

POLICY ISSUE

(Information)

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SECY-06-0167

FOR: The Commissioners

FROM: Luis A. Reyes
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SUBJECT: REPORT ON THE STATUS OF MIXED-OXIDE FUEL FABRICATION
FACILITY ACTIVITIES AND THE PLUTONIUM DISPOSITION
PROGRAM

PURPOSE:

To inform the Commission about the current status of activities and plans for staff review of the license application (LA) for the Mixed-Oxide Fuel Fabrication Facility (MFFF) and the Plutonium disposition program. This paper does not address any new commitments or resource implications.

SUMMARY:

The paper provides a summary of the current status of activities regarding the LA for the MFFF facility and the plutonium disposition program. The LA is expected to be submitted to the U.S. Nuclear Regulatory Commission (NRC) for review in the third quarter of calendar year 2006. Based on the U.S. Department of Energy's (DOE's) programmatic needs for the MFFF project, which calls for hot plant startup activities to take place in 2012-2014, it may not be advantageous for both DOE and NRC, in terms of efficiency and resource expenditures, to complete the review within the previously estimated two-year period. Therefore, the FY 2008 budget submission reflects a 3-year period for the safety review and a 1-year period for hearings.

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BACKGROUND:

In September 2000, the United States and the Russian Federation signed the Plutonium Management and Disposition Agreement, which committed each country to dispose of 34 metric tons (MTs) of surplus plutonium. To meet this goal, the National Nuclear Security Administration (NNSA) plans to construct the MFFF and associated processes, to combine plutonium oxide from weapons with uranium oxide, to produce a mixed-oxide that will be fabricated into nuclear fuel to be irradiated at U. S. commercial nuclear power plants. NNSA awarded a contract to Duke, Cogema, Stone and Webster (DCS) to design a mixed-oxide (MOX) facility, based on processes and facilities successfully operated by COGEMA Inc. in France. The MFFF will be located at DOE's Savannah River Site.

In July 2002 and October 2002, respectively, DCS submitted a revised Environmental Report (ER) and a revised Construction Authorization Request (CAR), for the MFFF, that addressed NNSA program changes announced in February 2002. The revised ER included a description of the new Waste Solidification Building (WSB), which NRC will not regulate. The WSB will receive and treat liquid wastes from the MFFF and nearby NNSA Pit Disassembly and Conversion Facility. The revised CAR addressed the processing of an additional 8.5 MTs surplus plutonium directed to the MFFF project as "alternate feed."

Staff issued the Draft Environmental Impact Statement (EIS) in February 2003 and a revised Draft Safety Evaluation Report (SER) on April 30, 2003. There were 19 remaining open items in the April 2003 Draft SER. Subsequent revisions to the DCS ER, in June and August 2003, addressed continuing changes in the design of NNSA's WSB. After the August 2003 ER revision (Rev. 4), staff had planned to issue the Final EIS in November 2003. The issuance of the Final SER was planned for December 2003. However, on November 5, 2003, NNSA and DCS informed NRC of a second major change in its Surplus Plutonium Disposition Program. The NNSA directed DCS to change the MFFF controlled-area boundary from a line that is largely contiguous with the Savannah River Site boundary [encompassing over 777 sq. km (300 sq. miles)], to the proposed MFFF restricted-area boundary (RAB). The proposed RAB encompasses approximately 0.06 sq. km (14 acres) of structures inside the km 0.17 sq. km (41-acre) MFFF site.

In April 2004, DCS informed NRC that NNSA had agreed to allow DCS to designate the entire 0.17 sq. km (41-acre) MFFF site as the new controlled area. In April 2004, a nuclear criticality safety open item and three chemical safety open items were closed, leaving seven chemical safety open items. DCS submitted another set of ER and CAR page changes, addressing these and other changes, to NRC, on June 10, 2004. Because of these changes, NRC had delayed the schedules for issuance of the Final EIS and Final SER. Staff published the Final EIS in January 2005.

On March 30, 2005, NRC issued a Construction Authorization (CA), to DCS, for a MFFF to be located at the Savannah River Site in South Carolina. The NRC staff's technical basis for issuing the CA is set forth in NUREG-1821, "Final Safety Evaluation Report on the Construction Authorization Request for the Mixed-Oxide Fuel Fabrication Facility at the Savannah River Site, South Carolina." The results of the staff's environmental review related to the issuance of the CA are contained in NUREG-1767, "Environmental Impact Statement on the Construction and Operation of a Mixed-Oxide Fuel Fabrication Facility at the Savannah River Site, South Carolina - Final Report."

The LA and integrated safety analyses (ISA) Summary to operate the facility and possess radioactive material for the MFFF are expected to be submitted to NRC in the third quarter of calendar year 2006.

The NNSA Principal Deputy Administrator, Mr. Jerald Paul, appearing before the Senate Armed Services Committee, on March 29, 2006, stated that the current plans call for construction of the MFFF to start in 2006, with operations to start in 2015. Mr. Paul also noted that FY 2007 will be a peak construction year.

The House Appropriations Committee passed a spending bill for FY 2007 which zeroed out funding for the MFFF. However, Senator Domenici has questioned the removal of funding for the MFFF and the White House indicated in a "statement of administration policy" that "elimination of funding for the MFFF will create a serious setback for plans to dispose of surplus weapons-grade plutonium."

DISCUSSION:

A. Current Plans for Working with DCS

DCS recently requested an indirect change of ownership for the MFFF. One of the partners, Duke Project Services group, entered into a stock purchase agreement to sell its shares in DCS to the Shaw Group. The Shaw Group had already owned a portion of DCS through its Stone and Webster Subsidiary. DCS remains the licensee and retains direction and control of the activities conducted under the CA for MFFF.

NRC evaluated the ownership change and determined that the transfer was acceptable because the basis for approving the CA did not rely on the ownership information in question. A letter was sent to DCS, on February 17, 2006, consenting to the transfer of control of the CA (ML060540100).

DCS informed the staff that it plans to move its staff from Charlotte, NC, to the Savannah River Site, in the summer of 2006. This move corresponds to the expected initiation of construction activities at the MFFF.

DCS has also informed the staff that the current schedule for submitting its LA and ISA Summary to NRC is the third quarter of calendar year 2006. The original estimate to complete the review of the LA and ISA Summary was about 2 years. However, based on DOE's programmatic needs for the MOX program, which calls for hot plant startup activities to take place in 2012-2014, it may not be advantageous for both parties in terms of efficiency and resource expenditures, to complete the review within the previously estimated two-year period. Therefore, the FY 2008 budget submission reflects a 3-year period for the safety review and a 1-year period for hearings.

NRC will publish a notice of opportunity for a hearing and hold a public meeting near the Savannah River site, upon receipt of the LA. The staff believes that, based on the FY 2008

budget submission, it has sufficient resources budgeted for both Headquarters and Region II to conduct the review .

B. Quality Assurance Audits/Inspections

DCS has provided the staff with a list of quality assurance audits and evaluations that it is planning to perform during FY 2006. This list includes audits of vendors, the design, the ISA, computer codes, etc. The staff plans to attend select audits, to perform oversight of DCS, based on an activity's importance to safety from the standpoint of licensing activities.

Region II has hired a full-time resident inspector for the MFFF. The selected individual is expected to relocate to the site by the summer of 2006. The resident inspector will coordinate preconstruction and constructional activities, with Headquarters and DCS. Sufficient Region II resources have been allocated, in the FY 2008 budget submission, to complete required inspection activities.

Nuclear construction activities are planned to begin in the fall of 2006. The staff has developed an inspection manual chapter and associated inspection procedures. These procedures will initially be used to verify compliance of DCS audit activities. Future evaluations of DCS audits will be called inspections in accordance with the manual chapter.

C. In-Office Review of LA and ISA Summary

On February 28 and March 1, 2006, the staff met with DCS representatives to informally review the draft LA and ISA Summary for the MOX facility that is planned to be constructed on the Savannah River Site. NRC comments on the LA and the ISA Summary focused on the level of detail and content of the draft document.

Based on NRC comments, DCS has modified the LA and ISA Summary. A follow-on in-office review of DCS was held on May 2-3, 2006. The purpose of the meeting was for DCS to present examples of how it addressed staff comments, on the LA and ISA Summary, from the previous in-office review. Based on the examples provided, the staff has reasonable confidence that the LA will pass a staff Acceptance Review and will be sufficiently complete to be docketed.

DCS has informed NRC that it has provided DOE with the LA and ISA Summary for review and approval in May 2006.

D. DOE/NRC Memorandum of Understanding on Security Issues

On March 6, 2003, the staff notified the Commission that the preparation of a DOE/NRC Memorandum of Understanding (MOU), concerning security of the proposed MFFF, had been deferred until after NRC approves the CAR. The Commission memorandum also stated that the staff will reopen negotiations with NNSA and resume development of an MOU, in the areas of classified and sensitive unclassified information and the granting of security clearances.

The previous draft MOU addressed the following issues:

- DOE would serve as the Cognizant Security Agency (CSA) until such time as the MFFF operating license might be issued, whereby the responsibility would then be transferred to the NRC. The CSA has the lead for: (1) conducting security inspections; (2) granting foreign ownership, control and influence approvals; (3) access control; and (4) issuing facility clearances.
- DOE would maintain operational responsibility for MFFF physical protection. The licensee would have to meet NRC and DOE physical protection requirements. For areas in which the requirements overlap, the licensee would adhere to the most restrictive requirement.
- During any construction or operation of the MFFF, NRC and DOE would plan to conduct joint physical security inspections, to avoid dual regulation and oversight.

The staff has been in contact with DOE about the reopening of MOU discussions. It is anticipated that the staff will meet with DOE representatives during the summer of this year. The scope of the MOU and the schedule for completion will be discussed in the interagency meetings.

E. Status of Russian MOX Program

NRC has continued to provide support to the NNSA/DOE and the Nuclear, Industrial and Environmental Regulatory Authority of Russia (Rostekhnadzor) (formerly Gosatomnadzor), in the area of Russian Federation (RF) plutonium disposition, via a reimbursable agreement with DOE. The support included performing reviews of draft RF-level regulations and guidance documents being developed by Rostekhnadzor, and reviewing regulatory plans and licensing road maps being developed by Rostekhnadzor and DOE.

DOE recently informed NRC staff of a shift in strategy for the U.S./Russian Federation Plutonium Disposition Program. Rather than the original approach the U.S. proposed for a disposition program using existing VVERs (Russian Light Water Reactors), the U.S. has indicated a willingness to allow the RF to begin an “early start” (target date of 2010) of plutonium disposition in fast reactors, specifically the BN-600. DOE is working with Rostekhnadzor and Rosenergetatom to remove the breeder “blanket” so the reactor would be a plutonium “burner” rather than a plutonium breeder. DOE is also working with Russia to modify the current core to a hybrid core of MOX and high enriched uranium.

U.S./Russian studies projected that the BN-600 would consume between 5 and 7 MTs of plutonium (one-third of a MT per year). Therefore, the use of the BN-600, by itself, will not be able to eliminate the total inventory of 34 MTs of plutonium in a reasonable time frame. The DOE/RF are exploring additional means of plutonium disposition (such as additional fast reactors and gas-cooled reactors).

The future of NRC interactions with Rostekhnadzor, based on the reimbursable agreement with DOE, is uncertain at this time, and is being reassessed by staff. Previous staff efforts were based on the COGEMA technology, which the U.S. facility will be based on, rather than the

vibropack technology that the Japanese and Russians are currently developing for the BN-600 fuel. Therefore, it is unclear to what extent DOE will request NRC input, going forward. Another hurdle to the construction of the MOX facilities has been the resolution of the liability protections for the plutonium disposition program. In a statement to the Senate Armed Services Committee on March 29, 2006, Mr. Jerald Paul, Principal Deputy Administrator of NNSA, stated, "The United States and Russia completed negotiations of a liability protocol for the program, and senior Russian government officials have assured the United States that the Russian government has no issues with this protocol and that it will be signed in the near future."

COORDINATION:

The Office of the General Counsel has reviewed this package and has no legal objection.

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