



# Nuclear Regulatory Commission Civil/Structural Technical Review Kickoff

13 March 2007



# AGENDA

- Design process
- Natural Phenomenon Hazards design bases

# Design Process

- Design process flow diagram

# Design Process

- Requirements
- Reference plant data
- Preliminary design/design basis
- Detail design development/design output documents
- Licensing documents
- Procedures
- Configuration management

# Requirements

- Design Requirements Document (DRD)
- Functional Classification List (FCL)
- Deviations Log
- Basis of Design (BOD) Documents (19)

# Reference Plant Data

- Melox and LaHague
  - general arrangements
  - process flow diagrams
  - lessons learned
  - sensors & actuators lists

# Preliminary Design/Design Basis

- Developed originally in preliminary design
- Process layout drawings (general arrangements)
- Electrical one-lines
- Piping and instrumentation diagrams
- System Description Documents
- Safety Requirements Documents
- Equipment and component sizing

# Detail Design Development/Design Output Documents

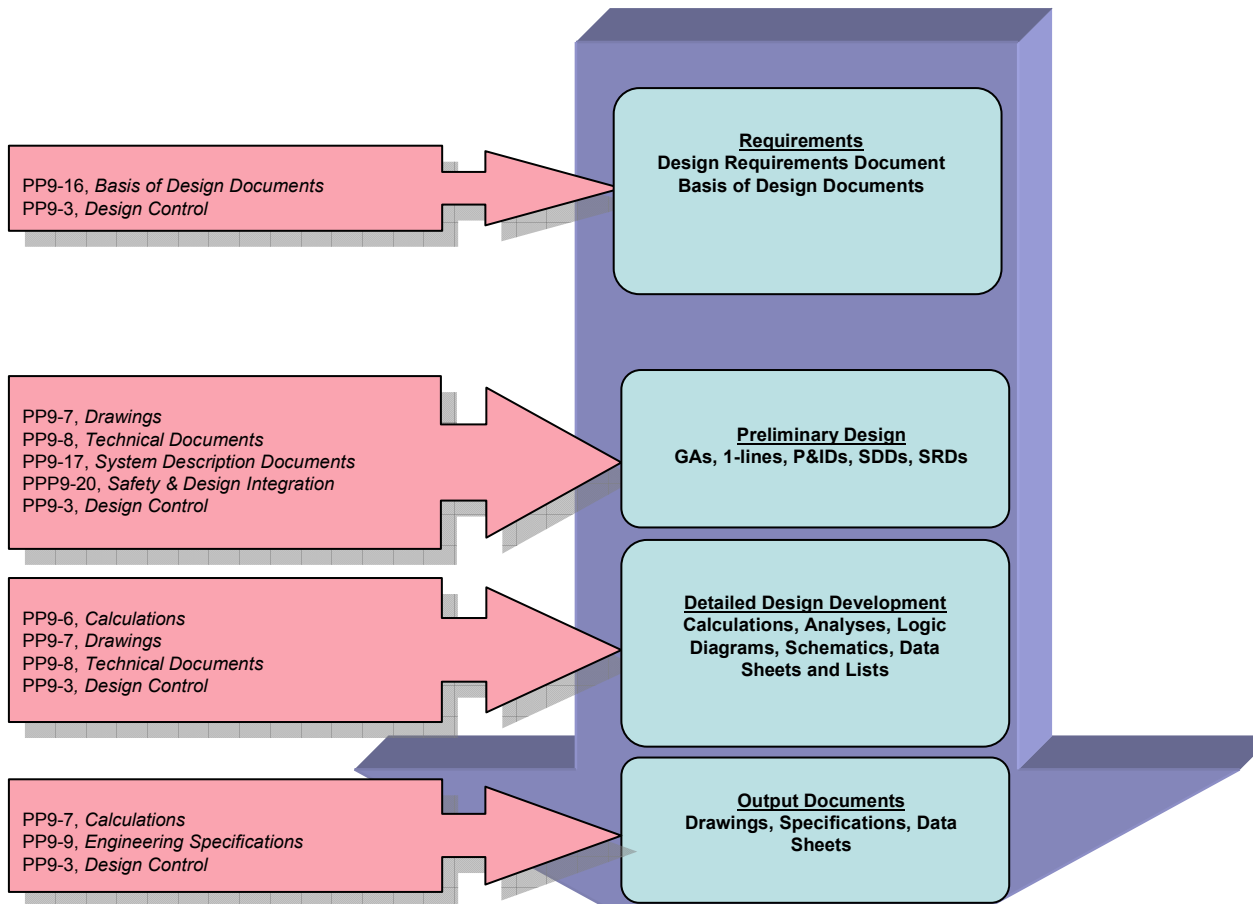
- Last phase of design development prior to implementation
- Prepare final calculations, drawings, analyses, technical specifications, and other procurement related documents
- Supports construction



# Licensing Documents

- Construction Authorization Request
  - Submitted to NRC - Feb 2001
  - FSER, Construction Authorization – March 2005
- License Application/Integrated Safety Analysis Summary/Submittal documents
  - Submitted to NRC – Sept 2006
  - Accepted for technical Review – December 2006
  - Redacted LA submitted – January 2007

# Procedures



# Configuration Management Plan

- Implements applicable Regulatory requirements
  - 10 CFR 70
  - MOX Quality Assurance Plan (MPQAP)
- Establishes programmatic requirements to maintain and document technical, physical and operational basis of the Project
- Provides implementation and verification of the change control process

# Configuration Management Plan

- Requirements established at the highest level are translated into lower tier implementation documents
- Implementation documents follow established review, approval, and configuration management process
- Changes/revisions to design and licensing documents are *managed* by the change control process
- Changes/revisions to design and licensing documents must receive required project and licensing reviews and approvals prior to implementation
- Configuration management ensures proper flow down of the requirements for the subsequent changes/revisions to implementing documents

# Configuration Management Plan

- Change Control
  - changes/revisions/updates to Engineering documentation (internal to Project for reviews and approvals)
  - changes/revisions/updates to Licensing documentation

# Natural Phenomena Hazards (NPH) Design Basis

# Severe Wind

CAR	FSER	LA/ISAS
130 mph  (Table 5.5-20)	130 mph acceptable  (11.1.1.3.2.2)	130 mph  (LA Table 1.1-2, ISAS Table 3.1-2)

# Extreme Wind/Tornado

CAR	FSER	LA/ISAS
<p>240 mph</p> <p>150 psf pressure drop</p> <p>55 psf rate of pressure drop</p> <p>(Table 5.5-20)</p>	<p>CAR values acceptable</p> <p>(11.1.1.3.2.3)</p>	<p>3 sec wind speed - 240 mph</p> <p>atmospheric pressure change -150 psf</p> <p>rate of pressure Drop - 55 psf</p> <p>(LA Table 1.1-2, ISAS Table 3.1-2)</p>



# Tornado Missile

CAR	FSER	LA/ISAS
<p>For 3" diameter standard steel pipe</p> <p>Horizontal Impact speed - 75 mph</p> <p>Vertical Impact Speed - 50 mph</p> <p>Maximum Height - 100 ft above grade</p> <p>(5.5.2.6.5.3)</p>	<p>CAR values acceptable</p> <p>(11.1.1.3.2.3)</p>	<p>For 3" diameter standard steel pipe</p> <p>Horizontal Impact speed - 75 mph</p> <p>Vertical Impact Speed - 50 mph</p> <p>Maximum Height - 100 ft above grade</p> <p>( LA Table 1.1-2, ISAS 3.1-2)</p>

# Rain, Snow, and Ice

CAR	FSER	LA/ISAS
<p>Rain - 7.4" in 1 hr, 3.9" in 15 min (roof design basis – 50 psf)</p> <p>10 psf snow or ice loading</p> <p>(Table 5.5-20, CAR 11.1.7.4.1.1)</p>	<p>Rain - roof systems designed to 50 psf acceptable</p> <p>Snow and Ice loading - 10 psf</p> <p>(11.1.1.3.2.2)</p>	<p>Rain - 7.4" in 1 hr, 3.9" in 15 min (roof design basis – 50 psf)</p> <p>Snow/Ice - 10 psf</p> <p>( LA 1.1.2.1.6.4.1.1, LA Table 1.1-2, ISAS 3.1-2)</p>

# Earthquake

CAR	FSER	LA/ISAS
0.20g horizontal ground acceleration	0.20g horizontal ground acceleration	0.20g horizontal ground acceleration
0.20g vertical ground acceleration	0.20g vertical ground acceleration	0.20g vertical ground acceleration
(Table 5.5-20)	(11.1.1.3.2.3)	(LA Table 1.1.2-2, ISAS 3.1-2)

# Design Basis Flood

CAR	FSER	LA/ISAS
<p>Design Flood Level (DFL) above MSL: 207.9 ft</p> <p>Probable Maximum Flood Level (PMF): 224.5 ft</p> <p>Site Grade Level~ 272 ft above MSL</p> <p>(1.3.4.2)</p>	<p>Design Flood Level (DFL) above MSL: acceptable</p> <p>Probable Maximum Flood Level (PMF): 224.5 ft</p> <p>Site Grade Level~ 272 ft above MSL</p> <p>(11.1.1.3.2.2)</p>	<p>Design Flood Level (DFL) above MSL: 207.9 ft</p> <p>Probable Maximum Flood Level (PMF): 224.5 ft</p> <p>Site Grade Level~ 272 ft above MSL</p> <p>(LA Table 1.1.2-2, ISAS Table 3.1-2)</p>

# Summary

- Design process
  - Requirements
  - Preliminary/detailed design
  - Reference plants
  - Licensing documents
  - Procedurally controlled
  - Configuration management
- NPH design basis
  - CAR, FSER and LA/ISAS consistent