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Current Nuclear Energy Updates: April – June 2010

MOX Fuel Commercial Use Began in Japan with Kyushu's Genkai 3 and Shikoku's Ikata 3

In order to enhance the efficient use of its energy resources, Japan has envisioned recycling its spent nuclear fuel since the earliest beginnings of its nuclear energy program. After many years of technological research and preparation, in 1997, the Japanese government stated the necessity to begin utilizing recycled nuclear fuel in the form of mixed-oxide (MOX) fuel in Japan's commercial nuclear reactors. Following on this statement, the Japanese electric power utilities announced their intention to comply with the initiative and begin consuming MOX fuel in their light water reactors.

In May of 2009, a shipment of MOX fuel arrived in Japan from France, delivering MOX fuel assemblies to Kyushu, Shikoku, and Chubu Electric Power Companies (EPCos). In December of the same year, Kyushu EPCo's Genkai Nuclear Power Station began consuming MOX fuel at its Number 3 Reactor, achieving the first step of the long term vision of recycling Japan's spent nuclear fuel. Shikoku EPCo's Ikata 3 followed suit in March 2010. Japanese utilities plan to have MOX fuel loaded in 16 to 18 reactors by 2015.

Ikata Nuclear Power Plant Source: Shikoku EPCo.

POWER TOPICS

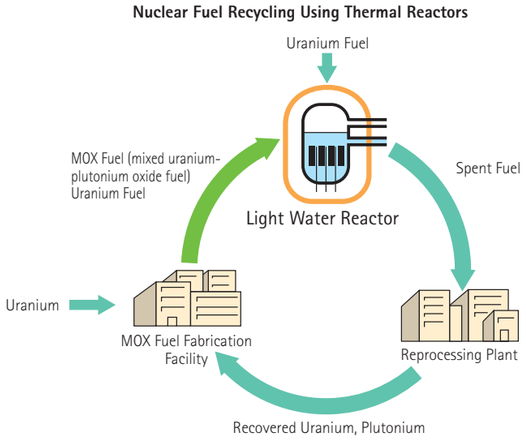
Safety and Security: Top Priorities for International Transport of MOX Fuel

Overseas Reprocessing and Shipping MOX Fuel

From the 1960s until 2001, the Japanese utilities had sent their spent nuclear fuel to Europe for reprocessing, prior to the time when Japan's own domestic reprocessing plant was to become operational. While shipments of spent fuel to Europe have been completed, this program necessitated the safe, long distance surface transportation of spent fuel from Japan to Europe; likewise, it necessitates the return shipments of waste and MOX fuel assemblies from Europe back to Japan.

Return shipments of MOX fuel from Europe will continue until the early 2020s at a pace of approximately one per year for the next ten years. The latest shipment of MOX fuel en route from France to Japan arrived safely in June 2010.

Safety and Security: Top Priorities for International Transport of MOX Fuel



Safety and Security of MOX Fuel Shipments

MOX fuel is transported to Japan in purpose-built vessels that are dedicated to the transport of radioactive materials. The vessels, owned and operated by British company Pacific Nuclear Transport Limited (PNTL), have covered more than five million miles for over 40 years without a single incident resulting in the release of radioactivity.

As with shipping spent fuel and highly radioactive waste, MOX fuel assemblies are carefully packaged for transport and are sealed inside specially designed shipping casks to protect workers, the public and the environment in severe accident scenarios. These massive and robust casks are designed according to Japanese, French and British law, as well as the standards of the International Atomic Energy Agency (IAEA). In accordance with international protocol and national regulations, the casks are, in turn, sealed inside the hull of PNTL's vessels.

Two of these MOX-bearing vessels, both armed and carrying highly trained security details, leave Europe for Japan, traveling in tandem for mutual security. The vessels travel directly, with no port calls and the route is carefully chosen to avoid areas of social disorder. These security measures for MOX shipments fully satisfy the requirements of the US-Japan Agreement.

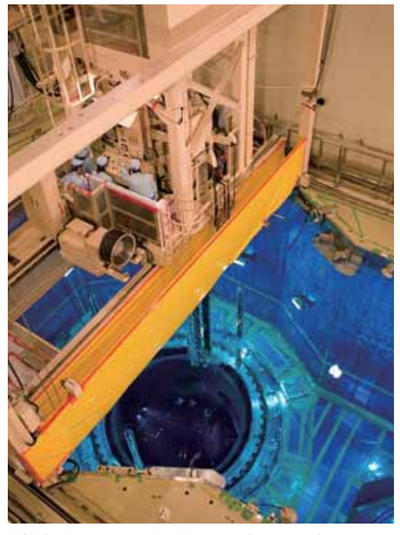

Transport Vessel


Off-loading of Transport Cask

U.S. Government Affirmation

A joint study by the U.S. Departments of Energy, Transportation, and State, the U.S. Environmental Protection Agency, and the U.S. Coast Guard has concluded that the sea transport of radioactive materials, including plutonium, "has a high degree of safety when carried out in compliance with existing international standards and national regulations." This transport system is identical to that which the United States government has employed for years to transport MOX and weapons grade plutonium powder to and from Europe.

Following are excerpts of letters sent by the U.S. government to several high-ranking members of the U.S. congress stating the adequacy of the physical protection measures to be employed for the transport of MOX fuel from Europe to Japan: "As required by the Agreement, Japan has prepared a transportation plan for the upcoming MOX shipment in close consultation with the United States. [...] USA experts have carefully scrutinized successive drafts of the plan over a period of several years. [...] In addition, the responsible USA Executive Branch agencies have formally reviewed the final plan. They have concluded that it fully satisfies all requirements of the 1988 US-Japan Agreement, including the requirements of adequate physical protection."


MOX fuel being loaded into Number 3 Reactor at Genkai Nuclear Power Station Source: Kyushu EPCo.

Japan's Nuclear Policy Principle

Japan's Atomic Energy Basic Act sets forth a national commitment that the development and utilization of nuclear energy shall be dictated solely for peaceful purposes. Japan is therefore an active supporter of the international non-proliferation regime. This principle provides an additional level of transparency with regard to plutonium use in Japan.