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John A Ventosa
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NL-13-015

April 15, 2013

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

SUBJECT: Proposed License Amendment Regarding Connection of Non Seismic Boric Acid Recovery System to the Refueling Water Storage Tank
Indian Point Unit Number 2
Docket No. 50-247
License No. DPR-26

Dear Sir or Madam:

Pursuant to 10 CFR 50.90, Entergy Nuclear Operations, Inc., (Entergy) hereby requests a License Amendment to Operating License DPR-26, Docket No. 50-247 for Indian Point Nuclear Generating Unit No. 2 (IP2). The proposed Technical Specification (TS) change contained herein would revise 3.5.4, "Refueling Water Storage Tank (RWST)" such that the non-seismically qualified piping of the temporary Boric Acid Recovery System (BARS) may be connected to the Refueling Water Storage Tank (RWST) seismic piping. Operation of the BARS from the RWST will be under administrative controls for a limited period of time (i.e., 30 days for RWST filtration prior to each fuel cycle). This change will only be applicable until Refueling Outage R22 ends (Spring 2016).

Entergy has evaluated the proposed change in accordance with 10 CFR 50.91(a)(1) using the criteria of 10 CFR 50.92(c) and Entergy has determined that this proposed change involves no significant hazards, as described in Attachment 1. The marked up page showing the proposed change is provided in Attachment 2. The associated Bases change is provided in Attachment 3 for information. A copy of this application and the associated attachments are being submitted to the designated New York State official in accordance with 10 CFR 50.91.

Entergy requests approval of the proposed amendment by January 20, 2014 and an allowance of 30 days for implementation. There are no new commitments being made in this submittal. If you have any questions or require additional information, please contact Mr. Robert Walpole, Manager, Licensing at (914) 254-6710.

A001
NRR

I declare under penalty of perjury that the foregoing is true and correct. Executed on April 15, 2013.

Sincerely,

JAV/sp

Attachments:
1. Analysis of Proposed Technical Specification Change Regarding Connection of Non Seismic BARS to Refueling Water Storage Tank
2. Marked Up Technical Specifications Page for Proposed Change Regarding Connection of Non Seismic BARS to Refueling Water Storage Tank
3. Marked Up Technical Specification Bases Change Associated with the Proposed Change Regarding Connection of Non Seismic BARS to Refueling Water Storage Tank

Enclosure:
1. Indian Point 2 Drawings and Calculation

cc: Mr. Douglas Pickett, Senior Project Manager, NRC NRR DORL
Mr. William Dean, Regional Administrator, NRC Region 1
NRC Resident Inspectors
Mr. Francis J. Murray, Jr., President and CEO, NYSERDA
Ms. Bridget Frymire, New York State Dept. of Public Service

ATTACHMENT 1 TO NL-13-015

ANALYSIS OF PROPOSED TECHNICAL SPECIFICATION CHANGE

REGARDING CONNECTION OF NON SEISMIC BARS

TO REFUELING WATER STORAGE TANK

ENTERGY NUCLEAR OPERATIONS, INC.
INDIAN POINT NUCLEAR GENERATING UNIT NO. 2DOCKET NO. 50-247

1.0 DESCRIPTION

Entergy Nuclear Operations, Inc (Entergy) is requesting an amendment to Operating License DPR-26, Docket No. 50-247 for Indian Point Nuclear Generating Unit No. 2 (IP2). The proposed Technical Specification (TS) change contained herein would revise 3.5.4, "Refueling Water Storage Tank (RWST)" such that the non-seismically qualified piping of the Boric Acid Recovery System (BARS) may be connected to the Refueling Water Storage Tank's (RWST) seismic piping and isolated by manual operation of RWST seismically qualified boundary valves under administrative controls for a limited period of time (i.e., 30 days per fuel cycle for filtration for removal of silica from the RWST water). This change will only be applicable for the next two fuel cycles and cannot be used after Refueling Outage R22 (Spring 2016).

The specific proposed change is listed in the following section.

2.0 PROPOSED CHANGE

The proposed TS change is as follows:

Directly under "LCO" add

- NOTE -

The RWST isolation valves 350, 727A and 845 connected to non-safety related piping may be opened under administrative controls for up to 30 days per fuel cycle for filtration until the end of refuel outage 22.

In addition, the Technical Specification Bases will be revised to clarify administrative controls.

3.0 BACKGROUND

Historically, IP2 was connecting the non seismic reverse osmosis system, identified as the Boric Acid Recovery System (BARS) to the seismic Spent Fuel Pool (SFP) Purification Loop to filter the refueling water storage tank (RWST) water while in plant conditions and modes for which the RWST was required to be operable. This alignment was utilized to remove silica from the RWST water. Removal of silica is necessary to maintain Reactor Coolant System (RCS) chemistry within fuel requirements and to improve water clarity during refueling to facilitate safe handling of fuel and to prevent delays in fuel movement. The water clarity is both a personnel and equipment safety consideration. Entergy had established the practice of recirculating the RWST for up to 30 days beginning up to about two months prior to a refueling outage for silica removal. Prior to refueling outage (RO) 2R20 the RWST was recirculated for a duration of 13 days. After recirculation the total concentration of silica was less than 1.1 ppm. Prior to RO 2R19 the RWST was recirculated for a duration of 11 days. A sample taken after recirculation had total concentration of silica of 1.3 ppm.

During plant operations in Modes 1 through 4, the RWST is required to be operable to maintain a borated water supply for accident mitigation purposes. The RWST is aligned to the suction of the high head safety injection pumps, the residual heat removal pumps and the containment spray

pumps during normal operation (Modes 1 through 4). During cold shutdown and refueling operation (Modes 5 and 6), the RWST may be credited as a borated water supply should the boric acid storage system not be functional. The contents of the RWST are also used to flood the refueling cavity during refueling operation. The water in the RWST is borated to a concentration sufficient to ensure that shutdown margin is maintained when the reactor is at cold shutdown conditions should RWST water be added to the reactor.

It was recognized that alignment to BARS could render the RWST inoperable during a seismic event since the BARS is a non-seismic system. To maintain operability, procedure changes had been made to direct manual operator action to isolate the non seismic connections to the RWST to ensure adequate inventory during Modes 1 through 4 when the RWST was required to be operable. After reviewing Information Notice (IN) 2012-01, "Seismic Considerations-Principally Issues Involving Tanks," Entergy concluded that manual actions could not be credited for this purpose without prior NRC approval and subsequently discontinued this practice. The SFP Purification Loop is a subsystem of the spent fuel pool cooling system that is connected to portions of the RWST piping. The SFP Purification Loop piping has been upgraded to seismic 1 so that during a seismic event no failure of the SFP Purification Loop piping is considered. However, when the non seismic BARS is connected to the Purification Loop there is the possibility a seismic event could affect the available water in the RWST. For this reason the IN 2012-01 requires that the RWST TS action statement be entered when non-seismic connections are made to the RWST. The completion time of the action statement does not allow time for purification.

Removal of silica by use of the BARS system is preferred to other means. For example, using dilution creates large quantities of liquid radioactive waste, or removing silica from the spent fuel pool has the potential for further deterioration of the Boraflex material in the storage racks. Consequently, and until modifications are made, this TS change request is being made to credit operator action to close the seismically qualified manual code boundary valves in the event of a seismic or design basis accident. Two refuel outages have been requested to complete modifications.

4.0 Technical Evaluation

This assessment addresses the proposed change to TS 3.5.4, "Refueling Water Storage Tank (RWST)." The TS change would allow voluntary connection of the non-seismic BARS to the seismic piping of the SFP Purification System with a 30 day limit for re-circulating the contents of the RWST for the purpose of silica filtration through the BARS during Modes 1 through 4 when the RWST is required to be operable. The following assessment provides the basis for the acceptability of the proposed change to the TS which provides for operator action to close the seismically qualified manual code boundary valves to assure RWST operability when re-circulating the tank through non-safety related piping.

The non-seismic BARS is connected to the seismic SFP Purification System as follows:

- The BARS suction line is connected to Valve 725 (see Drawing A227781, quadrant F-1 in the Enclosure) on the discharge to the Refueling Water Purification Pump (RWPP) by removing the valve bonnet and valve internals and installing a hose adapter plate.

- The BARS discharge line is connected to 2 inch line #252 upstream of 2 inch valve 350 (see Drawing 9321-F-2736, quadrant E-3 and Drawing 9321-F-2735 (valve 350 only),

quadrant I-4 in the Enclosure) by removing the 2"-150 psig flange and installing a hose adapter plate.

The RWPP will take suction through manual isolation valve 855 on line 2"-AC-151R#183 which is connected to the 16 inch line from the RWST downstream of isolation valve 846. Normally closed isolation valve 845 will be opened (Drawing A227781, quadrant I-1), and the RWPP will take suction through valve 727A and discharge to valve 725 (Drawing A227781 quadrants G-1 to E-1). Flow through valve 725 adapter plate is to the non seismic BARS since the spent fuel pit demineralizer is isolated. The flow from valve 725 is through a 2 inch hose adapter plate to the BARS which discharges to seismic line #252 upstream of valve 350. Flow will be through valve 350 and return line 3"-SI-151R#161 to the RWST. Flow would not be diverted back to the boric acid makeup system due to check valve 294 and normally closed manual valve 295 (see Drawings 9321-F-2736, quadrant E-3 and Drawing 9321-F-2735 (valve 350 only), quadrant I-4). The proposed manual action to isolate the BARS in the event of an actual or potential loss of RWST considered the following:

Operator Action Considerations

Entergy has confidence in the successful completion of manual actions due to the training program completed for all system operators and the specific procedural requirements for the BARS. During use of the BARS, the RWST level, temperature and boron concentration are monitored. A dedicated operator is assigned to remain in the vicinity of BARS at all times when the RWST Silica Cleanup Skid is aligned for operation. The operator has the ability to directly communicate with the Unit 2 control room and is equipped with an operational flashlight and trained on the location and operation of valves and the Refueling Water Purification Pump (Reference 2). If there is a RWST low level alarm received the Unit 2 control room supervisor will direct the operator to isolate the RWST Silica Cleanup System. The RWST Silica Cleanup System would also be isolated if:

- There is a Safety Injection (SI) actuation
- Lights go out in the PAB
- A RWST Silica Cleanup System Hose ruptures or breaks
- An indication of tremors or earthquake is evident

If the BARS has to be isolated for any of the reasons above, the dedicated operator would isolate suction to BARS through valves 845 and 727A, isolate discharge from BARS through valve 350, and secure the RWST Purification pump, if running.

Valves 845, 727A and 350 will be part of the Inservice Test Program with a test frequency of two years. Further, by procedure, valves 845, 727A and 350 will be cycled open and closed prior to putting the BARS in operation to provide reasonable assurance that all valves will close.

The allowable time for operator action to isolate the BARS unit has been calculated (Reference 1). This re-analysis was conservatively based on a simultaneous rupture of connections at valve 725 and at the flange upstream of valve 350. Scenarios for rupture with and without an SI signal were evaluated. The current RWST low level alarm is set to 37.01 feet, with the TS limit at 36.83 feet. In order to provide more time for the operator to perform the isolation function in a seismic or SI event during operation of BARS, the initial level of the RWST would be raised to 37.43 feet or higher, and a control room Plant Integrated Control System (PICS) alarm setpoint would be set at 37.33 ft (or higher) prior to aligning BARS. There would then be

4684 gallons of margin to the Technical Specifications limit (345,000 gallons) following a low RWST level alarm. If the RWST purification pump is in service providing flow to the BARS unit, a flow of 180 gallons per minute (gpm) was considered for the break flow through valve 725 and 91 gpm was considered for the break flow through the flange at valve 350. These are maximum flow rates resulting from pump runout and available head in the RWST. The total time available before reaching the TS limit would be 31 minutes, assuming the operator took 10 minutes to close valves 845/727A and trip the RWST purification pump (all in close proximity), and an additional 21 minutes to close valve 350.

For the same break(s) scenario, and considering actuation of SI, the RWST purification pump would receive a trip signal, and the corresponding total flow through the two break locations would be less limiting than the above scenario with no SI signal.

The refueling water purification pump is located on the 68 foot elevation of the Primary Auxiliary Building (PAB) with the pump control switch on an adjacent wall. Valves 845 and 727A are within about twelve feet of each other on opposite sides of the pump. The return line isolation valve 350 is located on the PAB 99.5 foot elevation. There is a card reader at the entry point to the PAB on the 80 foot elevation, but once inside there are no restrictions to reach valve 350 from valves 845 and 727A. A simulation performed by Operations, with an operator dispatched from the control room resulted in closure of valve 845 and 350 in a total of 5 minutes. An additional 2 minutes is conservatively estimated for tripping the purification pump and valve 727A, resulting in a total of 7 minutes. This time would be even shorter since there would be a dedicated operator for the BARS. This provides substantial margin to the total calculated time of 31 minutes to shutdown the BARS and maintain the RWST within the TS value following a control room alarm indication of 37.33 feet for RWST level.

Reference 2 will be revised to capture the RWST level requirements and operator action times.

Dose consequences associated with the operation of BARS

The dose consequences in the highly unlikely event of a Loss of Coolant Accident (LOCA) when BARS is in operation are discussed below.

Following the injection phase of a large break LOCA (about 20 minutes), the preferred means of cold leg recirculation is to use the internal recirculation pumps. This results in the fluid being kept inside containment until hot leg recirculation. At about 6.5 hours, the recirculation pumps send fluid from the containment to the suction of the high head safety injection pumps, with the potential for sump fluid leakage to leak back to the RWST and impact BARS. This flow path is isolated from the Refueling Water Purification Pump by check valve 847 and motor operated valve 1810 (8"-SI-189R, line#155 on drawing 9321-F-2735). It is possible for any leakage past these valves to migrate to the refueling water purification loop, however, this would be contained as the dedicated operator would close valves 845 and 727A.

Another potential for sump fluid leakage to impact BARS would be leakage through the 2 inch SI mini-flow line back to the RWST that is connected to valve 350. However, this would be limited to leakage through MOV 842/843, which are tested by 2-PT-R048 and have an acceptance criterion of 0.5 gallons per hour (gph). These valves and their acceptance criterion are also governed by the 2.0 gph limit for Emergency Core Cooling System (ECCS) leakage and so there would be no impact on dose.

The IP2 design is fairly unique in having internal recirculation pumps as well as residual heat removal (RHR) pumps. The RHR is the secondary means of achieving hot leg recirculation by drawing water from the reactor sump and delivering via the RWST suction line. This leakage pathway is not postulated because it would require a passive failure, which is not postulated to occur for 24 hours. The leakage associated with this pathway is not part of the TS 5.5.2 program, because that program does not assume the single passive failure. Likewise, the RG 1.183 guidance does not impose any additional single failure to determine this leakage path.

Thus in the highly unlikely event of a LOCA during the operation of BARS, there will be no impact on accident dose consequences.

Operating Experience

The BARS has been in use at IP2 since prior to refueling outage 16 in 2006, and Reference 2 will captures operator actions for isolation of BARS for any of the conditions discussed above. A search of Condition Reports since 2006 identified only logistic issues such as security clearance of the BARS equipment, manpower scheduling, tripping hazard due to BARS hoses, etc. There have been no seismic events during the use of BARS and no problems identified in the installing, use and removal of BARS.

5.0 REGULATORY ANALYSIS

5.1 No Significant Hazards Consideration

Entergy Nuclear Operations, Inc. (Entergy) has evaluated the safety significance of the proposed change to the Indian Point 2 Technical Specifications (TS) which revise IP2 TS 3.5.4, "Refueling Water Storage Tank (RWST)," to allow administrative control of the seismic RWST/non-seismic BARS interface. The proposed change has been evaluated according to the criteria of 10 CFR 50.92, "Issuance of Amendment". Entergy has determined that the subject change does not involve a Significant Hazards Consideration, as discussed below:

1. Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No. The use of the non seismic Boric Acid Recovery System (BARS) to re-circulate and filter the Refueling Water Storage Tank (RWST) water does not involve any changes or create any new interfaces with the reactor coolant system or main steam system piping. Therefore, the connection of the BARS Purification Loop to the RWST would not affect the probability of these accidents occurring. The BARS is not credited for safe shutdown of the plant or accident mitigation. Administrative controls ensure that the BARS can be isolated as necessary and in sufficient time to assure that the RWST volume will be adequate to perform the safety function as designed. Since the RWST will continue to perform its safety function and overall system performance is not affected, the consequences of the accident are not increased.

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

2. Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No. The design of the RWST and the SFP Purification Loop has been revised to allow recirculation and purification using the BARS for a short period of time (not to exceed 30 days per fuel cycle) for the next two fuel cycles. The added BARS takes RWST water in and processes it out without additional connections that could affect other systems and without an impact from its installation. Procedures for the operation of the plant, including BARs, will not create the possibility of a new or different type of accident. Contingent upon manual operator action, a BARS line break will not result in a loss of the RWST safety function. Similarly, an active or passive failure in the BARS will not affect safety related structures, systems or components.

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

3. Does the proposed amendment involve a significant reduction in a margin of safety?

Response: No. The SFP Purification Loop and recirculation and purification of the RWST water using the BARS is not credited for safe shutdown of the plant or accident mitigation. RWST volume will be maximized prior to purification and timely operator action can be taken to isolate the non seismic system from the RWST to assure it can perform its function. This will result in no significant reduction in the margin of safety.

Therefore the proposed change does not significantly reduce the margin of safety.

Based on the above, Entergy concludes that the proposed amendment to the Indian Point 2 Technical Specifications presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and accordingly, a finding of 'no significant hazards consideration' is justified.

5.2 Applicable Regulatory Requirements / Criteria

The NRC Order of February 11, 1980 required an evaluation of the degree of compliance with the GDC at the time. This section discusses continued compliance with certain of those criteria.

The plant will continue to meet Criterion 1 of 10 CFR 50 Appendix A which says "Structures, systems and components important to safety shall be designed, fabricated, erected, and tested to quality standards commensurate with the importance of the safety functions to be performed. Where generally recognized codes and standards are used, they shall be identified and evaluated to determine their applicability, adequacy, and sufficiency and shall be supplemented or modified as necessary to assure a quality product in keeping with the required safety function. A quality assurance program shall be established and implemented in order to provide adequate assurance that these structures, systems and components will satisfactorily perform their safety functions. Appropriate records of the design, fabrication, erection, and testing of structures, systems and components important to safety shall be maintained by or under the control of the nuclear power plant licensee throughout the life of the unit" and Criterion 2 which says "Structures, systems, and components important to safety shall be designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunami, and seiches without loss of capability

to perform their safety functions. The design bases for these structures, systems and components shall reflect: (1) appropriate consideration of the most severe of the natural phenomena that have been historically reported for the site and surrounding area, with sufficient margin for the limited accuracy, quantity, and period of time in which the historical data have been accumulated, (2) appropriate combinations of the effects of normal and accident conditions with the effects of the natural phenomena and (3) the importance of the safety functions to be performed."

The purification of the RWST will use the seismic piping meeting these criteria but will also use the non seismic piping which does not. Manual action will be used until the end of the next two refuel outages to assure isolation of the seismic piping from the non seismic piping during any condition requiring the RWST volume to be intact and threatening to reduce the RWST level below the TS allowable. This will assure continued compliance with these criteria.

The plant will continue to meet Criterion 35 which says "A system to provide abundant emergency core cooling shall be provided. The system safety function shall be to transfer heat from the reactor core following any loss of reactor coolant at a rate such that (1) fuel and clad damage that could interfere with continued effective core cooling is prevented and (2) clad metal-water reaction is limited to negligible amounts." The RWST provides a support function for this criterion since it supplies the water which is injected following an event and must contain the amount of water required by analysis. Manual action will be used until the end of the next two refuel outages to assure isolation of the seismic piping from the non credited non seismic piping to assure RWST level meets the TS allowable. This will assure continued compliance with this criterion.

5.3 Environmental Considerations

The proposed changes to the IP2 Technical Specifications do not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

6.0 PRECEDENCE

Joseph M. Farley Units 1 and 2 received approval for taking manual action to isolate the RWST from the non seismic SFP lines in Amendments 188 and 183, respectively (Reference 3). Indian Point 3 received approval for taking manual action to isolate the RWST from the non seismic SFP lines in Amendment 250 (Reference 4).

7.0 REFERENCES

1. IP-CALC-13-00005, Rev 1, "Engineering Evaluation of Postulated RWST Inventory Loss During the Reverse Osmosis Clean-up Skid Process in Accordance to 2-TAP-001-ROS due to a seismic Event" , March 2013.

2. 2-OSP-10.1.1, Support Procedure – Safety Injection Accumulators and Refueling Water Storage Tank Operations.

3. NRC Letter to Southern Nuclear Operating Company, Inc., "Joseph M. Farley Nuclear Plant, Units 1 and 2, Issuance of Amendments regarding Refueling Water Storage Tank (TAC NOS. ME8005 AND ME8006)", dated March 24, 2012.

4. NRC letter to Entergy, "Indian Point Nuclear Generating Unit No. 3 – Issuance of Amendment Re: Connecting Non-Seismic Purification System Piping to the Refueling Water Storage Tank (TAC NO. ME9263)", dated February 22, 2013.

ATTACHMENT 2 TO NL-13-015

MARKED UP TECHNICAL SPECIFICATION PAGE FOR PROPOSED CHANGE REGARDING CONNECTION OF NON SEISMIC BARS TO REFUELING WATER STORAGE TANK

Change indicated by Bold/Italics for addition

Unit 2 Affected Page:

3.5.4-1

ENTERGY NUCLEAR OPERATIONS, INC.
INDIAN POINT NUCLEAR GENERATING UNIT NO. 2
DOCKET NO. 50-247

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.4 Refueling Water Storage Tank (RWST)

LCO 3.5.4 The RWST shall be OPERABLE.

- NOTE -

The RWST isolation valves 350, 727A and 845 connected to non-safety related piping may be opened under administrative controls for up to 30 days per fuel cycle for filtration until the end of refuel outage 22.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. RWST boron concentration not within limits. OR RWST borated water temperature not within limits.	A.1	Restore RWST to OPERABLE status.	8 hours
B. One of the two required channels of the RWST level low low alarm inoperable.	B.1	Restore RWST level low low alarm to OPERABLE status.	7 days
C. RWST inoperable for reasons other than Condition A or B.	C.1	Restore RWST to OPERABLE status.	1 hour
D. Required Action and associated Completion Time not met.	D.1	Be in MODE 3.	6 hours
	AND		
	D.2	Be in MODE 5.	36 hours

ATTACHMENT 3 TO NL-13-015

MARKED UP TECHNICAL SPECIFICATION BASES CHANGE ASSOCIATED WITH THE PROPOSED CHANGES REGARDING CONNECTION OF NON SEISMIC BARS TO REFUELING WATER STORAGE TANK

Change indicated by Bold/Italics for addition

Unit 2 Affected Page:

3.5.4-4

ENTERGY NUCLEAR OPERATIONS, INC.
INDIAN POINT NUCLEAR GENERATING UNIT NO. 2DOCKET NO. 50-247

BASES

The IP2 ESFAS design does not include automatic switchover from the safety injection mode to the recirculation mode of operation based on low level in the RWST coincident with a safety injection signal. This function is performed manually by the operator who must be alerted by redundant alarms that annunciate RWST level low low. The switchover to the cold leg recirculation phase is manually initiated when the RWST level has reached the low low alarm setpoint and sufficient coolant inventory to support pump operation in recirculation mode is verified to be in the containment.

The RWST level low low alarm setpoint has both upper and lower limits. The upper limit is set to ensure that switchover does not occur until there is adequate water inventory in the containment to provide ECCS pump suction. (This is confirmed by recirculation and/or containment sump level indication.) The lower limit is set to ensure switchover occurs before the RWST empties, to prevent ECCS pump damage.

Requiring 2 channels of RWST level low low alarm ensures that the alarm function will be available assuming a single failure of one channel.

The RWST satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

The RWST ensures that an adequate supply of borated water is available to cool and depressurize the containment in the event of a Design Basis Accident (DBA), to cool and cover the core in the event of a LOCA, to maintain the reactor subcritical following a DBA, and to ensure adequate level in the recirculation and containment sump to support ECCS operation in the recirculation mode.

To be considered OPERABLE, the RWST must meet the water volume, boron concentration, and temperature limits established in the SRs.

RWST OPERABILITY requires OPERABILITY of two channels of the RWST level low low alarm. This is required because the IP2 ESFAS design does not include automatic switchover from the safety injection mode to the recirculation mode of operation based on low level in the RWST coincident with a safety injection signal. This function is performed manually by the operator who must be alerted by redundant alarms that annunciate RWST level low low. The switchover to the cold leg recirculation phase is manually initiated when the RWST level has reached the low low alarm setpoint and sufficient coolant inventory to support pump operation in recirculation mode is verified to be in the containment.

A note allows the RWST valves that isolate non-seismic piping to be opened under administrative control for filtration until the end of RO 22.

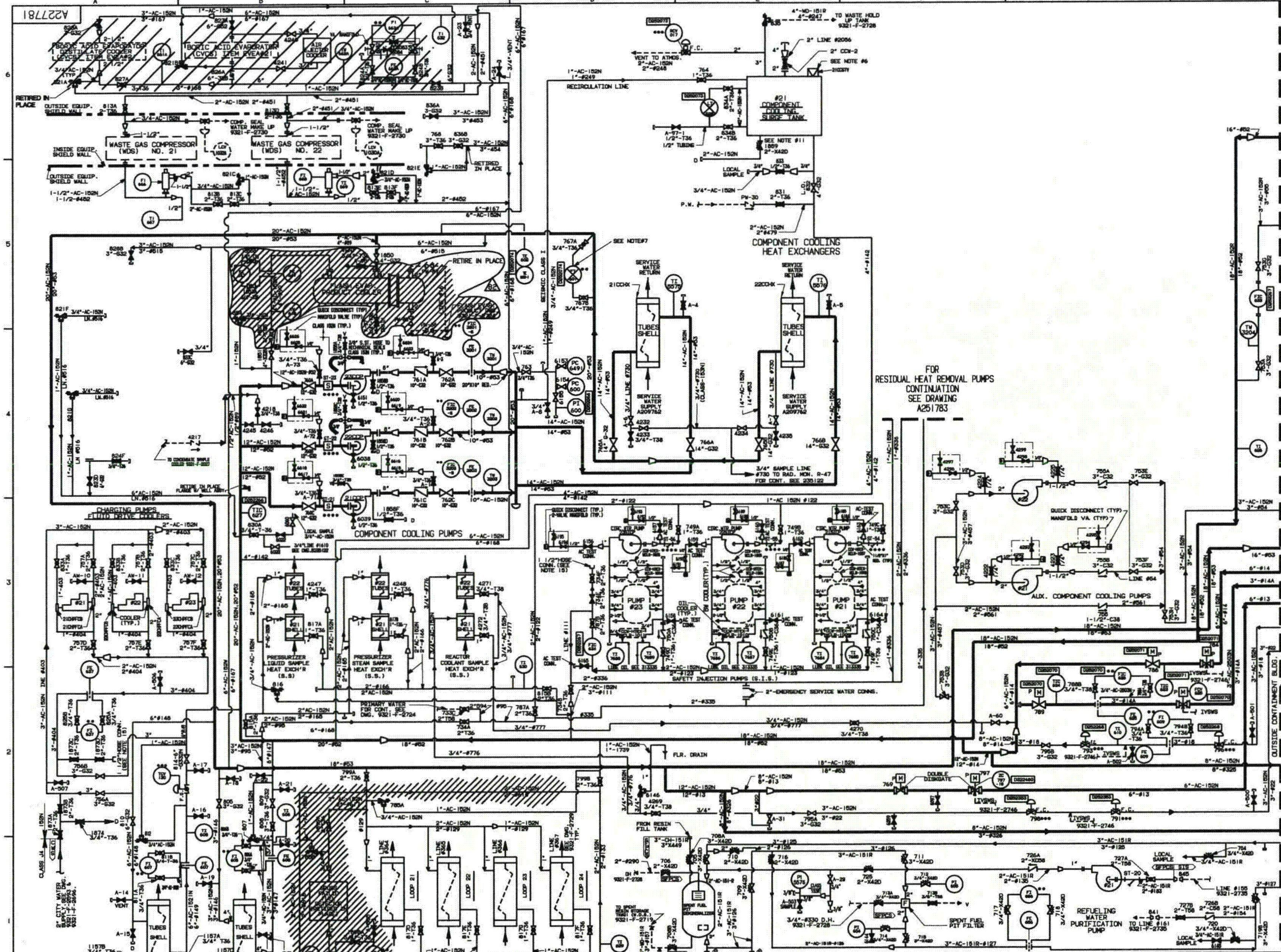
ENCLOSURE 1 TO NL-13-015

INDIAN POINT 2 DRAWINGS AND CALCULATION

Unit 2 Documents:

Drawing 227781
Drawing 9321-F-2735
Drawing 9321-F-2736
Calculation IP-CALC-13-00005, Rev 1

ENTERGY NUCLEAR OPERATIONS, INC.
INDIAN POINT NUCLEAR GENERATING UNIT NO. 2
DOCKET NO. 50-247


A227781
BORIC ACID EVAPORATOR DISTILLATE COOLER
BORIC ACID EVAPORATOR (CVCS) ITEM #VEA021
RETIRED IN PLACE
OUTSIDE EQUIP. SHIELD WALL
INSIDE EQUIP. SHIELD WALL
WASTE GAS COMPRESSOR (WDS) NO. 21
WASTE GAS COMPRESSOR (WDS) NO. 22
RECIRCULATION LINE
#21 COMPONENT COOLING SURGE TANK
TO WASTE HOLD UP TANK 9321-F-2728
VENT TO ATMOS.
LOCAL SAMPLE
COMPONENT COOLING HEAT EXCHANGERS
SERVICE WATER RETURN
SERVICE WATER SUPPLY
TUBES
SHELL
RETIRE IN PLACE
SEE NOTE#7
COMPONENT COOLING PUMPS
FOR RESIDUAL HEAT REMOVAL PUMPS CONTINUATION SEE DRAWING A251783
AUX. COMPONENT COOLING PUMPS
QUICK DISCONNECT (TYP) MANIFOLD VA. (TYP)
CHARGING PUMPS FLUID DRIVE COOLERS
PRESSURIZER LIQUID SAMPLE HEAT EXCH'R (S.S.)
PRESSURIZER STEAM SAMPLE HEAT EXCH'R (S.S.)
REACTOR COOLANT SAMPLE HEAT EXCH'R (S.S.)
PUMP #23
PUMP #22
PUMP #21
SAFETY INJECTION PUMPS (S.I.S.)
2"-EMERGENCY SERVICE WATER CONN.
FLR. DRAIN
DOUBLE DISKGATE
FROM RESIN FILL TANK
SPENT FUEL PIT FILTER
REFUELING WATER PURIFICATION PUMP
LOCAL SAMPLE
LOOP 21
LOOP 22
LOOP 23
LOOP 24
4-STEAM GENERATOR BLOWDOWN SAMPLE HEAT EXCHANGERS (S.S.)
RETIRED IN PLACE
NON-REGENERATIVE HEAT EXCHANGER (CVCS)
SEAL WATER HEAT EXCHANGER (CVCS)
OUTSIDE CONTAINMENT BLDG.
INSIDE SPENT FUEL STORAGE BLDG.
INSIDE CONTAINMENT BLDG.
FOR CONTINUATION SEE DWG.#9321-F-2720
WORK THIS DRAWING WITH DRAWING 9321-F-2720

NOTES

1. VALVES ARE NORMALLY INSTALLED WITH FLOW UNDER SEAT, EXCEPT FOR VALVE NO. 831.
2. LOCATE SUCTION CONNECTION IN BOTTOM HALF OF REACTOR COOLANT PIPING ON 45° ANGLE TO VERTICAL.
3. SPRING LOADED CHECK VALVE.
4. LOCATE IN ANNULAR RING BETWEEN SECONDARY SHIELD AND CONTAINMENT WALL.
5. LOCATE VALVE CLOSE TO SPENT FUEL PIT WALL
6. VACUUM BREAKER, SUPPLIED WITH TANK.
7. PRESSURE TAP LOCATED PER Ⓦ I&C STANDARDS.
8. PENETRATE WALL 6 FT. ABOVE FUEL ASSEMBLIES.
9. TERMINATE PIPE 6 FT. ABOVE FUEL ASSEMBLIES.
10. VENT AND DRAIN REQUIREMENT DEPEND UPON PIPING LAYOUT TO BE SPECIFIED BY A.E..
11. ELEVATION OF SURGE TANK NORMAL WATER LEVEL TO BE HIGHEST POINT IN COMPONENT COOLING SYSTEM.
12. REACTOR COOLANT PRESSURE INTERLOCK PREVENTS ISOLATION VALVE OPENING ABOVE SET PRESSURE.
13. SCHEDULE 140 PIPE.
14. FOR MISC. VENTS AND DRAINS REFER TO PHYSICAL PIPING DRAWINGS.
15. HOSE PROVIDED TO ENABLE COOLING WATER TO BE PIPED OUTSIDE THE BUILDING.
16. FOR LENGTH TABLE SEE 9321-F-2720.
17. *** INDICATES CONTROL VALVE HAS ADDITIONAL ASSOCIATED CONTROL EQUIPMENT AND IS REPRESENTED ON CONTROL VALVE HOOK-UP DETAIL DWG. 9321-F-7056.
18. ** -INDICATES INSTRUMENT HAS ADDITIONAL VALVES. DETAILS & VALVE IDENTIFICATION SHOWN ON DWGS. B242828.
19. **** ST-21, ST-22, ST-23, ST-54, ST-55, AND ST-56 ARE TEMPORARY START-UP STRAINERS WITH INTERNAL SCREENS REMOVED.
20. THE QUALITY GROUP A,B,C AND SEISMIC BOUNDARIES EXTEND TO THE FIRST SEISMIC SUPPORT/RESTRAINT BEYOND THE BOUNDARIES SHOWN.
21. 14" DIA. LINE NO 10 HAS 6" THICK INSULATION BETWEEN VALVES #730 AND #731.

INSERVICE INSPECTION NOTES:

1. CP=CONTAINMENT PENETRATIONS, ASME CLASS MC APPLIES.
2. FOR NON-CODE PIPING PENETRATING CONTAINMENT & NOT CLASSIFIED QUALITY GROUP "A", "B" OR "C" QUALITY GROUP "MC" DESIGNATION SHALL BE APPLIED.

REF. DWG.
B207540-INSTRU. PIPING ARR'GT FOR FE-3201, FE-3202 & FE-3203.

9321-F-2016-FLOW DIAGRAM SYMBOLS

EVERYTHING ON THIS DRAWING (EXCEPT FOR DASHED LINES) IS PART OF THE COMPONENT COOLING SYSTEM (CCS) AS DESCRIBED IN EXHIBIT "A" TO CI-240-1, UNLESS OTHERWISE INDICATED HEREIN.
CWS CITY WATER SYSTEM (PORTION NOT LISTED IN CI-240-1)
SFPCS SPENT FUEL POOL COOLING SYSTEM
RHR RESIDUAL HEAT REMOVAL

LEGEND

T-VALVE TO TRIP OR CLOSE ON HIGH CONTAINMENT PRESSURE
P-VALVE TO TRIP OR CLOSE ON HIGH-HIGH CONTAINMENT PRESSURE

82	INCORPORATED EC-3286	7/8/09	RM

D.N. F.A. W.J.KING 1/29/88
REVIEW APPROVALS

TITLE: FLOW DIAGRAM
AUXILIARY COOLANT SYSTEM -
UFSAR FIGURE No. 9.3-1 (SHT. 1)
DRWN. BY D. BALADO SCALE NONE
Entergy
STATION INDIAN POINT
DWG. NO. A227781-82 MY

9321-F-2735

INSIDE CONTAINMENT BUILDING FOR CONT SEE DWG A235296

INSIDE PRIMARY AUX. BUILDING

REFERENCE DRAWINGS: U.E. & C. NO.

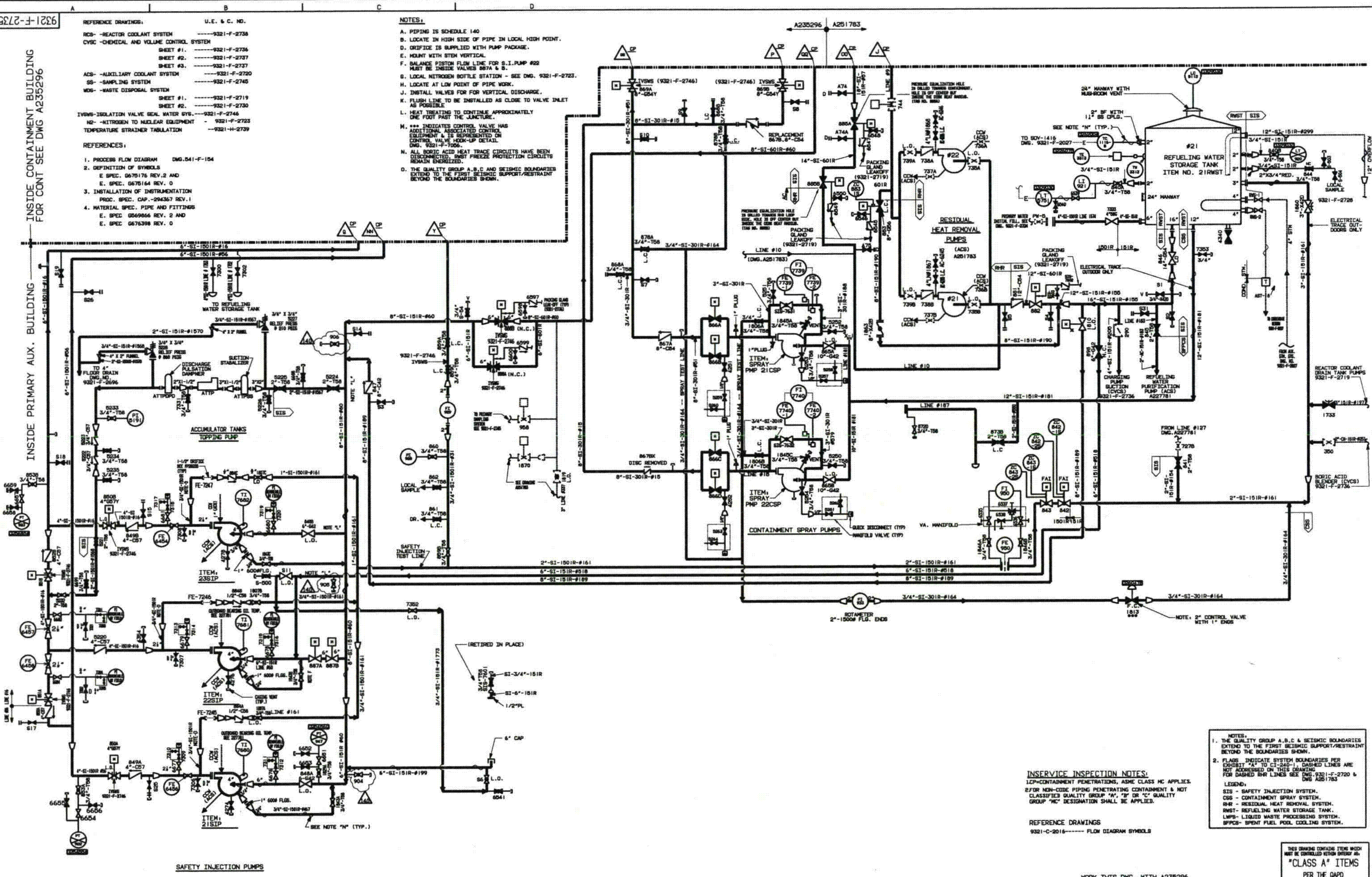
RCS- -REACTOR COOLANT SYSTEM -----9321-F-2738
CVSC -CHEMICAL AND VOLUME CONTROL SYSTEM
SHEET #1. ------9321-F-2736
SHEET #2. ------9321-F-2737
SHEET #3. ------9321-F-2737
ACS- -AUXILIARY COOLANT SYSTEM ----9321-F-2720
SS- -SAMPLING SYSTEM ------9321-F-2745
WDS- -WASTE DISPOSAL SYSTEM
SHEET #1. ------9321-F-2719
SHEET #2. ------9321-F-2730
IVSWS-ISOLATION VALVE SEAL WATER SYS.---9321-F-2746
N2- -NITROGEN TO NUCLEAR EQUIPMENT - 9321-F-2723
TEMPERATURE STRAINER TABULATION --9321-H-2739

REFERENCES:

1. PROCESS FLOW DIAGRAM DWG.541-F-154
2. DEFINITION OF SYMBOLS
   E SPEC. G675176 REV.2 AND
   E. SPEC. G675164 REV. 0
3. INSTALLATION OF INSTRUMENTATION
   PROC. SPEC. CAP.-294367 REV.1
4. MATERIAL SPEC. PIPE AND FITTINGS
   E. SPEC G569866 REV. 2 AND
   E. SPEC G676398 REV. 0

NOTES:

A. PIPING IS SCHEDULE 140
B. LOCATE IN HIGH SIDE OF PIPE IN LOCAL HIGH POINT.
D. ORIFICE IS SUPPLIED WITH PUMP PACKAGE.
E. MOUNT WITH STEM VERTICAL
F. BALANCE PISTON FLOW LINE FOR S.I.PUMP #22 MUST BE INSIDE VALVES 887A & B.
G. LOCAL NITROGEN BOTTLE STATION - SEE DWG. 9321-F-2723.
H. LOCATE AT LOW POINT OF PIPE WORK.
J. INSTALL VALVES FOR FOR VERTICAL DISCHARGE.
K. FLUSH LINE TO BE INSTALLED AS CLOSE TO VALVE INLET AS POSSIBLE
L. HEAT TREATING TO CONTINUE APPROXIMATELY ONE FOOT PAST THE JUNCTURE.
M. *** INDICATES CONTROL VALVE HAS ADDITIONAL ASSOCIATED CONTROL EQUIPMENT & IS REPRESENTED ON CONTROL VALVE HOOK-UP DETAIL DWG. 9321-F-7056.
N. ALL BORIC ACID HEAT TRACE CIRCUITS HAVE BEEN DISCONNECTED. RWST FREEZE PROTECTION CIRCUITS REMAIN ENERGIZED.
O. THE QUALITY GROUP A,B,C AND SEISMIC BOUNDARIES EXTEND TO THE FIRST SEISMIC SUPPORT/RESTRAINT BEYOND THE BOUNDARIES SHOWN.



INSERVICE INSPECTION NOTES:

1. CP=CONTAINMENT PENETRATIONS, ASME CLASS MC APPLIES.
2. FOR NON-CODE PIPING PENETRATING CONTAINMENT & NOT CLASSIFIED QUALITY GROUP "A", "B" OR "C" QUALITY GROUP "MC" DESIGNATION SHALL BE APPLIED.

REFERENCE DRAWINGS

9321-C-2016------ FLOW DIAGRAM SYMBOLS

NOTES:

1. THE QUALITY GROUP A,B,C & SEISMIC BOUNDARIES EXTEND TO THE FIRST SEISMIC SUPPORT/RESTRAINT BEYOND THE BOUNDARIES SHOWN.
2. FLAGS INDICATE SYSTEM BOUNDARIES PER EXHIBIT "A" TO CI-240-1. DASHED LINES ARE NOT ADDRESSED ON THIS DRAWING FOR DASHED RHR LINES SEE DWG.9321-F-2720 & DWG A251783

LEGEND:

SIS - SAFETY INJECTION SYSTEM.
CSS - CONTAINMENT SPRAY SYSTEM.
RHR - RESIDUAL HEAT REMOVAL SYSTEM.
RWST- REFUELING WATER STORAGE TANK.
LWPS- LIQUID WASTE PROCESSING SYSTEM.
SFPCS- SPENT FUEL POOL COOLING SYSTEM.

THIS DRAWING CONTAINS ITEMS WHICH MUST BE CONTROLLED WITHIN ENTERGY AS: "CLASS A" ITEMS PER THE QAPD

WORK THIS DWG. WITH A235296

THIS DWG. TO BE REVISED ONLY IN AUTOCAD.

REV	DESCRIPTION	DATE	BY	APPROVAL SIGNATURES ON FILE
140	INCORPORATED EC15883	3/25/10	RML	

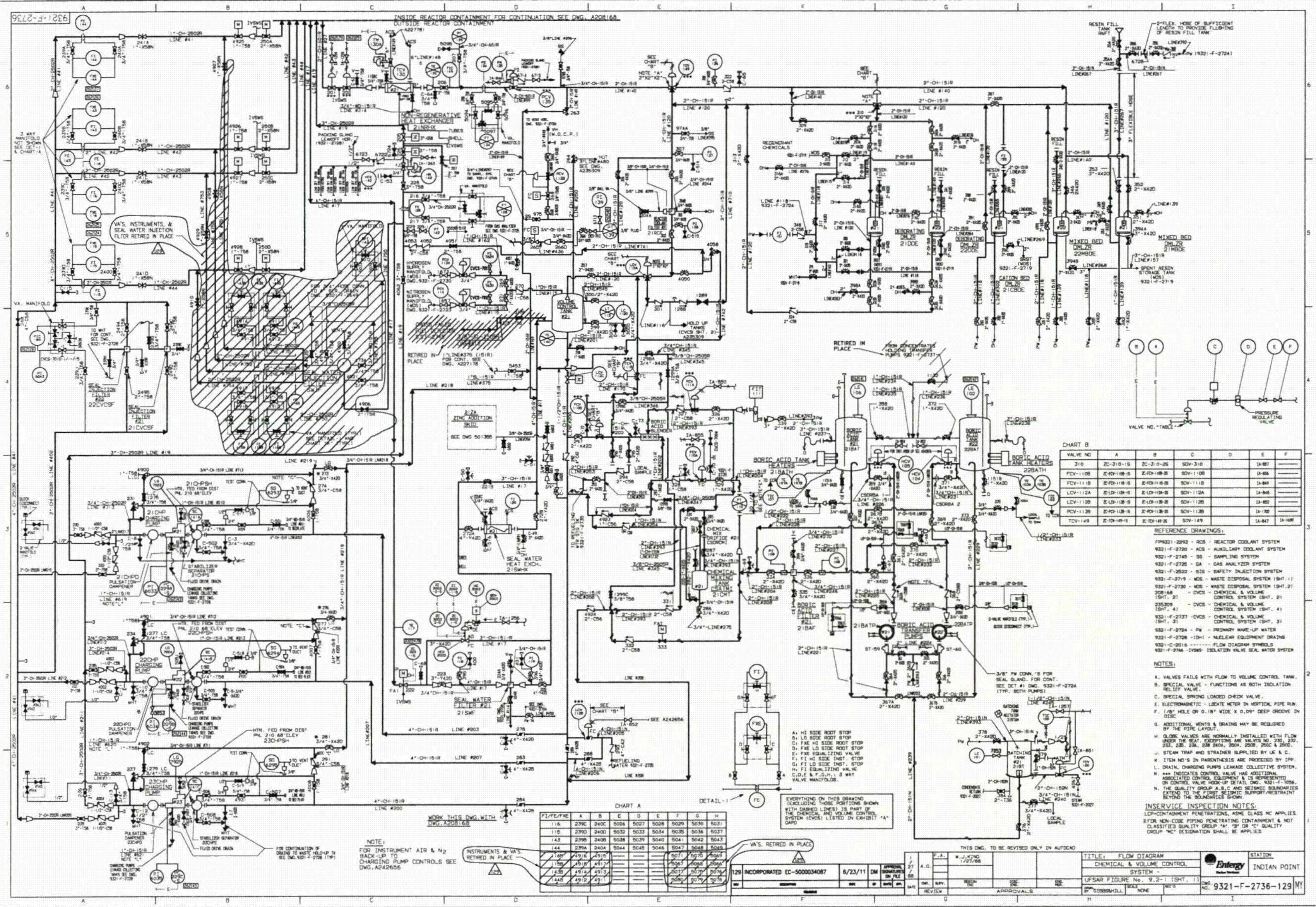
REVISION: T.CZEKIEWSKI 02/11/04 — THIS REVISION IS NON-CLASS PER THE QAPD. DRAWING UPDATED IN RESPONSE TO CR-IP2-2004-00396 RELEASE FOR RECORD. PN 69901-AF RL/TC

REVIEW: 2/12/88 A.G. F.A. — APPROVALS: W.J.KING 2/12/88

TITLE: FLOW DIAGRAM
SAFETY INJECTION SYSTEM
- UFSAR FIGURE No. 6.2-1 (SHT. 1)
DRAWN BY B.JOHN — SCALE NONE

Entergy — STATION: INDIAN POINT

DWG. NO. 9321-F-2735 MY



NOTE:
FOR INSTRUMENT AIR & N_2 BACK-UP TO CHARGING PUMP CONTROLS SEE DWG. A242656

WORK THIS DWG. WITH DWG. A208168

EVERYTHING ON THIS DRAWING (EXCLUDING THOSE PORTIONS SHOWN WITH DASHED LINES) IS PART OF THE CHEMICAL AND VOLUME CONTROL SYSTEM (CVCS) LISTED IN EXHIBIT "A" QAPD

CHART A

FI/FE/FXE	A	B	C	D	E	F	G	H
116	239C	240C	5026	5027	5028	5029	5030	5031
115	239D	240D	5032	5033	5034	5035	5036	5037
143	239B	240B	5038	5039	5040	5041	5042	5043
144	239A	240A	5044	5045	5046	5047	5048	5049
1168	4916	4915	—	—	—	5071	5070	5069
115B	4918	4917	—	—	—	5067	5068	5066
143B	4914	4913	—	—	—	5077	5075	5076
144B	4912	4911	—	—	—	5080	5079	5078

CHART B

VALVE NO	A	B	C	D	E	F
310	ZC-310-1S	ZC-310-2S	SOV-310		IA-887	—
FCV-110B	ZC-FCV-110B-1S	ZC-FCV-110B-2S	SOV-110B		IA-856	—
FCV-111B	ZC-FCV-111B-1S	ZC-FCV-111B-2S	SOV-111B		IA-849	—
LCV-112A	ZC-LCV-112A-1S	ZC-LCV-112A-2S	SOV-112A		IA-848	—
LCV-112B	ZC-LCV-112B-1S	ZC-LCV-112B-2S	SOV-112B		IA-852	—
PCV-113B	ZC-PCV-113B-1S	ZC-PCV-113B-2S	SOV-113B		IA-1700	—
TCV-149	ZC-TCV-149-1S	ZC-TCV-149-2S	SOV-149		IA-847	IA-1699

REFERENCE DRAWINGS:

FP9321-2293 - RCS - REACTOR COOLANT SYSTEM
9321-F-2720 - ACS - AUXILIARY COOLANT SYSTEM
9321-F-2745 - SS - SAMPLING SYSTEM
9321-F-2725 - GA - GAS ANALYZER SYSTEM
9321-F-2522 - SIS - SAFETY INJECTION SYSTEM
9321-F-2719 - WDS - WASTE DISPOSAL SYSTEM (SHT. 1)
9321-F-2730 - WDS - WASTE DISPOSAL SYSTEM (SHT. 2)
208168 (SHT. 2) - CVCS - CHEMICAL & VOLUME CONTROL SYSTEM (SHT. 2)
235309 (SHT. 4) - CVCS - CHEMICAL & VOLUME CONTROL SYSTEM (SHT. 4)
9321-F-2737 (SHT. 3) - CVCS - CHEMICAL & VOLUME CONTROL SYSTEM (SHT. 3)
9321-F-2724 - PW - PRIMARY MAKE-UP WATER
9321-F-2728 - (DH) - NUCLEAR EQUIPMENT DRAINS
9321-C-2016 ------- FLOW DIAGRAM SYMBOLS
9321-F-2746 - IVSWS - ISOLATION VALVE SEAL WATER SYSTEM

NOTES:

A. VALVES FAILS WITH FLOW TO VOLUME CONTROL TANK.
B. SPECIAL VALVE - FUNCTIONS AS BOTH ISOLATION RELIEF VALVE.
C. SPECIAL SPRING LOADED CHECK VALVE.
E. ELECTROMAGNETIC - LOCATE METER IN VERTICAL PIPE RUN.
F. 1/8" HOLE OR 0.18" WIDE X 0.09" DEEP GROOVE IN DISC
G. ADDITIONAL VENTS & DRAINS MAY BE REQUIRED BY THE PIPE LAYOUT.
H. GLOBE VALVES ARE NORMALLY INSTALLED WITH FLOW UNDER THE SEAT. EXCEPTIONS ARE VALVES NO. 230, 232, 233, 235, 236, 238 240A, 250A, 250B, 250C & 250D.
J. STEAM TRAP AND STRAINER SUPPLIED BY UE & C.
K. ITEM NO'S IN PARENTHESIS ARE PROCEDED BY IPP.
L. DRAIN, CHARGING PUMPS LEAKAGE COLLECTIVE SYSTEM.
M. *** INDICATES CONTROL VALVE HAS ADDITIONAL ASSOCIATED CONTROL EQUIPMENT & IS REPRESENTED ON CONTROL VALVE HOOK-UP DETAIL DWG. 9321-F-7056.
N. THE QUALITY GROUP A,B,C AND SEISMIC BOUNDARIES EXTEND TO THE FIRST SEISMIC SUPPORT/RESTRAINT BEYOND THE BOUNDARIES SHOWN.

INSERVICE INSPECTION NOTES:

1. CP-CONTAINMENT PENETRATIONS, ASME CLASS MC APPLIES.
2. FOR NON-CODE PIPING PENETRATING CONTAINMENT & NOT CLASSIFIED QUALITY GROUP "A", "B" OR "C" QUALITY GROUP "MC" DESIGNATION SHALL BE APPLIED.

THIS DWG. TO BE REVISED ONLY IN AUTOCAD

129	INCORPORATED EC-5000034087	6/23/11	DM	APPROVAL SIGNATURES ON FILE	
NO.	DESCRIPTION	DATE	BY	CHK'D	APP.

REVISIONS

DATE: 1/27/88 | A.G. | F.A. | W.J.KING 1/27/88
CHK. | SUPV. | DESIGN ENG. | DISC. ENG. | ENG. MGR.
REVIEW | APPROVALS

TITLE: FLOW DIAGRAM
CHEMICAL & VOLUME CONTROL SYSTEM -
UFSAR FIGURE No. 9.2-1 (SHT. 1)
DRN. BY GIBBS&HILL | SCALE NONE | REF'D

Entergy

STATION: INDIAN POINT

DWG. NO. 9321-F-2736-129 MY