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Development of Medical Isotope Production (Mo-99) by the Boiling Water Reactor (BWR)

HGNE Joins the Government-Industries Joint Meeting for Reliable Molybdenum-99[*1]/Technetium-99m[*2] Supply

Tokyo, November 15, 2010 - - - - Hitachi-GE Nuclear Energy, Ltd. (Masaharu Hanyu, President and Representative Director; "Hitachi GE") today announced that it has decided to start a commercial viability study on Molybdenum-99 production technology utilizing operating Boiling Water Reactors (BWR) ("BWR method"), in cooperation with GE Hitachi Nuclear Energy ("GEH"). In addition, Hitachi GE has decided to participate in the Government-Industries Joint Meeting on the Stable Supply of Molybdenum-99/Technetium-99[*3] (Secretariat: the Cabinet Office; the "Joint Meeting"), which was established by pertinent government and industry organizations in Japan.

Technetium pharmaceuticals (radiopharmaceuticals) comprised of Technetium-99m as a base ingredient are the most popular in the field of radionuclide examination, and Japan has the world's second largest demand after the United States. Technetium-99m is a radioisotope that is decayed from Molybdenum-99, which is also a radioisotope, and Japan imports whole Molybdenum-99. More than 90% of Molybdenum-99 is produced by a few aged research reactors overseas ("Research Reactor(s)"). A serious supply crunch of Molybdenum-99 has occurred worldwide when the long-term shutdown of the research reactor with the largest production coincided with the long disruption in air traffic due to the Icelandic volcanic eruption in April 2010.

To address the Molybdenum-99 supply shortage issue, the Japan Atomic Energy Commission issued a recommendation that "it would be necessary for relevant administrative bodies to proceed with studies on responsive measures at the national level under close collaboration and cooperation with pertinent organizations including Japan's industrial circles and R&D institutions" in its "Assessment on the Basic Concept of the Initiatives for Radiation Applications Presented in the Framework for Nuclear Energy Policy" (June 1, 2010). As a result, the Joint Meeting, a Government-Industries partnership organization, was established on October 6, 2010.

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Meanwhile, in the United States, the White House has established a working group to manage the radiopharmaceuticals supply shortage issue, in order to improve self-dependency and to cope with the restriction on the export of highly enriched uranium used in the conventional nuclear fission method. In this context, the U.S. Department of Energy (DOE) had solicited proposals on Molybdenum-99 production methods and the BWR method proposed by GEH was selected as a business case to be funded by the DOE.

In the BWR method, Molybdenum-99 is generated by neutron irradiation of raw Molybdenum in an operating BWR. As BWR fleets periodically calibrate neutron instrumentation for the reactor power measurement, every BWR is equipped with a system to traverse the calibrating device in and out of the reactor pressure vessel and the reactor containment vessel. This system makes neutron irradiation and transport of molybdenum easily accomplished.

Hitachi GE has worked with GEH to develop and commercialize the BWR method in a few years. Moreover, participating in the Joint Meeting, Hitachi GE intends to study with related organizations the feasibility of providing Molybdenum-99 using some of operating BWRs for technetium pharmaceuticals production.

Notes:

*1. Molybdenum-99: A radioisotope of molybdenum (Symbol for element: Mo; Atomic number: 42) that is produced via the nuclear fission of Uranium 235 in a reactor and via the neutron absorption of Molybdenum-98, which is contained in natural molybdenum. Its half-life is approximately 66 hours.

*2. Technetium-99m: A silver-gray, radioactive metal with the appearance of platinum (Symbol for element: Tc-99m; Atomic number: 43) that is a daughter nuclide produced via the decay of Molybdenum-99. Its half-life is approximately six hours. Technetium-99m changes into Technetium-99 by emitting a gamma ray.

*3. The Panel composed of the Cabinet Office, the Ministry of Education, Culture, Sports, Science and Technology, the Ministry of Health, Labour and Welfare, the Japanese Society of Nuclear Medicine, the Japan Radiological Society, Japan Industries Association of Radiological Systems, the Japan Radioisotope Association, Japan Atomic Energy Agency, National Institute of Radiological Sciences, Chiyoda Technol Corporation, Nihon Medi-Physics Co., Ltd., and FUJIFILM RI Pharma Co., Ltd. (associated website: http://wwwa.cao.go.jp/oaep/index.html).

■ About Hitachi-GE Nuclear Energy, Ltd.

Hitachi-GE Nuclear Energy, Ltd. (“Hitachi GE”) was incorporated in Japan on July 1, 2007, by Hitachi, Limited, and General Electric Company of the United States, by fusing together management resources from the nuclear businesses of both companies. Hitachi GE has sophisticated engineering capabilities to ensure consistent services from R&D to the design, manufacture, construction and maintenance services regarding BWRs. In particular, Hitachi GE has participated in all six domestic plant projects for the advanced boiling water reactor (ABWR), the most recent being the BWR type, boasting the top share in Japan.

About Hitachi ,Ltd.

Hitachi, Ltd. (NYSE: HIT / TSE: 6501), headquartered in Tokyo, Japan, is a leading global electronics company with approximately 360,000 employees worldwide. Fiscal 2009 (ended March 31, 2010) consolidated revenues totaled 8,968 billion yen ($96.4 billion). Hitachi will focus more than ever on the “Social Innovation Business,” which includes information & telecommunication systems, power systems, environmental, industrial and transportation systems, and social and urban systems, as well as the sophisticated materials and key devices that support them. For more information on Hitachi, please visit the company’s website at http://www.hitachi.com.

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