Update of IAEA Activities in Relation to the CRAFT project

Technical Meeting
Practical Application of Safety Assessment Methodologies (CRAFT Project)

IAEA Headquarters, 17-21 June 2013

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RW in the Safety Standards

**SAFETY FUNDAMENTALS**

**General Safety Requirements**
- Vol.1 Governmental and Regulatory Framework
- Vol.2 Leadership and Management for Safety
- Vol.3 Radiation Protection and Safety of Radiation Sources
- Vol.4 Safety Assessment
- Vol.5 Predisposal Management of Radioactive Waste
- Vol.6 Decommissioning and Termination of Activities
- Vol.7 Emergency Preparedness and Response

**Specific Safety Requirements**
- 1. Site Evaluation for Nuclear Installations
- 2. Safety of Nuclear Power Plants
  - 2.1 Design and Construction
  - 2.2 Commissioning and Operation
- 3. Safety of Research Reactors
- 4. Safety of Nuclear Fuel Cycle Facilities
- 5. Safety of Radioactive Waste Disposal Facilities
- 6. Safe Transport of Radioactive Material

**Collection of Safety Guides**

**Classification**
- 2010
- 2008
- 2013

**Management Systems**
- 2012
- 2006

**Spent Fuel Storage**
- IAEA Safety Standards
- Specific Safety Guide No. SSG-15

**RW Storage**
- IAEA Safety Standards
- Safety Guide No. WS-G-8.1

**Small Generators**
- IAEA Safety Standards
- DS 454

**FCFs**
- IAEA Safety Standards
- DS 447

**Reactors**
- IAEA Safety Standards
- DS 448
• **GSR Part 5, GSG-3:** Safety Case
  
  A collection of arguments and evidence in support of the safety of a facility or activity. This will normally include the findings of a safety assessment and a statement of confidence in these findings.

• **GSR Part 4, GSG-3:** Safety Assessment
  
  1. Assessment of all aspects of a practice that are relevant to protection and safety; includes siting, design & operation of the facility. This normally includes risk assessment and probabilistic SA.

  2. Analysis to predict the performance of an overall system and its impact, where the performance measure is the radiological impact or some other global measure of the impact on safety.
GSG-3: Components of the SC and SA

**Safety Case**

A. Safety Case Context

B. Safety Case Strategy

C. System Description

D. Safety Assessment

E. Iteration and Design Optimization

F. Management of Uncertainty

G. Limits, Controls and Conditions

H. Integration of Safety Arguments

**Safety Assessment**

Non radiological environmental impact:
- Radiological Impact
  - Scenarios
  - Models
  - Calculations

Operational Safety

Site and Engineering
Safety Assessment: GSR Part 4, GSG-3

GSG-3

Safety Assessment

Management System

Non radiological environmental impact

Radiological Impact

Scenarios

Models

Operational Safety

Site and Engineering

GSR Part 4

Preparation for the safety assessment

SAFETY ASSESSMENT

Features to be assessed

- Possible radiation risks
- Safety functions
- Site characteristics
- Radiation protection
- Engineering aspects
- Human factors
- Long term safety

Safety approach

- Defence in depth
- Safety margins
- Multiple barriers

Safety analysis

- Deterministic/probabilistic analysis
- Scope/approach
- Safety criteria
- Uncertainty/sensitivity
- Computer codes
- Operating experience

Uses of safety assessment

- Limits, conditions, etc.
- Maintenance, inspection
- Management system
- Emergency preparedness

Documentation (Safety Report)

- Independent verification

Submission to regulatory body

Regulatory review
GSG-3: Safety Guide

• Demonstrating the Safety of RWM
• Safety Case
  • Role, Components, Documentation and Use
• Safety Assessment
  • Approach, Scenarios, Models, Analysis of Results
• Specific Issues
  • SC evolution, graded approach, DID, facility lifetime, LTS
• Regulatory Review Process

Annex I  Examples of Hazards and Initiating Events
Annex II  Topical Issues for Review of SC
Annex III  Template of Regulatory Review Report
Annex IV  SADRWMS Project

Proposal to June 2010 WASSC
-> CRAFT
CRAFT (Complimentary Safety Reports, Development and Application to Waste Management Facilities)

3 Year Project

- 1st Plenary Meeting May 2011
- 2nd Plenary Meeting June 2012

Objectives:

1. **APPLY** GSG-3, SADRWMS methodology & SAFRAN Tool
2. **PROVIDE** a forum for application of the methodology and SAFRAN tool
3. **DEVELOP**, document Safety Reports TECDOCs illustrating application of GSG-3
   - Facility/process specific
   - Safety Case Process/Regulatory Review
Recent Developments:

• Publication of GSG-3, SADRWMS Methodology
  • GSG-3: April 2013 (May 3rd most viewed!)
  • SADRWMS TECDOC: 3Q 2013???

• CRAFT Working Groups
  • Work done to date?

• Norwegian Sponsorship
  • Support development, documentation of the CRAFT RADON-type Facility Application Case

• Indonesia
  • RWM facility in Serpong

• “Mediterranean Project”
  • Reinforcing SA capabilities using SAFRAN and support to licensing installations
“Mediterranean Project”

Objectives

• Improved capacities and capabilities for the cradle to grave management of SRS

• Staff of regulatory bodies and DSRS management organizations trained in preconditioning and disposal technologies and SA methodologies and tools

Key Activities Implemented: SAFRAN etc

• Implementation in SAFRAN Tool of a Generic SC & SA of the Borehole Disposal Concept (under implementation).

• Implementation in SAFRAN Tool of a Generic SC & SA for Predisposal Management of DSRS (under implementation).

• Original MSs: Slovenia, Croatia, Albania, Bosnia and Herzegovina, Cyprus, Greece, Malta, Montenegro, Turkey, Lebanon, Egypt, Libya, Morocco, Tunisia.


• Did not join yet, but invited: Algeria, Israel, Syria
Mediterranean Project: 2014

- Implementation in SAFRAN Tool of a **Generic SC & SA of the BDC and Predisposal Management of DSRS** (will continue).
- **WS**: organization and implementation of the review of the SC, SA for predisposal and disposal
- **SC**: Provision of assistance to the operators in the development of the SC & SA
- **EM** (total of 12?): Assist the regulators in the review of the safety case and safety assessment
Complimentary Safety Reports, Development and Application to Waste Management Facilities

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