

# MDEP: consolidation and expansion

by L. Burkhart\*

The Multinational Design Evaluation Programme (MDEP) continues to progress in its efforts to facilitate the safe and efficient licensing and regulation of new nuclear reactors worldwide. The MDEP is an international initiative undertaken by the regulators of ten countries to co-operate on safety reviews of new reactor designs, to encourage harmonisation of regulatory requirements and practices, and to find ways to do so. The International Atomic Energy Agency (IAEA) also participates in the MDEP efforts. Since the last *NEA News* update, the structure of the MDEP has evolved in order to better meet the challenges of licensing new reactors, but its purpose remains the same: to make regulatory design reviews more safety-focused and to leverage regulatory resources to ensure the safe operation of tomorrow's operating reactors.

As a backdrop to the MDEP is a world in which nuclear power plant design and construction is receiving both new and increasing interest. Construction has been ongoing in many of the MDEP countries for years such as in China, Japan, Korea and Russia. Two new European pressurised reactors (EPRs) have been under construction for some time in Finland and France. And governments are keenly engaged in new reactor design reviews in Canada, the United Kingdom, the United States and the other MDEP countries. The reality of the situation makes the work of the MDEP that much more vital to focusing the limited resources of government regulators on the most safety-significant issues. Leveraging each other's resources remains one of the advantages of working closely together on the MDEP.

The work of the MDEP has been consolidated from what was a three-stage programme a few years ago to a comprehensive programme that is working on the immediate design reviews of reactors that are being constructed and licensed in several MDEP countries, the convergence of mechanical and electrical component codes and standards, and the coordination of vendor inspections. Governed by the ten-member Policy Group consisting of the

top regulatory officials from MDEP countries, the work is implemented by the MDEP Steering Technical Committee which, in turn, provides guidance and direction to the five official working groups. These working groups are the two design-specific working groups – one each on AREVA's EPR design and Westinghouse's AP1000 design – and the three issue-specific working groups addressing mechanical component codes and standards, digital instrumentation and control issues, and vendor inspection co-operation efforts. The former working groups concentrate on sharing information among MDEP regulators on the various safety review efforts of the two designs, and the latter three are concentrating on addressing potential convergence and harmonisation in regulatory requirements and practices.

The Policy Group (PG), which is chaired by Mr. André-Claude Lacoste, Chairman of the French Nuclear Safety Authority (ASN), meets annually to discuss the results and future direction of the MDEP, making adjustments and providing policy direction to ensure that the programme is meeting its goals. At its March 2009 annual meeting, the PG approved converting the MDEP from a two-year project to a multi-year programme that should provide important interim results on new reactor issues. Another key effort of the PG has been to make more information available to other stakeholders, especially to non-MDEP regulators. A milestone event in carrying out this directive was the successful conduct of the MDEP Conference on New Reactor Design Activities, which was coordinated by the NEA MDEP Technical Secretariat staff and held at the OECD Conference Centre on 10-11 September 2009. Over 170 people attended from 23 countries and 11 international organisations.

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The Steering Technical Committee (STC), which is chaired by Mr. Gary Holahan from the US Nuclear Regulatory Commission (NRC) Office of New Reactors and which is comprised of members from all MDEP-country regulatory authorities having responsibility for licensing new reactors, provides direction and guidance to the working groups and consults the PG on important policy issues. The STC meets three times a year, usually in Paris, to review the status of each working group and to discuss evolving issues that may be addressed by the MDEP. As stated in the MDEP Terms of Reference, one of the key goals of the MDEP is to facilitate the licensing of Generation IV reactors when the time comes. The PG and the STC keep this in mind to ensure the long-term focus of MDEP efforts while balancing the need to obtain immediate co-operative results in the design-specific working groups.

The design-specific working groups include the most mature and the youngest of the MDEP working groups. The EPR Working Group has been in existence, in one form or another, for at least three years. Faced with the construction and/or licensing of the EPR in Canada, China, Finland (Chair), France (Co-Chair), the United Kingdom and the United States, these regulators are working together to discuss the various designs and to concentrate on coordinating the safety reviews and their results. The EPR Working Group meets twice a year and also includes co-operative efforts on specific areas such as digital instrumentation and control, probabilistic safety assessment, severe accidents, accidents and transients, radiological protection, human factors engineering and fire protection. The AP1000 Working Group involves the regulators facing reviews of that design such as Canada, China (Co-Chair), the United Kingdom and the United States (Chair). The AP1000 is under construction in China and under intense design reviews in these four countries. The AP1000 Working Group just completed its second meeting in September 2009 after its initial meeting in China in February 2009. Specific areas of co-operation include reviews of the large squib valves that are utilised to initiate the passive emergency core cooling systems, civil engineering and the structural review of the shield building, and the control rod drive mechanisms.

The issue-specific working groups are tasked with studying the similarities and differences in regulatory requirements and practices and trying to understand how complying with requirements in one country may apply or not apply to meeting requirements in another. Finding ways to eventually harmonise these requirements is a clear goal of the MDEP. For instance, in the Codes and Standards Working Group (CSWG), the MDEP regulators are working with the various mechanical codes standards development organisations (SDOs) to study how the codes differ

and why among the MDEP countries. This work is nearly complete for comparing these standards between France, Japan, Korea and the United States, and will be started soon for Canada and Russia. Once the difference and similarities are identified, potential paths to take to encourage convergence will be discussed and pursued.

The same sorts of efforts are ongoing as part of the Digital Instrumentation and Control Working Group (DICWG). This group is consulting with national and international electric standards development organisations such as the Institute of Electrical and Electronic Engineers (IEEE) and the International Electrotechnical Commission (IEC) to look for possible ways to achieve convergence.

The Vendor Inspection Co-operation Working Group (VICWG) is coordinating inspections among interested MDEP countries. In these efforts, one regulator conducts a vendor inspection and invites other MDEP regulators to witness the activities in order to facilitate familiarisation with each other's inspection procedures, conduct and documentation. Already about eight of these witnessed inspections have been completed and many more are planned. This work will lead to a better understanding about how one country can use the results of another country's inspection. The scope of these inspections is expected to expand from only pressure vessels to other components such as ASME Class 1 pipes, pumps and valves.

The results from these working groups' activities are communicated back to the STC and the PG, and an MDEP annual report is issued and made available to the public on the NEA's MDEP web pages ([www.nea.fr/mdep](http://www.nea.fr/mdep)). The Policy Group is leading the effort to make more information available to other stakeholders, especially to non-MDEP regulators. As mentioned previously, a key step in making more MDEP information available to these stakeholders was accomplished at the September 2009 Conference on New Reactor Design Activities, and a follow-on conference was proposed by the PG Chair in approximately two years. With the success of this conference and the PG approval to extend the MDEP to a long-term programme, we can be confident that the MDEP will continue to make a difference in new reactor regulation from now until the time that Generation IV reactors are under review. ■