

**The theme 'Safety & security in a changing world' ran through this magazine like a common thread, although sometimes only implicitly. To conclude, we reflect on this theme with Genserik Reniers, Professor of Safety of Hazardous Materials and head of the Safety & Security Science section at TU Delft, who effortlessly delivers a mini-lecture and shares his thoughts.**

text Ilse Oosterlaken interview Eveline Vreede and Ilse Oosterlaken sculpture Antony Gormley, 'Feeling Material IV'

# Safety & security in a changing world

## Safety & security...

'Safety' prevents harmful incidents due to natural disasters or human error. 'Security' is about incidents involving malicious intent, for example, by terrorists or criminals. 'Security' is often viewed more qualitatively (for example, from the perspective of psychology or political science), and 'safety' more quantitatively (for example, in economic or technical analyses).

It is therefore not surprising that in the Netherlands, 'security' has traditionally been a problem area that non-technical universities mainly address, and 'safety' has historically received more attention at TU Delft. Of course, there are exceptions, 'cyber security' also gets a lot of attention in Delft. But the fact that both his section and the TU Delft Safety & Security Institute so explicitly bring the two values together is nevertheless quite unique, says Reniers.

In most companies and organisations, they are not viewed in an integrated manner either. There is generally a separation in budgets, personnel and departments that deal with these two values or problem areas. This separation is the result of historical developments.

A barrier in bridging the gap is that – at least in the Netherlands – these values are the domain of different government departments; 'Safety' has traditionally been the responsibility of the Ministry of

Infrastructure and Water Management, while 'security' is instead seen as belonging to the territory of the Ministry of Justice and Security. One consequence is that legislation surrounding these two challenges is not viewed in conjunction, and according to Reniers, this does not give companies and organisations any incentive to do so either. It really depends on local 'champions', the people who see the usefulness and benefits, whether that happens.

"It would be interesting to discuss this with more companies," says Reniers, "but I am happy that at least more and more people know the difference between the two." Language does not always help with this (see box).

## ...in a changing world

But what is the benefit and usefulness of an integrated approach? Here, we finally arrive at the theme of a changing world. The website of the TU Delft Safety & Security Institute gives several examples of why 'security' is becoming increasingly important for engineers: Cars are increasingly becoming "computers on wheels" and can be controlled remotely, which makes 'security' as much a challenge for developers as 'safety'. And "the well-developed structures of strong dykes may not be as safe as expected if the flood defence system becomes hackable." In short, physical 'safety' and 'cyber security' become increasingly intertwined as information technology



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gets integrated into everything and cyber-physical systems become more common, Reniers confirms.

While creating this magazine, digital developments were not the only thing we discussed concerning a ‘changing world’. We also considered, for example, climate change and the transition to a sustainable economy, the increasing public attention for (in)equality and inclusion, and recent geopolitical developments. Can Reniers also say something about that? “Those are quite big themes!” is his first reaction. Of course, according to Reniers, there is a lot to say about each of these developments, but where do you start? Concerning climate change, for example, it is interesting, he believes, that natural disasters used to be mainly something that the government dealt with. But nowadays, companies in the EU are also obliged to make risk analyses on so-called ‘Natech’ risks. And while in the past, the emphasis in the field was mainly on preventing natural disasters, it is now more about ‘self-reliance’, or how we can deal with it if something like this happens.

In fact, Reniers reflects further on the magazine theme, the same developments in the field of safety & security science are important for many of these significant societal developments. For

example, increasing attention is being paid to the dynamic nature of risk analyses because risk levels constantly change over time.

With increasingly interconnected sectors and systems, it has also become more important to consider possible incidents in a larger context, more systemically. Small events that do not pose a problem for the security of a system on their own can, if occurring simultaneously, potentially have a major impact on it. In the last 5 to 10 years, various new analysis methods have been developed that include the systemic aspect of safety, such as FRAM (Functional Resonance Analysis Method) and STPA (Systems Theoretic Process Analysis). Research on such methods is still quite academic, and they are rarely applied in practice. So there is still much to do in the coming years in collaboration with stakeholders.

Finally, with the world’s growing complexity, we increasingly realise that risks are difficult to assess. That is why ‘resilience’ has become such an important topic in recent years. It is difficult, if not impossible, to predict what will happen. So we have to be prepared for a lot of options. “If you are resilient,” Reniers concludes, “you can handle many safety & security challenges.”

#### ‘Safety’ and ‘security’ in different languages

The clear distinction that is made in English between ‘safety’ and ‘security’ is not present in all languages. In Dutch, the word ‘veiligheid’ is in practice used for both, which can cause confusion. Strictly speaking, there is another

Dutch word that could serve as a specific translation of ‘security’, namely ‘beveiliging’, but in practice it is not common to use it in that way. The word mainly evokes associations with the personal protection of people who have received threats. In French there are two words, ‘sécurité’ and ‘sûreté’. But sur-

prisingly enough, the first is the translation of ‘safety’ and the second of ‘security’. A Frenchman and an Englishman could therefore easily misunderstand each other if they do not have a good command of each other’s language.



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# Today's grand challenges can no longer be solved with a single perspective or approach

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# progreSSIon

On the occasion of 10 years TU Delft Safety & Security Institute

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