

EIC-COEIC. Comissió d' Energia
Jornada BIOMASA, BIÒGÀS i NUCLEAR

Barcelona 3-10-2013

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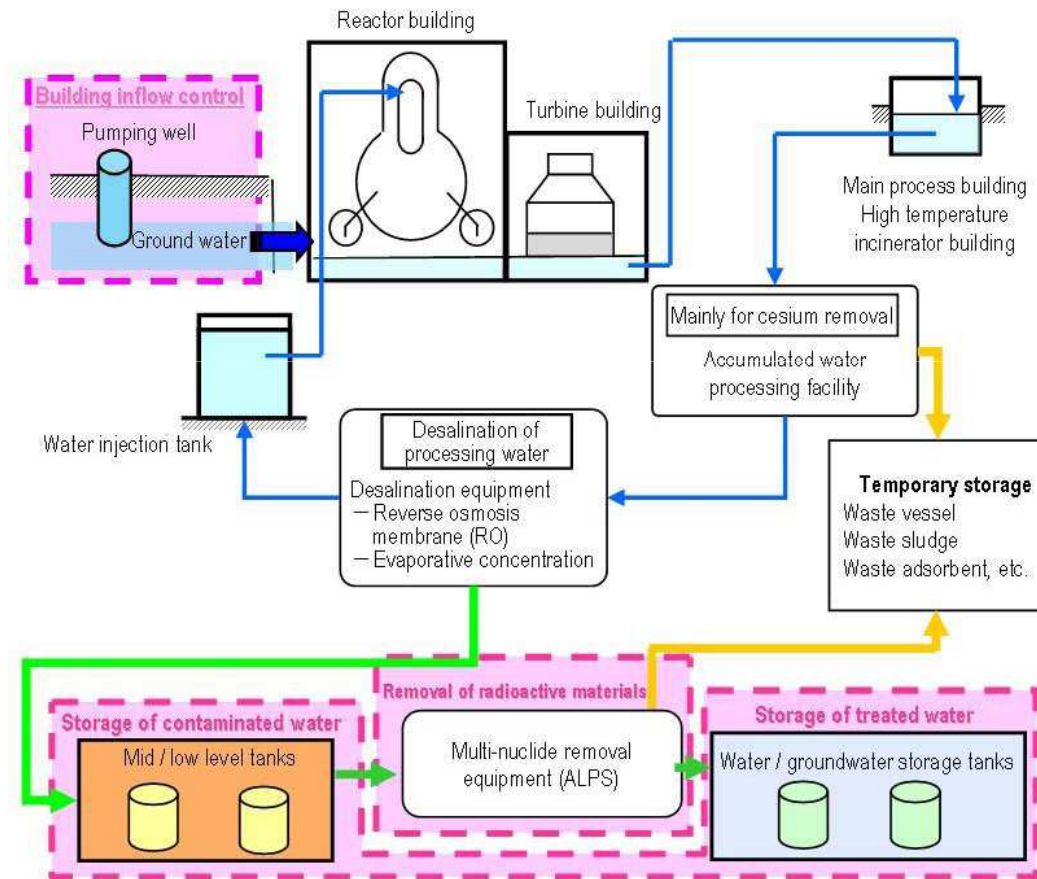
Barcelona 3, octubre 2013



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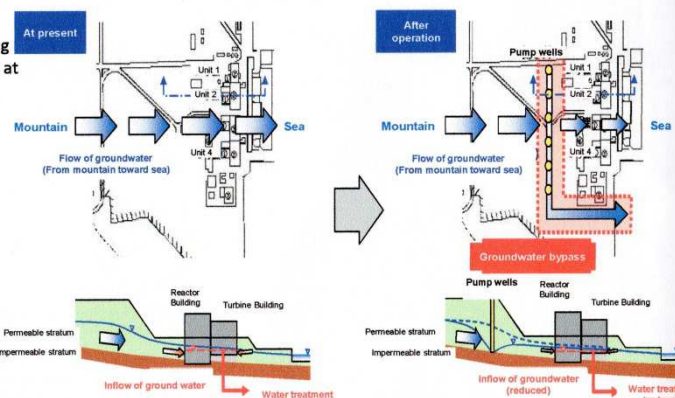
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Groundwater bypass

<Concept>
 - The plan to prevent groundwater from flowing into buildings by pumping up the groundwater at the mountain side of the buildings. **[Isolating]**



The diagram illustrates the 'Groundwater bypass' concept. On the left, 'At present', groundwater flows from the mountain side towards the sea, passing through buildings (Unit 1, Unit 2, Unit 4). On the right, 'After operation', a 'Groundwater bypass' system is implemented. Pump wells are installed on the mountain side to pump up groundwater before it reaches the buildings. This results in a 'reduced' inflow of groundwater into the buildings, which then undergo 'Water treatment (reduced)'. The diagram also shows a cross-section of the ground with 'Permeable stratum' and 'Impermeable stratum' layers, and labels for 'Reactor Building' and 'Turbine Building'.

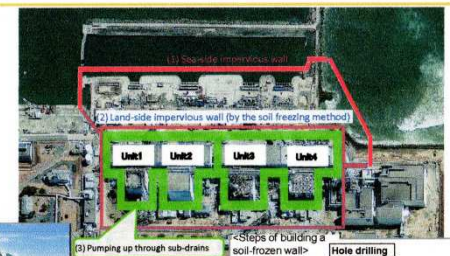
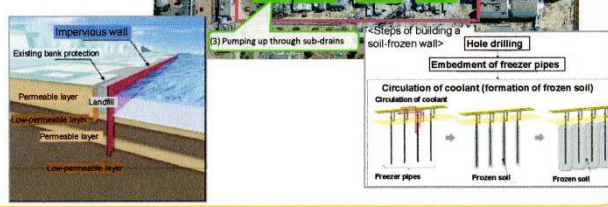
A tightly-sealed structure is adopted for each pump well.

Dedicated pipes and tanks are installed.

Sea side area

<Situations>
 - In May highly concentrated tritium (500,000 Bq/L) was detected in the groundwater on the sea side of the reactor buildings.

<Measures>
 - Installation of a soil-frozen wall **[Isolating]**
 - Installation of impervious wall in the port **[Preventing leakage]**
 - Removing contaminated water in the trench **[Removing]**
 - Pumping up groundwater through sub-drains **[Isolating]**
 - Sea side area pavement **[Isolating]**

The aerial view shows reactor buildings Unit 1, Unit 2, Unit 3, and Unit 4. Measures include: (1) Sea-side impervious wall, (2) Land-side impervious wall (by the soil freezing method), and (3) Pumping up through sub-drains. The cross-section diagram shows an 'Impervious wall' with 'Existing bank protection' on the sea side and 'Landfill' on the land side. It also illustrates the 'Embedment of freezer pipes' and the 'Circulation of coolant (formation of frozen soil)', showing 'Freezer pipes' leading to 'Frozen soil'.

[Source]TEPCO: <http://www.tepco.co.jp/>

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- **Sitanció Actual Parque Nuclear**
- 429 plantas en operaci3n 390.000MW
- + 4 nuevas plantas
 - 1 China, 1 Rusia, 2 Corea del Sur
- 76 Plantaas en construcci3n. 78.000 MW
- 97 Planificadas 100.000 MW
 - 2 Hinkley Point UK

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Groundwater bypass

<Concept>
 - The plan to prevent groundwater from flowing into buildings by pumping up the groundwater at the mountain side of the buildings. **[Isolating]**

At present: Flow of groundwater (From mountain toward sea) towards Reactor Building and Turbine Building.

After operation: Pump wells on the mountain side pump groundwater up, creating a 'Groundwater bypass' that prevents flow into buildings. Inflow of groundwater is reduced, and water treatment is also reduced.

A tightly-sealed structure is adopted for each pump well.

Dedicated pipes and tanks are installed.

Sea side area

<Situations>
 - In May highly concentrated tritium (500,000 Bq/L) was detected in the ground water on the sea side of the reactor buildings.

<Measures>
 - Installation of a soil-frozen wall **[Isolating]**
 - Installation of impervious wall in the port **[Preventing leakage]**
 - Removing contaminated water in the trench **[Removing]**
 - Pumping up groundwater through sub-drains **[Isolating]**
 - Sea side area pavement **[Isolating]**

(1) Sea side impervious wall

(2) Land-side impervious wall (by the soil freezing method)

(3) Pumping up through sub-drains

Steps of building a soil-frozen wall:

- Hole drilling
- Embedment of freezer pipes
- Circulation of coolant (formation of frozen soil)

Freezer pipes → Frozen soil → Frozen soil

[Source]TEPCO: <http://www.tepco.co.jp/>