COMPLE

POINT BEACH NUCLEAR PLANT
91-12 MODIFICATION REQUEST

MR Number 88-099*0

NOTE: Block numbers on this form correspond to paragraph numbers of Procedure QP 3-1. The use of black ink is required.

2.6 MODIFICATION REQUEST INITIATION

☐ UNIT 1 ☐ UNIT 2 ☒ COMMON FACILITIES

System: Aux Feedwater Location: Aux Feed Pump Room

Print Nos. M-217

Reason for Modification (Concise description of actual problem. List applicable reference documents):

☐ Plant Betterment ☐ Safety Issue ☒ Regulatory Requirement ☐ ALARA

☐ Other (Specify) _____

The existing minimum recirculation flowrate for each AFW pump is 30 gpm, this equates to ~8% of the BEP for the electric driven AFW pumps and ~6% of the BEP for the turbine driven AFW pumps. It is now recognized that to prevent inlet flow instabilities in centrifugal pumps that may lead to pump damage the minimum flow rate should be ~25% to 50% of the BEP. In response to NRC Bulletin 88-04 a commitment was made to increase the minimum recirculation flowrate of the AFW pumps. The recommended flow rate will be provided by Byron Jackson, pump manufacturer.

Proposed Change (Include sketches, effects on other components/systems, alternate approaches, installation/acceptance/completion date, if known.) Attach additional pages if needed.

Modify the AFW pump mini-recirc lines to provide the recommended flow rates.

Initiated By John A. Palmer Date 7/5/88

2.7 GROUP HEAD/SUPERVISOR Comments (include basis for due dates)

INITIAL EFFORT SHOULD INCLUDE ENSURING NRC HAS ACCEPTED 88-04 RESOLUTION RECOMMENDATIONS.

Priority: 1☐ 2☒ 3☐ 4☐ Required Due Date _____

☒ Recommended ☐ Not Recommended By W.B. Jones Date 7/5/88

2.8 MODIFICATION ENGINEER

10CFR50.59 Review Required

☒ Yes ☐ No Initials WBJ

QA STATUS: A/52

QA SCOPE

MICROFILMED

Form QP
Rev. 1

2.9 EQRS — SEE ATTACHED CLARIFICATION

QA Status: ☒ QA-scope ☐ Non QA-scope JAS 5/19/91

Clarification: 1A-4002, 2AF-4002, AF-4007, AF-4014

RECIRC LINE PIPING AND COMPONENTS TO BE QA UP TO AND INCLUDING RECIRC ISOLATION VALVES (~~1AF-15, AF-27, AF-40, 2AF-53~~). FIRST RESTRAINT DOWNSTREAM OF RECIRC ISOLATION VALVES TO BE QA. PIPING DOWNSTREAM OF RECIRC ISOLATION VALVES NEED NOT BE QA.

Signature A Zellen Date 10/28/89

2.10 SUPERVISOR - ADMINISTRATIVE SERVICES:

Charge Account Number(s): ~~5400-530-23XX24001~~ #91-530-23XX36517 JJM JAP

2.11 MANAGER - PBNP Preliminary Review (Also indicate required approvals in Block 2.16)

☒ Proposal Satisfactory ☐ Cancelled

Engineering Evaluation (includes conceptual design):

a. ☐ EQRS
b. ☐ NPERS
c. ☒ NSEAS
d. ☐ Other in plant (specify) _____
e. ☐ Contractor (specify) _____
f. ☐ Not required

Directed by a, b, c, d (circle appropriate)

Comments: IDENTIFY CHANGES THAT NEED TO BE MADE TO ACCOMODATE THE INCREASED FLOW. (1029) (P31A/B) (2P29)

Assigned Responsible Engineer IPA JAP/JAS/TDM Liaison Engineer IAP HLH

Signature [signature] Date 2/12/88

2.12 MODIFICATION ENGINEER Recommendations

(Also designate group engineering reviews in Block 2.14)

2.13 ENGINEERING EVALUATION/CONCEPTUAL DESIGN

See Form QP 3-1.4 if required

2.14 GROUP ENGINEERING EVALUATION REVIEWS

☒ M&C [signature] ☐ C/HP ____ ☐ RE ____ ☐ NPERS ____ ☐ Other (spec) ____

☒ OPS [signature] ☒ I&C [signature] ☒ ~~NPERS~~ [signature] ☐ NSEAS ____ ☐ Not Required

Review Comments/Training Scope:

See attached comments 4/13/90

Scope of Training:

PLANT STATUS UPDATE - OPERATIONS PERSONNEL & STA'S

Mod. Eng. Signature [signature] Date 2/5/88

QA SCOPING CLARIFICATION

MR NUMBER 88-099-13

1. QA Scope **QA SCOPE**

☒ Entire Modification
☐ Parts of Modification (Explain in Section 4)

2. Criterion Q4

3. Justification PROVIDE EMERGENCY CORE COOLING

4. Boundaries of QA Scope (if applicable)

FULL QA UP TO AND INCLUDING the FLOW CONTROL VALVE. THE DESIGN AND INSTALLATION OF RESTRAINTS SHOULD MEET SEISMIC 1 REQUIREMENTS. MATERIAL REQUIREMENTS SHALL BE DETERMINED DURING DESIGN PHASE.

5. Additional Considerations/Requirements

☒ Nuclear Safety Related
☐ Environmental Qualification Required
☐ Other (Explain)

6. QA Requirements (for portions of MR listed in Section 4)

Safety Related
☒ Full QA (per 10CFR50 App B; 10CFR21; QAPM Part 1)

Augmented Quality
☐ Regulatory Guide 1.97 Commitment
☐ Fire Protection QA (per 10CFR50 App J; QAPM App C)
☐ Radwaste Packaging QA (per 10CFR50 Subpart H; QAPM App D)
☐ Station Blackout QA (per Reg. Guide 1.155 App A)
☐ Other (Explain)

QA Review _____ Date 8/21/91

7. Changes (MR Step ~~2.20~~ Review)

NONE

8. Contractor Involvement ☒ Check if yes

Expected Installation: ☒ Outage: U2R17
☐ Other: _____

QA Review _____ Date 8/21/91

Form QAI 3.2-1
Revision 0

2.15 MODIFICATION ENGINEER - Review Routing PER 10CFR50.59

NRC Approval Required: ☐ No ☐ Yes (Contact NE)

2.16 REVIEWS AND APPROVALS

		Approved	Disapproved
☒ NPERS Review by _____	Date _____	☒	☐
☒ NSEAS Review by [signature]	Date 10/24/89	☒	☐
☒ Manager's Supervisory Staff Review MSSM No. 90-13 by [signature] (for MSS)	Date 07/10/90	☒	☐
☒ Other Reviews (specify) _____			
by _____	Date _____	☐	☐
by _____	Date _____	☐	☐
by _____	Date _____	☐	☐
by _____	Date _____	☐	☐

2.17 MANAGER - PBNP Approval

☒ Reviewed & Priority Satisfactory ☐ Reviewed & Changed Priority to _____

Responsibilities:

Final Design: NSEAS

Installation: M&C

Acceptance: OPS

Final Design Reviews (Manager - PBNP) to designate in Block 2.21; as a minimum should include groups responsible for operability and maintainability)

Scope of Training: ☒ Concur ☐ Change (Specify) _____

Modification Request ☒ Approved ☐ Disapproved [signature]

Date 07/10/90

2.18 DISTRIBUTION

Completed by MEB Date 7/17/90

2.19 RESPONSIBLE ENGINEER - Review

Establish schedule for completion of modification and related requirements. Identify design packages associated with this modification.

Modification Affects the Simulator: ☒ Yes (POSSIBLY) ☐ No

Responsible Engineer Julie Pederson Date 3-27-91

POINT BEACH NUCLEAR PLANT MODIFICATION REQUEST	MR NUMBER 88-099*B	Page 4 of 5

2.18

FINAL DESIGN

SCOPE: AFW mini-recirc lines for the motor-driven AFW pumps P38A&B will be increased in size from 1-½" to 2". This will increase the flow capacity from 30 gpm to approx. 80 gpm. In addition, flow indicating transmitters will be added to these lines

FINAL DESIGN DESCRIPTION:

See the attached items:

1. Design Inputs and Design Description
2. Final Design checklist
3. Isometric Drawings of the New Lines SK-AFW-008/009-88-099.
4. Piping Support Drawings PBA-1090 sheets 1-6 and SK-AFW-004,005,011
5. Transmitter Support Drawing SK-AFW-013/88-099
6. Electrical Layout and Wiring Drawings SK-AFW-011,012/88-099

Final design by John T. Schneider Date 8/29/91

Design verification by Debbie Cole Date 9/3/91
(reference QP 3-2)

2.19

FINAL DESIGN REVIEW

	SIGNATURE	DATE	COMMENTS	
☒ MTH		9/5/91	☐ None	☒ Attached
☒ OPS		9-5-91	☒ None	☐ Attached
☒ I&C		9-5-91	☐ None	☒ Attached
☐ RSE			☐ None	☐ Attached
☐ EIE			☐ None	☐ Attached
☐ NES→	Basic design by NES.		☐ None	☐ Attached
☐ Other	Design Review Signature Not required.		☐ None	☐ Attached
☐ Other			☐ None	☐ Attached

2.20

☑ QA ☐ Non-QA; Champs code: _____

BASIS:

☐ Quality Engineer _____ 9/4/91

FINAL DESIGN APPROVAL _____ Date 9/5/91

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Revision 5

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2.21 MODIFICATION ENGINEER: Review/Update

Manager's Supervisory Staff Review ☒ Yes ☐ No

50.59 Review Required ☒ Yes ☐ No

Approved X Disapproved _____

SER No. 91-025-02 ≠ 91-025-03 MSSM No. 91-12 / 91-

NRC Approval Required ☐ Yes ☒ No

2.22 RESPONSIBLE ENGINEER

Attach approved IWP:

Signature: John H. Schweda Date 9/6/91

2.22.10 MODIFICATION ENGINEER

Approve mod package and IWP:

Signature: WJS for Dat. 9/6/91

2.23 GENERAL SUPERINTENDENT - MAINTENANCE.

Installation Release – Note the two comments by JAS attached.

Final design, 10CFR50.59, and IWP are approved and adequate.

Signature: Koehler Date 9-6-91

2.27 MODIFICATION CLOSEOUT:

MR complete including completion of the installation work plan and the closeout checklist.

Responsible Engineer: John H. Schweda Date 12/3/91

Modification Engineer: WJS for Date 12/3/91

2.28 QUALITY ASSURANCE REVIEW:

☐ N/A ☒ Acceptance by [signature] Date 12/7/91

2.34 SUPERVISOR - STAFF SERVICES

Completion:

Documentation updates submitted and records complete

Signature R. G. Dent Date 12/18/91

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Revision 5

NUCLEAR POWER DEPARTMENT
DOCUMENT REVIEW

3 Doc. Review Package No. N/A

Sheet 1 of 1

INITIATOR

1 Document Title/Number/Revision/Date
Mod. 88-099+B P38A+B Mini-Recirc Lines

2 To: _____ Location: _____ Trans. #: _____
From: _____ Date: _____ Supt. Approval: _____
PLEASE REVIEW THIS DOCUMENT AND RETURN COMMENTS PRIOR TO _____

BLOCKS 4-6 TO BE COMPLETED BY REVIEWING ORGANIZATION

6 To: Mod Package Location: _____ Trans. #: _____
From: JAS Date: 9/3/91 Supt. Approval: _____
FEEDBACK REQUESTED: ☐ ORAL ☒ WRITTEN ☐ NONE

4 Comments:

Two issues have surfaced which need to be resolved before this mod package is released for installation

1. The reduced AFW due to the 3 minute time delay for the mini-recirc valve to close after reaching the upper flow setpoint was not addressed in the 50.59 evaluation.

2. FSAR section 14.1.10 "Loss of Normal Feedwater" was revised to discuss the non-seismic CSTs. The calculation which justified this change did not account for the reduced AFW due to the 3 minute time delay mentioned in #1 above.

Tim Dykstra from NES is working on resolution of these items.

7 Resolution:

1 & 2. A revised 50.59 safety evaluation has been written & approved documenting that the FSAR analysis is still met with the 3 minute time delay included.
SER 91-025-03

5 Comments By/Date:
Jack Schmidt 9/3/91

8 Resolution By/Date
Tim Dykstra 9/5/91

9 Review Date
Jack Schmidt 9/6/91

Copies to: Initiator
File _____

Form QP 5-3.1
Rev. 1

POINT BEACH NUCLEAR PLANT
STAFF DOCUMENT REVIEW

DOCUMENT NAME SER 91-025-03, Safety Evaluation for PSRA and PSDS Main Feedwater Line Modification

PROC/DOC. NO. SER-91-025-03
REV. NO. —
FILE NO. —
DATE 9/6/91

MSSM NO. ____
DATE ____
BY ____

Approved Manager [signature]
Date 9/6/91

REVIEW REQUIRED

MSSM POSITION	QUORUM INIT	DATE
Manager		
Gen Supt-OPS	[signature]	9/6/91
Reg Eng		
Gen Supt-MTN	[signature]	9-6-91
Supt-OPS	[signature]	9-6-91
Supt-TRN		
Supt-CHEM		
Supt-HP		
Supt-MTN		
Supt-I&C	[signature]	9-6-91
Supt-TCS		
MOE Engr		
MSE Engr		
EIE Engr		
IIE Engr		
AS-RES		

NOTES:

1. The provisions of 10 CFR 50.59 apply to all changes and must be evaluated and documented in accordance with QP 3.3, "Authorization of Changes, Tests, and Experiments." Attach QP 3-3.1 if review is required.

2. Technical Specification 15.6.8 applies for all procedural changes. A quorum of MSS members (four) must review the proposed change prior to approval by the manager.

3. For the purpose of review by an MSS quorum, only two alternate MSS members may be designated. They should be identified by placing an "A" adjacent to their position titles.

COMMENTS	INIT/DATE	RESOLUTION	INIT/DATE

RETURN TO DOCUMENT CONTROL UPON COMPLETION

NUCLEAR POWER DEPARTMENT
10 CFR 50.59 REPORT

Reference Document(s) # MR 88-099*B

Title of Proposed Modification,
Procedure Change, Test or Experiment Increased Auxiliary Feedwater Pump Mini-Recirc Line Flow Capacity

Prepared by Timothy T. Dulka Date 9/5/91

Reviewed by J. F. Sola Date 9/6/91

MSS Review/Date _____ MSS # _____

Manager - PBNP Approval _____ Date _____

In lieu of MSS and Manager signature, attached PBF-0026d if serial review has been conducted. (MSS and manager approval are not necessary for a determination of non-applicability.)

Section 1
Screening - Determination if Safety Evaluation is Required

A. Describe the modification, procedure change, test, or experiment and its expected effects. Include interim configurations or conditions.

Modification 88-099 replaces the existing mini-recirc lines of the Auxiliary Feedwater (AFW) Pumps with new larger capacity mini-recirc lines. The flow rate is increased to protect the pump from the adverse effects of hydraulic instability at low flow rates. The modification also adds recirc flow measurement instrumentation to provide local flow indication for in-service testing of the AFW pumps. MR 88-099 was initiated in response to NRC Bulletin 88-04 with refinements added by NRC Generic Letter 89-04. MR 88-099 is divided up into 4 parts. MR 88-099*A controls the installation for the Unit 1 steam driven AFW Pump (1P29), MR 88-099*B controls the installation for the two electric motor AFW Pumps (P38A & P38B), MR 88-099*C controls the installation for the Unit 2 steam driven AFW Pump (2P29) and MR 88-099*D controls the installation of conduit supports for P38A and P38B.

B. Does the change, test or experiment involve a change in the Technical Specification? If a change is required, briefly describe what the change should be and why it is required. NOTE: NRC approval is required prior to implementation. ___ Yes X No

C. 1. Will any system, structure or component (SSC) described in the PBNP FSAR, including its figures be altered? (Refer to step 2.1.2 for exception. This question may be answered "no" although the SSC is described in the PBNP FSAR.) X Yes ___ No

2. Could, within reasonable possibility, the proposed change affect the intended design, operation, function or method of function, of an SSC important to safety which is described in the PBNP FSAR? (This includes interim conditions.) ___ Yes X No

3. Will any procedure described in the PBNP FSAR be altered? ___ Yes X No

NUCLEAR POWER DEPARTMENT
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Section 1 - Continuation

4. Will a test or experiment be performed which is not described in the PBNP FSAR and affects the design, operation, function or method of function, of an SSC important to safety which is described in the PBNP FSAR? ___ Yes _X_ No

5. Will implementation affect a prior documented technical commitment to the NRC pertaining to the design, operation, function or method of function, of an SSC important to safety which is described in the PBNP FSAR? ___ Yes _X_ No

6. Is an evaluation required (are any of the above questions answered yes)? _X_ Yes ___ No

NOTE: If no, then provide basis for decision in Part D.
If yes, complete Sections 2 and 3.

D. Basis for determination that a safety evaluation is not required.

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Section 2
Determination if an Unreviewed Safety Question is Involved

A. List the licensing basis documents and sections where the system, structure, component, procedure, test, or experiment is described.

FSAR Sections 10.1, 10.2.2, 10.3, 10.4, 14.1.9, 14.1.10, 14.1.11, 14.2.4
Tech Specs 15.3.4.C, 15.4.8
NRC SERs dated 1/27/81, 4/21/82, 9/16/86

B. 1. Does the proposed activity increase the probability of occurrence of an accident previously evaluated in the PBNP FSAR? ___ Yes _X_ No

The accidents "Loss of External Electrical Load" (FSAR 14.1.9), "Loss of Normal Feedwater" (FSAR 14.1.10), "Loss o All AC Power to the Auxiliaries" (FSAR 14.1.11) and "Steam Generator Tube Rupture" (FSAR 14.2.4) are the accidents in the FSAR that involve the AFW System. In each case the AFW system is used to mitigate the consequences of the accident and is not a factor in the occurrence.

2. Does the proposed activity increase the consequences of an accident previously evaluated in the PBNP FSAR? ___ Yes _X_ No

Of the 4 accidents analyzed for in the PBNP FSAR the worst case accident involving the AFW system is the "Loss of Normal Feed Water". The accident analysis assumes an AFW flow of 100 gpm to the affected steam generators and concludes that during the accident there will be enough water inventory in the steam generators to provide cooling to the reactor coolant system. After each AFW pump is up to rated speed and flow, a shut signal is sent to it's associated min recirc valve which shuts after a 3 minute delay time. Calculation N-91-069 shows that each motor-driven AFW pump will deliver 111 gpm with it's mini-recirc valve full open vice the nominal 200 gpm flow. Calculation N-91-032 shows that each turbine-driven AFW pump will deliver 324 gpm with it's mini-recirc valve full open vice the nominal 400 gpm. If we apply single failure criteria to the safety related components of the AFW system, and the single failure is either AF-4007 or AF-4014 sticking open after the 3 minute delay time, each turbine-driven AFW pump at 324 gpm for 3 minute and 400 gpm thereafter, one motor-driven AFW pump at 111 gpm for 3 minutes and 200 gpm thereafter and the other motor-driven AFW pump at 111 gpm provide adequate flow to the steam generators for decay heat removal.

For the Loss of Normal Feedwater due to a seismic event, Calculation N-91-007 shows that the increased size of the m recirc line does not degrade the decay heat removal capability during the event.

3. Does the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the PBNP FSAR? ___ Yes _X_ N

The purpose of the new recirc line is to ensure the flow through the AFW pump will always be greater than the minir required to prevent pump damage due to low flow operation. The minimum flow requirement provided by the manufacturer is 70 gpm. The controls for AF-4007 and AF-4014 will be set to maintain a pump flow of at least 80 g Thus the increased recirc flow will reduce the possibility of AFW pump damage during the loss of normal feedwater accident.

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Section 2 - Continuation

4. Does the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the PBNP FSAR? ___ Yes _X_ No

The most limiting malfunction for the safety related components in the AFW system is the failure of one of the steam driven AFW pumps. This is analyzed for in the worst case accident of Loss of Normal Feedwater. The increase in the size of the mini-recirc line does not increase the consequences of this malfunction. If our single failure is the loss of the AFW pump, then both AF-4007 and AF-4014 are assumed to function properly and the mini-recirc lines will be isolated during the accident.

5. Does the proposed activity create the possibility of an accident of a different type than any previously evaluated in the PBNP FSAR? ___ Yes _X_ No

The new recirc lines have the same basic design configuration as the existing recirc lines.

6. Does the proposed activity create the possibility of a malfunction of equipment important to safety of a different type than any previously evaluated in the PBNP FSAR? ___ Yes _X_ No

After each AFW pump is up to rated speed and flow, a shut signal is sent to it's associated mini-recirc valve which shut after a 3 minute delay time. Calculation N-91-069 shows that each motor-driven AFW pump will deliver 111 gpm with it's mini-recirc valve full open vice the nominal 200 gpm flow. Calculation N-91-032 shows that each turbine-driven AFW pump will deliver 324 gpm with it's mini-recirc valve full open vice the nominal 400 gpm. If we apply single failure criteria to the safety related components of the AFW system, and the single failure is either AF-4007 or AF-401 sticking open after the 3 minute delay time, each turbine-driven AFW pump at 324 gpm for 3 minutes and 400 gpm thereafter, one motor-driven AFW pump at 111 gpm for 3 minutes and 200 gpm thereafter and the other motor-driven AFW pump at 111 gpm provide adequate flow to the steam generators for decay heat removal. For the Loss of Norma Feedwater due to a seismic event, Calculation N-91-007 shows that the increased size of the mini-recirc line does not degrade the decay heat removal capability during the event.

The new malfunction is within the scope of the analysis for the Normal Loss of Feedwater accident. Both AF-4007 an AF-4014 are included in the ASME Section XI test program and are verified to operate properly by IT-290

7. Does the proposed activity reduce the margin of safety defined in the Basis for any Technical Specification? ___ Yes _X_ No

Tech Spec 15.3.4.C allows for one motor-driven AFW pump to be taken out of service for maintenance or testing for period of 7 days. For a period of time during the installation, all 4 of the AFW mini-recirc lines will be isolated. Du this time no inservice pumps will be considered inoperable because pump discharge paths will be maintained. The installation also requires that one motor-driven AFW pump be taken out of service and then returned to service at a ti The requirements of the TS 7 day LCO will be invoked when an AFW pump is taken out of service, therefore there i reduction in the margin of safety.

DOES THE CHANGE, TEST OR EXPERIMENT INVOLVE AN UNREVIEWED SAFETY QUESTION? (IS THE ANSWER TO ANY OF THE ABOVE QUESTIONS YES?) ___ Yes _X_ N

NUCLEAR POWER DEPARTMENT
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Section 3
Evaluation Summary

Modification 88-099 replaces the existing mini-recirc lines of the auxiliary feedwater (AFW) pumps with new larger capacity mini-recirc lines. The flow rate is increased to protect the pump from the adverse effects of hydraulic instability at low flow rates. The modification also adds recirc flow measurement instrumentation to provide local flow indication for inservice testing of the AFW pumps. MR 88-099 was initiated in response to NRC Bulletin 88-04 with refinements added by NRC Generic Letter 89-04. MR 88-099 is divided up into 4 parts. MR 88-099*A controls the installation for the Unit 1 steam-driven AFW Pump (1P29), MR 88-099*B controls the installation for the two electric motor-driven AFW Pumps (P38A & P38B), MR 88-099*C controls the installation for the Unit 2 steam-driven AFW Pump (2P29) and MR 88-099*D controls the installation of conduit supports for P38A and P38B. This 10 CFR 50.59 safety evaluation is for MR 88-099*B only. MRs 88-099*A, C, D will be covered by other safety evaluations.

The capacity of the mini-recirc lines for the motor-driven AFW pumps will be increased from 30 gpm to a minimum of 7 gpm based on the recommendation of the manufacturer, Byron Jackson Products. The increased flow through the mini-recirc line is to protect the pumps from the adverse effects of hydraulic instability at low flow rates. After each AFW pump is up to rated speed and flow, a shut signal is sent to it's associated mini-recirc valve which shuts after a 3 minute delay time. Calculation N-91-069 shows that each motor-driven AFW pump will deliver 111 gpm with it's mini-recirc valve full open vice the nominal 200 gpm flow. Calculation N-91-032 shows that each turbine-driven AFW pump will deliver 324 gpm with it's mini-recirc valve full open vice the nominal 400 gpm. If we apply single failure criteria to the safety related components of the AFW system, and the single failure is either AF-4007 or AF-4014 sticking open after th 3 minute delay time, each turbine-driven AFW pump at 324 gpm for 3 minutes and 400 gpm thereafter, one motor-drive AFW pump at 111 gpm for 3 minutes and 200 gpm thereafter and the other motor-driven AFW pump at 111 gpm provi adequate flow to the steam generators for decay heat removal.

For the Loss of Normal Feedwater due to a seismic event, Calculation N-91-007 shows that the increased size of the mi recirc line does not degrade the decay heat removal capability during the event.

The new malfunction is within the scope of the analysis for the Normal Loss of Feedwater accident. Both AF-4007 and AF-4014 are included in the ASME Section XI test program and are verified to operate properly by IT-290

This modification will be completed with both unit 1 and unit 2 at power. For a period of time during the installation, 4 AFW mini-recirc lines will be isolated. During this time, all 4 AFW pumps will be considered inservice and operabl because the minimum flow requirements for the AFW pumps will be ensured through discharge paths to the steam generators. For the steam-driven pumps, the valves in the discharge paths to the steam generators are normally open. For the motor-driven pumps, the normally closed diaphragm operated valves (AF-4012 and AF-4019) in discharge path for their respected pumps will be throttled open to provide a discharge path to the steam generators. To complete the installation, one motor-driven AFW pump will be taken out of service and then returned to service at a time under the provisions of TS 15.3.4.C. Since the TS allows for a motor-driven AFW pump to be taken out of service for mainten or testing for a period of 7 days, there is no reduction in the margin of safet . Prior to placing the AFW pump back i service the testing required by TS 15.4.8 will be completed.

The AFW system is a Seismic Class 1 system. NRC SER dated 9/16/86 requires that the mini-recirc lines be Seismic Class 1 to the second isolation in series from the discharge of the AFW pump. The piping and supports for the compl modification have been designed to meet the Class 1 requirements. During the installation on the mini-recirc lines, temporary supports will be installed as needed to maintain the seismic qualification of any inservice AFW pump. In addition, due to the mini-recirc line modifications, two supports in the motor-driven AFW pump discharge lines (DB3 and DB3-H11) and one support in their cross connecting line (DB3-2H6) will require modification. Again, temporary supports will be installed, as needed prior to beginning modification work on any of these supports to maintain the sei qualification of any inservice AFW pump.

This modification does not involve an unreviewed safety question.

NUCLEAR POWER DEPARTMENT
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Reference Document(s) # MR 88-099*B

Title of Proposed Modification,
Procedure Change, Test or Experiment Increased Auxiliary Feedwater Pump Mini-Recirc Line Flow Capacity

Prepared by Timothy J. Rykstra Date 7/15/91

Reviewed by Julie Pedersen Date 7-15-91

For the MSS James Meinhart MSS # 91-12

Manager - PBNP Approval [signature] Date 7/16/91

In lieu of MSS and Manager signature, attached EQR-26d if serial review has been conducted. (MSS and manager approval are not necessary for a determination of non-applicability.)

Section 1
Screening - Determination if Safety Evaluation is Required

A. Describe the modification, procedure change, test, or experiment and its expected effects. Include interim configurations or conditions.

Modification 88-099 replaces the existing mini-recirc lines of the Auxiliary Feedwater (AFW) Pumps with new larger capacity mini-recirc lines. The flow rate is increased to protect the pump from the adverse effects of hydraulic instability at low flow rates. The modification also adds recirc flow measurement instrumentation to provide local flow indication for in-service testing of the AFW pumps. MR 88-099 was initiated in response to NRC Bulletin 88-04 with refinements added by NRC Generic Letter 89-04. MR 88-099 is divided up into 4 parts. MR 88-099*A controls the installation for the Unit 1 steam driven AFW Pump (1P29), MR 88-099*B controls the installation for the two electric motor AFW Pumps (P38A & P38B), MR 88-099*C controls the installation for the Unit 2 steam driven AFW Pump (2P29) and MR 88-099*D controls the installation of conduit supports for P38A and P38B.

B.

1.	Will any system, structure or component (SSC) described in the PBNP FSAR, including its figures be altered? (Ref. 2.1.2 for exception. This question may be answered "no" although the SSC is described in the FSAR.)	X Yes	___ No
2.	Could, within reasonable possibility, the proposed change affect the intended design, operation, function or method of function, of an SSC important to safety which is described in the PBNP FSAR?	___ Yes	X No
3.	Will any procedure described in the PBNP FSAR be altered?	___ Yes	X No
4.	Will a test or experiment be performed which is not described in the PBNP FSAR and affects the design, operation, function or method of function, of an SSC important to safety which is described in the PBNP FSAR?	___ Yes	X No
5.	Will implementation of a prior documented technical commitment to the NRC pertaining to the design, operation, function or method of function, of an SSC important to safety which is described in the PBNP FSAR be altered?	___ Yes	X No
6.	Is an evaluation required (are any of the above questions answered yes)?	X Yes	___ No

NOTE: If no, then provide basis for decision in Part C.
If yes, complete Sections 2-4.

Section 2
Determination if an Unreviewed Safety Question is Involved

A. List the licensing basis documents and sections where the system, structure, component, procedure, test, or experiment is described.

FSAR Sections 10.1, 10.2.2, 10.3, 10.4, 14.1.9, 14.1.10, 14.1.11, 14.2.4
Tech Specs 15.3.4.C, 15.4.8
NRC SERs dated 1/27/81, 4/21/82, 9/16/86

B. 1. Does the proposed activity increase the probability of occurrence of an accident previously evaluated in the PBNP FSAR? ___ Yes _X_ No

The accidents "Loss of External Electrical Load" (FSAR 14.1.9), "Loss of Normal Feedwater" (FSAR 14.1.10), "Loss of All AC Power to the Auxiliaries" (FSAR 14.1.11) and "Steam Generator Tube Rupture" (FSAR 14.2.4) are the accidents in the FSAR that involve the AFW system. In each case the AFW system is used to mitigate the consequences of the accident and is not a factor in the occurrence.

2. Does the proposed activity increase the consequences of an accident previously evaluated in the PBNP FSAR? ___ Yes _X_ No

Of the 4 accidents analyzed for in the PBNP FSAR the worst case accident involving the AFW system is the "Loss of Normal Feed Water". The accident analysis assumes an AFW flow of 100 gpm to the affected steam generators and concludes that during the accident there will be enough water inventory in the steam generators to provide cooling to the reactor coolant system. Calculation N-91-069 analyzes the impact of an AFW pump mini-recirc valve (AF-4007/AF-4014) sticking open. The calculation shows that the pump will still deliver 111 gpm vice the 200 gpm nominal flow. If we apply single failure criteria to the safety related components of the AFW system, and the single failure is either AF-4007 or AF-4014 sticking open, the 2 steam driven AFW pumps at 400 gpm each, the one electric AFW pump at 200 gpm and the other electric AFW pump at 111 gpm provide adequate flow to the steam generators for decay heat removal.

3. Does the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the PBNP FSAR? ___ Yes _X_ No

The purpose of the new recirc line is to ensure the flow through the AFW pump will always be greater than the minimum required to prevent pump damage due to low flow operation. The minimum flow requirement provided by the manufacturer is 70 gpm. The controls for AF-4007 and AF-4014 will be set to maintain a pump flow of at least 80 gpm. Thus the [illegible] recirc flow will reduce the possibility of AFW pump damage during the loss of normal feedwater accident.

4 Does the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the PBNP FSAR? ___ Yes _X_ No

The most limiting malfunction for the safety related components in the AFW system is the failure of one of the steam driven AFW pumps. This is analyzed for in the worst case accident of Loss of Normal Feedwater. The increase in the size of the mini-recirc line does not increase the consequences of this malfunction. If our single failure is the loss of the AFW pump, then both AF-4007 and AF-4014 are assumed to function properly and the mini-recirc lines will be isolated during the accident

Section 2 - Continuation

5. Does the proposed activity create the possibility of an accident of a different type than any previously evaluated in the PBNP FSAR? ___ Yes X No

The new recirc lines have the same basic design configuration as the existing recirc lines.

6. Does the proposed activity create the possibility of a malfunction of equipment important to safety of a different type than any previously evaluated in the PBNP FSAR? ___ Yes X No

Calculation N-91-069 analyzes the impact of either AF-4007 or AF-4014 sticking open. The calculation shows that the pump will still deliver 111 gpm vice the 200 gpm nominal flow to the steam generator(s). If we apply single failure criteria to the safety related components of the AFW system and the single failure is either AF-4007 or AF-4014 sticking open, the 2 steam driven AFW pumps at 400 gpm each, the one electric AFW pump at 200 gpm and the other AFW pump at 111 gpm provide adequate flow to the steam generators for decay heat removal. The new malfunction is within the scope of the analysis for the Normal Loss of Feedwater accident. Both AF-4007 and AF-4014 are included in the ASME Section XI test program and are verified to operate properly by IT-290

7. Does the proposed activity reduce the margin of safety defined in the Basis for any Technical Specification? ___ Yes X No

Tech Spec 15.3.4.C allows for one motor-driven AFW pump to be taken out of service for maintenance or testing for a period of 7 days. For a period of time during the installation, all 4 of the AFW mini-recirc lines will be isolated. During this time no inservice pumps will be considered inoperable because pump discharge paths will be maintained. The installation also requires that one motor-driven AFW pump be taken out of sevice and then returned to service at a time. The requirements of the TS 7 day LCO will be invoked when an AFW pump is taken out of service, therefore there is no reduction in the margin of safety.

DOES THE CHANGE, TEST OR EXPERIMENT INVOLVE AN UNREVIEWED SAFETY QUESTION? (IS THE ANSWER TO ANY OF THE ABOVE QUESTIONS YES?) ___ Yes X No

Section 3
Determination if a Technical Specification Change is Involved

Does the change, test or experiment involve a change in the Technical Specification? ___ Yes X No

If a change is required, briefly describe what the change should be and why it is required.

Section 4
Evaluation Summary

Modification 88-099 replaces the existing mini-recirc lines of the auxiliary feedwater (AFW) pumps with new larger capacity mini-recirc lines. The flow rate is increased to protect the pump from the adverse effects of hydraulic instability at low flow rates. The modification also adds recirc flow measurement instrumentation to provide local flow indication for inservice testing of the AFW pumps. MR 88-099 was initiated in response to NRC Bulletin 88-04 with refinements added by NRC Generic Letter 89-04. MR 88-099 is divided up into 4 parts. MR 88-099*A controls the installation for the Unit 1 steam-driven AFW Pump (1P29), MR 88-099*B controls the installation for the two electric motor-driven AFW Pumps (P38A & P38B), MR 88-099*C controls the installation for the Unit 2 steam-driven AFW Pump (2P29) and MR 88-099*D controls the installation of conduit supports for P38A and P38B. This 10 CFR 50.59 safety evaluation is for MR 88-099*B only. MRs 88-099*A, C, D will be covered by other safety evaluations.

The capacity of the mini-recirc lines for the motor-driven AFW pumps will be increased from 30 gpm to a minimum of 70 gpm based on the recommendation of the manufacturer, Byron Jackson Products. The increased flow through the mini-recirc line is to protect the pumps from the adverse effects of hydraulic instability at low flow rates. Calculation N-91-069 analyzes the impact of the increased mini-recirc flow if either AF-4007 or AF-4014 sticks open. The calculation shows that the pump will still deliver 111 gpm vice the 200 gpm nominal flow to the steam generator(s). If we apply single failure criteria to the safety related components of the AFW system and the single failure is either AF-4007 or AF-4014 sticking open, the 2 steam-driven AFW pumps at 400 gpm each, the one electric AFW pump at 200 gpm and the other AFW pump at 111 gpm provide adequate flow to the steam generators for decay heat removal. The new malfunction is within the scope of the analysis for the Normal Loss of Feedwater accident. Both AF-4007 and AF-4014 are included in the ASME Section XI test program and are verified to operate properly by IT-290

This modification will be completed with both unit 1 and unit 2 at power. For a period of time during the installation, all 4 AFW mini-recirc lines will be isolated. During this time, all inservice AFW pumps will be considered operable because the minimum flow requirements for the AFW pumps will be ensured through discharge paths to the steam generators. For the steam-driven pumps, the valves in the discharge paths to the steam generators are normally throttled open. For a motor-driven pump, the normally closed diaphragm operated valve (AF-4012 or AF-4019) in the pump discharge path will be throttled open to provide a discharge path to the steam generators. To complete the installation, one motor-driven AFW pump will be taken out of service at a time under the provisions of TS 15.3.4.C. Since the TS allows for a motor-driven AFW pump to be taken out of service for maintenance or testing for a period of 7 days, there is no reduction in the margin of safety. Prior to placing the AFW pump back in service the testing required by TS 15.4.8 will be completed.

Section 4
Evaluation Summary

The AFW system is a Seismic Class 1 system. NRC SER dated 9/16/86 requires that the mini-recirc lines be Seismic Class 1 to the second isolation valve in series from the discharge of the AFW pumps. The piping and supports for the completed modification have been designed to meet the Seismic Class 1 requirements. During installation work on the mini-recirc lines the seismic qualification of any inservice AFW pump will be maintained. Due to the mini-recirc line modifications, two supports in the motor-driven AFW pump discharge lines (DB3-2H7 and DB3-H11) and one support in their cross connecting line (DB3-2H6) will require modification. Temporary supports will be installed as needed prior to beginning modification work on any of these supports to maintain the seismic qualification of any inservice AFW pump.

This modification does not involve an unreviewed safety question.

MODIFICATION REQUEST 88-099*B
FINAL DESIGN DESCRIPTION

DESIGN INPUTS:

1. ANSI B31.1, 1967
2. BECHTEL LINE CLASS DB-3 AND JG-4
3. Byron Jackson Products Recommendation On Minimum Flow
4. Sargent & Lundy Piping Analysis (Accession #100070)
5. Sargent & Lundy Memos Dated 8/27/91 & 8/28/91
6. Calculations N-91-063 & N-91-069
7. NRC Bulletin 88-04
8. NRC Generic Letter 89-04
9. PBNP 3.2.5, "PBNP Pressure Test Program"
10. IT-10, "Electrically-Driven AFW Pumps"
11. Memo NPM-91-0704 On Radiography Requirements
11. Drawings:
    P&IDs, Bechtel M-217, M-209 sheet 4
    ISO, Bechtel P-103
    Electrical, Bechtel E-98 sheet 4
    Support, Bechtel DB-3-H206, 207, 208, 209

DESIGN DESCRIPTION:

Modification 88-099 increases the capacity of the Auxiliary Feedwater (AFW) mini-recirc lines and adds flow measurement instrumentation to these lines. MR 88-099 was initiated in response to NRC Bulletin 88-04 with refinements added by NRC Generic Letter 89-04. Design package B of the modification is for the motor-driven AFW pumps, P38A and P38B.

The capacity of the recirc lines is being increased from the present capacity of 30 gpm to approximately 80 gpm. The original recirc line capacity was established solely on the basis of pumped fluid temperature rise. In order to protect the pumps from the effects of hydraulic instability at low flow rates, the capacity of the recirc line will be increased per the recommendations of the manufacturer, Byron Jackson Products, to a minimum of 70 gpm. To ensure this minimum flow is met, the setpoints for the valve's controlling instrumentation will be adjusted so that the mini-recirc valve is open when flow in the discharge line is less than 80 gpm.

The size of the recirc piping from the branch off point on the discharge of the AFW Pumps to the common mini-recirc return header was increased from 1 1/2 inches to 2 inches. Appropriate sizing of the AFW recirc line was verified by Calculation N-91-063. The piping class is Bechtel DB-3 up to the manual globe valves (AF-27 & 40), and Bechtel line class JG-4 from the manual globe valves to the return header. The new components meet the pressure and temperature ratings for these line classes. These line classes call out carbon steel materials, however due to wear concerns the new piping components will be stainless steel. The use of stainless steel piping was incorporated into the Sargent & Lundy piping anlaysis of the modification (Accession No. 100070).

The piping up to and including the control valve, AF-4007/AF-4014, in the mini recirc lines is QA scope. All new piping supports will also be QA due to seismic concerns. The transmitter support does not need to be seismic since the transmitter is non-QA and is not located above any safety related equipment. The detailed layout of the new mini-recirc lines can be seen on Working Drawings SK-AFW-008 & 009/88-099. The details of the individual supports are shown on Working Drawings PBA-1070 sheets 1-6 and SK-AFW-013, 014, 015 & 016/88-099. Reference the Bill Of Materials for a list of the materials to be used and applicable purchase order numbers.

The 2 inch check valve, AF-115/AF-116, and control valve, AF-4007/AF-4014, are safety related valves. The check valve is a Rockwell 1500# class lift check valve, figure number 3674F316J. The control valve is a 2 inch 1500#, Copes Vulcan globe valve with a D-100-160 operator. The control valve was purchased from Marble Hill and was refurbished by plant maintenance prior to installation. This refurbishment was accomplished under MWR #911143 and included replacing the diaphragm and packing, touching up the painted surfaces on the valve operator, and a general cleaning and visual inspection. The refurbishment was necessary since the valve has been in long term storage. In additon, a manual handwheel and new smaller capacity spring will be added to the valve per MWR #913605. The handwheel is needed so that a recirc path can be made available in the event instrument air is lost to the valves. The spring is being changed out since the handwheels were found to be hard to operate with the existing spring which is rated for primary system pressure. The new spring was sized for 1440 psig which is above the shutoff head of the AFW pumps. The Copes Vulcan engineering department selected the necessary spring and they were purchased via P.O.#189332. The use of the new spring will require that the valves are set up with a 32 psig precompression. The valves will be set up per MI 5.2 in the MWR and the regulator set in the IWP.

Beyond the QA boundary a stainless steel plate orifice and flange will be installed for flow measurement. Local indication will be provided by a Rosemount differential pressure transmitter, model

no.1151DP5S22B1M5, with an integral LCD meter. The transmitter will be wall mounted and power will be supplied from a nearby receptacle circuit, which is powered from Panel 7L25. The additional load on this circuit will be insignificant. Cable and raceway schedules have been generated and are attached to the IWP. The DC power supply will be installed in an enclosure mounted near the transmitter. A valve manifold, isolation valves and tee will be provided for testing and calibration of the transmitter. The transmitter will be installed below the pipeline with its sensing lines sloped up to the flange connections at the piping centerline so that any air in the lines vents to the piping.

On the vertical portion of the piping, a flow restricting orifice will be installed to limit the flow rate to approximately 80 gpm. A manual 2 inch, globe valve will replace the existing 1 1/2 inch globe valve, AF-27/AF-40. The vertical section of the recirc lines for the P38A and P38B AFW pumps will be routed along the edge of the south wall in the cubicle. The recirc line will tie into the common mini-recirc return header via a half coupling. The existing 1-1/2" mini-recirc line will be cut off near the common header and capped.

Calculation N-91-069 estimated the effect the increased size of the recirc line would have on flow rates to the steam generators if AF-4007 or AF-4014 stuck open. The calculation shows that the affected pump would deliver 111 gpm instead of the 200 gpm nominal flow to the steam generator. If we apply single failure criteria to the safety related components of the AFW system and the single failure is either AF-4007 or AF-4014 sticking open, the steam driven AFW pumps at 400 gpm each, one electric AFW pump at 200 gpm, and the other electric AFW pump at 111 gpm still provide adequate flow to the steam generators for heat removal (this is addressed in the safety evaluation). It can be noted that manual valve AF-27/AF-40 could be used to isolate the recirc line if the control valve stuck open. In addition, the mini-recirc valves have position indication in the control room that would identify this failure. AF-4007 & AF-4014 were recently added to the ASME Section XI test program and are verified to open and close in IT-10.

The new recirc lines were seismically analyzed by Sargent & Lundy (Accession #100070). The piping was analyzed to meet the requirements of ASME Section III, Subsection NC of the Boiler & Pressure Vessel Code 1977 issue through winter 1978 addenda. An Impell study reconciles this code to the original construction code ANSI B31.1., 1967. Three new supports will be added and one existing support modified for each mini-recirc line. Two of the existing supports in each min-recirc line will be removed. In addition to these supports, three supports in the pump discharge lines will also require modification. The support details are shown in the drawings referenced earlier.

New conduit supports for the AFW pump motor cables will be installed by M.R. 88-099*D prior to starting work on the new recirc line. The new conduit supports were required in order to provide sufficient space for the new AF-4007 and AF-4014 valves.

The modification for P38A and P38B will be completed between the 1991 Unit 1 refueling outage and the 1991 Unit 2 refueling outage. The installation will require that all four AFW pump mini-recirc lines are isolated for a period of time. During this period of time a discharge path ensuring minimum flow will be met if any inservice AFW pump starts will be maintained by the use of administrative controls. During the installation of the tie-ins to the pump discharge lines and during the discharge line support work the affected pump, P38A or P38B, will be taken out of service under the provisions of the Tech Spec 7 day LCO. The support work will proceed such that all of the piping connected to the inservice AFW pumps remains seismic. The requirements that ensure this occurs are listed in the memo from Sargent & Lundy dated 8/27/91 (copy attached) and are incorporated in the IWPs.

As required by ANSI B31.1, 1967 visual examinations of all welds will be performed. The 900# class section of piping between the new check valves and the manual valves and the 150# class section of piping between the manual valves and the common mini-recirc return header will be hydro tested per PBNP 3.2.5. A hydro test at 1.5 times the design pressure for the welds upstream of the new check valve is not possible since there is no isolation valve or flange between this piping and the pump suction. Therefore an initial service leak test along with liquid penetrant NDE will be performed on the new welds. As noted in memo NPM 91-0704, radiography of the welds to the pump discharge lines is not required.

After installation, the new recirc lines will be leak and functionally tested. In addition, the pump discharge valves AF-4012 and AF-4019 will be stroked and the pump inservice test (IT-10) run. The IWP contains the details of the testing.

Modification Request 88-099*B
Final Design Description Attachment SHEET 1 of 3

Check Valve Sizing:

According to the Rockwell Edwards Tech Manual (CI00526), for trouble free check valve service the pressure drop over the check value must either be;

1. Greater than the ΔP required for full lift which is 5 psid for this check value or,
2. Greater than 25% of $\Delta P_{full\ lift}$ (1.25 psid) if good inlet flow conditions exist. Good inlet flow is defined as having 8 to 10 pipe diameters of straight pipe at the valve inlet in the Tech Manual. Note that a recent EPRI study states that 5 pipe diameters is adequate.

The ΔP over the check value is calculated per the equation given in the Tech Manual:

$$\Delta P = \left[\frac{w}{\beta C_V}\right]^2 \frac{1}{\rho}$$

$$w = 80 \frac{gal}{min} \times \frac{60\ min}{hr} \times .13368 \frac{ft^3}{gal} \times 62.4 \frac{lb}{ft^3}$$

$$w = 40{,}040\ lb/hr$$

$$\Delta P = \left[\frac{40{,}040}{(633)(60)}\right]^2 \frac{1}{62.4} = 1.78\ psid$$

Check Valve Sizing Continued:

Therefore the ΔP over the check valve is approx. 36% of the ΔP required for full lift however as seen on the isometric drawings there is only approx. 6" or 3 pipe diameters of straight pipe before the valve inlet.

These conditions may be slightly below the optimum conditions for check valve wear concerns however the use of this check valve is considered justified in this case since;

- The ΔP across the valve is above the minimum 25% of $\Delta P_{full\ lift}$.
- There is some straight pipe before the valve inlet.
- The AFW system is a standby system which is not in constant use. It is only placed in service for startups/shutdowns and for testing. and therefore wear, fatigue concerns are not that significant.

Modification Request 88-099*B
Final Design Description Attachment SHEET 3 of 3

Check Valve Sizing Continued:

- Even if the check valve failed, there would not be a safety concern. The check valves prevent flow from being forced backwards thru a non operating pump. The windmilling of the pump would not be a concern due to the pump rotating assembly design using o-ring rings.

John A Schwede
9/4/91

MR 88-099*B

M. Rowan 8/29/91
N/A

ADDED LOAD JUSTIFICATION FOR BREAKER 7L-25

REFERENCES:

BECHTEL DRAWING E-29 SHEET 27
MASTER DATA BOOK 3.2.9 PANEL 7L REV. 2

PRESENT LOAD: 8 DUPLEX RECEPTACLES

PER SECTION 220-3 (c)(5) OF THE 1990 NATIONAL ELECTRICAL CODE, EACH DUPLEX RECEPTACLE IS A 180 VA LOAD.

∴ TOTAL PRESENT LOAD = 8 x 180 VA
= 1440 VA OR 12 AMPS @ 120V.

ADDED LOAD: FOUR ROSEMOUNT TRANSMITTER POWER SUPPLIES

EACH POWER SUPPLY DRAWS ≈3 VA PER VENDOR DATA.

ADDED LOAD = 4 x 3VA = 12VA

∴ TOTAL DESIGNED LOAD = 1440VA + 12VA
= 1452VA OR 12.1 AMPS @ 120V.

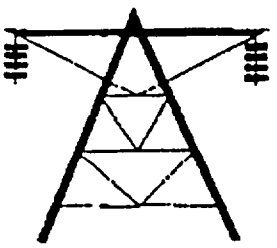
CONCLUSION:

SINCE BREAKER 7L-25 IS A 20 AMP BREAKER THE ADDED 0.1 AMP IS NEGLIGIBLE.

BW/IP International, Inc.
Pump Division

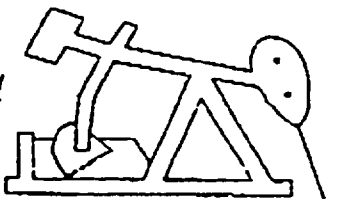
695 Church Rd. 708-741-0400
Elgin, IL 60123 800-888-3194

Fax 708-741-0687



Byron Jackson *United Centrifugal*

Products *Pumps*



Date: Sept 4 91 Total # of Pages: 5

To: JOHN SCHROEDER WEPCO
Location/Dept.

From: TOM DZUBIN ELGIN
Location/Dept.

CC. Attention

Subject S/N 691 S 1028/29
691 S 1030/31

Message: JOHN,

ATTACHED IS FOR MINIMUM FLOW ORIFICE. IF YOU NEED ANY MORE INFO PLEASE CALL

BW/IP International, Inc.

Byron Jackson Products
United Centrifugal Pumps
Pump Division

[illegible] Road

[illegible] 60123

Telephone [illegible]
Telex [illegible]
Fax [illegible]

7 August 1989

Wisconsin Electric Power Company
P.O. Box 2046
Milwaukee, Wisconsin 53201

Attention: Mr. R. A. Newton
General Superintendent - NSEAS

Attention: Mr. J. P. Austin

Subject: Wisconsin Electric P.O. No. 139764
Byron Jackson Job No. 891-C-2264.21
Minimum Flow Analysis

Gentlemen:

Thank you for your continued interest in Byron Jackson pumps. We are pleased to present the following report. This report concerns information regarding minimum flow rates for auxiliary feed water pumps at the Point Beach Nuclear Plant. This data was analyzed in accordance with minimum flow requirements as outlined in NRC bulletin 88-04.

In reviewing the files, it was noted that there are four (4) auxiliary feed pumps at the Point Beach Nuclear Station. While these pumps are identical in model number, they are slightly different. S/N 691-S-1028 and 1029 are designed for 400 GPM at 2754 feet. S/N 691-S-1030 & 1031 are also designed for 2754 feet of TDH but at 200 GPM. Both pumps used the same 1st stage hydraulics, but with a different series configuration.

The following guide lines should be followed in order to avoid damage due to operation at reduced flow rate:

S/N 691-S-1028/29: 1P29, 2P29

Accumulated Time (Hrs/Year)	Min. Flow (GPM)	% B.E.P.
1500	210	42
60-1500	130	26
→60	100 ←	20

S/N 691-S-1030/31: P38A & P38B

Accumulated Time (Hrs/Year)	Min. Flow (GPM)	% B.E.P.
1500	105	28
60-1500	75	20
→ 60	70 ←	19

Operation at 30 GPM should be avoided for both pumps.

This concludes the work requisition on purchase order 139764. We trust that this information is satisfactory. If you require additional information, please do not hesitate to contact me.

Very truly yours,

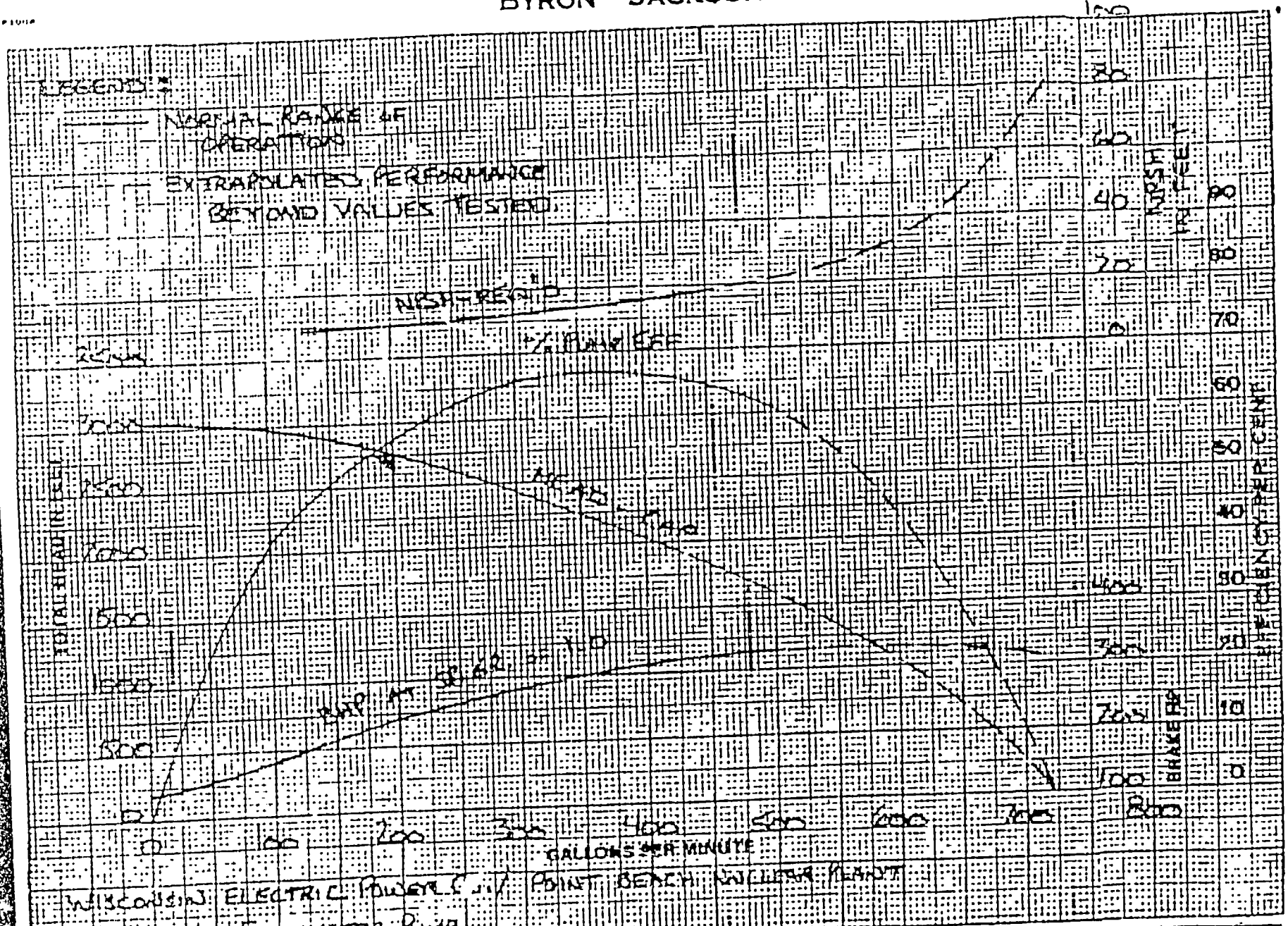
BW/IP INTERNATIONAL, INC.
PUMP DIVISION

W. Fred Grondhuis
Senior Sales Engineer

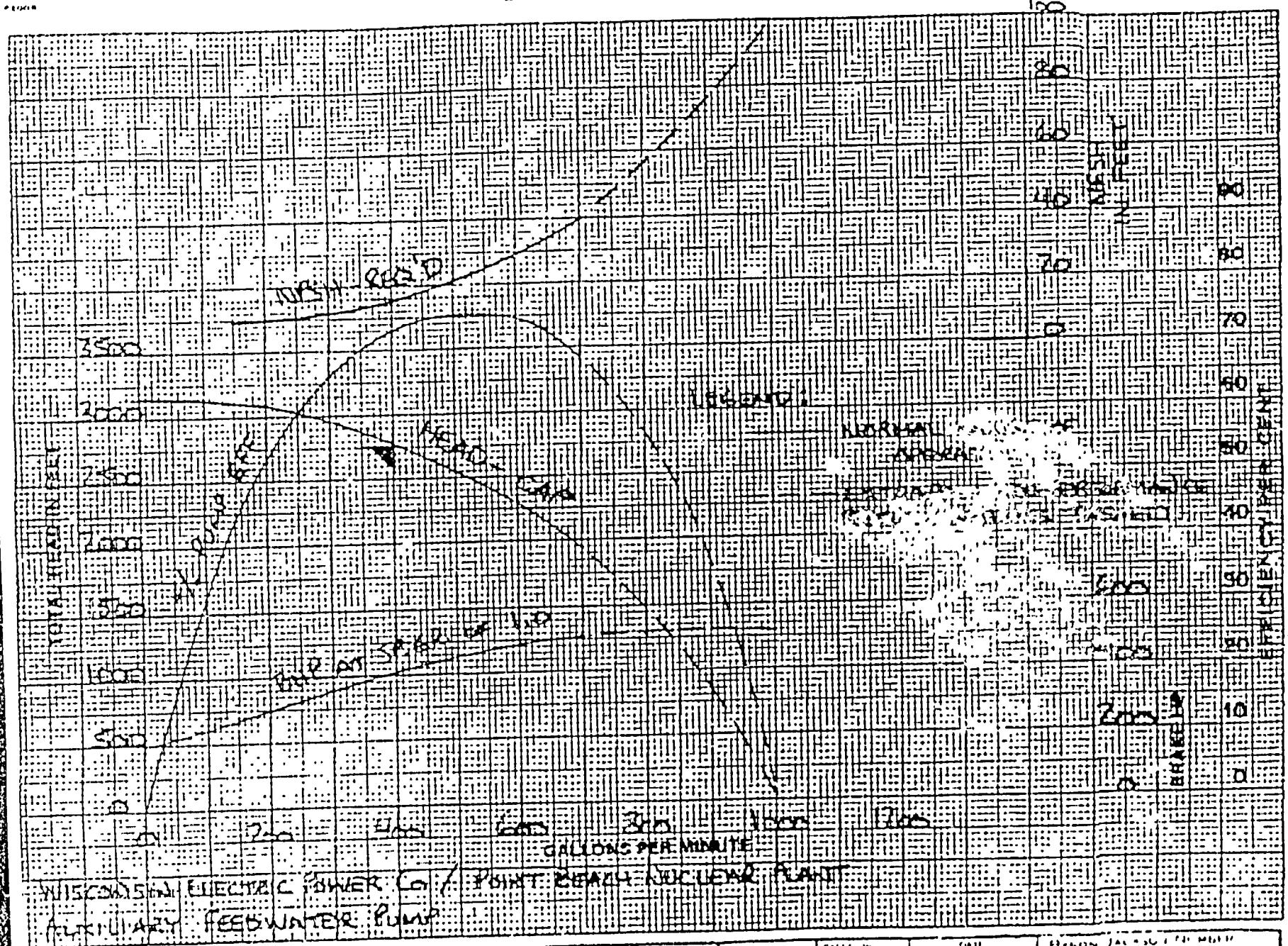
WFG/ss:WIEPCO7.ltr

CC: BW/IP International
Ms. Ruth Ellen Hawks - LAO

BYRON JACKSON



BYRON JACKSON



	RPM					
3 x 4 x 9 D-9 STG DVMX	3550	681-S-1028	R-365-1ST	T-30947	2 JULY 87	PC 36751
				MA	MA	

SPEED MEMO

TO TOM ROPSON — FROM TODD MIELKE
PHILLIPS/GETSCHOW — WE

SUBJECT MATERIAL TYPE DISCREPANCY ON BILL OF MATERIALS (MR 88-099 *B)

MESSAGE ITEM #11 ON THE BOM WAS INCORRECTLY RECORDED AS BEING TYPE 304L SS, WHEN IN ACTUALITY IT IS TYPE 316. THIS MISTAKE WAS FOUND ALSO WHEN PERFORMING THE RECIRC LINE CHANGE-OUT FOR IP-29, AT WHICH TIME ECR NE-91-233 WAS GENERATED TO CORRECT THIS PROBLEM. THEREFORE, THE USE OF THE TYPE 316 SS PIPING IS ACCEPTABLE FOR THIS MOD.

SIGNED T D Mielke DATE 8/29/91 PHONE 376

REPLY THANKS ó

SIGNED Tom Ropson DATE 8-29-91 PHONE 484

ORIGINAL (WHITE) - To Recipient and Return To Sender
COPY 1 (YELLOW) - For Recipient's File
COPY 2 (PINK) - For Sender's Follow-Up

To: Tom Ropson, Phillips, Getchow Co.

From: John Schroeder, PBNP

Subject: Modification 88-099, AFW Pumps Mini-Recirc Lines

Date: 08/27/91

For all work associated with Modification 88-099 in which HILTI Kwik Bolt IIs are used, the base plate holes may be up to 1/8" larger in diameter than the diameter of the Hilti bolt being used.

John A. Schroeder

FINAL DESIGN CHECKLIST

Title of Document MR 83-049*B

Document No. ——— Rev. ——— Date ———

INSTRUCTIONS:

A. Answer all questions in the checklist: (Note: if an entire section is not applicable, the section heading (e.g. 2.0 Mechanical Design Criteria) may be marked "NA" and a line drawn through the other items.)

B. A short explanation should be provided for the following two cases: (1) questions marked (*) which are answered No and (2) questions not marked (*) answered Yes. The explanation may be noted on this checklist or on QP 3-2.3, Final Design Checklist Explanation Sheet. Designer indicates answers using an (X). Reviewer indicates answers using a (✓).

REVIEW CHECKLIST CONSIDERATIONS:

		YES	NO	N/A
1.	**Are any of the general design criteria (FSAR, Section 1.3) applicable?**	X✓		
2.	**Mechanical Design Criteria**			
	Will the change:			
	a. Affect seismic boundaries?	X✓		
	b. Affect seismically qualified equipment?	X✓		
	c. Require seismic category "2 over 1" analysis?		X✓	
	d. Affect the assigned system design pressure or temperature?		X✓	
	*e. Be of a material compatible with the existing installation?	X✓		
	f. Require identification of applicable ASME B&PV codes and standards?	X✓		
	g. Require State of Wisconsin Administrative code permits/approvals?	X✓		
	*h. Have materials, protective coatings, and corrosion characteristics compatible with existing plant components?	X✓		
	i. Add a system/component to be included in the ASME B&V Section XI Inservice Inspection Program?		X✓	
	j. Require a new penetration in a primary system boundary?		X✓	
	k. Increase the potential for flooding?		X✓	
	l. Degrade existing flood barriers?		X✓	

REVIEW CHECKLIST CONSIDERATIONS: (continued)	YES	NO	N/A
3. Electrical Design Criteria			
Will the change:			
a. Affect the station electrical system?		✓	
b. Affect the station grounding or lightning protection system?		✓	
*c. Be compatible with existing electrical insulation and wiring?	✓		
d. Create an electrical problem in any of its failure modes?		✓	
*e. Be compatible with service transformer capacity?	✓		
f. Make any vital circuit susceptible to ground?		✓	
g. Require redundancy, diversity, and separation?		✓	
h. Require State of Wisconsin Administrative Code permits/approval?		✓	
i. Be seismically qualified? { The transmitter wiring is non-seismic. The miniature valve wires will not be adversely effected by the modification.		✓	
*j. Maintain UL (or equivalent) listings?	✓		
4. Mechanical Service System			
Will the change:			
a. Require service water?		✓	
b. Require closed loop cooling?		✓	
c. Require instrument air?	✓		
d. Require service air?		✓	
e. Increase heating, ventilation, or air conditioning (HVAC) loading?		✓	
f. Require demineralized water?		✓	
g. Require raw water?		✓	
h. Affect any other mechanical service system?		✓	
i. Require lubrication?		✓	
j. Require an independent means of pressure relief?		✓	
5. Electrical Distribution System			
Will the change:			
a. Affect electrical system capacity, output, or voltage?		✓	
b. Add more emergency diesel and/or station battery loading?		✓	

REVIEW CHECKLIST CONSIDERATIONS: (continued)	YES	NO	N/A
c. Add load to a vital bus?		X✓	
d. Add load to a non-vital bus?	X✓		
e. Add new raceways?	X✓		
f. Add cables to existing electrical raceways?		X✓	
g. Be routed through a fire wrapped cable tray?		X✓	
*h. Comply with thermal and electrical separation requirements?			X✓
*i. Comply with protective relaying requirements of equipment and systems?			X✓
6. Fire Protection			
Will the change:			
a. Affect fire protection requests listed in Section 6.1.1 of the FPER? conservatively checked Yes	X✓		
b. If the answer to "a" is yes, an evaluation must be performed per Section 6.2.2 of the FPER.	X✓		
c. Affect access to a fire zone, fire protection equipment or Appendix R safe shutdown equipment?		X✓	
d. Open a fire barrier?		X✓	
e. Affect fire protection system performance?		X✓	
f. Increase combustible loading in a room?		X✓	
g. Based on FPER Section 7.3, will the change affect the existing fire protection features of an Appendix R safe shutdown fire zone?		X✓	
h. Based on FPER Sections 4.4 and 4.5, will the change add to, delete from, or revise the listed systems and components?		✓	
i. If the answer to any item c through h is yes, a reevaluation must be performed per Section 6.2.10 of the FPER.			X✓
7. Security System			
Will the change:			
a. Be in a vital area?	X✓		
b. Require work near a vital area?		X✓	
c. Require work within 20' of fence?		X✓	
d. Affect security equipment and documents (including those containing safeguards information)?		✓	

REVIEW CHECKLIST CONSIDERATIONS: (continued)	YES	NO	N/A
e. Affect access controls?		X✓	
8. **Structural Design Criteria**			
Will the change:			
a. Add weight between existing pipe supports, hangars, or foundations?	X✓		
b. Require addition of new supports, hangers, or foundations?	X✓		
c. Affect stress calculations of pipe?	X✓		
d. Affect the loading or load capabilities of existing embeds or other anchor points?	X✓		
e. Require changes to existing equipment foundations?		X✓	
f. Affect accessibility of any equipment?		X✓	
g. Require a floor or wall loading analysis?		X✓	
h. Affect or be impacted by masonry block walls?		X✓	
i. Decrease free volume of containment?		X	✓
j. Change the amount of exposed aluminum in containment?			X✓
k. Introduce materials into containment that could affect sump performance or lead to equipment degradation?			X✓
l. Create an external or internal missile hazard?		X✓	
m. Be affected by winds or storms?		X✓	
n. Add a dynamic or potentially dynamic load to the system?		X✓	
o. Affect wall stress calculations for pressurized concrete cubicles or structures?		X✓	
p. Require core drills, expansion anchors, or re-bar cuts?	X✓		
q. Require clearance review for seismic movement or thermal expansion considerations?	X✓		
r. Change plant drainage/backfill requirements?		X✓	
s. Require protection from high energy line break jet?		X✓	
t. Require a penetration in the containment boundary?		X✓	
u. Require State of Wisconsin Administrative Code permits/approvals?	✓	X	

REVIEW CHECKLIST CONSIDERATIONS: (continued)	YES	NO	N/A
9. Operability			
Will the change:			
*a. Require construction verification and/or start-up (operability) testing?	X✓		
b. Require additional operations or maintenance staff?		X✓	
c. Require specially trained operators or maintenance personnel?		X✓	
d. Require procedure changes?	X✓		
e. Require a testability review?		X✓	
f. Require special testing procedures or equipment or impact other systems during testing?		X✓	
g. Potentially impact other systems, components, or structures.		X✓	
10. Hydraulic Design Criteria			
Will the change:			
a. Affect pump NPSH?		X✓	
b. Affect calculated pipe pressure drop?	X✓		
c. Affect fluid pressure?	X✓		
d. Affect fluid velocity?	X✓		
e. Affect system capacity or output?	X✓		
11. Fuel integrity considerations			
Will the change:			
a. Increase the potential for fueld handling damage?			X✓
b. Present the potential for introducing foreign material/debris into the RES or connecting systems?			X✓
c. Increase core barrier "baffle jetting"?			X✓
12. Chemistry Effects			
Will the change:			
a. Be a potential source of chemical contaminants? (from pipe)	✓	X	
b. Require establishment of chemistry limits?		X✓	
c. Require any routine chemical analyses?		X✓	
d. Require provisions for sampling?		X✓	
e. Require chemical additives?		X✓	
f. Affect presently established chemistry limits?		X✓	

REVIEW CHECKLIST CONSIDERATIONS: (continued)	YES	NO	N/A
13. ALARA Considerations			X✓
Will the change:			
a. Install any equipment in high radiation or containment areas?	___	___	___
b. Involve cobalt-laden materials in any primary systems?	___	___	___
c. Result in an anticipated increase in operational or maintenance exposures?	___	___	___
d. If the answer to "a", "b", "c" is yes, then an ALARA design review shall be performed using DG-G03, "ALARA Consideration Guidelines for Design and Installation." This review shall be documented on Form QP 3-2.2, "Final Design Checklist Explanation Sheet."	___	___	___
e. Result in an expected exposure of greater than 1 Rem for any individual during installation of the change?	___	___	___
f. Result in an anticipated collective exposure of greater than 2 Rem for the installation of the change?	___	___	___
g. If the answer to "e" or "f" is yes, then an ALARA review shall be performed for the installation aspects of the change per PBNP 3.7.4, "Radiological Review Guideline."	___	___	✓
14. Environmental Conditions			
Will the change:			
a. Require special handling, shipping, or environmental conditions for storage or construction?	___	X✓	
b. Be subject to adverse environmental conditions during storage or construction?	___	X✓	
*c. Require environmental qualification (EQ)?	___	___	X✓
d. Be attached to an EQ system/component?	___	X✓	
e. Modify HVAC requirements in the area?	___	X✓	
f. Change environmental parameters (e.g., temperature radiation, humidity)?	___	X✓	
15. Industrial Safety			
Will the change:			
a. Create a personnel hazard?	___	\✓	
b. Introduce hazardous material into the plant?	___	\✓	
c. Affect evacuation routes?	___	\✓	

REVIEW CHECKLIST CONSIDERATIONS: (continued)	YES	NO	N/A
d. Require that electrical equipment be grounded?	X✓		
e. Meet OSHA regulations?			X✓
16. Instrumentation and Control			
Will the change:			
*a. Have sufficient instruments for operators to monitor the process?	X✓		
*b. Have appropriate instrument scales?	X✓		
*c. Have the instruments, control switches, and indicating devices been appropriately located for human factors (both for operational and maintenance)?	X✓		
*d. Have alarms for off-normal conditions?			X✓
*e. Be capable of or require remote and/or automatic operation? FUNCTION OF MUSI-RECIRC DOES NOT CHANGE.			X✓
*f. Be capable of or require manual operation?	X✓		
g. Require calibration and maintenance requirements for the instruments to be specified?	X✓		
*h. Have specified the instruments with proper range and accuracy?	X✓		
17. Failures Modes and Effects Analysis			
Note: This section is applicable to all modifications. See IEEE 352-1975 "IEEE Guide for General Principles of Reliability Analysis of Nuclear Power Generating Station Protective System"			
Is it necessary that the design consider:			
a. How each portion of the configuration change may conceivably fail?	X✓		
b. What mechanisms might produce these modes of failure?			
c. What the effects could be if the failure did occur?			
d. If the postulated failure is in a safe or unsafe direction?			
e. How the failure would be detected?			
f. What inherent provisions are included to compensate for the failure?	✓		

Section 17 Addressed in 50.59

REVIEW CHECKLIST CONSIDERATIONS: (continued)	YES	NO	N/A
18. Installation			
Will the change:			
a. Present installation impacts on plant operations?	X ✓		
b. Will the installation activities increase the probability for, or consequences of flooding?		X ✓	
19. QA Requirements			
Will the change:			
a. Affect QA-scope systems or boundaries?	X ✓		
b. Require material certification?	X ✓		
c. Require personnel qualifications?	X ✓		
20. Operating Experience			
Will the change:			
a. Incorporate new types/modes of equipment not presently used at PBNP?		X ✓	
b. Benefit from a database search of the NODIL, NPRDS, CHAMPS, INPO Keywords, or other databases?		X ✓	

Designed by: Jack A Schrader Date 8/27/91

Reviewed by: T D Smith Date 8/31/91

Comments: ☐ None ☑ Attached on QP 5-3.1

Resolution by: Jack A Schrader Date 9/3/91

FINAL DESIGN CHECKLIST EXPLANATION SHEET

ITEM NO.	EXPLANATION
1.a.	General Design criteria for emergency core cooling, QA and seismic apply.
2.a.b.	A piping analysis of the modification was performed by Sargent & Lundy (Accession #100070) which addressed the seismic acceptability of the new mini-recirc lines.
2.f.	The modification meets the requirements of the original design code ANSI B31.1., 1967.
2.g.	The ANI will be notified and an SB-190 state notification form will be submitted by the mechanical contrator Phillips Getchow as required in the IWP.
4.c.	The existing IA connections for the mini-recirc valves will be reused. The new valves will be set up per MI 5.2 in the IWP.
5.d.	The four transmitters being installed under MR 88-099 will all get power from Panel 7L Breaker 25. The four transmitters will require 3 VA which will add 0.1 Amps to the circuit which is negligible.
5.e.	New conduits will be installed per the Raceway schedule and tickets attached to the IWPs. The cables and raceways will be installed per Spec. PB-196 since the transmitter wiring is Non-QA but will be mounted seismically since the installation is in the AFW room.
6.a.b.	The fire protection checklist is attached.
7.a.	The work will be in the AFW room.
8.a-d.q.	The piping analysis by Sargent & Lundy addressed the seismic acceptability of the modified system and designed the new and modified piping supports.
8.p.	Hilti bolts will be installed per MI 7.1 or equivalent.
9.d.	Inservice test IT-10 will require revision, this is called out in the IWP and DUCOC.
10.b-e.	Calculations N-91-063 & N-91-069 addressed the changes in mini-recirc line flow capacity made by the modification.
15.d.	The power supplies for the transmitters will be grounded to the electrical enclosures per the Working Drawings.

FINAL DESIGN CHECKLIST EXPLANATION SHEET

ITEM NO.	EXPLANATION
16.g.	ICP 13.8 will be revised to annually calibrate the new transmitters. The revision is a closeout item on the DUCOC.
17.	The failure modes and effects are addressed in the 50.59 evaluation, SER 91-025-02.
18.a.	The motor-driven AFW pumps will be taken out of service under the provisions of the Tech Spec 7 day LCO. For a period of time during the installation all four mini-recirc lines will be isolated, pump discharge paths will be administratively maintained during this time.
19.a.	As stated in the QA scoping section of the Mod and IWPs a portion of the MR is QA.
19.b.	Material certs will be required for all QA materials used and are contained in the QAR files.
19.c.	Welding and NDE qualifications will be reuqired per the welding procedure and codes referenced in the IWPs.

POINT BEACH NUCLEAR PLANT

FIRE PROTECTION CONFORMANCE CHECKLIST

MR Number 98-0794K Unit 1 _____ Unit 2 _____ Common Facilities X

System Aux Feedwater Location Fire Zone 304

NOTE: FPER 6.2.2.1 Complete Sections 1.0 - 4.6 for industrial fire safety.
FPER 6.2.2.2 Complete Sections 1.0 - 10.5 for Appendix R compliance.

1.0 PLANT ACCESS

1.1 Does the modification add/delete/revise any doors, walls, structures or equipment that may impede or alter access to a fire?

☐ Yes, go to 1.2
☒ No, go to 1.3

Comments: _____

1.2 Are alternate access routes available to th area of concern?

☐ Yes, go to 1.3
☐ No, go to 1.8, complete actions and resume at 1.3.

Comments: _____

1.3 Does the modification add/revise/remove ventilation that may either directly or indirectly alter air flow within an area or from area to area to impede access to a fire?

☐ Yes, go to 1.8, complete actions and resume at 1.4.
☒ No, go to 1.4

Comments: _____

1.4 Does the modification require installation of locks on previously unlocked doors or structural changes such as the addition/deletion/revision of walls, stairways, or doors?

☐ Yes, go to 1.5
☒ No, go to 1.6

Comments: _____

1.5 Does the installation of locks or structural changes affect the existing access/egress routes for fire fighting activity, safe shutdown equipment operations, and/or post-fire repairs?

☐ Yes, go to 1.8, complete actions and resume at 1.6.
☐ No, go to 1.6

Comments: _____

1.6 Does the modification affect the Appendix R safe shutdown timelines (time and motion study for AOP-10A and AOP-10B contained in FPER Section 4.7)?

☐ Yes, go to 1.8, complete actions and resume at 1.7.
☒ No, go to 1.7

Comments: _____

1.7 Does the modification block safe shutdown equipment or a local control station required to be accessible for safe shutdown?

☐ Yes, go to 1.8, complete actions and resume at 2.1.
☒ No, go to 2.1

Comments: _____

1.8 The modification affects plant accessibility. List the access effect(s) and refer to FPER, Section 6.2.10. RESUME checklist completion.

Access Effects: _____

2.0 APPENDIX R BARRIERS

2.1 Does the modification delete any fire barriers/area appearing in FPER, Section 3.0?

☐ Yes, go to 2.2
☒ No, go to 2.3

Comments: _____

2.2 Has a new barrier/area been defined?

☐ Yes, go to 2.3
☐ No, go to 2.14, complete actions and resume at 2.3.

Comments: _____

2.3 Does the modification revise any existing fire barriers (e.g., changes to supporting structural steel, barrier thickness or material, etc.)?

☐ Yes, go to 2.14, complete actions and resume at 2.4.
☒ No, go to 2.4

Comments: _____

2.4 Does the modification add/delete/revise any penetrations to fire barriers due to cables or pipes?

☐ Yes, go to 2.5
☒ No, go to 2.6

Comments: _____

2.5 Are the appropriate barrier penetration procedures specified?

☐ Yes, go to 2.6
☐ No, go to 2.14, complete actions and resume at 2.6.

Comments: _____

2.6 Does the modification add or replace any fire doors, frames or dampers?

☐ Yes, go to 2.7
☒ No, go to 2.8

Comments: _____

2.7 Do the new/replaced dampers/doors/frames meet requirements for rated fire barriers in the fire area and fire damper installation configurations as specified in FPER Section 7.3?

☐ Yes, go to 2.8
☐ No, go to 2.15, complete actions and resume at 2.8.

Comments: _____

2.8 Does the modification add or relocate any cable raceways to a location which presents intervening combustibles between redundant safe shutdown trains?

☐ Yes, go to 2.9
☒ No, go to 2.10

Comments: _____

2.9 Does the modification include installation of approved fire stops?

☐ Yes, go to 2.10
☐ No, go to 2.5, complete actions and resume at 2.10.

Comments: _____

2.10 Does the modification add/delete/revise any cable to an existing raceway which presents intervening combustibles between redundant safe shutdown trains?

☐ Yes, go to 2.11
☒ No, go to 2.12

Comments: _____

2.11 Does the modification include installation/reinstallation of approved fire stops?

☐ Yes, go to 2.12
☐ No, go to 2.15, complete actions and resume at 2.12.

Comments: _____

2.12 Does the modification add/delete/revise any curb, dikes, or drains in the area as described in FPER Section 5?

☐ Yes, go to 2.14, complete actions and resume at 2.13.
☒ No, go to 2.13

Comments: _____

2.13 Does the modification obstruct, remove/revise any suppression system or water spray nozzles or plume impingement shields in the area?

☐ Yes, go to 2.14, complete actions and resume at 3.1.
☒ No, go to 3.1

Comments: _____

2.14 Do the affected barriers/fire areas protect safe shutdown components or cables?

☐ Yes, go to 2.15
☐ No, go to 2.16

Comments: _____

2.15 The modification impacts Appendix R compliance. List the affected items and refer to FPER, Section 6.2.10.1. RESUME checklist completion.

Affected Items: _____

2.16 The modification could impact fire protection commitments and/or codes. List the affected item and refer to FPER, Section 6.2.10.2. RESUME checklist completion.

Affected Items: _____

3.0 FIRE PROTECTION SYSTEMS

3.1 Does the modification affect any portion of the fire protection system?

☐ Yes, go to 3.2
☒ No, go to 3.4

Comments: _____

3.2 Is the affected portion of fire protection system required for Appendix R safe shutdown compliance?

☐ Yes, go to 3.3
☐ No, go to 3.4

Comments: _____

3.3 Will the modified portion of fire protection systems meet the requirements of Appendix R as stated in the technical evaluations FPER Section 7.3?

☐ Yes, go to 3.4
☐ No, to go 3.18, complete actions and resume at 3.4.

Comments: _____

3.4 Does the modification add/delete/revise any fire protection system electrical components?

☐ Yes, go to 3.5
☒ No, go to 3.6

Comments: _____

3.5 Does the modification add/delete/revise anything that could impede the required fire protection system function?

☐ Yes, go to 3.17, complete actions and resume at 3.6.
☐ No, go to 3.6

Comments: _____

3.6 Does the modification add/delete/revise any fire detectors?

☐ Yes, go to 3.17, complete actions and resume at 3.7.
☒ No, go to 3.7

Comments: _____

3.7 Does the modification revise any ventilation system flow patterns or structural arrangements which may affect fire detection/suppression capability?

☐ Yes, go to 3.17, complete actions and resume at 3.8.
☒ No, go to 3.8

Comments: _____

3.8 Does the modification affect the annunciator system of the fire detectors?

☐ Yes, go to 3.17, complete actions and resume at 3.9.
☒ No, go to 3.9

Comments: _____

3.9 Does the modification add any new suppression systems?

☐ Yes, go to 3.10
☒ No, go to 3.11

Comments: _____

3.10 Has a suppression effects analysis been performed?

☐ Yes, go to 3.11
☐ No, go to 3.18, complete actions and resume at 3.11.

Comments: _____

3.11 Does the modification delete any suppression systems?

☐ Yes, go to 3.17, complete actions and resume at 3.12.
☒ No, go to 3.12

Comments: _____

3.12 Does the modification revise any suppression systems (e.g., changes in size, spacing; or arrangement of nozzles, piping, or pipe hangers)?

☐ Yes, go to 3.17, complete actions and resume at 3.13.
☒ No, go to 3.13

Comments: _____

3.13 Does the modification affect discharge characteristics of gaseous systems due to changes in room volume or ventilation systems?

☐ Yes, go to 3.17, complete actions and resume at 3.14.
☒ No, go to 3.14

Comments: _____

3.14 Does the design change affect the discharge of sprinklers due to structural/mechanical changes?

☐ Yes, go to 3.17, complete actions and resume at 3.15.
☒ No, go to 3.15

Comments: _____

3.15 Does the modification remove/revise any hose stations, hydrants, or fire extinguishers?

☐ Yes, go to 3.17, complete actions and resume at 3.16.
☒ No, go to 3.16

Comments: _____

3.16 Does the design change add/delete/revise any local or remote alarm actuation systems?

☐ Yes, go to 3.17, complete actions and resume at 4.1.
☒ No, go to 4.1

Comments: _____

3.17 Are the affected detection/suppression actuation system components located in a fire area/zone for Appendix R compliance?

☐ Yes, go to 3.18
☐ No, go to 3.19

Comments: _____

3.18 The modification impacts on Appendix R compliance. List the affected components and refer to FPER Section 6.2.10.1. RESUME checklist completion.

Affected Components: _____

3.19 The modification could impact fire protection commitments and/or codes. List the affected components and refer to FPER, Section 6.2.10.1. RESUME checklist completion.

Affected Components: _____

4.0 COMBUSTIBLE LOADING/FIRE HAZARD

4.1 Does the modification increase combustible loading or fire hazard due to new cable installed in cable trays?

☐ Yes, go to 4.4, complete actions and resume at 4.2.
☒ No, go to 4.2

Comments: _____

4.2 Does the modification increase combustible loading or fire hazard due to lubricating oil or grease?

☐ Yes. go to 4.4, complete actions and resume at 4.3.
☒ No, go to 4.3.

Comments: _____

4.3 Does the modification increase the combustible loading or fire hazard due to the addition of ordinary combustibles or combustible liquids?

☐ Yes, go to 4.4
☒ No, fire protection checklist complete. Sign below item 4.6 or continue Appendix R checklist at item 5.1.

Comments: _____

4.4 Does the increase affect the established level of fire hazard for the given fire area stated in the technical evaluation contained in FPER Section 7.3? NOTE: Contact WE fire protection group if input is needed.

☐ Yes, go to 4.6, complete actions and resume at 4.5.
☐ No, go to 4.5

Comments: _____

4.5 Does the increase exceed the existing fire control design capabilities of fire protection features for the given fire area? NOTE: Contact WE fire protection group if input is needed.

☐ Yes, go to 4.6, complete actions and sign fire protection checklist complete or continue Appendix R checklist at item 5.1.
☐ No, fire protection checklist complete. Sign below item 4.6 or continue Appendix R checklist at item 5.1.

Comments: _____

4.6 The modification impacts fire protection compliance. List the fire area and refer to FPER, Section 6.2.10. RESUME checklist completion.

Fire Area: _____

Conformance checklist completed in accordance with FPER Section 6.2.2.1.

By: Julie Pedersen Date: 6-3-91

5.0 SAFE SHUTDOWN COMPONENTS

5.1 Does the modification require addition of a safe shutdown component?

☐ Yes, go to 5.2
☒ No, go to 5.5

Comments: _____

5.2 Will the new component support other safe shutdown systems or component(s)?

☐ Yes, go to 5.3
☐ No, go to 5.4

Comments: _____

5.3 Are the safe shutdown system(s) or component(s) which the new component will be supporting required to operate for a fire in the fire area in which the new component will be located?

☐ Yes, go to 5.18, complete actions and resume at 5.4.
☐ No, go to 5.4

Comments: _____

5.4 Is a redundant component located either outside of the fire area or provided with Appendix R, Section III.G.2 separation?

☐ Yes, go to 5.5
☐ No, go to 5.18, complete actions and resume at 5.5.

Comments: _____

5.5 Does the modification require deletion of a safe shutdown component?

☐ Yes, go to 5.6
☒ No, go to 5.7

Comments: _____

5.6 Does a safe shutdown component exist that will perform the same function for which the component under consideration was required by AOP-10A and/or AOP-10B?

☐ Yes, go to 5.7
☐ No, go to 5.18, complete actions and resume at 5.7.

Comments: _____

5.7 Does the modification require revision of a safe shutdown component?

☒ Yes, go to 5.8
☐ No, go to 5.9

Comments: MR 88-092 modifies the recirc line on the Aux FW Pumps.

5.8 Will the revised shutdown component continue to perform its function required by AOP-10A and AOP-10B?

☒ Yes, go to 5.9
☐ No, go to 5.18, complete actions and resume at 5.9.

Comments: _____

5.9 Does the modification add/delete/revise safe shutdown equipment to the system flow path or boundary isolation from interconnecting systems?

☐ Yes, go to 5.11
☒ No, go to 5.10

Comments: _____

5.10 Does the modification add/delete/revise safe shutdown equipment to a connection to the system flow path or boundary isolation from interconnecting systems?

☒ Yes, go to 5.11
☐ No, go to 5.13

Comments: The recirc line ties the Aux FW system to the Condensate Storage Tank. The control valve which provides the boundary isolation will be changed out.

5.11 Does the modification affect the operation of the system (e.g., changes in system flow rate, change in normal positions, etc.)?

☐ Yes, go to 5.12
☒ No, go to 5.13

Comments: _____

5.12 Does the modification violate the safe shutdown systems performance goals as presented in FPER Section 4.0?

☐ Yes, go to 5.18, complete actions and resume at 5.13.
☐ No, go to 5.13

Comments: _____

5.13 Does the modification affect any mechanical sub- or support components of safe shutdown components not listed on the safe shutdown equipment list (e.g., SOVs, check valves, etc.)?

☒ Yes, go to 5.14
☒ No, go to 5.16

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Comments: _____

5.14 Does the modification to the sub- or support component affect the operability of its associated safe shutdown equipment?

☐ Yes, go to 5.15
☒ No, go to 5.16

Comments: The modified Aux FW temp recirc line will be set to operate the same as the original recirc line under non-test conditions.

5.15 Will the safe shutdown equipment continue to perform its function required by AOP-10A and/or AOP-10B?

☐ Yes, go to 5.16
☐ No, go to 5.18, complete actions and resume at 5.16.

Comments: _____

5.16 Does the modification add/delete/revise any electrical sub- or support components which support the identified safe shutdown component(s) (e.g., power supplies, relays, switches, motor operators)?

☐ Yes, go to 5.17
☒ No, go to 6.1

Comments: _____

5.17 Do the sub- or support components impact the operability of associated safe shutdown equipment required by AOP-10A and/or AOP-10B?

☐ Yes, go to 5.18, complete actions and resume at 6.1.
☐ No, go to 6.1

Comments: _____

5.18 The addition/deletion/revision of safe shutdown components, sub- or support components affects safe shutdown. List the equipment and the affected systems and refer to FPER Section 6.2.10.1. RESUME checklist completion.

Safe Shutdown System(s), Components, Sub- or Support Component(s): _____

6.0 SAFE SHUTDOWN CABLE ASSOCIATED CIRCUITS AND SPURIOUS OPERATION

6.1 Does the modification require addition of a safe shutdown cable?

☐ Yes, go to 6.2
☒ No, go to 6.4

Comments: _____

6.2 Will the cable be routed in a fire area(s) where, if a fire is postulated, the associated safe shutdown component is required to be operable?

☐ Yes, go to 6.3
☐ No, go to 6.4

Comments: _____

6.3 Will the failure of the new cable cause the associated safe shutdown component to be inoperable?

☐ Yes, go to 6.19, complete actions and resume at 6.4.
☐ No, go to 6.4

Comments: _____

6.4 Does the modification require deletion of a safe shutdown cable?

☐ Yes, go to 6.5
☒ No, go to 6.7

Comments: _____

6.5 Will the deletion of the cable affect local and/or remote control or indication capability of the associated safe shutdown component?

☐ Yes, go to 6.6
☐ No, go to 6.7

Comments: _____

6.6 Is the affected local and/or remote control or indication capability of the associated safe shutdown component required for Appendix R safe shutdown by AOP-10A and/or AOP-10B?

☐ Yes, go to 6.19, complete actions and resume at 6.7.
☐ No, go to 6.7

Comments: _____

6.7 Does the modification require revision or rerouting of an existing safe shutdown cable?

☐ Yes, go to 6.8
☒ No, go to 6.10

Comments: _____

6.8 Does the rerouting of the cable maintain the separation of unique trains required by Appendix R to achieve safe shutdown?

☐ Yes, go to 6.9
☐ No, go to 6,19, complete actions and resume at 6.10

Comments: _____

6.9 Will the revision of the cable affect the operability of the associated safe shutdown component?

☐ Yes, go to 6.19, complete actions and resume at 6.10.
☐ No, go to 6.10

Comments: _____

6.10 Does the modification require addition or revision of a circuit connected or to be connected to safe shutdown power supply?

☐ Yes, go to 6.11
☒ No, go to 6.12

Comments: _____

6.11 Will adequate electrical coordination between the safe shutdown power supply feeder breaker and the added or revised component breaker of fuse exist?

☐ Yes, go to 6.12
☐ No, go to 6.19, complete actions and resume at 6.12.

Comments: _____

6.12 Does the modification require addition or revision of any non-safe shutdown circuits?

☐ Yes, go to 6.13
☒ No, go to 6.15

Comments: _____

6.13 Will the new or revised cables be equipped with circuit breakers, fuses or some kind of current limiting device?

☐ Yes, go to 6.15
☐ No, go to 6.14

Comments: _____

6.14 Will the new or revised cables share a common enclosure (raceway, panel, etc.) with safe shutdown cables?

☐ Yes, go to 6.19, complete actions and resume at 6.15.
☐ No, go to 6.15

Comments: _____

6.15 Does the modification add/delete/revise any safe shutdown components and/or high/low pressure interfaces which could operate spuriously?

☐ Yes, go to 6.16
☒ No, go to 6.17

Comments: _____

6.16 Could the addition/deletion/revision of the spurious safe shutdown components alter system operation and prevent the achievement of safe shutdown?

☐ Yes, go to 6.19, complete actions and resume at 6.17.
☐ No, go to 6.17

Comments: _____

6.17 Does the modification add/delete/revise the circuits of any safe shutdown equipment listed in FPER Spurious Operations Table 4.7-1?

☐ Yes, go to 6.18
☒ No, go to 7.1

Comments: _____

6.18 Will the recommended resolution for mitigating the spurious operation listed in the table remain applicable after the modification?

☐ Yes, go to 7.1
☐ No, go to 6.19, complete actions and resume at 7.1

Comments: _____

6.19 The modification impacts safe shutdown. List the safe shutdown circuits and associated components and refer to FPER Section 6.2.10.1. RESUME checklist completion.

Safe Shutdown Circuits and Components: _____

7.0 EFFECTS ON EXEMPTIONS/EVALUATIONS

TE304

7.1 Is the modification proposed to be implemented in a fire zone for which an exemption is noted in the technical evaluation in FPER Section 7.3?

☒ Yes, go to 7.6, complete actions and resume at 7.2.
☐ No, go to 7.2

Comments: _____

7.2 Does the modification add/delete/revise any safe shutdown or spurious components and/or cables?

☐ Yes, go to 7.6, complete actions and resume at 7.3.
☒ No, go to 7.3

Comments: _____

7.3 Does the modification increase the combustible loading or level of fire hazard (including intervening combustibles) in fire zone of concern?

☐ Yes, go to 7.6, complete actions and resume at 7.4
☒ No, go to 7.4

Comments: _____

7.4 Does the modification add/delete/revise a detection or suppression system in the fire zone of concern?

☐ Yes, go to 7.6, complete actions and resume at 7.5.
☒ No, go to 7.5

Comments: _____

7.5 Does the modification affect any other means of fire protection (hatches, curbs, etc.)?

☐ Yes, go to 7.6, complete actions and resume at 7.7
☒ No, go to 7.7

Comments: _____

7.6 Does the modification violate a basis for the requested exemption?

☐ Yes, go to 7.9
☒ No, RESUME Checklist Completion

Comments: _____

7.7 Are the systems, components, or cables redundant to the systems, components, or cables affected by the modification located in fire zones for which other exemptions are noted in the technical evaluations in FPER Section 7.3?

☐ Yes, go to 7.8
☒ No, go to 8.1

Comments: _____

7.8 Does the modification violate a basis for these other exemption(s) (accessibility, low combustible loading, barriers, equipment location, etc.)?

☐ Yes, go to 7.9, complete actions and resume at 8.1.
☐ No, go to 8.1

Comments: _____

7.9 The modification violates the basis for an exemption or evaluation. List the basis affected and refer to FPER Section 6.2.10.1. RESUME checklist completion.

Cables and Components: _____

8.0 EMERGENCY LIGHTING

8.1 Does the modification add/delete,revise safe shutdown component(s) for which manual operation is required by AOP-10A?

☐ Yes, go to 8.2
☒ No, go to 8.4

Comments: _____

8.2 Is emergency lighting which meets the requirements of Appendix R, Section III.J provided at the component(s) and access/egress routes thereto?

☐ Yes, go to 8.4
☐ No, go to 8.3

Comments: _____

8.3 Does the modification add emergency lighting which meets the requirements of Appendix R Section III.J at the added component(s) and access/egress routes thereto?

☐ Yes, go to 8.4
☐ No, go to 8.11, complete action and resume at 8.4

Comments: _____

8.4 Does the modification add/delete/revise an emergency lighting system or any emergency lights?

☐ Yes, go to 8.5
☒ No, go to 8.7

Comments: _____

8.5 Is the affected portion of the emergency lighting system required for Appendix R safe hot shutdown and/or fire fighting purposes?

☐ Yes, go to 8.6
☐ No, go to 8.7

Comments: _____

8.6 Does the affected portion of emergency lighting system meet the requirements for intensity, coverage, and required battery capacity of the technical evaluation of emergency lighting capability at Point Beach Nuclear Plant, FPER Section 7.3?

☐ Yes, go to 8.7
☐ No, go to 8.11, complete action and resume at 8.7.

Comments: _____

8.7 Does the modification downgrade the ability to perform firefighting/safe shutdown activities efficiently during a blackout?

☐ Yes, go to 8.11, complete action and resume at 8.8.
☒ No, go to 8.8

Comments: _____

8.8 Does the modification involve any structural changes or equipment installations that may block the illumination path of an emergency light?

☐ Yes, go to 8.9
☒ No, go to 9.1

Comments: _____

8.9 Is the affected emergency light required for safe shutdown (e.g., required for illumination of safe shutdown component, local control station, or access/egress routes thereto)?

☐ Yes, go to 8.10
☐ No, go to 9.1

Comments: _____

8.10 Does the affected emergency light still meet the requirements of the technical evaluation of emergency lighting capability at Point Beach Nuclear Plant, FPER Section 7.3?

☐ Yes, go to 9.1
☐ No, go to 8.11, complete action and resume at 9.1.

Comments: _____

8.11 The modification impacts on Appendix R safe shutdown compliance. List the affected position of emergency lighting system and refer to FPER Section 6.2.10.1. RESUME checklist completion.

Emergency Lighting System: _____

9.0 PLANT COMMUNICATIONS

9.1 Does the modification add/delete/revise plant communication systems?

☐ Yes, go to 9.2
☒ No, go to 9.4

Comments: _____

9.2 Is the affected portion of plant communication system require for Appendix R safe shutdown and/or fire fighting purposes?

☐ Yes, go to 9.3
☐ No, go to 9.4

Comments: _____

9.3 Does the modification add/delete/revise anything (e.g., antenna system, repeaters, power supplies, etc.) that could impede plant communications including radio transmission or reception?

☐ Yes, go to 9.6, complete action and resume at 9.4.
☐ No, go to 9.4

Comments: _____

9.4 Does the modification involve any structural changes that may impede radio transmission, reception, or other communication means?

☐ Yes, go to 9.5
☒ No, go to 10.1

Comments: _____

9.5 Will the affected communication system still perform its function?

☐ Yes, go to 10.1
☐ No, go to 9.6, complete actions and resume at 10.1.

Comments: _____

9.6 The modification impacts on safe shutdown. List the affected portion of plant communication system and refer to FPER Section 6.2.10.1. RESUME checklist completion.

Plant Communication System: _____

FIRE PROTECTION CONFORMANCE CHECKLIST

10.0 REACTOR COOLANT PUMP OIL COLLECTION SYSTEM

10.1 Does the modification affect any portion of the RCP oil collection system?

☐ Yes, go to 10.2
☒ No, Sign checklist complete below item 10.5.

Comments: _____

_____

10.2 Does the modification affect the quantity of oil in the reactor coolant pumps?

☐ Yes, go to 10.5, complete actions and resume at 10.3.
☐ No, go to 10.3

Comments: _____

_____

10.3 Does the modification affect the seismic design of the RCP oil collection system?

☐ Yes, go to 10.5, complete actions and resume at 10.4.
☐ No, go to 10.4

Comments: _____

_____

10.4 Does the modification require the temporary removal of the RCP oil collection system during unit operation?

☐ Yes, go to 10.5, complete actions and sign checklist complete.
☐ No, sign checklist complete below item 10.5.

Comments: _____

_____

10.5 The modification impacts on safe shutdown compliance. List the components of the affected portion of the RCP lube oil collection system and refer to FPER Section 6.2.10.1. RESUME checklist completion.

Components: _____

_____

Conformance checklist completed in accordance with FPER Section 6.2.2.2.

By: Julie Pedersen Date: 6-3-91

DESIGN VERIFICATION NOTICE

Title of Document MR 88-099 #B, FINAL DESIGN & IWP's.

Document No. _____ Rev. _____ Date 8/31/91

Design Verification Method: ☒ Design Review ☐ Alternate Calcs

☐ Qualification Testing

Reviewer: T.D. MIELKE.

REVIEW CHECKLIST CONSIDERATIONS:

		YES	NO	N/A
1.	Were the inputs correctly selected and incorporated into design?	✓		
2.	Are assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent reverifications when the detailed design activities are completed?	✓		
3.	Are the appropriate quality and quality assurance requirements specified?	✓		
4.	Are the applicable codes, standards, and regulatory requirements including issue and addenda properly identified and are their requirements for design met?	✓		
5.	Have applicable construction and operating experience been considered?	✓		
6.	Have the design interface requirements been satisfied?	✓		
7.	Was an appropriate design method used?	✓		
8.	Is the output reasonable compared to inputs?	✓		
9.	Are the specified parts, equipment and processes suitable for the required application?	✓		
10.	Are the specified materials compatible with each other and the design environmental conditions to which the material will be exposed?	✓		
11.	Have adequate maintenance features and requirements been specified?	✓		
12.	Are accessibility and other design provisions adequate for performance of needed maintenance and repair?	✓		
13.	Has adequate accessibility been provided to perform the inservice inspection expected to be required during the plant life?	✓		
14.	Has the design properly considered radiation exposure to the public and plant personnel?			✓
15.	Are the acceptance criteria incorporated in the design documents sufficient to allow verification that design requirements have been satisfactorily accomplished?	✓		

DESIGN VERIFICATION NOTICE (continued)

		YES	NO	N//
16.	Have adequate pre-operational and subsequent periodic test requirements been appropriately specified, including acceptance criteria?	✓		
17.	Are adequate handling, storage, cleaning, and shipping requirements specified?	✓		
18.	Are adequate identification requirements specified?	✓		
19.	Are requirements for records adequately specified?	✓		
20.	Will the change remain within the analyzed or specified capabilities of any affected equipment?	✓		
21.	Has a field inspection been done?	✓		
22.	Have impacts on other systems been identified?	✓		

COMMENTS: None _____ Attached ✓ (Use Form QP 5-3.1)

Reviewed by: _____ Date 8/31/91

Approval by: _____ Date _____

NUCLEAR POWER DEPARTMENT
DOCUMENT REVIEW

3 Doc. Review Package No.

Sheet ____ of ____

INITIATOR

1 Document Title/Number/Revision/Date
MR 88-099+B FINAL DESIGN & IWPs

2 To: ____ Location: ____ Trans. #: ____
From: ____ Date: ____ Supt. Approval: ____
PLEASE REVIEW THIS DOCUMENT AND RETURN COMMENTS PRIOR TO ____

BLOCKS 4-6 TO BE COMPLETED BY REVIEWING ORGANIZATION

6 To: JAS Location: PBNP Trans. #: ____
From: TDM Date: 8/31/91 Supt. Approval: ____
FEEDBACK REQUESTED: ☐ ORAL ☒ WRITTEN ☐ NONE

4 Comments:

1) WILL THE INCREASED SIZE OF THE MINI-RECIRC LINE HAVE ANY AFFECT ON APPROACHING PUMP RUN-OUT, OR ON DEISEL LOADINGS? PLEASE ADDRESS THESE CONCERNS IN THE FINAL DESIGN DESCRIPTION.

2) MANUFACTURING PROCESS OF SS COMPONENTS TYPICALLY LEAVES SURFACE CONTAMINATION OF CHLORIDES, ETC. SUGGEST FLUSHING NEW SS RECIRC PIPING & COMPONENTS PRIOR TO CONNECTING THEM TO THE SYSTEM.

7 Resolution:

1) No. The discharge control valves control pump discharge pressure at 1100 psig

2) Added a Note to the IWPs to rinse out the new components with DI water and wipe down the inner surfaces

5 Comments By/Date:
[signature] 8/31/91

8 Resolution By/Date
[signature] 9/3/

9 Review Date
[signature] 9/3/9

Copies to: Initiator
File

Form QP 5-3.1
Rev. 1

NUCLEAR POWER DEPARTMENT
DOCUMENT REVIEW

3 Doc. Review Package No. 88-099*

Sheet 1 of 2

INITIATOR

1 Document Title/Number/Revision/Date

Mod Req 88-099*B

2 To: _____ Location: _____ Trans. #: _____

From: _____ Date: _____ Supt. Approval: _____

PLEASE REVIEW THIS DOCUMENT AND RETURN COMMENTS PRIOR TO _____

BLOCKS 4-6 TO BE COMPLETED BY REVIEWING ORGANIZATION

6 To: JAS Location: PBNP Trans. #: ——

From: JGS Date: 9/5/91 Supt. Approval: ——

FEEDBACK REQUESTED: ☐ ORAL ☐ WRITTEN ☒ NONE

4 Comments:

1) The final design description says the operator is a D-100-150 is it a 150 in² or 160 in² operator? If it is a 150 we have to stock spare parts for it since as far as I know the only sizes we currently have on site are D-100-60, D-100-100 D-100-160 & D-100-400.

2) The final design description calls the piping upstream of the manual isolation valve 1500# class, I thought Bechtel DB piping was a 900# class but the Aux feed piping DB-3 has a design temp & press of 100 oF & 1440 psig.

7 Resolution:

1. This was a typo. The operator is a D-100-160. The final design description has been changed

2. The valves this portion of line are 1500# class. The piping is 900# class. The final design description has been changed.

5 Comments By/Date:

J G Schmidt 9/5/91

8 Resolution By/Da

Jack Schmidt 9/5/

9 Review Da

Discussed with JGS

Copies to: Initiator
File _____

Form QP 5-3.1
Rev. 1

NUCLEAR POWER DEPARTMENT
DOCUMENT REVIEW

3 Doc. Review Package No.

Sheet 2 of 2

INITIATOR

1 Document Title/Number/Revision/Date

2 To: [ ] Location: [ ] Trans. #: _____

From: _____ Date: _____ Supt. Approval: _____

PLEASE REVIEW THIS DOCUMENT AND RETURN COMMENTS PRIOR TO _____

BLOCKS 4-6 TO BE COMPLETED BY REVIEWING ORGANIZATION

6 To: [ ] Location: [ ] Trans. #: _____

From: _____ Date: _____ Supt. Approval: _____

FEEDBACK REQUESTED: ☐ ORAL ☐ WRITTEN ☐ NONE

4 Comments:

3) The IWP (page 17) says to set up the value in accordance with MI 5.2, this was already done when we reconditioned the valves under a seperate MWR and I see no need to do it again. It would need to be redone if we change the spring, but we should do the spring change and setup before installing the valve not during the LCO.

7 Resolution:

3. The valves will be set up in the mwi which ~~refurbishes the valves and~~ installs the spring and handwheels The regulator will be set in the IWP. The IWP has been revised.

5 Comments By/Date:

J. A. Schwartz 9/5/91

8 Resolution By/Dat

Jack A. Schwartz 9/5

9 Review Dat

Discussed with JG

Copies to: Initiator
File

Form QP 5-3.1

NUCLEAR POWER DEPARTMENT
DOCUMENT REVIEW

3 Doc. Review Package No.

Sheet ____ of __

INITIATOR

1 Document Title/Number/Revision/Date
IWP 88-099*B-1/2

2 To: ____ Location: ____ Trans. #: ____
From: ____ Date: ____ Supt. Approval: ____
PLEASE REVIEW THIS DOCUMENT AND RETURN COMMENTS PRIOR TO ____

BLOCKS 4-6 TO BE COMPLETED BY REVIEWING ORGANIZATION

6 To: JAS Location: JAP Trans. #: ____
From: ____ Date: ____ Supt. Approval: ____
FEEDBACK REQUESTED: ☐ ORAL ☒ WRITTEN ☐ NONE

4 Comments:

1. Hi Limit for PC-4012 / PC-4019 should be returned to ≈ 51.00 mg not maximum.
2. Setpoint change form must be approved prior to changing dPIS-4007 / dPIS-4014 setpoints. in steps 4.3.
3. The transmitter is within the DB-3 hydro boundaries. Hydro pressure is 2160 psig. This is above the static piessure limit for the transmitter. Transmitter should be isolated and vented during hydro.
4. Any torque requirements for mounting transmitters?

7 Resolution:

1. IWPs revised.
2. Will be done
3. Per hydro sheet the rig will be attached to the flange. Transmitter lines will be disconnec
4. None. Transm is non-seismic

5 Comments By/Date:
John Pol 9-4-91

8 Resolution By/Da
[signature] 9/

9 Review Da
Discussed with JA

Copies to: Initiator
File ____

Form QP 5-3.1
Rev. 1

INTERNAL CORRESPONDENCE

NPM 91-0704

TO: D. E. Duenkel

FROM: J. A. Pederson, Responsible Engineer

DATE: May 03, 1991

SUBJECT: RADIOGRAPHY CONCERNS FOR M.R. 88-099*A

COPY TO: File M1.1 (M.R. 88-099A)

Original Bechtel piping NDE requirements for the 2" tie-in to the 4" discharge header would have required 100% RT of the butt welds. However, per the Bechtel letter of March 14, 1991 to T. D. Mielke, the basis for whether or not to do radiography should be "the present day editions of ANSI B31.1."

The ANSI/ASME B31.1-1986 edition states that "for temperatures between 350° F and 750° F inclusive with all pressures over 1025 psig" that the requirement for buttwelds is "RT for over NPS 2 with thickness over 3/4 inch." A visual is required for all sizes and thicknesses. Since the new Aux FW recirc piping is 2" schedule 80 piping (wall thickness = 0.218) tying into 4" schedule 80 piping (wall thickness = 0.337) only a visual inspection is required.

Julie Pederson

dn

Bechtel
777 East Eisenhower Parkway
Ann Arbor, Michigan 48108
Mailing address: P.O. Box 1000
Ann Arbor, Michigan 48106-1000

March 14, 1991

BLP-91-024

T.D. Mielke
Point Beach Nuclear Plant
Wisconsin Electric Power Company
6610 Nuclear Road
Two Rivers, WI 54241

In reply refer to
Chron 04530

Subject: Point Beach Nuclear Plant
WEPCo Contract 174593
Bechtel Job 10447-050-039
CRITICAL SERVICE PIPING

Dear Mr. Frieling:

This responds to a verbal request for information from your Todd Mielke to Ted vanVick on March 11, 1991. Mr. Mielke inquired as to the basis for Bechtel specifying 100% radiography of butt welds in ANSI B31.1 critical piping in original construction of systems at the Point Beach nuclear station.

In the past, it was Bechtel practice to designate certain non-nuclear systems in a light water-cooled nuclear power plant as "critical". For these systems, the design conditions and service were considered to warrant that their pressure integrity be verified by examination over and above that required by code. This approach was adopted because earlier editions of ANSI B31.1 did not impose adequate NDE requirements to establish the desired confidence in the pressure integrity of some piping systems.

However, the later versions of ANSI B31.1 have incorporated acceptable NDE requirements for those piping systems. Therefore, we have discontinued the earlier approach of classifying piping systems into critical and noncritical categories. We believe that the present-day editions of ANSI B31.1 provide for the desired confidence in the pressure integrity of the piping systems.

If you have any questions, please advise.

Sincerely,

T.W. Vanvick
Project Engineer

TWV/JOA/mv
031403

cc: J.O. Abel
G.D. Frieling, Downtown
B.O. Sasman, Downtown

Table 136.5.1

Mandatory Minimum
Nondestructive Tests for Welds

	100 Per Cent Radiography	Liquid Penetrant or Magnetic Particle
BUTT WELDS		
Steam Service above 925 F:		
Greater than 1-1/8 in. nominal wall thickness	Yes	Yes*
Equal to or less than 1-1/8 in. nominal wall thickness	No	Yes*
Steam Service 925 F and below:	No	No
Water Service — all pressures and temperatures:		
Greater than 1-5/8 in. nominal wall thickness	Yes	No
Equal to or less than 1-5/8 in. nominal wall thickness	No	No
FILLET AND SOCKET WELDS		
Steam Service above 2500 psi or 925 F	No	Yes*
All Other Services	No	No

* For austenitic materials only.

punent shall be completely radiographed.

(b) Random Radiography. Where random radiography is specified, one or more welds may be completely or partially radiographed. It must be recognized that random radiography will not insure fabricated product of predetermined quality throughout, and is in no way a substitute for 100 per cent radiography. Random radiography is considered to be only a desirable means of spot checking welder performance, particularly in field welding where conditions such as position, ambient temperatures, and cleanliness are not as readily controlled as in shop welding.

(c) Ultrasonic. Where 100 per cent ultrasonic testing is specified, the entire surface of the part being inspected shall be covered using extreme care and careful methods to be sure that a true representation of the actual conditions is obtained.

(d) Liquid Penetrant. Where liquid penetrant examination is specified, the entire surface of the component or weld being examined shall be covered. The examination shall be performed in accordance with the applicable requirements of Appendix VIII, Section VIII of the ASME Boiler and Pressure Vessel Code. The following standards of acceptance shall be met:

All linear discontinuities and aligned penetrant indications revealed by the test shall be removed. Aligned penetrant indications are those in which the average of the center-to-center distances between any one indication and the two adjacent indications in any straight line is less than 3/16 in. All other discontinuities revealed on the surface need not be removed unless the discontinuities are also revealed by radiography, in which case the pertinent radiographic specification shall apply.

(e) Magnetic Particle. Where magnetic particle testing is specified, the entire surface of the component or weld being examined shall be covered. The testing shall be performed in accordance with Appendix VI, Section VIII of the ASME Boiler and Pressure Vessel Code. The following standards of acceptance shall be met:

1. Castings — ASTM E 125 as supplemented by MSS SP-53.

2. Other components and welds — All linear discontinuities and aligned indications revealed by the test shall be removed. Aligned indications are those in which the average of the center-to-center distances between any one indication and the two adjacent indications in any straight line is less than 3/16 in. All other revealed discontinuities need not be removed unless the discontinuities are also revealed by radiography, in which case the pertinent radiographic specification shall apply.

137 LEAK TESTS

137.1 General.

It shall be mandatory that the design, fabrication, and erection of power piping, constructed under this Code demonstrate leak tightness. This requirement shall be met by a hydrostatic leak test prior to initial operation. Where a hydrostatic test is not practicable, an initial service leak test, a vacuum test, or [illegible] system [illegible].

137.1.1 Hydrostatic Leak Test.

When a hydrostatic leak test is conducted it shall conform to the provisions of Pars. 137.2, 137.3, and 137.4, covering test media, test preparation, and test pressure.

137.1.2 Initial Service Leak Test.

(a) An initial service leak test and inspection is acceptable when other types of tests are

A88

TABLE 136.4
MANDATORY MINIMUM NONDESTRUCTIVE EXAMINATIONS FOR PRESSURE WELDS OR WELDS TO PRESSURE RETAINING COMPONENTS

Type Weld	Piping Service Conditions and Nondestructive Examination		
	Temperatures Over 750°F (400°C) and at All Pressures	Temperatures Between 350°F (175°C) and 750°F (400°C) Inclusive With All Pressures Over 1025 psig [(7100 kPa (gage)]	All Others
Buttwelds (girth and longitudinal)	RT for over NPS 2. MT or PT for NPS 2 and less	RT for over NPS 2 with thickness over ¾ in. (19.0 mm). Visual for all sizes with thickness ¾ in. (19.0 mm) or less.	Visual for all sizes and thicknesses
Welded branch connections (size indicated is branch size) [see Note (7)]	RT for over NPS 4. MT or PT for NPS 4 and less	RT for branch over NPS 4 and thickness of branch over ¾ in. (19.0 mm) Visual for all sizes with branch thickness ¾ in. (19.0 mm) or less	Visual for all sizes and thicknesses
Fillet, socket, attachment, and seal welds	PT or MT for all sizes and thicknesses	Visual for all sizes and thicknesses	Visual for all sizes and thicknesses

NOTES:
(1) All welds must be given a visual examination in addition to the type of specific nondestructive examination specified.
(2) NPS — nominal pipe size.
(3) RT — radiographic examination; MT — magnetic particle examination; PT — liquid penetrant examination.
(4) RT of branch welds shall be performed before any nonintegral reinforcing material is applied.
(5) The thickness of buttwelds is defined as the thicker of the two abutting ends after end preparation.
(6) Temperatures and pressures shown are design.
(7) In lieu of radiography of welded branch connections when required above, liquid penetrant or magnetic particle examination is acceptable and, when used, shall be performed at the lesser of one-half of the weld thickness or each ½ in. of weld thickness and all accessible final weld surfaces.
(8) For nondestructive examination of the pressure retaining component, refer to the standards listed in Table 126.1 or the manufacturing specifications.
(9) Acceptance standards for NDT performed are as follows: MT — see Para. 136.4.3; PT — see Para. 136.4.4; VT — see Para. 136.4.2; RT — see Para. 136.4.5.
(10) Fillet welds not exceeding ¼ in. (6 mm) throat thickness which are used for the permanent attachment of nonpressure retaining parts are exempt from the PT or MT requirements of the above Table.

SARGENT & LUNDY
ENGINEERS
FOUNDED 1891
55 EAST MONROE STREET
CHICAGO, ILLINOIS 60603-5780
(312) 269-2000

August 27, 1991
Project No. 6904-22

Wisconsin Electric Power Company
Point Beach Nuclear Power Plant - Units 1 and 2

Auxiliary Feedwater/Feedwater Recirculation Line Modifications

Mr. G. D. Frieling
Nuclear Engineering and Analysis Section
Point Beach Nuclear Plant
6610 Nuclear Rd.
Two Rivers, Wisconsin 54241

Attention: Mr. J. Schroeder

Dear Mr. Frieling:

Sargent & Lundy has reviewed the proposed modifications to the Auxiliary Feedwater/Feedwater Recirculation Lines shown on Isometric Drawing P-103. The modifications consist of the following:

1. Replacement of anchors DB-3-H11, DB-3-2H6 and DB-3-2H7 on the 3" DB-3 Feedwater lines between pumps P38A and P38B.

2. Replacement of the 1-1/2" DB-3 recirculation lines coming off the 3" and 4" Feedwater lines from pumps P38A, P38B and 2-P29 with 2" diameter, Sch. 80 piping.

This letter will address the proposed sequencing of the modifications and their effect on existing subsystem structural loads and stresses.

<u>Replacement of Anchors DB-3-H11, DB-3-2H6 and DB-3-2H7</u>

A. Anchors DB-3-H11 and DB-3-2H7 may be replaced provided temporary vertical deadweight supports are added near the existing anchor locations and the corresponding pump (P38A or P-38B, respectively) is declared inoperable.

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B. Anchor DB-3-2H6 may be replaced while either pump P-38A or P-38B is in operation provided a temporary vertical support with a capacity of at least 500 lbs downward is added as close as possible to the existing anchor location.

The existing adjacent support configuration in conjunction with the temporary vertical support ensures that the piping will be adequately supported should a seismic event occur during replacement of anchor DB-3-2H6. Piping stresses and support loads will not be adversely affected; current stress margins are well below the allowable values in the affected areas.

Replacement of 1-1/2" Recirculation Lines

The 1-1/2" lines identified in Item 2 above may be replaced with 2" piping in two steps:

A. The 1-1/2" piping downstream of the last manually operated valve may be replaced during system operation provided the manually operated valve is closed and the piping is cut after the existing support between the manually operated valve and the first elbow.

B. The remaining piping from the connection to the Feedwater lines through the manually operated valve may be replaced while the corresponding pump (P38A, P38B or 2-P29) is declared inoperable. Temporary vertical deadweight supports shall be provided on the line as construction proceeds.

These modifications will not adversely affect existing header and branch pipe stresses and support loads due to substantial stress margins and reduced weight and pressure stresses. Only one of the above modifications may be performed at a time.

In addition, please note that valve 1AF-15 and the corresponding valves on the other branch lines were initially evaluated with a weight of 30 lbs. The actual weight of these valves is 35 lbs. The 5 lb difference in weight is small and will have an insignificant effect on the analysis results.

Also note that the two-way supports near the pneumatically operated valves on the branch lines (node points 70, 1460 and 2420 in the analysis) were analyzed as 3/8" standard U-bolts.

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Justification for the above conclusions will be documented in Addendum A to the stress report for Subsystem 1DD3BC-2", Auxiliary Feedwater, Accession No. 100070, Revision 01, EMD Accession No. 066934.

Should you have any questions, please call Ram Madugula at (312) 269-6803 or George Tokarski at (312) 269-6504.

Yours very truly,

G. Z. Tokarski
Systems Project Engineer

Copies:

M. A. Woznicki
A. Reimer
B. E. Lunde
G. C. Jones
G. T. Kitz
A. W. Szechowycz
M. G. Flynn
D. E. Olson
R. Madugula

SARGENT & LUNDY
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55 EAST MONROE STREET
CHICAGO, ILLINOIS 60603-5780
(312) 269-2000

August 28, 1991
Project No. 6904-22

Wisconsin Electric Power Company
Point Beach Nuclear Power Plant - Units 1 and 2

Auxiliary Feedwater Recirculation Line Routing Changes

Mr. G. D. Frieling
Nuclear Engineering and Analysis Section
Point Beach Nuclear Plant
6610 Nuclear Rd.
Two Rivers, Wisconsin 54241

Attention: Mr. J. Schroeder

Dear Mr. Frieling:

Sargent & Lundy has reviewed the attached sketches provided by your Mr. J. Schroeder showing required routing changes to the original design of the Auxiliary Feedwater Recirculation Lines. Subsequent conversations with Mr. Schroeder have identified the following additional changes to the piping dimensions shown on the sketches:

- the horizontal runs containing control valves "NS-1" and "NS-2" will need to be shortened by approximately 18.5" from the dimensions shown on the sketches
- the above change will result in a corresponding 18.5" increase in the length of the horizontal runs beyond the first riser

These changes are necessary to avoid interferences in the field.

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Based on an evaluation of existing stress margins and adjacent support capacities, the changes will have no adverse effect on the current analysis results. The dimension changes discussed above are acceptable; however, the locations of the supports near the risers ("NS-8" and "NS-9") and the supports near the control valves (DB3-H207 and DB3-H208) must be maintained at or near the dimensions shown on the sketches (relative to the risers and control valves).

Calculations justifying the above conclusions will be documented in Addendum A to the base stress analysis report (Subsystem 1DD3BC-2", Auxiliary Feedwater, Accession No. 100070, Revision 01, EMD Accession No. 066934).

Should you have any questions, please call me at (312) 269-6504.

Yours truly,

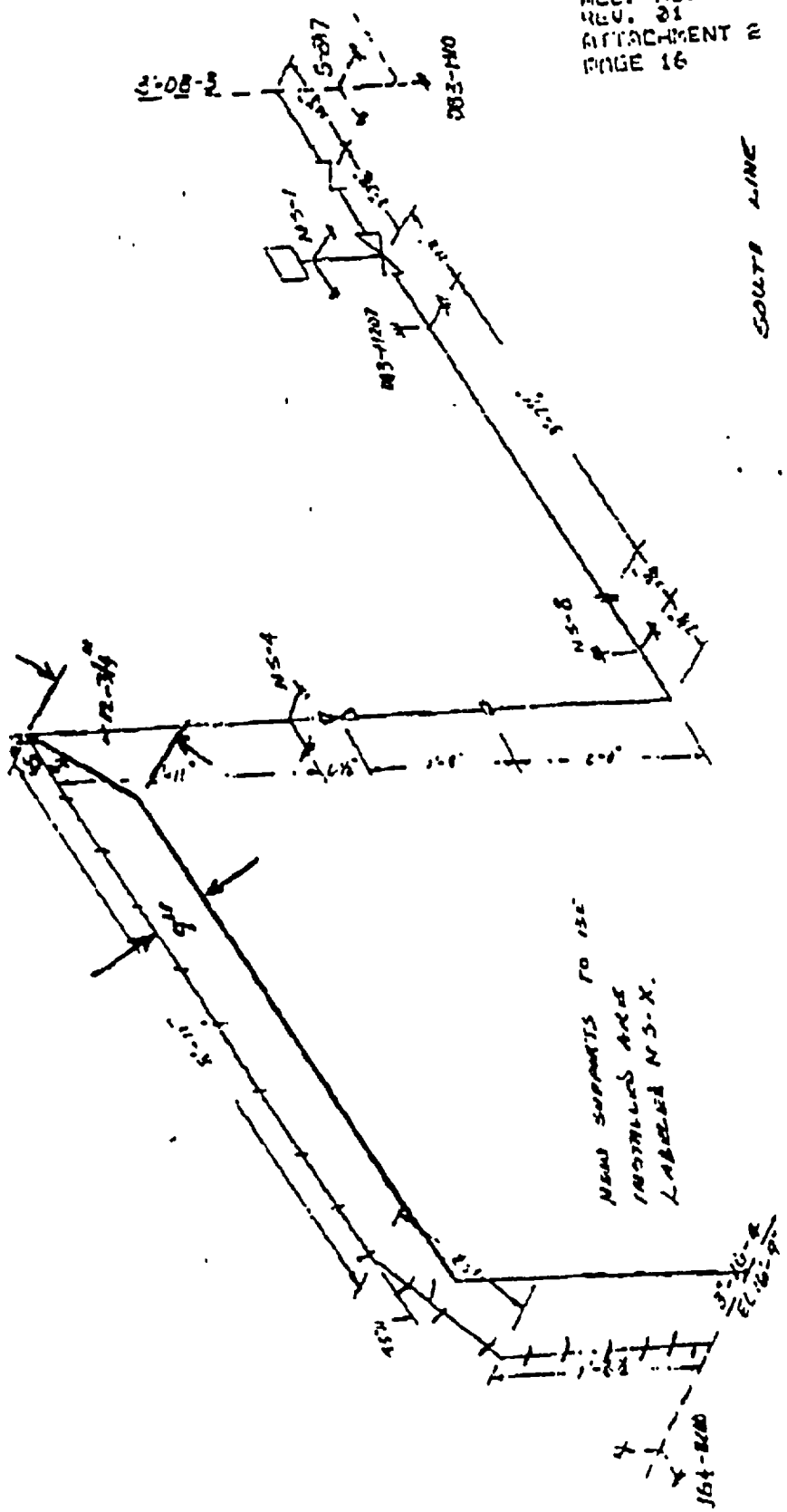
G. Z. Tokarski
Systems Project Engineer

Attachment
Copies:

M. A. Woznicki
A. Reimer
B. E. Lunda
G. T. Kitz
A. W. Szechowycz
D. E. Olson
R. Madugula

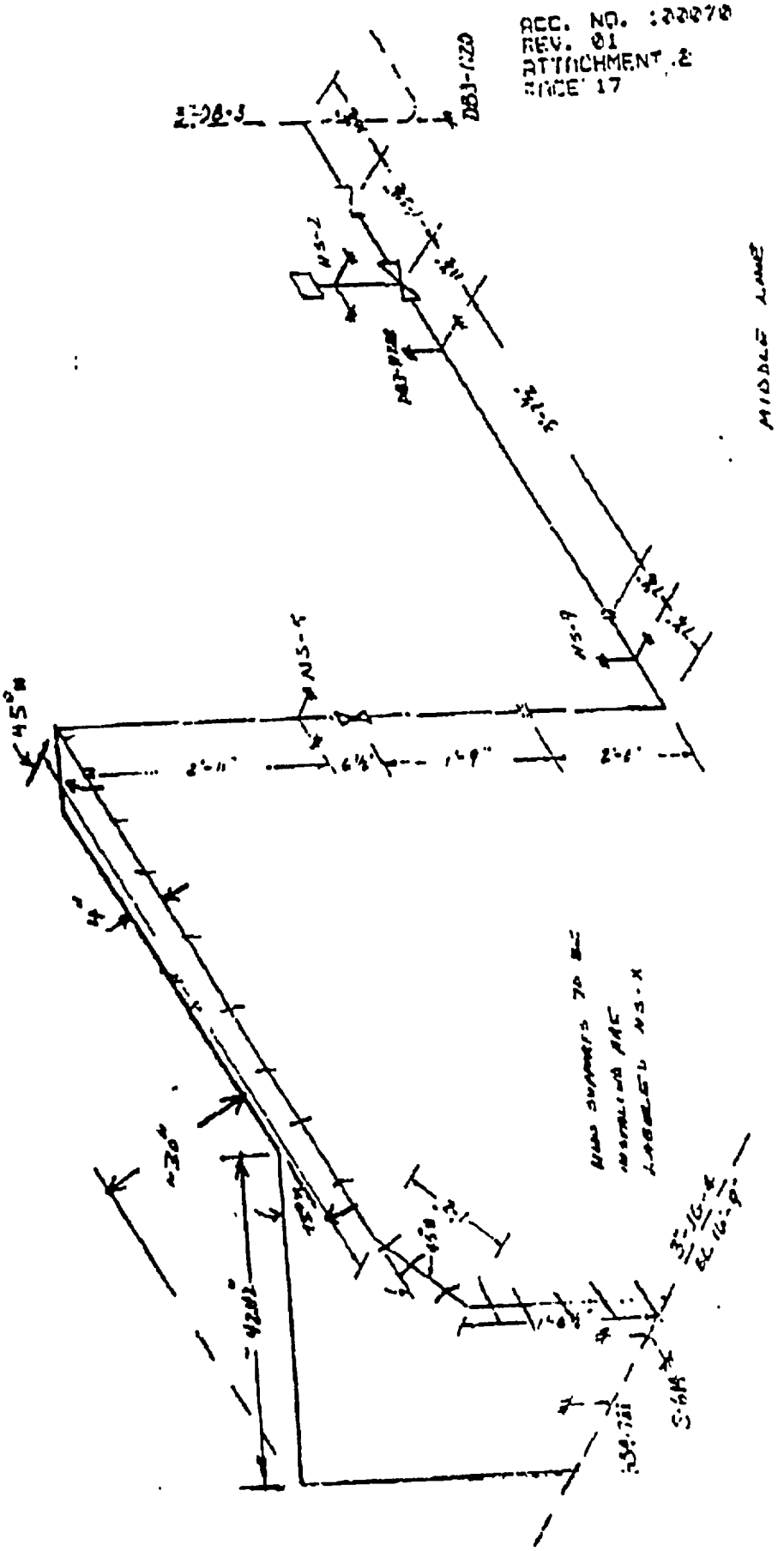
AUXILIARY FEEDWATER RECIRCULATION LINE MODIFICATION

SK-AFW-008/88-099



ACC. NO. :22070
REV. 01
ATTACHMENT 2
SHEET 17

AUXILIARY FEEDWATER RECIRCULATION LINE MODIFICATION
SK-AFW-009/88-099



SENT BY:22 11:01

Telecopy Cover Sheet

SARGENT & LUNDY

Please Print In Black Ink Only

Date: 09-19-91

Project No.: 8992 00

Work Group No.: 211

To: J. SCHROEDER

Telecopy Phone No.: 414 755 2321 X 233

Company Name: WISCONSIN ELECTRIC City: POINT BEACH State: WI

From: G. TOKARSKI Ext.: 6504 Loc.: 22013

Cover Sheet Plus 1 Page(s)

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(312) 269-3559 or (312) 269-2000

F0379 001 04-89

JOHN,

Here is revised note. Please send sketches so I can complete my calculation.

Thanks,

George Tokarski

PER CONVERSATIONS WITH J. SCHROEDER OF WE ON 9-18-91 THE FOLLOWING INSTALLATION DEVIATIONS HAVE BEEN IDENTIFIED ON SUBSYSTEM 1DD3BC-2" (AUX. FW RECIRC LINE TO CONDENSATE STORAGE TANK)

1. MIN. ~~SEPARATION~~ BETWEEN ANCHOR BOLTS ON SUPPORTS DB3A-2001G & DB3-H208 IS 7".

2. THE L2x2x1/4 ANGLE ON SUPPORT "NS-9" ON THE MIDDLE RECIRC LINE (REF. REPORT WE-100070) IS NOT WELDED TO CENTER OF PLATE (APPROX 0.6" OFF CENTER).

3. "3" MIN." DIMENSION ON DRAWING FOR SUPPORT "NS-9" IS 2 7/8".

BASED ON A REVIEW OF THE EXISTING CALCULATIONS FOR THE ABOVE SUPPORTS, THE DEVIATIONS ARE ACCEPTABLE BASED ON ENGINEERING JUDGEMENT DUE TO THE EXISTING MARGINS ON THE COMPONENTS.

NOTE THAT A FORMAL EVALUATION CONSIDERING THE CUMULATIVE EFFECTS OF ALL DEVIATIONS ON THIS SYSTEM WILL NEED TO BE PERFORMED & DOCUMENTED IN AN AS-BUILT ADDENDUM TO THE APPLICABLE REPORTS AFTER RECEIPT OF COMPLETE AS-BUILT INFO BY S&L.

Tom Talarski

COPES-VULCAN, INC.

White Consolidated Industries
LAKE CITY ERIE CO.) PA. U.S.A.

TELECOPY MESSAGE

PH: (814)774-3151 FAX: (814)774-2646

TO: WEP POINT BEACH

FAX NO. 414 755-2321 EXT. 233

ATTN: TODD MIELKE

DATE: 6/6/91

FROM: JEFF RUFFING X223

REFERENCE: D-166085 7620-95875-248

SUBJECT: SPRING CONVERSION

PAGE 1 OF 1

MESSAGE:

TODD,

I HAVE DONE SOME SPRING ANALYSIS AND SELECTED A SPRING THAT WILL MEET YOUR NEEDS MORE EFFICEINTLY. THE SPRING WILL COST $387.00 PER SPRING, ALSO REQUIRED ARE THE 4 HEX HEAD CAP SCREWS A PRICE OF $6.36 PER SET (QTY. 4). CV CURRENTLY HAS 3 SPRINGS IN STOCK AND PLENTY OF CAP SCREWS IN STOCK. THE ASSEMBLY DRAWING CAN BE REVISED UNDER THE OLD JOB # 9150-57403 INCLUDING THE HANDWHEEL CONVERSION. PLEASE REPLY ASAP SO WE CAN RESERVE THE SPRINGS FOR YOU. IF YOU HAVE ANY FURTHER QUESTIONS OR IF I CAN BE OF FURTHER ASSISTANCE PLEASE FEEL FREE TO GIVE ME A CALL. THANK YOU FOR YOUR TIME.

REGARDS

Jeff Ruffing

Springs are ordered.

JEFFREY R. RUFFING
MAINTENANCE SALES ENGINEER
CUSTOMER SERVICE DEPARTMENT
COPES-VULCAN, INC.
P.O. Box 877
[illegible] PA 16433-0877

CALCULATION REVIEW AND APPROVAL
NUCLEAR POWER DEPARTMENT

Calculation #
N-91-063
Number of pages
10 .9 cac 7/2/91

Title of Calculation:
P38A & B Recirc Line System Characteristics

☒ Original calculation

☐ Revised calculation. Revision #_____

☐ Superseding calculation. Supersedes calculation #_____

Modification #	Description:
88-099	AFW pump recirc line size increase.

Other References:
See attached.

Prepared By: Julia Pederson | Date: 6-24-91

This calculation has been reviewed in accordance with QP 3-6. The review was accomplished by one or a combination of the following (as checked):

___ A review of a representative sample of repetitive calculcations .

✓ A detailed review of the original calculation

___ A review of the calculation against a similar calculation previously performed

___ A review by an alternate, simplified or approximate method of calculation

Comments:
As annotated on calc. cac 7/2/91

Reviewed By:	Date:	Approved By:	Date:
C.C. Cantrell	7/2/91	D.L. Rainn	7/2/91

: ɔrpose:

The purpose of this calculation is to determine the system characteristics for the auxiliary feed pump mini-recirc system. This calc will address pumps P38A & B only.
In addition, this calc will determine the equivalent K (resistance coefficient) values for the recirc line to the CST.

References:

1. Byron Jackson Pump Curve T-30944 and T-30945 for pumps P38A & B respectively.
2. Crane Technical paper No. 410
3. Letter from Byron Jackson Pumps to WE dated August 7,1989 regarding required mini-recirc flows for the AFW pumps.
4. WE Dwg M-217 rev 4
5. Copes-Vulcan Dwg D-166085 rev 9
   Rockwell-Edwards Dwg C-464529 rev 5
6. Purchase Order No. 184514
7. Bechtel Dwgs: P-103 rev 7
   P-118 rev 5
   P-117 rev 5
   M-34 rev 8
   M-35 rev 6
   M-37 rev 6

Assumptions:

1. Calculation is based on the longest run of system piping which, by inspection is from the 2P29 aux feedwater pump.

Inputs:

TDH := 1192 psig	P38 head (psig) @ 200 gpm	✓
den := 62.4 lb/ft^3	Density of water	✓
Q := 70 gpm	Required mini recirc flow	✓

DISCHARGE LINE:

2" line info:

Schedule 80:

d280 := 1.939 in	Inside dia of 2" sch 80 pipe	✓

$K_{ent} := .5$ Recirc line pipe entrance ✓ 2/9

$CV_{chk} := 60$ Check valve flow coefficient (full) ✓

$CV_{cont} := 33$ Control valve flow coefficient (full) ✓

$f2 := .019$ Friction factor for 2" fully turbulent ✓

$K_{2glb} := 340 \cdot f2$ $K_{2glb} = 6.46$ 1500 #, 2" globe valve Ref 2 pg. A-27 ✓
Note: K is based on sch 160 pipe

$K_{290} := 14 \cdot f2$ 2" 90 degree elbow, Assumes $\frac{f}{2} = 1.5$ typical long radius ELL. ✓ cac 7/2/91

Determine flow meter orifice characteristics:

Typically, ß should be in the range of 0.5 to 0.75

$d_o := 1.375$ Selected orifice diameter ✓

$$\beta := \frac{d_o}{d280} \qquad \beta = 0.709$$ ✓

$$RE := 50.6 \cdot \frac{Q \cdot den}{d280 \cdot 1.2} \qquad RE = 9.499 \cdot 10^4$$ Ref Crane Eqn 3-3 ✓
Re doesn't change much with the small Q-range used, so a fixed C is SAT. cac 7/2/91

$C := .705$ Ref Crane Pg A-20 ✓

2" schedule 40:

$d240 := 2.067$ in Inside dia of 2" sch 40 pipe ✓

3" schedule 10:

$d310 := 3.26$ in Inside dia of 3" sch 10 pipe ✓

$f3 := .018$ Friction factor for 3" fully turbulent ✓

$K_{3gate} := f3 \cdot 8$ 3" gate valve ✓

$K_{3chk} := f3 \cdot 50$ 3" check valve ✓

$K_{3x3r} := f3 \cdot 20$ 3x3 tee flow thru run ✓
from next page. cac 7/2/91

3x3r

$K_{390} := 14 \cdot f3$ 3" 90 elbow ✓

3x2 reducer:

$\theta := 2 \cdot \operatorname{atan}\left[\frac{0.66}{3.5}\right]$ ✓

$\beta := \frac{d240}{d310}$ $\beta = 0.634$ ✓

$K_{3x2} := \frac{2.6 \cdot \left[\sin\left[\frac{\theta}{2}\right]\right] \cdot \left[1 - \beta^2\right]^2}{\beta^4}$ $K_{3x2} = 1.066$ enlargement ✓

4" schedule 10:

d410 := 4.26 in diameter of 4" sch 10 ✓

f4 := .017 friction factor for 4" line ✓

$K_{490} := f4 \cdot 14$ 4" 90 elbow ✓

4" schedule 80:

d480 := 3.826 in diameter of 4" sch 80 line ✓

6" schedule 10:

d610 := 6.357 in diameter of 6" sch 10 line ✓

f6 := .015 friction factor for 6" line ✓

$K_{6x6r} := 20 \cdot f6$ Flow thru tee 6x6 ✓

$K_{6x6b} := 60 \cdot f6$ Flow thru branch tee 6x6 ✓

$K_{6gate} := 8 \cdot f6$ 6" gate valve ✓

$K_{6chk} := f6 \cdot 50$ 6" check valve ✓

$K_{690} := 14 \cdot f6$ 6" 90 elbow ✓

$K_{xit} := 1$ Exit loss ✓

6x3 reducer:

$\theta := 2 \cdot \operatorname{atan}\left[\frac{1.55}{5.5}\right]$ ✓

$\beta := \frac{d310}{d610}$ ✓

$K_{6x3} := 2.6 \cdot \left[\sin\left[\frac{\theta}{2}\right]\right] \cdot \left[1 - \beta^2\right]^2$ $K_{6x3} = 0.383$ enlargement ✓

6x4 reducer:

$\theta := 2 \cdot \operatorname{atan}\left[\frac{1.05}{5.5}\right]$ ✓

$\beta := \frac{4.26}{d610}$ ✓

$K_{6x4} := \frac{.8 \cdot \left[\sin\left[\frac{\theta}{2}\right]\right] \cdot \left[1 - \beta^2\right]}{\beta^4}$ Contraction ✓

10" line info:

d1010 := 10.42 in diameter of 10" sch 10 line ✓

f10 := .014 friction factor for 10" line ✓

$K_{10gate} := f10 \cdot 8$ 10" gate valve ✓

$K_{1090} := f10 \cdot 14$ 10" 90 elbow ✓

$K_{1045} := f10 \cdot 8$ 10" 45 elbow ✓

$K_{10x10b} := f10 \cdot 60$ 10x10 tee branch flow ✓

$K_{10x6b} := f6 \cdot 60$ 10x6 tee branch flow ✓

Calculation:

pipe loss function:

$$DP(f,L,v,d) := .001294 \cdot f \cdot L \cdot den \cdot \frac{v^2}{d}$$ Ref Crane 410 eqn 3-5 ✓

velocity function:

$$v(d) := \frac{Q}{\left[\frac{\pi}{4 \cdot 144} \cdot d^2\right] \cdot 7.48 \cdot 60}$$ ✓

fitting loss function:

$$DPF(K,v) := .0001078 \cdot K \cdot den \cdot v^2$$ Ref Crane 410 eqn 3-14 ✓

equivalent resistance coefficient function:

$$K(dpt,d,q) := dpt \cdot \frac{d^4}{.00001799 \cdot den \cdot q^2}$$ Ref Crane 410 eqn 3-14 ✓

Calculate the pressure loss from the AFW pump discharge to the mini-recirc line tie-in:

piping:

$v480 := v(d480)$ ✓

$dP_1 := DP(f4,22,v480,d480)$ $dP_1 = 0.03$ ✓

fittings:

$K_{tot} := 3 \cdot K_{490}$ ✓

$dP_2 := DPF[K_{tot}, v480]$ $dP_2 = 0.018$ ✓

Calculate losses from the mini-recirc line entrance to globe valve:

pipe loss:

$v280 := v(d280)$ $v280 = 7.606$ ✓

$dP_3 := DP(f2,10,v280,d280)$ $dP_3 = 0.458$ ✓

fittings:

$K_{tot} := K_{ent} + 1 \cdot K_{290}$ $K_{tot} = 0.766$ ✓

$dP_4 := DPF[K_{tot}, v280]$ $dP_4 = 0.298$ ✓

valves:

control valve:

$$dP_5 := \left[\frac{Q}{CV_{cont}}\right]^2$$ $dP_5 = 4.5$ ✓

check valve:

$$dP_6 := \left[\frac{Q}{CV_{chk}}\right]^2$$ $dP_6 = 1.361$ ✓

globe valve:

$dP_7 := DPF[K_{2g16}, v280]$ $dP = 2.514$ ✓

From previous following page. 7/2/91

restricting orifice:

$$dP_8 := 948 \cdot \left[\frac{Q}{70}\right]^2 \qquad dP_8 = 948$$

Flow meter orifice:

$$dP_9 := \left[\frac{Q}{236 \cdot d_o^2 \cdot C}\right]^2 \cdot den \qquad dP_9 = 3.09$$

Calculate pressure loss from globe valve to 3x2 reducer:

piping:

$v240 := v(d240) \qquad v240 = 6.693$

$dP_{10} := DP(f2,26,v240,d240) \qquad dP_{10} = 0.865$

fittings:

$K_{tot} := 2 \cdot K_{290} + K_{3x2}$

$dP_{11} := DPF[K_{tot}, v240] \qquad dP_{11} = 0.482$

Calculate pressure loss from 3x2 reducer to 3x6 reducer:

piping:

$v310 := v(d310) \qquad v310 = 2.691$

$dP_{12} := DP(f3,157,v310,d310) \qquad dP_{12} = 0.507$

fittings/valves:

$K_{tot} := 7 \cdot K_{390} + K_{6x3} + 3 \cdot K_{3x3r} + K_{3gate} + K_{3chk}$

$dP_{13} := DPF[K_{tot}, v310]$ $dP_{13} = 0.208$ ✓ 8/9

Calculate pressure loss from 3x6 reducer to condensate storage tank:

piping:

$v610 := v(d610)$ $v610 = 0.708$ ✓

$dP_{14} := DP(f6,26,v610,d610)$ $dP_{14} = 0.002$ ✓

fittings/valves:

$K_{tot} := 2 \cdot K_{690} + K_{6x6b} + K_{6x6r} + K_{exit} + K_{6gate}$ ✓

$dP_{15} := DPF[K_{tot}, v610]$ $dP_{15} = 0.009$ ✓

Calculate suction piping pressure loss from condensate storage tank to 10x6 tee:

piping:

$v1010 := v(d1010)$ $v1010 = 0.263$ ✓

$dP_{16} := DP(f10,156,v1010,d1010)$ $dP_{16} = 0.001$ ✓

fittings/valves:

$K_{tot} := 2 \cdot K_{10gate} + 6 \cdot K_{1090} + 3 \cdot K_{1045} + K_{ent} + 2\ K_{10x10b} + K_{10x6b}$ ✓

$dP_{17} := DPF[K_{tot}, v1010]$ $dP_{17} = 0.002$ ✓

Calculate suction piping pressure loss from 10x6 tee to 4" 90 elbow:

piping:

$dP_{18} := DP(f6,27,v610,d610)$ $dP_{18} = 0.003$ ✓

fittings/valves:

$K_{tot} := K_{6gate} + K_{6chk} + 4 \cdot K_{690} + K_{6x6b} + K_{6x4}$ ✓

$dP_{19} := DPF[K_{tot}, v610]$ $dP_{19} = 0.01$ ✓

Calculate suction piping pressure loss due to 4" 90 elbow:

fitting:

$v410 := v(d410)$ $v410 = 1.576$ ✓

$dP_{20} := DPF[K_{490}, v410]$ $\quad dP_{20} = 0.004$ ✓ 9/9

Sum the dP for the system:

$\Sigma dP = 962.362$ psi ✓

360 cac 7/2/91

Comparing this value to the pump curve would indicate that the pump is delivering 95 gpm which is greater than the intial assumed flow rate of 70 gpm. Therfore, it is necessary to re-iterate by adjusting the flow rate until SYSTEM dP = Pump TDH.

Trial #	Q	System dP	Pump TDH	
1	70	2224 FT	3000 FT	✓
2	82	3052 FT	2998 FT	✓
3	80	2904 FT	2998 FT	✓ Acceptable

Calculate equivalent K values for the recirc line only based on 80 gpm:

$K1 := K[dP_3 + dP_4 + dP_5 + dP_6 + dP_7 + dP_8 + dP_9, d280, 80]$ $\quad K1 = 1.889\ 10^3$ ✓

$K2 := K[dP_{10} + dP_{11}, d240, 80]$ $\quad K2 = 3.42$ ✓

CALCULATION REVIEW AND APPROVAL
NUCLEAR POWER DEPARTMENT

Calculation #	
N-91-069	
Number of pages	
12	

Title of Calculation: Impact of Higher Capacity Recirculation System for the Electric Motor Driven AFW Pumps

☒ Original calculation

☐ Revised calculation. Revision #_____

☐ Superseding calculation. Supersedes calculation #_____

Modification #	Description:
88-099*B	Increased Aux Feed Pump Recirc Flow Capacity

Other References:

Prepared By:	Date:
Curtis A. Castell	7/8/91

This calculation has been reviewed in accordance with QP 3-6. The review was accomplished by one or a combination of the following (as checked):

___ A review of a representative sample of repetitive calculcations

✓ A detailed review of the original calculation

___ A review of the calculation against a similar calculation previously performed

___ A review by an alternate, simplified or approximate method of calculation

Comments:

Reviewed By:	Date:	Approved By:	Date:
[illegible]	7/9/91	[illegible]	JUL 9, 19[illegible]

Form QP 3-6.1

Purpose:

This calculation provides an estimate of the impact of the proposed higher capacity recirculation systems for the electric motor driven auxiliary feedwater pumps.

Assumptions:

1. The density of water will be assumed to be the nominal value of 62.4 lbm/cu. ft. Justification: This is a reasonable value for the standard density of water as given in many texts and reference 1 listed below. ✓

2. The acceleration of gravity will be assumed to be the nominal value of 32.2 ft/s^2. Justification: This is a reasonable value for the standard acceleration of gravity on the earth as given in many texts and reference 1 listed below. ✓

3. The nominal flow rate through one electric motor driven Auxiliary Feedwater Pump is 200 gpm. The recirculation line flow is about 80 gpm for the proposed system (Reference 12). Justification: The nominal flow rate is reasonable per assumption 5 and the recirculation line flows are reasonable for their intended design. ✓

4. The pressure at the discharge of T-24A and T-24B is assumed to be 1 psig. Justification: That pressure corresponds to a nominal level of 2.3 feet in the tanks. ✓

5. The electric motor driven pump nominal flow rate is 200 gpm. Justification: The discharge valve controllers are set to maintain the pump discharge pressure at 1200 psig. ✓

6. The feedline inside diameter is about 29 inches and the CST inside diameter is about 240 inches. Justification: These are reasonable values for these parameters. ✓

7. The conversion of gpm to flow velocity in a pipe in ft/s is 0.409x(flow in gpm)/(pipe ID in inches squared). Justification: This is a determined conversion factor. ✓

References:

1. Flow of Fluids through Valves, Fittings, and Pipe, Crane Technical Paper 410, 19th printing, 1980.

2. Drawing: Bechtel P-118, Aux. F.W. Pump Suction from Storage Tanks T-24A&B, Rev. 5.

3. Drawing: Bechtel P-117, Aux. F.W. Pump Suction from Storage Tanks T-24A&B, Rev. 4.

4. Drawing: Bechtel P-103, Emergency Feedwater Pumps to Main Feedwater Lines 4" & 3" DB-3, Rev. 6.

5. Drawing: Bechtel P-142, Emergency Feedwater from CTMT Pentration P-5 to Main Feedwater EB-9 EB-10 Inside (CTMT), Rev. 3.

6. Calculation N-90-029, Determination of Branch Resistance Coefficients in the AFW System, Rev. 0.

7. Calculation N-90-028, Auxiliary Feedwater Pump Flow-Head Characteristic Polynomials, Rev. 0.

8. Drawing Bechtel P-241, Emergency Feedwater from DB-3 into CTMT Penetration P-5 EB-10 Outside (CTMT), Rev. 4.

9. Drawing: Bechtel P-240, Emergency Feedwater from DB-3 into CTMT Penetration P-6 EB-10 Outside (CTMT), Rev. 4.

10. Drawing: Bechtel P-239, Emergency Feedwater from PENET P-5 to Main Feedwater System 3" EB-10, Rev 3.

11. Drawing: Bechtel P-242, Emergency Feedwater from Penet. P-6 to Main Feedwater System 3"-EB-10, Rev. 3.

12. Calculation N-91-063, Recirc line loss coefficient.

13. Letter dated March 17, 1989, from Robert B. Davidson (BW/IP International) to Hank Hoelscher (WE), Auxiliary Feedwater Pumps, (attached).

14. Calculation of K15A (attached).

15. Figure showing the AFW System nodalization (attached).

Calculation for Recirc. Only

Inputs

Density $\rho := 62.4$ (A1) ✓

Gravity $g := 32.2$ (A2) ✓

Friction Factors

$f3 := 0.018$	3 inch pipe	(R1)	✓
$f4 := 0.017$	4 inch pipe	(R1)	✓
$f6 := 0.015$	6 inch pipe	(R1)	✓
$f8 := 0.014$	8 inch pipe	(R1)	✓
$f10 := 0.014$	10 inch pipe	(R1)	✓

Elevations (Feet)

$Z1 := 28.83$	(R2)	✓
$Z11 := 10.03$	(R3)	✓
$Z15 := 9.97$	(R4)	✓
$Z15A := 10.92$	(R4)	✓

Pipe Diameter and K-factors (A3, R6, R12)

$d1 := 10.42$	$K1 := 0.5 + 184 \cdot f10$	K1 = 3 ✓
$d2 := 10.42$	$K2 := 0.5 + 180 \cdot f10$	K2 = 3 ✓
$d3 := 10.42$	$K3 := 254 \cdot f10$	K3 = 4 ✓
$d4 := 8.329$	$K4 := 0.043 + 28.4 \cdot f8$	K4 = 0 ✓
$d11 := 4.26$	$K11 := 0.4 + 254 \cdot f4$	K11 = 5 ✓
$d15A := 2.9$	$K15A := 136 \cdot f3$	K15A = 2 ✓
$dRC := 1.939$	$KRC := 1891.6$	KRC = 1892 ✓
$dcst := 240.$		

Flow Rates (GPM) (A3)

$Q1 := 46.4$

$Q2 := 46.4$

$Q3 := 92.8$

$Q4 := 92.8$

$Q11 := 92.8$

$Q15 := 92.8$

$Q15A := 92.8$

$QRC := 92.8$

4/12

Calculation

Velocity (FPS) (A7)

$$v1 := 0.409 \cdot \frac{Q1}{d1^2} \qquad v1 = 0$$ ✓

$$v2 := 0.409 \cdot \frac{Q2}{d2^2} \qquad v2 = 0$$ ✓

$$v3 := 0.409 \cdot \frac{Q3}{d3^2} \qquad v3 = 0$$ ✓

$$v11 := 0.409 \cdot \frac{Q11}{d11^2} \qquad v11 = 2$$ ✓

$$v15 := 0.409 \cdot \frac{Q15}{d15A^2} \qquad v15 = 5$$ ✓

$$v15A := 0.409 \cdot \frac{Q15A}{d15A^2} \qquad v15A = 5$$ ✓

$$vRC := 0.409 \cdot \frac{QRC}{dRC^2} \qquad vRC = 10$$ ✓

$$vcsta := 0.409 \cdot \frac{Q1}{dcst^2} \qquad vcsta = 0$$ ✓

$$vcstb := 0.409 \cdot \frac{Q2}{dcst^2} \qquad vcstb = 0$$ ✓

Frictional Pressure Loss (PSID) (R1)

$$C := 1.078 \cdot 10^{-4}$$ ✓

5/12

$DP1 := C \cdot K1 \cdot \rho \cdot v1^2$ $DP1 = 0$ ✓

$DP2 := C \cdot K2 \cdot \rho \cdot v2^2$ $DP2 = 0$ ✓

$DP3 := C \cdot K3 \cdot \rho \cdot v3^2$ $DP3 = 0$ ✓

$DP11 := C \cdot K11 \cdot \rho \cdot v11^2$ $DP11 = 0$ ✓

$DP15A := C \cdot K15A \cdot \rho \cdot v15A^2$ $DP15A = 0$ ✓

$DPRC := C \cdot KRC \cdot \rho \cdot vRC^2$ $DPRC = 1297$ ✓

Pressure Equations (Bernoulli's Equation from Ref. 1)

$P1 := 1$ (A4) ✓

$P2 := 1$ (A4) ✓

$$P11 := P1 + \frac{\rho}{144} \cdot \left[Z1 - Z11 + \frac{vcsta^2}{2 \cdot g} - \frac{v11^2}{2 \cdot g} \right] - DP1 - DP3 - DP11 \qquad P11 = 9$$ ✓

Pump Head Equation (R7)

$$\delta P2 := -7.837 \cdot 10^{-9} \cdot Q11^4 + 1.020 \cdot 10^{-5} \cdot Q11^3 - 6.086 \cdot 10^{-3} \cdot Q11^2 + 0.218 \cdot Q11 + 1321$$ ✓

$\delta P2 = 1296$ $P15 := P11 + \delta P2$ ✓ $P15 = 1305$

$$P15A := P15 + \frac{\rho}{144} \cdot \left[Z15 - Z15A + \frac{v15^2}{2 \cdot g} - \frac{v15A^2}{2 \cdot g} \right] - DP15A \qquad P15A = 1305$$ ✓

$$Pexit := P15A + \frac{\rho}{144} \cdot \left[Z15A - Z1 + \frac{v15A^2}{2 \cdot g} - \frac{vcsta^2}{2 \cdot g} \right] - DPRC \qquad Pexit = 0$$ ✓

Calculation for 200gpm with Recirc open. 6/12

Inputs

Density $\rho := 62.4$ (A1) ✓

Gravity $g := 32.2$ (A2) ✓

Friction Factors

$f3 := 0.018$	3 inch pipe	(R1)	✓
$f4 := 0.017$	4 inch pipe	(R1)	✓
$f6 := 0.015$	6 inch pipe	(R1)	✓
$f8 := 0.014$	8 inch pipe	(R1)	✓
$f10 := 0.014$	10 inch pipe	(R1)	✓

Elevations (Feet)

$Z1 := 28.8$	(R2)	✓
$Z11 := 10.03$	(R3)	✓
$Z15 := 9.97$	(R4)	✓
$Z15A := 10.92$	(R4)	✓

Pipe Diameter and K-factors (A3, R6, R12)

$d1 := 10.42$	$K1 := 0.5 + 184 \cdot f10$	K1 = 3 ✓
$d2 := 10.42$	$K2 := 0.5 + 180 \cdot f10$	K2 = 3 ✓
$d3 := 10.42$	$K3 := 254 \cdot f10$	K3 = 4 ✓
$d4 := 8.329$	$K4 := 0.043 + 28.4 \cdot f8$	K4 = 0 ✓
$d11 := 4.26$	$K11 := 0.4 + 254 \cdot f4$	K11 = 5 ✓
$d15A := 2.9$	$K15A := 136 \cdot f3$	K15A = 2
$dRC := 1.939$	$KRC := 1891.6$	KRC = 1892
$dcst := 240.$		

Flow Rates (GPM) (A3)

$Q1 := 100$

$Q2 := 100$

$Q3 := 200$

$Q4 := 200$

$Q11 := 200$

7/12

$Q15 := 200$

$Q15A := 200$

$QRC := 88.88$

Calculation

Velocity (FPS) (A7)

$$v1 := 0.409 \cdot \frac{Q1}{d1^2} \qquad v1 = 0 \quad ✓$$

$$v2 := 0.409 \cdot \frac{Q2}{d2^2} \qquad v2 = 0 \quad ✓$$

$$v3 := 0.409 \cdot \frac{Q3}{d3^2} \qquad v3 = 1 \quad ✓$$

$$v11 := 0.409 \cdot \frac{Q11}{d11^2} \qquad v11 = 5 \quad ✓$$

$$v15 := 0.409 \cdot \frac{Q15}{d15A^2} \qquad v15 = 10 \quad ✓$$

$$v15A := 0.409 \cdot \frac{Q15A}{d15A^2} \qquad v15A = 10 \quad ✓$$

$$vRC := 0.409 \cdot \frac{QRC}{dRC^2} \qquad vRC = 10 \quad ✓$$

$$vcsta := 0.409 \cdot \frac{Q1}{dcst^2} \qquad vcsta = 0 \quad ✓$$

$$vcstb := 0.409 \cdot \frac{Q2}{dcst^2} \qquad vcstb = 0 \quad ✓$$

Frictional Pressure Loss (PSID) (R1)

$$C := 1.078 \cdot 10^{-4}$$

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$DP1 := C \cdot K1 \cdot \rho \cdot v1^2$ $\quad DP1 = 0$ ✓

$DP2 := C \cdot K2 \cdot \rho \cdot v2^2$ $\quad DP2 = 0$ ✓

$DP3 := C \cdot K3 \cdot \rho \cdot v3^2$ $\quad DP3 = 0$ ✓

$DP11 := C \cdot K11 \cdot \rho \cdot v11^2$ $\quad DP11 = 1$ ✓

$DP15A := C \cdot K15A \cdot \rho \cdot v15A^2$ $\quad DP15A = 2$ ✓

$DPRC := C \cdot KRC \cdot \rho \cdot vRC^2$ $\quad DPRC = 1190$ ✓

Pressure Equations (Bernoulli's Equation from Ref. 1)

$P1 := 1$ (A4) ✓

$P2 := 1$ (A4) ✓

$$P11 := P1 + \frac{\rho}{144} \cdot \left[Z1 - Z11 + \frac{vcsta^2}{2 \cdot g} - \frac{v11^2}{2 \cdot g} \right] - DP1 - DP3 - DP11 \qquad P11 = 8$$ ✓

Pump Head Equation (R7)

$$\delta P2 := -7.837 \cdot 10^{-9} \cdot Q11^4 + 1.020 \cdot 10^{-5} \cdot Q11^3 - 6.086 \cdot 10^{-3} \cdot Q11^2 + 0.218 \cdot Q11 + 1321$$ ✓

$\delta P2 = 1190$ $\qquad P15 := P11 + \delta P2$ ✓ $\qquad P15 = 1199$

$$P15A := P15 + \frac{\rho}{144} \cdot \left[Z15 - Z15A + \frac{v15^2}{2 \cdot g} - \frac{v15A^2}{2 \cdot g} \right] - DP15A \qquad P15A = 1197$$

$$Pexit := P15A + \frac{\rho}{144} \cdot \left[Z15A - Z1 + \frac{v15A^2}{2 \cdot g} - \frac{vcsta^2}{2 \cdot g} \right] - DPRC \qquad Pexit = 0$$ ✓

9/12

Results:

With only the new recirculation line open:

Recirculation Line Flow Rate: 93 gpm ✓
Total Flow Rate: 93 gpm

With the new recirculation line open and the discharge flow control maintaining pump flow at 200 gpm:

Recirculation Line Flow Rate: 89 gpm ✓
Total Flow Rate: 200 gpm

Therefore, the balance 111 gpm could be supplied to the steam generator(s).

Conclusion:

This calculation shows that the proposed recirculation line will allow approximately 93 gpm flow when it is open. If the proposed recirculation line is open when the pump flow is being controlled to about 200 gpm, the recirculation line flow rate would be about 89 gpm. That would leave about 111 gpm to be supplied to the steam generator(s).

I cannot determine the significance of this situation on the PBNP FSAR accident analyses, because the failure of the recirculation system has not been evaluated. Also, the control system for the valve that controls the recirculation line is not safety grade or QA. Typically, current design criteria contained in NUREG-0800 (the standard review plan) require that all non-safety grade and non-QA equipment be assumed to fail to its worst-case condition (open for the recirculation valve) in addition to one limiting safety grade failure.

The limiting safety grade failure for the AFW system is typically a turbine driven AFW pump, because these pumps are the highest capacity. If auxiliary feedwater is actuated to one unit, then the electric motor driven pumps should still be able to provide sufficient flow to a unit without running out, even if the recirculation line valve fails open. It has been previously judged that the Auxiliary feedwater system flows may need to be corrected by operator action, but at least 5 minutes is allowable for these actions. (See evaluation for NCR N-91-035 and Calculation N-91-007).

88-099 HLA

10/12

BW/IP International, Inc.

Byron Jackson Products Pump Division

695 Chase Road

Elgin Illinois 60123

Telephone 312 741 0411
Telex RCA 25[illegible]
Fax 312 741 0657

Quotation

This quotation is made on the express condition that the terms below and on the reverse side are the exclusive terms and conditions of this transaction

17 March 1989

Wisconsin Electric Power Company
Point Beach Nuclear Plant
6610 Nuclear Road
Two Rivers, Wisconsin 54241

Attention: Mr. Hank Hoelscher

Subject: Auxiliary Feedwater Pumps
S/N's 681-S-1028/31

Dear Hank:

The minimum flow requirement as stated back in 1968 on these pumps is 30 gallons per minute. For our Engineering Dept. to calculate the minimum flow requirement by today's standards, we need a purchase order from Wisconsin Electric Power for $2,000.00 to complete this study.

Very truly yours,

BW/IP INTERNATIONAL, INC.
PUMP DIVISION

Robert B. Davidson
Regional Manager

RBD:ds (WISC.ELC)

CC: BW/IP International, Inc.
Mr. Fred Grondhuis - Elgin Sales

Determination of K15A

From Calc N-90-029:

1.	90° ELL	$14 f_T$	✓
2.	90° ELL	$14 f_T$	✓
3.	90° ELL	$14 f_T$	✓
4.	90° ELL	$14 f_T$	✓
Total Fittings		$56 f_T$	✓

Pipe length:

$(16'9'' - 9'11\frac{11}{16}'') + 6'7\frac{1}{4}'' + 2'9'' + (16'8'' - 10'11'')$ ✓

$= 16.75 - 9.97 + 6.60 + 2.75 + 16.67 - 10.92$ ✓

$= 21.88'$ ✓

Fittings

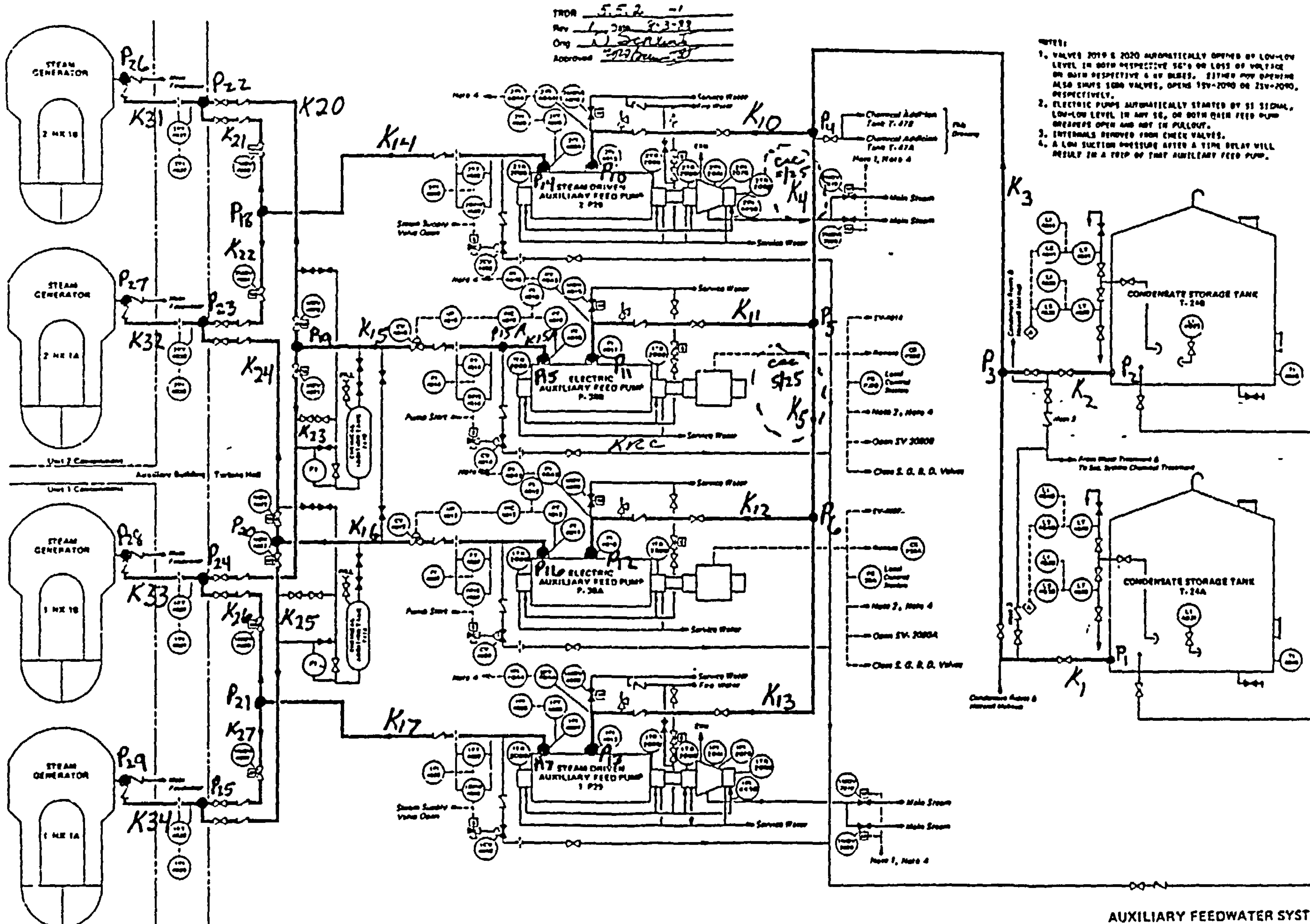
$4\frac{1}{2}'' + (2 \times 9'') = 31.5'' = 2.625$ ✓

Total:

$21.88' - 2.625' = 19.255'$ ✓

$K_{pipe} = f_T \frac{L}{D} = f_T \frac{19.255 \text{ ft}}{2.9''/12 \text{ in/ft}} = 79.7 f_T$ ✓

Total loss coeff. $K15A = 56 f_T + 79.7 f_T \doteq 136 f_T$ (3'')



FOR INFORMATION ONLY

AUXILIARY FEEDWATER SYSTEM
Figure 11.4.1

12/21

A10.1

Power Equipment Supply

Power Equipment Supply, Co. P.O. Box 190 New Washington, Indiana 47162 812.289.1000 812.293.4576 (Fax)

January 11, 1991
IRP-0293-91

WISCONSIN ELECTRIC
P. O. Box 2046
Milwaukee, WI 53201

ATTENTION: Mrs. Julie Pederson M.S. P377

SUBJECT: Valve, 2", Globe, 1500#, Stainless Steel,
Air Operated, Copes Vulcan
I.D. No. 2IA88RG

(4) AuxFW Recirc Lines

Dear Mrs. Pederson:

Pursuant to our telephone conversation today, I am enclosing the outline drawing, specification sheet and code data report applicable to the subject valve.

If you have any questions, please contact me at ext. 3482.

Sincerely,

Joseph A. Barbera

JOSEPH A. BARBERA
Sales and Marketing Engineer

JAB:lh

cc: File
Records Management

RECEIVED JAN 14
NUCLEAR

PAGE REV. NO 1 ISSUED 3/1/76 Westinghouse Electric Corporation
Rev 1 Total No. Spec SH. NUCLEAR ENERGY SYSTEMS

Davis PROJECT

VALVE TAG NOS.

E - SPEC. NO. 677000

SPEC. SHEET NO 25 OF 25

SPECIFICATION SHEET
CONTROL VALVES
SYSTEM CVCS

		LIQUIDS IN GPM	GASES IN	STEAM IN
FLUID UNITS				
1	BODY SIZE / PORT SIZE	2" / *		
2	FORM	GLOBE		
3	MATERIAL	* *		
4	END CONNECTIONS / SCH	SW		
5	BONNET	STD.		
6	PACKING OR SEAL T. CRANE CO.	2CRT		
7	TRIM MATERIAL	* *		
8	NO OF PORTS	1		
9	PLUG FORM	*		
10	PLUG & SEAT MATERIAL	* *		
11	CV REQUIRED	MAX		
12	GUIDING	CAGE		
13	ACTION CLOSE @ / OPEN @	0% / 100%		
14	FAILURE POSITION	CLOSED		
15	POSITIONER REQUIRED	NO		
16	BYPASS / GAUGES			
	FOR INPUT SIGNAL OF			
18	OUTPUT SHALL BE			
19	ACCESSORIES FILTER & REGULATOR NOTE (1)	YES		
20	HANDWHEEL	NO		
21	SOLENOID NOTE (1)	YES		
22	ELECTRO/PNEUMATIC TRANSDUCER	NO		
23	FOR INPUT SIGNAL OF			
24	OUTPUT SHALL BE			
	SERVICE CONDITIONS			
25	FLUID	WFI		
26	RADIOACTIVITY	YES		
		MIN / NORMAL / MAXIMUM		
27	FLOW			
28	Δ P @ FLOW PSI			
29	TEMP. @ FLOW °F	650		
30	INLET PRESS PSIG	2485		
31	OUTLET PRESS PSIG			
32	Δ P MAX. PSI	2485		
33	SP GR @ 60°F			
34				
35	ASME SECTION III RATING	1500/16.		
36	ASME CODE CLASS	1		

		OPERATORS
37	PNEUM., SPRING & DIAPHRAGM	YES
	SHALL FULL STROKE AT PSI	*
	SIZE SQ. IN.	*
38	OTHER	
	FULL STROKE IN	*
39	OPERATING SUPPLY MAX. PSI	95
	MANUFACTURERS DATA	
40	MANUFACTURER	COPES
41	ASSEMBLY DRAWING NO	*
42	OUTLINE DRAWING NO.	*
43	VALVE Cv	*
44	DESIGN Cv	—
45	MAX. POSSIBLE FLOW THRU VALVE WITH FULL LIFT @ SPECIFIC Δ P 5 PSI	*
46	SPECIAL REQUIREMENTS	1. 1/8" NEEDLE VALVE
47	IDENTIFICATION NO	2-FA222RG
48	INSTALLATION SKETCH	271C243
49	ADDITIONAL INFORMATION	LETDOWN LINE TO REG. HX. CHG. LINE ISOLATION.

NOTES.

(1) REFER TO INSTALLATION DWG. IN LINE 48

*INDICATES DATA TO BE FURNISHED BY SUPPLIER WITH QUOTATION

**PER SPEC

FORM 56211

REVISED

CORRECTED

FORM NPV-1 MANUFACTURERS' DATA REPORT FOR NUCLEAR PUMPS OR VALVES

As Required by the Provisions of the ASME Code Rules

1. Manufactured by Copes-Vulcan, Inc., Lake City, PA 16423 (Name & Address of Manufacturer) Order No. 7620-95375

2. Manufactured for Westinghouse Electric Corp. Nuclear Energy Systems, Pitts., PA 15230 (Name and Address) Order No 546-CCP-252015 BN

3. Owner Public Service Company of Indiana Unit #1

4. Location of Plant Indiana

5. Pump or Valve Identification WNES I.D. # 2 IA88RG CVI S/N 7620-95375-248-2" 1513# Control Valve (Brief description of service for which equipment was designed)

6. (a) Drawing No. D-166085 Rev. 8 Prepared by Copes-Vulcan, Inc.

(b) National Board No. 974

7. Design Conditions 2485 (Pressure) psi 650 (Temperature) °F

8. The material, design, construction, and workmanship complies with ASME Code Section III Class 1

Edition 1974 , Addenda Date Summer, 1975 , Case No. — — —

Mark No.	Material Spec. No.	Manufacturer	Remarks
(a) Castings			
(b) Forgings			
Body S/N 9082	ASME-SA182	McWilliams	GR F316
Bonnet S/N 8715	ASME-SA182	McWilliams	GR F316

FORM NPV-1 — (back)

Mark No	Material Spec. No.	Manufacturer	Remarks
(c) Bolting			
Studs Lot KX	ASME-SA453	Vitco	GR. 660
Nuts Lot N2	ASME-SA194	Vitco	GR. 6
(d) Other Parts			
Plug S/N 77-7	ASME-SA564	Cartech	GR. 630

8. Hydrostatic test 5445 psi. CVI S/N 7620-95375-248-6

CERTIFICATION OF DESIGN

Design information on file at Westinghouse Electric Corp., Nuclear Energy System

Stress analysis report on file at Copes-Vulcan, Inc.

Design specifications certified by F. K. Deluse (1) Prof. Eng. ME State PA Reg No 17128-E

Stress analysis report certified by George Sevok (1) Prof. Eng. ME State PA Reg. No. 7458-E

We certify that the statements made in this report are correct.

Date 20 June 19 77 Signed Copes-Vulcan, Inc. (Manufacturer) [signature]

Certificate of Authorization No N-826 expires June 24, 1977

CERTIFICATE OF SHOP INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and or the State of Province of Penna. and employed by Protection Mutual Ins., Co.* of Park Ridge, Ill. have inspected the equipment described in this data report on 6/20 19 77, and state that to the best of my knowledge and belief, the manufacturer has constructed this equipment in accordance with the applicable sections of ASME Section III.

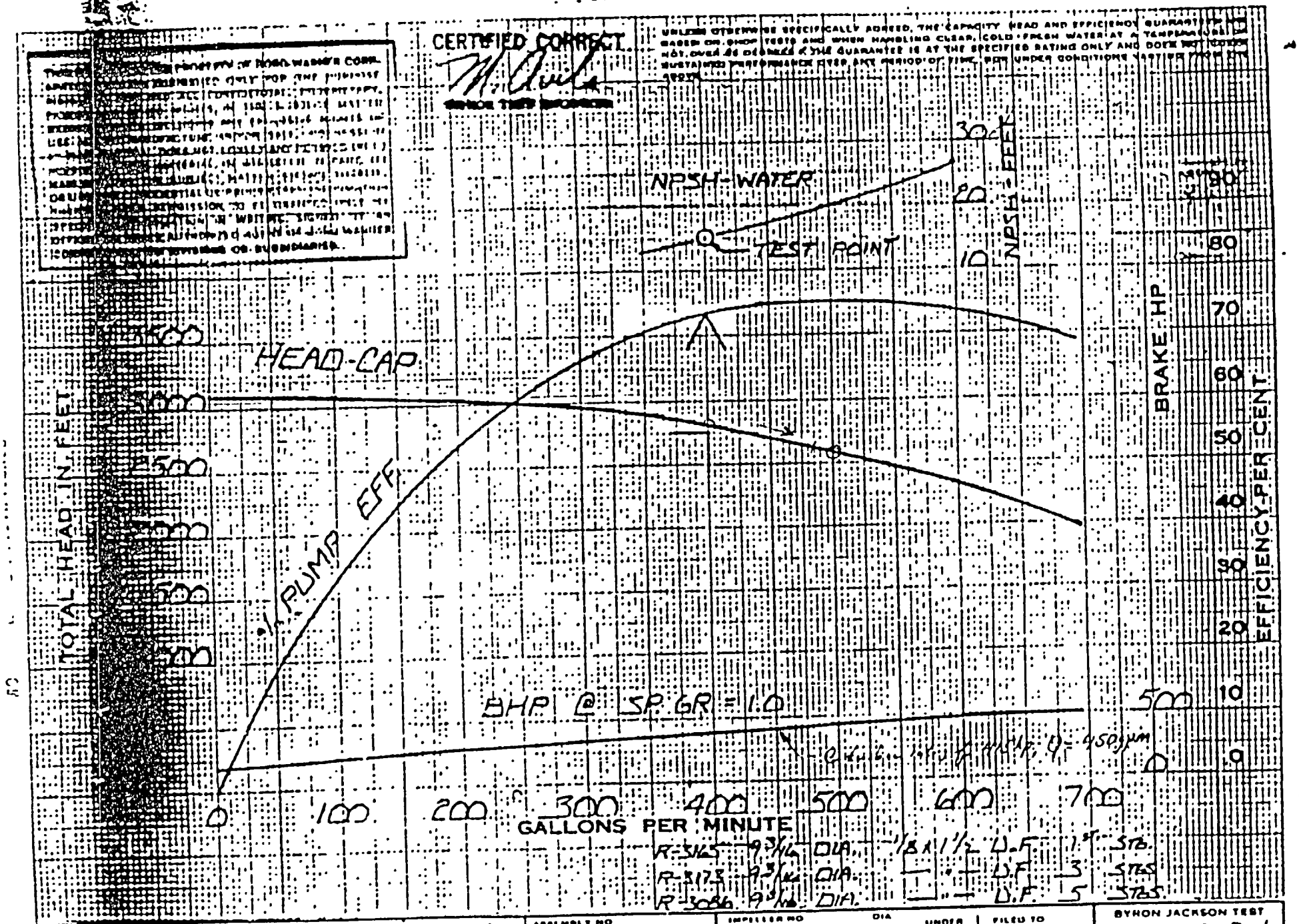
By signing this certificate, neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the equipment described in this data report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date 6/20/77

[signature] (Inspector) Commissions NB 5900 (National Board, State, Province and No.)

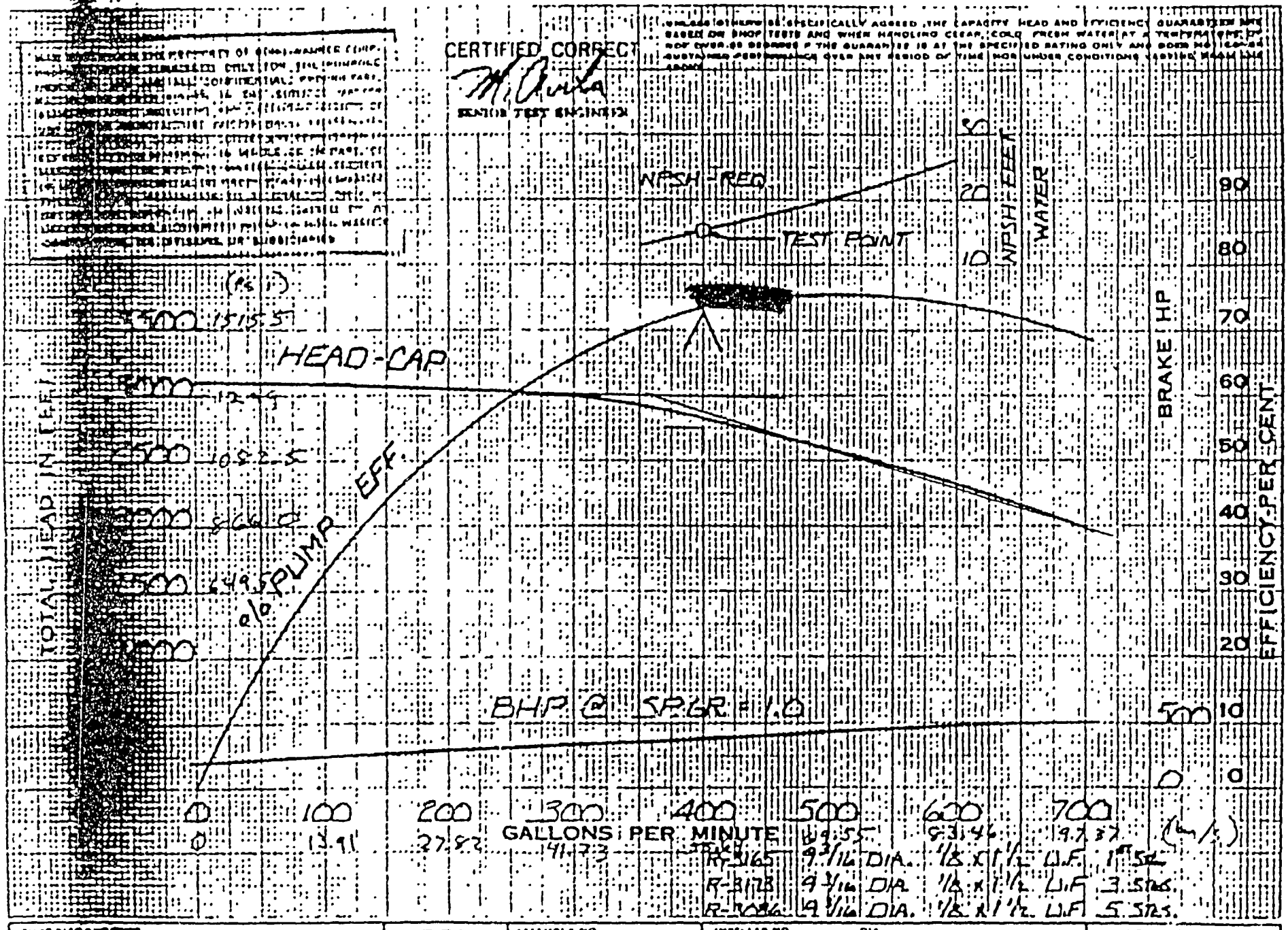
*Factory Mutual Systems

BYRON JACKSON 1P29



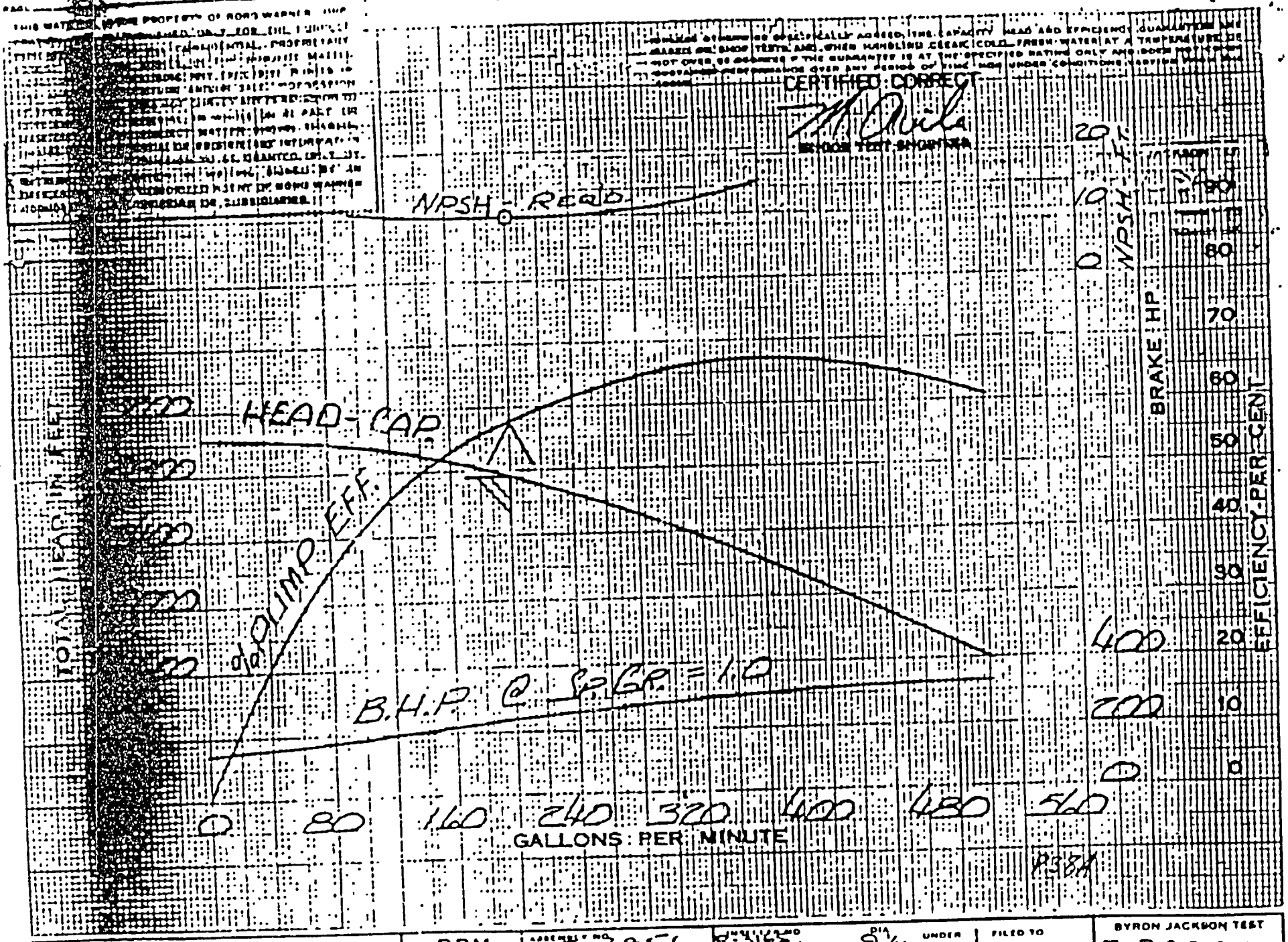
PUMP SIZE AND TYPE	RPM	ASSEMBLY NO	IMPELLER NO / DIA / UNDER / OVER	FILED TO	BYRON JACKSON TEST
3 x 4 x 9 : 0 9 STA. DVMX	3550		ABOVE		T-30947-1
		FAILURE NO	DATE	DATA BY	DRAWN BY
		[illegible]	5-8-69	D.K.	D.K.

BYRON JACKSON 2P29



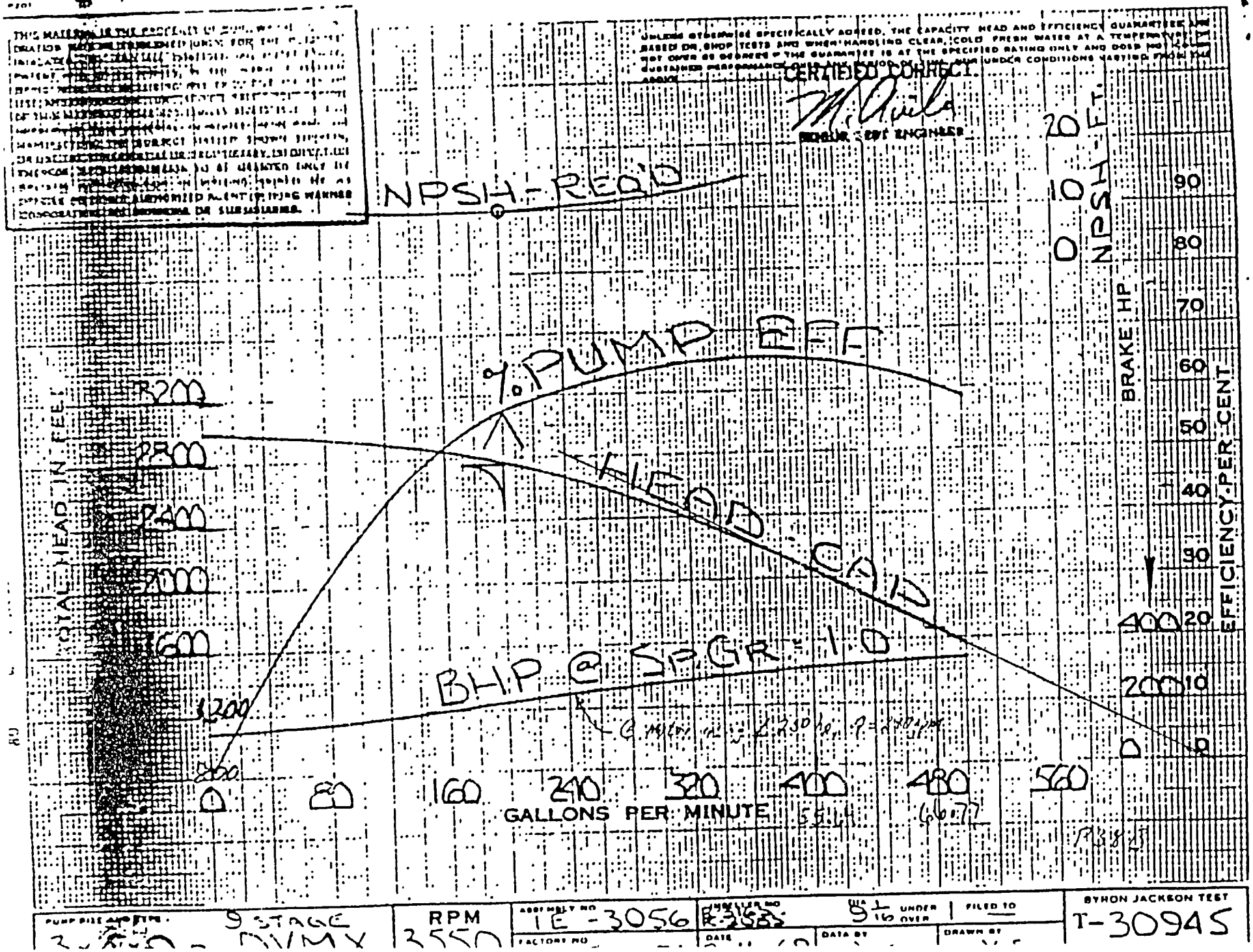
	RPM		IMPELLER NO	DIA	UNDER / OVER	FILED TO	BYRON JACKSON TEST	
							T-30951-1	

BYRON JACKSON P38A



PUMP SIZE AND TYPE	RPM	ASSEMBLY NO.	IMPELLER NO.	DIA.	FILED TO	BYRON JACKSON TEST
3 x 6 x 9B 9 STG DVIMX	3550	TE-3856	B-3165 B-3005	9 1/16 UNDER / OVER	—	T-30944.
		FACTORY NO. (GA) - S. 1030	DATE 7-29-69	DATA BY L.R.	DRAWN BY L.R.	

BYRON JACKSON



PUMP SIZE AND TYPE 3 x 6 - DVMX	9 STAGE	RPM 3550	ASSEMBLY NO TE-3056	IMPELLER NO R-3565	DIA 5 1/16 UNDER / 1/16 OVER FILED TO
			FACTORY NO	DATE	DATA BY / DRAWN BY

BYRON JACKSON TEST T-30945

POINT BEACH NUCLEAR PLANT MODIFICATION REQUEST	MR NUMBER 88-099*B	Page 1 of 6

2.27

DOCUMENTATION UPDATE SHEET AND CLOSEOUT CHECKLIST

N/A	Required For Acceptance (Completion)	Required For Closeout (Submittal)		Sign for Acceptance/ Closeout Requirements
			A. TRAINING	
✓	—		1. Pre-acceptance training; describe or specify lesson plan(s).	
—		✓ Plant Status Update Scheduled for PSU 91-8	2. Post-acceptance training; describe or specify course of lesson plan(s).	JAS
			B. FINAL DESIGN ORGANIZATION	
			1. Drawings/Procedures	
—	✓ M-217		a. Logics, P&IDs, 499 series elementaries, MDB, Control Room drawings updated; specify drawing number(s). Routed for other Approvals	JAS
—		✓ DCN 91-1981 M-217, P-103, P-159, P-303 sh. 5A, 5B, 12, 16a, 16b, 17a, 17b DCN's aren't #'d yet but we have-MEB.	b. DCNs - to quality engineer review, specify drawing number(s) and/or DCN number with number of sheet(s).	JAS
—	New Electrical Dwg New Support Dwgs.	✓ PBE-227 PBA-4040 sh 1-6	c. New Drawings - to supervisor - Staff Services; specify drawing number(s).	JAS
✓	—	—	d. Drawings Voided - to supervisor - Staff Services; specify drawing number(s).	
—	P.O.#'s are listed in the BOM	✓	2. Purchase orders - (also contract numbers); specify numbers.	JAS
—	—	—	3. Specifications - list to supervisor - Staff Services; specify number(s).	
—	—	✓ 1. For Cryos-Vulcan Control Valve CIM 00003 2. For Transmitter CIM 00325	4. Component Instruction Manuals (for issue, revision, deletion)- to supervisor - Staff Services; specify manual/instruction number(s) and vendor(s).	JAS

POINT BEACH NUCLEAR PLANT MODIFICATION REQUEST	MR NUMBER 88-099* B	Page 2 of 6

2.27

DOCUMENTATION UPDATE SHEET AND CLOSEOUT CHECKLIST

N/A	Required For Acceptance (Completion)	Required For Closeout (Submittal)		Sign for Acceptance/ Closeout Requirements
—	AS-Built Info. Sent To P.J. Kalvas On 11/13/91	✓	5. Cable and raceway schedule revisions - to supt. - Nuclear Systems Engineering, NSEAS.	JAS
✓	—	—	6. EQ Master List revisions - to Supt, - Nuclear Safety Analysis, NSEAS.	
✓		—	7. FPER revisions - to gen. supt., NSEAS.	
—	✓ W.E. Calcs. N-91-063, 069 S&L Calcs. In Stress Report	—	8. Calculations added/deleted to file.	JAS
✓		—	9. Calculation file reviewed for updating because of modification.	
✓ + Figure Change Only		—	10. FSAR - change; specify section(s) affected.	
✓	—	—	11. Technical Specification - change; specify section(s) affected and change request number if known.	
✓	—	—	12. Emergency Plan and EPIPs - change; specify section(s) affected.	
✓		—	13. Report major changes to radwaste treatment systems with annual FSAR update per PBNP Tech Spec 15.7.8.5.	
—	Information Provided to K.F. Grusso	✓	14. NPRDS Update - report MR changes to the NPRDS coordinator.	JAS
✓		—	15. Industrial Safety Review Committee Review - specify minutes.	
✓		—	16. ALARA Review - specify minutes or review document.	

2.27

DOCUMENTATION UPDATE SHEET AND CLOSEOUT CHECKLIST

N/A	Required For Acceptance (Completion)	Required For Closeout (Submittal)		Sign for Acceptance/ Closeout Requirements
✓		—	17. Report major changes to the containment aluminum inventory list with FSAR update.	
✓	—	—	18. Other:	

C. CHAMPS DATABASE

—	—	✓	1. Equipment Identification - additions assigned from CHAMPS/Detetions; list description and number(s). Add FE, FIT, FQ-4050A & B	JAS
—	—	✓	2. Permanent labeling - labels ~~on new equipment~~. requested from CHAMPS. For FEs, FITs, FQs	JAS
—		✓	3. Equipment Record - Update routed to CHAMPS coordinator specify change(s). Updates for all new components	JAS
—		✓	4. Equipment History ~~change/update~~ routed to CHAMPS coordinator. List equipment number(s). Updates for all new components	JAS
—	—	✓	5. Spare parts stocking and scrapping inputs into CHAMPS. Order Spare Transmitter → being done by S. Dacalso in conjunction with Unit 1 RHR/SI/CS test line mod	JAS
✓			6. Unused material removed from modification bin.	
✓	—	—	7. Mod Bin will Be Cleaned Out After D.P. C.	

D. OPERATIONS

✓	—	—	1. Abnormal operating, normal operating, and refueling procedures - change; specify section(s) affected.	

POINT BEACH NUCLEAR PLANT MODIFICATION REQUEST	MR NUMBER 88-094#B	Page 4 of 6

2.27

DOCUMENTATION UPDATE SHEET AND CLOSEOUT CHECKLIST

N/A	Required For Acceptance (Completion)	Required For Closeout (Submittal)		Sign for Acceptance/ Closeout Requirements
✓	—	—	2. Operating Instructions and checklists - change; specify section(s) affected.	
✓	—	—	3. Alarm response and RMS alarm setpoint and response books - change; specify section(s) affected.	
—	✓ IT-10	✓ IT-290 -290A -295 -295A	4. Testing - TS, IT, ORT, other - change; specify test(s) affected.	JAS
✓	—	—	5. EOPs, ECAs, CSPs - change; specify section(s) affected.	
✓	—	—	6. Periodic callups - change: specify section(s) affected.	
✓	—	—	7. "Programs" - change: specify program and section affected.	
✓	—	—	8. Fire protection procedure - specify section(s) affected.	
✓	—	—	9. Other _____	

E. MAINTENANCE

—	—	✓	1. Maintenance procedures/ instructions - change; specify section(s) affected.	JAS
	MI 5.2, "Air Operated Valves" Revision Sent To Typing 11/15/91			
✓		—	2. Preventative maintenance - initiate/revise CHAMPS callups.	
✓	—	—	3. Other _____	

POINT BEACH NUCLEAR PLANT MODIFICATION REQUEST	MR NUMBER 88-099*B	Page 5 of 6

2.27

DOCUMENTATION UPDATE SHEET AND CLOSEOUT CHECKLIST

N/A	Required For Acceptance (Completion)	Required For Closeout (Submittal)		Sign for Acceptance/ Closeout Requirements
			F. INSTRUMENTATION AND CONTROL	
—	—	✓	1. ICPs - change; specify procedure(s) affected.	JAS
	ICP 13.8 revision per J.A. Polanco	I&C initiating		
—	✓	—	2. Setpoint Document - change; specify section(s) affected.	JAS
	STPT 14.11			
✓		—	3. Preventive maintenance - initiate/revise CHAMPS callups.	
✓	—	—	4. Other _____	
			_____	
			G. SECURITY	
✓	—	—	1. Security Procedures - change; specify section(s) affected.	
✓	—	—	2. Security Plan - update as required.	
✓	—	—	3. Other _____	
			_____	
			H. INSERVICE INSPECTION	
✓		—	1. ISI program updated.	
✓		—	2. Miscellaneous HX ECT/Cleaning program updated.	
✓	—	—	3. Other _____	
			_____	

POINT BEACH NUCLEAR PLANT MODIFICATION REQUEST	MR NUMBER 88-099*B	Page 6 of 6

2.27

DOCUMENTATION UPDATE SHEET AND CLOSEOUT CHECKLIST

N/A	Required For Acceptance (Completion)	Required For Closeout (Submittal)		Sign for Acceptance/ Closeout Requirements
			I. TECHNICAL SERVICES	
✓	—	—	1. Reactor Engineering Instructions - change; specify section(s) affected.	
✓	—	—	2. Reactor Engineering refueling procedures - change; specify section(s) affected.	
✓	—	—	3. Refueling procedures - change; specify section(s) affected.	
✓	—	—	4. Software control - specify system affected and software change request number.	
✓	—	—	5. Other _____	
			_____	
			J. OTHER (CHEM., HP, ETC.)	
—	—	✓	1. Send As-Built Data To NES for Sargent & Lundy	JEL 12/2/91
—	—	✓	2. Close Out All ECRs On 88-099*B	JAS

SPEED MEMO

TO Steve Bacalzo
PBNP

FROM John Schneider
PBNP

SUBJECT Spare Transmitters for AFW Mini-Recirc Lines MM 84-4

MESSAGE Steve, When transmitters are ordered for the Unit 1 RHR/CS/SI test line mod please create a stocking request for a spare transmitter for these lines and for the AFW mini-recirc lines. The same model number ~~that~~ FIS used for the RHR/CS/SI lines will work for the AFW lines. (Rosemount # 1151DP5S22B1M8). On the stocking request form please enter the AFW transmitter numbers 1 FI-04049, 2 FI-04049, FI-04050A and FI-04050B. Thank You,

SIGNED John Schneider DATE 11/15/91 PHONE X252

REPLY Similar Transmitters will be ordered for U-1 RHR/SI/CS Test line Mod. We'll order Three (3) for the Mod and Two additional as Spares for this Mod and Aux Feed. Lot Description for the Spares "Westinghouse CHAMPS ID's for Aux Feed Transmitters.

SIGNED [signature] SB DATE 11/15/91 PHONE X320

ORIGINAL (WHITE) - To Recipient and Return To Sender
COPY 1 (YELLOW) - For Recipient's File
COPY 2 (PINK) - For Sender's Follow-Up

Form 3180 4 85 Lot # 704-3007

SPEED MEMO

TO: Paul Katers FROM: John Schneider

SUBJECT: Update CARDS FOR MR 88-099*B 4.4C

MESSAGE: Attached are the as-built cable and raceway schedules and tickets for the P-38A, P-38B and ZP-29 AFW Mini-Racine MCCs. Please have the CARDS updated to show all information the wiring diagram is shown on new drawing PBE-227.

Thank You,

SIGNED: John Schneider DATE: 11/13/91 PHONE: X252

REPLY

SIGNED DATE PHONE

ORIGINAL (WHITE) - To Recipient and Return To Sender
COPY 1 (YELLOW) - For Recipients File
COPY 2 (PINK) - For Senders Follow-Up

Form [illegible]

POINT BEACH NUCLEAR PLANT

PROCEDURE USAGE

Record/Field Copy Identification

RECORD

Field Copy Number

RED - Record Copy, BLACK - Field Copy

Procedure IWP 88-094 & B1, P38A Mini-Recirc Line Modification

Revision No. 0

Revision Date 9/6/91

Procedure Revision Checked Current and Group Tracking Checked for Temporary Changes:

By John A. Schneider Date 9/6/91

Record Copy Holder/Location John A. Schneider / PBNP

FIELD COPY DISTRIBUTION			
Copy No.	Holder/Location	Issue Date	Return Date
1	Phillips Getchius / PBNP	9/6/91	
2	I & C / PBNP	9/6/91	
3	Pieper Liaison, R.W. King / PBNP	9/6/91	
4			
5			
6			
7			
8			

NOTE 1: ANY TEMPORARY CHANGES MADE TO THIS PROCEDURE SHALL BE MADE TO THE RECORD COPY AND ALL OTHER FIELD COPIES THAT HAVE BEEN ISSUED.

NOTE 2: RETURN ALL FIELD COPIES TO THE HOLDER OF THE RECORD COPY UPON PROCEDURE COMPLETION.

IWP NUMBER 88-099*B-1 ~~Page 1 of~~

INSTALLATION WORK PLAN

PBNP MINOR PROCEDURE ☒

MAINTENANCE WORK REQUEST WORK PLAN ☐ Check As Applicable

MWR # 913664 : PG Pre-Fab Work
MWR # 913661 : PG Installation
MWR # 913706 : Piper Installation
MWR # 913707 : I&C Installation
Install Handwheel Conversion Kit and new Spring in Control Valve : 913605

FOR MODIFICATION # 88-099*B,

INSTALLATION WORK PLAN TITLE

Increase The Flow Capacity Of AFW Pump P-38A Mini-Recirc Line

UNIT PBO ☒ QA-SCOPE ☐ NON QA-SCOPE

Originator John A. Schroeder Date 8/24/91

Reviewer [signature] Date 9/3/91

Design Group Superintendent WB [signature] Date 9/5/91

Quality Engineer [signature] Date 9/4/91
9/4/91 9-5-91

Installation Group Superintendent WB for Date

Superintendent Operations [signature] Date 9-5-91

NOTE: Changes to this work plan must be done with the concurrence of the responsible engineer and the installation supervisor, or as delineated within the IWP.

Form C: 3-. 9
Revision :

FOR I&C USE ONLY
SHEET NO ____
COMPLETED ____

NUCLEAR POWER DEPARTMENT

PERMANENT PROCEDURE AND PROCEDURE REVISION REVIEW & APPROVAL

PROCEDURE IWP 88-099*B1, MINOR, P-38A AFW PUMP

Revision Number 0

DESCRIBE CHANGES

Date 9/6/91

Step Change/Reason MSS Summary Review

This IWP installs modification 88-099*B for the P-38A AFW Pump. The modification increases the capacity of this pump's mini-recirc line and adds a flow indicating transmitter to the line

J. Crowley

Use PBF-0026c for additional description of changes.

YES ☒ NO ☐ IS SCREENING FOR 10 CFR 50.59 APPLICABILITY REQUIRED IN ACCORDANCE WITH QP 3-3. IF YES, ATTACH APPLICABLE PORTIONS OF FORM QP 3-3.1.
IF NO, EXPLAIN: 50.54 evaluation was performed for the modification; SER 91-025-02

☐ ☒ CHECK IF THIS PROCEDURE CHANGE IMPLEMENTS A TEMPORARY CHANGE/ MODIFICATION TO THE FACILITY AND ATTACH FORM PBF-2013 COMPLETED AS DESCRIBED IN PBNP 2.1.1.

☒ ☐ CHECK IF CLASSROOM TRAINING IS NECESSARY: AFTER ISSUE ☒ BEFORE ISSUE ☐

IF YES, BRIEFLY DESCRIBE TRAINING DESIRED ON PBF-0026c AND ATTACH TO THIS FORM.
Training will be completed as part of mod closeout

☐ ☒ CHECK IF THIS REVISION CONSTITUTES A BIENNIAL REVIEW AS DESCRIBED IN PBNP 2.1.2.

Jack A. Schroeder Date 9/5/91
Originator

Date 9/5/91
Reviewer (Approval) Management person from cognizant group

APPROVALS

MAJOR Initial Issue All Revisions Cancellations MINOR, Rev. 0 Cancellations	Manager's Supervisory Staff Review** Date 9-5-91 (For the Supervisory Staff) **Form PBF-0026d must accompany this sheet if serial review and approval was conducted.	MSSM 91-15 Date 9/5/91 Manager - PBNP Approval
Minor and Special Process	Operating/Other Procedures Date Cognizant Group Head	SMPs/RMPs (both signatures required) Date Superintendent - Operations Date Cognizant Group Head
NNSR Manager Approval required for OPs	Date Group Head/Manager Approval Date Other Approval (If Required)	Date Manager - PBNP Approval (If Required) Date Other Approval (If Required)

See other side for summary of PBNP 2.1.1 approval requirements.

MINOR/SPECIAL PROCESS TEMPORARY CHANGE REVIEW AND APPROVAL

NOTE: REFER TO PROCEDURE PBNP 2.1.3, TEMPORARY CHANGES TO PROCEDURES, FOR GUIDANCE ON COMPLETING THIS FORM.

Form Designation/Distribution
(Circle one)

1. Sign off - not used
   Non-Sign off - Group Head with procedure
2. Group tracking with procedure copy
3. Sign off - original procedure in use
   Non-Sign off - procedure copy into manuals
4. Senior Clerk, Records Management w/o procedure

PROCEDURE NUMBER/TITLE IWP 88-099*B1, P38A Mini-Recir Line Modification

Revision Number/Date Rev 0, 9/6/91 Date of Change 9/8/91

UNIT: ☐ PB1 ☐ PB2 ☒ PB0

Temporary change valid until procedure completed.

Temporary change to be (one time use only) or duration of less than 24 hours? ☒ Yes ☐ No

If no, then temporary change tracking has been put into effect. Initials _____ Date _____

If the procedure is of a non-signoff type, list affected manual locations on form PBF-0026h and attach.

REQUIREMENTS

1. The procedure changes listed on this form shall not change the intent of the procedure.
2. If a screening for 10 CFR 50.59 applicability is required in accordance with QP 3-3, then complete applicable portions of Form QP 3-3 1 and attach. If screening has not been completed, provide a brief explanation why: The change is within the existing 50.59 evaluation performed for the modification SER-91-025-03
3. If this procedure change implements a temporary change/modification to the facility, then a temporary modification form, PBF-2013, shall be completed as described in PBNP 2.1.3 and attached.
4. If notification of others is required because of these changes, then such notification has been initiated. Groups/Individuals notified. Field copy holders notified

Step	Change/Reason
3.1.1.f	Deleted AF-27 from the Phase I tag series since both Phase I and Phase II tag outs will be completed at the same time and AF-27 is within the tagged out boundary. Also added a Note to this step stating that the two tag outs are to be completed before allowing any work.
3.1.2.a	Allowed the bonnet of existing AF-27 to be removed to facilitate drainage of the mini-recirc line.
3.1.2.4	Revised note above this step since the existing AF-27 will not be used.
3.1.4	Added a Note to this section stating that the two tag outs are to be completed before allowing any work.

Use continuation sheet, PBF-0026c for additional description of changes

Changes originated by John A. Sakowski Date 9/8/91

APPROVAL PRIOR TO USE

[signature] Date 9/9/91 Time 0815

DNS or Cognizant Supervisor

SUBSEQUENT REVIEW AND APPROVAL

[signature] Date 11-9-91

Cognizant Group Head

Permanent procedure change required? ☐ Yes ☒ No

If yes, revision initiated by: Originator _____ Date _____

POINT BEACH NUCLEAR PLANT

MINOR/SPECIAL PROCESS TEMPORARY CHANGE REVIEW AND APPROVAL

NOTE: REFER TO PROCEDURE PBNP 2.1.3, TEMPORARY CHANGES TO PROCEDURES, FOR GUIDANCE ON COMPLETING THIS FORM.

Form Designation/Distribution
(Circle one)

1. Sign off - not used
   Non-Sign off - Group Head with procedure
2. Group tracking with procedure copy
3. Sign off - original procedure in use
   Non-Sign off - procedure copy into manuals
4. Senior Clerk, Records Management w/o procedure

PROCEDURE NUMBER/TITLE EWR 88-044*B1, P3&A Mini-Recirc Line Modification

Revision Number/Date Rev. 0 9/6/91 Date of Change 9/12/91

UNIT: ☐ PB1 ☐ PB2 ☒ PBO

Temporary change valid until procedure completed

Temporary change to be one time use only or duration of less than 24 hours? ☒ Yes ☐ No

If no, then temporary change tracking has been put into effect. Initials _____ Date _____

If the procedure is of a non-signoff type, list affected manual locations on form PBF-6026h and attach.

REQUIREMENTS

1. The procedure changes listed on this form shall not change the intent of the procedure.
2. If a screening for 10 CFR 50.59 applicability is required in accordance with QP 3-3, then complete applicable portions of Form QP 3-3.1 and attach. If screening has not been completed, provide a brief explanation why: The change is within the 50.59 evaluation performed for the multi-recirc SER 91-125-03
3. If this procedure change implements a temporary change/modification to the facility, then a temporary modification form, PBF-2013, shall be completed as described in PBNP 2.1.3 and attached.
4. If notification of others is required because of these changes, then such notification has been initiated. Groups/Individuals notified Shift Supv. Writers notified

Step	Change/Reason
3.1.2 [illegible]	Removed the steps for resetting the high limit on the P3&A suction valve controller PC-1419 since this would require the instrument loop to be opened for a second at time making the valve fail open
5.2.2	Added step to reset high limit on PC-1419 after P3&A is declared operable
3.1.7	Note added to allow electrical work to be associated with Red Tag to be done earlier.
3.1.7.g 3.1.7.h.a. 3.1.7.h.b	Changed to allow Red Tag associated electrical work to be completed.

Use continuation sheet, PBF-0026c for additional description of changes

Changes originated by [signature] (copy 3.1.7 from 5.2.2) 3.1.7 3.1.7.g+h.b Date 9/12/91

APPROVAL PRIOR TO USE

[signature] Date 9/12/91 Time 1715

Shift or Cognizant Supervision

SUBSEQUENT REVIEW AND APPROVAL

[signature] Date 9/13/91

Cognizant Group Head

Permanent procedure change required? ☐ Yes ☒ No

If yes, revision initiated by Originator _____ Date _____