DEOUTH3	1.17E+01	1.78E+01	4.90E+00	5.01E+01	1.02E+01	6.61E+00	3.89E+01	5.89E+00	1.07E+01	2.82E+01	2.63E+00	4.27E+00
DEOUSK1	3.31E+04	2.09E+04	1.86E+04	2.24E+04	1.20E+00	1.91E+04	2.19E+04	1.15E+00	2.00E+04	2.14E+04	1.07E+00	6.76E-01
DEOUSK2	9.33E+02	5.75E+02	5.13E+02	6.17E+02	1.20E+00	5.25E+02	6.17E+02	1.17E+00	5.50E+02	6.03E+02	1.10E+00	6.61E-01
DEOUSK3	7.76E+01	4.79E+01	4.37E+01	5.25E+01	1.20E+00	4.47E+01	5.13E+01	1.15E+00	4.57E+01	5.01E+01	1.10E+00	6.76E-01
AEVAC	7.94E+03	1.86E+04	1.02E+04	4.17E+04	4.07E+00	1.15E+04	3.80E+04	3.31E+00	1.32E+04	2.82E+04	2.14E+00	5.25E+00
ASHEL	1.48E+04	1.66E+04	7.08E+03	2.09E+04	2.95E+00	8.51E+03	2.04E+04	2.40E+00	1.12E+04	2.00E+04	1.78E+00	1.41E+00
AIOD	1.07E+04	1.38E+04	6.92E+03	2.57E+04	3.72E+00	8.13E+03	1.95E+04	2.40E+00	1.07E+04	1.70E+04	1.58E+00	2.40E+00
RECMMT1	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
RECMMT2	5.01E-02	1.00E+00	5.01E-02	1.00E+00	2.00E+01	5.01E-02	1.00E+00	2.00E+01	1.55E-01	1.00E+00	6.46E+00	2.00E+01
RECMMT3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMBM1	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
RECMBM2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMBM3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99

RECMMB1	1.82E+00	1.51E+00	5.01E-01	2.40E+00	4.79E+00	1.12E+00	2.24E+00	2.00E+00	1.29E+00	1.82E+00	1.41E+00	1.32E+00
RECMMB2	1.00E+00	9.77E-01	4.27E-01	1.41E+00	3.31E+00	6.31E-01	1.26E+00	2.00E+00	9.55E-01	1.07E+00	1.12E+00	1.41E+00
RECMMB3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMLU1	0.00E+00	5.25E-01	1.15E-01	7.59E-01	6.61E+00	2.34E-01	7.24E-01	3.09E+00	3.98E-01	6.61E-01	1.66E+00	9.99E+99
RECMLU2	0.00E+00	1.05E-02	0.00E+00	5.01E-01	9.99E+99	0.00E+00	3.80E-01	9.99E+99	0.00E+00	3.80E-02	9.99E+99	9.99E+99
RECMLU3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMTH1	5.13E-01	8.71E-02	0.00E+00	8.51E-01	9.99E+99	0.00E+00	7.41E-01	9.99E+99	1.86E-02	3.16E-01	1.70E+01	1.66E+00
RECMTH2	3.24E-02	2.04E-02	0.00E+00	4.37E-01	9.99E+99	0.00E+00	2.14E-01	9.99E+99	0.00E+00	6.03E-02	9.99E+99	1.35E+01
RECMTH3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMSK1	9.50E-01	9.50E-01	2.82E-01	9.50E-01	3.37E+00	6.61E-01	9.50E-01	1.44E+00	9.50E-01	9.50E-01	1.00E+00	1.00E+00
RECMSK2	9.50E-01	9.50E-01	1.20E-01	9.50E-01	7.90E+00	3.39E-01	9.50E-01	2.80E+00	7.76E-01	9.50E-01	1.22E+00	1.00E+00
RECMSK3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RELVMT1	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
RELVMT2	5.01E-02	1.00E+00	5.01E-02	1.00E+00	2.00E+01	7.41E-02	1.00E+00	1.35E+01	8.71E-01	1.00E+00	1.15E+00	2.00E+01
RELVMT3	5.00E-02	5.00E-02	6.17E-04	5.01E-02	8.13E+01	3.24E-03	5.01E-02	1.55E+01	2.40E-02	5.01E-02	2.09E+00	1.00E+00
RELVBM1	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00

99 %-FRT	REF	MEDIAN	5 %	95 %	FAC1	10 %	90 %	FAC2	25 %	75 %	FAC3	95%/REF
RELVBM2	0.00E+00	6.03E-02	0.00E+00	1.00E+00	9.99E+99	0.00E+00	1.00E+00	9.99E+99	0.00E+00	7.41E-01	9.99E+99	9.99E+99
RELVBM3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RELVMB1	2.34E+00	1.91E+00	1.05E+00	2.63E+00	2.51E+00	1.32E+00	2.51E+00	1.91E+00	1.51E+00	2.19E+00	1.45E+00	1.12E+00
RELVMB2	1.48E+00	1.38E+00	1.00E+00	1.95E+00	1.95E+00	1.02E+00	1.86E+00	1.82E+00	1.12E+00	1.58E+00	1.41E+00	1.32E+00
RELVMB3	8.91E-01	2.82E-01	0.00E+00	9.77E-01	9.99E+99	0.00E+00	9.55E-01	9.99E+99	4.79E-02	7.94E-01	1.66E+01	1.10E+00
RELVLU1	0.00E+00	3.80E-01	0.00E+00	7.24E-01	9.99E+99	0.00E+00	6.31E-01	9.99E+99	1.86E-01	4.79E-01	2.57E+00	9.99E+99
RELVLU2	0.00E+00	1.41E-02	0.00E+00	5.62E-01	9.99E+99	0.00E+00	4.47E-01	9.99E+99	0.00E+00	5.62E-02	9.99E+99	9.99E+99
RELVLU3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RELVTH1	5.62E-01	2.29E-01	0.00E+00	8.91E-01	9.99E+99	1.02E-02	7.94E-01	7.76E+01	5.50E-02	5.50E-01	1.00E+01	1.58E+00
RELVTH2	1.62E-01	9.33E-02	0.00E+00	7.59E-01	9.99E+99	0.00E+00	5.25E-01	9.99E+99	2.45E-02	2.63E-01	1.07E+01	4.68E+00
RELVTH3	0.00E+00	0.00E+00	0.00E+00	5.50E-02	9.99E+99	0.00E+00	3.39E-02	9.99E+99	0.00E+00	1.05E-02	9.99E+99	9.99E+99
RELVSK1	9.50E-01	9.50E-01	9.12E-01	9.50E-01	1.04E+00	9.50E-01	9.50E-01	1.00E+00	9.50E-01	9.50E-01	1.00E+00	1.00E+00
RELVSK2	9.50E-01	9.50E-01	8.71E-01	9.50E-01	1.09E+00	9.50E-01	9.50E-01	1.00E+00	9.50E-01	9.50E-01	1.00E+00	1.00E+00
RELVSK3	8.91E-01	2.09E-01	0.00E+00	9.50E-01	9.99E+99	0.00E+00	9.33E-01	9.99E+99	2.24E-02	7.08E-01	3.16E+01	1.07E+00
REOUMT1	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
REOUMT2	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
REOUMT3	5.01E-02	5.01E-02	5.01E-02	1.38E-01	2.75E+00	5.01E-02	5.01E-02	1.00E+00	5.01E-02	5.01E-02	1.00E+00	2.75E+00
REOUBM1	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
REOUBM2	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
REOUBM3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
REOUMB1	1.91E+00	1.95E+00	1.07E+00	2.51E+00	2.34E+00	1.23E+00	2.34E+00	1.91E+00	1.78E+00	2.14E+00	1.20E+00	1.32E+00
REOUMB2	1.86E+00	1.82E+00	1.17E+00	2.24E+00	1.91E+00	1.32E+00	2.14E+00	1.62E+00	1.58E+00	1.95E+00	1.23E+00	1.20E+00
REOUMB3	9.77E-01	9.55E-01	4.17E-01	1.05E+00	2.51E+00	6.31E-01	1.02E+00	1.62E+00	9.33E-01	1.00E+00	1.07E+00	1.07E+00
REOULU1	0.00E+00	8.71E-02	0.00E+00	6.03E-01	9.99E+99	0.00E+00	4.79E-01	9.99E+99	0.00E+00	3.02E-01	9.99E+99	9.99E+99
REOULU2	0.00E+00	1.05E-02	0.00E+00	5.37E-01	9.99E+99	0.00E+00	4.68E-01	9.99E+99	0.00E+00	2.69E-01	9.99E+99	9.99E+99
REOULU3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00			

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                                    0.00E+00  9.99E+99  ||  9.99E+99
REOUTH1  6.46E-02  1.17E-01  | 0.00E+00  6.03E-01  9.99E+99  | 0.00E+00  4.90E-01  9.99E+99  | 3.47E-02
                                    2.95E-01  8.51E+00  ||  9.33E+00
REOUTH2  5.37E-02  9.55E-02  | 0.00E+00  5.75E-01  9.99E+99  | 0.00E+00  3.89E-01  9.99E+99  | 2.63E-02
                                    2.24E-01  8.51E+00  ||  1.07E+01
REOUTH3  0.00E+00  0.00E+00  | 0.00E+00  9.77E-02  9.99E+99  | 0.00E+00  5.62E-02  9.99E+99  | 0.00E+00
                                    2.63E-02  9.99E+99  ||  9.99E+99
REOUSK1  9.50E-01  9.50E-01  | 7.94E-01  9.50E-01  1.20E+00  | 9.33E-01  9.50E-01  1.02E+00  | 9.50E-01
                                    9.50E-01  1.00E+00  ||  1.00E+00
REOUSK2  9.50E-01  9.50E-01  | 8.51E-01  9.50E-01  1.12E+00  | 9.50E-01  9.50E-01  1.00E+00  | 9.50E-01
                                    9.50E-01  1.00E+00  ||  1.00E+00
REOUSK3  9.50E-01  8.51E-01  | 1.86E-01  9.50E-01  5.10E+00  | 3.63E-01  9.50E-01  2.62E+00  | 7.24E-01
                                    9.12E-01  1.26E+00  ||  1.00E+00
PECMMT   1.51E+03  8.13E+03  | 1.86E+03  3.47E+04  1.86E+01  | 2.00E+03  3.24E+04  1.62E+01  | 5.13E+03
                                    1.12E+04  2.19E+00  ||  2.29E+01
PECMBM   1.32E+03  1.35E+03  | 9.77E+02  1.62E+03  1.66E+00  | 1.07E+03  1.58E+03  1.48E+00  | 1.23E+03
                                    1.45E+03  1.17E+00  ||  1.23E+00
PECMMB   2.88E+04  2.69E+04  | 2.09E+04  4.17E+04  2.00E+00  | 2.29E+04  3.47E+04  1.51E+00  | 2.57E+04
                                    2.88E+04  1.12E+00  ||  1.45E+00
PECMLU   2.57E+02  5.89E+03  | 8.13E+02  2.75E+04  3.39E+01  | 1.91E+03  1.82E+04  9.55E+00  | 3.72E+03
                                    9.33E+03  2.51E+00  ||  1.07E+02
PECMTH   4.87E+02  3.98E+02  | 0.00E+00  6.92E+03  9.99E+99  | 0.00E+00  4.37E+03  9.99E+99  | 3.24E+01
                                    1.45E+03  4.47E+01  ||  1.42E+01
PECMSK   2.88E+04  2.40E+04  | 6.17E+03  2.69E+04  4.37E+00  | 1.38E+04  2.69E+04  1.95E+00  | 1.91E+04
                                    2.63E+04  1.38E+00  ||  9.33E-01
PELVMT   1.12E+04  1.15E+04  | 5.13E+03  8.91E+04  1.74E+01  | 6.46E+03  7.41E+04  1.15E+01  | 8.32E+03
                                    3.39E+04  4.07E+00  ||  7.94E+00
PELVBM   1.91E+03  3.02E+03  | 1.29E+03  1.66E+04  1.29E+01  | 1.35E+03  7.08E+03  5.25E+00  | 2.19E+03
                                    6.46E+03  2.95E+00  ||  8.71E+00
PELVMB   1.48E+05  1.38E+05  | 7.41E+04  2.14E+05  2.88E+00  | 8.32E+04  2.04E+05  2.45E+00  | 1.07E+05
                                    1.70E+05  1.58E+00  ||  1.45E+00
PELVLU   0.00E+00  9.33E+03  | 1.35E+01  6.46E+04  4.79E+03  | 2.09E+02  3.63E+04  1.74E+02  | 2.69E+03
                                    2.63E+04  9.77E+00  ||  9.99E+99
PELVTH   2.63E+03  5.37E+03  | 0.00E+00  4.79E+04  9.99E+99  | 1.12E+02  3.39E+04  3.02E+02  | 9.55E+02
                                    1.51E+04  1.58E+01  ||  1.82E+01
PELVSK   1.45E+05  1.10E+05  | 4.79E+04  1.70E+05  3.55E+00  | 6.61E+04  1.55E+05  2.34E+00  | 8.32E+04
                                    1.38E+05  1.66E+00  ||  1.17E+00
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Results for the mean value of the endpoints for the CB2 source term

MEAN VAL	REF	MEDIAN	5 %	95 %	FAC1	10 %	90 %	FAC2	25 %	75 %	FAC3	95%/REF
DECMBM1	3.21E-03	4.02E-03	2.29E-03	7.44E-03	3.24E+00	2.57E-03	6.55E-03	2.54E+00	3.04E-03	5.24E-03	1.72E+00	2.32E+00
DECMBM2	1.83E-04	2.15E-04	1.23E-04	3.92E-04	3.20E+00	1.38E-04	3.31E-04	2.41E+00	1.68E-04	2.70E-04	1.61E+00	2.14E+00
DECMBM3	2.99E-05	2.84E-05	1.17E-05	7.11E-05	6.06E+00	1.35E-05	5.91E-05	4.38E+00	1.85E-05	4.06E-05	2.19E+00	2.38E+00
DECMTH1	1.03E-01	1.53E-01	1.84E-02	5.22E-01	2.84E+01	3.54E-02	4.24E-01	1.20E+01	6.70E-02	2.66E-01	3.97E+00	5.08E+00
DECMTH2	3.15E-03	4.33E-03	7.32E-04	1.32E-02	1.81E+01	1.29E-03	1.09E-02	8.43E+00	2.20E-03	7.10E-03	3.23E+00	4.20E+00
DECMTH3	4.99E-04	5.56E-04	9.94E-05	1.45E-03	1.46E+01	1.62E-04	1.21E-03	7.46E+00	3.06E-04	8.48E-04	2.77E+00	2.91E+00
DECMSK1	3.58E-01	4.14E-01	1.80E-01	6.19E-01	3.44E+00	2.14E-01	5.99E-01	2.80E+00	2.93E-01	5.49E-01	1.87E+00	1.73E+00
DECMSK2	1.34E-02	1.15E-02	4.94E-03	1.78E-02	3.60E+00	5.99E-03	1.70E-02	2.84E+00	8.13E-03	1.50E-02	1.85E+00	1.33E+00
DECMSK3	3.17E-03	1.13E-03	3.96E-04	3.01E-03	7.61E+00	5.61E-04	2.52E-03	4.49E+00	7.45E-04	1.81E-03	2.43E+00	9.49E-01
DLCMED2	2.09E-02	6.32E-02	1.77E-02	5.53E-01	3.13E+01	2.33E-02	2.72E-01	1.17E+01	3.69E-02	1.21E-01	3.29E+00	2.64E+01
DLCMED3	4.23E-03	9.87E-03	3.64E-03	4.27E-02	1.17E+01	4.70E-03	2.87E-02	6.12E+00	6.61E-03	1.56E-02	2.37E+00	1.01E+01
DLCMED4	7.69E-04	1.75E-03	7.10E-04	5.39E-03	7.60E+00	9.25E-04	3.66E-03	3.96E+00	1.21E-03	2.56E-03	2.11E+00	7.02E+00
DLCMBM2	2.01E-02	3.68E-02	8.08E-03	1.11E-01	1.38E+01	1.40E-02	8.62E-02	6.15E+00	2.27E-02	5.96E-02	2.62E+00	5.54E+00
DLCMBM3	4.07E-03	7.13E-03	2.59E-03	2.31E-02	8.92E+00	3.40E-03	1.70E-02	5.01E+00	5.05E-03	1.11E-02	2.20E+00	5.67E+00
DLCMBM4	7.42E-04	1.39E-03	5.53E-04	5.06E-03	9.16E+00	6.87E-04	3.05E-03	4.44E+00	1.02E-03	2.20E-03	2.15E+00	6.82E+00
DLCMTH2	2.65E-02	4.78E-02	1.61E-02	1.30E-01	8.09E+00	2.02E-02	1.03E-01	5.13E+00	3.06E-02	7.62E-02	2.49E+00	4.90E+00
DLCMTH3	5.16E-03	8.53E-03	3.79E-03	2.45E-02	6.46E+00	4.46E-03	1.89E-02	4.24E+00	6.35E-03	1.33E-02	2.10E+00	4.74E+00
DLCMTH4	8.52E-04	1.59E-03	6.87E-04	5.18E-03	7.54E+00	8.29E-04	3.45E-03	4.17E+00	1.17E-03	2.37E-03	2.03E+00	6.08E+00
DLLVED2	1.53E-01	3.49E-01	1.60E-01	2.02E+00	1.27E+01	1.86E-01	9.37E-01	5.04E+00	2.36E-01	5.27E-01	2.23E+00	1.32E+01
DLLVED3	2.01E-02	4.40E-02	2.05E-02	2.22E-01	1.08E+01	2.33E-02	1.11E-01	4.77E+00	3.01E-02	6.63E-02	2.20E+00	1.11E+01
DLLVED4	2.75E-03	5.91E-03	2.75E-03	2.23E-02	8.11E+00	3.07E-03	1.44E-02	4.69E+00	3.94E-03	8.65E-03	2.20E+00	8.12E+00
DLLVBM2	1.36E-01	2.68E-01	1.15E-01	1.05E+00	9.20E+00	1.34E-01	5.85E-01	4.36E+00	1.76E-01	3.89E-01	2.21E+00	7.73E+00
DLLVBM3	1.82E-02	3.58E-02	1.53E-02	1.41E-01	9.17E+00	1.79E-02	7.80E-02	4.36E+00	2.35E-02	5.19E-02	2.21E+00	7.73E+00
DLLVBM4	2.58E-03	5.05E-03	2.17E-03	2.00E-02	9.22E+00	2.53E-03	1.11E-02	4.37E+00	3.33E-03	7.37E-03	2.22E+00	7.74E+00
DLLVTH2	3.69E-01	6.62E-01	3.28E-01	1.64E+00	4.99E+00	3.88E-01	1.26E+00	3.24E+00	5.10E-01	8.86E-01	1.74E+00	4.43E+00
DLLVTH3	4.25E-02	7.80E-02	3.86E-02	2.01E-01	5.21E+00	4.49E-02	1.44E-01	3.21E+00	5.88E-02	1.03E-01	1.75E+00	4.73E+00
DLLVTH4	4.14E-03	7.74E-03	4.00E-03	2.41E-02	6.02E+00	4.60E-03	1.49E-02	3.24E+00	5.79E-03	1.04E-02	1.80E+00	5.81E+00
AEVAC	6.08E+00	4.30E+01	8.64E+00	4.08E+03	4.72E+02	1.17E+01	1.62E+03	1.38E+02	2.22E+01	2.16E+02	9.74E+00	6.72E+02
ASHEL	4.31E+01	2.42E+02	5.50E+01	8.82E+03	1.60E+02	6.70E+01	5.84E+03	8.72E+01	1.12E+02	1.59E+03	1.42E+01	2.04E+02
AIOD	1.82E+01	2.66E+01	4.21E+00	8.74E+01	2.08E+01	6.28E+00	7.06E+01	1.12E+01	1.10E+01	4.65E+01	4.22E+00	4.81E+00
ARELIN	6.08E+00	4.30E+01	8.64E+00	4.08E+03	4.72E+02	1.18E+01	1.62E+03	1.37E+02	2.24E+01	2.16E+02	9.67E+00	6.72E+02
ARELTIM	9.51E+00	1.74E+01	3.08E+00	1.01E+02	3.27E+01	4.41E+00	7.11E+01	1.61E+01	8.31E+00	3.53E+01	4.25E+00	1.06E+01
RECMMT1	6.85E-05	1.24E-04	0.00E+00	2.93E-03	9.99E+99	3.93E-06	4.21E-04	1.07E+02	2.42E-05	3.39E-04	1.40E+01	4.29E+01
RECMMT2	.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMMT3	.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMBM1	.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMBM2	.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMBM3	.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMMB1	1.35E-03	2.58E-03	0.00E+00	8.39E-03	9.99E+99	8.55E-05	7.54E-03	8.82E+01	4.85E-04	6.37E-03	1.31E+01	6.19E+00
RECMMB2	.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMMB3	.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMLU1	.00E+00	0.00E+00	0.00E+00	4.63E-03	9.99E+99	0.00E+00	8.39E-04	9.99E+99	0.00E+00			

										0.00E+00	9.99E+99	9.99E+99
RECMLU2	.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMLU3	.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMTH1	.00E+00	0.00E+00	0.00E+00	2.47E-04	9.99E+99	0.00E+00	1.02E-04	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMTH2	.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMTH3	.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMSK1	1.35E-03	1.85E-03	0.00E+00	7.62E-03	9.99E+99	6.89E-05	7.15E-03	1.04E+02	3.63E-04	5.75E-03	1.58E+01	5.63E+00
RECMSK2	.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMSK3	.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RLCMMT2	1.01E-03	3.25E-03	9.30E-04	2.63E-02	2.83E+01	1.19E-03	1.63E-02	1.36E+01	1.86E-03	6.41E-03	3.46E+00	2.60E+01
RLCMMT3	2.05E-04	5.06E-04	1.85E-04	2.53E-03	1.37E+01	2.34E-04	1.70E-03	7.27E+00	3.44E-04	8.70E-04	2.53E+00	1.23E+01

MEAN VAL	REF	MEDIAN	5 %	95 %	FAC1	10 %	90 %	FAC2	25 %	75 %	FAC3	95%/REF
RLCMMT4	3.75E-05	9.13E-05	3.65E-05	2.89E-04	7.91E+00	4.55E-05	2.02E-04	4.44E+00	6.03E-05	1.33E-04	2.21E+00	7.70E+00
RLCMBM2	1.04E-04	1.90E-04	4.17E-05	5.75E-04	1.38E+01	7.22E-05	4.45E-04	6.15E+00	1.17E-04	3.07E-04	2.62E+00	5.54E+00
RLCMBM3	2.10E-05	3.68E-05	1.34E-05	1.19E-04	8.92E+00	1.76E-05	8.79E-05	5.01E+00	2.61E-05	5.73E-05	2.20E+00	5.67E+00
RLCMBM4	3.83E-06	7.19E-06	2.85E-06	2.61E-05	9.16E+00	3.55E-06	1.57E-05	4.44E+00	5.26E-06	1.13E-05	2.15E+00	6.82E+00
RLCMTH2	4.70E-05	8.47E-05	2.85E-05	2.30E-04	8.09E+00	3.57E-05	1.83E-04	5.13E+00	5.42E-05	1.35E-04	2.49E+00	4.90E+00
RLCMTH3	9.13E-06	1.51E-05	6.70E-06	4.33E-05	6.46E+00	7.90E-06	3.35E-05	4.24E+00	1.12E-05	2.36E-05	2.10E+00	4.74E+00
RLCMTH4	1.51E-06	2.82E-06	1.22E-06	9.17E-06	7.54E+00	1.47E-06	6.12E-06	4.17E+00	2.07E-06	4.20E-06	2.03E+00	6.08E+00
RLLVMT2	6.21E-03	1.29E-02	6.39E-03	3.98E-02	6.24E+00	7.40E-03	3.02E-02	4.08E+00	9.19E-03	1.81E-02	1.97E+00	6.41E+00
RLLVMT3	9.33E-04	2.06E-03	9.39E-04	9.42E-03	1.00E+01	1.08E-03	5.55E-03	5.14E+00	1.38E-03	3.08E-03	2.22E+00	1.01E+01
RLLVMT4	1.32E-04	2.85E-04	1.29E-04	1.34E-03	1.04E+01	1.45E-04	7.00E-04	4.84E+00	1.88E-04	4.26E-04	2.27E+00	1.01E+01
RLLVBM2	7.04E-04	1.38E-03	5.92E-04	5.40E-03	9.13E+00	6.93E-04	3.02E-03	4.36E+00	9.08E-04	2.01E-03	2.21E+00	7.67E+00
RLLVBM3	9.38E-05	1.85E-04	7.91E-05	7.25E-04	9.17E+00	9.22E-05	4.02E-04	4.36E+00	1.21E-04	2.68E-04	2.21E+00	7.73E+00
RLLVBM4	1.33E-05	2.61E-05	1.12E-05	1.03E-04	9.22E+00	1.31E-05	5.71E-05	4.37E+00	1.72E-05	3.80E-05	2.22E+00	7.74E+00
RLLVTH2	6.53E-04	1.17E-03	5.81E-04	2.89E-03	4.99E+00	6.87E-04	2.22E-03	3.24E+00	9.02E-04	1.57E-03	1.74E+00	4.43E+00
RLLVTH3	7.51E-05	1.38E-04	6.83E-05	3.56E-04	5.21E+00	7.94E-05	2.55E-04	3.21E+00	1.04E-04	1.82E-04	1.75E+00	4.73E+00
RLLVTH4	7.33E-06	1.37E-05	7.08E-06	4.26E-05	6.02E+00	8.15E-06	2.64E-05	3.24E+00	1.02E-05	1.85E-05	1.80E+00	5.81E+00
CDCMED	4.78E+04	1.15E+05	4.49E+04	5.48E+05	1.22E+01	5.81E+04	2.90E+05	5.00E+00	7.70E+04	1.70E+05	2.21E+00	1.15E+01
CDCMBM	4.61E+04	8.82E+04	3.51E+04	3.12E+05	8.91E+00	4.45E+04	1.92E+05	4.32E+00	6.36E+04	1.37E+05	2.15E+00	6.78E+00
CDCMTH	5.34E+04	1.00E+05	4.37E+04	3.31E+05	7.56E+00	5.34E+04	2.14E+05	4.00E+00	7.36E+04	1.49E+05	2.02E+00	6.20E+00
CDLVED	1.57E+05	3.42E+05	1.58E+05	1.50E+06	9.50E+00	1.78E+05	8.41E+05	4.72E+00	2.30E+05	5.08E+05	2.21E+00	9.59E+00
CDLVBM	1.46E+05	2.90E+05	1.24E+05	1.13E+06	9.08E+00	1.44E+05	6.26E+05	4.36E+00	1.90E+05	4.19E+05	2.21E+00	7.72E+00
CDLVTH	2.56E+05	4.82E+05	2.41E+05	1.45E+06	6.01E+00	2.87E+05	9.23E+05	3.21E+00	3.57E+05	6.45E+05	1.81E+00	5.67E+00
PECMMT	1.07E-01	1.55E-01	5.48E-03	2.91E+00	5.30E+02	1.62E-02	6.74E-01	4.16E+01	5.94E-02	2.88E-01	4.84E+00	2.71E+01
PECMBM	.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
PECMMB	2.08E+00	2.99E+00	1.09E-01	6.61E+00	6.05E+01	3.31E-01	6.07E+00	1.83E+01	1.20E+00	5.14E+00	4.27E+00	3.18E+00
PECMLU	.00E+00	0.00E+00	0.00E+00	3.62E+00	9.99E+99	0.00E+00	1.53E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
PECMTH	.00E+00	0.00E+00	0.00E+00	2.81E-01	9.99E+99	0.00E+00	1.44E-01	9.99E+99	0.00E+00	3.19E-02	9.99E+99	9.99E+99
PECMSK	2.08E+00	2.39E+00	4.47E-02	6.06E+00	1.36E+02	2.01E-01	5.72E+00	2.85E+01	9.03E-01	4.73E+00	5.24E+00	2.92E+00
PLCMMT	2.33E+03	5.82E+03	2.38E+03	2.82E+04	1.18E+01	2.81E+03	1.62E+04	5.77E+00	3.80E+03	9.04E+03	2.38E+00	1.21E+01
PLCMBM	2.38E+02	4.55E+02	1.81E+02	1.61E+03	8.91E+00	2.30E+02	9.92E+02	4.32E+00	3.28E+02	7.05E+02	2.15E+00	6.78E+00
PLCMTH	9.44E+01	1.77E+02	7.74E+01	5.86E+02	7.56E+00	9.45E+01	3.78E+02	4.00E+00	1.30E+02	2.63E+02	2.02E+00	6.20E+00

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PLLVMT   7.39E+03  1.61E+04  | 7.36E+03  8.23E+04  1.12E+01  | 8.27E+03  4.28E+04  5.17E+00  | 1.08E+04
                                    2.42E+04  2.25E+00  ||  1.11E+01
PLLVBM   7.54E+02  1.50E+03  | 6.41E+02  5.80E+03  9.04E+00  | 7.41E+02  3.23E+03  4.35E+00  | 9.79E+02
                                    2.16E+03  2.21E+00  ||  7.69E+00
PLLVTH   4.52E+02  8.52E+02  | 4.27E+02  2.56E+03  5.98E+00  | 5.08E+02  1.62E+03  3.20E+00  | 6.32E+02
                                    1.14E+03  1.80E+00  ||  5.65E+00
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RESULTS FOR THE 95TH PERCENTILES OF THE ENDPOINTS FOR THE CB2 SOURCE TERM

95 %-FRT	REF	MEDIAN	5 %	95 %	FAC1	10 %	90 %	FAC2	25 %	75 %	FAC3	95%/REF
DECMBM1	1.41E-02	1.86E-02	1.05E-02	3.39E-02	3.24E+00	1.20E-02	2.95E-02	2.45E+00	1.45E-02	2.40E-02	1.66E+00	2.40E+00
DECMBM2	1.10E-03	1.10E-03	5.75E-04	2.40E-03	4.17E+00	6.31E-04	1.91E-03	3.02E+00	8.13E-04	1.45E-03	1.78E+00	2.19E+00
DECMBM3	1.38E-04	1.35E-04	4.17E-05	3.39E-04	8.13E+00	4.79E-05	2.75E-04	5.75E+00	8.13E-05	1.95E-04	2.40E+00	2.45E+00
DECMTH1	4.07E-01	6.31E-01	7.76E-02	2.14E+00	2.75E+01	1.41E-01	1.74E+00	1.23E+01	2.69E-01	1.10E+00	4.07E+00	5.25E+00
DECMTH2	2.19E-02	2.45E-02	4.79E-03	6.03E-02	1.26E+01	8.32E-03	5.13E-02	6.17E+00	1.51E-02	3.63E-02	2.40E+00	2.75E+00
DECMTH3	2.45E-03	2.29E-03	2.82E-04	8.32E-03	2.95E+01	5.75E-04	6.46E-03	1.12E+01	1.23E-03	4.07E-03	3.31E+00	3.39E+00
DECMSK1	1.41E+00	1.70E+00	7.08E-01	2.51E+00	3.55E+00	8.71E-01	2.45E+00	2.82E+00	1.20E+00	2.24E+00	1.86E+00	1.78E+00
DECMSK2	8.32E-02	5.62E-02	2.45E-02	9.77E-02	3.98E+00	2.95E-02	8.71E-02	2.95E+00	4.07E-02	7.24E-02	1.78E+00	1.17E+00
DECMSK3	1.86E-02	6.92E-03	1.05E-03	1.86E-02	1.78E+01	1.58E-03	1.62E-02	1.02E+01	3.55E-03	1.20E-02	3.39E+00	1.00E+00
DLCMED2	7.76E-02	2.14E-01	6.61E-02	1.48E+00	2.24E+01	8.32E-02	7.59E-01	9.12E+00	1.32E-01	3.98E-01	3.02E+00	1.91E+01
DLCMED3	1.20E-02	3.24E-02	1.23E-02	1.20E-01	9.77E+00	1.51E-02	8.13E-02	5.37E+00	2.09E-02	5.01E-02	2.40E+00	1.00E+01
DLCMED4	2.95E-03	7.59E-03	3.16E-03	2.75E-02	8.71E+00	3.80E-03	1.91E-02	5.01E+00	5.13E-03	1.15E-02	2.24E+00	9.33E+00
DLCMBM2	7.41E-02	1.29E-01	3.89E-02	3.89E-01	1.00E+01	5.13E-02	3.02E-01	5.89E+00	8.13E-02	2.00E-01	2.45E+00	5.25E+00
DLCMBM3	1.15E-02	2.09E-02	7.59E-03	6.46E-02	8.51E+00	1.00E-02	4.79E-02	4.79E+00	1.45E-02	3.16E-02	2.19E+00	5.62E+00
DLCMBM4	2.88E-03	5.75E-03	2.57E-03	2.09E-02	8.13E+00	2.95E-03	1.23E-02	4.17E+00	4.07E-03	8.71E-03	2.14E+00	7.24E+00
DLCMTH2	1.07E-01	1.82E-01	7.76E-02	4.47E-01	5.75E+00	8.91E-02	3.80E-01	4.27E+00	1.26E-01	2.75E-01	2.19E+00	4.17E+00
DLCMTH3	1.74E-02	3.09E-02	1.38E-02	7.41E-02	5.37E+00	1.51E-02	6.31E-02	4.17E+00	2.14E-02	4.57E-02	2.14E+00	4.27E+00
DLCMTH4	3.31E-03	6.76E-03	3.02E-03	2.34E-02	7.76E+00	3.63E-03	1.35E-02	3.72E+00	4.79E-03	9.55E-03	2.00E+00	7.08E+00
DLLVED2	3.31E-01	8.32E-01	3.98E-01	4.17E+00	1.05E+01	4.68E-01	2.40E+00	5.13E+00	5.75E-01	1.26E+00	2.19E+00	1.26E+01
DLLVED3	5.37E-02	1.26E-01	6.03E-02	7.08E-01	1.17E+01	6.76E-02	3.55E-01	5.25E+00	8.51E-02	1.95E-01	2.29E+00	1.32E+01
DLLVED4	7.94E-03	1.82E-02	8.32E-03	8.91E-02	1.07E+01	9.77E-03	4.57E-02	4.68E+00	1.23E-02	2.75E-02	2.24E+00	1.12E+01
DLLVBM2	2.63E-01	5.62E-01	2.57E-01	2.14E+00	8.32E+00	2.88E-01	1.20E+00	4.17E+00	3.80E-01	8.13E-01	2.14E+00	8.13E+00
DLLVBM3	4.79E-02	9.55E-02	4.27E-02	3.55E-01	8.32E+00	4.79E-02	2.04E-01	4.27E+00	6.31E-02	1.38E-01	2.19E+00	7.41E+00
DLLVBM4	7.24E-03	1.48E-02	6.46E-03	5.62E-02	8.71E+00	7.24E-03	3.16E-02	4.37E+00	9.77E-03	2.14E-02	2.19E+00	7.76E+00
DLLVTH2	1.20E+00	2.24E+00	1.02E+00	4.90E+00	4.79E+00	1.20E+00	4.17E+00	3.47E+00	1.66E+00	3.09E+00	1.86E+00	4.07E+00
DLLVTH3	1.35E-01	2.57E-01	1.26E-01	6.17E-01	4.90E+00	1.51E-01	4.68E-01	3.09E+00	1.95E-01	3.47E-01	1.78E+00	4.57E+00
DLLVTH4	1.29E-02	2.51E-02	1.26E-02	7.76E-02	6.17E+00	1.48E-02	4.68E-02	3.16E+00	1.86E-02	3.31E-02	1.78E+00	6.03E+00
AEVAC	1.86E+01	1.58E+02	3.09E+01	9.77E+03	3.16E+02	4.79E+01	4.27E+03	8.91E+01	7.94E+01	8.32E+02	1.05E+01	5.25E+02
ASHEL	1.41E+02	8.32E+02	1.86E+02	2.04E+04	1.10E+02	2.29E+02	1.41E+04	6.17E+01	3.31E+02	4.27E+03	1.29E+01	1.45E+02
AIOD	6.17E+01	8.32E+01	1.41E+01	2.57E+02	1.82E+01	2.29E+01	2.40E+02	1.05E+01	4.27E+01	1.45E+02	3.39E+00	4.17E+00
ARELIN	1.86E+01	1.58E+02	3.09E+01	9.77E+03	3.16E+02	4.79E+01	4.27E+03	8.91E+01	7.94E+01	8.32E+02	1.05E+01	5.25E+02
ARELTIM	3.89E+01	6.17E+01	1.10E+01	2.82E+02	2.57E+01	1.70E+01	2.34E+02	1.38E+01	3.31E+01	1.20E+02	3.63E+00	7.24E+00
RECMMT1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMMT2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMMT3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMBM1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMBM2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMBM3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMMB1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMMB2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99

RECMMB3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMLU1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMLU2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMLU3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMTH1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMTH2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMTH3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMSK1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMSK2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMSK3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RLCMMT2	3.80E-03	1.12E-02	3.31E-03	1.05E-01	3.16E+01	4.37E-03	5.25E-02	1.20E+01	6.92E-03	2.14E-02	3.09E+00	2.75E+01
RLCMMT3	5.89E-04	1.70E-03	6.31E-04	7.08E-03	1.12E+01	7.59E-04	4.79E-03	6.31E+00	1.10E-03	2.82E-03	2.57E+00	1.20E+01

95 %-FRT	REF	MEDIAN	5 %	95 %	FAC1	10 %	90 %	FAC2	25 %	75 %	FAC3	95%/REF
RLCMMT4	1.45E-04	3.98E-04	1.55E-04	1.70E-03	1.10E+01	1.91E-04	1.05E-03	5.50E+00	2.57E-04	6.31E-04	2.45E+00	1.17E+01
RLCMBM2	3.80E-04	6.61E-04	2.00E-04	2.04E-03	1.02E+01	2.63E-04	1.55E-03	5.89E+00	4.17E-04	1.05E-03	2.51E+00	5.37E+00
RLCMBM3	5.89E-05	1.07E-04	3.89E-05	3.31E-04	8.51E+00	5.13E-05	2.51E-04	4.90E+00	7.41E-05	1.66E-04	2.24E+00	5.62E+00
RLCMBM4	1.48E-05	3.02E-05	1.32E-05	1.07E-04	8.13E+00	1.51E-05	6.31E-05	4.17E+00	2.09E-05	4.47E-05	2.14E+00	7.24E+00
RLCMTH2	1.91E-04	3.24E-04	1.35E-04	7.94E-04	5.89E+00	1.58E-04	6.76E-04	4.27E+00	2.24E-04	4.90E-04	2.19E+00	4.17E+00
RLCMTH3	3.02E-05	5.50E-05	2.45E-05	1.32E-04	5.37E+00	2.69E-05	1.12E-04	4.17E+00	3.80E-05	8.13E-05	2.14E+00	4.37E+00
RLCMTH4	5.89E-06	1.17E-05	5.37E-06	4.07E-05	7.59E+00	6.31E-06	2.34E-05	3.72E+00	8.51E-06	1.70E-05	2.00E+00	6.92E+00
RLLVMT2	1.51E-02	3.98E-02	1.82E-02	2.19E-01	1.20E+01	2.14E-02	1.35E-01	6.31E+00	2.75E-02	6.31E-02	2.29E+00	1.45E+01
RLLVMT3	2.51E-03	6.31E-03	2.82E-03	4.07E-02	1.45E+01	3.24E-03	2.04E-02	6.31E+00	4.17E-03	1.00E-02	2.40E+00	1.62E+01
RLLVMT4	3.80E-04	9.12E-04	3.98E-04	5.13E-03	1.29E+01	4.57E-04	2.51E-03	5.50E+00	6.03E-04	1.38E-03	2.29E+00	1.35E+01
RLLVBM2	1.38E-03	2.88E-03	1.32E-03	1.10E-02	8.32E+00	1.48E-03	6.17E-03	4.17E+00	1.95E-03	4.27E-03	2.19E+00	7.94E+00
RLLVBM3	2.45E-04	4.90E-04	2.19E-04	1.82E-03	8.32E+00	2.45E-04	1.05E-03	4.27E+00	3.24E-04	7.08E-04	2.19E+00	7.41E+00
RLLVBM4	3.80E-05	7.59E-05	3.31E-05	2.88E-04	8.71E+00	3.80E-05	1.62E-04	4.27E+00	5.01E-05	1.10E-04	2.19E+00	7.59E+00
RLLVTH2	2.14E-03	3.98E-03	1.82E-03	8.71E-03	4.79E+00	2.09E-03	7.41E-03	3.55E+00	2.95E-03	5.50E-03	1.86E+00	4.07E+00
RLLVTH3	2.40E-04	4.57E-04	2.24E-04	1.10E-03	4.90E+00	2.63E-04	8.32E-04	3.16E+00	3.47E-04	6.17E-04	1.78E+00	4.57E+00
RLLVTH4	2.29E-05	4.37E-05	2.24E-05	1.38E-04	6.17E+00	2.57E-05	8.32E-05	3.24E+00	3.24E-05	5.89E-05	1.82E+00	6.03E+00
CDCMED	1.00E+05	2.40E+05	1.02E+05	1.00E+06	9.77E+00	1.23E+05	6.17E+05	5.01E+00	1.62E+05	3.63E+05	2.24E+00	1.00E+01
CDCMBM	9.77E+04	1.95E+05	8.71E+04	7.24E+05	8.32E+00	9.55E+04	4.17E+05	4.37E+00	1.32E+05	2.88E+05	2.19E+00	7.41E+00
CDCMTH	1.10E+05	2.14E+05	9.33E+04	7.76E+05	8.32E+00	1.12E+05	4.27E+05	3.80E+00	1.51E+05	3.09E+05	2.04E+00	7.08E+00
CDLVED	4.17E+05	8.51E+05	3.98E+05	3.31E+06	8.32E+00	4.37E+05	2.14E+06	4.90E+00	5.75E+05	1.26E+06	2.19E+00	7.94E+00
CDLVBM	3.89E+05	7.59E+05	3.02E+05	3.09E+06	1.02E+01	3.72E+05	1.70E+06	4.57E+00	4.90E+05	1.10E+06	2.24E+00	7.94E+00
CDLVTH	6.31E+05	1.10E+06	5.62E+05	3.39E+06	6.03E+00	6.46E+05	2.19E+06	3.39E+00	8.13E+05	1.51E+06	1.86E+00	5.37E+00
PECMMT	9.55E-01	1.41E+00	3.02E-02	2.45E+01	8.13E+02	8.13E-02	3.47E+00	4.27E+01	4.27E-01	2.69E+00	6.31E+00	2.57E+01
PECMBM	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
PECMMB	1.86E+01	2.75E+01	6.03E-01	6.31E+01	1.05E+02	1.78E+00	5.89E+01	3.31E+01	8.51E+00	4.90E+01	5.75E+00	3.39E+00
PECMLU	0.00E+00	0.00E+00	0.00E+00	2.69E+01	9.99E+99	0.00E+00	1.66E+01	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
PECMTH	0.00E+00	0.00E+00	0.00E+00	2.45E+00	9.99E+99	0.00E+00	1.26E+00	9.99E+99	0.00E+00	3.09E-01	9.99E+99	9.99E+99
PECMSK	1.86E+01	2.24E+01	1.51E-01	5.89E+01	3.89E+02	1.10E+00	5.50E+01	5.01E+01	6.17E+00	4.47E+01	7.24E+00	3.16E+00
PLCMMT	4.90E+03	1.23E+04	5.01E+03	6.92E+04	1.38E+01	6.03E+03	3.63E+04	6.03E+00	8.13E+03	1.86E+04	2.29E+00	1.41E+01
PLCMBM	5.01E+02	1.00E+03	4.47E+02	3.72E+03	8.32E+00	4.90E+02	2.19E+03	4.47E+00	6.76E+02			

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                                1.48E+03  2.19E+00  ||  7.41E+00
PLCMTH   1.95E+02  3.80E+02  | 1.66E+02  1.38E+03  8.32E+00  | 2.00E+02  7.59E+02  3.80E+00  | 2.69E+02
                                5.50E+02  2.04E+00  ||  7.08E+00
PLLVMT   1.95E+04  3.89E+04  | 1.82E+04  1.78E+05  9.77E+00  | 2.00E+04  9.33E+04  4.68E+00  | 2.63E+04
                                5.75E+04  2.19E+00  ||  9.12E+00
PLLVBM   2.04E+03  3.89E+03  | 1.58E+03  1.58E+04  1.00E+01  | 1.91E+03  8.71E+03  4.57E+00  | 2.51E+03
                                5.75E+03  2.29E+00  ||  7.76E+00
PLLVTH   1.12E+03  1.95E+03  | 9.77E+02  6.03E+03  6.17E+00  | 1.15E+03  3.80E+03  3.31E+00  | 1.45E+03
                                2.69E+03  1.86E+00  ||  5.37E+00
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RESULTS FOR THE 99TH PERCENTILE OF THE ENDPOINTS FOR THE CB2 SOURCE TERM

99 %-FRT	REF	MEDIAN	5 %	95 %	FAC1	10 %	90 %	FAC2	25 %	75 %	FAC3	95%/REF
DECMBM1	8.71E-02	1.02E-01	5.75E-02	1.95E-01	3.39E+00	6.61E-02	1.74E-01	2.63E+00	7.76E-02	1.35E-01	1.74E+00	2.24E+00
DECMBM2	3.80E-03	5.13E-03	2.82E-03	9.12E-03	3.24E+00	3.24E-03	7.76E-03	2.40E+00	3.98E-03	6.61E-03	1.66E+00	2.40E+00
DECMBM3	7.24E-04	5.89E-04	2.45E-04	1.58E-03	6.46E+00	2.88E-04	1.26E-03	4.37E+00	4.07E-04	8.91E-04	2.19E+00	2.19E+00
DECMTH1	3.16E+00	4.68E+00	5.25E-01	1.58E+01	3.02E+01	1.05E+00	1.29E+01	1.23E+01	2.04E+00	8.13E+00	3.98E+00	5.01E+00
DECMTH2	6.61E-02	9.77E-02	1.55E-02	3.31E-01	2.14E+01	2.75E-02	2.75E-01	1.00E+01	4.47E-02	1.70E-01	3.80E+00	5.01E+00
DECMTH3	1.29E-02	1.48E-02	2.24E-03	3.55E-02	1.58E+01	3.80E-03	3.16E-02	8.32E+00	7.76E-03	2.29E-02	2.95E+00	2.75E+00
DECMSK1	1.12E+01	1.26E+01	5.50E+00	1.86E+01	3.39E+00	6.46E+00	1.82E+01	2.82E+00	8.91E+00	1.66E+01	1.86E+00	1.66E+00
DECMSK2	2.45E-01	2.82E-01	1.17E-01	4.17E-01	3.55E+00	1.45E-01	4.07E-01	2.82E+00	2.00E-01	3.72E-01	1.86E+00	1.70E+00
DECMSK3	7.76E-02	2.40E-02	9.33E-03	7.08E-02	7.59E+00	1.29E-02	5.62E-02	4.37E+00	1.70E-02	3.89E-02	2.29E+00	9.12E-01
DLCMED2	5.37E-01	1.78E+00	4.79E-01	1.78E+01	3.72E+01	5.89E-01	8.51E+00	1.45E+01	1.02E+00	3.55E+00	3.47E+00	3.31E+01
DLCMED3	7.94E-02	1.86E-01	6.92E-02	8.71E-01	1.26E+01	8.51E-02	5.75E-01	6.76E+00	1.23E-01	3.09E-01	2.51E+00	1.10E+01
DLCMED4	9.77E-03	2.40E-02	8.71E-03	6.03E-02	6.92E+00	1.10E-02	5.01E-02	4.57E+00	1.55E-02	3.63E-02	2.34E+00	6.17E+00
DLCMBM2	5.37E-01	1.00E+00	2.40E-01	3.24E+00	1.35E+01	3.72E-01	2.29E+00	6.17E+00	5.89E-01	1.62E+00	2.75E+00	6.03E+00
DLCMBM3	7.59E-02	1.35E-01	4.79E-02	4.17E-01	8.71E+00	6.17E-02	3.09E-01	5.01E+00	8.91E-02	2.04E-01	2.29E+00	5.50E+00
DLCMBM4	9.55E-03	1.78E-02	6.31E-03	5.62E-02	8.91E+00	8.13E-03	4.07E-02	5.01E+00	1.20E-02	2.75E-02	2.29E+00	5.89E+00
DLCMTH2	6.61E-01	1.26E+00	3.98E-01	3.55E+00	8.91E+00	5.13E-01	2.69E+00	5.25E+00	7.94E-01	1.95E+00	2.45E+00	5.37E+00
DLCMTH3	1.00E-01	1.58E-01	7.08E-02	4.57E-01	6.46E+00	8.32E-02	3.55E-01	4.27E+00	1.12E-01	2.40E-01	2.14E+00	4.57E+00
DLCMTH4	1.12E-02	2.09E-02	8.51E-03	5.89E-02	6.92E+00	1.05E-02	4.57E-02	4.37E+00	1.41E-02	3.16E-02	2.24E+00	5.25E+00
DLLVED2	4.68E+00	1.02E+01	4.57E+00	5.89E+01	1.29E+01	5.25E+00	2.82E+01	5.37E+00	6.76E+00	1.51E+01	2.24E+00	1.26E+01
DLLVED3	4.07E-01	8.71E-01	4.07E-01	5.01E+00	1.23E+01	4.68E-01	2.45E+00	5.25E+00	6.03E-01	1.32E+00	2.19E+00	1.23E+01
DLLVED4	4.68E-02	1.00E-01	4.68E-02	4.27E-01	9.12E+00	5.13E-02	2.45E-01	4.79E+00	6.61E-02	1.48E-01	2.24E+00	9.12E+00
DLLVBM2	3.89E+00	7.59E+00	3.16E+00	3.02E+01	9.55E+00	3.72E+00	1.66E+01	4.47E+00	4.90E+00	1.10E+01	2.24E+00	7.76E+00
DLLVBM3	3.63E-01	7.08E-01	2.95E-01	2.82E+00	9.55E+00	3.47E-01	1.55E+00	4.47E+00	4.57E-01	1.02E+00	2.24E+00	7.76E+00
DLLVBM4	4.17E-02	8.32E-02	3.55E-02	3.24E-01	9.12E+00	4.17E-02	1.78E-01	4.27E+00	5.50E-02	1.20E-01	2.19E+00	7.76E+00
DLLVTH2	1.00E+01	1.78E+01	8.91E+00	4.47E+01	5.01E+00	1.07E+01	3.47E+01	3.24E+00	1.38E+01	2.40E+01	1.74E+00	4.47E+00
DLLVTH3	8.91E-01	1.66E+00	8.13E-01	4.07E+00	5.01E+00	9.77E-01	3.09E+00	3.16E+00	1.26E+00	2.19E+00	1.74E+00	4.57E+00
DLLVTH4	7.24E-02	1.48E-01	7.24E-02	4.07E-01	5.62E+00	8.71E-02	2.63E-01	3.02E+00	1.07E-01	1.95E-01	1.82E+00	5.62E+00
AEVAC	2.68E+01	2.63E+02	4.68E+01	1.29E+04	2.75E+02	6.61E+01	6.03E+03	9.12E+01	1.55E+02	1.02E+03	6.61E+00	4.80E+02
ASHEL	2.40E+02	1.20E+03	2.69E+02	5.75E+04	2.14E+02	3.16E+02	2.24E+04	7.08E+01	5.75E+02	6.31E+03	1.10E+01	2.40E+02
AIOD	1.32E+02	2.04E+02	2.09E+01	3.39E+02	1.62E+01	2.95E+01	3.31E+02	1.12E+01	8.51E+01	2.48E+02	2.91E+00	2.57E+00
ARELIN	2.68E+01	2.63E+02	4.68E+01	1.29E+04	2.75E+02	6.92E+01	6.03E+03	8.71E+01	1.55E+02	1.02E+03	6.61E+00	4.80E+02
ARELTIM	1.02E+02	1.26E+02	1.86E+01	6.03E+02	3.24E+01	2.69E+01	4.37E+02	1.62E+01	5.13E+01	2.29E+02	4.47E+00	5.89E+00
RECMMT1	1.15E-03	2.19E-03	0.00E+00	1.95E-02	9.99E+99	0.00E+00	1.51E-02	9.99E+99	0.00E+00	1.00E-02	9.99E+99	1.70E+01
RECMMT2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMMT3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMBM1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMBM2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMBM3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMMB1	2.29E-02	4.07E-02	0.00E+00	3.02E-01	9.99E+99	0.00E+00	2.63E-01	9.99E+99	0.00E+00	1.74E-01	9.99E+99	1.32E+01
RECMMB2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00			

										75 %	FAC3	95%/REF
										0.00E+00	9.99E+99	9.99E+99
RECMMB3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMLU1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMLU2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMLU3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMTH1	0.00E+00	0.00E+00	0.00E+00	1.29E-02	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMTH2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMTH3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMSK1	2.29E-02	3.47E-02	0.00E+00	3.02E-01	9.99E+99	0.00E+00	2.63E-01	9.99E+99	0.00E+00	1.70E-01	9.99E+99	1.32E+01
RECMSK2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RECMSK3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RLCMMT2	2.63E-02	9.12E-02	2.34E-02	1.00E+00	4.27E+01	3.02E-02	5.89E-01	1.95E+01	5.13E-02	1.91E-01	3.72E+00	3.80E+01

99 %-FRT	REF	MEDIAN	5 %	95 %	FAC1	10 %	90 %	FAC2	25 %	75 %	FAC3	95%/REF
RLCMMT3	3.80E-03	9.77E-03	3.63E-03	5.25E-02	1.45E+01	4.37E-03	3.24E-02	7.41E+00	6.17E-03	1.70E-02	2.75E+00	1.38E+01
RLCMMT4	4.79E-04	1.29E-03	4.47E-04	3.55E-03	7.94E+00	5.62E-04	2.88E-03	5.13E+00	8.32E-04	2.00E-03	2.40E+00	7.41E+00
RLCMBM2	2.75E-03	5.13E-03	1.23E-03	1.66E-02	1.35E+01	1.95E-03	1.20E-02	6.17E+00	3.02E-03	8.32E-03	2.75E+00	6.03E+00
RLCMBM3	3.89E-04	6.92E-04	2.45E-04	2.14E-03	8.71E+00	3.24E-04	1.62E-03	5.01E+00	4.57E-04	1.05E-03	2.29E+00	5.50E+00
RLCMBM4	4.90E-05	9.12E-05	3.24E-05	2.88E-04	8.91E+00	4.27E-05	2.09E-04	4.90E+00	6.31E-05	1.41E-04	2.24E+00	5.89E+00
RLCMTH2	1.17E-03	2.24E-03	7.08E-04	6.31E-03	8.91E+00	9.12E-04	4.79E-03	5.25E+00	1.41E-03	3.47E-03	2.45E+00	5.37E+00
RLCMTH3	1.78E-04	2.82E-04	1.26E-04	8.13E-04	6.46E+00	1.48E-04	6.31E-04	4.27E+00	2.00E-04	4.27E-04	2.14E+00	4.57E+00
RLCMTH4	2.00E-05	3.72E-05	1.51E-05	1.05E-04	6.92E+00	1.82E-05	8.13E-05	4.47E+00	2.51E-05	5.62E-05	2.24E+00	5.25E+00
RLLVMT2	2.00E-01	4.07E-01	2.00E-01	1.00E+00	5.01E+00	2.24E-01	9.55E-01	4.27E+00	2.88E-01	5.89E-01	2.04E+00	5.01E+00
RLLVMT3	1.91E-02	4.27E-02	1.91E-02	2.40E-01	1.26E+01	2.19E-02	1.26E-01	5.75E+00	2.88E-02	6.61E-02	2.29E+00	1.26E+01
RLLVMT4	2.29E-03	4.79E-03	2.19E-03	2.57E-02	1.17E+01	2.45E-03	1.32E-02	5.37E+00	3.24E-03	7.41E-03	2.29E+00	1.12E+01
RLLVBM2	2.04E-02	3.89E-02	1.62E-02	1.58E-01	9.77E+00	1.95E-02	8.71E-02	4.47E+00	2.57E-02	5.62E-02	2.19E+00	7.76E+00
RLLVBM3	1.86E-03	3.63E-03	1.55E-03	1.45E-02	9.33E+00	1.82E-03	8.13E-03	4.47E+00	2.40E-03	5.25E-03	2.19E+00	7.76E+00
RLLVBM4	2.19E-04	4.27E-04	1.86E-04	1.70E-03	9.12E+00	2.14E-04	9.33E-04	4.37E+00	2.82E-04	6.17E-04	2.19E+00	7.76E+00
RLLVTH2	1.78E-02	3.16E-02	1.58E-02	7.94E-02	5.01E+00	1.91E-02	6.17E-02	3.24E+00	2.40E-02	4.27E-02	1.78E+00	4.47E+00
RLLVTH3	1.58E-03	2.88E-03	1.45E-03	7.24E-03	5.01E+00	1.74E-03	5.37E-03	3.09E+00	2.24E-03	3.89E-03	1.74E+00	4.57E+00
RLLVTH4	1.29E-04	2.57E-04	1.29E-04	7.24E-04	5.62E+00	1.51E-04	4.68E-04	3.09E+00	1.91E-04	3.47E-04	1.82E+00	5.62E+00
CDCMED	1.41E+05	3.02E+05	1.23E+05	1.00E+06	8.13E+00	1.58E+05	9.55E+05	6.03E+00	2.09E+05	4.68E+05	2.24E+00	7.08E+00
CDCMBM	1.35E+05	2.40E+05	1.02E+05	9.12E+05	8.91E+00	1.20E+05	5.25E+05	4.37E+00	1.70E+05	3.63E+05	2.14E+00	6.76E+00
CDCMTH	1.48E+05	2.63E+05	1.15E+05	9.33E+05	8.13E+00	1.38E+05	5.62E+05	4.07E+00	1.91E+05	3.80E+05	2.00E+00	6.31E+00
CDLVED	4.57E+05	9.55E+05	4.37E+05	4.37E+06	1.00E+01	4.90E+05	2.51E+06	5.13E+00	6.46E+05	1.48E+06	2.29E+00	9.55E+00
CDLVBM	4.37E+05	8.32E+05	3.39E+05	3.39E+06	1.00E+01	4.17E+05	1.86E+06	4.47E+00	5.50E+05	1.23E+06	2.24E+00	7.76E+00
CDLVTH	6.76E+05	1.23E+06	6.31E+05	3.72E+06	5.89E+00	7.24E+05	2.34E+06	3.24E+00	9.12E+05	1.70E+06	1.86E+00	5.50E+00
PECMMT	2.45E+00	3.31E+00	1.49E-01	6.76E+01	4.53E+02	4.31E-01	1.67E+01	3.87E+01	1.48E+00	5.50E+00	3.72E+00	2.75E+01
PECMBM	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
PECMMB	4.68E+01	6.31E+01	2.97E+00	1.26E+02	4.24E+01	8.81E+00	1.17E+02	1.33E+01	2.95E+01	1.00E+02	3.39E+00	2.69E+00
PECMLU	0.00E+00	0.00E+00	0.00E+00	6.92E+01	9.99E+99	0.00E+00	3.47E+01	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
PECMTH	0.00E+00	0.00E+00	0.00E+00	6.17E+00	9.99E+99	0.00E+00	3.16E+00	9.99E+99	0.00E+00	7.94E-01	9.99E+99	9.99E+99
PECMSK	4.68E+01	5.25E+01	1.31E+00	1.15E+02	8.79E+01	5.37E+00	1.10E+02	2.04E+01	2.14E+01	9.33E+01	4.37E+00	2.45E+00
PLCMMT	6.76E+03	1.58E+04	6.17E+03	9.33E+04	1.51E+01	7.76E+03	5.74E+04	7.40E+00	1.05E+04			

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                                   2.45E+04  2.34E+00  ||  1.38E+01
PLCMBM   6.92E+02  1.23E+03  | 5.25E+02  4.68E+03  8.91E+00  | 6.30E+02  2.69E+03  4.28E+00  | 8.71E+02
                                   1.86E+03  2.14E+00  ||  6.76E+00
PLCMTH   2.57E+02  4.68E+02  | 2.04E+02  1.62E+03  7.94E+00  | 2.45E+02  9.77E+02  3.98E+00  | 3.39E+02
                                   6.76E+02  2.00E+00  ||  6.31E+00
PLLVMT   2.19E+04  4.68E+04  | 2.04E+04  2.57E+05  1.26E+01  | 2.29E+04  1.32E+05  5.75E+00  | 3.09E+04
                                   7.08E+04  2.29E+00  ||  1.17E+01
PLLVBM   2.24E+03  4.37E+03  | 1.74E+03  1.74E+04  1.00E+01  | 2.14E+03  9.77E+03  4.57E+00  | 2.82E+03
                                   6.31E+03  2.24E+00  ||  7.76E+00
PLLVTH   1.20E+03  2.19E+03  | 1.10E+03  6.46E+03  5.89E+00  | 1.29E+03  4.17E+03  3.24E+00  | 1.62E+03
                                   2.95E+03  1.82E+00  ||  5.37E+00
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Results for the mean value of the endpoints for the DBA source term

MEAN VAL	REF	MEDIAN	5 %	95 %	FAC1	10 %	90 %	FAC2	25 %	75 %	FAC3	95%/REF
DLCMED2	1.63E-05	3.89E-05	1.91E-05	2.45E-04	1.28E+01	2.15E-05	1.14E-04	5.29E+00	2.78E-05	5.95E-05	2.14E+00	1.50E+01
DLCMED3	2.36E-06	5.32E-06	2.70E-06	2.94E-05	1.09E+01	3.09E-06	1.42E-05	4.60E+00	3.83E-06	8.02E-06	2.09E+00	1.25E+01
DLCMED4	2.75E-07	5.99E-07	2.98E-07	2.57E-06	8.62E+00	3.41E-07	1.49E-06	4.38E+00	4.23E-07	9.03E-07	2.14E+00	9.33E+00
DLCMBM2	1.45E-05	2.86E-05	1.32E-05	1.19E-04	9.06E+00	1.51E-05	6.54E-05	4.33E+00	2.00E-05	4.20E-05	2.11E+00	8.22E+00
DLCMBM3	1.97E-06	3.88E-06	1.80E-06	1.63E-05	9.03E+00	2.06E-06	8.96E-06	4.36E+00	2.72E-06	5.74E-06	2.11E+00	8.26E+00
DLCMBM4	2.48E-07	4.88E-07	2.27E-07	2.04E-06	8.99E+00	2.58E-07	1.13E-06	4.38E+00	3.40E-07	7.22E-07	2.13E+00	8.25E+00
DLCMTH2	4.18E-05	8.40E-05	4.20E-05	2.07E-04	4.93E+00	4.97E-05	1.52E-04	3.07E+00	6.24E-05	1.14E-04	1.83E+00	4.96E+00
DLCMTH3	8.56E-06	1.53E-05	7.42E-06	3.63E-05	4.90E+00	8.55E-06	2.87E-05	3.36E+00	1.16E-05	2.15E-05	1.86E+00	4.24E+00
DLCMTH4	6.67E-07	1.25E-06	6.53E-07	3.37E-06	5.16E+00	7.61E-07	2.30E-06	3.03E+00	9.63E-07	1.69E-06	1.75E+00	5.05E+00
DLOUED2	2.93E-05	5.64E-05	3.01E-05	2.94E-04	9.77E+00	3.20E-05	1.65E-04	5.17E+00	4.23E-05	8.23E-05	1.94E+00	1.00E+01
DLOUED3	3.76E-06	6.98E-06	3.66E-06	3.12E-05	8.53E+00	4.01E-06	1.85E-05	4.61E+00	5.28E-06	9.99E-06	1.89E+00	8.29E+00
DLOUED4	4.46E-07	7.96E-07	4.12E-07	3.11E-06	7.54E+00	4.62E-07	1.86E-06	4.03E+00	5.86E-07	1.14E-06	1.95E+00	6.96E+00
DLOUBM2	2.52E-05	3.85E-05	2.00E-05	1.37E-04	6.82E+00	2.26E-05	7.85E-05	3.47E+00	2.84E-05	5.36E-05	1.88E+00	5.43E+00
DLOUBM3	3.32E-06	5.07E-06	2.62E-06	1.81E-05	6.89E+00	3.00E-06	1.04E-05	3.45E+00	3.77E-06	7.11E-06	1.88E+00	5.44E+00
DLOUBM4	4.15E-07	6.35E-07	3.21E-07	2.27E-06	7.07E+00	3.76E-07	1.30E-06	3.46E+00	4.70E-07	8.88E-07	1.89E+00	5.48E+00
DLOUTH2	9.49E-05	1.57E-04	7.76E-05	3.67E-04	4.73E+00	9.16E-05	2.87E-04	3.14E+00	1.18E-04	2.17E-04	1.84E+00	3.87E+00
DLOUTH3	1.06E-05	1.75E-05	8.99E-06	3.94E-05	4.38E+00	1.05E-05	3.17E-05	3.02E+00	1.31E-05	2.38E-05	1.81E+00	3.72E+00
DLOUTH4	8.73E-07	1.43E-06	7.94E-07	3.42E-06	4.31E+00	9.48E-07	2.58E-06	2.72E+00	1.15E-06	1.95E-06	1.70E+00	3.92E+00
ARELIN	.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
ARELTIM	.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RLCMMT2	7.82E-07	1.95E-06	8.95E-07	1.32E-05	1.48E+01	1.04E-06	6.97E-06	6.73E+00	1.38E-06	3.20E-06	2.32E+00	1.69E+01
RLCMMT3	1.11E-07	2.65E-07	1.24E-07	1.63E-06	1.31E+01	1.43E-07	7.72E-07	5.40E+00	1.83E-07	3.97E-07	2.17E+00	1.47E+01
RLCMMT4	1.32E-08	2.94E-08	1.42E-08	1.64E-07	1.15E+01	1.63E-08	7.84E-08	4.80E+00	2.08E-08	4.47E-08	2.15E+00	1.24E+01
RLCMBM2	7.49E-08	1.48E-07	6.79E-08	6.16E-07	9.06E+00	7.80E-08	3.37E-07	4.33E+00	1.03E-07	2.17E-07	2.11E+00	8.22E+00
RLCMBM3	1.02E-08	2.00E-08	9.29E-09	8.39E-08	9.03E+00	1.06E-08	4.63E-08	4.36E+00	1.40E-08	2.96E-08	2.11E+00	8.26E+00
RLCMBM4	1.28E-09	2.52E-09	1.17E-09	1.05E-08	8.99E+00	1.33E-09	5.83E-09	4.38E+00	1.75E-09	3.73E-09	2.13E+00	8.25E+00
RLCMTH2	7.40E-08	1.49E-07	7.44E-08	3.67E-07	4.93E+00	8.79E-08	2.69E-07	3.07E+00	1.10E-07	2.02E-07	1.83E+00	4.96E+00
RLCMTH3	1.52E-08	2.71E-08	1.31E-08	6.43E-08	4.90E+00	1.51E-08	5.09E-08	3.36E+00	2.04E-08	3.81E-08	1.86E+00	4.24E+00
RLCMTH4	1.18E-09	2.22E-09	1.16E-09	5.96E-09	5.16E+00	1.35E-09	4.07E-09	3.03E+00	1.70E-09	2.98E-09	1.75E+00	5.05E+00
RLOUMT2	1.39E-06	2.87E-06	1.41E-06	1.68E-05	1.19E+01	1.60E-06	1.04E-05	6.51E+00	2.04E-06	4.30E-06	2.11E+00	1.20E+01
RLOUMT3	1.80E-07	3.49E-07	1.75E-07	1.94E-06	1.10E+01	1.97E-07	1.08E-06	5.50E+00	2.54E-07	5.14E-07	2.02E+00	1.08E+01
RLOUMT4	2.16E-08	3.93E-08	1.98E-08	1.78E-07	8.99E+00	2.19E-08	1.03E-07	4.71E+00	2.82E-08	5.72E-08	2.03E+00	8.22E+00
RLOUBM2	1.30E-07	1.99E-07	1.03E-07	7.05E-07	6.82E+00	1.17E-07	4.05E-07	3.47E+00	1.47E-07	2.77E-07	1.88E+00	5.43E+00
RLOUBM3	1.71E-08	2.62E-08	1.35E-08	9.32E-08	6.89E+00	1.55E-08	5.34E-08	3.45E+00	1.95E-08	3.67E-08	1.88E+00	5.44E+00
RLOUBM4	2.14E-09	3.27E-09	1.66E-09	1.17E-08	7.07E+00	1.94E-09	6.70E-09	3.46E+00	2.43E-09	4.58E-09	1.89E+00	5.48E+00
RLOUTH2	1.68E-07	2.77E-07	1.37E-07	6.50E-07	4.73E+00	1.62E-07	5.09E-07	3.14E+00	2.09E-07	3.85E-07	1.84E+00	3.87E+00
RLOUTH3	1.87E-08	3.09E-08	1.59E-08	6.97E-08	4.38E+00	1.86E-08	5.62E-08	3.02E+00	2.32E-08	4.21E-08	1.81E+00	3.72E+00
RLOUTH4	1.55E-09	2.54E-09	1.41E-09	6.06E-09	4.31E+00	1.68E-09	4.56E-09	2.72E+00	2.03E-09	3.45E-09	1.70E+00	3.92E+00
CDCMED	1.04E+01	2.32E+01	1.17E+01	1.21E+02	1.03E+01	1.35E+01	5.93E+01	4.39E+00	1.68E+01	3.53E+01	2.10E+00	1.16E+01
CDCMBM	9.11E+00	1.80E+01	8.59E+00	7.48E+01	8.71E+00	9.64E+00	4.14E+01	4.30E+00	1.26E+01	2.66E+01	2.12E+00	8.21E+00
CDCMTH	3.09E+01	5.78E+01	2.85E+01	1.38E+02	4.85E+00	3.38E+01	1.08E+02	3.19E+00	4.35E+01	7.94E+01	1.82E+00	4.47E+00
PLCMMT	4.96E-01	1.16E+00	5.54E-01	7.35E+00	1.33E+01	6.40E-01	3.19E+00	4.99E+00	8.18E-01			

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                                1.74E+00  2.13E+00  ||  1.48E+01
PLCMBM   4.70E-02  9.30E-02  | 4.43E-02  3.86E-01  8.71E+00  | 4.97E-02  2.14E-01  4.30E+00  | 6.49E-02
                                1.37E-01  2.12E+00  ||  8.21E+00
PLCMTH   5.48E-02  1.02E-01  | 5.05E-02  2.45E-01  4.85E+00  | 5.99E-02  1.91E-01  3.19E+00  | 7.71E-02
                                1.41E-01  1.82E+00  ||  4.47E+00
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RESULTS FOR THE 95TH PERCENTILE OF THE ENDPOINTS FOR THHE DBA SOURCE TERM

95 %-FRT	REF	MEDIAN	5 %	95 %	FAC1	10 %	90 %	FAC2	25 %	75 %	FAC3	95%/REF
DLCMED2	4.57E-05	1.12E-04	5.89E-05	5.37E-04	9.12E+00	6.76E-05	3.24E-04	4.79E+00	8.32E-05	1.62E-04	1.95E+00	1.17E+01
DLCMED3	6.92E-06	1.66E-05	8.71E-06	9.12E-05	1.05E+01	1.00E-05	4.79E-05	4.79E+00	1.20E-05	2.51E-05	2.09E+00	1.32E+01
DLCMED4	6.76E-07	1.62E-06	8.51E-07	8.91E-06	1.05E+01	9.55E-07	4.27E-06	4.47E+00	1.20E-06	2.45E-06	2.04E+00	1.32E+01
DLCMBM2	3.24E-05	6.61E-05	3.39E-05	2.69E-04	7.94E+00	3.80E-05	1.45E-04	3.80E+00	4.79E-05	9.33E-05	1.95E+00	8.32E+00
DLCMBM3	5.37E-06	1.10E-05	5.13E-06	4.37E-05	8.51E+00	5.89E-06	2.40E-05	4.07E+00	7.59E-06	1.58E-05	2.09E+00	8.13E+00
DLCMBM4	5.50E-07	1.12E-06	5.50E-07	4.37E-06	7.94E+00	6.17E-07	2.45E-06	3.98E+00	7.94E-07	1.62E-06	2.04E+00	7.94E+00
DLCMTH2	2.19E-04	4.57E-04	1.91E-04	9.77E-04	5.13E+00	2.40E-04	8.71E-04	3.63E+00	3.47E-04	6.46E-04	1.86E+00	4.47E+00
DLCMTH3	3.02E-05	5.75E-05	2.57E-05	1.35E-04	5.25E+00	3.09E-05	1.10E-04	3.55E+00	4.27E-05	8.13E-05	1.91E+00	4.47E+00
DLCMTH4	1.86E-06	3.63E-06	1.86E-06	8.71E-06	4.68E+00	2.19E-06	6.61E-06	3.02E+00	2.75E-06	4.90E-06	1.78E+00	4.68E+00
DLOUED2	8.32E-05	1.55E-04	8.51E-05	7.24E-04	8.51E+00	9.33E-05	4.57E-04	4.90E+00	1.17E-04	2.24E-04	1.91E+00	8.71E+00
DLOUED3	1.15E-05	2.19E-05	1.17E-05	1.12E-04	9.55E+00	1.32E-05	6.46E-05	4.90E+00	1.66E-05	3.16E-05	1.91E+00	9.77E+00
DLOUED4	1.20E-06	2.29E-06	1.17E-06	1.02E-05	8.71E+00	1.32E-06	6.17E-06	4.68E+00	1.66E-06	3.31E-06	2.00E+00	8.51E+00
DLOUBM2	6.76E-05	1.00E-04	5.13E-05	2.95E-04	5.75E+00	6.03E-05	2.00E-04	3.31E+00	7.24E-05	1.38E-04	1.91E+00	4.37E+00
DLOUBM3	9.55E-06	1.45E-05	7.41E-06	5.01E-05	6.76E+00	8.51E-06	2.88E-05	3.39E+00	1.07E-05	2.04E-05	1.91E+00	5.25E+00
DLOUBM4	1.07E-06	1.58E-06	7.94E-07	5.01E-06	6.31E+00	9.33E-07	3.24E-06	3.47E+00	1.15E-06	2.19E-06	1.91E+00	4.68E+00
DLOUTH2	3.31E-04	5.62E-04	2.51E-04	1.23E-03	4.90E+00	3.09E-04	1.07E-03	3.47E+00	4.37E-04	7.94E-04	1.82E+00	3.72E+00
DLOUTH3	3.80E-05	6.46E-05	3.16E-05	1.45E-04	4.57E+00	3.72E-05	1.17E-04	3.16E+00	4.90E-05	8.91E-05	1.82E+00	3.80E+00
DLOUTH4	2.57E-06	4.17E-06	2.34E-06	9.12E-06	3.89E+00	2.75E-06	7.41E-06	2.69E+00	3.31E-06	5.62E-06	1.70E+00	3.55E+00
ARELIN	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
ARELTIM	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RLCMMT2	2.09E-06	5.50E-06	2.75E-06	3.16E-05	1.15E+01	3.16E-06	2.00E-05	6.31E+00	3.98E-06	8.51E-06	2.14E+00	1.51E+01
RLCMMT3	3.16E-07	8.13E-07	3.98E-07	5.37E-06	1.35E+01	4.57E-07	2.82E-06	6.17E+00	5.89E-07	1.29E-06	2.19E+00	1.70E+01
RLCMMT4	3.16E-08	8.13E-08	3.98E-08	4.47E-07	1.12E+01	4.47E-08	2.51E-07	5.62E+00	5.75E-08	1.26E-07	2.19E+00	1.41E+01
RLCMBM2	1.66E-07	3.47E-07	1.74E-07	1.38E-06	7.94E+00	1.95E-07	7.41E-07	3.80E+00	2.45E-07	4.79E-07	1.95E+00	8.32E+00
RLCMBM3	2.82E-08	5.62E-08	2.69E-08	2.24E-07	8.32E+00	3.02E-08	1.23E-07	4.07E+00	3.89E-08	8.13E-08	2.09E+00	7.94E+00
RLCMBM4	2.82E-09	5.75E-09	2.82E-09	2.29E-08	8.13E+00	3.24E-09	1.26E-08	3.89E+00	4.07E-09	8.32E-09	2.04E+00	8.13E+00
RLCMTH2	3.89E-07	8.13E-07	3.39E-07	1.74E-06	5.13E+00	4.27E-07	1.55E-06	3.63E+00	6.17E-07	1.15E-06	1.86E+00	4.47E+00
RLCMTH3	5.37E-08	1.02E-07	4.47E-08	2.40E-07	5.37E+00	5.37E-08	1.95E-07	3.63E+00	7.59E-08	1.45E-07	1.91E+00	4.47E+00
RLCMTH4	3.24E-09	6.31E-09	3.31E-09	1.55E-08	4.68E+00	3.80E-09	1.17E-08	3.09E+00	4.90E-09	8.71E-09	1.78E+00	4.79E+00
RLOUMT2	3.89E-06	7.59E-06	3.98E-06	4.07E-05	1.02E+01	4.47E-06	2.69E-05	6.03E+00	5.62E-06	1.17E-05	2.09E+00	1.05E+01
RLOUMT3	5.37E-07	1.10E-06	5.62E-07	6.46E-06	1.15E+01	6.31E-07	3.89E-06	6.17E+00	7.94E-07	1.66E-06	2.09E+00	1.20E+01
RLOUMT4	5.89E-08	1.12E-07	5.62E-08	5.89E-07	1.05E+01	6.31E-08	3.55E-07	5.62E+00	7.94E-08	1.70E-07	2.14E+00	1.00E+01
RLOUBM2	3.47E-07	5.13E-07	2.63E-07	1.55E-06	5.89E+00	3.09E-07	1.02E-06	3.31E+00	3.80E-07	7.08E-07	1.86E+00	4.47E+00
RLOUBM3	4.90E-08	7.59E-08	3.80E-08	2.57E-07	6.76E+00	4.47E-08	1.51E-07	3.39E+00	5.62E-08	1.05E-07	1.86E+00	5.25E+00
RLOUBM4	5.50E-09	7.94E-09	0.00E+00	2.63E-08	9.99E+99	4.27E-09	1.66E-08	3.89E+00	5.75E-09	1.15E-08	2.00E+00	4.79E+00
RLOUTH2	5.89E-07	1.00E-06	4.47E-07	2.14E-06	4.79E+00	5.50E-07	1.91E-06	3.47E+00	7.76E-07	1.41E-06	1.82E+00	3.63E+00
RLOUTH3	6.76E-08	1.15E-07	5.50E-08	2.57E-07	4.68E+00	6.61E-08	2.04E-07	3.09E+00	8.51E-08	1.58E-07	1.86E+00	3.80E+00
RLOUTH4	4.57E-09	7.24E-09	0.00E+00	1.62E-08	9.99E+99	4.27E-09	1.32E-08	3.09E+00	5.62E-09	9.77E-09	1.74E+00	3.55E+00
CDCMED	3.39E+01	7.24E+01	3.55E+01	3.31E+02	9.33E+00	3.98E+01	1.86E+02	4.68E+00	5.01E+01	1.07E+02	2.14E+00	9.77E+00
CDCMBM	3.16E+01	6.17E+01	2.75E+01	2.63E+02	9.55E+00	3.24E+01	1.45E+02	4.47E+00	4.27E+01	9.33E+01	2.19E+00	8.32E+00

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CDCMTH   8.91E+01  1.55E+02  | 7.76E+01  4.07E+02  5.25E+00  | 9.12E+01  3.02E+02  3.31E+00  | 1.17E+02
                                     2.14E+02  1.82E+00  ||  4.57E+00
PLCMMT   1.62E+00  3.55E+00  | 1.66E+00  2.19E+01  1.32E+01  | 1.86E+00  1.00E+01  5.37E+00  | 2.40E+00
                                     5.50E+00  2.29E+00  ||  1.35E+01
PLCMBM   1.62E-01  3.16E-01  | 1.41E-01  1.38E+00  9.77E+00  | 1.66E-01  7.59E-01  4.57E+00  | 2.19E-01
                                     4.79E-01  2.19E+00  ||  8.51E+00
PLCMTH   1.58E-01  2.69E-01  | 1.38E-01  7.24E-01  5.25E+00  | 1.62E-01  5.37E-01  3.31E+00  | 2.04E-01
                                     3.80E-01  1.86E+00  ||  4.57E+00
```

Results for the 99th percentile of the endpoints for the DBA source term

99 %-FRT	REF	MEDIAN	5 %	95 %	FAC1	10 %	90 %	FAC2	25 %	75 %	FAC3	95%/REF
DLCMED2	4.57E-04	1.10E-03	5.13E-04	7.24E-03	1.41E+01	5.89E-04	3.47E-03	5.89E+00	7.59E-04	1.70E-03	2.24E+00	1.58E+01
DLCMED3	4.79E-05	1.10E-04	5.62E-05	6.61E-04	1.17E+01	6.46E-05	3.02E-04	4.68E+00	7.94E-05	1.62E-04	2.04E+00	1.38E+01
DLCMED4	5.25E-06	1.12E-05	5.62E-06	5.50E-05	9.77E+00	6.46E-06	2.95E-05	4.57E+00	8.13E-06	1.70E-05	2.09E+00	1.05E+01
DLCMBM2	3.98E-04	7.76E-04	3.55E-04	3.39E-03	9.55E+00	4.17E-04	1.86E-03	4.47E+00	5.50E-04	1.17E-03	2.14E+00	8.51E+00
DLCMBM3	3.89E-05	7.76E-05	3.55E-05	3.24E-04	9.12E+00	4.07E-05	1.78E-04	4.37E+00	5.37E-05	1.12E-04	2.09E+00	8.32E+00
DLCMBM4	4.68E-06	9.33E-06	4.37E-06	3.72E-05	8.51E+00	5.01E-06	2.09E-05	4.17E+00	6.46E-06	1.35E-05	2.09E+00	7.94E+00
DLCMTH2	9.12E-04	1.86E-03	9.55E-04	5.01E-03	5.25E+00	1.12E-03	3.39E-03	3.02E+00	1.41E-03	2.51E-03	1.78E+00	5.50E+00
DLCMTH3	1.95E-04	3.55E-04	1.66E-04	8.71E-04	5.25E+00	1.91E-04	6.76E-04	3.55E+00	2.63E-04	4.90E-04	1.86E+00	4.47E+00
DLCMTH4	1.41E-05	2.82E-05	1.35E-05	6.76E-05	5.01E+00	1.62E-05	5.25E-05	3.24E+00	2.09E-05	3.80E-05	1.82E+00	4.79E+00
DLOUED2	8.51E-04	1.58E-03	8.51E-04	9.12E-03	1.07E+01	9.33E-04	4.90E-03	5.25E+00	1.20E-03	2.40E-03	2.00E+00	1.07E+01
DLOUED3	7.76E-05	1.48E-04	7.76E-05	7.24E-04	9.33E+00	8.32E-05	3.98E-04	4.79E+00	1.07E-04	2.09E-04	1.95E+00	9.33E+00
DLOUED4	8.51E-06	1.58E-05	7.76E-06	6.31E-05	8.13E+00	8.91E-06	3.80E-05	4.27E+00	1.15E-05	2.19E-05	1.91E+00	7.41E+00
DLOUBM2	6.76E-04	1.05E-03	5.37E-04	3.80E-03	7.08E+00	6.17E-04	2.19E-03	3.55E+00	7.59E-04	1.48E-03	1.95E+00	5.62E+00
DLOUBM3	6.61E-05	1.00E-04	5.25E-05	3.55E-04	6.76E+00	5.89E-05	2.09E-04	3.55E+00	7.41E-05	1.45E-04	1.95E+00	5.37E+00
DLOUBM4	8.13E-06	1.23E-05	6.31E-06	4.37E-05	6.92E+00	7.24E-06	2.51E-05	3.47E+00	8.91E-06	1.78E-05	2.00E+00	5.37E+00
DLOUTH2	2.45E-03	4.27E-03	2.14E-03	1.00E-02	4.68E+00	2.51E-03	7.94E-03	3.16E+00	3.16E-03	5.89E-03	1.86E+00	4.07E+00
DLOUTH3	2.29E-04	3.89E-04	1.95E-04	9.12E-04	4.68E+00	2.29E-04	7.08E-04	3.09E+00	2.95E-04	5.37E-04	1.82E+00	3.98E+00
DLOUTH4	1.91E-05	3.24E-05	1.74E-05	6.92E-05	3.98E+00	2.00E-05	5.89E-05	2.95E+00	2.45E-05	4.27E-05	1.74E+00	3.63E+00
ARELIN	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
ARELTIM	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	0.00E+00	0.00E+00	9.99E+99	9.99E+99
RLCMMT2	2.19E-05	5.50E-05	2.45E-05	4.07E-04	1.66E+01	2.82E-05	2.09E-04	7.41E+00	3.80E-05	9.33E-05	2.45E+00	1.86E+01
RLCMMT3	2.19E-06	5.50E-06	2.63E-06	3.47E-05	1.32E+01	3.09E-06	1.74E-05	5.62E+00	3.89E-06	8.51E-06	2.19E+00	1.58E+01
RLCMMT4	2.51E-07	5.50E-07	2.75E-07	3.39E-06	1.23E+01	3.09E-07	1.62E-06	5.25E+00	3.89E-07	8.71E-07	2.24E+00	1.35E+01
RLCMBM2	2.09E-06	4.07E-06	1.82E-06	1.74E-05	9.55E+00	2.14E-06	9.55E-06	4.47E+00	2.82E-06	6.03E-06	2.14E+00	8.32E+00
RLCMBM3	2.00E-07	3.98E-07	1.82E-07	1.70E-06	9.33E+00	2.09E-07	9.12E-07	4.37E+00	2.75E-07	5.89E-07	2.14E+00	8.51E+00
RLCMBM4	2.40E-08	4.79E-08	2.24E-08	1.91E-07	8.51E+00	2.57E-08	1.07E-07	4.17E+00	3.31E-08	6.92E-08	2.09E+00	7.94E+00
RLCMTH2	1.62E-06	3.31E-06	1.70E-06	8.91E-06	5.25E+00	2.00E-06	6.03E-06	3.02E+00	2.51E-06	4.47E-06	1.78E+00	5.50E+00
RLCMTH3	3.47E-07	6.31E-07	2.95E-07	1.55E-06	5.25E+00	3.39E-07	1.20E-06	3.55E+00	4.68E-07	8.71E-07	1.86E+00	4.47E+00
RLCMTH4	2.51E-08	4.90E-08	2.40E-08	1.20E-07	5.01E+00	2.88E-08	9.33E-08	3.24E+00	3.72E-08	6.76E-08	1.82E+00	4.79E+00
RLOUMT2	3.98E-05	8.13E-05	3.98E-05	5.13E-04	1.29E+01	4.47E-05	3.24E-04	7.24E+00	5.75E-05	1.26E-04	2.19E+00	1.29E+01
RLOUMT3	3.72E-06	7.41E-06	3.63E-06	4.37E-05	1.20E+01	4.07E-06	2.51E-05	6.17E+00	5.25E-06	1.10E-05	2.09E+00	1.17E+01
RLOUMT4	4.17E-07	7.94E-07	3.80E-07	3.72E-06	9.77E+00	4.37E-07	2.14E-06	4.90E+00	5.62E-07	1.15E-06	2.04E+00	8.91E+00
RLOUBM2	3.55E-06	5.37E-06	2.75E-06	1.95E-05	7.08E+00	3.16E-06	1.12E-05	3.55E+00	3.89E-06	7.59E-06	1.95E+00	5.50E+00
RLOUBM3	3.39E-07	5.13E-07	2.69E-07	1.82E-06	6.76E+00	3.02E-07	1.07E-06	3.55E+00	3.80E-07	7.41E-07	1.95E+00	5.37E+00
RLOUBM4	4.17E-08	6.46E-08	3.31E-08	2.24E-07	6.76E+00	3.80E-08	1.29E-07	3.39E+00	4.68E-08	9.12E-08	1.95E+00	5.37E+00
RLOUTH2	4.37E-06	7.59E-06	3.80E-06	1.78E-05	4.68E+00	4.47E-06	1.38E-05	3.09E+00	5.62E-06	1.05E-05	1.86E+00	4.07E+00
RLOUTH3	4.07E-07	6.92E-07	3.47E-07	1.62E-06	4.68E+00	4.07E-07	1.26E-06	3.09E+00	5.13E-07	9.55E-07	1.86E+00	3.98E+00
RLOUTH4	3.39E-08	5.62E-08	3.09E-08	1.23E-07	3.98E+00	3.55E-08	1.02E-07	2.88E+00	4.37E-08	7.59E-08	1.74E+00	3.63E+00
CDCMED	4.79E+01	9.77E+01	4.79E+01	4.47E+02	9.33E+00	5.37E+01	2.51E+02	4.67E+00	6.92E+01	1.48E+02	2.14E+00	9.33E+00
CDCMBM	4.27E+01	8.32E+01	3.55E+01	3.55E+02	1.00E+01	4.27E+01	1.95E+02	4.57E+00	5.62E+01	1.26E+02	2.24E+00	8.32E+00
CDCMTH	1.15E+02	2.04E+02	1.05E+02	5.62E+02	5.37E+00	1.20E+02	3.96E+02	3.30E+00	1.55E+02	2.71E+02	1.75E+00	4.90E+00
PLCMMT	2.29E+00	4.79E+00	2.19E+00	2.82E+01	1.29E+01	2.57E+00	1.35E+01	5.25E+00	3.31E+00			

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                                        7.41E+00  2.24E+00  ||  1.23E+01
PLCMBM   2.19E-01  4.27E-01  | 1.82E-01  1.82E+00  1.00E+01  | 2.19E-01  1.02E+00  4.68E+00  | 2.95E-01
                                        6.46E-01  2.19E+00  ||  8.32E+00
PLCMTH   2.04E-01  3.63E-01  | 1.86E-01  1.00E+00  5.37E+00  | 2.14E-01  7.01E-01  3.28E+00  | 2.75E-01
                                        4.79E-01  1.74E+00  ||  4.90E+00
```

APPENDIX D

Parameters making major contributions to the overall uncertainty

This appendix lists those parameters whose uncertainty makes a major contribution to the overall uncertainty on the model predictions. The parameters are selected on the basis of being ranked in the top 5 positions according to the absolute value of the partial rank correlation coefficient, provided that the PRCC s above the level that might be observed by chance.

The endpoints are identified using the short code listed in Table C.1 of Appendix C. The input parameters are also identified using a short code, which is given for all the parameters in Table D.1. The remaining tables list the input parameters meeting the criteria specified above for each of the endpoints considered. The tables give the following information:

ENDP Short code name for the endpoint

INP.VAR. Short code name for the input parameters

RK Rank according to PRCC

PRCC Value of the partial rank correlation coefficient

SUM% The sum of the percentage contributions of the parameters to the uncertainty on the endpoint. The percentage contributions do not add up to 100% because of the effects of correlations between input parameter values, as discussed in the "Methodology Report"

%CON The percentage contribution to the uncertainty on the endpoint made by the uncertainty in the value of the parameter

%SCON The percentage contribution to the uncertainty on the endpoint made by the uncertainty in the value of the parameter, if the overall uncertainty is normalised to 100% (ie %CON/SUM%)

FAC1 The ratio of the 95th to the 5th percentile of the uncertainty distribution for this endpoint. (the uncertainty factor)

RSQ The coefficient of determination, R^2.

The quantities PRCC, percentage contribution and R^2 are described in the "Methodology Report".

The results given in Appendix C show that there are some endpoints and source terms where the results for many of the sets of parameter values are so small that they are below the lowest bin used in determining the uncertainty distribution on the endpoint. In some cases, it was not possible to determine the 95th percentile of the uncertainty distribution as the values are so low. In these cases there are so few "non-zero" values that an analysis of the important uncertain parameters is meaningless, and so results for those situations are not included in this appendix.

Table D.1 Description of the short names of the input parameters used in the following tables

Short name of parameter	Description of parameter
INDEPRT	Total initial deposition in respiratory tract
INDEPET	Initial deposition in extrathoracic region
INDEPTB	Initial deposition in tracheobronchial region
INDEPEXT	Initial deposition in extrathoracic region beyond the nasal region
ET1-ENV	Transfer coefficient: ET1region to environment
AI1-TBF	Transfer coefficient: pulmonary 1 region to the tracheobronchial region (rapid clearance rate)
AI2-TBF	Transfer coefficient: pulmonary 2 region to the tracheobronchial region (intermediate clearance rate)
AI3-TBF	Transfer coefficient: pulmonary 3 region to the tracheobronchial region (slow clearance rate)
AI3-LNTH	Transfer coefficient: pulmonary 3 region to the thoracic lymph nodes
BBF-ET2	Fast transfer coefficient: bronchial to extrathoracic regions
BBS-ET2	Slow transfer coefficient: bronchial to extrathoracic regions
ET2-STOM	Transfer coefficient: extrathoracic 2 to stomach
STOM-SI	Transfer coefficient: stomach to small intestine
SI-ULI	Transfer coefficient: small intestine to U.L.I.
ULI-LLI	Transfer coefficient: U.L.I. to L.L.I.
LLI-FAEC	Transfer coefficient: L.L.I. to Faeces
SRANY-BL	Transfer coefficient for Strontium: any lung compartment to blood
SRANY-AT	Transfer coefficient for Strontium: any lung compartment to transformed state in lung
SRAT-BL	Transfer coefficient for Strontium: transformed state in lung to blood
SRF1	Strontium: f1-factor
SRTC-LIV	Transfer coefficient for Strontium: blood to liver
SRTC-CB	Transfer coefficient for Strontium: blood to cortical bone
SRTB/COR	Strontium: Tratio of uptake to trabecular/cortical bone
SRTC-ULI	Transfer coefficient for Strontium: blood to U.L.I. (faeces)
SRTB-ULI	Transfer coefficient for Strontium: trabecular bone to U.L.I. (faeces)
SRCB-ULI	Transfer coefficient for Strontium: Cortical bone to U.L.I. (faeces)
SRLV-ULI	Transfer coefficient for Strontium: liver to U.L.I. (faeces)
RUANY-BL	Transfer coefficient for Ruthenium: any lung compartment to blood
RUANY-AT	Transfer coefficient for Ruthenium: any lung compartment to transformed state in lung
RUAT-BL	Transfer coefficient for Ruthenium: transformed state in lung to blood
RUF1	Ruthenium: f1 factor
RUTC-WB	Transfer coefficient for Ruthenium: blood to whole body
RUTC-WB2	Transfer coefficient for Ruthenium: blood to whole body 2 compartment
RUTC-ULI	Transfer coefficient for Ruthenium: blood to U.L.I.

RUWB-ULI	Transfer coefficient for Ruthenium: whole body to U.L.I.
RUWB2-UL	Transfer coefficient for Ruthenium: whole body 2 compartment to U.L.I.
TEANY-BL	Transfer coefficient for Tellurium: any lung compartment to blood
TEANY-AT	Transfer coefficient for Tellurium: any lung compartment to transformed state in lung
TEAT-BL	Transfer coefficient for Tellurium: transformed state in lung to blood
TEF1	Tellurium: f1 factor
TETC-BNE	Transfer coefficient for Tellurium: blood to bone
TETC-THR	Transfer coefficient for Tellurium: blood to thyroid
TETC-LIV	Transfer coefficient for Tellurium: blood to liver
TETC-ULI	Transfer coefficient for Tellurium: blood to U.L.I.
TEBN-ULI	Transfer coefficient for Tellurium: bone to U.L.I.
TETH-ULI	Transfer coefficient for Tellurium: thyroid to U.L.I.
TELV-ULI	Transfer coefficient for Tellurium: liver to U.L.I.
IANY-BL	Transfer coefficient for Iodine: any lung compartment to blood
IANY-AT	Transfer coefficient for Iodine: any lung compartment to transformed state in lung
IANYT-BL	Transfer coefficient for Iodine: transformed state in lung to blood
IF1	Iodine: f1-factor
ITC-THR	Transfer coefficient for Iodine: blood to thyroid
ITC-BLAD	Transfer coefficient for Iodine: blood to Bladder
ITHR-ULI	Transfer coefficient for Iodine: thyroid to U.L.I.
CSANY-BL	Transfer coefficient for Caesium: any lung compartment to blood
CSANY-AT	Transfer coefficient for Caesium: any lung compartment to transformed state in lung
CSAT-BL	Transfer coefficient for Caesium: transformed state in lung to Blood
CSF1	Caesium: f1-factor
CSTC-WB	Transfer coefficient for Caesium: blood to whole body
CSTC-WB2	Transfer coefficient for Caesium: blood to whole body 2 compartment
CSWB-ULI	Transfer coefficient for Caesium: whole body to U.L.I.
CSWB2-UL	Transfer coefficient for Caesium: whole body 2 compartment to U.L.I.
CEANY-BL	Transfer coefficient for Cerium: any lung compartment to blood
CEANY-AT	Transfer coefficient for Cerium: any lung compartment to transformed state in lung
CEAT-BL	Transfer coefficient for Cerium: transformed state in lung to blood
CEF1	Cerium: f1 factor
CETC-BNE	Transfer coefficient for Cerium: blood to bone
CETC-LIV	Transfer coefficient for Cerium: blood to liver
CETC-ULI	Transfer coefficient for Cerium: blood to U.L.I.
CEBN-ULI	Transfer coefficient for Cerium: bone to U.L.I.
CELV-ULI	Transfer coefficient for Cerium: liver to U.L.I.
PUANY-BL	Transfer coefficient for Plutonium: any lung compartment to blood
PUANY-AT	Transfer coefficient for Plutonium: any lung compartment to transformed state in lung
PUAT-BL	Transfer coefficient for Plutonium: transformed state in lung to blood
PUF1	Plutonium: f1 factor for plutonium biologically incorporated
PURM-ULI	Transfer coefficient for Plutonium: R.B.M. to U.L.I.

PUCM-ULI	Transfer coefficient for Plutonium: cortical marrow to U.L.I.
PUTC-TS	Transfer coefficient for Plutonium: blood to trabecular surface
PUTC-CS	Transfer coefficient for Plutonium: blood to cortical surface
PUTS-TV	Transfer coefficient for Plutonium: trabecular surface to trabecular volume
PUCS-CV	Transfer coefficient for Plutonium: cortical surface to cortical volume
PUTS-RBM	Transfer coefficient for Plutonium: trabecular surface to R.B.M.
PUTV-RBM	Transfer coefficient for Plutonium: trabecular volume to R.B.M.
PUCS-CM	Transfer coefficient for Plutonium: cortical surface to cortical marrow
PUCV-CM	Transfer coefficient for Plutonium: cortical volume to cortical marrow
PUTC-LIV	Transfer coefficient for Plutonium: blood to liver
PULV-ULI	Transfer coefficient for Plutonium: liver to U.L.I.
PUTC-ULI	Transfer coefficient for Plutonium: blood to U.L.I.
BLAD-URN	Transfer coefficient for bladder to uUrine
NA-INHAL	Na-Inhalation dose coefficient
MN-INGST	Mn-Ingestion dose coefficient
MN-INHAL	Mn-Inhalation dose coefficient
FE-INHAL	Fe-Inhalation dose coefficient
CO-INGST	Co-Ingestion dose coefficient
CO-INHAL	Co-Inhalation dose coefficient
ZN-INGST	Zn-Ingestion dose coefficient
ZN-INHAL	Zn-Inhalation dose coefficient
RB-INHAL	Rb-Inhalation dose coefficient
Y-INHAL	Y -Inhalation dose coefficient
ZR-INHAL	Zr-Inhalation dose coefficient
NB-INHAL	Nb-Inhalation dose coefficient
MO-INHAL	Mo-Inhalation dose coefficient
RH-INHAL	Rh-Inhalation dose coefficient
AG-INGST	Ag-Ingestion dose coefficient
AG-INHAL	Ag-Inhalation dose coefficient
SB-INHAL	Sb-Inhalation dose coefficient
BA-INHAL	Ba-Inhalation dose coefficient
LA-INHAL	La-Inhalation dose coefficient
PR-INHAL	Pr-Inhalation dose coefficient
ND-INHAL	Nd-Inhalation dose coefficient
W-INHAL	W -Inhalation dose coefficient
NP-INHAL	Np-Inhalation dose coefficient
AM-INHAL	Am-Inhalation dose coefficient
CM-INHAL	Cm-Inhalation dose coefficient
SKINRES	Skin residence time
ZRGRINDR	Zr-95 initial dose rate: deposited activity
ZRGR10D	Zr-95 dose to 10 days:deposited activity
ZRGR30D	Zr-95 dose to 30 days: deposited activity
ZRGR100D	Zr-95 dose to 100 days: deposited activity
ZRGR1Y	Zr-95 dose to 1 year: deposited activity
RUGRINDR	Ru-106 initial dose rate: deposited activity

RUGR30D	Ru-106 dose to 30 days: deposited activity
RUGR100D	Ru-106 dose to 100 days: deposited activity
RUGR1Y	Ru-106 dose to 1 year: deposited activity
RUGR3Y	Ru-106 dose to 3 years: deposited activity
IGRINDR	I-131 initial dose rate: deposited activity
IGR1D	I-131 dose to 1 day: deposited activity
IGR3D	I-131 dose to 3 days: deposited activity
IGR10D	I-131 dose to 10 days: deposited activity
IGR30D	I-131 dose to 30 days: deposited activity
IGR100D	I-131 dose to 100 days: deposited activity
CSGRINDR	Cs-137 initial dose rate: deposited activity
CSGR100D	Cs-137 dose to 100 days: deposited activity
CSGR1Y	Cs-137 dose to 1 year: deposited activity
CSGR3Y	Cs-137 dose to 3 years: deposited activity
CSGR10Y	Cs-137 dose to 10 years: deposited activity
CSGR30Y	Cs-137 dose to 30 years: deposited activity
CSGR100Y	Cs-137 dose to 100 years: deposited activity
LFGRNLVE	Location factor for normal living (NE), groundshine
LFGRSHLT	Location factor for sheltering (NE), groundshine
LFGRPROT	Location factor for intervention dose (NE), groundshine
LFGRCAR	Location factor for being in cars (NE), groundshine
LFGRNLVL	Location factor for norm.liv & interv.(NL), groundshine
LFCRNLIV	Location factor for normal living (NE&NL), cloudshine
LFCLSHLT	Location factor for sheltering (NE), cloudshine
LFCLPROT	Location factor for intervention (NE), cloudshine
LFIHNLIV	Location factor for normal living (NE&NL), inhalation
LFCLNLIV	Location factor for normal living (NE&NL), inhalation
LFIHSHLT	Location factor for sheltering(NE), inhalation
CNSRTGRN	Consumption rate for grain products
CNSRTPOT	Consumption rate for potatoes
CNSRTRTV	Consumption rate for root vegetables
CNSRTGVG	Consumption rate for green vegetables
CNSRTMLK	Consumption rate for milk (including milk products)
CNSRTCMT	Consumption rate for cows meat (including veal)
CNSRTCLV	Consumption rate for cows liver
CNSRTSMT	Consumption rate for sheep meat
CNSRTSLV	Consumption rate for sheep liver
CNSRTPRK	Consumption rate for pork
BRETHRAT	Breathing rate

Table D.2 Contributions of parameter uncertainties to the overall uncertainty on the endpoints

RESULTS FOR THE MEAN VALUE OF THE ENDPOINTS FOR THE UK1 SOURCE TERM

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
AEVAC	BBF-ET2	002	-.64	148.15	45.78	30.90	2.45E+00	.83
AEVAC	BBS-ET2	067	-.05	148.15	30.12	20.33	2.45E+00	.83
AEVAC	ET2-STOM	001	-.71	148.15	24.10	16.27	2.45E+00	.83
AEVAC	BRETHRAT	003	.55	148.15	14.46	09.76	2.45E+00	.83
AIOD	BRETHRAT	002	.67	108.31	23.81	21.98	2.73E+00	.84
AIOD	TETC-THR	001	.69	108.31	15.48	14.29	2.73E+00	.84
AIOD	INDEPEXT	003	.58	108.31	09.52	08.79	2.73E+00	.84
ASHEL	BBF-ET2	002	.63	143.35	44.58	31.10	1.85E+00	.83
ASHEL	BBS-ET2	075	.05	143.35	28.92	20.17	1.85E+00	.83
ASHEL	ET2-STOM	001	.71	143.35	24.10	16.81	1.85E+00	.83
ASHEL	BRETHRAT	003	-.53	143.35	13.25	09.24	1.85E+00	.83
DECMBM1	BRETHRAT	001	.79	206.61	21.98	10.64	3.75E+00	.91
DECMBM1	IGRINDR	003	.62	206.61	19.78	09.57	3.75E+00	.91
DECMBM1	LFGRCAR	002	.66	206.61	12.09	05.85	3.75E+00	.91
DECMBM2	BRETHRAT	001	.85	166.65	40.00	24.00	2.59E+00	.90
DECMBM2	LFGRCAR	003	.55	166.65	07.78	04.67	2.59E+00	.90
DECMBM2	INDEPEXT	002	.58	166.65	06.67	04.00	2.59E+00	.90
DECMBM3	BRETHRAT	001	.82	188.87	32.22	17.06	1.92E+00	.90
DECMBM3	IGRINDR	003	.53	188.87	17.78	09.41	1.92E+00	.90
DECMBM3	LFGRCAR	002	.71	188.87	16.67	08.83	1.92E+00	.90
DECMSK1	LFIHNLIV	001	.83	197.00	99.00	50.25	3.75E+00	1.00
DECMSK1	LFIHSHLT	003	.63	197.00	98.00	49.75	3.75E+00	1.00
DECMSK1	SKINRES	002	.74	197.00	00.00	00.00	3.75E+00	1.00
DECMSK2	LFIHSHLT	001	.77	196.97	98.99	50.26	2.12E+00	.99
DECMSK2	LFIHNLIV	003	.34	196.97	96.97	49.23	2.12E+00	.99
DECMSK2	SKINRES	002	.76	196.97	01.01	00.51	2.12E+00	.99
DECMSK3	LFIHSHLT	002	.64	190.72	94.85	49.73	1.47E+00	.97
DECMSK3	LFIHNLIV	094	.03	190.72	92.78	48.65	1.47E+00	.97
DECMSK3	SKINRES	001	.77	190.72	03.09	01.62	1.47E+00	.97
DECMSK3	BRETHRAT	003	-.21	190.72	00.00	00.00	1.47E+00	.97
DECMTH1	BRETHRAT	001	.67	120.91	19.77	16.35	3.06E+01	.86
DECMTH1	LFIHNLIV	021	.12	120.91	19.77	16.35	3.06E+01	.86
DECMTH1	LFIHSHLT	078	.04	120.91	19.77	16.35	3.06E+01	.86
DECMTH1	TETC-THR	002	.61	120.91	08.14	06.73	3.06E+01	.86
DECMTH1	ITC-THR	003	.60	120.91	05.81	04.81	3.06E+01	.86
DECMTH2	TETC-THR	001	.73	120.23	21.43	17.82	2.90E+01	.84
DECMTH2	BRETHRAT	002	.59	120.23	16.67	13.87	2.90E+01	.84
DECMTH2	TEANY-BL	008	.28	120.23	15.48	12.88	2.90E+01	.84
DECMTH2	TEAT-BL	052	.07	120.23	13.10	10.90	2.90E+01	.84
DECMTH2	INDEPEXT	003	.53	120.23	07.14	05.94	2.90E+01	.84
DECMTH3	BRETHRAT	002	.62	114.27	19.05	16.67	1.97E+01	.84
DECMTH3	TETC-THR	001	.70	114.27	17.86	15.63	1.97E+01	.84
DECMTH3	TEANY-BL	008	.26	114.27	13.10	11.46	1.97E+01	.84
DECMTH3	TEAT-BL	053	.06	114.27	11.90	10.41	1.97E+01	.84
DECMTH3	INDEPEXT	003	.56	114.27	08.33	07.29	1.97E+01	.84
DELVBM1	IGR10D	001	.54	357.90	46.32	12.94	5.48E+00	.95
DELVBM1	IGR3D	002	.51	357.90	45.26	12.65	5.48E+00	.95
DELVBM1	BRETHRAT	003	.47	357.90	03.16	00.88	5.48E+00	.95
DELVBM2	LFGRNLVE	003	.44	344.65	38.30	11.11	5.04E+00	.94
DELVBM2	RUGRINDR	001	.62	344.65	26.60	07.72	5.04E+00	.94
DELVBM2	BRETHRAT	002	.48	344.65	03.19	00.93	5.04E+00	.94
DELVBM3	LFGRNLVE	002	.43	344.68	38.30	11.11	5.34E+00	.94
DELVBM3	RUGRINDR	001	.68	344.68	31.91	09.26	5.34E+00	.94
DELVBM3	BRETHRAT	003	.40	344.68	02.13	00.62	5.34E+00	.94
DELVSK1	LFIHNLIV	002	.62	188.65	92.78	49.18	3.65E+00	.97
DELVSK1	LFIHSHLT	064	.05	188.65	90.72	48.09	3.65E+00	.97
DELVSK1	SKINRES	001	.82	188.65	05.15	02.73	3.65E+00	.97
DELVSK1	SRANY-BL	003	.19	188.65	00.00	00.00	3.65E+00	.97
DELVSK2	LFIHNLIV	002	.61	189.69	92.78	48.91	3.69E+00	.97
DELVSK2	LFIHSHLT	065	.05	189.69	90.72	47.83	3.69E+00	.97

DELVSK2	SKINRES	001	.82	189.69	06.19	03.26	3.69E+00	.97
DELVSK2	SRANY-BL	003	.19	189.69	00.00	00.00	3.69E+00	.97
DELVSK3	LFIHNLIV	002	.60	187.63	91.75	48.90	3.73E+00	.97
DELVSK3	LFIHSHLT	073	.05	187.63	89.69	47.80	3.73E+00	.97
DELVSK3	SKINRES	001	.82	187.63	06.19	03.30	3.73E+00	.97
DELVSK3	SRANY-BL	003	.19	187.63	00.00	00.00	3.73E+00	.97

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
DELVTH1	BRETHRAT	001	.71	116.11	22.99	19.80	2.32E+01	.87
DELVTH1	LFIHNLIV	012	.18	116.11	19.54	16.83	2.32E+01	.87
DELVTH1	LFIHSHLT	128	-.01	116.11	19.54	16.83	2.32E+01	.87
DELVTH1	ITC-THR	002	.69	116.11	08.05	06.93	2.32E+01	.87
DELVTH1	ITC-BLAD	003	-.66	116.11	06.90	05.94	2.32E+01	.87
DELVTH2	BRETHRAT	001	.69	118.57	20.93	17.65	2.32E+01	.86
DELVTH2	LFIHNLIV	012	.17	118.57	19.77	16.67	2.32E+01	.86
DELVTH2	LFIHSHLT	122	-.01	118.57	18.60	15.69	2.32E+01	.86
DELVTH2	INDEPEXT	003	.61	118.57	09.30	07.84	2.32E+01	.86
DELVTH2	ITC-THR	002	.64	118.57	06.98	05.89	2.32E+01	.86
DELVTH3	BRETHRAT	001	.69	118.57	22.09	18.63	2.22E+01	.86
DELVTH3	LFIHNLIV	013	.17	118.57	19.77	16.67	2.22E+01	.86
DELVTH3	LFIHSHLT	128	-.01	118.57	18.60	15.69	2.22E+01	.86
DELVTH3	ITC-THR	002	.64	118.57	06.98	05.89	2.22E+01	.86
DELVTH3	ITC-BLAD	003	-.62	118.57	05.81	04.90	2.22E+01	.86
DEOUBM1	IGR10D	001	.88	432.32	79.80	18.46	4.27E+00	.99
DEOUBM1	IGR3D	002	.84	432.32	79.80	18.46	4.27E+00	.99
DEOUBM1	IGR1D	062	-.06	432.32	55.56	12.85	4.27E+00	.99
DEOUBM1	IGR30D	045	-.08	432.32	54.55	12.62	4.27E+00	.99
DEOUBM1	RUGRINDR	003	.80	432.32	25.25	05.84	4.27E+00	.99
DEOUBM2	IGR3D	003	.61	429.90	60.82	14.15	4.22E+00	.97
DEOUBM2	IGR10D	002	.68	429.90	58.76	13.67	4.22E+00	.97
DEOUBM2	RUGRINDR	001	.84	429.90	49.48	11.51	4.22E+00	.97
DEOUBM2	IGR1D	061	-.05	429.90	46.39	10.79	4.22E+00	.97
DEOUBM3	RUGRINDR	001	.86	427.08	59.38	13.90	4.36E+00	.96
DEOUBM3	IGR3D	003	.54	427.08	52.08	12.19	4.36E+00	.96
DEOUBM3	IGR10D	002	.61	427.08	48.96	11.46	4.36E+00	.96
DEOUBM3	IGR1D	054	-.06	427.08	42.71	10.00	4.36E+00	.96
DEOUSK1	SKINRES	001	1.0	100.00	100.00	100.00	1.19E+00	1.00
DEOUSK1	CSGR100D	003	.00	100.00	00.00	00.00	1.19E+00	1.00
DEOUSK1	ZRGRINDR	002	.00	100.00	00.00	00.00	1.19E+00	1.00
DEOUSK2	SKINRES	001	1.0	100.00	100.00	100.00	1.19E+00	1.00
DEOUSK2	CSGR100D	003	.00	100.00	00.00	00.00	1.19E+00	1.00
DEOUSK2	ZRGRINDR	002	.00	100.00	00.00	00.00	1.19E+00	1.00
DEOUSK3	SKINRES	001	1.0	100.00	100.00	100.00	1.20E+00	1.00
DEOUSK3	CSGR100D	003	.00	100.00	00.00	00.00	1.20E+00	1.00
DEOUSK3	ZRGRINDR	002	.00	100.00	00.00	00.00	1.20E+00	1.00
DEOUTH1	BRETHRAT	001	.71	101.19	28.24	27.91	1.23E+01	.85
DEOUTH1	INDEPEXT	004	.65	101.19	14.12	13.95	1.23E+01	.85
DEOUTH1	ITC-THR	002	.70	101.19	10.59	10.47	1.23E+01	.85
DEOUTH1	ITC-BLAD	003	-.68	101.19	09.41	09.30	1.23E+01	.85
DEOUTH2	BRETHRAT	001	.69	107.11	26.19	24.45	1.22E+01	.84
DEOUTH2	INDEPEXT	004	.62	107.11	11.90	11.11	1.22E+01	.84
DEOUTH2	ITC-THR	002	.65	107.11	08.33	07.78	1.22E+01	.84
DEOUTH2	ITC-BLAD	003	-.64	107.11	07.14	06.67	1.22E+01	.84
DEOUTH3	BRETHRAT	001	.69	104.74	25.88	24.71	1.12E+01	.85
DEOUTH3	INDEPEXT	004	.62	104.74	11.76	11.23	1.12E+01	.85
DEOUTH3	ITC-BLAD	003	-.64	104.74	08.24	07.87	1.12E+01	.85
DEOUTH3	ITC-THR	002	.66	104.74	08.24	07.87	1.12E+01	.85
PECMBM	BRETHRAT	001	.86	161.09	45.56	28.28	3.39E+00	.90
PECMBM	LFGRCAR	003	.55	161.09	07.78	04.83	3.39E+00	.90
PECMBM	INDEPEXT	002	.60	161.09	06.67	04.14	3.39E+00	.90
PECMLU	INDEPET	001	-.86	107.75	26.67	24.75	3.14E+01	.90
PECMLU	INDEPTB	002	.74	107.75	20.00	18.56	3.14E+01	.90
PECMLU	BRETHRAT	003	.72	107.75	15.56	14.44	3.14E+01	.90
PECMMB	LFIHSHLT	006	.31	166.27	68.54	41.22	2.31E+00	.89
PECMMB	LFIHNLIV	111	.02	166.27	67.42	40.55	2.31E+00	.89
PECMMB	INDEPET	001	.57	166.27	04.49	02.70	2.31E+00	.89
PECMMB	BBF-ET2	002	.37	166.27	02.25	01.35	2.31E+00	.89
PECMMB	TETC-THR	003	.35	166.27	01.12	00.67	2.31E+00	.89
PECMMT	INDEPET	001	-.86	105.54	23.33	22.11	1.34E+01	.90
PECMMT	INDEPTB	002	.73	105.54	17.78	16.85	1.34E+01	.90
PECMMT	BRETHRAT	003	.72	105.54	14.44	13.68	1.34E+01	.90
PECMSK	LFIHNLIV	068	.05	136.78	35.63	26.05	8.56E+00	.87

PECMSK	LFIHSHLT	011	.17	136.78	35.63	26.05	8.56E+00	.87
PECMSK	INDEPET	001	.72	136.78	12.64	09.24	8.56E+00	.87
PECMSK	BRETHRAT	002	-.59	136.78	11.49	08.40	8.56E+00	.87
PECMSK	INDEPTB	003	-.58	136.78	11.49	08.40	8.56E+00	.87

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
PECMTH	TEANY-BL	008	.28	118.46	16.05	13.55	9.99E+09	.81
PECMTH	TEAT-BL	060	.06	118.46	14.81	12.50	9.99E+09	.81
PECMTH	IANY-BL	004	.46	118.46	13.58	11.46	9.99E+09	.81
PECMTH	TETC-THR	001	.63	118.46	13.58	11.46	9.99E+09	.81
PECMTH	INDEPEXT	003	.48	118.46	06.17	05.21	9.99E+09	.81
PECMTH	ITC-THR	002	.50	118.46	03.70	03.12	9.99E+09	.81
PELVBM	LFGRNLVE	003	.41	341.98	40.86	11.95	1.57E+01	.93
PELVBM	IGR30D	002	.42	341.98	25.81	07.55	1.57E+01	.93
PELVBM	RUGR30D	001	.60	341.98	21.51	06.29	1.57E+01	.93
PELVLU	INDEPET	001	-.84	115.53	20.00	17.31	1.14E+04	.90
PELVLU	LFIHNLIV	012	.17	115.53	17.78	15.39	1.14E+04	.90
PELVLU	LFIHSHLT	126	.01	115.53	17.78	15.39	1.14E+04	.90
PELVLU	INDEPTB	002	.69	115.53	14.44	12.50	1.14E+04	.90
PELVLU	BRETHRAT	003	.69	115.53	13.33	11.54	1.14E+04	.90
PELVMB	LFIHNLIV	002	.42	185.01	84.95	45.92	5.25E+00	.93
PELVMB	LFIHSHLT	120	.01	185.01	82.80	44.75	5.25E+00	.93
PELVMB	SKINRES	001	.57	185.01	03.23	01.75	5.25E+00	.93
PELVMB	INDEPET	003	.27	185.01	01.08	00.58	5.25E+00	.93
PELVMT	LFIHNLIV	007	.25	165.53	58.89	35.58	1.35E+01	.90
PELVMT	LFIHSHLT	064	.07	165.53	57.78	34.91	1.35E+01	.90
PELVMT	BRETHRAT	002	.53	165.53	06.67	04.03	1.35E+01	.90
PELVMT	INDEPET	001	-.64	165.53	05.56	03.36	1.35E+01	.90
PELVMT	INDEPTB	003	.49	165.53	04.44	02.68	1.35E+01	.90
PELVSK	LFIHNLIV	004	.42	176.08	83.70	47.54	6.17E+00	.92
PELVSK	LFIHSHLT	111	-.02	176.08	80.43	45.68	6.17E+00	.92
PELVSK	SKINRES	001	.60	176.08	04.35	02.47	6.17E+00	.92
PELVSK	BRETHRAT	003	-.44	176.08	03.26	01.85	6.17E+00	.92
PELVSK	INDEPET	002	.44	176.08	02.17	01.23	6.17E+00	.92
PELVTH	IANY-BL	006	.45	117.11	13.41	11.45	9.99E+09	.82
PELVTH	INDEPEXT	003	.58	117.11	12.20	10.42	9.99E+09	.82
PELVTH	ITC-THR	001	.64	117.11	09.76	08.33	9.99E+09	.82
PELVTH	ITC-BLAD	002	-.58	117.11	07.32	06.25	9.99E+09	.82
PEOUBM	RUGR30D	001	.84	421.88	53.13	12.59	1.57E+01	.96
PEOUBM	RUGRINDR	002	.60	421.88	48.96	11.61	1.57E+01	.96
PEOUBM	IGR30D	003	.54	421.88	36.46	08.64	1.57E+01	.96
PEOULU	INDEPET	001	-.86	105.58	25.84	24.47	9.99E+09	.89
PEOULU	INDEPTB	002	.72	105.58	19.10	18.09	9.99E+09	.89
PEOULU	BRETHRAT	003	.69	105.58	14.61	13.84	9.99E+09	.89
PEOUMB	RUGR30D	001	.68	271.42	40.48	14.91	1.90E+00	.84
PEOUMB	SKINRES	002	.62	271.42	10.71	03.95	1.90E+00	.84
PEOUMB	INDEPET	003	.41	271.42	02.38	00.88	1.90E+00	.84
PEOUMT	RUGR30D	002	.50	289.26	34.52	11.93	4.67E+00	.84
PEOUMT	RUGRINDR	009	.24	289.26	30.95	10.70	4.67E+00	.84
PEOUMT	BRETHRAT	003	.46	289.26	08.33	02.88	4.67E+00	.84
PEOUMT	INDEPET	001	-.55	289.26	04.76	01.65	4.67E+00	.84
PEOUSK	SKINRES	001	.80	146.38	41.46	28.32	2.25E+00	.82
PEOUSK	BRETHRAT	003	-.47	146.38	09.76	06.67	2.25E+00	.82
PEOUSK	INDEPET	002	.53	146.38	06.10	04.17	2.25E+00	.82
PEOUTH	BRETHRAT	004	.53	115.99	14.81	12.77	9.99E+09	.81
PEOUTH	IANY-BL	006	.42	115.99	12.35	10.65	9.99E+09	.81
PEOUTH	INDEPEXT	003	.58	115.99	12.35	10.65	9.99E+09	.81
PEOUTH	ITC-THR	001	.66	115.99	12.35	10.65	9.99E+09	.81
PEOUTH	ITC-BLAD	002	-.61	115.99	08.64	07.45	9.99E+09	.81
RECMBM1	IGRINDR	003	.69	239.57	27.47	11.47	2.40E+00	.91
RECMBM1	LFCLNLIV	020	.13	239.57	26.37	11.01	2.40E+00	.91
RECMBM1	LFCLSHLT	049	.07	239.57	24.18	10.09	2.40E+00	.91
RECMBM1	LFGRCAR	001	.72	239.57	16.48	06.88	2.40E+00	.91
RECMBM1	BRETHRAT	002	.69	239.57	13.19	05.51	2.40E+00	.91
RECMBM2	BRETHRAT	001	.89	129.96	61.11	47.02	1.59E+01	.90
RECMBM2	INDEPRT	004	.40	129.96	15.56	11.97	1.59E+01	.90
RECMBM2	INDEPEXT	002	.65	129.96	08.89	06.84	1.59E+01	.90
RECMBM2	TETC-BNE	003	.48	129.96	04.44	03.42	1.59E+01	.90
RECMLU1	BBF-ET2	003	.16	100.04	12.20	12.20	2.29E+00	.41
RECMLU1	IGRINDR	002	-.17	100.04	07.32	07.32	2.29E+00	.41
RECMLU1	ET1-ENV	001	.19	100.04	04.88	04.88	2.29E+00	.41
RECMLU2	INDEPET	001	-.72	109.85	20.99	19.11	6.66E+00	.81
RECMLU2	LFIHNLIV	011	.17	109.85	18.52	16.86	6.66E+00	.81
RECMLU2	LFIHSHLT	091	-.04	109.85	18.52	16.86	6.66E+00	.81
RECMLU2	INDEPTB	002	.56	109.85	16.05	14.61	6.66E+00	.81
RECMLU2	BRETHRAT	003	.45	109.85	07.41	06.75	6.66E+00	.81
RECMLU3	INDEPET	001	-.74	103.67	21.95	21.17	9.99E+09	.82

RECMLU3	INDEPTB	002	.63	103.67	20.73	20.00	9.99E+09	.82
RECMLU3	BRETHRAT	003	.59	103.67	17.07	16.47	9.99E+09	.82

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
RECMMB1	INDEPET	001	.83	106.88	22.73	21.27	9.92E+00	.88
RECMMB1	INDEPTB	002	-.70	106.88	19.32	18.08	9.92E+00	.88
RECMMB1	IANY-BL	004	.58	106.88	12.50	11.70	9.92E+00	.88
RECMMB1	BRETHRAT	003	-.60	106.88	10.23	09.57	9.92E+00	.88
RECMMB2	LFIHNLIV	035	.11	140.93	37.50	26.61	4.62E+00	.88
RECMMB2	LFIHSHLT	019	.14	140.93	37.50	26.61	4.62E+00	.88
RECMMB2	INDEPET	001	.74	140.93	12.50	08.87	4.62E+00	.88
RECMMB2	INDEPTB	002	-.57	140.93	09.09	06.45	4.62E+00	.88
RECMMB2	BRETHRAT	003	-.50	140.93	05.68	04.03	4.62E+00	.88
RECMMB3	LFIHSHLT	011	.16	108.96	20.51	18.82	1.63E+00	.78
RECMMB3	LFIHNLIV	082	-.04	108.96	19.23	17.65	1.63E+00	.78
RECMMB3	BRETHRAT	003	.48	108.96	11.54	10.59	1.63E+00	.78
RECMMB3	INDEPET	002	-.55	108.96	11.54	10.59	1.63E+00	.78
RECMMB3	INDEPTB	004	.48	108.96	11.54	10.59	1.63E+00	.78
RECMMB3	SKINRES	001	.55	108.96	11.54	10.59	1.63E+00	.78
RECMMT1	LFIHNLIV	010	.19	118.86	20.00	16.83	2.75E+00	.90
RECMMT1	LFIHSHLT	135	.00	118.86	20.00	16.83	2.75E+00	.90
RECMMT1	INDEPET	001	-.82	118.86	18.89	15.89	2.75E+00	.90
RECMMT1	INDEPTB	002	.70	118.86	14.44	12.15	2.75E+00	.90
RECMMT1	BRETHRAT	003	.69	118.86	13.33	11.21	2.75E+00	.90
RECMMT2	INDEPET	001	-.85	112.21	20.00	17.82	8.75E+00	.90
RECMMT2	BRETHRAT	002	.72	112.21	15.56	13.87	8.75E+00	.90
RECMMT2	INDEPTB	003	.72	112.21	15.56	13.87	8.75E+00	.90
RECMMT2	LFIHNLIV	077	.04	112.21	13.33	11.88	8.75E+00	.90
RECMMT2	LFIHSHLT	025	.12	112.21	13.33	11.88	8.75E+00	.90
RECMMT3	LFIHSHLT	009	.16	114.31	20.78	18.18	2.36E+01	.77
RECMMT3	LFIHNLIV	089	-.04	114.31	19.48	17.04	2.36E+01	.77
RECMMT3	INDEPET	001	-.60	114.31	11.69	10.23	2.36E+01	.77
RECMMT3	SKINRES	002	.55	114.31	11.69	10.23	2.36E+01	.77
RECMMT3	INDEPTB	003	.44	114.31	10.39	09.09	2.36E+01	.77
RECMSK1	INDEPET	001	.85	104.47	25.84	24.73	1.22E+01	.89
RECMSK1	INDEPTB	002	-.73	104.47	20.22	19.35	1.22E+01	.89
RECMSK1	BRETHRAT	003	-.70	104.47	14.61	13.98	1.22E+01	.89
RECMSK1	IANY-BL	004	.59	104.47	11.24	10.76	1.22E+01	.89
RECMSK2	LFIHNLIV	015	.15	128.08	29.21	22.81	1.27E+01	.89
RECMSK2	LFIHSHLT	045	.07	128.08	29.21	22.81	1.27E+01	.89
RECMSK2	INDEPET	001	.78	128.08	15.73	12.28	1.27E+01	.89
RECMSK2	INDEPTB	002	-.64	128.08	13.48	10.52	1.27E+01	.89
RECMSK2	BRETHRAT	003	-.64	128.08	12.36	09.65	1.27E+01	.89
RECMSK3	LFIHNLIV	133	.00	121.59	24.32	20.00	5.71E+00	.74
RECMSK3	LFIHSHLT	017	.12	121.59	24.32	20.00	5.71E+00	.74
RECMSK3	SKINRES	001	.62	121.59	22.97	18.89	5.71E+00	.74
RECMSK3	BRETHRAT	003	-.39	121.59	09.46	07.78	5.71E+00	.74
RECMSK3	INDEPET	002	.48	121.59	08.11	06.67	5.71E+00	.74
RECMTH1	IANY-BL	002	.60	116.63	22.62	19.39	9.99E+09	.84
RECMTH1	INDEPTB	003	-.54	116.63	11.90	10.20	9.99E+09	.84
RECMTH1	INDEPET	001	.64	116.63	08.33	07.14	9.99E+09	.84
RECMTH2	IANY-BL	003	.48	118.31	14.63	12.37	9.99E+09	.82
RECMTH2	TEANY-BL	009	.31	118.31	14.63	12.37	9.99E+09	.82
RECMTH2	TEAT-BL	109	.02	118.31	13.41	11.33	9.99E+09	.82
RECMTH2	TETC-THR	001	.61	118.31	10.98	09.28	9.99E+09	.82
RECMTH2	ITC-THR	002	.51	118.31	03.66	03.09	9.99E+09	.82
RECMTH3	TETC-THR	001	.62	113.32	20.00	17.65	9.99E+09	.75
RECMTH3	TEANY-BL	008	.19	113.32	16.00	14.12	9.99E+09	.75
RECMTH3	TEAT-BL	032	.09	113.32	16.00	14.12	9.99E+09	.75
RECMTH3	BRETHRAT	004	.43	113.32	12.00	10.59	9.99E+09	.75
RECMTH3	INDEPEXT	003	.43	113.32	06.67	05.89	9.99E+09	.75
RECMTH3	ITC-THR	002	.46	113.32	05.33	04.70	9.99E+09	.75
RELVBM1	IGR10D	006	.26	363.15	42.11	11.60	1.99E+00	.95
RELVBM1	IGR30D	001	.59	363.15	42.11	11.60	1.99E+00	.95
RELVBM1	LFGRNLVE	002	.44	363.15	38.95	10.73	1.99E+00	.95
RELVBM1	IGR3D	007	.25	363.15	37.89	10.43	1.99E+00	.95
RELVBM1	BRETHRAT	003	.38	363.15	02.11	00.58	1.99E+00	.95
RELVBM2	LFGRNLVE	004	.41	346.26	39.78	11.49	3.96E+01	.93
RELVBM2	IGR30D	003	.45	346.26	27.96	08.07	3.96E+01	.93
RELVBM2	RUGR30D	001	.58	346.26	19.35	05.59	3.96E+01	.93
RELVBM2	BRETHRAT	002	.47	346.26	03.23	00.93	3.96E+01	.93
RELVBM3	LFGRNLVE	004	.19	231.97	36.11	15.57	9.99E+09	.72
RELVBM3	LFGRSHLT	024	.10	231.97	30.56	13.17	9.99E+09	.72
RELVBM3	RUGRINDR	002	.26	231.97	23.61	10.18	9.99E+09	.72
RELVBM3	RUGR30D	001	.26	231.97	19.44	08.38	9.99E+09	.72
RELVBM3	CSGRINDR	003	.20	231.97	09.72	04.19	9.99E+09	.72
RELVLU1	INDEPET	001	-.42	178.73	14.75	08.25	9.99E+09	.61
RELVLU1	INDEPTB	002	.26	178.73	06.56	03.67	9.99E+09	.61

RELVLU1	PUCS-CM	003	.19	178.73	01.64	00.92	9.99E+09	.61

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
RELVLU2	INDEPET	001	-.64	113.48	21.62	19.05	8.17E+02	.74
RELVLU2	INDEPTB	002	.48	113.48	16.22	14.29	8.17E+02	.74
RELVLU2	LFIHNLIV	011	.15	113.48	14.86	13.09	8.17E+02	.74
RELVLU2	LFIHSHLT	061	-.06	113.48	14.86	13.09	8.17E+02	.74
RELVLU2	IANY-BL	003	-.40	113.48	09.46	08.34	8.17E+02	.74
RELVLU3	LFIHNLIV	009	.16	113.93	18.60	16.33	9.99E+09	.86
RELVLU3	LFIHSHLT	121	-.01	113.93	18.60	16.33	9.99E+09	.86
RELVLU3	INDEPET	001	-.76	113.93	16.28	14.29	9.99E+09	.86
RELVLU3	BRETHRAT	002	.63	113.93	15.12	13.27	9.99E+09	.86
RELVLU3	INDEPTB	003	.61	113.93	13.95	12.24	9.99E+09	.86
RELVMB1	IANY-BL	003	.48	117.50	16.25	13.83	4.92E+00	.80
RELVMB1	INDEPET	001	.67	117.50	16.25	13.83	4.92E+00	.80
RELVMB1	INDEPTB	002	-.54	117.50	16.25	13.83	4.92E+00	.80
RELVMB2	LFIHNLIV	042	.10	124.04	20.48	16.51	2.83E+00	.83
RELVMB2	LFIHSHLT	067	.05	124.04	19.28	15.54	2.83E+00	.83
RELVMB2	INDEPET	001	.67	124.04	12.05	09.71	2.83E+00	.83
RELVMB2	INDEPTB	002	-.53	124.04	12.05	09.71	2.83E+00	.83
RELVMB2	BBF-ET2	003	.42	124.04	04.82	03.89	2.83E+00	.83
RELVMB3	LFIHNLIV	002	.40	187.12	90.32	48.27	8.41E+00	.93
RELVMB3	LFIHSHLT	046	.07	187.12	89.25	47.70	8.41E+00	.93
RELVMB3	SKINRES	001	.57	187.12	03.23	01.73	8.41E+00	.93
RELVMB3	TETC-THR	003	.20	187.12	00.00	00.00	8.41E+00	.93
RELVMT1	LFIHNLIV	010	.16	143.01	20.93	14.64	1.84E+00	.86
RELVMT1	LFIHSHLT	133	.00	143.01	20.93	14.64	1.84E+00	.86
RELVMT1	BRETHRAT	002	.62	143.01	15.12	10.57	1.84E+00	.86
RELVMT1	INDEPET	001	-.71	143.01	13.95	09.75	1.84E+00	.86
RELVMT1	INDEPTB	003	.56	143.01	10.47	07.32	1.84E+00	.86
RELVMT2	LFIHNLIV	008	.19	142.08	23.86	16.79	6.56E+00	.88
RELVMT2	LFIHSHLT	133	.00	142.08	23.86	16.79	6.56E+00	.88
RELVMT2	BRETHRAT	002	.67	142.08	15.91	11.20	6.56E+00	.88
RELVMT2	INDEPET	001	-.76	142.08	13.64	09.60	6.56E+00	.88
RELVMT2	INDEPTB	003	.61	142.08	10.23	07.20	6.56E+00	.88
RELVMT3	LFIHNLIV	007	.22	170.49	73.86	43.32	2.38E+01	.88
RELVMT3	LFIHSHLT	022	.11	170.49	73.86	43.32	2.38E+01	.88
RELVMT3	BRETHRAT	002	.36	170.49	03.41	02.00	2.38E+01	.88
RELVMT3	INDEPET	001	-.46	170.49	02.27	01.33	2.38E+01	.88
RELVMT3	SKINRES	003	.33	170.49	01.14	00.67	2.38E+01	.88
RELVSK1	INDEPET	001	.71	134.17	18.29	13.63	4.36E+00	.82
RELVSK1	BRETHRAT	002	-.61	134.17	17.07	12.72	4.36E+00	.82
RELVSK1	INDEPTB	003	-.57	134.17	14.63	10.90	4.36E+00	.82
RELVSK2	LFIHNLIV	009	.17	131.80	25.88	19.64	3.38E+00	.85
RELVSK2	LFIHSHLT	133	.00	131.80	24.71	18.75	3.38E+00	.85
RELVSK2	BRETHRAT	002	-.60	131.80	14.12	10.71	3.38E+00	.85
RELVSK2	INDEPET	001	.68	131.80	12.94	09.82	3.38E+00	.85
RELVSK2	INDEPTB	003	-.55	131.80	11.76	08.92	3.38E+00	.85
RELVSK3	LFIHNLIV	002	.38	178.03	85.71	48.14	1.01E+01	.91
RELVSK3	LFIHSHLT	113	.01	178.03	83.52	46.91	1.01E+01	.91
RELVSK3	SKINRES	001	.56	178.03	04.40	02.47	1.01E+01	.91
RELVSK3	BRETHRAT	003	-.36	178.03	02.20	01.24	1.01E+01	.91
RELVTH1	IANY-BL	002	.56	128.75	25.00	19.42	9.99E+09	.80
RELVTH1	ITC-THR	001	.59	128.75	08.75	06.80	9.99E+09	.80
RELVTH1	ITC-BLAD	003	-.53	128.75	07.50	05.83	9.99E+09	.80
RELVTH2	IANY-BL	004	.50	126.25	18.75	14.85	9.99E+09	.80
RELVTH2	INDEPEXT	003	.54	126.25	11.25	08.91	9.99E+09	.80
RELVTH2	ITC-THR	001	.61	126.25	08.75	06.93	9.99E+09	.80
RELVTH2	ITC-BLAD	002	-.55	126.25	07.50	05.94	9.99E+09	.80
RELVTH3	BRETHRAT	003	.59	118.02	16.87	14.29	9.99E+09	.83
RELVTH3	LFIHNLIV	012	.16	118.02	14.46	12.25	9.99E+09	.83
RELVTH3	LFIHSHLT	092	-.04	118.02	13.25	11.23	9.99E+09	.83
RELVTH3	INDEPEXT	002	.59	118.02	12.05	10.21	9.99E+09	.83
RELVTH3	ITC-THR	001	.64	118.02	09.64	08.17	9.99E+09	.83
REOUBM1	IGR10D	002	.60	454.08	78.57	17.30	1.29E+00	.98
REOUBM1	IGR30D	001	.82	454.08	77.55	17.08	1.29E+00	.98
REOUBM1	IGR3D	004	.50	454.08	73.47	16.18	1.29E+00	.98
REOUBM1	IGR1D	006	.42	454.08	60.20	13.26	1.29E+00	.98
REOUBM1	RUGR30D	003	.59	454.08	13.27	02.92	1.29E+00	.98
REOUBM2	IGR10D	006	.36	451.55	61.86	13.70	2.38E+00	.97
REOUBM2	IGR30D	002	.70	451.55	60.82	13.47	2.38E+00	.97
REOUBM2	IGR3D	005	.37	451.55	59.79	13.24	2.38E+00	.97
REOUBM2	IGR1D	009	.17	451.55	51.55	11.42	2.38E+00	.97

REOUBM2	RUGRINDR	003	.50	451.55	31.96	07.08	2.38E+00	.97
REOUBM2	RUGR30D	001	.74	451.55	30.93	06.85	2.38E+00	.97

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
REOUBM3	RUGR30D	001	.85	416.68	56.25	13.50	3.05E+03	.96
REOUBM3	RUGRINDR	002	.63	416.68	51.04	12.25	3.05E+03	.96
REOUBM3	CSGRINDR	003	.57	416.68	29.17	07.00	3.05E+03	.96
REOULU1	INDEPET	001	-.62	154.57	19.48	12.60	9.99E+09	.77
REOULU1	INDEPTB	002	.55	154.57	18.18	11.76	9.99E+09	.77
REOULU1	IGR30D	005	-.29	154.57	15.58	10.08	9.99E+09	.77
REOULU1	BRETHRAT	003	.44	154.57	09.09	05.88	9.99E+09	.77
REOULU2	INDEPET	001	-.79	124.72	23.53	18.87	9.99E+09	.85
REOULU2	INDEPTB	002	.65	124.72	18.82	15.09	9.99E+09	.85
REOULU2	BRETHRAT	003	.59	124.72	11.76	09.43	9.99E+09	.85
REOULU3	INDEPET	001	-.84	096.60	25.00	25.88	9.99E+09	.88
REOULU3	INDEPTB	002	.69	096.60	18.18	18.82	9.99E+09	.88
REOULU3	BRETHRAT	003	.69	096.60	15.91	16.47	9.99E+09	.88
REOUMB1	IGR10D	024	-.12	195.59	25.76	13.17	3.53E+00	.66
REOUMB1	IGR3D	052	-.07	195.59	25.76	13.17	3.53E+00	.66
REOUMB1	IGR30D	023	-.12	195.59	22.73	11.62	3.53E+00	.66
REOUMB1	IGR1D	034	-.10	195.59	21.21	10.84	3.53E+00	.66
REOUMB1	IANY-BL	002	.32	195.59	10.61	05.42	3.53E+00	.66
REOUMB1	INDEPET	001	.39	195.59	04.55	02.33	3.53E+00	.66
REOUMB1	ITC-BLAD	003	-.24	195.59	01.52	00.78	3.53E+00	.66
REOUMB2	SKINRES	002	.41	103.13	10.61	10.29	2.52E+00	.66
REOUMB2	INDEPET	001	.46	103.13	09.09	08.81	2.52E+00	.66
REOUMB2	ITC-THR	003	.31	103.13	03.03	02.94	2.52E+00	.66
REOUMB3	IGR30D	004	.29	218.10	29.17	13.37	1.94E+00	.72
REOUMB3	IGR10D	130	-.01	218.10	23.61	10.83	1.94E+00	.72
REOUMB3	SKINRES	001	.55	218.10	16.67	07.64	1.94E+00	.72
REOUMB3	RUGR30D	002	.36	218.10	12.50	05.73	1.94E+00	.72
REOUMB3	INDEPET	003	.36	218.10	04.17	01.91	1.94E+00	.72
REOUMT1	IGR10D	024	.12	278.99	39.51	14.16	1.34E+00	.81
REOUMT1	IGR30D	005	.30	278.99	39.51	14.16	1.34E+00	.81
REOUMT1	IGR3D	021	.13	278.99	38.27	13.72	1.34E+00	.81
REOUMT1	IGR1D	039	.10	278.99	30.86	11.06	1.34E+00	.81
REOUMT1	BRETHRAT	002	.47	278.99	11.11	03.98	1.34E+00	.81
REOUMT1	INDEPET	001	-.55	278.99	06.17	02.21	1.34E+00	.81
REOUMT1	INDEPTB	003	.38	278.99	04.94	01.77	1.34E+00	.81
REOUMT2	IGR10D	034	.10	255.38	26.51	10.38	2.48E+00	.83
REOUMT2	IGR3D	026	.11	255.38	26.51	10.38	2.48E+00	.83
REOUMT2	BRETHRAT	002	.52	255.38	12.05	04.72	2.48E+00	.83
REOUMT2	INDEPET	001	-.61	255.38	08.43	03.30	2.48E+00	.83
REOUMT2	INDEPTB	003	.46	255.38	07.23	02.83	2.48E+00	.83
REOUMT3	RUGR30D	004	.42	259.78	29.27	11.27	7.17E+00	.82
REOUMT3	RUGRINDR	009	.20	259.78	26.83	10.33	7.17E+00	.82
REOUMT3	BRETHRAT	002	.46	259.78	09.76	03.76	7.17E+00	.82
REOUMT3	INDEPET	001	-.56	259.78	06.10	02.35	7.17E+00	.82
REOUMT3	INDEPTB	003	.42	259.78	06.10	02.35	7.17E+00	.82
REOUSK1	IGR10D	023	-.12	268.37	37.97	14.15	3.82E+00	.79
REOUSK1	IGR30D	006	-.27	268.37	36.71	13.68	3.82E+00	.79
REOUSK1	IGR3D	027	-.11	268.37	35.44	13.21	3.82E+00	.79
REOUSK1	IGR1D	032	-.10	268.37	30.38	11.32	3.82E+00	.79
REOUSK1	BRETHRAT	002	-.48	268.37	11.39	04.24	3.82E+00	.79
REOUSK1	INDEPET	001	.52	268.37	06.33	02.36	3.82E+00	.79
REOUSK1	INDEPTB	003	-.37	268.37	05.06	01.89	3.82E+00	.79
REOUSK2	BRETHRAT	003	-.50	221.54	13.92	06.28	2.94E+00	.79
REOUSK2	SKINRES	002	.54	221.54	10.13	04.57	2.94E+00	.79
REOUSK2	INDEPET	001	.55	221.54	07.59	03.43	2.94E+00	.79
REOUSK3	SKINRES	001	.82	141.50	46.34	32.75	2.23E+00	.82
REOUSK3	BRETHRAT	003	-.44	141.50	07.32	05.17	2.23E+00	.82
REOUSK3	INDEPET	002	.52	141.50	06.10	04.31	2.23E+00	.82
REOUTH1	IANY-BL	004	.48	138.39	19.23	13.90	9.99E+09	.78
REOUTH1	ITC-THR	001	.62	138.39	12.82	09.26	9.99E+09	.78
REOUTH1	INDEPEXT	003	.50	138.39	10.26	07.41	9.99E+09	.78
REOUTH1	ITC-BLAD	002	-.56	138.39	08.97	06.48	9.99E+09	.78
REOUTH2	IANY-BL	004	.46	117.76	16.46	13.98	9.99E+09	.79
REOUTH2	ITC-THR	001	.65	117.76	12.66	10.75	9.99E+09	.79
REOUTH2	INDEPEXT	003	.54	117.76	11.39	09.67	9.99E+09	.79
REOUTH2	ITC-BLAD	002	-.58	117.76	08.86	07.52	9.99E+09	.79
REOUTH3	BRETHRAT	004	.56	106.14	17.28	16.28	9.99E+09	.81
REOUTH3	INDEPEXT	003	.58	106.14	12.35	11.64	9.99E+09	.81
REOUTH3	ITC-THR	001	.66	106.14	12.35	11.64	9.99E+09	.81
REOUTH3	IANY-BL	006	.40	106.14	11.11	10.47	9.99E+09	.81
REOUTH3	ITC-BLAD	002	-.60	106.14	08.64	08.14	9.99E+09	.81

RESULTS FOR THE 95TH PERCENTILE OF THE ENDPOINTS FOR THE UK1 SOURCE TERM

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
AEVAC	BBF-ET2	002	-.63	150.01	46.34	30.89	3.09E+00	.82
AEVAC	BBS-ET2	080	-.04	150.01	30.49	20.33	3.09E+00	.82
AEVAC	ET2-STOM	001	-.70	150.01	24.39	16.26	3.09E+00	.82
AEVAC	BRETHRAT	003	.52	150.01	13.41	08.94	3.09E+00	.82
AIOD	BRETHRAT	002	.64	107.17	21.69	20.24	3.31E+00	.83
AIOD	TETC-THR	001	.70	107.17	18.07	16.86	3.31E+00	.83
AIOD	INDEPEXT	003	.57	107.17	08.43	07.87	3.31E+00	.83
ASHEL	BBF-ET2	002	.56	146.89	39.24	26.71	2.09E+00	.79
ASHEL	BBS-ET2	064	.05	146.89	25.32	17.24	2.09E+00	.79
ASHEL	ET2-STOM	001	.64	146.89	21.52	14.65	2.09E+00	.79
ASHEL	BRETHRAT	003	-.49	146.89	12.66	08.62	2.09E+00	.79
DECMBM1	IGRINDR	003	.62	222.00	20.88	09.41	3.55E+00	.91
DECMBM1	BRETHRAT	001	.75	222.00	18.68	08.41	3.55E+00	.91
DECMBM1	LFGRCAR	002	.66	222.00	12.09	05.45	3.55E+00	.91
DECMBM2	LFCLNLIV	029	.11	228.27	34.78	15.24	3.31E+00	.92
DECMBM2	LFCLSHLT	013	.16	228.27	34.78	15.24	3.31E+00	.92
DECMBM2	LFGRSHLT	027	.11	228.27	23.91	10.47	3.31E+00	.92
DECMBM2	IGRINDR	003	.61	228.27	16.30	07.14	3.31E+00	.92
DECMBM2	BRETHRAT	001	.74	228.27	14.13	06.19	3.31E+00	.92
DECMBM2	LFGRCAR	002	.66	228.27	11.96	05.24	3.31E+00	.92
DECMBM3	LFCLNLIV	097	-.03	269.38	42.05	15.61	2.82E+00	.88
DECMBM3	LFGRSHLT	046	.07	269.38	42.05	15.61	2.82E+00	.88
DECMBM3	LFCLSHLT	009	.21	269.38	40.91	15.19	2.82E+00	.88
DECMBM3	LFGRNLVE	011	.17	269.38	38.64	14.34	2.82E+00	.88
DECMBM3	LFGRCAR	001	.51	269.38	11.36	04.22	2.82E+00	.88
DECMBM3	BRETHRAT	002	.45	269.38	04.55	01.69	2.82E+00	.88
DECMBM3	TETC-BNE	003	.39	269.38	02.27	00.84	2.82E+00	.88
DECMSK1	LFIHNLIV	001	.89	196.00	99.00	50.51	3.63E+00	1.00
DECMSK1	LFIHSHLT	005	.17	196.00	97.00	49.49	3.63E+00	1.00
DECMSK1	RB-INHAL	003	-.20	196.00	00.00	00.00	3.63E+00	1.00
DECMSK1	SKINRES	002	.71	196.00	00.00	00.00	3.63E+00	1.00
DECMSK2	LFIHNLIV	002	.67	198.99	98.99	49.75	3.24E+00	.99
DECMSK2	LFIHSHLT	003	.62	198.99	98.99	49.75	3.24E+00	.99
DECMSK2	SKINRES	001	.71	198.99	01.01	00.51	3.24E+00	.99
DECMSK3	LFIHSHLT	002	.47	190.62	94.79	49.73	2.04E+00	.96
DECMSK3	LFIHNLIV	011	.12	190.62	93.75	49.18	2.04E+00	.96
DECMSK3	SKINRES	001	.61	190.62	02.08	01.09	2.04E+00	.96
DECMSK3	IGRINDR	003	-.16	190.62	00.00	00.00	2.04E+00	.96
DECMTH1	BRETHRAT	001	.67	120.03	20.00	16.66	3.02E+01	.85
DECMTH1	LFIHNLIV	019	.14	120.03	20.00	16.66	3.02E+01	.85
DECMTH1	LFIHSHLT	108	.02	120.03	18.82	15.68	3.02E+01	.85
DECMTH1	TETC-THR	003	.59	120.03	08.24	06.86	3.02E+01	.85
DECMTH1	ITC-THR	002	.60	120.03	05.88	04.90	3.02E+01	.85
DECMTH2	BRETHRAT	001	.67	118.58	19.77	16.67	2.75E+01	.86
DECMTH2	LFIHNLIV	031	.10	118.58	16.28	13.73	2.75E+01	.86
DECMTH2	LFIHSHLT	067	.05	118.58	16.28	13.73	2.75E+01	.86
DECMTH2	TETC-THR	002	.64	118.58	09.30	07.84	2.75E+01	.86
DECMTH2	ITC-THR	003	.61	118.58	05.81	04.90	2.75E+01	.86
DECMTH3	BRETHRAT	002	.62	119.03	17.86	15.00	1.70E+01	.84
DECMTH3	TETC-THR	001	.70	119.03	16.67	14.00	1.70E+01	.84
DECMTH3	TEANY-BL	009	.23	119.03	13.10	11.01	1.70E+01	.84
DECMTH3	TEAT-BL	036	.10	119.03	11.90	10.00	1.70E+01	.84
DECMTH3	ITC-THR	003	.55	119.03	04.76	04.00	1.70E+01	.84
DELVBM1	IGR10D	001	.55	366.34	47.37	12.93	5.75E+00	.95
DELVBM1	IGR3D	002	.51	366.34	46.32	12.64	5.75E+00	.95
DELVBM1	LFGRNLVE	003	.47	366.34	35.79	09.77	5.75E+00	.95
DELVBM2	LFGRNLVE	003	.45	354.74	40.00	11.28	5.25E+00	.95
DELVBM2	IGR10D	002	.46	354.74	35.79	10.09	5.25E+00	.95
DELVBM2	IGR3D	004	.44	354.74	35.79	10.09	5.25E+00	.95
DELVBM2	RUGRINDR	001	.58	354.74	21.05	05.93	5.25E+00	.95
DELVBM3	LFGRNLVE	003	.45	358.49	39.36	10.98	4.90E+00	.94
DELVBM3	RUGRINDR	001	.61	358.49	23.40	06.53	4.90E+00	.94
DELVBM3	BRETHRAT	002	.47	358.49	03.19	00.89	4.90E+00	.94
DELVSK1	LFIHNLIV	002	.62	188.65	92.78	49.18	3.63E+00	.97
DELVSK1	LFIHSHLT	062	.06	188.65	90.72	48.09	3.63E+00	.97
DELVSK1	SKINRES	001	.82	188.65	05.15	02.73	3.63E+00	.97

DELVSK1	SRANY-BL	003	.19	188.65	00.00	00.00	3.63E+00	.97
DELVSK2	LFIHNLIV	002	.62	188.65	92.78	49.18	3.63E+00	.97
DELVSK2	LFIHSHLT	064	.05	188.65	90.72	48.09	3.63E+00	.97
DELVSK2	SKINRES	001	.82	188.65	05.15	02.73	3.63E+00	.97
DELVSK2	SRANY-BL	003	.17	188.65	00.00	00.00	3.63E+00	.97

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
DELVSK3	LFIHNLIV	002	.60	187.63	91.75	48.90	3.72E+00	.97
DELVSK3	LFIHSHLT	073	.05	187.63	89.69	47.80	3.72E+00	.97
DELVSK3	SKINRES	001	.82	187.63	06.19	03.30	3.72E+00	.97
DELVSK3	SRANY-BL	003	.20	187.63	00.00	00.00	3.72E+00	.97
DELVTH1	BRETHRAT	001	.71	118.41	22.99	19.42	2.34E+01	.87
DELVTH1	LFIHNLIV	012	.17	118.41	19.54	16.50	2.34E+01	.87
DELVTH1	LFIHSHLT	132	.00	118.41	19.54	16.50	2.34E+01	.87
DELVTH1	ITC-THR	002	.68	118.41	08.05	06.80	2.34E+01	.87
DELVTH1	ITC-BLAD	003	-.66	118.41	06.90	05.83	2.34E+01	.87
DELVTH2	BRETHRAT	001	.71	119.56	22.99	19.23	2.14E+01	.87
DELVTH2	LFIHNLIV	012	.18	119.56	19.54	16.34	2.14E+01	.87
DELVTH2	LFIHSHLT	129	-.01	119.56	19.54	16.34	2.14E+01	.87
DELVTH2	ITC-THR	002	.68	119.56	08.05	06.73	2.14E+01	.87
DELVTH2	ITC-BLAD	003	-.66	119.56	06.90	05.77	2.14E+01	.87
DELVTH3	BRETHRAT	001	.69	117.41	20.93	17.83	2.09E+01	.86
DELVTH3	LFIHNLIV	014	.16	117.41	19.77	16.84	2.09E+01	.86
DELVTH3	LFIHSHLT	133	.00	117.41	18.60	15.84	2.09E+01	.86
DELVTH3	ITC-THR	002	.64	117.41	06.98	05.94	2.09E+01	.86
DELVTH3	ITC-BLAD	003	-.62	117.41	05.81	04.95	2.09E+01	.86
DEOUBM1	IGR10D	001	.88	434.68	81.63	18.78	4.27E+00	.98
DEOUBM1	IGR3D	002	.83	434.68	80.61	18.54	4.27E+00	.98
DEOUBM1	IGR1D	034	-.09	434.68	56.12	12.91	4.27E+00	.98
DEOUBM1	IGR30D	070	-.05	434.68	56.12	12.91	4.27E+00	.98
DEOUBM1	RUGRINDR	003	.78	434.68	24.49	05.63	4.27E+00	.98
DEOUBM2	IGR3D	003	.75	438.78	71.43	16.28	3.89E+00	.98
DEOUBM2	IGR10D	002	.81	438.78	70.41	16.05	3.89E+00	.98
DEOUBM2	IGR1D	077	-.04	438.78	52.04	11.86	3.89E+00	.98
DEOUBM2	IGR30D	069	-.05	438.78	48.98	11.16	3.89E+00	.98
DEOUBM2	RUGRINDR	001	.84	438.78	37.76	08.61	3.89E+00	.98
DEOUBM3	IGR3D	003	.69	439.79	64.29	14.62	3.98E+00	.98
DEOUBM3	IGR10D	002	.75	439.79	62.24	14.15	3.98E+00	.98
DEOUBM3	IGR1D	071	-.04	439.79	48.98	11.14	3.98E+00	.98
DEOUBM3	RUGRINDR	001	.85	439.79	44.90	10.21	3.98E+00	.98
DEOUSK1	SKINRES	001	1.0	100.00	100.00	100.00	1.20E+00	.99
DEOUSK1	PUCS-CM	002	-.15	100.00	00.00	00.00	1.20E+00	.99
DEOUSK1	PUTS-RBM	003	.15	100.00	00.00	00.00	1.20E+00	.99
DEOUSK2	SKINRES	001	.99	100.00	100.00	100.00	1.17E+00	.99
DEOUSK2	CSANY-AT	003	.18	100.00	00.00	00.00	1.17E+00	.99
DEOUSK2	CSGR3Y	002	-.18	100.00	00.00	00.00	1.17E+00	.99
DEOUSK3	SKINRES	001	1.0	100.00	100.00	100.00	1.20E+00	.99
DEOUSK3	CSGR3Y	002	.17	100.00	00.00	00.00	1.20E+00	.99
DEOUSK3	PUTS-RBM	003	.15	100.00	00.00	00.00	1.20E+00	.99
DEOUTH1	BRETHRAT	001	.71	103.55	28.24	27.27	1.20E+01	.85
DEOUTH1	INDEPEXT	004	.65	103.55	14.12	13.64	1.20E+01	.85
DEOUTH1	ITC-THR	002	.70	103.55	10.59	10.23	1.20E+01	.85
DEOUTH1	ITC-BLAD	003	-.68	103.55	09.41	09.09	1.20E+01	.85
DEOUTH2	BRETHRAT	001	.71	101.19	27.06	26.74	1.10E+01	.85
DEOUTH2	INDEPEXT	004	.65	101.19	12.94	12.79	1.10E+01	.85
DEOUTH2	ITC-THR	002	.70	101.19	10.59	10.47	1.10E+01	.85
DEOUTH2	ITC-BLAD	003	-.68	101.19	09.41	09.30	1.10E+01	.85
DEOUTH3	BRETHRAT	001	.69	103.56	25.88	24.99	1.05E+01	.85
DEOUTH3	INDEPEXT	004	.62	103.56	11.76	11.36	1.05E+01	.85
DEOUTH3	ITC-BLAD	003	-.64	103.56	08.24	07.96	1.05E+01	.85
DEOUTH3	ITC-THR	002	.66	103.56	08.24	07.96	1.05E+01	.85
PECMBM	BRETHRAT	001	.82	156.85	39.77	25.36	3.98E+00	.88
PECMBM	INDEPEXT	002	.56	156.85	06.82	04.35	3.98E+00	.88
PECMBM	LFGRCAR	003	.49	156.85	06.82	04.35	3.98E+00	.88
PECMLU	INDEPET	001	-.85	101.10	25.84	25.56	2.95E+01	.89
PECMLU	INDEPTB	002	.72	101.10	19.10	18.89	2.95E+01	.89
PECMLU	BRETHRAT	003	.70	101.10	15.73	15.56	2.95E+01	.89
PECMMB	LFIHSHLT	004	.20	168.75	76.25	45.19	2.09E+00	.80
PECMMB	LFIHNLIV	068	.05	168.75	75.00	44.44	2.09E+00	.80
PECMMB	INDEPET	002	.22	168.75	01.25	00.74	2.09E+00	.80
PECMMB	SKINRES	003	.22	168.75	01.25	00.74	2.09E+00	.80
PECMMB	TETC-THR	001	.25	168.75	01.25	00.74	2.09E+00	.80
PECMMT	INDEPET	001	-.87	101.09	24.44	24.18	1.20E+01	.90
PECMMT	INDEPTB	002	.74	101.09	18.89	18.69	1.20E+01	.90
PECMMT	BRETHRAT	003	.73	101.09	15.56	15.39	1.20E+01	.90
PECMSK	LFIHNLIV	088	.03	144.38	45.68	31.64	7.76E+00	.81
PECMSK	LFIHSHLT	011	.17	144.38	45.68	31.64	7.76E+00	.81
PECMSK	INDEPET	001	.58	144.38	09.88	06.84	7.76E+00	.81

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
PECMSK	BRETHRAT	003	-.45	144.38	08.64	05.98	7.76E+00	.81
PECMSK	INDEPTB	002	-.45	144.38	08.64	05.98	7.76E+00	.81
PECMTH	TEANY-BL	008	.30	122.16	17.28	14.15	9.99E+09	.81
PECMTH	TEAT-BL	062	.06	122.16	16.05	13.14	9.99E+09	.81
PECMTH	TETC-THR	001	.64	122.16	14.81	12.12	9.99E+09	.81
PECMTH	IANY-BL	004	.45	122.16	12.35	10.11	9.99E+09	.81
PECMTH	INDEPEXT	003	.46	122.16	06.17	05.05	9.99E+09	.81
PECMTH	ITC-THR	002	.48	122.16	03.70	03.03	9.99E+09	.81
PELVBM	LFGRNLVE	004	.37	333.68	39.13	11.73	1.55E+01	.92
PELVBM	IGR30D	003	.39	333.68	25.00	07.49	1.55E+01	.92
PELVBM	RUGR30D	001	.56	333.68	20.65	06.19	1.55E+01	.92
PELVBM	BRETHRAT	002	.45	333.68	04.35	01.30	1.55E+01	.92
PELVLU	INDEPET	001	-.83	116.82	19.10	16.35	9.99E+09	.89
PELVLU	LFIHNLIV	012	.17	116.82	19.10	16.35	9.99E+09	.89
PELVLU	LFIHSHLT	126	.01	116.82	19.10	16.35	9.99E+09	.89
PELVLU	BRETHRAT	002	.67	116.82	13.48	11.54	9.99E+09	.89
PELVLU	INDEPTB	003	.66	116.82	13.48	11.54	9.99E+09	.89
PELVMB	LFIHNLIV	002	.35	187.94	84.62	45.03	4.90E+00	.91
PELVMB	LFIHSHLT	070	.05	187.94	83.52	44.44	4.90E+00	.91
PELVMB	SKINRES	001	.54	187.94	03.30	01.76	4.90E+00	.91
PELVMB	RUGR30D	003	.23	187.94	02.20	01.17	4.90E+00	.91
PELVMT	LFIHNLIV	007	.20	159.14	43.18	27.13	1.48E+01	.88
PELVMT	LFIHSHLT	084	.05	159.14	43.18	27.13	1.48E+01	.88
PELVMT	BRETHRAT	002	.58	159.14	10.23	06.43	1.48E+01	.88
PELVMT	INDEPET	001	-.67	159.14	07.95	05.00	1.48E+01	.88
PELVMT	INDEPTB	003	.52	159.14	06.82	04.29	1.48E+01	.88
PELVSK	LFIHNLIV	002	.46	179.77	87.23	48.52	4.90E+00	.94
PELVSK	LFIHSHLT	134	.00	179.77	84.04	46.75	4.90E+00	.94
PELVSK	SKINRES	001	.67	179.77	05.32	02.96	4.90E+00	.94
PELVSK	BRETHRAT	003	-.37	179.77	01.06	00.59	4.90E+00	.94
PELVTH	IANY-BL	006	.45	117.25	13.58	11.58	9.99E+09	.81
PELVTH	INDEPEXT	002	.57	117.25	12.35	10.53	9.99E+09	.81
PELVTH	ITC-THR	001	.63	117.25	09.88	08.43	9.99E+09	.81
PELVTH	ITC-BLAD	003	-.57	117.25	07.41	06.32	9.99E+09	.81
PEOUBM	RUGR30D	001	.83	414.74	54.74	13.20	1.55E+01	.95
PEOUBM	RUGRINDR	002	.59	414.74	50.53	12.18	1.55E+01	.95
PEOUBM	CSGRINDR	003	.51	414.74	28.42	06.85	1.55E+01	.95
PEOULU	INDEPET	001	-.85	104.57	25.00	23.91	9.99E+09	.88
PEOULU	INDEPTB	002	.70	104.57	18.18	17.39	9.99E+09	.88
PEOULU	BRETHRAT	003	.67	104.57	14.77	14.12	9.99E+09	.88
PEOUMB	RUGR30D	001	.68	274.63	46.99	17.11	2.14E+00	.83
PEOUMB	IGR30D	003	.34	274.63	20.48	07.46	2.14E+00	.83
PEOUMB	SKINRES	002	.43	274.63	04.82	01.76	2.14E+00	.83
PEOUMT	RUGR30D	001	.55	318.03	45.78	14.39	6.76E+00	.83
PEOUMT	RUGRINDR	006	.26	318.03	39.76	12.50	6.76E+00	.83
PEOUMT	BRETHRAT	003	.39	318.03	06.02	01.89	6.76E+00	.83
PEOUMT	INDEPET	002	-.41	318.03	02.41	00.76	6.76E+00	.83
PEOUSK	SKINRES	001	.90	098.82	75.58	76.48	1.55E+00	.86
PEOUSK	BRETHRAT	003	-.38	098.82	03.49	03.53	1.55E+00	.86
PEOUSK	INDEPET	002	.47	098.82	03.49	03.53	1.55E+00	.86
PEOUTH	BRETHRAT	004	.54	111.07	16.05	14.45	9.99E+09	.81
PEOUTH	IANY-BL	006	.42	111.07	12.35	11.12	9.99E+09	.81
PEOUTH	INDEPEXT	003	.58	111.07	12.35	11.12	9.99E+09	.81
PEOUTH	ITC-THR	001	.66	111.07	12.35	11.12	9.99E+09	.81
PEOUTH	ITC-BLAD	002	-.60	111.07	08.64	07.78	9.99E+09	.81
RECMBM1	LFCLNLIV	016	.13	239.30	26.97	11.27	9.99E+09	.89
RECMBM1	IGRINDR	003	.63	239.30	25.84	10.80	9.99E+09	.89
RECMBM1	LFCLSHLT	067	.05	239.30	25.84	10.80	9.99E+09	.89
RECMBM1	LFGRCAR	001	.66	239.30	15.73	06.57	9.99E+09	.89
RECMBM1	BRETHRAT	002	.66	239.30	13.48	05.63	9.99E+09	.89
RECMMB1	INDEPET	001	.77	105.94	22.89	21.61	9.99E+09	.83
RECMMB1	INDEPTB	002	-.64	105.94	20.48	19.33	9.99E+09	.83
RECMMB1	BRETHRAT	003	-.57	105.94	12.05	11.37	9.99E+09	.83
RECMMB1	IANY-BL	004	.47	105.94	10.84	10.23	9.99E+09	.83
RECMMB2	LFIHNLIV	089	.03	124.31	29.73	23.92	9.99E+09	.74
RECMMB2	LFIHSHLT	026	.10	124.31	29.73	23.92	9.99E+09	.74
RECMMB2	INDEPET	001	.56	124.31	10.81	08.70	9.99E+09	.74
RECMMB2	BRETHRAT	002	-.37	124.31	08.11	06.52	9.99E+09	.74
RECMMB2	INDEPTB	003	-.36	124.31	08.11	06.52	9.99E+09	.74
RECMMT1	INDEPET	001	-.46	099.85	11.86	11.88	2.45E+00	.59
RECMMT1	INDEPTB	003	.29	099.85	08.47	08.48	2.45E+00	.59

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
RECMMT1	BBF-ET2	002	-.30	099.85	05.08	05.09	2.45E+00	.59
RECMMT2	LFIHNLIV	003	.30	192.70	95.83	49.73	9.99E+09	.96
RECMMT2	LFIHSHLT	001	.37	192.70	95.83	49.73	9.99E+09	.96
RECMMT2	SKINRES	002	.36	192.70	00.00	00.00	9.99E+09	.96
RECMSK1	INDEPET	001	.78	101.18	23.81	23.53	9.99E+09	.84
RECMSK1	INDEPTB	002	-.65	101.18	20.24	20.00	9.99E+09	.84
RECMSK1	BRETHRAT	003	-.61	101.18	14.29	14.12	9.99E+09	.84
RECMSK1	IANY-BL	004	.50	101.18	10.71	10.59	9.99E+09	.84
RECMSK2	LFIHNLIV	030	.10	127.41	30.14	23.66	9.99E+09	.73
RECMSK2	LFIHSHLT	090	.03	127.41	30.14	23.66	9.99E+09	.73
RECMSK2	BRETHRAT	002	-.46	127.41	13.70	10.75	9.99E+09	.73
RECMSK2	INDEPET	001	.55	127.41	12.33	09.68	9.99E+09	.73
RECMSK2	INDEPTB	003	-.37	127.41	09.59	07.53	9.99E+09	.73
RECMTH1	INDEPTB	002	-.48	104.04	16.22	15.59	9.99E+09	.74
RECMTH1	IANY-BL	004	.37	104.04	14.86	14.28	9.99E+09	.74
RECMTH1	INDEPET	001	.56	104.04	12.16	11.69	9.99E+09	.74
RECMTH1	TETC-THR	003	.38	104.04	05.41	05.20	9.99E+09	.74
RECMTH2	INDEPEXT	002	.30	068.00	12.00	17.65	9.99E+09	.50
RECMTH2	TETC-THR	001	.30	068.00	06.00	08.82	9.99E+09	.50
RECMTH2	RUGRINDR	003	-.22	068.00	00.00	00.00	9.99E+09	.50
RELVBM1	LFGRNLVE	047	.06	195.80	22.92	11.71	1.32E+00	.48
RELVBM1	IGR30D	001	.18	195.80	18.75	09.58	1.32E+00	.48
RELVBM1	RB-INHAL	003	.17	195.80	04.17	02.13	1.32E+00	.48
RELVBM1	SRANY-BL	002	-.17	195.80	00.00	00.00	1.32E+00	.48
RELVMB1	INDEPTB	002	-.54	123.79	18.42	14.88	9.99E+09	.76
RELVMB1	INDEPET	001	.60	123.79	14.47	11.69	9.99E+09	.76
RELVMB1	IANY-BL	004	.37	123.79	13.16	10.63	9.99E+09	.76
RELVMB1	BRETHRAT	003	-.41	123.79	07.89	06.37	9.99E+09	.76
RELVMB2	LFIHNLIV	009	.19	128.55	25.00	19.45	9.99E+09	.84
RELVMB2	LFIHSHLT	111	-.02	128.55	23.81	18.52	9.99E+09	.84
RELVMB2	INDEPET	001	.70	128.55	14.29	11.12	9.99E+09	.84
RELVMB2	BRETHRAT	002	-.56	128.55	11.90	09.26	9.99E+09	.84
RELVMB2	INDEPTB	003	-.55	128.55	11.90	09.26	9.99E+09	.84
RELVMB3	RUGRINDR	003	-.18	071.40	00.00	00.00	9.99E+09	.42
RELVMB3	TETC-BNE	001	-.21	071.40	00.00	00.00	9.99E+09	.42
RELVMB3	TETC-THR	002	.18	071.40	00.00	00.00	9.99E+09	.42
RELVMT2	LFIHNLIV	023	.11	113.71	27.59	24.26	3.47E+00	.58
RELVMT2	LFIHSHLT	118	-.01	113.71	27.59	24.26	3.47E+00	.58
RELVMT2	BRETHRAT	002	.28	113.71	06.90	06.07	3.47E+00	.58
RELVMT2	INDEPET	001	-.29	113.71	05.17	04.55	3.47E+00	.58
RELVMT2	INDEPTB	003	.25	113.71	05.17	04.55	3.47E+00	.58
RELVSK1	BRETHRAT	002	-.56	127.94	17.72	13.85	9.99E+09	.79
RELVSK1	INDEPET	001	.65	127.94	17.72	13.85	9.99E+09	.79
RELVSK1	INDEPTB	003	-.52	127.94	15.19	11.87	9.99E+09	.79
RELVSK2	LFIHNLIV	010	.18	138.86	27.06	19.49	9.99E+09	.85
RELVSK2	LFIHSHLT	129	.01	138.86	25.88	18.64	9.99E+09	.85
RELVSK2	BRETHRAT	002	-.60	138.86	14.12	10.17	9.99E+09	.85
RELVSK2	INDEPET	001	.70	138.86	12.94	09.32	9.99E+09	.85
RELVSK2	INDEPTB	003	-.55	138.86	10.59	07.63	9.99E+09	.85
RELVTH1	IANY-BL	003	.43	117.30	20.00	17.05	9.99E+09	.75
RELVTH1	ITC-BLAD	002	-.46	117.30	06.67	05.69	9.99E+09	.75
RELVTH1	ITC-THR	001	.48	117.30	05.33	04.54	9.99E+09	.75
RELVTH2	INDEPEXT	003	.41	101.43	10.29	10.14	9.99E+09	.68
RELVTH2	ITC-BLAD	002	-.45	101.43	08.82	08.70	9.99E+09	.68
RELVTH2	ITC-THR	001	.46	101.43	07.35	07.25	9.99E+09	.68
RELVTH3	RUGRINDR	003	-.18	071.40	00.00	00.00	9.99E+09	.42
RELVTH3	TETC-BNE	001	-.21	071.40	00.00	00.00	9.99E+09	.42
RELVTH3	TETC-THR	002	.18	071.40	00.00	00.00	9.99E+09	.42
REOUBM2	IGR10D	010	.12	311.70	40.00	12.83	9.99E+09	.60
REOUBM2	IGR3D	044	.07	311.70	38.33	12.30	9.99E+09	.60
REOUBM2	IGR30D	020	.10	311.70	35.00	11.23	9.99E+09	.60
REOUBM2	IGR1D	049	.07	311.70	31.67	10.16	9.99E+09	.60
REOUBM2	RUGR30D	001	.21	311.70	23.33	07.48	9.99E+09	.60
REOUBM2	CM-INHAL	003	.16	311.70	01.67	00.54	9.99E+09	.60
REOUBM2	TELV-ULI	002	.16	311.70	01.67	00.54	9.99E+09	.60
REOUMB1	IGR10D	018	-.12	213.50	32.43	15.19	9.99E+09	.74
REOUMB1	IGR30D	007	-.25	213.50	32.43	15.19	9.99E+09	.74
REOUMB1	IGR3D	054	-.07	213.50	28.38	13.29	9.99E+09	.74
REOUMB1	IGR1D	050	-.07	213.50	21.62	10.13	9.99E+09	.74
REOUMB1	BRETHRAT	002	-.41	213.50	10.81	05.06	9.99E+09	.74
REOUMB1	INDEPET	001	.51	213.50	08.11	03.80	9.99E+09	.74

REOUMB1	INDEPTB	003	-.34	213.50	06.76	03.17	9.99E+09	.74
REOUMB2	SKINRES	002	.55	173.74	13.16	07.57	9.99E+09	.76
REOUMB2	BRETHRAT	003	-.44	173.74	11.84	06.81	9.99E+09	.76
REOUMB2	INDEPET	001	.57	173.74	10.53	06.06	9.99E+09	.76

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
REOUMB3	BBS-ET2	003	-.22	072.00	02.00	02.78	9.99E+09	.50
REOUMB3	TETC-THR	001	.23	072.00	02.00	02.78	9.99E+09	.50
REOUMB3	BBF-ET2	002	.22	072.00	00.00	00.00	9.99E+09	.50
REOUMT2	BRETHRAT	002	.32	180.05	10.77	05.98	2.00E+01	.65
REOUMT2	INDEPET	001	-.46	180.05	09.23	05.13	2.00E+01	.65
REOUMT2	INDEPTB	003	.29	180.05	07.69	04.27	2.00E+01	.65
REOUSK1	IGR10D	023	-.12	267.94	37.18	13.88	9.99E+09	.78
REOUSK1	IGR30D	005	-.27	267.94	37.18	13.88	9.99E+09	.78
REOUSK1	IGR3D	035	-.09	267.94	34.62	12.92	9.99E+09	.78
REOUSK1	IGR1D	050	-.08	267.94	29.49	11.01	9.99E+09	.78
REOUSK1	BRETHRAT	002	-.45	267.94	11.54	04.31	9.99E+09	.78
REOUSK1	INDEPET	001	.45	267.94	05.13	01.91	9.99E+09	.78
REOUSK1	SKINRES	003	.33	267.94	03.85	01.44	9.99E+09	.78
REOUSK2	SKINRES	001	.58	206.37	14.10	06.83	9.99E+09	.78
REOUSK2	BRETHRAT	003	-.50	206.37	12.82	06.21	9.99E+09	.78
REOUSK2	INDEPET	002	.55	206.37	08.97	04.35	9.99E+09	.78
REOUTH1	INDEPEXT	002	.35	131.73	08.33	06.32	9.99E+09	.60
REOUTH1	ITC-BLAD	001	-.37	131.73	06.67	05.06	9.99E+09	.60
REOUTH1	ITC-THR	003	.34	131.73	05.00	03.80	9.99E+09	.60
REOUTH2	INDEPEXT	003	.43	102.90	11.76	11.43	9.99E+09	.68
REOUTH2	BRETHRAT	004	.34	102.90	10.29	10.00	9.99E+09	.68
REOUTH2	ITC-THR	001	.48	102.90	10.29	10.00	9.99E+09	.68
REOUTH2	ITC-BLAD	002	-.43	102.90	07.35	07.14	9.99E+09	.68
REOUTH3	CSAT-BL	002	.20	073.78	02.17	02.94	9.99E+09	.46
REOUTH3	PUANY-AT	001	-.22	073.78	02.17	02.94	9.99E+09	.46
REOUTH3	TETC-THR	003	.19	073.78	02.17	02.94	9.99E+09	.46

RESULTS FOR THE 99TH PERCENTILE OF THE ENDPOINTS FOR THE UK1 SOURCE TERM

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
AEVAC	BBF-ET2	002	-.63	150.55	45.78	30.41	4.07E+00	.83
AEVAC	BBS-ET2	064	-.05	150.55	30.12	20.01	4.07E+00	.83
AEVAC	ET2-STOM	001	-.70	150.55	24.10	16.01	4.07E+00	.83
AEVAC	BRETHRAT	003	.54	150.55	13.25	08.80	4.07E+00	.83
AIOD	BRETHRAT	002	.63	110.78	20.48	18.49	3.72E+00	.83
AIOD	TETC-THR	001	.72	110.78	20.48	18.49	3.72E+00	.83
AIOD	TEANY-BL	012	.21	110.78	12.05	10.88	3.72E+00	.83
AIOD	TEAT-BL	025	.12	110.78	12.05	10.88	3.72E+00	.83
AIOD	INDEPEXT	003	.54	110.78	07.23	06.53	3.72E+00	.83
ASHEL	BBF-ET2	002	.53	145.92	44.59	30.56	2.95E+00	.74
ASHEL	BBS-ET2	079	.04	145.92	29.73	20.37	2.95E+00	.74
ASHEL	ET2-STOM	001	.57	145.92	20.27	13.89	2.95E+00	.74
ASHEL	BRETHRAT	003	-.37	145.92	08.11	05.56	2.95E+00	.74
DECMBM1	BRETHRAT	001	.80	201.10	22.83	11.35	3.80E+00	.92
DECMBM1	IGRINDR	003	.65	201.10	21.74	10.81	3.80E+00	.92
DECMBM1	LFGRCAR	002	.68	201.10	11.96	05.95	3.80E+00	.92
DECMBM2	BRETHRAT	001	.81	173.31	31.11	17.95	3.09E+00	.90
DECMBM2	LFGRCAR	003	.55	173.31	07.78	04.49	3.09E+00	.90
DECMBM2	INDEPEXT	002	.55	173.31	05.56	03.21	3.09E+00	.90
DECMBM3	BRETHRAT	001	.81	181.09	31.11	17.18	2.00E+00	.90
DECMBM3	IGRINDR	003	.57	181.09	20.00	11.04	2.00E+00	.90
DECMBM3	LFGRCAR	002	.75	181.09	20.00	11.04	2.00E+00	.90
DECMSK1	LFIHNLIV	001	.85	197.00	99.00	50.25	3.72E+00	1.00
DECMSK1	LFIHSHLT	003	.50	197.00	98.00	49.75	3.72E+00	1.00
DECMSK1	SKINRES	002	.74	197.00	00.00	00.00	3.72E+00	1.00
DECMSK2	LFIHSHLT	002	.71	194.90	97.96	50.26	2.14E+00	.98
DECMSK2	LFIHNLIV	010	.12	194.90	95.92	49.21	2.14E+00	.98
DECMSK2	SKINRES	001	.72	194.90	01.02	00.52	2.14E+00	.98
DECMSK2	SRF1	003	.15	194.90	00.00	00.00	2.14E+00	.98
DECMSK3	LFIHSHLT	001	.77	192.93	96.97	50.26	1.74E+00	.99
DECMSK3	LFIHNLIV	099	-.02	192.93	93.94	48.69	1.74E+00	.99
DECMSK3	SKINRES	002	.77	192.93	02.02	01.05	1.74E+00	.99
DECMSK3	PUCS-CV	003	.21	192.93	00.00	00.00	1.74E+00	.99
DECMTH1	BRETHRAT	001	.67	122.07	19.77	16.20	2.95E+01	.86
DECMTH1	LFIHNLIV	019	.14	122.07	19.77	16.20	2.95E+01	.86
DECMTH1	LFIHSHLT	096	.03	122.07	19.77	16.20	2.95E+01	.86
DECMTH1	TETC-THR	003	.60	122.07	08.14	06.67	2.95E+01	.86
DECMTH1	ITC-THR	002	.61	122.07	05.81	04.76	2.95E+01	.86
DECMTH2	TETC-THR	001	.72	122.61	20.24	16.51	2.95E+01	.84
DECMTH2	BRETHRAT	002	.60	122.61	16.67	13.60	2.95E+01	.84
DECMTH2	TEANY-BL	008	.26	122.61	15.48	12.63	2.95E+01	.84
DECMTH2	TEAT-BL	037	.09	122.61	13.10	10.68	2.95E+01	.84
DECMTH2	INDEPEXT	003	.53	122.61	07.14	05.82	2.95E+01	.84
DECMTH3	BRETHRAT	002	.64	113.07	20.24	17.90	2.19E+01	.84
DECMTH3	TETC-THR	001	.69	113.07	16.67	14.74	2.19E+01	.84
DECMTH3	TEANY-BL	009	.25	113.07	11.90	10.52	2.19E+01	.84
DECMTH3	INDEPEXT	003	.57	113.07	08.33	07.37	2.19E+01	.84
DELVBM1	IGR10D	001	.51	359.57	46.81	13.02	5.62E+00	.94
DELVBM1	IGR3D	002	.49	359.57	45.74	12.72	5.62E+00	.94
DELVBM1	LFGRNLVE	003	.45	359.57	35.11	09.76	5.62E+00	.94
DELVBM2	LFGRNLVE	003	.43	344.67	37.23	10.80	5.13E+00	.94
DELVBM2	RUGRINDR	001	.62	344.67	26.60	07.72	5.13E+00	.94
DELVBM2	BRETHRAT	002	.51	344.67	04.26	01.24	5.13E+00	.94
DELVBM3	LFGRNLVE	003	.45	347.84	38.30	11.01	4.79E+00	.94
DELVBM3	RUGRINDR	001	.62	347.84	25.53	07.34	4.79E+00	.94
DELVBM3	BRETHRAT	002	.48	347.84	03.19	00.92	4.79E+00	.94
DELVSK1	LFIHNLIV	002	.62	188.65	92.78	49.18	3.63E+00	.97
DELVSK1	LFIHSHLT	065	.05	188.65	90.72	48.09	3.63E+00	.97
DELVSK1	SKINRES	001	.82	188.65	05.15	02.73	3.63E+00	.97
DELVSK1	SRANY-BL	003	.19	188.65	00.00	00.00	3.63E+00	.97
DELVSK2	LFIHNLIV	002	.60	187.63	91.75	48.90	3.80E+00	.97
DELVSK2	LFIHSHLT	074	.05	187.63	89.69	47.80	3.80E+00	.97
DELVSK2	SKINRES	001	.82	187.63	06.19	03.30	3.80E+00	.97
DELVSK2	SRANY-BL	003	.18	187.63	00.00	00.00	3.80E+00	.97

DELVSK3	LFIHNLIV	002	.60	189.69	92.78	48.91	3.72E+00	.97
DELVSK3	LFIHSHLT	073	.05	189.69	90.72	47.83	3.72E+00	.97
DELVSK3	SKINRES	001	.82	189.69	06.19	03.26	3.72E+00	.97
DELVSK3	SRANY-BL	003	.19	189.69	00.00	00.00	3.72E+00	.97

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
DELVTH1	BRETHRAT	001	.71	117.26	22.99	19.61	2.29E+01	.87
DELVTH1	LFIHNLIV	011	.18	117.26	19.54	16.66	2.29E+01	.87
DELVTH1	LFIHSHLT	124	-.01	117.26	19.54	16.66	2.29E+01	.87
DELVTH1	ITC-THR	002	.69	117.26	09.20	07.85	2.29E+01	.87
DELVTH1	ITC-BLAD	003	-.66	117.26	06.90	05.88	2.29E+01	.87
DELVTH2	BRETHRAT	001	.68	120.89	20.93	17.31	2.57E+01	.86
DELVTH2	LFIHNLIV	018	.16	120.89	18.60	15.39	2.57E+01	.86
DELVTH2	LFIHSHLT	134	.00	120.89	18.60	15.39	2.57E+01	.86
DELVTH2	TETC-THR	003	.61	120.89	08.14	06.73	2.57E+01	.86
DELVTH2	ITC-THR	002	.61	120.89	05.81	04.81	2.57E+01	.86
DELVTH3	BRETHRAT	001	.70	118.42	21.84	18.44	2.09E+01	.87
DELVTH3	LFIHNLIV	014	.16	118.42	19.54	16.50	2.09E+01	.87
DELVTH3	LFIHSHLT	136	.00	118.42	18.39	15.53	2.09E+01	.87
DELVTH3	ITC-THR	002	.65	118.42	06.90	05.83	2.09E+01	.87
DELVTH3	ITC-BLAD	003	-.63	118.42	05.75	04.86	2.09E+01	.87
DEOUBM1	IGR3D	002	.74	430.91	79.38	18.42	4.57E+00	.97
DEOUBM1	IGR10D	001	.79	430.91	78.35	18.18	4.57E+00	.97
DEOUBM1	IGR1D	072	-.05	430.91	54.64	12.68	4.57E+00	.97
DEOUBM1	IGR30D	049	-.07	430.91	53.61	12.44	4.57E+00	.97
DEOUBM1	RUGRINDR	003	.70	430.91	26.80	06.22	4.57E+00	.97
DEOUBM2	IGR3D	003	.65	436.09	63.92	14.66	4.07E+00	.97
DEOUBM2	IGR10D	002	.72	436.09	61.86	14.19	4.07E+00	.97
DEOUBM2	IGR1D	070	-.05	436.09	48.45	11.11	4.07E+00	.97
DEOUBM2	RUGRINDR	001	.84	436.09	46.39	10.64	4.07E+00	.97
DEOUBM3	IGR3D	003	.59	429.16	60.42	14.08	3.98E+00	.96
DEOUBM3	IGR10D	002	.65	429.16	57.29	13.35	3.98E+00	.96
DEOUBM3	RUGRINDR	001	.83	429.16	50.00	11.65	3.98E+00	.96
DEOUBM3	IGR1D	047	-.07	429.16	45.83	10.68	3.98E+00	.96
DEOUSK1	SKINRES	001	1.0	100.00	100.00	100.00	1.20E+00	.99
DEOUSK1	PUCS-CM	003	-.15	100.00	00.00	00.00	1.20E+00	.99
DEOUSK1	PUTS-RBM	002	.16	100.00	00.00	00.00	1.20E+00	.99
DEOUSK2	SKINRES	001	1.0	100.00	100.00	100.00	1.20E+00	.99
DEOUSK2	RUANY-AT	003	-.19	100.00	00.00	00.00	1.20E+00	.99
DEOUSK2	ZRGR30D	002	-.22	100.00	00.00	00.00	1.20E+00	.99
DEOUSK3	SKINRES	001	1.0	100.00	100.00	100.00	1.20E+00	.99
DEOUSK3	IGR1D	002	.21	100.00	00.00	00.00	1.20E+00	.99
DEOUSK3	NP-INHAL	003	.19	100.00	00.00	00.00	1.20E+00	.99
DEOUTH1	BRETHRAT	001	.71	102.37	28.24	27.59	1.29E+01	.85
DEOUTH1	INDEPEXT	004	.65	102.37	14.12	13.79	1.29E+01	.85
DEOUTH1	ITC-THR	002	.70	102.37	10.59	10.34	1.29E+01	.85
DEOUTH1	ITC-BLAD	003	-.68	102.37	09.41	09.19	1.29E+01	.85
DEOUTH2	BRETHRAT	001	.67	107.11	25.00	23.34	1.29E+01	.84
DEOUTH2	TETC-THR	002	.64	107.11	11.90	11.11	1.29E+01	.84
DEOUTH2	INDEPEXT	005	.60	107.11	10.71	10.00	1.29E+01	.84
DEOUTH2	ITC-THR	003	.63	107.11	07.14	06.67	1.29E+01	.84
DEOUTH3	BRETHRAT	001	.70	102.37	25.88	25.28	1.02E+01	.85
DEOUTH3	INDEPEXT	004	.63	102.37	11.76	11.49	1.02E+01	.85
DEOUTH3	ITC-THR	002	.67	102.37	09.41	09.19	1.02E+01	.85
DEOUTH3	ITC-BLAD	003	-.65	102.37	08.24	08.05	1.02E+01	.85
PECMBM	BRETHRAT	001	.89	137.73	56.67	41.15	1.66E+00	.90
PECMBM	INDEPRT	005	.39	137.73	14.44	10.48	1.66E+00	.90
PECMBM	INDEPEXT	002	.65	137.73	08.89	06.45	1.66E+00	.90
PECMBM	TETC-BNE	003	.50	137.73	03.33	02.42	1.66E+00	.90
PECMLU	INDEPET	001	-.83	098.87	25.29	25.58	3.39E+01	.87
PECMLU	INDEPTB	003	.68	098.87	18.39	18.60	3.39E+01	.87
PECMLU	BRETHRAT	002	.68	098.87	16.09	16.27	3.39E+01	.87
PECMMB	SKINRES	001	.36	095.78	14.89	15.55	2.00E+00	.47
PECMMB	LFIHNLIV	064	-.05	095.78	10.64	11.11	2.00E+00	.47
PECMMB	LFIHSHLT	020	.10	095.78	10.64	11.11	2.00E+00	.47
PECMMB	TETC-THR	002	.29	095.78	10.64	11.11	2.00E+00	.47
PECMMB	RUAT-BL	003	.14	095.78	00.00	00.00	2.00E+00	.47
PECMMT	INDEPET	001	-.86	103.33	22.22	21.50	1.86E+01	.90
PECMMT	INDEPTB	002	.73	103.33	17.78	17.21	1.86E+01	.90
PECMMT	BRETHRAT	003	.72	103.33	15.56	15.06	1.86E+01	.90
PECMSK	INDEPET	001	.75	104.75	17.86	17.05	4.37E+00	.84
PECMSK	INDEPTB	002	-.62	104.75	16.67	15.91	4.37E+00	.84
PECMSK	BRETHRAT	003	-.60	104.75	15.48	14.78	4.37E+00	.84
PECMTH	TEANY-BL	008	.31	122.17	17.28	14.14	9.99E+09	.81
PECMTH	TEAT-BL	072	.05	122.17	16.05	13.14	9.99E+09	.81
PECMTH	TETC-THR	001	.65	122.17	14.81	12.12	9.99E+09	.81
PECMTH	IANY-BL	005	.43	122.17	12.35	10.11	9.99E+09	.81

PECMTH	INDEPEXT	002	.46	122.17	06.17	05.05	9.99E+09	.81
PECMTH	ITC-THR	003	.46	122.17	02.47	02.02	9.99E+09	.81

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
PELVBM	LFGRNLVE	003	.37	331.87	40.66	12.25	1.29E+01	.91
PELVBM	RUGR30D	001	.61	331.87	28.57	08.61	1.29E+01	.91
PELVBM	RUGRINDR	002	.38	331.87	27.47	08.28	1.29E+01	.91
PELVLU	INDEPET	001	-.77	113.95	18.60	16.32	4.79E+03	.86
PELVLU	INDEPTB	002	.66	113.95	16.28	14.29	4.79E+03	.86
PELVLU	LFIHNLIV	008	.20	113.95	16.28	14.29	4.79E+03	.86
PELVLU	BRETHRAT	003	.66	113.95	15.12	13.27	4.79E+03	.86
PELVLU	LFIHSHLT	053	-.06	113.95	15.12	13.27	4.79E+03	.86
PELVMB	LFIHNLIV	002	.32	174.63	71.08	40.70	2.88E+00	.83
PELVMB	LFIHSHLT	056	-.06	174.63	68.67	39.32	2.88E+00	.83
PELVMB	SKINRES	001	.41	174.63	03.61	02.07	2.88E+00	.83
PELVMB	ITC-BLAD	003	-.31	174.63	01.20	00.69	2.88E+00	.83
PELVMT	LFIHNLIV	009	.15	156.52	48.19	30.79	1.74E+01	.83
PELVMT	LFIHSHLT	054	.07	156.52	48.19	30.79	1.74E+01	.83
PELVMT	BRETHRAT	002	.48	156.52	08.43	05.39	1.74E+01	.83
PELVMT	INDEPET	001	-.54	156.52	06.02	03.85	1.74E+01	.83
PELVMT	INDEPTB	003	.44	156.52	06.02	03.85	1.74E+01	.83
PELVSK	LFIHNLIV	004	.36	168.88	76.67	45.40	3.55E+00	.90
PELVSK	LFIHSHLT	106	-.02	168.88	74.44	44.08	3.55E+00	.90
PELVSK	SKINRES	001	.62	168.88	06.67	03.95	3.55E+00	.90
PELVSK	BRETHRAT	002	-.45	168.88	03.33	01.97	3.55E+00	.90
PELVSK	INDEPET	003	.36	168.88	02.22	01.31	3.55E+00	.90
PELVTH	IANY-BL	006	.42	116.03	13.58	11.70	9.99E+09	.81
PELVTH	INDEPEXT	003	.54	116.03	11.11	09.58	9.99E+09	.81
PELVTH	ITC-THR	001	.63	116.03	09.88	08.52	9.99E+09	.81
PELVTH	ITC-BLAD	002	-.58	116.03	07.41	06.39	9.99E+09	.81
PEOUBM	RUGR30D	001	.82	402.11	58.51	14.55	1.70E+01	.94
PEOUBM	RUGRINDR	003	.55	402.11	51.06	12.70	1.70E+01	.94
PEOUBM	CSGRINDR	002	.57	402.11	30.85	07.67	1.70E+01	.94
PEOULU	INDEPET	001	-.80	107.09	24.71	23.07	9.99E+09	.85
PEOULU	INDEPTB	002	.64	107.09	17.65	16.48	9.99E+09	.85
PEOULU	BRETHRAT	003	.58	107.09	11.76	10.98	9.99E+09	.85
PEOUMB	RUGR30D	001	.67	256.63	61.84	24.10	2.09E+00	.76
PEOUMB	RUGRINDR	036	.08	256.63	30.26	11.79	2.09E+00	.76
PEOUMB	CSGRINDR	003	.23	256.63	19.74	07.69	2.09E+00	.76
PEOUMB	SKINRES	002	.26	256.63	01.32	00.51	2.09E+00	.76
PEOUMT	RUGR30D	004	.40	253.75	28.75	11.33	8.51E+00	.80
PEOUMT	BRETHRAT	003	.44	253.75	10.00	03.94	8.51E+00	.80
PEOUMT	INDEPTB	002	.46	253.75	08.75	03.45	8.51E+00	.80
PEOUMT	INDEPET	001	-.54	253.75	07.50	02.96	8.51E+00	.80
PEOUSK	SKINRES	001	.90	094.13	78.82	83.74	2.14E+00	.85
PEOUSK	INDEPET	002	.45	094.13	03.53	03.75	2.14E+00	.85
PEOUSK	INDEPTB	003	-.30	094.13	02.35	02.50	2.14E+00	.85
PEOUTH	IANY-BL	006	.41	130.44	13.92	10.67	9.99E+09	.79
PEOUTH	INDEPEXT	003	.52	130.44	10.13	07.77	9.99E+09	.79
PEOUTH	ITC-THR	001	.61	130.44	10.13	07.77	9.99E+09	.79
PEOUTH	ITC-BLAD	002	-.58	130.44	08.86	06.79	9.99E+09	.79
RECMBM2	BRETHRAT	001	.19	087.50	07.50	08.57	9.99E+09	.40
RECMBM2	LFIHNLIV	002	.18	087.50	02.50	02.86	9.99E+09	.40
RECMBM2	TETC-BNE	003	.17	087.50	02.50	02.86	9.99E+09	.40
RECMLU1	ET1-ENV	001	.20	089.66	05.13	05.72	6.61E+00	.39
RECMLU1	TETC-ULI	003	.15	089.66	02.56	02.86	6.61E+00	.39
RECMLU1	RUGRINDR	002	.16	089.66	00.00	00.00	6.61E+00	.39
RECMLU2	INDEPET	001	-.64	110.57	21.05	19.04	9.99E+09	.76
RECMLU2	LFIHNLIV	013	.13	110.57	15.79	14.28	9.99E+09	.76
RECMLU2	LFIHSHLT	087	-.04	110.57	14.47	13.09	9.99E+09	.76
RECMLU2	INDEPTB	003	.46	110.57	13.16	11.90	9.99E+09	.76
RECMLU2	BRETHRAT	002	.47	110.57	11.84	10.71	9.99E+09	.76
RECMLU2	IANY-BL	004	-.44	110.57	11.84	10.71	9.99E+09	.76
RECMMB1	INDEPTB	002	-.49	112.56	18.06	16.04	4.79E+00	.72
RECMMB1	INDEPET	001	.60	112.56	15.28	13.57	4.79E+00	.72
RECMMB1	IANY-BL	003	.37	112.56	12.50	11.11	4.79E+00	.72
RECMMB2	LFIHNLIV	106	.02	131.47	22.86	17.39	3.31E+00	.70
RECMMB2	LFIHSHLT	041	.09	131.47	22.86	17.39	3.31E+00	.70
RECMMB2	TETC-THR	002	.39	131.47	07.14	05.43	3.31E+00	.70
RECMMB2	INDEPTB	003	-.29	131.47	05.71	04.34	3.31E+00	.70
RECMMB2	INDEPET	001	.41	131.47	04.29	03.26	3.31E+00	.70
RECMMB3	BRETHRAT	003	.18	080.34	04.35	05.41	9.99E+09	.46

RECMMB3	TETC-THR	001	.22	080.34	04.35	05.41	9.99E+09	.46
RECMMB3	BBS-ET2	002	-.18	080.34	02.17	02.70	9.99E+09	.46

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
RECMMT2	INDEPET	001	-.68	094.62	20.00	21.14	2.00E+01	.75
RECMMT2	INDEPTB	002	.45	094.62	13.33	14.09	2.00E+01	.75
RECMMT2	BRETHRAT	003	.42	094.62	08.00	08.45	2.00E+01	.75
RECMSK1	INDEPET	001	.57	095.43	20.00	20.96	3.37E+00	.65
RECMSK1	BRETHRAT	002	-.38	095.43	13.85	14.51	3.37E+00	.65
RECMSK1	INDEPTB	003	-.34	095.43	10.77	11.29	3.37E+00	.65
RECMSK2	INDEPET	001	.66	109.24	19.74	18.07	7.90E+00	.76
RECMSK2	INDEPTB	002	-.54	109.24	18.42	16.86	7.90E+00	.76
RECMSK2	BRETHRAT	003	-.45	109.24	10.53	09.64	7.90E+00	.76
RECMTH1	IANY-BL	002	.58	122.87	22.89	18.63	9.99E+09	.83
RECMTH1	INDEPTB	003	-.54	122.87	12.05	09.81	9.99E+09	.83
RECMTH1	INDEPET	001	.62	122.87	08.43	06.86	9.99E+09	.83
RECMTH2	TEANY-BL	008	.31	119.01	17.72	14.89	9.99E+09	.79
RECMTH2	TEAT-BL	116	.02	119.01	15.19	12.76	9.99E+09	.79
RECMTH2	TETC-THR	001	.60	119.01	11.39	09.57	9.99E+09	.79
RECMTH2	INDEPEXT	003	.44	119.01	06.33	05.32	9.99E+09	.79
RECMTH2	ITC-THR	002	.48	119.01	03.80	03.19	9.99E+09	.79
RECMTH3	BRETHRAT	003	.18	080.34	04.35	05.41	9.99E+09	.46
RECMTH3	TETC-THR	001	.22	080.34	04.35	05.41	9.99E+09	.46
RECMTH3	BBS-ET2	002	-.18	080.34	02.17	02.70	9.99E+09	.46
RELVBM2	LFGRNLVE	004	.32	336.64	38.89	11.55	9.99E+09	.90
RELVBM2	IGR30D	003	.33	336.64	27.78	08.25	9.99E+09	.90
RELVBM2	RUGR30D	001	.45	336.64	16.67	04.95	9.99E+09	.90
RELVBM2	BRETHRAT	002	.40	336.64	03.33	00.99	9.99E+09	.90
RELVLU1	INDEPET	001	-.43	177.36	14.52	08.19	9.99E+09	.62
RELVLU1	INDEPTB	002	.24	177.36	06.45	03.64	9.99E+09	.62
RELVLU1	PUCS-CM	003	.21	177.36	01.61	00.91	9.99E+09	.62
RELVLU2	INDEPET	001	-.65	111.14	27.78	25.00	9.99E+09	.72
RELVLU2	LFIHNLIV	010	.13	111.14	18.06	16.25	9.99E+09	.72
RELVLU2	LFIHSHLT	091	-.04	111.14	16.67	15.00	9.99E+09	.72
RELVLU2	IANY-BL	002	-.47	111.14	15.28	13.75	9.99E+09	.72
RELVLU2	INDEPTB	003	.39	111.14	11.11	10.00	9.99E+09	.72
RELVLU3	IANY-BL	002	-.19	075.51	06.67	08.83	9.99E+09	.45
RELVLU3	BRETHRAT	001	.21	075.51	04.44	05.88	9.99E+09	.45
RELVLU3	INDEPTB	003	.17	075.51	04.44	05.88	9.99E+09	.45
RELVMB1	IANY-BL	003	.39	116.97	16.90	14.45	2.51E+00	.71
RELVMB1	INDEPTB	002	-.42	116.97	12.68	10.84	2.51E+00	.71
RELVMB1	INDEPET	001	.47	116.97	08.45	07.22	2.51E+00	.71
RELVMB2	BBF-ET2	002	.32	139.50	06.06	04.34	1.95E+00	.66
RELVMB2	INDEPET	001	.35	139.50	04.55	03.26	1.95E+00	.66
RELVMB2	ITC-BLAD	003	-.31	139.50	04.55	03.26	1.95E+00	.66
RELVMB3	LFIHNLIV	002	.41	188.06	90.22	47.97	9.99E+09	.92
RELVMB3	LFIHSHLT	101	.02	188.06	88.04	46.81	9.99E+09	.92
RELVMB3	SKINRES	001	.55	188.06	03.26	01.73	9.99E+09	.92
RELVMB3	INDEPET	003	.27	188.06	01.09	00.58	9.99E+09	.92
RELVMT2	LFIHNLIV	036	.09	130.06	18.57	14.28	2.00E+01	.70
RELVMT2	LFIHSHLT	132	.00	130.06	18.57	14.28	2.00E+01	.70
RELVMT2	INDEPET	001	-.52	130.06	11.43	08.79	2.00E+01	.70
RELVMT2	BRETHRAT	002	.39	130.06	10.00	07.69	2.00E+01	.70
RELVMT2	INDEPTB	003	.36	130.06	08.57	06.59	2.00E+01	.70
RELVMT3	LFIHNLIV	002	.25	174.99	79.76	45.58	8.13E+01	.84
RELVMT3	LFIHSHLT	105	.03	174.99	78.57	44.90	8.13E+01	.84
RELVMT3	BRETHRAT	001	.30	174.99	03.57	02.04	8.13E+01	.84
RELVMT3	INDEPET	003	-.23	174.99	00.00	00.00	8.13E+01	.84
RELVSK1	IANY-BL	002	.27	117.61	13.73	11.67	1.04E+00	.51
RELVSK1	INDEPET	001	.33	117.61	11.76	10.00	1.04E+00	.51
RELVSK1	INDEPTB	003	-.27	117.61	09.80	08.33	1.04E+00	.51
RELVSK2	IANY-BL	002	.26	102.00	14.00	13.73	1.09E+00	.50
RELVSK2	INDEPET	001	.34	102.00	14.00	13.73	1.09E+00	.50
RELVSK2	INDEPTB	003	-.25	102.00	10.00	09.80	1.09E+00	.50
RELVSK3	LFIHNLIV	002	.42	184.79	90.22	48.82	9.99E+09	.92
RELVSK3	LFIHSHLT	115	.01	184.79	88.04	47.64	9.99E+09	.92
RELVSK3	SKINRES	001	.56	184.79	03.26	01.76	9.99E+09	.92
RELVSK3	BRETHRAT	003	-.34	184.79	01.09	00.59	9.99E+09	.92
RELVTH1	IANY-BL	002	.56	126.25	25.00	19.80	9.99E+09	.80
RELVTH1	ITC-THR	001	.59	126.25	08.75	06.93	9.99E+09	.80
RELVTH1	ITC-BLAD	003	-.54	126.25	07.50	05.94	9.99E+09	.80
RELVTH2	IANY-BL	004	.48	120.00	17.50	14.58	9.99E+09	.80
RELVTH2	INDEPEXT	002	.55	120.00	11.25	09.38	9.99E+09	.80

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
RELVTH2	ITC-THR	001	.58	120.00	07.50	06.25	9.99E+09	.80
RELVTH2	ITC-BLAD	003	-.53	120.00	06.25	05.21	9.99E+09	.80

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
RELVTH3	BRETHRAT	001	.47	104.69	21.88	20.90	9.99E+09	.64
RELVTH3	LFIHNLIV	035	.08	104.69	14.06	13.43	9.99E+09	.64
RELVTH3	LFIHSHLT	117	-.01	104.69	12.50	11.94	9.99E+09	.64
RELVTH3	ITC-BLAD	002	-.40	104.69	06.25	05.97	9.99E+09	.64
RELVTH3	ITC-THR	003	.37	104.69	04.69	04.48	9.99E+09	.64
REOUBM2	INDEPRT	002	.19	166.60	04.44	02.67	1.00E+00	.45
REOUBM2	LFCLPROT	001	.21	166.60	02.22	01.33	1.00E+00	.45
REOUBM2	PUTC-ULI	003	-.15	166.60	02.22	01.33	1.00E+00	.45
REOULU1	INDEPET	001	-.53	150.01	18.57	12.38	9.99E+09	.70
REOULU1	IGR30D	005	-.24	150.01	15.71	10.47	9.99E+09	.70
REOULU1	INDEPTB	002	.45	150.01	15.71	10.47	9.99E+09	.70
REOULU1	BRETHRAT	003	.35	150.01	07.14	04.76	9.99E+09	.70
REOULU2	INDEPET	001	-.68	097.43	23.68	24.30	9.99E+09	.76
REOULU2	INDEPTB	002	.55	097.43	19.74	20.26	9.99E+09	.76
REOULU2	BRETHRAT	003	.50	097.43	13.16	13.51	9.99E+09	.76
REOULU3	BRETHRAT	001	.25	074.50	09.30	12.48	9.99E+09	.43
REOULU3	INDEPET	002	-.20	074.50	04.65	06.24	9.99E+09	.43
REOULU3	INDEPTB	003	.18	074.50	04.65	06.24	9.99E+09	.43
REOUMB1	ITC-THR	001	.36	103.69	08.93	08.61	2.34E+00	.56
REOUMB1	INDEPEXT	003	.24	103.69	05.36	05.17	2.34E+00	.56
REOUMB1	ITC-BLAD	002	-.32	103.69	05.36	05.17	2.34E+00	.56
REOUMB2	IGR30D	001	.37	205.69	33.80	16.43	1.91E+00	.71
REOUMB2	IGR10D	117	.01	205.69	25.35	12.32	1.91E+00	.71
REOUMB2	ITC-THR	002	.36	205.69	04.23	02.06	1.91E+00	.71
REOUMB2	INDEPET	003	.32	205.69	02.82	01.37	1.91E+00	.71
REOUMB3	SKINRES	001	.45	113.20	13.24	11.70	2.51E+00	.68
REOUMB3	INDEPTB	003	-.34	113.20	08.82	07.79	2.51E+00	.68
REOUMB3	INDEPET	002	.40	113.20	05.88	05.19	2.51E+00	.68
REOUMT3	INDEPET	001	-.42	128.00	14.04	10.97	2.75E+00	.57
REOUMT3	INDEPTB	002	.30	128.00	10.53	08.23	2.75E+00	.57
REOUMT3	BRETHRAT	003	.25	128.00	08.77	06.85	2.75E+00	.57
REOUSK1	INDEPET	001	.36	114.79	12.96	11.29	1.20E+00	.54
REOUSK1	IANY-BL	003	.25	114.79	09.26	08.07	1.20E+00	.54
REOUSK1	INDEPTB	002	-.28	114.79	09.26	08.07	1.20E+00	.54
REOUSK2	INDEPET	001	.43	092.55	18.52	20.01	1.12E+00	.54
REOUSK2	INDEPTB	002	-.30	092.55	12.96	14.00	1.12E+00	.54
REOUSK2	IANY-BL	003	.27	092.55	11.11	12.00	1.12E+00	.54
REOUSK3	SKINRES	001	.75	158.75	33.75	21.26	5.10E+00	.80
REOUSK3	BRETHRAT	003	-.47	158.75	11.25	07.09	5.10E+00	.80
REOUSK3	INDEPET	002	.49	158.75	05.00	03.15	5.10E+00	.80
REOUTH1	IANY-BL	004	.47	135.08	19.48	14.42	9.99E+09	.77
REOUTH1	ITC-THR	001	.62	135.08	12.99	09.62	9.99E+09	.77
REOUTH1	INDEPEXT	003	.50	135.08	10.39	07.69	9.99E+09	.77
REOUTH1	ITC-BLAD	002	-.56	135.08	07.79	05.77	9.99E+09	.77
REOUTH2	IANY-BL	005	.44	120.46	15.38	12.77	9.99E+09	.78
REOUTH2	ITC-THR	001	.64	120.46	12.82	10.64	9.99E+09	.78
REOUTH2	INDEPEXT	003	.54	120.46	11.54	09.58	9.99E+09	.78
REOUTH2	ITC-BLAD	002	-.57	120.46	08.97	07.45	9.99E+09	.78
REOUTH3	BRETHRAT	002	.58	098.72	22.37	22.66	9.99E+09	.76
REOUTH3	ITC-THR	001	.60	098.72	11.84	11.99	9.99E+09	.76
REOUTH3	INDEPEXT	004	.50	098.72	10.53	10.67	9.99E+09	.76
REOUTH3	ITC-BLAD	003	-.55	098.72	07.89	07.99	9.99E+09	.76

RESULTS FOR THE MEAN VALUE OF THE ENDPOINTS FOR THE CB2 SOURCE TERM

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
AEVAC	BBF-ET2	002	-.51	155.10	37.18	23.97	4.72E+02	.78
AEVAC	BBS-ET2	099	-.03	155.10	23.08	14.88	4.72E+02	.78
AEVAC	ET2-STOM	001	-.63	155.10	21.79	14.05	4.72E+02	.78
AEVAC	BRETHRAT	003	.42	155.10	10.26	06.62	4.72E+02	.78
AFBIBEE	BBF-ET2	002	-.42	144.77	32.84	22.68	1.05E+00	.67
AFBIBEE	BBS-ET2	114	.02	144.77	19.40	13.40	1.05E+00	.67
AFBIBEE	ET2-STOM	001	-.47	144.77	19.40	13.40	1.05E+00	.67
AFBIBEE	INDEPEXT	003	.26	144.77	02.99	02.07	1.05E+00	.67
AFBIGRA	BBF-ET2	002	-.51	155.10	37.18	23.97	1.08E+00	.78
AFBIGRA	BBS-ET2	094	-.03	155.10	23.08	14.88	1.08E+00	.78
AFBIGRA	ET2-STOM	001	-.63	155.10	21.79	14.05	1.08E+00	.78
AFBIGRA	BRETHRAT	003	.42	155.10	10.26	06.62	1.08E+00	.78
AFBIMIL	BBF-ET2	002	-.48	150.04	34.21	22.80	1.06E+00	.76
AFBIMIL	BBS-ET2	086	-.03	150.04	22.37	14.91	1.06E+00	.76
AFBIMIL	ET2-STOM	001	-.60	150.04	22.37	14.91	1.06E+00	.76
AFBIMIL	BRETHRAT	003	.41	150.04	10.53	07.02	1.06E+00	.76
AFBIVEG	CSGR1Y	001	.44	161.84	38.18	23.59	1.00E+00	.55
AFBIVEG	CSGR3Y	003	.17	161.84	16.36	10.11	1.00E+00	.55
AFBIVEG	STOM-SI	002	.19	161.84	03.64	02.25	1.00E+00	.55
AFBTBEE	CSGR30Y	001	.37	192.79	23.19	12.03	1.00E+00	.69
AFBTBEE	LFGRNLVL	027	.10	192.79	21.74	11.28	1.00E+00	.69
AFBTBEE	LFGRNLVE	095	-.03	192.79	20.29	10.52	1.00E+00	.69
AFBTBEE	CSGR10Y	002	.29	192.79	18.84	09.77	1.00E+00	.69
AFBTBEE	CSGR3Y	003	.24	192.79	11.59	06.01	1.00E+00	.69
AFBTGRA	CSGR3Y	001	.48	210.39	25.97	12.34	1.00E+00	.77
AFBTGRA	CSGR10Y	003	.29	210.39	15.58	07.41	1.00E+00	.77
AFBTGRA	ET2-STOM	002	-.31	210.39	03.90	01.85	1.00E+00	.77
AFBTMIL	CSGR10Y	003	.33	188.91	20.83	11.03	1.01E+00	.72
AFBTMIL	LFGRNLVL	015	.14	188.91	19.44	10.29	1.01E+00	.72
AFBTMIL	CSGR30Y	002	.34	188.91	18.06	09.56	1.01E+00	.72
AFBTMIL	CSGR3Y	001	.35	188.91	16.67	08.82	1.01E+00	.72
AFBTVEG	CSGR3Y	001	.66	224.74	40.00	17.80	1.01E+00	.85
AFBTVEG	LFGRNLVL	007	.19	224.74	27.06	12.04	1.01E+00	.85
AFBTVEG	LFGRNLVE	061	-.06	224.74	25.88	11.52	1.01E+00	.85
AFBTVEG	CSGR10Y	003	.42	224.74	23.53	10.47	1.01E+00	.85
AFBTVEG	CSGR1Y	002	.49	224.74	21.18	09.42	1.01E+00	.85
AIOD	BRETHRAT	001	.74	103.53	31.76	30.68	2.08E+01	.85
AIOD	INDEPEXT	004	.67	103.53	16.47	15.91	2.08E+01	.85
AIOD	ITC-BLAD	002	-.71	103.53	14.12	13.64	2.08E+01	.85
AIOD	ITC-THR	003	.70	103.53	11.76	11.36	2.08E+01	.85
ARELIN	BBF-ET2	002	-.51	153.82	37.18	24.17	4.72E+02	.78
ARELIN	BBS-ET2	095	-.03	153.82	23.08	15.00	4.72E+02	.78
ARELIN	ET2-STOM	001	-.63	153.82	21.79	14.17	4.72E+02	.78
ARELIN	BRETHRAT	003	.42	153.82	10.26	06.67	4.72E+02	.78
ARELTIM	CSGR3Y	001	.48	216.50	25.32	11.70	3.27E+01	.79
ARELTIM	CSGR1Y	002	.36	216.50	21.52	09.94	3.27E+01	.79
ARELTIM	ET2-STOM	003	-.36	216.50	05.06	02.34	3.27E+01	.79
ASHEL	BBF-ET2	002	-.51	153.82	35.90	23.34	1.60E+02	.78
ASHEL	BBS-ET2	101	-.03	153.82	23.08	15.00	1.60E+02	.78
ASHEL	ET2-STOM	001	-.62	153.82	21.79	14.17	1.60E+02	.78
ASHEL	BRETHRAT	003	.42	153.82	10.26	06.67	1.60E+02	.78
CDCMBM	CSWB2-UL	001	-.70	100.01	24.66	24.66	8.91E+00	.73
CDCMBM	CSGR30Y	003	.43	100.01	17.81	17.81	8.91E+00	.73
CDCMBM	CSGR100Y	006	.30	100.01	13.70	13.70	8.91E+00	.73
CDCMBM	CSTC-WB	002	.49	100.01	01.37	01.37	8.91E+00	.73
CDCMED	CSWB2-UL	001	-.56	106.25	18.75	17.65	1.22E+01	.64
CDCMED	CSGR30Y	003	.31	106.25	12.50	11.76	1.22E+01	.64
CDCMED	CSTC-WB	002	.34	106.25	00.00	00.00	1.22E+01	.64
CDCMTH	CSWB2-UL	001	-.68	110.97	23.29	20.99	7.56E+00	.73
CDCMTH	CSGR30Y	002	.47	110.97	21.92	19.75	7.56E+00	.73
CDCMTH	CSGR100Y	006	.32	110.97	16.44	14.81	7.56E+00	.73
CDCMTH	CSTC-WB	003	.46	110.97	01.37	01.23	7.56E+00	.73
CDLVBM	CSWB2-UL	001	-.78	072.42	31.58	43.61	9.08E+00	.76
CDLVBM	CSF1	003	.51	072.42	13.16	18.17	9.08E+00	.76
CDLVBM	CSTC-WB	002	.60	072.42	03.95	05.45	9.08E+00	.76

CDLVED	CSWB2-UL	001	-.69	072.48	28.99	40.00	9.50E+00	.69
CDLVED	CSF1	004	.38	072.48	10.14	13.99	9.50E+00	.69
CDLVED	CSWB-ULI	003	-.41	072.48	05.80	08.00	9.50E+00	.69
CDLVED	CSTC-WB	002	.49	072.48	02.90	04.00	9.50E+00	.69

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
CDLVTH	CSWB2-UL	001	-.71	076.35	23.68	31.02	6.01E+00	.76
CDLVTH	ITC-BLAD	002	-.57	076.35	10.53	13.79	6.01E+00	.76
CDLVTH	ITC-THR	003	.55	076.35	09.21	12.06	6.01E+00	.76
CDLVTH	CSF1	006	.40	076.35	07.89	10.33	6.01E+00	.76
DECMBM1	LFCLNLIV	008	.21	278.74	37.23	13.36	3.24E+00	.94
DECMBM1	LFCLSHLT	049	.07	278.74	34.04	12.21	3.24E+00	.94
DECMBM1	IGRINDR	002	.76	278.74	25.53	09.16	3.24E+00	.94
DECMBM1	BRETHRAT	001	.77	278.74	12.77	04.58	3.24E+00	.94
DECMBM1	LFGRCAR	003	.69	278.74	11.70	04.20	3.24E+00	.94
DECMBM2	LFCLNLIV	021	.13	299.99	51.09	17.03	3.20E+00	.92
DECMBM2	LFCLSHLT	019	.14	299.99	48.91	16.30	3.20E+00	.92
DECMBM2	LFGRNLVE	023	.13	299.99	36.96	12.32	3.20E+00	.92
DECMBM2	LFGRSHLT	120	.01	299.99	36.96	12.32	3.20E+00	.92
DECMBM2	LFGRNLVL	037	-.09	299.99	30.43	10.14	3.20E+00	.92
DECMBM2	IGRINDR	002	.44	299.99	11.96	03.99	3.20E+00	.92
DECMBM2	LFGRCAR	003	.43	299.99	06.52	02.17	3.20E+00	.92
DECMBM2	BRETHRAT	001	.53	299.99	04.35	01.45	3.20E+00	.92
DECMBM3	LFGRNLVE	020	.13	282.36	28.24	10.00	6.06E+00	.85
DECMBM3	BBF-ET2	002	.47	282.36	16.47	05.83	6.06E+00	.85
DECMBM3	CSGRINDR	003	.38	282.36	12.94	04.58	6.06E+00	.85
DECMBM3	ET2-STOM	001	.58	282.36	10.59	03.75	6.06E+00	.85
DECMSK1	LFIHNLIV	001	.91	196.00	99.00	50.51	3.44E+00	1.00
DECMSK1	LFIHSHLT	136	.00	196.00	97.00	49.49	3.44E+00	1.00
DECMSK1	RB-INHAL	003	-.17	196.00	00.00	00.00	3.44E+00	1.00
DECMSK1	SKINRES	002	.72	196.00	00.00	00.00	3.44E+00	1.00
DECMSK2	LFIHNLIV	001	.52	190.72	94.85	49.73	3.60E+00	.97
DECMSK2	LFIHSHLT	006	.23	190.72	93.81	49.19	3.60E+00	.97
DECMSK2	SKINRES	002	.45	190.72	01.03	00.54	3.60E+00	.97
DECMSK2	ET2-STOM	003	.42	190.72	00.00	00.00	3.60E+00	.97
DECMSK3	LFIHNLIV	011	.18	160.99	42.68	26.51	7.61E+00	.82
DECMSK3	LFIHSHLT	104	.03	160.99	42.68	26.51	7.61E+00	.82
DECMSK3	BBF-ET2	002	.43	160.99	18.29	11.36	7.61E+00	.82
DECMSK3	ET2-STOM	001	.55	160.99	10.98	06.82	7.61E+00	.82
DECMSK3	BRETHRAT	003	-.38	160.99	06.10	03.79	7.61E+00	.82
DECMTH1	BRETHRAT	002	.69	117.23	20.69	17.65	2.84E+01	.87
DECMTH1	LFIHNLIV	011	.18	117.23	18.39	15.69	2.84E+01	.87
DECMTH1	LFIHSHLT	116	-.02	117.23	17.24	14.71	2.84E+01	.87
DECMTH1	ITC-THR	001	.73	117.23	12.64	10.78	2.84E+01	.87
DECMTH1	ITC-BLAD	003	-.69	117.23	10.34	08.82	2.84E+01	.87
DECMTH2	LFIHNLIV	011	.16	123.00	22.99	18.69	1.81E+01	.87
DECMTH2	LFIHSHLT	105	.02	123.00	22.99	18.69	1.81E+01	.87
DECMTH2	BRETHRAT	003	.68	123.00	19.54	15.89	1.81E+01	.87
DECMTH2	ITC-THR	001	.72	123.00	11.49	09.34	1.81E+01	.87
DECMTH2	ITC-BLAD	002	-.68	123.00	09.20	07.48	1.81E+01	.87
DECMTH3	LFIHNLIV	012	.12	127.07	25.88	20.37	1.46E+01	.85
DECMTH3	LFIHSHLT	047	.06	127.07	25.88	20.37	1.46E+01	.85
DECMTH3	BRETHRAT	003	.59	127.07	14.12	11.11	1.46E+01	.85
DECMTH3	ITC-THR	001	.69	127.07	10.59	08.33	1.46E+01	.85
DECMTH3	ITC-BLAD	002	-.65	127.07	09.41	07.41	1.46E+01	.85
DLCMBM2	CSGR30Y	001	.65	132.01	41.03	31.08	1.38E+01	.78
DLCMBM2	CSGR100Y	003	.48	132.01	30.77	23.31	1.38E+01	.78
DLCMBM2	CSWB2-UL	002	-.59	132.01	12.82	09.71	1.38E+01	.78
DLCMBM3	CSGR30Y	002	.55	117.34	30.67	26.14	8.92E+00	.75
DLCMBM3	CSGR100Y	004	.39	117.34	22.67	19.32	8.92E+00	.75
DLCMBM3	CSWB2-UL	001	-.66	117.34	18.67	15.91	8.92E+00	.75
DLCMBM3	CSTC-WB	003	.41	117.34	00.00	00.00	8.92E+00	.75
DLCMBM4	CSWB2-UL	001	-.69	108.23	24.66	22.78	9.16E+00	.73
DLCMBM4	CSGR30Y	003	.43	108.23	19.18	17.72	9.16E+00	.73
DLCMBM4	CSGR100Y	006	.30	108.23	13.70	12.66	9.16E+00	.73
DLCMBM4	CSTC-WB	002	.48	108.23	01.37	01.27	9.16E+00	.73
DLCMED2	BBF-ET2	002	-.33	142.52	22.73	15.95	3.13E+01	.66
DLCMED2	ET2-STOM	001	-.43	142.52	15.15	10.63	3.13E+01	.66
DLCMED2	CSGR30Y	003	.32	142.52	12.12	08.50	3.13E+01	.66
DLCMED3	CSGR30Y	002	.37	125.00	18.75	15.00	1.17E+01	.64
DLCMED3	CSGR100Y	006	.23	125.00	12.50	10.00	1.17E+01	.64
DLCMED3	CSWB2-UL	001	-.46	125.00	12.50	10.00	1.17E+01	.64
DLCMED3	ET2-STOM	003	-.29	125.00	06.25	05.00	1.17E+01	.64
DLCMED4	CSWB2-UL	001	-.61	104.62	21.21	20.27	7.60E+00	.66
DLCMED4	CSGR30Y	003	.36	104.62	16.67	15.93	7.60E+00	.66
DLCMED4	CSGR100Y	007	.21	104.62	10.61	10.14	7.60E+00	.66
DLCMED4	CSTC-WB	002	.39	104.62	01.52	01.45	7.60E+00	.66
DLCMTH2	CSGR30Y	001	.66	138.41	41.03	29.64	8.09E+00	.78

DLCMTH2	CSGR100Y	003	.48	138.41	30.77	22.23	8.09E+00	.78
DLCMTH2	CSWB2-UL	002	-.55	138.41	10.26	07.41	8.09E+00	.78

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
DLCMTH3	CSGR30Y	002	.58	127.66	34.21	26.80	6.46E+00	.76
DLCMTH3	CSGR100Y	003	.40	127.66	25.00	19.58	6.46E+00	.76
DLCMTH3	CSWB2-UL	001	-.63	127.66	17.11	13.40	6.46E+00	.76
DLCMTH4	CSGR30Y	002	.48	120.25	22.97	19.10	7.54E+00	.74
DLCMTH4	CSWB2-UL	001	-.68	120.25	22.97	19.10	7.54E+00	.74
DLCMTH4	CSGR100Y	006	.33	120.25	17.57	14.61	7.54E+00	.74
DLCMTH4	CSTC-WB	003	.46	120.25	01.35	01.12	7.54E+00	.74
DLLVBM2	CSWB2-UL	001	-.78	072.42	31.58	43.61	9.20E+00	.76
DLLVBM2	CSF1	003	.51	072.42	13.16	18.17	9.20E+00	.76
DLLVBM2	CSTC-WB	002	.60	072.42	03.95	05.45	9.20E+00	.76
DLLVBM3	CSWB2-UL	001	-.78	072.42	31.58	43.61	9.17E+00	.76
DLLVBM3	CSF1	003	.51	072.42	13.16	18.17	9.17E+00	.76
DLLVBM3	CSTC-WB	002	.60	072.42	03.95	05.45	9.17E+00	.76
DLLVBM4	CSWB2-UL	001	-.78	072.42	31.58	43.61	9.22E+00	.76
DLLVBM4	CSF1	003	.51	072.42	13.16	18.17	9.22E+00	.76
DLLVBM4	CSTC-WB	002	.60	072.42	03.95	05.45	9.22E+00	.76
DLLVED2	CSWB2-UL	001	-.64	075.81	25.76	33.98	1.27E+01	.66
DLLVED2	CSF1	004	.34	075.81	09.09	11.99	1.27E+01	.66
DLLVED2	CSWB-ULI	003	-.37	075.81	06.06	07.99	1.27E+01	.66
DLLVED2	CSTC-WB	002	.44	075.81	01.52	02.01	1.27E+01	.66
DLLVED3	CSWB2-UL	001	-.67	076.13	26.87	35.29	1.08E+01	.67
DLLVED3	CSF1	004	.36	076.13	08.96	11.77	1.08E+01	.67
DLLVED3	CSWB-ULI	003	-.39	076.13	05.97	07.84	1.08E+01	.67
DLLVED3	CSTC-WB	002	.47	076.13	02.99	03.93	1.08E+01	.67
DLLVED4	CSWB2-UL	001	-.71	068.59	30.00	43.74	8.11E+00	.70
DLLVED4	CSF1	004	.40	068.59	10.00	14.58	8.11E+00	.70
DLLVED4	CSWB-ULI	003	-.43	068.59	05.71	08.32	8.11E+00	.70
DLLVED4	CSTC-WB	002	.52	068.59	02.86	04.17	8.11E+00	.70
DLLVTH2	ITC-BLAD	001	-.73	070.90	21.52	30.35	4.99E+00	.79
DLLVTH2	ITC-THR	002	.70	070.90	16.46	23.22	4.99E+00	.79
DLLVTH2	CSWB2-UL	003	-.65	070.90	15.19	21.42	4.99E+00	.79
DLLVTH3	CSWB2-UL	002	-.67	068.84	18.18	26.41	5.21E+00	.77
DLLVTH3	ITC-BLAD	001	-.69	068.84	18.18	26.41	5.21E+00	.77
DLLVTH3	ITC-THR	003	.66	068.84	14.29	20.76	5.21E+00	.77
DLLVTH4	CSWB2-UL	001	-.73	075.97	25.33	33.34	6.02E+00	.75
DLLVTH4	CSF1	006	.42	075.97	09.33	12.28	6.02E+00	.75
DLLVTH4	ITC-BLAD	003	-.51	075.97	08.00	10.53	6.02E+00	.75
DLLVTH4	CSTC-WB	002	.52	075.97	02.67	03.51	6.02E+00	.75
PECMLU	BBF-ET2	002	-.33	112.19	15.15	13.50	9.99E+09	.66
PECMLU	BBS-ET2	032	-.10	112.19	12.12	10.80	9.99E+09	.66
PECMLU	INDEPTB	003	.33	112.19	07.58	06.76	9.99E+09	.66
PECMLU	INDEPET	001	-.41	112.19	04.55	04.06	9.99E+09	.66
PECMMB	LFIHNLIV	001	.62	192.79	96.91	50.27	6.05E+01	.97
PECMMB	LFIHSHLT	099	.03	192.79	94.85	49.20	6.05E+01	.97
PECMMB	INDEPET	003	-.25	192.79	00.00	00.00	6.05E+01	.97
PECMMB	SKINRES	002	.25	192.79	00.00	00.00	6.05E+01	.97
PECMMT	LFIHNLIV	003	.31	182.22	87.78	48.17	5.30E+02	.90
PECMMT	LFIHSHLT	041	.08	182.22	86.67	47.56	5.30E+02	.90
PECMMT	BBF-ET2	002	-.32	182.22	02.22	01.22	5.30E+02	.90
PECMMT	INDEPET	001	-.32	182.22	00.00	00.00	5.30E+02	.90
PECMSK	LFIHNLIV	001	.40	181.85	88.64	48.74	1.36E+02	.88
PECMSK	LFIHSHLT	057	-.06	181.85	85.23	46.87	1.36E+02	.88
PECMSK	BRETHRAT	003	-.24	181.85	01.14	00.63	1.36E+02	.88
PECMSK	INDEPET	002	.25	181.85	00.00	00.00	1.36E+02	.88
PECMTH	BRETHRAT	002	.52	110.79	18.92	17.08	9.99E+09	.74
PECMTH	LFIHNLIV	018	.13	110.79	14.86	13.41	9.99E+09	.74
PECMTH	LFIHSHLT	091	-.03	110.79	13.51	12.19	9.99E+09	.74
PECMTH	IANY-BL	004	.45	110.79	12.16	10.98	9.99E+09	.74
PECMTH	ITC-THR	001	.54	110.79	10.81	09.76	9.99E+09	.74
PECMTH	ITC-BLAD	003	-.48	110.79	08.11	07.32	9.99E+09	.74
PLCMBM	CSWB2-UL	001	-.70	100.01	24.66	24.66	8.91E+00	.73
PLCMBM	CSGR30Y	003	.43	100.01	17.81	17.81	8.91E+00	.73
PLCMBM	CSGR100Y	006	.30	100.01	13.70	13.70	8.91E+00	.73
PLCMBM	CSTC-WB	002	.49	100.01	01.37	01.37	8.91E+00	.73
PLCMMT	CSWB2-UL	001	-.52	111.12	15.87	14.28	1.18E+01	.63
PLCMMT	BBF-ET2	007	-.23	111.12	11.11	10.00	1.18E+01	.63
PLCMMT	CSGR30Y	004	.28	111.12	11.11	10.00	1.18E+01	.63
PLCMMT	ET2-STOM	003	-.30	111.12	06.35	05.71	1.18E+01	.63

PLCMMT	CSTC-WB	002	.31	111.12	00.00	00.00	1.18E+01	.63

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
PLCMTH	CSWB2-UL	001	-.68	110.97	23.29	20.99	7.56E+00	.73
PLCMTH	CSGR30Y	002	.47	110.97	21.92	19.75	7.56E+00	.73
PLCMTH	CSGR100Y	006	.32	110.97	16.44	14.81	7.56E+00	.73
PLCMTH	CSTC-WB	003	.46	110.97	01.37	01.23	7.56E+00	.73
PLLVBM	CSWB2-UL	001	-.78	072.42	31.58	43.61	9.04E+00	.76
PLLVBM	CSF1	003	.51	072.42	13.16	18.17	9.04E+00	.76
PLLVBM	CSTC-WB	002	.60	072.42	03.95	05.45	9.04E+00	.76
PLLVMT	CSWB2-UL	001	-.67	074.63	26.87	36.00	1.12E+01	.67
PLLVMT	CSF1	004	.36	074.63	08.96	12.01	1.12E+01	.67
PLLVMT	CSWB-ULI	003	-.38	074.63	05.97	08.00	1.12E+01	.67
PLLVMT	CSTC-WB	002	.46	074.63	01.49	02.00	1.12E+01	.67
PLLVTH	CSWB2-UL	001	-.71	076.35	23.68	31.02	5.98E+00	.76
PLLVTH	ITC-BLAD	002	-.57	076.35	10.53	13.79	5.98E+00	.76
PLLVTH	ITC-THR	003	.54	076.35	09.21	12.06	5.98E+00	.76
PLLVTH	CSF1	006	.40	076.35	07.89	10.33	5.98E+00	.76
RECMLU1	BBF-ET2	002	-.37	105.03	15.00	14.28	9.99E+09	.60
RECMLU1	BRETHRAT	003	.28	105.03	08.33	07.93	9.99E+09	.60
RECMLU1	INDEPET	001	-.38	105.03	05.00	04.76	9.99E+09	.60
RECMMB1	LFIHNLIV	001	.56	190.62	95.83	50.27	9.99E+09	.96
RECMMB1	LFIHSHLT	100	-.03	190.62	93.75	49.18	9.99E+09	.96
RECMMB1	INDEPET	002	-.25	190.62	00.00	00.00	9.99E+09	.96
RECMMB1	SKINRES	003	.23	190.62	00.00	00.00	9.99E+09	.96
RECMMT1	LFIHNLIV	001	.40	186.96	92.39	49.42	9.99E+09	.92
RECMMT1	LFIHSHLT	070	.05	186.96	91.30	48.83	9.99E+09	.92
RECMMT1	INDEPET	002	-.32	186.96	00.00	00.00	9.99E+09	.92
RECMMT1	SKINRES	003	.23	186.96	00.00	00.00	9.99E+09	.92
RECMSK1	LFIHNLIV	001	.46	184.79	92.39	50.00	9.99E+09	.92
RECMSK1	LFIHSHLT	069	-.05	184.79	90.22	48.82	9.99E+09	.92
RECMSK1	BRETHRAT	002	-.22	184.79	01.09	00.59	9.99E+09	.92
RECMSK1	INDEPET	003	.19	184.79	00.00	00.00	9.99E+09	.92
RECMTH1	BRETHRAT	003	.42	101.56	15.63	15.39	9.99E+09	.64
RECMTH1	INDEPEXT	004	.36	101.56	10.94	10.77	9.99E+09	.64
RECMTH1	LFIHNLIV	007	.18	101.56	10.94	10.77	9.99E+09	.64
RECMTH1	LFIHSHLT	017	-.12	101.56	10.94	10.77	9.99E+09	.64
RECMTH1	ITC-BLAD	002	-.42	101.56	09.38	09.24	9.99E+09	.64
RECMTH1	ITC-THR	001	.44	101.56	07.81	07.69	9.99E+09	.64
RLCMBM2	CSGR30Y	001	.65	132.01	41.03	31.08	1.38E+01	.78
RLCMBM2	CSGR100Y	003	.48	132.01	30.77	23.31	1.38E+01	.78
RLCMBM2	CSWB2-UL	002	-.59	132.01	12.82	09.71	1.38E+01	.78
RLCMBM3	CSGR30Y	002	.55	117.34	30.67	26.14	8.92E+00	.75
RLCMBM3	CSGR100Y	004	.39	117.34	22.67	19.32	8.92E+00	.75
RLCMBM3	CSWB2-UL	001	-.66	117.34	18.67	15.91	8.92E+00	.75
RLCMBM3	CSTC-WB	003	.41	117.34	00.00	00.00	8.92E+00	.75
RLCMBM4	CSWB2-UL	001	-.69	108.23	24.66	22.78	9.16E+00	.73
RLCMBM4	CSGR30Y	003	.43	108.23	19.18	17.72	9.16E+00	.73
RLCMBM4	CSGR100Y	006	.30	108.23	13.70	12.66	9.16E+00	.73
RLCMBM4	CSTC-WB	002	.48	108.23	01.37	01.27	9.16E+00	.73
RLCMMT2	BBF-ET2	002	-.36	149.24	26.87	18.00	2.83E+01	.67
RLCMMT2	ET2-STOM	001	-.47	149.24	17.91	12.00	2.83E+01	.67
RLCMMT2	BBS-ET2	124	.01	149.24	16.42	11.00	2.83E+01	.67
RLCMMT2	CSGR30Y	003	.27	149.24	08.96	06.00	2.83E+01	.67
RLCMMT3	CSGR30Y	003	.33	128.60	15.87	12.34	1.37E+01	.63
RLCMMT3	BBF-ET2	004	-.26	128.60	14.29	11.11	1.37E+01	.63
RLCMMT3	CSWB2-UL	001	-.42	128.60	09.52	07.40	1.37E+01	.63
RLCMMT3	ET2-STOM	002	-.35	128.60	09.52	07.40	1.37E+01	.63
RLCMMT4	CSWB2-UL	001	-.57	107.81	18.75	17.39	7.91E+00	.64
RLCMMT4	CSGR30Y	003	.32	107.81	14.06	13.04	7.91E+00	.64
RLCMMT4	CSTC-WB	002	.35	107.81	00.00	00.00	7.91E+00	.64
RLCMTH2	CSGR30Y	001	.66	138.41	41.03	29.64	8.09E+00	.78
RLCMTH2	CSGR100Y	003	.48	138.41	30.77	22.23	8.09E+00	.78
RLCMTH2	CSWB2-UL	002	-.55	138.41	10.26	07.41	8.09E+00	.78
RLCMTH3	CSGR30Y	002	.58	127.66	34.21	26.80	6.46E+00	.76
RLCMTH3	CSGR100Y	003	.40	127.66	25.00	19.58	6.46E+00	.76
RLCMTH3	CSWB2-UL	001	-.63	127.66	17.11	13.40	6.46E+00	.76
RLCMTH4	CSGR30Y	002	.48	120.25	22.97	19.10	7.54E+00	.74
RLCMTH4	CSWB2-UL	001	-.68	120.25	22.97	19.10	7.54E+00	.74
RLCMTH4	CSGR100Y	006	.33	120.25	17.57	14.61	7.54E+00	.74
RLCMTH4	CSTC-WB	003	.46	120.25	01.35	01.12	7.54E+00	.74
RLLVBM2	CSWB2-UL	001	-.78	072.42	31.58	43.61	9.13E+00	.76
RLLVBM2	CSF1	003	.51	072.42	13.16	18.17	9.13E+00	.76

RLLVBM2	CSTC-WB	002	.60	072.42	03.95	05.45	9.13E+00	.76

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
RLLVBM3	CSWB2-UL	001	-.78	072.42	31.58	43.61	9.17E+00	.76
RLLVBM3	CSF1	003	.51	072.42	13.16	18.17	9.17E+00	.76
RLLVBM3	CSTC-WB	002	.60	072.42	03.95	05.45	9.17E+00	.76
RLLVBM4	CSWB2-UL	001	-.78	072.42	31.58	43.61	9.22E+00	.76
RLLVBM4	CSF1	003	.51	072.42	13.16	18.17	9.22E+00	.76
RLLVBM4	CSTC-WB	002	.60	072.42	03.95	05.45	9.22E+00	.76
RLLVMT2	CSWB2-UL	001	-.58	095.41	18.46	19.35	6.24E+00	.65
RLLVMT2	BBF-ET2	006	-.26	095.41	12.31	12.90	6.24E+00	.65
RLLVMT2	ET2-STOM	003	-.32	095.41	07.69	08.06	6.24E+00	.65
RLLVMT2	CSTC-WB	002	.38	095.41	01.54	01.61	6.24E+00	.65
RLLVMT3	CSWB2-UL	001	-.63	086.19	24.62	28.56	1.00E+01	.65
RLLVMT3	CSWB-ULI	003	-.36	086.19	06.15	07.14	1.00E+01	.65
RLLVMT3	CSTC-WB	002	.42	086.19	01.54	01.79	1.00E+01	.65
RLLVMT4	CSWB2-UL	001	-.68	072.04	27.94	38.78	1.04E+01	.68
RLLVMT4	CSF1	004	.37	072.04	08.82	12.24	1.04E+01	.68
RLLVMT4	CSWB-ULI	003	-.40	072.04	05.88	08.16	1.04E+01	.68
RLLVMT4	CSTC-WB	002	.48	072.04	02.94	04.08	1.04E+01	.68
RLLVTH2	ITC-BLAD	001	-.73	070.90	21.52	30.35	4.99E+00	.79
RLLVTH2	ITC-THR	002	.70	070.90	16.46	23.22	4.99E+00	.79
RLLVTH2	CSWB2-UL	003	-.65	070.90	15.19	21.42	4.99E+00	.79
RLLVTH3	CSWB2-UL	002	-.67	068.84	18.18	26.41	5.21E+00	.77
RLLVTH3	ITC-BLAD	001	-.69	068.84	18.18	26.41	5.21E+00	.77
RLLVTH3	ITC-THR	003	.66	068.84	14.29	20.76	5.21E+00	.77
RLLVTH4	CSWB2-UL	001	-.73	075.97	25.33	33.34	6.02E+00	.75
RLLVTH4	CSF1	006	.42	075.97	09.33	12.28	6.02E+00	.75
RLLVTH4	ITC-BLAD	003	-.51	075.97	08.00	10.53	6.02E+00	.75
RLLVTH4	CSTC-WB	002	.52	075.97	02.67	03.51	6.02E+00	.75

RESULTS FOR THE 95TH PERCENTILE OF THE ENDPOINTS FOR THE CB2 SOURCE TERM

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
AEVAC	BBF-ET2	002	-.52	151.92	36.71	24.16	3.16E+02	.79
AEVAC	BBS-ET2	104	-.02	151.92	22.78	14.99	3.16E+02	.79
AEVAC	ET2-STOM	001	-.63	151.92	22.78	14.99	3.16E+02	.79
AEVAC	BRETHRAT	003	.41	151.92	08.86	05.83	3.16E+02	.79
AFBIBEE	CEF1	002	.14	084.16	02.63	03.13	1.00E+00	.38
AFBIBEE	CNSRTGRN	003	-.14	084.16	02.63	03.13	1.00E+00	.38
AFBIBEE	NP-INHAL	001	.15	084.16	02.63	03.13	1.00E+00	.38
AFBIGRA	CEF1	002	.14	084.16	02.63	03.13	1.00E+00	.38
AFBIGRA	CNSRTGRN	003	-.14	084.16	02.63	03.13	1.00E+00	.38
AFBIGRA	NP-INHAL	001	.15	084.16	02.63	03.13	1.00E+00	.38
AFBIVEG	SKINRES	002	.17	063.12	02.63	04.17	1.00E+00	.38
AFBIVEG	TEANY-BL	001	.17	063.12	02.63	04.17	1.00E+00	.38
AFBIVEG	SRCB-ULI	003	-.16	063.12	00.00	00.00	1.00E+00	.38
AFBTVEG	CSGR3Y	001	.20	154.29	13.04	08.45	1.02E+00	.46
AFBTVEG	AI3-LNTH	003	.18	154.29	04.35	02.82	1.02E+00	.46
AFBTVEG	TEBN-ULI	002	.18	154.29	02.17	01.41	1.02E+00	.46
AIOD	BRETHRAT	001	.74	103.53	31.76	30.68	1.82E+01	.85
AIOD	INDEPEXT	004	.67	103.53	17.65	17.05	1.82E+01	.85
AIOD	ITC-BLAD	002	-.70	103.53	14.12	13.64	1.82E+01	.85
AIOD	ITC-THR	003	.69	103.53	11.76	11.36	1.82E+01	.85
ARELIN	BBF-ET2	002	-.52	150.65	36.71	24.37	3.16E+02	.79
ARELIN	BBS-ET2	100	-.03	150.65	22.78	15.12	3.16E+02	.79
ARELIN	ET2-STOM	001	-.63	150.65	22.78	15.12	3.16E+02	.79
ARELIN	BRETHRAT	003	.41	150.65	08.86	05.88	3.16E+02	.79
ARELTIM	CSGR3Y	001	.53	220.30	30.38	13.79	2.57E+01	.79
ARELTIM	LFGRNLVL	008	.17	220.30	22.78	10.34	2.57E+01	.79
ARELTIM	CSGR1Y	002	.37	220.30	21.52	09.77	2.57E+01	.79
ARELTIM	CSGR10Y	003	.29	220.30	16.46	07.47	2.57E+01	.79
ASHEL	BBF-ET2	002	-.51	152.55	35.90	23.53	1.10E+02	.78
ASHEL	BBS-ET2	100	-.03	152.55	23.08	15.13	1.10E+02	.78
ASHEL	ET2-STOM	001	-.62	152.55	23.08	15.13	1.10E+02	.78
ASHEL	BRETHRAT	003	.41	152.55	10.26	06.73	1.10E+02	.78
CDCMBM	CSWB2-UL	001	-.72	078.89	29.58	37.50	8.32E+00	.71
CDCMBM	CSF1	003	.44	078.89	11.27	14.29	8.32E+00	.71
CDCMBM	CSTC-WB	002	.53	078.89	02.82	03.57	8.32E+00	.71
CDCMED	CSWB2-UL	001	-.61	088.91	23.81	26.78	9.77E+00	.63
CDCMED	CSWB-ULI	003	-.31	088.91	04.76	05.35	9.77E+00	.63
CDCMED	CSTC-WB	002	.40	088.91	01.59	01.79	9.77E+00	.63
CDCMTH	CSWB2-UL	001	-.70	090.17	28.17	31.24	8.32E+00	.71
CDCMTH	CSF1	003	.42	090.17	09.86	10.93	8.32E+00	.71
CDCMTH	CSGR30Y	005	.32	090.17	09.86	10.93	8.32E+00	.71
CDCMTH	CSTC-WB	002	.50	090.17	02.82	03.13	8.32E+00	.71
CDLVBM	CSWB2-UL	001	-.79	072.75	32.47	44.63	1.02E+01	.77
CDLVBM	CSF1	004	.52	072.75	14.29	19.64	1.02E+01	.77
CDLVBM	CSWB-ULI	003	-.52	072.75	06.49	08.92	1.02E+01	.77
CDLVBM	CSTC-WB	002	.61	072.75	03.90	05.36	1.02E+01	.77
CDLVED	CSWB2-UL	001	-.73	065.30	30.56	46.80	8.32E+00	.72
CDLVED	CSF1	004	.43	065.30	11.11	17.01	8.32E+00	.72
CDLVED	CSWB-ULI	003	-.46	065.30	05.56	08.51	8.32E+00	.72
CDLVED	CSTC-WB	002	.55	065.30	04.17	06.39	8.32E+00	.72
CDLVTH	CSWB2-UL	001	-.73	067.11	25.00	37.25	6.03E+00	.76
CDLVTH	CSF1	006	.41	067.11	09.21	13.72	6.03E+00	.76
CDLVTH	ITC-BLAD	002	-.52	067.11	07.89	11.76	6.03E+00	.76
CDLVTH	CSTC-WB	003	.52	067.11	02.63	03.92	6.03E+00	.76
DECMBM1	LFCLNLIV	006	.28	293.71	50.53	17.20	3.24E+00	.95
DECMBM1	LFCLSHLT	046	.07	293.71	46.32	15.77	3.24E+00	.95
DECMBM1	LFGRNLVE	045	.07	293.71	34.74	11.83	3.24E+00	.95
DECMBM1	LFGRSHLT	081	.03	293.71	32.63	11.11	3.24E+00	.95
DECMBM1	LFGRNLVL	077	-.04	293.71	29.47	10.03	3.24E+00	.95
DECMBM1	IGRINDR	001	.74	293.71	20.00	06.81	3.24E+00	.95
DECMBM1	LFGRCAR	003	.66	293.71	10.53	03.59	3.24E+00	.95
DECMBM1	BRETHRAT	002	.72	293.71	08.42	02.87	3.24E+00	.95
DECMBM2	LFCLNLIV	013	.14	308.14	47.67	15.47	4.17E+00	.86
DECMBM2	LFCLSHLT	066	.05	308.14	45.35	14.72	4.17E+00	.86
DECMBM2	LFGRNLVE	045	.07	308.14	38.37	12.45	4.17E+00	.86

DECMBM2	LFGRSHLT	087	.03	308.14	38.37	12.45	4.17E+00	.86
DECMBM2	LFGRNLVL	106	-.02	308.14	32.56	10.57	4.17E+00	.86
DECMBM2	IGRINDR	003	.33	308.14	12.79	04.15	4.17E+00	.86
DECMBM2	BBF-ET2	002	.38	308.14	08.14	02.64	4.17E+00	.86
DECMBM2	ET2-STOM	001	.48	308.14	05.81	01.89	4.17E+00	.86

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
DECMBM3	BBF-ET2	002	.46	277.67	16.47	05.93	8.13E+00	.85
DECMBM3	CSGRINDR	003	.38	277.67	12.94	04.66	8.13E+00	.85
DECMBM3	ET2-STOM	001	.56	277.67	10.59	03.81	8.13E+00	.85
DECMSK1	LFIHNLIV	001	.90	196.97	100.00	50.77	3.55E+00	.99
DECMSK1	LFIHSHLT	110	-.02	196.97	96.97	49.23	3.55E+00	.99
DECMSK1	INDEPRT	003	.20	196.97	00.00	00.00	3.55E+00	.99
DECMSK1	SKINRES	002	.65	196.97	00.00	00.00	3.55E+00	.99
DECMSK2	LFIHNLIV	002	.41	186.15	89.36	48.00	3.98E+00	.94
DECMSK2	LFIHSHLT	028	.10	186.15	88.30	47.43	3.98E+00	.94
DECMSK2	BRETHRAT	003	-.37	186.15	02.13	01.14	3.98E+00	.94
DECMSK2	ET2-STOM	001	.42	186.15	01.06	00.57	3.98E+00	.94
DECMSK3	LFIHNLIV	010	.17	157.50	30.00	19.05	1.78E+01	.80
DECMSK3	LFIHSHLT	133	.00	157.50	30.00	19.05	1.78E+01	.80
DECMSK3	BBF-ET2	002	.44	157.50	23.75	15.08	1.78E+01	.80
DECMSK3	ET2-STOM	001	.57	157.50	13.75	08.73	1.78E+01	.80
DECMSK3	BRETHRAT	003	-.36	157.50	06.25	03.97	1.78E+01	.80
DECMTH1	BRETHRAT	002	.69	116.08	20.69	17.82	2.75E+01	.87
DECMTH1	LFIHNLIV	011	.18	116.08	17.24	14.85	2.75E+01	.87
DECMTH1	LFIHSHLT	112	-.02	116.08	17.24	14.85	2.75E+01	.87
DECMTH1	ITC-THR	001	.73	116.08	12.64	10.89	2.75E+01	.87
DECMTH1	ITC-BLAD	003	-.69	116.08	10.34	08.91	2.75E+01	.87
DECMTH2	LFIHNLIV	009	.21	128.74	32.18	25.00	1.26E+01	.87
DECMTH2	LFIHSHLT	128	.00	128.74	32.18	25.00	1.26E+01	.87
DECMTH2	BRETHRAT	003	.61	128.74	13.79	10.71	1.26E+01	.87
DECMTH2	ITC-THR	001	.70	128.74	10.34	08.03	1.26E+01	.87
DECMTH2	ITC-BLAD	002	-.64	128.74	08.05	06.25	1.26E+01	.87
DECMTH3	LFIHNLIV	018	.11	126.45	18.07	14.29	2.95E+01	.83
DECMTH3	LFIHSHLT	084	.04	126.45	18.07	14.29	2.95E+01	.83
DECMTH3	BRETHRAT	003	.56	126.45	13.25	10.48	2.95E+01	.83
DECMTH3	ITC-BLAD	001	-.64	126.45	10.84	08.57	2.95E+01	.83
DECMTH3	ITC-THR	002	.64	126.45	08.43	06.67	2.95E+01	.83
DLCMBM2	CSGR30Y	001	.66	131.65	44.30	33.65	1.00E+01	.79
DLCMBM2	CSGR100Y	003	.48	131.65	31.65	24.04	1.00E+01	.79
DLCMBM2	CSWB2-UL	002	-.62	131.65	13.92	10.57	1.00E+01	.79
DLCMBM3	CSGR30Y	002	.58	131.60	34.21	26.00	8.51E+00	.76
DLCMBM3	CSGR100Y	003	.41	131.60	23.68	17.99	8.51E+00	.76
DLCMBM3	CSWB2-UL	001	-.65	131.60	17.11	13.00	8.51E+00	.76
DLCMBM4	CSWB2-UL	001	-.72	087.52	27.78	31.74	8.13E+00	.72
DLCMBM4	CSF1	003	.43	087.52	11.11	12.69	8.13E+00	.72
DLCMBM4	CSGR30Y	005	.31	087.52	09.72	11.11	8.13E+00	.72
DLCMBM4	CSTC-WB	002	.52	087.52	02.78	03.18	8.13E+00	.72
DLCMED2	BBF-ET2	003	-.32	144.06	19.70	13.67	2.24E+01	.66
DLCMED2	CSGR30Y	002	.34	144.06	15.15	10.52	2.24E+01	.66
DLCMED2	ET2-STOM	001	-.42	144.06	13.64	09.47	2.24E+01	.66
DLCMED3	CSGR30Y	002	.39	135.79	19.40	14.29	9.77E+00	.67
DLCMED3	CSWB2-UL	001	-.46	135.79	10.45	07.70	9.77E+00	.67
DLCMED3	ET2-STOM	003	-.36	135.79	08.96	06.60	9.77E+00	.67
DLCMED4	CSWB2-UL	001	-.58	103.20	20.63	19.99	8.71E+00	.63
DLCMED4	CSWB-ULI	003	-.28	103.20	04.76	04.61	8.71E+00	.63
DLCMED4	CSTC-WB	002	.37	103.20	01.59	01.54	8.71E+00	.63
DLCMTH2	CSGR30Y	001	.65	138.01	40.51	29.35	5.75E+00	.79
DLCMTH2	CSGR100Y	003	.44	138.01	27.85	20.18	5.75E+00	.79
DLCMTH2	CSWB2-UL	002	-.58	138.01	11.39	08.25	5.75E+00	.79
DLCMTH3	CSGR30Y	001	.58	140.31	32.47	23.14	5.37E+00	.77
DLCMTH3	CSGR100Y	003	.39	140.31	22.08	15.74	5.37E+00	.77
DLCMTH3	CSWB2-UL	002	-.58	140.31	11.69	08.33	5.37E+00	.77
DLCMTH4	CSWB2-UL	001	-.70	102.81	26.39	25.67	7.76E+00	.72
DLCMTH4	CSGR30Y	005	.37	102.81	12.50	12.16	7.76E+00	.72
DLCMTH4	CSF1	003	.41	102.81	09.72	09.45	7.76E+00	.72
DLCMTH4	CSTC-WB	002	.49	102.81	02.78	02.70	7.76E+00	.72
DLLVBM2	CSWB2-UL	001	-.76	075.99	30.67	40.36	8.32E+00	.75
DLLVBM2	CSF1	003	.49	075.99	13.33	17.54	8.32E+00	.75
DLLVBM2	CSTC-WB	002	.57	075.99	02.67	03.51	8.32E+00	.75

DLLVBM3	CSWB2-UL	001	-.77	073.73	31.58	42.83	8.32E+00	.76
DLLVBM3	CSF1	003	.50	073.73	13.16	17.85	8.32E+00	.76
DLLVBM3	CSTC-WB	002	.59	073.73	03.95	05.36	8.32E+00	.76
DLLVBM4	CSWB2-UL	001	-.77	072.42	31.58	43.61	8.71E+00	.76
DLLVBM4	CSF1	003	.50	072.42	13.16	18.17	8.71E+00	.76
DLLVBM4	CSTC-WB	002	.59	072.42	03.95	05.45	8.71E+00	.76

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
DLLVED2	CSWB2-UL	001	-.60	096.97	20.00	20.62	1.05E+01	.65
DLLVED2	CSWB-ULI	003	-.33	096.97	04.62	04.76	1.05E+01	.65
DLLVED2	CSTC-WB	002	.39	096.97	01.54	01.59	1.05E+01	.65
DLLVED3	CSWB2-UL	001	-.62	084.66	23.08	27.26	1.17E+01	.65
DLLVED3	CSWB-ULI	003	-.35	084.66	04.62	05.46	1.17E+01	.65
DLLVED3	CSTC-WB	002	.41	084.66	01.54	01.82	1.17E+01	.65
DLLVED4	CSWB2-UL	001	-.67	077.61	26.87	34.62	1.07E+01	.67
DLLVED4	CSF1	004	.36	077.61	08.96	11.54	1.07E+01	.67
DLLVED4	CSWB-ULI	003	-.38	077.61	05.97	07.69	1.07E+01	.67
DLLVED4	CSTC-WB	002	.46	077.61	01.49	01.92	1.07E+01	.67
DLLVTH2	ITC-BLAD	001	-.80	076.84	28.05	36.50	4.79E+00	.82
DLLVTH2	ITC-THR	002	.77	076.84	20.73	26.98	4.79E+00	.82
DLLVTH2	CSWB2-UL	003	-.57	076.84	09.76	12.70	4.79E+00	.82
DLLVTH2	CNSRTGVG	004	.50	076.84	08.54	11.11	4.79E+00	.82
DLLVTH3	ITC-BLAD	001	-.75	073.43	22.78	31.02	4.90E+00	.79
DLLVTH3	ITC-THR	002	.72	073.43	18.99	25.86	4.90E+00	.79
DLLVTH3	CSWB2-UL	003	-.61	073.43	12.66	17.24	4.90E+00	.79
DLLVTH3	CNSRTGVG	004	.44	073.43	07.59	10.34	4.90E+00	.79
DLLVTH4	CSWB2-UL	001	-.73	076.34	25.00	32.75	6.17E+00	.76
DLLVTH4	CSF1	005	.44	076.34	09.21	12.06	6.17E+00	.76
DLLVTH4	ITC-BLAD	003	-.52	076.34	07.89	10.34	6.17E+00	.76
DLLVTH4	ITC-THR	004	.52	076.34	07.89	10.34	6.17E+00	.76
DLLVTH4	CSTC-WB	002	.53	076.34	02.63	03.45	6.17E+00	.76
PECMLU	BBF-ET2	002	-.31	111.13	12.70	11.43	9.99E+09	.63
PECMLU	INDEPTB	003	.28	111.13	06.35	05.71	9.99E+09	.63
PECMLU	INDEPET	001	-.38	111.13	04.76	04.28	9.99E+09	.63
PECMMB	LFIHNLIV	001	.60	191.76	96.91	50.54	1.05E+02	.97
PECMMB	LFIHSHLT	103	.03	191.76	94.85	49.46	1.05E+02	.97
PECMMB	INDEPEXT	003	.20	191.76	00.00	00.00	1.05E+02	.97
PECMMB	SKINRES	002	.29	191.76	00.00	00.00	1.05E+02	.97
PECMMT	LFIHNLIV	001	.35	187.92	91.21	48.54	8.13E+02	.91
PECMMT	LFIHSHLT	048	.07	187.92	90.11	47.95	8.13E+02	.91
PECMMT	BBF-ET2	003	-.27	187.92	02.20	01.17	8.13E+02	.91
PECMMT	INDEPET	002	-.34	187.92	00.00	00.00	8.13E+02	.91
PECMSK	LFIHNLIV	001	.40	180.87	88.76	49.07	3.89E+02	.89
PECMSK	LFIHSHLT	065	-.05	180.87	85.39	47.21	3.89E+02	.89
PECMSK	BRETHRAT	003	-.23	180.87	01.12	00.62	3.89E+02	.89
PECMSK	INDEPET	002	.23	180.87	00.00	00.00	3.89E+02	.89
PECMTH	BRETHRAT	001	.50	108.70	21.74	20.00	9.99E+09	.69
PECMTH	LFIHNLIV	015	.12	108.70	14.49	13.33	9.99E+09	.69
PECMTH	LFIHSHLT	086	-.04	108.70	13.04	12.00	9.99E+09	.69
PECMTH	INDEPEXT	003	.40	108.70	11.59	10.66	9.99E+09	.69
PECMTH	ITC-THR	002	.48	108.70	10.14	09.33	9.99E+09	.69
PLCMBM	CSWB2-UL	001	-.72	078.89	29.58	37.50	8.32E+00	.71
PLCMBM	CSF1	003	.43	078.89	11.27	14.29	8.32E+00	.71
PLCMBM	CSTC-WB	002	.52	078.89	02.82	03.57	8.32E+00	.71
PLCMMT	CSWB2-UL	001	-.57	095.12	20.97	22.05	1.38E+01	.62
PLCMMT	BBF-ET2	006	-.22	095.12	09.68	10.18	1.38E+01	.62
PLCMMT	CSWB-ULI	003	-.29	095.12	04.84	05.09	1.38E+01	.62
PLCMMT	CSTC-WB	002	.36	095.12	01.61	01.69	1.38E+01	.62
PLCMTH	CSWB2-UL	001	-.71	091.58	28.17	30.76	8.32E+00	.71
PLCMTH	CSF1	003	.42	091.58	09.86	10.77	8.32E+00	.71
PLCMTH	CSGR30Y	005	.32	091.58	09.86	10.77	8.32E+00	.71
PLCMTH	CSTC-WB	002	.51	091.58	02.82	03.08	8.32E+00	.71
PLLVBM	CSWB2-UL	001	-.79	071.45	32.47	45.44	1.00E+01	.77
PLLVBM	CSF1	004	.52	071.45	14.29	20.00	1.00E+01	.77
PLLVBM	CSWB-ULI	003	-.52	071.45	06.49	09.08	1.00E+01	.77
PLLVBM	CSTC-WB	002	.61	071.45	03.90	05.46	1.00E+01	.77
PLLVMT	CSWB2-UL	001	-.70	068.13	28.99	42.55	9.77E+00	.69
PLLVMT	CSF1	004	.38	068.13	10.14	14.88	9.77E+00	.69
PLLVMT	CSWB-ULI	003	-.42	068.13	05.80	08.51	9.77E+00	.69
PLLVMT	CSTC-WB	002	.50	068.13	02.90	04.26	9.77E+00	.69
PLLVTH	CSWB2-UL	001	-.73	067.11	25.00	37.25	6.17E+00	.76
PLLVTH	CSF1	006	.41	067.11	09.21	13.72	6.17E+00	.76
PLLVTH	ITC-BLAD	002	-.52	067.11	07.89	11.76	6.17E+00	.76
PLLVTH	CSTC-WB	003	.52	067.11	02.63	03.92	6.17E+00	.76
RLCMBM2	CSGR30Y	001	.66	131.65	44.30	33.65	1.02E+01	.79
RLCMBM2	CSGR100Y	003	.49	131.65	31.65	24.04	1.02E+01	.79
RLCMBM2	CSWB2-UL	002	-.62	131.65	13.92	10.57	1.02E+01	.79
RLCMBM3	CSGR30Y	002	.58	130.29	34.21	26.26	8.51E+00	.76

RLCMBM3	CSGR100Y	003	.41	130.29	23.68	18.17	8.51E+00	.76
RLCMBM3	CSWB2-UL	001	-.65	130.29	17.11	13.13	8.51E+00	.76

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
RLCMBM4	CSWB2-UL	001	-.72	086.13	27.78	32.25	8.13E+00	.72
RLCMBM4	CSF1	003	.43	086.13	11.11	12.90	8.13E+00	.72
RLCMBM4	CSGR30Y	005	.31	086.13	09.72	11.29	8.13E+00	.72
RLCMBM4	CSTC-WB	002	.52	086.13	02.78	03.23	8.13E+00	.72
RLCMMT2	BBF-ET2	002	-.35	147.74	25.37	17.17	3.16E+01	.67
RLCMMT2	ET2-STOM	001	-.46	147.74	16.42	11.11	3.16E+01	.67
RLCMMT2	BBS-ET2	123	.01	147.74	14.93	10.11	3.16E+01	.67
RLCMMT2	CSGR30Y	003	.30	147.74	11.94	08.08	3.16E+01	.67
RLCMMT3	BBF-ET2	004	-.30	141.78	17.91	12.63	1.12E+01	.67
RLCMMT3	CSGR30Y	003	.34	141.78	13.43	09.47	1.12E+01	.67
RLCMMT3	ET2-STOM	001	-.42	141.78	13.43	09.47	1.12E+01	.67
RLCMMT3	CSWB2-UL	002	-.41	141.78	07.46	05.26	1.12E+01	.67
RLCMMT4	CSWB2-UL	001	-.54	104.79	17.74	16.93	1.10E+01	.62
RLCMMT4	BBF-ET2	006	-.25	104.79	12.90	12.31	1.10E+01	.62
RLCMMT4	ET2-STOM	003	-.31	104.79	08.06	07.69	1.10E+01	.62
RLCMMT4	CSTC-WB	002	.34	104.79	00.00	00.00	1.10E+01	.62
RLCMTH2	CSGR30Y	001	.65	139.28	40.51	29.09	5.89E+00	.79
RLCMTH2	CSGR100Y	003	.44	139.28	27.85	20.00	5.89E+00	.79
RLCMTH2	CSWB2-UL	002	-.58	139.28	11.39	08.18	5.89E+00	.79
RLCMTH3	CSGR30Y	001	.58	140.31	32.47	23.14	5.37E+00	.77
RLCMTH3	CSGR100Y	003	.39	140.31	22.08	15.74	5.37E+00	.77
RLCMTH3	CSWB2-UL	002	-.58	140.31	11.69	08.33	5.37E+00	.77
RLCMTH4	CSWB2-UL	001	-.70	102.81	26.39	25.67	7.59E+00	.72
RLCMTH4	CSGR30Y	005	.36	102.81	12.50	12.16	7.59E+00	.72
RLCMTH4	CSF1	003	.41	102.81	09.72	09.45	7.59E+00	.72
RLCMTH4	CSTC-WB	002	.49	102.81	02.78	02.70	7.59E+00	.72
RLLVBM2	CSWB2-UL	001	-.76	075.99	30.67	40.36	8.32E+00	.75
RLLVBM2	CSF1	003	.49	075.99	13.33	17.54	8.32E+00	.75
RLLVBM2	CSTC-WB	002	.57	075.99	02.67	03.51	8.32E+00	.75
RLLVBM3	CSWB2-UL	001	-.77	073.73	31.58	42.83	8.32E+00	.76
RLLVBM3	CSF1	003	.50	073.73	13.16	17.85	8.32E+00	.76
RLLVBM3	CSTC-WB	002	.59	073.73	03.95	05.36	8.32E+00	.76
RLLVBM4	CSWB2-UL	001	-.77	072.42	31.58	43.61	8.71E+00	.76
RLLVBM4	CSF1	003	.50	072.42	13.16	18.17	8.71E+00	.76
RLLVBM4	CSTC-WB	002	.59	072.42	03.95	05.45	8.71E+00	.76
RLLVMT2	CSWB2-UL	001	-.57	104.65	18.46	17.64	1.20E+01	.65
RLLVMT2	BBF-ET2	006	-.25	104.65	12.31	11.76	1.20E+01	.65
RLLVMT2	ET2-STOM	003	-.34	104.65	07.69	07.35	1.20E+01	.65
RLLVMT2	CSTC-WB	002	.36	104.65	01.54	01.47	1.20E+01	.65
RLLVMT3	CSWB2-UL	001	-.59	095.29	20.31	21.31	1.45E+01	.64
RLLVMT3	BBF-ET2	006	-.24	095.29	10.94	11.48	1.45E+01	.64
RLLVMT3	CSWB-ULI	003	-.33	095.29	04.69	04.92	1.45E+01	.64
RLLVMT3	CSTC-WB	002	.39	095.29	01.56	01.64	1.45E+01	.64
RLLVMT4	CSWB2-UL	001	-.63	089.48	24.24	27.09	1.29E+01	.66
RLLVMT4	CSF1	004	.34	089.48	09.09	10.16	1.29E+01	.66
RLLVMT4	CSWB-ULI	003	-.36	089.48	06.06	06.77	1.29E+01	.66
RLLVMT4	CSTC-WB	002	.42	089.48	01.52	01.70	1.29E+01	.66
RLLVTH2	ITC-BLAD	001	-.81	075.62	28.05	37.09	4.79E+00	.82
RLLVTH2	ITC-THR	002	.77	075.62	20.73	27.41	4.79E+00	.82
RLLVTH2	CSWB2-UL	003	-.57	075.62	09.76	12.91	4.79E+00	.82
RLLVTH2	CNSRTGVG	004	.50	075.62	08.54	11.29	4.79E+00	.82
RLLVTH3	ITC-BLAD	001	-.75	073.43	22.78	31.02	4.90E+00	.79
RLLVTH3	ITC-THR	002	.72	073.43	18.99	25.86	4.90E+00	.79
RLLVTH3	CSWB2-UL	003	-.61	073.43	12.66	17.24	4.90E+00	.79
RLLVTH3	CNSRTGVG	004	.43	073.43	07.59	10.34	4.90E+00	.79
RLLVTH4	CSWB2-UL	001	-.73	076.34	25.00	32.75	6.17E+00	.76
RLLVTH4	CSF1	005	.44	076.34	09.21	12.06	6.17E+00	.76
RLLVTH4	ITC-BLAD	003	-.52	076.34	07.89	10.34	6.17E+00	.76
RLLVTH4	ITC-THR	004	.52	076.34	07.89	10.34	6.17E+00	.76
RLLVTH4	CSTC-WB	002	.53	076.34	02.63	03.45	6.17E+00	.76

RESULTS FOR THE 99TH PERCENTILE OF THE ENDPOINTS FOR THE CB2 SOURCE TERM

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
AEVAC	BBF-ET2	002	-.52	153.83	37.18	24.17	2.75E+02	.78
AEVAC	BBS-ET2	104	-.02	153.83	23.08	15.00	2.75E+02	.78
AEVAC	ET2-STOM	001	-.63	153.83	23.08	15.00	2.75E+02	.78
AEVAC	BRETHRAT	003	.41	153.83	10.26	06.67	2.75E+02	.78
AIOD	BRETHRAT	001	.73	101.18	30.95	30.59	1.62E+01	.84
AIOD	INDEPEXT	004	.67	101.18	16.67	16.48	1.62E+01	.84
AIOD	ITC-BLAD	002	-.69	101.18	13.10	12.95	1.62E+01	.84
AIOD	ITC-THR	003	.69	101.18	11.90	11.76	1.62E+01	.84
ARELIN	BBF-ET2	002	-.52	153.18	36.71	23.97	2.75E+02	.79
ARELIN	BBS-ET2	099	-.03	153.18	22.78	14.87	2.75E+02	.79
ARELIN	ET2-STOM	001	-.63	153.18	22.78	14.87	2.75E+02	.79
ARELIN	BRETHRAT	003	.41	153.18	10.13	06.61	2.75E+02	.79
ARELTIM	CSGR3Y	001	.57	215.33	38.46	17.86	3.24E+01	.78
ARELTIM	CSGR1Y	002	.35	215.33	21.79	10.12	3.24E+01	.78
ARELTIM	CSGR10Y	003	.31	215.33	19.23	08.93	3.24E+01	.78
ASHEL	BBF-ET2	002	-.51	151.26	37.18	24.58	2.14E+02	.78
ASHEL	BBS-ET2	118	-.02	151.26	23.08	15.26	2.14E+02	.78
ASHEL	ET2-STOM	001	-.62	151.26	23.08	15.26	2.14E+02	.78
ASHEL	BRETHRAT	003	.40	151.26	08.97	05.93	2.14E+02	.78
CDCMBM	CSWB2-UL	001	-.71	085.73	28.57	33.33	8.91E+00	.70
CDCMBM	CSF1	004	.41	085.73	10.00	11.66	8.91E+00	.70
CDCMBM	CSGR30Y	005	.29	085.73	08.57	10.00	8.91E+00	.70
CDCMBM	CSWB-ULI	003	-.42	085.73	05.71	06.66	8.91E+00	.70
CDCMBM	CSTC-WB	002	.51	085.73	02.86	03.34	8.91E+00	.70
CDCMED	CSWB2-UL	001	-.56	088.55	21.31	24.07	8.13E+00	.61
CDCMED	CSWB-ULI	003	-.30	088.55	04.92	05.56	8.13E+00	.61
CDCMED	CSTC-WB	002	.35	088.55	01.64	01.85	8.13E+00	.61
CDCMTH	CSWB2-UL	001	-.69	088.59	27.14	30.64	8.13E+00	.70
CDCMTH	CSGR30Y	005	.34	088.59	11.43	12.90	8.13E+00	.70
CDCMTH	CSF1	003	.39	088.59	10.00	11.29	8.13E+00	.70
CDCMTH	CSTC-WB	002	.49	088.59	02.86	03.23	8.13E+00	.70
CDLVBM	CSWB2-UL	001	-.79	071.45	32.47	45.44	1.00E+01	.77
CDLVBM	CSF1	004	.52	071.45	14.29	20.00	1.00E+01	.77
CDLVBM	CSWB-ULI	003	-.52	071.45	06.49	09.08	1.00E+01	.77
CDLVBM	CSTC-WB	002	.61	071.45	03.90	05.46	1.00E+01	.77
CDLVED	CSWB2-UL	001	-.70	066.68	28.99	43.48	1.00E+01	.69
CDLVED	CSF1	004	.40	066.68	10.14	15.21	1.00E+01	.69
CDLVED	CSWB-ULI	003	-.42	066.68	05.80	08.70	1.00E+01	.69
CDLVED	CSTC-WB	002	.50	066.68	02.90	04.35	1.00E+01	.69
CDLVTH	CSWB2-UL	001	-.71	069.32	24.00	34.62	5.89E+00	.75
CDLVTH	ITC-BLAD	002	-.56	069.32	10.67	15.39	5.89E+00	.75
CDLVTH	CSF1	007	.37	069.32	08.00	11.54	5.89E+00	.75
CDLVTH	ITC-THR	003	.53	069.32	08.00	11.54	5.89E+00	.75
DECMBM1	IGRINDR	001	.78	262.76	29.79	11.34	3.39E+00	.94
DECMBM1	LFCLNLIV	011	.17	262.76	28.72	10.93	3.39E+00	.94
DECMBM1	BRETHRAT	002	.77	262.76	13.83	05.26	3.39E+00	.94
DECMBM1	LFGRCAR	003	.69	262.76	11.70	04.45	3.39E+00	.94
DECMBM2	LFCLNLIV	028	.11	252.73	46.24	18.30	3.24E+00	.93
DECMBM2	LFCLSHLT	011	.21	252.73	45.16	17.87	3.24E+00	.93
DECMBM2	LFGRSHLT	094	.03	252.73	29.03	11.49	3.24E+00	.93
DECMBM2	LFGRNLVE	043	.09	252.73	25.81	10.21	3.24E+00	.93
DECMBM2	BRETHRAT	001	.76	252.73	13.98	05.53	3.24E+00	.93
DECMBM2	LFGRCAR	003	.49	252.73	06.45	02.55	3.24E+00	.93
DECMBM2	INDEPEXT	002	.58	252.73	05.38	02.13	3.24E+00	.93
DECMBM3	BBF-ET2	002	.46	272.98	17.65	06.47	6.46E+00	.85
DECMBM3	ET2-STOM	001	.59	272.98	11.76	04.31	6.46E+00	.85
DECMBM3	CSGRINDR	003	.30	272.98	10.59	03.88	6.46E+00	.85
DECMSK1	LFIHNLIV	001	.91	196.00	99.00	50.51	3.39E+00	1.00
DECMSK1	LFIHSHLT	107	.02	196.00	97.00	49.49	3.39E+00	1.00
DECMSK1	RB-INHAL	003	-.16	196.00	00.00	00.00	3.39E+00	1.00
DECMSK1	SKINRES	002	.71	196.00	00.00	00.00	3.39E+00	1.00
DECMSK2	LFIHNLIV	001	.82	198.99	100.00	50.25	3.55E+00	.99
DECMSK2	LFIHSHLT	003	.49	198.99	97.98	49.24	3.55E+00	.99
DECMSK2	SKINRES	002	.72	198.99	01.01	00.51	3.55E+00	.99
DECMSK3	LFIHNLIV	013	.16	159.77	48.78	30.53	7.59E+00	.82

DECMSK3	LFIHSHLT	061	.06	159.77	48.78	30.53	7.59E+00	.82
DECMSK3	BBF-ET2	003	.38	159.77	13.41	08.39	7.59E+00	.82
DECMSK3	ET2-STOM	001	.52	159.77	08.54	05.35	7.59E+00	.82
DECMSK3	BRETHRAT	002	-.40	159.77	06.10	03.82	7.59E+00	.82

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
DECMTH1	BRETHRAT	003	.69	117.23	20.69	17.65	3.02E+01	.87
DECMTH1	LFIHNLIV	011	.18	117.23	18.39	15.69	3.02E+01	.87
DECMTH1	LFIHSHLT	113	-.02	117.23	17.24	14.71	3.02E+01	.87
DECMTH1	ITC-THR	001	.73	117.23	12.64	10.78	3.02E+01	.87
DECMTH1	ITC-BLAD	002	-.69	117.23	10.34	08.82	3.02E+01	.87
DECMTH2	BRETHRAT	002	.69	120.69	20.69	17.14	2.14E+01	.87
DECMTH2	LFIHNLIV	011	.14	120.69	20.69	17.14	2.14E+01	.87
DECMTH2	LFIHSHLT	081	.04	120.69	20.69	17.14	2.14E+01	.87
DECMTH2	ITC-THR	001	.73	120.69	11.49	09.52	2.14E+01	.87
DECMTH2	ITC-BLAD	003	-.69	120.69	10.34	08.57	2.14E+01	.87
DECMTH3	LFIHNLIV	018	.10	123.56	28.24	22.86	1.58E+01	.85
DECMTH3	LFIHSHLT	019	.09	123.56	28.24	22.86	1.58E+01	.85
DECMTH3	BRETHRAT	003	.59	123.56	14.12	11.43	1.58E+01	.85
DECMTH3	ITC-THR	001	.68	123.56	10.59	08.57	1.58E+01	.85
DECMTH3	ITC-BLAD	002	-.64	123.56	08.24	06.67	1.58E+01	.85
DLCMBM2	CSGR30Y	001	.63	136.39	37.66	27.61	1.35E+01	.77
DLCMBM2	CSGR100Y	003	.44	136.39	27.27	19.99	1.35E+01	.77
DLCMBM2	CSWB2-UL	002	-.58	136.39	11.69	08.57	1.35E+01	.77
DLCMBM3	CSGR30Y	002	.58	130.29	34.21	26.26	8.71E+00	.76
DLCMBM3	CSGR100Y	003	.42	130.29	25.00	19.19	8.71E+00	.76
DLCMBM3	CSWB2-UL	001	-.64	130.29	17.11	13.13	8.71E+00	.76
DLCMBM4	CSGR30Y	002	.59	132.49	35.06	26.46	8.91E+00	.77
DLCMBM4	CSGR100Y	003	.42	132.49	24.68	18.63	8.91E+00	.77
DLCMBM4	CSWB2-UL	001	-.65	132.49	16.88	12.74	8.91E+00	.77
DLCMED2	BBF-ET2	002	-.34	148.61	22.73	15.30	3.72E+01	.66
DLCMED2	ET2-STOM	001	-.44	148.61	16.67	11.22	3.72E+01	.66
DLCMED2	CSGR30Y	003	.31	148.61	10.61	07.14	3.72E+01	.66
DLCMED3	CSGR30Y	002	.38	131.22	20.31	15.48	1.26E+01	.64
DLCMED3	CSWB2-UL	001	-.42	131.22	09.38	07.15	1.26E+01	.64
DLCMED3	ET2-STOM	003	-.31	131.22	07.81	05.95	1.26E+01	.64
DLCMED4	CSGR30Y	002	.46	131.34	28.36	21.59	6.92E+00	.67
DLCMED4	CSGR100Y	004	.28	131.34	17.91	13.64	6.92E+00	.67
DLCMED4	CSWB2-UL	001	-.51	131.34	13.43	10.23	6.92E+00	.67
DLCMED4	CSTC-WB	003	.29	131.34	00.00	00.00	6.92E+00	.67
DLCMTH2	CSGR30Y	001	.65	137.14	39.74	28.98	8.91E+00	.78
DLCMTH2	CSGR100Y	003	.46	137.14	28.21	20.57	8.91E+00	.78
DLCMTH2	CSWB2-UL	002	-.54	137.14	10.26	07.48	8.91E+00	.78
DLCMTH3	CSGR30Y	002	.61	138.99	38.96	28.03	6.46E+00	.77
DLCMTH3	CSGR100Y	003	.45	138.99	28.57	20.56	6.46E+00	.77
DLCMTH3	CSWB2-UL	001	-.62	138.99	14.29	10.28	6.46E+00	.77
DLCMTH4	CSGR30Y	001	.62	142.88	38.96	27.27	6.92E+00	.77
DLCMTH4	CSGR100Y	003	.42	142.88	25.97	18.18	6.92E+00	.77
DLCMTH4	CSWB2-UL	002	-.62	142.88	14.29	10.00	6.92E+00	.77
DLLVBM2	CSWB2-UL	001	-.78	070.15	32.47	46.29	9.55E+00	.77
DLLVBM2	CSF1	004	.51	070.15	12.99	18.52	9.55E+00	.77
DLLVBM2	CSWB-ULI	003	-.52	070.15	06.49	09.25	9.55E+00	.77
DLLVBM2	CSTC-WB	002	.61	070.15	03.90	05.56	9.55E+00	.77
DLLVBM3	CSWB2-UL	001	-.78	075.05	31.58	42.08	9.55E+00	.76
DLLVBM3	CSF1	003	.51	075.05	14.47	19.28	9.55E+00	.76
DLLVBM3	CSTC-WB	002	.60	075.05	03.95	05.26	9.55E+00	.76
DLLVBM4	CSWB2-UL	001	-.77	072.42	31.58	43.61	9.12E+00	.76
DLLVBM4	CSF1	003	.50	072.42	13.16	18.17	9.12E+00	.76
DLLVBM4	CSTC-WB	002	.59	072.42	03.95	05.45	9.12E+00	.76
DLLVED2	CSWB2-UL	001	-.64	076.95	24.62	31.99	1.29E+01	.65
DLLVED2	CSF1	004	.34	076.95	09.23	11.99	1.29E+01	.65
DLLVED2	CSWB-ULI	003	-.36	076.95	06.15	07.99	1.29E+01	.65
DLLVED2	CSTC-WB	002	.43	076.95	01.54	02.00	1.29E+01	.65
DLLVED3	CSWB2-UL	001	-.65	075.41	26.15	34.68	1.23E+01	.65
DLLVED3	CSF1	004	.34	075.41	09.23	12.24	1.23E+01	.65
DLLVED3	CSWB-ULI	003	-.37	075.41	06.15	08.16	1.23E+01	.65
DLLVED3	CSTC-WB	002	.44	075.41	01.54	02.04	1.23E+01	.65
DLLVED4	CSWB2-UL	001	-.69	076.45	29.41	38.47	9.12E+00	.68
DLLVED4	CSF1	004	.38	076.45	10.29	13.46	9.12E+00	.68
DLLVED4	CSWB-ULI	003	-.41	076.45	05.88	07.69	9.12E+00	.68
DLLVED4	CSTC-WB	002	.49	076.45	02.94	03.85	9.12E+00	.68
DLLVTH2	ITC-BLAD	001	-.72	070.51	20.51	29.09	5.01E+00	.78
DLLVTH2	ITC-THR	002	.68	070.51	16.67	23.64	5.01E+00	.78
DLLVTH2	CSWB2-UL	003	-.65	070.51	15.38	21.81	5.01E+00	.78
DLLVTH3	ITC-BLAD	001	-.72	073.07	20.51	28.07	5.01E+00	.78

DLLVTH3	ITC-THR	002	.69	073.07	16.67	22.81	5.01E+00	.78
DLLVTH3	CSWB2-UL	003	-.64	073.07	15.38	21.05	5.01E+00	.78

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
DLLVTH4	CSWB2-UL	001	-.68	078.35	21.62	27.59	5.62E+00	.74
DLLVTH4	ITC-BLAD	002	-.60	078.35	13.51	17.24	5.62E+00	.74
DLLVTH4	ITC-THR	003	.57	078.35	10.81	13.80	5.62E+00	.74
PECMLU	BBF-ET2	002	-.33	112.19	15.15	13.50	9.99E+09	.66
PECMLU	BBS-ET2	031	-.10	112.19	12.12	10.80	9.99E+09	.66
PECMLU	INDEPTB	003	.33	112.19	07.58	06.76	9.99E+09	.66
PECMLU	INDEPET	001	-.41	112.19	04.55	04.06	9.99E+09	.66
PECMMB	LFIHNLIV	001	.56	190.62	95.83	50.27	4.24E+01	.96
PECMMB	LFIHSHLT	132	-.01	190.62	93.75	49.18	4.24E+01	.96
PECMMB	INDEPEXT	002	.20	190.62	00.00	00.00	4.24E+01	.96
PECMMB	RUTC-WB2	003	.20	190.62	00.00	00.00	4.24E+01	.96
PECMMT	LFIHNLIV	003	.30	182.22	87.78	48.17	4.53E+02	.90
PECMMT	LFIHSHLT	037	.09	182.22	86.67	47.56	4.53E+02	.90
PECMMT	BBF-ET2	002	-.32	182.22	02.22	01.22	4.53E+02	.90
PECMMT	INDEPET	001	-.33	182.22	00.00	00.00	4.53E+02	.90
PECMSK	LFIHNLIV	001	.38	179.32	86.21	48.08	8.79E+01	.87
PECMSK	LFIHSHLT	064	-.05	179.32	83.91	46.79	8.79E+01	.87
PECMSK	BRETHRAT	003	-.24	179.32	01.15	00.64	8.79E+01	.87
PECMSK	INDEPET	002	.26	179.32	00.00	00.00	8.79E+01	.87
PECMTH	BRETHRAT	002	.52	110.79	18.92	17.08	9.99E+09	.74
PECMTH	LFIHNLIV	019	.12	110.79	14.86	13.41	9.99E+09	.74
PECMTH	LFIHSHLT	092	-.03	110.79	13.51	12.19	9.99E+09	.74
PECMTH	IANY-BL	004	.44	110.79	12.16	10.98	9.99E+09	.74
PECMTH	ITC-THR	001	.54	110.79	10.81	09.76	9.99E+09	.74
PECMTH	ITC-BLAD	003	-.48	110.79	08.11	07.32	9.99E+09	.74
PLCMBM	CSWB2-UL	001	-.71	087.16	30.00	34.42	8.91E+00	.70
PLCMBM	CSF1	004	.41	087.16	10.00	11.47	8.91E+00	.70
PLCMBM	CSWB-ULI	003	-.42	087.16	05.71	06.55	8.91E+00	.70
PLCMBM	CSTC-WB	002	.51	087.16	02.86	03.28	8.91E+00	.70
PLCMMT	CSWB2-UL	001	-.51	103.27	16.95	16.41	1.51E+01	.59
PLCMMT	BBF-ET2	006	-.22	103.27	11.86	11.48	1.51E+01	.59
PLCMMT	ET2-STOM	003	-.29	103.27	06.78	06.57	1.51E+01	.59
PLCMMT	CSTC-WB	002	.30	103.27	00.00	00.00	1.51E+01	.59
PLCMTH	CSWB2-UL	001	-.69	090.02	27.14	30.15	7.94E+00	.70
PLCMTH	CSGR30Y	005	.33	090.02	11.43	12.70	7.94E+00	.70
PLCMTH	CSF1	003	.39	090.02	10.00	11.11	7.94E+00	.70
PLCMTH	CSTC-WB	002	.49	090.02	02.86	03.18	7.94E+00	.70
PLLVBM	CSWB2-UL	001	-.79	071.45	32.47	45.44	1.00E+01	.77
PLLVBM	CSF1	004	.52	071.45	14.29	20.00	1.00E+01	.77
PLLVBM	CSWB-ULI	003	-.52	071.45	06.49	09.08	1.00E+01	.77
PLLVBM	CSTC-WB	002	.61	071.45	03.90	05.46	1.00E+01	.77
PLLVMT	CSWB2-UL	001	-.67	070.16	26.87	38.30	1.26E+01	.67
PLLVMT	CSF1	004	.36	070.16	08.96	12.77	1.26E+01	.67
PLLVMT	CSWB-ULI	003	-.39	070.16	05.97	08.51	1.26E+01	.67
PLLVMT	CSTC-WB	002	.46	070.16	01.49	02.12	1.26E+01	.67
PLLVTH	CSWB2-UL	001	-.71	067.99	24.00	35.30	5.89E+00	.75
PLLVTH	ITC-BLAD	002	-.56	067.99	10.67	15.69	5.89E+00	.75
PLLVTH	ITC-THR	003	.53	067.99	08.00	11.77	5.89E+00	.75
RECMLU1	CSANY-BL	003	-.17	097.72	06.52	06.67	9.99E+09	.46
RECMLU1	BRETHRAT	002	.20	097.72	04.35	04.45	9.99E+09	.46
RECMLU1	INDEPET	001	-.22	097.72	04.35	04.45	9.99E+09	.46
RECMMB1	LFIHNLIV	001	.54	191.49	96.81	50.56	9.99E+09	.94
RECMMB1	LFIHSHLT	030	-.07	191.49	94.68	49.44	9.99E+09	.94
RECMMB1	SKINRES	002	.19	191.49	00.00	00.00	9.99E+09	.94
RECMMB1	TEF1	003	.16	191.49	00.00	00.00	9.99E+09	.94
RECMMT1	LFIHNLIV	001	.53	192.71	96.88	50.27	9.99E+09	.96
RECMMT1	LFIHSHLT	069	.05	192.71	94.79	49.19	9.99E+09	.96
RECMMT1	RUWB-ULI	003	-.16	192.71	00.00	00.00	9.99E+09	.96
RECMMT1	SKINRES	002	.31	192.71	00.00	00.00	9.99E+09	.96
RECMSK1	LFIHNLIV	001	.45	185.72	93.41	50.30	9.99E+09	.91
RECMSK1	LFIHSHLT	044	-.06	185.72	90.11	48.52	9.99E+09	.91
RECMSK1	BRETHRAT	002	-.21	185.72	01.10	00.59	9.99E+09	.91
RECMSK1	SKINRES	003	.17	185.72	00.00	00.00	9.99E+09	.91
RECMTH1	BRETHRAT	002	.31	090.62	09.43	10.41	9.99E+09	.53
RECMTH1	LFIHNLIV	005	.22	090.62	09.43	10.41	9.99E+09	.53
RECMTH1	INDEPEXT	003	.26	090.62	07.55	08.33	9.99E+09	.53
RECMTH1	ITC-THR	001	.33	090.62	07.55	08.33	9.99E+09	.53
RLCMBM2	CSGR30Y	001	.63	137.69	37.66	27.35	1.35E+01	.77

RLCMBM2	CSGR100Y	003	.44	137.69	27.27	19.81	1.35E+01	.77
RLCMBM2	CSWB2-UL	002	-.57	137.69	11.69	08.49	1.35E+01	.77

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
RLCMBM3	CSGR30Y	002	.59	128.60	33.77	26.26	8.71E+00	.77
RLCMBM3	CSGR100Y	003	.42	128.60	24.68	19.19	8.71E+00	.77
RLCMBM3	CSWB2-UL	001	-.64	128.60	16.88	13.13	8.71E+00	.77
RLCMBM4	CSGR30Y	002	.59	132.49	35.06	26.46	8.91E+00	.77
RLCMBM4	CSGR100Y	003	.42	132.49	24.68	18.63	8.91E+00	.77
RLCMBM4	CSWB2-UL	001	-.65	132.49	16.88	12.74	8.91E+00	.77
RLCMMT2	BBF-ET2	002	-.37	149.97	26.47	17.65	4.27E+01	.68
RLCMMT2	ET2-STOM	001	-.48	149.97	19.12	12.75	4.27E+01	.68
RLCMMT2	BBS-ET2	120	.01	149.97	16.18	10.79	4.27E+01	.68
RLCMMT2	CSGR30Y	003	.26	149.97	07.35	04.90	4.27E+01	.68
RLCMMT3	BBF-ET2	004	-.28	135.94	15.63	11.50	1.45E+01	.64
RLCMMT3	CSGR30Y	003	.34	135.94	15.63	11.50	1.45E+01	.64
RLCMMT3	ET2-STOM	002	-.35	135.94	10.94	08.05	1.45E+01	.64
RLCMMT3	CSWB2-UL	001	-.38	135.94	07.81	05.75	1.45E+01	.64
RLCMMT4	CSGR30Y	002	.40	129.27	21.54	16.66	7.94E+00	.65
RLCMMT4	CSWB2-UL	001	-.45	129.27	10.77	08.33	7.94E+00	.65
RLCMMT4	ET2-STOM	003	-.30	129.27	07.69	05.95	7.94E+00	.65
RLCMTH2	CSGR30Y	001	.65	137.14	39.74	28.98	8.91E+00	.78
RLCMTH2	CSGR100Y	003	.46	137.14	28.21	20.57	8.91E+00	.78
RLCMTH2	CSWB2-UL	002	-.54	137.14	10.26	07.48	8.91E+00	.78
RLCMTH3	CSGR30Y	002	.61	137.69	37.66	27.35	6.46E+00	.77
RLCMTH3	CSGR100Y	003	.45	137.69	28.57	20.75	6.46E+00	.77
RLCMTH3	CSWB2-UL	001	-.62	137.69	14.29	10.38	6.46E+00	.77
RLCMTH4	CSGR30Y	001	.63	139.72	38.46	27.53	6.92E+00	.78
RLCMTH4	CSGR100Y	003	.42	139.72	25.64	18.35	6.92E+00	.78
RLCMTH4	CSWB2-UL	002	-.62	139.72	14.10	10.09	6.92E+00	.78
RLLVBM2	CSWB2-UL	001	-.78	071.45	32.47	45.44	9.77E+00	.77
RLLVBM2	CSF1	004	.51	071.45	12.99	18.18	9.77E+00	.77
RLLVBM2	CSWB-ULI	003	-.52	071.45	06.49	09.08	9.77E+00	.77
RLLVBM2	CSTC-WB	002	.60	071.45	03.90	05.46	9.77E+00	.77
RLLVBM3	CSWB2-UL	001	-.78	073.74	31.58	42.83	9.33E+00	.76
RLLVBM3	CSF1	003	.51	073.74	13.16	17.85	9.33E+00	.76
RLLVBM3	CSTC-WB	002	.60	073.74	03.95	05.36	9.33E+00	.76
RLLVBM4	CSWB2-UL	001	-.77	072.42	31.58	43.61	9.12E+00	.76
RLLVBM4	CSF1	003	.50	072.42	13.16	18.17	9.12E+00	.76
RLLVBM4	CSTC-WB	002	.59	072.42	03.95	05.45	9.12E+00	.76
RLLVMT2	CSWB2-UL	001	-.58	098.40	20.31	20.64	5.01E+00	.64
RLLVMT2	BBF-ET2	006	-.25	098.40	10.94	11.12	5.01E+00	.64
RLLVMT2	CSWB-ULI	003	-.32	098.40	04.69	04.77	5.01E+00	.64
RLLVMT2	CSTC-WB	002	.38	098.40	01.56	01.59	5.01E+00	.64
RLLVMT3	CSWB2-UL	001	-.61	085.92	23.44	27.28	1.26E+01	.64
RLLVMT3	CSWB-ULI	003	-.34	085.92	04.69	05.46	1.26E+01	.64
RLLVMT3	CSTC-WB	002	.41	085.92	01.56	01.82	1.26E+01	.64
RLLVMT4	CSWB2-UL	001	-.66	071.27	27.27	38.26	1.17E+01	.66
RLLVMT4	CSF1	004	.35	071.27	09.09	12.75	1.17E+01	.66
RLLVMT4	CSWB-ULI	003	-.38	071.27	06.06	08.50	1.17E+01	.66
RLLVMT4	CSTC-WB	002	.45	071.27	01.52	02.13	1.17E+01	.66
RLLVTH2	ITC-BLAD	001	-.71	072.73	20.78	28.57	5.01E+00	.77
RLLVTH2	ITC-THR	002	.68	072.73	16.88	23.21	5.01E+00	.77
RLLVTH2	CSWB2-UL	003	-.64	072.73	15.58	21.42	5.01E+00	.77
RLLVTH3	ITC-BLAD	001	-.72	071.79	20.51	28.57	5.01E+00	.78
RLLVTH3	ITC-THR	002	.69	071.79	16.67	23.22	5.01E+00	.78
RLLVTH3	CSWB2-UL	003	-.64	071.79	15.38	21.42	5.01E+00	.78
RLLVTH4	CSWB2-UL	001	-.67	078.35	21.62	27.59	5.62E+00	.74
RLLVTH4	ITC-BLAD	002	-.61	078.35	13.51	17.24	5.62E+00	.74
RLLVTH4	ITC-THR	003	.57	078.35	10.81	13.80	5.62E+00	.74

Results for the mean value of the endpoints for the DBA source term

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
CDCMBM	CSWB2-UL	001	-.77	068.85	29.87	43.38	8.71E+00	.77
CDCMBM	CSF1	004	.51	068.85	12.99	18.87	8.71E+00	.77
CDCMBM	CSWB-ULI	003	-.54	068.85	07.79	11.31	8.71E+00	.77
CDCMBM	CSTC-WB	002	.60	068.85	03.90	05.66	8.71E+00	.77
CDCMED	CSWB2-UL	001	-.66	070.14	25.37	36.17	1.03E+01	.67
CDCMED	CSF1	004	.34	070.14	07.46	10.64	1.03E+01	.67
CDCMED	CSWB-ULI	003	-.41	070.14	05.97	08.51	1.03E+01	.67
CDCMED	CSTC-WB	002	.46	070.14	01.49	02.12	1.03E+01	.67
CDCMTH	ITC-BLAD	001	-.78	071.96	24.39	33.89	4.85E+00	.82
CDCMTH	ITC-THR	002	.76	071.96	19.51	27.11	4.85E+00	.82
CDCMTH	CSWB2-UL	003	-.61	071.96	10.98	15.26	4.85E+00	.82
CDOUBM	CSWB2-UL	001	-.72	083.79	25.68	30.65	6.80E+00	.74
CDOUBM	CSGR30Y	005	.40	083.79	16.22	19.36	6.80E+00	.74
CDOUBM	CSGR100Y	007	.30	083.79	12.16	14.51	6.80E+00	.74
CDOUBM	CSWB-ULI	003	-.45	083.79	06.76	08.07	6.80E+00	.74
CDOUBM	CSTC-WB	002	.53	083.79	01.35	01.61	6.80E+00	.74
CDOUED	CSWB2-UL	001	-.57	087.72	18.46	21.04	7.87E+00	.65
CDOUED	CSGR30Y	004	.31	087.72	12.31	14.03	7.87E+00	.65
CDOUED	CSWB-ULI	003	-.34	087.72	06.15	07.01	7.87E+00	.65
CDOUED	CSTC-WB	002	.36	087.72	00.00	00.00	7.87E+00	.65
CDOUTH	ITC-BLAD	001	-.78	076.52	25.93	33.89	4.20E+00	.81
CDOUTH	ITC-THR	002	.75	076.52	18.52	24.20	4.20E+00	.81
CDOUTH	CSWB2-UL	003	-.56	076.52	08.64	11.29	4.20E+00	.81
DLCMBM2	CSWB2-UL	001	-.77	071.45	29.87	41.81	9.06E+00	.77
DLCMBM2	CSF1	004	.50	071.45	12.99	18.18	9.06E+00	.77
DLCMBM2	CSWB-ULI	003	-.54	071.45	07.79	10.90	9.06E+00	.77
DLCMBM2	CSTC-WB	002	.60	071.45	03.90	05.46	9.06E+00	.77
DLCMBM3	CSWB2-UL	001	-.77	068.85	29.87	43.38	9.03E+00	.77
DLCMBM3	CSF1	004	.51	068.85	12.99	18.87	9.03E+00	.77
DLCMBM3	CSWB-ULI	003	-.54	068.85	07.79	11.31	9.03E+00	.77
DLCMBM3	CSTC-WB	002	.60	068.85	03.90	05.66	9.03E+00	.77
DLCMBM4	CSWB2-UL	001	-.77	070.15	29.87	42.58	8.99E+00	.77
DLCMBM4	CSF1	004	.51	070.15	12.99	18.52	8.99E+00	.77
DLCMBM4	CSWB-ULI	003	-.54	070.15	07.79	11.10	8.99E+00	.77
DLCMBM4	CSTC-WB	002	.60	070.15	03.90	05.56	8.99E+00	.77
DLCMED2	CSWB2-UL	001	-.62	078.85	21.21	26.90	1.28E+01	.66
DLCMED2	BBF-ET2	007	-.23	078.85	09.09	11.53	1.28E+01	.66
DLCMED2	CSWB-ULI	003	-.37	078.85	06.06	07.69	1.28E+01	.66
DLCMED2	CSTC-WB	002	.42	078.85	01.52	01.93	1.28E+01	.66
DLCMED3	CSWB2-UL	001	-.65	073.13	23.88	32.65	1.09E+01	.67
DLCMED3	CSF1	004	.33	073.13	07.46	10.20	1.09E+01	.67
DLCMED3	CSWB-ULI	003	-.39	073.13	05.97	08.16	1.09E+01	.67
DLCMED3	CSTC-WB	002	.45	073.13	01.49	02.04	1.09E+01	.67
DLCMED4	CSWB2-UL	001	-.69	071.04	26.09	36.73	8.62E+00	.69
DLCMED4	CSF1	004	.37	071.04	08.70	12.25	8.62E+00	.69
DLCMED4	CSWB-ULI	003	-.44	071.04	07.25	10.21	8.62E+00	.69
DLCMED4	CSTC-WB	002	.50	071.04	02.90	04.08	8.62E+00	.69
DLCMTH2	ITC-BLAD	001	-.76	070.00	23.75	33.93	4.93E+00	.80
DLCMTH2	ITC-THR	002	.73	070.00	18.75	26.79	4.93E+00	.80
DLCMTH2	CSWB2-UL	003	-.62	070.00	11.25	16.07	4.93E+00	.80
DLCMTH3	ITC-BLAD	001	-.81	073.46	27.71	37.72	4.90E+00	.83
DLCMTH3	ITC-THR	002	.78	073.46	20.48	27.88	4.90E+00	.83
DLCMTH3	CSWB2-UL	003	-.58	073.46	08.43	11.48	4.90E+00	.83
DLCMTH4	ITC-BLAD	001	-.74	068.75	20.00	29.09	5.16E+00	.80
DLCMTH4	ITC-THR	002	.72	068.75	16.25	23.64	5.16E+00	.80
DLCMTH4	CSWB2-UL	003	-.65	068.75	13.75	20.00	5.16E+00	.80
DLOUBM2	CSWB2-UL	001	-.72	082.43	25.68	31.15	6.82E+00	.74
DLOUBM2	CSGR30Y	006	.38	082.43	13.51	16.39	6.82E+00	.74
DLOUBM2	CSGR100Y	008	.28	082.43	10.81	13.11	6.82E+00	.74
DLOUBM2	CSWB-ULI	003	-.46	082.43	06.76	08.20	6.82E+00	.74
DLOUBM2	CSTC-WB	002	.54	082.43	02.70	03.28	6.82E+00	.74
DLOUBM3	CSWB2-UL	001	-.72	079.73	25.68	32.21	6.89E+00	.74
DLOUBM3	CSGR30Y	006	.38	079.73	13.51	16.94	6.89E+00	.74
DLOUBM3	CSGR100Y	008	.28	079.73	10.81	13.56	6.89E+00	.74
DLOUBM3	CSF1	004	.42	079.73	08.11	10.17	6.89E+00	.74
DLOUBM3	CSWB-ULI	003	-.46	079.73	06.76	08.48	6.89E+00	.74
DLOUBM3	CSTC-WB	002	.54	079.73	02.70	03.39	6.89E+00	.74

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
DLOUBM4	CSWB2-UL	001	-.72	081.08	25.68	31.67	7.07E+00	.74
DLOUBM4	CSGR30Y	006	.39	081.08	14.86	18.33	7.07E+00	.74
DLOUBM4	CSGR100Y	008	.28	081.08	10.81	13.33	7.07E+00	.74
DLOUBM4	CSF1	004	.42	081.08	08.11	10.00	7.07E+00	.74
DLOUBM4	CSWB-ULI	003	-.46	081.08	06.76	08.34	7.07E+00	.74
DLOUBM4	CSTC-WB	002	.54	081.08	02.70	03.33	7.07E+00	.74
DLOUED2	CSWB2-UL	001	-.53	095.31	15.63	16.40	9.77E+00	.64
DLOUED2	BBF-ET2	007	-.23	095.31	10.94	11.48	9.77E+00	.64
DLOUED2	CSWB-ULI	002	-.32	095.31	06.25	06.56	9.77E+00	.64
DLOUED2	CSTC-WB	003	.32	095.31	00.00	00.00	9.77E+00	.64
DLOUED3	CSWB2-UL	001	-.56	086.18	18.46	21.42	8.53E+00	.65
DLOUED3	CSGR30Y	004	.28	086.18	09.23	10.71	8.53E+00	.65
DLOUED3	CSWB-ULI	003	-.34	086.18	06.15	07.14	8.53E+00	.65
DLOUED3	CSTC-WB	002	.35	086.18	00.00	00.00	8.53E+00	.65
DLOUED4	CSWB2-UL	001	-.62	088.05	20.90	23.74	7.54E+00	.67
DLOUED4	CSGR30Y	004	.32	088.05	11.94	13.56	7.54E+00	.67
DLOUED4	CSWB-ULI	003	-.37	088.05	07.46	08.47	7.54E+00	.67
DLOUED4	CSTC-WB	002	.41	088.05	01.49	01.69	7.54E+00	.67
DLOUTH2	ITC-BLAD	001	-.82	077.07	30.12	39.08	4.73E+00	.83
DLOUTH2	ITC-THR	002	.79	077.07	20.48	26.57	4.73E+00	.83
DLOUTH2	CSWB2-UL	003	-.53	077.07	07.23	09.38	4.73E+00	.83
DLOUTH3	ITC-BLAD	001	-.80	074.40	28.05	37.70	4.38E+00	.82
DLOUTH3	ITC-THR	002	.77	074.40	19.51	26.22	4.38E+00	.82
DLOUTH3	CSWB2-UL	003	-.55	074.40	08.54	11.48	4.38E+00	.82
DLOUTH4	ITC-BLAD	001	-.71	075.63	20.51	27.12	4.31E+00	.78
DLOUTH4	ITC-THR	002	.67	075.63	14.10	18.64	4.31E+00	.78
DLOUTH4	CSWB2-UL	003	-.61	075.63	12.82	16.95	4.31E+00	.78
PLCMBM	CSWB2-UL	001	-.77	068.85	29.87	43.38	8.71E+00	.77
PLCMBM	CSF1	004	.51	068.85	12.99	18.87	8.71E+00	.77
PLCMBM	CSWB-ULI	003	-.54	068.85	07.79	11.31	8.71E+00	.77
PLCMBM	CSTC-WB	002	.60	068.85	03.90	05.66	8.71E+00	.77
PLCMMT	CSWB2-UL	001	-.63	077.35	22.73	29.39	1.33E+01	.66
PLCMMT	CSWB-ULI	003	-.38	077.35	06.06	07.83	1.33E+01	.66
PLCMMT	CSTC-WB	002	.43	077.35	01.52	01.97	1.33E+01	.66
PLCMTH	ITC-BLAD	001	-.78	071.96	24.39	33.89	4.85E+00	.82
PLCMTH	ITC-THR	002	.76	071.96	19.51	27.11	4.85E+00	.82
PLCMTH	CSWB2-UL	003	-.61	071.96	10.98	15.26	4.85E+00	.82
PLOUBM	CSWB2-UL	001	-.72	083.79	25.68	30.65	6.80E+00	.74
PLOUBM	CSGR30Y	005	.40	083.79	16.22	19.36	6.80E+00	.74
PLOUBM	CSGR100Y	007	.30	083.79	12.16	14.51	6.80E+00	.74
PLOUBM	CSWB-ULI	003	-.45	083.79	06.76	08.07	6.80E+00	.74
PLOUBM	CSTC-WB	002	.53	083.79	01.35	01.61	6.80E+00	.74
PLOUMT	CSWB2-UL	001	-.54	098.44	17.19	17.46	9.89E+00	.64
PLOUMT	CSWB-ULI	003	-.33	098.44	06.25	06.35	9.89E+00	.64
PLOUMT	CSTC-WB	002	.33	098.44	00.00	00.00	9.89E+00	.64
PLOUTH	ITC-BLAD	001	-.78	076.52	25.93	33.89	4.20E+00	.81
PLOUTH	ITC-THR	002	.75	076.52	18.52	24.20	4.20E+00	.81
PLOUTH	CSWB2-UL	003	-.56	076.52	08.64	11.29	4.20E+00	.81
RLCMBM2	CSWB2-UL	001	-.77	071.45	29.87	41.81	9.06E+00	.77
RLCMBM2	CSF1	004	.50	071.45	12.99	18.18	9.06E+00	.77
RLCMBM2	CSWB-ULI	003	-.54	071.45	07.79	10.90	9.06E+00	.77
RLCMBM2	CSTC-WB	002	.60	071.45	03.90	05.46	9.06E+00	.77
RLCMBM3	CSWB2-UL	001	-.77	068.85	29.87	43.38	9.03E+00	.77
RLCMBM3	CSF1	004	.51	068.85	12.99	18.87	9.03E+00	.77
RLCMBM3	CSWB-ULI	003	-.54	068.85	07.79	11.31	9.03E+00	.77
RLCMBM3	CSTC-WB	002	.60	068.85	03.90	05.66	9.03E+00	.77
RLCMBM4	CSWB2-UL	001	-.77	070.15	29.87	42.58	8.99E+00	.77
RLCMBM4	CSF1	004	.51	070.15	12.99	18.52	8.99E+00	.77
RLCMBM4	CSWB-ULI	003	-.54	070.15	07.79	11.10	8.99E+00	.77
RLCMBM4	CSTC-WB	002	.60	070.15	03.90	05.56	8.99E+00	.77
RLCMMT2	CSWB2-UL	001	-.59	092.33	20.00	21.66	1.48E+01	.65
RLCMMT2	BBF-ET2	006	-.26	092.33	12.31	13.33	1.48E+01	.65
RLCMMT2	CSWB-ULI	003	-.35	092.33	06.15	06.66	1.48E+01	.65
RLCMMT2	CSTC-WB	002	.39	092.33	01.54	01.67	1.48E+01	.65
RLCMMT3	CSWB2-UL	001	-.62	075.82	21.21	27.97	1.31E+01	.66
RLCMMT3	BBF-ET2	007	-.23	075.82	09.09	11.99	1.31E+01	.66
RLCMMT3	CSWB-ULI	003	-.37	075.82	06.06	07.99	1.31E+01	.66
RLCMMT3	CSTC-WB	002	.42	075.82	01.52	02.00	1.31E+01	.66
RLCMMT4	CSWB2-UL	001	-.66	073.12	25.37	34.70	1.15E+01	.67
RLCMMT4	CSF1	004	.34	073.12	07.46	10.20	1.15E+01	.67

RLCMMT4	CSWB-ULI	003	-.41	073.12	07.46	10.20	1.15E+01	.67
RLCMMT4	CSTC-WB	002	.46	073.12	01.49	02.04	1.15E+01	.67

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
RLCMTH2	ITC-BLAD	001	-.76	070.00	23.75	33.93	4.93E+00	.80
RLCMTH2	ITC-THR	002	.73	070.00	18.75	26.79	4.93E+00	.80
RLCMTH2	CSWB2-UL	003	-.62	070.00	11.25	16.07	4.93E+00	.80
RLCMTH3	ITC-BLAD	001	-.81	073.46	27.71	37.72	4.90E+00	.83
RLCMTH3	ITC-THR	002	.78	073.46	20.48	27.88	4.90E+00	.83
RLCMTH3	CSWB2-UL	003	-.58	073.46	08.43	11.48	4.90E+00	.83
RLCMTH4	ITC-BLAD	001	-.74	068.75	20.00	29.09	5.16E+00	.80
RLCMTH4	ITC-THR	002	.72	068.75	16.25	23.64	5.16E+00	.80
RLCMTH4	CSWB2-UL	003	-.65	068.75	13.75	20.00	5.16E+00	.80
RLOUBM2	CSWB2-UL	001	-.72	082.43	25.68	31.15	6.82E+00	.74
RLOUBM2	CSGR30Y	006	.38	082.43	13.51	16.39	6.82E+00	.74
RLOUBM2	CSGR100Y	008	.28	082.43	10.81	13.11	6.82E+00	.74
RLOUBM2	CSWB-ULI	003	-.46	082.43	06.76	08.20	6.82E+00	.74
RLOUBM2	CSTC-WB	002	.54	082.43	02.70	03.28	6.82E+00	.74
RLOUBM3	CSWB2-UL	001	-.72	079.73	25.68	32.21	6.89E+00	.74
RLOUBM3	CSGR30Y	006	.38	079.73	13.51	16.94	6.89E+00	.74
RLOUBM3	CSGR100Y	008	.28	079.73	10.81	13.56	6.89E+00	.74
RLOUBM3	CSF1	004	.42	079.73	08.11	10.17	6.89E+00	.74
RLOUBM3	CSWB-ULI	003	-.46	079.73	06.76	08.48	6.89E+00	.74
RLOUBM3	CSTC-WB	002	.54	079.73	02.70	03.39	6.89E+00	.74
RLOUBM4	CSWB2-UL	001	-.72	081.08	25.68	31.67	7.07E+00	.74
RLOUBM4	CSGR30Y	006	.39	081.08	14.86	18.33	7.07E+00	.74
RLOUBM4	CSGR100Y	008	.28	081.08	10.81	13.33	7.07E+00	.74
RLOUBM4	CSF1	004	.42	081.08	08.11	10.00	7.07E+00	.74
RLOUBM4	CSWB-ULI	003	-.46	081.08	06.76	08.34	7.07E+00	.74
RLOUBM4	CSTC-WB	002	.54	081.08	02.70	03.33	7.07E+00	.74
RLOUMT2	BBF-ET2	005	-.27	103.11	14.06	13.64	1.19E+01	.64
RLOUMT2	CSWB2-UL	001	-.50	103.11	14.06	13.64	1.19E+01	.64
RLOUMT2	ET2-STOM	002	-.34	103.11	07.81	07.57	1.19E+01	.64
RLOUMT2	CSWB-ULI	003	-.31	103.11	06.25	06.06	1.19E+01	.64
RLOUMT3	CSWB2-UL	001	-.53	096.87	15.63	16.14	1.10E+01	.64
RLOUMT3	BBF-ET2	007	-.24	096.87	10.94	11.29	1.10E+01	.64
RLOUMT3	CSWB-ULI	002	-.32	096.87	06.25	06.45	1.10E+01	.64
RLOUMT3	CSTC-WB	003	.32	096.87	00.00	00.00	1.10E+01	.64
RLOUMT4	CSWB2-UL	001	-.58	087.72	20.00	22.80	8.99E+00	.65
RLOUMT4	CSGR30Y	004	.29	087.72	10.77	12.28	8.99E+00	.65
RLOUMT4	CSWB-ULI	003	-.35	087.72	06.15	07.01	8.99E+00	.65
RLOUMT4	CSTC-WB	002	.37	087.72	00.00	00.00	8.99E+00	.65
RLOUTH2	ITC-BLAD	001	-.82	077.07	30.12	39.08	4.73E+00	.83
RLOUTH2	ITC-THR	002	.79	077.07	20.48	26.57	4.73E+00	.83
RLOUTH2	CSWB2-UL	003	-.53	077.07	07.23	09.38	4.73E+00	.83
RLOUTH3	ITC-BLAD	001	-.80	074.40	28.05	37.70	4.38E+00	.82
RLOUTH3	ITC-THR	002	.77	074.40	19.51	26.22	4.38E+00	.82
RLOUTH3	CSWB2-UL	003	-.55	074.40	08.54	11.48	4.38E+00	.82
RLOUTH4	ITC-BLAD	001	-.71	075.63	20.51	27.12	4.31E+00	.78
RLOUTH4	ITC-THR	002	.67	075.63	14.10	18.64	4.31E+00	.78
RLOUTH4	CSWB2-UL	003	-.61	075.63	12.82	16.95	4.31E+00	.78

RESULTS FOR THE 95TH PERCENTILE OF THE ENDPOINTS FOR THE DBA SOURCE TERM

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
CDCMBM	CSWB2-UL	001	-.78	070.15	29.87	42.58	9.55E+00	.77
CDCMBM	CSF1	004	.51	070.15	12.99	18.52	9.55E+00	.77
CDCMBM	CSWB-ULI	003	-.56	070.15	07.79	11.10	9.55E+00	.77
CDCMBM	CSTC-WB	002	.61	070.15	03.90	05.56	9.55E+00	.77
CDCMED	CSWB2-UL	001	-.70	065.73	28.57	43.47	9.33E+00	.70
CDCMED	CSF1	004	.39	065.73	10.00	15.21	9.33E+00	.70
CDCMED	CSWB-ULI	003	-.46	065.73	07.14	10.86	9.33E+00	.70
CDCMED	CSTC-WB	002	.52	065.73	02.86	04.35	9.33E+00	.70
CDCMTH	ITC-BLAD	001	-.75	070.00	22.50	32.14	5.25E+00	.80
CDCMTH	ITC-THR	002	.72	070.00	16.25	23.21	5.25E+00	.80
CDCMTH	CSWB2-UL	003	-.63	070.00	12.50	17.86	5.25E+00	.80
CDCMTH	CNSRTMLK	004	.53	070.00	08.75	12.50	5.25E+00	.80
CDOUBM	CSWB2-UL	001	-.72	081.07	27.03	33.34	7.41E+00	.74
CDOUBM	CSGR30Y	006	.35	081.07	10.81	13.33	7.41E+00	.74
CDOUBM	CSF1	004	.43	081.07	09.46	11.67	7.41E+00	.74
CDOUBM	CSGR100Y	008	.25	081.07	09.46	11.67	7.41E+00	.74
CDOUBM	CSWB-ULI	003	-.46	081.07	08.11	10.00	7.41E+00	.74
CDOUBM	CSTC-WB	002	.55	081.07	02.70	03.33	7.41E+00	.74
CDOUED	CSWB2-UL	001	-.62	078.48	23.08	29.41	8.13E+00	.65
CDOUED	CSGR30Y	005	.29	078.48	10.77	13.72	8.13E+00	.65
CDOUED	CSWB-ULI	003	-.37	078.48	07.69	09.80	8.13E+00	.65
CDOUED	CSTC-WB	002	.42	078.48	01.54	01.96	8.13E+00	.65
CDOUTH	ITC-BLAD	001	-.73	075.61	23.08	30.53	4.27E+00	.78
CDOUTH	ITC-THR	002	.69	075.61	15.38	20.34	4.27E+00	.78
CDOUTH	CSWB2-UL	003	-.59	075.61	11.54	15.26	4.27E+00	.78
CDOUTH	CNSRTMLK	004	.48	075.61	07.69	10.17	4.27E+00	.78
DLCMBM2	CSWB2-UL	001	-.76	072.39	28.95	39.99	7.94E+00	.76
DLCMBM2	CSF1	004	.48	072.39	10.53	14.55	7.94E+00	.76
DLCMBM2	CSWB-ULI	003	-.51	072.39	06.58	09.09	7.94E+00	.76
DLCMBM2	CSTC-WB	002	.58	072.39	02.63	03.63	7.94E+00	.76
DLCMBM3	CSWB2-UL	001	-.77	070.15	29.87	42.58	8.51E+00	.77
DLCMBM3	CSF1	004	.50	070.15	11.69	16.66	8.51E+00	.77
DLCMBM3	CSWB-ULI	003	-.54	070.15	07.79	11.10	8.51E+00	.77
DLCMBM3	CSTC-WB	002	.60	070.15	03.90	05.56	8.51E+00	.77
DLCMBM4	CSWB2-UL	001	-.76	072.37	28.95	40.00	7.94E+00	.76
DLCMBM4	CSF1	004	.49	072.37	11.84	16.36	7.94E+00	.76
DLCMBM4	CSWB-ULI	003	-.52	072.37	07.89	10.90	7.94E+00	.76
DLCMBM4	CSTC-WB	002	.59	072.37	02.63	03.63	7.94E+00	.76
DLCMED2	CSWB2-UL	001	-.57	091.02	16.67	18.31	9.12E+00	.66
DLCMED2	BBF-ET2	008	-.24	091.02	10.61	11.66	9.12E+00	.66
DLCMED2	CSWB-ULI	003	-.33	091.02	04.55	05.00	9.12E+00	.66
DLCMED2	CSTC-WB	002	.37	091.02	01.52	01.67	9.12E+00	.66
DLCMED3	CSWB2-UL	001	-.59	086.19	20.00	23.20	1.05E+01	.65
DLCMED3	BBF-ET2	008	-.23	086.19	09.23	10.71	1.05E+01	.65
DLCMED3	CSWB-ULI	003	-.34	086.19	06.15	07.14	1.05E+01	.65
DLCMED3	CSTC-WB	002	.39	086.19	01.54	01.79	1.05E+01	.65
DLCMED4	CSWB2-UL	001	-.61	090.99	19.70	21.65	1.05E+01	.66
DLCMED4	CSWB-ULI	003	-.35	090.99	06.06	06.66	1.05E+01	.66
DLCMED4	CSTC-WB	002	.41	090.99	01.52	01.67	1.05E+01	.66
DLCMTH2	ITC-BLAD	001	-.85	075.56	30.23	40.01	5.13E+00	.86
DLCMTH2	ITC-THR	002	.83	075.56	22.09	29.24	5.13E+00	.86
DLCMTH2	CNSRTGVG	003	.63	075.56	12.79	16.93	5.13E+00	.86
DLCMTH3	ITC-BLAD	001	-.84	074.13	30.59	41.27	5.25E+00	.85
DLCMTH3	ITC-THR	002	.81	074.13	21.18	28.57	5.25E+00	.85
DLCMTH3	CNSRTGVG	003	.57	074.13	10.59	14.29	5.25E+00	.85
DLCMTH4	ITC-BLAD	001	-.75	070.34	19.75	28.08	4.68E+00	.81
DLCMTH4	ITC-THR	002	.72	070.34	16.05	22.82	4.68E+00	.81
DLCMTH4	CSWB2-UL	003	-.66	070.34	13.58	19.31	4.68E+00	.81
DLOUBM2	CSWB2-UL	001	-.71	093.43	23.68	25.35	5.75E+00	.76
DLOUBM2	CSGR30Y	003	.48	093.43	22.37	23.94	5.75E+00	.76
DLOUBM2	CSGR100Y	007	.35	093.43	17.11	18.31	5.75E+00	.76
DLOUBM2	CSTC-WB	002	.49	093.43	01.32	01.41	5.75E+00	.76
DLOUBM3	CSWB2-UL	001	-.72	085.32	25.33	29.69	6.76E+00	.75
DLOUBM3	CSGR30Y	005	.41	085.32	16.00	18.75	6.76E+00	.75
DLOUBM3	CSGR100Y	007	.30	085.32	13.33	15.62	6.76E+00	.75

DLOUBM3	CSWB-ULI	003	-.45	085.32	06.67	07.82	6.76E+00	.75
DLOUBM3	CSTC-WB	002	.52	085.32	01.33	01.56	6.76E+00	.75

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
DLOUBM4	CSWB2-UL	001	-.71	092.00	24.00	26.09	6.31E+00	.75
DLOUBM4	CSGR30Y	003	.46	092.00	21.33	23.18	6.31E+00	.75
DLOUBM4	CSGR100Y	007	.34	092.00	16.00	17.39	6.31E+00	.75
DLOUBM4	CSTC-WB	002	.50	092.00	01.33	01.45	6.31E+00	.75
DLOUED2	BBF-ET2	006	-.24	096.95	12.31	12.70	8.51E+00	.65
DLOUED2	CSWB2-UL	001	-.49	096.95	12.31	12.70	8.51E+00	.65
DLOUED2	ET2-STOM	002	-.31	096.95	06.15	06.34	8.51E+00	.65
DLOUED2	CSWB-ULI	003	-.29	096.95	04.62	04.77	8.51E+00	.65
DLOUED3	CSWB2-UL	001	-.50	104.68	14.06	13.43	9.55E+00	.64
DLOUED3	BBF-ET2	006	-.24	104.68	12.50	11.94	9.55E+00	.64
DLOUED3	CSWB-ULI	003	-.30	104.68	06.25	05.97	9.55E+00	.64
DLOUED3	ET2-STOM	002	-.31	104.68	06.25	05.97	9.55E+00	.64
DLOUED4	CSWB2-UL	001	-.52	101.59	15.15	14.91	8.71E+00	.66
DLOUED4	CSGR30Y	002	.32	101.59	12.12	11.93	8.71E+00	.66
DLOUED4	BBF-ET2	008	-.24	101.59	10.61	10.44	8.71E+00	.66
DLOUED4	ET2-STOM	003	-.31	101.59	06.06	05.97	8.71E+00	.66
DLOUTH2	ITC-BLAD	001	-.85	072.09	31.40	43.56	4.90E+00	.86
DLOUTH2	ITC-THR	002	.83	072.09	22.09	30.64	4.90E+00	.86
DLOUTH2	CNSRTGVG	003	.57	072.09	09.30	12.90	4.90E+00	.86
DLOUTH3	ITC-BLAD	001	-.83	077.37	30.95	40.00	4.57E+00	.84
DLOUTH3	ITC-THR	002	.80	077.37	20.24	26.16	4.57E+00	.84
DLOUTH3	CNSRTGVG	003	.53	077.37	09.52	12.30	4.57E+00	.84
DLOUTH4	ITC-BLAD	001	-.72	075.95	20.25	26.66	3.89E+00	.79
DLOUTH4	ITC-THR	002	.67	075.95	13.92	18.33	3.89E+00	.79
DLOUTH4	CSWB2-UL	003	-.61	075.95	12.66	16.67	3.89E+00	.79
PLCMBM	CSWB2-UL	001	-.78	070.49	29.49	41.84	9.77E+00	.78
PLCMBM	CSF1	004	.52	070.49	12.82	18.19	9.77E+00	.78
PLCMBM	CSWB-ULI	003	-.56	070.49	07.69	10.91	9.77E+00	.78
PLCMBM	CSTC-WB	002	.61	070.49	03.85	05.46	9.77E+00	.78
PLCMMT	CSWB2-UL	001	-.67	067.17	26.87	40.00	1.32E+01	.67
PLCMMT	CSF1	004	.35	067.17	08.96	13.34	1.32E+01	.67
PLCMMT	CSWB-ULI	003	-.42	067.17	07.46	11.11	1.32E+01	.67
PLCMMT	CSTC-WB	002	.47	067.17	02.99	04.45	1.32E+01	.67
PLCMTH	ITC-BLAD	001	-.75	073.75	22.50	30.51	5.25E+00	.80
PLCMTH	ITC-THR	002	.72	073.75	17.50	23.73	5.25E+00	.80
PLCMTH	CSWB2-UL	003	-.63	073.75	12.50	16.95	5.25E+00	.80
PLCMTH	CNSRTMLK	004	.53	073.75	08.75	11.86	5.25E+00	.80
PLOUBM	CSWB2-UL	001	-.72	079.72	27.03	33.91	7.59E+00	.74
PLOUBM	CSGR30Y	006	.35	079.72	10.81	13.56	7.59E+00	.74
PLOUBM	CSF1	004	.43	079.72	09.46	11.87	7.59E+00	.74
PLOUBM	CSGR100Y	008	.25	079.72	09.46	11.87	7.59E+00	.74
PLOUBM	CSWB-ULI	003	-.46	079.72	06.76	08.48	7.59E+00	.74
PLOUBM	CSTC-WB	002	.54	079.72	02.70	03.39	7.59E+00	.74
PLOUMT	CSWB2-UL	001	-.58	081.26	20.31	24.99	9.77E+00	.64
PLOUMT	CSGR30Y	005	.27	081.26	09.38	11.54	9.77E+00	.64
PLOUMT	CSWB-ULI	003	-.35	081.26	07.81	09.61	9.77E+00	.64
PLOUMT	CSTC-WB	002	.38	081.26	00.00	00.00	9.77E+00	.64
PLOUTH	ITC-BLAD	001	-.73	074.33	23.08	31.05	4.27E+00	.78
PLOUTH	ITC-THR	002	.69	074.33	15.38	20.69	4.27E+00	.78
PLOUTH	CSWB2-UL	003	-.60	074.33	11.54	15.53	4.27E+00	.78
PLOUTH	CNSRTMLK	004	.48	074.33	07.69	10.35	4.27E+00	.78
RLCMBM2	CSWB2-UL	001	-.76	073.70	28.95	39.28	7.94E+00	.76
RLCMBM2	CSF1	004	.48	073.70	10.53	14.29	7.94E+00	.76
RLCMBM2	CSWB-ULI	003	-.51	073.70	07.89	10.71	7.94E+00	.76
RLCMBM2	CSTC-WB	002	.58	073.70	02.63	03.57	7.94E+00	.76
RLCMBM3	CSWB2-UL	001	-.77	070.15	29.87	42.58	8.32E+00	.77
RLCMBM3	CSF1	004	.50	070.15	11.69	16.66	8.32E+00	.77
RLCMBM3	CSWB-ULI	003	-.54	070.15	07.79	11.10	8.32E+00	.77
RLCMBM3	CSTC-WB	002	.60	070.15	03.90	05.56	8.32E+00	.77
RLCMBM4	CSWB2-UL	001	-.76	069.74	28.95	41.51	8.13E+00	.76
RLCMBM4	CSF1	004	.49	069.74	11.84	16.98	8.13E+00	.76
RLCMBM4	CSWB-ULI	003	-.52	069.74	07.89	11.31	8.13E+00	.76
RLCMBM4	CSTC-WB	002	.59	069.74	02.63	03.77	8.13E+00	.76
RLCMMT2	CSWB2-UL	001	-.55	100.08	15.15	15.14	1.15E+01	.66
RLCMMT2	BBF-ET2	005	-.27	100.08	13.64	13.63	1.15E+01	.66
RLCMMT2	ET2-STOM	002	-.37	100.08	09.09	09.08	1.15E+01	.66
RLCMMT2	CSTC-WB	003	.35	100.08	00.00	00.00	1.15E+01	.66
RLCMMT3	CSWB2-UL	001	-.56	096.96	16.92	17.45	1.35E+01	.65
RLCMMT3	BBF-ET2	006	-.27	096.96	13.85	14.28	1.35E+01	.65
RLCMMT3	ET2-STOM	003	-.34	096.96	07.69	07.93	1.35E+01	.65
RLCMMT3	CSTC-WB	002	.37	096.96	00.00	00.00	1.35E+01	.65

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
RLCMMT4	CSWB2-UL	001	-.58	098.58	18.18	18.44	1.12E+01	.66
RLCMMT4	BBF-ET2	006	-.26	098.58	13.64	13.84	1.12E+01	.66
RLCMMT4	ET2-STOM	003	-.35	098.58	07.58	07.69	1.12E+01	.66
RLCMMT4	CSTC-WB	002	.37	098.58	01.52	01.54	1.12E+01	.66
RLCMTH2	ITC-BLAD	001	-.85	075.56	30.23	40.01	5.13E+00	.86
RLCMTH2	ITC-THR	002	.83	075.56	22.09	29.24	5.13E+00	.86
RLCMTH2	CNSRTGVG	003	.64	075.56	12.79	16.93	5.13E+00	.86
RLCMTH3	ITC-BLAD	001	-.84	076.48	30.59	40.00	5.37E+00	.85
RLCMTH3	ITC-THR	002	.81	076.48	22.35	29.22	5.37E+00	.85
RLCMTH3	CNSRTGVG	003	.57	076.48	10.59	13.85	5.37E+00	.85
RLCMTH4	ITC-BLAD	001	-.75	072.80	19.75	27.13	4.68E+00	.81
RLCMTH4	ITC-THR	002	.73	072.80	17.28	23.74	4.68E+00	.81
RLCMTH4	CSWB2-UL	003	-.66	072.80	13.58	18.65	4.68E+00	.81
RLOUBM2	CSGR30Y	003	.48	093.34	22.67	24.29	5.89E+00	.75
RLOUBM2	CSWB2-UL	001	-.70	093.34	22.67	24.29	5.89E+00	.75
RLOUBM2	CSGR100Y	007	.35	093.34	17.33	18.57	5.89E+00	.75
RLOUBM2	CSTC-WB	002	.50	093.34	01.33	01.42	5.89E+00	.75
RLOUBM3	CSWB2-UL	001	-.72	081.32	25.33	31.15	6.76E+00	.75
RLOUBM3	CSGR30Y	005	.41	081.32	16.00	19.68	6.76E+00	.75
RLOUBM3	CSGR100Y	007	.30	081.32	12.00	14.76	6.76E+00	.75
RLOUBM3	CSWB-ULI	003	-.45	081.32	06.67	08.20	6.76E+00	.75
RLOUBM3	CSTC-WB	002	.52	081.32	01.33	01.64	6.76E+00	.75
RLOUBM4	CSWB2-UL	001	-.69	093.24	25.68	27.54	9.99E+09	.74
RLOUBM4	CSGR30Y	002	.45	093.24	18.92	20.29	9.99E+09	.74
RLOUBM4	CSGR100Y	007	.30	093.24	14.86	15.94	9.99E+09	.74
RLOUBM4	CSTC-WB	003	.44	093.24	00.00	00.00	9.99E+09	.74
RLOUMT2	BBF-ET2	003	-.29	109.27	16.92	15.48	1.02E+01	.65
RLOUMT2	CSWB2-UL	001	-.46	109.27	10.77	09.86	1.02E+01	.65
RLOUMT2	ET2-STOM	002	-.37	109.27	09.23	08.45	1.02E+01	.65
RLOUMT3	BBF-ET2	004	-.28	104.69	15.63	14.93	1.15E+01	.64
RLOUMT3	CSWB2-UL	001	-.47	104.69	12.50	11.94	1.15E+01	.64
RLOUMT3	ET2-STOM	002	-.36	104.69	09.38	08.96	1.15E+01	.64
RLOUMT3	CSWB-ULI	003	-.29	104.69	04.69	04.48	1.15E+01	.64
RLOUMT4	BBF-ET2	006	-.28	107.65	15.15	14.07	1.05E+01	.66
RLOUMT4	CSWB2-UL	001	-.49	107.65	12.12	11.26	1.05E+01	.66
RLOUMT4	ET2-STOM	002	-.36	107.65	09.09	08.44	1.05E+01	.66
RLOUMT4	CSWB-ULI	003	-.30	107.65	04.55	04.23	1.05E+01	.66
RLOUTH2	ITC-BLAD	001	-.85	074.41	32.56	43.76	4.79E+00	.86
RLOUTH2	ITC-THR	002	.83	074.41	22.09	29.69	4.79E+00	.86
RLOUTH2	CNSRTGVG	003	.57	074.41	09.30	12.50	4.79E+00	.86
RLOUTH3	ITC-BLAD	001	-.83	077.37	30.95	40.00	4.68E+00	.84
RLOUTH3	ITC-THR	002	.80	077.37	20.24	26.16	4.68E+00	.84
RLOUTH3	CNSRTGVG	003	.53	077.37	09.52	12.30	4.68E+00	.84
RLOUTH4	ITC-BLAD	001	-.67	078.99	18.42	23.32	9.99E+09	.76
RLOUTH4	CSWB2-UL	003	-.59	078.99	13.16	16.66	9.99E+09	.76
RLOUTH4	ITC-THR	002	.61	078.99	10.53	13.33	9.99E+09	.76

Results for the 99th percentile of the endpoints for the DBA source term

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
CDCMBM	CSWB2-UL	001	-.78	067.94	29.49	43.41	1.00E+01	.78
CDCMBM	CSF1	004	.52	067.94	12.82	18.87	1.00E+01	.78
CDCMBM	CSWB-ULI	003	-.56	067.94	07.69	11.32	1.00E+01	.78
CDCMBM	CSTC-WB	002	.61	067.94	03.85	05.67	1.00E+01	.78
CDCMED	CSWB2-UL	001	-.71	065.73	28.57	43.47	9.33E+00	.70
CDCMED	CSF1	004	.39	065.73	10.00	15.21	9.33E+00	.70
CDCMED	CSWB-ULI	003	-.46	065.73	07.14	10.86	9.33E+00	.70
CDCMED	CSTC-WB	002	.52	065.73	02.86	04.35	9.33E+00	.70
CDCMTH	ITC-BLAD	001	-.72	068.75	18.75	27.27	5.37E+00	.80
CDCMTH	CSWB2-UL	003	-.68	068.75	16.25	23.64	5.37E+00	.80
CDCMTH	ITC-THR	002	.70	068.75	15.00	21.82	5.37E+00	.80
CDCMTH	CNSRTMLK	004	.51	068.75	07.50	10.91	5.37E+00	.80
CDOUBM	CSWB2-UL	001	-.72	079.46	27.40	34.48	7.76E+00	.73
CDOUBM	CSF1	004	.43	079.46	09.59	12.07	7.76E+00	.73
CDOUBM	CSGR30Y	006	.32	079.46	09.59	12.07	7.76E+00	.73
CDOUBM	CSGR100Y	008	.24	079.46	08.22	10.34	7.76E+00	.73
CDOUBM	CSWB-ULI	003	-.47	079.46	08.22	10.34	7.76E+00	.73
CDOUBM	CSTC-WB	002	.54	079.46	02.74	03.45	7.76E+00	.73
CDOUED	CSWB2-UL	001	-.62	075.40	23.08	30.61	7.94E+00	.65
CDOUED	CSGR30Y	006	.26	075.40	07.69	10.20	7.94E+00	.65
CDOUED	CSWB-ULI	003	-.38	075.40	07.69	10.20	7.94E+00	.65
CDOUED	CSTC-WB	002	.41	075.40	01.54	02.04	7.94E+00	.65
CDOUTH	ITC-BLAD	001	-.73	074.33	23.08	31.05	4.47E+00	.78
CDOUTH	ITC-THR	002	.68	074.33	15.38	20.69	4.47E+00	.78
CDOUTH	CSWB2-UL	003	-.59	074.33	11.54	15.53	4.47E+00	.78
CDOUTH	CNSRTMLK	004	.50	074.33	08.97	12.07	4.47E+00	.78
DLCMBM2	CSWB2-UL	001	-.77	074.05	29.87	40.34	9.55E+00	.77
DLCMBM2	CSF1	004	.50	074.05	12.99	17.54	9.55E+00	.77
DLCMBM2	CSWB-ULI	003	-.55	074.05	07.79	10.52	9.55E+00	.77
DLCMBM2	CSTC-WB	002	.61	074.05	03.90	05.27	9.55E+00	.77
DLCMBM3	CSWB2-UL	001	-.77	071.45	29.87	41.81	9.12E+00	.77
DLCMBM3	CSF1	004	.51	071.45	12.99	18.18	9.12E+00	.77
DLCMBM3	CSWB-ULI	003	-.54	071.45	07.79	10.90	9.12E+00	.77
DLCMBM3	CSTC-WB	002	.61	071.45	03.90	05.46	9.12E+00	.77
DLCMBM4	CSWB2-UL	001	-.77	067.55	29.87	44.22	8.51E+00	.77
DLCMBM4	CSF1	004	.51	067.55	11.69	17.31	8.51E+00	.77
DLCMBM4	CSWB-ULI	003	-.54	067.55	07.79	11.53	8.51E+00	.77
DLCMBM4	CSTC-WB	002	.60	067.55	03.90	05.77	8.51E+00	.77
DLCMED2	CSWB2-UL	001	-.61	084.92	21.21	24.98	1.41E+01	.66
DLCMED2	BBF-ET2	006	-.25	084.92	09.09	10.70	1.41E+01	.66
DLCMED2	CSWB-ULI	003	-.37	084.92	06.06	07.14	1.41E+01	.66
DLCMED2	CSTC-WB	002	.41	084.92	01.52	01.79	1.41E+01	.66
DLCMED3	CSWB2-UL	001	-.62	077.34	21.21	27.42	1.17E+01	.66
DLCMED3	CSWB-ULI	003	-.37	077.34	06.06	07.84	1.17E+01	.66
DLCMED3	CSTC-WB	002	.42	077.34	01.52	01.97	1.17E+01	.66
DLCMED4	CSWB2-UL	001	-.66	067.14	25.37	37.79	9.77E+00	.67
DLCMED4	CSF1	004	.34	067.14	07.46	11.11	9.77E+00	.67
DLCMED4	CSWB-ULI	003	-.41	067.14	07.46	11.11	9.77E+00	.67
DLCMED4	CSTC-WB	002	.45	067.14	01.49	02.22	9.77E+00	.67
DLCMTH2	ITC-BLAD	001	-.72	069.21	20.51	29.63	5.25E+00	.78
DLCMTH2	ITC-THR	002	.68	069.21	15.38	22.22	5.25E+00	.78
DLCMTH2	CSWB2-UL	003	-.64	069.21	14.10	20.37	5.25E+00	.78
DLCMTH3	ITC-BLAD	001	-.83	074.99	29.76	39.69	5.25E+00	.84
DLCMTH3	ITC-THR	002	.80	074.99	21.43	28.58	5.25E+00	.84
DLCMTH3	CSWB2-UL	003	-.54	074.99	07.14	09.52	5.25E+00	.84
DLCMTH4	ITC-BLAD	001	-.80	073.18	25.61	35.00	5.01E+00	.82
DLCMTH4	ITC-THR	002	.76	073.18	19.51	26.66	5.01E+00	.82
DLCMTH4	CSWB2-UL	003	-.60	073.18	09.76	13.34	5.01E+00	.82
DLCMTH4	CNSRTGVG	004	.48	073.18	08.54	11.67	5.01E+00	.82
DLOUBM2	CSWB2-UL	001	-.73	079.99	26.67	33.34	7.08E+00	.75
DLOUBM2	CSGR30Y	006	.35	079.99	10.67	13.34	7.08E+00	.75
DLOUBM2	CSF1	004	.43	079.99	09.33	11.66	7.08E+00	.75
DLOUBM2	CSGR100Y	008	.26	079.99	09.33	11.66	7.08E+00	.75
DLOUBM2	CSWB-ULI	003	-.48	079.99	08.00	10.00	7.08E+00	.75
DLOUBM2	CSTC-WB	002	.56	079.99	02.67	03.34	7.08E+00	.75
DLOUBM3	CSWB2-UL	001	-.71	082.43	25.68	31.15	6.76E+00	.74
DLOUBM3	CSGR30Y	005	.39	082.43	14.86	18.03	6.76E+00	.74
DLOUBM3	CSGR100Y	008	.29	082.43	12.16	14.75	6.76E+00	.74
DLOUBM3	CSWB-ULI	003	-.45	082.43	06.76	08.20	6.76E+00	.74
DLOUBM3	CSTC-WB	002	.53	082.43	01.35	01.64	6.76E+00	.74

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
DLOUBM4	CSWB2-UL	001	-.71	086.48	24.32	28.12	6.92E+00	.74
DLOUBM4	CSGR30Y	004	.41	086.48	17.57	20.32	6.92E+00	.74
DLOUBM4	CSGR100Y	007	.30	086.48	13.51	15.62	6.92E+00	.74
DLOUBM4	CSWB-ULI	003	-.44	086.48	06.76	07.82	6.92E+00	.74
DLOUBM4	CSTC-WB	002	.52	086.48	01.35	01.56	6.92E+00	.74
DLOUED2	CSWB2-UL	001	-.53	098.43	15.63	15.88	1.07E+01	.64
DLOUED2	BBF-ET2	006	-.25	098.43	12.50	12.70	1.07E+01	.64
DLOUED2	CSWB-ULI	002	-.32	098.43	06.25	06.35	1.07E+01	.64
DLOUED2	CSTC-WB	003	.31	098.43	00.00	00.00	1.07E+01	.64
DLOUED3	CSWB2-UL	001	-.52	098.44	15.63	15.88	9.33E+00	.64
DLOUED3	CSGR30Y	004	.29	098.44	10.94	11.11	9.33E+00	.64
DLOUED3	CSWB-ULI	002	-.31	098.44	06.25	06.35	9.33E+00	.64
DLOUED3	CSTC-WB	003	.31	098.44	00.00	00.00	9.33E+00	.64
DLOUED4	CSWB2-UL	001	-.57	092.34	20.00	21.66	8.13E+00	.65
DLOUED4	CSGR30Y	004	.33	092.34	13.85	15.00	8.13E+00	.65
DLOUED4	CSGR100Y	009	.19	092.34	09.23	10.00	8.13E+00	.65
DLOUED4	CSWB-ULI	003	-.33	092.34	06.15	06.66	8.13E+00	.65
DLOUED4	CSTC-WB	002	.35	092.34	00.00	00.00	8.13E+00	.65
DLOUTH2	ITC-BLAD	001	-.82	074.66	30.12	40.34	4.68E+00	.83
DLOUTH2	ITC-THR	002	.78	074.66	20.48	27.43	4.68E+00	.83
DLOUTH2	CSWB2-UL	003	-.51	074.66	06.02	08.06	4.68E+00	.83
DLOUTH3	ITC-BLAD	001	-.81	078.06	29.27	37.50	4.68E+00	.82
DLOUTH3	ITC-THR	002	.78	078.06	20.73	26.56	4.68E+00	.82
DLOUTH3	CSWB2-UL	003	-.51	078.06	06.10	07.81	4.68E+00	.82
DLOUTH4	ITC-BLAD	001	-.76	081.25	25.00	30.77	3.98E+00	.80
DLOUTH4	ITC-THR	002	.73	081.25	17.50	21.54	3.98E+00	.80
DLOUTH4	CSWB2-UL	003	-.56	081.25	10.00	12.31	3.98E+00	.80
PLCMBM	CSWB2-UL	001	-.78	065.37	29.49	45.11	1.00E+01	.78
PLCMBM	CSF1	004	.52	065.37	12.82	19.61	1.00E+01	.78
PLCMBM	CSWB-ULI	003	-.56	065.37	07.69	11.76	1.00E+01	.78
PLCMBM	CSTC-WB	002	.62	065.37	03.85	05.89	1.00E+01	.78
PLCMMT	CSWB2-UL	001	-.67	068.66	26.87	39.13	1.29E+01	.67
PLCMMT	CSF1	004	.36	068.66	08.96	13.05	1.29E+01	.67
PLCMMT	CSWB-ULI	003	-.43	068.66	07.46	10.87	1.29E+01	.67
PLCMMT	CSTC-WB	002	.47	068.66	02.99	04.35	1.29E+01	.67
PLCMTH	ITC-BLAD	001	-.72	070.00	18.75	26.79	5.37E+00	.80
PLCMTH	CSWB2-UL	003	-.68	070.00	16.25	23.21	5.37E+00	.80
PLCMTH	ITC-THR	002	.70	070.00	15.00	21.43	5.37E+00	.80
PLCMTH	CNSRTMLK	004	.51	070.00	07.50	10.71	5.37E+00	.80
PLOUBM	CSWB2-UL	001	-.72	079.46	27.40	34.48	7.76E+00	.73
PLOUBM	CSF1	004	.42	079.46	09.59	12.07	7.76E+00	.73
PLOUBM	CSGR30Y	006	.32	079.46	09.59	12.07	7.76E+00	.73
PLOUBM	CSGR100Y	008	.24	079.46	08.22	10.34	7.76E+00	.73
PLOUBM	CSWB-ULI	003	-.47	079.46	08.22	10.34	7.76E+00	.73
PLOUBM	CSTC-WB	002	.54	079.46	02.74	03.45	7.76E+00	.73
PLOUMT	CSWB2-UL	001	-.58	080.95	22.22	27.45	9.77E+00	.63
PLOUMT	CSWB-ULI	003	-.35	080.95	07.94	09.81	9.77E+00	.63
PLOUMT	CSTC-WB	002	.37	080.95	00.00	00.00	9.77E+00	.63
PLOUTH	ITC-BLAD	001	-.73	074.33	23.08	31.05	4.47E+00	.78
PLOUTH	ITC-THR	002	.68	074.33	15.38	20.69	4.47E+00	.78
PLOUTH	CSWB2-UL	003	-.59	074.33	11.54	15.53	4.47E+00	.78
PLOUTH	CNSRTMLK	004	.50	074.33	08.97	12.07	4.47E+00	.78
RLCMBM2	CSWB2-UL	001	-.78	072.75	29.87	41.06	9.55E+00	.77
RLCMBM2	CSF1	004	.51	072.75	12.99	17.86	9.55E+00	.77
RLCMBM2	CSWB-ULI	003	-.55	072.75	07.79	10.71	9.55E+00	.77
RLCMBM2	CSTC-WB	002	.61	072.75	03.90	05.36	9.55E+00	.77
RLCMBM3	CSWB2-UL	001	-.77	070.15	29.87	42.58	9.33E+00	.77
RLCMBM3	CSF1	004	.51	070.15	12.99	18.52	9.33E+00	.77
RLCMBM3	CSWB-ULI	003	-.54	070.15	07.79	11.10	9.33E+00	.77
RLCMBM3	CSTC-WB	002	.61	070.15	03.90	05.56	9.33E+00	.77
RLCMBM4	CSWB2-UL	001	-.77	067.55	29.87	44.22	8.51E+00	.77
RLCMBM4	CSF1	004	.51	067.55	11.69	17.31	8.51E+00	.77
RLCMBM4	CSWB-ULI	003	-.54	067.55	07.79	11.53	8.51E+00	.77
RLCMBM4	CSTC-WB	002	.60	067.55	03.90	05.77	8.51E+00	.77
RLCMMT2	CSWB2-UL	001	-.58	092.33	18.46	19.99	1.66E+01	.65
RLCMMT2	BBF-ET2	006	-.28	092.33	13.85	15.00	1.66E+01	.65
RLCMMT2	CSWB-ULI	003	-.34	092.33	06.15	06.66	1.66E+01	.65
RLCMMT2	CSTC-WB	002	.38	092.33	00.00	00.00	1.66E+01	.65
RLCMMT3	CSWB2-UL	001	-.58	089.04	18.75	21.06	1.32E+01	.64
RLCMMT3	BBF-ET2	006	-.25	089.04	10.94	12.29	1.32E+01	.64
RLCMMT3	CSWB-ULI	003	-.34	089.04	06.25	07.02	1.32E+01	.64

RLCMMT3	CSTC-WB	002	.39	089.04	01.56	01.75	1.32E+01	.64

ENDP	INP.VAR	RK	PRCC	SUM%	%CON	%SCON	FAC1	RSQ
RLCMMT4	CSWB2-UL	001	-.63	075.82	24.24	31.97	1.23E+01	.66
RLCMMT4	CSF1	004	.32	075.82	07.58	10.00	1.23E+01	.66
RLCMMT4	CSWB-ULI	003	-.38	075.82	06.06	07.99	1.23E+01	.66
RLCMMT4	CSTC-WB	002	.43	075.82	01.52	02.00	1.23E+01	.66
RLCMTH2	ITC-BLAD	001	-.72	070.49	20.51	29.10	5.25E+00	.78
RLCMTH2	ITC-THR	002	.68	070.49	15.38	21.82	5.25E+00	.78
RLCMTH2	CSWB2-UL	003	-.64	070.49	14.10	20.00	5.25E+00	.78
RLCMTH3	ITC-BLAD	001	-.83	074.99	29.76	39.69	5.25E+00	.84
RLCMTH3	ITC-THR	002	.80	074.99	21.43	28.58	5.25E+00	.84
RLCMTH3	CSWB2-UL	003	-.54	074.99	07.14	09.52	5.25E+00	.84
RLCMTH4	ITC-BLAD	001	-.80	073.18	25.61	35.00	5.01E+00	.82
RLCMTH4	ITC-THR	002	.77	073.18	19.51	26.66	5.01E+00	.82
RLCMTH4	CSWB2-UL	003	-.60	073.18	09.76	13.34	5.01E+00	.82
RLCMTH4	CNSRTGVG	004	.48	073.18	08.54	11.67	5.01E+00	.82
RLOUBM2	CSWB2-UL	001	-.73	077.33	26.67	34.49	7.08E+00	.75
RLOUBM2	CSGR30Y	006	.35	077.33	10.67	13.80	7.08E+00	.75
RLOUBM2	CSF1	004	.43	077.33	09.33	12.07	7.08E+00	.75
RLOUBM2	CSGR100Y	008	.25	077.33	09.33	12.07	7.08E+00	.75
RLOUBM2	CSWB-ULI	003	-.48	077.33	06.67	08.63	7.08E+00	.75
RLOUBM2	CSTC-WB	002	.55	077.33	02.67	03.45	7.08E+00	.75
RLOUBM3	CSWB2-UL	001	-.71	082.43	25.68	31.15	6.76E+00	.74
RLOUBM3	CSGR30Y	005	.39	082.43	14.86	18.03	6.76E+00	.74
RLOUBM3	CSGR100Y	008	.29	082.43	12.16	14.75	6.76E+00	.74
RLOUBM3	CSWB-ULI	003	-.45	082.43	06.76	08.20	6.76E+00	.74
RLOUBM3	CSTC-WB	002	.53	082.43	01.35	01.64	6.76E+00	.74
RLOUBM4	CSWB2-UL	001	-.71	085.13	24.32	28.57	6.76E+00	.74
RLOUBM4	CSGR30Y	004	.41	085.13	16.22	19.05	6.76E+00	.74
RLOUBM4	CSGR100Y	007	.30	085.13	13.51	15.87	6.76E+00	.74
RLOUBM4	CSWB-ULI	003	-.44	085.13	06.76	07.94	6.76E+00	.74
RLOUBM4	CSTC-WB	002	.52	085.13	01.35	01.59	6.76E+00	.74
RLOUMT2	BBF-ET2	005	-.29	101.57	16.92	16.66	1.29E+01	.65
RLOUMT2	CSWB2-UL	001	-.50	101.57	13.85	13.64	1.29E+01	.65
RLOUMT2	ET2-STOM	002	-.36	101.57	09.23	09.09	1.29E+01	.65
RLOUMT2	CSWB-ULI	003	-.31	101.57	06.15	06.05	1.29E+01	.65
RLOUMT3	BBF-ET2	005	-.27	103.10	14.06	13.64	1.20E+01	.64
RLOUMT3	CSWB2-UL	001	-.50	103.10	14.06	13.64	1.20E+01	.64
RLOUMT3	ET2-STOM	002	-.34	103.10	07.81	07.58	1.20E+01	.64
RLOUMT3	CSWB-ULI	003	-.30	103.10	06.25	06.06	1.20E+01	.64
RLOUMT4	CSWB2-UL	001	-.54	098.43	17.19	17.46	9.77E+00	.64
RLOUMT4	CSGR30Y	004	.30	098.43	12.50	12.70	9.77E+00	.64
RLOUMT4	CSWB-ULI	003	-.32	098.43	06.25	06.35	9.77E+00	.64
RLOUMT4	CSTC-WB	002	.32	098.43	00.00	00.00	9.77E+00	.64
RLOUTH2	ITC-BLAD	001	-.82	074.66	30.12	40.34	4.68E+00	.83
RLOUTH2	ITC-THR	002	.78	074.66	20.48	27.43	4.68E+00	.83
RLOUTH2	CSWB2-UL	003	-.51	074.66	06.02	08.06	4.68E+00	.83
RLOUTH3	ITC-BLAD	001	-.81	076.84	29.27	38.09	4.68E+00	.82
RLOUTH3	ITC-THR	002	.78	076.84	20.73	26.98	4.68E+00	.82
RLOUTH3	CSWB2-UL	003	-.51	076.84	06.10	07.94	4.68E+00	.82
RLOUTH4	ITC-BLAD	001	-.77	081.25	25.00	30.77	3.98E+00	.80
RLOUTH4	ITC-THR	002	.73	081.25	17.50	21.54	3.98E+00	.80
RLOUTH4	CSWB2-UL	003	-.56	081.25	10.00	12.31	3.98E+00	.80