LIMITING CONDITION FOR OPERATION

3.4.9.3 At least two overpressure protection devices shall be OPERABLE, and each device shall be either:

a. A residual heat removal (RHR) suction relief valve with a lift setting of less than or equal to 450 psig, or

b. A power operated relief valve (PORV) with a lift setpoint that varies with RCS temperature which does not exceed the limit established in Figure 3.4-4a for Unit 1 (Figure 3.4-4b for Unit 2).

APPLICABILITY: MODES 4, 5, and 6 with the reactor vessel head on.

ACTION:

a. With one of the two required overpressure protection devices inoperable in MODE 4, restore two overpressure protection devices to OPERABLE status within 7 days or depressurize and vent the RCS through at least a 2 square inch vent within the next 8 hours.

b. With one of the two required overpressure protection devices inoperable in MODES 5 or 6, restore two overpressure protection devices to OPERABLE status within 24 hours or vent the RCS through at least a 2 square inch vent within the next 8 hours.

c. With both of the required overpressure protection devices inoperable, depressurize and vent the RCS through at least a 2 square inch vent within 8 hours.

d. With the RCS vented per ACTIONS a, b, or c, verify the vent pathway at least once per 31 days when the pathway is provided by a valve(s) that is locked, sealed, or otherwise secured in the open position; otherwise, verify the vent pathway every 12 hours.

e. In the event either the PORVs, RHR suction relief valves, or the RCS vents are used to mitigate an RCS pressure transient, a Special Report shall be prepared and submitted to the Commission pursuant to Specification 6.9.2 within 30 days. The report shall describe the circumstances initiating the transient, the effect of the PORVs, RHR suction relief valves, or RCS vents on the transient, and any corrective action necessary to prevent recurrence.

f. The provisions of Specification 3.0.4 are not applicable.

Replace with Insert A

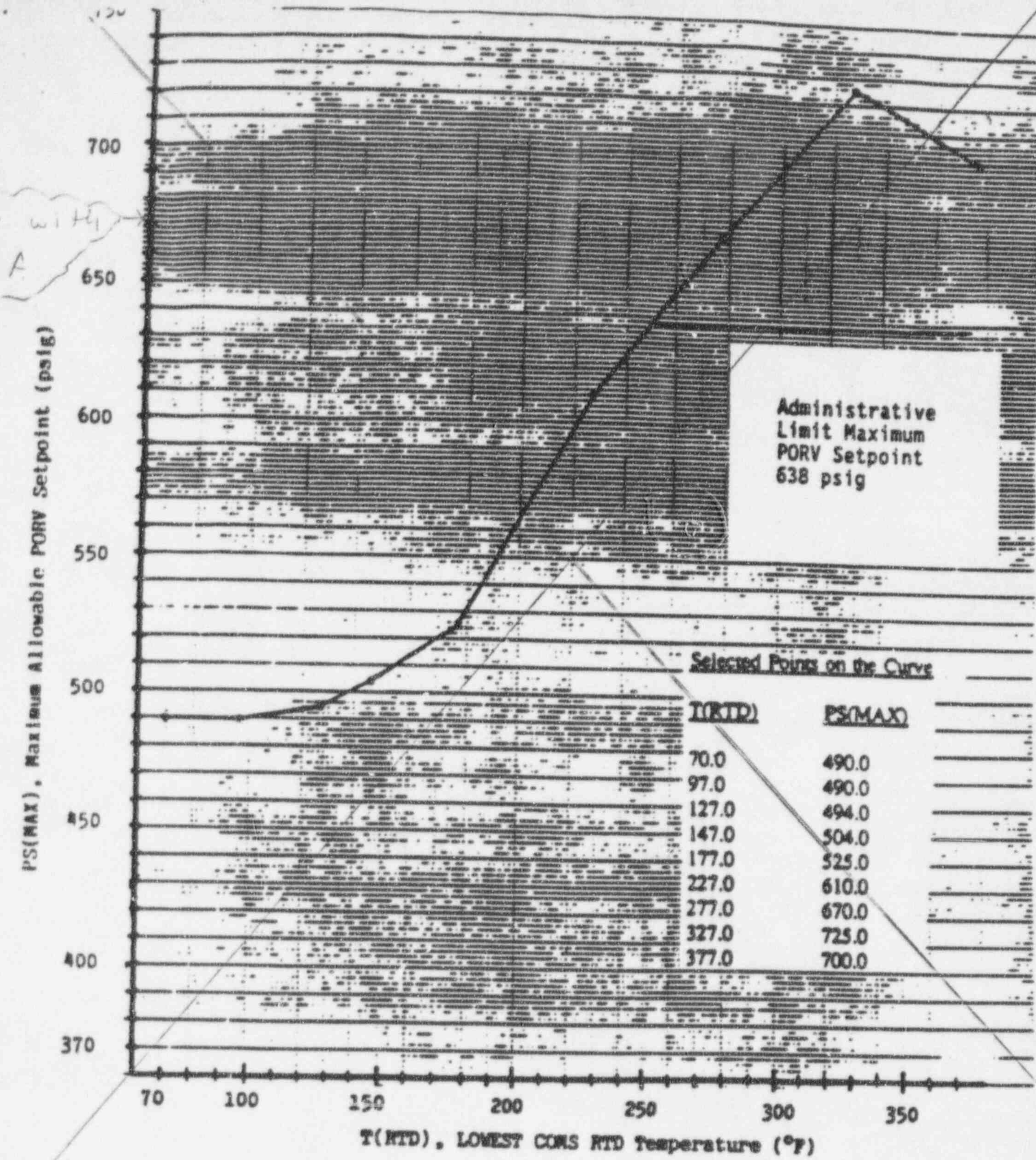
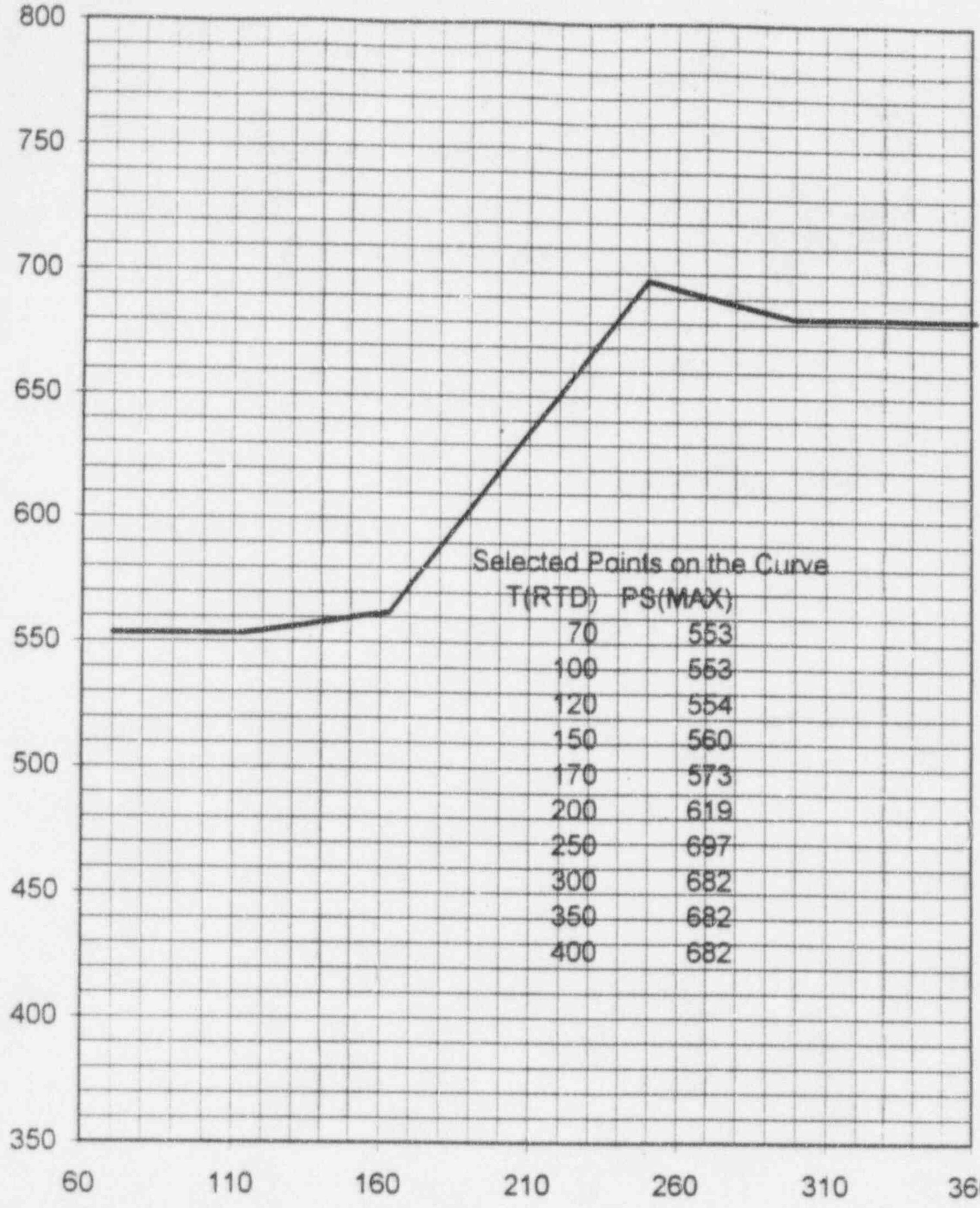


FIGURE 3.4-4a
NOMINAL PORV PRESSURE RELIEF SETPOINT VERSUS
RCS TEMPERATURE FOR THE COLD OVERPRESSURE PROTECTION SYSTEM
APPLICABLE UP TO 5.37 EFPY (UNIT 1)

16

Insert A


800
750
700
650
600
550
500
450
400
350
60
110
160
210
260
310
360
Selected Points on the Curve
T(RTD) PS(MAX)
70 553
100 553
120 554
150 560
170 573
200 619
250 697
300 682
350 682
400 682

ATTACHMENT C

EVALUATION OF SIGNIFICANT HAZARDS CONSIDERATIONS FOR
PROPOSED CHANGES TO APPENDIX A
TECHNICAL SPECIFICATIONS OF
FACILITY OPERATING LICENSES
NPF-72 AND NPF-77

Commonwealth Edison has evaluated this proposed amendment and determined that it involves no significant hazards considerations. According to Title 10 Code of Federal Regulations Section 50 Subsection 92 Paragraph c (10 CFR 50.92 (c)), a proposed amendment to an operating license involves no significant hazards considerations if operation of the facility in accordance with the proposed amendment would not:

1. Involve a significant increase in the probability or consequences of an accident previously evaluated; or

2. Create the possibility of a new or different kind of accident from any accident previously evaluated; or

3. Involve a significant reduction in a margin of safety.

A. INTRODUCTION

Commonwealth Edison (ComEd) proposes to revise Figure 3.4-4a, "Nominal PORV Pressure Relief Setpoint Versus RCS Temperature For The Cold Overpressure Protection System Applicable up to 5.37 EFPY (Unit 1)," of Technical Specification (TS) 3.4.9.3. The index page entry associated with Figure 3.4-4a will also be changed to reflect the changes in Figure 3.4-4a. The format of Figure 3.4-4a will be revised to improve readability. Figure 3.4-4a describes the nominal Pressurizer Power Operated Relief Valve (PORV) setpoints for the Low Temperature Overpressure Protection System (LTOPS) as a function of Reactor Coolant System (RCS) temperature.

Currently, Figure 3.4-4a is valid until Braidwood Unit 1 reaches 5.37 Effective Full Power Years (EFPY). In addition, the current Figure 3.4-4a contains an administrative limit line at 638 pounds per square inch gauge (psig) to protect PORV downstream piping from water hammer effects during pressurizer solid water conditions and contains allowances for a 60 psig pressure instrument uncertainty, a 13°F temperature instrument uncertainty and a 14°F temperature streaming allowance.

The current Figure 3.4-4a also contains allowances for a 50^0F thermal transport effect associated with the postulated heat injection transient.
In order to extend the duration of applicability for Figure 3.4-4a to 16 EFPY and remove the administrative limit line it is necessary to revise the current Figure 3.4-4a.

The current Figure 3.4-4a, "Nominal PORV Pressure Relief Setpoint Versus RCS Temperature For The Cold Overpressure Protection System Applicable up to 5.37 EFPY (Unit 1)," will be replaced with a new Figure 3.4-4a, "Nominal PORV Pressure Relief Setpoint Versus RCS Temperature For The Cold Overpressure Protection System Applicable up to 16 EFPY (Unit 1)."

As the basis for generating the revised Figure 3.4-4a, a revised steady state 10 CFR 50 Appendix G Pressure Temperature (PT) limit curve was generated for 16 EFPY using the data from WCAP 14241, "Analysis of Capsule X from the Commonwealth Edison Company Braidwood Unit 1 Reactor Vessel Radiation Surveillance Program," and WCAP 12685 "Analysis of Capsule U from the Commonwealth Edison Company Braidwood Unit 1 Reactor Vessel Radiation Surveillance Program." These documents were submitted to the NRC on March 21, 1995, and October 22, 1990 respectively. The revised Appendix G PT limits curve also accounts for the flow induced pressure difference between the pressure transmitter in the RCS loop piping and the reactor vessel midplane, and takes advantage of a 10% relaxation of the maximum allowable RCS pressure in accordance with American Society of Mechanical Engineers (ASME) Code Case N-514. ComEd applied for permission to use the criteria of ASME Code Case N-514 in the determination of LTOPS setpoints via letter dated November 30, 1994, supplemented by a letter dated May 8, 1995.

Finally, a constant 800 psig RCS pressure value was selected to control PORV piping loads due to waterhammer effects from PORV actuation during water solid pressurizer conditions. The pressure values on the revised 10 CFR 50 Appendix G PT limit curve, or the 800 psig PORV discharge piping water hammer load limit, whichever was lower at a given temperature, were then used to develop the revised Figure 3.4-4a.

That portion of the revised Figure 3.4-4a limited by the Appendix G PT limits retains the 60 psig pressure instrument uncertainty, the 13^0F temperature instrument uncertainty and the 50^0F thermal transport effect for heat injection events.

K:nla\bwd\bwltcps3

For that portion of the revised Figure 3.4-4a limited by the 800 psig PORV discharge piping limit, the 60 psig pressure instrument uncertainty is retained with credit taken for the elevational difference between the PORV LTOPS pressure sensor and the PORV itself. This elevation difference is approximately 74 feet, so the actual pressure at the PORV discharge will be approximately 32 psig less than the pressure seen by the pressure transmitter. The 13^{0}F temperature instrument uncertainty and the 50^{0}F thermal transport effect for heat injection events are also retained in this section of Figure 3.4-4a.

The 14^{0}F temperature streaming allowance is not included in the LTOPS setpoint curve since WCAP 14040, "Methodology used to Develop Cold Overpressure Mitigating System Setpoints and RCS Heatup and Cooldown Limit Curves," Section 3.2.2, "Pressure limit Selection," assumes LTOPS events are most likely to occur during isothermal conditions in the RCS. Thus, temperature streaming would not be a consideration.

The revised Figure 3.4-4a also does not contain the administrative limit line at 638 psig.

The TS index page entry associated with Figure 3.4-4a is being changed to reflect the change in the duration of applicability of Figure 3.4-4a, and the format of Figure 3.4-4a is being changed to improve readability.

B. NO SIGNIFICANT HAZARDS ANALYSIS

1. The proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

The new LTOPS curve will not change any postulated accident scenarios. The revised curve was developed using industry standards and regulations which are recognized as being inherently conservative. Appropriate instrument uncertainties and allowances have been included in the development of the LTOPS curves. The PT and LTOPS curves provide RCS pressure limits to protect the Reactor Pressure Vessel (RPV) from brittle fracture by clearly separating the region of normal operations from the region where the RPV is subject to brittle fracture.

Using Regulatory Guide (RG) 1.99, "Radiation Embrittlement of Reactor Vessel Materials," Revision 2, Braidwood Unit 1 Surveillance Capsule U and Capsule X results and the requirements of Appendix G to 10 CFR 50, as modified by the guidance in ASME Code Case N-514, a new LTOPS curve was prepared. This new curve, in conjunction with the PT Limit curves, and the heatup and cooldown ranges provides the required assurance that the RPV is protected from brittle fracture.

No changes to the design of the facility have been made, no new equipment has been installed, and no existing equipment has been removed or modified. This amendment will not change any system operating modes. The revised LTOPS curve provides assurance that the RPV is protected from brittle fracture.

The index page and format changes are purely administrative in nature and are designed to reflect the change in the duration of applicability of Figure 3.4-4a and improve the readability of Figure 3.4-4a. These administrative changes will have no effect on any equipment, system, or operating mode.

Thus, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. The proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

The use of the new LTOPS curve does not change any postulated accident scenarios. The new LTOPS curve was generated using Braidwood capsule surveillance data and an approved, conservative methodology. No new equipment will be installed, and no existing equipment will be modified. No new system interfaces are created, and no existing system interfaces are modified. The new LTOPS curve provides assurance that the RPV is protected from brittle fracture.

No new accident or malfunction mechanism is introduced by this amendment.

The index page and format changes are purely administrative in nature and are designed to reflect the change in the duration of applicability of Figure 3.4-4a, and improve the readability of Figure 3.4-4a. These administrative changes will have no effect on any equipment, system, or operating mode.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. The proposed change does not involve a significant reduction in a margin of safety.

The new LTOPS curve was developed using industry standards and regulations which are recognized as being inherently conservative. Appropriate instrument uncertainties and allowances are included in the development of the new LTOPS curve. This amendment will not change the operational characteristics or design of any equipment or system.

All accident analysis assumptions and conditions will continue to be met. The RPV is adequately protected from non-ductile failure by the revised LTOPS curve.

The index page and format changes are purely administrative in nature and are designed to reflect the change in the duration of applicability of Figure 3.4-4a, and improve the readability of Figure 3.4-4a. These administrative changes will have no effect on any equipment, system, or operating mode.

Thus, the proposed change does not involve a significant reduction in a margin of safety.

Therefore, based on the above evaluation, ComEd has concluded that these changes involve no significant hazards considerations.

ATTACHMENT D

ENVIRONMENTAL ASSESSMENT FOR
PROPOSED CHANGES TO APPENDIX A
TECHNICAL SPECIFICATIONS OF
FACILITY OPERATING LICENSES
NPF-72 AND NPF-77

Commonwealth Edison Company (ComEd) has evaluated this proposed license amendment request against the criteria for identification of licensing and regulatory actions requiring environmental assessment in accordance with Title 10, Code of Federal Regulations, Part 51, Section 21 (10 CFR 51.21). ComEd has determined that this proposed license amendment request meets the criteria for a categorical exclusion set forth in 10 CFR 51.22(c)(9). This determination is based upon the following:

1. **The proposed licensing action involves the issuance of an amendment to a license for a reactor pursuant to 10 CFR 50 which changes a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or which changes an inspection or a surveillance requirement.**

This proposed license amendment request replaces Figure 3.4-4a, "Nominal PORV Pressure Relief Setpoint Versus RCS Temperature For The Cold Overpressure protection System Applicable up to 5.37 EFPY (Unit 1)," of Technical Specification 3.4.9.3 with a new Figure 3.4-4a, "Nominal PORV Pressure Relief Setpoint Versus RCS Temperature For The Cold Overpressure protection System Applicable up to 16 EFPY (Unit 1)," and makes administrative changes to the index page for Technical Specification 3.4.9.3 to support the revised Figure 3.4-4a. The format of Figure 3.4-4a is also being revised to improve readability.

2. **This proposed license amendment request involves no significant hazards considerations.**

As demonstrated in Attachment C, this amendment request involves no significant hazards considerations.

3. **There is no significant change in the types or significant increase in the amounts of any effluent that may be released offsite.**

This amendment request will not result in the installation of any new equipment, or the modification of any existing equipment.

No changes will be made in the mode of operation of any plant system or equipment.

No new release paths or mechanisms will be created by this amendment.

Thus, there is no significant change in the types or significant increase in the amounts of any effluent that may be released off site.

4. There is no significant increase in individual or cumulative occupational radiation exposure.

No new equipment will be installed, and no existing equipment will be modified. No new operating modes or procedures are created. Plant operation will remain unchanged.

Thus, there is no significant increase in individual or cumulative occupational radiation exposure.

Therefore, pursuant to 10 CFR 51.22(b), neither an environmental impact statement nor an environmental assessment is necessary for this proposed license amendment request.

ATTACHMENT E

Graphs and Tables

Table 1

Braidwood Unit 1 Pressure Limit

Temp deg F	Appendix G without Margins psig	Appendix G with 60 psi Instrumentation Error psig	Code Case N-514 psig	Less Dynamic DP psig	Modified Maximum Limit psig
60	620	560	616	582	582
65	621	561	617	583	583
70	621	561	617	583	583
75	621	561	617	583	583
80	621	561	617	583	583
85	621	561	617	583	583
90	621	561	617	583	583
95	621	561	617	583	583
100	621	561	617	583	583
105	621	561	617	583	583
110	621	561	617	583	583
110	796	736	810	776	770
115	822	762	838	804	770
120	849	789	868	790	770
125	878	818	900	822	770
130	910	850	935	857	770
135	944	884	973	895	770
140	981	921	1013	935	770
145	1020	960	1056	978	770
150	1062	1002	1103	1025	770
155	1108	1048	1153	1075	770
160	1158	1098	1206	1128	770
165	1209	1149	1264	1186	770
170	1265	1205	1326	1248	770
175	1325	1265	1392	1314	770
180	1390	1330	1463	1385	770
185	1459	1399	1539	1461	770
190	1534	1474	1621	1543	770
195	1613	1553	1709	1631	770
200	1699	1639	1803	1725	770
205	1791	1731	1904	1826	770
210	1889	1829	2011	1933	770
215	1994	1934	2127	2049	770
220	2106	2046	2127	2049	770
225	2226	2166	2166	2088	770
230	2354	2294	2294	2216	770
235	2490	2430	2430	2352	770
240	2633	2573	2573	2495	770
245	2786	2726	2726	2648	770
250	2947	2887	2887	2809	770
255	3117	3057	3057	2979	770
260	3296	3236	3236	3158	770

Table 2

PORV Setpoint and Transient Pressures

RCS Temp deg F	Unadjusted Appendix G Value psig	Appendix G Adjusted for Instrument Error (-60 psi) psig	Instrument Error Adjusted Appendix G with Code Case N-514 psig	Instrument Error Adjusted Appendix G with Code Case N-514 Reduced by Appropriate DP Value and Limited to Piping Limit psig	(2) Nominal PORV Setpoint psig	Transient Pressure Overshoot psig	Peak Transient RCS Pressure psig
70	621	561	617	583	553	30	583
100	621	561	617	583	553	30	583
120	849	789	868	770	554	28	582
150	1062	1002	1103	770	560	34	594
200	1699	1639	1803	770	619	52	671
250	2947	2887	2887	770	697	73	770
300	(4)	(4)	(4)	770	682	88	770

Notes:

1. When the Appendix G with Code Case N-514 exceeds 770 (800 - 30 psi elevation adjusted instrument uncertainty) psig, the 770 psig PORV piping pressure limit governs and is used for LTOP analysis.

2. The nominal PORV setpoint value from the proposed Tech Spec Figure 3.4-4a. This value represents the highest allowed PORV setpoint. Actual PORV setpoints may be less than the nominal value given.

3. Differential pressure effects are the pressure corrections to account for flow induced pressure differences between the reactor vessel center line and the location of the pressure transmitter. Differential pressure effects are not applicable for the 770 (800 - 30 psi uncertainty) psig PORV piping pressure limit since the reactor vessel center line is no longer the pressure limiting location in the reactor coolant system.

4. Appendix G values were not calculated for temperatures in excess of 250 deg F since the Appendix G pressure limit at 250 deg F is 2947 psig which exceeds the normal operating pressure of 2235 psig.

5. Pressure instrument uncertainty is accounted for as follows:

   Appendix G Limits - Appendix G limits are adjusted down 60 psig prior to applying the 10% allowance of Code Case N-514.

   800 psig Limit - The PORV piping limit is adjusted down 60 psig for instrument uncertainty and then adjusted up 30 psig due to the 74 ft (approx.) elevational difference between the pressure instrument location and the top of the pressurizer. The net adjusted PORV piping limit becomes 770 psig.

Figure 1
Braidwood Unit 1 Appendix G and Code Case N-514 Limits at 16 EFPY

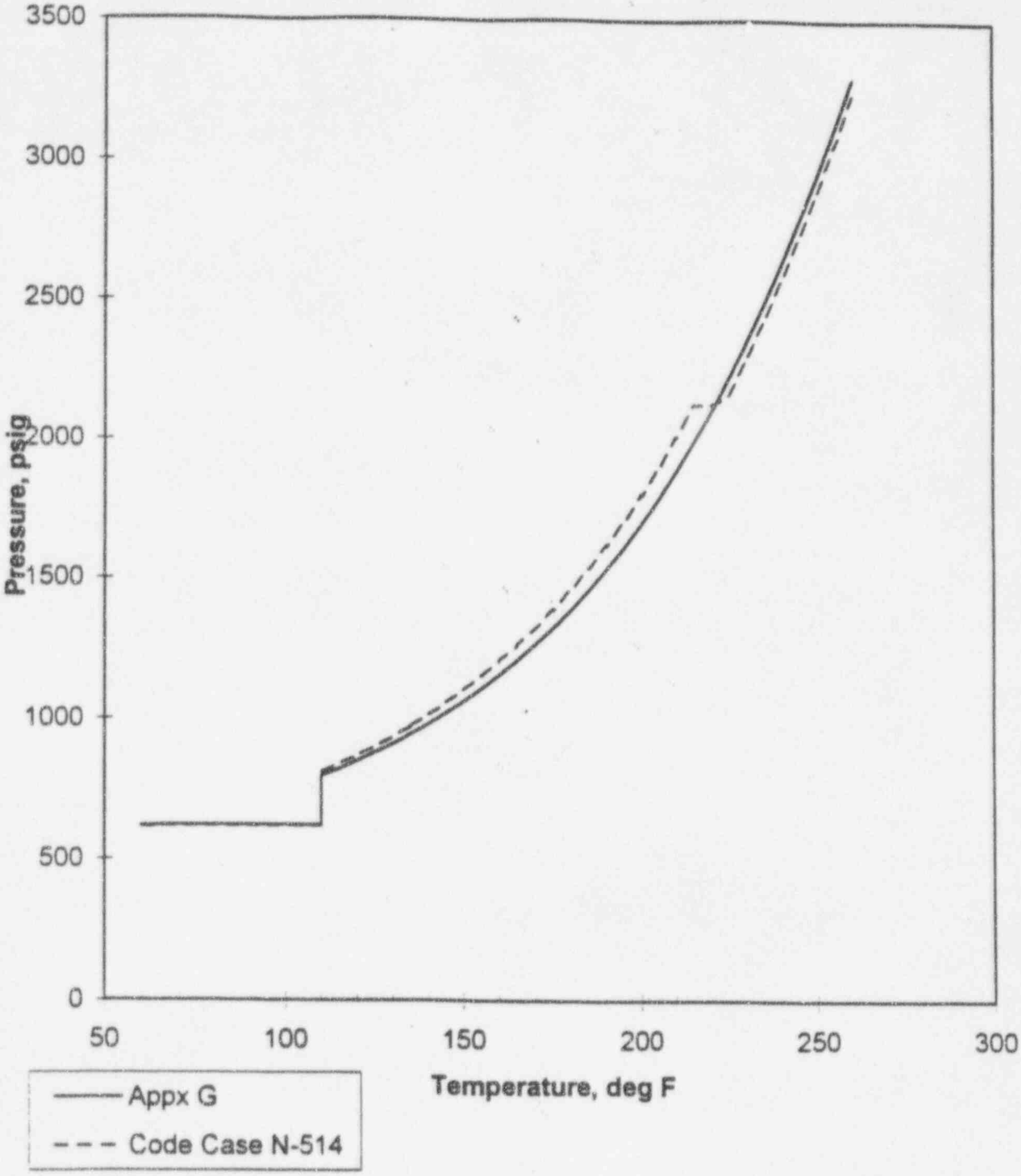
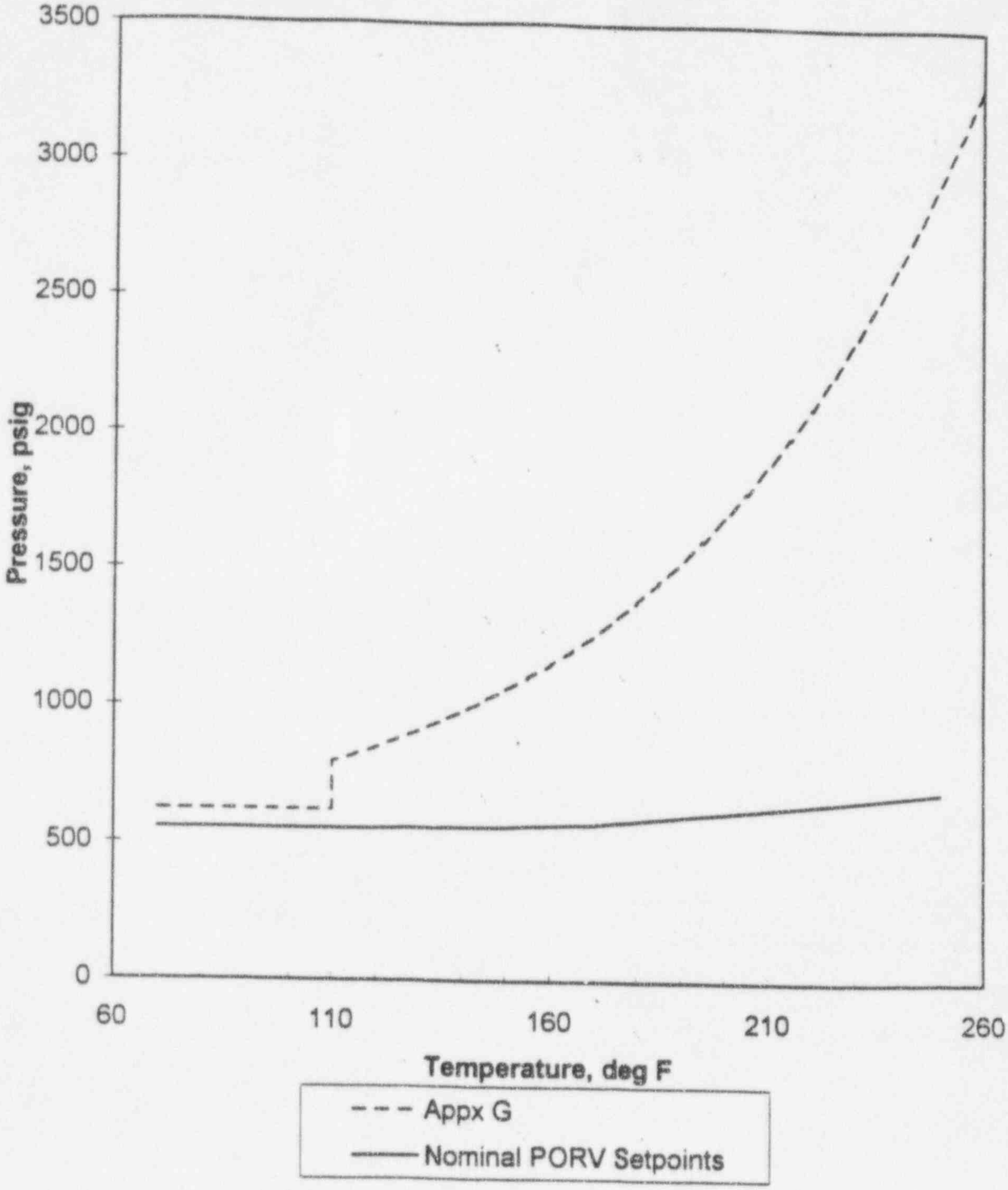


Figure 2
Braidwood Unit 1 PORV Setpoint and 16 EFPY Appendix G vs. RCS Temperature



ATTACHMENT
F
REVIEW OF QUESTIONS AND RESPONSES
APRIL 20, 1995
REQUEST FOR ADDITIONAL INFORMATION

1. Provide the revised Appendix G curves based on 8.5 effective full power years (EFPY) for the reactor heatup and cooldown process.

See Figures 1 and 2 and Table 1 of this attachment.

2. Provide the curves of pressure/temperature (P/T) limits which are developed in accordance with ASME Code Case N-514.

See Figures 1 and 2 and Table 1 of this attachment.

3. It is our understanding that the instrument uncertainties have not been incorporated in the propcsed figure 3.4-4a (power operated relief valve (PORV) setpoints for low-temperature overpressure protection (LTOP) applicable up to 8.5 EFPY) as well as in the proposed P/T limits in Item 2 above. This design is not acceptable to the staff. The margins in the Appendix G curves can not be used to justify the elimination of the instrument uncertainties in the LTOP setpoints. Other wise the P/T limits will not be adequately protected by these setpoints. Please provide a revised Figure 3.4-4a for staff review.

See Insert A of Attachment B of this amendment request.

4. Provide a discussion on the change made for the administrative limit to protect the PORV discharge piping from water hammer effects.

See the discussion in Section F, "Bases of the Revised Requirement," of Attachment A of this amendment request.

5. Technical Specification (TS) 3.4.9.3 is effective at 350°F (Mode 4 and below). The proposed PORV setpoints cover 400°F. What is the actual enable temperature for LTOP? Discuss the basis for this LTOP enable temperature in light of Appendix G requirements.

Per Braidwood Station operating procedures and TS, the LTOP system is physically enabled at a Reactor Coolant System (RCS) temperature of 350°F (entry into Mode 4).

At Braidwood, the RHR inlet relief valve capacity was verified to be sufficient to provide overpressure protection for the RHR system for the mass input from two centrifugal charging pumps operating and discharging into the RCS in an unthrottled condition while letdown is isolated.

The LTOP design basis mass injection transient postulates one centrifugal charging pump injecting to the RCS in an unthrottled condition with RCS letdown isolated. Thus, the preceding discussion shows that, at Braidwood, the RHR inlet relief valve is capable of protecting the RHR system during the design basis LTOP mass injection event.

2. RHR pressure relief valves may not be able to relieve their rated capacity due to a greater than estimated back-pressure.

The Westinghouse valve design data used to procure the Braidwood relief valves assumes that the valve discharge pressure is 100 psig and that the discharge flow is two phase at the maximum temperature. The Braidwood RHR relief valves discharge to the Recycle Holdup Tanks. This provides a backpressure of only 12 psig versus 100 psig. Thus, at Braidwood, the valve backpressure is significantly less than the estimated backpressure and issue 2 is not a concern.

3. Inconsistencies may exist in RHR relief valve design basis documentation.

A review was conducted of the Westinghouse design information and the Braidwood Updated Final Safety Analysis Report and no inconsistencies were identified.

K:nla\bwd\bwltops3