Contribution ID: **23** Type: **Oral**

The relationship between the regulatory frameworks and codes & standards for fusion facilities

Codes and standards (C&S) play an important role in the regulatory frameworks for both, radiation protection and nuclear facilities. Currently, internationally different approaches for fusion regulation either already exists or are currently being developed based either the regulatory framework for radiation protection or nuclear facilities. Thereby, the fusion regulatory framework most likely should be technology neutral, meaning it should be applicable to magnetic or inertial confinement and other approach.
Even though, C&S do not immediately pose binding requirements their content can become requirements in the licensing process through their application by the competent authority and their integration in the licensing documentations.
The IAEA Safety Fundamentals (SF-1) and the General Safety Requirements for Safety Assessment for Facilities and Activities (GSR Part 4 (Rev 1)) include a graded approach. This graded approach needs to be implemented by specifying criteria when/if certain safety functions shall be implemented for a certain facility or activity and how such safety functions should be qualified. The requirement to implement certain safety functions is typically set in higher level regulatory documents whereas the way how to implement a certain level of qualification for a safety function is given by C&S. Examples are the German Safety Requirements for Nuclear Power Plants as higher level document and the KTA standards.
Up to now, no country has such higher-level fusion specific regulatory requirements. But there exists already different international C&S for safety relevant systems of fusion facilities (e. g. ISO 16646 and ISO/FDIS 18518). It will be discussed how such C&S can potentially set requirements for the use of certain safety functions and a certain level of qualifying them even though the decisions were not yet made at a higher level in the regulatory framework. If C&S were e.g. based on the technical implementation for a single application for which a certain regulatory regime is applicable, they might include requirements set by that regulatory regime. Such requirements could be the consideration of certain operational boundary conditions, to withstand certain internal or external events, or qualification requirements like the application of the single failure criterion. Unintentionally, such C&S could lead to an interdigitation between radiation protection regulation and nuclear facilities regulation if they become international standards.

Technical Categories Addressed

Other Systems

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Session Classification: Applicability to Regulation Frameworks and Safety