

Current Status of “Roadmap towards Restoration from the Accident at Fukushima Daiichi Nuclear Power Station, TEPCO” (Revised edition)

Appendix 3

August 17, 2011
Nuclear Emergency Response Headquarters
Government-TEPCO Integrated Response Office

Red colored letter: newly added to the previous version, : already reported to the government, Green colored shading: achieved object

Issues		As of Apr. 17	Step 1 (around 3 months)	Step 2 (around 3 to 6 months after achieving Step1) current status (as of Aug. 17)	Mid-term issues (around 3 years)
I. Cooling	(1) Reactor	Fresh water Injection	Cooling by minimum injection rate (injection cooling)	Stable cooling	Cold shutdown condition
			Consideration and preparation of reuse of accumulated water		
			Nitrogen gas injection		
			Improvement of work environment		
II. Mitigation	(2) Spent Fuel Pool	Fresh water injection	Reliability improvement in injection operation / remote-control operation *ahead of schedule	Stable cooling	More stable cooling
			Circulation cooling system (installation of heat exchanger) *partially ahead of schedule		
II. Mitigation	(3) Accumulated Water	Transferring water with high radiation level	Installation of storage / processing facilities	Secure storage place	Reduction of total amount of contaminated water
	(4) Ground water	Storing water with low radiation level	Installation of storage facilities / decontamination processing	Mitigate ocean contamination	Mitigate ocean contamination (continued)
II. Mitigation	(5) Atmosphere / Soil	Dispersion of inhibitor	Mitigation of contamination of groundwater	Mitigate ocean contamination	Mitigate ocean contamination (continued)
			Consideration of method of impermeable wall against groundwater		
II. Mitigation	(6) Atmosphere / Soil	Removal of debris	Dispersion of inhibitor (continued)	Mitigate scattering (continued)	Mitigate scattering (continued)
			Removal of debris (continued)		
			Installation of reactor building cover (Unit 1)		
			Removal of debris (top of Unit 3&4 R/B)		
	(7) Atmosphere / Soil	Start of installation work of reactor building container	Consideration of reactor building container		

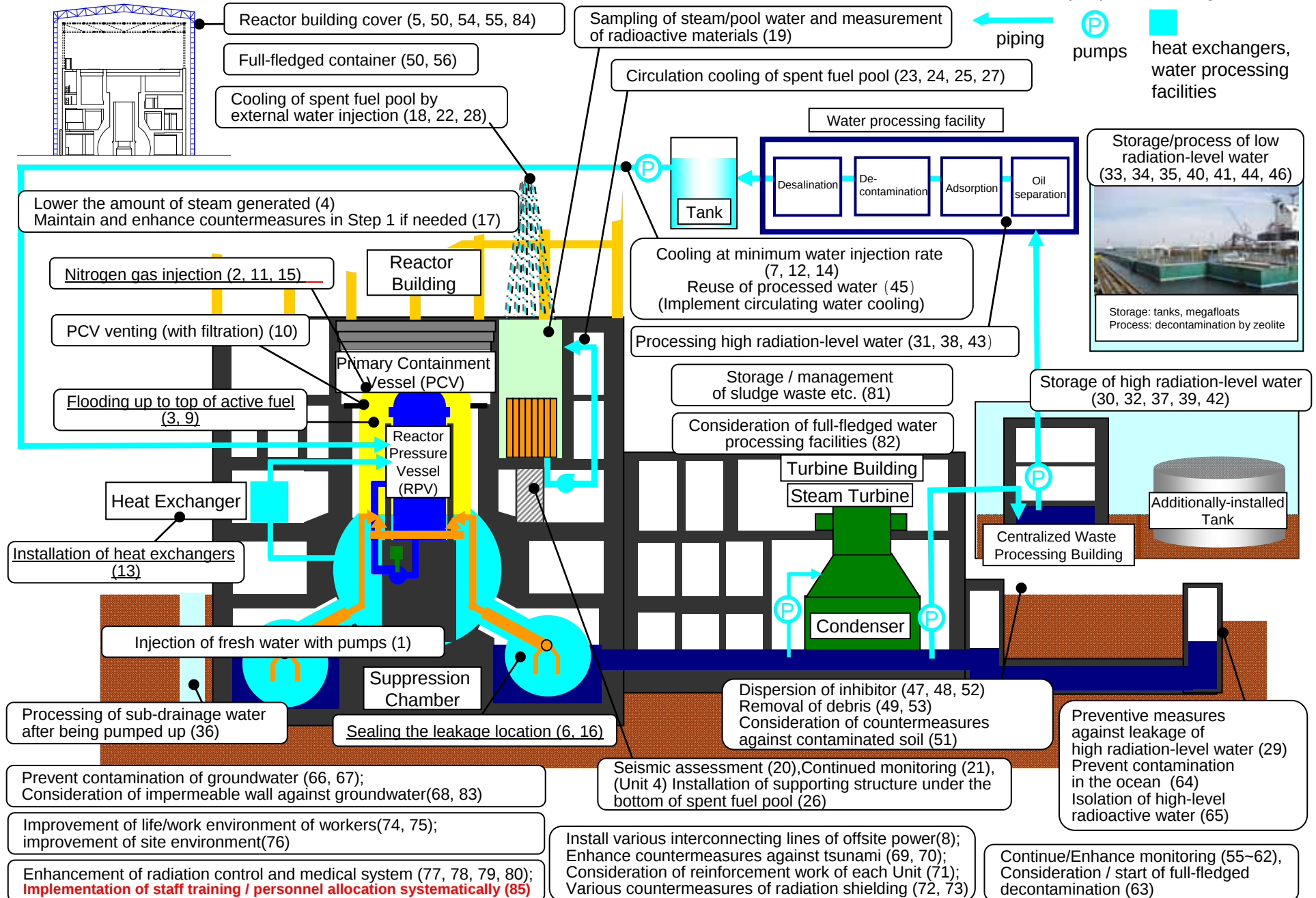
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Issues		As of Apr. 17	Step 1 (around 3 months)	Step 2 (around 3 to 6 months after achieving Step1) ▼ current status (as of Aug. 17)	Mid-term issues (around 3 years)
III. Monitoring/Decontamination	(㊟) Measurement, Reduction and Disclosure	Expansion, enhancement and disclosure of radiation dose monitoring in and out of the power station			Continuous environmental monitoring
				Consideration / start of full-fledged decontamination	Continuous decontamination
IV. Countermeasures for aftershocks, etc	(㊟) Tsunami, Reinforcement, etc	Enhancement of countermeasures against aftershocks and tsunami, preparation for various countermeasures for radiation shielding			Continue various countermeasures for radiation shielding
			(Unit 4 spent fuel pool) Installation of supporting structure	Consideration / implementation of reinforcement work of each Unit	Reinforcement work of each Unit
V. Environment improvement	(㊟) Life/work environment		Improvement of workers' living / working environment		Improvement of workers' life / work environment
	(㊟) Radiation control / Medical care		Improvement of radiation control / medical system		Improvement of radiation control / medical system
	(㊟) Staff Training, personnel allocation			Implementation of staff training / personnel allocation systematically	Implementation of staff training / personnel allocation systematically
Measures for Mid-term issues				Government's concept of securing safety Establishing plant operation plan based on the safety concept	Response based on the plant operation plan

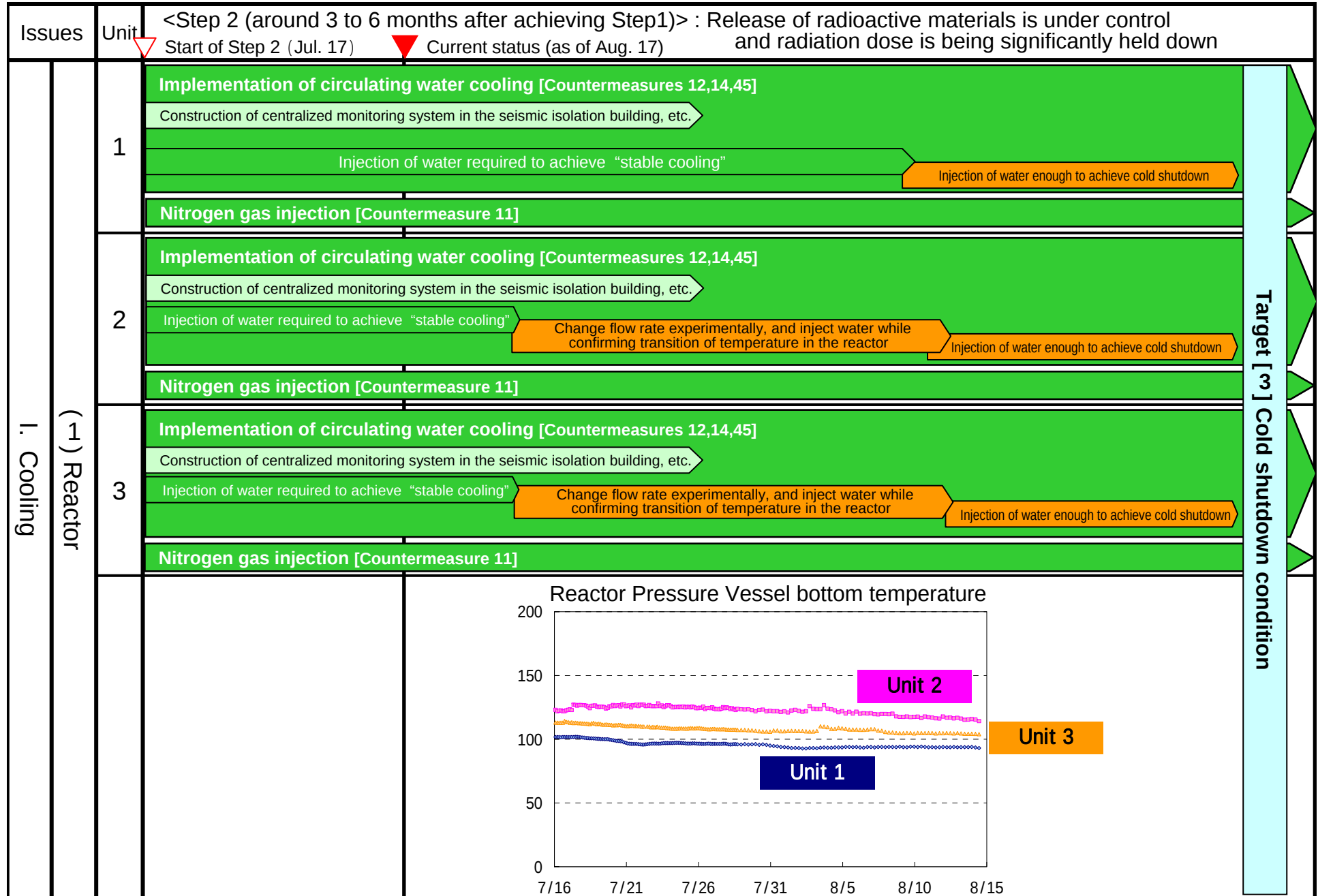
Overview of Major Countermeasures in the Power Station as of August 17

Under line: deleted countermeasures, red colored: newly added countermeasures, : already reported to the government



Current Status of Countermeasures (1)

Red frame: progressed countermeasures from the previous version, : already reported to government



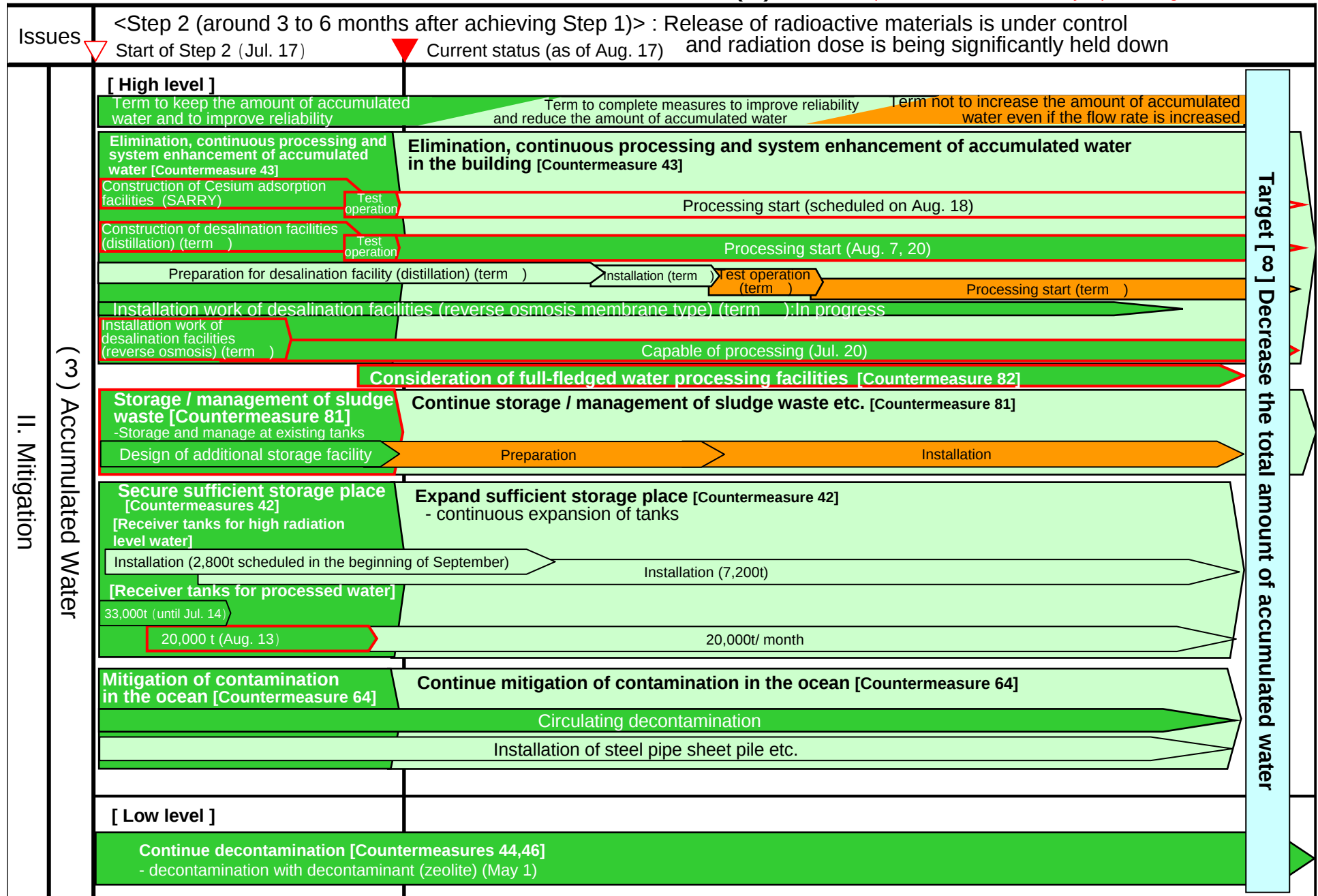
Legend : Implemented (monitored by government as necessary) : Safety check by government (report) : Under construction : Field work started : Field work not started yet

Red frame: progressed countermeasures from the previous version, : already reported to government

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Current Status of Countermeasures (3)

Red frame: progressed countermeasures from the previous version. : already reported to government



Target [∞] Decrease the total amount of accumulated water

Legend : Implemented (monitored by government as necessary) : Safety check by government (report) : Under construction : Field work started : Field work not started yet

Current Status of Countermeasures (4)

Red colored letter: newly added to the previous version, Red frame: progressed countermeasures from the previous version, : already reported to government

Issues		<Step 2 (around 3 to 6 months after achieving Step1)> : Release of radioactive materials is under control Start of Step 2 (Jul. 17) Current status (as of Aug. 17) and radiation dose is being significantly held down	
II. Mitigation	(4) Groundwater	Implementation of preventions against expansion of groundwater contamination [Countermeasure 67] - Sub-drainage management with expansion of storage / processing facilities	Target [4] Mitigation of ocean contamination
		Design of impermeable wall against groundwater [Countermeasure 68] Begin establishment of impermeable wall against groundwater [Countermeasure 83]	
	(5) Atmosphere / Soil	Confirmation of solidification of inhibitor [Countermeasure 52]	Target [5] Prevent scattering of radioactive materials
		Removal of debris [Countermeasure 53] : Collected debris (volume of approx.700 containers (as of Aug. 17)	
		Installation of reactor building cover (Unit 1) [Countermeasures 54,55] ·Under construction	
		Removal of debris on top of reactor buildings (Unit 3&4) [Countermeasures 84] - Under preparatory construction (Unit3: Jun. 20, Unit4: Jun. 24)	
		Preparation work for Unit 3 (Removal of debris on the ground, maintenance of road for crane etc.)	
		Preparation work for Unit 4 (Removal of debris on the ground, maintenance of road for crane etc.)	
	Soil	Consideration of reactor building container [Countermeasure 50]	Target [2] Sufficiently reduce radiation dose
III. Monitoring / Decontamination	(6) Measurement, Reduction and Disclosure	Continue to assess current release of radioactive materials [Countermeasures 60,61] · TEPCO has assessed current value of released amount from Units 1 to 3 through the same way as announced on Jul. 19: ✓The release rate on the assumption that all measured radioactivity arises from the current emission from the reactor buildings is evaluated to be approx. two-hundred-million Bq/hour (This is approx. ten million of the emission rate after the accident.) ✓Excluding the effect of already released radioactive materials, evaluation of exposure doses at the site boundary using the current release rate showed that the maximum exposure dose is 0.4 mSv/year. · Analyze the effect of reducing release as well as improve accuracy of estimated exposure doses through measures including measuring the radioactive materials concentration around the reactor buildings, measuring radioactive materials newly falling at survey points, etc.	Target [2] Sufficiently reduce radiation dose
		Implementation of monitoring in cooperation with the government, prefectures, municipalities and operators [Countermeasures 62]	
		Consideration / start of full-fledged decontamination [Countermeasures 63]	

Legend

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Current Status of Countermeasures (5)

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Issues		<Step 2 (around 3 to 6 months after achieving Step1)> : Release of radioactive materials is under control	
		Start of Step 2 (Jul. 17)	Current status (as of Aug. 17) and radiation dose is being significantly held down
IV. Countermeasures against aftershocks, etc	(~) Tsunami, reinforcement, etc	(Unit 4) Installation of supporting structure under the bottom of the fuel pool [Countermeasure 26] (Jul. 30) Consideration and implementation of reinforcement work of each Unit [Countermeasure 71] - Seismic resistance is being evaluated - Investigation inside the building is planned after measures to reduce radiation dose has achieved Continue various countermeasures for radiation shielding [Countermeasure 73]	Target [9] Mitigation of disasters
	(∞) Living/Working Environment	Continuation and enhancement of improvement of workers' living / working environment [Countermeasure 75] - Plan to build temporary dormitories capable of accommodating approx. 1,600 people; approx. 1,200 people have already moved in (as of Aug. 15) - Sixteen on-site rest stations have been established (approx. 3,500m² in size with a capacity to accommodate approx. 1,200 people) (as of Aug. 15)	Target [8] Enhancement of environment of improvement
	(∞) Radiation control /Medical care	Continuous improvement of radiation control [Countermeasure 78] - Reinforcement of radiation control by NISA - Expansion of whole-body counters, implementation of monthly internal exposure measurement - Automated recording of personal radiation dose, written notification of exposure dose , introduction of workers' certificates with photos - Consideration of long-term healthcare such as enhancement of safety training for workers and establishing database etc. Continuous reinforcement of medical system [Countermeasure 80] - Install new emergency medical facility, establish organization with plural resident doctors (on call 24 hours a day), speedy transportation of patients - Intensive preventive measures against heat stroke (trainings for new workers), countermeasures for mental health and conducting medical examination - Establish industrial hygiene system such as preventive healthcare	Target [8] Enhancement of healthcare
V. Environment improvement		Systematic staff training and personnel allocation [Countermeasure 85] - Promoting human resources training in cooperation with the government and operators	Target [2] Exhaustive radiation dose control

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