



June 11, 2009

U. S. Nuclear Regulatory Commission,
Washington, DC 20555

ATTENTION: Document Control Desk

SUBJECT: Calvert Cliffs Nuclear Power Plant
Unit Nos. 1 & 2; Docket Nos. 50-317 & 50-318
Revision to License Amendment for Measurement Uncertainty Recapture Power
Uprate

REFERENCES:

- (a) Letter from Mr. D. R. Bauder (CCNPP) to Document Control Desk (NRC), dated August 29, 2008, License Amendment Request: Appendix K Measurement Uncertainty Recapture – Power Uprate Request
- (b) Letter from Mr. D. V. Pickett (NRC) to Mr. J. A. Spina (CCNPP), dated March 24, 2009, Request for Additional Information Re: License Amendment for Measurement Uncertainty Recapture Power Uprate - Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2 (ADAMS Accession ML090790024)

In Reference (a), Calvert Cliffs Nuclear Power Plant, Inc. (Calvert Cliffs) submitted a license amendment request to the Nuclear Regulatory Commission (NRC) for a measurement uncertainty recapture power uprate for Calvert Cliffs Nuclear Power Plant, Units 1 and 2. Following discussions with the NRC staff, Calvert Cliffs is modifying Reference (a) as follows. The allowed outage time whenever the LEFM CheckPlus System is in an out-of-service condition was originally proposed as a 30-day allowed outage time. We are now proposing a 72 hour allowed outage time for this condition. We have modified Sections I.7 and I.8 of Reference (a) to address this change. Attachment (1) is submitted as a replacement for Sections I.7 and I.8 which are located in Attachment (2) of Reference (a). Please replace the content of Sections I.7 and I.8 in Reference (a) with the attached sections.

Calvert Cliffs has also determined it is necessary to request a change in the implementation period for our submittal in Reference (a) due to the installation schedule for the LEFM CheckPlus System for Unit 1. We are now requesting separate implementation dates for the Units. For Unit 2 the implementation date requested remains as no later than 180 days from the completion of its 2009 refueling outage. For Unit 1, we now request an implementation date of no later than 180 days following the completion of its 2010 refueling outage. These changes allow us sufficient time to modify/test necessary equipment, implement procedure changes and conduct necessary training on each Unit.

In addition, per discussion with the NRC staff, modification of the proposed allowed outage time from 30 days to 72 hours as indicated in Attachment (1) is sufficient to eliminate the need to respond to the

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Attachments: (1) Sections I.7 and I.8 Revision
(2) Calculation No. CA07018, Revision No. 00001, Main Feedwater Pressure Input
Uncertainty to Caldon CheckPlus LEFM

cc: D. V. Pickett, NRC
S. J. Collins, NRC

Resident Inspector, NRC
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ATTACHMENT (1)

SECTIONS I.7 AND I.8 REVISION

ATTACHMENT (1)
SECTIONS I.7 AND I.8 REVISION

I.7 OUTAGE TIME

Each of the Caldon LEFM CheckPlus Systems to be installed will consist of two measurement sections. One measurement section is installed in the feedwater header to each SG. Each measurement section consists of two planes of transducers with four pairs of transducers in each plane, as described in Reference I-2. The transducers provide input to the electronic unit cabinet, which consists of two subsystems of electronics hardware. Each subsystem receives input from one plane of the measurement sections. Outputs from the electronic unit are provided to the Plant Computer via the Plant Data Network and DAS for the calculation of calorimetric power. Programmed logic in the DAS and Plant Computer, alert operators when the system is in an OOS condition. The LEFM CheckPlus is considered to be OSS for the following conditions:

- LEFM CheckPlus System Meter Status Not Normal – the meter status (Normal, Alert, Failed) is communicated to the DAS and Plant Computer. A meter status of other than normal triggers the Plant Computer alarm. The meter status is determined from a series of on-line self-diagnostics to verify that the system is operating within its design basis uncertainty limits. The following conditions result in a meter status of other than normal:
 - failure of one or more transducer paths,
 - velocity profile out of limits,
 - analog input out of limits,
 - system uncertainty out of limits.

The meter is considered to be OOS for either an Alert or Failed meter status.

- Loss of communication from the LEFM CheckPlus System to the Plant Computer.
- Cabinet temperature exceeds its high temperature limit.

Guidance will be provided to identify the actions to be taken by the Control Room staff upon alarm annunciation. If the system is OOS, time accrues against the allowable outage times. Allowable outage times will be described in the TRM. Upon reaching the limit for the allowable outage time, the maximum power limit will be reduced to the pre-uprate licensed power limit of 2700 MWt (98.6% proposed RTP). Power is adjusted, as required, to ensure the pre-uprate licensed power limit is not exceeded.

Two outage times are proposed:

- If the LEFM CheckPlus System is OOS and the Plant Computer is available to perform the secondary calorimetric calculation, the allowable outage time is 72 hours, provided steady-state conditions exist. Steady-state conditions are defined as power variations of less than 10% from the initial power level when the system is declared OOS.
- If the Plant Computer is unavailable or if another input to the secondary calorimetric calculation fails (other than the LEFM CheckPlus System), the allowable outage time is less than or equal to 24 hours.

LEFM CheckPlus System OOS, Plant Computer Available

A 72 hour outage time is proposed if the LEFM CheckPlus System is OOS but the Plant Computer is available to perform the secondary calorimetric calculation. The 72 hour outage time is based upon:

- Calculation of calorimetric power using the Plant Computer from alternate plant instrumentation. The operator can select an alternate set of parameters in lieu of the output of the Caldon LEFM CheckPlus System to calculate calorimetric power for feedwater flow, temperature, and pressure.

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Existing plant instrumentation, such as the feedwater venturis, currently being used to calculate secondary calorimetric power, is used for the alternate set of parameters.

- Normalizing the alternate input for feedwater flow and temperature to the Caldon LEFM CheckPlus feedwater flow and temperature. A rolling average of the ratio of the LEFM CheckPlus input to the alternate input is calculated on the Plant Computer. When the alternate set of parameters is selected, the last known good value of the average ratios will be applied such that the output of the calorimetric calculation using the alternate parameters closely matches the output of the calculation using the Caldon LEFM CheckPlus System. As shown in Table I-1, the calorimetric calculation is not sensitive to changes in feedwater pressure, such that no correction is necessary to feedwater pressure.
- Unlikely occurrence of venturi nozzle fouling or defouling. Calvert Cliffs does not have a history of venturi nozzle fouling and subsequent defouling. Therefore, no change in calorimetric output from fouling or defouling is anticipated during the 72 hour OOS time. With the LEFM CheckPlus System OOS, alternate indications such as turbine first stage pressure and feedwater temperature, will be used to ensure that plant power is not adjusted to account for venturi nozzle defouling, in the unlikely event fouling exists. Adjustments based on nozzle fouling, should it occur, would result in a conservative adjustment to calorimetric power.
- Negligible instrument drift. Instrument drift over a 72 hour period is negligible and can be verified using alternate plant instrumentation such as turbine first stage pressure.
- Anticipated margin. The assumed values for feedwater flow uncertainty and feedwater temperature uncertainty to support the requested 1.38% uprate are more conservative than typical values for the LEFM CheckPlus System, which can be used to support uprates on the order of 1.6% to 1.7%. When the calorimetric uncertainty assessment is revised to incorporate the vendor calibration reports, the calorimetric uncertainty is reduced, increasing the available margin.

Most repairs to the Caldon LEFM CheckPlus System are expected to be completed within a shift. The 72 hours gives plant personnel sufficient time to diagnose, plan, implement, and verify repairs to the system. If repairs are not completed within the 72 hour window, operators take action as indicated in Section I.8 below.

Plant Computer Unavailable

An outage time less than or equal to 24 hour is proposed if the Plant Computer is unavailable or if another input to the secondary calorimetric calculation fails, regardless of the status of the Caldon LEFM CheckPlus System. The outage time is based upon:

- The minimum frequency for the calibration of the power range nuclear instrumentation in accordance with Technical Specification Surveillance Requirement 3.3.1.2. Per Technical Specification Surveillance Requirement 3.3.1.2, the power range nuclear instruments are adjusted every 24 hours based on the reactor thermal power calculation. Therefore, the actual duration of the allowable outage time is determined from the next required adjustment of the power range nuclear instruments after the failure is identified.
- The precision of the Plant Computer calculation is required to support the increased power level. Without the Plant Computer, the uncertainty of alternate indications that may be used to calculate calorimetric power exceeds the uncertainty required to support the power uprate. Additionally, averaging of the calorimetric calculation is no longer available.
- The failure of shared inputs to the calorimetric calculation. Alternate inputs are available only for feedwater flow, temperature, and pressure. Other inputs, such as steam pressure, do not have

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alternate inputs. If a shared input fails, calorimetric power cannot be calculated on the Plant Computer.

Occasional bad quality data is expected and would not result in entrance into the OOS time unless the bad quality data resulted in bad quality for the four hour averaged calorimetric power calculation.

If Calvert Cliffs is unable to restore the Plant Computer to normal operation within the 24 hour window, operators take action as indicated in Section I.8 below.

I.8 OPERATOR ACTION TO REDUCE POWER

For each of the outage times indicated in Section I.7, if necessary repairs are not completed within the allowed outage time window, operators take action to limit the maximum thermal power limit to the pre-uprate licensed power limit of 2700 MWt. One additional restraint on maximum power operation will be placed whenever a unit is within the 72 hour outage window due to the Caldon LEFM CheckPlus system being OOS. In this situation, if the plant experiences a power change of more than 10% power, the maximum thermal power limit will be limited to the pre-uprate licensed power limit of 2700 MWt. Although power changes have not been shown as having a significant effect on the alternate calorimetric instrumentation, this conservative action ensures that a plant transient does not adversely impact the accuracy of the alternate calorimetric instrumentation.

Calvert Cliffs intends to document, within the site's TRM, necessary operator actions to address the instances when the Caldon LEFM CheckPlus System is not available to provide the feedwater flow element inputs to the heat balanced calorimetric algorithm power measurement, as well as actions to be taken if these inputs are not restored in the allowed time. Operator actions are captured in the TRM vice the Technical Specifications as the feedwater flow element inputs to the heat balance calorimetric algorithm do not meet the criteria of 10 CFR 50.36(c)(2)(ii) for establishing a Technical Specification Limiting Condition for Operation (LCO) as indicated below.

Criterion 1

The Caldon LEFM CheckPlus feedwater flow element inputs are not used to detect and indicate abnormal degradation of the reactor coolant pressure boundary.

Criterion 2

The Caldon LEFM CheckPlus feedwater flow element inputs are not initial conditions of a design basis accident (DBA) or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

Criterion 3

The Caldon LEFM CheckPlus feedwater flow element inputs are not part of the primary success path and do not function or actuate to mitigate a DBA or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

Criterion 4

In the event of the Caldon LEFM CheckPlus ultrasonic feedwater flow element inputs not being available for the heat balance calorimetric algorithm, the inputs will be determined by alternate instrumentation thus, the Caldon LEFM CheckPlus ultrasonic feedwater flow element inputs are not significant to public health and safety.

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It is therefore concluded that an LCO is not required to be included in the Technical Specifications in accordance with 10 CFR 50.36(c)(2)(ii) to address the functional requirements for the Caldon LEFM CheckPlus feedwater flow element inputs to the heat balance calorimetric algorithm.