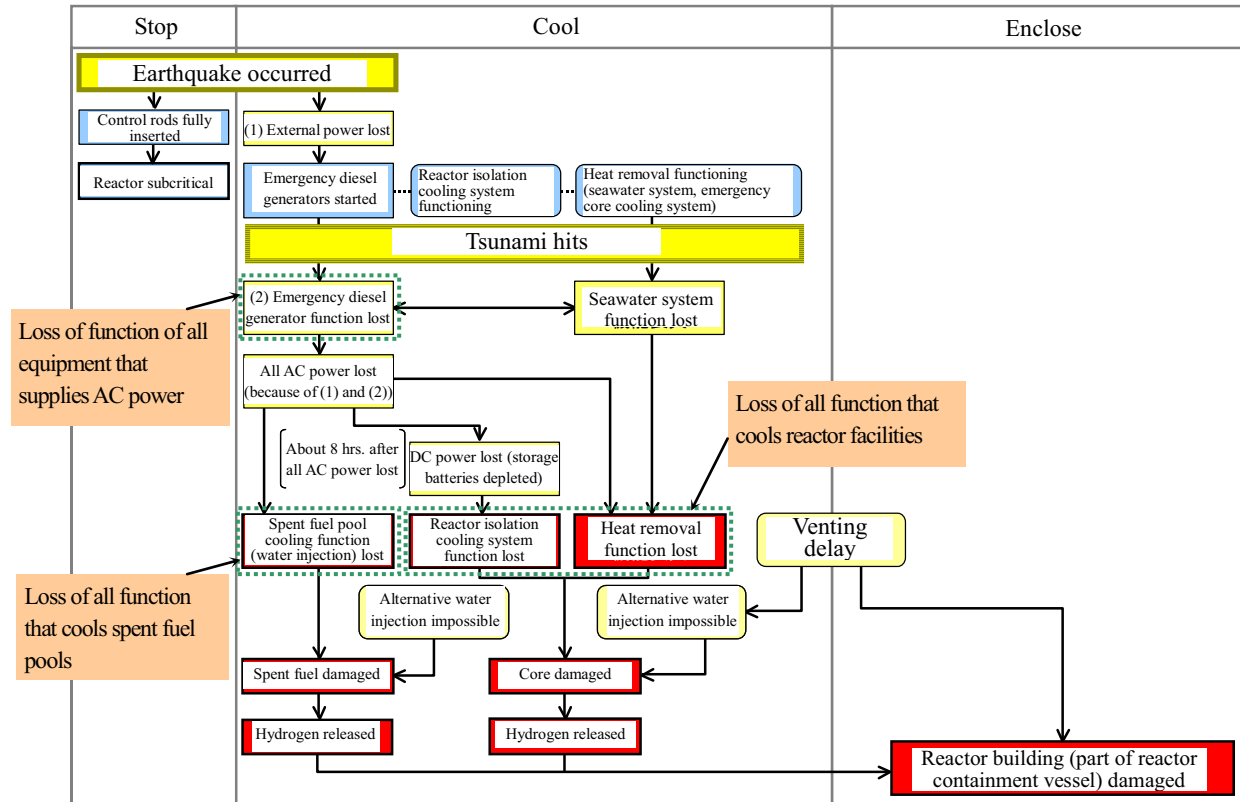


Emergency Safety Measures at Hamaoka Nuclear Power Station (Overview)

1. Overview of emergency safety measures taken

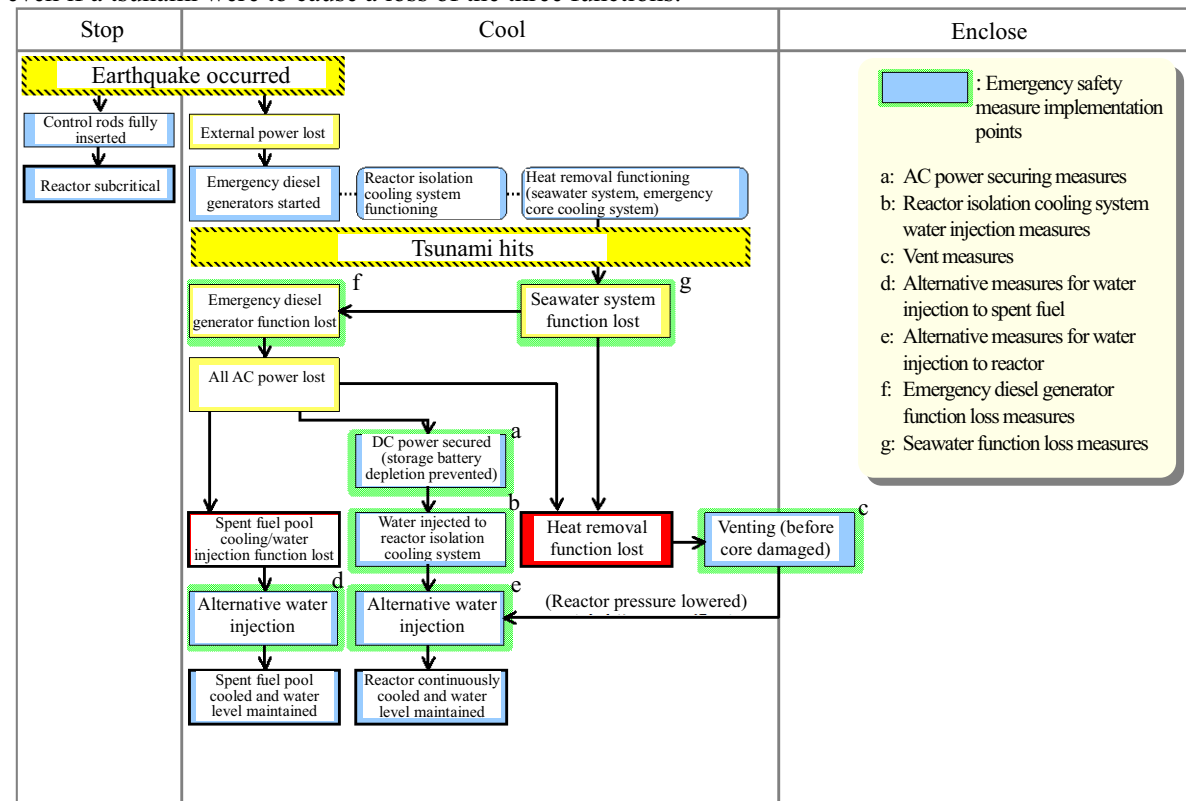
(1) Progression of events up to Tokyo Electric Power Co., Inc. Fukushima Daiichi Nuclear Power Station accident (estimated)

As a result of earthquake and tsunami, the power station lost three functions (function of all equipment that supplies AC power, all function that cools reactor facilities, and all function that cools spent fuel pools). The progress leading up to the accident is conjectured to have been as below.



(2) Overview of measures taken at Hamaoka Nuclear Power Station (emergency safety measures taken)

Chubu Electric Power has taken emergency safety measures that will allow us to prevent damage to our nuclear reactor cores and spent fuel, control releases of radioactive materials and restore reactor facilities' cooling function even if a tsunami were to cause a loss of the three functions.



2. Overview of report based on instructions from Minister of Economy, Trade and Industry

(1) Conduct urgent inspections

Inspect emergency response machinery and equipment [corresponds to implementation points a, b, d - g]
We conducted urgent inspections of the following machinery and equipment used to respond to emergency situations caused by tsunami, and confirmed that there were no irregularities.

Storage batteries (existing), water tanks, water pumps, reactor isolation cooling system equipment, emergency diesel generation equipment, residual heat removal equipment, etc. (a total of about 70 pieces of equipment)

Check waterproof function of reactor buildings [corresponds to implementation points a, b, d - f]

As an emergency safety measure, to prevent seawater from getting into reactor buildings, which house equipment that has to function such as the reactor isolation cooling system equipment, water pumps as an alternative means of injecting water, and so on, we checked the soundness of the waterproofing function of through-ways, doors, etc. in the outer wall of the buildings, and confirmed that there were no irregularities.

(2) Inspect emergency response plan [corresponds to implementation points a - e, g]

To provide the means to take emergency action in the event that the three functions are lost because of tsunami, our quality assurance management system documents now prescribe [1] the establishment of necessary plans, [2] the posting of necessary personnel, [3] training measures, [4] placement of necessary materials and equipment and [5] periodic evaluation and necessary measures. In addition, we have established an "Emergency Operations Handbook (for Loss of Power Functions, Etc.)," including the following procedures, as specific response procedures in the event the three functions are lost.

- Procedures for supplying power, etc. for function of water injection to reactor with reactor isolation cooling system and to use emergency generators to operate water pumps necessary for alternative water injection to reactor and spent fuel pool
- Procedures for ensuring water supply with portable power pumps, etc. to maintain water in reactor isolation cooling system
- Alternative water injection procedures to enable continued injection of water to reactor if that is not possible with the reactor isolation cooling system (includes reactor depressurization procedures)
- Vent operating procedures to operate reactor containment vessel vents promptly in the event of losing all AC power
- Alternative water injection procedures to enable continued injection of water to spent fuel pool in the event of losing all AC power Etc.

(3) Secure power for emergencies [corresponds to implementation points a, c - e]

We have put in place emergency generators capable of making up the necessary power capacity and have put in place the necessary connecting cables from the emergency generators to connect power receiving panels, etc., according to the established procedures.

We additionally inspected these materials and equipment and confirmed that there were no irregularities.

<Number of units put in place>

Materials/equipment	No. 1	No. 2	No. 3	No. 4	No. 5	Remarks
Emergency generator	1	1	2	2	3	<ul style="list-style-type: none"> • Supplies power to chargers and maintains function of reactor isolation cooling system, supervisory control system and safety-relief valves • Supplies power to water pump • Three placed on higher ground as spares



(4) Secure a final heat removal function for emergencies, (5) Secure ability to cool spent fuel pools in emergencies

- Secure water with portable power pumps, etc. [corresponds to implementation points b, d, e]

We have put in place the following necessary materials and equipment, according to the established procedures.

We additionally inspected these materials and equipment and confirmed that there were no irregularities.



<Number of units put in place>

Materials/equipment	No. 1	No. 2	No. 3	No. 4	No. 5	Remarks
Portable power pump	2	2	2	2	2	<ul style="list-style-type: none"> • Secure water • Alternative measures for water injection to reactor • Secure cooling of spent fuel pool • All placed on higher ground, including four as spares
Fire hoses* ¹ (using 1.3 MPa pressure)	(six hoses, each 20 m long) × two sets	Same as left	Same as left	Same as left	Same as left	

*¹: One set put in place for each portable power pump

•Vent reactor containment vessel [corresponds to implementation point c]

We have put in place the following necessary materials and equipment, according to the established procedures.

<Number of units put in place>

Materials/equipment	No. 1	No. 2	No. 3	No. 4	No. 5	Remarks
Nitrogen cylinder			2	2	2* ²	For operating pneumatic valves

*²: Using existing spare cylinders (one put in place for each valve to be operated)

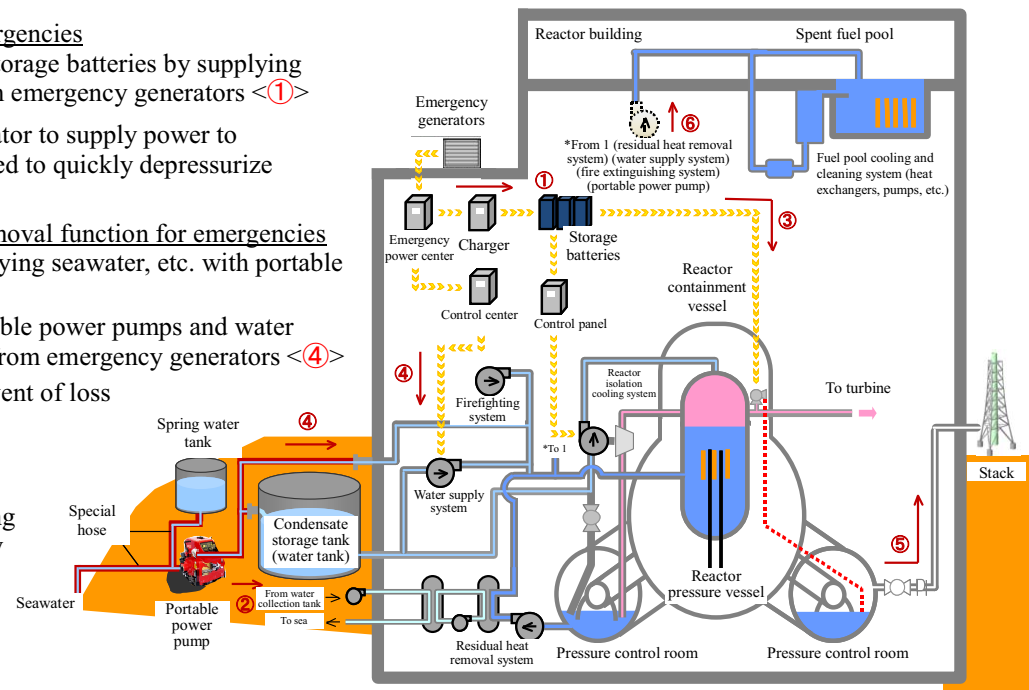
<Overview of emergency safety measures at Hamaoka Nuclear Power Station>

(3) Secure power for emergencies

- Prevent depletion of storage batteries by supplying power to chargers with emergency generators <①>
- Use emergency generator to supply power to safety-relief valves used to quickly depressurize reactor <③>

(4) Secure a final heat removal function for emergencies

- Secure water by supplying seawater, etc. with portable power pumps <②>
- Inject water with portable power pumps and water pumps getting power from emergency generators <④>
- Operate vents in the event of loss of AC power <⑤>
- Inject water with portable power pumps and water pumps getting power from emergency generators <⑥>



(6) Other voluntarily taken measures [corresponds to implementation points a, d, e, g]

- We have established procedures for securing spare electric motors and exchanging them in case the motors of seawater pumps are exposed to water by tsunami and their function lost, so that the motors' function can be restored promptly.
- We have put in place temporary equipment and established procedures for transferring fuel with that equipment in case a tsunami causes the loss of function of fuel transfer pumps of emergency diesel generators kept outdoors.
- We have put heavy equipment in place to remove debris and make access to the power station easier after a tsunami.

(7) Conduct drills based on emergency response plan

We conducted individual drills (including nighttime drills) using the procedures we had established and materials and equipment we had put in place, and a comprehensive drill that imagined simultaneous tsunami damage to Reactors No. 1-5.

We will continue to conduct drills regularly.

Individual drills

- Alternative measures for water injection to reactor
- Alternative measures for water injection to spent fuel pool
- Ensuring water supply with portable power pumps
- Supplying power with emergency generators, etc.

Individual drill (nighttime drill)



Comprehensive drill

A comprehensive drill to respond to a situation in which power is lost, all reactors are simultaneously damaged and a major tsunami alert has been issued

Comprehensive drill



(Reference) Response schedule

Emergency safety measures	March 2011		April 2011	
(1) Conduct urgent inspections			April 18 Inspection completed	
(2) Inspect emergency response plan		Write procedures, etc.	April 20 Established	
(3) Secure power for emergencies			April 12 Put in place	
(4) Secure a final heat removal function for emergencies	Portable power pumps	April 14 Put in place	April 15 Put in place	
(5) Secure ability to cool spent fuel pools in emergencies	Nitrogen cylinders	April 15 Put in place	April 14 Put in place	
(6) Other voluntarily taken measures			April 19 Put in place	
(7) Conduct drills based on emergency response plan			Individual drills	Comprehensive drill April 19

3. Future measures

We will take the following measures to increase tolerance of the power station in terms of tsunami safety.

	FY2011	FY2012	FY2013
◆ Build breakwater	▼ April 5 Ground survey begun		
◆ Build breakwater in the seawater pump area	▼ April 5 Construction work begun		
◆ Enhance reliability of waterproof doors			
◆ Place emergency AC power equipment on higher ground			
◆ Secure spare storage batteries			
◆ Secure spare equipment for emergency core cooling system			
◆ Ensure emergency materials and equipment			