

JAPAN NUCLEAR FUEL LIMITED

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Message from the President

Naohiro Masuda, President



At Rokkasho-mura in Aomori Prefecture blessed with a rich natural environment, Japan Nuclear Fuel Limited (JNFL) operates the Uranium Enrichment Plant, Low-Level Radioactive Waste Disposal Center, Vitrified Waste Storage Center, and Spent Fuel Receiving & Storage Facility with the understanding and cooperation of the people of the community, and we are moving forward with test operation of the Reprocessing Plant, which will recycle spent fuel no longer used at nuclear power plants, as well as construction of the MOX Fuel Fabrication Plant.

These facilities are currently undergoing reviews to verify their conformity

to Japan's new regulatory requirements, which were formulated taking into account lessons learned from the accidents at Tokyo Electric Power Company's Fukushima Daiichi Nuclear Power Station, knowledge available from other countries, and other information.

Moreover, during the active tests conducted at the Reprocessing Plant, through test operation of the vitrification facility and other facilities, we have surmounted a variety of difficulties and issues step-by-step and accumulated technology necessary for full-scale operation.

JNFL as an integral element supporting Japan's energy future will work together to complete the Reprocessing Plant, which will serve as a key component of the nuclear fuel cycle enabling us to fulfill our mission "to establish a nuclear fuel cycle and produce new energy for the future."

More than anything else, we are able to operate thanks to the trust that the people of the community have placed in us. We will always keep this in mind as we continue to advance our operations giving top priority to safety and never forgetting the gratitude to the people of the community who have supported the nuclear fuel cycle operation for so many years.



Nuclear power, carbon-free generation

Conventional electricity generation is one of the major sources of carbon dioxide emissions, the biggest factor of global warming. Transformation of our energy system to one that is clean and less dependent on coal and other fossil fuels effectively develops a solution to reduce carbon dioxide emissions. Nuclear power is considered an effective carbon mitigation option. Nuclear power can address the competing needs for carbon dioxide emissions reduction, economic development and energy supply.

It is an important energy strategy for the future of Japan, a nation with limited natural resources, to aim to ensure stable supply "Energy Security" with "Economic Efficiency" on the premise of "Safety", as well as to pursue "Environment" suitability, so called "3E+S". The strategic energy plan decided by the Japanese government in 2014 recognizes nuclear power as an important base-load power source, and the Japanese government promotes the nuclear fuel cycle.

Nuclear Fuel Cycle

What is the nuclear fuel cycle?

The series of activities associated with nuclear power generation is referred to collectively as the nuclear fuel cycle. Natural uranium for use in a nuclear reactor, goes through the steps of mining, refining, conversion, enrichment and fuel fabrication. These steps are called the "front end" of the nuclear fuel cycle. After uranium has been used in a reactor as fuel, the used fuel, also called spent fuel, may undergo further steps including reprocessing before wastes are disposed. These steps are known as the "back end" of the nuclear fuel cycle. If uranium and plutonium recovered through spent fuel reprocessing are reused at nuclear power plants, it is referred to as a "closed" nuclear fuel cycle.

JNFL is responsible for some parts of the nuclear fuel cycle, including Uranium Enrichment, High-Level Radioactive Waste Storage, Low-Level Radioactive Waste Disposal, Reprocessing, and MOX Fuel Fabrication of the nuclear fuel cycle.

Significance of the nuclear fuel cycle

A closed nuclear fuel cycle could provide Japan with a long-term solution to its energy strategy.

1. Production of a semi-domestic energy resource

It is extremely important for Japan, a resource poor country, to establish self-sufficiency in energy.

Although Japan produces a mere 6% of its energy domestically, and reprocessing spent fuel can produce MOX, a semi-domestic energy resource created from spent fuel.

About 96% of spent fuel is uranium and up to 1% is plutonium. These materials are valuable resources and both can be recycled as MOX fuel, saving 10 to 20% of the natural uranium in the nuclear fuel cycle with light water reactors.



Peaceful Use of Nuclear Energy

The Strategic Energy Plan decided by the Japanese government in 2014 stated the establishment of a nuclear fuel cycle and the effective use of uranium and plutonium as energy sources. Japan remains committed to the policy of not possessing reserves of plutonium of which use is undetermined on the premise of peaceful use of plutonium. Prime Minister Abe addressed at the Nuclear Security Summit in March 2014, "With regard to plutonium, we will firmly maintain our policy that we should possess no plutonium reserves without specified purposes. In order to effectively carry out this policy, we pay due consideration to the balance between the supply and demand of plutonium."

Japan utilizes nuclear energy for peaceful purposes through faithful implementation of the IAEA Safeguards.

Since receiving the "broader conclusion" by IAEA, the result of the absence of undeclared nuclear material and activities in the state in 2004, Integrated Safeguards have been applied to Japan under the Additional Protocol.

Plutonium Utilization with LWRs

("Pluthermal" Program)

Plutonium separated from spent fuel through reprocessing is recovered as MOX, oxide material mixed with uranium, in consideration of nuclear proliferation risks. After the step of fuel fabrication, MOX fuel is used at domestic nuclear power plants. It is planned to be fully consumed at 16 to 18 light water reactors under the plutonium utilization program in Japan.



Reprocessing

The Rokkasho Reprocessing Plant is the first commercial reprocessing plant in Japan. The Plutonium Uranium Reduction Extraction (PUREX) process introduced to this plant has proved high performance in Japan and abroad.

To reduce the proliferation risk, the Rokkasho Reprocessing Plant adopted the Plutonium-Uranium Co-extraction Technology that combines recovered uranium with separated plutonium before denitration. Through this process, plutonium is recovered as uranium-plutonium mixed oxide (MOX) at the end of the process, so that the plutonium is never recovered on its own.

The maximum capacity of the plant is 800 ton-U/year, enough to reprocess spent fuel produced from about 40 reactors at 1,000 MW class nuclear power plants.

	Facility Outline
Site	Rokkasho-mura, Aomori Prefecture
Capacity	800 ton-U/year
Completion of construction	The first half of the FY2022
Construction cost	About 2,193 billion yen









Central Control Room

Each operation unit of principle process is assembled in the central control room. Operations of the Reprocessing Plant are managed and monitored here, 24 hours a day.



Spent Fuel Storage Facility Spent fuel is stored at nuclear power stations and at the Rokkasho Reprocessing Plant for more than 4 years in total, during which its decay heat decreases to the level in which it can be reprocessed. JNFL's Spent Fuel Storage Facility has the total storage capacity of 3,000 ton-U for both BWR and PWR spent fuel.



Reprocessing flow

Safeguards at Rokkasho Reprocessing Plant

Strict safeguards have been applied to the Rokkasho Reprocessing Plant according to International Atomic Energy Agency (IAEA) and Nuclear Regulatory Authority's (NRA) Japan Safeguards Office (JSGO) to ensure producing fissionable material such as plutonium only for peaceful purposes. The advanced safeguards systems for the Rokkasho Reprocessing Plant, of which no other examples exist in the world, have been highly regarded by experts of safeguards. The approaches to safeguards at the Rokkasho Reprocessing Plant are as follows:

1. Automatic Verification Systems and Process Monitor-

ing Systems

The safeguards approach for the Rokkasho Reprocessing Plant requires a continuous inspection regime.

The Rokkasho Reprocessing Plant has been under constant surveillance by automatic verification systems⁽¹⁾ and process monitoring systems⁽²⁾ along the flow path of the nuclear materials in the whole process, including the nuclear waste treatment process. These systems ensure credible safeguards activities so that unusual operations such as the removal of nuclear materials from the process and anomalies do not occur. In addition, inspectors are stationed at the Rokkasho Reprocessing Plant while the plant is in operation to allow for continuous human surveillance.

2. Integrated Inspection Information System (I3S)

IAEA and JSGO have developed and introduced the Integrated Inspection Information System (I3S). The I3S collects inspection data from the system automatically to support evaluation of inspections and diagnosis of equipment.

3. Near-Real Time Material Accountancy (NRTA)

Near-Real Time Material Accountancy is implemented for timely detection as an advanced nuclear material accountancy technique. The application of NRTA for short-period sequence analysis provides for early indication of the diversion.

4. On-Site Laboratory (OSL)

IAEA and JSGO are jointly setting up their own OSL⁽³⁾ in the Rokkasho Reprocessing Plant. OSL provides timely analytical results incorporated with the Automatic Sampling Authentication System. It also allows IAEA and JSGO to identify questionable results.



(1) Automatic verification systems Plutonium Inventory Measurement System (PIMS)



(2) Process monitoring systems



(3) Analysis operation by IAEA at OSL

Nuclear Security Measures at Rokkasho Reprocessing Plant

The Rokkasho Reprocessing Plant has introduced strict security measures, taking into consideration the scheme of the security measures of the defence in depth^(note) concept in the international guideline INFCIRC 225/rev.5 by IAEA.

Note: Defence in depth describes a combination of multiple layers of systems and measures that have to be overcome or circumvented before nuclear security is compromised. (Source: IAEA Security Series)





- 1. Guarded Area
 - ID conformation of the person and vehicle by security guards
 - · Physical barriers with Surveillance Cameras, and Intrusion Sensor
- 2. Limited Access Area
 - ID conformation with inspection (article, vehicle)
 - · Physical barriers with Surveillance Cameras, and Intrusion Sensor (more than dual)
- 3. Ingress & Egress Control Building
 - Bio attestation
 - · Inspection by X- ray Machine and Metal Detector and so on
- 4. Protected Area
 - · Physical barriers with Surveillance Cameras, and Intrusion Sensor (more than dual)
- 5. Inner Area
 - · Bio attestation
 - · Inspection by Metal Detector, and Explosive Detector
- 6. Vital Area
 - Bio attestation
 - Inspection by Metal Detector, and Explosive Detector

JNFL is making every effort to strengthen nuclear security and reduce the continuing threat of nuclear terrorism including the following measures:

Two Person Rule Control System

From the insider threat viewpoint, Japan introduced the "two person rule". JNFL implemented the Two Person Rule Control System at the vital areas in our facilities.

Force on Force Exercise

Force on Force Exercise for nuclear facilities has been introduced in Japan since 2010. According to the NRA's requirement, JNFL is delivering those exercises in regular basis with the cooperation of police, and a "complete scenario-less exercise" is enforced as a mandatory requirement.

MOX Fuel Fabrication

The MOX Fuel Fabrication Plant is positioned as an important facility for plutonium recycling.

MOX fuel is manufactured from uranium plutonium mixed oxide produced by reprocessing. The capacity of the MOX Fuel Fabrication Plant is on a scale to match with the amount of MOX products that go through reprocessing at the Rokkasho Reprocessing Plant. In this way, all of the recovered plutonium will be surely consumed under the plutonium utilization program.

MOX fuel was first used in a thermal reactor in 1963. Since the 1980s, about 2,000 tons of MOX fuel has been fabricated and loaded into reactors (mostly PWR) for commercial use in Europe.

MOX fuel consists of about 7 to 9% plutonium mixed with reprocessed uranium, assuming that the plutonium has about two thirds fissile isotopes. Energy of MOX fuel is equivalent to 4% U-235 enriched uranium oxide fuel. The plutonium content of MOX fuel produced in JNFL's MOX Fuel Fabrication Plant varies from around 4 to 10% depending on the design of the fuel.

The MOX Fuel Fabrication Plant properly maintains necessary measures for Safety, Safeguards and Security.

	Facility Outline
Site	Rokkasho-mura, Aomori Prefecture
Capacity	130 ton HM/year
Completion of construction	The first half of the FY2024
Construction cost	About 390 billion yen





MOX Fuel Fabrication Plant (image)



Interim Storage for Returned Vitrified Waste from France and UK

Since 1969, Japanese nuclear power plants generated about 25,000 tons of spent fuel. Ten Japanese electric utilities signed reprocessing contracts with the French company COGEMA (now AREVA NC) and the British company BNFL (now held by the government's Nuclear Decommissioning Authority). One third of Japanese spent fuel was reprocessed in La Hague Plant, France, and Sellafield Plant, UK. The contracts lay down that conditioned final residues are to be returned to the country of origin, and about 2,200 vitrified wastes are transported to Japan from France and the UK. They belong to the ten Japanese electric utilities that are responsible for the safe storage and disposal of the wastes.



Returned wastes are stored in the interim storage facility owned by JNFL for 30-50 years prior to final disposal.

	Facility Outline
Site	Rokkasho-mura, Aomori Prefecture
Capacity	2,880 canisters of vitrified waste
Beginning of operation	April, 1995
Construction cost	About 125 billion yen



Vitrified Waste Storage Center





A transportation cask for vitrified waste canister





Remote inspection room for vitrified waste canister

Top part of the storage area

8

Vitrified waste canister



If the spent fuel is later reprocessed, leaving only 3% as high-level radioactive waste.

High level waste in solution is confined within glass, solidifying within a stainless vitrified waste canister. It contains approximately 400kg of glass.

The vitrified waste canisters are transported in a specific cask designed to ensure the safety of the transport, which weighs around 100 tonnes, is 6.6 meters long and 2.4 meters in diameter.

The ships have been specially designed and are only used for the transport of nuclear materials. The casks and ships used, as well as the organisation of the transport meet the safety requirements of the applicable international and national regulations.



Final disposal

In Japan, it has been decided that the high-level radioactive waste (vitrified waste) will be disposed of in stable host rock formation more than 300 meters underground. A multi-barrier system consisting of engineered and natural (geological) barriers will isolate from the environment and contain the radioactive waste over the long timescales. The Japanese government planned to initiate operation of a final disposal facility for high-level radioactive waste in the late 2030's and established the Nuclear Waste Management Organization of Japan (NUMO) as an entity for disposing of authorized by the Final Disposal Act.





Low-Level Radioactive Waste Disposal

In Japan, low-level radioactive waste (LLW) is classified into four categories (L1, L2, L3 and TRU waste) according to radioactivity concentration and its origin. Radioactive waste disposal is performed in phases by entities responsible for each category of waste.

JNFL accepts L2 type of LLW that is generated through operating domestic nuclear power plants which are owned by electric utility companies containing small amounts of mostly short-lived radioactivity, such as cobalt-60 (Half-life is about 5 years). Each category of LLW has a different disposal concept ^(See Diagram 1). L2 type waste is disposed of in a concrete pit at the depth of ten meters or more at the JNFL site ^(See Diagram 2).

JNFL has been approved the operation of the disposal facilities with a total capacity of $80,000 \text{ m}^3$ (400,000 of 200-liter waste drums).



Low-Level Radioactive Waste Disposal

	Facility Outline
Site	Rokkasho-mura, Aomori Prefecture
Capacity	Authorized capacity : 80,000 \vec{m}^3 (equivalent to 400,000 of 200-liter waste drums); planned to be expanded to 600,000 \vec{m}^3 (equivalent to 3 million of 200-liter waste drums)
Beginning of operation	December, 1992
Construction cost	About 160 billion yen *Construction cost for a capacity of 200,000 m ² (equivalent to 1 million 200-liter waste drums)

Low-Level Radioactive Waste Disposal Center

Diagram 1. Disposal concept for radioactive waste in Japan



This is made from "Graphical Flip-chart of Nuclear & Energy Related Topics 2014" by the Federation of Electric Power Companies of Japan.





Transportation

Waste packages that have passed inspection are then transported to the Low-Level Radioactive Waste Disposal Center by ship and truck.

Inspection

Final inspection is made after receiving the waste packages.

Stacking Drums

Waste packages are stacked inside the disposal facility.

Filling with Mortar

Mortar is poured in the spaces between the waste packages.

It is further enforded by porous concrete to drain in case water percoaltes.

Covering with Concrete

A reinforced-concrete lid is placed atop the disposal facility, resembling a monolithic rock.

Covering with Soil

The concrete pit is covered with the impervious layer of bentonitemixed soil and earth covering is conducted up to the ground level in a final process.





Mutsuogawara Port















Even if the rainwater percolates into the Disposal Facility, the structure is designed to release the water through porous concrete layer.

Uranium Enrichment

Natural uranium consists primarily of U-235 and U-238. When neutrons collide with U-235, it emits huge amounts of energy through a fission reaction, whereas U-238 is less fissile than U-235. Since natural uranium are contains only approximately 0.7% of U-235, isotope separation (uranium enrichment) is needed to increase its content to 3 to 5% to be used as fuel for light water reactors.

JNFL is the only licensee of uranium enrichment in Japan, and there are plans for the Uranium Enrichment Plant to provide for an ultimate capacity of 1,500 ton-SWU/year, enough to meet about one third of the needs of domestic nuclear power plants.

	Facility Outline
Site	Rokkasho-mura, Aomori Prefecture
Capacity	Authorized capacity : 1,050 ton-SWU/year
Beginning of operation	March, 1992
Construction cost	About 250 billion yen





Uranium Enrichment Plant



Domestic technology developed in Japan

Feeding a gaseous uranium compound, uranium hexafluoride, into a rapidly spinning rotor of a centrifuge separates U-235 and U-238. The heavier isotope, U-238 is pushed outward, while U-235, the lighter isotope, gathers at the center of the rotor. Gas with the higher U-235 concentration is drawn off and sent to another centrifuge. Repeating this process several times produces uranium with increase U-235 content. Using this method, JNFL developed an advanced centrifuge with high efficiency and safety, based on the Japan Atomic Energy Agency's technology.





Central Control Room of Uranium Enrichment Plant



Feed and Withdrawal Room

Homogenization Room

Uranium enrichment process





Cascade room where centrifuges, linked with each other, are placed

Cascade

Since a single centrifuge can only increase the enrichment by a slight degree, the process must be repeated by many centrifuges to attain the level of enrichment required for light water reactors. A series of centrifuges-a "Cascade"-is thus linked to produce the necessary level of enrichment.

The maximum enrichment level of uranium 235 at JNFL's Uranium Enrichment Plant is limited to 5%.

Ensuring safety

Nuclear facilities approach their design and operation so as to prevent the occurrence of abnormalities and their expansion, and mitigate the development into an accident. JNFL facilities have adopted the following measures based on this "Defence in depth" philosophy:

- 1. To prevent occurrence abnormalities:
 - Safety designs to prevent criticality, fire, explosion, and leaking.
 - Perform to a safety-side through fail-safe systems.
- 2. To prevent expansion abnormalities:
 - Monitoring systems to detect abnormalities.
 - Automatic stop systems, so called interlock systems, to control abnormalities.
- 3. To mitigate consequence of accidents:
 - Physical barriers with thick concrete cell to contain radioactive material and the air pressure control to prevent leaking radioactive materials out.
 - Internal air is released after filtering radioactive materials out as much as possible.



Example of safety measures based on the defence in depth philosophy at the Rokkasho Reprocessing Plant

Consideration of Fukushima

Initiatives for improving the facilities' safety and reliability

Various initiatives were taken for the improvement of safety through the design and construction of our facilities.

Conventional Consideration of the Chuetsu-Oki Earthquake in July 16, 2007

Safety Design

the Daiichi Nuclear Power Station accident due to the East Japan Great Earthquake in March 11, 2011 Compliance with New Regulatory Requirements (Enforced in December, 2013) Reliability

Making continuous efforts to improve safety

In addition to previous safety initiatives, JNFL has strengthened safety measures to achieve compliance with the New Regulatory Requirements.



Example of safety measures at JNFL facilities (In the case of the Rokkasho Reprocessing Plant)

Securing power supply

Important safety functions of each facility need to be maintained in the event of station blackout. For this reason, dual or even triple systems are adopted as a backup power supply.

- The reprocessing plant receives power from the electric power company via three transmission lines along two routes.
- **2** Emergency diesel generators
- **3** Power supply trucks

Maintaining the cooling functions

In order to maintain important functions such as cooling functions for spent fuel and high-level radioactive liquid waste in the case of the Reprocessing Plant, JNFL has a system in place to always secure necessary water and equipment. It has also been confirmed that water can be drawn from the nearby Obuchi Marsh.

- 4 Water tanks
- **5** Fire engines
- 6 Portable pumps
- 7 Large-scale pumps

Preparing for earthquakes

According to strict assessment conducted in line with the New Regulatory Requirements, JNFL believes that our facilities have a sufficient level of seismic safety that can withstand the maximum anticipated earthquake.

8 Estimating the maximum level of seismic ground motions

Taking into account various earthquakes that could affect the facility, the standards of maximum ground motion (design-basis ground motion) were raised from the precious levels and additional seismic reinforcement measures were taken so that the facility is capable of withstanding stronger tremors.

9 Geological surveys

Trench surveys, off-shore sonic prospecting and other geological surveys are conducted around the plant site to further expand the scope of geological data available.

Environmental Monitoring

The gas and liquid radioactive waste generated in nuclear fuel cycle facilities is discharged after ensuring that is emissions are sufficiently safe.

To ensure the environmental safety of the surrounding area, JNFL has performed environmental monitoring since before the construction of the Rokkasho nuclear fuel cycle facilities.

The level of radioactivity in the surrounding environment and the concentration of radioactivity in the air, as well as collected samples of soil, agricultural produce, and river and sea water are analyzed at the Environmental Radioactivity Monitoring Center.



Environmental Radioactivity Monitoring Center



Assessing the impact of radioactive materials

The impact of radioactive materials discharged from the Rokkasho Reprocessing Plant was calculated to be approximately 0.022mSv/year based on the assumption that the maximum amount of spent fuel capable of being processed (800 ton-U/year) is processed. A government safety inspection has confirmed that this level of discharge falls far below the dose limit for the general public (1mSv/year).

This calculation is also based on a hypothetical person receiving radiation from all the pathways, such as inhalation, consumption of livestock and marine products, and engagement in fishing activities.





Sampling work

*1: Radiation injury is given as 1 mSv effective dose equivalent where each body part is equally affected by a 1 mGy full-body absorbed dose of gamma-ray radiation. *2: Natural radioactive material in the air *3: Radiation level that is sufficiently lower than the level of radiation in nature and there is no need to be treated as radioactive material for safety

reasons 4: The dose for people working at a power plant or other nuclear facility must not exceed 50 mSv during one year or 100 mSv over five years. 5: In April 2016, the dose limit for workers handling radiation in an emergency during the time when they are engaged in emergency work was raised to 250 mSv pursuant to revision of the Ordinance on Prevention of lonizing Radiation Hazards and other controls.

Radiation in one's daily lives

Everyone comes in contact with radioactive materials on a daily basis because it exists naturally in the environment. We are subjected to a world average of approximately 2.4mSv/year through daily activities such as breathing and consumption of food.

JNFL's Mission

Our mission is to establish a nuclear fuel cycle and produce new energy for the future.

Japan depends on imports for almost all of its energy resources. Therefore, securing domestic energy resources by promoting the use of alternative energy resources is very important for Japan, and it is necessary to proceed in a way to keep a good balance with economic efficiency to realize a stable energy supply in the future. Both nuclear generation and its supporting nuclear fuel cycle are necessary to achieve this task.

As a licensee of nuclear fuel cycle businesses including Reprocessing, MOX Fuel Fabrication, Vitrified Waste Storage, Low-Level Radioactive Waste Disposal and Uranium Enrichment, we are committed to the safe operation of our facilities, achieving nuclear nonproliferation. We must fulfill the peaceful use of nuclear energy and make proactive contributions to this field by sharing our experiences.

JNFL's Corporate Values

We strive to greatly value people who work together and people in the community and to challenge cutting-edge technologies from around the world in order to build up a global foothold in the nuclear industry at Rokkasho-mura.

JNFL values its employees and their families to promote our businesses. We are aiming to develop an attractive working environment where we work under healthy conditions to establish a nuclear fuel cycle. To achieve this purpose, we must help and respect each other.

We have been supported by the understanding and cooperation of the community over the years, during the construction of the nuclear fuel cycle facilities at Rokkasho-mura. We are grateful for people from the community and promise them to make our best efforts in order to build a trusting relationship between JNFL and the community, which is the closest stakeholder. On this account, we operate our facilities giving the top priority to safety. We believe this will contribute to the development of the community as well as the improvement of the quality of life in the community.

It is necessary to maintain technical skills and abilities to respond properly at operation fields for the stable operation of our nuclear fuel cycle facilities. We continue to foster human resources and upgrade our technical skills, challenging to achieve the world's top level of nuclear fuel cycle technologies. We are eager for Rokkasho-mura to be well- known globally as a significant base of the nuclear fuel cycle, which can help in the development of society.

Japan Nuclear Fuel Limited (JNFL)		
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Aomori Office	To-o Nippo Shinmachi Building, 2-2-11 Shinmachi, Aomori City, Aomori Prefecture	
Tokyo Office	Hibiya Kokusai Building, 2-2-3 Uchisaiwai-cho, Chiyoda-ku, Tokyo	
Established	July 1, 1992	
Capital Stock	400 billion Yen	
Shareholders	10 domestic electric power companies and other domestic companies	
Customers	10 domestic electric power companies	
Affiliated Companies	Aomori GENNEN Technology Center, J-Tech, Japan Nuclear Fuel Chemical Analysis co., Ltd. (J-Cal), Nippon Composite Materials co., Ltd. (NCM)	



The bird of Aomori Prefecture, the Swan



The flower of Rokkasho-mura, the Orange-yellow Day Lily



The specialty of Aomori Prefecture, the Apple

JAPAN NUCLEAR FUEL LIMITED

Website

www.jnfl.co.jp/english/



This is JNFL's corporate symbol which symbolizes our development in harmony with society. The horizontal infinity mark symbolizes growing young leaves and the nuclear fuel cycle; the green vertical ovals symbolizes the developing community; and the central blue oval symbolizes communication between the company and the community.