Simulator Fidelity

Impact to Operations

Conference on
Nuclear Training and
Education

NRC White Finding

- In September 2015, the NRC issued a white finding related to River Bend's control room simulator,
- The finding states the training simulator was not set up to ensure reproduction of all challenges operators might encounter during a specific unplanned reactor shutdown scenario.
- As a result, operations personnel were presented with additional challenges to control the plant and maintain plant parameters following a reactor scram on December 25, 2014.

NRC White Finding

- This was seen as a Violation of 10CFR55.46(c)(1) resulted in a White Finding with low to moderate safety significance.

NRC White Finding

- The primary issue dealt with the simulator failing to accurately model feedwater flow and reactor vessel level response following a scram.

NRC White Finding

- On 12/25/2014, a loss of Reactor Protection System (RPS) ‘B’ resulted in a SCRAM. During SCRAM recovery efforts, Feedwater (FW) Level control issues were experience due to FW Regulating Valve seat leakage and a failure of the startup FW Regulating valve resulting in a high level (level 8) and a trip of the reactor feed pumps.
- During post event testing the simulator did not result in a water level reaching the level 8 setpoint.

NRC White Finding

- Operational characteristic changes associated with either the Simulator or the Reference Unit can create non-compliance with 10 CFR Part 55.46(c)(1), as compliance is a function of the comparison between the two
- The simulator was originally designed with a total Feedwater Regulating Valve (FRV) Leakage variable in the model coding. However, the variable was set at zero (0) leakage with no instructor capability to manipulate the variable.

NRC White Finding

- The actual Reference Unit FRVs are not zero leakage components when new and degrade to higher leakage over time.
- The magnitude of the deviation between the Reference Unit and the Simulator is only evident at low flow conditions such as startup or shutdown conditions.
- Visibility of the deviation relies upon ANSI/ANS 3.5 required testing, Post Event Simulator Testing (PEST) and the feedback from simulator users.

NRC White Finding

- Lessons Learned
- As we go forward in Simulator Training in the Nuclear Power Industry, consistent coordination between the Simulation group and the Station line organizations to ensure that current plant operational objective data is captured and communicated and implemented to maintain simulation fidelity.