POLICY ISSUE
NOTATION VOTE

November 29, 2007 SECY-07-0207

FOR: The Commissioners

FROM: Luis A. Reyes
Executive Director for Operations

SUBJECT: MULTINATIONAL DESIGN EVALUATION PROGRAM - STAGE 2 PILOT PROJECT

PURPOSE:

The purpose of this paper is to seek Commission approval for continued participation by U.S. Nuclear Regulatory Commission (NRC) staff in the Multinational Design Evaluation Program (MDEP). The paper provides a summary of the conclusions of the MDEP Stage 2 pilot project and recommendations developed by the MDEP Steering Technical Committee (STC). The final report of the STC is under development and is scheduled to be issued to the MDEP Policy Group in January 2008.

SUMMARY:

The pilot project demonstrated that there would be a significant benefit in continuing multilateral efforts to cooperate on new reactor reviews. The pilot project also demonstrated that MDEP provides a reasonable framework for working with other regulatory authorities to identify areas for further cooperation. The staff is therefore recommending that the Commission approve the staff's continued involvement to take advantage of these opportunities through the development and implementation of a revised MDEP. The revised program would focus on enhanced cooperation on design evaluations and related inspections and would continue to seek opportunities for convergence of regulatory practices.

This paper also addresses resource allocation with respect to anticipated work.

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BACKGROUND:

In SECY-06-0192, "Multinational Design Approval Program (MDAP)," dated September 1, 2006, the staff provided the MDAP Stage 2 Terms of Reference and a description of the MDAP pilot working groups. The paper requested that the Commission approve NRC staff participation in Phase 1 of MDAP Stage 2, including the pilot project and assessment as detailed in the Terms of Reference. In the staff requirements memorandum (SRM) to SECY-06-0192 dated September 15, 2006, the Commission approved the staff's recommendation to participate in the pilot project and assessment.

The pilot project concluded in September 2007, and the staff provided preliminary conclusions to the Commission in a note to Commissioner's Assistants "Preliminary Conclusions Of The Multinational Design Evaluation Program Stage 2 Pilot Project," dated September 11, 2007. In SRM- COMGBJ-07-0004, dated October 5, 2007, the Commission stated that, before authorizing any Stage 2 Phase 2 activities (i.e., implementation of the pilot project recommendations), the Commission would require greater development of the specific proposals, expected benefits, and anticipated resource commitments. The Commission directed the staff to proceed with the overall process and approach described in the SRM to SECY-06-0192, and provide a paper that would have the benefit of the STC discussions from the October 2007 MDEP meeting. On October 8-10, 2007, the staff participated in a meeting of the MDEP STC to discuss the findings of the pilot project and develop conclusions and recommendations for the next phase of MDEP.

This paper summarizes the conclusions and recommendations developed by the MDEP STC at its October 2007 meeting. The leadership of each participating agency is currently reviewing these conclusions and recommendations. The final report is under development, and it is scheduled to be issued to the MDEP Policy Group in January 2008. The staff will represent the Commission's positions and directions in the preparations of the final report and will, to the extent possible, have them reflected in the final report to the MDEP Policy Group.

DISCUSSION:

The MDEP is a multinational initiative to develop innovative approaches to leverage the resources and knowledge of the national regulatory authorities who will be reviewing new reactor power plant designs. MDEP consists of three stages: Stage 1 involves multilateral cooperation within existing regulatory frameworks; Stage 2 focuses on enhanced multinational cooperation and convergence of codes, standards, and safety goals; and Stage 3 involves implementation of Stage 2 products to facilitate licensing processes for new reactors, including those being developed by the Generation IV International Forum.

A year-long pilot project was initiated to assess the feasibility of the Stage 2 goal to more closely align differing national regulatory frameworks in consideration of new reactor designs. Topics considered under Stage 2 were identified as broad scope or specific scope. Broad-scope topics were defined as technical or regulatory issues that are more policy oriented, such as licensing basis, scope of design safety review, and safety goals. To facilitate completing the pilot project within 1 year, the STC focused its attention on the regulatory requirements and the regulatory programs and practices in three selected areas, namely, severe accidents, emergency core

cooling system performance, and digital instrumentation and control (I&C) systems. The study of these selected areas provided insights into these specific areas and, more broadly, into the overall licensing basis, scope of design review, and use of safety goals in the participating countries. By considering a broad range of vendor, utility, and regulator activities for each of these three topics, the STC intended to develop a sufficiently broad understanding of the regulatory activities in each country to support findings and recommendations to the MDEP Policy Group. Specific-scope topics were defined as those issues that are more technical in nature and that require discussion by technical experts, such as component manufacturing oversight. To evaluate this area, the STC created a working group on component manufacturing oversight.

The pilot project demonstrated that there would be a significant benefit in continuing multilateral efforts to cooperate on new reactor reviews. The pilot project also demonstrated that MDEP provides a reasonable forum for working together to identify areas for cooperation and possible convergence of regulatory practices.

The STC concluded that harmonization of regulatory requirements is not feasible in the short term (i.e., for the reactor designs currently under review). However, participating countries should continue with cooperation initiatives, as increased cooperation is a prerequisite to convergence. Cooperation will allow a better understanding of each other's processes to encourage and facilitate eventual convergence. In addition, the STC believes that there is a benefit to formalizing the interactions and cooperative arrangements among the MDEP participants for specific reactor designs. The STC concluded that convergence may be pursued on specific reference regulatory practices, which will help in the cooperative initiatives.

The STC identified specific opportunities for enhanced cooperation within existing regulatory frameworks as well as areas where enhanced cooperation would be facilitated by establishing reference regulatory practices. The STC will recommend to the MDEP Policy Group that these opportunities be pursued through the development and implementation of a revised MDEP. The new program would focus on enhanced cooperation on design evaluations and inspections and would continue to seek opportunities for convergence of regulatory practices. The specific recommendations developed from the pilot program activities constitute the goals of the new program, and successful implementation of the recommendations will result in tools that can be used to enhance the ability of regulatory bodies to cooperate in reactor design evaluations, vendor inspections, and construction oversight, leading to more efficient and more safety-focused regulatory decisions.

The revised program would be implemented under the MDEP Policy Group and the STC, with the Nuclear Energy Agency of the Organization for Economic Cooperation and Development continuing to serve the Secretariat function. The STC will recommend the formation of two types of working groups under the STC. The first includes design-specific working groups to share information and cooperate on specific reactor design evaluations. A working group would be created for each new reactor design that is under review by multiple countries. The countries that are actively reviewing, or preparing to review, the specific reactor design would participate in the appropriate working group. One of these working groups could absorb the activities currently being undertaken by the United States, Finland, and France to share information on the Evolutionary Power Reactor review as part of MDEP Stage 1. When

appropriate, working groups could include Generation IV designs. The second type of working group would cover issues applicable to all reactor designs, such as component manufacturing oversight, codes and standards for component manufacturers, digital I&C standards, and tools and data to support safety reviews.

These working groups would be responsible for implementing the following activities, identified by the STC as actions that are achievable in the near term and that would result in improved multinational cooperation:

- Undertake a multinational vendor inspection program.
- Establish working groups to maximize interaction and cooperation among regulators during the planning and conduct of new reactor design evaluations and construction oversight.
- Complete the evaluation of the similarities and differences among codes and standards for pressure boundary components.
- Evaluate the similarities and differences in other codes and standards, beginning with a comparison of the digital I&C standards.
- Develop a legal framework and the necessary agreements that will support the free exchange of information, including the results of independent analysis and research, among MDEP participants.
- Complete the evaluation of the similarities and differences in the overall scope of the regulatory review and analysis for severe accidents.
- Compare how top-level safety goals are derived and expressed and how achievement is judged among the participating countries, and determine the extent to which the goals can be considered equivalent.
- Compare the approaches used for taking account of operating experience in regulatory reviews for new reactors.
- Develop a program to collect, share, and use construction experience feedback in regulatory reviews.
- Establish an electronic library to collect and share regulatory documents of common interest related to design review and inspection of new reactors. Support the document collection by developing a model for a description that can be included, or added to, regulatory documents so that it is possible to understand the regulatory review performed and the decision reached.

Stage 3 of MDEP was originally envisioned as the long-term implementation of Stage 2 activities for future reactor designs. In the judgment of the STC, the best way to meet the long-

terms goals of MDEP is to focus on cooperation and convergence of regulatory practices that will eventually develop into convergence of regulatory requirements. Progress towards harmonized regulatory practices and requirements for Generation IV reactor designs will be a natural outgrowth of the recommendations discussed above, and such activities may be implemented through a separate working group under the STC in the structure proposed. The eventual inclusion of future reactor activities as a working group, in addition to the inclusion of the current Stage 1 activities as a design-specific working group, obviates the need for a three-stage program. Therefore, the STC recommends that all stages of MDEP be combined into a single program with the structure previously described.

RECOMMENDATION:

The staff recommends that the Commission approve continued staff participation in MDEP at the level of effort already budgeted for Fiscal Year (FY) 2008 and FY 2009, including support for implementation of the recommendations of the MDEP Stage 2 pilot project. The staff considers Commission support for the revised MDEP to be essential to achieving the desired safety enhancements associated with increased multinational cooperation. In addition, the development of the proposed library of regulatory information and the formal structure for multinational cooperation provided by MDEP will be significantly more effective and efficient that the numerous bilaterial activities that they will replace.

RESOURCES:

The FY 2008 budget includes a total of 2.7 full-time equivalents (FTE) and $100K for MDEP, 2.2 FTE and $100K in the Office of New Reactors (NRO) and 0.5 FTE in the Office of International Programs (OIP). The FY 2009 budget request includes a total of 3.9 FTE and $100K, 3.4 FTE and $100K in NRO and 0.5 FTE in OIP.

The staff plans to manage most of the MDEP activities through currently budgeted programs without significant additional resources. Staff participation in the multinational vendor inspection program, for example, would be limited to inspections that the staff was already planning to undertake. The staff expects that the participation of additional regulatory bodies, particularly the regulator in the country where the inspection is taking place, would result in both an efficiency gain and an improved inspection. Other cooperative efforts, such as the design-specific working groups, would also be limited to reviews that the staff is already planning to undertake, and the staff expects that the agency would also realize efficiency gains for those reviews.

In addition, the proposed program includes communication and interaction with other entities engaged in similar activities to ensure that MDEP does not duplicate efforts.

It is not anticipated that the Office of Nuclear Regulatory Research (RES) will have lead responsibility for implementing any part of the proposed program; therefore, RES does not anticipate needing any additional FTE.

COORDINATION:

The Office of the General Counsel has reviewed this paper and has no legal objection. The Office of the Chief Financial Officer has reviewed this paper for resource implications and concurs. The Office of International Programs has reviewed this paper and agrees with the recommendation.

/RA/

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