

Post Fukushima Flooding and Seismic Hazard Reevaluation Status

Flooding Hazard Reevaluation

- The licensees for all operating power reactor sites have completed their hazard reevaluation and have submitted their Flood Hazard Reevaluation Reports (FHRR).
- The NRC used a graded approach to address flood hazard results that exceed the current design basis.
- The NRC expects that the licensees for 47* operating reactor sites will submit a focused evaluation (FE) to address local intense precipitation and to leverage available physical margin. The licensees for 43 operating reactor sites have provided their focused evaluations. The NRC expects the remaining FEs to be submitted by mid-2019.
- The NRC expects that the licensees for five operating power reactor sites will submit integrated assessments (IA) to address the reevaluated flooding hazard impact on their sites. The licensees for four operating power reactor sites have submitted an integrated assessment. The fifth IA (which involves a probabilistic storm surge analysis) is expected in 2019.

Seismic Hazard Reevaluation

- The licensees for all operating power reactor sites have completed their hazard reevaluation and have submitted their Seismic Hazard and Screening Reports (SHSR).
- The NRC used a graded approach to address seismic hazard results that exceed the current design basis.
- The licensees for 34 operating power reactor sites completed the expedited seismic evaluation process (ESEP) screening and evaluation. All of the expected ESEP reports have been submitted.
- The NRC expects that the licensees for 18 operating power reactor sites will complete a seismic probabilistic risk assessment (SPRA). The licensees for 8 sites have submitted their SPRA. The NRC expects the remaining SPRAs to be completed by the end of 2019.
- The NRC requested that the licensees for 49 operating power reactor sites submit one or more limited scope evaluations (i.e., high frequency evaluations and spent fuel pool evaluations). All of the limited scope evaluations have been submitted.

Mitigation Strategies Assessments

- The licensees for 59 out of 60* operating power reactor sites have submitted their Flood Hazard mitigation strategies assessment (MSA).
- The licensees for 50 out of 60* operating power reactor sites have submitted their Seismic Hazard MSA. The remaining seismic MSAs depend on insights to be developed as part of the SPRA process.

* The NRC granted Entergy's requests to defer the submittal date for remaining seismic and flooding reevaluation activities for Pilgrim and Indian Point to a date beyond the planned permanent shutdown in 2019 and 2021. The NRC is evaluating FENOCs request to defer the submittal date for the FE for Perry to a date beyond the permanent shutdown in 2021.

A table with the status of the hazard reevaluations is provided on the following pages. Site names that are highlighted in dark green have completed all post-Fukushima activities and the NRC has issued a completion letter.

Flooding and Seismic Hazard Reevaluation Status for Operating Reactors – Regions I and II

Region I		Flood Hazard			Seismic Hazard					Region II		Flood Hazard			Seismic Hazard				
		FHRR	MSA	FE/IA	SHSR	ESEP	LSE	MSA	SPRA			FHRR	MSA	FE/IA	SHSR	ESEP	LSE	MSA	SPRA
Beaver Valley	1 2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Browns Ferry	1 2 3	Yes	Yes	2Q 2019	Yes	Yes	Yes	1Q 2020	4Q 2019
Calvert Cliffs	1 2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NR	Brunswick	1 2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NR
FitzPatrick		Yes	Yes	Yes	Yes	Yes	Yes	Yes	NR	Catawba	1 2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NR
GINNA		Yes	Yes	Yes	Yes	NR	Yes	Yes	NR	Farley	1 2	Yes	Yes	Yes	Yes	NR	NR	Yes	NR
Hope Creek		Yes	Yes	Yes	Yes	NR	Yes	Yes	NR	Harris		Yes	Yes	Yes	Yes	NR	Yes	Yes	NR
Indian Point	2 3	Yes	Yes	Note 1	Yes	Yes	Note 1	Note 1	Note 1	Hatch	1 2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NR
Limerick	1 2	Yes	Yes	Yes	Yes	NR	Yes	Yes	NR	McGuire	1 2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NR
Millstone	2 3	Yes	Yes	3Q 2019	Yes	NR	Yes	Yes	NR	North Anna	1 2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Nine Mile Point	1 2	Yes	Yes	Yes	Yes	NR	Yes	Yes	NR	Oconee	1 2 3	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Peach Bottom	2 3	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Robinson		Yes	Yes	Yes	Yes	Yes	Yes	1Q 2020	4Q 2019
Pilgrim		Yes	Note 2	Note 2	Yes	Yes	Note 2	Note 2	Note 2	St. Lucie	1 2	Yes	Yes	Yes	Yes	NR	NR	Yes	NR
Salem	1 2	Yes	Yes	Yes	Yes	NR	Yes	Yes	NR	Sequoyah	1 2	Yes	Yes	2Q 2019	Yes	Yes	Yes	1Q 2020	4Q 2019
Seabrook		Yes	Yes	Yes	Yes	Yes	Yes	Yes	NR	Summer		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Susquehanna	1 2	Yes	Yes	NR	Yes	NR	Yes	Yes	NR	Surry	1 2	Yes	Yes	Yes	Yes	NR	NR	Yes	NR
Three Mile Island		Yes	Yes	Yes	Yes	Yes	Yes	Yes	NR	Turkey Point	3 4	Yes	Yes	Yes	Yes	NR	NR	Yes	NR
										Vogtle	1 2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
										Watts Bar	1 2	Yes	Yes	2Q 2019	Yes	Yes	Yes	Yes	Yes

NR = Not Required

Note 1: The NRC granted Entergy's request to defer the submittal date for remaining seismic and flooding reevaluation activities and the seismic MSA submittal for Indian Point until August 1, 2020 (Unit 2) and August 1, 2021 (Unit 3).

Note 2: The NRC granted Entergy's request to defer the submittal date for remaining seismic and flooding reevaluation activities and the flooding and seismic MSA submittals for Pilgrim until December 31, 2019.

Flooding and Seismic Hazard Reevaluation Status for Operating Reactors – Regions III and IV

Region III	Flood Hazard			Seismic Hazard					Region IV	Flood Hazard			Seismic Hazard						
	FHRR	MSA	FE/IA	SHSR	ESEP	LSE	MSA	SPRA		FHRR	MSA	FE/IA	SHSR	ESEP	LSE	MSA	SPRA		
Braidwood	1 2	Yes	Yes	Yes	Yes	NR	Yes	Yes	NR	ANO	1 2	Yes	Yes	Yes	Yes	NR	Yes	Yes	NR
Byron	1 2	Yes	Yes	NR	Yes	NR	Yes	Yes	NR	Callaway		Yes	Yes	NR	Yes	Yes	Yes	4Q 2019	3Q 2019
Clinton		Yes	Yes	NR	Yes	NR	Yes	Yes	NR	Columbia		Yes	Yes	Yes	Yes	Yes	Yes	4Q 2019	3Q 2019
DC Cook	1 2	Yes	Yes	Yes	Yes	Yes	Yes	1Q 2020	4Q 2019	Comanche Peak	1 2	Yes	Yes	Yes	Yes	NR	NR	Yes	NR
Davis Besse		Yes	Yes	Yes	Yes	Yes	Yes	Yes	NR	Cooper		Yes	Yes	Yes	Yes	Yes	Yes	Yes	NR
Dresden	2 3	Yes	Yes	Yes	Yes	Yes	Yes	Yes	4Q 2019	Diablo Canyon	1 2	Yes	Yes	Yes	Yes	NR	Yes	Yes	Yes
Duane Arnold		Yes	Yes	Yes	Yes	NR	Yes	Yes	NR	Grand Gulf		Yes	Yes	Yes	Yes	NR	NR	Yes	NR
Fermi		Yes	Yes	NR	Yes	Yes	Yes	Yes	NR	Palo Verde	1 2 3	Yes	Yes	Yes	Yes	NR	NR	Yes	NR
LaSalle	1 2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NR	River Bend		Yes	Yes	Yes	Yes	NR	Yes	Yes	NR
Monticello		Yes	Yes	Yes	Yes	Yes	Yes	Yes	NR	South Texas Project	1 2	Yes	Yes	NR	Yes	NR	NR	Yes	NR
Palisades		Yes	Yes	Yes	Yes	Yes	Yes	4Q 2019	3Q 2019	Waterford		Yes	Yes	Yes	Yes	NR	Yes	Yes	NR
Perry		Yes	Yes	Note 3	Yes	Yes	Yes	Yes	NR	Wolf Creek		Yes	Yes	Yes	Yes	Yes	Yes	Yes	NR
Point Beach	1 2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NR										
Prairie Island	1 2	Yes	Yes	Yes	Yes	NR	NR	Yes	NR										
Quad Cities	1 2	Yes	Yes	Yes	Yes	NR	Yes	Yes	NR										

NR = Not Required

Note 3: FENOC has requested deferral of remaining flood reevaluation activities based on early shutdown of the unit. The NRC is evaluating the deferral request.