

Standards for Evaluation of Emergency Response Facilities

Sung Il Kim

KINS, 34 Gwaha-Ro, Yuseong-Gu, Daejeon 305-338, Republic of Korea
sikim@kins.re.kr

1. Introduction

In accordance with the Act on Physical Protection and Radiological Emergency, nuclear power plant licensees shall have the emergency response facilities in preparation for radiological disasters. The facilities include the main control room (MCR), onsite technical support center (TSC), onsite operational support center (OSC), and near-site emergency operations facility (EOF). This study provides guidance on the criteria and methodology for the evaluation of emergency response facilities.

2. Functional Criteria for Emergency Response Facilities

In this section functional criteria for ERFs are described to meet the requirements of the MEST Notice No. 2009-37 (Standards for Establishment, etc. of Radiological Emergency Plan for Nuclear Licensee)

2.1 Main Control Room

The main control room should have in such a function that it shall classify types of radiological emergencies, the initial report and notification of emergencies on-and-off site, and perform emergency response management prior to the launch of technical support center.

2.2 Technical Support Center

The technical support center shall perform function of emergency operations center prior to the launch of emergency operations facility, and prevent disorder of main control room, provide appropriate technical, administrative support for the staff in main control room, relieve the staff of any unnecessary tasks not directly related with system operations of a nuclear reactor.

2.3 Operations Support Center

The operations support center shall function as the waiting room for the operations support personnel, nominated by a nuclear licensee, whose duties include maintenance of the facility, fix-ups, fire fighting, first aid, radiation control, decontamination, and monitoring of radiation and environment. It shall also establish cooperation systems with main control room, technical support center and emergency operations facility and provide support.

2.4 Emergency Operations Facility

The emergency operations facility shall supervise the emergency response activities in radiological emergencies, monitor release of radioactive materials to the environment, survey and assess radioactivity on-and-off site and the expected public exposure quantity, execute public protective actions, cooperate and coordinate emergency response activities with the external disaster response agencies and cooperative agencies.

3. Items for Evaluation of Emergency Response Facilities

Each emergency response facilities have the required items to perform the function appropriately. Table I shows the items for evaluation corresponding emergency response facilities.

Table I. Items for ERFs

Items	ERFs
Location	TSC, EOF
Structure	TSC, EOF
Habitability	TSC, MCR, OSC, EOF
Staffing and Training	TSC, MCR, OSC, EOF
Size	TSC, OSC, EOF
Radiological Monitoring	TSC, MCR, OSC, EOF
Communications	TSC, MCR, OSC, EOF
Instrumentation, Data System Equipment and Power Supplies	TSC, OSC, EOF
Technical Data and Data System	TSC, OSC, EOF
Records Availability and Management	TSC, MCR, OSC, EOF

3.1 Locations

The TSC should be located in the proximity of main control room and in the same building. The EOF shall be located within 10 km of the outside of emergency planning zone.

3.2 Structure

Its structure shall be strong enough to sustain earthquake, storms, flood, etc.

3.3 Habitability

The emergency staffs shall be protected from radiological hazards, including direct radiation, airborne radioactivity and the surface contamination degree from inplant sources under accident conditions.

3.4 Staffing and Training

Upon activation of the ERFs, designated personnel shall report directly to the ERFs and achieve full functional operation within the target time. In case of U.S. the ERFs shall be fully functional within 30 minutes of activation. For the ERFs to function effectively, the staff personnel must be aware of their responsibilities during accident. The licensee shall, therefore, develop training programs for these personnel.

3.5 Size

It shall be large enough to accommodate equipment and materials deemed necessary to supervise the emergency response activities and manage the staff. Table II shows the comparison of required minimum size of working space between Korea and U.S.

Table II. Minimum size of ERFs

ERFs	Korea	U.S.
TSC	200 m ² /unit	75 ft ² /person (7 m ² /person)
OSC	150 m ² /unit	
EOF	400 m ² /unit	

3.6 Radiological Monitoring

To ensure adequate radiological protection of emergency staffs, radiation monitoring systems shall be provided in the ERFs. These monitoring systems may be composed of installed monitors or dedicated, portable monitoring equipment. These systems shall indicate radiation dose rates, airborne radioactivity concentrations and the surface contamination degree inside the ERFs while it is in use during an emergency.

3.7 Communications

The ERFs shall have reliable voice communications facilities which include primary and backup means of communication. In addition, facsimile transmission capability between the ERFs shall be provided.

3.8 Instrumentation, Data System Equipment and Power Supplies

Equipment shall be provided to gather, store, and display data needed in the ERFs to analyze and exchange information on plant conditions. It shall be equipped with SPDS(Safety Parameter Display System) or the corresponding system to assess the progress of an accident in nuclear facilities except in the OSC. And emergency power supply system shall be provided to cope with power-failure emergencies.

3.9 Technical Data and Data System

The technical data system will receive, store, process and display information sufficient to perform assessments of the actual and potential onsite and offsite environmental consequences of an emergency condition.

3.10 Records Availability and Management

The ERFs shall have ready access to up-to-date plant records, procedures, and emergency plans needed to exercise overall management of licensee emergency response sources. The method of storage and presentation of the records shall ensure ease of access under emergency conditions. The records available to the ERFs shall be completely updated as necessary to ensure currency and completeness.

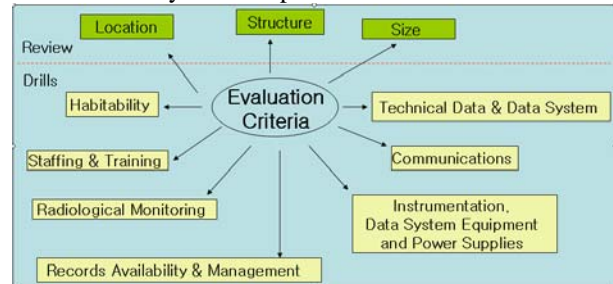


Fig. 1. Methodology for evaluation of the ERFs

4. Conclusions

In this study, the standard for emergency response facilities of nuclear power plant licensees in preparation for radiological emergency was established to evaluate its suitability. Figure 1 shows respectively the more focused on the methodology for evaluation of the emergency response facilities in case of review and radiological emergency exercise stage.

Not only functional criteria but also integration with overall emergency planning is most important factor from the emergency preparation point of view. Therefore, the goals of the ERFs should include management of overall licensee emergency response, coordination of radiological and environmental assessment, determination of recommended public protective actions, and coordination of emergency response activities with Offsite Emergency Management Center(OEMC) and Local Emergency Management Center(LEMC).

The methodology in this paper will be used to review and inspect the emergency response facilities which are planned or operated by nuclear power reactor operators.

REFERENCES

- [1] Act on Physical Protection and Radiological Emergency
- [2] MEST Notice No. 2009-37 "Standards for Establishment, etc. of Radiological Emergency Plan for Nuclear Licensee"
- [3] NUREG-0696, "Functional Criteria for Emergency Response Facilities"
- [4] NUREG-0814, "Methodology for Evaluation of Emergency Response Facilities"