

## A Review of Strategies for Development and Revision of IAEA Safety Standards

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### 1. Introduction

The IAEA works for the safe, secure and peaceful uses of nuclear science and technology [1]. In the 50th anniversary of the IAEA safety standards (SS) in 2008, a vision was formulated that IAEA SS would be seen as the global reference for protecting people and the environment from harmful effects of ionizing radiation [2]. There are gradual needs of global harmonization of SS, which should be also considered in the Korean nuclear industry. In order to globally secure and improve nuclear safety of its member states, IAEA has been providing a variety of safety related review services including IRRS (Integrated Regulatory Review Service) which is performed based on IAEA SS. Korea has a plan to take IRRS in 2011. Consequently, Korea needs to understand strategies for development and revision of IAEA SS to prepare the reflection of IAEA SS on Korean SS as well as IRRS.

### 2. Strategies for the Establishment of SS [3]

In the 50th anniversary of the IAEA SS in 2008, key conditions for SS program were discussed in the areas of SS series, contents, and review and approval process. Eleven strategies were then established based on the key conditions as follows [2]:

#### 2.1. Clear Categories Consistent with the Member States' Needs and Use

Since the establishment of the SS Series in 1996, the various reports on the SS development always recommended to keep a hierarchy of the SS with three categories, safety fundamentals, safety requirements and safety guides.

#### 2.2. Clear, Logical and Integrated Structure based on a Unified Safety Philosophy

The structure of SS is depicted in Figure.1. Ten safety principles presented in SF-1 form the basis upon which safety requirements are developed and safety measures are implemented in order to achieve the fundamental. The main thrust of the new structure is the integration of the thematic safety requirements into a set of general safety requirements applicable to all facilities and activities. General safety requirements are complemented by a series of facility and activity specific safety requirements. For general safety

requirements and specific safety requirements, a format has been adopted with a discrete set of overarching requirements followed by requirements of associated conditions to be met, both expressed as "shall" statements. When necessary, the publication includes explanatory text in support of the safety requirements. The requirements will address what must be done while the guides will address how this may be achieved.



Figure 1. Hierarchy of the Safety Standards [2]

#### 2.3. Clear Scope in Terms of Areas Covered and Level of Detail in Each Category

Safety requirements include the introduction of overarching requirements with requirements on associated conditions and the inclusion of explanations of the concepts in the safety requirements. Safety guides should clearly state the types of facilities and activities being addressed, the topics being covered, the related requirements and how each of these requirements can be met, the other safety standards that have to be consulted. SS should highlight any interface with security measures whenever they play a role in achieving safety objectives and should include reference to the related security guidance in the Nuclear Security Series. Safety reports series may complement and be directly related to safety requirements or safety guides.

#### 2.4. Consensus at the Highest Level on What Constitutes a High Level of Safety (Approval Process)

The commission of SS has a special overview role with regard to the IAEA SS. SS are developed in close consultation with the member states (through their representatives in the commission and committees and the 120 day commenting period) and with representatives of relevant international organizations.

Approval by the Board of Governors is required for the publication of safety fundamentals and safety requirements. The IAEA Director General approves the publication of safety guides.

#### *2.5. User Friendliness*

The structure of SS should be easily identifiable. The overall number of SS should be manageable. The format and style of the SS and particularly safety requirements should facilitate their use for the establishment of the regulatory framework in the member states. The terminology used should be harmonized throughout the SS series such that the terms can be easily translated into different languages, considering the legal aspects involved.

#### *2.6. Manageable Number of SS*

The set of safety requirements should be stabilized with general safety requirements in seven parts complemented by specific safety requirements in six parts. For the optimization of the number of safety guides, the number in the thematic areas is limited to those of a generic nature, which is supplemented by facility specific safety guides; those that may be applicable to several types of facilities among the facility specific guides are identified so as to avoid the establishment of guides addressing the same topical issue for different types of facilities/activities; and, wherever possible, additional topics as part of the revision of existing safety guides are included rather than by developing new safety guides.

#### *2.7. Clarity, Rigor and Efficiency of the Processes*

Clear, rigorous, transparent and efficient planning, preparation, consultation, approval, and publication processes should be maintained, involving the different users in the regulatory authorities and the industry in the member states as well as cosponsoring international organizations before approval by the SS Committees, the Commission on SS and the Board of Governors.

#### *2.8. Involvement of Stakeholders*

The member states, UN, its specialized agencies concerned and other intergovernmental and non-governmental organizations are involved in various forms throughout the drafting, review and approval of the IAEA SS.

#### *2.9. Effective Feedback Mechanisms to Improve SS*

Feedback is used to identify areas where new standards need to be developed or where the contents and clarity and completeness of existing standards need to be improved.

#### *2.10. Harmonized Terminology*

Drafters of safety and security related IAEA publications should use terms as recommended by the safety glossary. Unless otherwise justified and accepted through the review process, there should be no individual glossary in individual publications. All IAEA publications should refer to the IAEA safety glossary (including the edition). Each SS could include a section listing definitions, providing such definitions were copied directly from the IAEA safety glossary or were reviewed new or revised definitions, accepted for inclusion into the safety glossary.

#### *2.11. Promotion of the IAEA SS*

The secretariat, the members of the SS Committees, the members of the commission on SS and more generally any member involved in the SS planning, development, review/revision, approval and establishment process should actively promote the use and application worldwide of the safety standards and promote the dissemination of feedback from this use.

### **3. Concluding Remarks**

Recently, Korean nuclear industry continues its effort to export Korean NPPs and Korean regulatory body has various plans to enhance capabilities of safety regulation including IRRS. In this paper, strategies for the development and revision of IAEA SS are reviewed to understand the strategies and then to prepare the reflection of IAEA SS on Korean SS as well as IRRS.

In a circumstance of gradual needs of global harmonization of SS, there has been a crisis of nuclear accidents in Japan on 11<sup>th</sup> of March, 2011. An accident in a country can affect its neighbor country, which has been demonstrated from several nuclear accidents (TMI, Chernobyl, etc.). Much more attention would be paid to the international harmonization of SS. Hence, international measures need to be prepared against the crisis as well as domestic ones.

### **REFERENCES**

- [1] IAEA Homepage, <http://www.iaea.org/OurWork/>.
- [2] IAEA, "Strategies and Process for the Establishment of IAEA Safety Standards (SPESS)", Department of Nuclear Safety and Security (NS), April, 2010.
- [3] Jun Su Ha, Ingoo Kim, "A Review of Strategies and Processes for the Establishment of IAEA Safety Standards", KINS/AR-913, 2011.