

February 15, 2007

MEMORANDUM TO: Chairman Klein  
Commissioner McGaffigan  
Commissioner Merrifield  
Commissioner Jaczko  
Commissioner Lyons

FROM: Janice Dunn Lee, Director /RA/  
Office of International Programs

SUBJECT: DUNN LEE AND HOLAHAN TRIP REPORT FROM  
JANUARY 31-FEBRUARY 1, 2007 VISIT TO CHINA

On January 31, 2007, Gary Holahan, Deputy Director, Office of New Reactors, and I met with officials from China to begin discussions on future nuclear safety cooperation related to the recent purchase of the Westinghouse AP 1000 reactor. The Chinese representatives included members of the State Environmental Protection Agency (SEPA), the National Nuclear Safety Center (NNSA), and the Nuclear and Radiation Safety Centre.

The Chinese representatives outlined a proposed program of cooperation which would include extensive technical and material documentation for a safety review, software support for nuclear safety analysis and assessment, technical consultations in the conduct of the safety review, personnel training, and on-site inspection of nuclear components and equipment. They proposed that the work come under the recently established Steering Committee between the U.S. NRC - NNSA. The Steering Committee would meet annually to plan the detailed program of work and guide its implementation. In addition, they requested that a Memorandum of Understanding (MOU) be developed between NRC and NNSA to specifically address nuclear safety cooperation on the AP 1000 over a five-year period. This MOU would fall under the broader nuclear safety arrangement, "NRC-NNSA Protocol for Cooperation in Nuclear Safety Matters", which has been in effect since 1981.

The NRC representatives presented the status of new reactor licensing in the U.S., outlined the steps for early site permits and combined operating licenses (COLs) in the U.S., and discussed our specific interest in construction and inspection as China will begin construction of the AP 1000 well in advance of the U.S.

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The Commissioners

-2-

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Discussion of Areas of Potential Cooperation on AP 1000 Projects

Mr. Wang Jun (Deputy General Director, NNSA) led the discussion of NNSA's interest in NRC-NNSA cooperation on AP1000 projects. He explained that NNSA would use a regulatory process similar to that used in the U.S. to license the first generation of reactors, namely, a Construction Permit, followed by a fuel load approval ("operating license"), and finally an approval for commercial operation. Although such a process would not require complete design information at the Construction Permit stage, NNSA indicated that they intend to perform a safety and environmental review comparable to NRC's Combined License (COL) review.

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(b)(4) The completion of a Construction Permit review in less than two years is consistent with NRC experience in the 1970's and 1980's; however, the number of issues that NNSA would try to resolve at this stage seems considerably greater than what the NRC undertook. To support this aggressive review program, NNSA is requesting considerable support from the NRC.

NNSA presented preliminary thoughts on the scope of cooperation which envisions increased NRC-NNSA cooperation in the near term and would continue through the safety review and inspections of siting, design, manufacturing, construction, commissioning (i.e. fuel load approval) and operation of the new units. The specific areas of interest would be finalized through the joint NRC-NNSA Steering Committee. The requested areas of cooperation would likely include:

- Providing copies of all NRC documents relevant to the review and approval of the AP 1000 and AP 1000 related sites including rules, guidance documents, safety evaluations, independent test and analysis reports, review questions and responses.
- Providing access to the NRC computer codes for independent analysis of design basis and severe accidents. As part of their interest in the independent analysis, NNSA proposed to join the "International Nuclear Accident Analysis Software Club: (e.g. CAMP and CSARP).
- Providing technical consultation to assist NNSA carry out their AP 1000 reviews including NRC review, comments, and recommendations on the NNSA Safety Evaluation Report (SER) on the Preliminary Safety Analysis Report (PSAR), NNSA SER on the Final Safety Analysis Report (FSAR), environmental reviews and related questions and responses.
- Providing personnel training relevant to AP 1000 including both comprehensive training courses on all aspects of NRC review activities, and exchange of technical staff. With respect to personnel exchanges, NNSA proposed that selected NNSA staff take three to six months of on-the-job training at NRC; and that selected NRC experts present one to two weeks of specialized training seminars in China.

The Commissioners

-3-

- Providing expert support and participation in NNSA inspection of construction and manufacturing activities

NRC identified general areas where NNSA could provide support relevant to AP 1000 activities, including construction inspection activities and oversight of First-of-a-Kind-Engineering.

#### Preliminary Assessment of the NNSA Proposal

The NNSA proposal is generally consistent with NRC goals and initiatives to increase cooperation on new reactor activities. The proposal has many of the elements of the MDEP Stage 1 program approved by the Commission. Specific activities in an NRC-NNSA program would differ from those in the MDEP Stage 1 program because the EPR and AP-1000 projects are at different stages (i.e. AP 1000 design is certified by the NRC while the EPR design certification application is yet to be submitted). The major benefit to NRC from NRC-NNSA cooperation is likely to be in the areas of Construction Inspection and First-of-a-Kind Engineering, while the major benefits to NNSA would likely be in the design review. It is not clear at this point whether there would be significant benefits to increased cooperation in the areas of component manufacturing oversight or site and environmental issues.

To make the NNSA 2007 proposal feasible would require three conditions:

- (1) FY-2007 full funding of the new reactor program;
- (2) integration of the NNSA requests into a broader program of training and infrastructure development useful to both NNSA and new NRC staff; and
- (3) near-term use of contractors (most likely through the consortium of DOE National Laboratories). In addition to meeting NNSA's needs, this would allow near-term restart of contract support, in anticipation of the extensive support needed in FY-2008, and would contribute significantly to contractor familiarity with Part 52, AP 1000, and new reactor issues in general.

#### Policy Considerations

An important policy issue related to the NNSA proposal will be their desire for full access to NRC (and NRC contractor) computer codes for safety analysis. Computer codes associated with nuclear fuel design and performance are of particular sensitivity, requiring Commission involvement and likely Department of Energy and Department of State agreement.

#### Next Steps

With regard to next steps, China will be sending a small team to the U.S. in March to attend the Regulatory Information Conference, have further discussions on NRC reaction to their proposed program of cooperation, and finalize the framework of the MOU. In May 2007 there will be a senior delegation of Ministers in Washington to attend the second meeting of the U.S.- China Strategic Economic Dialogues (SEDs), led by the Secretary of Treasury. The Chinese have proposed that this opportunity be used for the signing of the MOU which would help to integrate nuclear safety into the dialogue which includes among other things, environment, energy, and

The Commissioners

-4-

public health issues. The NNSA has indicated plans to invite Chairman Klein to formally launch the NRC-NNSA program of cooperation sometime in the second half of 2007.

In our discussions, we suggested that cooperation focus first on the items that could be done with relative ease, (e.g., documents already in existence). We noted to the Chinese that the area of computer codes and analysis would be more complicated because they require approvals within the U.S. Government. The request for a training workshop in the June 2007 time period will be difficult as we will need to consider how to implement such a workshop. Various financial arrangements will also need to be addressed, as appropriate, on a project specific basis.

Staff is currently assessing in more detail, the proposed elements of cooperation, including the technical, legal, and resource implications. The staff will then develop a proposed MOU which will be forwarded to the Commission for its review and approval. In addition, the staff will provide the Commission with background and details pertaining to the computer codes requested by the Chinese. The staff will also develop a milestone chart to coordinate program level activities leading up to the signing of the MOU. A near-term overview of the staff's activities associated with this effort will be provided to the Commission via a Technical Assistants briefing.

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\*previously concurred \*\*previously concurred with comments \*\*\*electronic concurrence

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