

ATTACHMENT 4

**LICENSE AMENDMENT REQUEST 249
KEWAUNEE POWER STATION CONVERSION TO IMPROVED TECHNICAL
SPECIFICATIONS**

**APPLICABILITY OF WCAP-14333 AND WCAP 15376 TO KEWAUNEE POWER
STATION**

NON-PROPRIETARY

**KEWAUNEE POWER STATION
DOMINION ENERGY KEWAUNEE, INC.**

APPLICABILITY OF WCAP-14333 AND WCAP-15376 TO KEWAUNEE

The following tables demonstrate the applicability of WCAP-14333 and WCAP-15376 to Kewaunee Power Station (Kewaunee). The tables were taken directly from the Westinghouse Owner’s Group (WOG) implementation guidance letters and fulfill part of condition 1 from both NRC SERs approving the above WCAPs. Table 1 and 2 show applicability of the general analysis parameters from the WCAPs. Table 3 shows the applicability of the reactor trip actuation signals while Table 4 shows the applicability of the ESFAS actuation signals. Table 5 demonstrates the applicability of the human reliability analysis and fulfills condition 4 of the WCAP-15376 NRC SER.

**Table 1
 WCAP-14333 Implementation Guidelines:
 Applicability of the Analysis General Parameters**

Parameter	WCAP-14333 Analysis Assumptions	Plant Specific Parameter
Logic Cabinet Type (1)	SSPS or Relay	Relay
Component Test Intervals (2)		
• Analog channels	3 months	1 month (12)
• Logic cabinets (SSPS)	2 months	NA
• Logic cabinets (Relay)	1 month	1 month
• Master Relays (SSPS)	2 months	NA
• Master Relays (Relay)	1 month	1 month
• Slave Relays	3 months	18 months
• Reactor trip breakers	2 months	1 month (13)
Analog Channel Calibrations (3)		
• Done at-power	Yes	Yes
• Interval	18 months	18 months (3)

Table 1 (continued)
WCAP-14333 Implementation Guidelines:
Applicability of the Analysis General Parameters

Parameter	WCAP-14333 Analysis Assumptions	Plant Specific Parameter
Typical At-Power Maintenance Intervals (4)		
• Analog channels	24 months	Equal to or greater than 24 months
• Logic cabinets (SSPS)	18 months	NA
• Logic cabinets (Relay)	12 months	Equal to or greater than 12 months
• Master relays (SSPS)	Infrequent (5)	NA
• Master relays (Relay)	Infrequent (5)	Infrequent
• Slave relays	Infrequent (5)	Infrequent
• Reactor trip breakers	12 months	18 months
AMSAC (6)	Credited for AFW pump start	AMSAC initiates AFW pump start
Total Transient Event Frequency (7)	3.6	1.2
ATWS Contribution to CDF (current PRA model) (8)	8.4E-6	7.2E-7
Total CDF from Internal Events (current PRA model) (9)	5.8E-5	3.2E-5
Total CDF from Internal Events (IPE) (10)	Not Applicable	6.6E-5

NOTES FOR TABLE 1:

- Both types of logic cabinets, SSPS and Relay, are included in WCAP-14333. The analysis is applicable to Kewaunee.
- Test intervals are equal to or greater than those used in WCAP-14333 or are justified in notes 12 and 13. Therefore, the WCAP-14333 analysis is applicable to Kewaunee.

NOTES FOR TABLE 1 (CONTINUED):

3. Channel calibrations can be performed at power and most calibration intervals are equal to or greater than that used in WCAP-14333. The exception is the Nuclear Power Range, which is calibrated quarterly at power. The frequency of this calibration will not change with this proposed amendment. This difference in calibration frequency does not effect the conclusions of the WCAP. Therefore, the WCAP analysis is applicable to Kewaunee.
4. Kewaunee's maintenance intervals are equal to or greater than those used in WCAP-14333, and therefore, the analysis is applicable to Kewaunee.
5. Only corrective maintenance is performed on master and slave relays. The maintenance interval on typical relays is relatively long, that is, experience has shown they do not typically fail completely. Failure of slave relays usually involves failure of individual contacts. This is consistent with Kewaunee's experience and WCAP-14333 applies to Kewaunee.
6. AMSAC will initiate AFW pump start and WCAP-14333 is applicable to Kewaunee.
7. This entry includes the total frequency for initiators requiring a reactor trip signal to be generated for event mitigation to assess the importance of ATWS events to CDF. Events initiated by a reactor trip are not included. Since the plant specific value is less than the WCAP-14333 value, this analysis is applicable to Kewaunee.
8. This entry includes the ATWS contribution to core damage frequency (from at-power, internal events). This is required to determine if the ATWS event is a large contributor to CDF.
9. This entry indicates the total CDF from internal events (including internal flooding) for the most recent PRA update. This is required for comparison to the NRC's risk-informed CDF acceptance guidelines.
10. This entry indicates the total CDF from internal events from the IPE model submitted to the NRC in response to Generic Letter 88-20, "Individual Plant Examination for Severe Accident Vulnerabilities – 10 CFR 50.54(f)." See Note 11 for differences between the most recent Kewaunee PRA model update and that included in the Kewaunee GL 88-20 response.

NOTES FOR TABLE 1 (CONTINUED):

11. The Kewaunee PRA has been frequently updated since the final IPE submittal in December 1992, and incorporates plant design changes and upgraded methods to be consistent with the current state of the art. This list is not an exhaustive list, but a list of the major changes.
 - Removed operator action to stop RHR pumps running on miniflow
 - Took credit for RWST refill
 - Took credit for air accumulators on certain AOV's
 - Modeled alternate means of cooling air compressors
 - Changed reactor cavity configuration from dry to wet
 - Test and maintenance modeled for both trains instead of just one
 - Loss of DC bus modeled for each train instead of most conservative
 - Loss of AC Bus modeled for each train instead of most conservative
 - Component cooling modeled so each train has a 0.5 probability of being in standby
 - LOCA's, SGTR's, and SLB's modeled so each loop has a 0.5 probability of being the broken loop
 - Charging pump relief valve model corrected
 - Service water strainers removed based on analysis
 - Pressurizer PORV block valves no longer assumed open
 - Converted from Grafter to WinNUPRA
 - Updated all failure rate data, including initiating events
 - Incorporated approved WOG seal LOCA model
 - Recalculate all important HEPs
 - Based on revised TH analysis, removed credit for LPI in Medium LOCA
 - Redesign ISL removing credit for RWST refill and MOV closure against high pressure
 - Redesign steam line break, modeling PTS concerns
 - Resolved numerous Peer review Facts & Observations
 - Reperformed all thermal hydraulic computer code calculations incorporating new steam generators and power uprate. Addressed Category A and B Facts and Observations from the Westinghouse Owners Group peer review.
 - Added new flooding model to address inadequacies in the IPE model.

NOTES FOR TABLE 1 (CONTINUED):

12. Analog channel test is at the original licensed interval of one month. The STI increase to three months was justified and approved by the NRC in WCAP-10271-P-A, which has not been implemented at Kewaunee. However, this analysis remains applicable.
13. RTB testing is at the original licensed interval of one month. This interval was not evaluated in the WCAP. Therefore, the WCAP RTB STI is not applicable and Kewaunee will not implement any change to RTB test frequency.


Table 2
WCAP-15376 Implementation Guidelines:
Applicability of the Analysis General Parameters

a,c

--

Table 2
WCAP-15376 Implementation Guidelines:
Applicability of the Analysis General Parameters

a.c



NOTES FOR TABLE 2 (CONTINUED):

a,c

--

Table 3
WCAP-14333 and WCAP-15376 Implementation Guidelines:
Applicability of Analysis Reactor Trip Actuation Signals

a,c



NOTES FOR TABLE 3:

a,c

[Empty rectangular box for notes]

Table 4
WCAP-14333 and WCAP-15376 Implementation Guidelines:
Applicability of Analysis Engineered Safety Features Actuation Signals

a.c.

--

NOTES FOR TABLE 4:

[

a.c

]

APPLICABILITY OF WCAP-14333 AND WCAP-15376 TO KEWAUNEE

Table 5
WCAP-15376 Implementation Guidelines:
Applicability of the Human Reliability Analysis

