

## ***IRRS Good Practices***

### **Review and Assessment (Module 6)**

#### ***Review and assessment for research reactors***

#### **The Netherland – Initial Mission**

Mission date: June 2023

##### ***Good Practice***

The Authority for Nuclear Safety and Radiation Protection (ANVS) has developed the guide on use of the PSA level 3 and implemented it for the licensing process of research reactors.

##### ***Observation***

The Dutch legal framework (Bkx Decree) prescribes how risk analyses for specific types of nuclear facilities have to be performed. This risk analysis is carried out in the form of a full Probabilistic Safety Assessment, PSA. The ANVS has developed a guide for the use of Level 3 PSA which has been successfully used during the licensing of PALLAS research reactor.

##### ***Basis***

GSR Part 4, Requirement 6, para. 4.19 states that “*The possible radiation risks associated with the facility or activity include the level and likelihood of radiation exposure of workers and the public, and of the possible release of radioactive material to the environment, that are associated with anticipated operational occurrences or with accidents that lead to a loss of control over a nuclear reactor core, nuclear chain reaction, radioactive source or any other source of radiation.*”

##### ***IAEA Comments/Highlights***

In the Netherlands, all research reactors shall have a full scope level 3 PSA, enabling them not only to show compliance with legal limits but also to gain a fundamental overview of the risk contribution of the structures, systems and components (SSCs). To enable a clear PSA

acceptance process, ANVS has developed and recently updated a comprehensive Level 3 PSA guide, to complement the level 1 and 2 guidance from the IAEA.

### **South Africa – Initial Mission**

Mission Date: December 2016

#### ***Good Practice***

The National Nuclear Regulator (NNR) required South African Nuclear Energy Corporation SOC Limited (Necsa) to develop a detailed ageing management program for SAFARI-1 taking into account the considerations and guidelines made by NNR to demonstrate that it could continue to operate safely

#### ***Observation***

NNR required Necsa to develop a detailed ageing management program for SAFARI-1 taking into account the considerations and guidelines made by NNR to demonstrate that it could continue to operate safely. There were only a few research reactors in the world with such ageing management programs.

#### ***Basis***

GSR Part 4<sup>1</sup>, 4.6, states that “A safety assessment has to be carried out at the design stage for a new facility or activity, or as early as possible in the lifetime of an existing facility or activity. For facilities and activities that continue over long periods of time, the safety assessment needs to be updated as necessary through the stages of the lifetime of the facility or activity, so as to take into account possible changes in circumstances (such as the application of new standards or new scientific and technological developments), changes in site characteristics, and modifications to the design or operation, and also the effects of ageing.”

#### ***IAEA Comments/Highlights***

NNR required Necsa to do a detailed reassessment of the SAFARI-1 research reactor after the Fukushima accident, similar to the European Stress Test. Necsa is responsible for undertaking and promoting research and development (R&D) in the field of nuclear energy and radiation sciences and technology. This re-assessment was considered to be a strength.

The programme contained ageing management and post-Fukushima safety assessment. The result of this program would be used by the NNR to assess and allow the safe continued operation of SAFARI-1 until at least 2030.

---

<sup>1</sup> IAEA GSR Part 4 was superseded by GSR Part 4 (Rev. 1) in 2016.

The NNR had also performed improvements to what had been identified in the SARIS report as weaknesses related to review and assessment:

- a) In 2016 regulatory reports and records were readily available to the reviewers.
- b) Progress had been made in the development of the competence of NNR staff members, based on the IAEA SARCON subcontract module.

### **South Africa – Initial Mission**

Mission Date: December 2016

#### ***Good Practice***

The NNR required Necsa to develop the PSA level 2 and level 3 to SAFARI 1, to ensure that the research reactor would continue to operate safely without undue radiation risks.

#### ***Observation***

The NNR required Necsa to develop the Probabilistic Safety Assessment level 2 and level 3 to SAFARI-1, to ensure that the research reactor would continue to operate safely without undue radiation risks. There were only a few research reactors in the world with such a program.

#### ***Bases***

- (1) GSR Part 1 Requirement 1, states that “*The government shall establish a national policy and strategy for safety, the implementation of which shall be subject to a graded approach in accordance with national circumstances and with the radiation risks associated with facilities and activities, to achieve the fundamental safety objective and to apply the fundamental safety principles established in the Safety Fundamentals*”
- (2) GSR Part 1 para. 2.4 states that “*The national policy and strategy for safety shall be implemented in accordance with a graded approach, depending on national circumstances, to ensure that the radiation risks associated with facilities and activities, including activities involving the use of radiation sources, receive appropriate attention by the government or by the regulatory body.*”

#### ***IAEA Comments/Highlights***

No comments or highlights on this good practice.