April 24, 2009

MEMORANDUM TO: Nader Mamish, Deputy Director
Licensing and Inspection Directorate
Division of Spent Fuel Storage and Transportation, NMSS

FROM: Pierre Saverot, Project Manager **/RA/**
Licensing Branch
Division of Spent Fuel Storage and Transportation, NMSS

SUBJECT: SUMMARY OF APRIL 21, 2009, MEETING WITH AREVA NP REGARDING THE GLOBAL SHIPPING CONTAINER

Background

AREVA NP (AREVA) is designing a new fresh fuel transportation package to support the EPR reactors' fleet (USA, Europe, China, other countries). Test plans for regulatory testing will be completed in June 2009. Drop tests and thermal tests are scheduled to be performed at BAM in Germany in February 2010 (ORNL being considered as a backup facility), and the package application is planned for submittal in the fall of 2010. The possibility of air transport is also envisioned for a limited number of packages (i.e., less than 4) if fuel is found to be defective after transportation. If air transport is used, AREVA will submit a separate supplement. It is also possible that this package may be used for shipment of reprocessed uranium in which case it will be considered as a Type B package for the NRC licensing review. Potential interactions between NRC and ASN (French Competent Authority) might be discussed at the NRC-ASN June 2009 meeting.

Discussion

Materials and Structural Issues

The package design includes four types of materials, i.e., stainless steel, balsa wood, BORA resin, and rubber. Staff noted that the application should clearly state if the rubber dampers are not considered as safety features and are only used for protection of the commercial value of the fuel. Staff also explained that all “important to safety” materials shall be properly defined and characterized and that the use of “generic” materials is likely to be contested during the application review.

Staff noted that findings in recently approved packages, e.g., the “Traveller” package, would be helpful in identifying commonly encountered technical issues. This includes the “chimney effect” associated with a damaged outer shell and bounding properties specifications for impact limiter materials under cold and hot conditions for free drop testing. AREVA indicated that it will specify “restricted properties” for balsa wood and demonstrate that all impact limiters are properly sized with no G load effect. Staff stated that the application should clearly explain how the secondary impacts are handled and how the most damaging configuration is being evaluated.

Air Transport Issues

AREVA explained that the rubber dampers will be identical to those used in the INF-19 package and that the possibility of air transport (even for a limited number of packages) will likely require the removal of all hydrogenous materials, i.e., rubber and balsa wood, and the selection of substitutes.

Staff said that specific regulatory requirements for air transport of fissile materials are in 10 CFR 71.55(f). Also, staff said that the package would be categorized as a Type B package if AREVA considered the possibility of shipment of reprocessed uranium, because of the ^{234}U and ^{236}U contents of reprocessed uranium. Staff strongly encouraged AREVA to submit an application that is exclusively focused on its real needs, not on prospective and still undefined shipments.

Staff said that (i) analytical tools must be used to supplement test results, (ii) cladding is not always considered to be containment boundary, and (iii) the applicant shall ensure that there is no more than one A2 quantity for a Type A package. Staff also stated that recently updated Interim Staff Guidance (ISG) documents should be used by the applicant, in addition to the Standard Review Plan, to prepare this package application.

Criticality Issues

Staff clearly stated that it does not accept code to code comparisons and that complete benchmarking information is needed for all codes. Staff also clarified the assumptions to be used for gaps prior to and during accident conditions. Gaps need to be evaluated because both the impact on the fuel cladding integrity and on the closure system must be assessed. Staff further specified that the applicant must either justify that there is no gap or assume, per 10 CFR 71.55(b), a flooded gap and take no credit for the cladding as containment boundary. Staff also asked what was the justification for the 25% burned thickness of the outer layer of the BORA resin, and AREVA answered that this was the result obtained with the FS-69 neutron absorber material!

Regarding the CRISTAL benchmarking results versus IHECSBE experiments, staff expressed concerns in the code because all results were trended “over the line” (which is unusual) and said that the code used by the applicant may need to be readjusted. Staff also noted that, in one instance, the applicant presented Keff values of 0.99899.

Testing Issues

Staff noted, and AREVA acknowledged, that the puncture drop test ought to follow the 30-ft free drop to satisfy U.S. regulations. The slap down drop angle determination was discussed and reference was made to the Sandia National Laboratory report often used by other applicants for the subject matter. Staff also noted that the SER for the “Traveller” package emphasized the missing testing and the need of analytical models. AREVA stated that the AREVA “MAP” package, recently approved by NRC, had already incorporated some feedback from the “Traveller” application.

On the use of accelerometers, staff noted that as many accelerometers as needed should be positioned at key locations to aid in the interpretation of results. Staff stated that analytical models are considered helpful and may be used as a supplemental tool to prototypical testing. In particular, staff advised AREVA to (i) run thermal simulations to capture transients and perform a detailed post-fire analysis, (ii) evaluate the interactions between the fuel assembly and the internal container when an end-fitting gets damaged in an end drop scenario (lattice expansion issue).

On the testing plan being developed, staff noted that it does not review test plans but only test results. However, pre-application meetings to discuss testing plans can be arranged.

AREVA indicated a number of topics, e.g., drop test order and test plans, representativeness of prototypes for testing, drop configurations, etc., that could be the subject of potential NRC-ASN interactions. Staff said that the timeframes for the package application's regulatory review and the development of a protocol for joint NRC-ASN interactions are likely to differ in view of the fact that it took several years to develop and finalize the "Joint Canada – United States Guide for Approval of Type B(U) and Fissile Material Transportation Packages" (NUREG 1886). Staff also said that, "at the end of the day," the applicant still has to meet NRC regulations.

Staff also reminded AREVA that all input/output files must be included in the application. Staff said that it sees "open communications" as the best way to meet all parties' needs and that AREVA can request several pre-application meetings to obtain clear guidance and enhance the likelihood of a high quality application.

The enclosures are the agenda, the list of meeting attendees, and a copy of the slides AREVA presented at the meeting. The staff did not make any regulatory commitments at the meeting.

Docket No. 71-9351
TAC No. L24331

Enclosures:
1. Meeting Agenda
2. List of Meeting Attendees
3. AREVA handouts

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Distribution: SFST r/f NMSS r/f NRC Attendees

OFC	SFST	E	SFST	C	SFST			
NAME	PSaverot		MDeBose		EJBenner			
DATE	04/23/2009		04/24/2009		04/24/2009			

C=Without attachment/enclosure E=With attachment/enclosure N=No copy **OFFICIAL RECORD COPY**

Agenda

Meeting between AREVA NP and the
Nuclear Regulatory Commission
April 21, 2009
1:00 p.m. – 4:00 p.m.

- Opening Comments
- Presentation of the Project: timeframe, needs, requirements
- Package Design and Criticality Aspects
- Overview of Planned tests
- Discussions and Clarifications of NRC requirements
- Potential Interactions between NRC and ASN
- Package Application Contents and Proposed Submittal Schedule
- Opportunity for Public Comment
- Closing Comments and Conclusions

Meeting Between AREVA NP and the
Nuclear Regulatory Commission
April 21, 2009
Meeting Attendees

NRC/NMSS/SFST

Larry Campbell	301-492-3295	larry.campbell@nrc.gov
Jimmy Chang	301-492-3272	jimmy.chang@nrc.gov
Eric Benner	301-492-3294	eric.benner@nrc.gov
Ata Istar	301-492-3409	ata.istar@nrc.gov
Zhian Li	301-492-3235	zhian.li@nrc.gov
Pierre Saverot	301-492-3408	pierre.saverot@nrc.gov
Jorge Solis	301-492-3282	jorge.solis@nrc.gov
David Tang	301-492-3328	david.tang@nrc.gov
Bob Tripathi	301-492-3282	bhasker.tripathi@nrc.gov

AREVA NP

Charlie Sanders	434-832-5216	charlief.sanders.ext@areva.com
Michel Doucet	33-4-72748881	michel.doucet@areva.com
Pascale Faye	33-4-72748614	pascale.faye@areva.com

AREVA TN INTERNATIONAL

Francois Marvaud	33-1-34965199	francois.marvaud@areva.com