

## 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 licensees for 45\* operating reactor sites completed focused evaluations (FE) to address local intense precipitation and to leverage available physical margin to protect against the reevaluated flood levels. All of the expected focused evaluation reports have been submitted. The NRC has completed its review of all of the focused evaluation reports.
- The licensees for 6 operating power reactor sites completed integrated assessments (IA) to address the reevaluated flooding hazard impact on their sites. All of the expected integrated assessment reports have been submitted. The NRC has completed its review of all of the integrated assessment reports.

### 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 and the NRC has completed its review of the ESEP reports.
- The licensees for 15\* operating power reactor sites completed seismic probabilistic risk assessments (SPRA). All of the expected SPRA reports have been submitted. The NRC has completed its review of 11 of these SPRA reports.
- 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 and the NRC has completed its review of these limited scope evaluations.

### Mitigation Strategies Assessments

- As noted in the seismic hazard (ADAMS Accession No. ML19140A307, dated July 3, 2019) and flood hazard (ADAMS Accession No. ML19067A247, dated August 20, 2019) binning letters, the staff has suspended its review of the remaining MSAs based on the final approved MBDBE rule. For the reviews not yet completed, or not yet submitted, the staff will evaluate the mitigation strategies, as appropriate, as part of its review of FE, IA, or SPRA reports.
- Licensees are no longer expected to submit MSAs associated with their reevaluated hazards.

\* The NRC granted Entergy's requests to defer the submittal dates for remaining seismic and flooding reevaluation activities for Indian Point and Palisades to dates beyond the planned permanent shutdown dates in 2021 and 2022.

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

### 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         | FE/IA  | SHSR           | ESEP | LSE    | SPRA     |              |             | FHRR         | FE/IA | SHSR           | ESEP | LSE | SPRA |
| Beaver Valley     | 1<br>2 | Yes          | Yes    | Yes            | Yes  | Yes    | Yes      | Browns Ferry | 1<br>2<br>3 | Yes          | Yes   | Yes            | Yes  | Yes | Yes  |
| Calvert Cliffs    | 1<br>2 | Yes          | Yes    | Yes            | Yes  | Yes    | NR       | Brunswick    | 1<br>2      | Yes          | Yes   | Yes            | Yes  | Yes | NR   |
| FitzPatrick       |        | Yes          | Yes    | Yes            | Yes  | Yes    | NR       |              | Catawba     | 1<br>2       | Yes   | Yes            | Yes  | Yes | Yes  |
| GINNA             |        | Yes          | Yes    | Yes            | NR   | Yes    | NR       | Farley       | 1<br>2      | Yes          | Yes   | Yes            | NR   | NR  | NR   |
| Hope Creek        |        | Yes          | Yes    | Yes            | NR   | Yes    | NR       |              | Harris      |              | Yes   | Yes            | Yes  | NR  | Yes  |
| Indian Point      | 2<br>3 | Yes          | Note 1 | Yes            | Yes  | Note 2 | Note 2   | Hatch        | 1<br>2      | Yes          | Yes   | Yes            | Yes  | Yes | NR   |
|                   | Note 2 |              |        |                |      | Note 2 | Limerick |              | 1<br>2      |              |       |                |      |     |      |
| Millstone         | 2<br>3 | Yes          | Yes    | Yes            | NR   | Yes    | NR       | McGuire      | 1<br>2      | Yes          | Yes   | Yes            | Yes  | Yes | NR   |
| Nine Mile Point   | 1<br>2 | Yes          | Yes    | Yes            | NR   | Yes    | NR       | North Anna   | 1<br>2      | Yes          | Yes   | Yes            | Yes  | Yes | Yes  |
| Peach Bottom      | 2<br>3 | Yes          | Yes    | Yes            | Yes  | Yes    | Yes      |              | Oconee      | 1<br>2<br>3  | Yes   | Yes            | Yes  | Yes | Yes  |
| Salem             | 1<br>2 | Yes          | Yes    | Yes            | NR   | Yes    | NR       | Robinson     |             | Yes          | Yes   | Yes            | Yes  | Yes | Yes  |
| Seabrook          |        | Yes          | Yes    | Yes            | Yes  | Yes    | NR       | St. Lucie    | 1<br>2      | Yes          | Yes   | Yes            | NR   | NR  | NR   |
| Susquehanna       | 1<br>2 | Yes          | NR     | Yes            | NR   | Yes    | NR       | Sequoyah     | 1<br>2      | Yes          | Yes   | Yes            | Yes  | Yes | Yes  |
| Three Mile Island |        | Yes          | Yes    | Yes            | Yes  | Yes    | NR       | Summer       |             | Yes          | Yes   | Yes            | Yes  | Yes | Yes  |
|                   |        |              |        |                |      |        |          | Surry        | 1<br>2      | Yes          | Yes   | Yes            | NR   | NR  | NR   |
|                   |        |              |        |                |      |        |          | Turkey Point | 3<br>4      | Yes          | Yes   | Yes            | NR   | NR  | NR   |
|                   |        |              |        |                |      |        |          | Vogtle       | 1<br>2      | Yes          | Yes   | Yes            | Yes  | Yes | Yes  |
|                   |        |              |        |                |      |        |          | Watts Bar    | 1<br>2      | Yes          | Yes   | Yes            | Yes  | Yes | Yes  |

NR = Not Required

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

Note 2: For Unit 3, the NRC granted Entergy's request to defer the submittal date for remaining seismic reevaluation activities until August 1, 2021. For Unit 2, completion of the seismic reevaluation activities is no longer required because of the permanent shutdown of unit 2 on April 30, 2020.

### 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         | FE/IA | SHSR           | ESEP | LSE | SPRA   |                     |             | FHRR         | FE/IA | SHSR           | ESEP | LSE | SPRA |
| Braidwood      | 1<br>2 | Yes          | Yes   | Yes            | NR   | Yes | NR     | ANO                 | 1<br>2      | Yes          | Yes   | Yes            | NR   | Yes | NR   |
| Byron          | 1<br>2 | Yes          | NR    | Yes            | NR   | Yes | NR     | Callaway            |             | Yes          | NR    | Yes            | Yes  | Yes | Yes  |
| Clinton        |        | Yes          | NR    | Yes            | NR   | Yes | NR     | Columbia            |             | Yes          | Yes   | Yes            | Yes  | Yes | Yes  |
| DC Cook        | 1<br>2 | Yes          | Yes   | Yes            | Yes  | Yes | Yes    | Comanche Peak       | 1<br>2      | Yes          | Yes   | Yes            | NR   | NR  | NR   |
| Davis Besse    |        | Yes          | Yes   | Yes            | Yes  | Yes | NR     | Cooper              |             | Yes          | Yes   | Yes            | Yes  | Yes | NR   |
| Dresden        | 2<br>3 | Yes          | Yes   | Yes            | Yes  | Yes | Yes    | Diablo Canyon       | 1<br>2      | Yes          | Yes   | Yes            | NR   | Yes | Yes  |
| Duane Arnold   |        | Yes          | Yes   | Yes            | NR   | Yes | NR     | Grand Gulf          |             | Yes          | Yes   | Yes            | NR   | NR  | NR   |
| Fermi          |        | Yes          | NR    | Yes            | Yes  | Yes | NR     | Palo Verde          | 1<br>2<br>3 | Yes          | Yes   | Yes            | NR   | NR  | NR   |
| LaSalle        | 1<br>2 | Yes          | Yes   | Yes            | Yes  | Yes | NR     | River Bend          |             | Yes          | Yes   | Yes            | NR   | Yes | NR   |
| Monticello     |        | Yes          | Yes   | Yes            | Yes  | Yes | NR     | South Texas Project | 1<br>2      | Yes          | NR    | Yes            | NR   | NR  | NR   |
| Palisades      |        | Yes          | Yes   | Yes            | Yes  | Yes | Note 3 | Waterford           |             | Yes          | Yes   | Yes            | NR   | Yes | NR   |
| Perry          |        | Yes          | Yes   | Yes            | Yes  | Yes | NR     | Wolf Creek          |             | Yes          | Yes   | Yes            | Yes  | Yes | NR   |
| Point Beach    | 1<br>2 | Yes          | Yes   | Yes            | Yes  | Yes | NR     |                     |             |              |       |                |      |     |      |
| Prairie Island | 1<br>2 | Yes          | Yes   | Yes            | NR   | NR  | NR     |                     |             |              |       |                |      |     |      |
| Quad Cities    | 1<br>2 | Yes          | Yes   | Yes            | NR   | Yes | NR     |                     |             |              |       |                |      |     |      |

NR = Not Required

Note 3: The NRC has granted Entergy's request to defer the submittal date for the SPRA until December 31, 2022.