Inspection in Japan

March 15th, 2007

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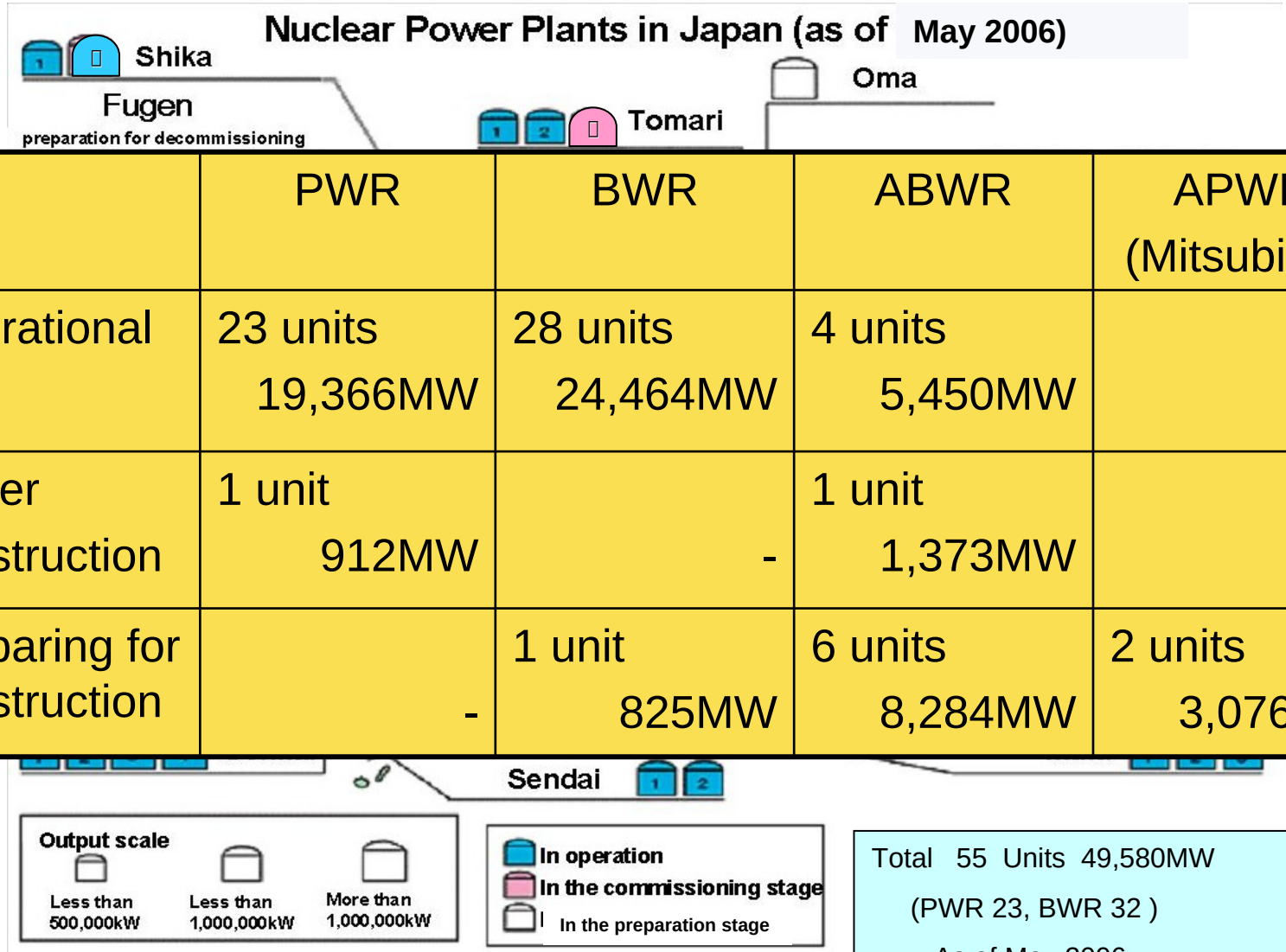
Nuclear Power Generation in Japan

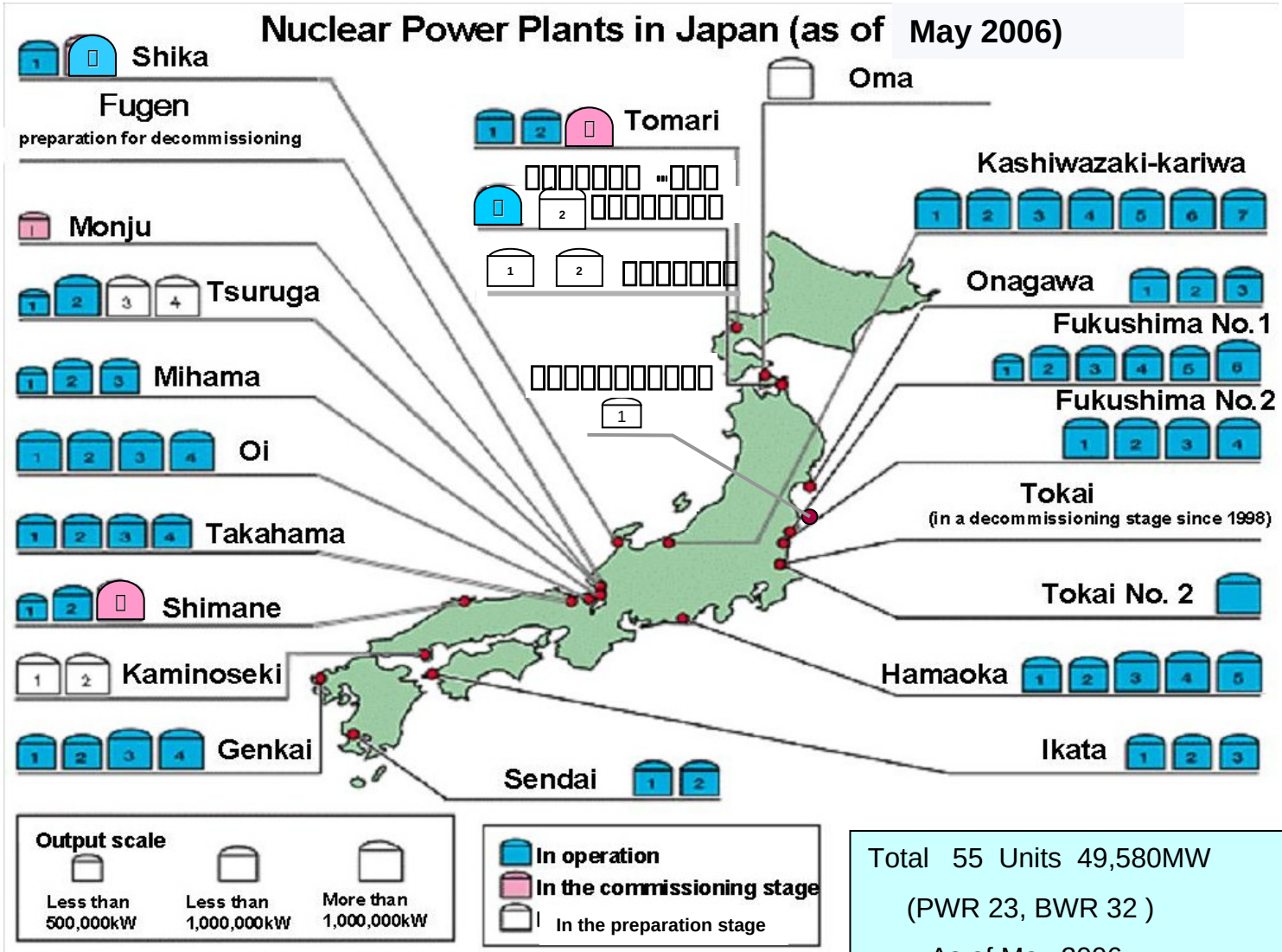


	PWR	BWR	ABWR	APWR (Mitsubishi)
Operational	23 units 19,366MW	28 units 24,464MW	4 units 5,450MW	-
Under construction	1 unit 912MW	-	1 unit 1,373MW	-
Preparing for construction	-	1 unit 825MW	6 units 8,284MW	2 units 3,076MW

Total 55 Units 49,580MW
(PWR 23, BWR 32)
As of May 2006

NISA Nuclear and Industrial Safety Agency

Nuclear Power Generation in Japan



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NISA Nuclear and Industrial Safety Agency

Nuclear Safety Regulation on Commercial Nuclear Power Plants

Operators (Electric Power Company)	Nuclear and Industrial Safety Agency (NISA)

Licensing

- Application for License for the Establishment of a Reactor → Safety Assessment and Review
- Nuclear Safety Commission
- NSC express its opinions
- License for the Establishment of a Reactor

	Conformity with the Technical Standards	Securing of Safety and Security

Construction

- Application for Construction Plan → Approval of Construction Plan
- Start Construction
- Fuel Assembly Inspection *1
- Audit on Welding Safety Management *2
- Pre-Service Inspection *1

Operation

- Application for the Approval to Operational Safety Program → Approval to Operational Safety Program
- Application for the Approval to Physical Protection of Nuclear Material and Facilities Program → Approval to Physical Protection of Nuclear Material and Facilities Program
- Commence Operation
- Conduct Operational Safety Program ← Operational Safety Inspection
- Conduct Physical Protection of Nuclear Material and Facilities Program ← Physical Protection of Nuclear Material and Facilities Inspection
- Self Periodical Inspection ← Audit of Operator's Periodical Safety Management and its Evaluation *3
- Self Periodical Inspection ← Periodical Inspection *1

Decommissioning

- Application for Decommissioning Program → Approval of Decommissioning Program
- Application for Confirmation to the completion of decommissioning → Confirmation to the Completion of Decommissioning (License becomes invalid)

- Obligation to Maintain Conformity with Technical Standards
- Orders Against Violation
- Obligation to take Safety Measures & Obligation to take Physical Protection Measures
- Orders Against Violation

(note) *JNES performs a part of the Inspection.
*JNES performs the Audit.
*JNES performs the Audit and NISA evaluates it.

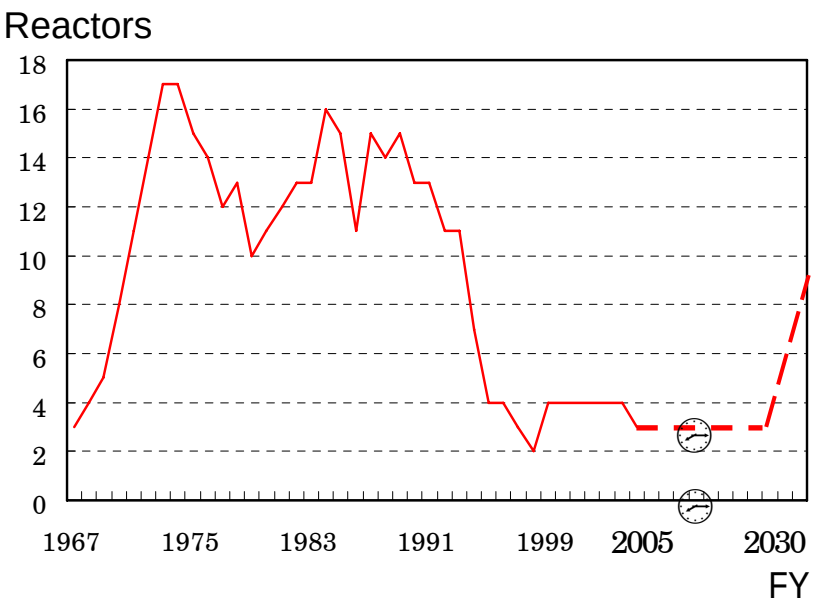
The Law on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors

Electricity Utilities Industry Law

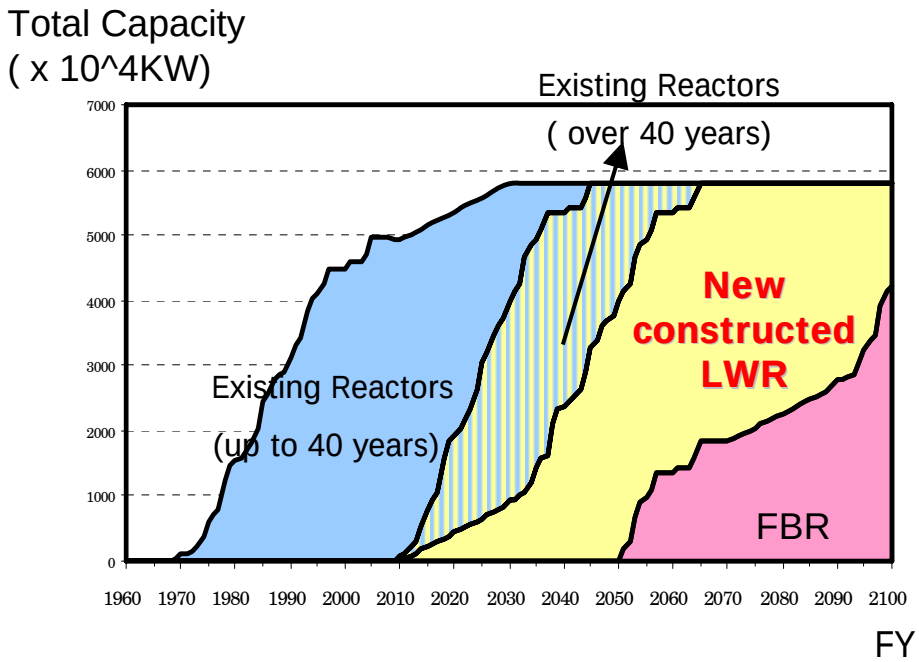
Future plan of reactor construction

- Within a few decades, new construction of NPPs will be flagging.
- After 2030, it will be expected to increase demands for existing LWRs to replace. .

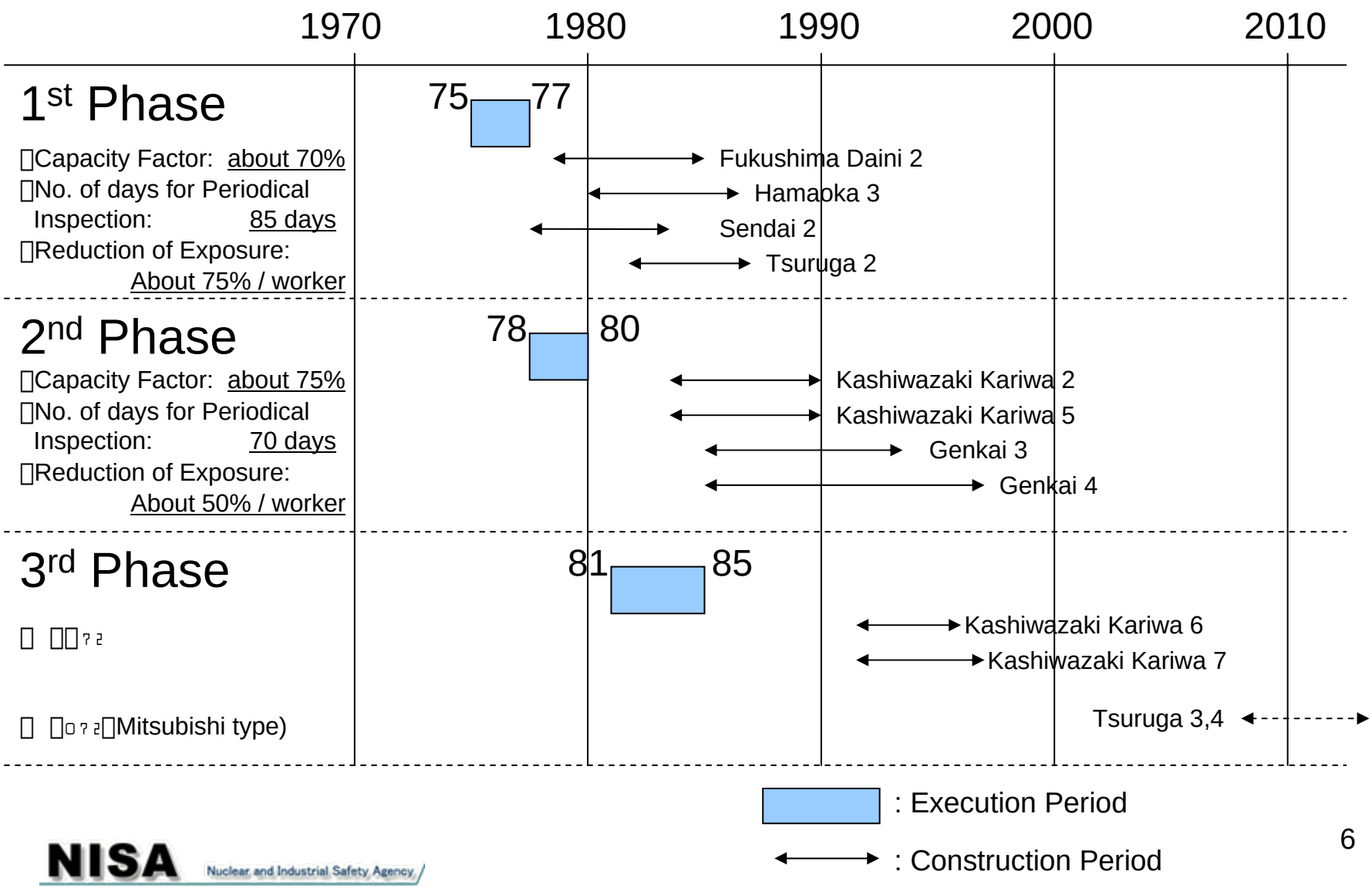
Trend of reactors under construction in Japan



Future Commercial Reactors in JAPAN



Improvement and Standardization of Light Water Reactors



NISA Nuclear and Industrial Safety Agency

Further Improvement of Regulatory Inspections

□□The Study Group on Nature and Method of Inspection" under the Nuclear and Industrial Safety Advisory Committee has resume since November 2005

<Background> The regulatory inspection system, especially periodical inspection, was fully changed in October, 2003 – from inspection of hardware to inspection of management systems.

<Purpose of this series of discussion> To seek the way to further improve the regulatory inspection system based on over two-year experiences of the current inspection.

Further Improvement of Reg. Inspections (Contd.)

- Main issues discussed were;
  - i) Most of the current regulatory inspections are performed during outage periods. Good balance should be sought between outage inspections and in-service inspections, aiming at more effective and efficient inspections.
  - ii) Currently, almost same regulatory inspections are performed for NPPs. Different scales and contents of inspections might be necessary reflecting the results of regulatory evaluation of maintenance programs of individual licensees.
  - iii) Extensive inspection might be necessary for the plants operated long periods of time.
- Discussion was carried out with various concerned parties.
- The final report was issued in September 2006 with reflection of public comments.

Further Improvement of Reg. Inspections (Contd.)

Main Conclusions of the Report

- Regulatory inspections should be more plant specific, taking plant specific characteristics (including designs, ages, safety performance levels, effectiveness of safety management programs, etc.) into account.
- Regulatory inspections, more extensive than average, should be performed for aged plants.
- NISA should enhance in-service regulatory inspection.
- For important operating events, licensees should perform root cause analyses and NISA should monitor those activities, especially for preventing incidents due to human errors or organizational factors.

Implementation of inspection in accordance with the stages of construction

Construction process	stage	Inspection Process	contents
foundation excavation casting of foundation concrete nuclear rector building construction installation of a nuclear reactor CV foundation work in the PCV nuclear reactor building construction installation of nuclear reactor and steam turbine generator functional test for unit equipment functional test for system Fuel loading Criticality start-up test	(a) stage	When it becomes possible to make a test for structure, strength or leak.	Material inspection, Dimensional inspection, Appearance inspection, Assembly and installation Inspection, Pressure Inspection, Leak inspection, and Foundation inspection
	(b) stage	When the lower half of the steam turbine cylinder is installed.	ɜteam turbine inspection, Dimensional inspection, Appearance inspection, Assembly and installation inspection, and support e.t.c.
	(c) stage	when the loading of the fuel in the reactor is possible.	Verification tests for the function or performance required for the operation and safety of the reactor
	(d) stage	when the criticality operation of the reactor can be started.	Verification tests for the function or performance required for the reactivity control of the reactor core and for the ensuring of safety
	(e) stage	when all the work for the construction plan is completed.	Verification tests for the overall performance of the power generation plant.

Recent pre-service inspection

Pre-service Inspection Items

	condition	Type	Inspection Items					
			Total	(a) Stage	(b) Stage	(c) Stage	(d) Stage	(e) Stage
Hokuriku EPCO Siga Unit 2	Operation	ABWR	□□□	□□	□	□□	□	□□
Tohoku EPCO Higashi-Dori Unit 1	Operation	BWR5	□□□	□□	□	□□	□	□□
Hokkaido EPCO Tomari Unit 3	Under construction	PWR	□□□	About □□□	□	□□	□	□