

## Summary of Observations

### Temporary Instruction 2515/183, “Followup to the Fukushima Daiichi Fuel Damage Event”

#### Summary of Observations:

The following are some general observations made during the performance of TI 2515/183. While individually, none of these observations posed a significant safety issue, they indicate a potential industry trend of failure to maintain equipment and strategies required to mitigate some design and beyond design basis events.

Nuclear plants have multiple, redundant, strategies for which the overall function is to mitigate damage to the facility’s fuel elements and containment. The failure of a strategy due to equipment failure, procedure inadequacy, inadequate training, etc., does not mean that the other redundant strategies would not have successfully performed their function. During this inspection, while some deficiencies were identified that would have caused a single strategy to be compromised or fail, no functions were compromised that would have resulted in damage to the fuel elements or containment.

The results of the inspections are being assessed in greater detail through the NRC’s Reactor Oversight Process and will also be examined by the NRC’s Task Force’s examining the agency’s regulatory requirements, programs, processes, and implementation in light of information from the Fukushima Daiichi event.

#### Licensee Capability to Mitigate Fires in Large Areas of the Plant in accordance with 10 CFR 50.54(hh)(2)

- Some equipment (mainly pumps) would not operate when tested or lacked test acceptance criteria
- Some equipment was missing or dedicated to other plant operations
- In some cases plant modifications had rendered strategies unworkable
- Fuel for pumps was not always readily available

#### Licensee Capability to Mitigate Station Blackout (SBO) Conditions

- In a few cases procedural or training deficiencies existed.

#### Licensee Capability to Mitigate Design Basis Internal and External Events

- Some equipment (mainly pumps) would not operate when tested or lacked test acceptance criteria
- Some discrepancies were identified with barrier and penetration seals

## Licensee Capability to Respond to Beyond Basis Events involving Fires, Floods, and Seismic Events

- Some equipment to mitigate fires and SBO was stored in areas that were not seismically qualified or could be flooded

### **Matrix of Observations by Facility:**

The attached matrix is a per-site summary of observations associated with TI 2515/183. The matrix was developed to provide NRC and external stakeholders with a quick method to review the observations, however, the matrix is not an in-depth assessment of the findings. As noted above, NRC is currently performing a thorough assessment of the identified issues to provide to the Task Force with insights on the U.S. nuclear industry's readiness to cope with beyond design basis events.

### **Using the Matrix:**

While the TI was not designed to ask "yes/no" questions, the matrix provides basic answers in this way to help guide the user to information regarding a facility that they may be interested in. The inspection reports should be reviewed for additional information on the observation.

Plant / Site	Region	Section 03.01: B.5.b/50.54(hh)(2)	Section 03.02: Station Blackout (SBO)	Section 03.03: Flooding	Section 03.04: Seismic activity coincident with large fires or flooding
		Were the licensee's mitigation capabilities <sup>1</sup> satisfactory at the time of the initial review?	Were the licensee's mitigation capabilities <sup>1</sup> satisfactory at the time of the initial review?	Were the licensee's mitigation capabilities <sup>1</sup> satisfactory at the time of the initial review?	Was the licensee's review and assessment satisfactory?
Beaver Valley	I	YES	YES	YES	YES
Calvert Cliffs	I	YES	YES	YES	YES
Fitzpatrick	I	YES	YES	YES	YES
Genoa	I	YES	YES	YES	YES
Hope Creek	I	YES	YES	YES	YES
Indian Point 2	I	YES	YES	YES	YES
Indian Point 3	I	YES	YES	YES	YES
Limerick	I	YES	YES	YES	YES
Millstone	I	YES	YES	YES	YES
Nine Mile Point	I	YES	YES	YES	YES
Oyster Creek	I	Function Met; Strategy Not Demonstrated (corrected)	YES <sup>2</sup>	YES	YES
Peach Bottom	I	YES	YES	YES	YES
Pilgrim	I	Function Met; Strategy Not Demonstrated (resolution in progress) <sup>2</sup>	YES	YES	YES
Salem	I	YES	YES	YES	YES
Seabrook	I	YES	YES	YES	YES
Susquehanna	I	YES	YES	YES	YES
Three Mile Island	I	YES	YES	YES	YES
Vermont Yankee	I	YES	YES	YES	YES
Browns Ferry	II	YES	YES <sup>2</sup>	YES	YES
Brunswick	II	YES	YES	YES	YES
Catawba	II	YES	YES	YES	YES
Crystal River	II	YES	YES	YES	YES
Farley	II	YES	YES	YES	YES
Harris	II	YES	YES	YES	YES
Hatch	II	Function Met; Strategy Not Demonstrated (resolution in progress) <sup>2</sup>	YES	YES	YES
McGuire	II	YES	YES	YES	YES
North Anna	II	YES	YES	YES <sup>2</sup>	YES
Oconee	II	Function Met; Strategy Not Demonstrated (resolution in progress) <sup>2</sup>	YES	YES <sup>2</sup>	YES
Robinson	II	YES	YES	YES	YES
Sequoyah	II	YES <sup>2</sup>	YES	YES	YES
St. Lucie	II	YES	YES	YES	YES
Summer	II	YES	YES	YES	YES
Surry	II	YES <sup>2</sup>	YES	YES	YES
Turkey Point	II	YES	YES	YES	YES
Vogtle	II	YES	YES	YES	YES
Watts Bar	II	YES <sup>2</sup>	YES	YES	YES
Braidwood	III	Function Met; Strategy Not Demonstrated (resolution in progress) <sup>2</sup>	YES	YES	YES
Byron	III	YES	YES	YES <sup>2</sup>	YES
Clinton	III	Function Met; Strategy Not Demonstrated (resolution in progress)	YES	YES	YES
D.C. Cook	III	YES	YES	YES	YES
Davis-Besse	III	YES	YES	YES	YES
Dresden	III	YES	YES	YES	YES
Duane Arnold	III	YES	YES	YES	YES
Fermi	III	YES	YES	YES	YES
Kewaunee	III	Function Met; Strategy Not Demonstrated (resolution in progress)	YES	YES	YES
LaSalle	III	YES	YES <sup>2</sup>	Function Met; Strategy Not Demonstrated (resolution in progress)	YES
Monticello	III	YES	YES	YES	YES
Palisades	III	YES	YES	YES	YES
Perry	III	YES	YES	YES	YES
Point Beach	III	YES	YES	Function Met; Strategy Not Demonstrated (resolution in progress) <sup>2</sup>	YES
Prairie Island	III	YES	YES	YES	YES
Quad Cities	III	YES	YES	YES	YES
Arkansas Nuclear	IV	YES	YES	YES	YES
Callaway	IV	YES	YES	YES	YES
Columbia	IV	YES	YES	YES	YES
Comanche Peak	IV	YES	YES <sup>2</sup>	YES <sup>2</sup>	YES
Cooper	IV	YES	YES	YES	YES
Diablo Canyon	IV	YES <sup>2</sup>	YES <sup>2</sup>	YES	YES
Fort Calhoun	IV	YES	YES <sup>2</sup>	YES <sup>2</sup>	YES
Grand Gulf	IV	YES <sup>2</sup>	YES <sup>2</sup>	YES	YES
Palo Verde	IV	YES	YES	YES	YES
River Bend	IV	Function Met; Strategy Not Demonstrated (corrected) <sup>2</sup>	Function Met; Strategy Not Demonstrated (corrected)	YES	YES
San Onofre	IV	YES	YES	YES	YES
South Texas	IV	YES <sup>2</sup>	YES	YES	YES
Waterford	IV	YES <sup>2</sup>	Function Met; Strategy Not Demonstrated (corrected) <sup>2</sup>	YES	YES
Wolf Creek	IV	Function Met; Strategy Not Demonstrated (resolution in progress)	Function Met; Strategy Not Demonstrated (resolution in progress)	YES	YES

1. There are multiple and redundant mitigation strategies. A "Function Met; Strategy Not Demonstrated" response in this column means that a mitigation strategy was not demonstrated, however, the overall mitigation function would still have worked and protected against fuel and containment damage.

2. The response for this item was determined through both a review of the inspection report and ongoing evaluations.