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Towards Convergence of Technical Nuclear Safety Practices in Europe

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Severe accidents & emergency preparedness

The management of nuclear & radiological emergency situations is carried out with different organisation patterns from one country to another. Hans De Neef, from the General Directorate Crisis Centre of the Federal Ministry of Internal affairs, Christian Vandecasteele, Co-ordinator Nuclear Emergency Planning at the Federal Agency for Nuclear Control and Didier Degueldre, Branch Manager Fire Protection, Accidents & Emergencies at Bel V explain how the Belgian organisation involves all safety experts in a comprehensive emergency response organisation.

Emergency response *made in Belgium*

The organisation set up in Belgium for the management of emergency situations at federal level is described in the Royal Decree of 31/01/2003. "*In such cases,* explains Hans De Neef, *the Governmental Crisis & Coordination Centre (GCCC) activates three emergency management groups to facilitate and organise the national emergency coordination: the Federal Coordination Committee in charge of the strategic coordination and the decision-making processes, the Evaluation Cell in charge of assessing the emergency situation and advising the Federal Coordination Committee, and the Information Cell in charge of the information of the public about the situation and the decisions made. If suitable, the Federal Coordination Committee could also*

Exercise with local fire brigade (Beveren, Belgium).

decide to activate the Socio-economic Cell to assess the social and economical consequences of the emergency situation." The emergency management set up in case of nuclear or radiological emergencies relies fully on the emergency arrangements explained above. "*But due to their impact on the public, they are managed at national level, based on a particular emergency response plan,*" Christian Vandecasteele stresses.

The specificity of the nuclear/radiological emergency response plan

Aimed at co-ordinating the actions towards protection of the population and the environment for the Belgian territory in the event of a nuclear accident or any other radiological emergency situation that could lead to an over-exposure of the population or to a significant contamination of the environment, this plan published in 2003 as a Royal Decree establishes the tasks that the various departments and organisations would have to accomplish if the case arises, each within their legal and regulatory competences. Hans De Neef recalls that "*in the case of a nuclear or radiological emergency situation, the Federal Coordination Committee directs the off-site operations, under the authority of the Minister of Internal Affairs*" and that "*the implementation of the actions decided at federal level and the management of the intervention teams are under the leadership of the Governor(s) of the province(s) concerned, with the help of the Mayors concerned.*"

Evaluate the potential consequences and gather field radiological information

The *Evaluation Cell* is composed of experts from different organisations such as the Federal Agency for Nuclear Control (FANC), Bel V, the

Empirical research on crises: the three major lessons learned from Fukushima Daiichi

The first lesson is that three isolated events – an earthquake, a tsunami and a nuclear accident – can concatenate into a multiple disaster. Such 'domino-effect' scenarios have been neglected so far, since analyses were often limited to single events for capacity reasons. Even in Japan, only the supposedly greatest single risk, i.e. earthquake, was considered in the planning, but not the correlated risk of a "tsunami". Otherwise, the emergency generators would probably have been configured differently. The second lesson is that extreme events with a very low probability of occurrence – e.g. once in 100,000 years of operation – were usually disregarded as a 'residual risk' by crisis research scientists. Conversely, risks with a much lower probability of occurrence were paid far greater attention, because they were supposed to occur earlier. If the focus is increasingly placed, in the future, on the possible extent of damage, the comparably low probability of occurrence will lose importance, even in the case of nuclear plants. I think the third lesson learned from Fukushima Daiichi is that crisis analyses are limited mostly to the breakdown of the system itself – e.g. a nuclear power plant – with the subsequent failure of the redundant emergency systems being disregarded. For instance, at Fukushima Daiichi, the measuring equipment was not operational because of a failure of the emergency power supply, while the fire fighters' vehicles were swept away by the tsunami. Slightly exaggerating, I would say future crisis and contingency plans should be focussed first and foremost on the breakdown of emergency systems themselves.

Frank Roselieb
Managing Director of the Krisennavigator (Crisis Navigator)
Institute for Crisis Research
(a spin-off of the University of Kiel)

In Belgium, nuclear or radiological emergencies are managed at national level, due to their major impact on the public.

National Meteorological Institute, the technical and radiological support bodies. Didier Degueldre explains their role: "*They are tasked with assessing all information received from the affected installation and other sources of information. They evaluate the installation status and its estimated time evolution in order to assess the real or potential consequences of the situation with a view to issuing advice on protective measures for the population and the environment.*" The protective measures strongly depend on the time elapsed since the event's occurrence and encompass sheltering, evacuation, stable iodine intake, access control, food ban, relocation, environment decontamination, water and food controls as well as medical care.

The *Evaluation Cell* is supported by a *Measurement Cell* in charge of gathering field radiological information: monitoring of external radiation of the air and of the deposits, sample measurements, etc. "*In the current organisation, the* Evaluation Cell *gathers all the necessary capabilities and expertise to perform a global assessment of the situation independently from the operator of the affected nuclear installation or plant,*" Christian Vandecasteele points out. With this purpose, the cell includes members from various and complementary bodies, thus covering a wide spectrum of knowledge and skills pertaining to the nuclear installations, the radiological impact of radioactive releases (including atmospheric dispersion modelling), radioecology, etc. The described organisation gives the *emergency management groups independent assessment and response capabilities*. However, in the context of an emergency, the presence of a representative of the affected licensee acting as a liaison officer with the on-site emergency response organisation allows speeding up, improving and facilitating the technical and radiological assessments needed to issue advice on protective actions for the population and the environment.

Bel V, an integrator in the Belgian organisation

Commenting on the particular role of Bel V, Didier Degueldre emphasises: "*As the TSO of the Belgian nuclear safety authority, its role fits perfectly with the integrated technical and radiological assessment approach, as it sends two representatives to the* Evaluation Cell *of the GCCC. One participates in the technical assessment of the affected installation or plant, in close co-operation with the licensee and other technical experts, the other in the assessment of the real or potential radiological consequences, in close co-operation with other radiological experts*".