Entergy

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Fred Dacimo
Vice President, Operations

August 7, 2003

Re: Indian Point Units 2 and 3
Dockets 50-247 and 50-286
NL-03-128

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Stop O-P1-17
Washington, DC 20555-0001

SUBJECT: **60-Day Response to NRC Bulletin 2003-01 Regarding Potential Impact of Debris Blockage of Emergency Sumps**

Reference: NRC Bulletin 2003-01, "Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized-Water Reactors", dated June 9, 2003

Dear Sir:

The U.S. Nuclear Regulatory Commission (NRC) issued the referenced NRC Bulletin to inform licensees of NRC-sponsored research that identifies the potential for adverse effects due to debris blockage of emergency sumps and related flowpaths. Licensees are required to provide a written response stating either that debris blockage effects have been analyzed (response option 1), or describe any interim compensatory measures being implemented until an evaluation is complete (response option 2). Entergy Nuclear Operations, Inc. (Entergy) is herein providing a response to the Bulletin based on option 2.

Activities have previously been initiated at Indian Point Units 2 and 3 (IP2 and IP3) to evaluate the potential for sump blockage. Entergy has been active in monitoring and participating in industry efforts to address this potential concern. Containment walkdowns have been performed to collect data regarding the types and quantities of insulation that could contribute to sump blockage. Containment inspections and analyses have also been performed to quantify the potential for the transport of failed paints and other coating to the sumps. In addition, an analysis has been performed for IP2 to assess the effect of LOCA-generated debris on recirculation sump performance. The analysis accounts for the accumulation of fibrous insulation and transportable particulates on the sump screen, resulting in a head loss of approximately six inches. The remaining net positive suction head available for the recirculation pumps under this condition is greater than one foot. Therefore, based on the efforts completed so far, Entergy believes that the likelihood of debris blockage at IP2 and IP3 is low. Since the final industry and regulatory guidance has not yet been issued regarding evaluation methods and assumptions, Entergy has determined that a response based on option 1 of the Bulletin is

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not appropriate at this time. Entergy has therefore assessed the need to adopt the interim compensatory measures as described in the Bulletin for response option 2. The results of this assessment are provided in Attachment 1.

The response to this Bulletin contains two commitments regarding compensatory measures to be taken. The commitments are summarized in Attachment 2. If you have any questions regarding this submittal, please contact Kevin Kingsley at (914) 734-5581.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 8/7/03

Sincerely,

Fred R. Dacimo
Vice President, Operations
Indian Point Energy Center

cc: Mr. Patrick D. Milano, Senior Project Manager
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ATTACHMENT 1 TO NL-03-128

60-DAY RESPONSE TO NRC BULLETIN 2003-01

Entergy Nuclear Operations, Inc
Indian Point Nuclear Generating Units 2 and 3
Docket No 50-247 and 50-286

60-DAY RESPONSE TO NRC BULLETIN 2003-01 REGARDING POTENTIAL IMPACT OF DEBRIS BLOCKAGE OF EMERGENCY SUMPS

The following sections describe the status of compensatory measures at Indian Point Units 2 (IP2) and 3 (IP3) regarding response option 2 of NRC Bulletin 2003-01.

1. Operator training on indications of and responses to sump clogging

Entergy Nuclear Operations, Inc (Entergy) does not currently have operator training specific to sump clogging. The current philosophy for emergency operating procedures provides for symptom-based responses rather than diagnosing a specific condition, such as sump clogging. Existing operator training does include monitoring the operating pumps (recirculation pumps or residual heat removal pumps) for erratic flow that could be symptomatic of sump clogging.

In addition, IP2 and IP3 are designed with two separate sumps. The recirculation sump, which supplies the recirculation pumps located inside containment, is the normal source for post-switchover core cooling. In the event that adequate core cooling is not established with the recirculation pumps, existing procedures and operator training provide for use of an alternate source consisting of the containment sump, which also is equipped with screens, and the residual heat removal pumps, located outside of containment. The two independent sumps are located on the bottom elevation of containment, but are located approximately 90° apart. This configuration provides diversity and can be used to reduce the potential for a loss of recirculation capability caused by sump-clogging.

Operator training is also provided on existing procedures that address a loss of the recirculation capability from both the normal and alternate sources. Sump clogging is one scenario that could result in this condition. Operator actions involve delaying depletion of the RWST by minimizing flow and depressurizing the reactor coolant system to reduce break flow.

Although operator training on specific responses to sump clogging is not appropriate unless procedures are developed for these responses, Entergy is preparing a lesson plan that will present the mechanisms and potential consequences of sump clogging. This training will be included in the licensed operator requalification cycle scheduled to begin in September 2003 for IP3 operators and October 2003 for IP2 operators. These training cycles will be completed by January 2004.

2. Procedure modifications to delay switchover to containment sump recirculation

Entergy has determined that it is not prudent to implement this compensatory measure until additional evaluations are performed. Operator action to secure or throttle emergency core cooling or containment spray flow needs to be carefully evaluated to ensure that these steps would not result in conditions that are inconsistent with current design basis analyses. The availability of appropriate instrumentation is also a factor in determining what action may be suitable as a compensatory measure.

Entergy intends to participate in an Owners Group program that is being developed to assess potential changes to the generic Emergency Response Guidelines. That information would subsequently be used to identify potential plant-specific changes to the Emergency Operating Procedures (EOPs) for IP2 and IP3.

Entergy has performed a preliminary review of the current EOPs to identify areas where compensatory measures of some form already exist. The transfer from the injection phase to the recirculation phase is a manual process involving actuation of a series of control switches, based on operator decision points defined in the procedure. The transfer sequence is initiated when the refueling water storage tank (RWST) is at approximately 9.2 feet for IP2 and 11.5 feet for IP3, as long as sufficient water level in containment is verified. At this time, one containment spray pump is secured while the remaining pump continues to run. This action reduces the drain-down rate of the RWST. Also, if the inability to establish or maintain recirculation flow is diagnosed, the EOPs currently provide for securing containment spray, depending on containment pressure and the number of containment fan coolers operating. In addition, existing procedures provide for water addition to the RWST, under certain circumstances, using the primary water system.

Recirculation is initially established by starting only one recirculation pump. The procedure directs operators to maintain maximum flow without exceeding a specified limiting flowrate. Under the current philosophy, it is important to establish a maximum flowrate to maintain adequate core cooling and account for recirculation flow that may bypass the core because of the break location. At a later point in the process, a second recirculation pump is started, and the procedure directs operators to maintain the maximum flowrate for both pumps. Although this assures abundant flow for core cooling, it could theoretically increase entrainment of debris on the sump screens due to the higher approach velocity. Current procedures direct operators to secure pumps on loss of recirculation sump suction (IP2), or to monitor for stable recirculation flow and throttle flow if needed (IP3).

3. Alternative water sources to refill the RWST

As described in the previous section, existing procedures provide for the addition of water to the RWST under certain circumstances. Refilling the RWST is not credited in the safety analyses and introduces the potential for containment flooding with adverse effect on equipment at the affected level in containment. Provisions for refill would only be applicable in beyond design basis circumstances, such as loss of recirculation capability. For IP3, makeup to the RWST using the primary water system is directed in the event that recirculation flow cannot be established or maintained, and RWST level drops to 11.5 feet. IP2 also has provisions for adding makeup using the primary water system. The design at Indian Point does not provide for cross-connecting the RWSTs for the two units or other major refill sources. Entergy is not currently planning to adopt a compensatory measure for alternate water sources, because a suitable method to accomplish this is not available.

4. Containment cleaning and foreign material controls

ENO currently has foreign material control programs that are applicable to containment and include provisions to ensure that inappropriate materials are not left in containment and that the containment sumps are free of debris. The containment closeout process followed prior to plant

startup includes containment walkdown and inspection activities. Based on existing administrative controls Entergy is not planning to adopt additional compensatory measures in this area.

5. Containment drainage paths

The interior layout of the containment building does not involve 'chokepoints' that would restrict reactor coolant break flow from reaching the containment or recirculation sumps. The refueling cavity has a 4-inch nominal drain line to allow containment spray water that flows to this area to be returned to the lower elevation of containment. Existing administrative controls are in place to verify that the blind flange used on this line during refueling operations is removed prior to startup. Because of containment interior design and existing administrative controls, additional compensatory measures regarding containment drainage paths are not necessary.

6. Sump screen integrity

The sump screens are inspected following each refueling outage to verify that the as-left condition is consistent with the design requirements. In response to an assessment performed following the last refueling outage at IP3, improvements to the containment closeout procedures for IP2 and IP3 are planned to provide more specific steps to verify that the recirculation and containment sump screens are intact, with no adverse gaps or breaches. The procedure improvements will be completed prior to the next refueling outage for each unit.

ATTACHMENT 2 TO NL-03-128

COMMITMENTS REGARDING 60-DAY RESPONSE TO NRC BULLETIN 2003-01

Entergy Nuclear Operations, Inc
Indian Point Nuclear Generating Units 2 and 3
Docket No 50-247 and 50-286

COMMITMENTS REGARDING 60-DAY RESPONSE TO NRC BULLETIN 2003-01

Number	Commitment	Due Date
NL-03-128-01	Provide operator training regarding the mechanisms and potential consequences of sump clogging	January 2004
NL-03-128-02	Revise containment closeout procedures to provide additional detailed instruction regarding the as-left condition and configuration of the recirculation and and containment sumps.	Prior to use in the next refueling outage.