

Review the Assessment Methodologies for Nuclear Security for Research Reactors and Associated Facilities (RRAF)

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The security of research reactors and associated facilities are subject to regulatory assessment. This oversight is designed to ensure that the security system meets the required regulatory standards nationally and internationally. Though the intention of this is to prove that the systems will work against a defined adversary stated in regulations, it does not always be fully assured that it will work perfectly. The reasons could be the differing judgments on the effectiveness of certain measures and the fact that there is no one straight security measure that is likely to be wholly effective against that method and may not always be clear how other measures compensate for any such deficiency.

Some questions also arise because of the inevitable compromises that have to be made to accommodate conflicting priorities and because of the complexity of the systems involved. This starting point of the Methodology is, therefore, the existing regulatory framework, policies and guidance on which the security system is based. If, as a result of the Assessment, a security system is deemed insufficient it needs to be borne in mind that the failure may be, at least in part, in the Regulations not just their application.

This paper summarizes the work conducted by the authors working on the International Atomic Energy Agency (IAEA) Coordinated Research Project (CRP) on “Nuclear Security for Research Reactors and Associated Facilities (RRAFs)-J02006” and more specifically, Task 1. A Hypothetical Atomic Research Institute (HARI) was established to serve as the State’s premier nuclear energy research facility. HARI’s purpose is to build scientific expertise and capacity for the country. The Institute houses a research reactor facility, radioisotope production facility, fuel element fabrication facility, gamma irradiation facility, waste processing and storage facility, and administrative and facility support facilities. The study only considered the research reactor facility in the HARI.

The main objective of this paper is to apply NUSAM results which are a performance-based methodological framework in a systematic, structured, comprehensive and appropriately transparent manner on Research Reactors and Associated facilities. The framework will be used to assess the nuclear security of nuclear and other radioactive materials, as well as associated facilities and activities within regulatory control. It is also to determine which methodology to apply, Simple, Complex or both, for RRAFs ensuring alignment between the NUSAM and RRAF CRPs and to develop “case study/ies” for RRAFs. The objective is to provide an environment for the sharing and transfer of knowledge and experience, and to provide guidance on, and practical examples of good practice in assessing the security of RRAFs and activities.

The intent of the Research Reactor Case Study was to evaluate the assessment methodology outlined as part of the NUSAM Methodological Framework. This case study focuses upon the use of a tabletop approach, which normally produces qualitative results, an alternate approach should include the use of a complementary tool for neutralization, which produces quantitative results. The tabletop proved adequate for the application of evaluating the effectiveness of the physical protection system at a research reactor facility. The following represents the conclusions of the working group team: 1) Tabletop prove useful, however with the absence of site-specific performance tested data, analysis would be difficult. 2) Tabletops have great impact if all stakeholders are involved and provide relevant information in the conduct of the tabletop analysis.

Gender

Male

State

Other

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