Document: ISO/TC 85/SC 5/WG 8/ISO-7753:2023 Summary

Nuclear criticality safety — Use of criticality accident alarm systems for operations

This document provides a summary of the following:

> **ISO-7753:2023 (Second Edition)** *Nuclear criticality safety — Use of criticality accident alarm systems for operations*
> *Sûreté-criticité — Systèmes de détection et d'alarme de criticité dans le cadre de l'exploitation*

What is this standard?

This international standard provides requirements and guidance regarding the use of Criticality Accidents Alarm Systems (CAAS). Such systems are dedicated to limit consequences of criticality accidents. They are aimed at being implemented in facilities operating with fissionable materials where a criticality accident cannot be reasonably ruled out and a significant dose to personnel can occur as a result of the accident. A CAAS provides a means of alerting personnel in the event of high radiation intensity and is associated with a procedure for the evacuation of personnel.

What does it cover?

ISO-7753 specifies performance and testing requirements for a CAAS. More specifically, it covers:

- The requirements for detection
- Fundamental aspects of system design, consistent with the IEC 60860 standard
- Alarm implementation recommendations and requirements
- Detectors positioning recommendations and requirements
- Testing requirements
- Guidance on personnel training

The net safety improvement resulting from the implementation of a CAAS is not covered by this standard and is expected to have been evaluated beforehand. Three informative annexes supplement the standard with:

- elements for the definition of the minimum accident of concern (MAC)
- examples for the positioning of CAAS detectors
- factor to consider when assessing whether a CAAS is needed or not

Why is it useful?

Nuclear Criticality Safety (NCS) programmes at facilities are primarily directed at avoiding nuclear criticality accidents. However, the possibility of criticality accidents exists, and the consequences can be life-threatening. A CAAS provides a means to limit the consequences to personnel of such accidents. Although the extent and complexity of a CAAS may vary greatly with the size and type of operation being considered, ISO-7753 represents the international consensus of the minimum requirements for the implementation and the use of a CAAS.

Who should use it?

An individual or body who has responsibility in the design or maintenance of NCS for any process or facility where a criticality accident cannot be reasonably ruled out, and where a CAAS would provide a net safety improvement. These individuals would typically be NCS specialists with the responsibilities of assessment, peer review or authorisation of NCS documentation as well as radiological protection specialists, usually in charge of operating CAAS. Also, CAAS designers and individuals or bodies with responsibilities of oversight and regulation of facilities and processes that involve the provision of NCS.

Where can I find out more?

The ISO-7753 standard webpage can be found at the ISO website:

https://www.iso.org/standard/81438.html