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Anchoring TSO Experience by Developing A Common Safety Assessment Guide

EUROSAFE

- European initiative
 - Aimed at promoting convergence of technical nuclear safety practices
 - Members from 7 countries:
BEL, ESP, FIN, FRA, GER, SWE and UK
 - www.eurosafe-forum.org
- Common Safety Assessment Guide developed by 3 of the member organisations
 - Bel V for Belgium (before 14/04/2008: AVN)
 - GRS for Germany
 - IRSN for France

Development of A Common Safety Assessment Guide

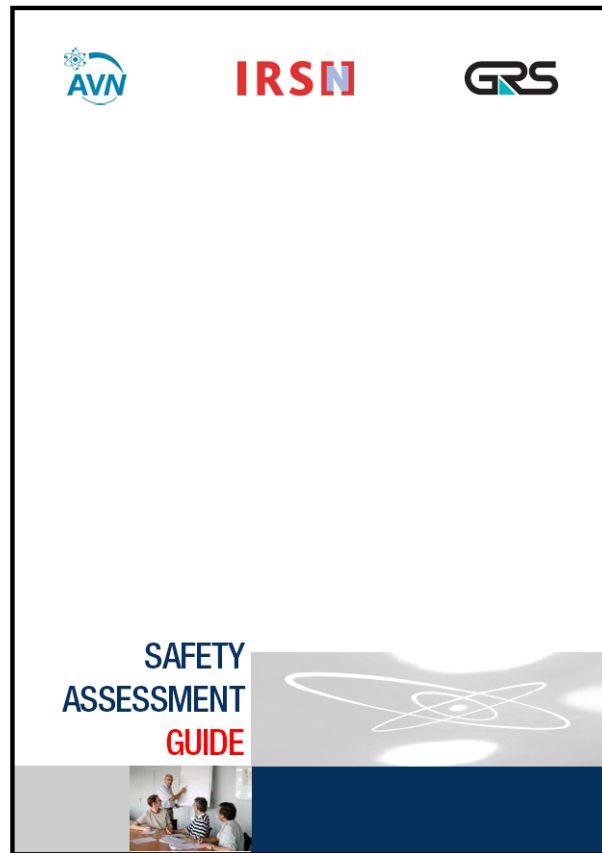
- As TSOs, Bel V (AVN), GRS and IRSN have a longstanding close cooperation in nuclear safety
- Idea to develop a common Safety Assessment Guide
 - To set down harmonised principles
 - To ensure that safety assessments in the 3 organisations
 - are done according to the same lines
 - can therefore be used with the same confidence

Safety Assessment Guide: Contents

- Safety Assessment Objectives
- Requirements of SA of nuclear activities
 - Expertise body independence and competence
 - Transparency and traceability
 - ...
- Safety assessment process
 - Request review
 - Assessment processing
 - Independent verification
 - Delivery and filing

Safety Assessment Guide

- Available at http://www.grs.de/module/layout_upload/tso_safety.pdf



Extension of the EUROS SAFE Co-operation

- 3 working groups
 - WG 1: Safety Assessment Guide (SAG)
 - WG 2: Identification of research needs
 - WG 3: Knowledge and information management
- WG 1: Extended Safety Assessment Guide
 - Generic part on processing safety assessments
 - Generic part on technical guidance
 - Specific technical assessment guides
 - At present, being developed for NPPs

Technical SAGs Under Development

- Mechanical Systems (leader: GRS)
- Electrical Systems (leader: GRS)
- Incidents and precursor analysis (leader: IRSN)
- Environmental Qualification (leader: Bel V)
- Severe accidents (leader: IRSN)
- Safety systems (fluid and auxiliary systems) (leader: IRSN)
- Human Factors Analysis (leader: GRS)
- Organisational Analysis (leader: Bel V)
- Transient and accident analysis (leader: Bel V)

Review Guidance Document for Deterministic Safety Assessment of Mechanical Systems

Outline

- Introduction
- Purpose and scope
- Relations to other TSAGs
- Key principles at a glance

Introduction

TSAG document

- Common structure for all safety assessment objectives
 - Purpose and scope
 - Important definitions and concepts
 - Review procedure
 - Acceptance criteria
 - Review findings
- max 12 p., if necessary, subdivided in separate documents
- Reference list
- Living document
- Appendix of SAG-document

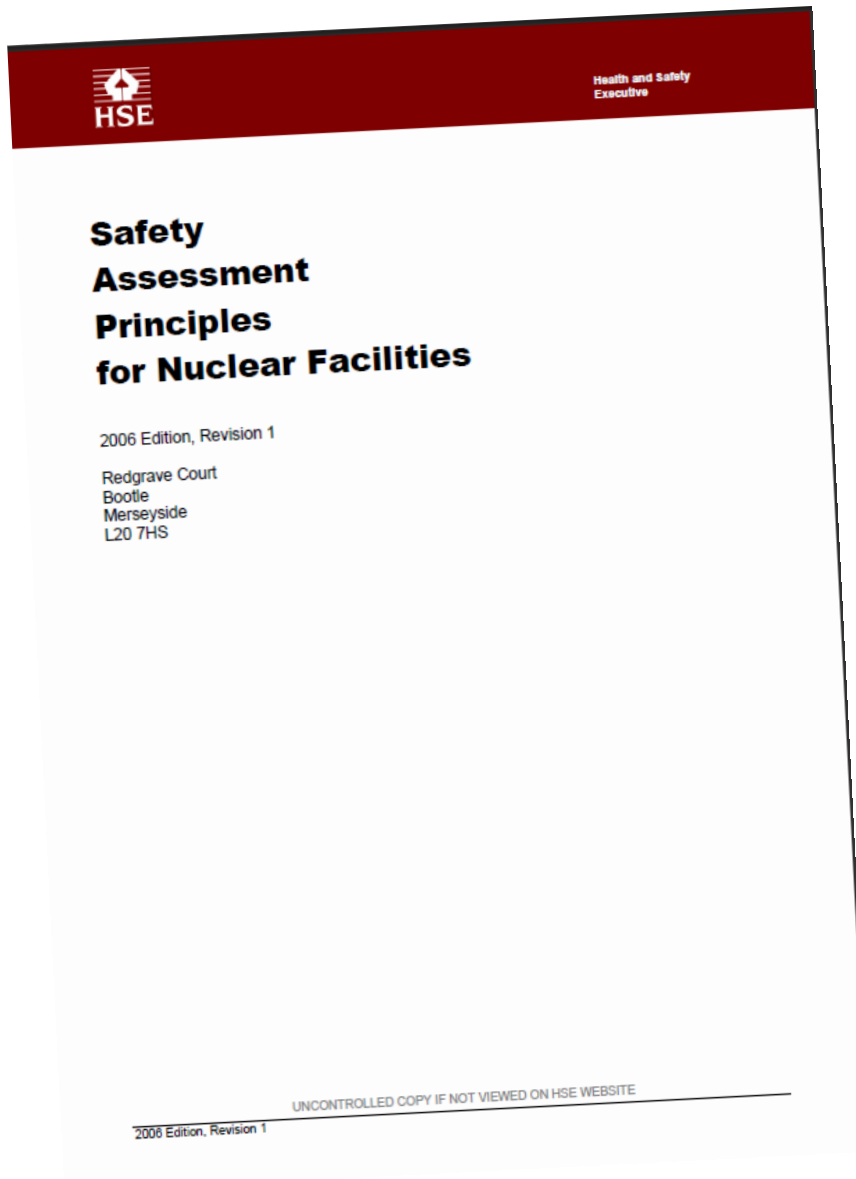
References

- U.S. NRC NUREG-0800:
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr0800/>
- IAEA Guidance documents
- WENRA Reactor Safety Reference Levels
 - Issue G: Safety classification of structures, systems and components
 - Issue H: Operational limits and conditions
 - Issue I: Ageing management
 - Issue K: Maintenance, in-service inspection and functional testing

References: UK Health and Safety Executive

- Safety Assessment Principles 2006

- Available at <http://www.hse.gov.uk/nuclear/>



The screenshot shows the HSE Nuclear website interface. The top navigation bar includes links for Home, Contact HSE, Feedback, Help, A-Z index, and Site map, along with a search box. The main content area features a 'Nuclear home' section with a list of links: Who we are, Stakeholders, Programme of work, Live issues, Information (with sub-links for EIADR, LLC reports, Safeguards, Security regulation, Safety Assessment Principles, Technical Assessment Guides, Nuclear research, Generic Design Assessment, and Geological Disposal), Nuclear e-Bulletin, Newsletter, Quarterly summaries, Links, and Contact us / feedback. A 'Local search' box is also present. The central banner reads 'Health and safety in the Nuclear industry' and describes the role of the Nuclear Directorate (ND). To the right, there are several promotional boxes: 'Your industry' (Agriculture), 'Health & safety topics' (Asbestos), 'Myth of the month', 'Recruiting now', 'Nuclear e-Bulletin' (listing years 2006, 1992, 1983, 1979), 'Safety Assessment Principles', 'UK Nuclear Regulators New Reactor Assessment', 'Environmental Impact Assessment for Decommissioning Regulations', and 'Geological Disposal Managing Radioactive Waste Safely'. The footer contains the date 'Updated 15.10.08' and various legal notices.

Purpose and Scope

- Providing guidance on the interpretation of the safety assessment principles
- Focusing on engineering work and principles and is intended for the use in the safety assessment

TSAG Mechanical Systems

Mechanical engineering

- pumps
- valves
- fittings

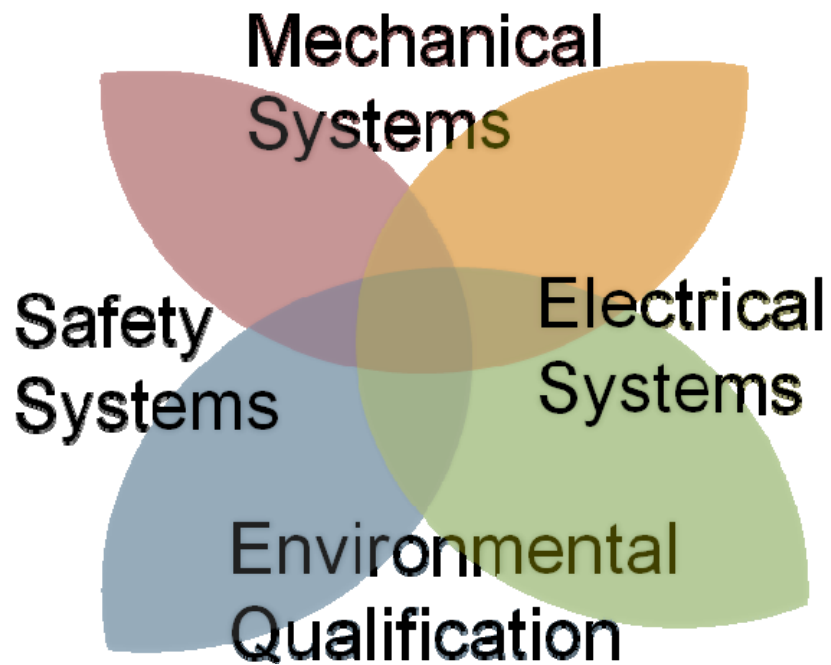
Structural steelwork

- piping
- heat exchangers
- pressure vessels
- buildings and structures

Structural concrete and brickwork

- buildings and structures
- foundation
- fastening, bolting and anchoring

Relations to other Technical SAGs



- TSAG MechSys:
 - structural integrity
- TSAG ElecSys:
 - incl. instrumentation and control
- TSAG EnvQual:
 - harsh and mild environment
- TSAG SafetySys:
 - fluid and auxiliary systems

Key Principles (1)

- General principles
 - Design, construction and operation including inspection and maintenance
 - Identification of deficiencies and weaknesses
- Design
 - Structural design
 - Mechanical design

Key Principles (2)

- Manufacturing and construction
 - Construction materials
 - Construction methods
 - Non-conformances
 - Design changes and improvements

Key Principles (3)

- Operation
 - Leakage during operation
 - Safe operation envelope
- Pre- and in-service inspections
 - Pre- and in-service inspection
 - Inspection techniques
 - Testing
 - Analysis of the SC, use of data and sensitivity studies

Key Principles (4)

- Additional engineering principles
 - Site investigations
 - Safety categorisation
 - Methods of analysis
 - Consideration of flood defences
 - Effects of plant ageing
 - Decommissioning and dismantling

Outcome

- Providing guidance, helping questions and statements for reviewing
 - Note: no requirements
- Technical SAGs are living documents; the paper will be updated periodically
- Anchoring existing knowledge and competence

Conclusions

- Bel V, GRS and IRSN
 - Have laid down common safety assessment principles
 - Are focusing now on development of technical Safety Assessment Guides
- Important steps
 - To harmonise safety assessment principles and working methods
 - To anchor existing knowledge and competence
 - To transfer knowledge to young and new staff members