



Public Service Company of Colorado

September 14, 1979
Fort St. Vrain
Unit No. 1
P-79208

Mr. Karl V. Seyfrit
Nuclear Regulatory Commission
Region IV
Office of Inspection and Enforcement
611 Ryan Plaza Drive
Suite 1000
Arlington, Texas 76012

Docket No. 50-267

Subject: NRC IE Bulletin No. 79-15
Dated July 11, 1979

Dear Mr. Seyfrit:

This letter is to inform you of the action taken in response to IE Bulletin No. 79-15 concerning deep draft pumps.

A list containing the manufacturer, model number, rated capacity and plant application of the fourteen safety related deep draft pumps installed at Fort St. Vrain is included in Attachment A to this letter. Attachment B provides general pump dimensions in the form of vendor drawings. A discussion of the startup history, type and frequency of testing and a description of the routine maintenance history of all safety related deep draft pumps is contained in Attachment C. Eleven of the fourteen safety related deep draft pumps are in continuous operation and do not have startup histories. The start up histories for the remaining three pumps (P-4501, P-4501S and P-2105) are discussed in Attachment C.

The operational problems and major repair efforts have been in the general category of wear. Pump components subject to wear include shafts, bowls, impellers, bushings, bearings, "O" rings and couplings. A major repair effort is defined as that work which requires pump or drive unit removal and/or disassembly due to pump performance characteristics which adversely affect pump performance. A detailed discussion of the major repair efforts on each pump is included in Attachment D. The longest period of pump operability between major repair efforts is also included in this attachment.

1229 254


7910300 382

POOR ORIGINAL

Mr. Karl V. Seyfrit
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Page 2

Fort St. Vrain has not experienced the difficulties expressed in I&E Bulletin 79-15 as can be observed in the attachments to this letter. The deep draft pumps have operated properly and have experienced only expected wear. The part replacement frequency due to wear has been acceptable, i.e. long term cooling capability has not been abnormally affected by replacement of worn parts. I&E Bulletin 79-15 is considered closed by submittal of this letter.

Very truly yours,


J.K. Fuller, Vice President
Engineering and Planning

JKF:eg

Attachments

1229 255

Fort St. Vrain
Unit No. 1
P-79204

ATTACHMENT A
MANUFACTURER, MODEL NUMBER,
CAPACITY AND PLANT APPLICATION OF
DEEP DRAFT PUMPS

1229 256

EQUIPMENT NUMBER	MANUFACTURER	MODEL NUMBER	CAPACITY	PLANT APPLICATION
P-2101	GOULD PUMPS	VIC-C.C.8JL0	340 GPM	BEARING WATER PUMP 1A
P-2101-S	GOULD PUMPS	VIC-C.C.8JL0	340 GPM	BEARING WATER PUMP 1B
P-2102	GOULD PUMPS	VIC-C.C.8JL0	340 GPM	BEARING WATER PUMP 1C
P-2102-S	GOULD PUMPS	VIC-C.C.8JL0	340 GPM	BEARING WATER PUMP 1D
P-2105	GOULD PUMPS	VIC-4X9AHC	170 GPM	BEARING WATER MAKE-UP PUMP
P-2106	GOULD PUMPS	VIC-C.C.8JL0	340 GPM	BEARING WATER PUMP 1E
P-2107	GOULD PUMPS	VIC-C.C.8JL0	340 GPM	BEARING WATER PUMP 1F
P-4201	WORTHINGTON CORP.	20H-500-1	5250 GPM	SERVICE WATER PUMP 1A
P-4202	WORTHINGTON CORP.	20H-500-1	5250 GPM	SERVICE WATER PUMP 1B
P-4202-S	WORTHINGTON CORP.	20H-500-1	5250 GPM	SERVICE WATER PUMP 1C
P-4501	WORTHINGTON CORP.	15M-185-3	1500 GPM	FIRE WATER PUMP 1A
P-4501-S	WORTHINGTON CORP.	15M-185-3	1500 GPM	EMERGENCY FIRE WATER PUMP 1B (DIESEL DRIVEN)
P-4118-A	WORTHINGTON CORP.	20H-430-1	5340 GPM	CIRCULATING WATER MAKE-UP
P-4118-B	WORTHINGTON CORP.	20H-430-1	5340 GPM	CIRCULATING WATER MAKE-UP

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ATTACHMENT B
OVERALL DIMENSIONS OF
DEEP DRAFT PUMPS

1229 258

P-2101/S, P-2102/S, P-2106, P-2107

54-1-C-12

POOR ORIGINAL

NO.		NOTES	
1		TOLERANCE ON ALL DIMENSIONS IS ± 1/16 IN. FOR 1/4 IN. PER 8 FT., WHICHEVER IS GREATER	
2		PIPE YAM CONNECTIONS A. 1/4 IN. NOT STUFFING BOX DRAIN B. 1/4 IN. NOT Suction GAGE C. 1/4 IN. NOT DISCHARGE GAGE D. 1/4 IN. NOT STUFFING BOX BYPASS RETURN E. 1/4 IN. NOT BARETEL VENT. DRIVER MAY BE ROTATED AT 90° INTERVALS ABOUT VERTICAL CENTRAL LINE FOR DETAILS REFER TO DRIVER DIMENSION DRAWING.	
3		FOR APPROVAL REV. DATE GOULDS PUMPS INDUSTRY, CALIFORNIA CERT. & APVD. FOR CONSTRUCTION DATE 5-22-71 BY -113 D-113	
4		BASE PLATE PLAN	
5		STUFFING BOX USE GROOVED BUSHING (AVAILABLE FROM ARVADA PUMP CO.)	
6		STUFFING BOX PURGE PORT 1/4" SS 1/4" DIA PURGE LINE 10 1/4"	
7		DISCHARGE 1/4" IN DIA 1/4" DIA FLANGE 1/4" DIA X R.P.	
8		Suction 5" IN DIA 1/4" DIA FLANGE 1/4" DIA X R.P.	
9		CLEARANCE REQUIRED TO REMOVE MOTOR	
10		ROTATION	
11		15 1/2"	
12		10 1/4"	
13		8 1/2"	
14		8 1/2"	
15		15 1/2"	
16		15 1/2"	
17		15 1/2"	
18		15 1/2"	
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96		15 1/2"	
97		15 1/2"	
98		15 1/2"	
99		15 1/2"	
100		15 1/2"	

CUSTOMER		GULF ENERGY AND ENVIR.	
REF. NO.	121- P-1	ITEM	P-2101
PUMP SIZE	8 JLO	NO. STAGES	11
CMH	340	TDH	1155 FT
SP. GR.	1.15	TEMP	150 °F
DRIVER MFR.	WEST	TYPE	
HP	150	RFM	3600
PH	3	HZ	60
FRAME	405	IP	ENCLOSURE
WEIGHT	103	PUMP	DRIVER

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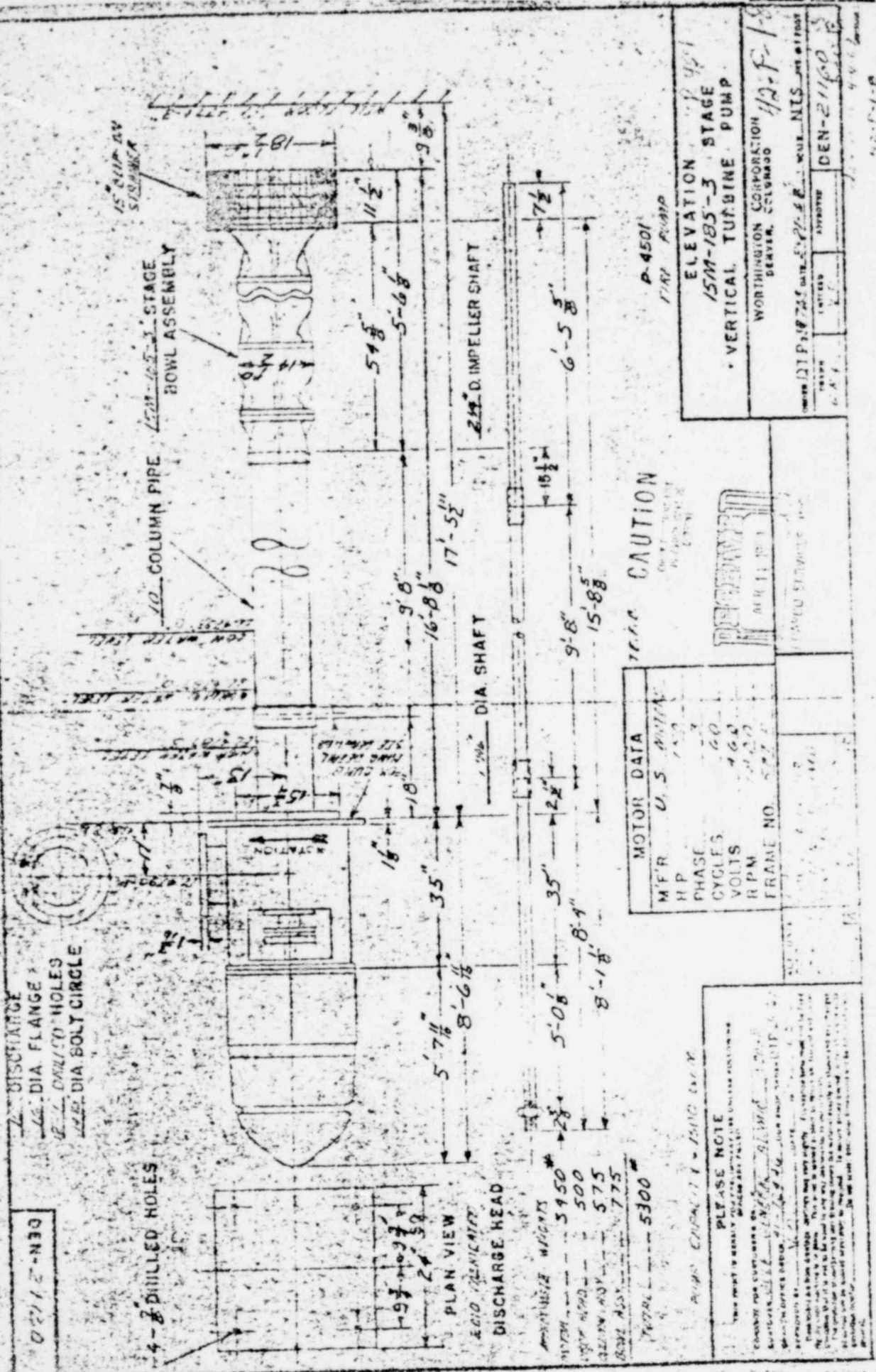
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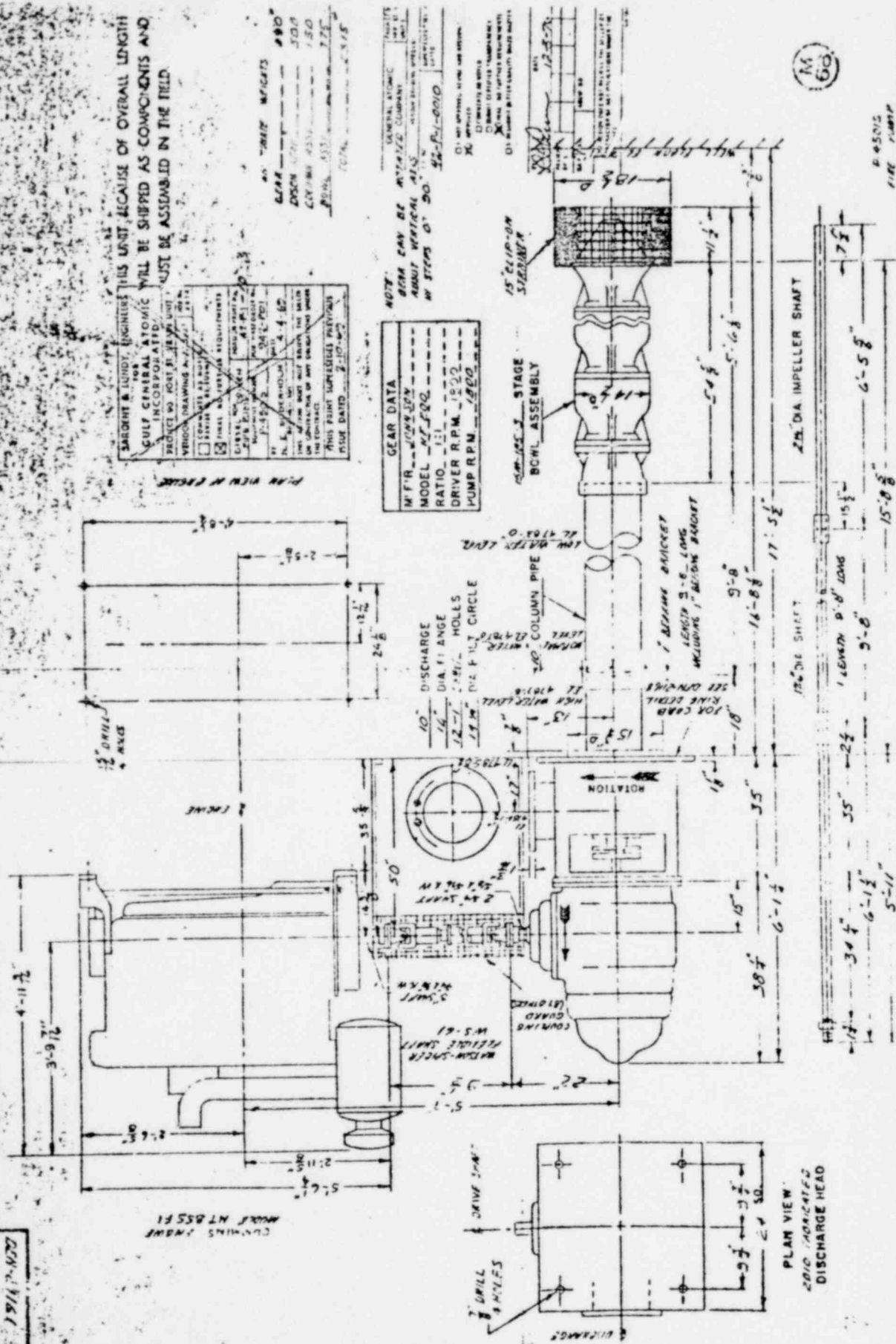
PUMP SIZE		NO. STAGES	
CMH	340	TDH	1155 FT</

POOR ORIGINAL



S-1057-d

1229 263

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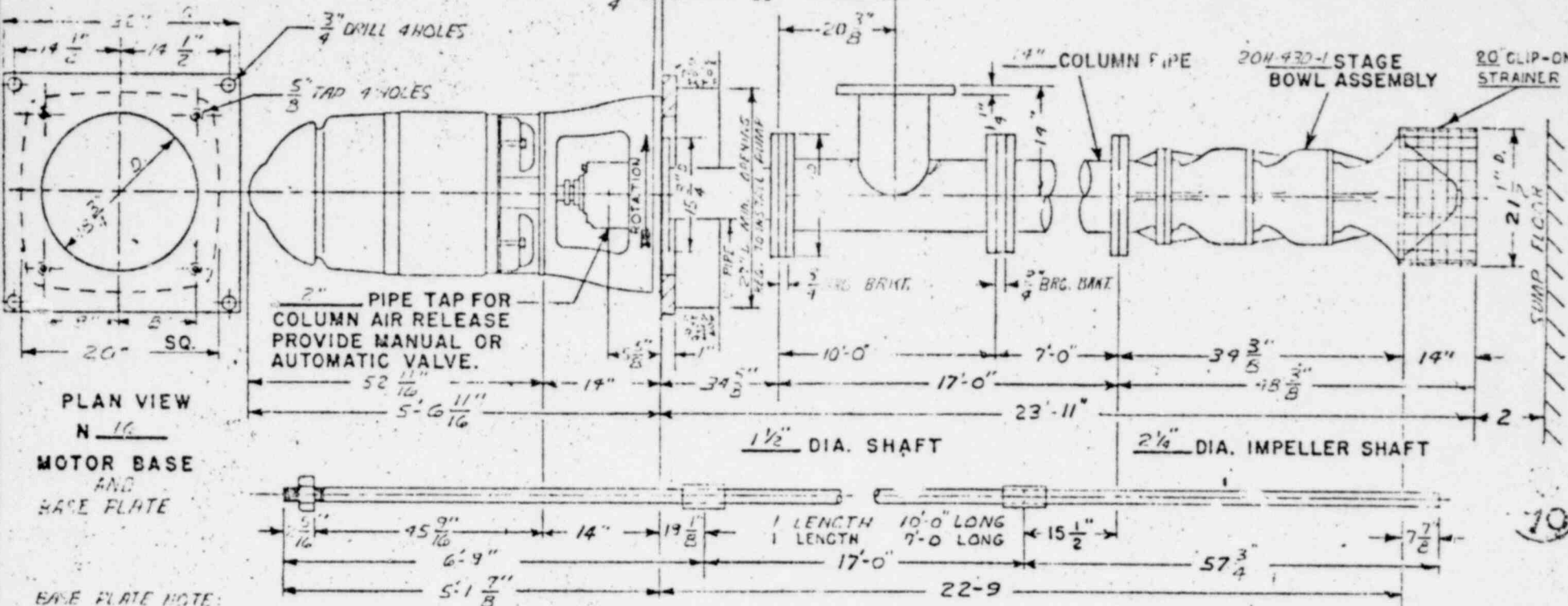
26552-N30

12" DISCHARGE
13" DIA. FLANGE
12-1" DRILLED HOLES
17" DIA. BOLT CIRCLE



APPROXIMATE WEIGHTS
MOTOR-----2550#
MOTOR BASE-----250
BASE PLATE-----175
COLUMN ASSY-----1670
BOWL ASSY-----725
TOTAL-----5300#

POOR ORIGINAL



PLAN VIEW
N 16
MOTOR BASE
AND
BASE PLATE

BASE PLATE NOTE:
BASE PLATE COVER PLATE
MUST BE INSTALLED & REMOVED
WITH THE MOTOR SALE.

MOTOR DATA

M.F.R. WESTINGHOUSE
H.P. 150
PHASE 3
CYCLES 60
VOLTS 460
R.P.M. 1760
FRAME NO. 497TP

T.E.F.C.

PUMP DATA

CAPACITY GPM. 5340
TOTAL HEAD 92.5 FT.

FOND WATER PUMPS

ELEVATION

20H-430-1 STAGE
VERTICAL TURBINE PUMP

WORTHINGTON CORPORATION
DENVER, COLORADO

ORDER DTP-33555 DATE 3-27-67 SCALE N.T.S. 1/4" = 1' FOOT

DRAWN
W.F.S.

CHECKED
J.C.

APPROVED

DEN-23594

PLEASE NOTE

THIS PRINT IS MERELY FOR PRELIMINARY USE UNLESS FOLLOWING
SPACES ARE FILLED

CORRECT FOR CUSTOMER'S ORDER 255-60050
CUSTOMER'S NAME 255-60050
BRANCH OFFICE ORDER 255-60050 OUR SHOP ORDER 255-60050
APPROVED BY DATE

Drawings are for drawings, castings may vary slightly. Foundation bolts must not be fixed
rigidly until machine is in place. This print is issued subject to return on demand and under
condition that it is not to be used in any way detrimental to our interests.
The purchase accompanying this drawing covers the material exactly as shown. Any changes
or errors will be quoted separately as required. To secure price quoted, order will refer to
drawing number. Do not scale; additional dimensions will be furnished upon
request.

ALT. DATE 10-1-64

ADDED PUMP
DATA & CAL WAS
26-10 REV ACCORD
PER ADU741

AS

11-22-63

TOP PIPE WAS
14" DIS. CASE
WAS THREADED

AS

10-26-70

OVERALL LENGTH
WAS 26-11" REV
ACCORD PER
DTP 35578

AS

P4118A, P4118B

1229 264

ATTACHMENT C
A SUMMARY OF STARTUP, TESTING
AND ROUTINE MAINTENANCE HISTORY

1229 265

The safety-related deep draft pumps are started up and operated in a variety of modes. Eleven of the pumps are associated with systems that are continuously in operation, specifically the bearing water system, the service water system and the circulating water make-up system. The other three pumps are associated with intermittent applications.

Four of the six bearing water pumps, P-2101/01S/02/02S/06/07, are normally in operation at or near their rated flow of 340 gpm at all times. One, two or all three of the service water pumps, P-4201/02/02S, may be in operation at any one time depending on plant cooling water requirements. The service water pumps normally each operate at or near their rated flow of 5,250 gpm. One circulating water make-up pump, P-4118A/B, is normally in operation at all times. The circulating water make-up pumps are normally throttled to maintain the required level in the cooling tower basin and therefore operate at a variety of flow rates below their full rated capacity, 5,340 gpm. The selection of which of these eleven pumps are in operation at any one time is a function of a wide variety of plant conditions.

The firewater pumps, P-4501/01S, and the bearing water make-up pump, P-2105, are operated on an intermittent basis. The normal function of the electric driven firewater pump, P-4501, is to maintain firewater tank level, and therefore its operation is sporadic. The diesel driven firewater pump, P-4501S, is started weekly to insure operability. When the backup bearing water system is out of service, the bearing water make-up pump, P-2105, is operated in a demand mode to supply make-up water to the bearing water system.

There are a variety of instruments and alarms on each of these systems that monitor system and pump performance and provide early indication of any pump problems. The number of pump startup cycles is not instrumented or monitored.

Safety-related deep draft pumps are tested on a periodic basis using set test procedures. Tests performed include vibration checks, pump differential pressure measurements, visual checks of oil levels, proper greasing, water leaks, and packing condition. The bearing water pumps, P-2101/01S/02/02S/06/07, and the bearing water make-up pump, P-2105, are tested annually. The service water pumps, P-4201/02/02S, are tested semi-annually. The firewater pumps, P-4501/01S, are tested quarterly. The circulation water make-up pumps, P-4118A/B, are the subject of a recently proposed fire protection technical specification which would require these pumps to be tested weekly. Pump testing procedures and information is maintained by the Maintenance Department.

During operation, pumps are checked approximately every two hours by the operations staff. It is from these informal checks that most routine maintenance is initiated. Examples of routine maintenance are adding oil to maintain proper level, adjusting packings, etc. This maintenance may or may not require the pump to be taken out of service. A detailed history of testing and routine maintenance is available at the plant site.

Fort St. Vrain
Unit No. 1
P- 79204

ATTACHMENT D
OPERATIONAL PROBLEMS
AND MAJOR REPAIR REPORTS

1229 267

P-2101
5/28/75

Cleaned driver motor windings.
 Longest period of operability: 5/75 to present, 51 months.

P-2101S

1/14/74 Repaired shafts, new bearings installed
 Longest period of operability: 1/74 to present, 67 months.

P-2102

6/22/77 New pump installed
 Longest period of operability: 6/77 to present, 26 months.

P-2102S

2/18/74 Repaired shafts, new bushings and bearings.

9/17/76 Bowl assembly rebuilt.
 Longest period of operability: 9/76 to present, 35 months.

P-2105

6/17/77 New pump installed

3/28/78 Bowl assembly rebuilt and tested.
 Longest period of operability: 3/78 to present, 17 months.

P-2106

12/11/74 Replace shaft, bowl bearings installed and bowls repaired

7/1/76 Repaired shaft, bowl assembly rebuilt.
 Longest period of operability: 7/76 to present, 37 months.

P-2107

3/2/77 Pump rebuilt, new seal installed.

4/7/78 Repaired shaft, bowl assembly rebuilt and factory tested.
 Longest period of operability: 4/75 to 3/77, 23 months.

P-4201/02/02S

12/8/77 Pump rebuilt and factory tested.

Longest period of operability:
 P-4201: 6/75 to 12/77, 30 months
 P-4202: 11/75 to 12/77, 25 months
 P-4202S: 12/75 to 12/77, 24 months

P-4501

Longest period of operability: 3/74 to present, 65 months

P-4501S

9/76 Gasoline engine replaced with diesel engine.
 Longest period of operability: 9/76 to present, 35 months.

P-4118-A/P-4118-B: Longest period of operability: 6/75 to present.

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