Overview of Actions to Reinforce Hamaoka Nuclear Power Station Tsunami Countermeasures

Attachment

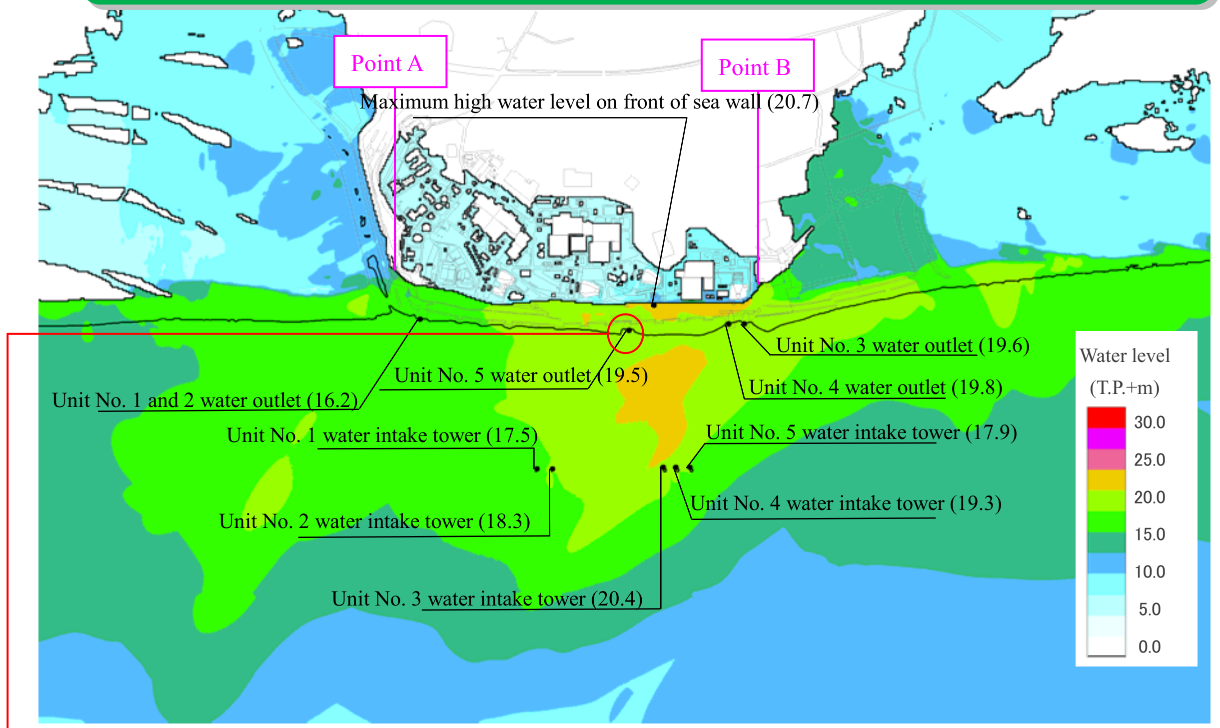
1. Assessment of the Current Status of Tsunami Countermeasures in Light of Published Results from the Cabinet Office

(1) Regarding Tsunami Simulation Using the Cabinet Office Tsunami Fault Model

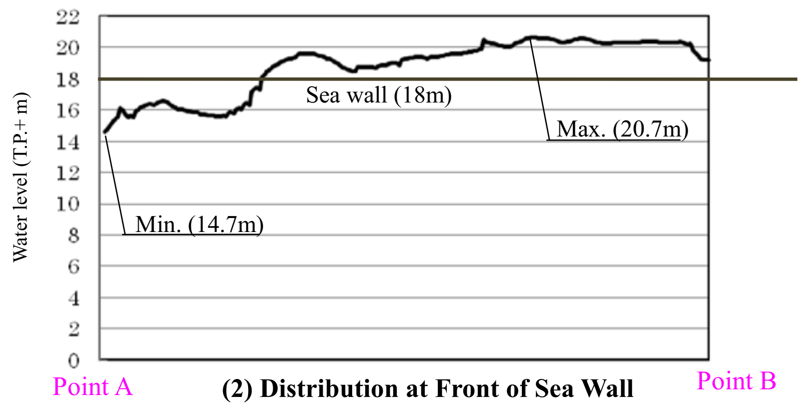
Chubu Electric Power Co., Inc. has used the tsunami fault model from the Cabinet Office to conduct a tsunami simulation in light of data related to estimates of tsunami height and other such matters provided in connection with the second report by the Committee for Modeling a Nankai Trough Megaquake of the Cabinet Office, published in August 2012.

The water level reached by the tsunami in this simulation was from 14.7 to 20.7 m higher than Tokyo Bay mean sea level (T.P.) at the front of the sea wall.

Distribution of Maximum Tsunami Water Levels in and Around the Grounds in Chubu Electric Power Simulation*



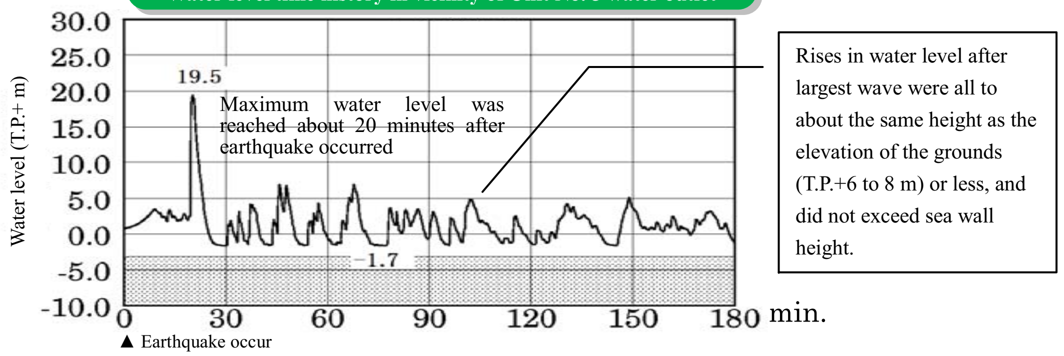
(1) Planar distribution



(2) Distribution at Front of Sea Wall

* Levels indicate maximum values at each location and do not show distribution at any specific time.

Water level time history in vicinity of Unit No. 5 water outlet

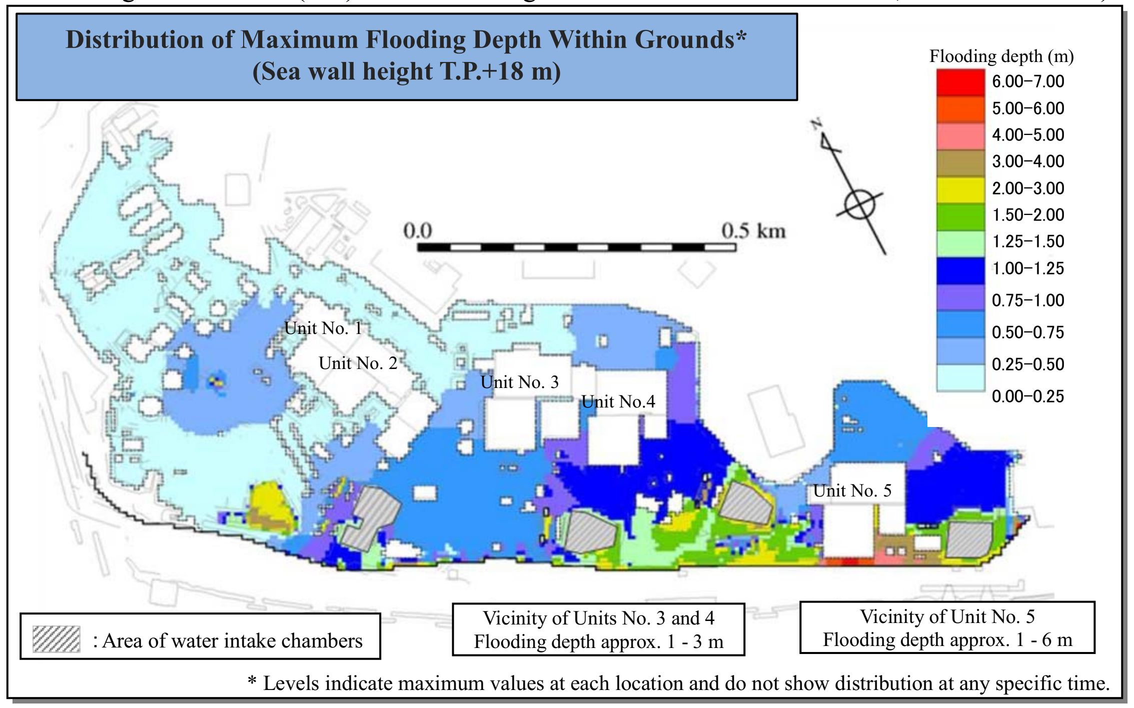


(2) Distribution of flooding in power station grounds

The tsunami overflows the sea wall on the east side of the grounds that is T.P.+18 m in height, but the sea wall serves to limit the amount of flooding within the grounds. (The duration of the sea wall overflow is about 1 minute.)

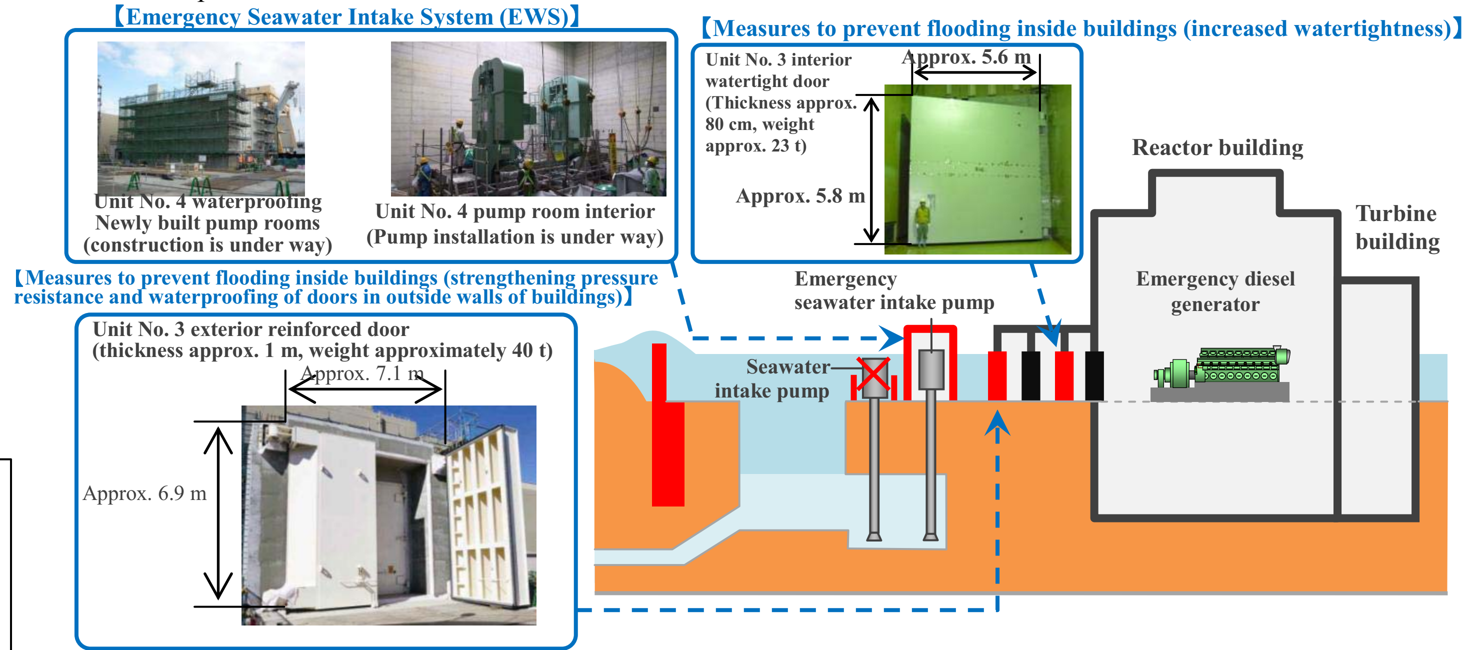
Flooding in the area of Units No. 3 and 4 due to overflow of the sea wall and overflow from the water intake chambers and other such facilities is to an approximate depth of from 1 to 3 m (equivalent to T.P.+7 to 9 m), and in the area of Unit No. 5, from 1 to 6 m (equivalent to T.P.+9 to 14 m). About 30 minutes after inundation, the water recedes to a level of about 20 cm or less due to drainage from water intake chambers and other such facilities.

(Depth of flooding = Water level (T.P.) – Elevation of grounds: 6 m at Units No. 3 and 4; 8 m at Unit No. 5)



(3) Assessment of Impact on Hamaoka Nuclear Power Station Tsunami Countermeasures

Overflow of the sea wall and overflow from intake chambers and other such facilities cause flooding of seawater intake pumps that are necessary for cooling of reactor equipment. However, it was confirmed that cold shutdown of the reactor can be achieved promptly due to measures to prevent flooding inside buildings by strengthening the pressure resistance and waterproofing of doors in outside walls of buildings, etc., together with measures to assure seawater cooling function by means of pumps inside waterproofed buildings (emergency seawater intake system (EWS)), even when Hamaoka Nuclear Power Station Units No. 3 to 5 are in operation.



2. Regarding the Reinforcement of Tsunami Countermeasures

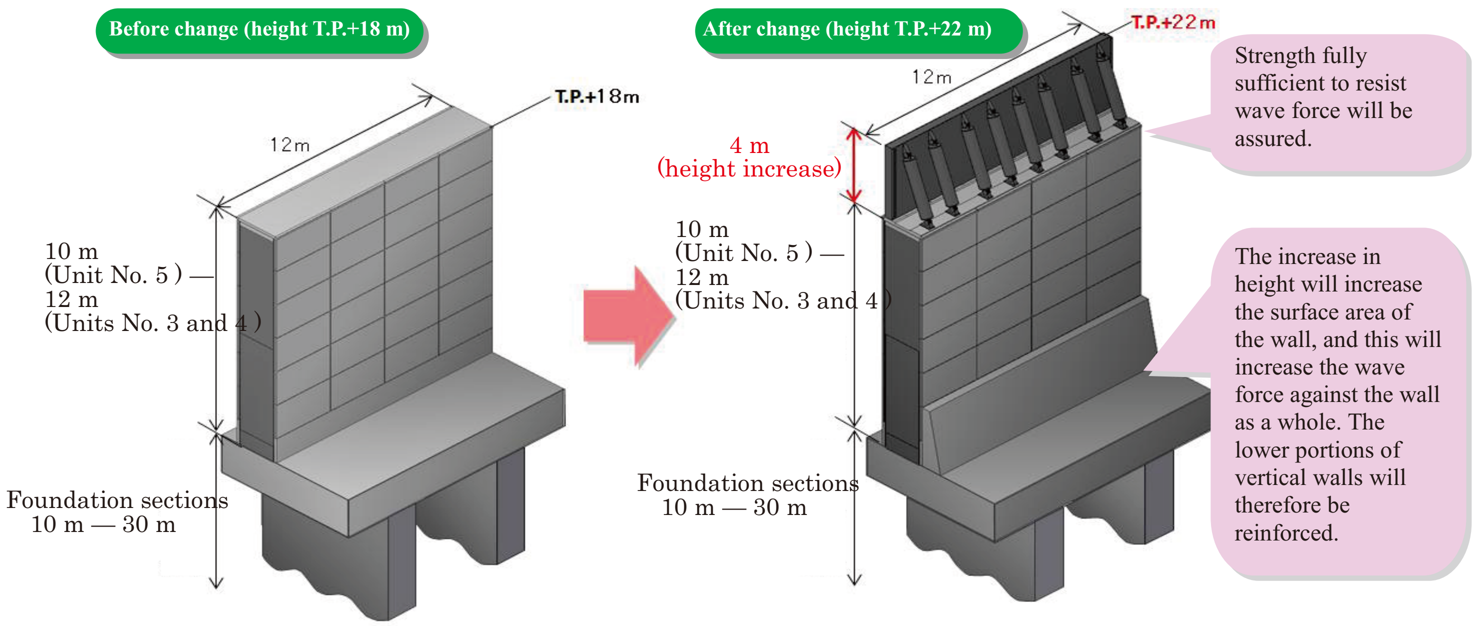
Chubu Electric Power is also committed to even more thoroughgoing pursuit of our approach to countermeasures for tsunami under the Cabinet Office tsunami fault model, which are the largest type of giant tsunami (hereafter "tsunami on the Cabinet Office model"). We are implementing reinforced Flooding Prevention Measures (1) and Flooding Prevention Measures (2) in order to further increase tsunami safety.

Construction of tsunami countermeasures (flooding prevention measures)		Reinforced countermeasures
Flooding Prevention Measures (1): Prevention of flooding inside power station grounds Prevention of flooding inside power station grounds by installation of sea walls (T.P.+18 m) and other such means	+	**Increase height of sea wall and east-west embankment** **Change in height of sea wall**
Flooding Prevention Measures (2): Measures to prevent flooding inside buildings Maintaining seawater cooling function and preventing flooding inside buildings when grounds are flooded	+	**Install automatic closing device on building openings (Unit No. 5)**

(1) Reinforcement of Flooding Prevention Measures (1)

<1> Regarding the increase in height of sea wall and east-west embankment

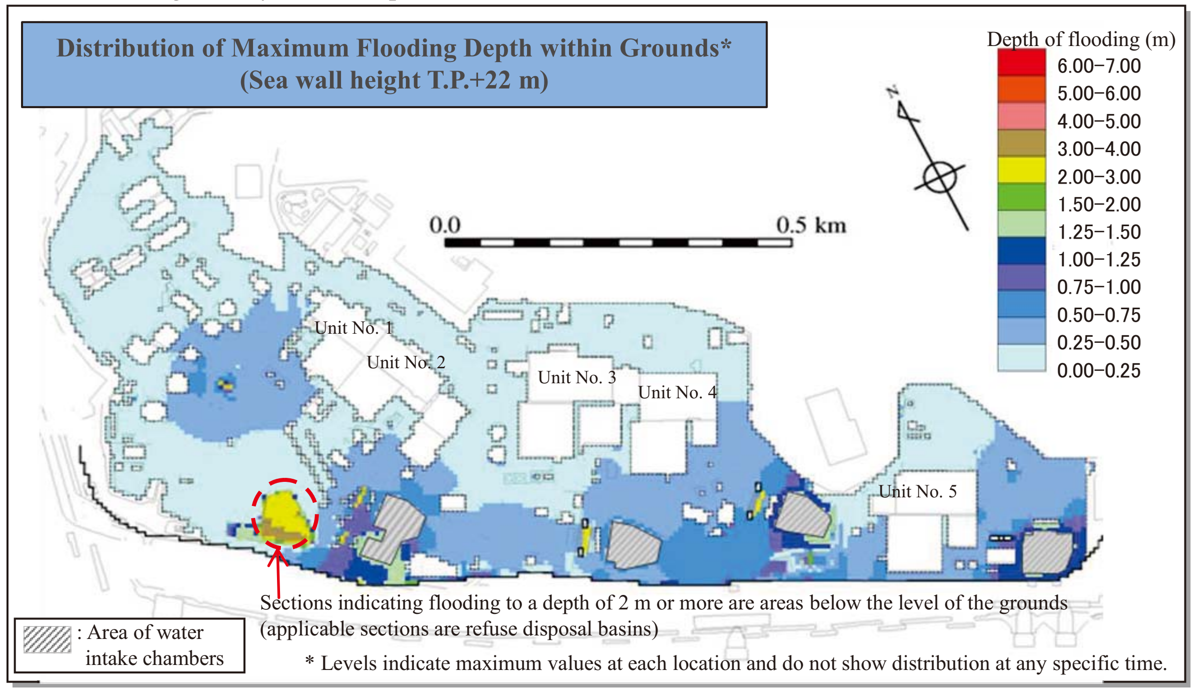
In order to heighten the effect of preventing flooding within the power station grounds to the greatest possible extent, the height of the sea wall will be increased from the present T.P.+18 m to T.P.+22 m. The height of the east-west embankments will also be raised from T.P.+18 to 20 m to T.P.+22 to 24 m.



(Conceptual image)

<<Depth of Flooding After Increase in Sea Wall Height>>

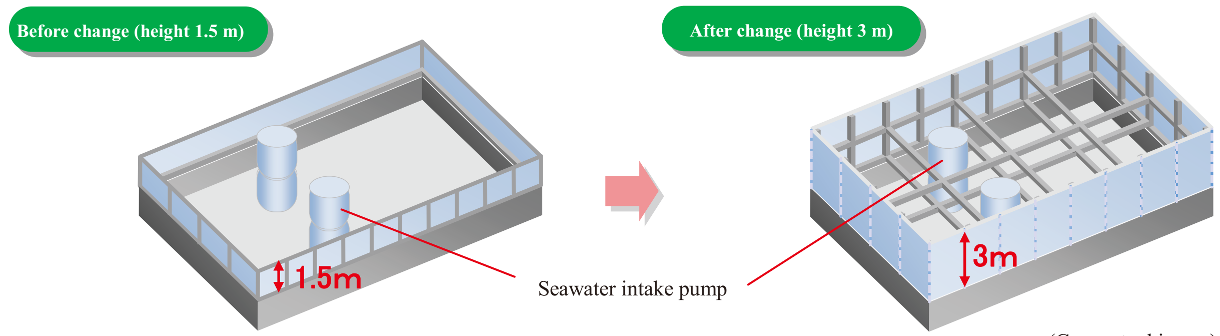
The overflow over the sea wall from a tsunami on the Cabinet Office model will be eliminated. Flooding within the grounds will be limited to overflow from intake chambers and other such facilities, and flooding in the vicinity of Units No. 3 to 5 will generally be to a depth of no more than 1 m or less, or at most 2 m or less.



* Levels indicate maximum values at each location and do not show distribution at any specific time.

<2> Regarding the change in sea wall height

The depth of flooding in the area around the seawater intake pumps will be about 1.3 m at most. In order to be certain of reinforcing the function of preventing flooding of seawater intake pumps that are necessary for cooling reactor equipment, the height of the sea wall in the seawater intake pump area will be raised from the present 1.5 m to 3 m. As the sea wall is made higher, work to reinforce its structure will also be carried out.



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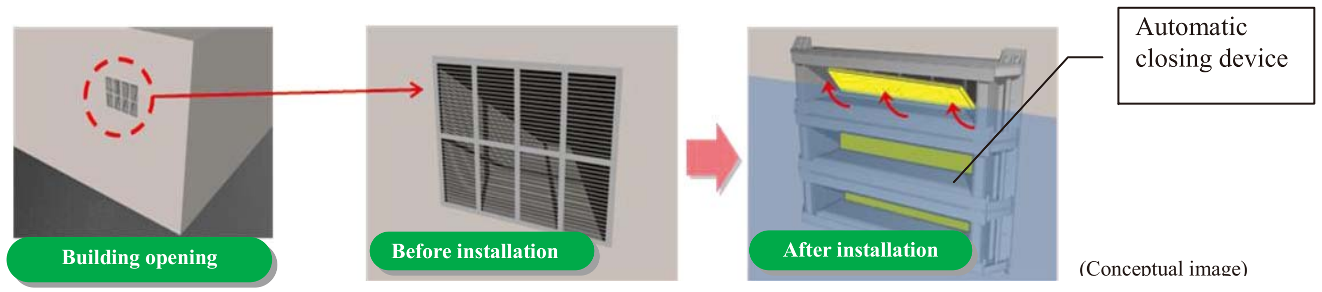
(2) Reinforcement of Flooding Prevention Measures (2)

Preparations will be made against the eventuality of increased flooding within the power station grounds by a tsunami that overflows the sea wall and by overflow from intake chambers and other such facilities. The measures to prevent flooding inside buildings will therefore be further secured. When the tsunami in the recent simulation overflowed the sea wall and flooded the power station grounds, the maximum flood level in the vicinity of Unit No. 5 was about 5 m higher than in the vicinity of Units No. 3 and 4. Therefore, the building opening located high up on Unit No. 5 will be equipped with a new automatic closing device that has been under consideration for practical application.



(Conceptual image)