Commonwealth Edison Company
1400 Opus Place
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January 13, 1998

ComEd

U. S Nuclear Regulatory Commission
Washington, D. C 20555

Attention: Document Control Desk

Subject: Supplemental Information Pertaining to Technical Specification Amendment Regarding Pressure Temperature Curves
Byron and Braidwood Nuclear Power Stations
NRC Docket Numbers: 50-454, 50-455, 50-456 and 50-457

References:

1. J. Hosmer letter to the Nuclear Regulatory Commission dated May 21, 1997, transmitting Technical Specification Amendment Request.

2. J. Hosmer letter to the Nuclear Regulatory Commission dated November 18, 1997, transmitting Supplement to Technical Specification Amendment Request.

3. J. Hosmer letter to the Nuclear Regulatory Commission dated December 3, 1997, transmitting WCAP-14824, Rev. 2.

4. December 10, 1997, December 12, 1997, and December 30, 1997, Teleconferences between the Commonwealth Edison Company and the Nuclear Regulatory Commission Regarding the Pending Technical Specification Amendment.

5. H. Gene Stanley letter to the Nuclear Regulatory Commission dated January 8, 1998, transmitting Response to Request for Additional Information Regarding the Pending Technical Specification Amendment.

6. January 9, 1998, Teleconference between the Commonwealth Edison Company and the Nuclear Regulatory Commission Regarding the Pending Technical Specification Amendment.

Reference 1 transmitted the Technical Specification Amendment regarding the Pressure Temperature Curves for Braidwood and Byron Units 1 and 2. Subsequently, Reference 2 transmitted a Supplement to the Technical Specification Amendment Request. Reference 3 transmitted WCAP-14824, Rev. 2 "Byron Unit 1 Heatup and Cooldown Limit Curves for Normal Operation and Surveillance Weld Metal Integration for Byron and Braidwood." During the Reference 4 Teleconferences and subsequent teleconferences, the Nuclear Regulatory Commission (NRC) questioned this material. In response to

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those questions the Commonwealth Edison Company (ComEd) provided Reference 5. In order to complete their review of the amendment request, the NRC initiated the Reference 6 teleconference. This letter is providing the additional information requested in that call.

Please address any questions that you may have on this correspondence to this office.

Sincerely,

H. Gene Stanley
PWR Vice President

Attachment

cc: Byron/Braidwood Project Manager – NRR
Senior Resident Inspector – Byron
Regional Administrator – RIII
Office of Nuclear Safety – IDNS

ATTACHMENT

Question 1: Provide an example of the LTOP PORV setpoint calculation, including unit specific instrument uncertainties and heat and mass injection PORV overshoots.

Response:

References;

1. H. Stanley Letter to NRC dated January 8, 1998, transmitting PTLR Response.
2. Westinghouse Letter CAE-96-106, "Commonwealth Edison Company Byron Units 1 and 2 LTOPS Setpoints Based on 10 and 12 EFPY P/T Limits," January 17, 1996.
3. Westinghouse Report, "Setpoint Program Determination for the Westinghouse Overpressure Mitigation System in the Byron/Braidwood Plants," L.E. Engelhardt, October 1982.
4. Byron Calculation No. BYR96-293, "Channel Accuracy for Power Operated Relief Valve (PORV) Setpoints and Wide Range RCS Temperature Indications (Unit 1 Original Steam Generators and Replacement Steam Generators)," February 27, 1997.

The following information is provided to clarify and augment the responses to questions 3 and 13 provided in Reference 1. All data presented here are for the Byron Unit 1 LTOP setpoint determination. The LTOP setpoints for Byron Unit 2 and Braidwood Units 1 & 2 are determined in a similar manner using unit specific instrument uncertainties. Table 1 below presents the data used to determine the pressure setpoints for the most limiting heat injection (HI) cases and the mass injection (MI) cases. The Appendix G pressure requirement for greater than or equal to 200 °F has been conservatively limited to 800 psig to protect the PORV downstream piping. The calculated Appendix G pressure limit is actually 1483 psig for temperatures greater than 180 °F, therefore the PORV downstream piping pressure restriction is limiting. Since the 10% pressure relaxation permitted by Code Case N-514 and the 1996 Addenda of ASME Section XI, Appendix G, was developed for the reactor vessel, the 10% pressure increase was not applied when the pressure was limited by the piping, 800 psig pressure limit. Also, when the pressure is limited to 800 psig by the PORV downstream piping, the pump ΔP is 0 psig because the PORV downstream piping is not subject to the dynamic and static pressure head that exists between the RCS pressure sensors and the RPV core midplane. The values for the heat and mass injection overshoots listed in Table 1 were determined by Westinghouse in Reference 3.

Table 1: Byron Unit 1 Data for LTOP Setpoint Determination

RCS Temp (F)	App. G without Margin (psig) (Note 1)	CC N-514 (psig)	Pump ΔP (psi) (Note 2)	Setpoint without Over shoot (psig)	HI PORV Over shoot (psi)	HI Setpoint (psig)	Shifted HI Setpoint (psig) (Note 3)	MI PORV Over shoot (psi)	MI Setpoint (psig)
70	621	683.	34.	649.	11.	638.	-	29.	620.
100	621	683.	34.	649.	21.	628.	-	29.	620.
120	621	683.	78.	605.	28.	577.	638.	29.	576.
150	621	683.	78.	605.	36.	569.	628.	29.	576.
200	800	800.	0.	800.	52.	748.	569.	28.	772.
250	800	800.	0.	800.	73.	727.	748.	28.	772.
300	800	800.	0.	800.	88.	712.	727.	28.	772.

Note 1: For 200 °F and above, Appendix G pressure is significantly greater than the 800 psig limit protecting the downstream PORV piping, e.g. 1483 psig @ 180 °F.
Note 2: Pump ΔP is set to 0 psi when pressure is limited to 800 psig.
Note 3: HI setpoint pressures are shifted to account for the assumed 50 °F temperature differential between the RCS and the steam generator.

The LTOP setpoints are determined using the smallest of the HI, shifted HI and MI setpoints and subtracting the instrument uncertainties. Table 2 below presents the minimum HI and MI setpoints, the Byron Unit 1 instrument uncertainties, and the LTOP setpoints for selected RCS temperatures.

Table 2: Byron Unit 1 Instrument Uncertainty and LTOP Setpoints

RCS Temp. (°F)	Setpoint No Instrument Uncertainty (Notes 1, 2)	Byron-1 Instrument Uncertainty 1PB-0406C/D	Setpoint with Uncertainty (Note 2)	Byron-1 PCV-456 Setpoint (Note 2)
70	620.	106.	514.	514.
100	620.	106.	514.	514.
120	576. (569.)	107.	469. (462.)	462.
150	569.	107.	462.	462.
200	569.	107.	462.	462.
250	727. (712.)	108.	619. (604.)	604.
300	712.	108.	604.	604.

Note 1: These setpoint values are the minimum values from the HI, shifted HI and MI setpoints presented in Table 1 above.
Note 2: These setpoints have been conservatively lowered for 120 °F and 250 °F to the values in the parentheses.

The PCV-456 setpoints have been conservatively lowered for temperatures of 120 °F, and 250 °F to simplify the PORV curve into three constant temperature ranges.

Question 2: Provide additional explanation of the "average of averages" approach used in the best estimate chemistry calculation for weld wire heat No. 442002.

Response:

References:

1) Framatome Technologies Inc. (FTI) letter INS-97-2526, June 30, 1997
2) FTI letter INS-97-4954, December 17, 1997
3) WCAP-14824 Revision 2, Table 2, with errata (CAE-97-233/CCE-97-316)

The "average of averages" approach is used as a weighting process, since the number of measurements from some separately identified sources, such as the Byron Unit 1 and Unit 2 surveillance blocks, is much greater than from other sources, such as the individual weld qualification blocks.

ComEd believes that the "average of averages" approach used in WCAP-14824 Revision 2, in which (for a given weld wire heat) all available test results from separate and distinct test or production welds are averaged, and the resulting values for separate and distinct test or production welds subsequently averaged to obtain the best estimate value, provides the most appropriate estimate of weld chemistry . This approach eliminates the inappropriate weighting effect which widely varying numbers of analyses can have when performed on individual weld blocks. Also, although the effect of FTI's "coil weighting" approach is nil due to the large spool size FTI assumes, ComEd believes that a coil weighting approach is not a fundamentally sound basis for evaluating weld chemistry, due to the complete lack of documentation of coil changes or intra-coil splices which may have occurred or been present during production of welds.