

RECOVERY FROM REFUELING

Unit _____
Date _____
DSS _____

RECORD

PROCEDURE VERIFIED CURRENT AND CHECKED FOR TEMPORARY CHANGES IF FIELD
COPIES REQUIRED. USE PBF-0026; LAW NP 1.2.4 AND DO NOT COMPLETE THIS BLOCK.

BY: _____ DATE: _____

1.0 PURPOSE

To outline the procedure and steps required to recover from a refueling operation.

2.0 REFERENCES

- 2.1 LER 301-91-003-00
- 2.2 LER 266-93-004-00
- 2.3 IR 96-006, NRC Inspection Report; NRC Commitment for Operations procedures
PMT/QC reviews.

NOTE: Asterisk (*) after a step number indicates a Technical Specification requirement.

3.0 PRECAUTIONS AND LIMITATIONS

- 3.1 Radiation levels must be monitored per the Chemistry and Health Physics group requirements.
- 3.2 The water level must be maintained above the refueling cavity lights at all times the lights are in operation.
- 3.3 The reactor vessels shall not be pressurized or partially pressurized with the vessel metal temperature below 70°F.
- 3.4 Installation and loading (tensioning) of the closure studs shall be performed only when all metal surfaces of the vessel head and head flange, vessel seal flange, and upper shell course are above 70°F.
- 3.5* Per Technical Specification 15.3.8.7, the containment purge supply and exhaust system shall be demonstrated operable by verifying isolation occurs on both high radiation trips and manual initiation within four days prior to and at least once per seven days during refueling operations.
- 3.6* The containment personnel hatch doors shall be capable of being closed which means that other than the hatch door O-ring protectors, no other equipment can be placed in or run through the hatch during refueling operations, i.e., hoses, monorail, or portable ramp sections.

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3.7 Rinsing cavity walls during draindown will cause a boron dilution. Avoid excessive use of rinse water so a minimum boron concentration of 1800 ppm is maintained.

3.8 Adhere to the requirements of NP 8.4.10, to prevent the introduction of foreign material into the refueling cavity.

4.0 INITIAL CONDITIONS

INITIALS

4.1 Reactor Engineering has released the plant to be returned to operating conditions.

4.2 Refueling cavity and RHR boron concentration is ≥ 2100 ppm

Cavity Boron _____ ppm RHR Boron _____ ppm

5.0 PROCEDURE

NOTE: *Certain steps of this procedure may be commenced at any time as long as they do not adversely affect the overall sequence.*

NOTE: *Certain steps of RP-1B request level changes be made to the refueling cavity and reactor vessel. These level changes shall be made by performing the appropriate steps of OP-4D.*

5.1 Verify the fuel transfer system gate valve is shut and CL-1E updated

5.2 Position the fuel transfer cart per OI-53.

5.3 Lower refueling cavity water level per OP-4D, Part 3 or 4 to that desired for upper internals installation, ~60.5 ft. cavity level.

5.4* RP-1B Attachment A completed for upper internals installation.
(Reference 2.1 & 2.2)

5.5 Install the upper internals into the reactor vessel and then place internals lifting rig in its storage stand per RMP 96.

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NOTE: *The DSS may elect to N/A Step 5.6 if rod latching is scheduled to take place shortly.*

5.6 After the upper internals are installed;

5.6.1 Notify CAS the 3rd door closed requirement is no longer in effect.

5.6.2 Reverse the "Door closed" signs (2 per door) on the upper and lower hatch 3rd doors.

5.7 Reinstall any rod control cluster drive shafts removed for inspection.

5.8 Lower refueling cavity water level per OP-4D, Part 3 or 4 until the drive shaft buttons just appear above the water level. Stabilize water level.

Record Date: _____
Time: _____

5.9* Complete RP-1B, Attachment B. (Reference 2.1 and 2.2)

NOTE: *Step 5.9 shall be complete prior to start of 5.10.*

5.10 Relatch the rod control cluster element drive shafts in accordance with RP-4A, "Drive Shaft Unlatching Tool Operating Procedure."

5.11 After the control rod drive shafts are latched,

5.11.1 Notify CAS the 3rd door closed requirement is no longer in effect.

5.11.2 Reverse the "Door closed" signs (2 per door) on the upper and lower hatch 3rd doors.

5.12 Turn off the underwater lights 15L (23L) Breakers 1, 3, 5, 7, 9, 11, 13, 15, 17, and 19.

5.13 Record the date and time just prior to continuing cavity pumpdown.

Date _____ Time _____

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- 5.14 Compare above time to that recorded in Step 5.8. If more than 12 hours has elapsed, then obtain cavity and RHR boron samples.

Cavity Boron _____ RHR Boron _____

If less than 12 hours has elapsed, this step and Step 5.15 are N/A.

- 5.15 If the cavity or RHR boron samples are ≥ 2000 ppm, continue with Step 5.16. If the cavity or RHR boron samples are between 1800 and < 2000 ppm, then notify Chemistry to implement sampling and analysis of the cavity and RHR every 2 1/2 hours to assure a minimum concentration of 1800 ppm is maintained during remainder of the cavity pumpdown. Notify HP that use of cavity rinse water shall be minimized.

- 5.16 Have Chemistry determine maximum RWST level, for present RHR/Refueling cavity boron concentration, that will leave enough room to adjust "RWST" boron concentration to ≥ 2100 ppm and < 2500 ppm, prior to leaving cold shutdown.

Max. RWST Level _____ %

***CAUTION* DO NOT LOWER REACTOR VESSEL LEVEL TO $\leq 55\%$.**

- 5.17 Continue lowering the water level in the refueling cavity per OP-4D, Part 3 or 4, to a desired reactor vessel level between 65-75%.

- 5.18 Perform a channel check of LT-447/447A by comparing the 2 channels. Use computer addresses LT-447 and YXLT-447A if available. If $> 3\%$ deviation exists, perform another vent/drain operation of both channels.

- 5.19 Verify stable conditions

5.19.1 RHR flow

5.19.2 Reactor vessel level

NOTE: Refer to HP 2.5.2 prior to draining/venting

5.20 As the reactor head is being placed down, drain the reactor vessel leakoff tubing by positioning the following valves.

| | | | |
|--------|--|------|-------|
| 5.20.1 | RC-522, reactor vessel leakoff tubing to RCDT Isolation. | Shut | _____ |
| 5.20.2 | RC-519, reactor vessel flange inner leakoff | Open | _____ |
| 5.20.3 | RC-520, reactor vessel flange outer leakoff | Open | _____ |
| 5.20.4 | RC-597, reactor vessel flange leakoff solenoid | Open | _____ |

***CAUTION* RADIOACTIVE WATER WILL DRAIN FROM RC-597A.**

| | | | |
|--------|---|------------------|----------------|
| 5.20.5 | RC-597A, reactor vessel leakoff tubing local drain valve. | Uncapped Open | _____ _____ |
|--------|---|------------------|----------------|

5.21 When the leakoff tubing is drained, position the following valves:

| | | | |
|--------|--|----------------|----------------|
| 5.21.1 | RC-597A, reactor vessel leakoff tubing local drain valve | Shut Capped | _____ _____ |
| 5.21.2 | RC-597, reactor vessel leakoff solenoid | Shut | _____ |
| 5.21.3 | RC-520, reactor vessel flange outer leakoff | Shut | _____ |

5.22 Commence lowering the water level of the lower refueling cavity in accordance with RP-1D. Hose down the cavity walls as the level is dropped.

5.23 After the cavity drain down is completed, align the refueling water circulating pump for normal operation per CL-5C.

***CAUTION* THE REACTOR VESSEL HEAD SHALL NOT BE SET IN PLACE IF REACTOR VESSEL LEVEL IS $\leq 55\%$.**

5.24* RP-1B Attachment C complete for setting reactor vessel head. (Reference 2.1 and 2.2)

5.25 Set the reactor vessel head in place per RMP 96.

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5.26 After the reactor vessel head is set,

5.26.1 Notify CAS the 3rd door closed requirement is no longer in effect.

5.26.2 Reverse the "Door closed" signs (2 per door) on the upper and lower hatch 3rd doors.

5.27 Commence cleaning up the cavity in accordance with Chemistry and Health Physics instructions.

NOTE: *A ratchet and torque wrench with 1-11/16" socket is recommended for transfer tube flange bolt installation due to high dose rates in the area.*

NOTE: *Maximum transfer tube flange bolt torque value is 300 ft-lbs. Tightening sequence is to lightly tighten the first bolt then move directly across the circle for the second bolt, move 1/4 way around the circle for the third bolt, and directly across for the fourth, continuing the sequence until all are tightened.*

NOTE: *QC Inspector must witness performance of Steps 5.28.1 and 5.28.2*

5.28 Fuel transfer tube flange replacement.

5.28.1 Note any transfer gate valve leakage in remarks, and replace transfer tube flange. (Flexitallic gaskets 913-1078, 913-1086; wrench/sockets 1-11/16" and 5/8".)

5.28.2 Record final torque value _____ ft-lbs

Torque Wrench No. _____ Cal Date: _____

5.28.3 Flange bolting properly torqued to final value recorded.

5.28.4 Attach brass alignment pins to eye bolt storage locations at the base of the flange lifting cable.

PMT

5.28.5 ORT-12, Fuel Transfer Tube Flange Seal, completed with satisfactory results.

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NOTE: *Removal of flux mapping thimble seals may result in a cold leg opening greater than 1 square inch. Reference OP-4F for hot leg vent path requirements.*

- 5.29 Reinsert the flux mapping thimble into the vessel and install the high pressure seals per ICP 10.29.

I&C

NOTE 1: *The RCS is open to atmosphere when any one of the following conditions is satisfied:*

- a. *At least one primary manway is removed.*
- b. *One PORV is open.*
- c. *The reactor vessel head is unbolted.*
- d. *One pressurizer safety valve is removed.*

NOTE 2: *When the RCS is $<360^{\circ}\text{F}$ and not open to the atmosphere, the LTOP system must be operable and enabled.*

NOTE 3: *When the RCS is not open to the atmosphere and either cold leg is $\leq 75^{\circ}\text{F}$, no more than one SI pump shall be operable. The inoperable pump shall have its associated 4160 volt breaker racked out or its discharge valve shut and operator power removed.*

- 5.30* Check reactor coolant system conditions are acceptable for installation of the reactor vessel studs.

- 5.30.1 Reference RP-1B Attachment D.

DSS

- 5.30.2 If LTOP is being utilized as a condition of acceptability for reactor vessel stud installation then perform the following, otherwise N/A this step.

- a. Place the low temperature overpressure protection (LTOP) in service per CL-4C.
- b. Verify with the WCC that all applicable post maintenance test requirements for the LTOP system have been performed, i.e., IT-200 (205).

DSS

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5.30.3 Conditions are acceptable for reactor vessel stud installation.

DSS

5.31 Install and tension reactor vessel head studs per RMP 96.

MTN

***CAUTION* THE RV HEAD AND PRESSURIZER VENT SOLENOID VALVES MUST BE OPENED BEFORE THE BLANK FLANGE AND SPOOL PIECE ARE INSTALLED.**

5.32 RV Head and Pressurizer Vent Path

5.32.1 Open the RV head vent solenoid valves, RC-570A and RC-570B.

5.32.2 Open the pressurizer vent solenoid valves, RC-580A and 580B.

5.32.3 Open RC-575A, RCS gas vent to PRT solenoid valve.

5.32.4 Install the RV head vent spool piece, leave the RV head vent isolation valve, RC-500, open.

5.32.5 Install the blank flange between RC-576 and RC-577.

MTN

5.33 Install the reactor vessel level system high side spool piece.

MTN

5.34 Reinstall the thermocouple conoseals.

I&C

NOTE: The filling and venting of the reactor coolant system may commence at this time in accordance with OP-4A.

MTN

5.35 Connect thermocouple wiring.

MTN

5.36 Install the control rod drive mechanisms seismic supports.

MTN

5.37 Connect the remaining CRDM and RPI electrical cables to the disconnect panels on the RPV head lift rig, according to the connector labels.

MTN

5.38 Replace the missile shield.

MTN

5.39 Replace and reconnect the rod drive cooling air supply system.

MTN

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5.40 Replace the ventilation top hats.

5.41 Ensure final cleanup of the cavity area is complete.

5.42 Cavity drain line alignment;

5.42.1 Verify WL-1705 and WL-1711 are red locked shut.

5.42.2 Drain the cavity drain line using the flange drain valve.

NOTE: *Flange should remain affixed to the pipe or open flange face.
A 1-1/16 wrench is required.*

5.42.3 Remove the drain line cleanout flange.

I&C

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ATTACHMENT A

POINT BEACH NUCLEAR PLANT

REACTOR VESSEL UPPER INTERNALS INSTALLATION CHECKOFF DATA SHEET

| COMPONENT | CONDITION/STATUS | DATE | TIME | INITIALS |
|---|------------------|------|------|----------|
| Specify RHR Pump on Line | | | | |
| Describe Boric Acid Flow Path | | | | |
| Audible Count Rate in Control and Containment* | | | | |
| Plant Evacuation Alarm Tested (Audible in Containment) | | | | |
| High Flux at Shutdown Alarm Tested | | | | |
| CAS Notified of 3rd Door Closed Requirement (Reference 2.2) | | | | |
| Lower Hatch Doors Capable of Being Closed* Reference 3.6 | | | | |
| Lower Hatch third Door Closed, Door Closed Signs Posted on Door, and Auto Door Closer Installed* (Notes 5 & 6) (Reference 2.1) | | | | |
| Upper Hatch Doors Capable of Being Closed* (Reference 3.6) | | | | |
| Upper Hatch third Door Closed, Door Closed Signs Posted on Door, and Auto Door Closer Installed* (Notes 5 & 6) (Reference 2.1) | | | | |
| Communications Checked Control and Containment* | | | | |
| W-5A - Refueling Surface Exhaust-Operable (NOTE 1) | | | | |
| W-5B - Refueling Surface Supply-Operable (NOTE 1) | | | | |
| RE-102-EI. 66' In Service* | | | | |
| RE-212-Cont. Nobel Gas - In Service* | | | | |
| RE-305-Purge Stack Sping L. R. Nobel Gas In Service* | | | | |
| Containment Vent. Isol. Trip Test RE-212* (NOTE 2 & 4) | | | | |
| Containment Vent. Isol. Trip Test RE-305* (NOTE 2 & 4) | | | | |
| Containment Vent. Isol. Manual* (NOTE 2 & 3 & 4) | | | | |

(*) Tech Spec Requirement

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ATTACHMENT B

POINT BEACH NUCLEAR PLANT

CONTROL ROD LATCHING CHECKOFF DATA SHEET

| COMPONENT | CONDITION/STATUS | DATE | TIME | INITIALS |
|--|------------------|------|------|----------|
| Specify RHR Pump on Line | | | | |
| Describe Boric Acid Flow Path | | | | |
| Audible Count Rate in Control and Containment* | | | | |
| Plant Evacuation Alarm Tested (Audible in Containment) | | | | |
| High Flux at Shutdown Alarm Tested | | | | |
| CAS Notified of 3rd Door Closed Requirement (Reference 2.2) | | | | |
| Lower Hatch Doors Capable of Being Closed* (Reference 3.6) | | | | |
| Lower Hatch third Door Closed, Door Closed Signs Posted on Door, and Auto Door Closer Installed* (Notes 5 & 6) (Reference 2.1) | | | | |
| Upper Hatch Doors Capable of Being Closed* (Reference 3.6) | | | | |
| Upper Hatch third Door Closed, Door Closed Signs Posted on Door, and Auto Door Closer Installed* (Notes 5 & 6) (Reference 2.1) | | | | |
| Communications Checked Control and Containment* | | | | |
| W-5A - Refueling Surface Exhaust-Operable (NOTE 1) | | | | |
| W-5B - Refueling Surface Supply-Operable (NOTE 1) | | | | |
| RE-102-El. 66' In Service* | | | | |
| RE-212-Cont. Nobel Gas - In Service* | | | | |
| RE-305-Purge Stack Sping L. R. Nobel Gas In Service* | | | | |
| Containment Vent. Isol. Trip Test RE-212* (NOTE 2 & 4) | | | | |
| Containment Vent. Isol. Trip Test RE-305* (NOTE 2 & 4) | | | | |
| Containment Vent. Isol. Manual* (NOTE 2 & 3 & 4) | | | | |

(*) Tech Spec Requirement

ATTACHMENT C

POINT BEACH NUCLEAR PLANT

REACTOR VESSEL HEAD SET CHECKOFF DATA SHEET

| COMPONENT | CONDITION/STATUS | DATE | TIME | INITIALS |
|--|------------------|------|------|----------|
| Specify RHR Pump on Line | | | | |
| Describe Boric Acid Flow Path | | | | |
| Audible Count Rate in Control and Containment* | | | | |
| Plant Evacuation Alarm Tested (Audible in Containment) | | | | |
| High Flux at Shutdown Alarm Tested | | | | |
| CAS Notified of 3rd Door Closed Requirement (Reference 2.2) | | | | |
| Lower Hatch Doors Capable of Being Closed* Reference 3.6 | | | | |
| Lower Hatch third Door Closed, Door Closed Signs Posted on Door, and Auto Door Closer Installed* (Notes 5 & 6) (Reference 2.1) | | | | |
| Upper Hatch Doors Capable of Being Closed* (Reference 3.6) | | | | |
| Upper Hatch third Door Closed, Door Closed Signs Posted on Door, and Auto Door Closer Installed* (Notes 5 & 6) (Reference 2.1) | | | | |
| Communications Checked Control and Containment* | | | | |
| W-5A - Refueling Surface Exhaust-Operable (NOTE 1) | | | | |
| W-5B - Refueling Surface Supply-Operable (NOTE 1) | | | | |
| RE-102-EI. 66' In Service* | | | | |
| RE-212-Cont. Nobel Gas - In Service* | | | | |
| RE-305-Purge Stack Sping L. R. Nobel Gas In Service* | | | | |
| Containment Vent. Isol. Trip Test RE-212* (NOTE 2 & 4) | | | | |
| Containment Vent. Isol. Trip Test RE-305* (NOTE 2 & 4) | | | | |
| Containment Vent. Isol. Manual* (NOTE 2 & 3 & 4) | | | | |

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Attachments A, B and C, Cont.

NOTE 1: W-6A and W-6B must be running for operation of W-5A or W-5B.

*NOTE 2: * Trip testing must be done within four days prior to and at least once per seven days during refueling operation. Verify at least one purge supply and one purge exhaust valve shuts. (Valve operability is referenced in IST Acceptance Criteria Binder.)*

NOTE 3: Manual initiation consists of verifying the purge supply and exhaust valves shut by means of their control switches on the back of C-04.

NOTE 4: If previously tested per RP-1C and test meets limits of Note 2 then retest is not required. Record date and time of last test.

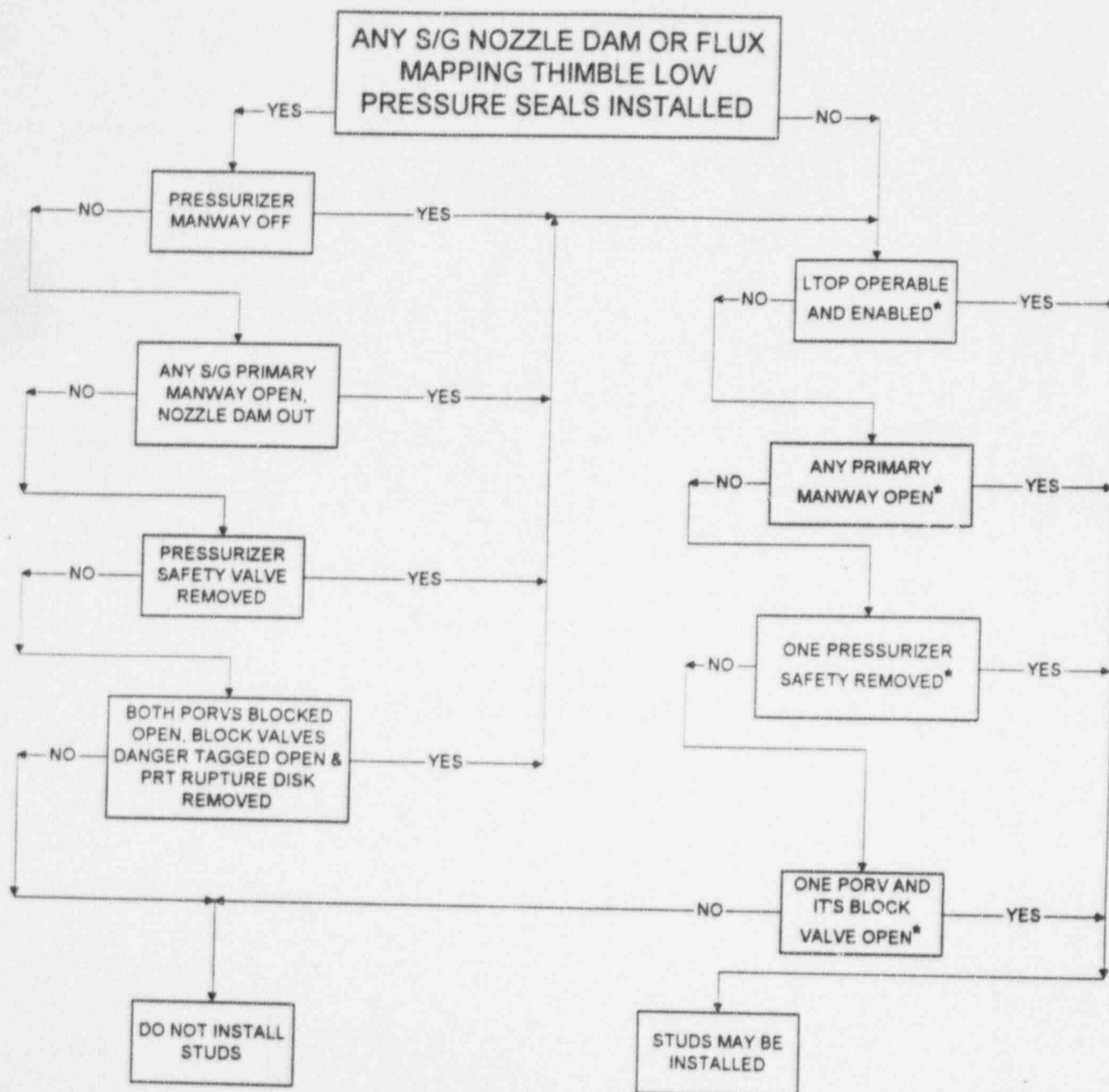
NOTE 5: Signs for the third door (2 per door) are stored in the sign holder on each third door. Signs should be reversed when not required.

*NOTE 6: * The 3rd door must be equipped with weather stripping and an operable automatic door closer.*

Remarks:

ATTACHMENT D

REACTOR VESSEL HEAD STUD INSTALLATION REQUIREMENTS



(*) Tech Spec Requirement