Department of Energy
National Nuclear Security Administration
Washington, DC 20585

May 17, 2002

Mr. John T. Conway
Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Avenue, N.W.
Suite 700
Washington, DC 20004-2901

Dear Mr. Conway:

In your letter dated March 7, 2002, you requested a report regarding the design of the Sandia Underground Reactor Facility (SURF). Specifically, the request asked for a response that, "(1) defines the confinement system and its boundaries for this new facility, (2) classifies the confinement system based on its potential hazards to the public and workers, and (3) identifies the design and procurement requirements for the confinement system consistent with the level of hazard." The request also asked that issues described in a Board staff issue report dated January 8, 2002, be addressed. Our report on the issues ~~are~~ is enclosed.

My staff and I have reviewed your concerns and are addressing them in the ongoing Preliminary Safety Analysis Report and design effort for the project. We are working with your staff to assure your issues are understood and addressed and we will continue to provide them updated information. Your letter and the final disposition of the issues will be addressed in the Critical Decision-3 (CD-3) that will precede the start of construction. CD-3 has been postponed indefinitely pending resolution of design basis issues. It is also possible that the start of construction for this project will be further delayed due to unrelated program management decisions. That decision will be made in the next few weeks and a more accurate project schedule can then be developed. I appreciate your assistance in reviewing the SURF project.

Sincerely,

Everet H. Beckner
Deputy Administrator
for Defense Programs

Enclosure

cc: Mark Whitaker, S-3.1

SANDIA UNDERGROUND REACTOR FACILITY – Report on Design Issues

Introduction

The SURF Preliminary Safety Analysis Report (PSAR) is currently under review with final issue resolution slated for late summer 2002. The current PSAR contains postulated events with unmitigated offsite radiological consequences in the REM range. PSAR reviewers have raised several issues regarding postulated event analysis assumptions and methods used. Further accident analysis is required to resolve reviewer issues and firmly establish the design basis events.

Additionally, the SURF design includes systems to address non-radiological hazards that warrant further consideration regarding their safety classification due to their importance to life safety. These analyses are currently underway. The PSAR delay in establishment of design basis accidents has delayed final safety classification of some SURF structures, systems and components. Once event consequence issues are resolved, systems can be classified and, design and procurement requirements can be identified and implemented.

1. Confinement system definition and boundaries

The confinement system functions and boundaries have not been established to a construction level of detail. We have provided the Board staff with a preliminary design description describing the confinement boundary. However, the system boundary has not been finalized. Further detailed design work must occur prior to being able to communicate the precise confinement boundary for the SURF design.

2. Confinement system classification

The safety classification for the systems needed for confinement have not been finalized. Final establishment of design basis events and accident analyses have not yet been completed. Final safety classification can not be completed until the accident analyses are completed.

3. Design and Procurement Requirements for the Confinement System

Once the safety classification for systems needed for confinement have been determined, design and procurement requirements will be established.

4. Additional issues described in the January 8, 2002 staff issue report

One Board staff concern regards the use of high explosives elevating the hazard occupancy designation of SURF which could effect egress requirements. The quantities of explosives used at SURF do not meet the threshold for elevated hazard occupancy levels. Any required mitigating features associated with explosives work at SURF will be captured in the design of the facility or operational procedures as appropriate.

Another topic discussed in the Board staff report involved seismic/structural concerns. It should first be noted that the current SURF accident analysis identifies one earthquake-induced event. This event involves falling debris damaging the reactor fuel, which results in a release of fission products contained in the fuel matrix. The SAR risk ranking process resulted in a risk ranking of 3 for this event, "minor risk to public, collocated workers, workers, or the environment'. Based on the accident analysis, systems are not needed to mitigate the consequences of this scenario. Given the above, the primary focus on current seismic design efforts involves maintaining structural integrity during a seismic event to ensure life safety. The project has established a Performance Category 2 (PC2) as the Design Basis Earthquake. Designing and building to PC2 will address life safety concerns during a credible seismic event. A key focus during the design is ensuring facility egress can be maintained after a seismic event.

Finally the Board staff, "believes a more systematic approach is required, using system and facility design descriptions to document project requirements based on the guidance contained in DOE-STD-3024-98, Content of System Design Descriptions." We agree that the SURF project could benefit by using organizational tools such as the system design description approach described in the referenced standard. The SURF project team has been asked to apply the principles of STD-3024 in developing a process to capture relevant design information during the ongoing design process.

Path Forward

Outstanding PSAR issues are scheduled for resolution by late summer 2002. Design will continue on structures, systems, and components not subject to PSAR induced uncertainties. Critical Decision –3 (design completion and construction approval) originally slated for fall 2002 has been postponed indefinitely pending resolution of design basis issues. However, our goal is to achieve CD-3 before August 2004 in order to utilize budgeted construction funding. The current funding profile (recent integrated project prioritization effort) for SURF supports commencement of construction September 2004.

Commitment

The Department will provide the Board with additional information to answer the March 7, 2002 reporting requirements as soon as the design process provides information that is reviewed and verified and ready for independent review.