SPEAKER / PRESENTATION INFORMATION

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Biography

- 1980: Graduated from the University of Tokyo, Nuclear Engineering, and entered PNC. Engaged in development of FBR reprocessing technologies and design of FBR reprocessing facility.
- 1984: Engaged in coordination of PNC-DOE Joint Criticality Data Development Program
- 1986: PNC-DOE Collaboration on Fast Reactor Fuel Cycle Technology Development
- 1991: Engaged in safety design of the Recycle Equipment Test Facility, especially in criticality safety design and licensing
- 1997: Investigated the cause of the fire and explosion incident at the Bituminization Demonstration Facility of Tokai Reprocessing Plant.
- 2000: General Manager in charge of development of FBR reprocessing technologies.
- 2008: Unit Director of advanced reprocessing unit of advanced nuclear system research and development directorate.

Title

Present Status on the Development of Advanced Reprocessing Technology for FBR Spent Fuel and Related Criticality Safety Design Issues

Abstract

The Japan Atomic Energy Agency (JAEA) launched the "Fast Reactor (FR) Fuel Cycle Technology Development (FaCT)" Project in cooperation with Japanese electric utilities in 2006.

The FaCT project seeks to adopt innovative technologies by 2010, and, based on R&D associated with these technologies, the conceptual design of demonstration and/or commercial facilities by 2015. It would then be possible to achieve development targets such as safety and reliability, sustainability (environmental protection, waste management, and efficient utilization of nuclear fuel resources), economic competitiveness and nuclear non-proliferation. This program proposes commercialization by 2015.

In the FaCT project, the advanced aqueous reprocessing system (NEXT: New Extraction System for TRU Recovery) has been developed, which was selected as the most promising concept for commercialization. The NEXT process is composed of the following process and equipment: (1) disassembly and shear, (2) dissolution with continuous dissolver, (3) crystallization with continuous crystallizer for pre-recovery of excessive uranium, (4) U/Pu/Np co-recovery with centrifugal contactors, (5) MA recovery with extraction chromatography, and (6) salt-free process for waste reduction.

Criticality safety features will be included in the design of each unique piece of required equipment, such as continuous dissolver, centrifugal contactors, and slab tanks for intermediate vessels.

In envisioning the future fuel cycle, Japan will face the need to increase equipment capacity to enable reprocessing 500–800 tons of FBR spent fuel per year due to increased circulation of plutonium with FBR. This issue will be discussed at this workshop.