

PMLevyCOLPEm Resource

From: Habib, Donald
Sent: Wednesday, August 05, 2015 4:05 PM
To: PMLevyCOLPEm Resource
Subject: FW: ISG-11 Trip - Summary Description
Attachments: DCP-4827 Change Summary.docx

From: Kitchen, Robert [mailto:Robert.Kitchen@duke-energy.com]
Sent: Wednesday, August 05, 2015 8:21 AM
To: Habib, Donald
Cc: Cutright, Wayne; Taylor, Larry; Steve Franzone (Steve.Franzone@FPL.com); Jennifer Meneely (meneelje@westinghouse.com)
Subject: [External_Sender] ISG-11 Trip - Summry Description

Don – As discussed, attached is a summary of an emergent issue that we plan to address in the Levy COLA. We thought the attached summary would be helpful for you and reviewers to get an early understanding of the reason for the change and expected impact. It would be good if we could discuss in the public meeting, Thursday, 8/13. Let me know if you have questions.

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Subject: FW: ISG-11 Trip - Summary Description
Sent Date: 8/5/2015 4:05:05 PM
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From: Habib, Donald

Created By: Donald.Habib@nrc.gov

Recipients:
"PMLevyCOLPEm Resource" <PMLevyCOLPEm.Resource@nrc.gov>
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Proposed change by WEC - APP-GW-GEE-4827, Changes to Ensure PMS Compliance with IEEE 603 Operating Bypass Requirements

With regard to IEEE 603- 1999, the Source Range nuclear Instrumentation includes a flux doubling function, the P-6 permissive enablesthis function. Thefunction is reinstatedautomatically when reset by P-6, which satisfies a part of IEEE 603 for the automatic removal of the block. However this function does not employ an operating bypass permissive to prevent blocking the function or actuating the function when the conditions are not met.

Note: The P-6 permissive is the Intermediate Range Neutron flux for allowing block of Source Range and automatic energization of Source Range Neutron flux.

Three changes are proposed to ensure compliance with IEEE 603 and to support normal plant operation needs. The first two are to the PMS design. The third is to the Technical Specifications. Detailed changes are described at the end of this document.

- 1) Add a new permissive, P-8, to permit blocking the flux logic during reactor startup. (Prevents blocking of flux doubling below 510°F RCS temperature for reactor startup, 510°F is the minimum temperature for criticality)
- 2) Add logic that will cause the PMS to force CVS valves 136A and 136B closed if the flux doubling logic is blocked during shutdown conditions (< 510°F).(Actuation if flux doubling is bypassed below 510°F RCS temperature, which is one option from IEEE 603, the other is to prevent the blocking, and this design change actuates the function).
- 3) Include new permissive and actuation in Tech Specs, and describe in Tier 2 information

IEEE 603 is a standard for safety systems imposed directly by 10 CFR part 50.55a(h). Clause 6.6 of the standard establishes two requirements for "Operating Bypasses" This logic is included for many PMS functions to permit them to be blocked, as required by IEEE 603, so normal plant operations can occur without unnecessary actuation of safety systems. Portions of the block/reset associated with the flux doubling logic do not comply with IEEE 603 Section 6.6. A permissive is required for bypasses in safety systems. In DCD revision 19, the flux doubling actuation bypass does not have a permissive to prevent operation to bypass the actuation.

10 CFR 50.55a(h)(3)

(h) *Protection and safety systems.* Protection systems of nuclear power reactors of all types must meet the requirements specified in this paragraph. Each combined license for a utilization facility is subject to the following conditions.

(3) *Safety systems.* Applications filed on or after May 13, 1999, for construction permits and operating licenses under this part, and for design approvals, design certifications, and combined licenses under part 52 of this chapter, must meet the requirements for safety systems in IEEE Std. 603–1991 and the correction sheet dated January 30, 1995.

Definition from IEEE-603

operating bypass: Inhibition of the capability to accomplish a safety function that could otherwise occur in response to a particular set of generating conditions.

NOTE—An operating bypass is not the same as a maintenance bypass. Different modes of plant operation may necessitate an automatic or manual bypass of a safety function. Operating bypasses are used to permit mode changes (e.g., prevention of initiation of emergency core cooling during the cold shutdown mode).

6.6 Operating bypasses

Whenever the applicable permissive conditions are not met, a safety system shall automatically prevent the activation of an operating bypass or initiate the appropriate safety function(s). If plant conditions change so that an activated operating bypass is no longer permissible, the safety system shall automatically accomplish one of the following actions:

- a) Remove the appropriate active operating bypass(es).
- b) Restore plant conditions so that permissive conditions once again exist.
- c) Initiate the appropriate safety function(s).

Preliminary Scope of Change to DCD:

- Figure 7.2-1 (Sheet 3 of 21); Add logic for condition when source range flux doubling signal may be manually blocked and automatically reset.
- Section 7.3.1.2.14, Boron Dilution Block; Revise discussion of conditions when the source range flux doubling signal may be manually blocked and when it is reinstated.
- Table 7.3-1, Engineered Safety Features Actuation Signals (ESFAS) (Sheet 6 of 9) to replace the permissive for the flux doubling calculation signal for Block of Boron Dilution with one that reflects revised conditions when manual block is permitted and automatic unblock occurs.
- Table 7.3-1 (Sheet 7) to replace the permissive for the flux doubling calculation signal for Chemical Volume Control System Isolation with the same permissive as was used for the Block of Boron Dilution on Sheet 6.
- Table 7.3.2, Interlocks for ESFAS (Sheet 1 of 4) to insert new rows for P-8 designations.
- Section 9.3.6.3.7, under Demineralized Water System Isolation Valves, add statement that valves also close during shutdown conditions, whenever the flux doubling signal is blocked to prevent inadvertent boron dilution.
- Section 9.3.6.4.5.1, Boron Dilution Events; add statement when flux doubling signal is blocked during shutdown, the demineralized water system isolation valves are closed to prevent inadvertent boron dilution.
- Section 9.3.6.7, Instrumentation Requirements, under Demineralized Water System Isolation Valves; add statement when flux doubling signal is blocked during shutdown, the demineralized water system isolation valves are closed to prevent inadvertent boron dilution without calling out the valves by name.
- Table 14.3-2 (Sheet 9 of 17), Design Basis Accident Analysis, under reference to Section 7.3.1.2.14; add statement which describes when isolation valves for the demineralized water system close, that they also close if source range doubling flux doubling is blocked during shutdown conditions.
- Table 14.3-2 (Sheet 12) under reference to Section 9.3.6.7, Instrument Requirements under discussion for the demineralized water system isolation valves; add statement which describes when isolation valves for the demineralized water system close, that they also close if source range doubling flux doubling is blocked during shutdown conditions.
- Section 19E2.7.2, Design Features to Address Shutdown Safety (for the demineralized water system); add that the source-range flux-doubling signal “closes the safety related remotely operated CVS makeup isolation valves to terminate the event”, as well as isolating the line from the demineralized water system “to the makeup pump suction” by closing two safety related remotely operated valves.
- Technical Specifications Table 3.3.2-1 (Page 9 of 13), Engineered Safeguards Actuation System Instrumentation, Function 15, Boron Dilution Block-Source Range Neutron Flux

Doubling to add that for MODE 3 this function is not applicable for valve isolation functions whose associated flow path is isolated.

- Technical Specifications Table 3.3.2-1 (Page 10 of 13) insert a new item d. for Reactor Coolant Average Temperature, P-8.
- Tech Spec Bases Section B3.3.2 under ACTIONS (Page 3.3.2-57), add P-8 to the interlocks applicable to Condition J.
- Tech Spec Bases Section B3.3.2, Subsection 15, include Boron Dilution Block to clarify the equipment actuated.
- Tech Spec Bases Section B3.2.2, add Subsection 18.d., Reactor Coolant Average Temperature, P-8 and change numbering of following sections accordingly.