

U.S. Proposal For A Multinational Design Approval Program
March 28, 2006 - Chairman Nils Diaz

With the worldwide resurgence of interest and activity in the construction of new nuclear power facilities, the world's national regulatory authorities will likely be faced with many challenges in the reactor licensing arena. To address these challenges, the United States Nuclear Regulatory Commission (NRC) has been developing innovative approaches to ensure that it can complete its work in a timely and effective way, while not losing track of its overall safety mission. Unlike the previous generation of nuclear power plants, the majority of nuclear power plants to be built around the world in the next 5 to 15 years will likely be limited to a small number of relatively standardized designs, purchased from a limited number of multinational corporations. Such standardization in nuclear power plant design creates an opportunity to leverage the resources and knowledge of the national regulatory authorities who will be tasked with the review of the new reactor power plant designs. To address this opportunity, the NRC has developed a proposal for a Multinational Design Approval Program (MDAP).

As currently envisioned, the MDAP will be implemented in three stages. Stage 1 of the MDAP will focus on new light water reactor designs for which a vendor is seeking a U.S. design certification and for which the same or similar reactor design is being reviewed by the NRC's regulatory counterparts for licensing in their respective countries. As part of the MDAP, the participating regulatory authorities would share results of their design review activities. Collaborative reviews and collaborative research of identified issues would also be considered as applicable. In the U.S., the NRC would use its current design certification process, as specified in 10 CFR Part 52. The NRC would, however, incorporate the expertise of other national regulatory bodies into the technical design reviews that are performed by NRC staff. Other governments participating in Stage 1 of the MDAP would be free to utilize the MDAP outputs to facilitate their own unique national licensing processes.

Stage 1 of the MDAP has begun and is currently focused on the planned design reviews associated with the AREVA NP - EPR reactor. The EPR reactor is now being constructed in Finland, has been proposed for construction in France, and is undergoing pre-application reviews in the U.S., in anticipation of a late 2007 U.S. design certification application submission. Initial bilateral meetings were held in January and February 2006 between the NRC and its regulatory counterparts in Finland and France, STUK and ASN, respectively. The first steps in Stage 1 will be centered around exchanging information on the breadth and depth of the ongoing EPR design reviews being conducted by the French and Finnish governments. Insights will also be obtained from AREVA NP regarding the process being used to bring the European EPR design into conformance with U.S. design standards. The participating regulatory authorities will then determine what specific technical areas of their planned design review would best benefit from cooperation with their foreign regulatory counterparts. The level of cooperation achievable in Stage 1 of the MDAP will depend in large part on the relative standardization of the reactor design across the three participating countries. Application of MDAP Stage 1 to the regulatory

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design reviews of other reactors, not yet licensed by the U.S., will be considered on a case by case basis, as applicable.

Stage 2 of the MDAP, as currently envisioned, would be more extensive and would begin in parallel with the Stage 1 effort. At the beginning of Stage 2, technical representatives from a group of core countries would be assembled to structure the MDAP process, leading to the formation of a Stage 2 steering committee. The steering committee would then formulate the policy direction and form working groups associated with specific technical modules. The primary objective of the Stage 2 modules would be to facilitate the licensing of the reactor designs emanating from the Generation IV program. This would be accomplished through convergence of the regulatory safety goals, design criteria, codes, and standards that are associated with approving the new reactor designs. It is, however, likely that the Stage 2 work could also be used to facilitate the licensing of more near-term reactors. Lessons learned from the recent WENRA initiative to harmonize reactor safety should also be considered by the steering committee.

One possible technical module that has been discussed initially, and would likely provide near-term benefits, might be directed towards achieving regulatory reciprocity on the manufacturing oversight of international reactor suppliers and components. The NRC anticipates that with the emergence of reactor construction in the U.S. and the expected international outsourcing of reactor components, enhanced oversight in this area may be desirable. Other possible technical modules for consideration include the design criteria, codes, and standards associated with quality assurance, risk assessment, and severe accident mitigation features.

In completing its work, it is anticipated that the Stage 2 working groups would utilize the IAEA Safety Standards as the overarching network to satisfy international safety objectives. The working groups would review the applicable IAEA Safety Standards for completeness and would identify a strategy for integrating the applicable IAEA standards into a group of modules that would constitute the core for a multinational design certification process.

For Stage 2 of the MDAP, the NRC believes that it would be beneficial to make use of the services of the OECD's Nuclear Energy Agency (NEA) to act as a secretariat since the NEA membership is closely aligned to those countries involved in the development of new nuclear power plant facilities. Also, the NEA is currently serving as secretariat for the Generation IV International Forum (GIF). Much of the infrastructure developed for the GIF can be used for the MDAP initiative, thus saving significant staff effort in developing the necessary administrative framework and associated documents. Since the results of the MDAP Stage 2 initiative will be used to facilitate the reviews of the plant designs being developed by the GIF, a close link needs to be maintained between the GIF and MDAP initiatives. Having the NEA serve as secretariat for both the GIF and the MDAP can help to ensure integration of the two initiatives.

It is important to note that the NEA will be serving solely as a secretariat and will not be providing technical direction to the project. The technical direction will come from the MDAP Stage 2 Steering Committee. Interfaces between the NEA and the IAEA will be set up to ensure

effective communication and alignment with IAEA activities in similar areas. This will include having the IAEA participate in the MDAP Stage 2 activities, in an ex-officio capacity.

Stage 3, the implementation and expansion stage of the MDAP, would use the products of the Stage 2 effort to review the advanced reactor designs emanating from the Generation IV International Forum (GIF). Stage 3 should help to maximize the effectiveness of the regulatory design reviews of these advanced reactors.

It is anticipated that participation in the MDAP program would help the participating regulatory authorities carry out their missions of ensuring the safety of new reactor designs. Among the specific benefits that could be derived from participation in the MDAP program are:

- The diversity that each participating regulatory authority brings to Stage 1 of the MDAP should provide additional assurance that any significant technical issues associated with the design of the reactor have been identified and resolved. For the U.S., sharing information with the French and Finnish regulators will allow the NRC to better identify such issues during its pre-application reviews, and will allow the agency to leverage its work with the work done by the NRC's counterparts to resolve such issues early in the review process.
- The MDAP should provide an incentive towards developing more internationally-standardized reactor designs, which would allow for more meaningful international exchanges of reactor operating experience. This should, in turn, help to enhance both national and international reactor safety.
- Stages 2 and 3 of the MDAP should foster the safety of reactors in those countries which are planning to build and license new nuclear power facilities, but whose regulatory infrastructure is not as extensive or as experienced as that which exists in more developed nuclear nations.
- Stage 2 of the MDAP should enhance the safety of the next generation of nuclear power plants being conceived for deployment. Participation of peer foreign regulators in the development of international design review codes, standards, and regulations should allow for a more comprehensive safety review.
- The convergence of regulatory safety goals in Stage 2 of the MDAP should result in enhanced clarity and transparency when communicating the safety of new reactor designs to the general public.
- Working with international regulatory partners in a collaborative manner should provide added insights on how other governments license new reactors. Such insights could potentially be used to improve the effectiveness and efficiency of national licensing processes.

