Implementation Plan of the measures to be taken at Fukushima Daiichi Nuclear Power Station designated as a Specified Reactor Facility (outline)

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Tokyo Electric Power Company

東京電力
TEPCO

1. Post-Earthquake Regulations Up to the Present

Units 1~4

◎Nuclear Reactor Regulation Act Article 64: Application of emergency measures

◎ Nuclear Reactor Regulation Act Article 67: Appropriate reporting of measures on ensuring safety by report collection

Currently, there are regulations specifying amendment and revision of the Facility Management Plan as well as subjecting the plan to assessment in accordance with the Policy on Mid-Term Security as instructed by the Nuclear and Industrial Safety Agency

Also, in addition to the Facility Management Plan, an Implementation Plan for Reliability Improvement Measures in accordance with Nuclear and Industrial Safety Agency instructions has been submitted and already assessed

◎With regard to the Technical specification, an application was presented for Chapter 12 corresponding to the Facility Management Plan as instructed by the Nuclear and Industrial Safety Agency, and authorization received.

Units 5 & 6

◎ Nuclear Reactor Regulation Act Article 64: Application of emergency measures

◎ Not subject to the Facility Management Plan in accordance with the Policy on Mid-Term Security

◎Basically, the previous regulations stipulated under the Electricity Business Act and Nuclear Reactor Regulation Act continue in place

2. Regulations in the Future

Units 1~4

Units 5 & 6

◎Designation as a Specified Reactor Facility

A facility where a nuclear accident has occurred and emergency measures are taken is designated to be a Specified Reactor Facility and special regulations commensurate with condition of the equipment are stipulated for the designated facility

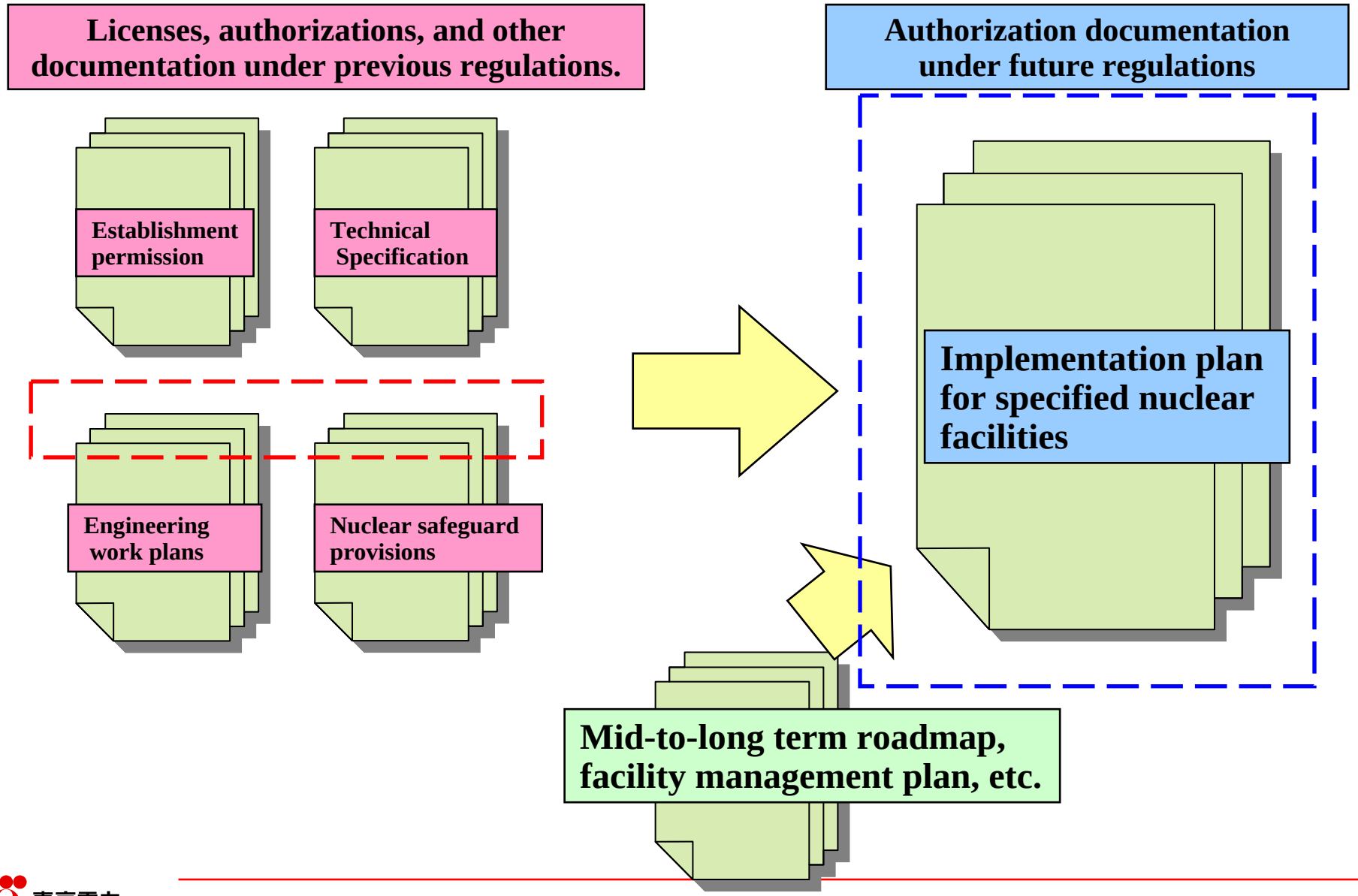
◎Examination and inspection using an Implementation Plan

After designation as a Specified Reactor Facility, "matters concerning measures to be adopted" are presented to the operator who then formulates an Implementation Plan based on said matters, and the Nuclear Regulation Authority assesses the validity of said Implementation Plan, and conducts inspections to verify whether or not an appropriate response is being made based on the Implementation Plan.

Units 5 & 6

◎Previous regulations under the Electricity Business Act and Nuclear Reactor Regulation Act continue in place, but there will be a transition to regulations based on the aforementioned Implementation Plan with regard to stably continuing and maintaining a cold shutdown

3. What Does “Implementation Plan” Entail?



4. Organization of “Implementation Plan”

The Implementation Plan is created based on “matters concerning measures to be adopted” as presented by the Nuclear Regulation Authority in accordance with the law.

“Implementation Plan” Organization

- **I. Overall Schedule and risk assessment of the specified nuclear facility**
- **II. Design and equipment of the specified nuclear facility**
- **III. Security of specified nuclear facility**
- **IV. Physical protection of specified nuclear fuel material**
- **V. Fuel debris removal and decommissioning**
- **VI. Promotion of understanding of implementation of implementation plan**
- **VII. Undergoing inspections pertaining to implementation plan**

The Facility Management Plan, Implementation Plan for Reliability Improvement Measures, Technical Specifications, Physical Protection Program and so on are appropriately reflected in formulation the Implementation Plan

5. “Implementation Plan” Content I: Overall Schedule and Risk Assessment (1 of 2)

Matters Concerning Measures to be Adopted

- The overall schedule through completion of decommissioning including the schedules for decommissioning the reactor as well as removal and storage of fuel debris for Units 1~4 and the overall schedule for maintaining and continuing cold shutdown for Units 5 and 6 are to be respectively defined, and assessments conducted of each schedule and stage to reduce risks and optimize the entire specified nuclear facility

Overall Schedule: Schedules for Units 1~4

Description

- Principal schedule and mid-term schedule under the mid-to-long term roadmap
- Reflection of the accelerated schedule for removal of spent fuel from Unit 4

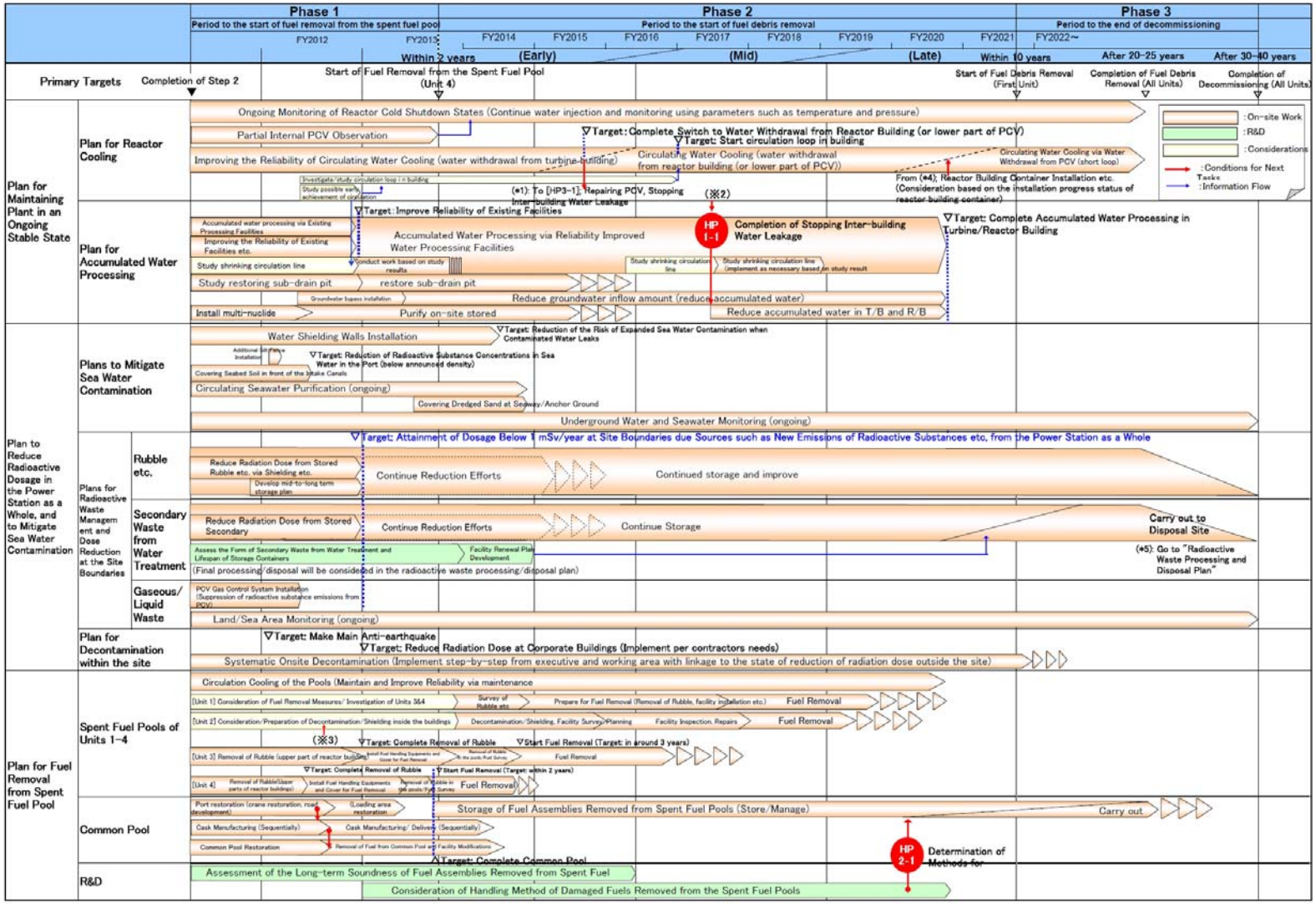
Overall Schedule: Schedules for Units 5 & 6

Description

- Maintaining and monitoring cold shutdown state
- Outline of plan for removal of fuel scheduled in the future

Reference: Illustration of Overall Schedule for Units 1~4

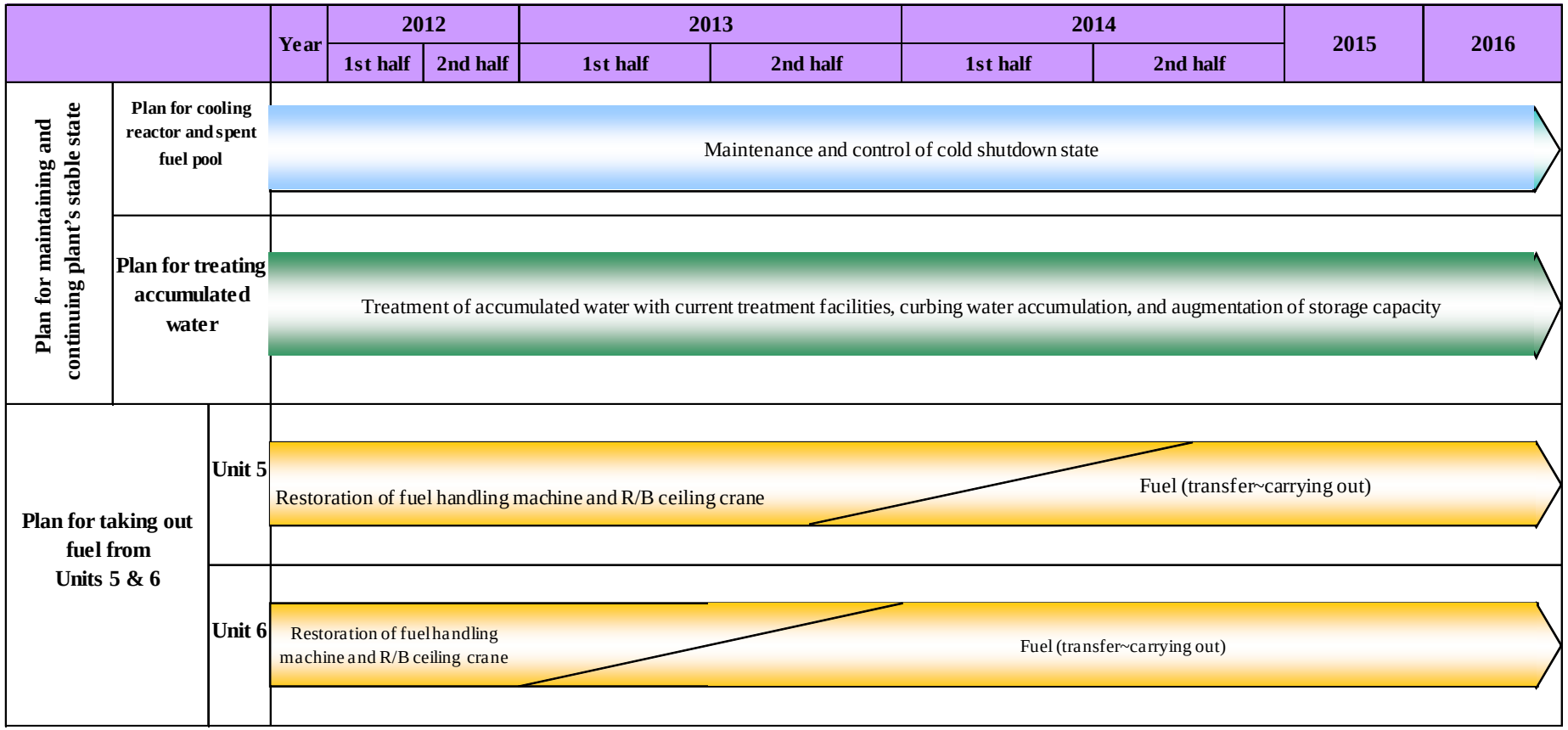
Main Schedule of Mid-and-long-term Roadmap towards the Decommissioning of Fukushima Daiichi Nuclear Power Station Units 1-4, TEPCO



*This roadmap will be updated in consideration of the on-site situation and the latest research and development results.

Reference: Illustration of Overall Schedule for Units 5 & 6

TEPCO Fukushima Daiichi Nuclear Power Station Units 5 & 6: Mid-Term Schedule



***The mid-term schedule will continue to be reviewed based on site conditions.**

6. “Implementation Plan” Content I: Overall Schedule and Risk Assessment (2 of 2)

Risk Assessment

Matters Concerning Measures to be Adopted

- In conducting risk assessments of the entire specified nuclear facility and all equipment, assessments are executed which include impact on the broader environment outside the site, and the reduction of risks and optimization are to be sufficient to ensure safety inside and outside of the site.

Description

(1) Description is given of assessments of environmental impact on a wide-area at the current point in time
(In wide-area assessments, the impact from specified nuclear facilities is extremely small.)
(2) Major risks
・Description is given of risk assessments pertaining to fuel debris, spent fuel, etc.
(3) Measures to reduce assumed risks and future planned risks for each facility individually are listed and described
(In cases where a detailed construction method has been determined, a description is given to the effect that the implementation plan is amended as necessary)

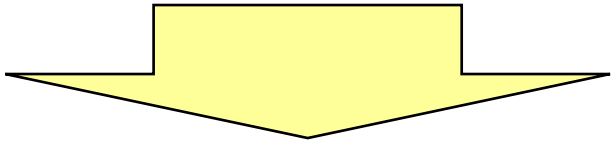
Also under (3), the most recent priority issues are:

・Reduction in the quantity of contaminated water being produced and reduction in the quantity of contaminated water for storage through reliable processing
・Early removal of spent fuel from the spent fuel pool

7. “Implementation Plan” Content II: Design and Equipment (1 of 2)

Matters Concerning Measures to be Adopted Regarding Design and Equipment

(1) Monitoring of reactor, etc.
(2) Removal of residual heat
(3) Monitoring, etc. of reactor containment facility ambient atmosphere
(4) Maintenance of inert atmosphere
(5) Fuel removal and appropriate storage and management of removed fuel
(6) Ensuring power source
(7) Design considerations for loss of power
(8) Treatment, storage and management of radioactive solid waste
(9) Treatment, storage and management of radioactive liquid waste
(10) Treatment and storage of radioactive gaseous waste
(11) Radiation protection, etc. of the area surrounding the site by curbing, etc. the release of radioactive materials
(12) Management, etc. of workers’ radiation exposure
(13) Emergency measures
(14) Design considerations
(15) Other matters concerning measures to be adopted



Corresponding to the aforementioned items, content equivalent to that in conventional “establishment permissions,” “engineering work plans,” and other such documentation is required. An implementation plan is comprised of the following four parts.

(1) Overall description of all equipment subject to each item under the “matters concerning measures to be adopted”
(2) Design, specifications, operating status of each facility individually
(3) Responses concerning management of radiation exposure and disposal of radioactive waste
(4) Emergency responses

8. “Implementation Plan” Content II: Organization of Chapter II (1 of 2)

Organization of Chapter II of “Implementation Plan” (1 of 2)

Chapter	Section	Paragraph	Description object and overview	
II. Design and Equipment of Specified Nuclear Facility	1. Matters to be considered regarding design and equipment	1.1 ~1.14	Descriptions directly subject to “matters concerning measures to be adopted” and descriptions of lines to Paragraphs 2~4	
	2. Structure and equipment of specified nuclear facility and engineering work plans	2.1 ~2.34	Units 1~4 + Shared	Units 5 & 6
			・Reactor cooling facilities ・Nitrogen-sealed facilities ・Spent fuel pool (SFP) ・Standby liquid control facilities ・Contaminated water treatment facilities ・Contaminated water storage buildings ・Electrical system facilities ・Gas control facilities ・PCV measuring gauges ・Radioactive solid waste management facilities ・Removal from SFP ・Spent fuel pool ・Cask temporary storage facilities ・Monitoring rooms & control rooms ・Radiation control-related facilities ・Advanced liquid processing system ・Miscellaneous solid waste incinerator	・Reactor pressure vessel ・Reactor containment facility ・Control rods and control rod drive system ・Residual heat removal system ・Core standby cooling system ・Make up water condensate system ・Reactor water clean-up system ・R/B regular venting system ・Fuel pool cooling cleanup system ・Fuel handling system and new fuel storage facility ・Standby gas treatment system ・Main control room ventilation system ・On-site transport containers ・Electrical system facilities ・Accumulated water storage facilities ・Measurement control equipment

Blue: Based on Facility Management Plan

Red: Based on establishment permissions, engineering work plans

Green: Newly created

9. “Implementation Plan” Content II: Organization of Chapter II (2 of 2)

Organization of Chapter II of “Implementation Plan” (2 of 2)

Chapter	Section	Paragraph	Description overview
II. Design and Equipment of Specified Nuclear Facility	3. Responses concerning management of radiation exposure and disposal of radioactive waste	3.1 ~3.4	3.1 Radiation protection and radiation control 3.2 Management of radioactive waste, etc. 3.3 Dose assessment 3.4 Reduction in radiation risk **Description of content noted in facility management plan**
	4. Emergency responses	4.1 ~4.5	4.1 Response to equipment failure 4.2 Response to fire 4.3 Response to earthquake, tsunami 4.4 Response to heavy rainfall, typhoon, tornado **Description of Content noted in reliability improvement measures**

10. “Implementation Plan” Content III: Security of Specified Nuclear Facility

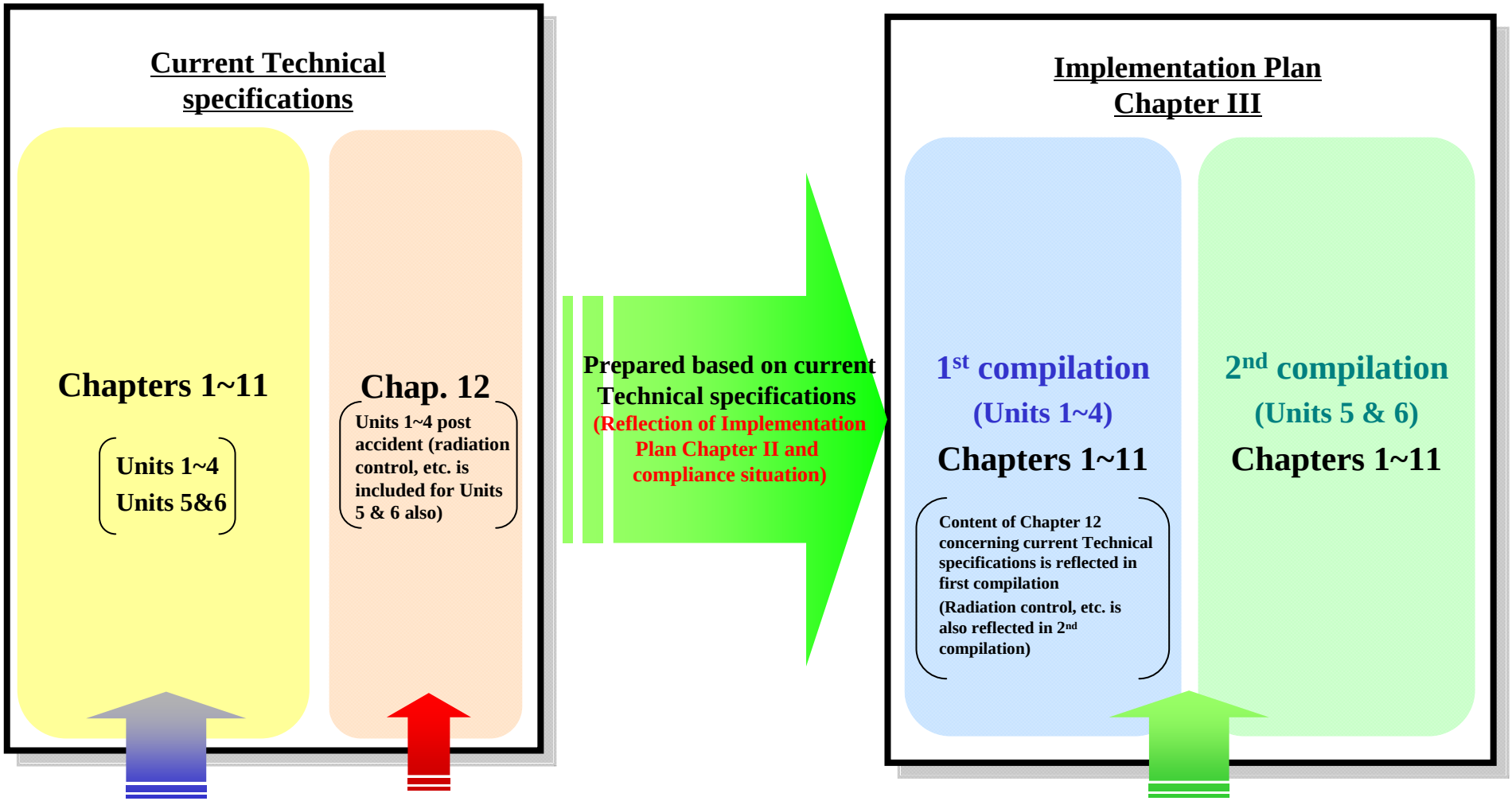
Matters Concerning Measures to be Adopted

- By adopting operation management, maintenance management, radiation controls, radioactive waste management, emergency measures, environmental radiation monitoring inside and outside the site and other appropriate measures, appropriate and reliable implementation of “II. Matters Concerning Measures to be Adopted Regarding Design and Equipment” is ensured and the safety of workers and areas inside and outside the site are secured.
- Particularly, with regard to emergency measures during an accident or disaster, a system for notifying and communicating with organizations concerned, development of a medical care system for times of emergency and other such systems are implemented in addition to responding to the emergency situation.
- Also, study and training will be appropriately implemented for employees and workers, including those of affiliate companies, to maintain and improve skills and capabilities

Description

○ Parts corresponding to technical specifications (separate descriptions given for Units 1~4 and Units 5 & 6)
○ Technical specifications in accordance with conventional reactor regulations (Chapters 1~11) developed based on compliance in the field
○ Technical specifications in accordance with the Facility Management Plan (Chapter 12) described based on the content of Chapter II
○ In Chapter III, a description is given of the responses pertaining to “development of a medical care system and system for notifying and communicating with organizations concerned during an emergency” and “study and training for employees and workers including those of affiliate companies”

“Implementation Plan” Content III: Organization of Chapter III



11. “Implementation Plan” Content IV: Physical Protection of Specified Nuclear Fuel Material

Matters Concerning Measures to be Adopted

- Appropriate measures are to be adopted to prevent sabotage or unlawful transfer by theft or other appropriation of nuclear fuel material within a specified nuclear facility.

Description

○Because there are descriptions concerning physical protection of nuclear material and undisclosed information is included, this content is submitted separate from the main part of the implementation plan

12. “Implementation Plan” Content V: Fuel Debris Removal and Decommissioning

Matters Concerning Measures to be Adopted

- After nuclear fuel material including fuel debris and other material is reliably maintained below criticality and the primary containment vessel has been water sealed and other such measures have been adopted, the nuclear fuel material is safely removed, prevented from dispersing, appropriately shielded, cooled and stored.
- Appropriate measures are to be adopted for realizing as promptly and safely as possible the decommissioning of Units 1~4 while working to ensure the safety of workers and the area inside and outside of the site.
- In addition to the aforementioned, measures are to be adopted when deemed to be necessary to prevent disasters and other calamities.

Description

○The work required up to the commencement of removal of fuel debris and other material is performed in the reactor building and other structures under high dose conditions. Currently, cooling water injected into the core is leaking from the reactor pressure vessel and primary containment vessel, but the condition of the leak locations has not been able to be verified, so it is difficult to finalize the specific methods for removing fuel debris and other material.

○Boundaries are to be constructed for filling the primary containment vessel with water and working underwater is considered to be the most superior method for radiation shielding, so it has been decided to water seal the primary containment vessel and adopt other measures suited to such conditions.

○Fuel debris and other material is to be safety removed while maintaining it in a subcritical state and measures are to be adopted to prevent dispersion as well as for shielding, cooling and other appropriate accident prevention measures and stored, and development of the necessary technology will proceed.

○In order to conduct the decommissioning work promptly and safety, measures will first be adopted to reduce the dose inside the reactor building by means of decontamination or shielding, and development of the necessary technology will proceed.

○After development has proceeded of the aforementioned technology, the specific methods and other means will be reflected at the finalized stage in the implementation plan.

13. "Implementation Plan" Content VI: Promotion of Understanding of Implementation Plan

Matters Concerning Measures to be Adopted

- In implementing the implementation plan, the plan's measures, substance of risk assessments, progress on measures, and other matters will continue to be explained to the public at large including local residents and municipalities, and bulletins and information will be disclosed in an effort to promote understanding.

Description

In implementing the implementation plan, by undertaking the following responses, the plan's measures, substance of risk assessments, progress on measures and other matters will continue to be explained to the public at large including local people and municipalities, and bulletins and information will be disclosed in an effort to promote understanding.

○In accordance with the Agreement on Ensuring Safety of Areas Surrounding Nuclear Power Stations (Safety Agreement) and the Agreement on Notification and Communication Related to Nuclear Power Stations (Notification and Communication Agreement), notification and communication are reliably provided to local municipalities.

○With regard to progress and other matters, press releases are issued when appropriate, and disclosure documentation is published on the company's website.

○In Fukushima Prefecture, information is provided through the media as appropriate, and press conferences are held as necessary in cases of emergency.

○To people in the local area, disclosure and other documentation is distributed and press releases are provided using media as necessary to increase opportunities for direct exposure to local residents.

○To the extent it does not impeded the site work schedule, the site is opened to those concerned including local municipalities in an effort to promote understanding.

13. “Implementation Plan” Content VII: Undergoing Inspections Pertaining to Implementation Plan

Matters Concerning Measures to be Adopted

- Inspections are undergone in accordance with Article 64-3 Paragraph 7 of the Act with regard to facilities in the implementation plan, measures for security, and measures for physical protection of nuclear fuel material.

Description

○ “Inspections conducted by the Nuclear Regulation Authority are undergone in accordance with Article 64-3 Paragraph 7 of the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors as pertains to facilities in the implementation plan, measures for security, and measures for physical protection of nuclear fuel material.”