

SEE ATTACHED BIDDERS LIST

DATE: May 4, 1967  
BID REQUEST NO.: 6118- M-6  
BID DUE: 12 O'CLOCK NOON June 2, 1967  
MATERIAL: Auxiliary Feedwater Pumps

REQUIRED JOB SITE: See Page 2 of 2  
LOCATION: Two Creeks, Wisconsin  
10 Mi. North of Railhead, Two Rivers, Wisc.  
4 COPIES (INCLUDING ORIGINAL) OF YOUR PRO-  
POSAL, ALL ATTACHMENTS, AND ALL SUPPLE-  
MENTAL CORRESPONDENCE ARE REQUIRED FOR  
PROPER CONSIDERATION OF YOUR BID.  
SPECIAL INSTRUCTIONS:

1. SEE "SUPPLEMENTAL INSTRUCTIONS TO BIDDERS" ATTACHED.
2. In addition to the above four copies, please send three copies direct to:  
Mr. A. A. Simmons  
Point Beach Project  
Westinghouse Atomic Power Division  
P. O. Box 355  
Pittsburgh, Pennsylvania 15230

*Please review  
relevant parts  
of contract  
with*

*CAF  
RJH*



*Spec File 5.5.1*

BECHTEL CORPORATION  
ENGINEERS-CONSTRUCTORS

P.O. BOX 3965  
SAN FRANCISCO, CALIFORNIA 94119  
TELEPHONE 415-433-4567

**BID REQUEST**

- bcc: J. D. Franklin (1)  
J. K. Leslie (3)  
C. P. Cords (1)  
A. A. Simmons (6)  
G. A. Reed (4) ✓

**INCLUDE THE FOLLOWING INFORMATION**

Quote Firm Prices.

Unit Prices and Total Net Extended Prices F.O.B. jobsite\* Amount of freight must be shown separately. If any customs duties, sales or use taxes are included they must be stated as separate items.

Terms of Payment.

Supplier.

Shipping Point.

Shipping Weight and Unit Weight.

Promised Delivery Date.

- \* Via Truck: Two Creeks, Wisconsin.
- Via Rail: F.O.B. Cars, Two Rivers, Wisconsin.

*A/23*

BECHTEL CORPORATION

O. S. Hoskins  
Purchasing Agent

TO: Ingersoll Rand Co.  
350 Brannan Street  
San Francisco, California

Attn: Frank J. Merritt

TO: Byron Jackson Pumps  
2 Pine Street  
San Francisco, California

Attn: Bob Christensen

TO: Pacific Pumps, Inc.  
9 First Street  
San Francisco, California

Attn: J. D. Sempson

TO: De Laval Turbine Inc.  
201 East Millbrae Avenue  
Millbrae, California

Attn: J. Allan Greenland

TO: Worthington Corp.  
280 Harbor Way  
S. San Francisco, California 94080

Attn: W. E. Forman

Tel: 871-6455

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**BID REQUEST**

Becht. M-6  
Rev. 3 REQUISITION

Plant Spec - 55.1  
POWER AND INDUSTRIAL DIVISION

MATERIAL

AUXILIARY FEEDWATER PUMPS

ATTACHMENTS: Specifications 6118-M-6, 6118-G-1, 6118-G-3 & 6118-G-32, Supplemental Instructions to Bidders & General Conditions		CON CODE 3.01	
REQUIRED FOR: Wisconsin Michigan Power Company Point Beach Nuclear Plant Units 1 & 2		MATERIAL REQUIRED AT JOB SITE NOT LATER THAN See Note 1 Below	
SHOP INSPECTION: REQUIRED <input checked="" type="checkbox"/> NOT REQUIRED <input type="checkbox"/>			
FURNISH AND DELIVER TO: Bechtel Corp., c/o Wisconsin Michigan Power Company, Point Beach Nuclear Plant, Two Creeks, Wisconsin			
△	ITEM NO.	QUANTITY AND UNIT	DESCRIPTION
	A	1 Lot	Drawings, Instructions and Data in accordance with attached Form G-321-C.
△			Auxiliary Feedwater Pumps and accessories in accordance with attached Specification 6118-M-6, Rev. 3 as follows:
△	1a & c	2	Auxiliary Feedwater Pump and accessories and steam turbine driver. Byron Jackson pump. 3 x 4 x 9D-DVMX with Terry ZS-4 turbine.
△	1b, d & e	2	Auxiliary Feedwater Pump and accessories less main pump motor driver. Byron Jackson pump 3 x 4 x 9B-DVMX.
			NOTE:
△			1) Ship to arrive at jobsite on dates indicated below. Earlier shipment will not be
△	10-27-68		Revised to delete lube oil piping & shift driven oil pump & reissued for purchase
△	7-17-68		Revised to include turbine test Procedures & Reissued for Purchase
△	2-27-63		Issued for Purchase
△	5-4-67		Issued for Quotations
JOB NO. 6119			REV. 3
REQUISITION NO. 6118-M-5			SHEET 1 OF 2 SHEETS
NO.	DATE	REVISIONS	APPROVALS

6119



Specification No. 6118-M-6  
Job No. 6118  
October 28, 1968, Rev. 3

SPECIFICATION  
FOR  
AUXILIARY FEEDWATER PUMPS  
POINT BEACH NUCLEAR PLANT  
UNITS 1 & 2  
WISCONSIN MICHIGAN POWER COMPANY

Consisting of:

1.  Specific Conditions  
(Revision 3, October 28, 1968)
2. Specification 6118-G-1, General Project Requirements  
(Revision 1, March 24, 1967)
3. Specification 6118-G-3, General Painting Requirements  
for Mechanical and Electrical Equipment  
(Revision 1, March 10, 1967)
4. Specification 6118-E-32, Electric Motors  
(Revision 2, March 10, 1967)

Bechtel Corporation  
San Francisco, California

Specification No. 6118-M-6  
Job No. 6118  
October 28, 1968, Rev. 3

SPECIFICATION  
FOR  
AUXILIARY FEEDWATER PUMPS  
POINT BEACH NUCLEAR PLANT

SPECIFIC CONDITIONS

1.0 SCOPE OF WORK

These Specific Conditions and attachments cover the furnishing and delivery of the equipment specified. The work is also subject to the terms and conditions of the contract and the General Project Requirements, Specification 6118-G-1 attached.

1.1 Work Included

1.1.1 This specification covers the furnishing and delivery, fob job site, of auxiliary feedwater pumps complete with related accessories, all in accordance with requirements as specified herein and to include the following:

Item 1a Auxiliary feedwater pump with a steam turbine driver, complete with flexible coupling, guard, recirculation orifice, ring lube oil systems for pump and turbine, turbine bearing L.O. coolers and turbine hydraulic governor with shaft driven pump, common base plate for mounting all above equipment, local gage panel (Item 1c), thermal insulation and metal lagging for the turbine, temporary suction strainers and all other materials and equipment required for a complete installation.

Item 1b Motor driven auxiliary feedwater pump, complete with flexible coupling, guard, recirculation orifices, ring lube oil system, common base plate for mounting all above equipment and electric drive motor, local gage panel (Item 1d), temporary suction strainers, and all other materials and equipment required for a complete installation except for main pump electric motor drivers which will be supplied to the Seller's shop by the Buyer.

Specification No. 6118-M-6  
Job No. 6118  
October 28, 1968, Rev. 3

Item 1c A local gage panel consisting of 1/4" sheet metal plate mounted on suitable support brackets, fixed to the common baseplate of Item 1a above.



A directly connected pump suction and discharge pressure gage, of approved type, shall be flush mounted on the gage panel.



All the auxiliary control and alarm components shall be prewired to a terminal box located at the rear of this panel.



All pump bearing temperature detectors shall be prewired to a separate terminal box provided only for bearing temperature detectors. This terminal box shall be mounted at the rear of the gage panel.

All RTD wiring shall be twisted triple copper conductors minimum conductor size #12 with aluminum foil or deposited metal on mylar tape wire shield to be terminated on separate terminal of outgoing terminal block, but isolated from ground at RTD end.

All thermocouple extension wiring shall be "Copper-Constantan" size #16, twisted pair with shielded aluminum foil or deposited metal on mylar tape wire shield to be terminated on separate terminal of outgoing terminal block but isolated from ground at thermocouple end.

Minimum control wiring conductors to be #12.

Item 1d A local gage panel similar to Item 1c for mounting on common base plate of Item 1b, and including drive motor bearing temperature detector wiring to terminal box.

Item 1e Mounting, assembly and testing of Buyer furnished electric motor drivers on common base with pump and accessories under Item 1b above.



Specification No. 6118-M-6  
Job No. 6118  
October 28, 1968, Rev. 3

1.1.2 The Seller shall provide the services of a qualified Erection Superintendent to supervise the complete installation and placing in service of the pumps, motors and turbines.

1.2 Work Not Included

The following associated items and work will be furnished, erected and/or installed by others and are not a part of this specification:

- 1.2.1 Labor for erection and field testing.
- 1.2.2 Foundations and foundation bolts.
- 1.2.3 All external piping and valves except that forming an integral part of the pump sealing, venting, draining and lubricating.
- 1.2.4 Motor driven auxiliary feedwater pump electric drive motors, drive motor starters and electric wiring to pump drive motors. Drive motors to Seller's requirements will be supplied to Seller's shop for assembly with the pump and testing.
- 1.2.5 Valves and controls for the recirculation system.
- 1.2.6 Flow controls and valves for controlling the low load bypass flow.

1.3 Codes and Standards

The subject equipment shall conform to the current requirements of applicable standards of the Hydraulic Institute (HI), American Standards Association (ASA), American Society for Testing Materials (ASTM), American Society of Mechanical Engineers (ASME), National Electric Manufacturer's Association (NEMA), National Fire Protection Association (NFPA), and the National Electric Code (NEC), and the American Petroleum Institute (API #615), except as specified hereunder.

1.4 Attachments

The following attachments are included as part of this specification:

- 1.4.1 Specification 6118-G-1, General Project Requirements.

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Specification No. 6118-M-6  
Job No. 6118  
October 27, 1968, Rev. 3

- 1.4.2 Specification 6118-G-3, General Painting Requirements for Mechanical and Electrical Equipment.
- 1.4.3 Specification 6118-E-32, Electric Motors.
- 1.4.4 Drawing 6118-MR-6, Fig. 1, Auxiliary Feedwater Pump Cycle.
- 1.4.5 Data Sheet 6118-MR-6, Fig. 2, Horizontal Centrifugal Pump -- Turbine Driven Auxiliary Feedwater Pumps.
- 1.4.6 Data Sheet 6118-MR-6, Fig. 3, Horizontal Centrifugal Pump -- Motor Driven Auxiliary Feedwater Pumps.
- 1.4.7 Induction Motor Data Sheet, Westinghouse Form 54082, for Motor Driven Auxiliary Feedwater Pumps, Data Sheet 6118-MR-6, Fig. 4.

## 2.0 RATING AND CONDITIONS OF SERVICE

- 2.1 The Seller shall select the pump rated speed based on considerations of optimum pump and driver design and satisfactory operation. The motor driven pump unit shall be selected with due consideration given to the rating and economics of the available Westinghouse motor drivers furnished separately.
- 2.2 The system in which the pumps will be used is as described herein and as illustrated in 6118-M-6, Fig. 2, auxiliary feedwater pump cycle.
- 2.3 The pumps shall be of heavy duty powerhouse type and suitable for short infrequent operation.
- 2.4 Pump capacity and required TDH is given in paragraph 3.2 below. The required TDH for the feed pump is the resultant of system resistance (with control valve wide open), steam generator pressure, static head, and feed pump suction pressure. Each feed pump shall operate satisfactorily at the point where the head capacity curve for a single pump intersects the curve of required pump TDH.

Pumps shall be designed for quick start with no warm-up and shall be capable of reaching design conditions in 30 seconds or less when power is supplied to the driver (steam to the turbine driver and electric power to the motor driver).

3.0 DESIGN AND CONSTRUCTION

3.1 General Arrangement

3.1.1 Each pump together with its motor or turbine driver and accessories shall be mounted on a rigid, fabricated steel, deep rim base plate of adequate size. The base plate shall be large enough to preclude equipment overlapping and shall be provided with a two (2) inch IPS tapped drain connection.

Leveling screws shall be provided in tapped base plate holes in order to facilitate alignment in the field.

3.1.2 Either turbine driven pump and two (2) motor driven pumps shall be capable of operating in parallel throughout the entire range of suction, discharge and flow conditions contained in this specification without cavitation, vibration, instability of flow, overheating or any other adverse effects which might limit the ability of any pump to provide the required flow continuously.

3.1.3 Each pumping unit shall be capable of sustained operation at minimum flow.

3.1.4 Each pump shall have the capability of being automatically and remotely started without attention.

3.1.5 Each pumping unit (pump, driver, coupling and base plate) shall be designed for seismic acceleration of 0.06 g horizontally and 0.04 g vertically occurring simultaneously with normal operating load, including normal thermal transients, without exceeding code allowable stress. Furthermore, the equipment shall withstand a simultaneous horizontal acceleration of 0.12 g and vertical of 0.08 g in conjunction with the normal loads and the maximum thermal transients without loss of function of equipment, or components.



3.2 Operating Conditions

Design capacity -- turbine driven 400 gpm

Design capacity -- motor driven 200 gpm

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Suction pressure	16' min. -- 175' max.
Feedwater temperature	50°F min. -- 100°F max.
Feedwater condition -- normal	filtered and demineralized
Feedwater conditions -- emergency	raw, non-saline, unfiltered lake water
⚠ TDH at design capacity	1192 psig -- 400 gpm 1192 psig -- 200 gpm
⚠ Discharge pressure at shutoff (Maximum)	1305 psig -- 200 gpm 1340 psig -- 400 gpm

For Turbine Driver:

Steam pressure, operating	680 - 1085 psig
Steam temperature, operating	500 - 556°F
⚠ Steam pressure, maximum continuous	1085 psig
Steam pressure, maximum intermittant	1193 psig
Steam conditions	1/4% moisture
Exhaust pressure	10 psig

3.3 Pump Construction

3.3.1 Type

Horizontal, multi-stage, hydraulically balanced, horizontally split case with horizontal suction and discharge nozzles with weld ends suitable for the service. All component parts shall be renewable.

3.3.2 Bearings

⚠ Bearings shall be ball, ring oil lubricated. Oil level shall be visually indicated. Copper-Constantan thermocouples shall be provided for each main bearing, wired to terminal box.

3.3.3 Shaft Seals

⚠ Shaft seals shall be exposed to suction pressure and be of the non-mechanical type.

3.3.4 Couplings

Couplings shall be flexible, all steel, oil lubricated and capable of accommodating changes in shaft length from expansion. All couplings shall be provided with guards bolted to the base.

3.3.5 Vibration



Vibration, measured on the shaft and perpendicular to it, shall not exceed 2 mils double amplitude at all speeds up to 110% of rated speed.

3.4 Turbine Driver Construction

3.4.1 Type

Direct drive, complete and suitable for the service specified with hydraulically operated speed control, overspeed trip mechanism, integral trip throttle valve with shutoff valve attached. Casing shall be suitably insulated and lagged. All components shall be renewable.

3.4.2 Bearings



Bearings shall be split sleeve, ring lubricated. Thrust bearings shall accommodate the turbine unbalance only.

3.4.3 Lubrication and Control Oil System



3.4.3.1 The turbine shall be equipped with a ring type lube oil system, integral bearing reservoir oil cooling coils and instruments and accessories necessary for a complete installation.

3.4.3.2 The lubricating oil system shall be suitable for operation with main turbine lube oil.



3.4.4 Glands

Gland packing shall be of the spring loaded split carbon ring type.

3.4.5 Accessories

In addition to those accessories specified elsewhere, the following accessories shall be provided and installed.

- a. One (1) reed type tachometer.
- b. Hand operated speed changer.
- c. 4-1/2" pressure gages indicating the following:

- Nozzle bowl pressure
  - Exhaust pressure

- d. Trico visible oilers

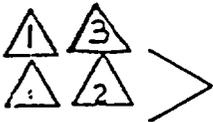
- f. Limit switch on the throttle trip valve (125 V D.C.).

3.5 Electric Motors

3.5.1 Without exception, all electric motors rated less than 125 HP shall be in accordance with the attached Specification 6118-E-32. No bearing temperature monitoring is required on motors rated less than 125 HP.

3.5.2 Motor driven auxiliary feedwater pump electric drive motors will be of Westinghouse manufacture and will be supplied by the Buyer to the Seller's shop. The Seller shall submit his motor requirements with his bid, including mounting, RPM, horsepower, bearing type recommended, rotations, WK<sup>2</sup> of driven equipment, breakaway torque and any other specific requirements on the attached Induction Motor Data Sheet. The Seller shall also state the approximate date at which motors should be delivered to his shop. These motor drivers will be 480 V, 3 phase, 60 cycle, induction type equipped with space heaters and drip proof enclosures.

3.5.3 All motors shall be selected for operation indoors at an ambient temperature of approximately 115°F.



### 3.6 Piping and Connections

3.6.1 All welding connections 2-1/2" and over shall be butt welded and those 2" and under, socket welded. End preparation details for butt welding joints will be furnished to the Seller after award of the order.

3.6.2 Auxiliary feedwater pump suction and the discharge connections shall be butt welded. The Seller shall furnish details of suction and discharge connections, and indicate how they are to be adapted for hydrostatic testing. If a grooved ring on the discharge is proposed for clamping a blank for hydrostatic testing, the design must be approved by the Buyer. If a flanged ring or a groove is provided for clamping purposes, it shall be machined or ground-off after the test.

3.6.3 The pumps shall be furnished complete with all internal connecting piping required for operation of the units. Piping handling the pumped fluid shall be seamless carbon steel pipe per ASTM A-106 Grade B. All piping shall be in accordance with current requirements of the Code for Pressure Piping, ASA B 31.1.



### 3.7 Orifices

3.7.1 Each pump shall be furnished with a pressure reducing orifice to be used in conjunction with the Buyer's "on-off" control valve in the pump recirculation piping. The orifice shall be provided with weld end connections for installation in the Buyer's piping. If the flow through the orifice may cause erosion, special materials, such as 316 stainless steel, shall be used.



3.8 Start-Up Strainers



The Seller shall furnish fine mesh start-up strainers for each pump, to be installed in the suction piping. Strainer drawings shall be submitted at an early stage of design. The size of the strainers shall match that for the suction piping and may be one size larger than that of the pump suction connection. The pump suction piping will be 6" stainless steel, schedule 10S, for the turbine driven pumps, and 4" stainless steel, schedule 10S, for the motor driven pumps. The strainers shall have a 3/4" pressure gage connection provided upstream of strainer mesh. A downstream connection is provided in customers piping.

4.0

MATERIALS



4.1 Metals with low melting points such as lead, tin, etc., are not to be used in the construction of pumps where such metal will come in contact with the feedwater.

4.2 Pump



Shaft, shaft nuts and sleeves	410 S.S. H.T.
Impellers and rings	410 S.S. & 410 S.S. H.T.
Casing and stuffing box	4 - 6% chrome steel
Casing rings	420 S.S. H.T.
Balance disc	17% chrome steel
Balance disc head	410 S.S. H.T.

4.3 Turbine



Casing	Carbon steel
Shaft	Forged 4140 H.T.
Blading	Terry solid WHL
Blade discs	Forged 4140 H.T.
Packing	Carbon rings

5.0 DESIGN CONSIDERATION

5.1 Pump motors are driven from a limited emergency power source and shall not consume more power than that required for the conditions stated herein. The pumps

shall match system characteristics as closely as possible with minimum throttling, preferably zero, at design conditions. The best efficiency point shall be as near design capacity as practical.

5.2 Painting and Preparation for Shipment

5.2.1 Shop Standard Primer (for exposure to Industrial atmosphere) shall be in accordance with paragraph 3.1 of Specification 6118-G-3 "General Painting Requirements" as attached.

5.2.2 Shop Standard Finish (for exposure to Industrial atmosphere as specified in the Specific Conditions) shall be in accordance with paragraph 3.2 of Specification 6118-G-3 "General Painting Requirements" as attached.

5.3 The pumps shall be shipped to the jobsite completely assembled and mounted on the base plates. Flanged ends, openings and connections shall be suitable protected for shipment.

1  
6.0 TESTS AND INSPECTIONS

6.1 The Buyer shall be granted access to the Seller's plant during fabrication.

6.2 It shall be the responsibility of the Seller to work out with the motor driver manufacturer, through the Buyer, a compatible procedure for starting up the combined unit.

6.3 The pumps shall be shop tested at rated conditions by the Seller in accordance with the procedures of the Test Code of the current Standards of the Hydraulic Institute. The Terry steam turbines shall be shop tested at rated conditions by the Seller in accordance with the procedures of the latest edition of API Standard 615, "Mechanical-Drive Steam Turbines for General Refinery Services." Tests shall include but not be limited to those as stated in Section VI of the API Standard 615. Final testing of each pump and turbine shall be performed after completion of any corrective machining required to meet the requirements of this Specification. Due notification shall be given the Buyer so that his inspector may be present to witness the test.

6.4 A certificate of shop test of the pumps and turbines shall be furnished to the Buyer, and the pumps and turbines shall not be shipped until the Buyer has approved the pump characteristics and all test results.

2

2

Specification No. 6118-M-6  
Job No. 6118  
October 29, 1963, Rev. 3

△ 2 6.5 After installation, the pumps and drivers will be thoroughly tested by the Owner to verify the performance under actual operating conditions. The pumps and drivers shall meet all the requirements of this Specification and all of the Seller's guarantees prior to acceptance.

7.0 MARKING

Turbine driven pumps shall be identified by equipment numbers 1-P29 and 2-P20, respectively. Motor driven pumps shall be identified by equipment numbers P38A and P38B, respectively. A nameplate shall be attached to each pump stating the name and serial number, and capacity and head at rated conditions. Additional information to be included will be supplied at a later date.

8.0 GUARANTEES

△ 1 > The Seller shall guarantee that the pumps and accessories furnished will be entirely suitable for the service described herein, will conform to all current applicable codes, and will safely and satisfactorily meet all conditions of performance and design specified herein for a period of not less than 18 months after initial operation of the plant. Initial operation is defined as the first time the turbine generator is synchronized with Wisconsin Michigan Power Company's system.

P-11-62  
 11-19-63  
 2/27/68  
 5/11/67  
 3 Reissued for Purchase  
 2 Reissued for Purchase  
 1 ISSUED FOR PURCHASE  
 0 ISSUED FOR BIDS  
 YMP  
 JMS  
 JMS  
 JMS

This schedule of drawing and data requirements is to be fulfilled before rendering final invoices. See below for drawings required and dates due. Failure of Vendor to comply with drawing and data requirements may result in order cancellation in the case of initial drawings, or final payment being withheld in the case of final drawings. Drawings are to be forwarded to:  
 Bechtel Corporation POWER & INDUSTRIAL, 149 NEW MONTGOM. San Francisco 94111, Calif.  
 (Division or Department) (Street Address) (Zone)  
 Attention: J. K. LESLIE. In addition, forward with shipment, one set of any drawings necessary for field installation. Forward copies of all transmittal letters to Purchasing Department, P. O. Box 3965, San Francisco 5, California 94119. Attention: Expediter

REV.	DESCRIPTION	TYPE OF DRAWINGS AND OTHER REQUIREMENTS	APPROVAL BEFORE FAB. (YES/NO)	KIND OF COPIES	NUMBER REQUIRED	
					INITIAL	FINAL
A	OUTLINE DIMENSIONS AND FOUNDATION REQUIREMENTS	YES	TRANSPARENCY PRINTS	1	1	
B	CROSS SECTION WITH PARTS LISTS, WITH PRICES	NO	TRANSPARENCY PRINTS			
C	SHOP DETAIL DRAWINGS	NO	TRANSPARENCY PRINTS			
D	CERTIFIED PERFORMANCE DATA	NO	TRANSPARENCY PRINTS			
E	WIRING DIAGRAMS	YES	TRANSPARENCY PRINTS	1	1	
F						
G						
H	CODE CERTIFICATES AND/OR INSPECTION REPORTS	NO	ORIGINAL COPIES		4	
J	INSTRUCTIONS FOR ERECTION OR INSTALLATION, OPERATION AND MAINTENANCE	NO	MANUALS OF EACH TYPE		35 $\Delta$	
K	LIST OF RECOMMENDED SPARE PARTS FOR ONE YEAR'S OPERATION, WITH PRICES	NO	TRANSPARENCY		1	
L	COMPLETED BECHTEL CORPORATION DATA SHEETS	YES	TRANSPARENCY		1	
M						

Initial drawings must show all information necessary for Purchaser's design of foundations and any connections to other equipment.  
 Vendor's drawings will be reviewed and approved only as to arrangement and conformance to the specifications and related drawings, and approval shall not be construed to relieve or mitigate the Vendor's responsibility for accuracy or adequacy and suitability of materials and/or equipment represented thereon.  
 Final drawings must be certified and must show, adjacent to title block, Purchaser's equipment title and number, mfr's serial no. and purchase order number. Final transparencies shall be process cloth tracings, black line on vellum, kodagraph or autopositive vellum. Initial transparencies may be any of the foregoing or solid vellum made from faultless masters. Initial drawings required within 15 days of receipt of firm order. Final drawings required within 15 days of receipt of approved initial drawings, or within 30 days of receipt of firm order if no initial drawings are requested.

G-321-C 11-19-63	 BECHTEL POWER AND INDUSTRIAL DIVISION	DRAWINGS AND DATA REQUIREMENTS <b>AUXILIARY FEEDWATER PUMPS</b> WESTINGHOUSE ELECTRIC CORPORATION ATOMIC POWER DIVISION WISCONSIN MICHIGAN POWER COMPANY POINT BIACH NUCLEAR PLANT UNIT 1 & 2	JOB No. <u>6118</u>	REV
			ATTACHMENT TO REQUISITION NUMBER <u>6118-M-6</u>	3

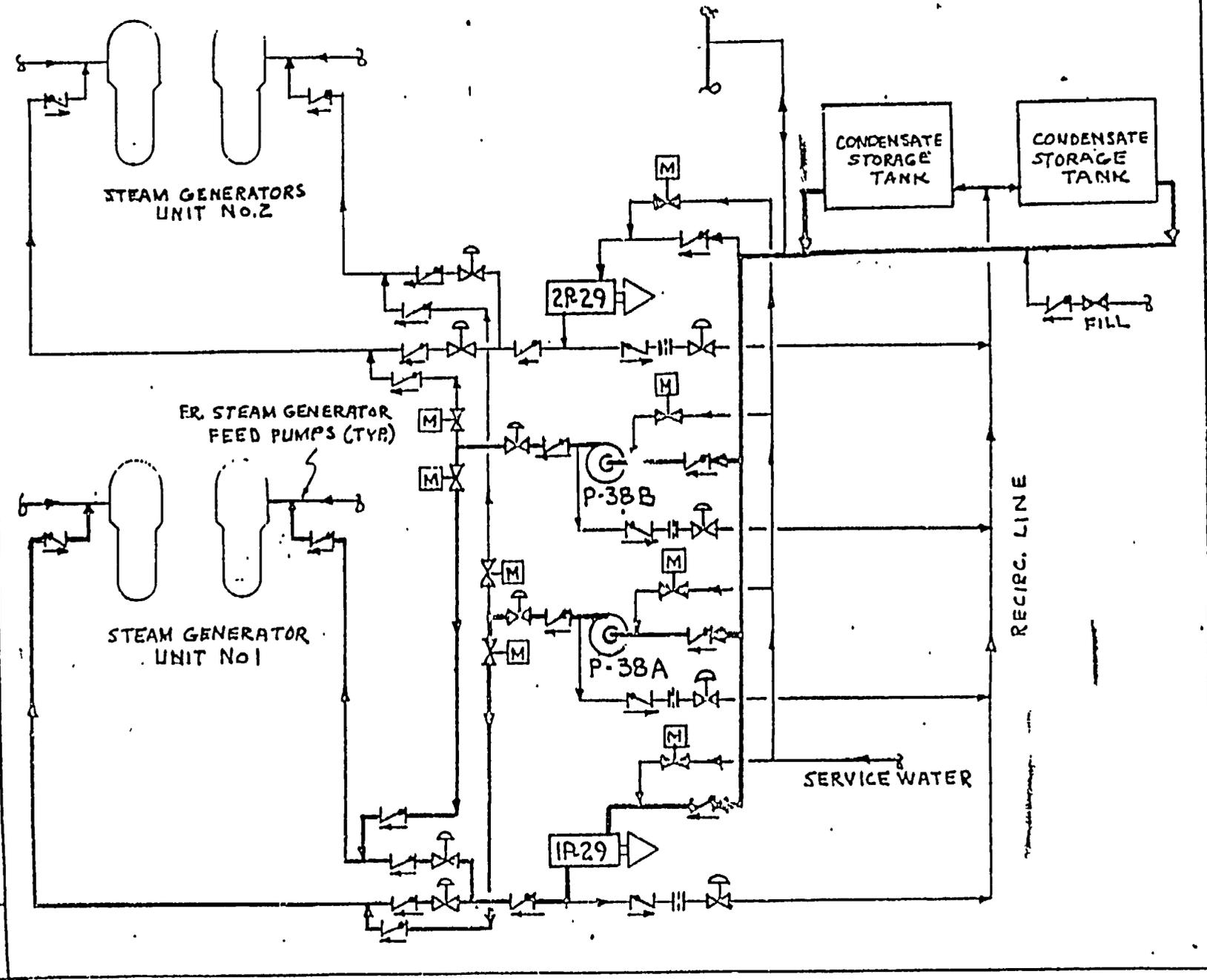
G-231-A 8-8-62	3	Reissued for Purchase	JAW					10-27-67	
	2	Reissued for Purchase	JAW					7-17-67	
	1	ISSUED FOR PURCHASE	JAW					2/27/68	
	0	ISSUED FOR QUOTATION	JAW	JAW				5/4/67	
	REV.	DESCRIPTION	ENG	OR	CHK	SUPV	MATL	APPROVALS	DATE

BECHTEL CORPORATION  
POWER AND INDUSTRIAL DIVISION

WISCONSIN MICHIGAN POWER CO.  
POINT BEACH NUCLEAR PLANT  
AUX. FEEDWATER PUMP CYCLE

JOB NO. 6118  
6118-MR-6  
FIG. No. 1

REV. 3



10-20-68  
 2-17-67  
 2-27-67  
 4-24-67

3 Reissued for Purchase  
 2 Reissued for Purchase  
 1 ISSUED FOR PURCHASE  
 0 ISSUED FOR BIDS

DATE

APPROVALS

SUPV

CHK

OR

ENG

REV. DESCRIPTION

LIQUID PUMPED \_\_\_\_\_

FLOW: NORMAL/DESIGN \_\_\_\_\_ (GPM) (LBS/HR)

FLOW TEMP/SPECIFIC GRAVITY \_\_\_\_\_

VISCOSITY (SSU)/VAPOR PRESS. (PSIA) \_\_\_\_\_

PRESSURE: SUCTION/DISCHARGE \_\_\_\_\_ (PSIA)

DIFFERENTIAL: FEET/PSI \_\_\_\_\_

NPSH: AVAILABLE/REQUIRED \_\_\_\_\_ (FT)

BHP/DRIVER HP/EFFICIENCY (AT RATING) \_\_\_\_\_

IMPELLER DIAMETER: BID/MAX \_\_\_\_\_

IMPELLER EYE: AREA/ENTRANCE VEL: \_\_\_\_\_

RPM/ROTATION (FACING COUPLING) \_\_\_\_\_

MAX. ALLOW WORK PRESS./NO. STAGES \_\_\_\_\_

WEAR RING (OR IMPELLER) CLEARANCE \_\_\_\_\_

CASE MATERIAL: INNER/OUTER \_\_\_\_\_

IMPELLER MATERIAL \_\_\_\_\_

WEAR RING MTL: CASE/IMPELLER \_\_\_\_\_

SHAFT: MATERIAL/DIAMETER \_\_\_\_\_

SHAFT SLEEVE MTL/EXTEND THRU GLAND? \_\_\_\_\_

COUPLING: TYPE/MANUFACTURER \_\_\_\_\_

COUPLING GUARD REQUIRED? \_\_\_\_\_

BASEPLATE: TYPE/MATERIAL \_\_\_\_\_

SHAFT SEAL: TYPE/SEALING COHN? \_\_\_\_\_

BEARINGS: TYPE: THRUST/RADIAL \_\_\_\_\_

LUBRICATION: THRUST/RADIAL \_\_\_\_\_

SUCTION CONNECTION: SIZE/RATING/FACING  
 (DOUBLE) (SINGLE)/POSITION \_\_\_\_\_

DISCHARGE CONNECTION: SIZE/RATING/FACING  
 POSITION \_\_\_\_\_

PUMP MANUFACTURER \_\_\_\_\_

TYPE & SIZE \_\_\_\_\_

NET WEIGHT (PUMP ONLY)/SERIAL NUMBER \_\_\_\_\_

DRIVER MFG./FURN BY \_\_\_\_\_

(MOTOR) (TURB.) / (INTEGRAL) (CPLD.) \_\_\_\_\_

SERIAL NUMBER/DRAWING REFERENCE \_\_\_\_\_

INSPECTION/HYDROSTATIC TEST? \_\_\_\_\_

PERFORMANCE TEST?/WITNESSED? \_\_\_\_\_

COST CODE \_\_\_\_\_

(70 NO) (REQ'N NO.) (SPEC NO) \_\_\_\_\_

3 Reissued for purchase  
 2 Reissued for purchase  
 1 ISSUED FOR PURCHASE  
 0 ISSUED FOR BIDS

LIQUID PUMPED \_\_\_\_\_  
 FLOW: NORMAL/DESIGN \_\_\_\_\_ (GPM) (LDS/HR)  
 FLOW TEMP/SPECIFIC GRAVITY \_\_\_\_\_  
 VISCOSITY (SSU)/VAPOR PRESS. (PSIA) \_\_\_\_\_  
 PRESSURE: SUCTION/DISCHARGE \_\_\_\_\_ (PSIA)  
 DIFFERENTIAL: FEET/PSI \_\_\_\_\_  
 NPSH: AVAILABLE/REQUIRED \_\_\_\_\_ (FT)

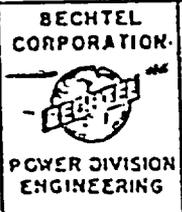
BHP/DRIVER HP/EFFICIENCY (AT RATING) \_\_\_\_\_  
 IMPELLER DIAMETER: BID/MAX \_\_\_\_\_  
 IMPELLER EYE: AREA/ENTRANCE VEL: \_\_\_\_\_  
 RPM/ROTATION (FACING COUPLING) \_\_\_\_\_  
 MAX. ALLOW WORK PRESS./NO. STAGES \_\_\_\_\_  
 WEAR. RING (OR IMPELLER) CLEARANCE \_\_\_\_\_

CASE MATERIAL : INNER/OUTER \_\_\_\_\_  
 IMPELLER MATERIAL \_\_\_\_\_  
 WEAR RING MTL: CASE/IMPELLER \_\_\_\_\_  
 SHAFT: MATERIAL/DIAMETER \_\_\_\_\_  
 SHAFT SLEEVE MTL/EXTEND THRU GLAND? \_\_\_\_\_  
 COUPLING: TYPE/MANUFACTURER \_\_\_\_\_  
 COUPLING GUARD REQUIRED? \_\_\_\_\_  
 BASEPLATE: TYPE/MATERIAL \_\_\_\_\_  
 SHAFT SEAL: TYPE/SEALING CONN? \_\_\_\_\_  
 BEARINGS: TYPE: THRUST/RADIAL \_\_\_\_\_  
 LUBRICATION: THRUST/RADIAL \_\_\_\_\_  
 SUCTION CONNECTION: SIZE/RATING/FACING  
 (DOUBLE) (SINGLE)/POSITION \_\_\_\_\_  
 DISCHARGE CONNECTION: SIZE/RATING/FACING  
 POSITION \_\_\_\_\_

PUMP MANUFACTURER \_\_\_\_\_  
 TYPE & SIZE \_\_\_\_\_  
 NET WEIGHT (PUMP ONLY)/SERIAL NUMBER \_\_\_\_\_  
 DRIVER MFG./FURN BY \_\_\_\_\_  
 (MOTOR) (TURB.) / (INTEGRAL) (CPLD.) \_\_\_\_\_  
 SERIAL NUMBER/DRAWING REFERENCE \_\_\_\_\_  
 INSPECTION/HYDROSTATIC TEST? \_\_\_\_\_  
 PERFORMANCE TEST?/WITNESSED? \_\_\_\_\_  
 COST CODE \_\_\_\_\_  
 WO NO (REQ'N NO.) (SPEC NO) \_\_\_\_\_

REV. DESCRIPTION

M. 307-E  
 6. 28. 56



HORIZONTAL CENTRIFUGAL PUMP DATA SHEET  
 WISCONSIN MICHIGAN POWER COMPANY  
 POINT BEACH NUCLEAR PLANT  
 MOTOR DRIVEN AUXILIARY FEEDWATER  
 PUMPS

JOB No 6118  
 6118-MR-6  
 Fig. 3  
 SHEET OF

REV.  
 3

INDUCTION MOTOR DATA SHEET  
WESTINGHOUSE FORM S-1082

6118-M-6: FIG:4

1	PROJECT POINT BEACH NUCLEAR PLANT S.O. NO. 6118-M-6	DATE	BY
2	FURNISHED BY		
3	MARK OR ITEM NO. P38A & P38B : AUXILIARY FEEDWATER PUMPS.		
4	PURCHASER'S REQUIREMENTS	DATA FURNISHED BY SELLER	
5	SERVICE Auxiliary Feedwater Pump Dr.	MAKE	
6	TYPE Induction	FRAME NO.	
7	NO. OF UNITS Two (2)	HORSEPOWER	
8	MOUNTING	SERVICE FACTOR	
9	ELEC. CHARACTERISTICS 480 V. 3 PH 60 CY	FULL LOAD RPM	
10	SYNCH. SPEED. RPM	FULL LOAD AMP	
11	HORSEPOWER	LOCKED ROTOR AMP	
12	SERVICE FACTOR	STARTING TORQUE, % F.L.	
13	ENCLOSURE	PULL-OUT TORQUE, % F.L.	
14	INSULATION CLASS	EFF.-FULL LOAD, %	
15	INSULATION TREATMENT	EFF.-3/4 LOAD, %	
16	AMBIENT TEMP-C	EFF.-1/2 LOAD, %	
17	STATOR TEMP RISE-C	P.F.-FULL LOAD, %	
18	BEARING TYPE	P.F.-3/4 LOAD, %	
19	BEARING TEMP RELAY	P.F.-1/2 LOAD, %	
20	BEARING FASND COUPLER/RTD's	P.F.-LOCKED ROTOR	
21	HALF COUPL. OR SHEAVE MTD. BY	SPACE HTRS., TOTAL WATTS	
22	ROTATION*	RADIAL BEARING-TYPE	
23	WKT OF DRIVEN EQUIP.	THRUST BEARING-TYPE	
24	BRKDY. TORQ. DRYN. EQUIP.	BEARING SERVICE-HR.	
25	OVERSIZE COND. BOX	NORMAL SRG. OPER. TEMP-C	
26	COND. BOX LOCATION	NET WEIGHT-LB.	
27	SPACE HEATERS, VOLTAGE, PHASE	OIL COOL. SYS. REQ'D	
28	SPLIT END BELLS	BRG. OIL PRESS. RANGE, PSI	
29	TERMINAL LUGS, TYPE	BRG. OIL REQ'D EA. BRG. GPM	
30	STATOR HIGH TEMP DEVICE	NAME PLATE CODE LETTER	
31	ADJUSTABLE SLIDE RAILS	PERMISSIBLE STARTS PER HR:	
32	SOLEPLATES	MOTOR AT AMBIENT TEMP	
33	PROJECT ELEV., FT.	MOTOR AT RATED TOTAL TEMP	
34	SHAFT (HOLLOW, SOLID)	TYPE SEALED INSUL. SYS.	
35	COUPLING (SELF-RELEASE)	DESCRIPTION OF INSUL. SYS.	
36	SOLID, NONREVERSING		
37	ADJUSTABLE, FLEXIBLE		
38	VERT. MAX DOWNTHRUST		
39	VERT. MAX UP THRUST		
40	VERT. MIN UP THRUST		
41	VERT. MIN DOWN THRUST		
42	(WITH MOTOR RUNNING)		
43	SIDE THRUST		
44	MAX REVERSE SPEED		
45	DRAIN PLUG AND VENT		
46	AIR INTAKE SCREENS		
47			
48			
49			
50			
51			
52	REMARKS:	REMARKS:	
53	ALL PERFORMANCE DATA BASED ON NORMAL RATED	ALL PERFORMANCE DATA BASED ON NORMAL RATED	
54	VOLTAGE AND FREQUENCY	VOLTAGE AND FREQUENCY	
55	ITEMS 30-44 APPLY TO VERTICAL MOTORS ONLY	INDICATE IF DATA IS ESTIMATED	
56			
57			
58			
59			
60	* VIEWED FROM END OPPOSITE COUPLING END		