Gap Analysis Between the National Arrangements on Emergency Preparedness and Response and IAEA GSR Part7

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1. Introduction

In 2015, IAEA published the revised safety requirements in emergency preparedness and response (EPR), IAEA Safety Standards Series No. GSR Part 7. It includes the update developments on the nuclear or radiological emergency preparedness and response, the experience and lessons learned from the Fukushima accident, and the 2007 recommendations of the International Commission on Radiological Protection (ICRP). Korea EPR arrangements have been taken into account the GS-R-2 and the related IAEA safety guidelines. In this paper, gap analysis between GSR Part 7 and Korean EPR arrangements on the EPR strategy was conducted to take into account the revised requirements in emergency preparedness and response system.

2. Structure and contents of GSR Part 7

2.1 Major updates from GS-R-2 to GSR Part 7

The requirements of GSR Part 7 [1] are comprised of 3 categories of requirements, which are general requirements (5), functional requirements (14) and requirements for infrastructure (7), guidance values for restricting exposure of emergency workers and generic criteria for use in emergency preparedness and response.

Major updates from GS-R-2 [2] to GSR Part 7 are as follows.

2.2 New or strengthened concepts in GSR Part 7

The new or strengthened concepts in GSR Part 7 are Interface with nuclear security in EPR; Protection strategy and the role of different dosimetric concepts (generic criteria, operational criteria and reference level); Protection of emergency workers and helpers in an emergency; Termination of a nuclear or radiological emergency; Waste management following a nuclear or radiological emergency; International assistance in EPR; Emergency management system; Graded approach in EPR with focus on the hazard assessment and emergency

Table 1. Updates from GS-R-2 to GSR Part 7

GS-R-2	GSR Part 7
General Requirements	
Basic Responsibility	***Emergency management system***
	Roles and responsibility
Threat assessment	Hazard assessment
	Protection strategy
Functional Requirements	
Carrying out urgent protective actions	Taking urgent protective actions and ***other response actions***
Protecting emergency workers	Protecting emergency workers and ***helpers in an emergency***
Carrying out countermeasures (agriculture, ingestion, longer term protective actions)	Taking early protective actions and ***other response actions***
	Managing radioactive waste in an emergency
Conducting recovery operations	***Terminating an emergency***
-	***(NEW) Requesting, Providing and receiving international assistance for EPR***
-	***(NEW) Analysing the emergency and the emergency response***
Requirements for Infrastructure	
Organization	Organizations and ***staffing*** for EPR

planning zones and distances; and System for placing radiological health hazards in perspective.

IAEA has the plan to provide technical documents to support the revised requirements implementation and has been developing Safety Standards and EPR Series publications such as Termination of emergency, communication with the public and so on. Through adoption of the revised safety requirements, IAEA intends to establish the EPR arrangements for adequate level of preparedness and response for a nuclear or radiological emergency.

2.3 Identified gaps in protection strategy

GSR Part 7 requires to develop the protection strategy justified and optimized in the preparedness stage. Protection strategies are developed by considering two dosimetric concepts: first is reference level in terms of residual dose and second is generic criteria in terms of projected dose and received dose. Generic criteria in terms of projected dose is impossible to be measure directly. Therefore, generic criteria is needed the operational criteria; operational intervention levels (OILs), Emergency action levels (EALs) and Observable indicators.

Reference level isn't applied yet. Korea has been studying the adoption of 2007 recommendations of ICRP and according to these result, reference level of emergency situation also would be set.

Current protection strategies of EPR system in Korea are based on intervention level to be regarded as projected dose. Standards for determining urgent public protective actions such as evacuation, sheltering, administration of thyroid blocking agent are determined according to the Act on Physical Protection and Radiological Emergency (APPRE). The values of standards for determining urgent public protective actions are estimated by using simulation code and they are not directly measured values. Therefore, after radioactive release, according to the characteristics of emergency stage, OILs should be set to allow for effective emergency response, derived from generic criteria and agreed upon in the preparedness stage. Current OILs are based on Generic procedures for monitoring in a nuclear or radiological emergency (TECDOC-1092) and have some problems for example plum survey. So it should be revised by applying the new documents which are Use in Preparedness and Response for a Nuclear or Radiological Emergency (GSG-2) and Operational Intervention Levels for Reactor Emergencies (EPR-NPP-OILs).

3. Conclusion

In this paper, we identified the gaps of the revised requirements in protection strategy. Identifying the gaps between GSR Part 7 and Korean EPR arrangements and reflecting the results in the legislation and manuals can strengthen the EPR system and contribute to make practical and efficient national EPR framework.

REFERENCES

[1] INTERNATIONAL ATOMIC ENERGY AGENCY, Preparedness and Response for a Nuclear or Radiological Emergency, IAEA Safety Standards Series No. GSR Part 7, IAEA, Vienna, 2015.

[2] INTERNATIONAL ATOMIC ENERGY AGENCY, Preparedness and Response for a Nuclear or Radiological Emergency, IAEA Safety Standards Series No. GS-R-2, IAEA, Vienna, 2002.