Seminar 1a – Nuclear installation safety assesment – Session 1

Chaired by C. Cozzo (PSI) / O. Dubois (IRSN)

10:00 - 10:30 | Impulse speech

Development of TSO capacity in Turkey

Y. Ceylan (NÜTED, Turkey)

The presentation will address the Regulatory Infrastructure of Turkey, the Establishment and Development Steps of NÜTED (Turkish Technical Support Organization) and the current status of Akkuyu NPP and future plan for new NPP and Future Projection of NÜTED.

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10:30 - 11:00 | No. 102

The Role of the Technical Support Organisation in Defending against Regulatory Capture

T. Blaxhall (JACOBS RSD)

Regulatory capture results when regulators consciously or unconsciously align to the economic and operational needs of the regulated industry rather than focusing primarily on their statutory or public duty to protect the public. In the extreme a Regulator can be seen to support and serve the industry that is being regulated. There are numerous examples of where investigations into major accidents in high hazard industries have highlighted elements of regulatory capture as contributing factors, including the Fukushima Daiichi accident. The significant media scrutiny of the FAA in the Boeing 737 Max 8 accidents of 2018/2019 also suggests characteristics of regulatory capture.

The lessons learned from incidences of regulatory capture have illustrated the requirement for robust regulatory systems that are alert to the characteristics of regulatory capture and have suitable organisational defences to prevent it. This paper will highlight the warning signs that regulatory bodies should be aware of in order to prevent regulatory capture, associated defences against capture, and the role that TSOs can play in supporting this.

This paper will discuss the key areas where TSO activities can directly and indirectly support regulatory bodies in defence against regulatory capture. The paper will highlight situations where the risk of regulatory capture is high, using lessons from relevant case studies, and how the TSO is imperative in guarding against it.

The independence of the TSO is key in helping the regulatory body to avoid regulatory capture. It is essential for the TSO to implement robust arrangements to maintain independence and thus help defend against regulatory capture. The TSO should be free from the pressures of both industry and the regulator and seek to take a solely analytical view on the safety of the technology used and approaches taken to nuclear safety by operators. Means of achieving this will be discussed, including reference to the TSO independence arrangements implemented by Jacobs RSD by way of example.

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11:00 - 11:30 | No. 103

COVID-19 management in German nuclear facilities – Reconciling health protection and nuclear safety

M. Jopen (GRS)

The COVID-19 pandemic brings about considerable changes and restrictions affecting almost all areas of private life, society and economy. This includes also nuclear power plants and other nuclear facilities. This contribution describes the management of COVID-19 in German nuclear facilities and discusses insights into how to reconcile requirements for health protection and nuclear safety.

To ensure nuclear safety, German nuclear facilities are subject to a legislative and regulatory framework which includes minimum requirements for the number and qualification of relevant personnel and for the conduct of periodic testing and refuelling outages. On the other hand, the German Infection Protection Act entitles the competent authorities to adopt different measures to prevent and control infectious diseases like COVID-19. The law distinguishes between monitoring, preventive measures and mitigative measures including quarantine orders or restrictions of gatherings of a large number of people. Accordingly, there is a potential for conflict between these different requirements if e.g. essential personnel would not be available in a pandemic situation.

As an illustration of the COVID-19 management in compliance with all requirements – both from a health protection and a nuclear safety point of view – the plans for prevention, control and contingency in German nuclear power plants are presented. A focus is set on measures for refuelling outages and handling of inspections as well as expert participation therein under pandemic conditions. This is complemented by the description of approaches in other German nuclear facilities (e.g. research reactors) and TSOs like GRS.

Finally, the experiences and insights from the application of the pertinent rules and regulations for health protection and nuclear safety are discussed from a TSO perspective.

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11:30 - 12:00 | No. 104

Recent Developments in the Assessment of Hazard Combinations

C. Strack (GRS), G. Thuma (GRS) and M. Roewekamp (GRS)

The lessons learned from the Fukushima Daiichi accident re-emphasized the need for a thorough assessment of external hazards and consequential external or internal haz-ards. This led to renewed international efforts concerning hazard assessment, which is reflected in numerous stress tests performed worldwide addressing a broad scope of hazard assessments and major revisions of national and international regulations and guidelines for hazard assessment. All these activities consider combinations of hazards. According to new IAEA Safety Guides, which are partially still under development, the consideration of hazard combinations in the design and operation of nuclear power plants represents state-of-the-art. GRS has strongly contributed to the development of such state-of-the-art approaches and corresponding guidance.

Hazard analyses are needed over the whole lifetime of a nuclear installation. Re-assessments of the plant and site require updates of the hazard analyses. State-of-the art analyses should also cover hazard combinations. Depending on the number of credi-ble individual hazards for a given site and plant, the resulting number of potential hazard combi¬nations of different types increase at least quadratic and with higher order combi-nations even more. A separate assessment of all these combinations is unrealistic. Therefore, a thorough and systematic screening process for identifying credible hazard combinations is needed in order to reduce the number of combinations for in-depth anal-yses. The screening needs also to ensure that no combination with a non-negligible im-pact on plant and site safety is missing.

To facilitate the hazards screening, GRS has developed a tool, which automatically en-sures a consistent and well-documented screening of individual hazards and hazard combinations. This is achieved through several means which assist the user in the screening process but also require to give reasoning for screening out hazards. The tool can be adjusted to user needs through simple text-based inputs. The output consists of several lists of hazards and hazard combinations for further analyses and an automated screening protocol wh ich provides reasoning for the result of each screening step based on pre-defined as well as user defined screening criteria.

The assessment approach will be presented at Eurosafe.