STP Overview

• Three Owners – Units 1 & 2
  - NRG Energy   44%
  - CPS Energy   40%
  - Austin Energy 16%

STP Nuclear Operating Company was formed in 1997
Performance Summary

• For seven consecutive years, STP has produced more electricity than all other two-unit facilities in the nation (2004-2010)

• Last October, named as one of 12 companies to the EHS Today 2010 list of America’s Safest Companies
  - First nuclear facility to receive this award

• Last October, STP filed an application with the NRC to extend the operating license of Units 1 and 2

• Safely completed 30th refueling outage (Unit 1) in May. Preparing for Unit 2 refueling outage this fall

• In 2011, will invest $90 million in plant maintenance, improvements and refueling
The Event

Fukushima Daiichi Nuclear Power Station

Tsunami Impact
• 54 operating nuclear power plants (NPPs) in Japan - 49 gigawatts

• Tokyo Electric Power Company (TEPCO) operates 17 NPPs
  - 6 at Fukushima Daiichi
  - 4 at Fukushima Daini
  - 7 at Kashiwazaki-Kariwa

• TEPCO produces 27% of Japan’s electricity

• One new TEPCO NPP was also under construction (Higashidori)
At time of the earthquake...

- Reactors 1, 2 and 3 were operating; shut down automatically (seismic trip)
- Reactors 4, 5 and 6 were in cold shutdown for annual outage
Event Initiation

- Tohoku Pacific earthquake - Friday, March 11, 2011, at 2:26 pm
- Operating reactors tripped at both Fukushima sites (Daiichi, Daini)
- Offsite power lost - emergency diesel generators started

- Tsunami ≥ 10 m impacted sites
- Fukushima Daiichi station designed for 5.7 m tsunami
- Tsunami was beyond design basis
- Emergency diesels and some battery power lost due to flooding
Without AC power – they lost…

- Make-up water capability to the Reactor and Spent Fuel Pool (SFP)
- “Heat Sink” for decay heat removal

Loss of make-up and cooling -

- Allowed water to boil off
- Fuel became exposed / damaged
- Hydrogen formed; explosions damaged Unit 1, 3 and 4 secondary containments
- Unit 2 containment suppression chamber was damaged
• Equivalent to our General Emergency was declared
• Public (~ 200,000 people) evacuated within 20 km (13 miles) of the plant
• Cautiously stable

• Start recovery by 2012

• Future of nuclear in Japan?

• Root cause?
STP DESIGN DIFFERENCES
Designed to withstand substantial earthquake even though we are not in a significant earthquake zone

- Seismically hardened
- Four-foot thick concrete
- Reinforced with large steel rebar
- Steel liner plate
- Post tensioned
- Watertight
Emergency Core Cooling Systems

Designed to withstand earthquakes, high winds, and flooding

- Seismically hardened structures
- Site @ + 29’ MSL
- Watertight doors @ + 41’ MSL
- 3 safety “trains”
- Other U.S. plants have 2
- System trains are independent
Spent Fuel Pools

Designed to withstand earthquakes, high winds, and flooding

- In seismically hardened buildings
- Substantial concrete construction
- Lined with stainless steel
- Watertight doors
- Diesel generator backed
U.S. INDUSTRY RESPONSE
• Formed the Fukushima Steering Committee

• Developed the “Way Forward” document that identifies focus areas (Building Blocks), strategic goals and guiding principles the U.S. industry will accomplish.

• Developed a response plan to drive implementation of established goals with specific actions – near term and long term.
U.S. Industry Initiatives to Ensure Safety

They include:

• Short Term (December 2011)
  – Verified that all critical components, procedures and staffing are in place and functional for mitigating flooding, seismic events, large area fires and explosions.
  – Implement interim compensatory measures as necessary to ensure spent fuel pool cooling is protected at all times. Additional guidance was also issued to evaluate defense in depth on cooling power sources, instrumentation and procedural guidance.
  – Assess the continued effectiveness of operator fundamentals and training programs.
  – Assess each facility’s ability to cope without power for 24 hours and not incur fuel damage. Actions will be taken to maximize coping capability within the existing design and licensing basis.
They include:

- Short Term (December 2011) *continued*
  - Established an integrated network of information flow from nuclear facilities worldwide to understand actions being taken and to incorporate lessons learned.
  - Evaluating near-term guideline changes to accident management and emergency response programs based on lessons learned from Fukushima.
  - Maintain open, transparent communications with all key stakeholders in regard to industry actions and lessons learned.
  - Complete a cause analysis of the Fukushima event so that facts and appropriate long-term actions can be understood and implemented.
• Long Term:
  – Re-evaluate credible, site-specific hazards that could lead to a prolonged loss of power. Identify and implement corrective actions to ensure the strategic goal of no fuel damage is achieved.
  – Develop an industry protocol for the timely deployment of critical materials to assist each facility in an emergency.
  – Evaluate emergency preparedness strategies and amend as necessary to incorporate lessons learned from the Fukushima accident.
  – Implement action plans to ensure spent fuel pool cooling as well as containment integrity are maintained in accordance with the strategic goals.
Independent study commissioned, 90 day report issued
  - Clarify the Regulatory Framework
  - Re-evaluate, as necessary, the design basis for seismic and flood protection
  - Evaluate enhancements to seismically induced floods and fires
  - Station Blackout

Process to disposition recommendations under discussion
Conclusions

• STP has one of the safest designs in the world/experienced, well-trained workforce

• The safety of our friends and neighbors in the local communities is our primary responsibility

• The U.S. nuclear industry response to Fukushima is a significant challenge

• The root cause of the accident, both technically and organizationally, must be understood

• U.S. energy demand continues to grow-What is our state’s/nation’s long-term energy strategy?