



# New Reactor Licensing Status and Lessons Learned

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October 26, 2012

## Overview

- Status of Licensing Reviews for Large Light-Water Reactors
- Insights and Lessons Learned
- Summary

## Completed Reviews

- 4 design certification (DC) applications
- 2 DC amendment applications
- 2 combined license (COL) applications
  - 4 licenses issued, units under construction
- 4 early site permit (ESP) applications

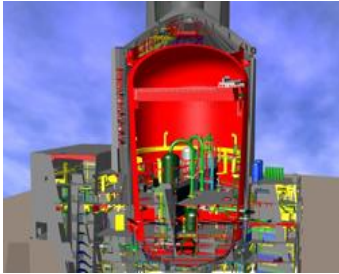
## Ongoing Reviews

- 3 DC applications
  - GE-H Economic Simplified Boiling Water Reactor (ESBWR)
  - AREVA Evolutionary Power Reactor (EPR)
  - Mitsubishi U.S. Advanced Pressurized Water Reactor (US APWR)
- 2 DC renewal applications
  - GE-H Advanced Boiling Water Reactor (ABWR) Renewal
  - Toshiba ABWR Renewal
- 16 COL applications
  - 10 active, 5 suspended, 1 withdrawn
- 1 ESP application
  - Public Service Enterprise Group Incorporated

# New Reactor Applications (Large LWRs<sup>+</sup>)



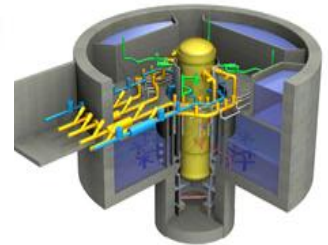
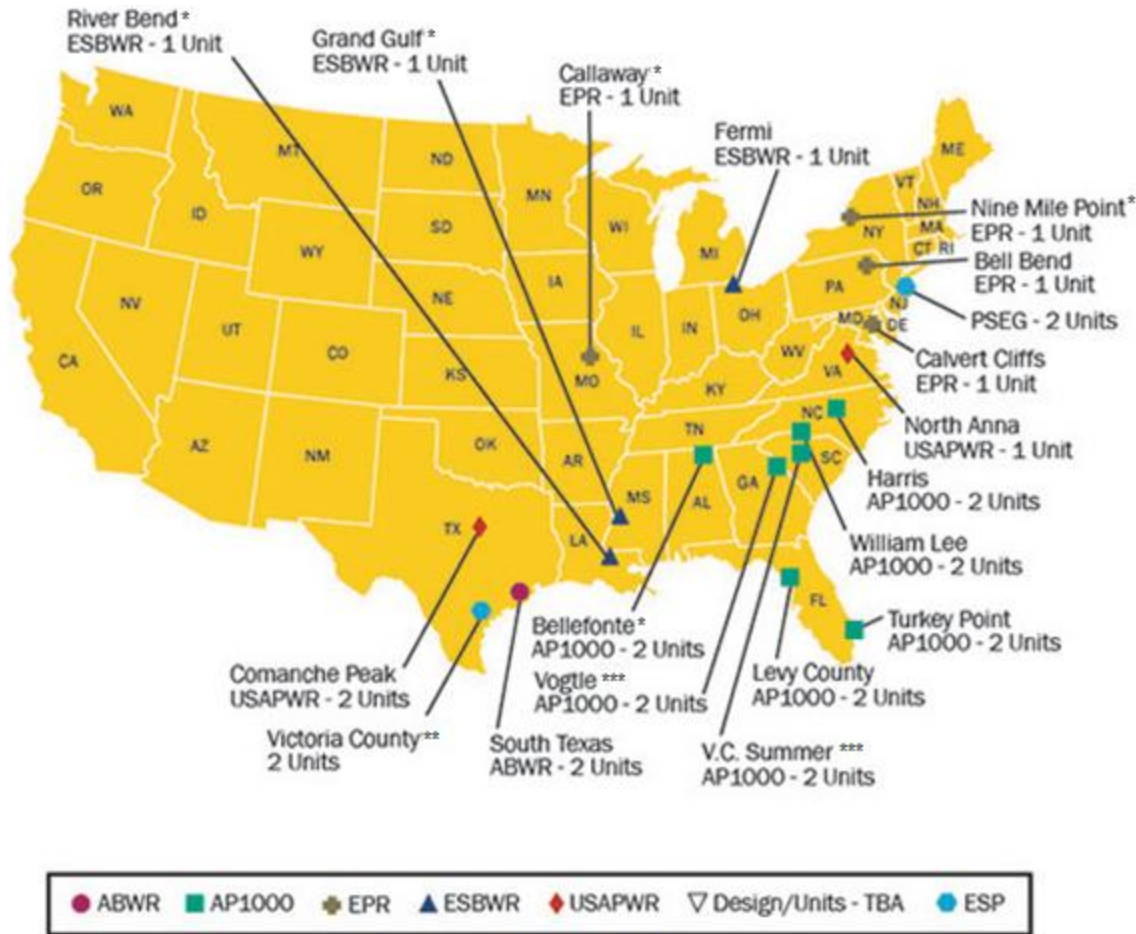
ABWR



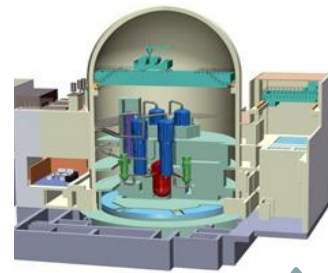
AP1000



EPR



ESBWR



USAPWR

\* Review suspended by applicant

\*\* COL application withdrawn

\*\*\* COLs Issued

<sup>+</sup>Large LWRs-- Large Light-Water Reactors, generally of the order of 1000 MW(e) or more

## Lessons Learned - Pre-Application

- Early interaction, prior to application submittal
- Conduct pre-application reviews to address
  - Major issues that could require Commission policy guidance
  - Major technical issues that could be resolved under existing NRC regulations on policy, and
  - Research needed to resolve identified issues
- Used effectively for Design Certification reviews
  - Thermal-hydraulic codes, including the supporting test programs and scaling methods
  - Preparation for Small Modular Reactor reviews

## Lessons Learned – Application Review

- Communication – meetings and teleconferences to address issues
- Licensing audits – onsite review of detailed calculations and discussion with analysts
- Awareness of issues on similar applications
- Awareness of issues under consideration by other countries

## Lessons Learned - Construction Oversight

- 2 COL applications completed
  - 4 units under construction (Vogtle 3 & 4, and V.C. Summer 2 & 3)
- Translation of design into construction documents
  - One-step vs. two-step process
- Construct to the Licensing Basis ... or Change It
  - Understand the licensing basis
  - Follow the Part 52 change process
  - Ensure that a robust method for maintaining and changing the licensing basis is in place

➡ Licensee is Accountable ←



## Changes during Construction

- Need NRC Approval? NRC review time could impact construction schedule?
- License condition allows use of Preliminary Amendment Request (PAR) process
- NRC Letter stating no objection to the licensee installing and testing the proposed changed design feature pending NRC's review of the LAR
- Avoids unnecessary construction delays

## Construction Related LAR Challenges

- License Amendment Request (LAR) - In time to support construction schedules
- Must be high quality
  - Licensee goal is to obtain approval without a need for Requests for Additional Information (RAIs)
- Pre-submittal meetings on draft amendment requests
- Experience to date
  - First 3 amendments – No RAIs needed
  - Quick turnaround – First LAR completed in less than 3 months

# Fukushima Lessons Learned

- Fukushima Lessons Learned ... in progress
  - Recommendations – SECY-12-0025
  - Tier 1 orders and requests for information – March 2012
  - For applications not yet approved or submitted – expect applicants to address Commission-approved Fukushima actions

## Ongoing Lessons Learned Review

- Bipartisan Policy Center Report issued April 6, 2010
  - Commended staff efforts on licensing reviews
  - Recommended lessons learned review after first COL issued
- Staff has initiated comprehensive review to identify best-practices and potential enhancements to its new reactor licensing processes
  - Report will be published in early 2013
  - Report will be provided to international community

# Summary

- Completed several reviews using the 10 CFR Part 52 (“one-step”) licensing process – 4 units under construction
- Implementing several lessons learned and best practices
- One-step licensing process, by design, is rigid and requires constructing the plant to the approved licensing basis
- Understanding of licensing basis and applicable change processes is key to successful construction activities
- Formal lessons learned report on new reactor licensing to be completed in early 2013 – this addresses a recommendation of the Bipartisan Policy Center