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Japanese Manufacturers to Take Initiative Developing New World-class Reactors

On September 12, three parties – the Ministry of Economy, Trade and Industry (METI), the Federation of Electric Power Companies (FEPC) and the Japan Electrical Manufacturers' Association (JEMA) – announced that they would begin full-scale development of next-generation light water reactors (LWRs), as a national project, starting in the upcoming fiscal year (April 1, 2008, to March 31, 2009), targeted at becoming international standards. Eight years will be needed to complete the basic designs, at a cost of JPY 60 billion ($520 million at $1=115 yen) in combined private and public funds. One BWR design and one PWR design, each with 1,700-1,800MW of electric output, will be developed.

Having worked on feasibility studies for such next-generation LWRs since the previous fiscal year (April 1, 2006, to March 31, 2007), the three decided to move to full-scale development, taking into account the increased demand for replacement reactors in Japan that is expected to start around 2030, and expected growth in the world market.

The basic points agreed on are as follows:

(1) Manufacturers will take the initiative in the project and include the next-generation LWRs to be developed in their primary reactor line-ups.

(2) Japan's electric power utilities understand the efforts of the manufacturers and will cooperate actively from their positions as principal users.

(3) The national government of Japan will take special actions toward ensuring necessary budgets while developing an environment conducive to international activities.

A total of eleven utilities will participate in the project, including nine members of FEPC (all except the Okinawa Electric Power Co.), plus the Japan Atomic Power Company (JAPC) and the Electric Power Development Co. (EPDC or J-Power). Participating manufacturers are Toshiba Corporation, Hitachi-GE Nuclear Energy, Ltd., and Mitsubishi Heavy Industries, Ltd. (MHI). The three parties will establish a consortium-like organization to implement the project, and are now working toward that.

The major concepts guiding the development of next-generation LWRs include the following:

(1) The use of at least 5% enriched fuel in reactors (the first time ever in the world) to substantially reduce spent fuel and attain the world's highest availability factor.

(2) The use of base-isolation technology to enable a standardized plant without regard to site conditions.

(3) The development of new materials and water chemistry to allow an 80-year plant life and substantially reduce exposure dose during maintenance work.

(4) Substantially shorter construction periods through the adoption of innovative construction technology.

(5) The simultaneous realization of the world's highest levels of safety and economy through the optimal combinations of passive and active systems.

(6) State-of-the-art digitalization of operations, simultaneously improving availability factors and safety.

For a two-year period, starting in the upcoming fiscal year, conceptual designs will be addressed and elemental technologies will be developed, in order to assess the feasibility of the plant concepts. The results will then be evaluated by the first half of FY10 (starting on April 1,

2010). A decision will then be made on whether to reflect them in development plans that year and after, or to make further modifications.

METI will develop standards for the next-generation LWRs in parallel with the progress of their development. It will also provide advanced regulations in cooperation with the safety authorities.

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