

## DISTRIBUTION

7-9098  
☒ Original, Responsible Section Head Action  
☐ File Copy, Master File

DAVIS-BESSE NUCLEAR POWER STATION - UNIT 1  
 TEMPORARY MODIFICATION REQUEST  
 ED 6926

## COPIES TO BE MODIFIED FOR IMMEDIATE IMPLEMENTATION

1 SS 3 CTRM File 1-TIC  
 1 ops Eng 1 working  
 1 CTRM 1 mps

## SECTION 1

## PROCEDURE TITLE AND NUMBER

Startup Feed Pump Op

SP1106.27.5

## REASON FOR CHANGE

reference to steps in step 5.1.4 is incorrect

## CHANGE

step 5.1.4 to read:

— 5.1.4 When pump reaches rated speed, have the local operator verify steps 11, 12, and 13 of the Startup Feedpump Checklist.

8507300014 850417  
 PDR ADOCK 05000346  
 P PDR

## IS PROCEDURE REVISION REQUIRED

Yes ☒No ☐

If no, this modification is valid until \_\_\_\_\_

## PREPARED BY

Michael A. Parker

## DATE

4/6/85

## APPROVED BY

H. A. Hall

## DATE

4/6/85

## APPROVED BY

D. J. L.

## DATE

4/6/85

## SUBMITTED BY (Section Head)

WTO' Connor/2002

## DATE

4/11/85

## RECOMMENDED BY (SRB Chairman)

[Signature]

## DATE

APR 17 1985

## QA APPROVED BY (Manager of Quality Assurance)

[Signature]

## DATE

APR 17 1985

## APPROVED BY (Station Superintendent)

[Signature]

## DATE

APR 17 1985

DBAB

## DISTRIBUTION

☒ Original, Responsible Section Head Action

☐ File Copy, Master File

DAVIS-BESSE NUCLEAR POWER STATION - UNIT 1  
 TEMPORARY MODIFICATION REQUEST  
 ED 6926

T-8687  
 COPIES TO BE MODIFIED FOR IMMEDIATE IMPLEMENTATION

SS  
 CR  
 12 F. 12 (3)  
 OPS ENG

working copy

## SECTION 1

## PROCEDURE TITLE AND NUMBER

SP 1106.27.5 STARTUP FEEDPUMP

## REASON FOR CHANGE

Address NRC concern identified in safety Evaluation for License Condition 2.C.(3)(t). This was requested by George Bradley. Operation must verify that the feedwater piping is  $< 275$  psig for high energy break considerations.

## CHANGE

add new step 5.2.6 as follows:

5.2.6 — Verify that the SUEP feedwater piping is less than 275 psig.

— psig PI 500, Suction Pressure

— psig PI 943, Discharge Pressure.

## IS PROCEDURE REVISION REQUIRED

Yes ☒

No ☐

If no, this modification is valid until \_\_\_\_\_

PREPARED BY	W.T. O'Connor	DATE	12/28/84
APPROVED BY	W.J. O'Connor	DATE	12/28/84
APPROVED BY	<i>[Signature]</i>	DATE	12/28/84
SUBMITTED BY (Section Head)	W.T. O'Connor	DATE	1/2/85
RECOMMENDED BY (SRB Chairman)	<i>[Signature]</i>	DATE	JAN 3 1985
QA APPROVED BY (Manager of Quality Assurance)	NA	DATE	
APPROVED BY (Station Superintendent)	<i>[Signature]</i>	DATE	JAN 3 1985

## Davis-Besse Nuclear Power Station

Unit No. 1

System Procedure SP 1106.27

Startup Feed Pump Operating Procedure

## NUCLEAR SAFETY RELATED

## Record of Approval and Changes

Prepared by L. Bladel, J. Dennis, B. O'Connor, B. Zemenski5/30/75

Date

Submitted by Terry D. Murray

Section Head

6/6/75

Date

Recommended by Jack E. Evers

SRB Chairman

10/21/75

Date

QA Approved NA

Manager of Quality Assurance

Date

Approved by Jack E. Evers

Station Superintendent

8/13/76

Date

Revision No.	SRB Recommendation	Date	QA Approved	Date	Sta. Supt. Approved	Date
1	<u>BBB</u>	9/2/80	N/A		<u>TOMM</u>	9/18/80
2	<u>BBB</u>	10/7/80	N/A		<u>TOMM</u>	3/17/81
3	<u>Am. Dennis</u>	6/24/82	N/A		<u>TOMM</u>	7/27/82
4	<u>Am. Dennis</u>	6/6/84	N/A		<u>TOMM</u>	7/11/84
5	<u>Am. Dennis</u>	12/17/84	NA		<u>Am. Dennis</u>	12/17/84

Plant Manager Approval/Date

## 1. PURPOSE

To provide a procedure for the operation of the startup feedwater pump. The startup feed pump will be used to fill the steam generators and maintain steam generator level during plant startups and shutdowns.

Normally the startup feed pump will take a suction from the deaerator storage tanks and discharge to the feedwater system upstream of the No. 4 feedwater heaters. Suction can also be taken from the condensate storage tanks. This procedure will be used in conjunction with Plant Startup Procedure, PP 1102.02 and Plant Shutdown and Cooldown, PP 1102.10 to establish specific flow paths.

The specifications on the startup feed pump are:

Type - constant speed, horizontal, seven stage centrifugal, motor driven

Flow - design: 360 gpm  
minimum: 60 gpm

Head - operating: 2550-1800 ft. (1100 PSID-780 PSID Across pump)  
design: 2350 ft  
shutoff: 2600 ft

Temperature - operating: 40-220°F  
design: 220°F

Motor:

Power Supply - non-essential 4.16 KV Bus D2 BKR AD 210

Full load amps - 44 amps, 350 H.P., 3600 RPM

## 2. LIMITATIONS AND PRECAUTIONS

2.1 NEVER THROTTLE A SUCTION VALVE ON A PUMP!

5 | 2.2 SUFP suction valve (FW 32 or FW 91) will always be opened slowly when filling pump.

2.3 NEVER START OR OPERATE A PUMP UNLESS YOU ARE SURE THAT THE PUMP MINIMUM FLOW REQUIREMENTS ARE MET! THIS CAN BE ACCOMPLISHED BY ENSURING THE PUMP MINIMUM RECIRC OR DISCHARGE FLOW PATH IS OPEN AND CAN PASS THE MINIMUM FLOW REQUIREMENTS! SUFP MINIMUM FLOW IS 60 GPM!

2.4 SUFP bearing lube oil temperatures should not exceed 180°F. If this condition occurs, the SUFP should be shutdown immediately. If a lube oil temperature is approaching 180°F, reduce pump flow to maintain <180°F.

2.5 SUFP motor maximum stator temperature is 266°F.

2.6 The following starting duty must not be exceeded:

2.6.1 2 starts in succession with motor initially at ambient temperature.

2.6.2 1 start in succession with motor initially at rated operating temperature.

2.6.3 Subsequent starts after 2.6.1:

1. Limited to 1/2 hour apart.

2.6.4 Subsequent starts after 2.6.2:

1. Limited to 1 hour apart.

2.7 Maximum Delta P across SUFP suction strainer is 5 psid.

2.8 During a plant shutdown to prevent actuation of the Steam and Feed Rupture Control System, the SUFP must be started before the last Main Feed Pump Turbine is shutdown.

2.9 The SUFP piping located in the auxiliary feed pump rooms must remain isolated except as required by EP 1202.01, RPS, SFAS, SFRCS or SG Tube Rupture; or during plant startups and shutdowns. An operator must remain in the SUFP/AFP room while the pump is operating in Modes 1, 2, or 3. In the event of a leak in the feedwater or cooling water piping, the operator will stop the SUFP or notify the control room to stop the SUFP and the operator will isolate the feedwater and cooling water piping for the SUFP.

### 3. REFERENCES

3.1 Bechtel Drawings (P&ID)

3.1.1 M-006B, Feedwater System

3.1.2 M-007, Steam Generator Secondary

3.2 Technical Manuals

3.2.1 Bingham Startup Feed Pump Manual for pump number P-15

3.3 USAR Section 10.4.7.2, and 3.6.2.7.2.12

3.4 Operating License Condition 2.C.(3)(t)

### 4. PREREQUISITES

4.1 The Feedwater System is filled, vented, and in normal lineup as per SP 1106.07, FW System Procedure.

\_\_\_\_ 4.2 Turbine Plant Cooling Water System is in service as per SP 1104.39 (Turbine Plant Cooling Water System Procedure).

5| \_\_\_\_ 4.3 Valve Verification List A of this procedure has been completed.

5. PROCEDURE

\_\_\_\_ 5.1.1 Send an operator to the startup feed pump to perform the SUFP checklist, Step 1-10.

\_\_\_\_ 5.1.2 Monitor, after starting the SUFP, the following computer points until pump conditions have stabilized:

			<u>Maximum</u>
a.	SUFP DISCH PRESS	P942	1200
b.	SUFP IN STRNR DP	P940	5 PSID
c.	SUFP MTR O/B BRG OT	T914	180°F
d.	SUFP MTR P/E BRG O <sub>1</sub>	T915	180°F
e.	SUFP MTR STATOR TEMP	T916	266°F
f.	PUMP M/E BRG O/T	T913	180°F
g.	PUMP O/B BRG O/T	T917	180°F
h.	PUMP THR BRG M/T	T918	180°F

CAUTION: When the SUFP is started and supplying the feedwater system, flow will be controlled at the S/U flow control valves SP 7A and SP 7B. If too much flow exists on the SUFP, it will be necessary to throttle back these valves!

\_\_\_\_ 5.1.3 Start the SUFP by turning control room switch HIS 579 to the "Start" position and release. The switch will spring return to normal.

NOTE: SUFP discharge pressure should be greater than 900 psig at all times and running current should be less than 44 amps.

\_\_\_\_ 5.1.4 When the pump reaches rated speed, have the local operator verify Steps 10 and 11 of the Startup Feed Pump Checklist.

Section 5.1 completed by \_\_\_\_\_ Date \_\_\_\_\_

5.2 SUFP Shutdown Procedure

\_\_\_\_ 5.2.1 Stop the SUFP, turn HIS 579 to the "Stop" position and release. The switch will spring return to normal.

5| \_\_\_\_ 5.2.2 Remove and DNO tag the close power fuses for AD 210 to prevent damage to the SUFP due to considerations in the following steps.



- 5 | \_\_\_\_\_ 5.2.3      Close and DNO tag CW 196 and CW 197.
- \_\_\_\_\_ 5.2.4      Close and DNO tag Both FW 91 suction from the CST's  
                    AND FW 32 suction from the DST's.
- 5 | \_\_\_\_\_ 5.2.5      Close and DNO tag FW 106.

Section 5.2 completed by \_\_\_\_\_ Date \_\_\_\_\_

## STARTUP FEED PUMP CHECKLIST

5 | CAUTION: An operator MUST remain in the SUFP room once the pump is unisolated and the plant is in Modes 1, 2, or 3. IF the SUFP feedwater or cooling water piping develops a leak, THEN shutdown the startup feed pump locally (or notify the control room to stop the pump) AND CLOSE FW 106, FW 32, FW 91, CW 196 and CW 197. Isolate the leaking pipe first.

1. Lineup Turbine Plant Cooling Water to the SUFP Seal Water Cooler and the SUFP L.O. Cooler as follows:

<u>Valve No.</u>		<u>Position</u>	
___ CW 106	Main inlet Iso to MFPT Lube Oil Coolers and SUFP Seal Water and L.O. Coolers	Open	
___ CW 107	Main inlet Iso to MFPT Lube Oil Coolers and SUFP Seal Water and L.O. Coolers	Open	Located west of MFPT 1-1
___ CW 196	SUFP seal water/L.O. coolers inlet (Remove DNO	Open	
___ CW 197	SUFP seal water/L.O. coolers outlet (Remove DNO)	Open	
___ CW 132	SUFP seal water cooler inlet	Open	
___ CW 134	SUFP seal water cooler outlet	Open	
___ CW 133	SUFP L.O. cooler inlet	Open	
___ CW 135	SUFP L.O. cooler outlet	Open	

- 5 | \_\_\_ 2. Remove DNO tag and open FW 91 from condensate storage tanks OR FW 32 from deaerator storage tank as directed by the Shift Supervisor.
- \_\_\_ 3. Remove DNO tag and open SUFP discharge valve to FW system, FW 106. The FW System will be pressurized to the startup control valves when the pump is started.
- \_\_\_ 4. To warm and to flush the normally stagnant pump suction line, open suction strainer drain FW83 and drain water to a floor drain.

NOTE: This floor drain goes to the Miscellaneous Waste Drain Tank.

- \_\_\_ 5. Ensure SUFP seal water supply valve, located beneath pump casing, is open.
- \_\_\_ 6. Ensure oil level in pump oil reservoir is at the "high" mark on the sight glass.
- \_\_\_ 7. Check to ensure both motor bearing oil levels are "normal" as indicated on the sight glasses.
- 5 | \_\_\_ 8. Ensure SUFP minimum recirc valve FW93 is open.
- \_\_\_ 9. Vent the SUFP casing by opening FW 77.

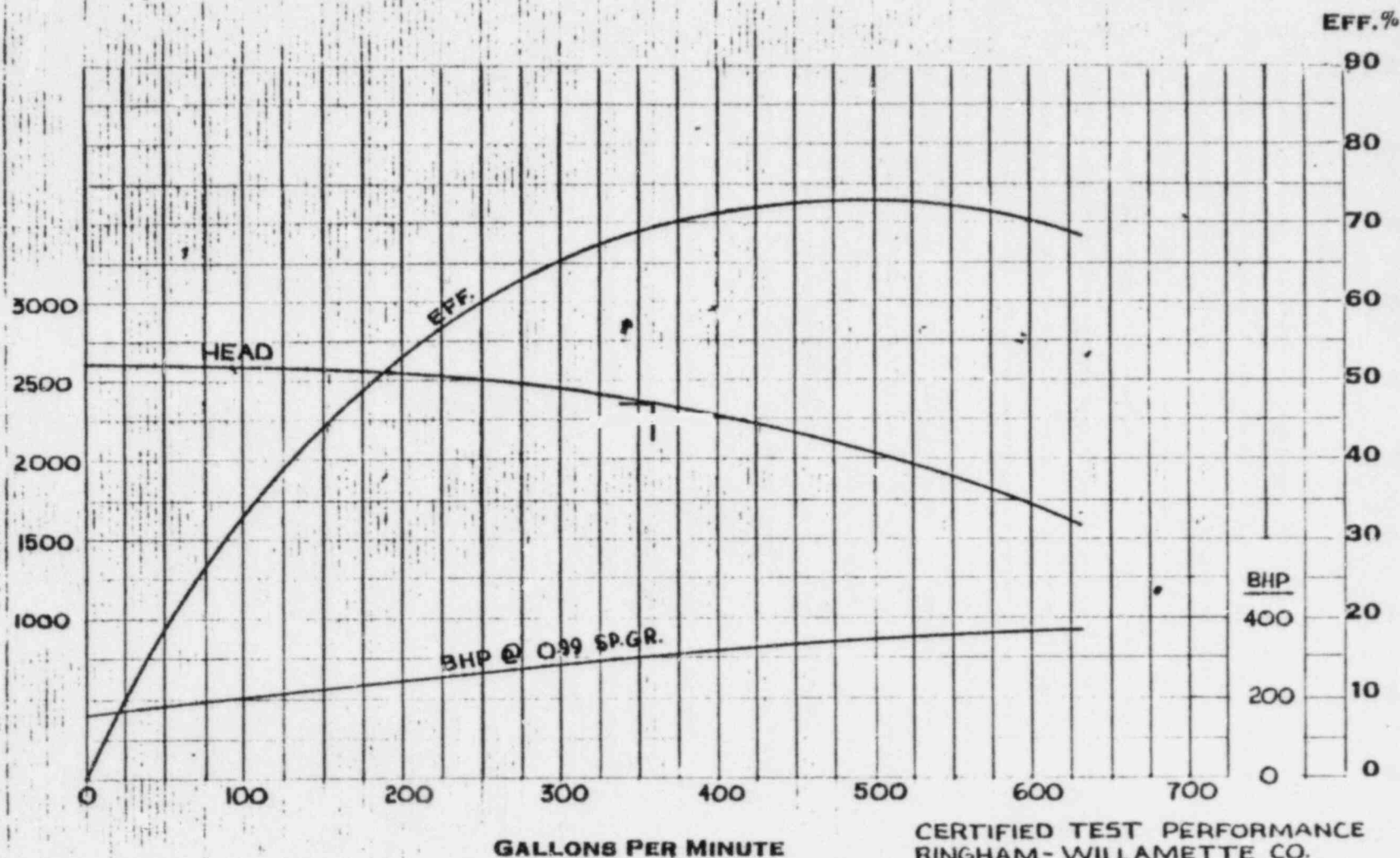


- 5| \_\_\_\_\_ 10. Remove the DNO tag and install the close power fuses for Breaker AD 210.
- \_\_\_\_\_ 11. After the SUFP is started by the Control Room Operator, ensure the SUFP discharge pressure is greater than 900 psig and flow is less than 300 gpm (104" H<sub>2</sub>O). Use PDI 2657 and Attachment 2 to determine flow.

NOTE: 900 psig and 300 gpm corresponds to a total flow of 22,000#/hr on FI SP3A and FI SP3B.

12. Monitor the following using the local indicators:
- \_\_\_\_\_ 12.1 Thrust bearing plate metal temperature. TE499G (max 180°F)
- \_\_\_\_\_ 12.2 SUFP seal water cooler out temperature as read on TI 2664.
- \_\_\_\_\_ 12.3 SUFP L.O. cooler out temperature as read on TI 673.
- \_\_\_\_\_ 12.4 SUFP discharge pressure as read on PI 943.
- \_\_\_\_\_ 12.5 SUFP flow PDI 2657 (design flow 360 GPM).
- \_\_\_\_\_ 13. Observe the SUFP for any unusual vibration.

TOTAL DYNAMIC HEAD IN FEET

Attachment  
Page 1 of 1

CERTIFIED TEST PERFORMANCE  
BINGHAM-WILLAMETTE CO.  
PORTLAND, OREGON

TOLEDO EDISON CO.  
TRIC ILLUMINATING  
START-UP FEED - P-15  
PUMP SN. - 220048

CHARACTERISTIC CURVE SHEET  
BINGHAM PUMP DIVISION  
BINGHAM-WILLAMETTE COMPANY  
PORTLAND OREGON & SHREVEPORT, LA.  
D.K. 12/11/72

IMPELLER  
MAX. 10 1/8"  
DIA.  
MIN. —  
DIA. —  
EYE SQ.  
AREA 11.9 IN.

3 x 6 x 9 E MSD 7STG. PUMP

DIA. IMPELLER  
9 7/16"

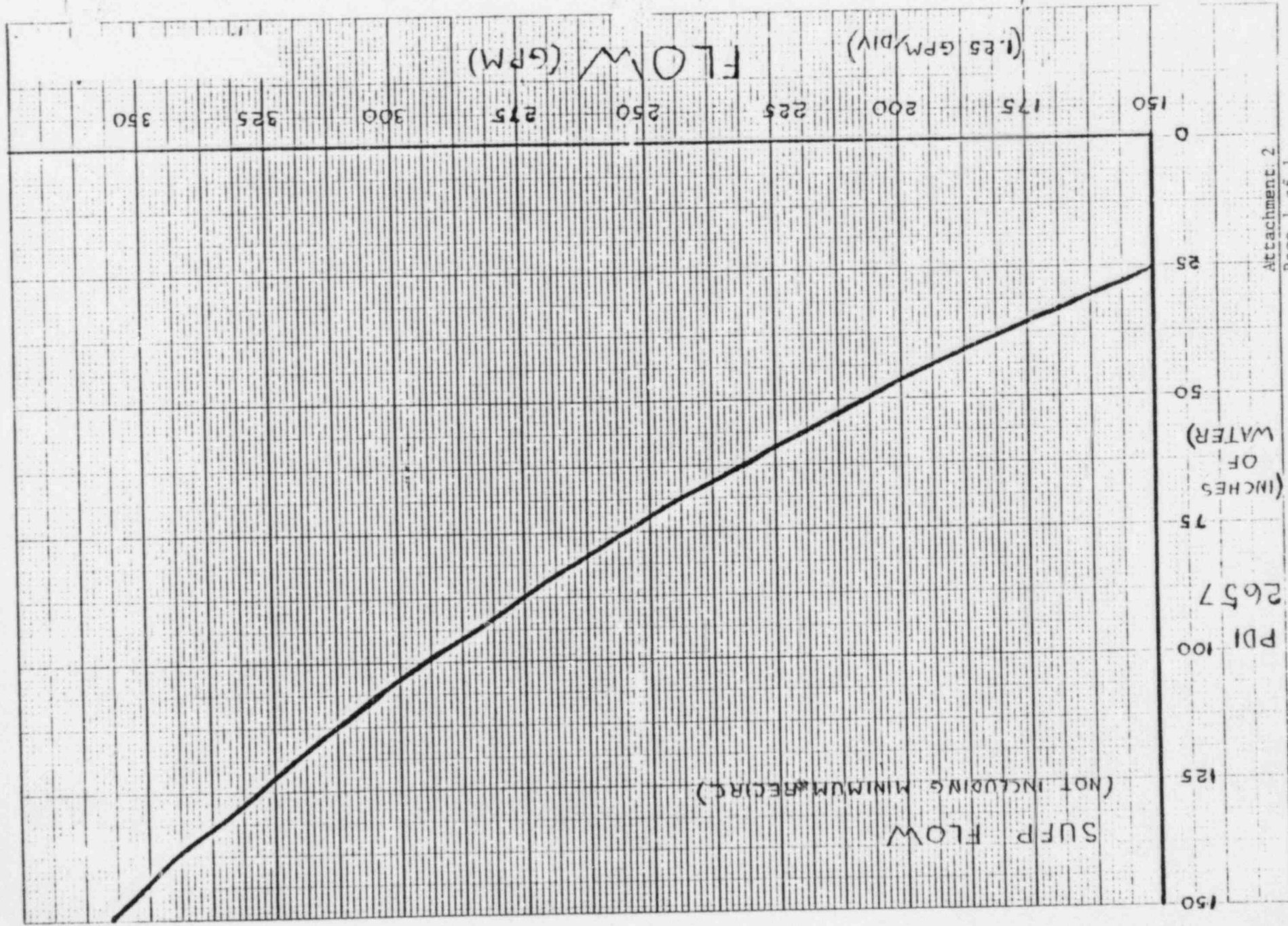
IMPELLER PATT.  
0313 MSD-6  
2-71313CPB-1/2 1/4

3560 R.P.M.

N.P.S.H. REQUIRED

REFERENCE

CURVE NO.  
31463



VALVE VERIFICATION LIST A

Startup Feed Pump  
Startup and Normal Operations

Verification List Only - Consult Shift Supervisor Prior to Repositioning Valve

VALVE DESCRIPTION	P&ID No. Coord.	VALVE NUMBER	VALVE POSITION	VERIFY BY
Deaer Storage Tk 1-2 Out Iso Valve	M-006B C-10	FW 2	Open	
Deaer Storage Tk 1-1 Out Iso Valve	M-006B C-3	FW 1	Open	
Deaer Storage Tk Outlet Cross Connect	M-006B G-10	FW 423	Open	
Deaer Storage Tk Outlet Cross Connect Iso	M-006B D-3	FW 84	Open	
Deaer Storage Tk to AFP & SUFP	M-006B H-7	FW 85	Locked Closed*	
SUFP Suction from Deaer Stg Tks	M-006B J-5	FW 32	Closed & DNO Tagged	
SUFP Suction	M-006B J-5	FW 91	Closed & DNO Tagged	
AFP Suction from Condensate Stg Tk	M-006A C-12	CD 167 CD 168 <sup>or</sup>	Open	
AFP Suction from Condensate Stg Tk	M-006B H-7	CD 170	Locked Open*	
Startup Feed Pump Seal Water Cooler 1-1 Inlet Isolation	M-009 H-2	CW 132	Open	
Startup Feed Pump Seal Water Cooler 1-1 Outlet Isolation	M-009 J-2	CW 134	Open	
Startup Feed Pump Lube Oil Cooler Inlet Isolation	M-009 J-2	CW 133	Open	
Startup Feed Pump Lube Cooler 1-1 Outlet Isolation	M-009 K-2	CW 135	Open	
SUFP Seal Water Cooler/L.O. Cooler Inlet Header Isolation	M-009 H-2	CW 196	Closed & DNO Tagged	
SUFP Seal Water Cooler/L.O. Cooler Outlet Header Isolation	M-009 J-3	CW 197	Closed & DNO Tagged	
Inlet Isol to MFPT Lo Coolers and SUFP Seal Water and Lo Coolers	M-009 H-2	CW 106	Open	
Outlet Isol to MFPT Lo Coolers and SUFP Seal Water and Lo Coolers	M-009 H-2	CW 107	Open	
SUFP Min Recirc Isolation to Deaer 1-1	M-006B B-4	FW 96	Open	
SUFP Min Recirc Isolation to Deaer 1-2	M-006B B-4	FW 97	Open	
MFP 1-1 Min Recirc Outlet Isolation	M-006B C-4	FW 34	Open	

\*Controlled per AD 1839.02



Sheet No. 2  
of 2

10

SP 1106.27.5

VALVE VERIFICATION LIST A

Startup Feed Pump  
Startup and Normal Operations

Verification List Only - Consult Shift Supervisor Prior to Repositioning Valve

VALVE DESCRIPTION	P&ID No. Coord.	VALVE NUMBER	VALVE POSITION	VERIFY BY
MFP 1-2 Min Recirc Outlet Isolation	M-006B C-9	FW 35	Open	
MFP Min Flow Line X-Conn Between Deaerators 1-1 and 1-2	M-006 B-4	FW 98	Closed	
SUFP Disch to FW System	M-006B F-7	FW 106	Closed & DNO Tagged	
SUFP 1-1 Suction Strainer Drain	M-006B K-5	FW 83	Closed	
SUFP 1-1 Suction Diff Press Switch Source	M-006B J-5	FW 500A	Open	
SUFP 1-1 Suction Diff Press Switch Source	M-006B J-5	FW 500B	Open	
SUFP 1-1 Suction Diff Press Switch	M-006B J-5	PDSH 500	In Service	
SUFP 1-1 Suction Line Drain Valve	M-006B J-4	FW 92	Closed	
SUFP 1-1 Vent Valve	M-006B J-4	FW 77	Closed	
SUFP 1-1 Drain Valve	M-006B K-4	FW 78	Closed	
SUFP 1-1 Discharge Press Indication Source	M-006B K-3	FW 495	Open	
SUFP 1-1 Discharge Press Transmitter	M-006B K-3	PI 495 & PT 495	In Service	
SUFP 1-1 Discharge Press Indication	M-006B K-3	PI 943	In Service	
SUFP 1-1 Minimum Recirculation Valve	M-006B J-2	FW 93	Open	
SUFP 1-1 Discharge Valve	M-006B J-2	FW 100	Open	
SUFP 1-1 Discharge Line Drain Valve	M-006B J-2	FW 101	Closed	
SUFP 1-1 Discharge Diff Press Indication	M-006B J-2	PDI 2657	In Service	
SUFP Disch Diff Press Indicator Source	M-006 J-2	FW 2657A	Open	
SUFP Disch Diff Press Indicator Source	M-006 J-2	FW 2657B	Open	

Reviewed by \_\_\_\_\_ Date \_\_\_\_\_  
Shift Supervisor or Assistant Shift Supervisor

END