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ComEd

May 23, 1997

United States Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555-0001

Subject: Supplement to the Application for EMERGENCY Amendment to Appendix A, Technical Specifications, for Facility Operating License:

Braidwood Nuclear Power Station, Unit 1
Facility Operating License NPF-72
NRC Docket Nos. 50-456

"Emergency Core Cooling System Venting"

Reference: 1. H. Gene Stanley (ComEd) letter to the United States Nuclear Regulatory Commission (NRC) Document Control Desk, "Application for Emergency Amendment to Appendix A, Technical Specifications, for Facility Operating License NPF-72, 'Emergency Core Cooling System Venting'," dated May 23, 1997

In Reference 1, Commonwealth Edison Company (ComEd) proposed to amend Appendix A, Technical Specifications, for Facility Operating License NPF-72 for Braidwood Nuclear Power Station, Unit 1 (Braidwood)pursuant to Title 10, Code of Federal Regulations, Part 50, Section 90 (10 CFR 50.90). ComEd proposed to revise Technical Specification Surveillance Requirement (TSSR) 4.5.2.b.1 for Unit 1 as it related to the requirement to vent the Emergency Core Cooling System (ECCS) pump casings and discharge piping high points outside containment. The current TSSR 4.5.2.b.1 requirements would be retained for Unit 2 although the page would be renumbered as a result of the proposed change to Unit 1.

The purpose of this supplement is to limit the applicability of the changes proposed for Braidwood Unit 1, in Reference 1, to the end of cycle 7. A revised markup of Technical Specification (TS) page 3/4 5-4a is included in Attachment B.

For ease of review, ComEd is resubmitting an entire package to supersede that was provided in Reference 1.

ComEd requests the United States Nuclear Regulatory Commission (NRC) Staff process this proposed license amendment request as an EMERGENCY as defined in 10 CFR 50.91(a)(5). Braidwood Unit 1 is currently in Day 54 of its sixth refuel outage. Braidwood Unit 1 is in Mode 3, Hot Standby, and prepared to transition to Mode 2, Startup, following refueling activities. An EMERGENCY situation exists in that failure to act in a timely way will result in the prevention of the resumption of power operation for Braidwood Unit 1 and result in unnecessary thermal transient of cooling the plant down from Mode 3, Hot Standby, to Mode 5, Cold Shutdown. This EMERGENCY situation occurred because it was identified on May 22, 1997, that Braidwood was not in literal compliance with the wording of TSSR 4.5.2.b.1. Braidwood considered itself in compliance with the requirement by crediting the dynamic venting action of the system in operation as meeting the requirement to ensure that the ECCS piping is full of water. For the piping not directly in the flowpath, gas accumulation was judged not to be credible due to the pressure prevalent in the piping. The idle centrifugal charging pump was considered to be self-venting due to the system design and piping configuration. Due to these circumstances, a opportunity to make a timely application did not exist

Attachment A includes a detailed description of the changes.

Markups of all proposed revisions to the Technical Specification (TS) pages are included in Attachment B.

The proposed changes in this license amendment request have been reviewed and approved by both On-site and Off-site Review in accordance with ComEd procedures. ComEd has reviewed this proposed license amendment request in accordance with 10 CFR 50.92(c) and has determined that no significant hazards considerations exist. The No Significant Hazards Determination is included as Attachment C.

An environmental assessment has been completed and is included as Attachment D.

ComEd is notifying the State of Illinois of our application for this license amendment request by transmitting a copy of this letter and its attachments to the designated State Official.

Braidwood will ultrasonically examine the piping described in the new TSSR 4.5.2.b.3 on a weekly basis approval of the exigent TS amendment request submitted for both Byron and Braidwood, also submitted on May 23, 1997.

To the best of my knowledge and belief, the statements contained in this document are true and correct. In some respects these statements are not based on my personal knowledge, but on information furnished by other ComEd employees, contractor employees, and/or consultants. Such information has been reviewed in accordance with company practice, and I believe it to be reliable.

Please address any comments or questions regarding this matter to Terrence W. Simpkin, Braidwood Regulatory Assurance Supervisor, at (815)458-2801, extension 2980.

Sincerely,

H. Gene Stanley
Site Vice President
Braidwood Nuclear Generating Station

Attachments
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cc: A. B. Beach, Regional Administrator - RIII
G. F. Dick Jr., Byron/Braidwood Project Manager - NRR
C. J. Phillips, Senior Resident Inspector - Braidwood
Office of Nuclear Facility Safety - IDNS

ATTACHMENT A

DESCRIPTION AND SAFETY ANALYSIS OF
PROPOSED CHANGES TO APPENDIX A
TECHNICAL SPECIFICATIONS OF
FACILITY OPERATING LICENSE NPF-72

A. DESCRIPTION OF THE PROPOSED CHANGE

Commonwealth Edison (ComEd) proposes to revise Braidwood Technical Specification (TS) 4.5.2.b.1 and associated bases for Unit 1 as it relates to the requirement to vent the Emergency Core Cooling Systems (ECCS) pump casings and discharge piping high points. The change will revise the venting requirement to encompass the non-operating ECCS pumps and discharge piping which are provided with high point vent valves. Those portions of the ECCS systems which are in communication with operating system pressure and/or flow would not be required to be vented. This would normally encompass the High Head Safety Injection (CV) subsystem during Modes 1-4 operation, and the Low Head Safety Injection Subsystem (RH) during periods when shutdown cooling is in operation. Additionally, the wording of the surveillance will be revised to clearly indicate that the installed high point vent valves and pump casing vent valves will be utilized to accomplish the venting operation. The Intermediate Head Safety Injection (SI) subsystem and the RH subsystem are equipped with pump casing vents. The centrifugal CV pumps are not equipped with pump casing vent valves due to the configuration of the suction and discharge piping. Both the suction and discharge piping enter the pump casing from the top, so the pumps are essentially self-venting. Finally, a new requirement is added to ultrasonically examine the discharge piping of the idle centrifugal pump and the portion of the piping upstream of the High Head Safety Injection isolation valves (1SI8801A&B) adjacent to the vent valve 1SI045 on a monthly basis. These changes are required to align the surveillance requirement with the physical construction of the installed piping, and accommodate operating conditions which preclude cycling of the installed high point vent valve during system operation, while continuing to provide assurance that the ECCS piping remains water solid. These proposed changes are discussed in detail in Section E of this attachment. The affected TS and bases pages showing the proposed revisions are included in Attachment B of this request.

B. DESCRIPTION OF THE CURRENT REQUIREMENT

TS 4.5.2.b.1 requires that once per 31 days, the ECCS pump casings and discharge piping high points outside of containment be vented.

C. BASES FOR THE CURRENT REQUIREMENT

The bases for the current requirement is to provide confidence that the ECCS piping is filled with water, and that voiding which could result in unacceptable dynamic loading be precluded. This will help ensure that the ECCS systems will be capable of performing their design function.

D. NEED FOR REVISION OF THE REQUIREMENT

In order to accommodate those portions of the ECCS subsystems which are in operation during the Modes of applicability, and thus not subject to voiding, and to clearly recognize that installed features will be utilized to accomplish the venting activity, the surveillance requirement will be revised to require that only those trains of Intermediate Head Safety Injection (SI) and Low Head SI (RH) which are not in operation will be vented on a monthly basis. This change will better align the venting requirements with the installed piping and vent valve configuration, and preclude the obvious safety concern with venting subsystems which are in operation.

E. DESCRIPTION OF THE REVISED REQUIREMENT

TS 4.5.2.b.1 will be revised to require that each ECCS subsystem be demonstrated OPERABLE at least once per 31 days by venting the ECCS pump casings and discharge piping high points outside of containment that are equipped with high point vent valves for subsystems not in direct communication with operating systems. An expanded bases discussion will be added to clarify that only the RH and SI pumps are equipped with pump casing vent valves. Additionally, it will note that the CV subsystem will not normally be vented, and the operating train of RH will not be vented while shutdown cooling is in operation. Additionally, a new requirement is added to ultrasonically examine the discharge piping of the idle centrifugal pump and the portion of the piping upstream of the High Head Safety Injection isolation valves (1SI8801A&B) adjacent to the vent valve 1SI045 on a monthly basis. Industry experience has shown that ultrasonic examination is effective at identifying voided piping. This process is procedurally controlled at ComEd.

F. BASES FOR THE REVISED REQUIREMENT

The bases for the revised requirement is unchanged from that of the original requirement. The purpose of venting the non-operating subsystems is to ensure that the piping is full of water and to provide confidence that water hammer which could result from voiding would not result in unacceptable dynamic loads. Those subsystems which will not be manually vented are in communication with an operating system and subject to system flow and/or pressure. For the CV subsystem, the non-active portion of piping upstream of the injection line isolation valves is subjected to CV pump discharge pressure of approximately 2500 psia. The pumps are designed and installed to be virtually self-venting, and are not provided with casing vent valves. The design of the pump places the suction and discharge piping at the top of the pump casing. The CV suction piping is in communication with either the Refueling Water Storage Tank (RWST) or the Volume Control Tank (VCT). Both of these sources provide a net positive suction pressure for the pumps.

For the RH subsystem in operation during shutdown cooling, the piping which is excluded from manual venting is subjected to a pressure of approximately 360 psia and flows which vary from approximately 1000 gpm to 3000 gpm. The operating RH pump and piping are not subject to gas accumulation under these conditions.

UT examination of portions of the CV piping will be subject to a "go-no go" acceptance criterion. If the line is determined to be water solid, the surveillance requirement will be met. If the UT examination reveals that the line is not water solid, the appropriate equipment will be declared inoperable and associated actions taken.

The design of the CV pumps is such that significant air does not collect in the pumps, whether they are running or not. The suction and discharge lines are on the top of the CV pumps and the internal cavities in the pump are small enough that significant air accumulation in the pump casings would not occur. In addition, there is a mini-flow recirculation line on the discharge side of each CV pump. For the running CV pump, any air in the discharge piping is expected to either recirculate to the VCT suction or stay in solution and pass through the CV injection lines to the reactor vessel.

Even though ComEd considers it highly unlikely that significant air bubbles would exist anywhere in the CV system piping, there is some potential that small amounts of air could accumulate on the upstream side of check valves that protect the standby CV pump from charging header backpressure. However, as documented in the requests for Operating License Amendment 36 for Braidwood, ComEd previously evaluated the consequences of air in the ECCS system piping. The NRC used these arguments as part of the bases for approving the amendment.

ComEd recently reviewed related calculations. A review of the potentially affected piping was performed. The VCT provides the net positive suction head for the CV pumps. The VCT is located at elevation 426 feet. The VCT level is typically maintained between 37% level (approximate elevation 431 feet) and 55% (approximate elevation 433 feet). In addition, the VCT is maintained at a minimum of 15 psig for reactor coolant pump seal backpressure. This is equivalent to 34 feet of water at standard temperature and pressure.

The elevation of the CV pump discharge check valves is at approximately elevation 370 feet. The elevation of the highest point of the discharge piping outside containment is approximately 397 feet. Thus, based on static pressures on the suction side of the CV pumps, air bubbles in the discharge piping of the CV system are unlikely. However, if an air bubble became entrapped in the discharge piping, the discharge piping would be subjected to transient loads during system operation. The air bubble would act as a cushion, traveling along the piping. The air-water interface would impart an impact load in the piping at each change in direction. The affected piping is safety related and is seismically supported.

A review of the RH and SI systems was previously performed to address the potential formation of air bubbles in ECCS piping. Although a static evaluation concluded that the analyzed piping would be water solid, a study was performed to evaluate air bubbles in 2-inch and 8-inch diameter RH piping. The study concluded that the fluid transient loads associated with a water-solid condition in the 2-inch line were small. Reevaluating this line with an air bubble did not increase the fluid transient loads significantly. The 8-inch diameter line experienced considerably larger fluid transient loads. Thus, the 8-inch line was considered the limiting case in this study. An evaluation of the 8-inch line with a 77-foot long air bubble (approx. 19.5 ft^3) concluded that the fluid transient loads were less than the capacities of the supports. An evaluation for a totally voided RH discharge line also yielded fluid transient loads less than the support capacities. The study concluded that the presence of an air bubble would not create a design concern.

The subject CV piping is comprised of 4-inch diameter schedule 160 stainless steel piping. A typical length of piping between the CV pump discharge and the containment isolation valves (SI8801 valves) is 160 feet (approx. 10.5 ft^3). The effects of a bubble in the CV discharge piping are expected to be enveloped by the evaluation of the 8-inch line. The integrity of the 4-inch schedule 160 piping would not be challenged by these loads.

Finally, Braidwood has performed Ultrasonic Testing (UT) inspections of the CV piping system. Specifically, the piping on the discharge side of the standby CV pump up to the downstream check valves for both units was UT inspected along with the stagnant piping around the SI045 valve. No air voids were identified in either section of piping.

G. IMPACT OF THE PROPOSED CHANGE

The changes proposed in this request will provide continued confidence that unacceptable accumulations of gases will not occur, and align the surveillance requirements with the designed configuration of the ECCS piping. Additionally, it will preclude an obvious safety concern by exempting piping in communication with operating systems from this manual venting.

H. SCHEDULE REQUIREMENTS

ComEd requests that these proposed changes be approved on an emergency basis. Approval of this amendment is necessary to support the restart of Braidwood Unit 1. The unit is currently in Mode 3, and prepared to enter Mode 2 for startup physics testing following refueling activities. As provided in 10CFR 50.91, an emergency situation exists in that failure to act on this request in a timely manner will prevent resumption of power operation, and result in the unit being returned to Mode 5, with the accompanying unnecessary thermal cycle on the unit. The circumstances could not have been foreseen and timely application made because Braidwood considered itself in compliance with the requirement by crediting the dynamic venting action of the system in operation as meeting the requirement to ensure the ECCS piping is full of water. For the piping not directly in the flowpath, gas accumulation was judged to be not credible due to the pressure prevalent in the piping. The idle centrifugal CV pump was considered to be self-venting due to the system design and piping configuration. It was identified to Braidwood on May 22, 1997, that it's position with respect to meeting the surveillance requirement was not in literal compliance with the Technical Specification wording. As such, the opportunity to make timely application did not exist. ComEd also requests that these changes be made effective immediately upon issuance, as the current surveillances being performed will ensure compliance with the revised requirements.

ATTACHMENT B

MARKED UP PAGES FOR
PROPOSED CHANGES TO APPENDIX A
TECHNICAL SPECIFICATIONS OF
FACILITY OPERATING LICENSE NPF-72

BRAIDWOOD STATION UNIT 1
REVISED PAGES:

3/4 5-4a (new page for Unit 1)
3/4 5-4b (applicable to Unit 2)
B 3/4 5-2