



# *Power For Industry*

SC Energy Users Committee  
Annual Meeting  
May 6, 2011

Kenny Jackson  
Vice-President, Rates & Regulatory Services

Alan Torres  
General Manager, Nuclear Plant Construction

# To be discussed . . .

- Rate matters
- Meeting load growth
- New nuclear
- Japan

# 2011 SCE&G Regulatory Schedule

## 2011 Regulatory Schedule – SCE&G

<u>New Nuclear</u>	<u>Other Matters</u>
✓ 2/14 – Q4 2010 Status Report	✓ 1/31 – Demand Side Management Filing
✓ 4/4 – Updated Cost Hearing	✓ 2/28 - Integrated Resource Plan Filing
5/16 – Q1 2011 Status Report	✓ 3/24 – Electric Fuel Cost Review
5/27 - BLRA Revised Rate Application	6/15 - Gas RSA Filing
8/15 – Q2 2011 Status Report	Nov. – Purchased Gas Adjustment Review
11/14 – Q3 2011 Status Report	

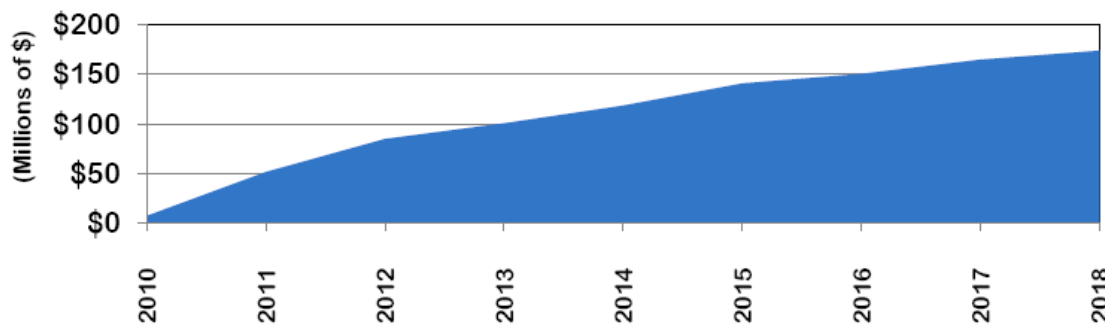
✓ Completed

# Schedule of Nuclear Project Capital Costs

	<u>Projection 12/31/2010</u>	<u>As Approved In Order 2010-12</u>	<u>Change</u>
Base Capital Cost, 2007 Dollars	\$4,270,404	\$4,096,455	173,949*
Add: Escalation	<u>\$1,260,855</u>	<u>\$1,807,948</u>	<u>(\$547,093)</u>
Total Project Cash Flow	\$5,531,259	\$5,904,403	(\$373,144)
Add: AFUDC	<u>\$ 255,684</u>	<u>\$ 283,721</u>	<u>(\$ 28,037)</u>
<b>Gross Construction Cost</b>	<b>\$5,786,943</b>	<b>\$6,188,124</b>	<b>(\$401,181)</b>

\* In 2010, the South Carolina Supreme Court ruled that contingency costs were not permitted to be part of the approved capital cost schedule. As a result, SCE&G is required to specifically identify and itemize costs that were previously classified as contingency costs. On November 15, the Company filed a petition with the SCPSC to identify currently known capital costs of \$173.9 million that will be incurred during construction of the new nuclear units.

**\$174M Capital Costs**



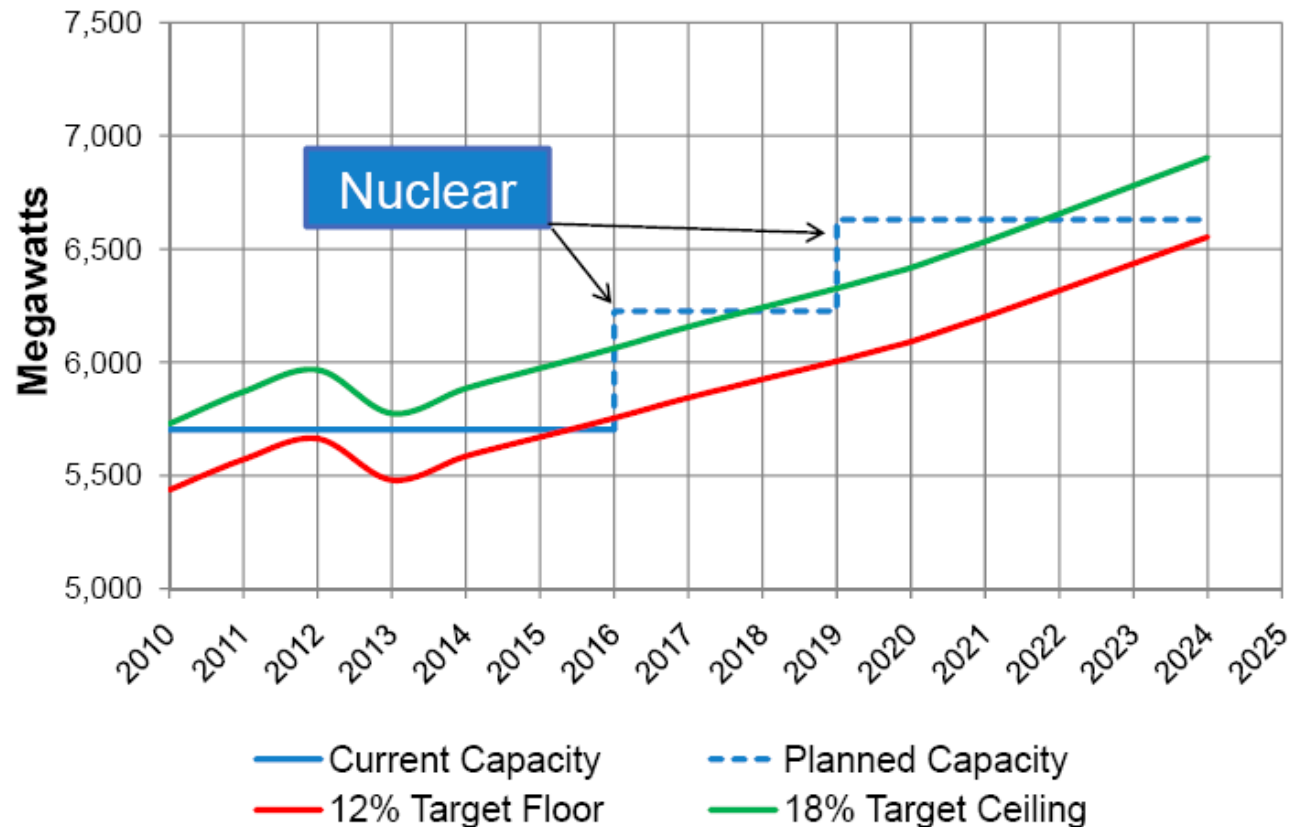
# The Need For New Generation

## Reserve Margin Requirements

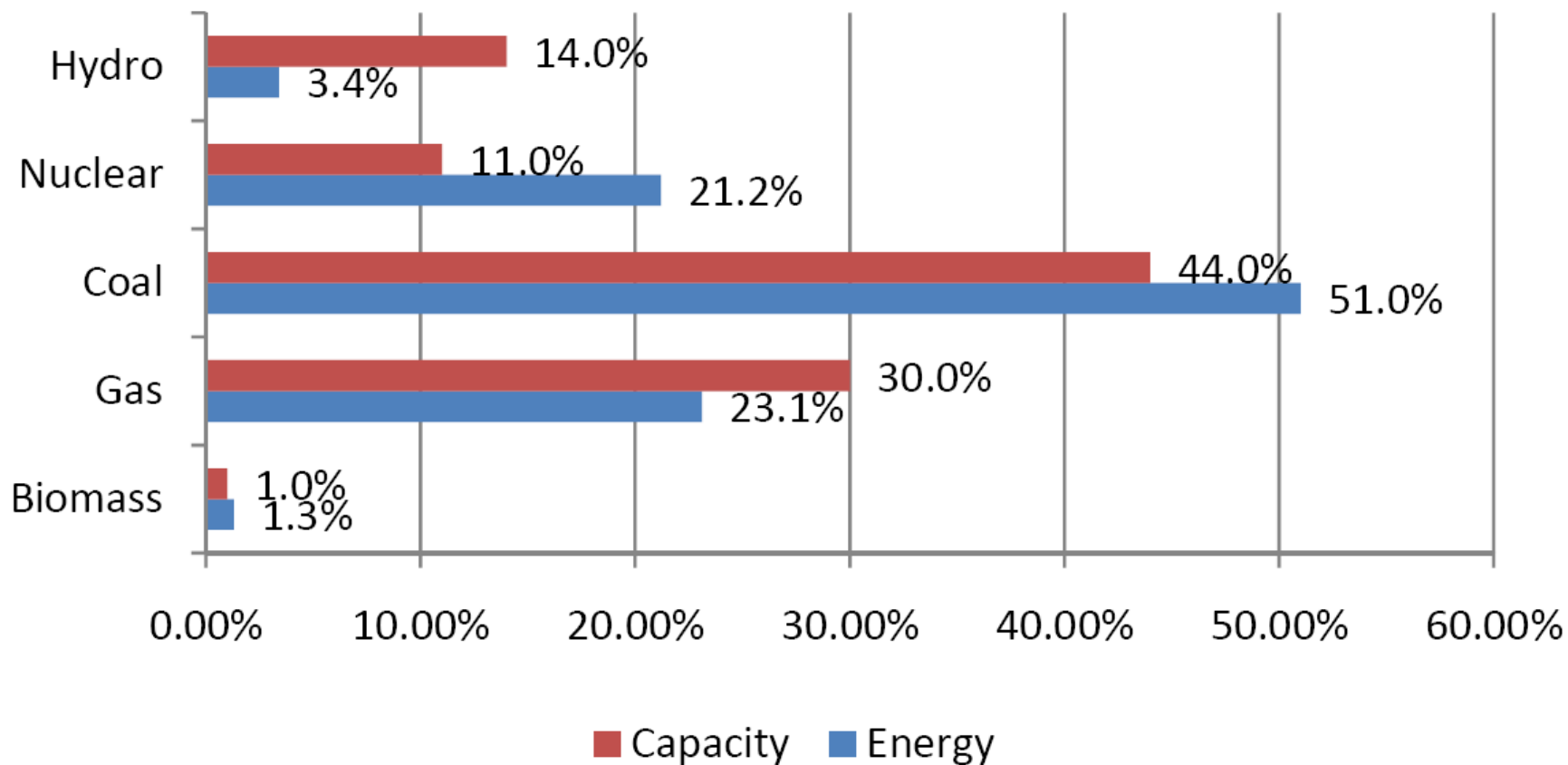
### Reserve Margin Target:

- 12% Target Floor
- 18% Target Ceiling

Need for base-load by 2016

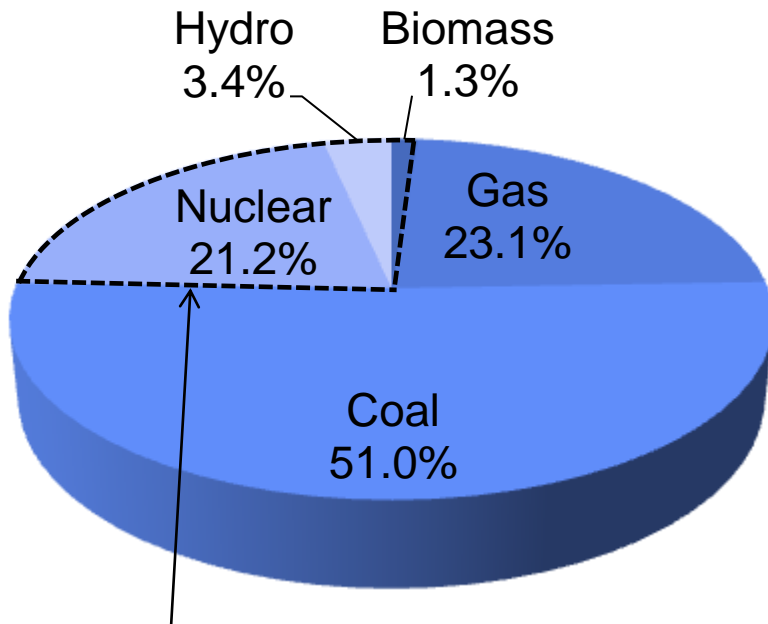


# 2010 Generating Resources



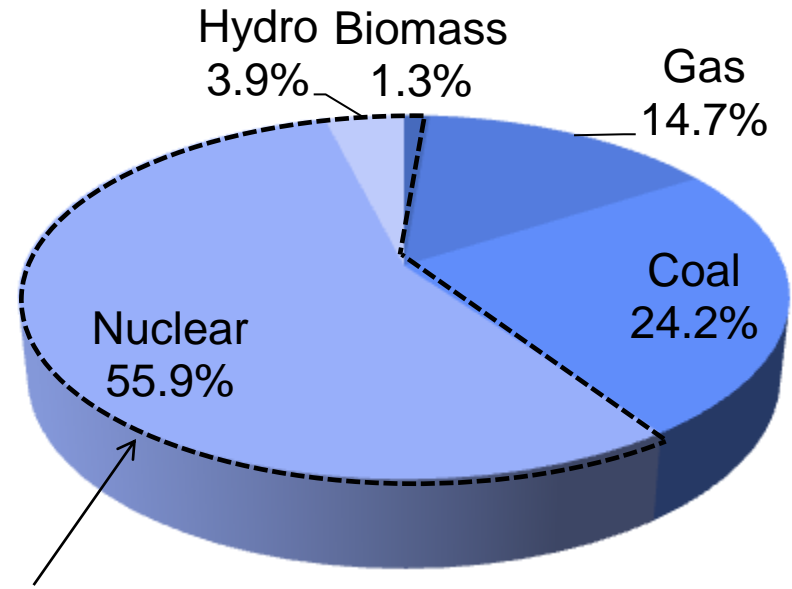
# SCE&G Generation Mix

## 2010 Generation Mix



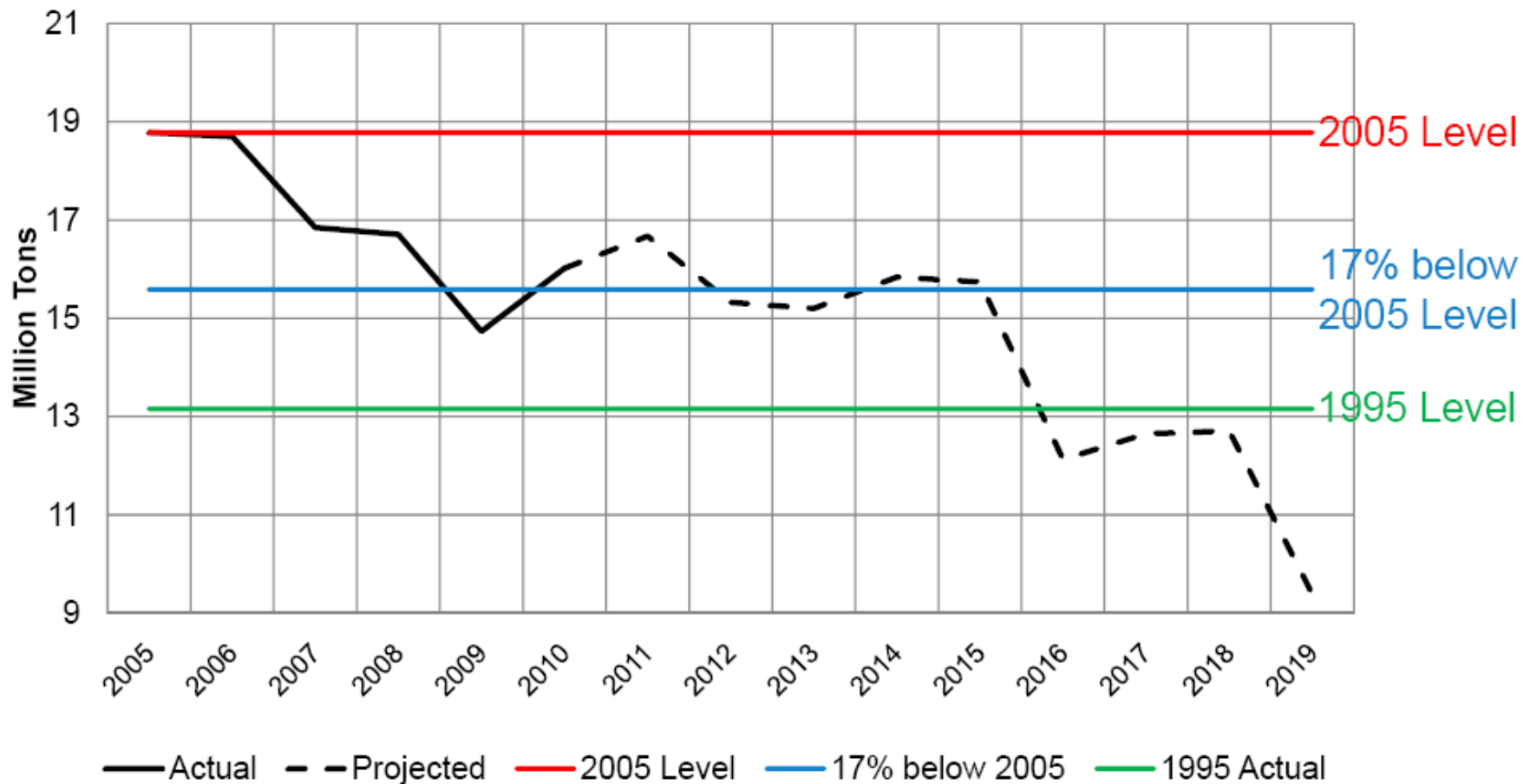
**26% Non-emitting**

## 2019 Generation Mix



**61% Non-emitting**

# Greenhouse Gas Emissions



Source: Ex Parte Communication Briefing with SC PSC – 4/28/2011

# Boeing Opts for 100% Renewable

- Power supply from:
  - 2.6 MW thin-film solar laminate panels owned, installed and maintained by SCE&G on the new Final Assembly building roof.
  - SCE&G will supplement the solar generated energy with power from its system resources, coupled with renewable energy certificates from a generating facility on its system.
  - One of the largest solar rooftop installations of its kind in the Southeast.



# Progress of the New Nuclear Units

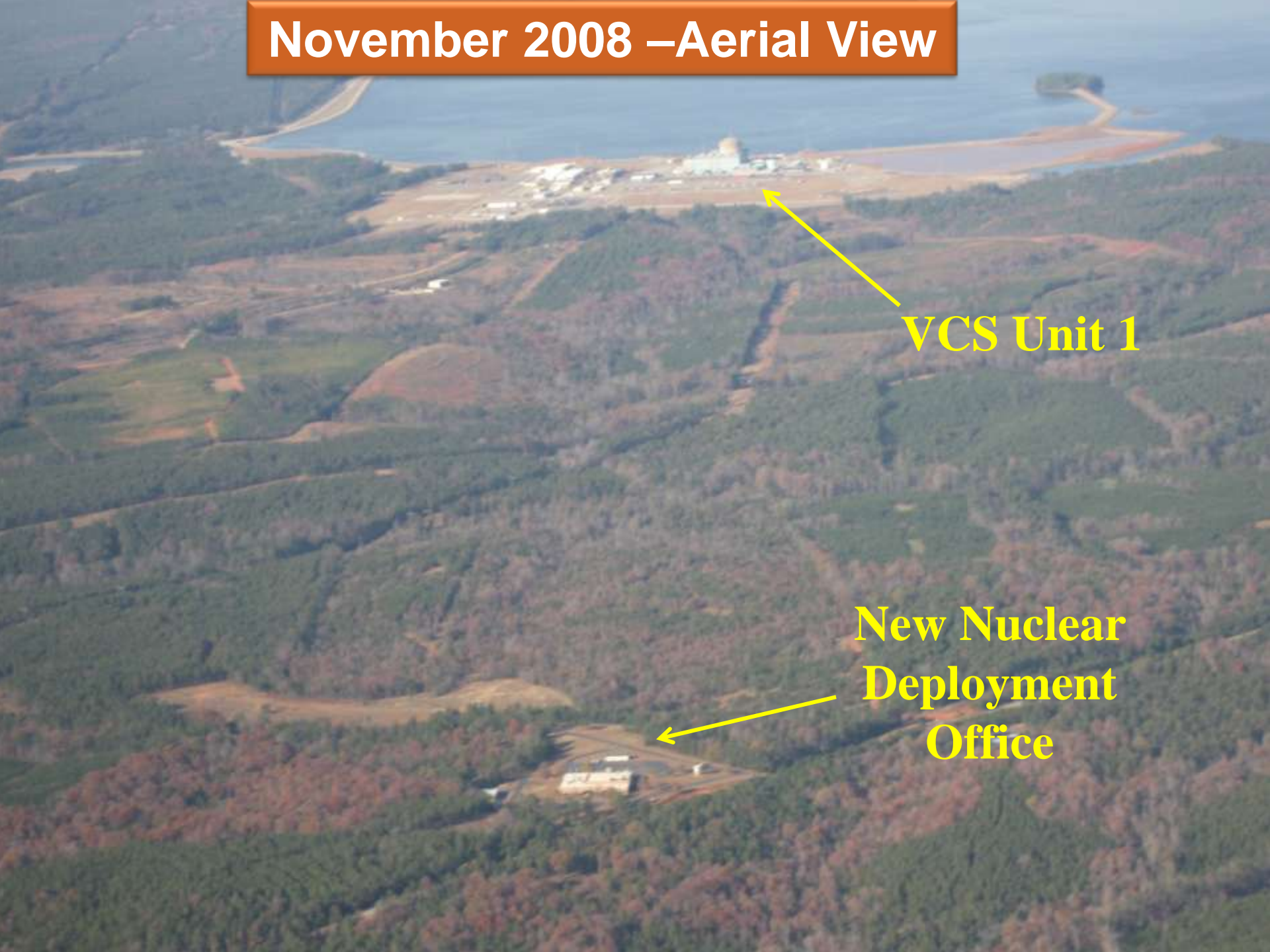


*Powering the Future of  
South Carolina*

**November 2008 –Aerial View**

**VCS Unit 1**

**New Nuclear  
Deployment  
Office**



# VC Summer Units 2&3 - January 2011



# UNIT 2 POWER BLOCK

TURBINE BUILDING

TURBINE BUILDING LAYDOWN AREA

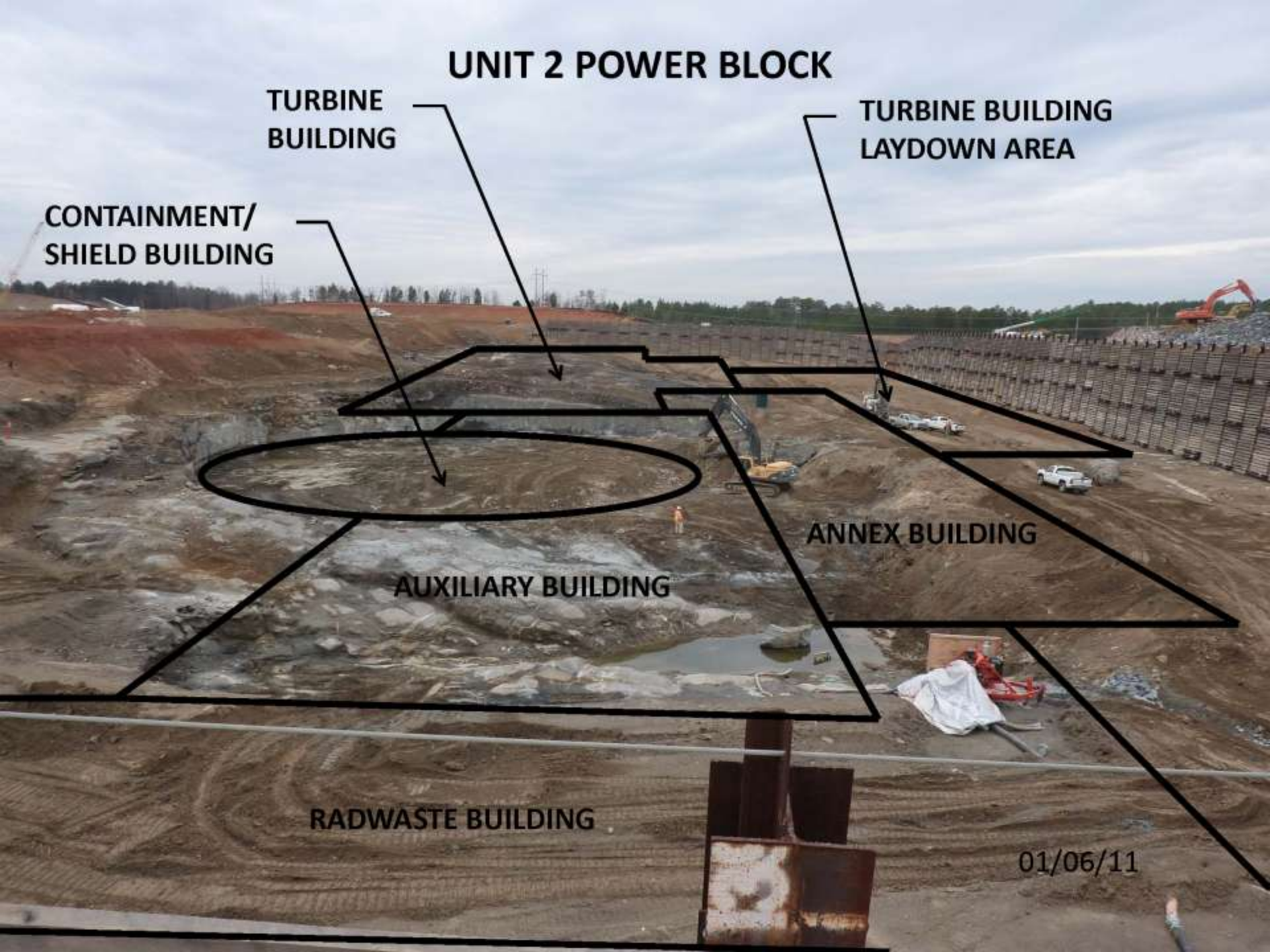
CONTAINMENT/SHIELD BUILDING

ANNEX BUILDING

AUXILIARY BUILDING

RADWASTE BUILDING

01/06/11

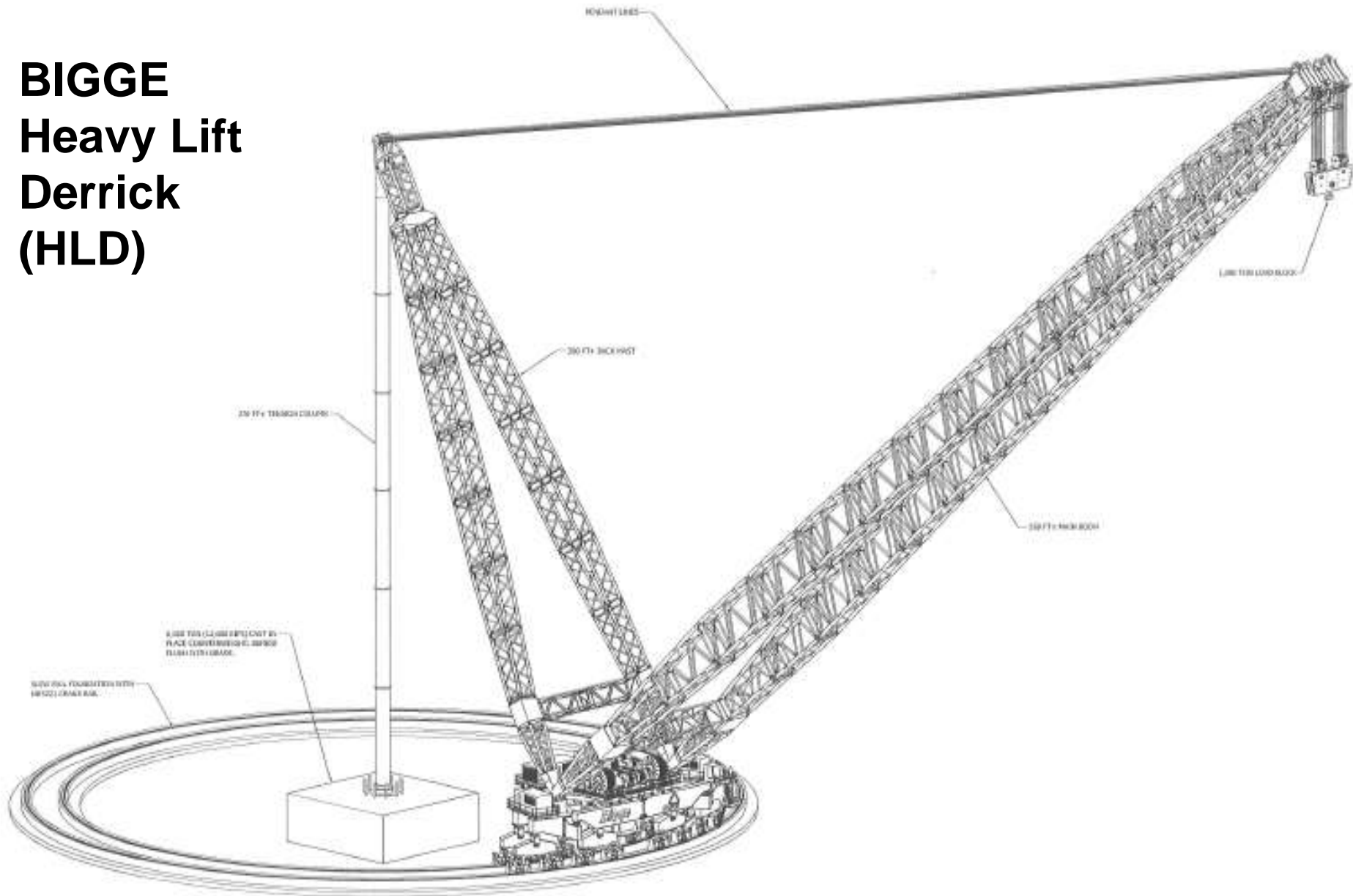


# Unit 2 CWS Flowable Fill Completion



05/19/2010

# BIGGE Heavy Lift Derrick (HLD)



# BATCH PLANT

PRIMARY

BACK-UP



# Doosan Manufacturing Update



SG Lower Assembly - Unit 2A



SG Upper Vessel - Unit 2A



SG Channel Head - Unit 2B

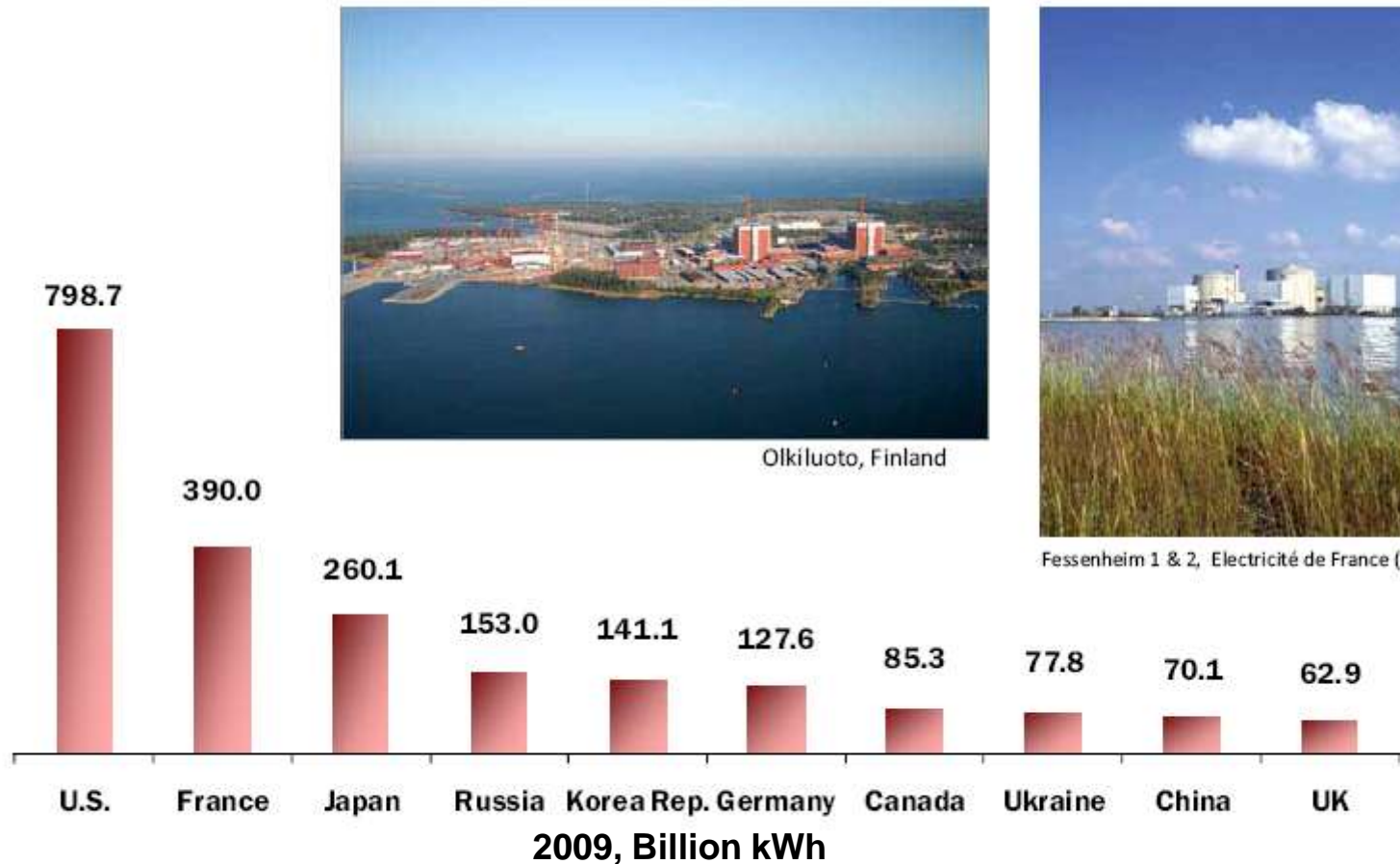


SG Intermediate Shell - Unit 2B

# What Happened in Japan?



# Top 10 Nuclear Generating Countries



Source: International Atomic Energy Agency, U.S. is from Energy Information Administration

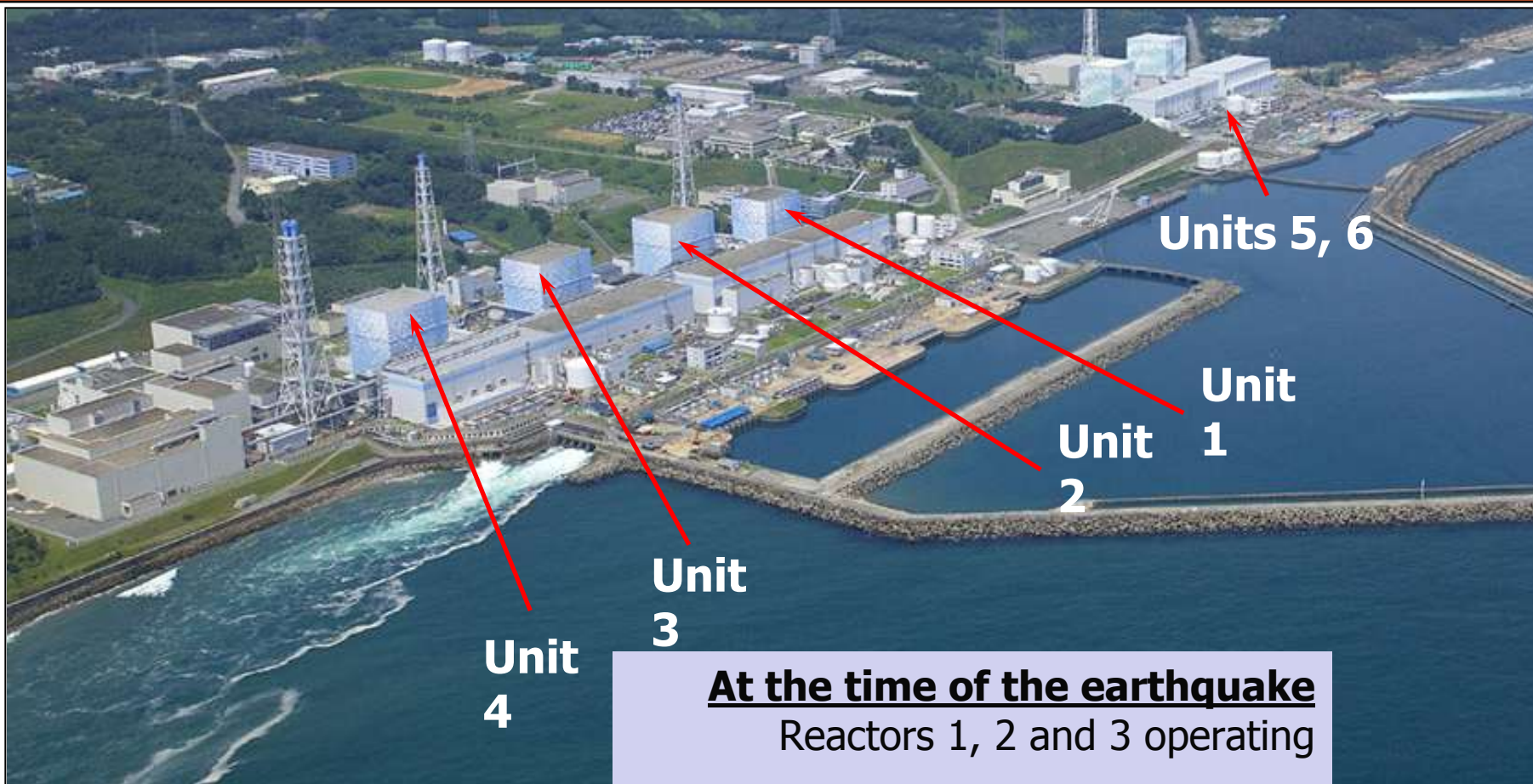
Updated: 5/10

# Nuclear Energy in Japan

- 54 operating nuclear reactors (49 gigawatts)
- Two nuclear plants under construction
- Tokyo Electric Power Co. produces 27% of Japan's electricity
- 12,000 MW of nuclear energy capacity shut down



# Fukushima Daiichi Before Accident



**At the time of the earthquake**  
Reactors 1, 2 and 3 operating

Reactors 4, 5 and 6 shutdown for  
maintenance, inspection, refueling



# Timeline of Events

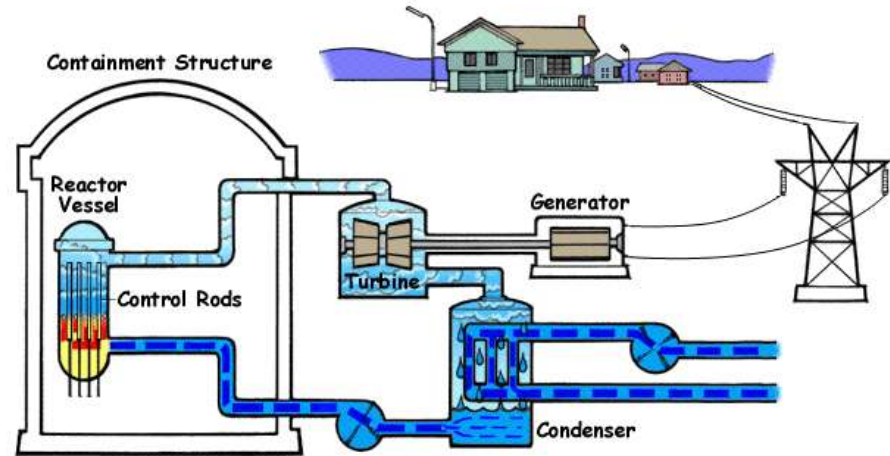
- **Earthquake occurs at 2:46 p.m. March 11**
  - Power grid in northern Japan fails
  - Reactors are mainly undamaged
  - Reactors are automatically shutdown as designed
  - Power generation stops
  - Diesel generators start, providing back-up power to emergency systems
  - Emergency core cooling systems are running
  - Plant is in stable condition

# Timeline of Events (continued)

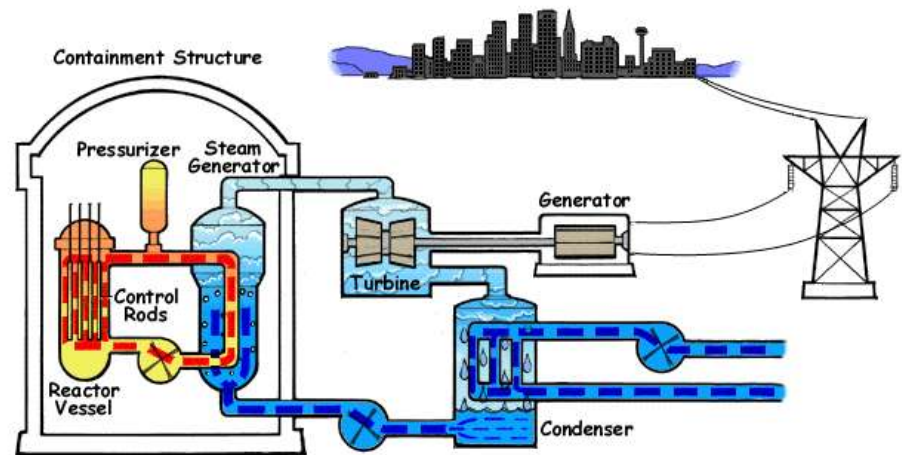
- **Tsunami hits plant at 3:41 p.m. (less than one hour later)**
  - Plant reportedly designed for tsunami about 6 meters. Actual tsunami is approx twice that
  - Flooding of diesel generators causes them to fail, resulting in station blackout
  - Only batteries are still available
  - Failure of emergency core cooling systems

# How Are We Different?

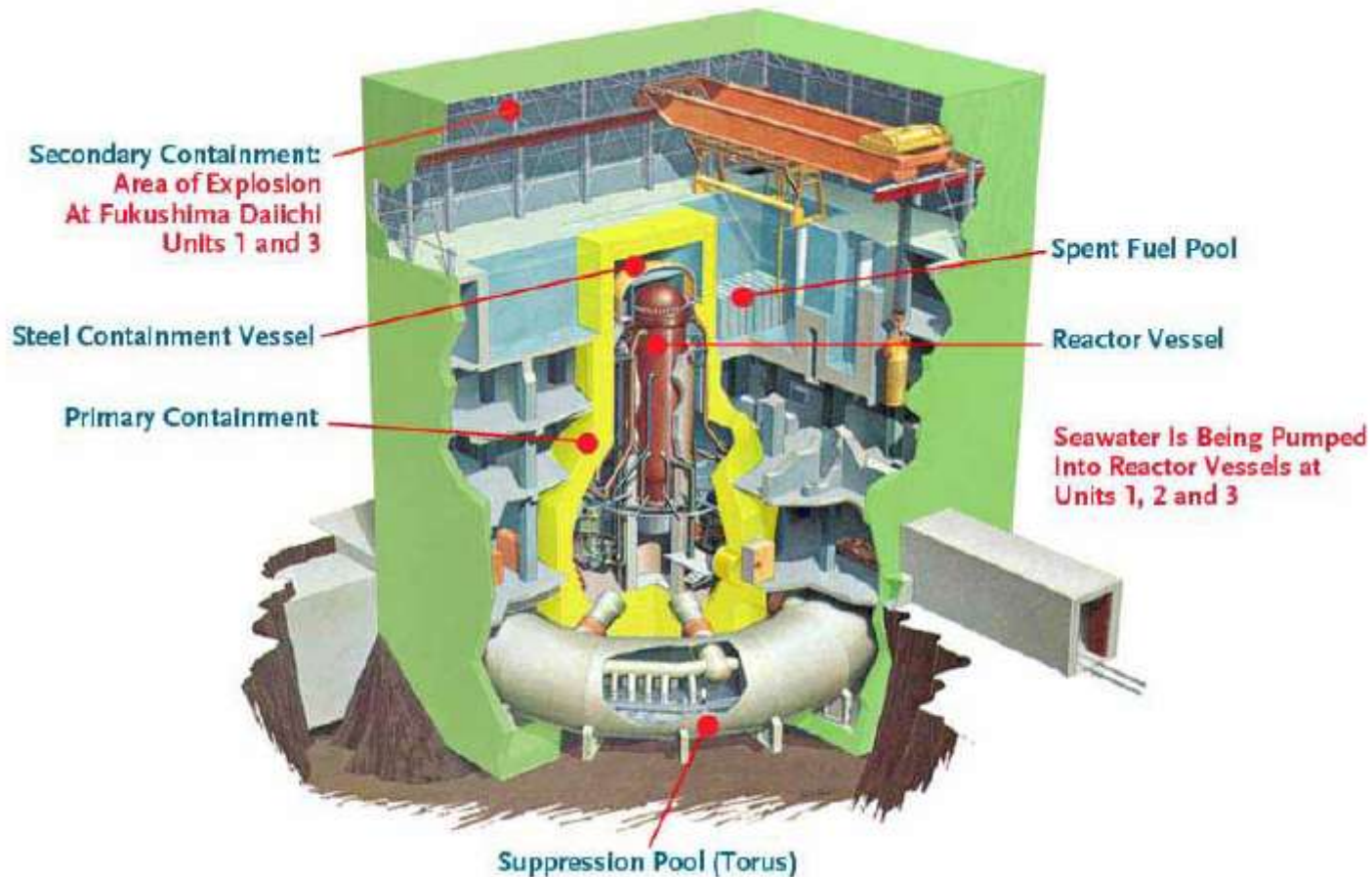
Fukushima Daiichi:  
Boiling  
Water Reactor



V.C. Summer:  
Pressurized Water  
Reactor



# Boiling Water Reactor Design at Fukushima Daiichi

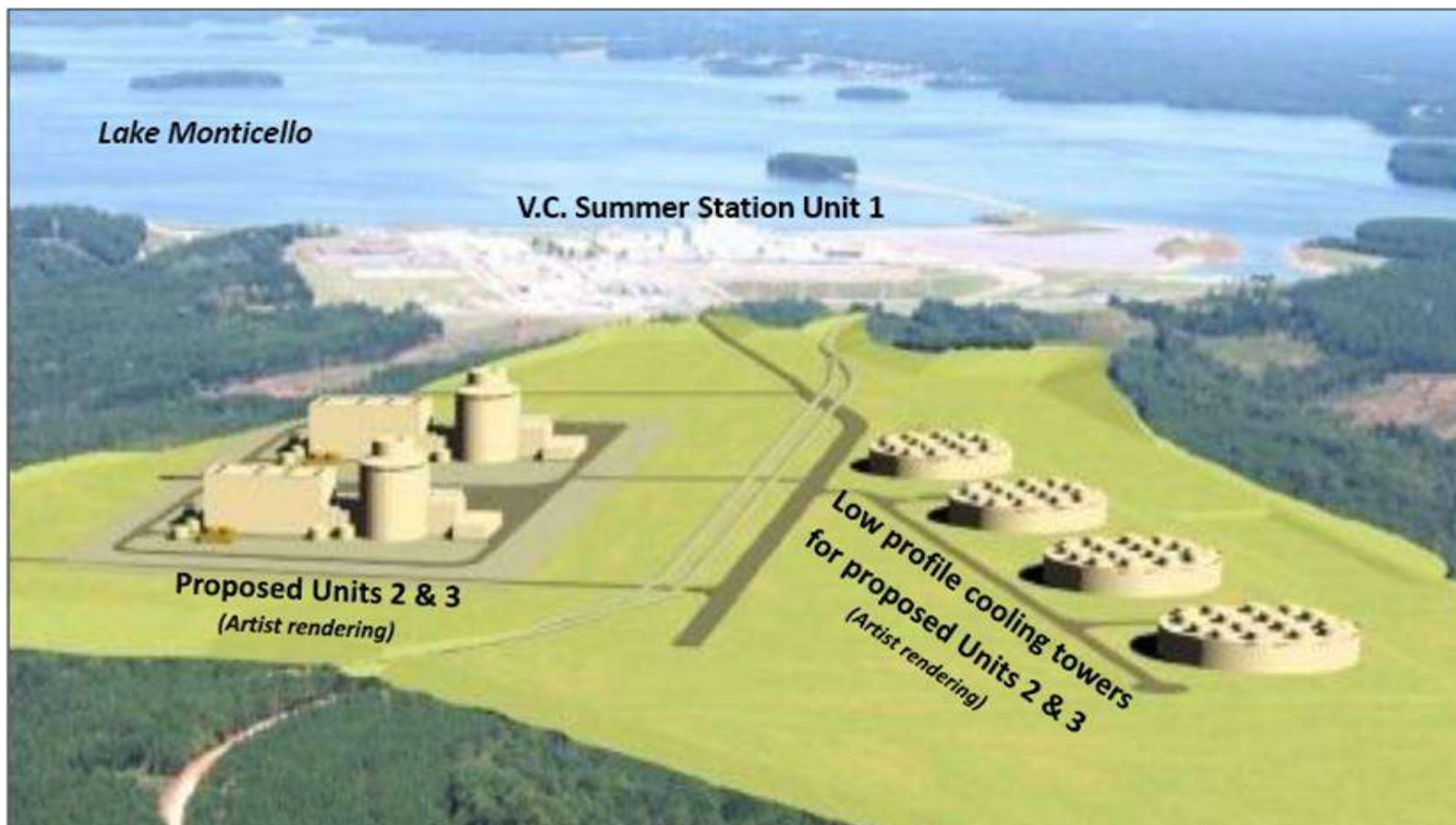


Updated 3/17/11

# After the Accident



# Can the Japanese Incident Happen Here?



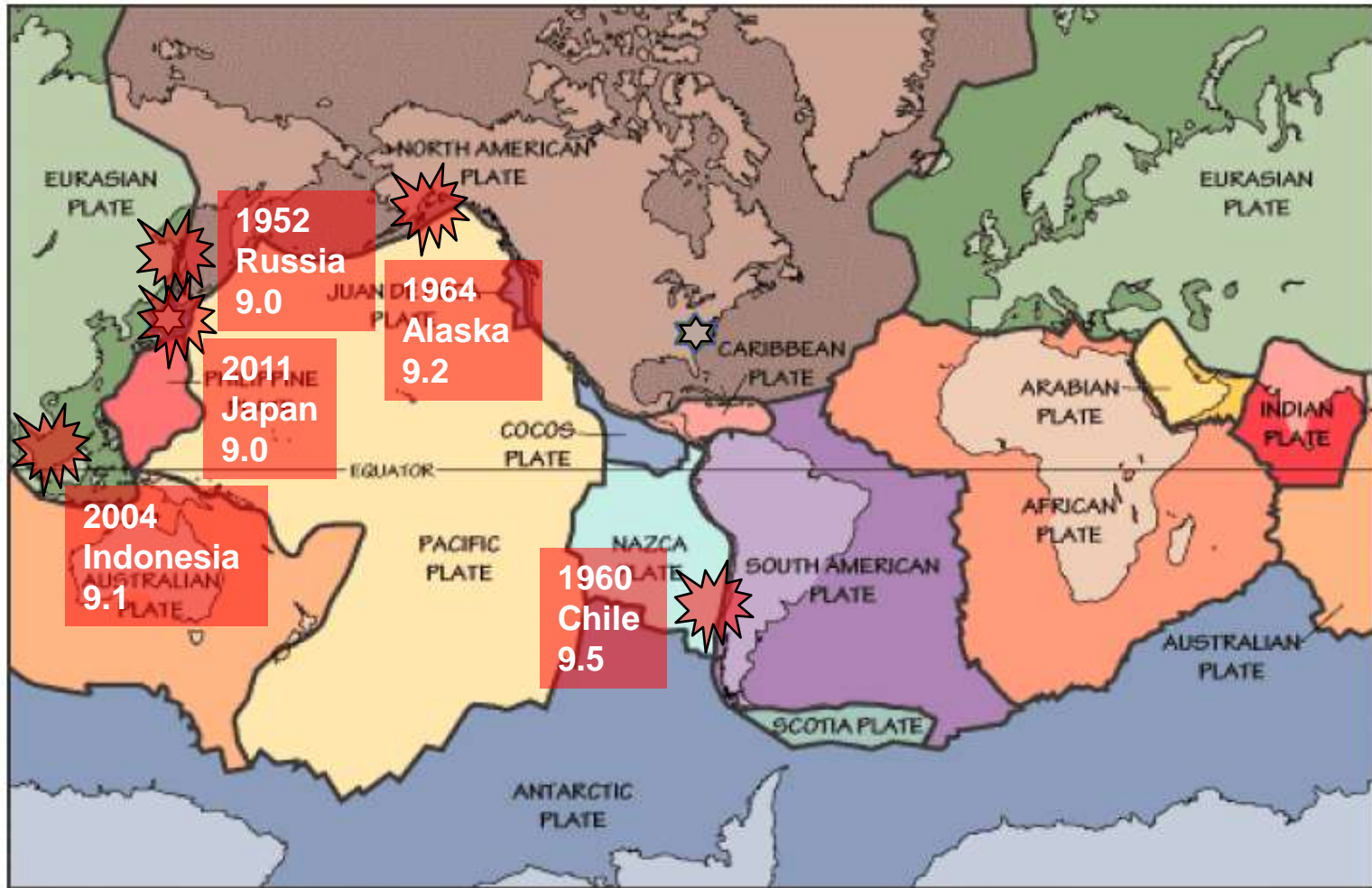
# Our Site Is Much Less Likely to Have an Earthquake or Tsunami

- Very large earthquakes occur at adjacent tectonic plates. We aren't near one.
- There are no active or capable faults within the vicinity of the site which are capable of producing large earthquakes.
- Our site is 435 feet above sea level and more than 100 miles from the ocean.

# VC Summer Seismic Considerations

- Don't focus on Richter scale
- Design to ground motion and acceleration
- Evaluate largest quake in our region
- Evaluated Charleston 1886 quake, but Union County 1913 quake causes more ground motion
- Union County quake moved near site and is our basis for the design
- South Carolina is not near the edge of a tectonic plate

# Global Tectonic Plates



# What Protective Measures Do Our Plants Have?



# US Nuclear Plants Take Extreme Events Into Consideration

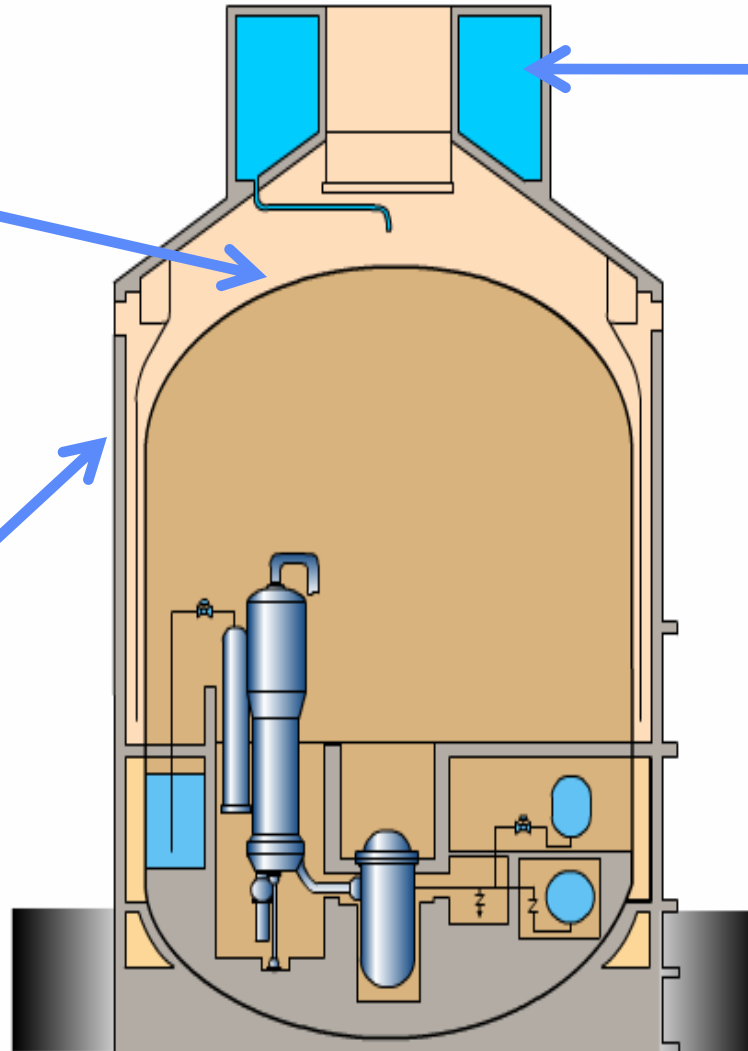
- Earthquakes and floods
- Loss of off-site power and on-site power
- Hydrogen generation as a result of fuel damage during loss-of-coolant accidents
- Aircraft impact
- Loss of large areas of the plant

# New Units – AP1000 Design

**Steel Containment Vessel 1.75" steel**

**Passive Containment Cooling Tank 780,000 gallons**

**Shield Building 3' thick concrete between 3/4" steel plates**



# Industry Taking Steps to Ensure Safety at Nuclear Power Plants

- In the short-term, the industry will verify readiness to manage extreme events.
- In the long-term, the industry will:
  - Conduct a careful analysis of the Japanese accident and how reactors, systems, structures, components, fuel and operators performed.
  - Incorporate lessons learned into U.S. reactor designs and operating practices.

# Radiation from Japan

- More than 30 US nuclear plants and all areas of the US detected low level radiation from Japan
- VC Summer has only seen very low levels of an isotope of iodine (I-131)
- I-131 has a very short half-life (8 days) so it goes away completely in about 2 months
- We notified our peers and DHEC, and will continue to work with agencies such as NEI to communicate our results
- The radiation levels from I-131 are now declining

# Is it Dangerous?

- The levels are so low they are barely detectable
- Radiation instrumentation is extremely sensitive. The levels detected are a very small fraction of any action levels and are not hazardous
- A person would have to breathe this air for more than 30 years to get a dose equal to a cross country airline flight (5 millirem)
- About same exposure as 15 bananas a year

# Regulatory Limits of Radiation

- Limits are set for the public and workers
  - General public dose limit from nuclear plants is 100 millirem per year (10 chest X-rays)
  - Nuclear workers 5,000 millirem per year (5 CT scans) (average nuclear worker receives 180 millirem in a year)
  - Emergency limits for Japan and US 25,000 millirem. **No worker in Japan has exceeded 20,000 millirem.**
  - Current science shows no biological effects below 25,000 millirem.

# Environmental Monitoring

- Air
- Surface Water – Broad River & Lake Monticello
- Groundwater
- Drinking water (including the site itself, Jenkinsville and Columbia )
- Fish from the river and lake
- Sediment from the river and lake
- On-site garden (collards, turnips, tomatoes, squash corn & grass)
- Direct radiation readings using TLDs



# In Summary

- Earthquake and tsunami like Japan is very unlikely here.
- Fukushima Daiichi plants survived the earthquake and shutdown automatically, tsunami was the problem
- Our plant is different (PWR v. BWR).
- Our protective measures take extreme events into consideration, even more so since 9/11.
- Radioactivity from Japan, while detected here, poses no health concerns to the U.S.
- Industry will learn from Japan and is already taking short-term and long-term actions.
- We are continuing to move forward with construction of our new plants.

# QUESTIONS