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Special Feature

Safe, Sustainable Use of Nuclear Energy

Nuclear power is responsible for nearly a third of Japan's total electric power generating capacity, helping to assure continuous provision of electricity.

Besides benefitting from the stable supply and price of nuclear fuel, nuclear power stations have the advantage of producing no CO₂ emissions in the process of generating electric power.

For Japan, which depends on imports for most of its energy resources, promoting the "nuclear fuel cycle" is essential to achieving a stable supply of energy well into the future. This cycle involves reprocessing spent fuel from nuclear power stations and reusing the extracted plutonium and uranium.

Plan and Background of the Ohma Nuclear Power Station Project

The J-POWER Group has been carrying out surveys and studies concerning nuclear power development since 1954. The Ministry of Economy, Trade and Industry (METI) in April 2008 gave its approval to build a nuclear reactor at the Ohma Nuclear Power Station in Ohma-machi, Shimokita-gun, Aomori Prefecture, which had been in preparation since 1976. Construction began in May 2008 and is currently under way.

With the aim of starting operation in November 2014, we are now proceeding with work on this facility, giving highest priority to assuring safety and gaining the understanding of the surrounding communities.

Overview of the Ohma Nuclear Power Station

Location	Ohma-machi, Shimokita-gun, Aomori Prefecture
Output	1,383 MW
Reactor type	Advanced Boiling Water Reactor (ABWR)
Fuel	Enriched uranium and uranium-plutonium mixed oxide



Artist's rendering of completed Ohma Nuclear Power Station

Site of Ohma Nuclear Power Station



- June 1976 Ohma town council requested environmental survey for hosting a nuclear power station
- August 1983 Environmental survey of proposed site
- December 1984 Decision by Ohma town council to attract a nuclear power station
- August 1995 Atomic Energy Commission abandons prototype ATR plant in favor of full-MOX-ABWR
- September 1998 Environment impact survey reports submitted to MITI
- December 1998 First round of public hearings
- August 1999 Incorporated into the Basic Plan for Electric Power Development
- September 1999 Application for approval of nuclear reactor installation (withdrawn in March 2004 due to revision of power station deployment plan)
- March 2004 Application for approval of nuclear reactor installation
- June 2005 METI asks advice of Nuclear Safety Commission/Atomic Energy Commission
- October 2005 Second round of public hearings
- April 2008 Nuclear reactor installation approved
- May 2008 Approval and start of phase 1 construction project
- December 2008 Approval of phase 2 construction project

INTERVIEW

Importance of the Ohma Nuclear Power Project Resolute Progress Toward the Nuclear Fuel Cycle

Osamu Hagiwara

Leader, Construction Administration Group, Nuclear Power Construction Department



Significance of Full-MOX-ABWR

The J-POWER Group believes it is necessary to diversify our energy sources by the addition of nuclear power generation, for reasons that include achieving energy security and countering global warming.

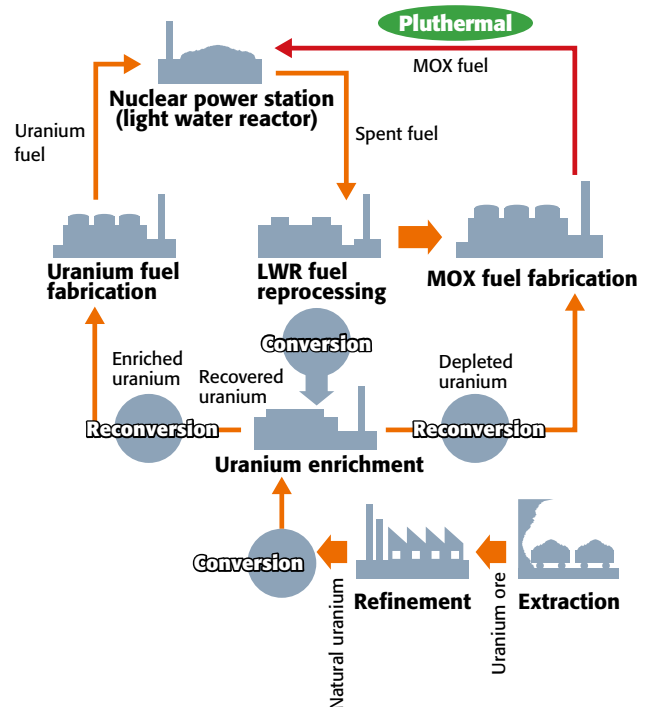
Natural uranium consists mostly of U-238, an isotope that is not readily fissionable. Fissile U-235 makes up only about 0.7 percent of the total. Nuclear power stations use enriched uranium, in which the percentage of U-235 is raised to between 3 and 5 percent. Nuclear fission produces heat and neutrons, and this thermal energy is used by nuclear power stations to generate electricity. When U-238 absorbs a neutron, it is converted to fissile U-239. By reprocessing and recovering the resulting U-239 and reusing it in nuclear power stations, uranium can be utilized more efficiently.

The use of uranium and plutonium mixed oxide (MOX) fuel in nuclear power stations (light water reactors) for the purpose of using plutonium as nuclear reactor fuel is called “pluthermal” in Japan.

The Ohma nuclear power station is being constructed as a full-MOX-ABWR facility, aimed at loading MOX fuel in all the reactor cores. Based on Japan’s policy of increasing the flexibility of the pluthermal program, this approach plays an important role toward conserving and effectively using valuable uranium resources. A statement adopted by the Japan Atomic Energy Commission in August 1995 assessed the significance of full-MOX-ABWR as follows.

- It has been positioned as part of Japan’s policy of broadening flexibility of plans to use MOX fuel in light water reactors, which is a key means of medium-term recycling of nuclear fuel.
- It is seen as technically feasible without changing the existing basic ABWR specifications, and has ample prospects of being economically feasible for use in actual reactors.

>>> The Nuclear Fuel Cycle Concept



COLUMN

How the Construction Project Is Progressing

Ohma Nuclear Power Construction Office

Building a full MOX nuclear power station with safety as our highest priority

As of May 2009, the Ohma Nuclear Power Construction Office is busy mainly with foundation excavation work for the reactor building, turbine building and other main buildings.

The construction site is located in a region with a severe climate featuring strong winds and sub-freezing average temperatures in winter. As we carry out the construction work, we are making safety assurance our top priority and paying careful attention to the surrounding environment.

Soon we will begin earthwork for the water intake and discharge facilities, assembly of steel plating in the reactor containment vessel using a huge slewing crane, and installation of the circulating water pipes as well as other mechanical and electrical work. The foundation excavation work for the main buildings currently under way is scheduled for completion by fall 2009, after which construction of the buildings themselves will start based on the results of bedrock testing for the reactor building.

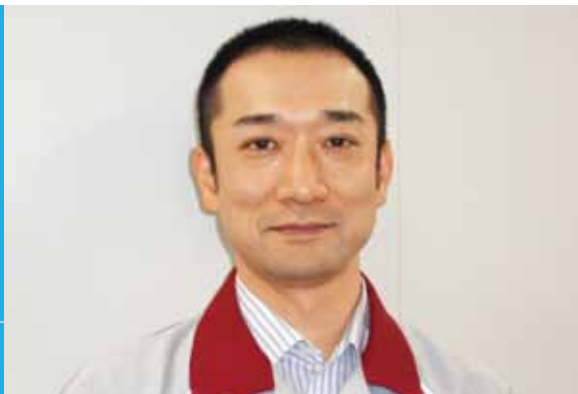


INTERVIEW

Assuring Safety/Maintaining Reliability Going forward together with the local communities, giving top priority to safety

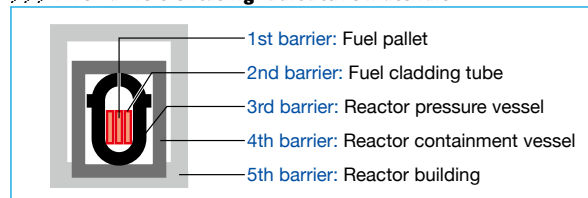
Takaya Nakano

Nuclear Engineering Group, Ohma Nuclear Power Construction Office, Ohma General Management Department



A nuclear power station must adopt a "defense-in-depth" approach to safety, with multiple, redundant, independent safety layers, in acknowledgement of the reality that radioactive materials are being handled, that machines can fail, and that human beings can make mistakes. These layers are designed to prevent problems from arising in the first place, prevent errors from spreading and developing into accidents, and prevent abnormal discharge of radioactive materials outside the site. The most important of these is ensuring no abnormal outside emission of radioactive materials, and to this end five layers of barriers are created to keep the materials enclosed in rigorous security.

>>> Five barriers encasing radioactive materials



The Ohma Nuclear Power Station additionally adopts the following safety assessment and design measures.

Seismic Safety

A nuclear power station is designed to withstand an earthquake of the maximum scale anticipated in the area where it is located. This is true also in the case of the Ohma Nuclear Power Station, for which detailed geological surveys have been conducted. The power station was designed with sufficient seismic safety margin and will be monitored as necessary with additional assessments and verifications based on the latest knowledge.

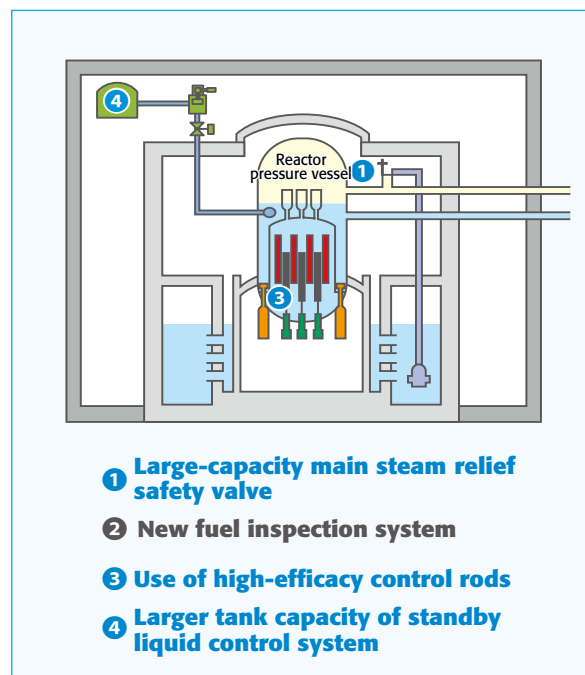
In September 2006, the Nuclear Safety Commission revised the *Regulatory Guide for Reviewing Seismic Design of Nuclear Power Reactor Facilities*, adopting a more sophisticated method of plotting seismic motion on which seismic design is based, and broadening the scope of facilities to be treated with the highest level of importance. Following the government safety review of the Ohma Nuclear Power Station based on the revised Regulatory Guide, we obtained approval in April 2008 for nuclear reactor installation.

Measures Enabling Full MOX Use

The Ohma Nuclear Power Station, while having the same basic specifications as a conventional ABWR reactor, uses MOX fuel in all reactor cores. Supporting this use, necessary measures are taken in the equipment design so that sufficient safety can be assured. The main equipment design measures enabling full MOX use are as follows.

- Larger main steam relief safety valve capacity keeps reactor pressure from rising when an abnormal condition occurs.
- A new fuel inspection system is adopted that reduces the exposure of workers to radioactive materials when conducting incoming inspection of new MOX fuel.
- Some of the control rods adopted are of higher efficacy than conventional rods, raising their reactor shutdown capability.
- Capacity of the standby liquid control system has been increased, providing greater backup capability for reactor shutdown by control rods.

>>> Main specifications of facilities supporting full MOX use in the Ohma Nuclear Power Station



Our Quality Assurance Efforts

A quality assurance program is essential to the peace of mind and trust of the surrounding communities. We have established a quality assurance organization headed by the President, in accord with the Nuclear Quality Regulations, and implement quality assurance measures based on the Quality Policy for Nuclear Safety.

Quality Policy for Nuclear Safety

Basic Policy

With sincerity and pride underlying all our corporate activities, and with safety as our first priority, each of us shall be involved in quality assurance activities by making ourselves fully aware of our duties and roles, as well as their importance. In this way we will build the Ohma Nuclear Power Station as a facility worthy of the local community's trust and peace of mind.

Conduct Rules

1. We will perform high-quality design and construction work, giving top priority to assuring safety.
2. We will observe the requirements in laws and regulations, as well as the company's own rules.
3. We will strive for smooth communication with the surrounding communities, the national government, and other related institutions.
4. We will work continuously to improve the effectiveness of quality assurance activities.

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Information Disclosure

In building the Ohma Nuclear Power Station, keeping the public properly informed in timely fashion is an important part of earning the trust of surrounding communities.

- We use the Web to give updates on the construction progress, publish press releases and provide other information.
- We provide information to the news media at milestones in the project and other appropriate times.
- If an accident should occur, we are committed to properly informing the public through our website and media releases.
- We provide construction progress updates in our monthly PR magazine *New Pocket* available on our website.
- We offer tours to local residents who would like to see the construction progress for themselves.



J-POWER website, "Nuclear Power Generation Services"

web <http://www.jpower.co.jp/bs/field/gensiryoku/index.html>
(Japanese only)

COLUMN

Coexistence with Local Communities

Ohma Nuclear Power Construction Office

We at the Ohma Nuclear Power Construction Office are engaged in a variety of activities directed at residents of the surrounding communities, seeking to build understanding of the nuclear power station and gain their trust.

● Communicating

We issue a monthly PR magazine, *New Pocket*, for residents of surrounding communities, taking up local issues as well as providing information on progress in building the Ohma Nuclear Power Station. We also regularly host lectures on cultural themes, cinema showings, family events and other such activities.

● Supporting education aimed at the next generation

In cooperation with educational institutions, we offer science classes, stage presentations and other extracurricular activities as well as providing on-going assistance with science education.

● Participating in local events

We take advantage of every opportunity for daily contacts with people in the surrounding communities, such as by taking part in traditional festivals, arts preservation activities, and beautification and other events held by local municipalities and groups.



J-POWER Group employees take part in the Ohma Inari Shrine festival