

SeabrookLANPEm Resource

From: Browne, Kenneth <Kenneth.J.Browne@nexteraenergy.com>
Sent: Wednesday, August 23, 2017 4:47 PM
To: Poole, Justin
Subject: [External_Sender] NEE Slide Deck-Seabrook 8-23
Attachments: 2017_08_24_NEE_PublicMeeting.pdf

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Subject: [External_Sender] NEE Slide Deck-Seabrook 8-23
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Created By: Kenneth.J.Browne@nexteraenergy.com

Recipients:
"Poole, Justin" <Justin.Poole@nrc.gov>
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MESSAGE	0	8/23/2017 4:47:04 PM
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Seabrook Station License Amendment Request 16-03 ASR Structural Evaluation Methodology

Ken Browne, Mike Collins

24 August 2017

NextEra Energy's nuclear fleet is 4th largest in MW generation and number of reactors in the U.S.



Acquired: 2007
Point Beach
(Wisconsin)
1,193 MWe

Acquired: 2006
Duane Arnold
(Iowa)
615 MWe

Acquired: 2002
Seabrook
(New Hampshire)
1,245 MWe

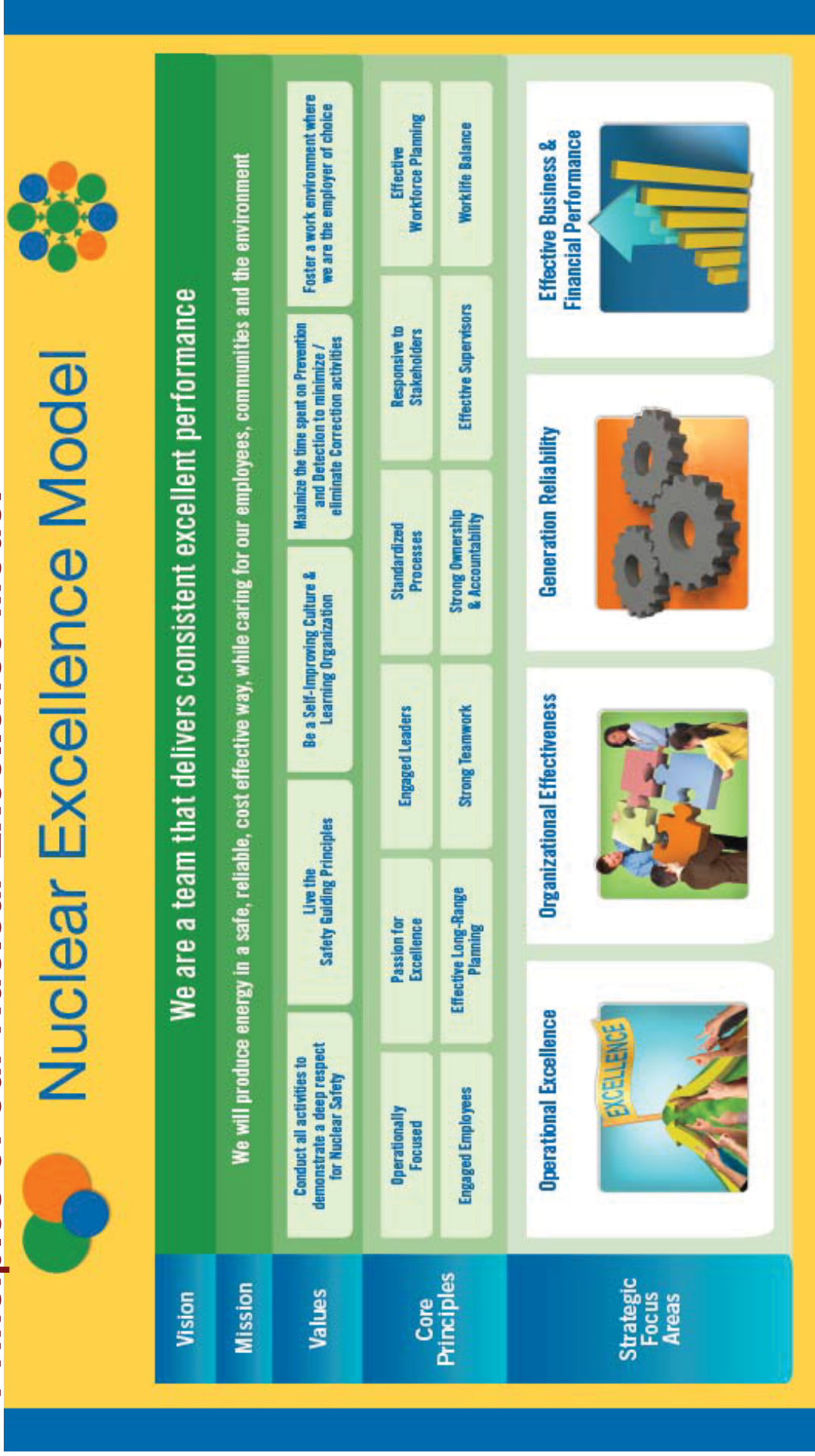
St. Lucie
(Florida)
2,000 MWe

Turkey Point
(Florida)
1,600 MWe

NextEra Energy's nuclear plants represent approximately 27 percent of our generation



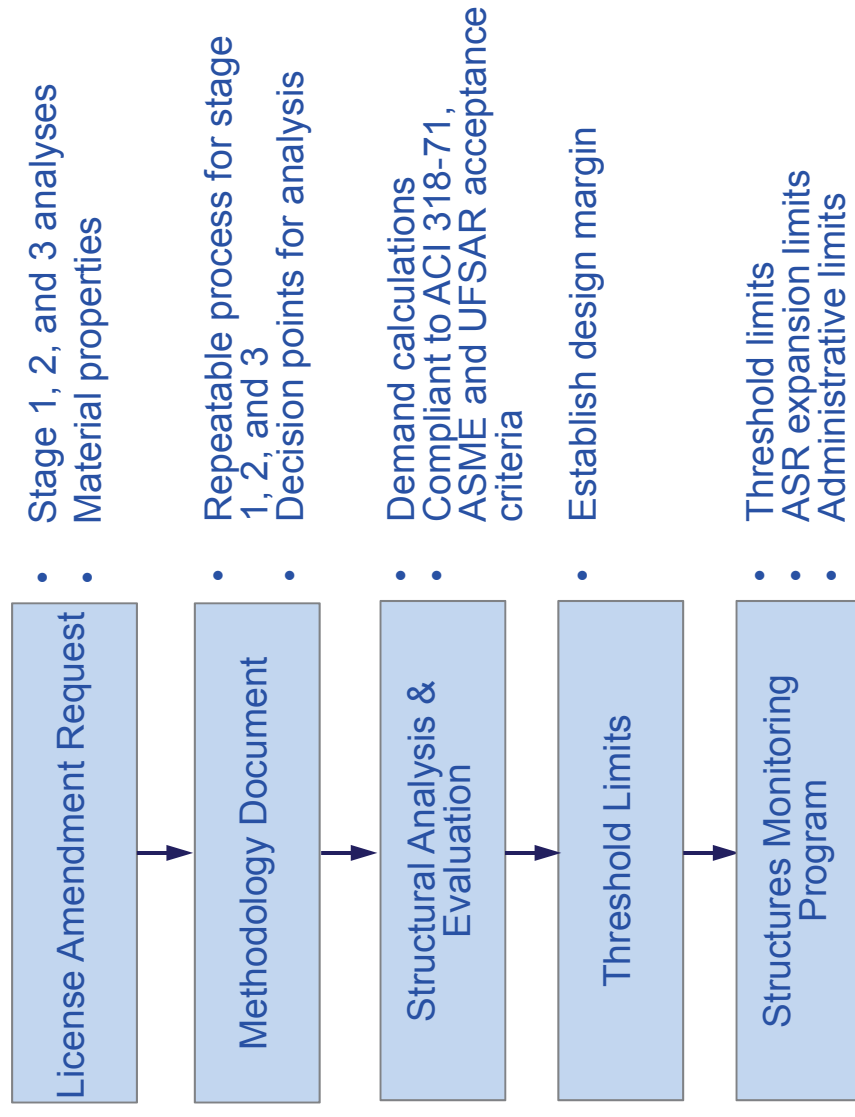
The foundation for everything we do are the Values and Core Principles of our Nuclear Excellence Model



Objective

- **Understand staff expectations for methodology**
- **Address comments on LAR Stage 3 methodology**
- **Discuss methodology document**
- **Show consistency of applied methodology**
- **Schedule & path forward**

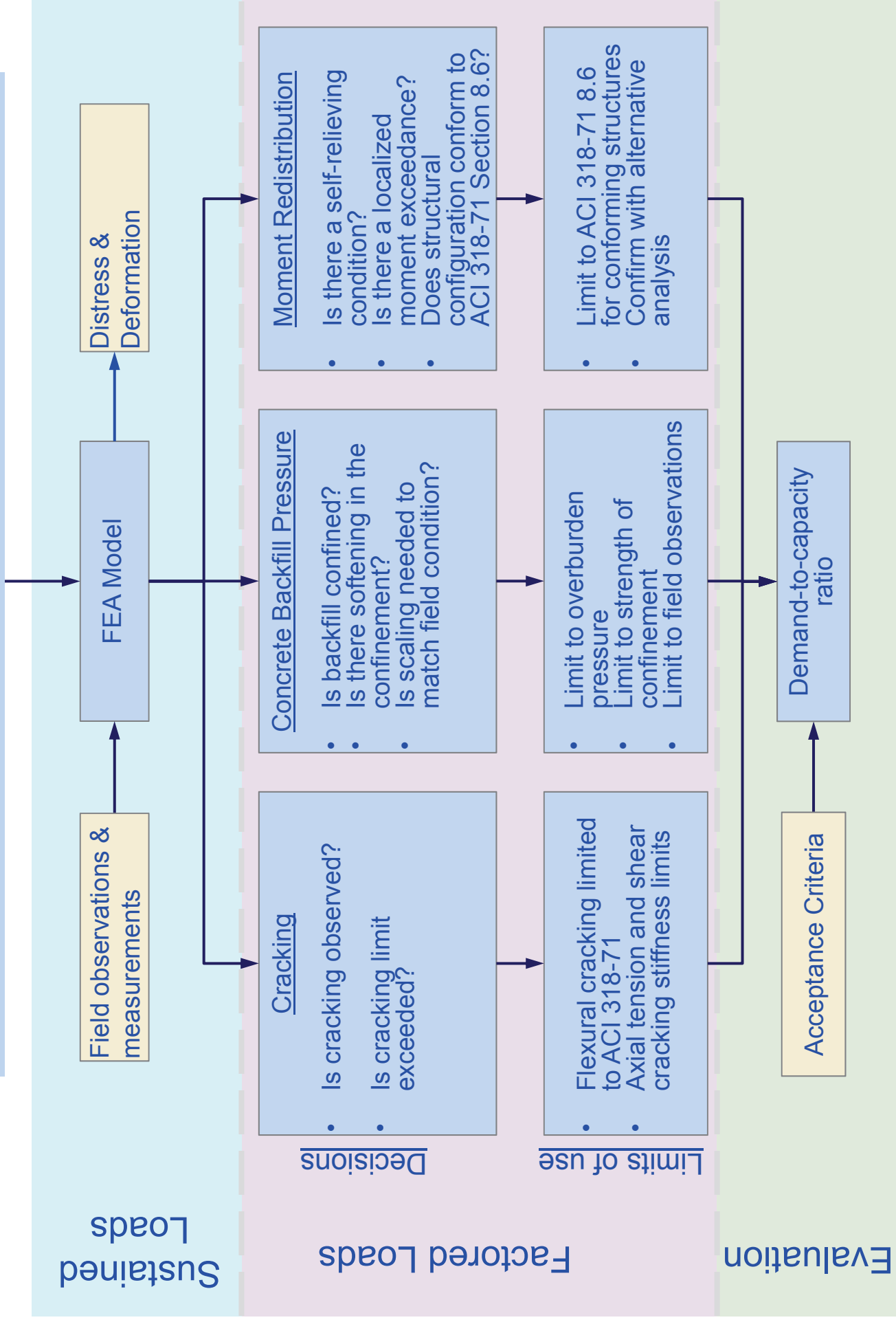
Overview of ASR Evaluation Process



Overview of Methodology Document

- **Overview**
- **Codes and Standards**
- **Materials**
- **Load and load combinations**
- **Analysis**
 - Stage One and Stage Two
 - Stage Three
 - Correlation of model to field conditions
 - Decision points
- **Acceptance Criteria**
- **ASR Threshold Limits and Monitoring**

Stage Three Evaluation Process



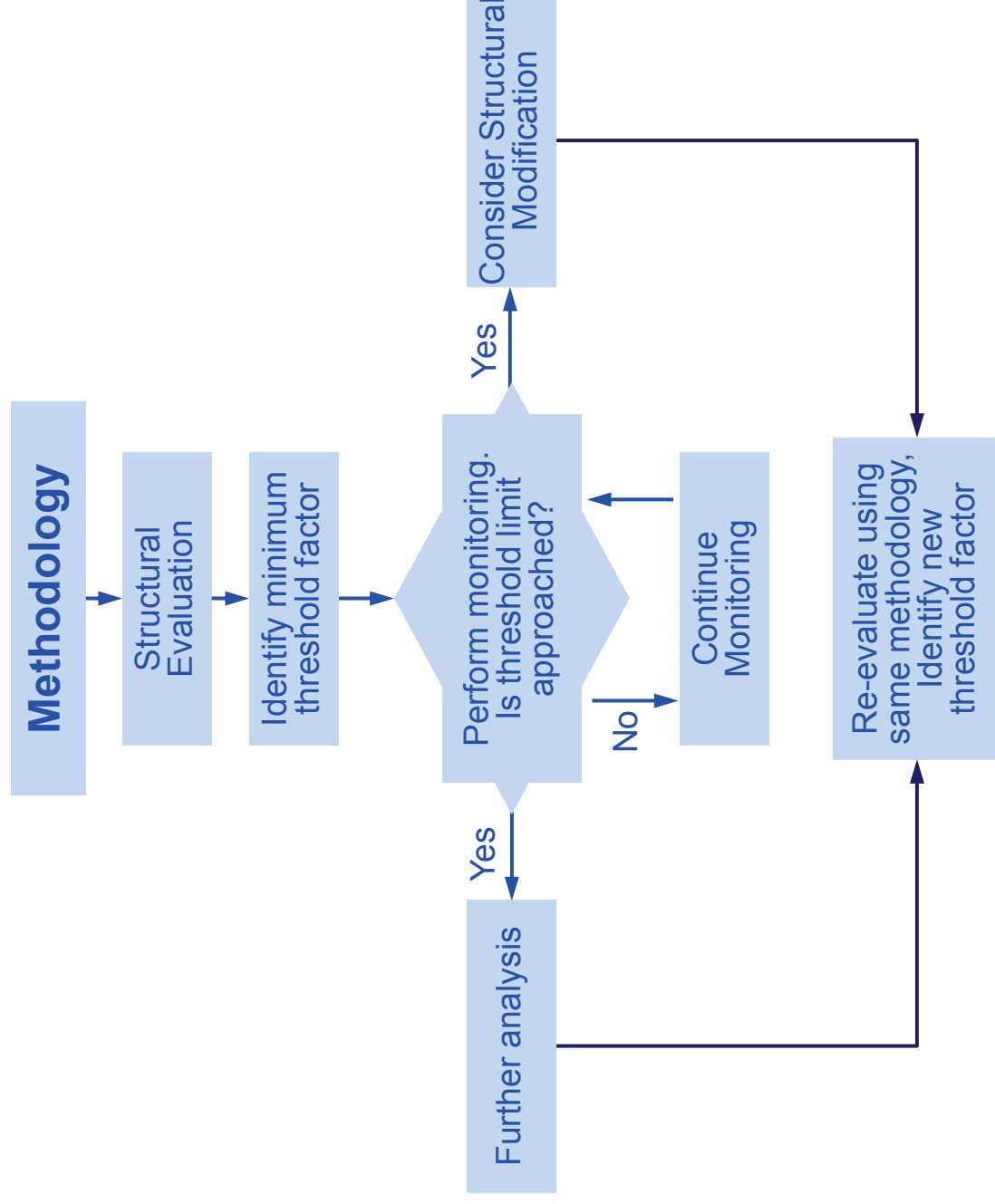
Consistency of Methodology

Consistency of Methodology

	Stage▶														
	CEB	Make-up Air Intake	RHR	FSB	Control & Diesel	Mech. Pen. & MSFW-W	Cooling Tower	Electrical Manholes	Condensate Storage Tank	Equipment Hatch	Containment	Steam Gen. Blowdown	CEVA	Electrical Tunnel	Containment Internals
LOADS AND LOAD COMBINATIONS								3,2,1	2	1	1	1	1	1	1
Load Combinations	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Containment	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	✓	NA	NA	NA	NA
Containment Internal Structures	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	✓
Other Seismic Category I Structures	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	NA	✓	✓	✓	NA
ANALYSIS															
Selection of Starting Stage	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Stage One Analyses	NA	NA	NA	NA	NA	NA	NA	✓	✓	✓	✓	✓	✓	✓	✓
Stage Two Analyses	NA	NA	NA	NA	NA	NA	NA	✓	✓	✓	NA	NA	NA	NA	NA
Stage Three Analyses	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	NA	NA	NA	NA	NA
Field Observations to Support Stage Three Analyses	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	NA	NA	NA	NA	NA
Non-ASR Demands for Stage Three Analyses	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	NA	NA	NA	NA	NA
ASR Demands for Stage Three Analyses	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	NA	NA	NA	NA	NA
ASR Expansion of Structural Components	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	NA	NA	NA	NA	NA
ASR Expansion of Concrete Backfill	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	NA	NA	NA	NA	NA
Correlation of Model with Field Conditions	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	NA	NA	NA	NA	NA
Refined Analytical Methods	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	NA	NA	NA	NA	NA
Use of Cracked Section Properties in Stage Three Analyses	NR	✓	✓	✓	✓	✓	✓	✓	✓	✓	NA	NA	NA	NA	NA
Use of Moment Redistribution in Stage Three Analyses	✓	NR	✓*	NR	NR	NR	✓	✓*	✓	✓	NA	NA	NA	NA	NA
Factored Load Calculation	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	NA	NA	NA	NA	NA
ACCEPTANCE CRITERIA															
Acceptance Criteria for Containment	NA	NA	NA	NA	NA	NA	NA	NA	NA	✓	✓	NA	NA	NA	NA
Acceptance Criteria for Other Seismic Category 1 Structures	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	NA	✓	✓	✓	✓
Impact of ASR on Code of Record Acceptance Criteria	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Acceptance Criteria for Isolation Gaps	✓	NA	✓	✓	✓	✓	✓	✓	✓	✓	NA	✓	✓	✓	✓
Acceptance Criteria for Foundations	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Acceptance Criteria for Stability	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
ASR THRESHOLD LIMITS AND MONITORING															
Methodology to Account for Potential Future ASR Expansion	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
ASR Threshold Limits and Monitoring for Stage One Structures	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.5	1.8	3.5	3.0	3.0	✓
ASR Threshold Limits and Monitoring for Stage Two Structures	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.6	NA	NA	NA	NA	NA
ASR Threshold Limits and Monitoring for Stage Three Structures	1.2	1.4	1.2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

= Completed Structure
 = In-Progress Structure
 = Evaluation follows this Section of the Methodology
 = Not Applicable
 = Not Required
 * = Moment redistribution conforming to ACI 318-71 Section 8.6 only

Threshold Monitoring



Building Deformation Analyses (1 of 2)

Structure	Schedule	Percent Complete
Condensate water storage tank	Complete	100%
Containment enclosure building	Complete	100%
Containment enclosure ventilation area	Complete	100%
Containment structure	Complete	100%
Equipment hatch missile shield	Complete	100%
Steam generator recovery blowdown bldg.	Complete	100%
Control room make-up air intake	Complete	100%
Electrical cable tunnels	Complete	100%
Pre-action valve building	3Q2017	80%
RHR equipment vault	Complete	100%
Containment internal structures	3Q2017	80%
Main steam and feed water east pipe chase	3Q2017	50%
Hydrogen recombiner structure	3Q2017	50%
Safety-related electrical duct banks and manholes	1Q2018	40%
Emergency feedwater pump building	3Q2017	10%
Fuel storage building	3Q2017	60%

Structures that are/expected to be Stage 3

Building Deformation Analyses (2 of 2)

Structure	Schedule	Percent Complete
Control Building	4Q2017	10%
Diesel Generator Building		
Mechanical Penetration	4Q2017	30%
Personnel hatch area		
Main steam and feed water west pipe chase		
Primary auxiliary building	4Q2017	10%
Service water cooling tower incl. switchgear rooms	1Q2018	
Service water access (inspection) vault	1Q2018	
Circulating water pumphouse (below el. 21')	2Q2018	
Service water pumphouse		
Piping (RCA) Tunnels	2Q2018	
Tank farm area	2Q2018	
Waste processing building	2Q2018	

■ Structures that are/expected to be Stage 3

Discussion with NRC Staff

Wrap Up

- The importance to establish a repeatable methodology with limits is understood
- A consistent methodology is being applied in the structural evaluations
- A methodology document will be submitted

Next Steps

- Submit methodology document
- Respond to issued RAls
- Maintain communications with NRC staff