

Issues at Fukushima Daiichi Unit 3 March, 2011

Outline

What	Problem(s)	Damage to reactor
When	Date	See timeline
	Different, unusual, unique	Large earthquake/ tsunami; mixed oxide fuel
Where	State, city	Fukushima, Japan
	Facility, site	Daiichi Nuclear Power Station
	Unit, area, equipment	Unit 3
	Task being performed	Operating at full power

Impact to the Goals

Worker Safety	7 workers injured
Public Safety	Potential for health impacts
Environmental	Release of radiation to environment
Cust. Service	Evacuation of public within 20 km
Cust. Service	Rolling blackouts
Production-Schedule	Loss of electrical production capacity
Property, Equip, Mtls	Catastrophic damage to plant
Labor, Time	Massive efforts to cool reactor

Frequency	Very rare	This incident	?
		Annualized Cost	?

Timeline

Date	Time	Description
March 11, 2011	2:46 p.m.	Earthquake of magnitude 8.9 (1)
		Reactor automatically shut down (2)
		Tsunamis of at least 7 meters (3)
		Automatic startup of emergency diesel generators (4)
	3:41 p.m.	Emergency diesel generators malfunction (4)
	8:15 p.m.	Emergency declared at Daiichi power plant (5)
	10:00 p.m.	Government evacuates local residents within 3 km radius (5)
March 12, 2011	7:00 a.m.	Evacuation of local residents within 10 km radius (5)
	3:36 p.m.	Hydrogen explosion at unit 3 (6)
	7:11 p.m.	Evacuation periphery expands to 20 km around the Daiichi plant and 10 km around the Daini plant (5)
	10:35 p.m.	Iodine tablets distributed (7)
March 13, 2011	5:10 a.m.	Unable to confirm level of water injection to the reactor by the reactor core isolation cooling system (8)
		Declaration of emergency (8)
		High Pressure Cooling System automatically stopped (8)
		Attempt to restart the Cooling System failed (9)
	8:41 - 9:20 a.m.	Safety relief valve manually opened to vent (10)
	1:12 p.m.	Injection of sea water and boric acid into reactor vessel (11)
March 14, 2011	6:50 a.m.	Pressure in the reactor containment vessel increased to 530 kPa (11)
	11:01 a.m.	Hydrogen explosion at the Daiichi unit 3 reactor building (6)
March 16, 2011	8:30 a.m.	Reports of steam coming from reactor building
March 17, 2011	6:15 a.m.	Increase in pressure of the suppression chamber
	9:48 a.m.	Water discharge by Self-Defense Force's helicopters (12)
	7-8:09 p.m.	Water discharge by the riot police's high-pressure water cannon trucks and Self-Defense Force's fire engines (12)
March 18, 2011	2-2:45 p.m.	Water discharge by Self-Defense Force's fire engines and US army's fire engines (12)
	4:00 p.m.	New electrical transmission line connected

