Entergy

Entergy Nuclear Northeast
Entergy Nuclear Operations, Inc
Indian Point Energy Center
295 Broadway, Suite 1
PO Box 249
Buchanan, NY 10511-0249

November 26, 2002

Re: Indian Point Unit No. 2
Docket No. 50-247
NL-02-148

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

Subject: Response to Request for Additional Information Regarding Sections 3.3.1, 3.5.3, 3.7.8, 3.8.3, 3.8.4, and 3.8.6 of the Improved Technical Specifications (ITS) (TAC Nos. MB5062, MB5069, MB5067, MB5070, MB6394, MB6396, MB6397, MB6398 and MB6399)

Reference:
1) Entergy letter (NL-02-016) to NRC, "License Amendment Request (LAR 02-005) Conversion to Improved Standard Technical Specifications," dated March 27, 2002
2) Entergy letter (NL-02-092) to NRC, "Supplement 1 to the Indian Point 2 License Amendment Request for Conversion to Improved Standard Technical Specifications," dated July 10, 2002
3) NUREG 1431, "Standard Technical Specifications Westinghouse Plants," Revision 2, dated April 2001
4) 10 CFR 50.36, "Technical Specifications," as amended
5) NRC letter to Entergy Nuclear Operations, Inc., "Request for Additional Information (RAI) Regarding Section 3.5.3 – Emergency Core Cooling System (ECCS) – Shutdown - The Improved Technical Specifications Beyond Scope Issue No. 1 (TAC No. MB5062)," dated September 26, 2002
6) NRC letter to Entergy Nuclear Operations, Inc., "Request for Additional Information (RAI) Regarding Section 3.8.3 – Diesel Fuel Oil and Starting Air - Beyond Scope Issue No. 8 (TAC No. MB5069)," dated October 3, 2002
7) NRC letter to Entergy Nuclear Operations, Inc., "Request for Additional Information (RAI) Regarding Section 3.7.8 – Service Water System - Beyond Scope Issue No. 6 (TAC No. MB5067)," dated October 10, 2002

A001

8) NRC letter to Entergy Nuclear Operations, Inc., "Request for Additional Information (RAI) Regarding Improved Technical Specification (ITS) Beyond Scope Issue No. 9, ITS Section 3.8.4 DC Sources - Operating (TAC No. MB5070)," dated October 17, 2002
9) NRC letter to Entergy Nuclear Operations, Inc., "Comments and Request for Additional Information (RAI) Regarding Improved Technical Specification (ITS) Beyond Scope Issues (BSI)-S1, BSI-S2, BSI-S3, BSI-S4, BSI-S5, BSI-S6 (TAC Nos. MB6394, MB6395, MB6396, MB6397, MB6398, and MB6399)," dated October 17, 2002

Dear Sir:

By letter dated March 27, 2002 (Reference 1) as supplemented by letter dated July 10, 2002 (Reference 2), Entergy Nuclear Operations, Inc. (ENO) requested to amend the Indian Point 2 (IP2) Plant Operating License, Appendices A and B, "Technical Specifications." The proposed amendment converts the IP2 Current Technical Specifications (CTS) to Improved Technical Specifications (ITS) in accordance with NUREG 1431, "Standard Technical Specifications Westinghouse Plants," (Reference 3), and the Code of Federal Regulations (CFR) (Reference 4).

The U.S. Nuclear Regulatory Commission (NRC) staff reviewing the request has determined that additional information is required to complete its review. The subject requests for additional information are dated September 26, October 3, October 10, and two dated October 17, 2002 (References 5, 6, 7, 8, and 9 respectively).

A list of acronyms that may have been used in this submittal has been provided as Attachment 1 to this letter. Attachment 2 to this letter, "Response to Request for Additional Information Regarding Sections 3.3.1, 3.5.3, 3.7.8, 3.8.3, 3.8.4, and 3.8.6 of the Improved Technical Specifications (ITS)," provides ENO's response to the subject requests for additional information. The IP2 Actions described in Attachment 2 will be incorporated in a future supplement to the ITS submittal packages. Per the response to RAI 3.3.1-2, a copy of Specification No. FIX-95-A-001, "Guidelines for Preparation of Instrument Loop Accuracy and Setpoint Determination Calculations," Revision 1 has been provided as Attachment 3 (Proprietary) to this letter.

Attachment 3 contains proprietary information as defined by 10 CFR 2.790 (a)(4). Accordingly, it is requested that the information to which Entergy asserts proprietary claims be withheld from public disclosure in accordance with the Commission's regulations. There is no Non-Proprietary version of this attachment.

No new regulatory commitments are being made by ENO in this correspondence.

Should you or your staff have any questions regarding this matter, please contact the IP2 ITS Project Manager, Mr. William Blair at (914) 734-5336.

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

Sincerely,

Executed on 11/26/02

Fred Dacimo
Vice President – Operations
Indian Point 2

Attachments

cc: See page 4

cc (w/o Attachment 3):

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ATTACHMENT 1 TO NL-02-148

List of Acronyms That May Be Used In This Submittal

Entergy Nuclear Operations, Inc.
Indian Point Unit No. 2
Docket No. 50-247

List of Acronyms That May Be Used In This Submittal

AC	Air Conditioning or Alternating Current
AOT	Allowed Outage Time
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATWS	Anticipated Transient Without Scram
CFR	Code of Federal Regulations
CLB	Current License Basis
COLR	Core Operating Limits Report
COT	Channel Operational Test
CST	Condensate Storage Tank
CTS	Current Technical Specification
DB	Design-Basis
DBA	Design-Basis Accident
DC	Direct Current
DG	Diesel Generator
DOC	Discussion of Change (from the CTS)
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generator
ESF	Engineered Safeguard Feature
FR	Federal Register
GDC	General Design Criteria
HEPA	High Efficiency Particulate Air
Hz	Hertz
IRM	Intermediate Range Monitor
ISI	Inservice Inspection
ITS	Improved (converted) Technical Specifications
JFD	Justification For Difference
kV	Kilovolt
kW	Kilowatt
LAR	License Amendment Request
LCO	Limiting Condition for Operation
LOCA	Loss of Coolant Accident
LOOP	Loss of Offsite Power
LOP	Loss of Power
MSIV	Main Steam Isolation Valve
NUMAC	Nuclear Measurement Analysis and Control
PAM	Post-Accident Monitoring
P/T	Pressure/Temperature
QA	Quality Assurance
RAI	Request for Additional Information
RCS	Reactor Coolant System
RG	Regulatory Guide

RHR	Residual Heat Removal
RPS	Reactor Protection System
RPV	Reactor Pressure Vessel
RTP	Rated Thermal Power
SDC	Shutdown Cooling
SDM	Shutdown Margin
SE	Safety Evaluation
SER	Safety Evaluation Report
SR	Surveillance Requirement
SRM	Source Range Monitor
STS	Improved Standard Technical Specification(s), NUREG-1431, Rev. 2
SW	Service Water
TRM	Technical Requirements Manual
TS	Technical Specifications
TSTF	Technical Specifications Task Force (re: generic changes to the STS)

ATTACHMENT 2 TO NL-02-148

Response to Request for Additional Information Regarding Sections 3.3.1, 3.5.3, 3.7.8, 3.8.3, 3.8.4, and 3.8.6 of the Improved Technical Specifications (ITS)

Entergy Nuclear Operations, Inc.
Indian Point Unit No. 2
Docket No. 50-247

Response to Request for Additional Information

The NRC Staff reviewing information provided in the March 27, 2002 license amendment request as supplemented by letter dated July 10, 2002 has determined that additional information is required to complete its review. The following are the specific requests from the NRC staff and ENO's response to those requests.

3.3.1 : Reactor Protection System (RPS) Instrumentation

NRC RAI Number	TAC Number:
3.3.1 - 2	**MB6394**

NRC Request for Additional Information (RAI):

Item 2 - BSI for staff review
CTS 2.3.1
ITS per DOC L.1
Staff review of new setpoint methodology required.

Entergy (IP2) Response:

The IP2 setpoint methodology is documented in IP2 Specification No. FIX-95-A-001, "Guidelines For Preparation Of Instrument Loop Accuracy And Setpoint Determination Calculations," Revision 1. A copy of this specification is attached to this response. The calculations supporting allowable values for ITS LCO 3.3.1, Reactor Protection System (RPS) Instrumentation, ITS 3.3.2, Engineered Safety Feature Actuation System (ESFAS) Instrumentation, and ITS 3.3.5, Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation, are currently being developed. The results of these calculations and sample calculations will be provided to the NRC in a separate submittal.

Entergy (IP2) Action:

IP2 is submitting a copy of IP2 Specification No. FIX-95-A-001, "Guidelines For Preparation Of Instrument Loop Accuracy And Setpoint Determination Calculations," Revision 1, as part of this response.

Questions regarding this response should be directed to Dick Bense at (914) 734-5895 (RBENS90@Entergy.Com) or Bill Blair at (914) 737-4167 (WBlair@Entergy.Com).

3.3.1 : Reactor Protection System (RPS) Instrumentation

NRC RAI Number	TAC Number:
3.3.1 - 4	**MB6395**

NRC Request for Additional Information (RAI):

Item 4 - BSI for staff review
CTS 2.3.1.B(4), Overtemperature Delta Temperature
ITS per DOCs A.8.f and LA.4
Staff review of changes to STS equations. Application of "*" note to COLR variables in TS equation is inconsistent with CTS and NUREG-1431.

Entergy (IP2) Response:

As stated in the IP2 ITS submittal dated March 26, 2002, IP2 is currently in the process of developing revised values for these functions using a methodology consistent with Part I of ISA-S67.04-1994, "Setpoints for Nuclear Safety-Related Instrumentation." When completed, the site-specific methodology and the resulting values (including the equation used for the Over-Temperature Delta T Function) will be submitted to the NRC for review and approval as part of a supplement to the ITS submittal.

Differences between the equation for Over-temperature Delta T in CTS 2.3.1.B(4) and ITS Table 3.3.1, Note 1, are explained in DOC A.8.f.
CTS 2.3.1.B(4) differs from proposed ITS 3.3.1, Note 1, because CTS 2.3.1.B(4) is an abbreviated version of the IP2 Over-temperature delta T function which comes from Indian Point Nuclear Generating Station Unit No. 2 Plant Manual Volume VI: Precautions, Limitations, and Setpoints. CTS 2.3.1.B(4) is abbreviated in that it does not include the Laplace transform operators that model system response or show the associated Tau values that represent the electronic dynamic compensation time constant settings. Although not shown in CTS 2.3.1.B(4), the Tau values are controlled administratively. The validity of the Over-Temperature Delta T Function equation is being confirmed as part of the determination of the allowable value.

Entergy (IP2) Action:

IP2 will make a separate submittal for all of the allowable values for ITS 3.3.1, Reactor Protection System, ITS 3.3.2, Engineered Safety Feature Actuation System, and ITS 3.3.5, Loss of Power Diesel Generator Start Instrumentation. This submittal will include the allowable values and the equation for the Over-Temperature Delta T Function.

Questions regarding this response should be directed to Dick Bense at (914) 734-5895 (RBENS90@Entergy.Com) or Bill Blair at (914) 737-4167 (WBlair@Entergy.Com).

3.3.1 : Reactor Protection System (RPS) Instrumentation

NRC RAI Number	TAC Number:
3.3.1 - 5	**MB6396**

NRC Request for Additional Information (RAI):

Item 5 - BSI for staff review
CTS 2.3.1.B(5), Overpressure (sic) Delta Temperature
ITS per DOCs A.9.f and LA.4
Staff review of changes to STS equations. Application of "*" note to COLR variables in TS equation is inconsistent with CTS and NUREG-1431.

Entergy (IP2) Response:

As stated in the IP2 ITS submittal dated March 26, 2002, IP2 is currently in the process of developing revised values for these functions using a methodology consistent with Part I of ISA-S67.04-1994, "Setpoints for Nuclear Safety-Related Instrumentation." When completed, the site-specific methodology and the resulting values (including the equation used for the Over-Power Delta T Function) will be submitted to the NRC for review and approval as part of a supplement to the ITS submittal.

Differences between the equation for Over-power Delta T in CTS 2.3.1.B(5) and ITS Table 3.3.1, Note 1, are explained in DOC A.9.f.
CTS 2.3.1.B(5) differs from proposed ITS 3.3.1, Note 2, because CTS 2.3.1.B(5) is an abbreviated version of the IP2 Over-temperature delta T function which comes from Indian Point Nuclear Generating Station Unit No. 2 Plant Manual Volume VI: Precautions, Limitations, and Setpoints. CTS 2.3.1.B(5) is abbreviated in that it uses a differential (dT/dt) in place of the Laplace transform operators that model system response or show the associated Tau values that represent the electronic dynamic compensation time constant settings. Although not shown in CTS 2.3.1.B(5), the Tau values are controlled administratively. The validity of the Over-Power Delta T Function equation is being confirmed as part of the determination of the allowable value.

Preliminary review of the Over-Power Delta T Function equation during the recent calculation of the allowable value determined that the Over-Power Delta T Function equation shown in both CTS 2.3.1.B(5) and ITS 3.3.1, Note 2, does not reflect that the installed function includes compensation for axial flux difference (f(delta I)). Additionally, ITS 3.3.1, Note 2, inadvertently left out the parameter T (average temperature) when it converted the differential (dT/dt) to the Laplace transform operators.

Entergy (IP2) Action:

IP2 will make a separate submittal for all of the allowable values for ITS 3.3.1, Reactor Protection System, ITS 3.3.2, Engineered Safety Feature Actuation System, and ITS 3.3.5, Loss of Power Diesel Generator Start Instrumentation. This submittal will include the allowable values and the equation for the Over-Power Delta T Function.

Questions regarding this response should be directed to Dick Bense at (914) 734-5895 (RBENS90@Entergy.Com) or Bill Blair at (914) 737-4167 (WBlair@Entergy.Com).

3.3.1 : Reactor Protection System (RPS) Instrumentation

NRC RAI Number	TAC Number:
3.3.1 - 6	**MB6397**

NRC Request for Additional Information (RAI):

Item 6 - BSI for staff review
CTS 2.3.2.A(1) and 2.3.2.(A)2, P-7 Interlocks
Correct CTS inequality markup errors replacing "less than or equal to" with " < " for "P-10, < 10% RTP" and "< 10% turbine power."

Entergy (IP2) Response:

IP2 will revise the CTS markup to show that Allowable Values for the interlock for P-10 and interlock for the turbine first stage pressure input to P-7 have not yet been calculated. The inequality symbol associated with these values (i.e., whether we use "<" or "less than or equal to") will depend on the results of the allowable value calculations. Reversing inequality signs (e.g., replacing 'greater than' with 'less than') in the conversion from the CTS and to the ITS was necessary because CTS specifies conditions when trip functions must be Operable (e.g. when RTP is greater than 10%) but ITS specifies conditions when the relay that enables those trips must change state (e.g., when RTP is less still than 10%).

As stated in the IP2 ITS submittal dated March 26, 2002, IP2 is currently in the process of developing revised allowable values for trip functions in ITS 3.3.1, 3.3.2 and 3.3.5 using a methodology consistent with Part I of ISA-S67.04-1994, "Setpoints for Nuclear Safety-Related Instrumentation." When completed, the site-specific methodology and the resulting values will be submitted to the NRC for review and approval as part of a supplement to the ITS submittal.

The difference between the terms "...equivalent full load" and " % turbine power" is addressed in the response to RAI 3.3.1-7.

Entergy (IP2) Action:

IP2 will make a separate submittal for all of the allowable values for ITS 3.3.1, Reactor Protection System, ITS 3.3.2, Engineered Safety Feature Actuation System, and ITS 3.3.5, Loss of Power Diesel Generator Start Instrumentation. This submittal will include the allowable values for the interlock for P-10 and interlock for the turbine first stage pressure input to P-7 including the required inequality sign.

Questions regarding this response should be directed to Dick Bense at (914) 734-5895 (RBENS90@Entergy.Com) or Bill Blair at (914) 737-4167 (WBlair@Entergy.Com).

3.3.1 : Reactor Protection System (RPS) Instrumentation

NRC RAI Number	TAC Number:
3.3.1 - 15	**MB6398**

NRC Request for Additional Information (RAI):

Item 17
CTS T3.5-2, No. 1
ITS T3.3.1-1, F.1
Add reference to Mode 1, 2, 3(a), 4(a), 5(a) in DOC M.2. Add B.2 justification to DOC M.2. The analysis appears to not be met.

Entergy (IP2) Response:

DOC M.2 addresses new requirements for redundancy added to CTS Table 3.5-2, Function No. 1, in ITS Table 3.3.1-1, Function No. 1 (i.e., the reactor manual trip function).

DOC M.2 explains if one of the two required channels of reactor manual trip is inoperable, then the inoperable channel must be restored within 48 hours. DOC M.2 will be revised to explain that: if redundancy is not restored within 48 hours when in Mode 1 or 2, Required Action B.2 will require that the reactor be placed in Mode 3 within the following 6 hours; and, if redundancy is not restored within 48 hours when in Mode 3, 4 or 5, Required Action C.2 will require that action is initiated immediately to insert all rods and that the rod control system is made incapable of rod withdrawal within the following hour.

Entergy (IP2) Action:

Revise DOC M.2 as described above.

Questions regarding this response should be directed to Dick Bense at (914) 734-5895 (RBENS90@Entergy.Com) or Bill Blair at (914) 737-4167 (WBlair@Entergy.Com).

3.5.3 : ECCS - Shutdown

NRC RAI Number	TAC Number:
3.5.3 - 2	**MB5062**

NRC Request for Additional Information (RAI):

The proposed LCO 3.5.3 requires that for Mode 4, one ECCS Residual Heat Removal (RHR) subsystem and one ECCS Recirculation subsystem be OPERABLE. The Bases section for LCO 3.5.3 (page B 3.5.3-1) states that the required LCO is "to ensure that sufficient ECCS flow is available to the core following a DBA." Provide the results of analysis to support the acceptance of the cited statement in the Bases section for the LCO 3.5.3. In the submittal, identify the limiting DBA used to determine the required ECCS flow and show the available ECCS flow is greater than the required flow.

Entergy (IP2) Response:

IP2 does not have a plant specific analysis for a loss of inventory event when in Mode 4. However, the maximum reactor coolant system (RCS) saturation pressure in Mode 4 (i.e., <350 F) is approximately 120 psig. The RHR pumps are each rated at 3000 gpm at a design head of 350 feet which is equivalent to 152 psig. (Refer to FSAR Table 6.2-7, RHR Pump Design Parameters). The RHR pump performance curve, UFSAR Figure 6.2-7, Residual Heat Removal Pump Performance, indicates that an RHR pump discharge pressure remains above the maximum RCS saturation pressure even at flow rates exceeding 4000 gpm.

Although the charging pumps and the high head safety injection pumps (if available) would be used to attempt to maintain pressurizer level during a loss of inventory event in Mode 4, the RHR pump will be capable of delivering coolant to the RCS at a rate of at least 3000 gpm even if the RCS is at the saturation pressure for an RCS temperature of 350 F.

Therefore, IP2 will adopt requirements for ECCS in Mode 4 consistent with those already approved for IP3 (i.e., one RHR pump and one Recirculation pump shall be operable in Mode 4).

Entergy (IP2) Action:

None

Questions regarding this response should be directed to Dick Bense at (914) 734-5895 (RBENS90@Entergy.Com) or Bill Blair at (914) 737-4167 (WBlair@Entergy.Com).

3.7.8 : Service Water System (SWS)

NRC RAI Number	TAC Number:
3.7.8 - 1	**MB5067**

NRC Request for Additional Information (RAI):

3.7.8 L.1 - The proposed justification of maintaining functional capability, although losing redundancy, is does not provide acceptable justification for the less restrictive AOT. However, two minor points were also provided as justification that may justify the reduction if more information is provided. Please provide the evaluation or analysis for the conclusion that there is a "low probability of an event during the AOT for the pump on the essential and/or non-essential header." Also, provide more explanation on the statement that the time limit for ITS LCO 3.8.1 supports the less restrictive AOT.

Entergy (IP2) Response:

The IP2 Service Water System consists of two separate headers that are designated as either essential or non-essential. The essential SWS heat loads are those which must be supplied with cooling water immediately following a LOCA and/or loss of offsite power. Examples of essential loads are the emergency diesel generators (EDGs) and containment fan cooler units (FCUs). The non-essential SWS heat loads are those which are required following a postulated LOCA only after the switch over to the recirculation phase. The most significant non-essential loads are the component cooling water (CCW) heat exchangers.

10 CFR 50, Appendix A, Criterion 34, Residual Heat Removal, and Criterion 35, Emergency Core Cooling, require that the service water system have suitable redundancy to assure that the system safety function can be accomplished assuming a single failure when using either onsite power or offsite power. The single header design of both the essential and non-essential headers is consistent with requirement that the system must withstand failure of a single active component during the short term immediately following an accident, or a single active or passive failure during the long-term recirculation cooling phase following an accident. The active components on the IP SWS essential header are three pumps, and the redundant ESFAS valves that supply SWS to all three EDGs, and the redundant ESFAS valves that supply cooling water to the five fan cooler units. The active components on the IP SWS non-essential header are three pumps.

The essential SWS heat loads can be cooled by any two of the three service water pumps on the essential header. The non-essential SWS heat loads can be cooled by any one of the three service water pumps on the non-essential header. The SWS pumps are each supported by an independent safeguards power train. Therefore, single failure tolerance is achieved by CTS 3.3.F which requires that IP2 have three operable service water pumps on the essential header and two operable service water pumps on the nonessential header. Opening of either of two ESFAS valves that supply SWS to all three EDGs is sufficient to support the EDGs. Opening of either of two ESFAS valves that supply SWS to FCUs is sufficient to support the EDGs. Therefore, single failure tolerance is achieved by CTS 3.3.F which implicitly requires that both EDG ESFAS valves and both FCU ESFAS valves are operable with the statement that "any of its associated piping or valves" must be operable.

CTS 3.3.F.1.b and CTS 3.3.F.2.b allow 12 hours for restoration if one of the required service water pumps or any of its associated piping or valves is found inoperable. ITS 3.7.8, Conditions C and D,

maintain the 12 hour Completion Time from CTS 3.3.F.1.b if one of the two EDG ESFAS valves or one of the two FCU ESFAS valves becomes inoperable. ITS 3.7.8 also clarifies that immediate shutdown is required if the SWS inoperability results in a loss of safety function for EDGs or FCUs. The 12 hour Completion Time for ESFAS valve inoperability is maintained based on current licensing basis. This is consistent with the recognition that failure of the remaining ESFAS valve during the 12 hour Completion Time could result in the inoperability of three EDGs or five FCUs.

CTS 3.3.F.1.b and CTS 3.3.F.2.b allow 12 hours for restoration of an inoperable essential SWS pump and 24 hours for restoration of a non-essential pump if one of the required pumps is inoperable. ITS 3.7.8, Conditions A and B, extend the Completion Time for restoration of an inoperable SWS pump to 72 hours. This change is justified in DOC L.1. This change is acceptable because the allowable out of service time for SWS pumps should be consistent with the allowable out of service time for ECCS pumps. The allowable out of service time for ECCS pumps is based on NRC Memorandum to V. Stello, Jr., from R.L. Baer, "Recommended Interim Revisions to LCOs for ECCS Components," December 1, 1975. This document concluded that "An event accompanied by a loss of offsite power and the failure of an EDG can disable one ECCS train until power is restored. A reliability analysis has shown that the impact of having one full ECCS train inoperable is sufficiently small to justify continued operation for 72 hours." The risk associated with an inoperable essential SWS pump is smaller than the risk associated with an inoperable ECCS pump because Containment Spray alone is sufficient to meet containment cooling requirements if there is reduced flow to the FCUs. Additionally, the SWS pumps are needed to support EDG operation only if there is a loss of offsite power. Finally, one or more essential and non-essential SWS pumps are operating during normal plant operation which reduces the potential for an undetected failure resulting in the failure of an SWS pump to start.

Entergy (IP2) Action:

IP2 will revise ITS LCO 3.7.8, DOC L.1, to include the additional justification provided above.

3.8.3 : Diesel Fuel Oil and Starting Air

NRC RAI Number	TAC Number:
3.8.3 - 4	**MB5069**

NRC Request for Additional Information (RAI):

With regard to the EDG air starting system, Standard Review Plan (SRP) Section 9.5.6, "Emergency Diesel Engine Starting System," provides the guidance to size the air receivers. SRP Section 9.5.6, in part, states that as a minimum the air starting system should be capable of cranking a cold diesel engine five times without recharging the air receiver(s). The air starting system capacity should be determined as follows: (1) each cranking cycle duration should be approximately 3 seconds; (2) consist of two to three engine revolutions; or (3) air start requirements per engine start provided by the engine manufacturer; whichever air start requirement is larger. Also, the LCO in STS Section B 3.8.3 states: "The starting air system is required to have a minimum capacity for five successive diesel generator start attempts without recharging the air start receivers."

In ITS Section B 3.8.3, regarding sufficient air start capacity for each EDG, ENO proposed to change the above cited "five" starts to "four" starts. It is the staff's position that the proposed ITS Section B 3.8.3, regarding sufficient air start capacity for each EDG, should be consistent with the guidance described in the STS. Therefore, please revise the proposed ITS to retain the "five' start air capacity requirement for the air receivers, and to comply with the STS guidance.

Entergy (IP2) Response:

IP2 FSAR 8.3.2.1 states that: "Each air receiver has sufficient storage for four normal starts. However, the diesel will consume only enough air for one automatic start during any particular power failure. This is because of the engine control system, which is designed to shut down and lock out any engine that did not start during the initial try."

As explained in ITS Package 3.8.3, Bases insert 3.8.3 - 1 - 04, FSAR 8.3.2.1 had been interpreted as requiring four 'normal starts' (i.e., the DG starts and reaches rated speed within 10 seconds) with no requirement for conserving air for additional start attempts.

IP2 recently initiated a design change to adjust the start failure relay actuation from 37 seconds (i.e., conserving no air for additional start attempts after a failed start) to 13 seconds (i.e., conserving enough air for one additional start attempt after a failed start).

IP2 will revise ITS Package 3.8.3, Bases insert 3.8.3 - 1 - 04, to reflect the pending design change when it is implemented.

Entergy (IP2) Action:

IP2 will revise ITS Package 3.8.3, Bases insert 3.8.3 - 1 - 04, to reflect the pending design change when it is implemented.

Questions regarding this response should be directed to Dick Bense at (914) 734-5895 (RBENS90@Entergy.Com) or Bill Blair at (914) 737-4167 (WBlair@Entergy.Com).

3.8.3 : Diesel Fuel Oil and Starting Air

NRC RAI Number	TAC Number:
3.8.3 - 5	**MB5069**

NRC Request for Additional Information (RAI):

ENO proposed to re-designate Section LCO 3.8.3.E. and Section SR 3.8.3.4 of the STS as Section LCO 3.8.3.F and Section SR 3.8.3.5, respectively, in the ITS.

Section SR 3.8.3.4 of the STS requires verification that each EDG air start receiver pressure is greater than or equal to 225 psig once per 31 days. Also, STS Section LCO 3.8.3.E requires that when one or more diesel generators with starting air receiver pressure <225 psig and greater than or equal to 125 psig, restore the starting air receiver pressure to greater than or equal to 225 psig within 48 hours.

ENO proposed to change the range of pressure limits for the air start receivers. Section SR 3.8.3.5 of the proposed ITS requires to verify that each EDG air start receiver pressure is greater than or equal to 250 psig once per 31 days. Also, ITS Section LCO 3.8.3.E requires that when one or more diesel generators with starting air receiver pressure <250 psig and greater than or equal to 90 psig, restore the starting air receiver pressure to greater than or equal to 250 psig within 48 hours.

ENO has not provided the rationale for the above proposed changes to the pressure limits for the air start receivers. Please provide detailed discussion, including changes to system design, components, etc., to demonstrate the need for the above proposed changes to the pressure limits for the air start receivers. Also, please demonstrate that at the air receiver pressure of 90 psig, there is adequate capacity for at least one EDG start attempt.

Entergy (IP2) Response:

IP2 current Technical Specifications do not have explicit requirements for the DG air start receivers and do not specify any required minimum pressure. A requirement for periodic verification that EDG air receiver pressure is greater than 250 psig is being added to the ITS by DOC M.3 of ITS 3.8.3. Justification for continued operation for 48 hours when EDG air receiver pressure is less than 250 psig but greater than 90 psig is being added to the ITS by DOC L.4 of ITS 3.8.3.

This change is supported by Consolidated Edison Calculation No. MMM-00010-00, 'Sufficient Storage in EDG Air Receiver Storage,' which determined that an air receiver pressure of 250 psig is sufficient to support 5 normal EDG starts (i.e., the DG starts and reaches rated speed within 10 seconds) and, based on vendor input, an air receiver pressure of 90 psig will reliably start the diesel. Note that IP2 ITS LCO 3.8.3 was written to support the IP2 design requirement in IP2 FSAR 8.3.2.1 which states that: "Each air receiver has sufficient storage for four normal starts."

A copy of the summary sheet for Consolidated Edison Calculation No. MMM-00010-000, 'Sufficient Storage in EDG Air Receiver Storage,' was supplied to the NRC by electronic mail on August 8, 2002.

Entergy (IP2) Action:

None

Questions regarding this response should be directed to Dick Bense at (914) 734-5895 (RBENS90@Entergy.Com) or Bill Blair at (914) 737-4167 (WBlair@Entergy.Com).

3.8.3 : Diesel Fuel Oil and Starting Air

NRC RAI Number	TAC Number:
3.8.3 - 6	**MB5069**

NRC Request for Additional Information (RAI):

The Entergy Nuclear Operations Inc. (ENO) proposed to convert the Indian Point Unit No. 2 (IP2) Current Technical Specifications (CTS) to the IP2 Improved Technical Specifications (ITS) based on NUREG-1431, "Standard Technical Specifications (STS) for Westinghouse Plants," Revision 2, dated April 2001. Sections 3.8.3 and SR 3.8.3 of the STS include an Limiting Condition for Operation (LCO) and Surveillance Requirements (SR), respectively, for the emergency diesel generator (EDG) lube oil inventory required to be maintained in the EDG engine oil sumps. These STS LCO and SR would be eliminated from the proposed ITS. ENO stated that the required EDG lube oil inventory would be maintained under administrative controls.

With regard to licensee's application requests for removing/relocating existing plant Technical Specifications (TS) and SR, the staff's position is that CTS/STS TS and SR that fall within or satisfy any of the four criteria described in 10 CFR 50.36 (c) (2) (ii) must be retained in the TS, while those TS sections and SR sections that do not fall within or satisfy any of these criteria may be relocated to other licensee's administratively controlled documents, such as plant Technical Requirements Manuals (TRMs).

The lube oil inventory maintained in EDG engine oil sumps is required to support the operation of EDGs which provide the standby AC power sources to the plant. The STS sections 3.8.3 and SR 3.8.3, regarding EDG lube oil, have direct impact on EDG operability, and meet the minimum requirement as described in 10 CFR 50.36(c)(2)(ii) for inclusion in the TS. Therefore, please revise the proposed ITS to retain the STS LCO and SR imposed on the lube oil inventory required to be maintained in the EDG engine sumps.

Entergy (IP2) Response:

IP2 current Technical Specifications do not have explicit requirements for a periodic verification that a minimum DG lube oil inventory is maintained on site. IP2 is not adding this requirement to the ITS. However, the Indian Point Site (IP2 and IP3) has an administrative program for maintaining an onsite inventory of lube oil suitable for use in the DGs that will ensure sufficient lube oil for the EDGs will be available to support post accident operation of the EDGs.

This requirement for a minimum lube oil inventory was not added to the Technical Specifications based on current licensing basis because of the existing administrative program. Additionally, IP2 does not expect to have to add significant amounts of lube oil during the 7 days following an accident. A similar exception was approved for the IP3 during the IP3 conversion to ITS. This exception was approved in IP3 Amendment 205.

Entergy (IP2) Action:

None

Questions regarding this response should be directed to Dick Bense at (914) 734-5895 (RBENS90@Entergy.Com) or Bill Blair at (914) 737-4167 (WBlair@Entergy.Com).

3.8.4 : DC Sources - Operating

NRC RAI Number	TAC Number:
3.8.4 - 2	**MB5070**

NRC Request for Additional Information (RAI):

1. Confirm that the battery charger was sized using IEEE 308 and Regulatory Guide 132 and is capable to recharge a discharged battery within 15 hours while supporting the normal DC loads.

2. Confirm that the DC normal loads are higher than the DC accident loads.

3. The ITS SR 3.8.4.2 should have specific values for the charger rate and duration of charge to be verified. Please re-submit SR 3.8.4.2 to include the Indian Point 2 present values so the verification of each battery charger is specific.

Entergy (IP2) Response:

Question 1:
Confirm that the battery charger was sized using IEEE 308 and Regulatory Guide 132 and is capable to recharge a discharged battery within 15 hours while supporting the normal DC loads.

Response to Question 1:
IEEE 308, 1974, "IEEE Standard Criteria for Class 1E Power Systems for Nuclear Power Generating Stations," establishes requirements for sizing battery chargers. Regulatory Guide (RG) 1.32, Revision 2, "Criteria for Safety Related Electric Power Systems for Nuclear Power Plants," Regulatory Position C.1.b, "Battery Charger Supply," defines one acceptable method of meeting regulatory requirements for battery chargers as follows: "The provisions of Section 5.3.4 of IEEE Std 308-1974 should be construed to mean that the capacity of the battery charger supply should be based on the largest combined demands of the various steady state loads and the charging capacity to restore the battery from the design minimum charge state to the fully charged state, irrespective of the status of the plant during which these demands occur." Note that a minimum recharge time is not specified by the Standard or the RG.

IP2 FSAR 8.2.3.5 establishes the IP2 specific requirement that "Each battery has been sized to carry its expected shutdown loads for a period of 2 hours following a plant trip and a loss of all AC power. All equipment supplied by the batteries are maintained operable with minimum expected voltages at the battery terminals during the 2 hrs. Each of the four battery chargers has been sized to recharge its own discharged battery within 15 hours while carrying its normal load."

Based on IP2 FSAR 8.2.3.5, the IP2 design minimum charge state discussed in RG 1.32, Section C.1.b, for the four batteries at IP2 is battery charge state following a 2 hour battery discharge at the rate that would occur following a Safety Injection (SI) actuation coincident with Unit trip and Loss of Offsite Power (LOOP) assuming the chargers are not in operation. During the first 2 hours of this event, each battery can carry all necessary DC loads associated with its respective 125 VDC power panel assuming that the associated battery charger is not available.

The battery chargers meet Regulatory position C.1.b of RG 1.32 because at the end of the two hour design basis period described above:

a) the steady state accident DC loads can be carried by the battery chargers with sufficient capacity left over to permit recharging of their respective batteries; and,
b) the chargers can also carry the normal operating steady state DC loads on their respective 125 VDC power panels with sufficient capacity left over to permit recharging of their respective batteries.

Case a) above is supported by the following calculations that show the steady state accident loads, at the end of the two hour design basis period, are less than the 250 amp capacity of the battery chargers:

EGP-00011-03, IP2-DC Load Study Battery 21 Calculation
EGP-00012-04, IP2-DC Load Study Battery 22 Calculation
EGP-00013-03, IP2-DC Load Study Battery 23 Calculation
EGP-00014-03, IP2-DC Load Study Battery 24 Calculation

In case b) above, the IP2 UFSAR also specifies a minimum charger capacity sufficient to permit a maximum charging time of 15 hours to return the batteries to the fully charged condition. This capability is verified by:

FEX-00058-00, Verification of the Charge Time Adequacy of Battery Charger 21;
FEX-00059-00, Verification of the Charge Time Adequacy of Battery Charger 22;
FEX-00060-00, Verification of the Charge Time Adequacy of Battery Charger 23; and
FEX-00061-00, Verification of the Charge Time Adequacy of Battery Charger 24.

Question 2:
Confirm that the DC normal loads are higher than the DC accident loads.

Response to Question 2:
The calculations described above indicate that the steady state DC accident loads at the end of the two-hour design basis battery loading cycle are larger than the normal steady state DC loads. The accident vs. normal load difference is slight and simple substitution of the steady state accident DC loads determined by the EGP calculations into the corresponding FEX calculations will show that the 15 hour recharge time is easily met for all four batteries. This assumes that the DC load experienced at the end of the first 2 hours of the accident continues indefinitely with no credit taken for DC load management. Additionally, IP2 has two separate sources of DC control power for each of the two trains of DC control power as described in the Bases of ITS 3.8.4.

Question 3:
The ITS SR 3.8.4.2 should have specific values for the charger rate and duration of charge to be verified. Please re-submit SR 3.8.4.2 to include the Indian Point 2 present values so the verification of each battery charger is specific.

Response to Question 3:
The CTS specifies no surveillance requirements for the battery chargers. IP-2 will adopt the Battery Charger surveillance requirement of the STS (NUREG 1431) with appropriate modifications to account for IP2 current design and licensing basis described in IP2 FSAR 8.2.3.5.

Questions regarding this response should be directed to Dick Bense at (914) 734-5895 (RBENS90@Entergy.Com) or Bill Blair at (914) 737-4167 (WBlair@Entergy.Com).

Action Required:
IP-2 will include the following battery charger surveillance requirement in a future supplement to the ITS submittal:

SR 3.8.4.2
Verify each battery charger supplies >250 amps at greater than or equal to the minimum established float voltage for >4 hours.

OR

Verify each battery charger can recharge the battery to the fully charged state within 15 hours while supplying the normal steady state loads, after a battery discharge to the bounding design basis event discharge state.

The associated Bases will be revised to reflect the SRs as presented above.

Entergy (IP2) Action:

IP2 will revise ITS SR 3.8.4.2 and the associated Bases as described above.

Questions regarding this response should be directed to Dick Bense at (914) 734-5895 (RBENS90@Entergy.Com) or Bill Blair at (914) 737-4167 (WBlair@Entergy.Com).

3.8.6 : Battery Cell Parameters

NRC RAI Number	TAC Number:
3.8.6 - 1	**MB6399**

NRC Request for Additional Information (RAI):

RAI 3.8.6-1
STS SR 3.8.6.1, DB.2
The proposed ITS 3.8.6 is not adopting STS SR 3.8.6 which requires the licensee to verify each battery float current at an interval of 7 days. The remaining proposed ITS SRs have no surveillance activities on the 7-day interval, and thus the operability for each battery is not determined until proposed ITS SR 3.8.6.1, .2, and .3 are conducted. This 31 days duration is unacceptable to the staff.
Comment: The licensee to adopt STS SR 3.8.6.1 or proposed equivalent surveillance activities for ensuring that battery operability are determined every 7-day interval. This is a Beyond scope item if STS SR 3.8.6.1 is not adopted and incorporated in the IP-2's proposed ITS.

Entergy (IP2) Response:

CTS 4.6.C.1 and 4.6.C.2 identify existing surveillance requirements for the station batteries. CTS 4.6.C.1 requires that "Every month, the voltage of each cell, the specific gravity and temperature of a pilot cell in each battery and each battery voltage shall be measured and recorded." CTS 4.6.C.1 requires that "Every 3 months, each battery shall be subjected to a 24-hour equalizing charge, and the specific gravity of each cell, the temperature reading of every fifth cell, the height of electrolyte, and the amount of water added shall be measured and recorded." Note that there are no existing requirements for any surveillance intended to verify battery operability at a Frequency of 7 days. This is consistent with Section 4.3.1 of IEEE Standard 450-1995, IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications," which recommends various battery checks at a Frequency of "at least once per month."

IP2 ITS is maintaining the following CTS requirements in the ITS: monthly verification of battery pilot cell voltage and temperature and electrolyte level of all cells.; and, quarterly verification of each connected cell voltage. Additionally, IP2 ITS 5.5.15, "Battery Monitoring and Maintenance Program," will require that IP2 implement a formal program that provides for battery maintenance and restoration from a degraded condition based on the recommendations of IEEE Standard 450-1995.

IP2 acknowledges, as stated in Section 4.5 of IEEE Standard 450-1995, that "the most accurate indicator 'of a return to full change' is a stabilized charging or float current. Specific gravity readings may not be accurate when the battery is on charge following a discharge or following the addition of water." This was the basis for the Note in Table 3.8.8-1 of STS (NUREG-1431), Rev.1, that allows use of float current instead of specific gravity to verify that a battery is fully charged following a battery charge for a maximum of 7 days.

Based on the NRC concern, IP2 will add a new requirement to verify battery float current every 7 days and the associated Conditions and Required Actions as described in LCO 3.8.6 of STS (NUREG-1431), Rev.2. However, IP2 must use a clamp on DC ammeter to monitor float current because IP2 does not have installed instrumentation capable of measuring battery float current. The accuracy of the DC ammeter is limited because of the configuration of the battery cables. Therefore, the acceptance criteria

of the 7 day SR for float current will be "< 5 amps." This acceptance criteria is sufficient to identify a significantly discharged battery. IP2 will also adopt the relaxation provided by Condition A of LCO 3.8.6 of STS (NUREG-1431), Rev.2. Condition A allows continued operation with one battery with one or more cells below the minimum cell voltage for 7 days if float current and battery voltage are within limits. IP2 did not adopt this relaxation in the original submittal because it did not adopt the requirement for periodic verification of float current.

Entergy (IP2) Action:

IP2 will revise ITS LCO 3.8.6 to include the following requirements from LCO 3.8.6 from STS (NUREG-1431), Rev.2: Condition A, associated Required Actions and Bases; Condition B, associated Required Actions and Bases; and SR 3.8.6.1 and associated Bases.

Questions regarding this response should be directed to Dick Bense at (914) 734-5895 (RBENS90@Entergy.Com) or Bill Blair at (914) 737-4167 (WBlair@Entergy.Com).