Status of countermeasures against tsunami at Kashiwazaki Kariwa Nuclear Power Station

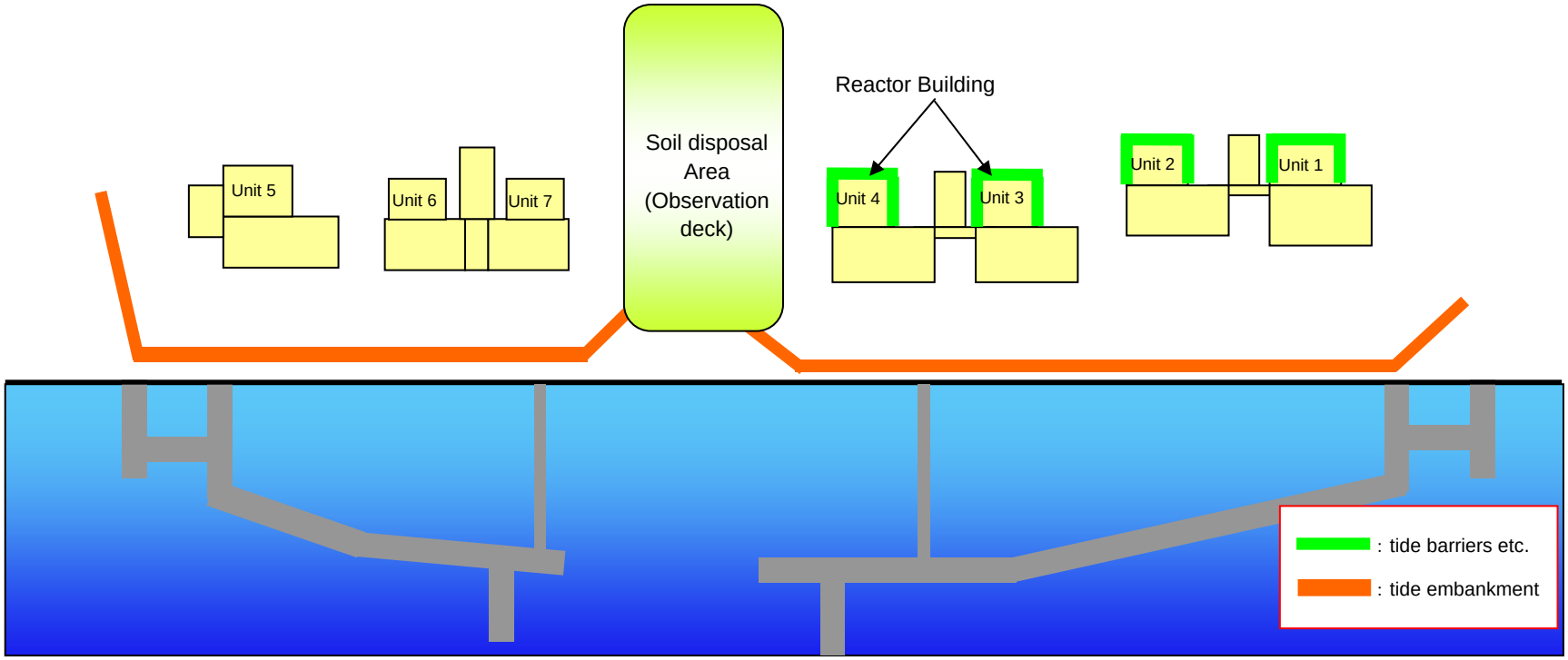
June 30, 2011

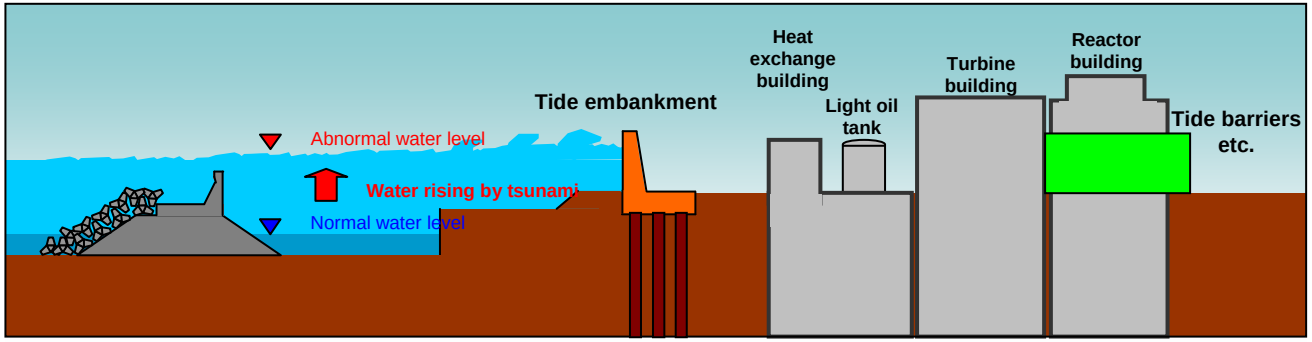
Tokyo Electric Power Company

Kashiwazaki Kariwa Nuclear Power Station

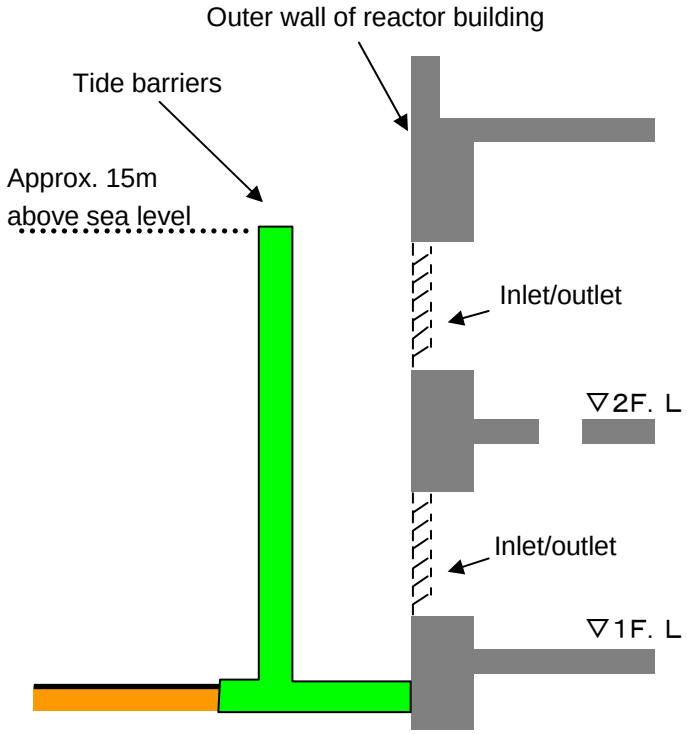
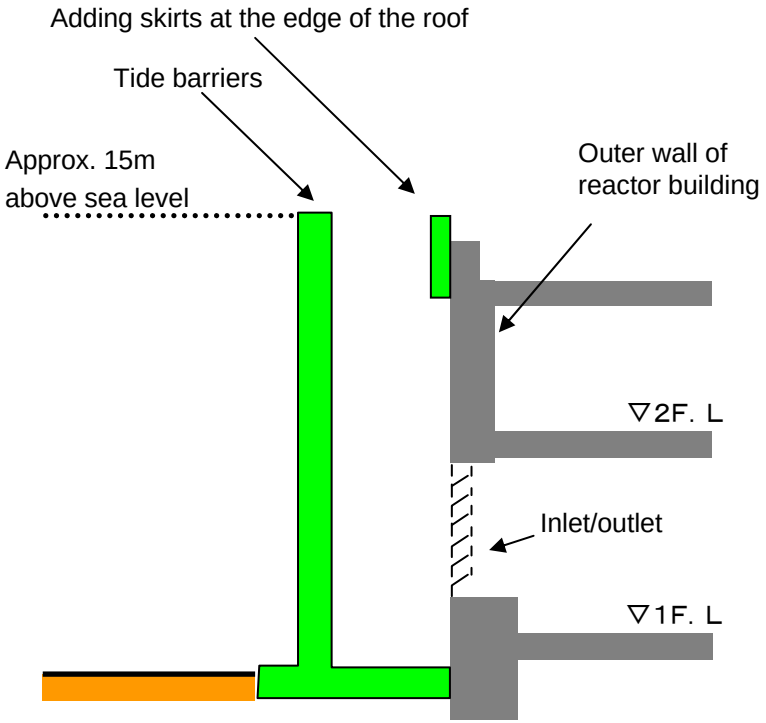
TEPCO 東京電力

Overview of tide embankment and tide barriers etc.

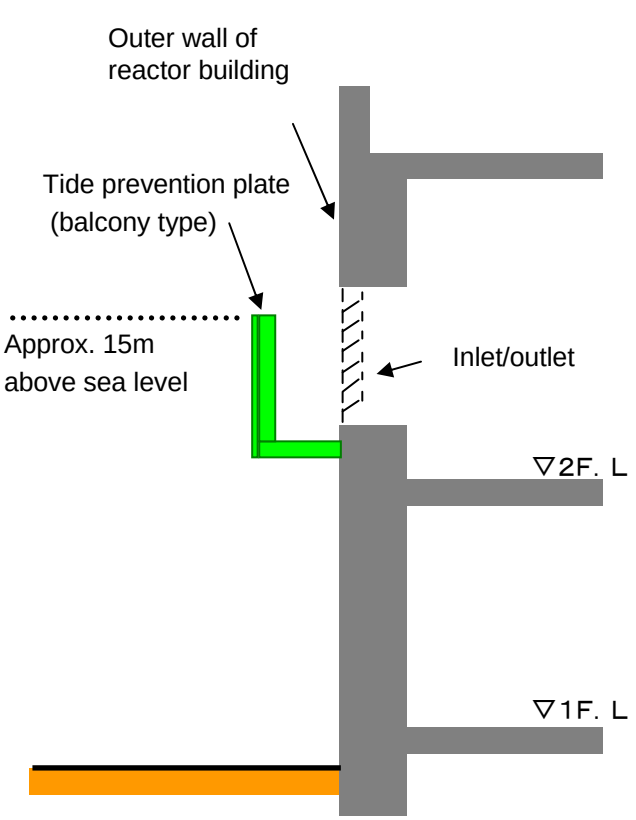
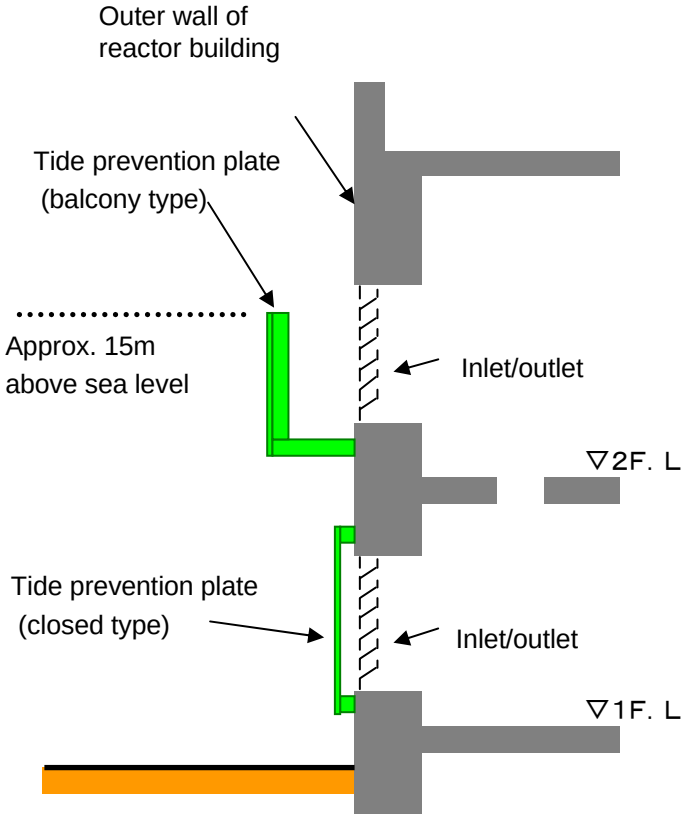




Overview of tide barriers

Form	Tide barrier	
Overview		

Overview of tide prevention plate

Form	Tide prevention plate (balcony type)	Upper : Tide prevention plate (balcony type) Lower : Tide prevention plate (closed type)
Overview		

Overview of doors at reactor buildings

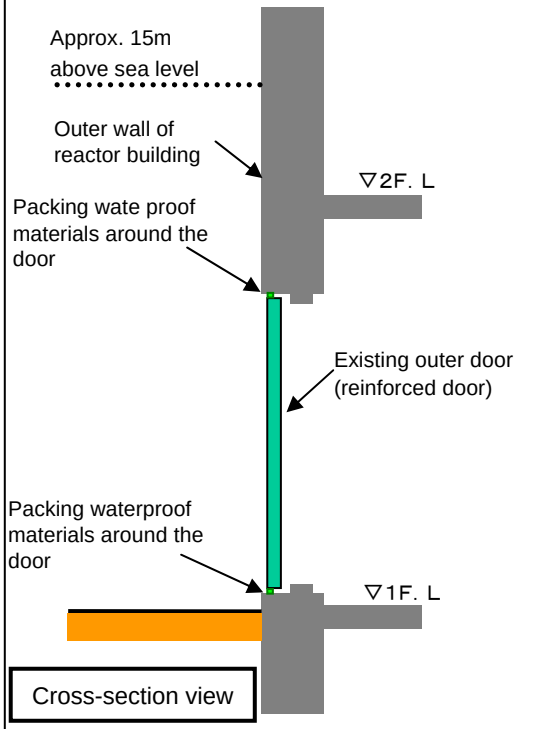
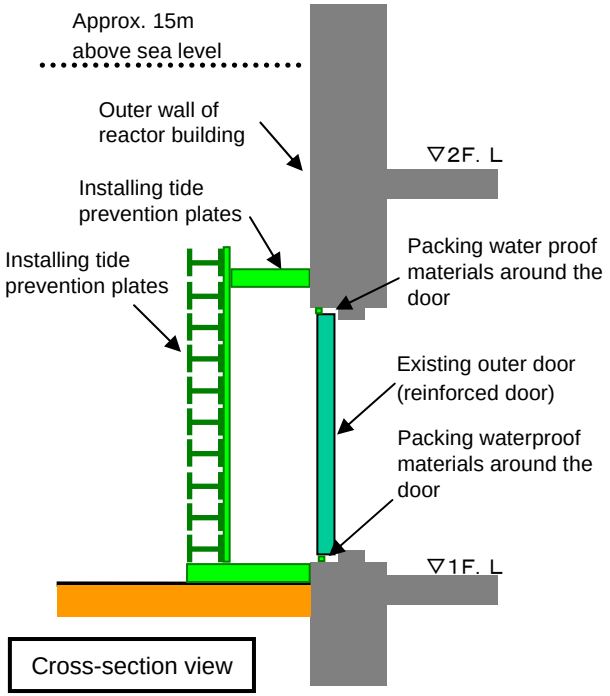
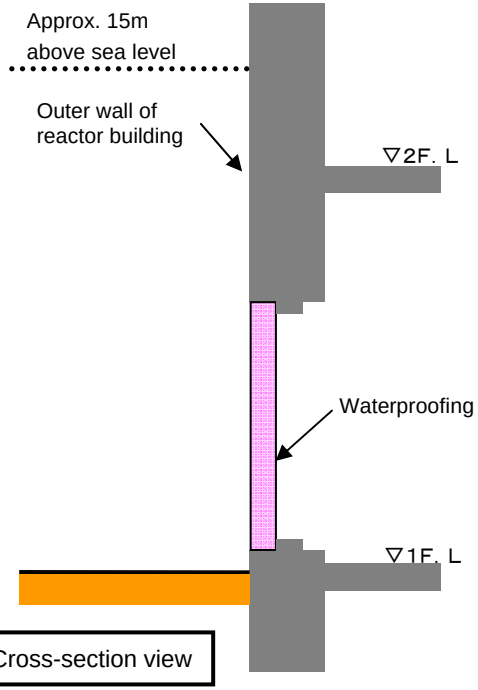
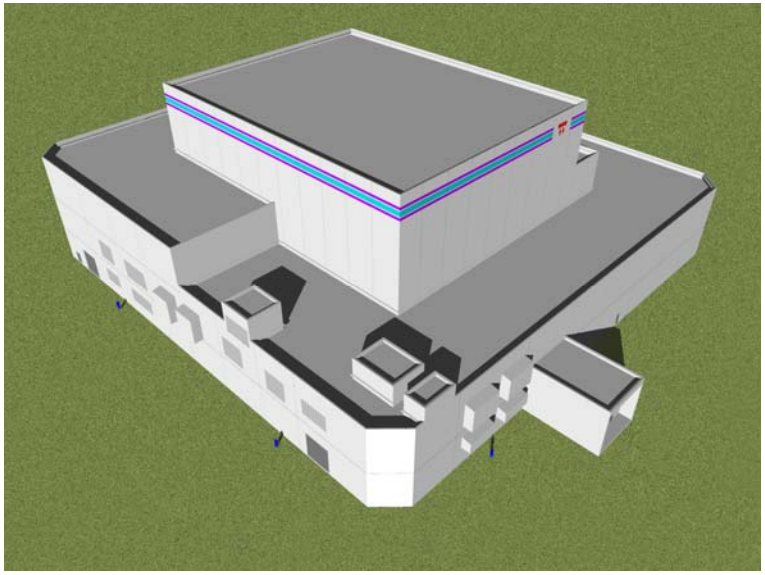
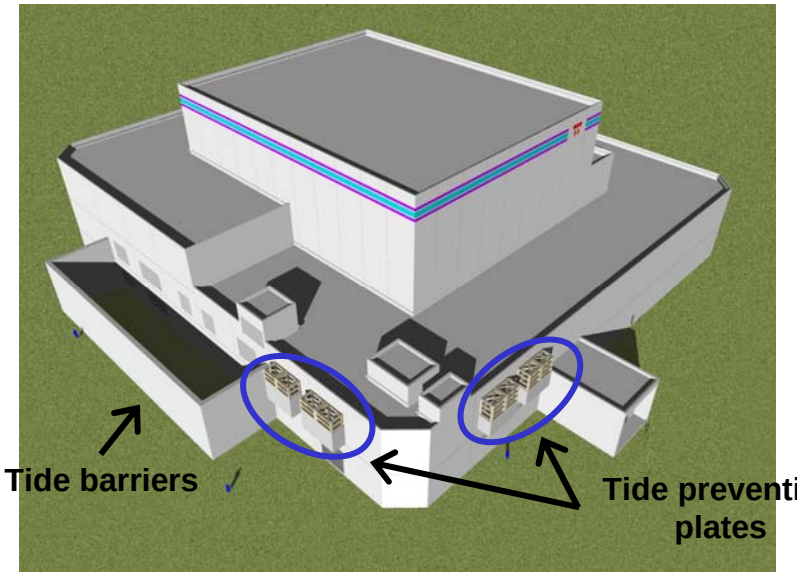
	Packing waterproof materials around entrance doors (current status at Units 2, 3 and 4)	Installing a tide prevention plate in front of entrance doors, and packing waterproof materials (current status at Unit 1)	Waterproof entrance doors at reactor buildings (image of permanent measures)
Overview	 Cross-section view  Image photo	 Cross-section view  Image photo	 Cross-section view  Image photo

Image of Unit 1 reactor building after installing tide barriers etc.

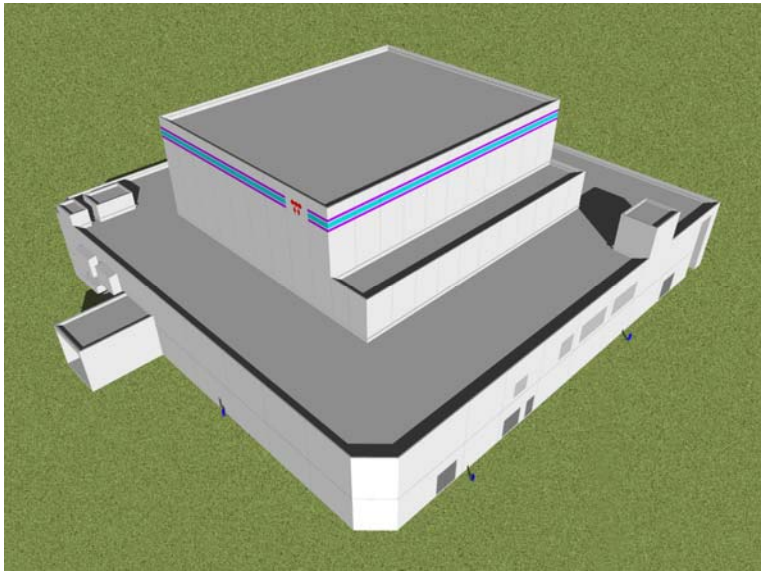
◆ Before implementation (southeast side)



◆ Image after implementation (southeast side)



◆ Before implementation (northeast side)



◆ image after implementation (northeast side)

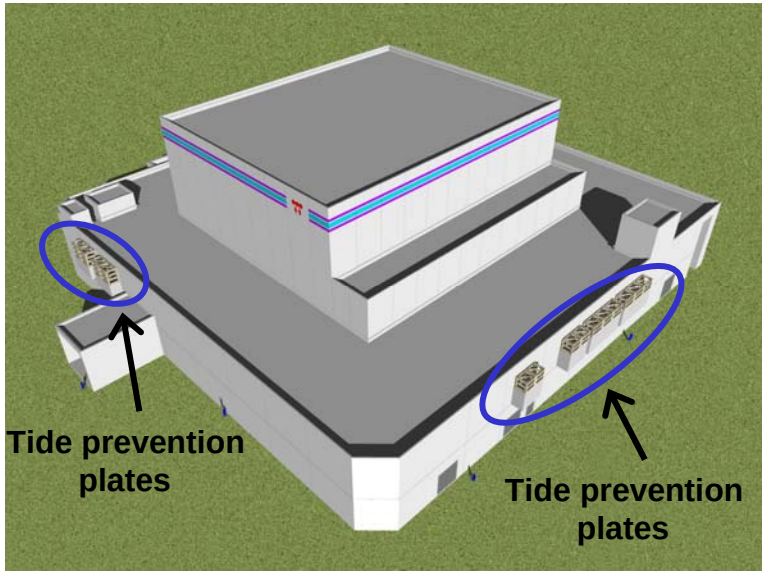
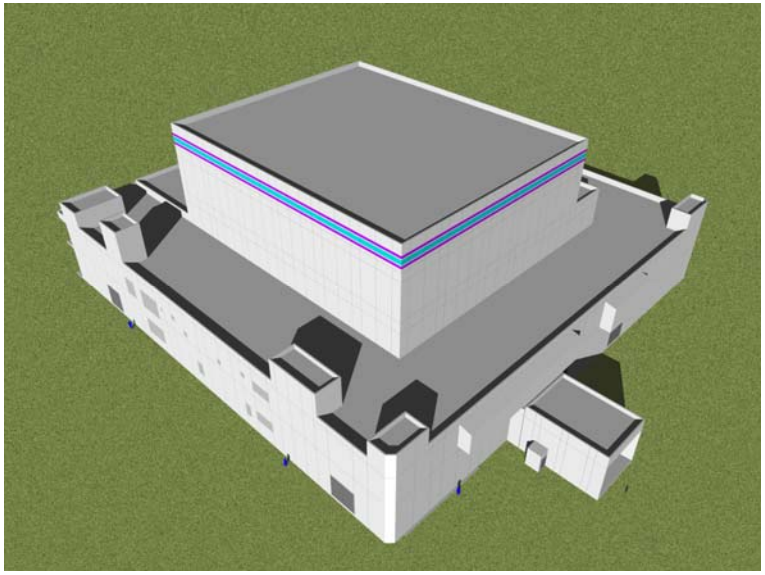
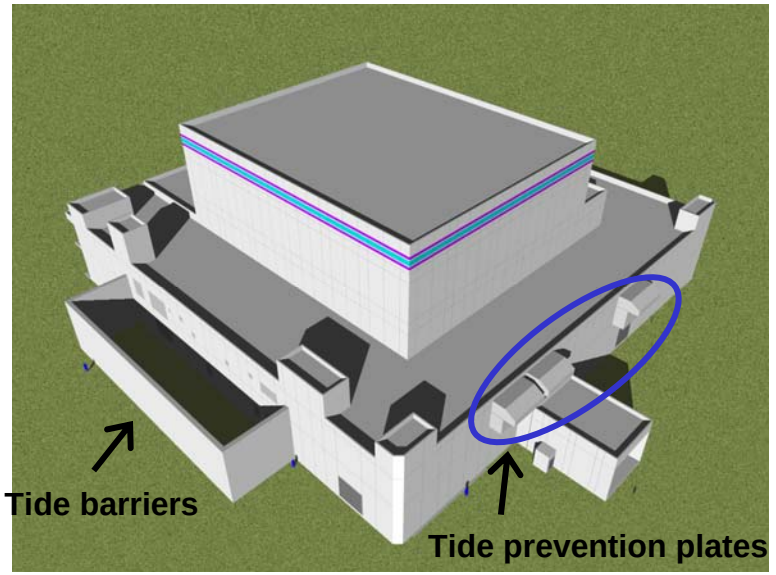


Image of Unit 2 reactor building after installing tide barriers etc.

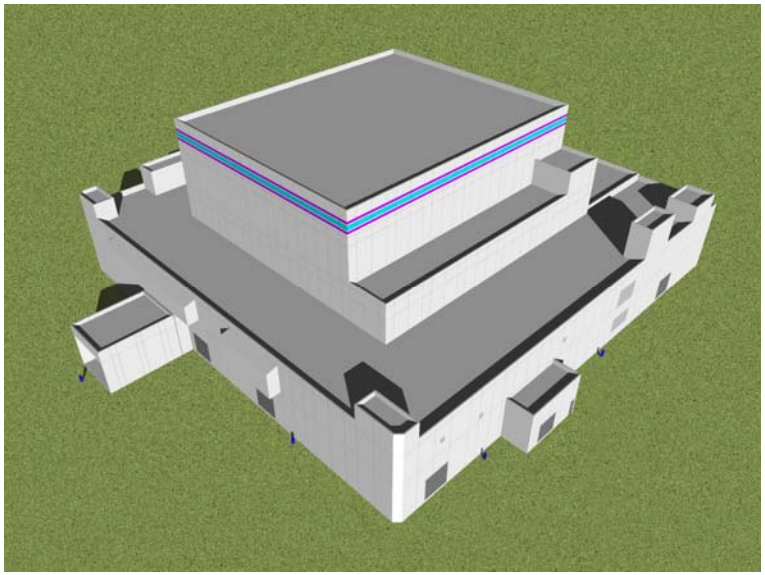
◆ Before implementation (southeast side)



◆ Image after implementation (southeast side)



◆ Before implementation (northeast side)



◆ Image after implementation (northeast)

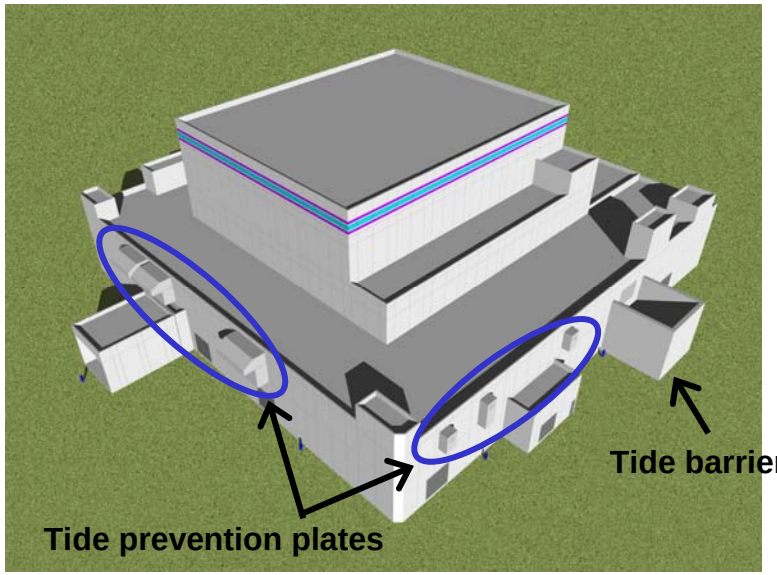
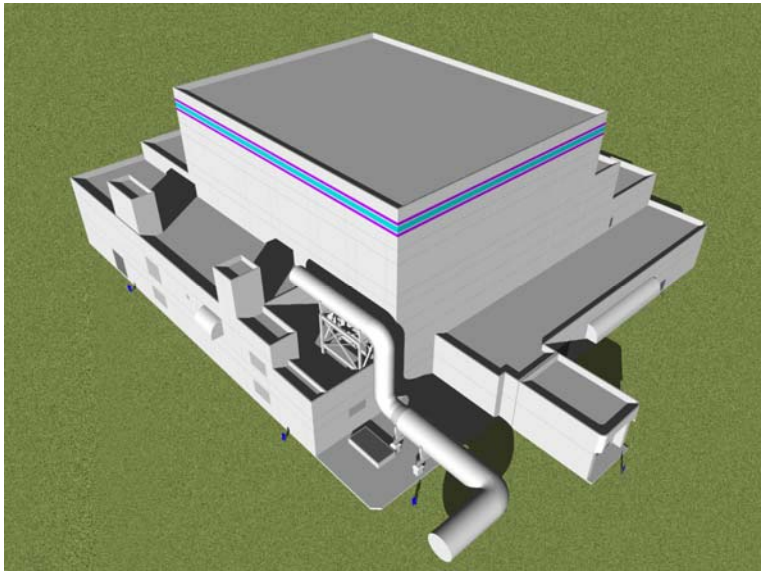
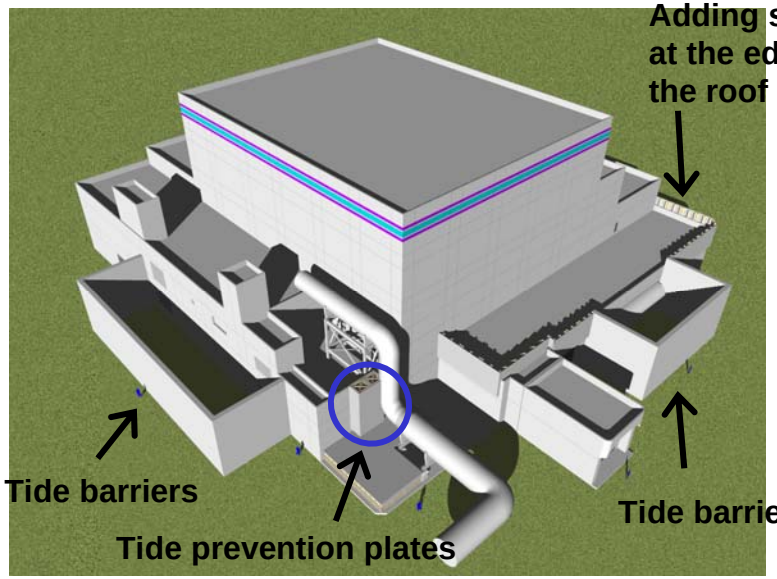


Image of Unit 3 reactor building after installing tide barriers etc.

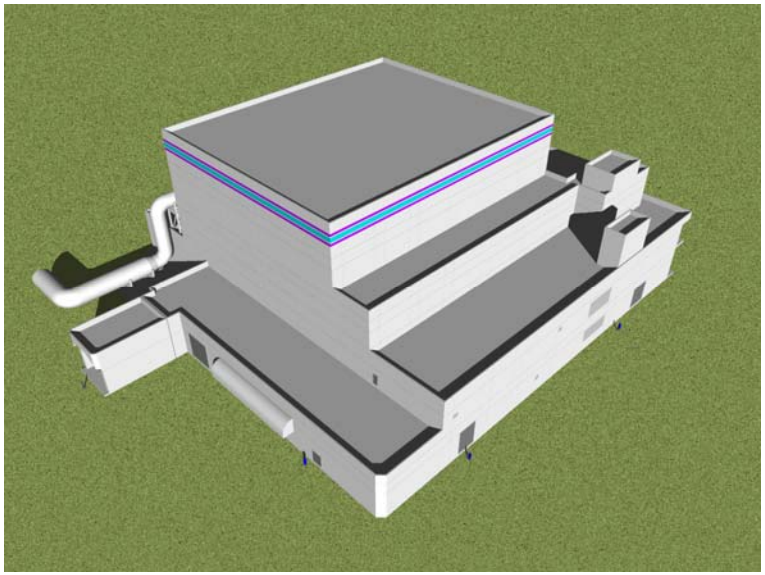
◆ Before implementation (southeast side)



◆ Image after implementation (southeast side)



◆ Before implementation (northeast side)



◆ Image after implementation (northeast)

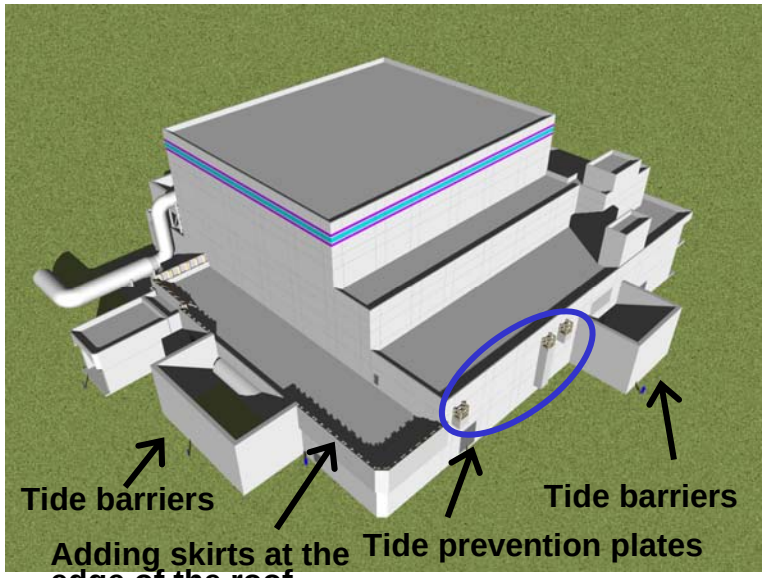
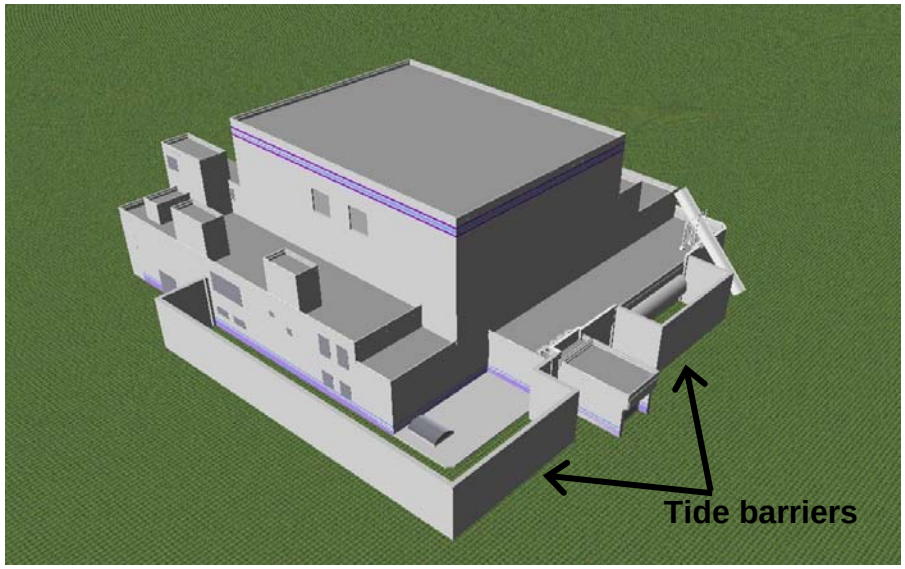


Image of Unit 4 reactor building after installing tide barriers etc.

◆ Before implementation (southeast side)

◆ Image after implementation (southeast side)



◆ Before implementation (northeast side)

◆ Image after implementation (northeast)

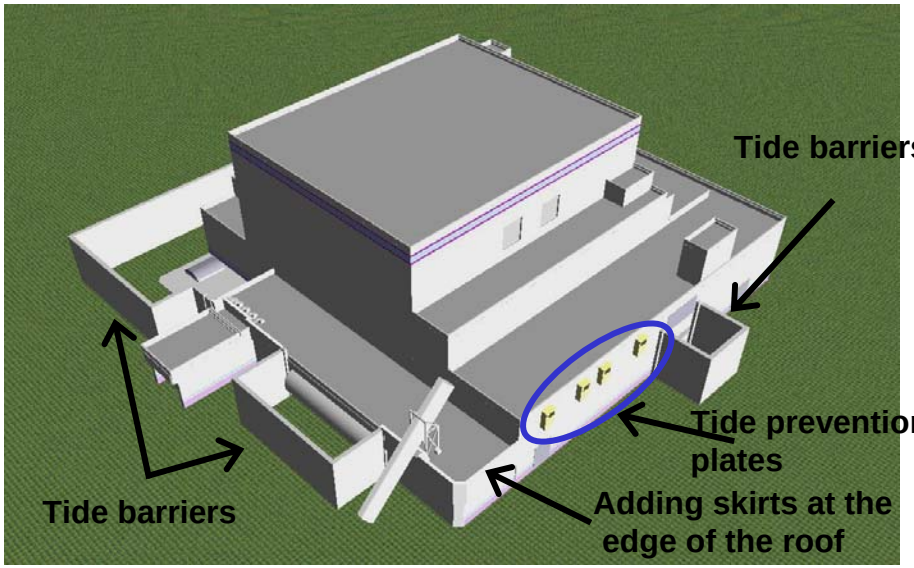
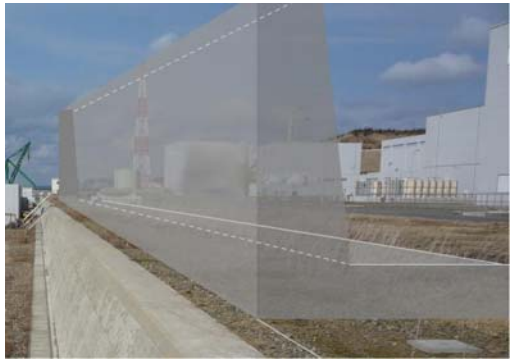


Image after installing tide embankment

Image of tide embankment

Embankment type



Wall type

Height：Approx. 15m above sea level

Length：-Arahama side (Units 1 to 4)

Approx. 1.5 km

-Ohminato side (Units 5 to 7)

Approx. 1 km

Status of implementing countermeasures in the future against tsunami

As of June 29, 2011

Item	Status	Schedule		
		Fiscal year 2011	Fiscal year 2012	Fiscal year 2013
Ⅰ. Establishment of tide embankment	Designing	Design → (Planned) commencement of work in the latter half of FY 2011		(Planned) completion in around 1Q of FY 2013
Ⅱ. Prevention of flood in buildings				
（1）Establishment of tide barriers (including waterproofing inlets etc.)	Commencement of work * Refer to the next page	(Planned) commencement of work in April		(Planned) completion in around the latter half of FY 2012
（2）Waterproofing doors in reactor buildings	Designing in detail	Design → (Planed) commencement of work in July		(Planned) completion in around the latter half of FY 2012
Ⅲ. Further improvement of functions such as heat removal and cooling				
（1）Installment of water resources	Designing	Design → (Planned) commencement of work in the latter half of FY 2011		(Planned) completion in around the first half of FY 2012
（2）Additional deployment of gas turbine generation vehicle	1 vehicle deployed, Arranging 1 more	(Planned) procurement in/before July		(Planned) deployment in around the latter half of FY 2011
（3）Installment of high voltage power board for emergency and layout of permanent cables to reactor buildings	Designing in detail	Design/ manufacture → (Planed) commencement of work in Aug		(Planned) completion in around the first half of FY 2012
（4）Installment of substitute submergible pumps and sea water heat exchange systems	Designing in detail	Design → (Planed) commencement of work in July		(Planned) completion in around the first half of FY 2012
（5）Installment of top bent systems at reactor buildings	Designing in detail	Design → (Planed) commencement of work in August		(Planned) completion in around the first half of FY 2012
（6）Increase of environment monitoring systems ・increase of monitoring vehicles	Analyzing details	Design/ procurement		(Planned) completion in around the latter half of FY 2011
（7）Establishment of storages for materials for emergency on hills	Analyzing design condition	Design → (Planned) commencement of work in December		(Planned) completion in around the first half of FY 2012

Status of implementing flood prevention measures at Kashiwazaki Kariwa Nuclear Power Station

As of June 29, 2011

Status of implementing flood prevention measures to buildings

Item	Status	Schedule	
		Fiscal year 2011	Fiscal year 2012
① Measures to improve reliability of flood prevention to inlets in reactor buildings			
Unit 1 Tide prevention plates (closed type) 4 places	Done	Design	Commencement of work on May 11. Completed on May 29.
Tide prevention plates (balcony type)13 places* *6 places added	Done	Design	Commencement of work on May 11. Completed at 7 places on May 29. (Newly added 6 places: Completed on June 29.)
② Measures to improve reliability of waterproof at entrance doors in reactor buildings Unit 1 8 places	Done	Design	Commencement of work on May 11. Completed on May 29.
③ Measures to improve reliability of waterproof at doors inside reactor buildings			
Unit 1 37 places	Done		Commencement of work on April 8. Completed on April 30. (Newly added 2 places: Completed on May 27.)
Unit 2 42 places	Done		Commencement of work on April 8. Completed on June 10.
Unit 3 36 places	Done		Commencement of work on April 8. Completed on June 10.
Unit 4 42 places	Done		Commencement of work on April 8. Completed on June 2.
Unit 5 23 places	Done		Commencement of work on April 8. Completed on May 31.
Unit 6 43 places	Done		Commencement of work on April 8. Completed on June 2.
Unit 7 14 places	Done		Commencement of work on April 8. Completed on June 2.
Total: 237 places			