December 21st, 2017

The 24th N-20 Joint Statement

The group N-20, consisting of representatives and experts of the nuclear industry, research field as well as the government of Japan and France, held its 24th meeting in Tokyo on December 21st, 2017. During the meeting, experts from both countries exchanged information and opinion on the following topics:

1. National nuclear Energy Policy
2. Light Water Reactor general issues
3. Fleet Long-term Operation
4. Dismantling and Decommissioning Programs
5. Fukushima Issues
6. Fuel Cycle/ Waste Issues
7. R&D/ Future Systems

The participants discussed about several issues, and selected key points are highlighted as follows:

I/ National nuclear Energy Policy

Japan introduced its Basic Policy for Nuclear Energy and the White Paper on Nuclear Energy 2016 with an emphasis on providing the public with easy-to-understand information regarding nuclear energy policies. The process of reviewing the Strategic Energy Plan in 2014 was also explained. The discussion to realize the goal toward 2030 is already underway in the Strategic Policy Committee while a Round Table for Studying Energy Situation was newly established to achieve the goal of Paris agreement toward 2050.

In regard to the Energy Transition for Green Growth Law published in 2015, France detailed a thorough investigation of its energy policy with a view to prepare the next Multi-annual Energy Plan (MEP) to be adopted by 2018. One objective of the act is to reach 50% of nuclear in the electricity mix by 2025, but this would have a negative impact on GHG emission and security of supply. A more balanced approach to reduce the share of nuclear energy in the mix seems to be a better solution.

Both countries recognize the importance of nuclear energy and value its use in the energy mix to secure stable supply and reduce GHG emissions.

II/ LWR general issues

While the nuclear industry is still in a difficult situation, we think that it will keep playing a certain role as a realistic option of electricity source, from the view of energy security, economic efficiency

and environment as long as we have electrical power demand at a certain level and no efficient available storage. Actually it is forecasted by each organization concerned that the world nuclear share in the energy mix will remain at a stable level.

Restructuring of the nuclear industry is in the final stage in France. Now, nuclear industry in France will be streamlined, and it is expected to provide major benefits. EDF is already leading the promotion of domestic and international reactor projects. Also, EDF promotes international projects in cooperation with Japan.

Successful restart of NPPs is indeed important in Japan. NRA review for restart is steadily progressing. On the other hand, with lawsuits against NPPs spreading across the country, it is important to thoroughly explain to the court, and proceed with the review by winning public acceptance

For both France and Japan, it is the responsibility of the nuclear industry to carry out its role in improving technology and continuously achieving a high safety level.

III/ Fleet Long-term Operation

Japan emphasized that plant operations exceeding 40 years are essential to a certain extent to accomplish the goal of 20-22% nuclear power share in 2030. The challenges are huge investments for safety measures to comply with the New Regulatory Requirements and a long period of time for licensing and construction work etc. The target is to exclude review and construction period from the calculation of the operating period to ensure a longer investment recovery period. In order to achieve the societyôs trust for operations exceeding 40 years, it is hoped that many more plants will accomplish operations exceeding 40 years.

France explained that Grand Carenage and the LTO programme are closely interlinked: Grand Carenage is an industrial programme that seeks to extend the service life of EDF's nuclear fleet with continuously enhanced safety standards, whilst seeking alignment with the "energy transition" promoted by the French authorities. It comprises two constituent parts: a technical component and a managerial component that seek to change the way the licensee, the engineering staff and industry contractors interact. The fourth periodic safety review of the 900-MWe reactor fleet seeks to align the safety objectives of these reactors as closely as possible with those of generation-3 reactors. These activities are incorporated into the Grand Carenage programme, which seeks to ensure that they are properly implemented on the stations.

Both parties value the importance of long term operation. Exchanges regarding technical aspects and acceptance should be deepened.

IV/ Dismantling and Decommissioning Programs

Both France and Japan introduced respective effort for Dismantling & Decommissioning, which is one of the most important challenges for nuclear industry, based on accumulated know-how

and experience.

First, the Japan Atomic Power Company picked up nuclear reactors under decommissioning and preparation for decommissioning in Japan, including work schedule. As for practical examples, the case of D&D for the Research Reactor and Dismantling status for commercial reactor, Tokai 1, were expressed.

Next, the following four conditions for efficient proceeding of D&D were mentioned:

1. Organization & Staff with culture & Mindset suitable for D&D Project
2. Securing Paths for Spent Fuel and LLW
3. Adequate D&D Cost and Accounting System
4. Reasonable D&D regulation and operation

It is pointed out that smoothly securing the above elements is key for the success of D&D Business. To achieve this goal, the Japan Atomic Power Company is working very hard.

On the French side, EDF and New AREVA Holding, major players of nuclear industry, already turn their efforts to D&D of their own permanently shutdown nuclear facilities. At the same time, their professional approach is valued in international projects, such as US, Germany and UK.

It was expressed ñé managing the complexity and gathering experience is the keyò in their presentation. EDF, as a utility company, and New AREVA Holding, a fuel cycle business entity, is quite unique combination from global context. Also it is stressed that they can combine successful and distinctive experiences from France, as well as from abroad.

France and Japan have been accumulating lessons learned from their past D&D experience. The capitalized know-how and expertise would be precious assets. One of the most important points of D&D Business is how to achieve the most efficient maneuver. We need the full utilization of such assets.

V/ Fukushima Issues

In regard to restoration of the Fukushima Daiichi accident, TEPCO expressed sincere appreciation for the bilateral cooperation between France and Japan.

TEPCO presented that the proceeding with decommissioning work steadily in a stable manner for Fukushima Revitalization. Japan as a whole will work together in the long term for Fukushima Revitalization.

And TEPCO also said it will continue to share information learned with global nuclear industry in the hope of contributing to safety operation of nuclear fleet in the world

CEA presented the prospective technology for Fukushima fuel debris retrieval and evaluated the technology that could be effective later.

In an effort toward unsolved Fukushima issues, both parties were able to mutually confirm that frequent information exchanges and cooperation will be continued in the future.

VI/ Fuel Cycle/ Waste Issues

Taking advantage of the long running experience of its industrial platform (La Hague and Melox), AREVA implements a strong continuous improvement program to strengthen its industrial excellence. The gain of reliability is the foundation to develop flexible, fitted to need services, allowing to extend the industrial capability of the 2 plants, through flexible offers and fitted to purpose adaptation of the plants. The most recent example is the project called TCP, a new head end able to treat ñspecial fuelsò.

JNFL explained the current status of its Rokkasho Nuclear Fuel Cycle Plants. JNFL finds it very difficult to start operation of the reprocessing plant currently scheduled for FY2018. JNFL explained the progress of safety review of reprocessing plant and MOX fabrication plant, and safety review on severe accidents and design standards have been almost finished.

Regarding the conformance to new regulatory requirements, detailed design of RRP and MOX fuel fabrication is expected to get approval by NRA. Detailed design of MOX fuel fabrication plant is currently being implemented by JNFL. Finally, JNFL reported the problem of maintenance system that oil feed pipe to emergency DG had not been maintained for a long time at the reprocessing plant.

VII/ R&D/ Future Systems

France presented the current status of ASTRID program, including its fuel cycle, and the summary of the related cooperation with JAEA, MHI and MFBR in the framework of the 2014 agreement. ASTRID was introduced as a technological reactor for Gen IV demonstration of the relevancy and performances of innovations in the fields of safety and operability. Numerous industrial partners from France (EDF, AREVA, Bouyguesé), Europe and the world (GE, Toshiba) are participating in the program, which is led by CEA in the framework of an agreement with the French State covering design studies until a basic design stage. Focuses have been made on recent results of the qualification program, and on the roadmap on experimental facilities that will be useful to support the ASTRID qualification program.

Another focus was made on some important facilities, under construction or at a project stage:

- The JHR is now at an advanced stage of building, with civil works being finished. CEA in cooperation with consortium members is preparing the first experiments to be conducted in JHR, in different fields: fuel, material, and technology for experimental devices. JHR is also at the center of the IAEA ICERR label.
- Nuclear Energy Division launched a major optimization work for the project of critical mock-up Zephyr, which is due to replace Eole / Minerve, and also for the MOSAIC project, a new hot laboratory that is supposed to replace LECA in Cadarache, in order to provide up to date capabilities in PIE for fuel and material studies, linked with the JHR programs.
- Another important facility will be Plinius 2, the future platform for prototypic corium

experimental R&D, both for Gen IV (sodium corium interaction) and Gen II-III (corium water interaction), with capacity to handle hundreds of kg of prototypic corium for experiments.

Japan explained the JAEAôs R&D status. Japanese government decided to abandon the restart of Monju in Dec. 2016, considering the excessive cost to conform to new regulatory standards after the 1F accident. JAEA submitted the application for approval of decommissioning plan of Monju in Dec. 2017. But Japan will adhere to implementing R&Ds for the fast reactor to promote nuclear fuel cycle according to ñStrategic Energy Planò. The strategy roadmap to develop the fast reactor will be formulated in 2018.

Current status and next step of ASTRID collaboration was also presented. France and Japan will make their best efforts to conclude the discussion by the end of 2018 at the latest in order to initiate a new phase of cooperation.

VIII/ Conclusion

Both parties acknowledged that this 2017 edition of the N20 meeting was fruitful, and allowed as usual candid and deep discussion about issues at hand for Japanese and French nuclear executives, and look forward to gathering again in 2018 in France, at a date to be mutually agreed. Both parties underline that the new N20 meeting organization implemented this year is more efficient.