

## **14.0 EMERGENCY MANAGEMENT**

### **14.1 CONDUCT OF REVIEW**

This chapter of the revised draft Safety Evaluation Report (DSER) reviews the emergency management and related information presented/provided by the applicant during a meeting with the staff on January 4, 2002 (Reference 14.3.3), further related information presented by the applicant in Chapters 5, 11, and 14 of the revised Construction Authorization Request (CAR), and information in revised CAR Table 5.6-1 (principal structures, systems, and components [PSSCs] related to emergency conditions). The staff used the applicable portions of Chapter 14.0 in NUREG-1718 as guidance in performing the review. The staff reviewed how the information in the revised CAR, and the other information referenced above, addresses the following regulations:

- Section 70.23(b) of 10 CFR states, as a prerequisite to construction approval, that the design bases of the PSSCs and the quality assurance program be found to provide reasonable assurance of protection against natural phenomena and the consequences of potential accidents.
- Section 70.64 of 10 CFR requires that baseline design criteria (BDC) and defense-in-depth practices be incorporated into the design of new facilities. With respect to emergency capability, 10 CFR 70.64(a)(6) requires that the design of the proposed facility provide for emergency capability to maintain control of (1) licensed material and hazardous chemicals produced from licensed material; (2) evacuation of on-site personnel; and (3) onsite emergency facilities and services that facilitate the use of available offsite services.

As discussed further below, the staff evaluated the applicant's Safety Assessment provided in Chapter 5 of the revised CAR (including the PSSCs related to emergency conditions referenced in revised CAR Table 5.6-1) to ensure that the applicant considered all appropriate accident initiators, and to ensure that the BDC for emergency capability was met. The staff found that the applicant considered internal, external, and natural phenomenon hazards. Those accident initiators that were not used as parts of the design basis were adequately explained. While DCS did not specifically cite 10 CFR 70.64(a)(6) in the revised CAR, Duke, Cogema, Stone & Webster (DCS) addressed how it planned to meet each of the BDC in the slides it presented at a meeting on January 4, 2001 (Reference 14.3.3). In the presentation, the applicant indicated that it would meet the BDC for Emergency Capability through Emergency Planning Design Criteria and the Site Work Task Agreement (WTA), including integration with the U.S. Department of Energy's (DOE's) Savannah River Site (SRS) emergency plan; the Emergency Onsite Mixed Oxide Fuel Fabrication Facility (MFFF or the facility) Evacuation Plan; utilization of existing onsite facilities and services at SRS, coordinated through WTA; and safe havens provided to personnel while controlling potential losses of licensed material.

The applicant's assessment of potential loss of control of radioactive material is discussed in Section 5.5.2.1, "Loss of Confinement/Dispersion of Nuclear Material Events," of the revised CAR. In Section 5.5.2.10.6.2, "Events Involving Hazardous Chemicals and Radioactive Material," the applicant concluded that the chemical events would be bounded by the radioactive release events and no additional PSSCs in this area would be required. Although open items have been identified in other revised DSER sections regarding release of hazardous chemicals and radioactive material, the staff finds that the applicant has considered all of the event categories in its analysis, which is sufficient for emergency planning purposes.

In revised CAR Section 5.5.2.1.6, the applicant identified the following ten potential Loss-of-confinement events:

- Over-temperature.
- Corrosion.
- Small breaches in glovebox confinement boundary or backflow from a glovebox through utility lines.
- Leaks of Aqueous Polishing Process vessels or pipes within process cells.
- Canister handling operations.
- Rod handling operations.
- Breaches in containers Outside gloveboxes due to handling operations.
- Over-under-pressurization of glovebox.
- Excessive temperature due to decay heat from radioactive materials.
- Glovebox dynamic exhaust failure.

DCS identified the following 12 PSSCs to either prevent these hypothetical events from occurring, or to mitigate the potential consequences:

- The safety instrumentation and controls (I&C) system.
- C3 confinement system.
- Material maintenance and surveillance programs.
- The C4 confinement system.
- The process cell.
- Process cell entry controls.
- 3013 canister outer can opening device.
- M 3013 canister.
- Material handling equipment and material handling controls.
- Glove box pressure controls.
- The high depressurization exhaust system.
- Training and procedures.

The staff's evaluation of the applicant's methodology concerning loss of confinement is presented in Section 5 of this revised DSER. The staff notes that 10 CFR 20.1801, "Security of Stored Material," and 10 CFR 20.1802, "Control of Material Not in Storage," has specific requirements for control of licensed material and these requirements will need to be addressed by the applicant as part of any request for a special nuclear materials (SNM) possession and use license. Although open items have been identified in other revised DSER sections regarding release of hazardous chemicals and radioactive material, the staff finds that the applicant has considered all of the event categories in its analysis, which is sufficient for emergency planning purposes.

In order to demonstrate that the emergency capability to evacuate onsite personnel was considered during the formulation of the facility preliminary design, the applicant stated in the January 4, 2001, presentation that it would have an emergency onsite evacuation plan that utilizes existing onsite facilities and services at SRS, and safe havens for personnel protection, while controlling potential material loss. In Chapter 14 of the revised CAR, the applicant committed to establishing a protocol with DOE Savannah River Operations Office (DOE-SR), for the integration of existing SRS Emergency plans. The staff finds this acceptable for construction authorization, but will need to review both the facilities evacuation plan and the

protocol with SRS during the review of the applicant's request for an SNM possession and use license. In Sections 11.1 and 11.5 of the revised CAR, the applicant discussed plans to provide safe havens for facility personnel. The applicant has committed to providing each safe haven with emergency communication systems. The PSSCs required to allow facility personnel time to safely leave the proposed facility or go to safe havens would be the same as those describe above for maintaining control of licensed material and hazardous chemicals produced from licensed material. The staff finds the design basis for evacuation of onsite personnel acceptable, because the plan contains sufficient safe routes to evacuate the facility and/or provides safe havens for its personnel.

In order to demonstrate the presence of onsite emergency facilities and services that facilitate the use of available offsite services, and that this requirement was considered during the formulation of the facility preliminary design, the applicant identified Emergency Control Rooms and supporting systems such as emergency alternating current (AC) power system and Emergency Control Room air conditioning systems as PSSCs to ensure control room operators a safe environment during an emergency event. Emergency communication systems are described in Section 11.5 of the revised CAR and in Section 11.5.1.1.2.4 of this revised DSER. As discussed above, the applicant, in Chapter 14 of the revised CAR, committed to establishing a protocol with DOE-SR for the integration of existing SRS Emergency plans. The staff finds the design basis for onsite emergency facilities that facilitate the use of available offsite services acceptable because the preliminary design provided for the establishment of an Emergency Control Room and a process to coordinate with the existing DOE safety infrastructure at the SRS.

## **14.2 EVALUATION FINDINGS**

In Section 14 of the revised CAR, DCS provided design basis information pertaining to emergency management measures for the proposed facility. Based on the staff's review of the revised CAR and supporting information provided by the applicant relevant to emergency management, the staff finds that DCS, at the construction authorization stage, has met the BDC for emergency capability set forth in 10 CFR 70.64(a)(6). Accordingly, the staff concludes, pursuant to 10 CFR Section 70.23(b), that the design bases of the PSSCs pertaining to emergency management provide reasonable assurance of protection against natural phenomena and the consequences of potential accidents.

## **14.3 REFERENCES**

- 14.3.1 Nuclear Regulatory Commission (U.S.) (NRC). NUREG-1718, "Standard Review Plan for the Review of an Application for a Mixed Oxide (MOX) Fuel Fabrication Facility." NRC: Washington, D.C. January 2000.
- 14.3.2 \_\_\_\_\_. NUREG/CR-6410,"Nuclear Fuel Cycle Facility Accident Analysis Handbook." NRC: Washington, D.C. 1998.
- 14.3.3 Persinko, A., U.S. Nuclear Regulatory Commission (NRC), memorandum to Leeds, E., NRC, dated January 24, 2001, RE January 4-5, 2001 Summary of Meeting with Duke Cogema Stone & Webster to Discuss Design Basis for the Mixed Oxide Fuel Fabrication Facility

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