[Reference]

Future Utilization of Fukushima Daiichi NPS Units 5 and 6

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Future utilization of Units 5 and 6

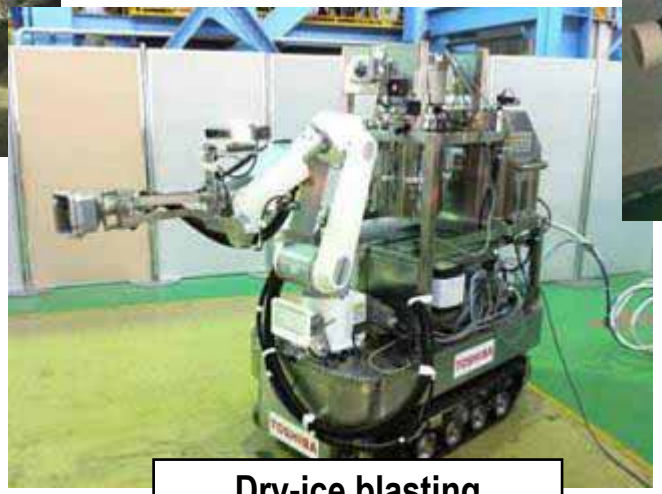
- In the Mid-and-long-term Roadmap, we describe out plan to conduct research and development for: remote decontamination devices for use inside reactor buildings; investigation of the inside of primary containment vessels; and equipment to remove fuel debris.
- Fukushima Daiichi NPS Units 5 and 6 are now being considered for use as full-size mock up testing (actual equipment verification testing) facilities. In this regard, we will be advised by research institutions, including International Research Institute for Nuclear Decommissioning (IRID), and manufacturers.

Remote decontamination devices for use inside reactor buildings (FYs 2013 and 2014)

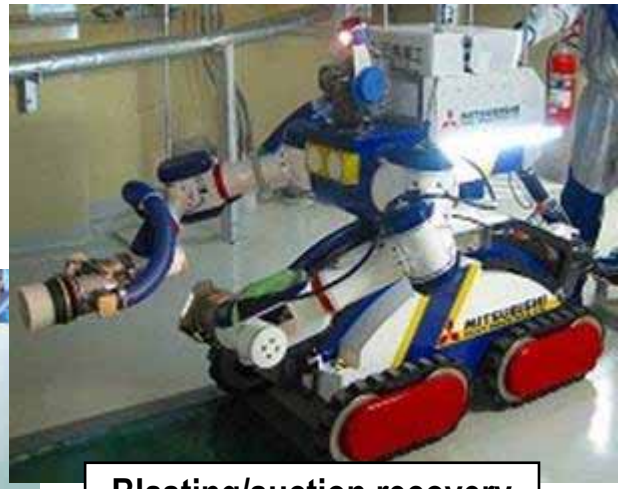
- Development of remote decontamination devices suitable for contamination conditions of the sites, which are intended to improve work environments for investigations, repairs, etc. of leakage spots at a primary containment vessel in order to enable fuel debris removal
  - Organization and development of effective decontamination technologies suitable for each contamination condition.
  - Development of remote decontamination devices for use in severe environments such as a high radiation dose environment and a small-space environment.

[Illustrations of devices to be developed]

High-pressure washing decontamination device



Dry-ice blasting decontamination device



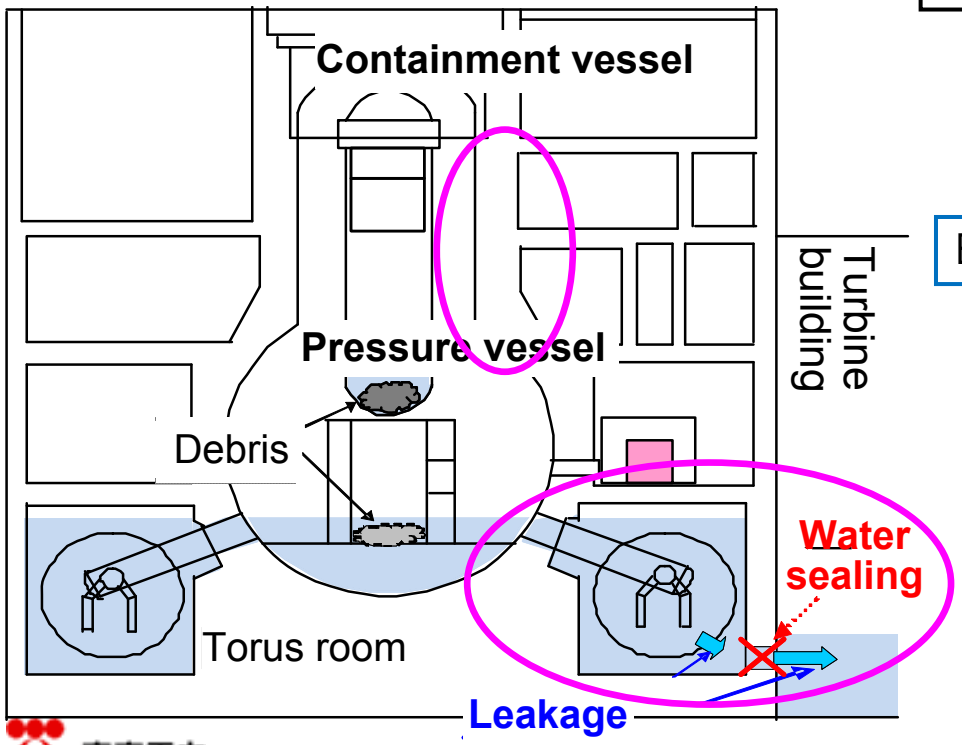
Blasting/suction recovery decontamination device

Inspectional investigation device for a primary containment vessel (FYs 2013 and 2014)

- Development of a remote investigation device applicable to leakage spots of a primary containment vessel (PCV)
  - Development of a remote investigation device for use in severe environments such as a high radiation dose environment and a small-space environment

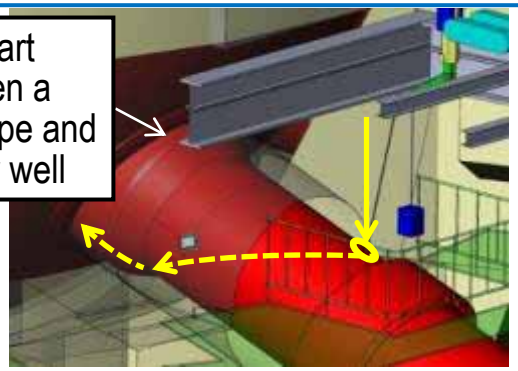
[Illustrations of inspectional investigation of each part]

Inspectional investigations are to be conducted in the upper and lower parts of the primary containment vessel (the examples illustrate only the investigation in the lower part).



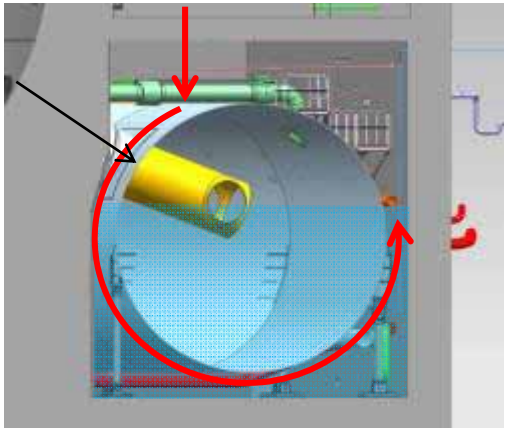
Example 1: Joint part between a vent pipe and the dry well

Joint part between a vent pipe and the dry well



The device is brought down through a hole in the 1st floor, travels while suctioning itself on the vent pipe, and inspects the joint part.

Example 2: Outer surface of the lower part of S/C

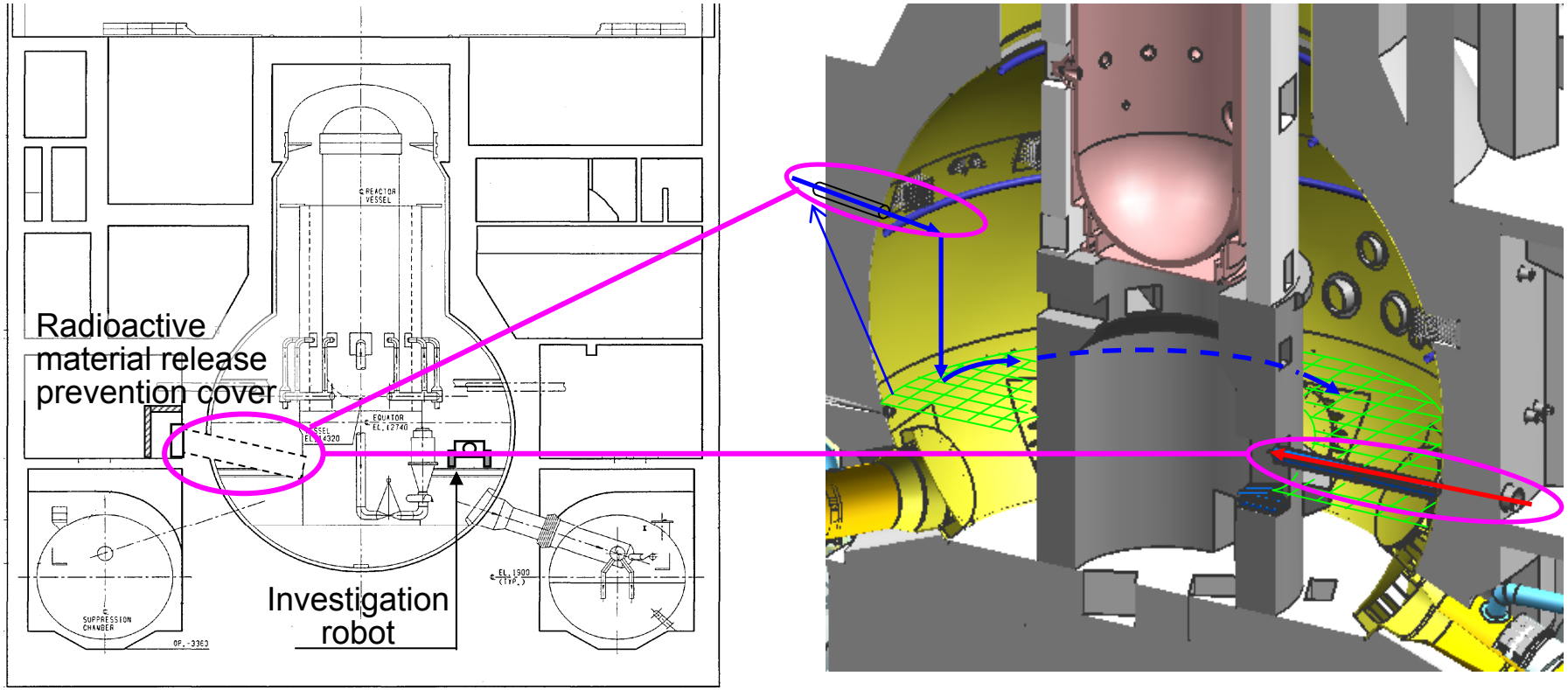


The device travels while suctioning itself on the shell, and inspects the lower part of S/C.

Methods, devices, etc. to access the inside of a primary containment vessel (FYs 2015 and 2016)

- Development of remote investigation methods and devices for obtaining information on the inside conditions of a primary containment vessel and the conditions of fuel debris
  - Development of a remote investigation technology for use in a high-temperature, high-humidity and highly radioactive environment
  - A system to prevent radioactive materials from being released

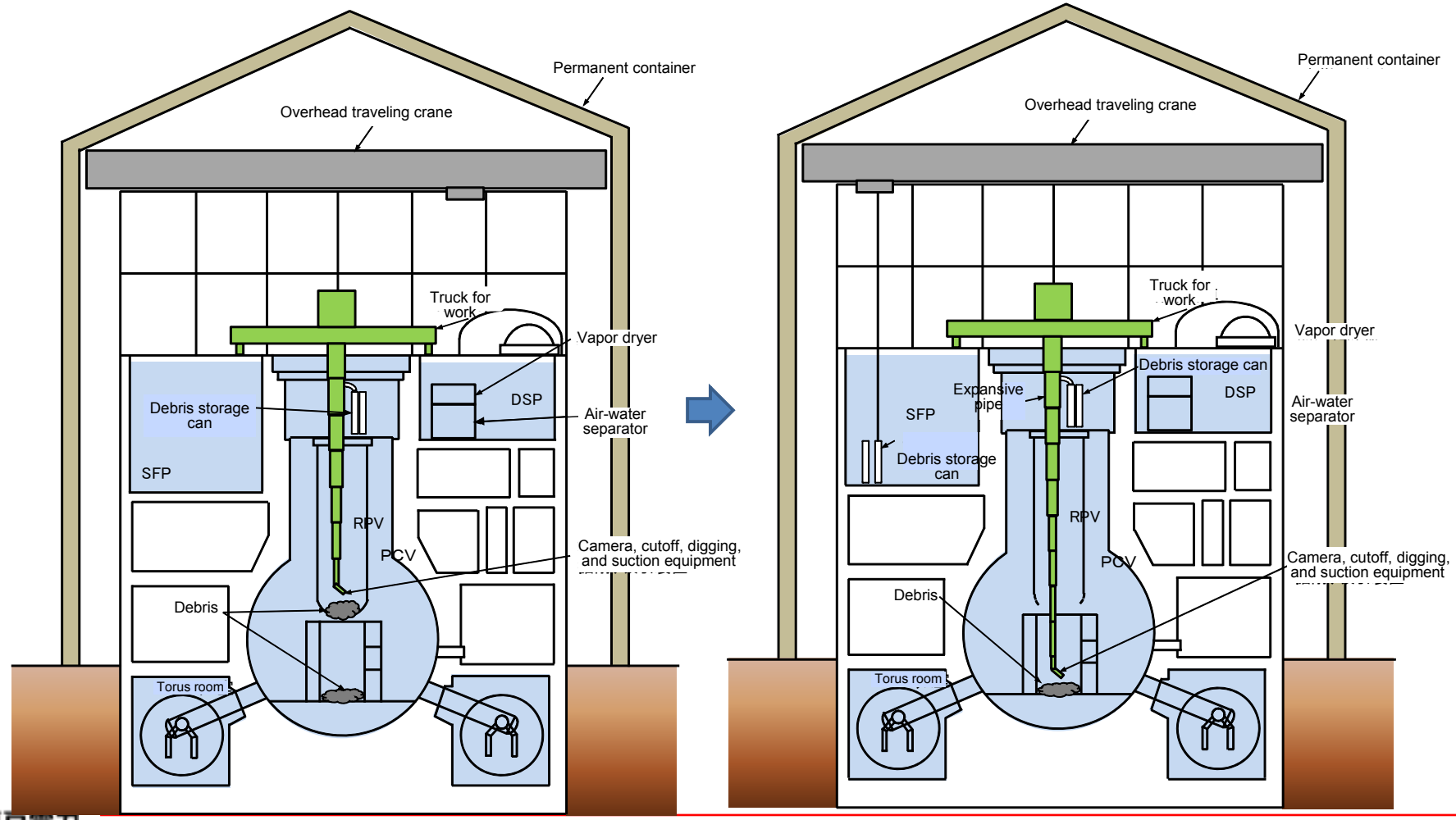
[Illustrations of the investigation device and an access route]



Devices for removing fuel debris and reactor core internal structures (FYs 2018 and 2019)

- Development of devices for removing fuel debris and reactor core internal structures from reactor pressure vessel and primary containment vessel (including related devices)

[Conceptual illustrations of removal of fuel debris and reactor core internal structures from reactor pressure vessel and primary containment vessel]



<Reference 1> General data on the respective units at Fukushima Daiichi NPS

	Unit 1[*1]	Unit 2[*1]	Unit 3[*1]	Unit 4[*1]	Unit 5	Unit 6
Output [MW]	460	784	784	784	784	1,100
Start of commercial operation	Mar. 26, 1971	Jul.18, 1974	Mar. 27, 1976	Oct. 12, 1978	Apr.18, 1978	Oct. 24, 1979
Accumulated power generation amount [TWh][*2]	86.9	155.9	159.0	157.4	162.2	212.6
Accumulated plant capacity factor [%][*3]	53.9	61.8	66.1	70.6	71.6	70.1
Type of reactor Type of reactor container	BWR-3 Mark I	BWR-4 Mark I	BWR-4 Mark I	BWR-4 Mark I	BWR-4 Mark I	BWR-4 Mark II
Main contractor	GE	GE and Toshiba	Toshiba	Hitachi	Toshiba	GE and Toshiba
Location	Okuma Town, Futaba-gun, Fukushima Pref.				Futaba Town, Futaba-gun, Fukushima Pref.	

*1: Fukushima Daiichi NPS Units 1 to 4 were decommissioned on April 19, 2012.
*2: Figures do not include power generation amounts before the start of commercial operation.
*3: As of the end of March, 2011

<Reference 2> Actions taken and current statuses regarding Units 5 and 6 after the Tohoku-Chihou-Taiheiyou-Oki Earthquake

< Actions taken after the Tohoku-Chihou-Taiheiyou-Oki Earthquake >

- When the earthquake occurred, Units 5 and 6 were under periodic inspections. While the reactors had been loaded with fuel, all of the control rod had been inserted.
- After the occurrence of the earthquake, external power supply was lost. However, emergency power supply of Unit 6 was available as it was not affected by tsunami. Therefore, emergency responses such as restoration of heat removing functions were successfully carried out.
- On March 20, 2011, the water temperatures of the reactors became below 100ºC, and the reactors shifted to a cold shutdown state.

< Current status of the spent fuels at Unit 5 >

- At present, there is spent fuel stored in the reactor and in the spent fuel pool.
- The device for removing fuel from the reactor is currently under inspection. We are planning to transfer fuel from the reactor to the spent fuel pool in the first half of FY2014.

< Current status of the spent fuels at Unit 6 >

- On November 29, 2013, we completed transferring fuel from the reactor to the spent fuel pool, and all of the spent fuel is currently stored inside the spent fuel pool.