Japan

Kiyoshi Yamauchi, ANS Japan Local Section and IC member, sent the following report from Japan, which I have edited:

1. Energy Policy and Activities of Ministry of Economy, Trade and Industry (METI)

The current "Energy Basic Plan", approved by the Cabinet on April 11, 2014, emphasized that nuclear energy would be one of the important base load power and the desirable "power best mix" in 2,030 as electric power base. METI decided, in July 2015, that nuclear should be reduced down to 20-22 % from 30 % before "the Great earthquake disaster" in 2011. The "Round Table for Studying Energy Situations" was established by MITI in August 2017, aiming to hold discussion on future directions of long-term energy policies based on the forecast for the circumstances surrounding energy in 2050. This Round Table made a suggestion in April 2018 that renewable energy should be pursued to be a major electric-power source as non-carbon and every optional power source for non-carbon also should be pursued. Concerning nuclear, whereas it is recognized as a non-carbon option, dependency should be reduced and social reliability should be regained and technology development and resource enforcement should be pursued. The Energy Basic Plan is expected to be revised in this summer.

2. Nuclear Regulation

Nuclear Regulatory Authority

Chairman Toyoshi Fuketa, was assigned on September 22, 2017, for a 5-year term.

Fracture-Zone Issue

Fracture-zone issues at Tsuruga-site, Higashidori-site and Shika-site, which were judged as active faults by the Sub-Committee, have been under discussion in the plant re-start application review and final decision has not been made.

Monju (Prototype FBR) Issue

Based on the Government decision to decommission the Monju reactor, whereas the promotion of fuel cycle and development of fast reactors be pursued, on Dec.21, 2016, JAEA applied the decommissioning plan to the NRA in December 2017 and the NRA approved this plan on March 28, 2018. The whole project is expected to take around 30 years and fuel removal from the core will be started this summer.

Review of Current Inspection System

Nuclear Reactor Regulation Law was revised to incorporate the concept of "Reactor Oversight Process (ROP)" and was issued on April 14, 2017. Total enforcement is expected

in April 2020 and trial operation is expected in October 2018. Discussion on making detailed rules has been started and detailed rules and guides for trial use will be issued before the start of the trial use.

3. Status of LWRs Restart & Plant Life Extension

Applications of restart for NRA review on conformity with new safety regulation, enforced in July 2013, were started. Applications as of April 2018 are still 26 reactors at 16 sites (16 PWR, 4ABWR, 6 BWR).

Most recently, 2 ABWRs, Kashiwazaki-Kariwa 6&7 granted approval of restart in December 2017 and total number of approved plants are 13, namely 11 PWRs and 2 ABWRs. Kashiwazaki-Kariwa 6&7 are the first plants approved as BWRs. 2 PWRs, namely Ohi 3 and Genkai 3, were just restarted in March 2018. Consequently, 7 plants among 13 have already been restarted.

Concerning the NRA review of installation plan of Special Mitigating Means for Specific Major Events such as airplane crash, Takahama 3&4 and Sendai 1&2 already granted approval, and Ikata 3 will grant approval soon.

After plant life extension approval was granted for Takahama 1&2 and Mihama-3, JAPC applied for Tokai unit-2 in November 2017.

Applicant	NPP	Туре	Comme rcial Operati on	Application
Hokkaido	Tomari 1	PWR	1989	July, 2013
	Tomari 2	PWR	1991	
	Tomari 3	PWR	2009	
Kansai	Ohi 3	PWR	1991	Restarted (March, 2018)
	Ohi 4	PWR	1993	Approval Obtained (May 2017)
	Mihama 3	PWR	1976	Approval Obtained (November ,2016) (Life Extension Approved, November 2016)
	Takahama1	PWR	1974	Approval Obtained
	Takahama2	PWR	1975	(June ,2016) (Life Extension Approved, June 2016)
	Takahama 3	PWR	1985	Restarted (July, 2017)
	Takahama 4	PWR	1985	Restarted (June 2017)
Shikoku	Ikata 3	PWR	1994	Restarted (September, 2016)
Kyushu	Sendai 1	PWR	1984	Restarted (September, 2015)
	Sendai 2	PWR	1985	Restarted (November, 2015)

	Genkai 3	PWR	1994	Restarted (March, 2018)
	Genkai 4	PWR	1997	Approval Obtained
				(January, 2017)
Tokyo	Kashiwazaki-	ABWR	1996	Approval Obtained
-	Kariwa 6			(December, 2017)
	Kashiwazaki-	ABWR	1997	
	Kariwa 7			
Chugoku	Shimane 2	BWR	1989	December, 2013
Tohoku	Onagawa 2	BWR	1995	December, 2013
	Higashidori 1	BWR	2005	June, 2014
Chubu	Hamaoka 3	BWR	1987	June, 2015
	Hamaoka 4	BWR	1993	February, 2014
Hokuriku	Shika 2	ABWR	2006	August, 2014
JAPC	Tokai 2	BWR	1978	May, 2014
	Tsuruga 2	PWR	1987	November, 2015
EPDC	Ohma (Full	ABWR	Not yet	December, 2014
	Mox)			

* Although Ikata Unit 3 was restarted in September 2016, the Hiroshima High Court issued the provisional injunction to prohibit the restart on December 13, 2017, cancelling the decision of the Hiroshima District Court, which rejected the injunction request by anti-nuclear group. Consequently, Ikata Unit-3 cannot continue to be operated.

4. Activities of Atomic Energy Society of Japan (AESJ) (http://www.aesj.or.jp/en/)

ANS and Atomic Energy Society of Japan (AESJ) have established a bilateral agreement in 1999 to provide a mutual cooperation and since then AESJ is one of the so-called sister-societies" of ANS.

(1) Annual Conference

2018 Spring Annual Meeting was held at Osaka University, on March 26-28, 2018, where many special plenaries and sessions, such as restart of nuclear plants regarding post-Fukushima, experimental training and utilization of research nuclear reactors, and so on were organized and implemented successfully under cooperation with the Local Section of AESJ and a local organizing committee. Also, the presentation ceremonies for AESJ Awards, Excellent Student Awards, and recognition of long-term members were conducted as well. More than 1,400 people attended, including many students.







(2) Fukushima Daiichi Accident Related Activity

"Fukushima Decommissioning Committee" of AESJ continues a scientific advice activity for the decommissioning of the Fukushima Daiichi plant and a follow-up activity suggested in "AESJ Fukushima Daiichi Nuclear Accident Report". This Committee held a symposium on Fukushima Daiichi Decommissining on March 18, 2018 in Tokyo on what the current subjects or problems to face with and what or how AESJ could cope with.

The current subjects or problems pointed out are absence of the following:

- Total project management and suitable operation scheme
- Milestones with key date and responsibility
- · Safety target and risk evaluation of whole decommissioning activities
- Criteria and evaluation method of building structures integrity, experienced of
- earthquake loads, tsunami flooding, salt damage in long term duration.
- Back cast study from the end state options

ASEJ strongly stated that they would like to proceed activities to cope with these.

7. Activities of ANS Japan Section (http://aesj.or.jp/kaigai/en/index.html)

ANS Japan Section is managed by the International Nuclear Information Network ININ) of the Atomic Energy Society of Japan (AESJ). The members are about 180, and among them the number of ANS national members are about 20. There are ten officers in the Executive Committee.

Major activities in 2017 are as follows:

(1) Semi-annual Members General Meeting was held twice in Spring and Autumn at the AESJ semi-annual conferences, at Sapporo city and Osaka city, respectively.

(2) Executive Committee Meeting was held five times per year.

(3) Workshops by the invited speakers were held four times.

"Nuclear Knowledge Management, Challenges and Opportunities", by Mr.
Huang Wei, Director, Division of Planning, Information and knowledge
Management in Department of Nuclear Energy(NEPIK), IAEA, on July 18, 2017

• "Current Energy Policy in the United States and Nuclear Power", by Mr. Ross Matzkin-Bridger, Director, Department of Energy (DOE) Japan Office, on September 14, 2017

• "International Cooperation on the Nuclear Infrastructure Development toward New Nuclear Power Countries" by Mr. Akio Toba, Director, JAIF International Cooperation Center (JICC), on December 8, 2018

• "World Trends in Electric Power Market and Nuclear Power", by Mr. Yuji Kuroda, Senior Researcher, Japan Electric Power Information Center, Inc. (JEPIC), on March 27, 2018.

(4) Communication opportunities to the section members through e-mail, Web and annual Newsletter have been utilized.

(5) This year, we continued a plan to invite the President of ANS to the Japan Local Section and AESJ, where original invitation plan was jointly developed with the ANS Taiwan section in 2016. But unfortunately, schedule did not match to realize it. We continue to make efforts to realize a plan to welcome a visit of the ANS President to Japan at the next opportunity.

The officers for the ININ of AESJ, as well as ANS Local section 2018, were voted in in March 2018. Mr. Yukio Tachibana of the Japan Atomic Energy Agency (JAEA) becomes the new Chair of the Executive Committee from April 2018 to March 2019, and started activities for 2018.

8. Recent Status of Fukushima Daiichi NPP Restoration

(1) Road Map and Technical Strategic Plan

"The Intermediate and Long Term Road Map for Fukushima Decommissioning and Contaminated Water Removal", originally issued in December 2011, has been revised every other year and the latest revision was issued in September 2017, reflecting recent finding and activities, especially the decision of debris removal approach as "access from the lateral direction in the air". "The Technical Strategic Plan", originally issued in April 2015 by NDF, has been revised every year and the latest revision was issued in August 2017. (2) Means for Contaminated Water Treatment

Contaminated water has been generated due to underground water flow into the reactor building where fuel debris exists. Total efforts of extracting underground water, installation of water shielding wall at the sea side and starting of partial freezing operation of water shielding wall at the mountain side has been effective to reduce the amount of contaminated water in the reactor building.

(3) Fuel Removal from Spent Fuel Pit

As for Unit 1, the work to install the new cover of reactor building for spent-fuel removal has been started.

(4) Investigation inside the containment vessel (PCV)

Investigation by camera inside the PCV of Unit 2 and Unit 1 were conducted in February 2017 and in March 2017 respectively. These were the first trials of taking pictures by camera inside the PCV. Investigation by underwater camera inside the PCV of Unit 3 was conducted in July 2017. This was the first trial of taking pictures of the lower head of reactor vessel. Multiple structures were destroyed and some of the support bracket were lost. Concerning Unit 2, investigation by movie camera was conducted in this January 2018. This information could be important to investigate the detailed method to take out the fuel debris.

(5) Research and Development

"International Research Institute for Nuclear Decommissioning" (IRID) together with reactor vendors and Japan Atomic Energy Association (JAEA) has been continuing to work for R&D of decommissioning of Fukushima Daiichi using the METI fund in accordance with the Road Map and Technical Strategic Plan already issued. Major areas are as follows;

• Investigation technology inside PCV and RPV including development of devices and access route

• Monitoring inside PCV and RPV to investigate the spread of fuel debris

• Technology and engineering method of fuel debris removal including device development

• Study of possibility of occurrence of re-criticality and recommendation how to avoid this during debris removal

• Integrity of structures such as reactor building and reactor support structures (pedestal), and so on.