

U.S. Japan Bilateral
Decommissioning Workshop
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Decommissioning of NPPs in Japan

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NPPs under Decommissioning



- ✓ Of 57 NPPs built in Japan, 3 reactors had declared decommissioning before TEPCO Fukushima Daiichi NPS accident, and **21 reactors** have followed after the accident.
- ✓ 4 reactors obtained the special approval to extend its operational period up to the age of 60.

NPPs declared for Decommissioning After Fukushima * excluding 6 reactors in Fukushima Daiichi NPS

Reactor*	Type	Start Date	Age at shut-down	MWe
Tsuruga-1	BWR	1970/03/14	45	357
Mihama-1	PWR	1970/11/28	44	340
Mihama-2	PWR	1972/07/25	42	500
Shimane-1	BWR	1974/03/29	40	460
Genkai-1	PWR	1975/10/15	39	559
Ikata-1	PWR	1977/09/30	38	566
Ohi-1	PWR	1979/03/27	38	1,175
Ohi-2	PWR	1979/12/05	38	1,175
Genkai-2	PWR	1981/03/30	38	559
Ikata-2	PWR	1982/03/19	36	566
Fukushima Daini-1	BWR	1982/04/20	37	1,100
Fukushima Daini-2	BWR	1984/02/03	35	1,100
Onagawa-1	BWR	1984/06/01	34	524
Fukushima Daini-3	BWR	1985/06/21	34	1,100
Fukushima Daini-4	BWR	1987/08/25	32	1,100

Regulatory Framework for Decommissioning



(*1) Decommissioning Plan

(*2) Safety review for decommissioning is conducted at meetings **open to the public** and all materials are internet available, **which contributes to the transparency to all stakeholders.**

Decommissioning Plan (D-Plan)

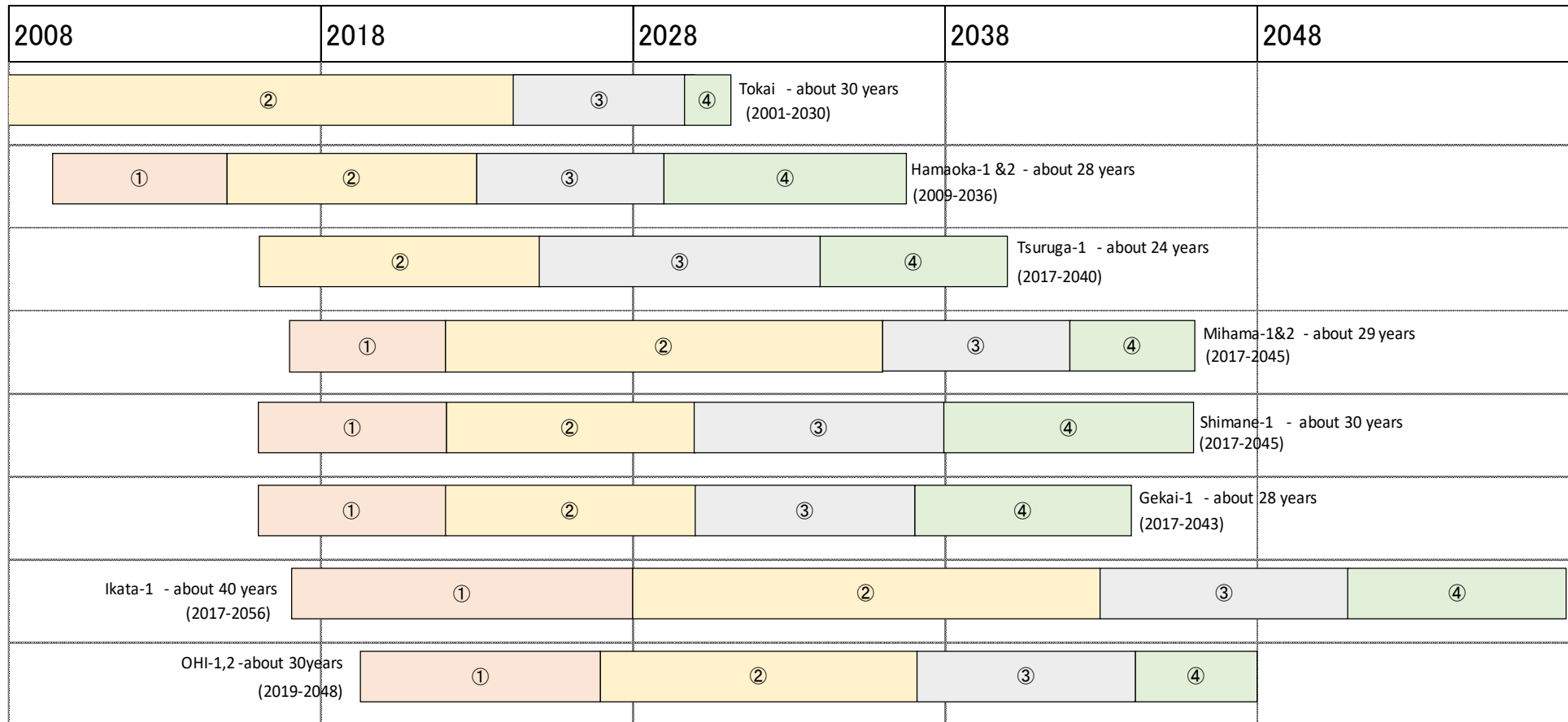


- Developed by licensees, subject to NRA approval
- Details of decommissioning processes to be described including,
 - ✓ steps and measures
 - ✓ duration for each step
 - ✓ functions need to be maintained during decommissioning stage
 - ✓ estimation of waste incurred and their disposal measures
 - ✓ management and transfer of nuclear fuel material
 - ✓ cost estimation and financing
 - ✓ radiation protection throughout all activities,
- Revised according to the progress of decommissioning activities, also subject to approval.

Decommissioning Process - Timeline



Decommissioning in Progress



Decommissioning is expected to continue for about 30 years and the process consists of 4 major steps: 1) Preparation for disassembly, 2) Disassembly of reactor peripherals, 3) Disassembly of reactor, and 4) Disassembly of buildings and dismantling.

Smooth transition from operation to decommissioning



- Incentive for licensees to appropriately transfer from operation to decommissioning
 - ✓ With the **approval of D-Plan**, status changes **clearly from operation to decommissioning**, and regulatory requirements applied to the plant is simplified in terms of safety function and inspection.
 - ✓ Approval of D-Plan is not just an **incentive** but a measure to make licensees **properly conduct** decommissioning according to the approved plan.

Operational Safety Program (1/2)



- The licensee shall prepare to modify Operational Safety Program includes a maintenance and management program of the reactor facilities, from power operating period to decommissioning.
- Operational Safety Program have to be approved by NRA prior to starting decommissioning.

Operational Safety Program (2/2)



- Many sites have **reactors in different stages**, i.e. reactors in operation, in decommissioning, and under conformity review.
- Proper management and regulation **corresponding to such a mixed situation** is necessary. In particular, since the status of decommissioning changes gradually, timely management is crucial.
- Besides **D-Plan**, which is amended as necessary according to the situation of the site, licensees are required to modify their **Operational Safety Programs**, which cover organizational structure and measures for maintaining safety. Licensees with multiple reactors at various stages make efforts to accommodate such situations in their program.

Decommissioning Implementation Policy



- **Obligation to licensees to consider decommissioning before and while in operation**

- ✓ The Act was amended in 2018 so that licensees are obliged to prepare and publish **Decommissioning Implementation Policy** for all nuclear facilities basically before operation, including the ones in operation.
- ✓ A **Decommissioning Implementation Policy** covers **the same items** to be covered in the **D-Plan** which should be submitted when entering into decommissioning.
- ✓ This new regulation gives **licensees opportunities to consider and prepare seriously** for decommissioning at an early stage, and supports smooth transition from operation to decommissioning.
- ✓ The public is available to access Decommissioning Implementation Policy on NRA web site.

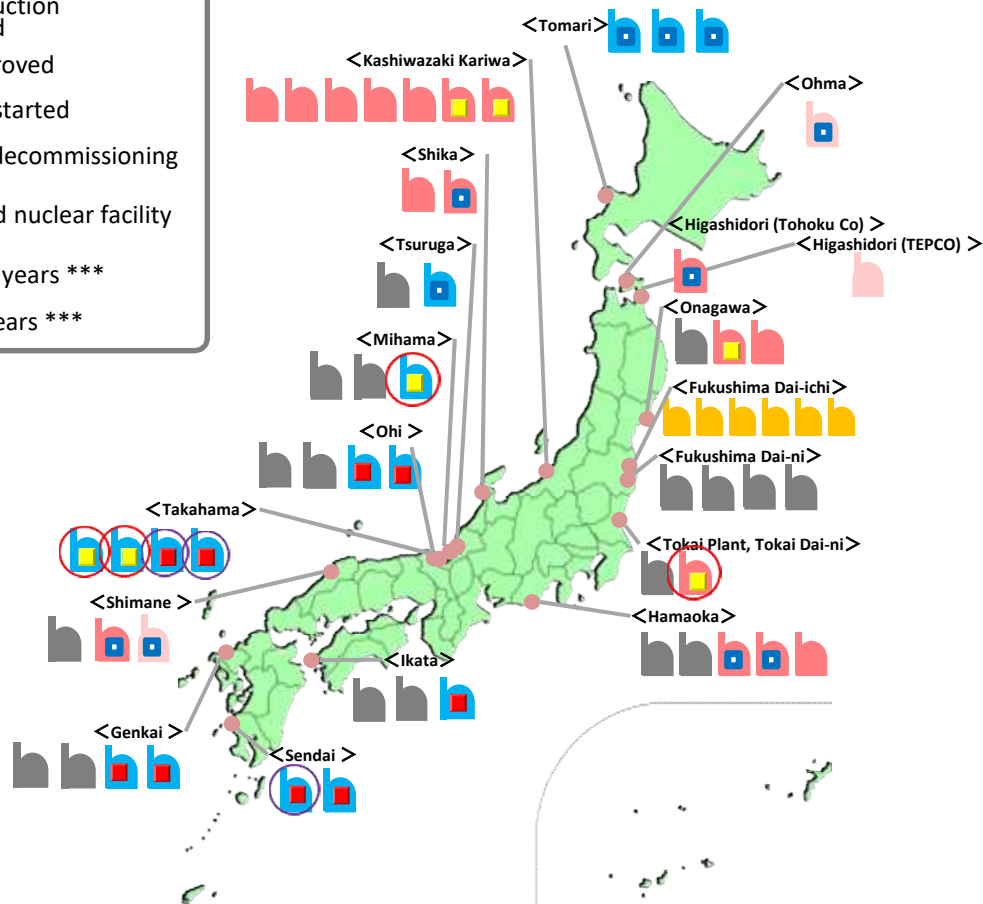
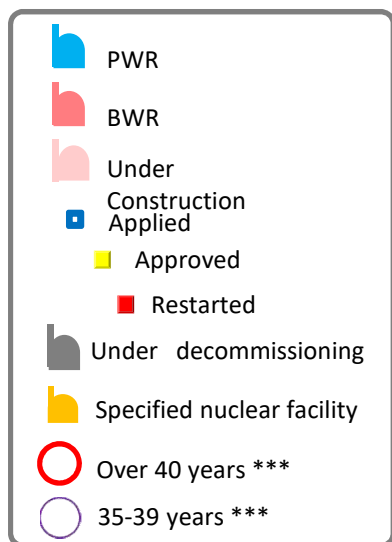
Summary



- Due to the change of regulation after TEPCO Fukushima Daiichi NPS accident, a number of NPPs have declared decommissioning - to date, in total **24 out of 57** are so declared.
- Approval and timely modification of **D-Plan** and **Operational Safety Program** give licensees incentive to move onto, and conduct decommissioning appropriately, because of simplified regulation.



(Reference) Current Status



As of July, 2020

Total	60*	
Applied	27	PWR 16 BWR 11
Approved	16	PWR 12 BWR 4
<i>Restarted</i>	<i>9</i>	<i>PWR 9 BWR 0</i>
Under decommissioning**	24	GCR 1 PWR 8 BWR 15
Others	9	PWR 0 BWR 9

* Including plants under construction (3 reactors)

** Including Fukushima Daiichi NPPs and other NPPs declared for decommissioning.

*** Except reactors already declared decommissioning



<https://www.nsr.go.jp/english/index.html>