

April 23, 2007

MEMORANDUM TO: R. William Borchardt, Director  
Office of New Reactors

Janice Dunn Lee, Director  
Office of International Programs

FROM: Jeffrey Jacobson, Senior International Relations Officer */RA/*  
Office of International Programs

Larry J. Burkhart, Senior Project Manager */RA/*  
EPR Projects Branch 1  
Division of New Reactor Licensing  
Office of New Reactors

SUBJECT: FOREIGN TRAVEL TRIP REPORT

Enclosed is the trip report for our travel to Paris, France, during the period March 20 - 24, 2007 for trilateral meetings with the Finnish nuclear regulatory authority and the French nuclear safety authority. The purpose of the trip was to continue implementation of Stage 1 of the Multinational Design Evaluation Program. The U.S. Nuclear Regulatory Commission plans to host the next meeting in September 2007.

Enclosure:  
Trip Report

cc: See next page

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**TRIP REPORT**  
**TRILATERAL MEETING WITH THE**  
**FINNISH AND FRENCH NUCLEAR REGULATORY AUTHORITIES**  
**PARIS, FRANCE MARCH 22 AND 23, 2007**

**Travel Dates:** March 20 - 24, 2007, Paris, France

**Travelers:** Jeffrey Jacobson - OIP/ICAS, Larry Burkhart - NRO/DNRL/NAR1, Norbert Carte - NRO/DE/ICE1, Mary Ann Ashley - NRO/DCIP/CCIB

**Organization/Event:** Trilateral meeting with the French nuclear safety authority (ASN/IRSN) and Finnish nuclear regulatory authority (STUK), respectively, at ASN headquarters in Paris.

**Desired Outcomes (from pre-notification):** To continue implementation of Multinational Design Evaluation Program (MDEP) Stage 1 as approved by the Commission. This exchange will result in a more efficient and safety-focused review of the U.S. Evolutionary Power Reactor (EPR) standard design. Specific topics to be discussed at this meeting include digital instrumentation and control and construction inspection program as well as next steps in implementation of MDEP Stage 1.

**Results Achieved:** Nuclear Regulatory Commission (NRC) attendees exchanged information with counterparts on the status of the reviews of the EPR designs in each country: Olkiluoto 3 (OL3) which is under construction in Finland; Flamanville 3 (FA3) which is under construction permitting review in France; and the US EPR which is in pre-application review for design certification in the U.S. The three parties also exchanged information on the regulatory processes for licensing reactors in each country including applicable regulatory requirements in the digital instrumentation and control (I&C) area. In addition, representatives from ASN/IRSN, STUK, and NRC discussed their programs for the inspection of construction activities and for inspection of manufacturers.

Next steps in implementation of MDEP Stage 1 were also discussed. ASN representatives stated that they would like to provide a draft document (similar to the MDEP Stage 2 terms of reference) to STUK and NRC for comment in an attempt to define the scope of work of MDEP Stage 1 and other issues such as generating and maintaining a database of information that would facilitate inclusion of other national regulators.

**Summary of Trip:** On March 22 and 23, 2007, NRC attendees participated in the second trilateral meeting to discuss AREVA's EPR design. In addition to NRC attendees, representatives from the Finnish and French regulators, STUK and ASN/IRSN, respectively, also participated.

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### EPR Project Status

On March 23, 2007, each country's representatives provided an overview of the status of the design/licensing reviews of the EPR. In Finland, the OL3 project is delayed 1.5 years from the original schedule (we have known this for at least 6 months) due to delays in the detailed design (civil and systems designs), manufacturing of main components, and implementation of civil work. The nuclear island work is on the critical path. Detailed design of OL3 is planned to be completed by the end of 2007. The I&C and Electrical systems are under review, the technical specifications are to be submitted by the end of 2007, and the design of the main control room and simulator should be complete by the end of 2007. The OL3 simulator should be ready for training personnel in October 2008.

In France, the draft authorization decree, that would allow start of construction of FA3, was signed by the Minister of Health in March 2007 and is currently awaiting signature by the Minister of Industry and the Prime Minister. On April 11, 2007, Prime Minister Chirac signed the authorization decree thus granting EDF permission to start construction on FA3. ASN, IRSN, and EDF will agree on the scope of the technical assessment that will be performed on the design of FA3 to support operations, and EDF will apply for a fuel loading application which is currently planned for October 2010 (somewhat equivalent to an operating license). The French standing group of experts on the EPR (group known as the GPR) will meet throughout this assessment period and at the request of ASN. When ASN/IRSN have completed their technical assessment of the design and the GPR concurs, ASN may authorize fuel loading and operation (authorization by the Prime Minister is not necessary).

### Development of Enhanced MDEP Stage 1 Framework

ASN/IRSN proposed developing a more refined framework for the MDEP Stage 1 project. Such a framework was believed to be necessary in order to better structure cooperation associated with the licensing reviews of the EPR and would also provide guidance that could be used to assess expansion of the MDEP Stage 1 into other reactor designs or allow participation by additional countries. It is envisioned that MDEP Stage 1 would continue to operate on three levels. The first level would consist of annual or biannual meetings where project management level staff would exchange information on the EPR licensing status and construction/operating experience, and where technical topics would be identified for more in-depth technical exchanges. The second level would be more in-depth technical discussions on specific topics by technical experts. The third level would be either bilateral or multilateral exchanges of detailed technical information, specifically for the purpose of leveraging regulatory review efforts. As part of this discussion, STUK and NRC representatives discussed their ongoing cooperation associated with review of the OL3 main control room design, which would seem to be an example of a level three cooperative effort as defined above. Another issue discussed was the need to formulate a database of knowledge on MDEP Stage 1 so that inclusion of other countries into this initiative could be more efficiently facilitated.

It was agreed that ASN would provide a draft MDEP Stage 1 framework document for comment and that STUK and NRC would provide feedback. It was also agreed that the NRC would host the next MDEP Stage 1 meeting, possible in September/October 2007.

### Instrumentation and Control Systems

On March 22, 2007, members of each national regulator provided an overview of each country's regulatory framework in the I&C area as well as a description of the I&C design proposed in each country (as much as was available to the regulator at the time). Particular focus was given to the priority actuation and control system (PACS) which seems to be the area where most of the differences exist among the three I&C designs. These differences appear to be based in utility (license or applicant) requirements and not necessarily in regulatory requirements. The use of a hardwired backup for some protection functions in the OL3 digital I&C system is a result of STUK regulatory input (we discussed this at the first trilateral meeting and again at this meeting).

Given the similarity of the certain regulatory requirements, and the similarity in design of the EPRs, the U.S. NRC attendees discussed the value of possibly sharing licensee generated design information among the three regulators. ASN emphasized that the material submitted was the property of the applicant and could not be released without proper authorization, and additionally, this licensee generated information is in French. As such, the sharing of licensee generated design information in this area may be limited to the NRC and STUK. Each country provided the status of their respective reviews and associated documentation of the EPR digital I&C systems. Some technical reports have already been produced by STUK and ASN on certain topics. Since the digital I&C design is still being finalized in Finland, France, and the U.S., detailed design information is not yet available.

The PACS was discussed because the designs will be different in each of the three designs. For the U.S. EPR, AREVA-NP plans to use the AV42 priority control module as the basis for the PACS. In Finland, TVO (the licensee) has required a more complex system that uses the AV42 and the PAC10, based on a field programmable gate array, to add diversity (STUK said that this was not a regulatory requirement and that the addition of the PAC10 leads to a more complex design that is not fully finalized yet but appears to be acceptable). In France, EDF (the licensee) plans to minimize the use of devices such as the AV42 and will apply the PACS system that is used in the currently operating N4 plants.

The standards that would be used for the design of the I&C system is ETC-C (which is similar to the RCC-M code for mechanical systems but ETC-C would be specific to the EPR). Although ASN representatives stated that the submission date of the detailed I&C system design is not yet known, the general architecture information and diversity and defense in depth information should be submitted in July 2007 and ASN's review should be completed in about one year.

The attendees indicated that more in-depth discussions in this area would be useful once additional detailed design information becomes available. Also, the notion of identifying specific regulatory review products that could be utilized by the other regulators was discussed in principal. One such area might be with regard to software validation.

### Construction and Manufacturing Inspections

In a parallel session, representatives from the three countries discussed their associated programs for the inspection of construction activities and the inspection of manufacturers. Some significant differences were identified in the approaches currently being taken in the three countries. For example, in Finland and France, the regulator is required to inspect the

manufacturers of all Class 1 mechanical components. In Finland, the same staff from the regulator perform the licensing design reviews and inspect manufacturing and installation work, whereas the U.S. and France have separate and distinct staffs to complete each activity. Also, in Finland and France, the manufacturing inspections currently include the inspection of technical, as well as quality assurance attributes. This point was seen as particularly noteworthy, as the NRC is currently in the process of developing its manufacturing inspection program. Also, both the STUK and ASN programs allow for regulatory hold points in manufacturing and construction. All three countries agreed to identify a vendor in each country for the possibility of performing joint manufacturing inspections. This would allow for a more complete understanding of the regulatory practices in each country and would serve as a first step towards increased cooperation in this area. During the first inspections, it is likely that the host country would perform the inspection and the regulators in the other two countries would be invited to observe. A future round of inspections might involve actual joint inspection activities, with a long range goal to leverage more inspections performed by foreign regulators of manufacturers in their home countries.

The possibility of assigning an NRC inspector from Region II to STUK for two to three months to participate in construction inspection activities was also discussed. Such an exchange would provide several benefits including allowing the NRC to obtain first-hand information on the how STUK integrates its technical reviews and inspection effort. Subsequent to the meeting STUK and NRC have tentatively agreed to send a Region II inspector to STUK for a period of approximately two months beginning June 2007.

The MDEP Stage 1 technical exchange on inspection programs also identified the need to develop a 'glossary' of inspection types to ensure that the all parties have a common understanding of the activities and scope of the various inspections.

#### Next Steps

- Continue to establish schedule and extent of cooperation with STUK and ASN/IRSN in technical areas where it makes most sense, i.e., where our regulatory approaches and the respective designs are similar. As previously identified in the first trilateral meeting, these areas could include control room design, technical specifications (TSs), probabilistic risk assessment, I&C, fire protection, outage management issues, and construction and manufacturing inspection.
- Provide feedback to STUK and ASN/IRSN on the proposed document to define MDEP Stage 1. Keep management informed of status of MDEP Stage 1 proposals by the French and Finnish regulators.
- NRO and Region II will define a program for an NRC construction inspector to be assigned to STUK for period of two months beginning June 2007.
- Identify a U.S. vendor for a manufacturing inspection, STUK and ASN to observe. Participate as observers in manufacturing inspections led by STUK and ASN.
- Identify portions of OL3 FSAR which the NRC would review and provide comment on back to STUK, similar to what we have already done on the OL3 main control design information.

- NRO staff will ensure that NRC staff involved in the development of digital I/C guidance are informed by the information obtained from STUK and ASN, including the NRC staff participating in the MDEP Stage 2 effort that is looking at digital I/C requirements.
- OIP and NRO personnel will continue to inform management, the EDO, and the Commission of the status of MDEP Stage1 efforts via quarterly notes to the Commissioners' technical assistants.
- NRO/OIP to make plans for hosting the next MDEP Stage 1 meeting, Sept/Oct 2007.

**Points for Commission Consideration/Items of Interest:**

No additional items at this time. OIP and NRR will continue to inform the Commission of the status of all stages of the MDEP.

**List of Meeting Attendees:**

IRSN

Jean-Michel Evrard

ASN

Claude Barbalat

Olivier Gupta

Philippe Dupuy

Olivier Deschildre

Pierre Charpentier

STUK

Juhani Hyvärinen (head of the office on plant technology),

Petteri Tiippana (head, plant projects)

Tapani Virolainen (electrical systems)

NRC

Jeffrey Jacobson, OIP

Larry Burkhart, NRO

Norbert Carte, NRO

Mary Ann Ashley, NRO