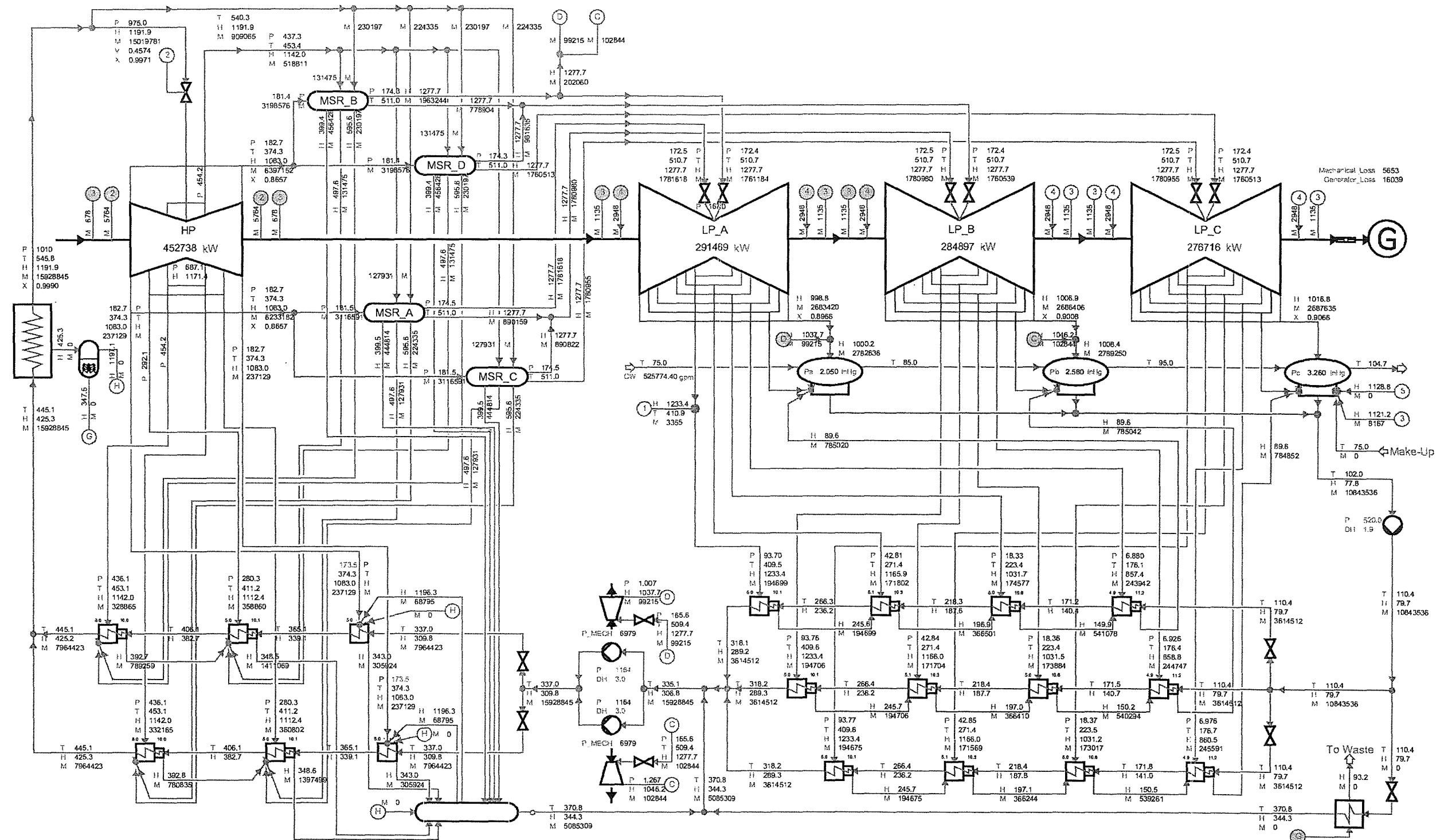




P Pressure psia
 T Temperature °F
 H Enthalpy Btu/lb
 M Massflow lb/h
 TS Saturation temperature °F

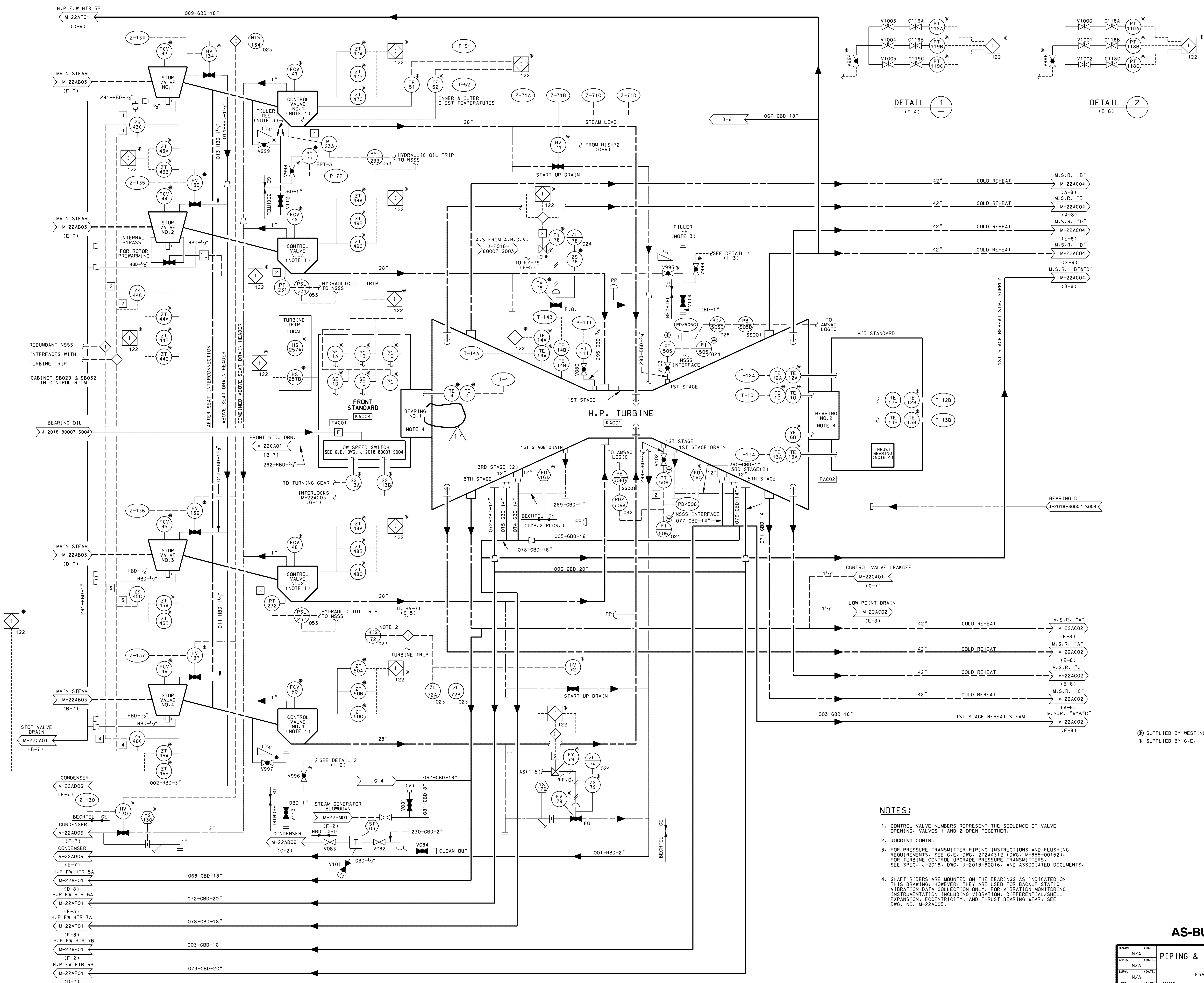
Generator_Output 1284130 KW
 Reactor_Thermal_Output 3579.0 MJ/s
 Heat_Rate 9510.0 Btu/kWh

NOTES:
 1. DATA TAKEN FROM ALSTOM HEAT BALANCE
 75V1741-110a DATED JULY 28, 2004. REFER
 TO CALLAWAY DRAWING M-2000-00001.

REV. OL-15
 5/06

CALLAWAY PLANT
 FIGURE 10.1-2
 TURBINE CYCLE HEAT BALANCE
 100 PERCENT
 OF MANUFACTURER'S GUARANTEED
 RATING

Figure 10.1-3 Deleted



REV.	DATE	DRWN
INCORP.	2/6/91	HLP
APPD.		
RFB	TJM	N/A
REDRAWN FOR CLARITY		
REV.	DATE	DRWN
INCORP.	8/27/93	MAL
APPD.		
R/LW	TJM	N/A
INCORP.		
RFR-08718A.		
REV.	DATE	DRWN
INCORP.	10/1/93	SB
APPD.		
CDC	TJM	N/A
INCORP.		
RFR-0752.		
REV.	DATE	DRWN
INCORP.	03/03/97	RFB
APPD.		
DJB	TJM	N/A
INCORP.		
RFR-0930AB		
(MFR-0930AD)		
REV.	DATE	DRWN
INCORP.	11/05/04	
DRWN	CHKD, SUPV.	
INCORP.	FWM	
INCORP.	RFR-3283A	
REV.	DATE	DRWN
INCORP.	12/11/09	
DRWN	CHKD, SUPV.	
INCORP.	TWS	
INCORP.	RFR-2294A.	
REV.	DATE	DRWN
INCORP.	10/12/05	
DRWN	CHKD, SUPV.	
INCORP.	TWS	
INCORP.	RFR-2294A.	
REV.	DATE	DRWN
INCORP.	03/20/06	
APPD.		
F	12	
REV.	DATE	DRWN
INCORP.	05/31/06	
APPD.		
FWM	RFB	TWS
INCORP.		
RFR-06-0042		
REV.	DATE	DRWN
INCORP.	07/09/09	
DRWN	CHKD, SUPV.	
INCORP.	RFB	
INCORP.	RFR-0001001	
INCORP.	CA 200903688	
REV.	DATE	DRWN
INCORP.	04/19/19	
APPD.		
CHKD, SUPV.	SJK, MAL	KAS
INCORP.		
REV.	08-0039.	
REV.	0.	
REV.	DATE	DRWN
INCORP.	05/11/19	
DRWN	CHKD, SUPV.	
INCORP.	EDH	AHR
INCORP.	DME	
REV.	08-0027.	
REV.	FCN-08.	

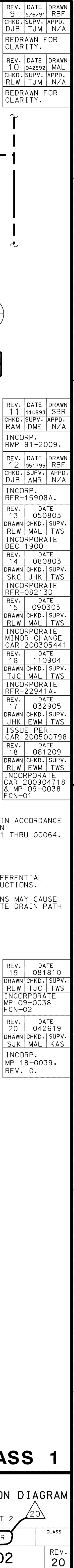
⊗ SUPPLIED BY WESTINGHOUSE
* SUPPLIED BY G.E.

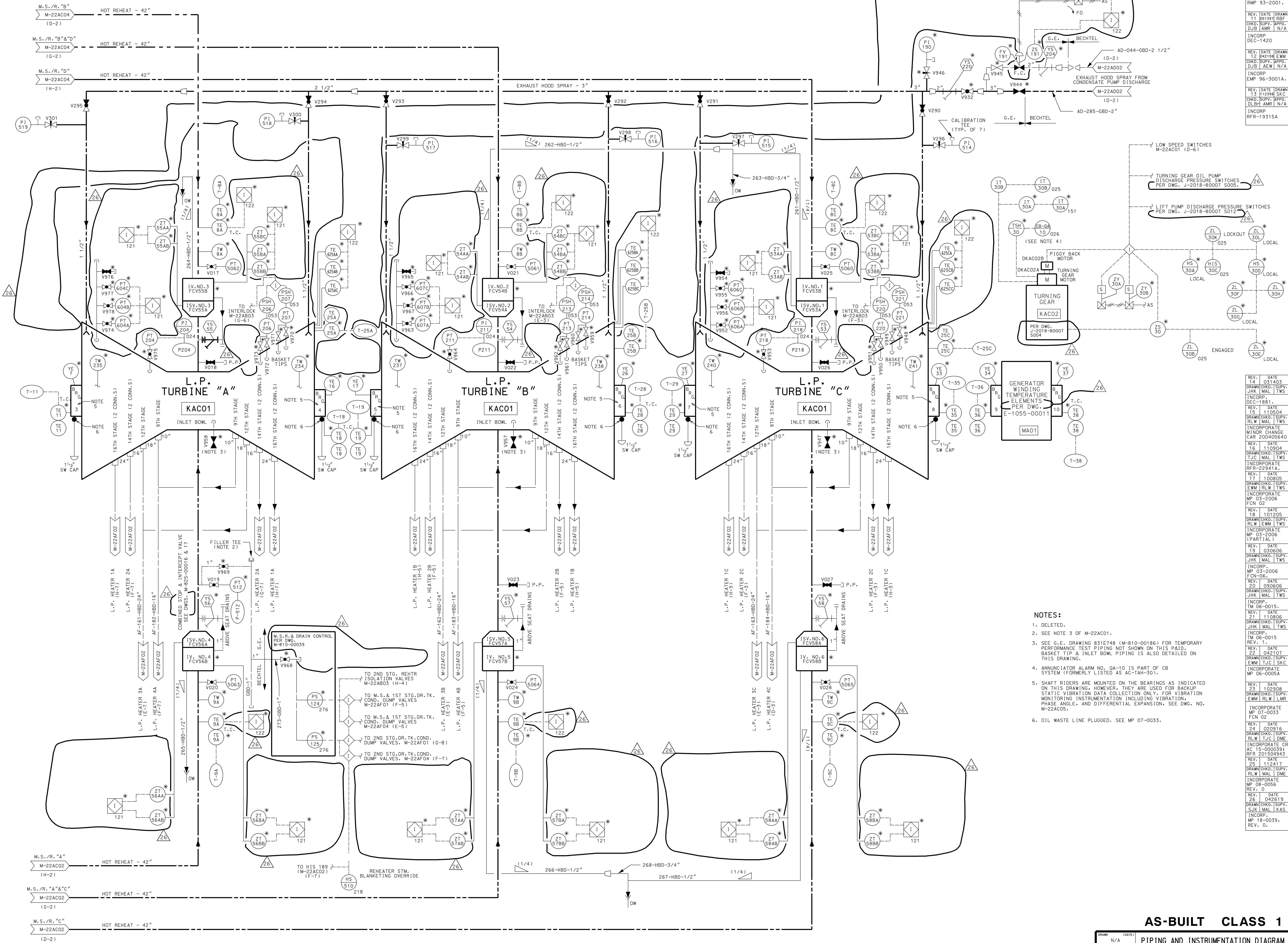
NOTES:

1. CONTROL VALVE NUMBERS REPRESENT THE SEQUENCE OF VALVE OPENING, VALVES 1 AND 2 OPEN TOGETHER.
2. JOGGING CONTROL
3. FOR PRESSURE TRANSMITTER PIPING INSTRUCTIONS AND FLUSHING REQUIREMENTS, SEE G-E, DWG. 272A4312 (DWG. M-855-00152), FOR TURBINE CONTROL UPGRADE PRESSURE TRANSMITTERS, SEE SPEC. J-2018, DWG. J-2018-80016, AND ASSOCIATED DOCUMENTS.
4. SHAFT RIDS ARE MOUNTED ON THE BEARINGS AS INDICATED ON THIS DRAWING, HOWEVER, THEY ARE USED FOR BACKUP STATIC VIBRATION DATA COLLECTION ONLY, FOR VIBRATION MONITORING INSTALLATION INCLUDING VIBRATION DIFFERENTIAL/SHELL EXPANSION, ECCENTRICITY, AND THRUST BEARING WEAR, SEE DWG. NO. M-22AC05.

AS-BUILT CLASS 1

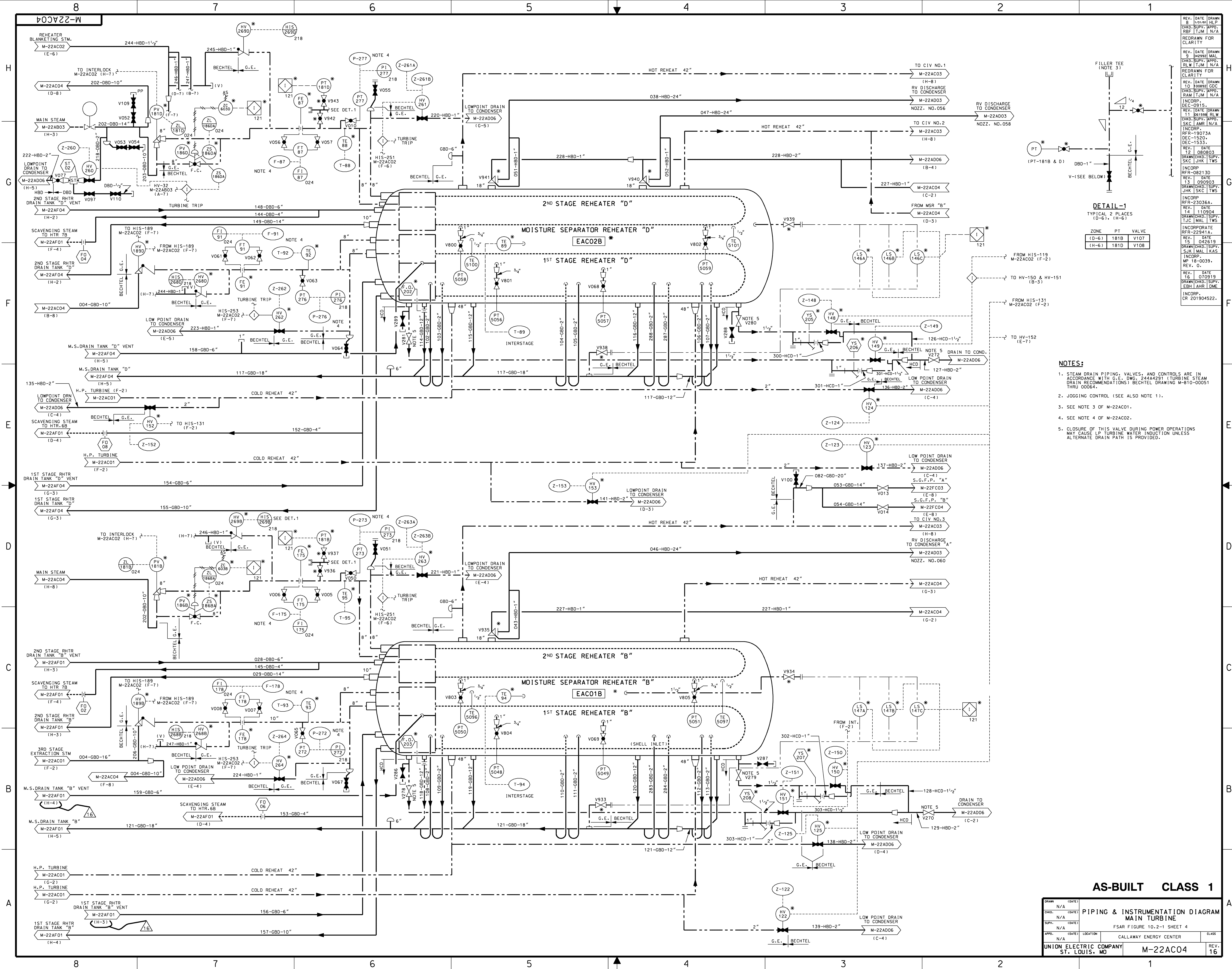
DRAWN (DATE)		PIPING & INSTRUMENTATION DIAGRAM MAIN TURBINE FSAR FIGURE 10.2-1 SHEET 1		
N/A				
CHKD. (DATE)				
N/A				
SUPV. (DATE)		UNION ELECTRIC COMPANY ST. LOUIS, MO		
N/A				
APPD. (DATE)				
N/A				
LOCATION		CALLAWAY ENERGY CENTER		CLASS
M-22AC01		REV.		17

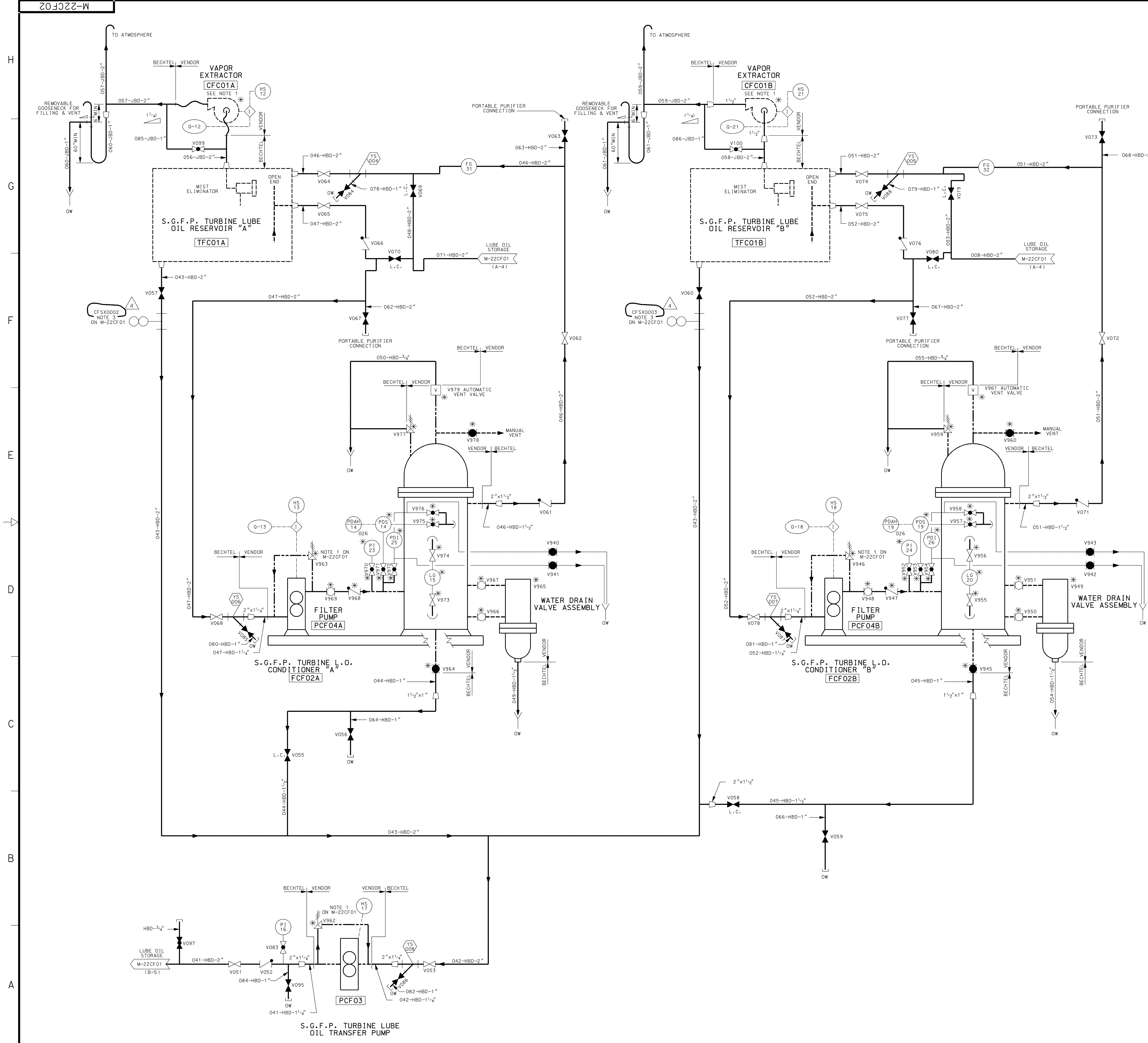




AS-BUILT CLASS 1

DATE	REV.	BY	CHKD.	APPD.	LOCATION	CLASS
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03/14/03	15	N/A	N/A	N/A	CALLAWAY ENERGY CENTER	REV. 26
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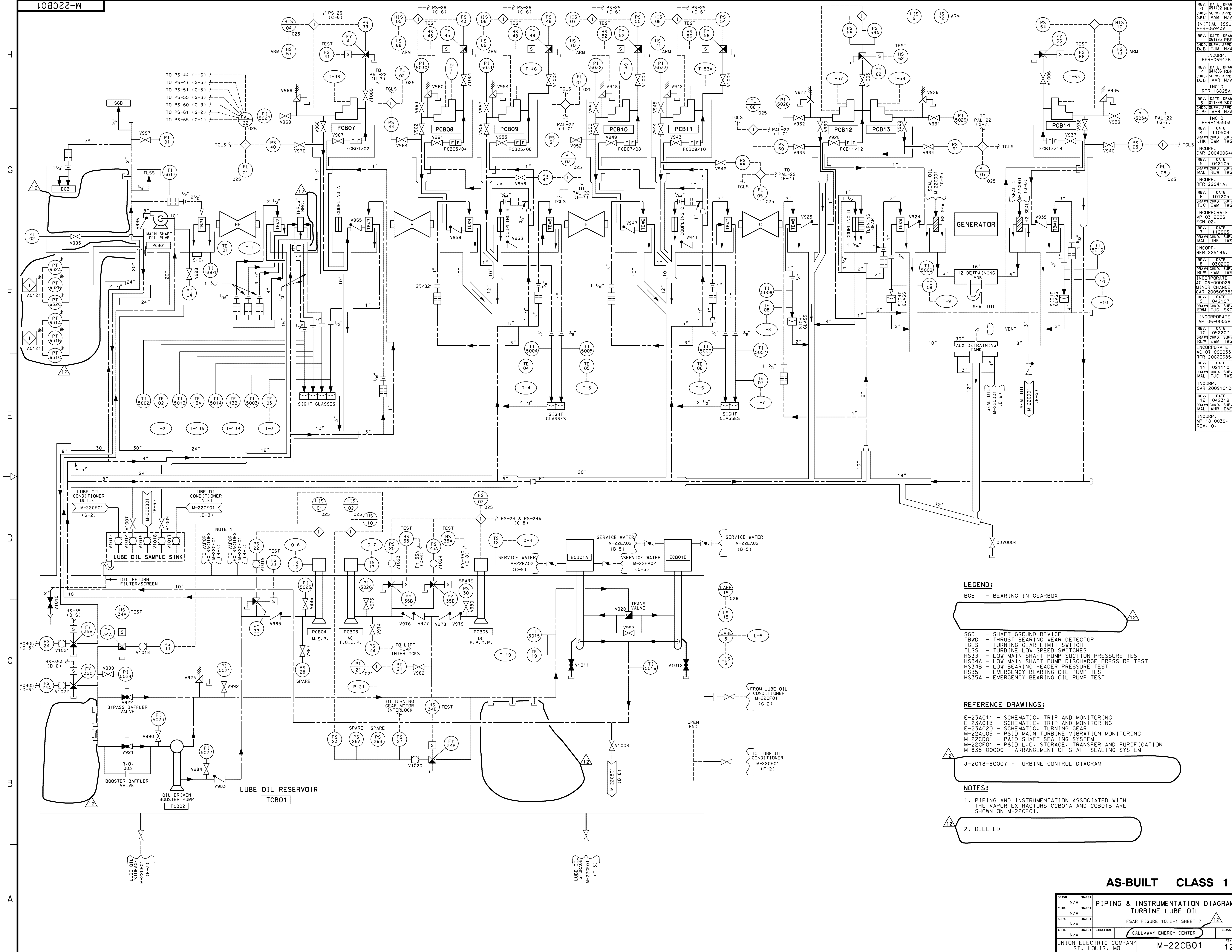




NOTES:
1. INSTRUMENTS LOGIC AND SCHEMATIC DIAGRAMS ASSOCIATED WITH CFC01A AND CFC01B ARE SHOWN IN SYSTEM FC.

AS-BUILT CLASS 1

DRWN	N/A	DATE	
CHKD	N/A	DATE	
SUPV	N/A	DATE	
APPR	N/A	DATE	
LOCATION	FSAR FIGURE 10.2-1 SHEET 6		
CALLAWAY ENERGY CENTER		CLASS	
UNION ELECTRIC COMPANY ST. LOUIS, MO		M-22CF02	REV. 4



LEGEND:

BGB - BEARING IN GEARBOX

SGD - SHAFT GROUND DEVICE
TBWD - THRUST BEARING WEAR DETECTOR
TGLS - TURNING GEAR LIMIT SWITCH
TLSS - TURBINE LOW SPEED SWITCHES
HS34A - LOW MAIN SHAFT PUMP DISCHARGE PRESSURE TEST
HS34B - LOW BEARING HEADER PRESSURE TEST
HS35 - EMERGENCY BEARING OIL PUMP TEST
HS35A - EMERGENCY BEARING OIL PUMP TEST

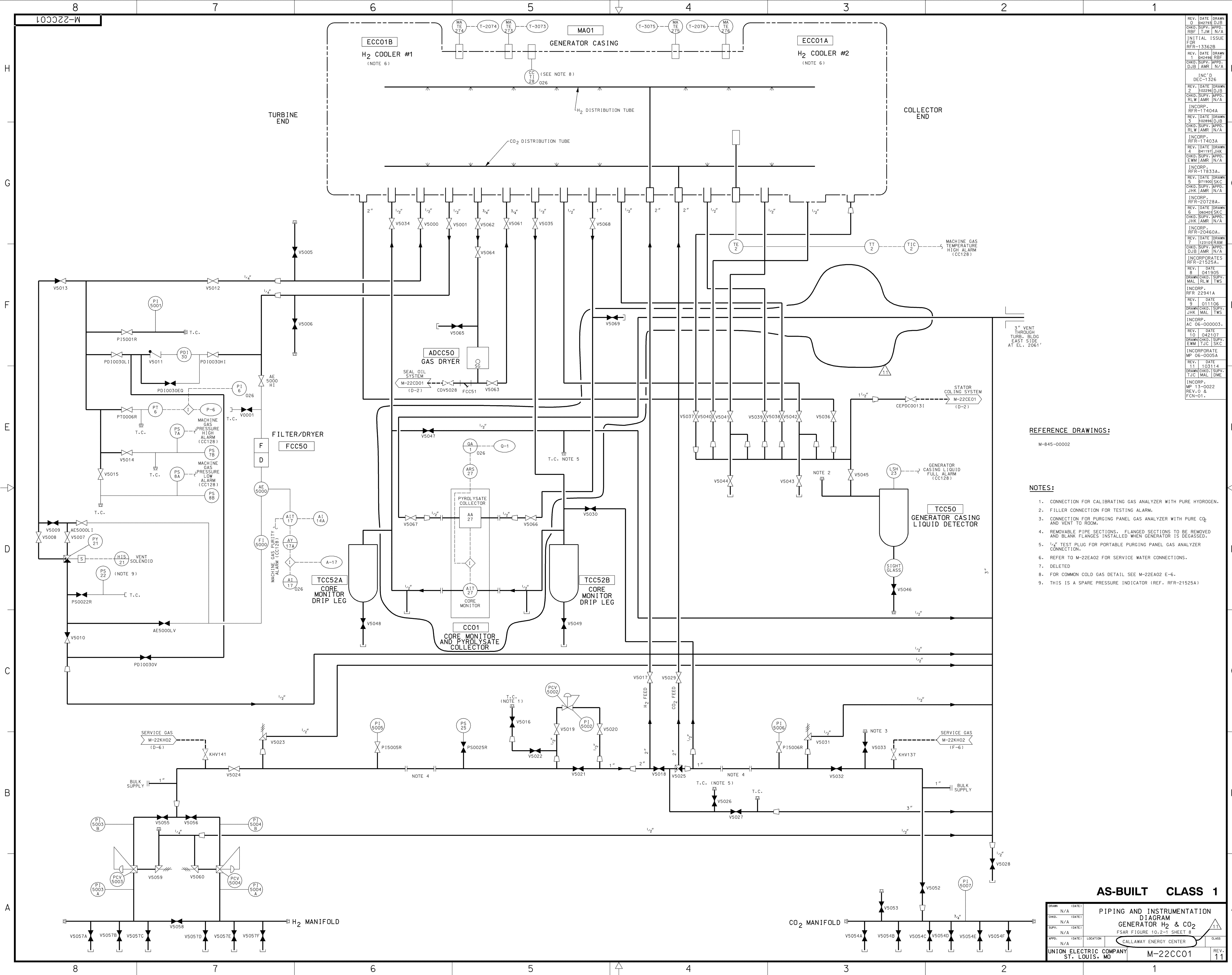
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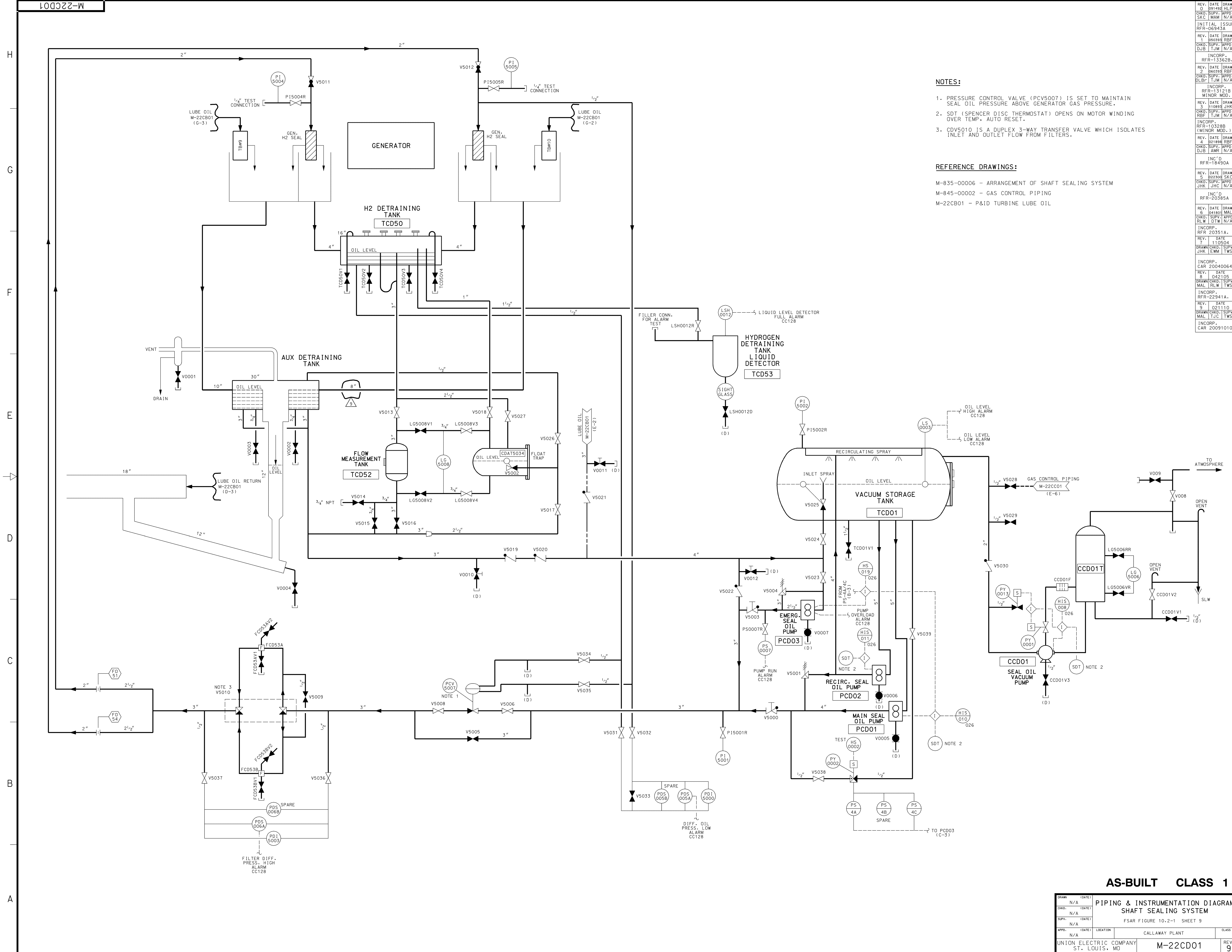
E-23AC11 - SCHEMATIC, TRIP AND MONITORING
E-23AC13 - SCHEMATIC, TRIP AND MONITORING
E-23AC20 - SCHEMATIC, TURNING GEAR
M-22AC05 - P&ID MAIN TURBINE VIBRATION MONITORING
M-22CD01 - P&ID SHAFT SEALING SYSTEM
M-22CF01 - P&ID L.O. STORAGE, TRANSFER AND PURIFICATION
M-835-00006 - ARRANGEMENT OF SHAFT SEALING SYSTEM

NOTES:

1. PIPING AND INSTRUMENTATION ASSOCIATED WITH THE VAPOR EXTRACTORS CCB01A AND CCB01B ARE SHOWN ON M-22CF01.

2. DELETED





- NOTES:**
1. PRESSURE CONTROL VALVE (PCV5007) IS SET TO MAINTAIN SEAL OIL PRESSURE ABOVE GENERATOR GAS PRESSURE.
 2. SDT (SPENCER DISC THERMOSTAT) OPENS ON MOTOR WINDING OVER TEMP, AUTO RESET.
 3. CDV5010 IS A DUPLEX 3-WAY TRANSFER VALVE WHICH ISOLATES INLET AND OUTLET FLOW FROM FILTERS.

REFERENCE DRAWINGS:

M-835-00006 - ARRANGEMENT OF SHAFT SEALING SYSTEM
M-845-00002 - GAS CONTROL PIPING
M-22CB01 - P&ID TURBINE LUBE OIL

REV.	DATE	DRAWN	CHKD.	SUPV.	APPR.	SKC	MAM	N/A
INITIAL	ISSUE	REFR-06943A						
REV.	DATE	DRAWN	CHKD.	SUPV.	APPR.	SKC	MAM	N/A
1	050393	RBF						
INCORP.	REFR-13362B							
REV.	DATE	DRAWN	CHKD.	SUPV.	APPR.	SKC	MAM	N/A
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INCORP.	REFR-13121B							
REV.	DATE	DRAWN	CHKD.	SUPV.	APPR.	SKC	MAM	N/A
3	110893	JHK						
INCORP.	REFR-10328B							
REV.	DATE	DRAWN	CHKD.	SUPV.	APPR.	SKC	MAM	N/A
4	021898	RBF						
INCORP.	REFR-18490A							
REV.	DATE	DRAWN	CHKD.	SUPV.	APPR.	SKC	MAM	N/A
5	022300	SKC						
INCORP.	REFR-20385A							
REV.	DATE	DRAWN	CHKD.	SUPV.	APPR.	SKC	MAM	N/A
6	041801	MAL						
INCORP.	REFR-20351A							
REV.	DATE	DRAWN	CHKD.	SUPV.	APPR.	SKC	MAM	N/A
7	110504	JHK						
INCORP.	REFR-22941A							
REV.	DATE	DRAWN	CHKD.	SUPV.	APPR.	SKC	MAM	N/A
8	021110	JHK						
INCORP.	REFR-22941A							
REV.	DATE	DRAWN	CHKD.	SUPV.	APPR.	SKC	MAM	N/A
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INCORP.	REFR-22941A							
REV.	DATE	DRAWN	CHKD.	SUPV.	APPR.	SKC	MAM	N/A
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INCORP.	REFR-22941A							

AS-BUILT CLASS 1

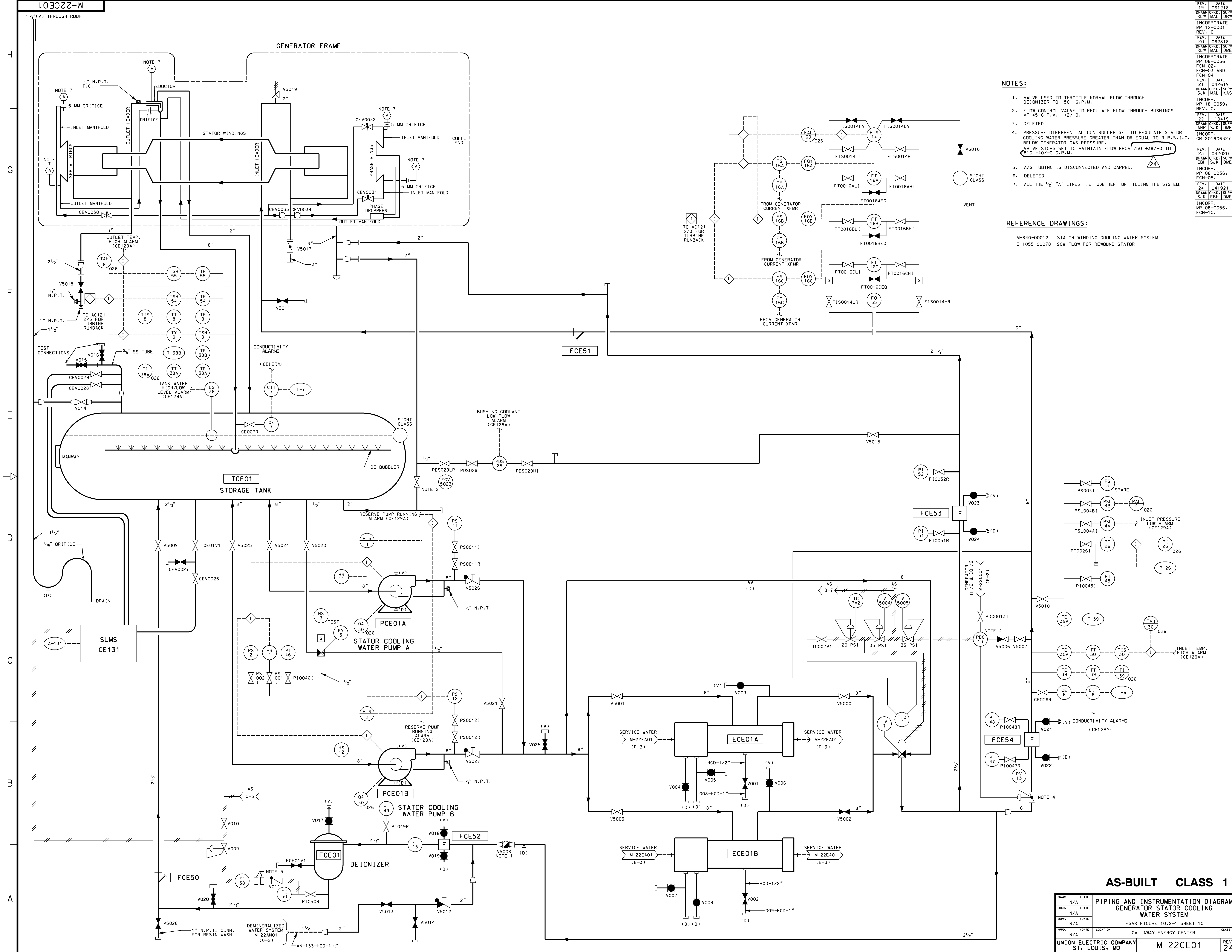
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N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

UNION ELECTRIC COMPANY
ST. LOUIS, MO

CALLAWAY PLANT

GLASS

REV. 9



- NOTES:**
1. VALVE USED TO THROTTLE NORMAL FLOW THROUGH DETONIZER TO 50 G.P.M.
 2. FLOW CONTROL VALVE TO REGULATE FLOW THROUGH BUSHINGS AT 45 G.P.M. $\pm 2/-0$.
 3. DELETED
 4. PRESSURE DIFFERENTIAL CONTROLLER SET TO REGULATE STATOR COOLING WATER PRESSURE GREATER THAN OR EQUAL TO 3 P.S.I.G. BELOW GENERATOR GAS PRESSURE.
VALVE STOPS SET TO MAINTAIN FLOW FROM 750 $\pm 38/-0$ TO 810 $\pm 40/-0$ G.P.M.
 5. A/S TUBING IS DISCONNECTED AND CAPPED.
 6. DELETED
 7. ALL THE $\frac{1}{2}$ " "A" LINES TIE TOGETHER FOR FILLING THE SYSTEM.

REFERENCE DRAWINGS:

M-840-00012 STATOR WINDING COOLING WATER SYSTEM
E-1055-00078 SCW FLOW FOR REWOUND STATOR

AS-BUILT CLASS 1

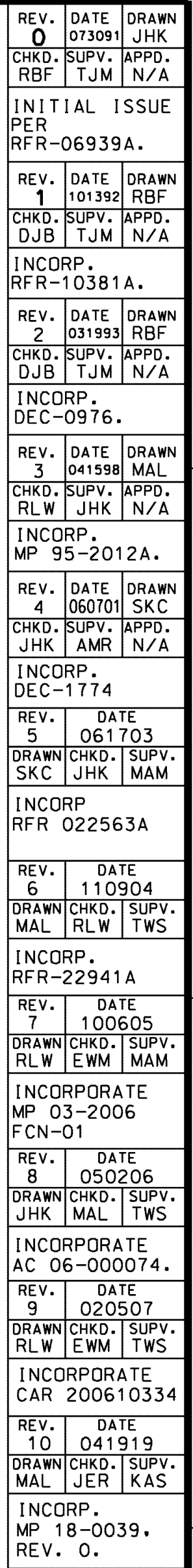
DRWG	N/A	DATE	
CHKD	N/A	DATE	
SUPV	N/A	DATE	
APPD	N/A	LOCATION	
UNION ELECTRIC COMPANY ST. LOUIS, MO			CLASS

**PIPING AND INSTRUMENTATION DIAGRAM
GENERATOR STATOR COOLING
WATER SYSTEM**

FSAR FIGURE 10.2-1 SHEET 10
CALLAWAY ENERGY CENTER

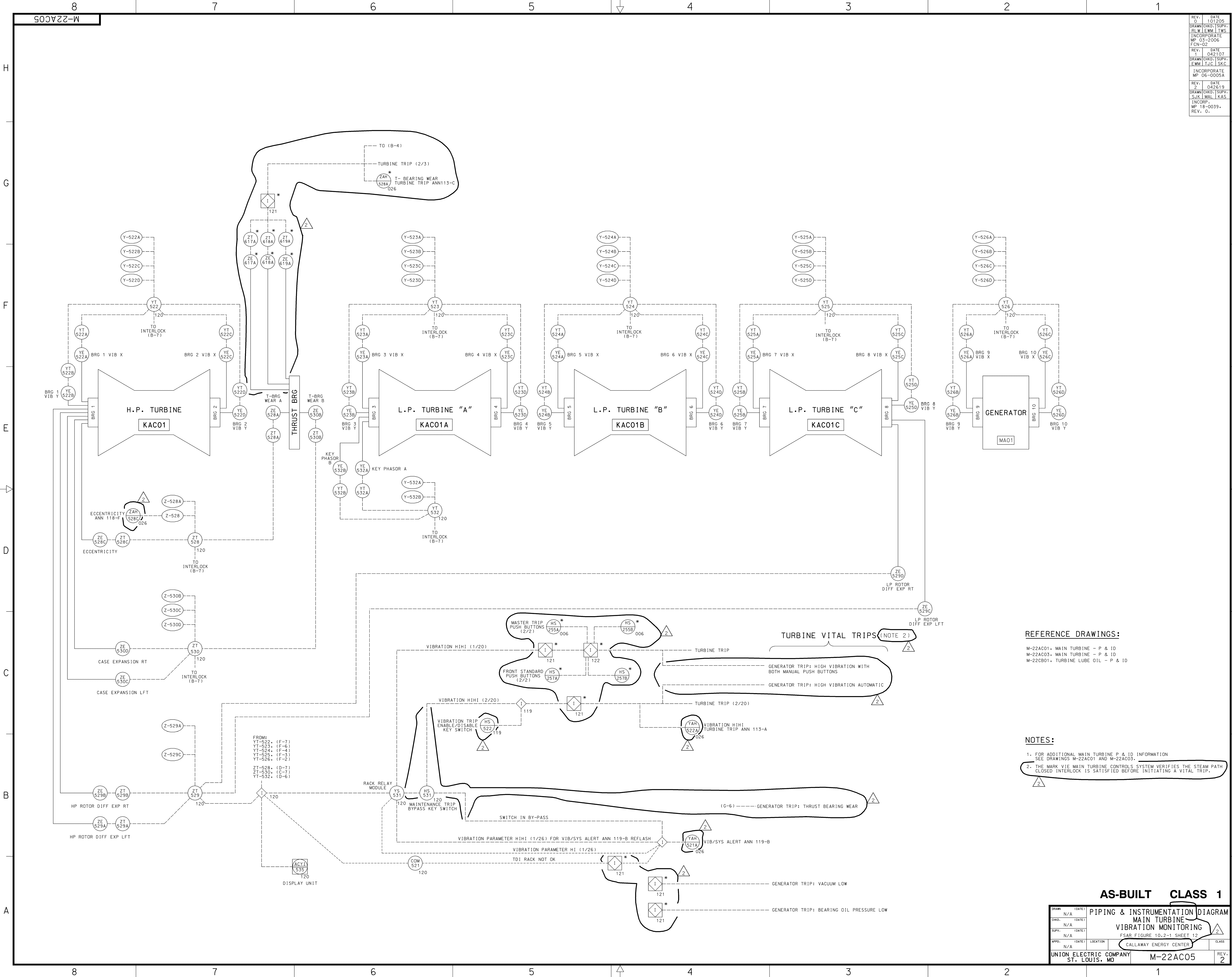
M-22CE01

REV. 24



- AS-BUILT CLASS 1**

DRAWN (DATE)		PIPING AND INSTRUMENTATION DIAGRAM MAIN TURBINE HYDRAULIC CONTROL SYSTEM FSAR FIGURE 10.2-1 SHEET 11				10
N/A						
CHKD. (DATE)						
N/A						
SUPV. (DATE)						
N/A						
APPRO. (DATE)		LOCATION		CALLAWAY ENERGY CENTER		CLASS
N/A						
UNION ELECTRIC COMPANY ST. LOUIS, MO				M-22CH01		REV. 10



REV.	DATE	BY	CHKD.	SUPV.
1	042107	FWML	JAC	SKC
2	042619	SJK	MAL	KAS
3	042619	SJK	MAL	KAS
4	042619	SJK	MAL	KAS
5	042619	SJK	MAL	KAS
6	042619	SJK	MAL	KAS
7	042619	SJK	MAL	KAS
8	042619	SJK	MAL	KAS
9	042619	SJK	MAL	KAS
10	042619	SJK	MAL	KAS
11	042619	SJK	MAL	KAS
12	042619	SJK	MAL	KAS
13	042619	SJK	MAL	KAS
14	042619	SJK	MAL	KAS
15	042619	SJK	MAL	KAS
16	042619	SJK	MAL	KAS
17	042619	SJK	MAL	KAS
18	042619	SJK	MAL	KAS
19	042619	SJK	MAL	KAS
20	042619	SJK	MAL	KAS

REFERENCE DRAWINGS:

- M-22AC01, MAIN TURBINE - P & ID
- M-22AC03, MAIN TURBINE - P & ID
- M-22CB01, TURBINE LUBE OIL - P & ID

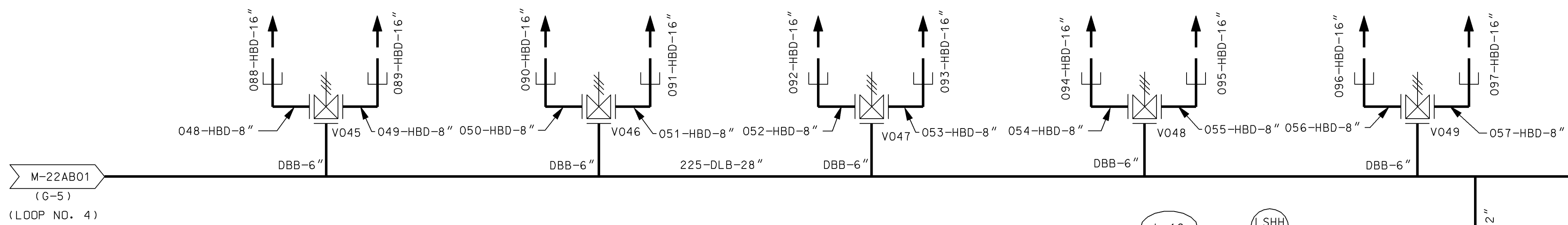
NOTES:

- FOR ADDITIONAL MAIN TURBINE P & ID INFORMATION SEE DRAWINGS M-22AC01 AND M-22AC03.
- THE MARK VIE MAIN TURBINE CONTROLS SYSTEM VERIFIES THE STEAM PATH CLOSED INTERLOCK IS SATISFIED BEFORE INITIATING A VITAL TRIP.

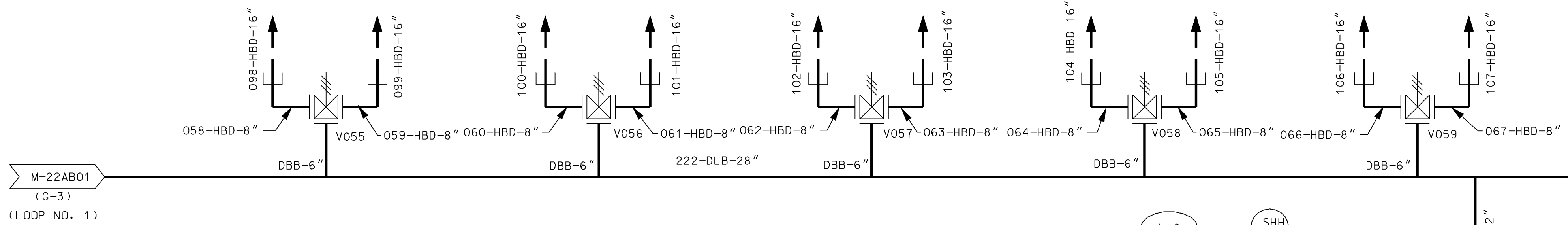
AS-BUILT CLASS 1

DRWN	N/A	DATE		1
CHKD	N/A	DATE		2
SUPV	N/A	DATE		3
APPR	N/A	DATE	LOCATION	CLASS
UNION ELECTRIC COMPANY	ST. LOUIS, MO	M-22AC05	REV.	2

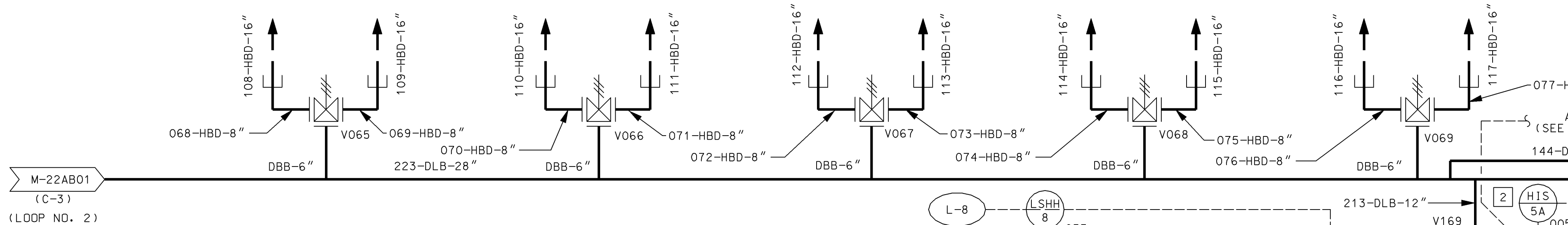
SPRING LOADED SAFETY VALVES



SPRING LOADED SAFETY VALVES



SPRING LOADED SAFETY VALVES



SPRING LOADED SAFETY VALVES

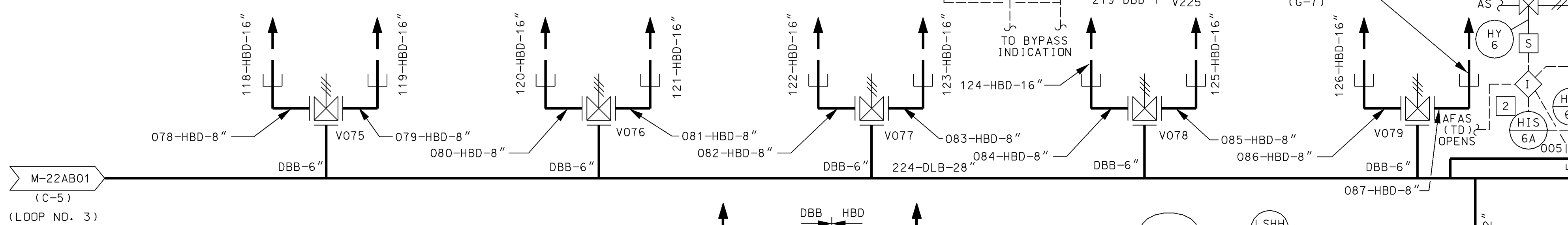
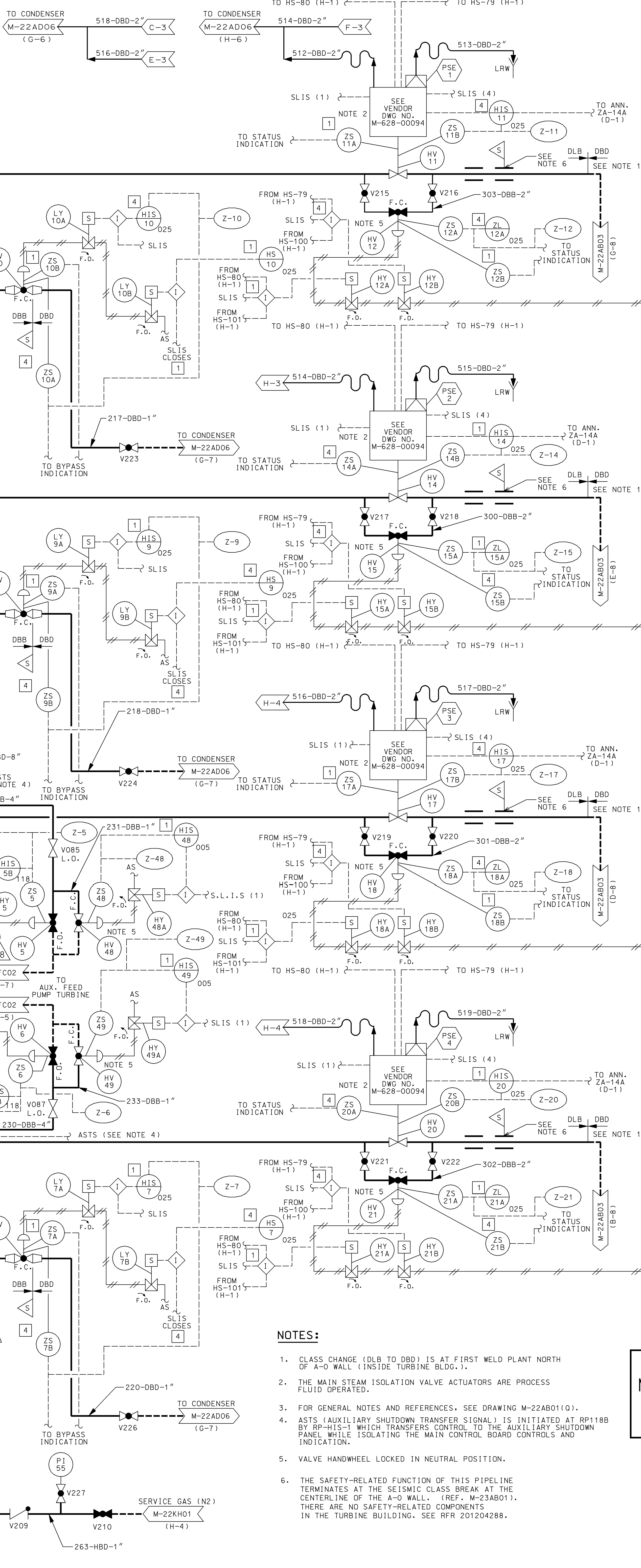


TABLE FOR LINE NUMBERS

SAFETY VALVE NUMBERS																	
DESCRIPTION	V045	V046	V047	V048	V049	V055	V056	V057	V058	V059	V065	V066	V067	V068	V069	V075	V076
"A"	483	488	493	498	503	456	461	466	471	476	429	434	439	444	449	402	407
"B"	484	489	494	499	504	457	462	467	472	477	430	435	440	445	450	403	408
"C"	*485	490	*495	500	*505	*458	463	*468	473	*478	431	436	*441	446	*451	*404	*409
"D"	486	491	496	501	506	459	464	469	474	479	432	437	442	447	452	405	410
"E"	487	492	497	502	507	460	465	470	475	480	433	438	443	448	453	406	411
"F"	481	481	481	481	481	454	454	454	454	454	427	427	427	427	427	400	400
"G"	323	323	323	323	323	310	310	310	310	310	321	321	321	321	321	312	312
"H"	313	313	313	313	313	322	322	322	322	322	311	311	311	311	311	320	320
"I"	482	482	482	482	482	455	455	455	455	455	428	428	428	428	428	401	401

TYPICAL FOR EACH SAFETY VALVE ARRANGEMENT

FOR NITROGEN BLANKETING OF STEAM GENERATORS



- NOTES:
- CLASS CHANGE (DLB TO DBD) IS AT FIRST WELD PLANT NORTH OF A-O WALL (INSIDE TURBINE BLDG.).
 - THE MAIN STEAM ISOLATION VALVE ACTUATORS ARE PROCESS FLUID OPERATED.
 - FOR GENERAL NOTES AND REFERENCES, SEE DRAWING M-22AB01(0).
 - ASTS (AUXILIARY SHUTDOWN TRANSFER SIGNAL) IS INITIATED AT RP118B BY RP-HIS-1 WHICH TRANSFERS CONTROL TO THE AUXILIARY SHUTDOWN PANEL WHILE ISOLATING THE MAIN CONTROL BOARD CONTROLS AND INDICATION.
 - VALVE HANDWHEEL LOCKED IN NEUTRAL POSITION.
 - THE SAFETY-RELATED FUNCTION OF THIS PIPELINE TERMINATES AT THE SEISMIC CLASS BREAK AT THE CENTERLINE OF THE A-O WALL (BREF. M-23AB01). THERE ARE NO SAFETY-RELATED COMPONENTS IN THE TURBINE BUILDING. SEE RFR 201204288.

ANY REVISION TO THIS DWG. MAY REQUIRE A REVISION TO M-22AB04, M-22AB05, M-22AB06 AND/OR M-22AB07

AS-BUILT CLASS 1

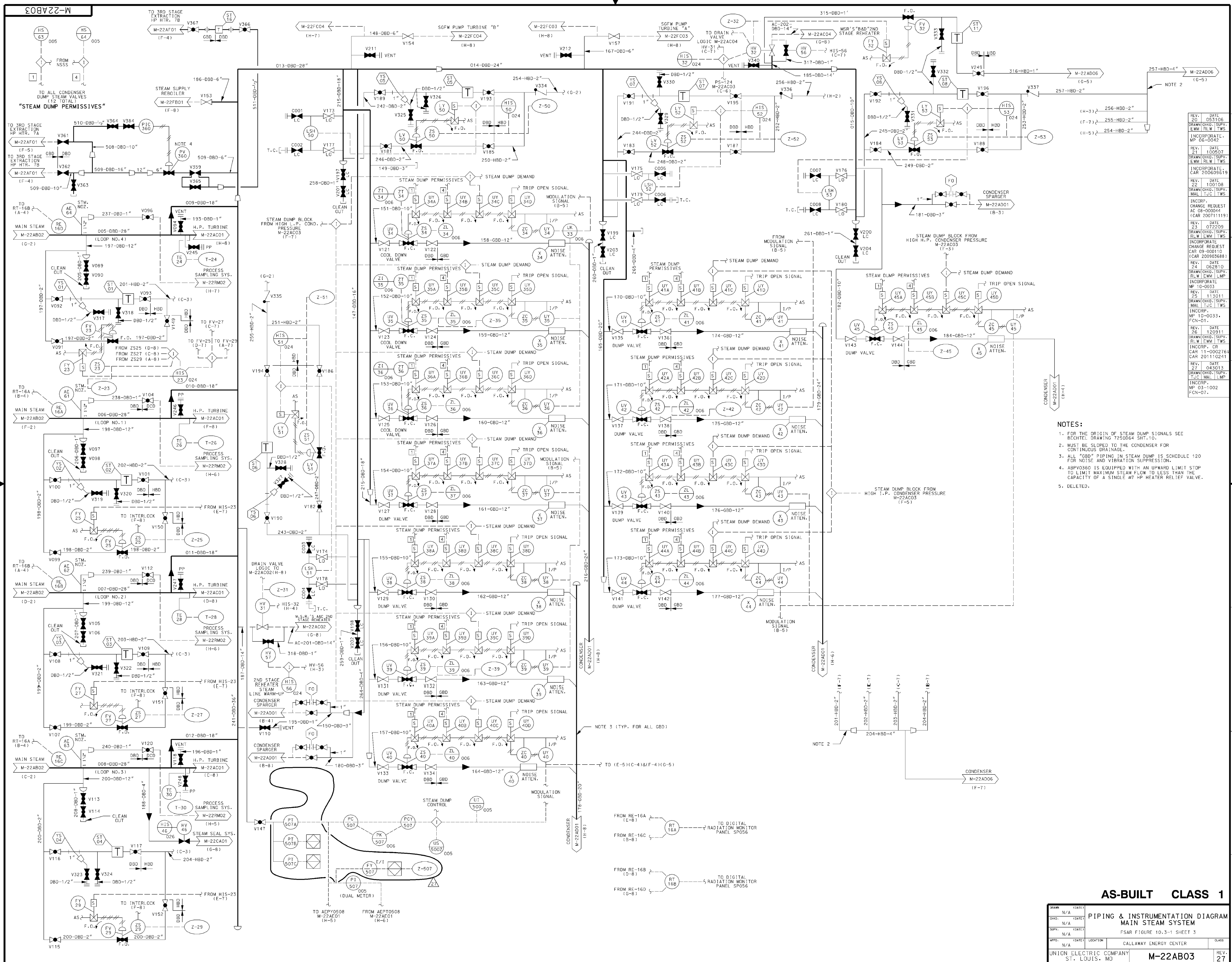
PIPING AND INSTRUMENTATION DIAGRAM
MAIN STEAM SYSTEM

FSAR FIGURE 10.3-1 SHEET 2

UNION ELECTRIC COMPANY
ST. LOUIS, MO

M-22AB02(Q)

REV. 18

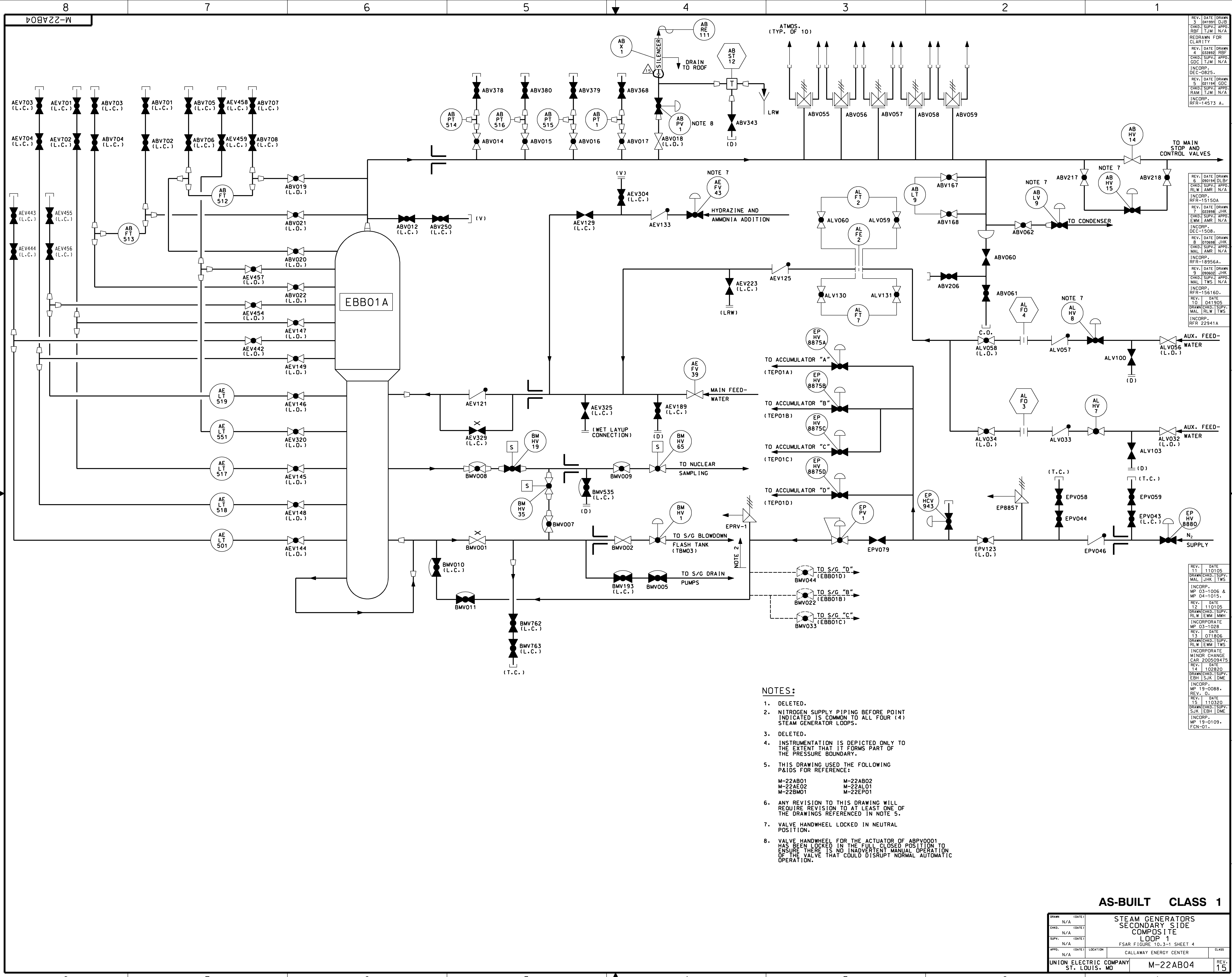


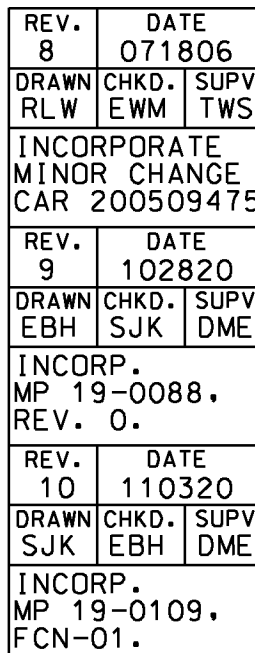
REV.	DATE	DESCRIPTION
1	03/10/06	DRAWN CHD, SUPV. EWM, LFW, TWS
2	03/10/07	DRAWN CHD, SUPV. EWM, LFW, TWS
3	03/10/08	DRAWN CHD, SUPV. EWM, LFW, TWS
4	03/10/09	DRAWN CHD, SUPV. EWM, LFW, TWS
5	03/10/10	DRAWN CHD, SUPV. EWM, LFW, TWS
6	03/10/11	DRAWN CHD, SUPV. EWM, LFW, TWS
7	03/10/12	DRAWN CHD, SUPV. EWM, LFW, TWS
8	03/10/13	DRAWN CHD, SUPV. EWM, LFW, TWS
9	03/10/14	DRAWN CHD, SUPV. EWM, LFW, TWS
10	03/10/15	DRAWN CHD, SUPV. EWM, LFW, TWS
11	03/10/16	DRAWN CHD, SUPV. EWM, LFW, TWS
12	03/10/17	DRAWN CHD, SUPV. EWM, LFW, TWS
13	03/10/18	DRAWN CHD, SUPV. EWM, LFW, TWS
14	03/10/19	DRAWN CHD, SUPV. EWM, LFW, TWS
15	03/10/20	DRAWN CHD, SUPV. EWM, LFW, TWS
16	03/10/21	DRAWN CHD, SUPV. EWM, LFW, TWS
17	03/10/22	DRAWN CHD, SUPV. EWM, LFW, TWS
18	03/10/23	DRAWN CHD, SUPV. EWM, LFW, TWS
19	03/10/24	DRAWN CHD, SUPV. EWM, LFW, TWS
20	03/10/25	DRAWN CHD, SUPV. EWM, LFW, TWS
21	03/10/26	DRAWN CHD, SUPV. EWM, LFW, TWS
22	03/10/27	DRAWN CHD, SUPV. EWM, LFW, TWS
23	03/10/28	DRAWN CHD, SUPV. EWM, LFW, TWS
24	03/10/29	DRAWN CHD, SUPV. EWM, LFW, TWS
25	03/10/30	DRAWN CHD, SUPV. EWM, LFW, TWS
26	03/10/31	DRAWN CHD, SUPV. EWM, LFW, TWS
27	03/10/32	DRAWN CHD, SUPV. EWM, LFW, TWS
28	03/10/33	DRAWN CHD, SUPV. EWM, LFW, TWS
29	03/10/34	DRAWN CHD, SUPV. EWM, LFW, TWS
30	03/10/35	DRAWN CHD, SUPV. EWM, LFW, TWS
31	03/10/36	DRAWN CHD, SUPV. EWM, LFW, TWS
32	03/10/37	DRAWN CHD, SUPV. EWM, LFW, TWS
33	03/10/38	DRAWN CHD, SUPV. EWM, LFW, TWS
34	03/10/39	DRAWN CHD, SUPV. EWM, LFW, TWS
35	03/10/40	DRAWN CHD, SUPV. EWM, LFW, TWS
36	03/10/41	DRAWN CHD, SUPV. EWM, LFW, TWS
37	03/10/42	DRAWN CHD, SUPV. EWM, LFW, TWS
38	03/10/43	DRAWN CHD, SUPV. EWM, LFW, TWS
39	03/10/44	DRAWN CHD, SUPV. EWM, LFW, TWS
40	03/10/45	DRAWN CHD, SUPV. EWM, LFW, TWS
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67	03/10/72	DRAWN CHD, SUPV. EWM, LFW, TWS
68	03/10/73	DRAWN CHD, SUPV. EWM, LFW, TWS
69	03/10/74	DRAWN CHD, SUPV. EWM, LFW, TWS
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74	03/10/79	DRAWN CHD, SUPV. EWM, LFW, TWS
75	03/10/80	DRAWN CHD, SUPV. EWM, LFW, TWS
76	03/10/81	DRAWN CHD, SUPV. EWM, LFW, TWS
77	03/10/82	DRAWN CHD, SUPV. EWM, LFW, TWS
78	03/10/83	DRAWN CHD, SUPV. EWM, LFW, TWS
79	03/10/84	DRAWN CHD, SUPV. EWM, LFW, TWS
80	03/10/85	DRAWN CHD, SUPV. EWM, LFW, TWS
81	03/10/86	DRAWN CHD, SUPV. EWM, LFW, TWS
82	03/10/87	DRAWN CHD, SUPV. EWM, LFW, TWS
83	03/10/88	DRAWN CHD, SUPV. EWM, LFW, TWS
84	03/10/89	DRAWN CHD, SUPV. EWM, LFW, TWS
85	03/10/90	DRAWN CHD, SUPV. EWM, LFW, TWS
86	03/10/91	DRAWN CHD, SUPV. EWM, LFW, TWS
87	03/10/92	DRAWN CHD, SUPV. EWM, LFW, TWS
88	03/10/93	DRAWN CHD, SUPV. EWM, LFW, TWS
89	03/10/94	DRAWN CHD, SUPV. EWM, LFW, TWS
90	03/10/95	DRAWN CHD, SUPV. EWM, LFW, TWS
91	03/10/96	DRAWN CHD, SUPV. EWM, LFW, TWS
92	03/10/97	DRAWN CHD, SUPV. EWM, LFW, TWS
93	03/10/98	DRAWN CHD, SUPV. EWM, LFW, TWS
94	03/10/99	DRAWN CHD, SUPV. EWM, LFW, TWS
95	03/10/100	DRAWN CHD, SUPV. EWM, LFW, TWS

- NOTES:
- FOR THE ORIGIN OF STEAM DUMP SIGNALS SEE BECHTEL DRAWING T25064 SHT.10.
 - MUST BE SLOPED TO THE CONDENSER FOR CONTINUOUS DRAINAGE.
 - ALL "GDB" PIPING IN STEAM DUMP IS SCHEDULE 120 FOR NOISE AND VIBRATION SUPPRESSION.
 - ASPV0360 IS EQUIPPED WITH AN UPWARD LIMIT STOP TO LIMIT MAXIMUM STEAM FLOW TO LESS THAN THE CAPACITY OF A SINGLE #7 HP HEATER RELIEF VALVE.
 - DELETED.

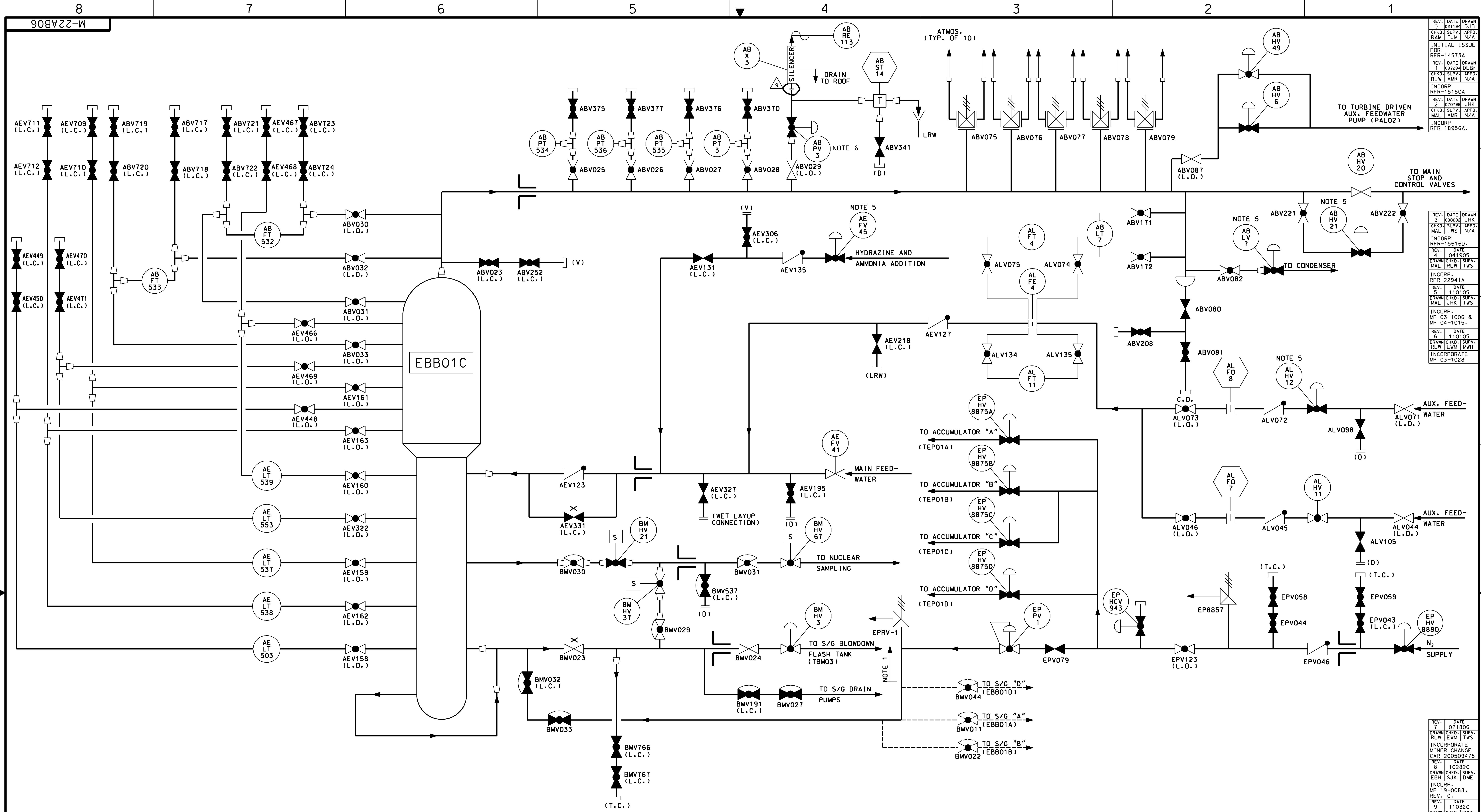
AS-BUILT CLASS 1

ITEM	DATE	DESCRIPTION
1	03/10/06	DRAWN CHD, SUPV. EWM, LFW, TWS
2	03/10/07	DRAWN CHD, SUPV. EWM, LFW, TWS
3	03/10/08	DRAWN CHD, SUPV. EWM, LFW, TWS
4	03/10/09	DRAWN CHD, SUPV. EWM, LFW, TWS
5	03/10/10	DRAWN CHD, SUPV. EWM, LFW, TWS
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7	03/10/12	DRAWN CHD, SUPV. EWM, LFW, TWS
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9	03/10/14	DRAWN CHD, SUPV. EWM, LFW, TWS
10	03/10/15	DRAWN CHD, SUPV. EWM, LFW, TWS
11	03/10/16	DRAWN CHD, SUPV. EWM, LFW, TWS
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13	03/10/18	DRAWN CHD, SUPV. EWM, LFW, TWS
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79	03/10/84	DRAWN CHD, SUPV. EWM, LFW, TWS
80	03/10/85	DRAWN CHD, SUPV. EWM, LFW, TWS
81	03/10/86	DRAWN CHD, SUPV. EWM, LFW, TWS
82	03/10/87	DRAWN CHD, SUPV. EWM, LFW, TWS
83	03/10/88	DRAWN CHD, SUPV. EWM, LFW, TWS
84	03/10/89	DRAWN CHD, SUPV. EWM, LFW, TWS
85	03/10/90	DRAWN CHD, SUPV. EWM, LFW, TWS
86	03/10/91	DRAWN CHD, SUPV. EWM, LFW, TWS
87	03/10/92	DRAWN CHD, SUPV. EWM, LFW, TWS
88	03/10/93	DRAWN CHD, SUPV. EWM, LFW, TWS
89	03/10/94	DRAWN CHD, SUPV. EWM, LFW, TWS
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91	03/10/96	DRAWN CHD, SUPV. EWM, LFW, TWS
92	03/10/97	DRAWN CHD, SUPV. EWM, LFW, TWS
93	03/10/98	DRAWN CHD, SUPV. EWM, LFW, TWS
94	03/10/99	DRAWN CHD, SUPV. EWM, LFW, TWS
95	03/10/100	DRAWN CHD, SUPV. EWM, LFW, TWS





- | | | | | |
|---|---|----------|--|------------|
| DRAWN (DATE)
N/A | STEAM GENERATORS
SECONDARY SIDE
COMPOSITE
LOOP 2 | | | REV.
10 |
| CHKD. (DATE)
N/A | FSAR FIGURE 10.3-1 SHEET 5 | | | |
| SUPP. (DATE)
N/A | CALLAWAY ENERGY CENTER | | | |
| APPD. (DATE)
N/A | LOCATION | | | CLASS |
| UNION ELECTRIC COMPANY
ST. LOUIS, MO | | M-22AB05 | | |

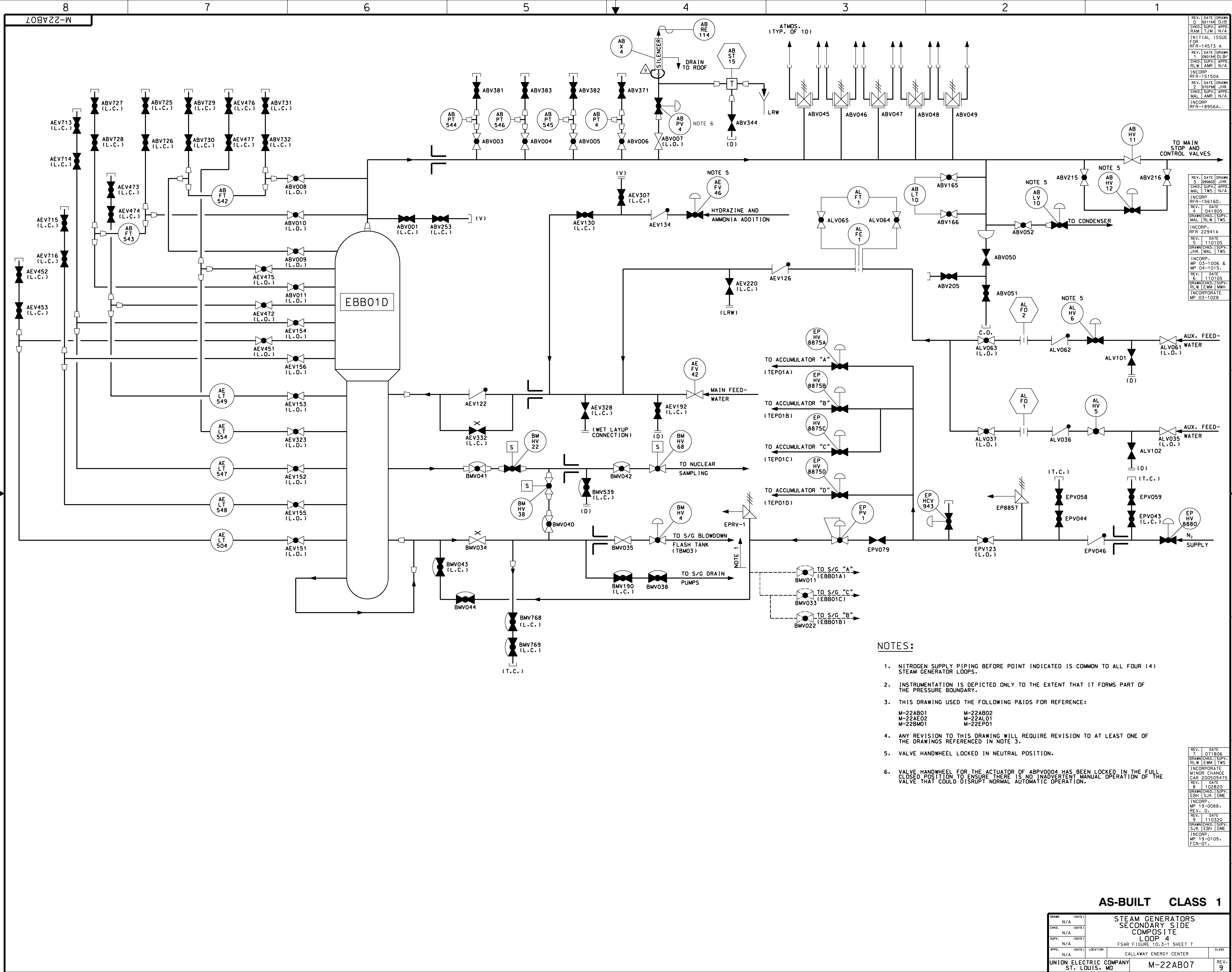


NOTES:

1. NITROGEN SUPPLY PIPING BEFORE POINT INDICATED IS COMMON TO ALL FOUR (4) STEAM GENERATOR LOOPS.
2. INSTRUMENTATION IS DEPICTED ONLY TO THE EXTENT THAT IT FORMS PART OF THE PRESSURE BOUNDARY.
3. THIS DRAWING USED THE FOLLOWING P&IDS FOR REFERENCE:
M-22AB01 M-22AB02
M-22AE02 M-22AL01
M-22BM01 M-22EP01
4. ANY REVISION TO THIS DRAWING WILL REQUIRE REVISION TO AT LEAST ONE OF THE DRAWINGS REFERENCED IN NOTE 3.
5. VALVE HANDWHEEL LOCKED IN NEUTRAL POSITION.
6. VALVE HANDWHEEL FOR THE ACTUATOR OF ABPV0003 HAS BEEN LOCKED IN THE FULL CLOSED POSITION TO ENSURE THERE IS NO INADVERTENT MANUAL OPERATION OF THE VALVE THAT COULD DISRUPT NORMAL AUTOMATIC OPERATION.

AS-BUILT CLASS 1

DRAWN	N/A	(DATE)	STEAM GENERATORS SECONDARY SIDE COMPOSITE LOOP 3
CHKD.	N/A	(DATE)	FSAR FIGURE 10.3-1 SHEET 6
SUPV.	N/A	(DATE)	CALLAWAY ENERGY CENTER
APPD.	N/A	(DATE)	CLASS
UNION ELECTRIC COMPANY ST. LOUIS, MO	M-22AB06	REV. 9	

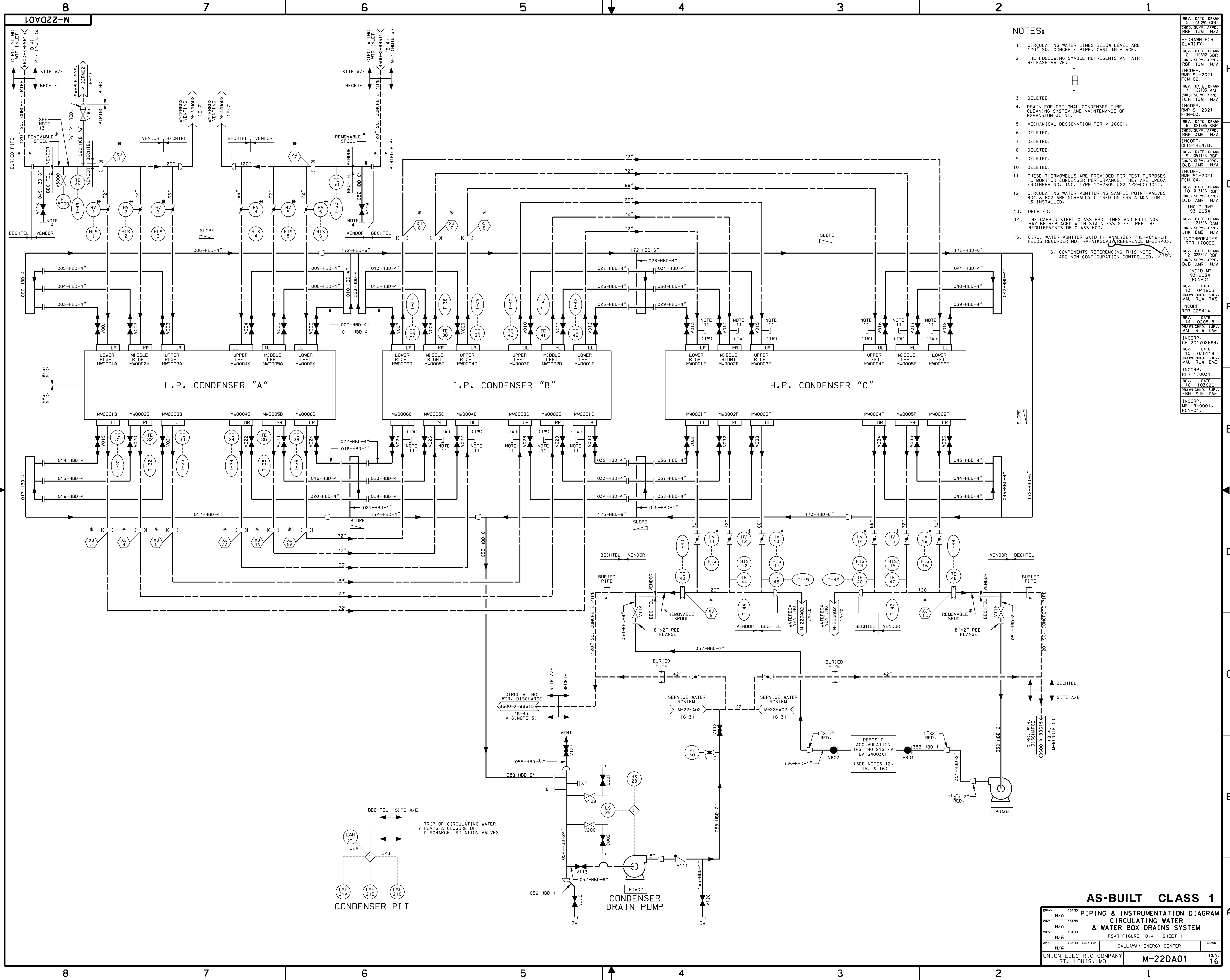


NOTES:

1. NITROGEN SUPPLY PIPING BEFORE POINT INDICATED IS COMMON TO ALL FOUR (4) STEAM GENERATOR LOOPS.
2. INSTRUMENTATION IS DEPICTED ONLY TO THE EXTENT THAT IT FORMS PART OF THE PRESSURE BOUNDARY.
3. THIS DRAWING USED THE FOLLOWING P&IDS FOR REFERENCE:
M-22AB01 M-22AB02
M-22AE02 M-22AL01
M-22BM01 M-22EP01
4. ANY REVISION TO THIS DRAWING WILL REQUIRE REVISION TO AT LEAST ONE OF THE DRAWINGS REFERENCED IN NOTE 3.
5. VALVE HANDWHEEL LOCKED IN NEUTRAL POSITION.
6. VALVE HANDWHEEL FOR THE ACTUATOR OF ABPV004 HAS BEEN LOCKED IN THE FULL CLOSED POSITION TO ENSURE THERE IS NO INADVERTENT MANUAL OPERATION OF THE VALVE THAT COULD DISRUPT NORMAL AUTOMATIC OPERATION.

AS-BUILT CLASS 1

DRAWN (DATE)		STEAM GENERATORS	
N/A (DATE)		SECONDARY SIDE	
N/A (DATE)		COMPOSITE	
N/A (DATE)		LOOP 4	
N/A (DATE)		FSAR FIGURE 10.3-1 SHEET 7	
N/A (DATE)		CALLAWAY ENERGY CENTER	
UNION ELECTRIC COMPANY		M-22AB07	
ST. LOUIS, MO		REV. 9	



- NOTES:
- CIRCULATING WATER LINES BELOW LEVEL ARE 120" SO. CONCRETE PIPE, CAST IN PLACE.
 - THE FOLLOWING SYMBOL REPRESENTS AN AIR RELEASE VALVE:
 - DELETED.
 - DRAIN FOR OPTIONAL CONDENSER TUBE CLEANING SYSTEM AND MAINTENANCE OF EXPANSION JOINT.
 - MECHANICAL DESIGNATION PER M-20001.
 - DELETED.
 - DELETED.
 - DELETED.
 - DELETED.
 - DELETED.
 - THESE THERMOWELLS ARE PROVIDED FOR TEST PURPOSES TO MONITOR CONDENSER PERFORMANCE. THEY ARE OMEGA ENGINEERING, INC. TYPE 1"-2605 U22 1/2-CCT304).
 - CIRCULATING WATER MONITORING SAMPLE POINT VALVES 801 & 802 ARE NORMALLY CLOSED UNLESS A MONITOR IS INSTALLED.
 - DELETED.
 - THE CARBON STEEL CLASS HBD LINES AND FITTINGS MAY BE REPLACED WITH STAINLESS STEEL PER THE REQUIREMENTS OF CLASS HCD.
 - CIRC. WATER MONITOR SKID PH ANALYZER PHL-4016-CH FEEDS RECORDER NO. RM-AIK20A8. REFERENCE M-22RM03.
 - COMPONENTS REFERENCING THIS NOTE ARE NON-CONFIGURATION CONTROLLED.

AS-BUILT CLASS 1

PIPING & INSTRUMENTATION DIAGRAM

CIRCULATING WATER

& WATER BOX DRAINS SYSTEM

FSR FIGURE 10.4-1 SHEET 1

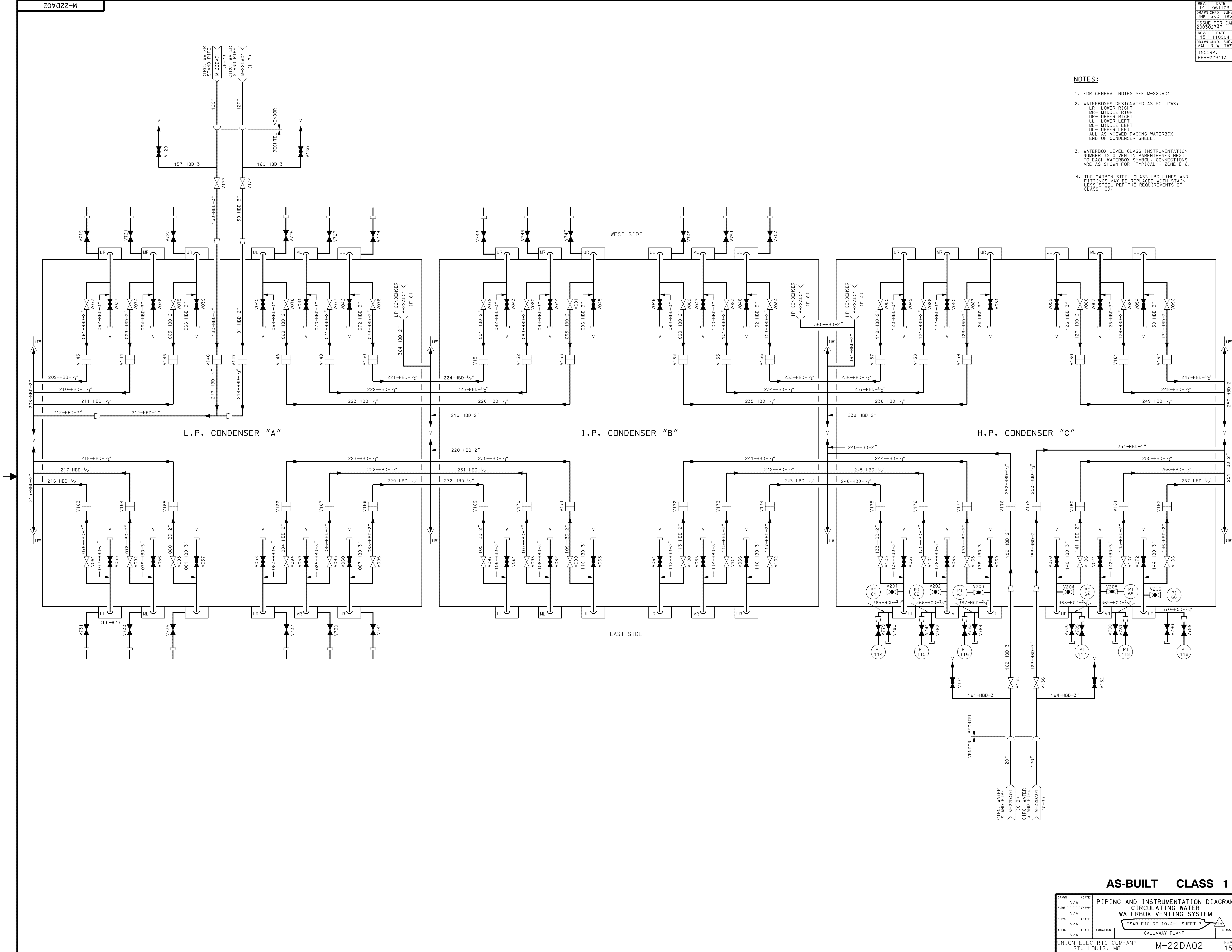
REV.	DATE	BY	CHKD.	DATE	LOC.	CLASS
1	08/29/01	GOB				
2	09/03/01	GOB				
3	09/03/01	GOB				
4	09/03/01	GOB				
5	09/03/01	GOB				
6	09/03/01	GOB				
7	09/03/01	GOB				
8	09/03/01	GOB				
9	09/03/01	GOB				
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100	09/03/01	GOB				

UNION ELECTRIC COMPANY
ST. LOUIS, MO

M-22DA01

REV. 16

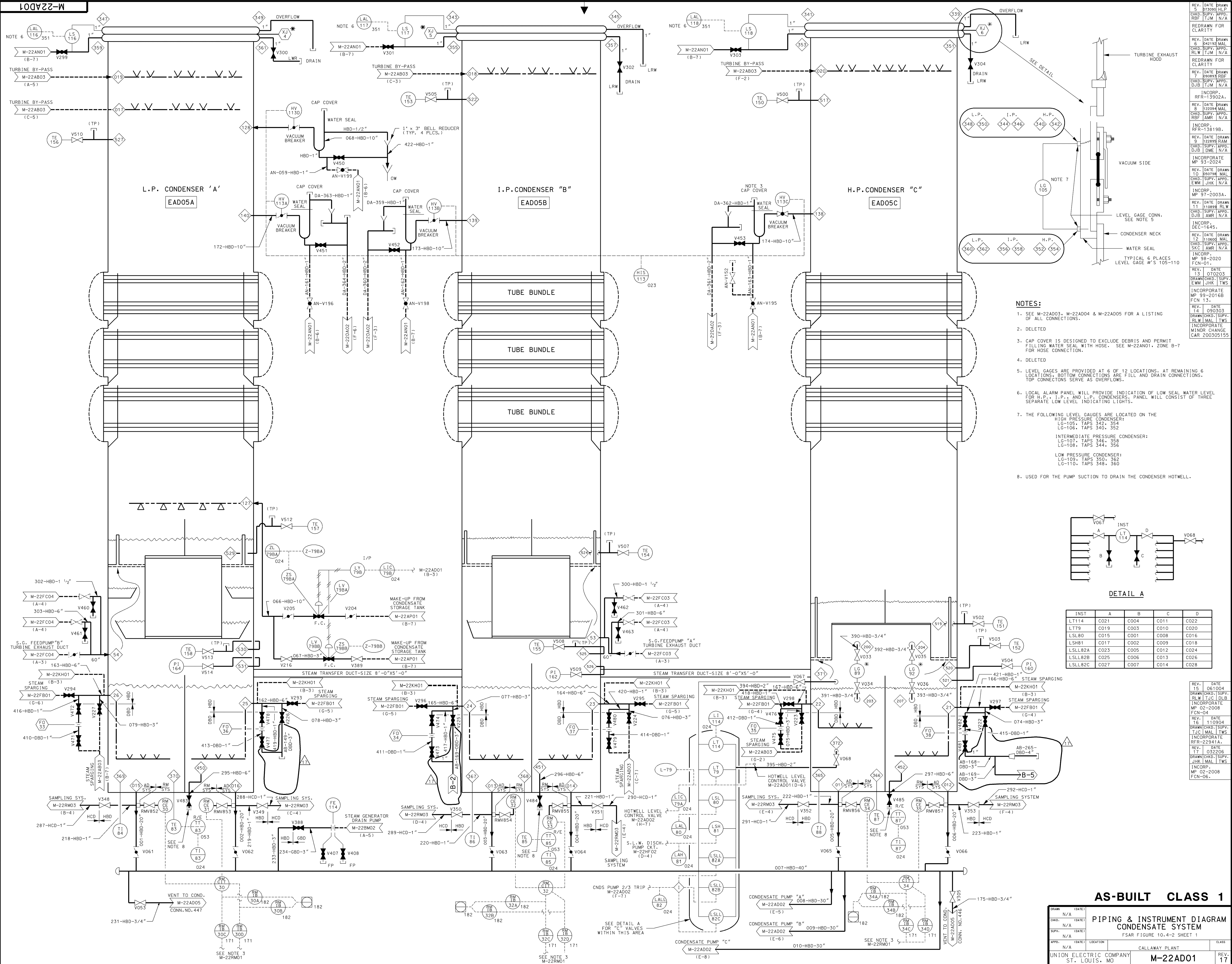
Figure 10.4-1 (Sheet 2) Deleted



- NOTES:**
- FOR GENERAL NOTES SEE M-22DA01
 - WATERBOXES DESIGNATED AS FOLLOWS:
LR - LOWER RIGHT
MR - MIDDLE RIGHT
UR - UPPER RIGHT
LL - LOWER LEFT
ML - MIDDLE LEFT
UL - UPPER LEFT
ALL AS VIEWED FACING WATERBOX
END OF CONDENSER SHELL.
 - WATERBOX LEVEL GLASS INSTRUMENTATION
NUMBER IS GIVEN IN PARENTHESES NEXT
TO EACH WATERBOX SYMBOL. CONNECTIONS
ARE AS SHOWN FOR "TYPICAL". ZONE B-6.
 - THE CARBON STEEL CLASS HBD LINES AND
FITTINGS MAY BE REPLACED WITH STAIN-
LESS STEEL PER THE REQUIREMENTS OF
CLASS HCD.

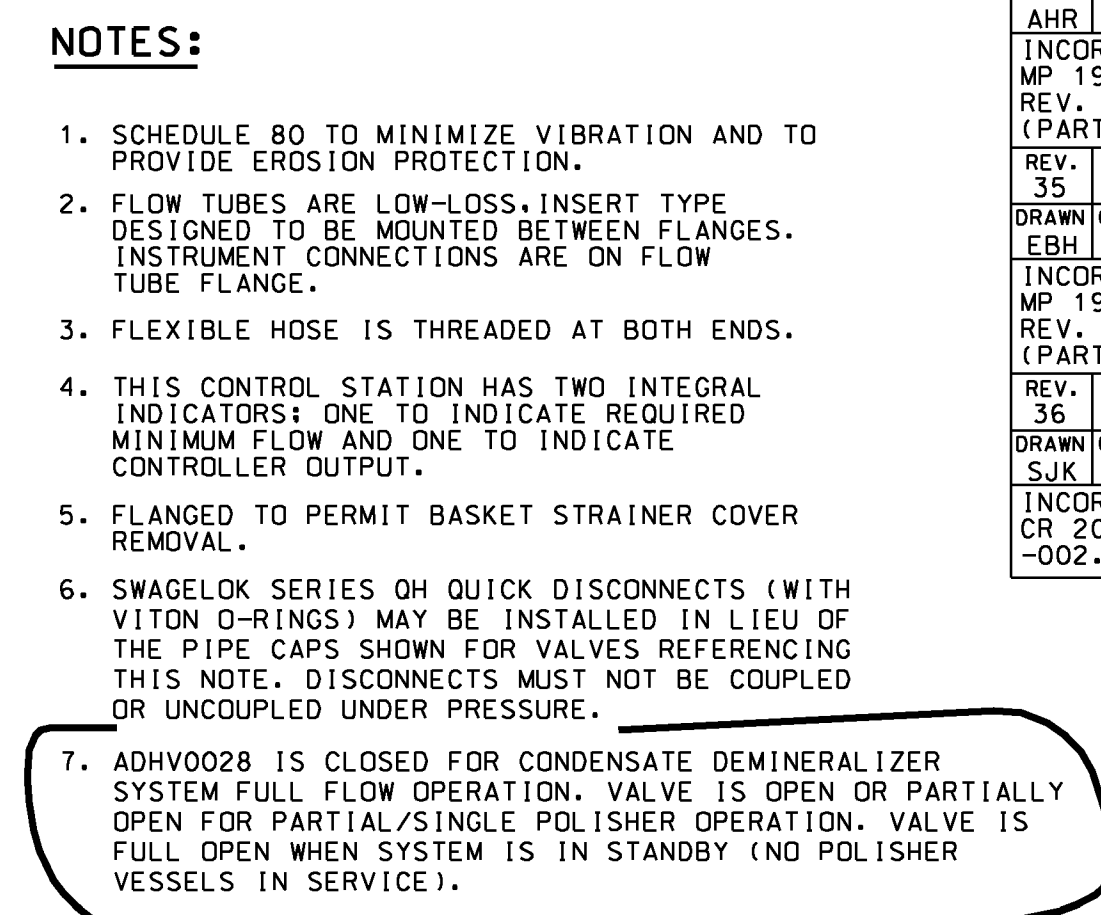
AS-BUILT CLASS 1

DRAWN	N/A	(DATE)	PIPING AND INSTRUMENTATION DIAGRAM		
CHD	N/A	(DATE)	CIRCULATING WATER		
SUPV.	N/A	(DATE)	WATERBOX VENTING SYSTEM		
APPRO.	N/A	(DATE)	FSAR FIGURE 10.4-1 SHEET 3		
APPD.	N/A	(DATE)	LOCATION	CALLAWAY PLANT	CLASS
UNION ELECTRIC COMPANY			M-22DA02		REV. 15
ST. LOUIS, MO					



INST	A	B	C	D
LT114	C021	C004	C011	C022
LT79	C019	C003	C010	C020
LSL80	C015	C001	C008	C016
LSH81	C017	C002	C009	C018
LSLL82A	C023	C005	C012	C024
LSLL82B	C025	C006	C013	C026
LSLL82C	C027	C007	C014	C028

REV.	E
13	06
DRAWN	CHIKO
RLW	TJC
INCORPORATED	
MP	02-20-20
FCN	04
REV.	C
16	11
DRAWN	CHIKO
TJC	MAI
INCORPORATED	
RFB	23-23-23
REV.	E
17	03
DRAWN	CHIKO
JHK	MAI
INCORPORATED	
MP	02-20-20
FCN	06



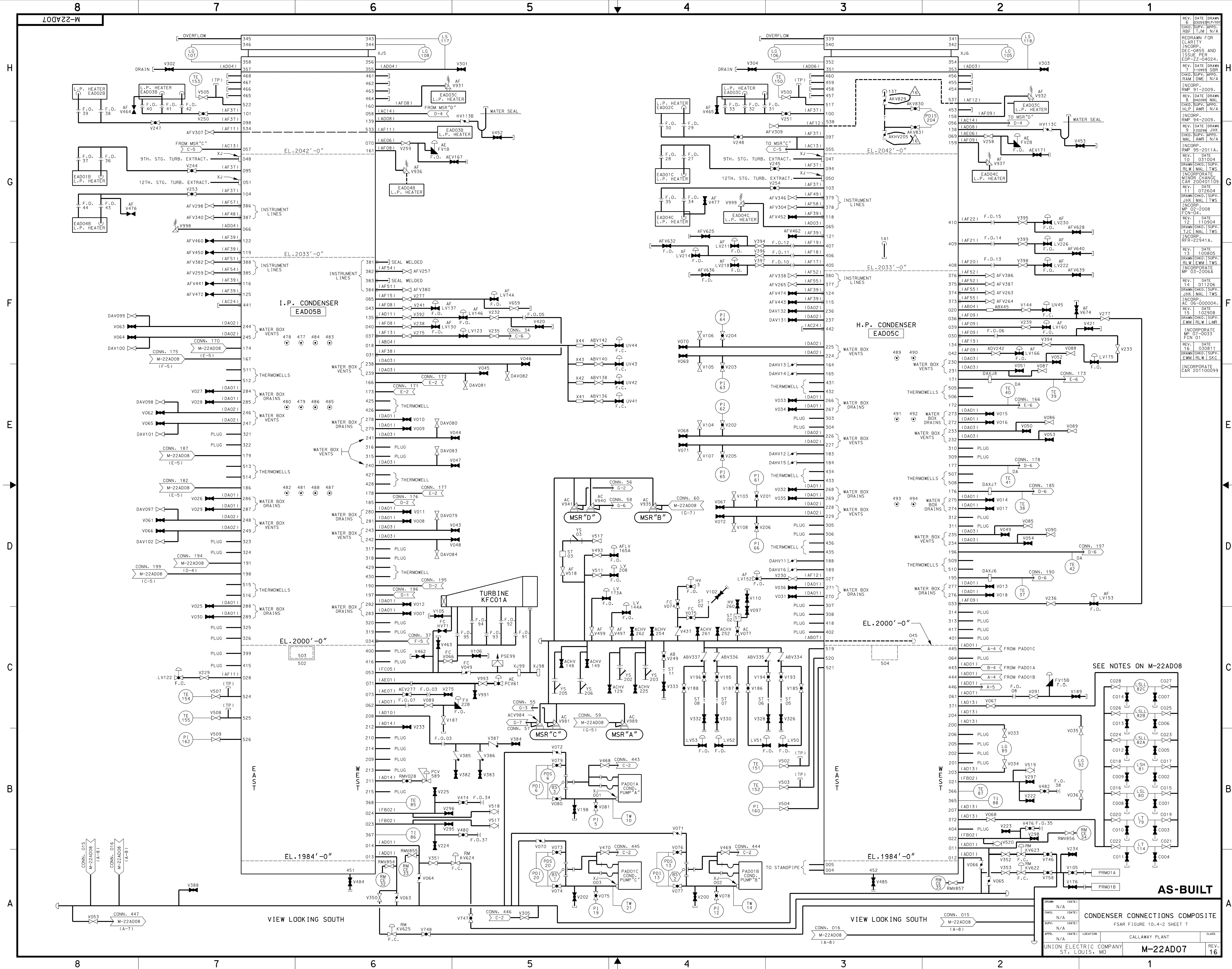
CONDENSER CONNECTION NUMBER			CONDENSER LOCATION			LINE NUMBER	LINE CLASS	LINE SIZE	CONNECTIN SIZE	CONDENSER ISOLATION VALVE NUMBER	SERVICE	DRAWING INTERFACE NUMBER	INTERFACE DRAWING ZONE	REMARKS
C	B	A	C	B	A									
HP	IP	LP	HP	IP	LP									
001					X		HBD	120"	120"		CIRC. WATER INLET (STANDPIPE)	DA01	G-6	
002					X		HBD	120"	120"		CIRC. WATER INLET (STANDPIPE)	DA01	G-8	
004	X						HBD	120"	120"		CIRC. WATER OUTLET (STANDPIPE)	DA01	D-2	
005	X						HBD	120"	120"		CIRC. WATER OUTLET (STANDPIPE)	DA01	D-4	
011	X					005	HBD	20"	20"	ADV-065	CONDENSATE OUTLET	AD01	B-3	
012	X					006	HBD	20"	20"	ADV-066	CONDENSATE OUTLET	AD01	B-3	
013		X				003	HBD	20"	20"	ADV-063	CONDENSATE OUTLET	AD01	B-5	
014		X				004	HBD	20"	20"	ADV-064	CONDENSATE OUTLET	AD01	B-5	
015			X			001	HBD	20"	20"	ADV-061	CONDENSATE OUTLET	AD01	B-7	
016			X			002	HBD	20"	20"	ADV-062	CONDENSATE OUTLET	AD01	B-7	
017				X			GBD	24"	24"		TURBINE BYPASS (4 VALVES)	AD01	H-8	SCH.120(NOTE 3)
018		X					GBD	24"	24"		TURBINE BYPASS (4 VALVES)	AD01	H-6	SCH.120(NOTE 3)
019			X				GBD	20"	20"		TURBINE BYPASS (3 VALVES)	AD01	H-8	SCH.120(NOTE 3)
020	X						GBD	12"	12"		TURBINE BYPASS (1 VALVE)	AD01	H-4	SCH.120(NOTE 3)
021	X					166	HBD	6"	6"	ADV-222/297	LOW LOAD CONDENSATE HEATING SYSTEM SPARGER	AD01	B-2	
022	X					167	HBD	6"	6"	ADV-223/298	LOW LOAD CONDENSATE HEATING SYSTEM SPARGER	AD01	B-4	
023		X				164	HBD	6"	6"	ADV-224/295	LOW LOAD CONDENSATE HEATING SYSTEM SPARGER	AD01	B-4	
024		X				165	HBD	6"	6"	ADV-225/296	LOW LOAD CONDENSATE HEATING SYSTEM SPARGER	AD01	B-6	
025			X			162	HBD	6"	6"	ADV-226/293	LOW LOAD CONDENSATE HEATING SYSTEM SPARGER	AD01	C-7	
026			X			163	HBD	6"	6"	ADV-227/294	LOW LOAD CONDENSATE HEATING SYSTEM SPARGER	AD01	C-8	
027	X					082	HBD	8"	12"	ADV-230	HTR 1C SHELL NORMAL OUTLET	AF02	G-3	12"x8" REDUCER AT CONDENSER
028		X				081	HBD	8"	12"	ADV-229	HTR 1B SHELL NORMAL OUTLET	AF02	G-5	
029			X			080	HBD	8"	12"	ADV-228	HTR 1A SHELL NORMAL OUTLET	AF02	G-8	
030	X					085	HBD	6"	6"	ADV-233	HTR 4C SHELL DUMP	AF02	B-3	
031			X			084	HBD	6"	6"	ADV-232	HTR 4B SHELL DUMP	AF02	B-5	
032			X			083	HBD	6"	6"	ADV-231	HTR 4A SHELL DUMP	AF02	B-8	
033	X					088	HBD	8"	12"	ADV-236	HTR 1C SHELL DUMP	AF02	G-3	12"x8" REDUCER AT CONDENSER
034		X				087	HBD	8"	12"	ADV-235	HTR 1B SHELL DUMP	AF02	G-5	
035			X			086	HBD	8"	12"	ADV-234	HTR 1A SHELL DUMP	AF02	G-8	
036	X					AF-144	HBD	12"	12"		HTR 1C SHELL DUMP	AF02	G-3	LINES PASS THRU COND. SHELLS
037		X				AF-142	HBD	12"	12"		HTR 1B SHELL DUMP	AF02	G-5	
038			X			AF-140	HBD	12"	12"		HTR 1A SHELL DUMP	AF02	G-7	
039	X					091	HBD	8"	10"	ADV-239	HTR 2C SHELL DUMP	AF02	E-3	10"x8" REDUCER AT CONDENSER
040		X				090	HBD	8"	10"	ADV-238	HTR 2B SHELL DUMP	AF02	E-5	
041			X			089	HBD	8"	10"	ADV-237	HTR 2A SHELL DUMP	AF02	E-8	
042	X					094	HBD	6"	8"	ADV-242	HTR 3C SHELL DUMP	AF02	C-3	8"x6" REDUCER AT CONDENSER
043		X				093	HBD	6"	8"	ADV-241	HTR 3B SHELL DUMP	AF02	C-5	
044			X			092	HBD	6"	8"	ADV-240	HTR 3A SHELL DUMP	AF02	C-8	
045	X					123	HBD	20"	20"	NONE	MISC. DRAIN HEADER	AD06	A-4	SCH.80 NOTE 3
046			X			125	HBD	20"	20"	NONE	MISC. DRAIN HEADER	AD06	C-8	SCH.80 NOTE 3
047	X						HBD	14"	16"		NINTH STG. TURBINE EXTRACTION	AF02	C-4	LINES PASS THRU COND. SHELLS
048		X					HBD	14"	16"		NINTH STG. TURBINE EXTRACTION	AF02	C-6	
049			X				HBD	14"	16"		NINTH STG. TURBINE EXTRACTION	AF02	C-8	
050	X						HBD	24"	24"		12TH STG. TURBINE EXTRACTION	AF02	E-4	
051		X					HBD	24"	24"		12TH STG. TURBINE EXTRACTION	AF02	E-6	
052			X				HBD	24"	24"		12TH STG. TURBINE EXTRACTION	AF02	E-8	
053		X					HBD	60"	60"	FCV-049	S.G.F.P. EXHAUST, FROM KFC01A	FC03	A-3	
054			X				HBD	60"	60"	FCV-050	S.G.F.P. EXHAUST, FROM KFC01B	FC04	A-3	
055	X					AC-049	HBD	24"	24"		M.S.R. R.V. DISCHARGE	AC02	D-2	
056	X					AC-038	HBD	24"	24"		M.S.R. R.V. DISCHARGE	AC04	H-2	
057		X				AC-039	HBD	24"	24"		M.S.R. R.V. DISCHARGE	AC02	D-2	
058		X				AC-047	HBD	24"	24"		M.S.R. R.V. DISCHARGE	AC04	H-2	
059			X			AC-037	HBD	24"	24"		M.S.R. R.V. DISCHARGE	AC02	H-2	
060			X			AC-046	HBD	24"	24"		M.S.R. R.V. DISCHARGE	AC04	D-2	
061	X					012	HBD	8"	10"	ADV-091	CONDENSATE PUMP "B" MIN. FLOW	AD02	E-5	10"x8" RED. AT COND. NOZZLE AND NOTE 3
062		X				011	HBD	8"	10"	ADV-089	CONDENSATE PUMP "C" MIN. FLOW	AD02	E-7	
063			X			013	HBD	8"	10"	ADV-093	CONDENSATE PUMP "A" MIN. FLOW	AD02	E-3	PLUGGED
064	X								2"					
065	X					131	HBD	1"	1"		L.P. HTR. NO. 4C CHANNEL R.V.	AD02	G-3	
066		X				130	HBD	1"	1"		L.P. HTR. NO. 4B CHANNEL R.V.	AD02	G-5	
067			X			129	HBD	1"	1"		L.P. HTR. NO. 4A CHANNEL R.V.	AD02	G-6	
068			X			118	GCD	6"	20"	AEFV-36	FEEDWATER RECIRC.	AE01	C-5	SCH. 80 NOTE 3
069	X					116	HBD	10"	10"	ADV-258	S.G.F.P. "A" MIN. FLOW	AE01	D-6	SCH. 100 NOTE 3
070		X				117	HBD	10"	10"	ADV-259	S.G.F.P. "B" MIN. FLOW	AE01	B-6	SCH. 100 NOTE 3
071		X				122	HBD	1 1/2"	1"		S.G.F.P. "A" SEAL DRAIN	AE01	C-5	1 1/2"x1" REDUCER CONDENSER NOZZLE
072			X			121	HBD	1 1/2"	1"		S.G.F.P. "B" SEAL DRAIN	AE01	A-5	
073		X				AE-107	HBD	1"	1"	AEV-277	S.G.F.P. "A" WARM-UP RECIRC.	AE01	E-3	
074			X			AE-106	HBD	1"	1"	AEV-276	S.G.F.P. "B" WARM-UP RECIRC.	AE01	C-4	
075			X			132	HBD	10"	16"	ADV-267	M.S. DRAIN TANK "B" DUMP	AF01	G-5	VALVE AT CONDENSER
076			X			276	HBD	10"	16"	ADV-268	M.S. DRAIN TANK "A" DUMP	AF01	G-5	
077			X			135	GBD	6"	8"	ADV-270	1ST STG.RHT.DRAIN TANK "B" DUMP	AF01	G-3	
078			X			134	GBD	6"	8"	ADV-269	1ST STG.RHT.DRAIN TANK "A" DUMP	AF01	G-7	
079			X			136	EBD	6"	10"	ADV-271	2ND STG.RHT.DRAIN TANK "B" DUMP	AF01	G-2	
080			X			272	EBD	6"	10"	ADV-272	2ND STG.RHT.DRAIN TANK "A" DUMP	AF01	G-8	12"x10" REDUCER @ COND. NOZZLE

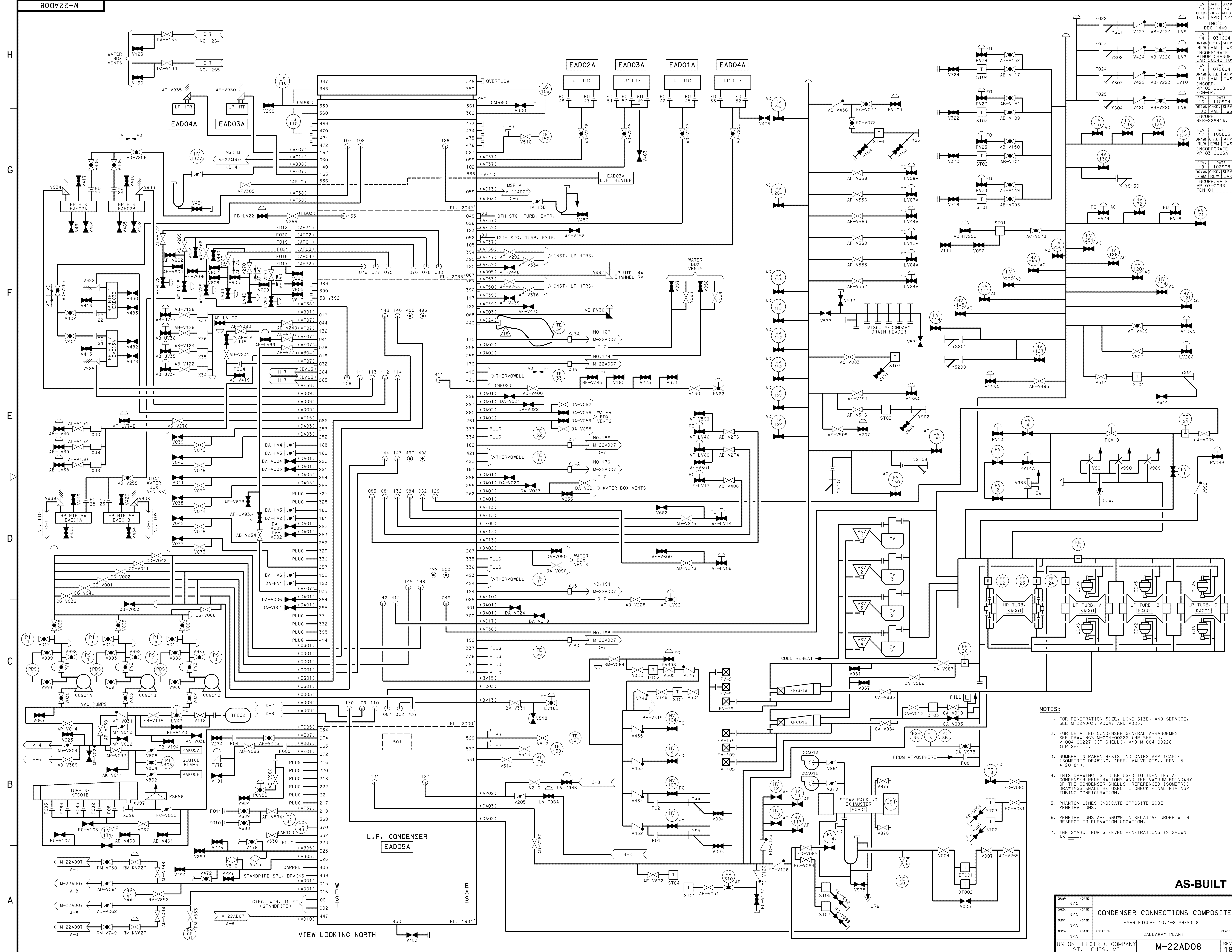
CONDENSER CONNECTION NUMBER	CONDENSER LOCATION			LINE NUMBER	LINE CLASS	LINE SIZE	CONNECT IN SIZE	CONDENSER ISOLATION VALVE NUMBER	SERVICE	DRAWING INTERFACE NUMBER	INTERFACE DRAWING ZONE	REMARKS
	C	B	A									
	HP	IP	LP									
081			X	145	GBD	12"	12"	ADV-274	H.P. HTR. NO. 7B SHELL DUMP	AF01	E-3	
082			X	144	GBD	12"	12"	ADV-273	H.P. HTR. NO. 7A SHELL DUMP	AF01	E-8	
083			X	147	GBD	12"	16"	ADV-276	H.P. HTR. NO. 6B SHELL DUMP	AF01	D-3	
084			X	146	GBD	16"	16"	ADV-275	H.P. HTR. NO. 6A SHELL DUMP	AF01	D-7	
085		X		148	HBD	16"	16"	ADV-277	HTR. DRAIN TANK "A" DUMP	AF01	B-3	
086			X	149	HBD	16"	16"	ADV-278	HTR. DRAIN TANK "B" DUMP	AF01	B-3	
087			X	375	HBD	8"	16"		MISC. DRAIN HEADER	AD06	A-5	
094	X			103	HBD	3"	3"	ADV-245	HEATER NO. 1C VENT	AF03	H-5	
095		X		102	HBD	3"	3"	ADV-244	HEATER NO. 1B VENT	AF03	H-4	
096			X	101	HBD	3"	3"	ADV-243	HEATER NO. 1A VENT	AF03	H-3	
097	X			106	HBD	3"	3"	ADV-248	HEATER NO. 2C VENT	AF03	F-5	
098		X		105	HBD	3"	3"	ADV-247	HEATER NO. 2B VENT	AF03	F-4	
099			X	104	HBD	3"	3"	ADV-246	HEATER NO. 2A VENT	AF03	F-3	
100	X			109	HBD	3"	3"	ADV-251	HEATER NO. 3C VENT	AF03	E-5	
101		X		108	HBD	3"	3"	ADV-250	HEATER NO. 3B VENT	AF03	E-4	
102			X	107	HBD	3"	3"	ADV-249	HEATER NO. 3A VENT	AF03	E-3	
103	X			112	HBD	3"	3"	ADV-254	HEATER NO. 4C VENT	AF03	C-5	
104		X		111	HBD	3"	3"	ADV-253	HEATER NO. 4B VENT	AF03	C-4	
105			X	110	HBD	3"	3"	ADV-252	HEATER NO. 4A VENT	AF03	C-3	
106			X	113	HBD	2 1/2"	2 1/2"	ADV-255	H.P.HTR.NO. 5A & 5B VENT	AF03	C-6	
107			X	114	HCD	2 1/2"	2 1/2"	ADV-256	H.P.HTR.NO. 6A & 6B VENT	AF03	E-6	
108			X	115	HCD	2 1/2"	2 1/2"	ADV-257	H.P.HTR.NO. 7A & 7B VENT	AF03	H-6	
109		X		306	HBD	8"	8"		H.P. HTR. NO. 5B RV	AF03	B-6	
110		X		305	HBD	8"	8"		H.P. HTR. NO. 5A RV	AF03	B-8	VALVE 1S CLASS GBD VALVE 1S CLASS GCD VALVE 1S CLASS GCD
111		X		307	HBD	6"	6"		H.P. HTR. NO. 6A RV	AF03	D-8	
112		X		308	HBD	6"	6"		H.P. HTR. NO. 6B RV	AF03	D-6	
113		X		309	HBD	6"	6"		H.P. HTR. NO. 7A RV	AF03	G-8	
114			X	310	HBD	6"	6"		H.P. HTR. NO. 7B RV	AF03	G-6	
115	X			AF-283	HBD	1 1/2"	1 1/2"		L.P. HTR. NO. 1C DRAIN	AF03	G-5	
116		X		281	HBD	1 1/2"	1 1/2"		L.P. HTR. NO. 1B DRAIN	AF03	G-4	
117			X	279	HBD	1 1/2"	1 1/2"		L.P. HTR. NO. 1A DRAIN	AF03	G-2	
118	X			302	HBD	1 1/2"	1 1/2"		L.P. HTR. NO. 2C DRAIN	AF03	F-5	LINES PASS THRU CONDENSER SHELLS
119		X		300	HBD	1 1/2"	1 1/2"		L.P. HTR. NO. 2B DRAIN	AF03	F-4	
120			X	298	HBD	1 1/2"	1 1/2"		L.P. HTR. NO. 2A DRAIN	AF03	F-2	
121	X			320	HBD	1 1/2"	1 1/2"		L.P. HTR. NO. 3C DRAIN	AF03	D-5	
122		X		318	HBD	1 1/2"	1 1/2"		L.P. HTR. NO. 3B DRAIN	AF03	D-4	
123			X	316	HBD	1 1/2"	1 1/2"		L.P. HTR. NO. 3A DRAIN	AF03	D-2	
124	X			338	HBD	1 1/2"	1 1/2"		L.P. HTR. NO. 4C DRAIN	AF03	B-5	
125		X		336	HBD	1 1/2"	1 1/2"		L.P. HTR. NO. 4B DRAIN	AF03	B-4	
126			X	334	HBD	1 1/2"	1 1/2"		L.P. HTR. NO. 4A DRAIN	AF03	B-2	MOTOR OPER. VALVE
127		X		066	HBD	10"	10"	ADV-216/205	CONDENSATE MAKE-UP TO HOTWELL	AD01	D-7	
128		X		068	HBD	10"	10"	ADHV-113D	VACUUM BREAKER	AD01	F-7	
129		X		128	HBD	12"	12"	CAV-006	STEAM PACKING UNLOADING VALVE	CA01	G-6	
130		X		127	HBD	3"	3"	ADV-265	STM. PACKING EXHAUSTER DRAIN	CA01	A-4	
131		X		151	HBD	4"	4"	ADV-280	MISC. DRAIN HEADER	AD06	A-8	
132		X		152	HBD	4"	4"	ADV-406	MISC.COND.DRAIN TANK (TUBE BUNDLE)	LE04	D-7	
133		X		056	HBD	4"	4"	ADV-266	REBOILER DRAIN TANK	FB01	C-8	
134	X			201	HBD	6"	6"		L.P.HTR.NO.4C SHELL DUMP	AF02	B-3	LINES PASS THRU SHELL
135		X		199	HBD	6"	6"		L.P.HTR.NO.4B SHELL DUMP	AF02	B-5	
136			X	197	HBD	6"	6"		L.P.HTR.NO.4A SHELL DUMP	AF02	B-7	
137	X			069	HBD	4"	4"		DEMINERALIZER FLUSH LINE	AK01	D-2	MOTOR OPERATED VALVES
138	X			174	HBD	10"	10"	ADHV-113C	VACUUM BREAKER	AD01	F-3	
139		X		173	HBD	10"	10"	ADHV-113B	VACUUM BREAKER	AD01	F-6	
140			X	172	HBD	10"	10"	ADHV-113A	VACUUM BREAKER	AD01	F-7	
141	X						14"					
142		X			HBD	4"	4"		STEAM GEN. BLOWDOWN SYSTEM	BM01	H-2	
143		X			HBD	8"	8"		AIR VAPOR TAKEOFF FOR L.P. UPPER SOUTH TUBE BUNDLE	CG01	G-7	
144			X		HBD	8"	8"		AIR VAPOR TAKEOFF FOR L.P. MIDDLE SOUTH TUBE BUNDLE	CG01	G-7	
145		X			HBD	8"	8"		AIR VAPOR TAKEOFF FOR L.P. LOWER SOUTH TUBE BUNDLE	CG01	G-7	
146			X		HBD	8"	8"		AIR VAPOR TAKEOFF FOR L.P. UPPER NORTH TUBE BUNDLE	CG01	G-7	
147		X			HBD	8"	8"		AIR VAPOR TAKEOFF FOR L.P. MIDDLE NORTH TUBE BUNDLE	CG01	G-7	
148			X		HBD	8"	8"		AIR VAPOR TAKEOFF FOR L.P. LOWER NORTH TUBE BUNDLE	CG01	G-7	
158	X			158	HBD	6"	6"		L.P. HTR. NO. 3C R.V.	AF03	D-5	
159	X			155	HBD	6"	6"		L.P. HTR. NO. 4C R.V.	AF03	C-5	
160		X		157	HBD	6"	6"		L.P. HTR. NO. 3B R.V.	AF03	D-4	

[illegible]

REV.	DATE		
5.	11/29/93	JHK	
CHKD.	SUPV.	APPD.	
RFB	TJM	N/A	
INCP			
RMP 92-2016.			
REV.	DATE		
6.	10/23/96	JHK	
CHKD.	SUPV.	APPD.	
MAL	AMR	N/A	
INCP			
RMP 95-2011.			
REV.	DATE		
7.	06/10/04		
DRAWN	CHKD.		
RLW	TJC	DLB	
INCP			
MP 02-2008			
FCN-04			
REV.	DATE		
8.	11/09/04		
DRAWN	CHKD.		
TJC	MAL	TWS	
INCP			
RFR-22941A.			
REV.	DATE		
9.	10/29/08		
DRAWN	CHKD.	SUPV.	
EWL	WLM	LMR	
INCP			
RMP 07-0033			
FCN 01			

AS-BUILT		CLASS 1		FLN DT	
DRWN	N/A	(DATE)			
ENGRD.	N/A	(DATE)			
SUPPV.	N/A	(DATE)			
APPRD.	N/A	(DATE)	LOCATION	CALLAWAY PLANT	CLASS
UNION ELECTRIC COMPANY ST. LOUIS, MO			M-22AD05		REV. 9



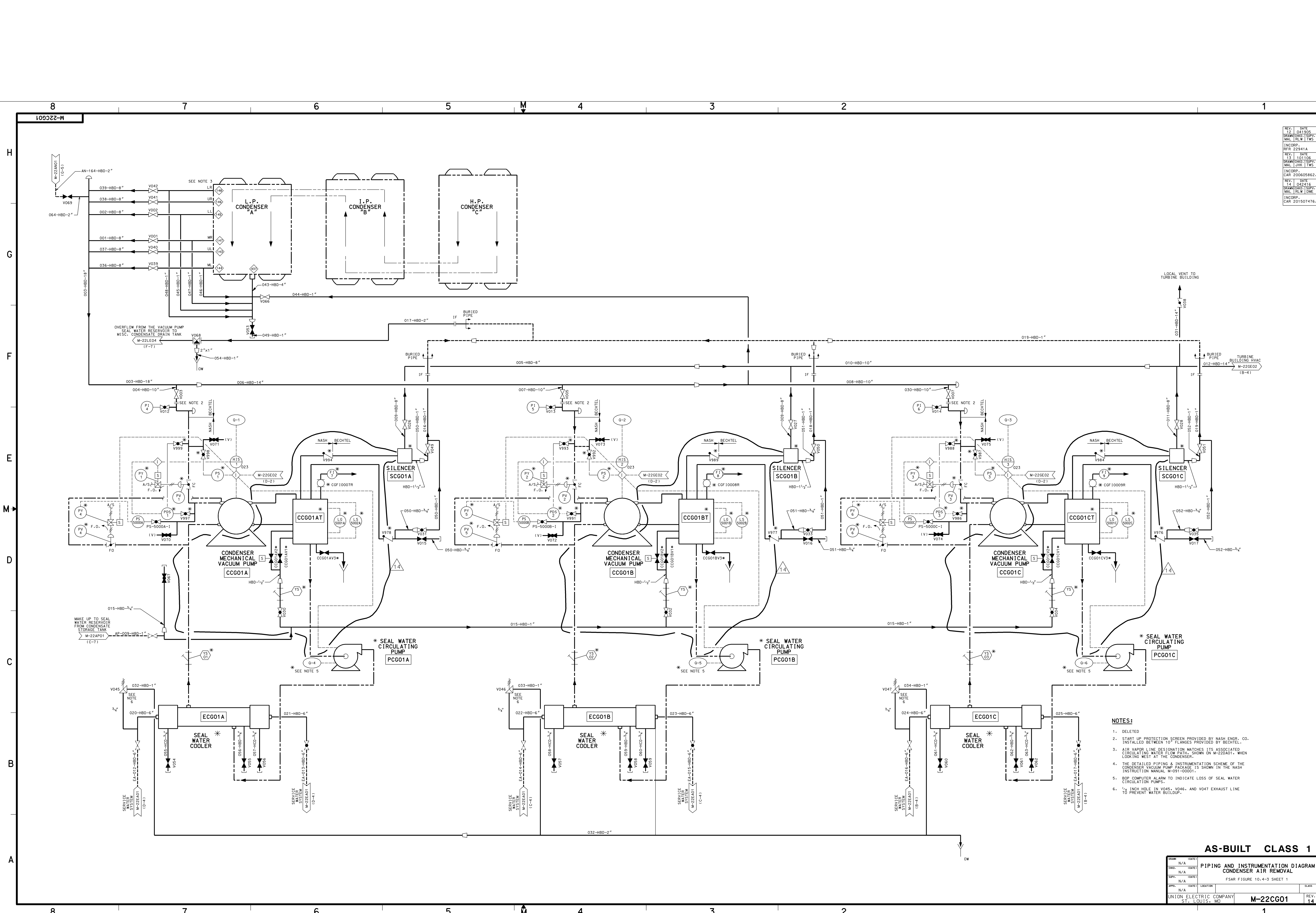


- NOTES:**
- 1. FOR PENETRATION SIZE, LINE SIZE, AND SERVICE, SEE M-22AD03, AD04, AND AD05.
 - 2. FOR DETAILED CONDENSER GENERAL ARRANGEMENT, SEE DRAWINGS M-04-00226 (HP SHELL), M-04-00227 (LP SHELL), AND M-04-00228 (LP SHELL).
 - 3. NUMBER IN PARENTHESIS INDICATES APPLICABLE ISOMETRIC DRAWING. (REF. VALVE QTS., REV. 5 4-20-81).
 - 4. THIS DRAWING IS TO BE USED TO IDENTIFY ALL CONDENSER PENETRATIONS AND THE VACUUM BOUNDARY OF THE CONDENSER SHELLS. REFERENCED ISOMETRIC DRAWINGS SHALL BE USED TO CHECK FINAL PIPING/TUBING CONFIGURATION.
 - 5. PHANTOM LINES INDICATE OPPOSITE SIDE PENETRATIONS.
 - 6. PENETRATIONS ARE SHOWN IN RELATIVE ORDER WITH RESPECT TO ELEVATION LOCATION.
 - 7. THE SYMBOL FOR SLEEVED PENETRATIONS IS SHOWN AS

AS-BUILT

DATE	13 07/89	REV.	18
DRAWN	N/A	CHD.	N/A
SUPV.	N/A	APPD.	N/A
LOCATION	CALLAWAY PLANT	CLASS	
UNION ELECTRIC COMPANY		M-22AD08	
ST. LOUIS, MO		REV.	

CONDENSER CONNECTIONS COMPOSITE	
FSAR FIGURE 10.4-2 SHEET 8	



REV.	DATE	BY
12	041905	DRW/CHD: TSPV
13	031106	MAL: RLW/TWS
14	042416	DRW/CHD: TSPV
15	042416	MAL: RLW/TWS
16	042416	DRW/CHD: TSPV
17	042416	MAL: RLW/TWS
18	042416	DRW/CHD: TSPV
19	042416	MAL: RLW/TWS
20	042416	DRW/CHD: TSPV
21	042416	MAL: RLW/TWS

- NOTES:**
1. DELETED
 2. START UP PROTECTION SCREEN PROVIDED BY NASH ENGR. CO. INSTALLED BETWEEN 10" FLANGES PROVIDED BY BECHTEL.
 3. AIR VAPOR LINE DESIGNATION MATCHES ITS ASSOCIATED CIRCULATING WATER FLOW PATH, SHOWN ON M-22DA01, WHEN LOOKING WEST AT THE CONDENSER.
 4. THE DETAILED PIPING & INSTRUMENTATION SCHEME OF THE CONDENSER VACUUM PUMP PACKAGE IS SHOWN IN THE NASH INSTRUCTION MANUAL M-091-00001.
 5. BOP COMPUTER ALARM TO INDICATE LOSS OF SEAL WATER CIRCULATION PUMPS.
 6. 1/2 INCH HOLE IN V045, V046, AND V047 EXHAUST LINE TO PREVENT WATER BULLUP.

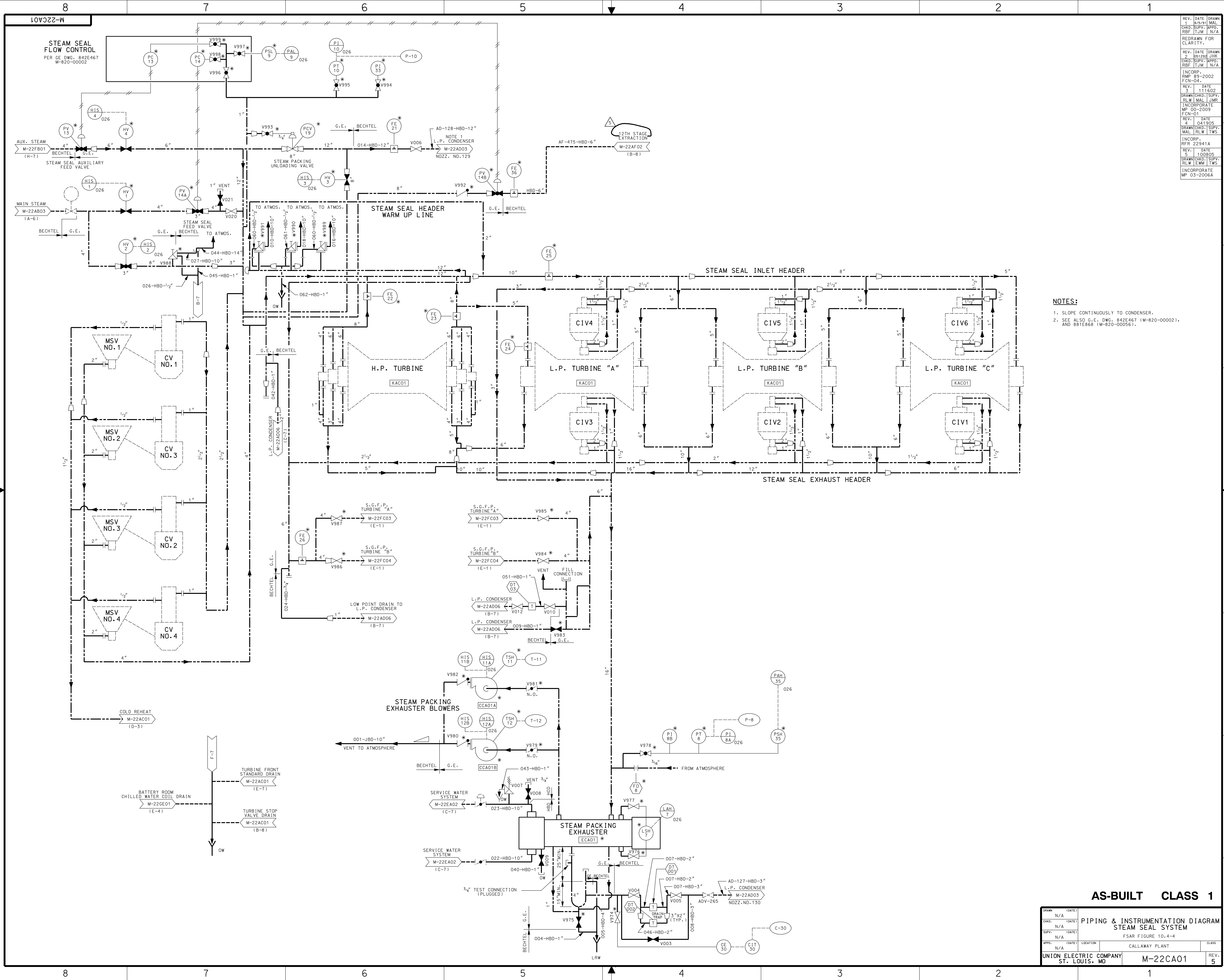
AS-BUILT CLASS 1

PIPING AND INSTRUMENTATION DIAGRAM

CONDENSER AIR REMOVAL

FSAR FIGURE 10.4-3 SHEET 1

DRWN	(DATE)	N/A
ENGRD	(DATE)	N/A
CHKD	(DATE)	N/A
APPV	(DATE)	N/A
UNION ELECTRIC COMPANY	ST. LOUIS, MO	M-22CG01
REV.	14	



REV.	DATE	DRAWN
1	8/5/91	MAL
2	09/28/91	JHK
3	11/6/92	JHK
4	04/19/95	JHK
5	10/08/95	JHK
6	03/20/96	JHK

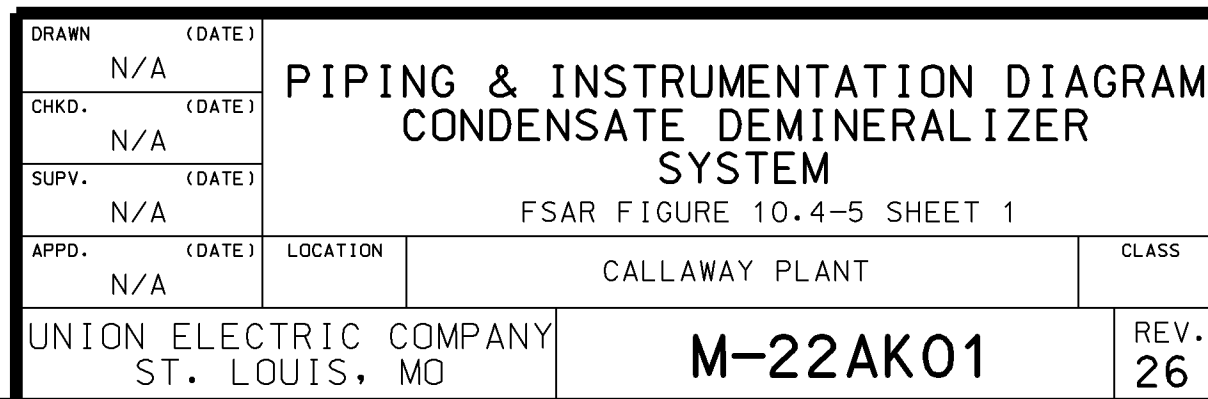
- NOTES:**
1. SLOPE CONTINUOUSLY TO CONDENSER.
 2. SEE ALSO G.E. DWG. 842E467 (M-820-00002), AND 881E868 (M-820-00056).

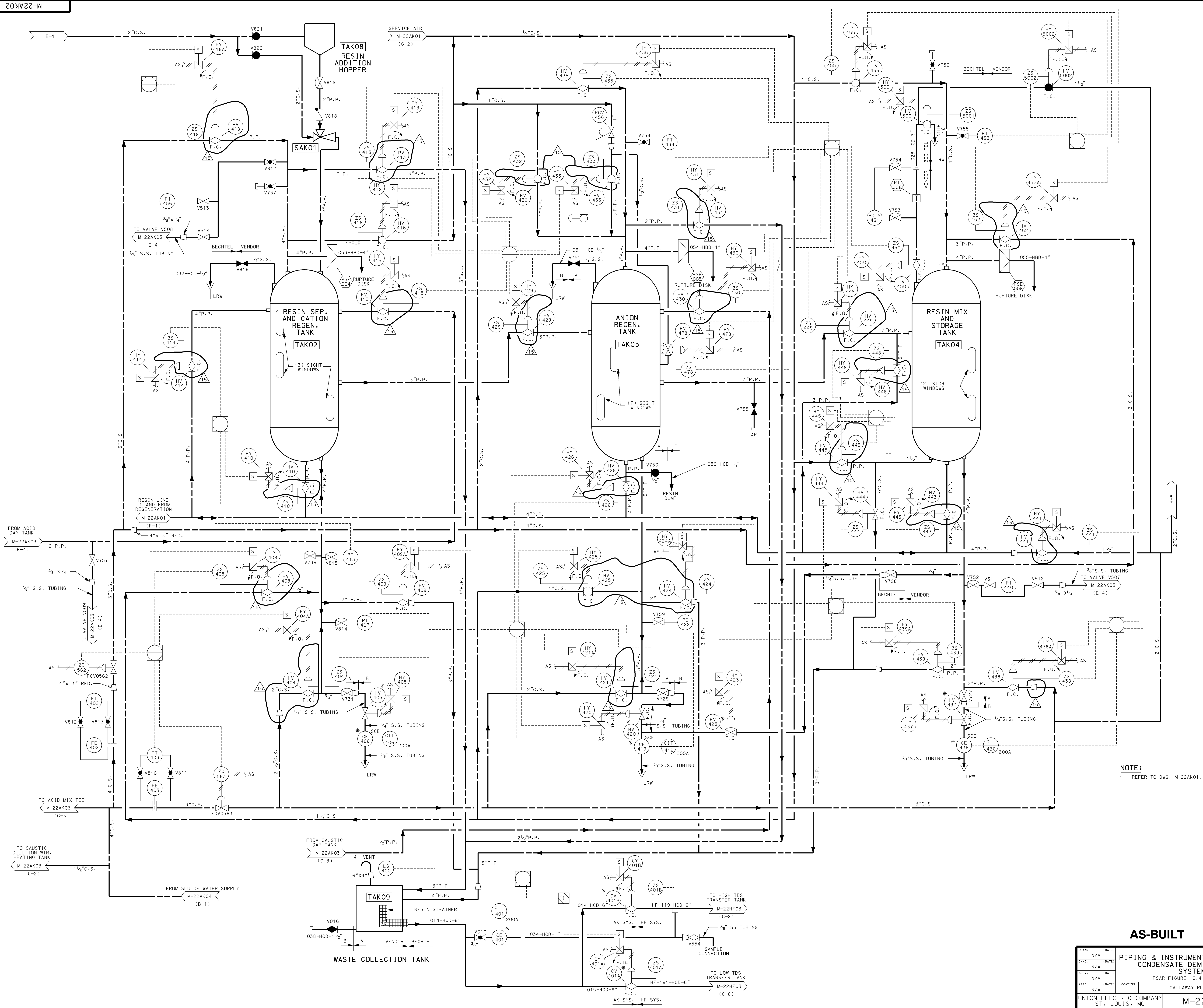
AS-BUILT CLASS 1

CHD.	DATE	LOCATION	CLASS
N/A			
N/A			
N/A			
N/A			
N/A			

UNION ELECTRIC COMPANY
ST. LOUIS, MO

PIPING & INSTRUMENTATION DIAGRAM
STEAM SEAL SYSTEM
FSAR FIGURE 10.4-4
CALLAWAY PLANT
M-22CA01
REV. 5

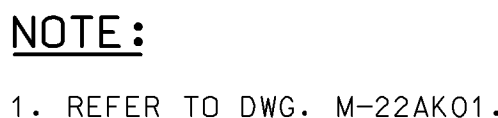




NOTE:
1. REFER TO DWG. M-22AK01.

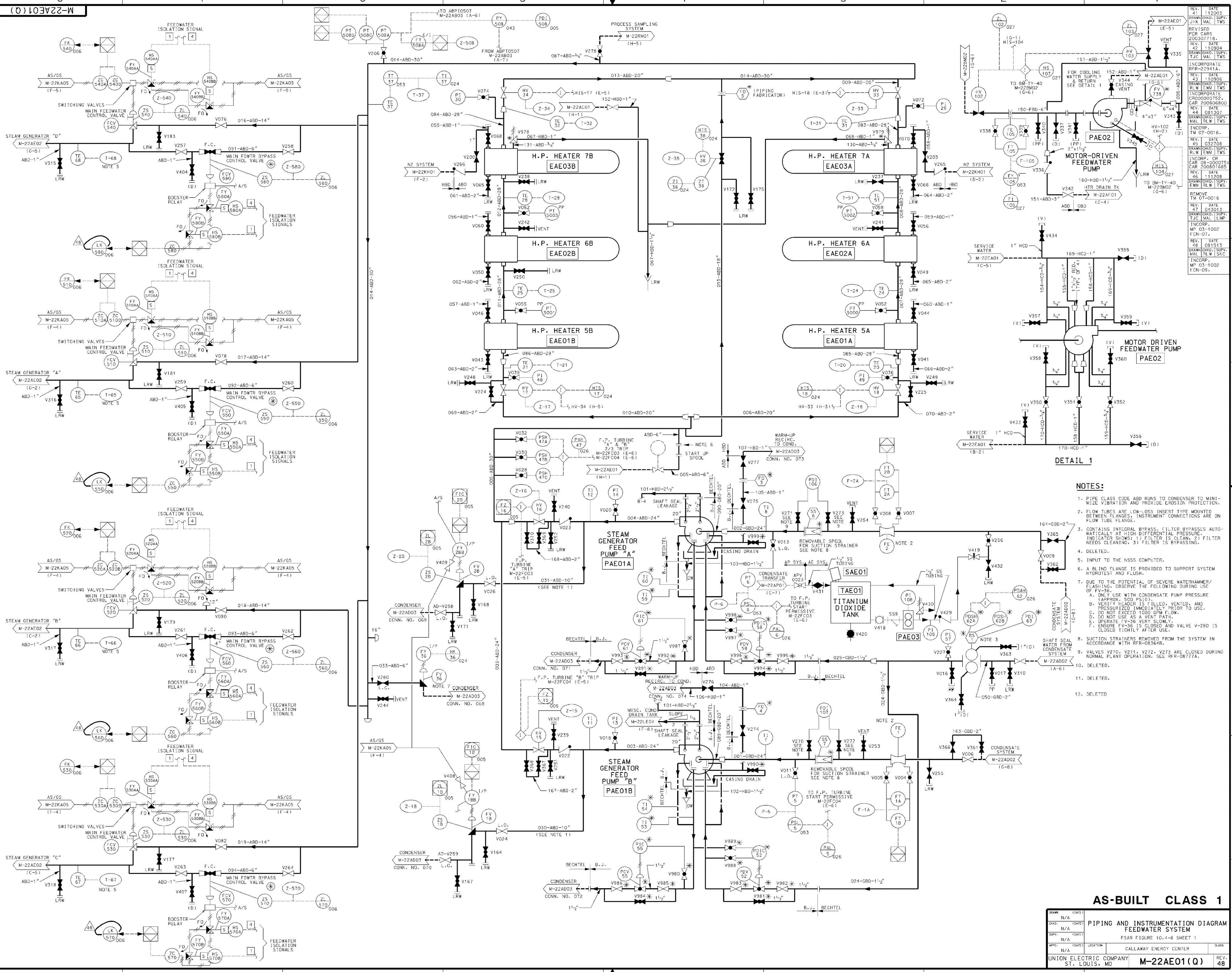
AS-BUILT CLASS 1

DRAWN				DATE			
N/A				(DATE)			
CHKD.				N/A			
SURV.				N/A			
APPR.				N/A			
N/A				N/A			
UNION ELECTRIC COMPANY				ST. LOUIS, MO			
M-22AK02				REV. 15			



REV. 24	DATE 071608	
DRAWN RLW	CHKD. EWM	SUPV. JHK
INCORPORATE MP 99-2016 FCN-15		

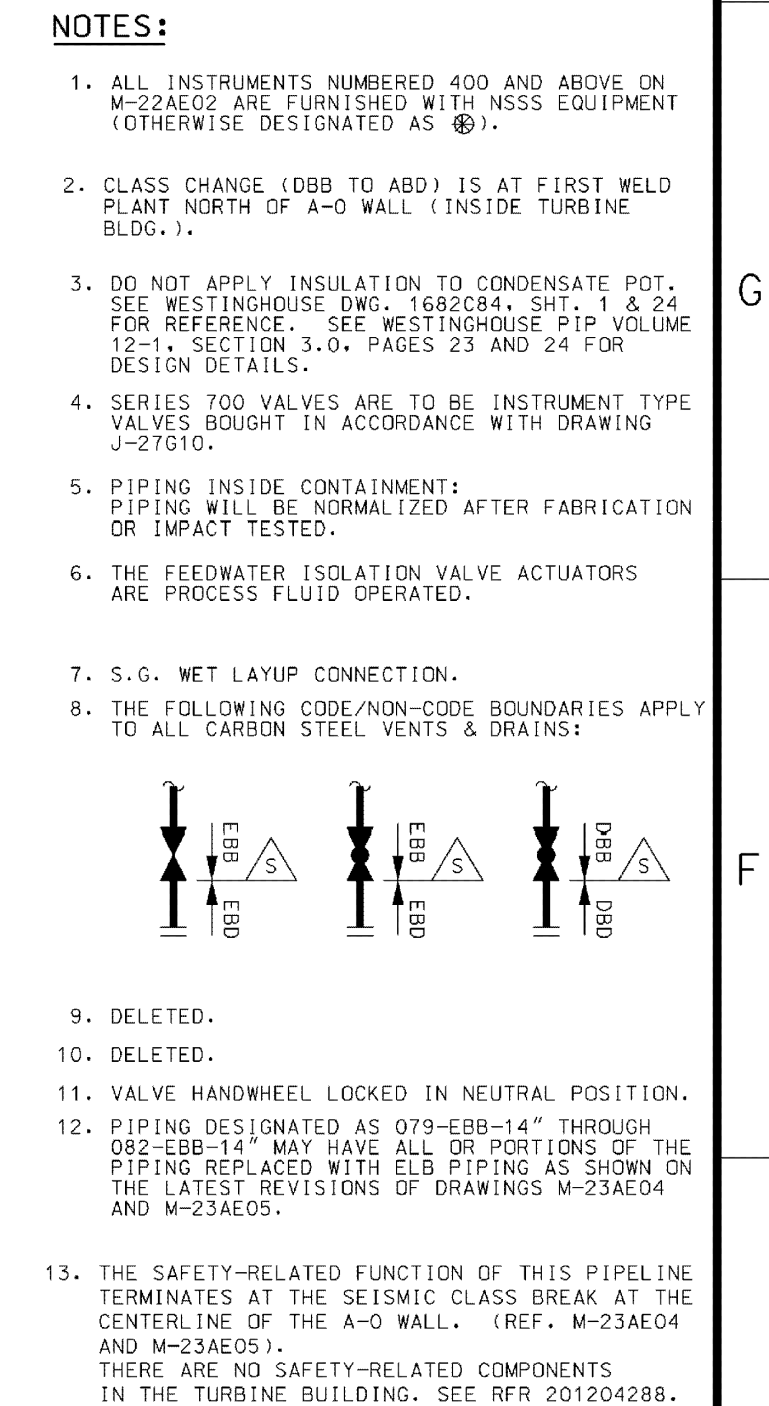
DRWN	(DATE)						
N/A		PIPING & INSTRUMENTATION DIAGRAM CONDENSATE DEMINERALIZER SYSTEM FSAR FIGURE 10.4-5 SHEET 3					
CHKD.	(DATE)						
N/A							
SUPV.	(DATE)						
N/A							
APPRO.	(DATE)	LOCATION	CALLAWAY PLANT				CLASS
N/A							
UNION ELECTRIC COMPANY ST. LOUIS, MO			M-22AK03				REV. 24



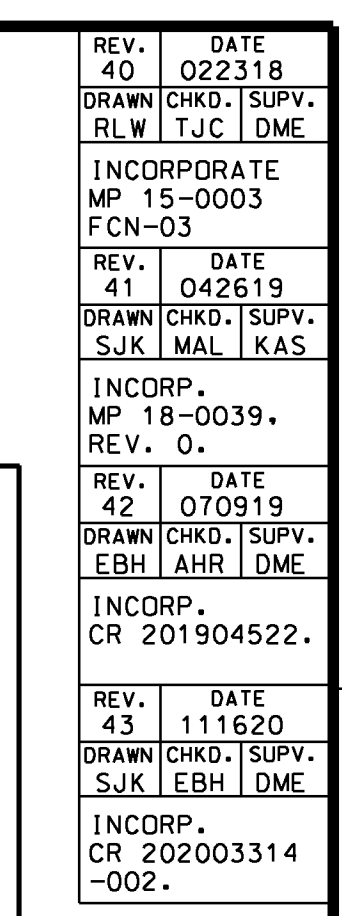
- NOTES:**
1. PIPE CLASS CODE ABD RUNS TO CONDENSER TO MINIMIZE VIBRATION AND PROVIDE EROSION PROTECTION.
 2. FLOW TUBES ARE LOW-LOSS INSERT TYPE MOUNTED BETWEEN FLANGES. INSTRUMENT CONNECTIONS ARE ON FLOW TUBE FLANGE.
 3. CONTAINS INTEGRAL BYPASS. FILTER BYPASSES AUTOMATICALLY AT HIGH DIFFERENTIAL PRESSURE. INDICATOR SHOWS: 1) FILTER IS CLEAN, 2) FILTER NEEDS CLEANING, 3) FILTER IS BYPASSING.
 4. DELETED.
 5. INPUT TO THE NSSS COMPUTER.
 6. A BLIND FLANGE IS PROVIDED TO SUPPORT SYSTEM HYDROTEST AND FLUSH.
 7. DUE TO THE POTENTIAL OF SEVERE WATERHAMMER/FLASHING, OBSERVE THE FOLLOWING DURING USE OF FV-36.
A. ONLY USE WITH CONDENSATE PUMP PRESSURE (APPROX. 500 PSIG).
B. VERIFY HEADER IS FILLED, VENTED, AND PRESSURIZED IMMEDIATELY PRIOR TO USE.
C. DO NOT EXCEED 1000 GPM FLOW.
D. DO NOT USE AS A VENT PATH.
E. OPERATE FV-36 VERY SLOWLY.
F. ENSURE FV-36 IS CLOSED AND VALVE V-280 IS CLOSED TIGHTLY AFTER USE.
 8. SUCTION STRAINERS REMOVED FROM THE SYSTEM IN ACCORDANCE WITH RFR-083648.
 9. VALVES V270, V271, V272, V273 ARE CLOSED DURING NORMAL PLANT OPERATION. SEE RFR-087774.
 10. DELETED.
 11. DELETED.
 12. DELETED.

AS-BUILT CLASS 1

DRWN	N/A	(DATE)	
CHG	N/A	(DATE)	
SUPV	N/A	(DATE)	
APPD	N/A	(DATE)	
UNION ELECTRIC COMPANY	ST. LOUIS, MO	M-22AE01(Q)	REV. 48



N/A		PIPING AND INSTRUMENTATION DIAGRAM FEEDWATER SYSTEM FSAR FIGURE 10.4-6 SHEET 2		CLASS
CHKD.	(DATE)			
SUPV.	(DATE)			
ISSD.	(DATE)			
N/A		LOCATION	CALLAWAY ENERGY CENTER	
N/A				
UNION ELECTRIC COMPANY ST. LOUIS, MO			M-22AE02(Q) REV. 32	

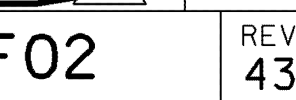


A	B	C	D	E
LC-9	C041	C042	C035	C036
LSHH-7	C023	C024	C019	C020
LC-8	C025	C026	C021	C022
LT-259			C322	C323
LC-45	C073	C074	C069	C070
LSHH-44	C071	C072	C067	C068
LT-258			C320	C321
LC-46	C093	C094	C087	C088
LT-255			C314	C315
LT-256			C316	C317
LSHH-24			C099	C100
LSHH-64			C103	C104
LC-60	C053	C054 (GLOBE)	C047	C048
LC-59	C033	C034	C029	C030
LSHH-58	C031	C032	C027	C028
LT-260			C324	C325
LSLL-70C			C003	C004
LSL-77			C001	C002
LSL-78			C423	C422
LSHH-12	C063	C064	C059	C060
LC-13	C065	C066	C061	C062
LC-14	C081	C082	C075	C076
LT-257			C318	C319
LC-716	C013	C014	C009	C010
LT-71A	C418	C421	C005	C006
LT-71B	C417	C416	C040	C419
LT-74A	C011	C012	C007	C008
LT-74B	C412	C413	C415	C414

- ## NOTES:
1. SCHEDULE 80 PIPE FOR VIBRATION AND EROSION CONSIDERATIONS.
 2. FLOW TUBES ARE LOW-LOSS, INSERT TYPE DESIGNED TO BE MOUNTED BETWEEN FLANGES. INSTRUMENT CONNECTIONS ARE ON FLOW TUBE FLANGE.
 3. LINES DESIGNED FOR SELF-VENTING DRAINAGE.
 4. REDUCERS IN ALL FEEDWATER HEATER INLET LINES ARE LOCATED PER HEI STANDARDS.
 5. SCHEDULE 80 PIPING REQUIRED FOR EROSION CONSIDERATIONS.
 6. CHEMISTRY SAMPLE POINTS TO BE USED WITH RMW0860. RFR 21893A.

AS-BUILT CLASS 1

DRAWN	(DATE)	PIPING & INSTRUMENTATION DIAGRAM					
CHECKED	(DATE)	FEEDWATER HEATER EXTRACTION					
SUPV.	(DATE)	DRAINS AND VENTS					
FSAR FIGURE 10.4-6 SHEET 3							
APPROD.	(DATE)	LOCATION	CALLAWAY ENERGY CENTER				CLASS
	N/A						
UNION ELECTRIC COMPANY ST. LOUIS, MO			M-22AF01				REV. 43



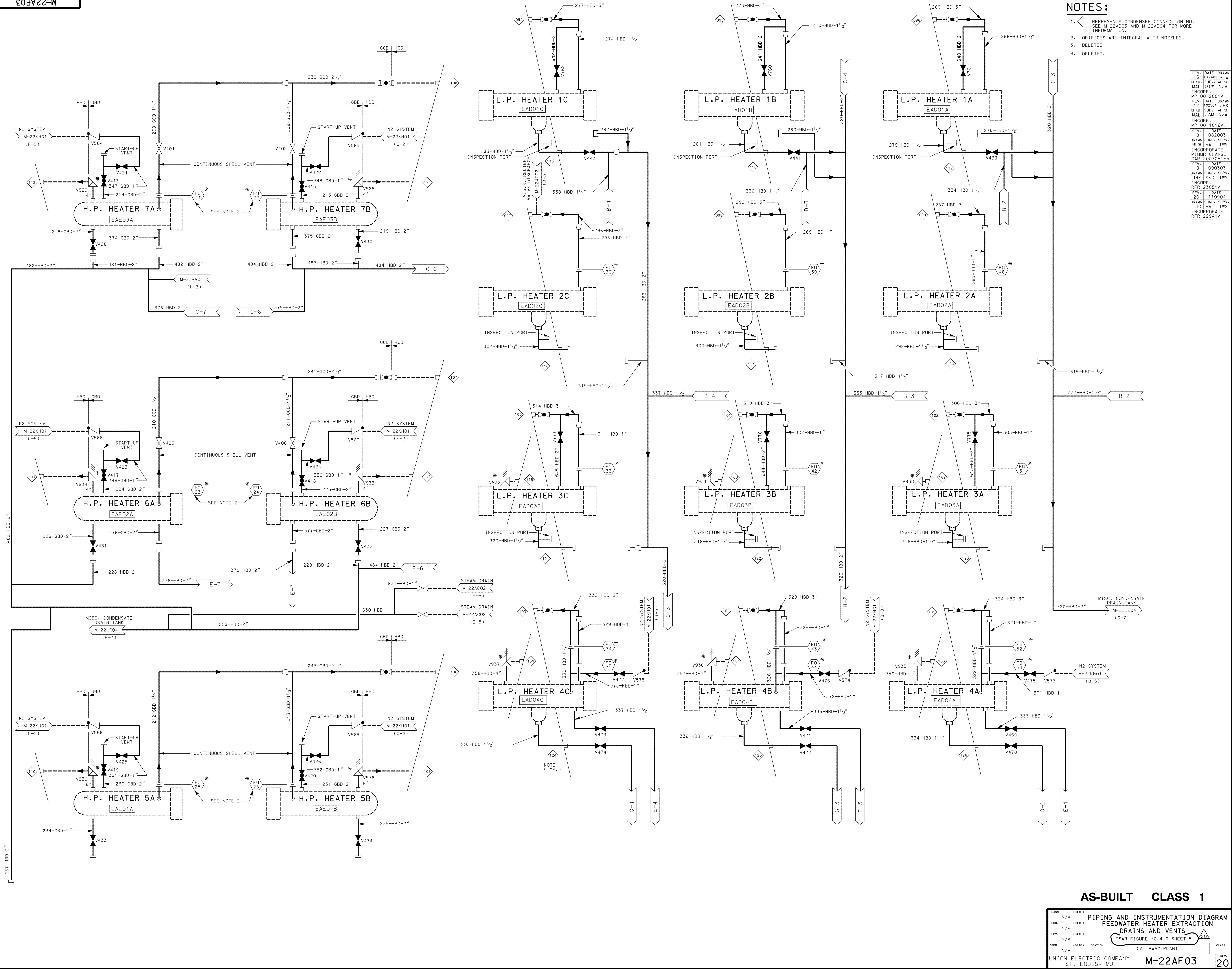
NOTES:

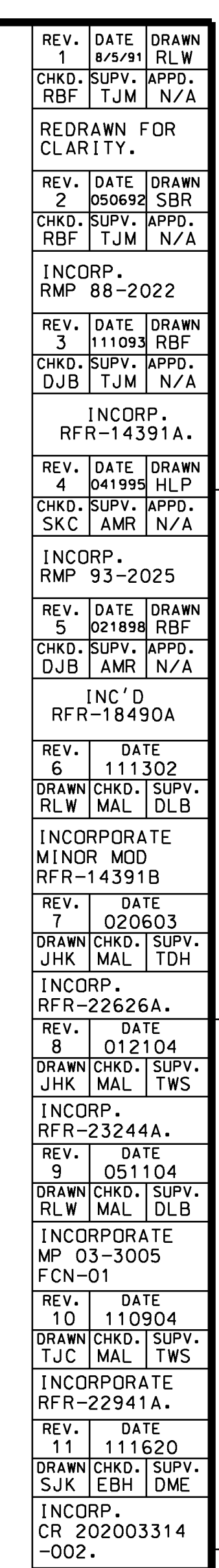
1. REPRESENTS CONDENSER CONNECTION NO. SEE M-22AD03 AND M-22AD04 FOR MORE INFORMATION.
2. ORIFICES ARE INTEGRAL WITH NOZZLES.
3. DELETED.
4. DELETED.

REV.	DATE	DRAWN	16	04/04/01	RLW
CHKD.	SUPV.	APPD.	MAL	DTW	N/A
INCORP.	MP	00-2001A			
REV.	DATE	DRAWN	17	10/05/01	JHK
CHKD.	SUPV.	APPD.	MAL	JAM	N/A
INCORP.	MP	00-1016A			
REV.	DATE	DRAWN	18	08/20/03	JHK
CHKD.	SUPV.	APPD.	MAL	TWS	
INCORP.	MP	00-2003A			
REV.	DATE	DRAWN	19	09/03/03	JHK
CHKD.	SUPV.	APPD.	MAL	TWS	
INCORP.	MP	00-2005A			
REV.	DATE	DRAWN	20	11/09/04	JHK
CHKD.	SUPV.	APPD.	MAL	TWS	
INCORP.	MP	00-2005A			

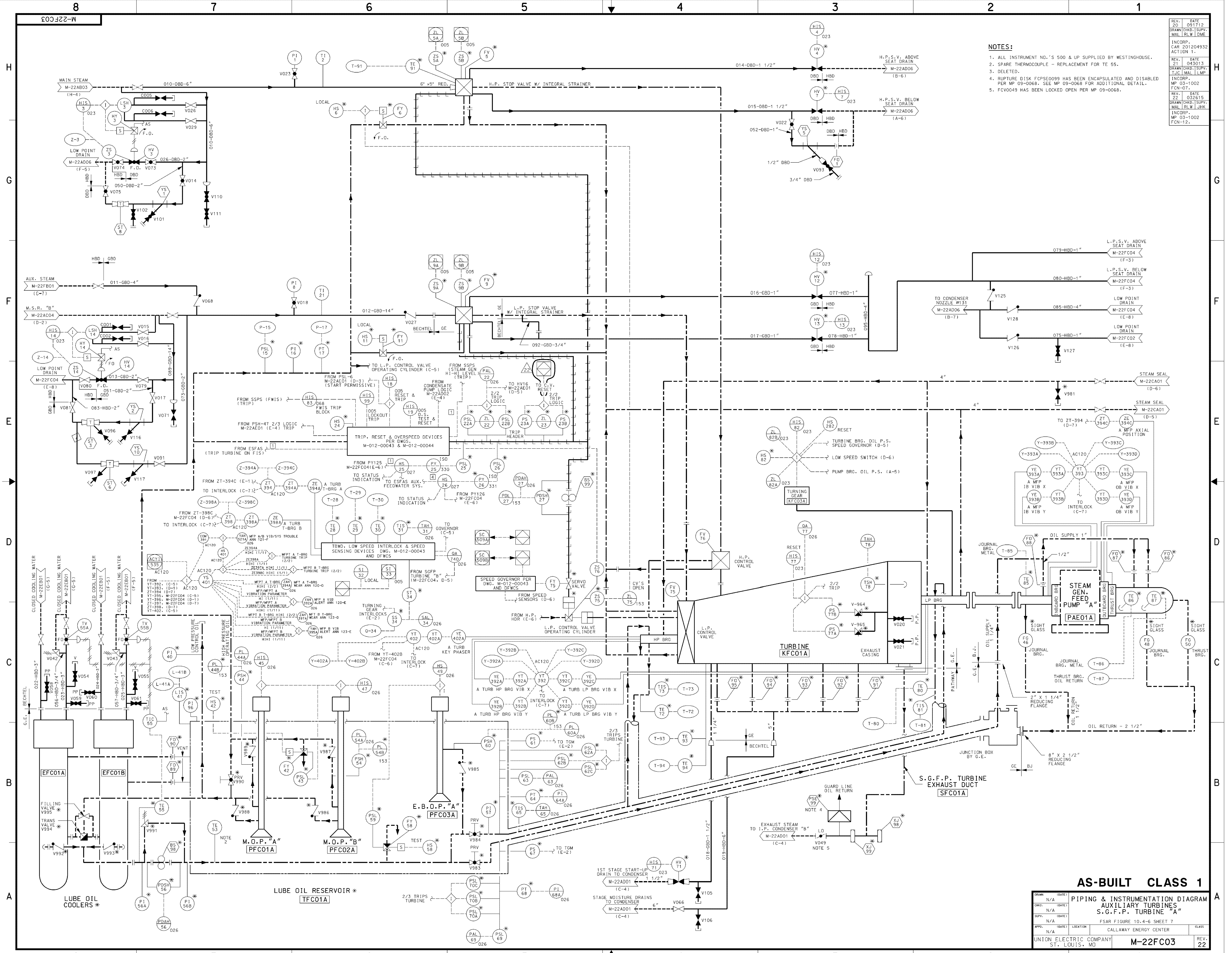
AS-BUILT CLASS 1

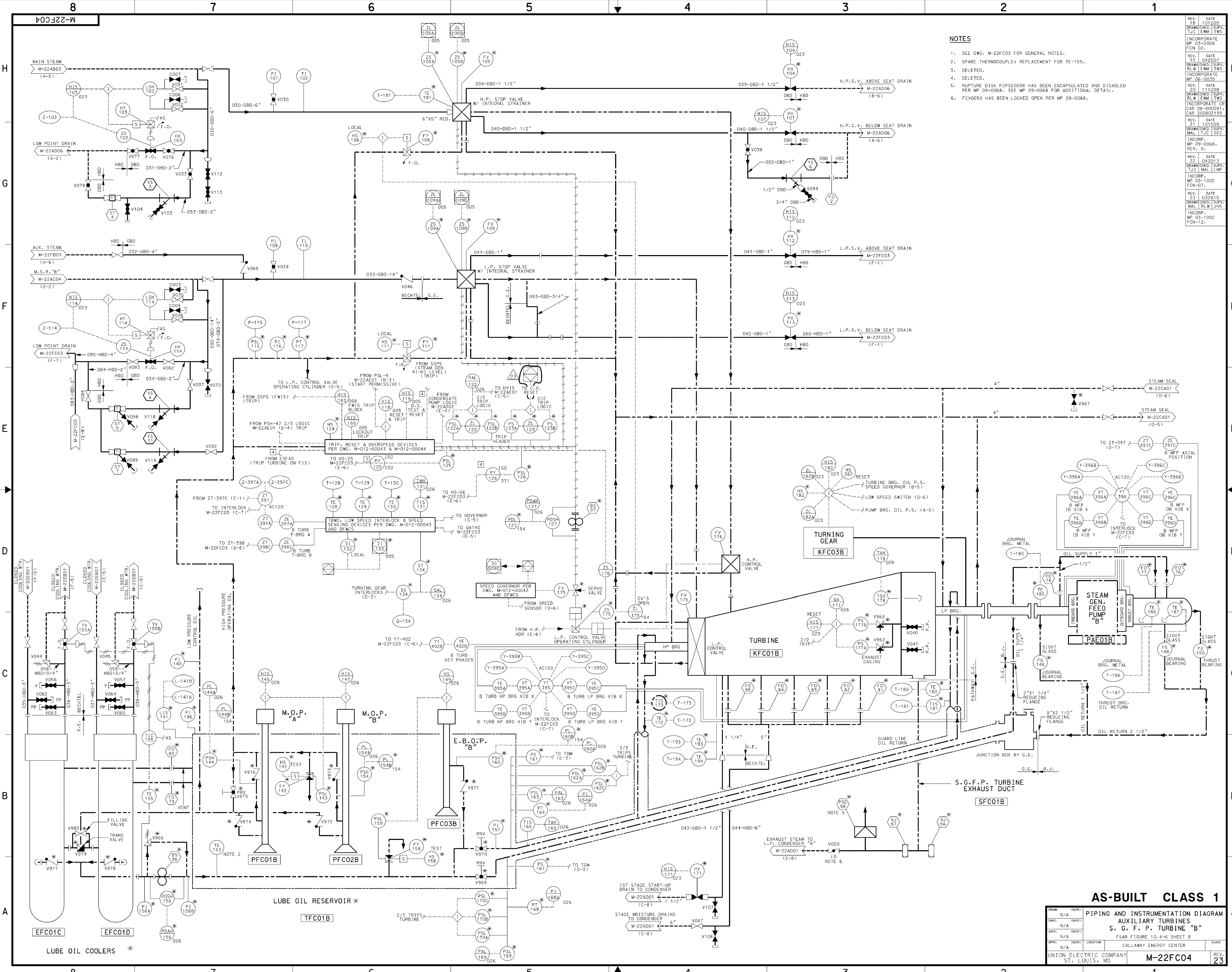
DRAWN	N/A	(DATE)			
CHKD.	N/A	(DATE)			
SUPV.	N/A	(DATE)			
APPD.	N/A	(DATE)			
LOCATION	CALLAWAY PLANT				
UNION ELECTRIC COMPANY	ST. LOUIS, MO				
M-22AF03					
REV.	20				





DRAWN	(DATE)	PIPING & INSTRUMENTATION DIAGRAM FEEDWATER HEATER EXTRACTION DRAINS AND VENTS FSR FIGURE 10.4-6 SHEET 6		
CHG.	(DATE)			
SUPV.	(DATE)			
APPRO.	(DATE)			
N/A		CALLAWAY PLANT		
UNION ELECTRIC COMPANY ST. LOUIS, MO			M-22AF04	REV. 11





- NOTES**
- SEE DWG. M-22FC03 FOR GENERAL NOTES.
 - SPARE THERMOCOUPLE; REPLACEMENT FOR TE-155.
 - DELETED.
 - DELETED.
 - RUPTURE DISK FCPSE009B HAS BEEN ENCAPSULATED AND DISABLED PER MP 09-0066. SEE MP 09-0066 FOR ADDITIONAL DETAIL.
 - FCV0050 HAS BEEN LOCKED OPEN PER MP 09-0066.

REV.	DATE	BY	CHKD.	APPD.
18	01/20/05	BRANNON, SUPV.	TJC	LWS
19	04/25/07	BRANNON, SUPV.	RLW	LWS
20	11/12/08	BRANNON, SUPV.	RLW	LWS
21	01/15/09	BRANNON, SUPV.	RLW	LWS
22	04/30/13	BRANNON, SUPV.	RLW	LWS
23	03/25/15	BRANNON, SUPV.	RLW	LWS

AS-BUILT CLASS 1

PIPING AND INSTRUMENTATION DIAGRAM

AUXILIARY TURBINES

S. G. F. P. TURBINE "B"

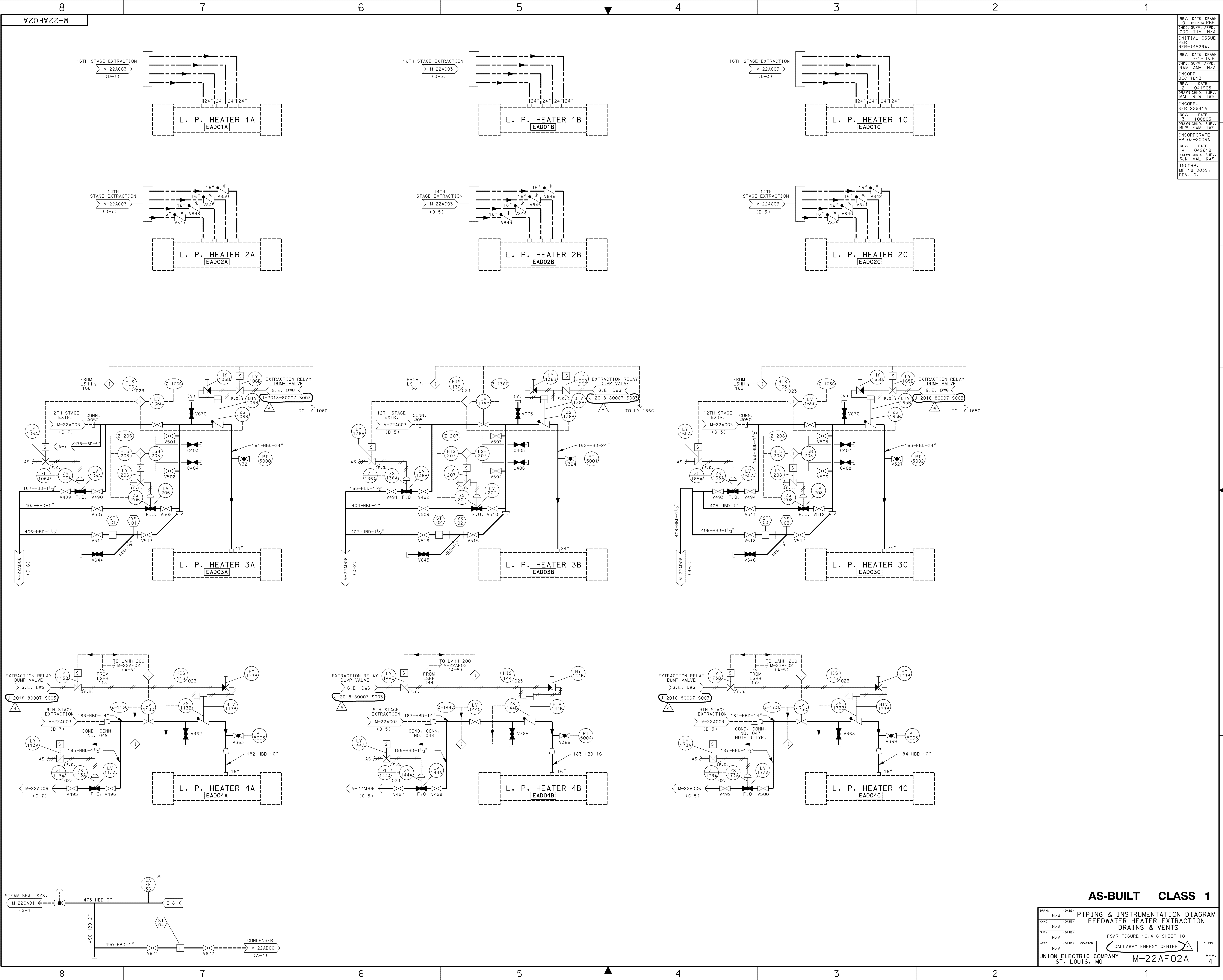
FSAR FIGURE 10.4-6 SHEET 8

CALLAWAY ENERGY CENTER

UNION ELECTRIC COMPANY
ST. LOUIS, MO

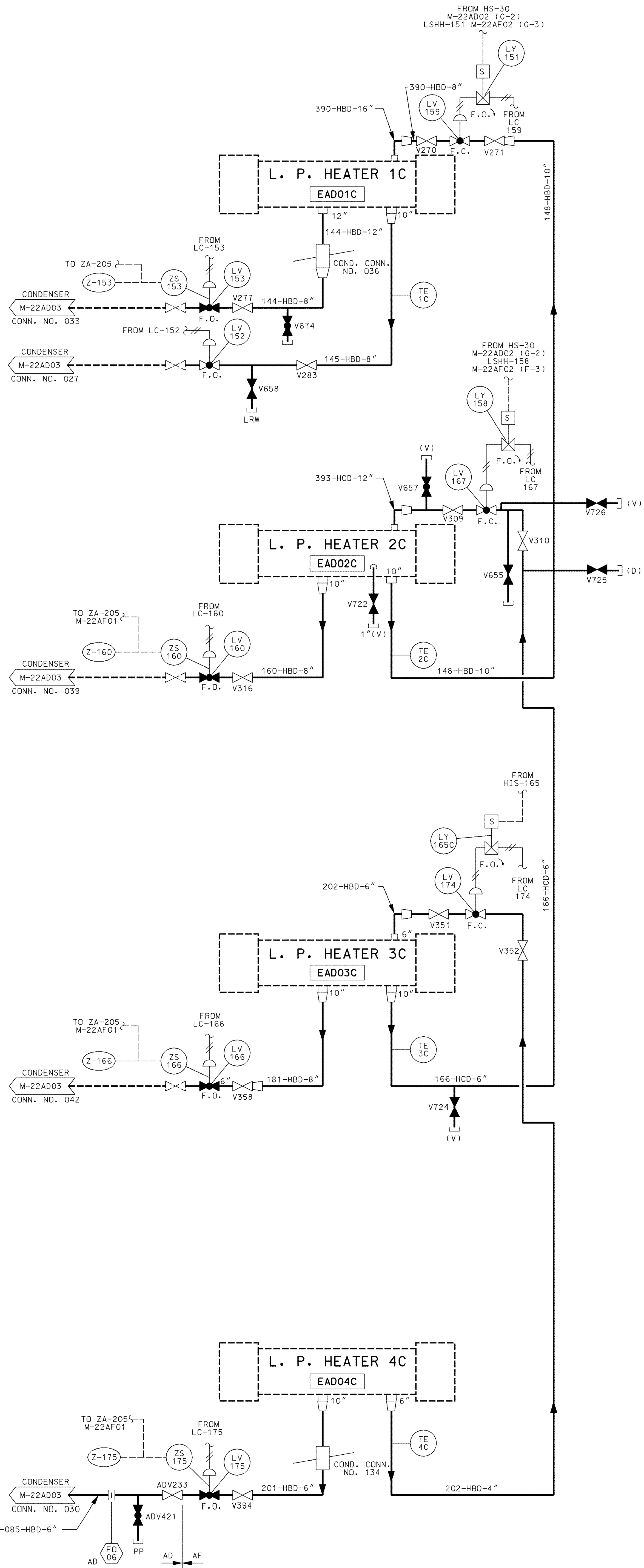
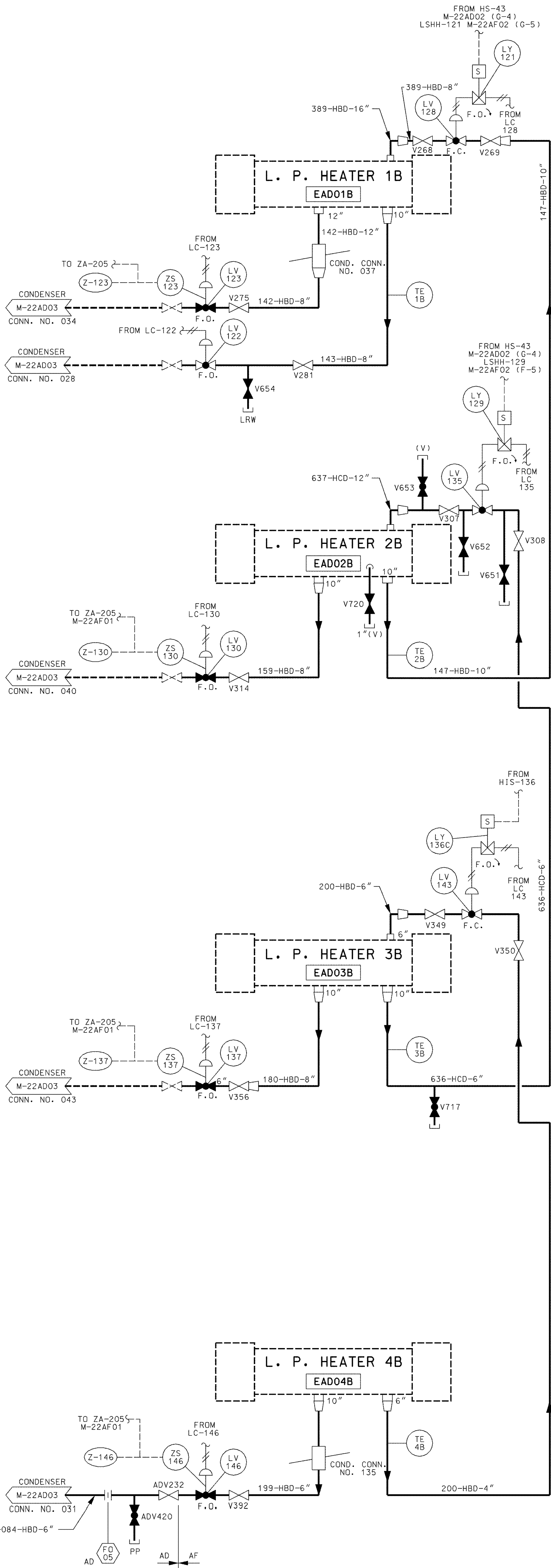
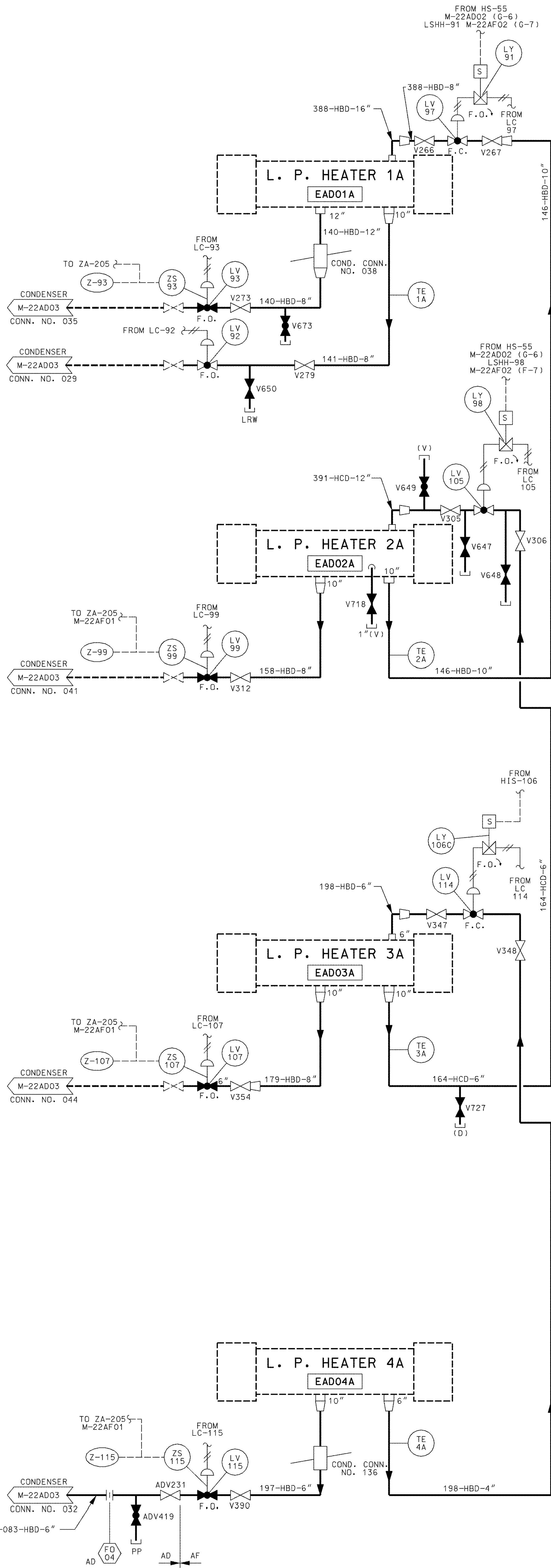
M-22FC04

REV. 23



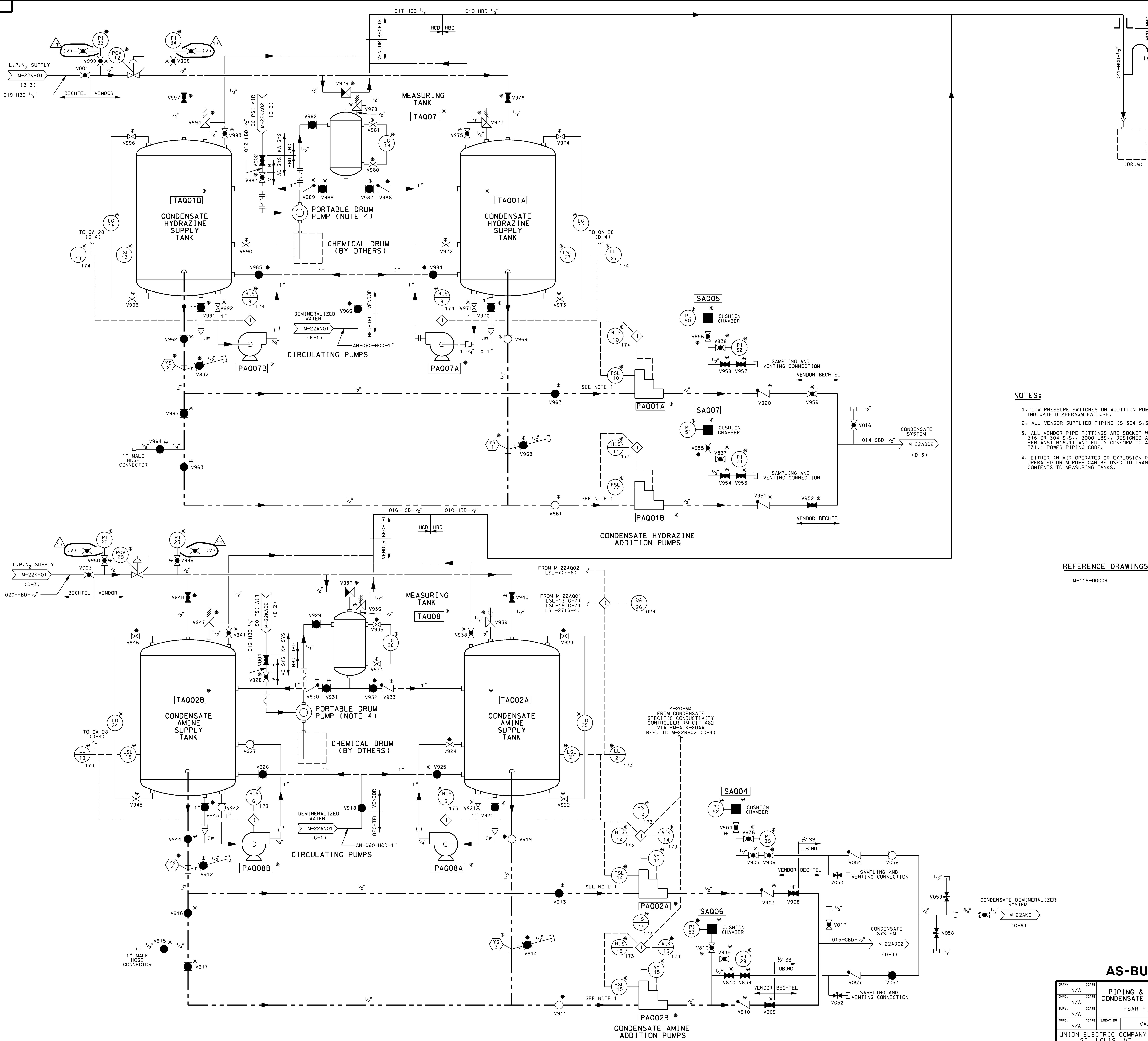
REV.	DATE	DRAWN
0	020394	RBF
CHKD.	SUPV.	APPR.
GDC	TJM	N/A
INITIAL	ISSUE	
PER		
REFR-14529A.		
REV.	DATE	DRAWN
1	042098	MAL
CHKD.	SUPV.	APPR.
HLP	AMR	N/A
INCORP.		
RMP	24-2009.	
REV.	DATE	DRAWN
2	102396	JHK
CHKD.	SUPV.	APPR.
DJB	JHK	N/A
INCORP.		
RMP	35-2011.	
REV.	DATE	DRAWN
3	031798	RLW
CHKD.	SUPV.	APPR.
MAL	RLW	N/A
INCORP.		
REFR-18815A.		
REV.	DATE	DRAWN
4	041905	
DRAWN	CHKD.	SUPV.
MAL	RLW	TWS
INCORP.		
REFR-22941A		

M-22AF02B



AS-BUILT CLASS 1

DRAWN	N/A	(DATE)	PIPING & INSTRUMENTATION DIAGRAM
CHKD.	N/A	(DATE)	FEEDWATER HEATER EXTRACTION
SUPV.	N/A	(DATE)	DRAINS & VENTS
APPD.	N/A	(DATE)	FSAR FIGURE 10.4-6 SHEET 11
LOCATION	CALLAWAY PLANT	CLASS	
UNION ELECTRIC COMPANY	M-22AF02B	REV.	4
ST. LOUIS, MO			



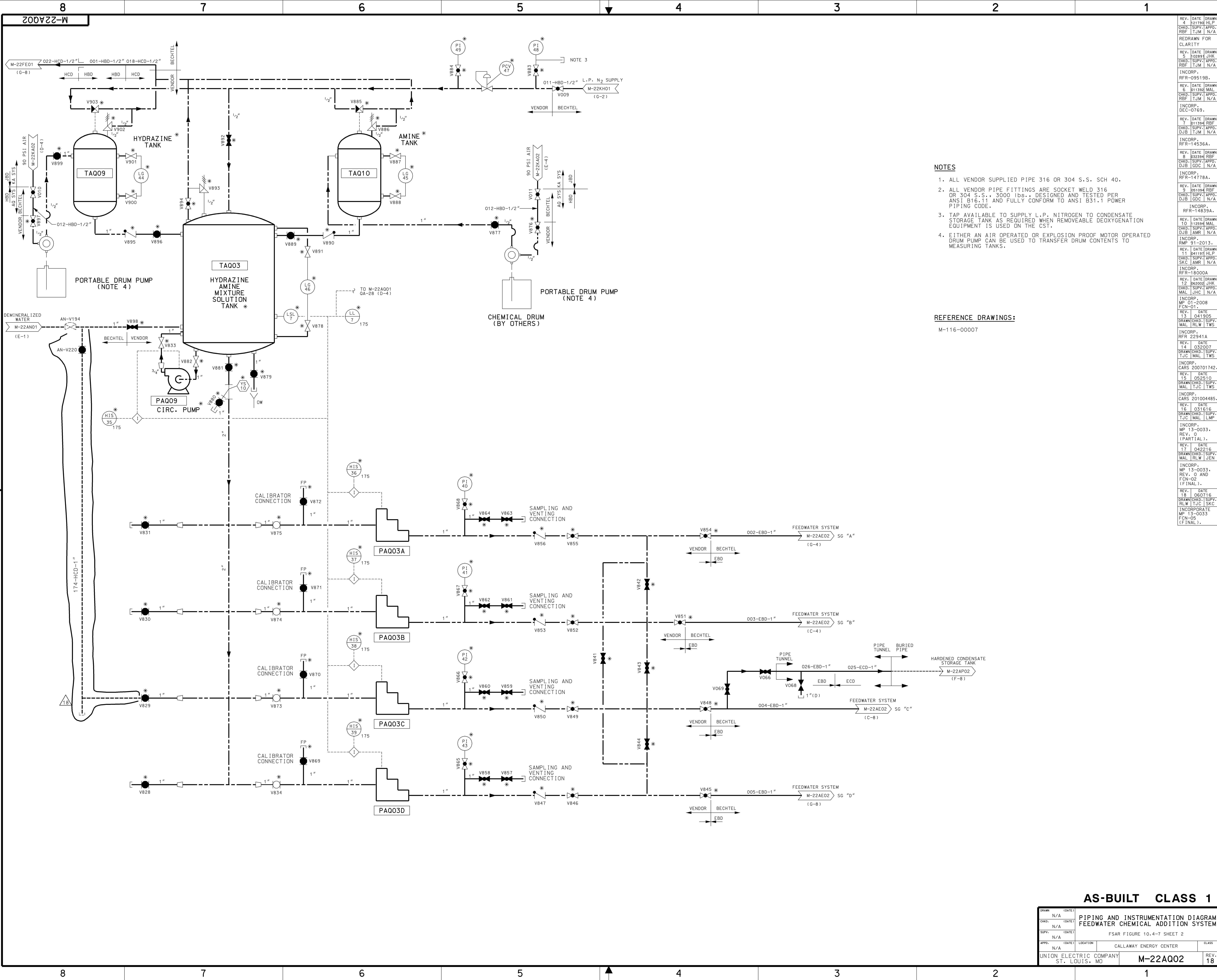
- NOTES:
- 1. LOW PRESSURE SWITCHES ON ADDITION PUMPS INDICATE DIAPHRAGM FAILURE.
 - 2. ALL VENDOR SUPPLIED PIPING IS 304 S.S SCH. 40.
 - 3. ALL VENDOR PIPE FITTINGS ARE SOCKET WELD, 316 OR 304 S.S., 3000 LBS., DESIGNED AND TESTED PER ANSI B16.11 AND FULLY CONFORM TO ANSI B31.1 POWER PIPING CODE.
 - 4. EITHER AN AIR OPERATED OR EXPLOSION PROOF MOTOR OPERATED DRUM PUMP CAN BE USED TO TRANSFER DRUM CONTENTS TO MEASURING TANKS.

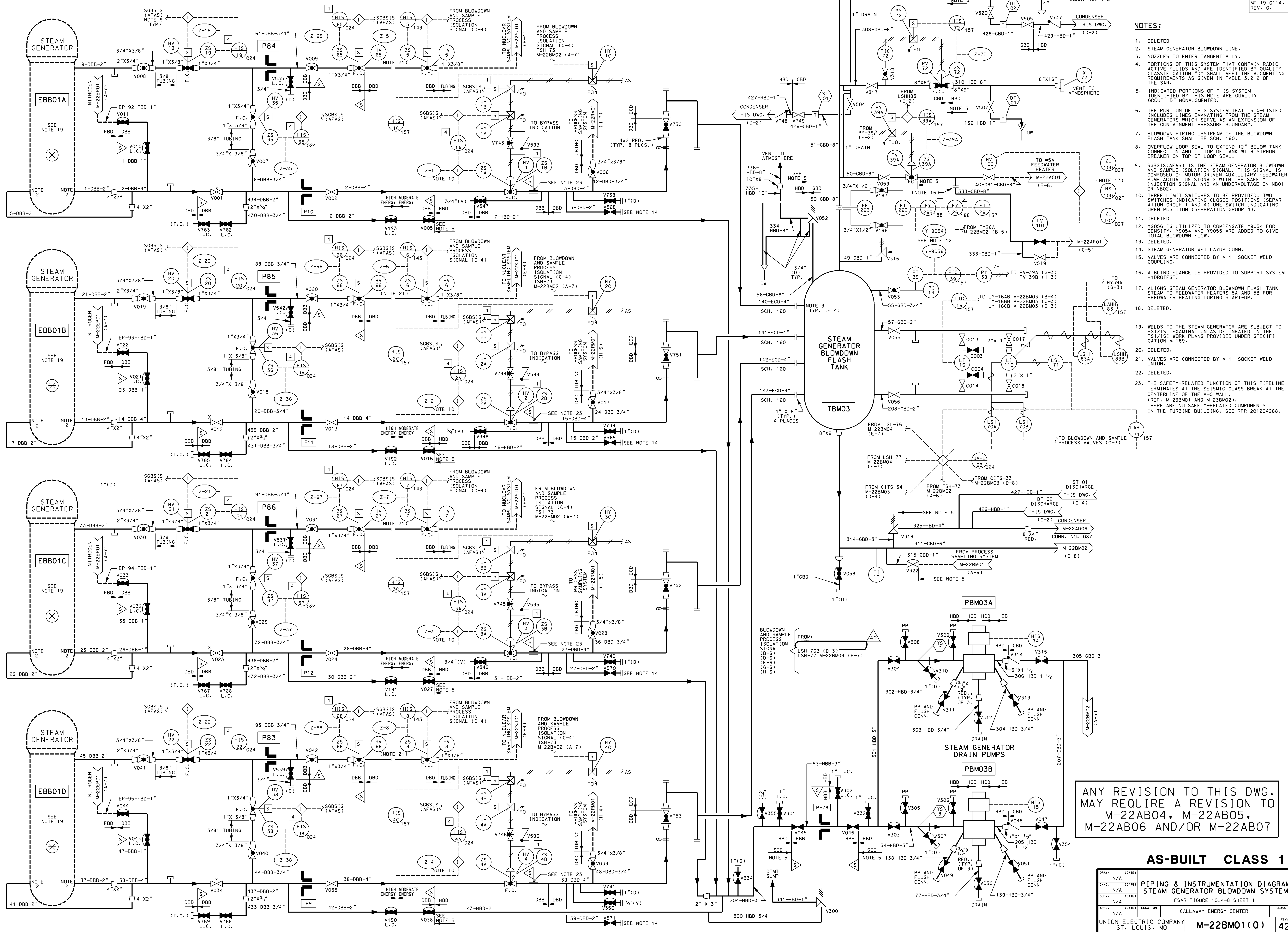
REFERENCE DRAWINGS:
M-116-00009

AS-BUILT CLASS 1

PIPING & INSTRUMENTATION DIAGRAM
CONDENSATE CHEMICAL ADDITION SYSTEM
FSAR FIGURE 10.4-7 SHEET 1

DRAWN	N/A	DATE	
CHKD.	N/A	DATE	
SUPV.	N/A	DATE	
APPD.	N/A	LOCATION	CALLAWAY ENERGY CENTER
UNION ELECTRIC COMPANY ST. LOUIS, MO	M-22AQ01	REV. 17	

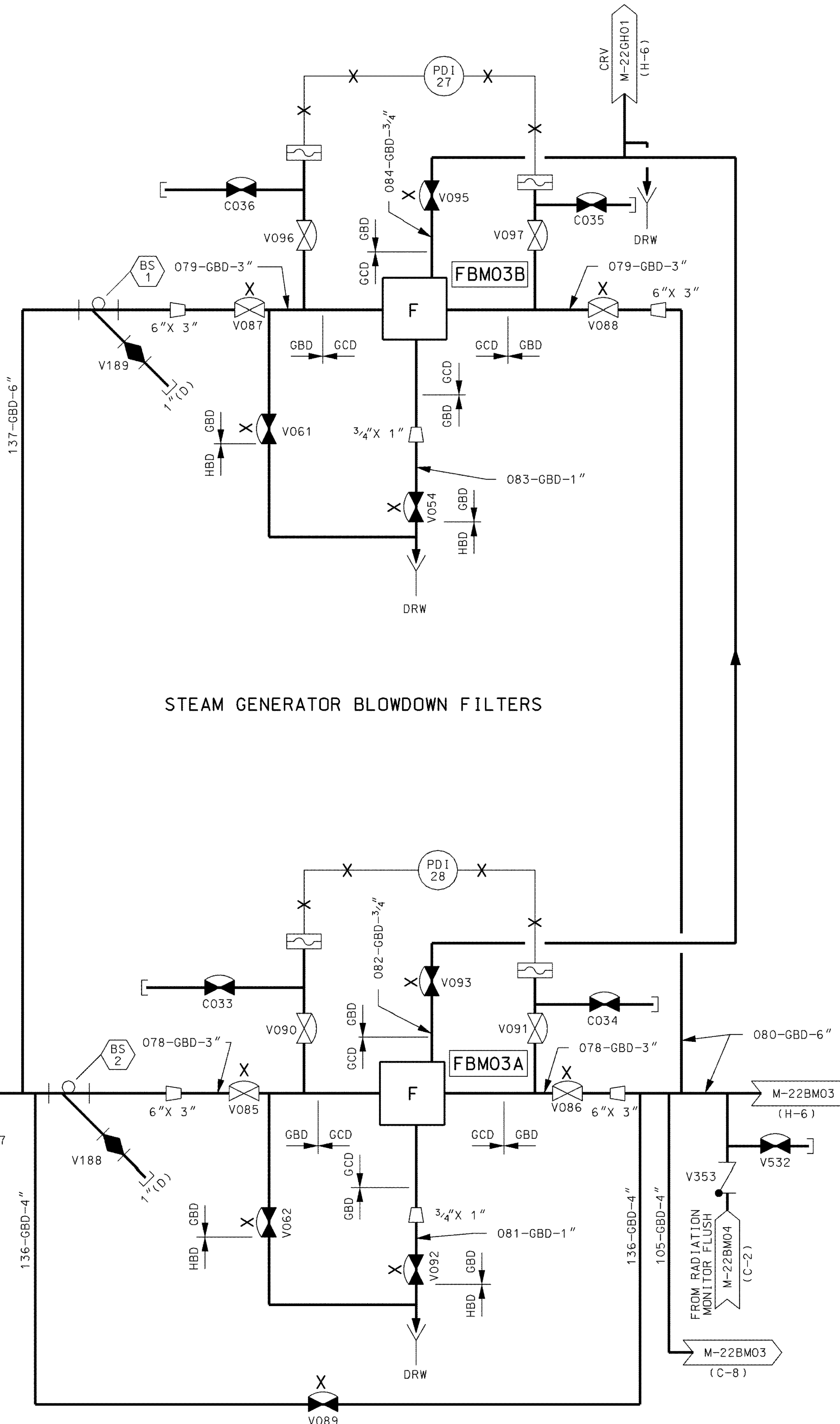
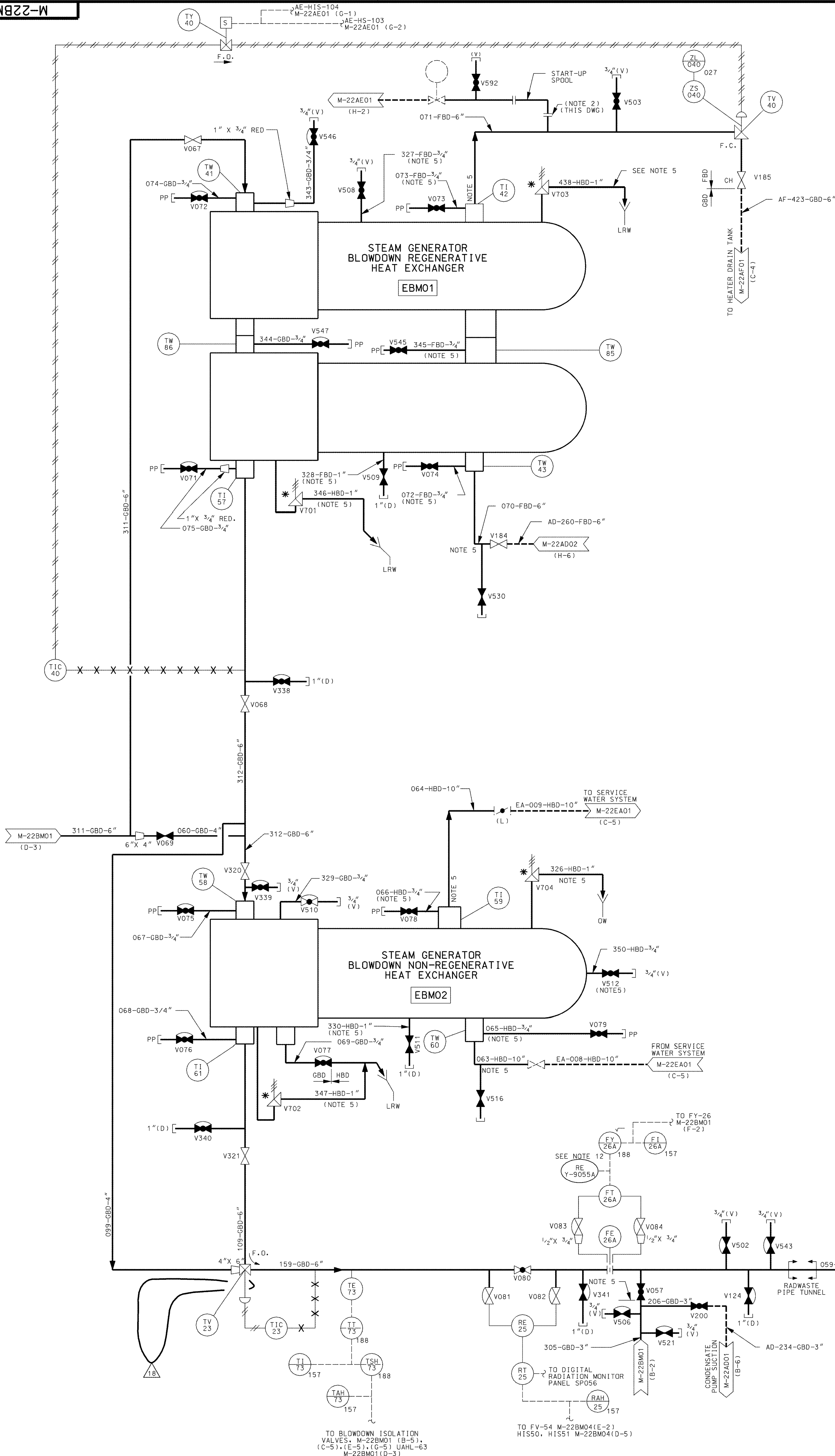




- NOTES:**
- DELETED
 - STEAM GENERATOR BLOWDOWN LINE.
 - NOZZLES TO ENTER TANGENTIALLY.
 - PORTIONS OF THIS SYSTEM THAT CONTAIN RADIO-ACTIVE FLUIDS AND ARE IDENTIFIED BY QUALITY CLASSIFICATION "D" SHALL MEET THE AUGMENTING REQUIREMENTS AS GIVEN IN TABLE 3.2-2 OF THE SAR.
 - INDICATED PORTIONS OF THIS SYSTEM ARE QUALITY GROUP "D" NONAUGMENTED.
 - THE PORTION OF THIS SYSTEM THAT IS 0-LISTED INCLUDES LINES EMANATING FROM THE STEAM GENERATORS WHICH SERVE AS AN EXTENSION OF THE CONTAINMENT PRESSURE BOUNDARY.
 - BLOWDOWN PIPING UPSTREAM OF THE BLOWDOWN FLASH TANK SHALL BE SCH. 160.
 - OVERFLOW LOOP SEAL TO EXTEND 12" BELOW TANK CONNECTION AND TO TOP OF TANK WITH SIPHON BREAKER ON TOP OF LOOP SEAL.
 - SGBSIS(AFAS) IS THE STEAM GENERATOR BLOWDOWN AND SAMPLE ISOLATION SIGNAL. THIS SIGNAL IS COMPOSED OF MOTOR DRIVEN AUXILIARY FEEDWATER PUMP ACTUATION SIGNALS WITH THE SAFETY INJECTION SIGNAL AND AN UNDERVOLTAGE ON NB01 OR NB02.
 - THREE LIMIT SWITCHES TO BE PROVIDED. TWO SWITCHES INDICATING CLOSED POSITIONS (SEPARATION GROUP 1 AND 4) ONE SWITCH INDICATING OPEN POSITION (SEPARATION GROUP 4).
 - DELETED
 - Y9056 IS UTILIZED TO COMPENSATE Y9054 FOR DENSITY. Y9054 AND Y9055 ARE ADDED TO GIVE TOTAL BLOWDOWN FLOW.
 - DELETED.
 - STEAM GENERATOR WET LAYOUT CONN.
 - VALVES ARE CONNECTED BY A 1" SOCKET WELD COUPLING.
 - A BLIND FLANGE IS PROVIDED TO SUPPORT SYSTEM HYDROTEST.
 - ALIGN STEAM GENERATOR BLOWDOWN FLASH TANK STEAM TO FEEDWATER HEATERS 5A AND 5B FOR FEEDWATER HEATING DURING START-UP.
 - DELETED.
 - WELDS TO THE STEAM GENERATOR ARE SUBJECT TO PS/ISI EXAMINATION AS DELINEATED IN THE PS/ISI WORK PLANS PROVIDED UNDER SPECIFICATION M-189.
 - DELETED.
 - VALVES ARE CONNECTED BY A 1" SOCKET WELD UNION.
 - DELETED.
 - THE SAFETY-RELATED FUNCTION OF THIS PIPELINE TERMINATES AT THE SEISMIC CLASS BREAK AT THE CENTERLINE OF THE 4-O WALL. (REF. M-23BM01 AND M-23BM02). THERE ARE NO SAFETY-RELATED COMPONENTS IN THE TURBINE BUILDING. SEE RFR 201204288.

ANY REVISION TO THIS DWG. MAY REQUIRE A REVISION TO M-22AB04, M-22AB05, M-22AB06 AND/OR M-22AB07

AS-BUILT CLASS 1			
PIPING & INSTRUMENTATION DIAGRAM			
STEAM GENERATOR BLOWDOWN SYSTEM			
FSAR FIGURE 10.4-8 SHEET 1			
CALLAWAY ENERGY CENTER			
UNION ELECTRIC COMPANY			
ST. LOUIS, MO			
M-22BM01 (0)			
REV. 42			



NOTES:

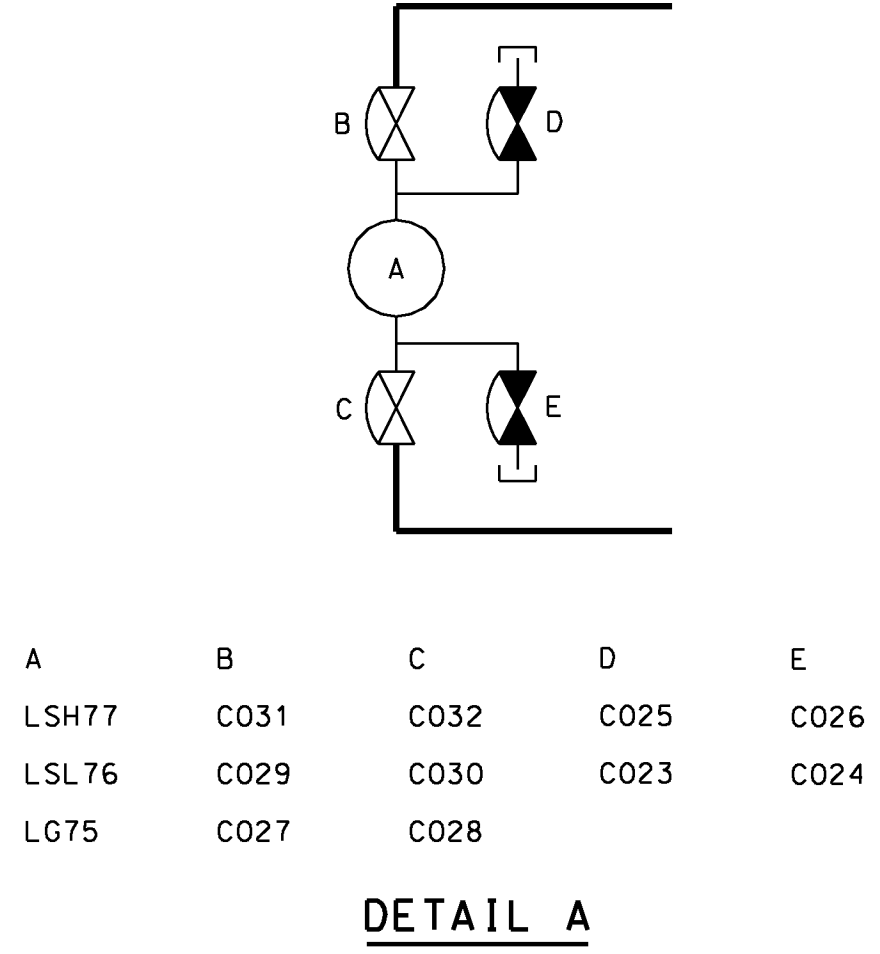
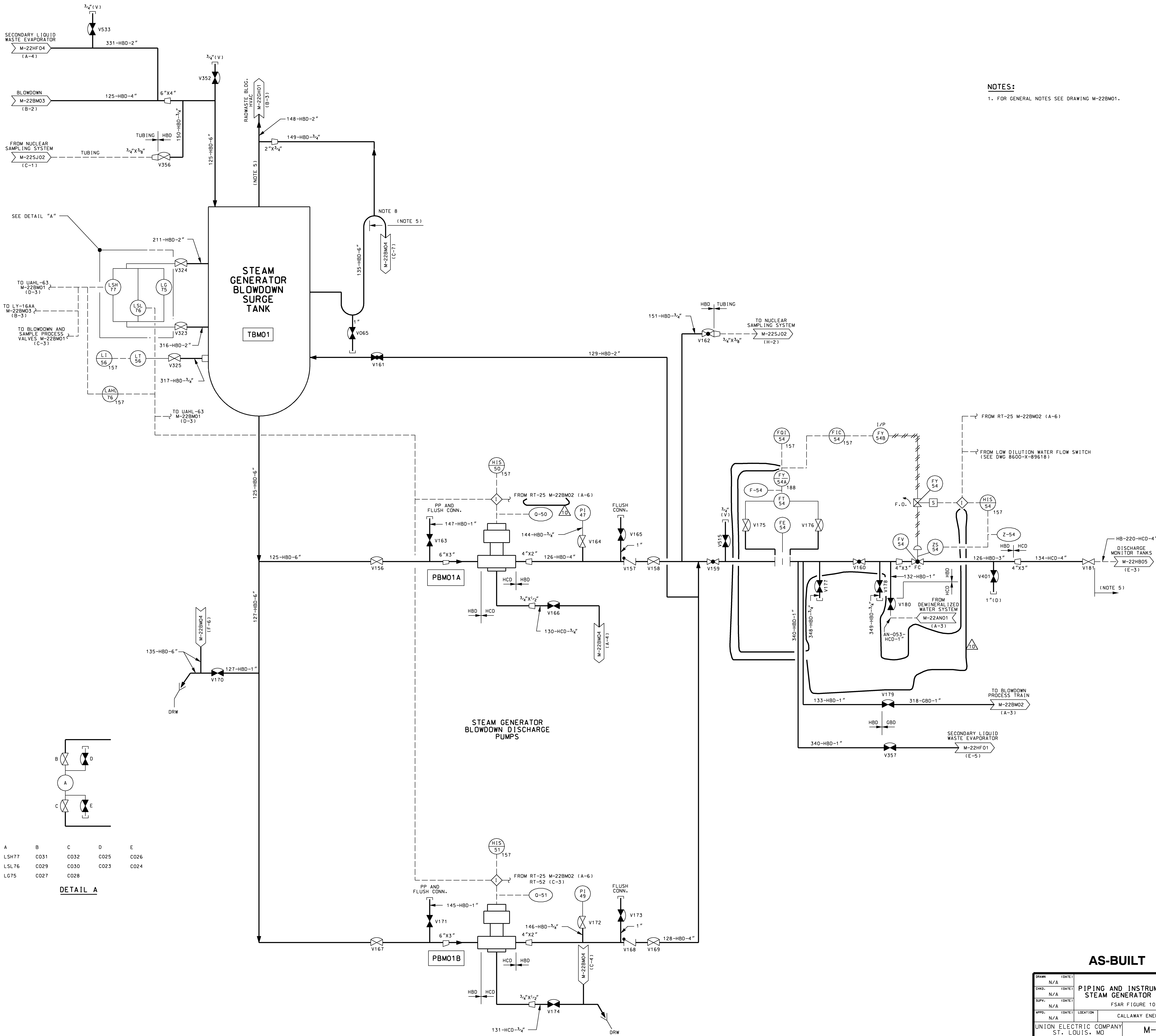
- FOR GENERAL NOTES SEE DRAWING M-22BM01.
- A BLIND FLANGE IS PROVIDED TO SUPPORT SYSTEM HYDROTEST AND FLUSH.
- DELETED

AS-BUILT CLASS 1

DRAWN	N/A	(DATE)	
CHECKED	N/A	(DATE)	
SUPPLY	N/A	(DATE)	
APPD.	N/A	(DATE)	
LOCATION	CALLAWAY PLANT	CLASS	
UNION ELECTRIC COMPANY	ST. LOUIS, MO	M-22BM02	REV. 18

PIPING & INSTRUMENTATION DIAGRAM
STEAM GENERATOR BLOWDOWN SYSTEM

FSAR FIGURE 10.4-8 SHEET 2

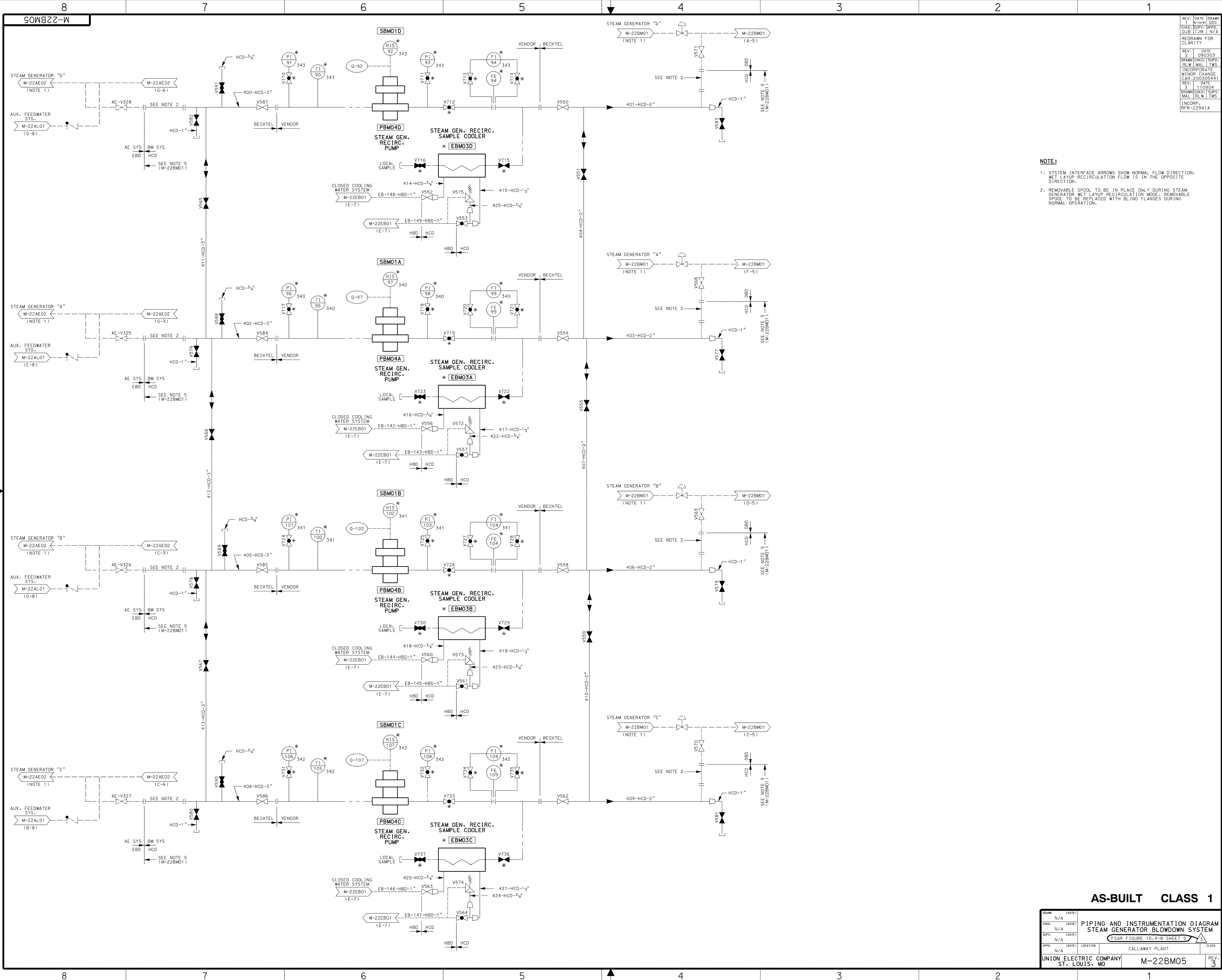


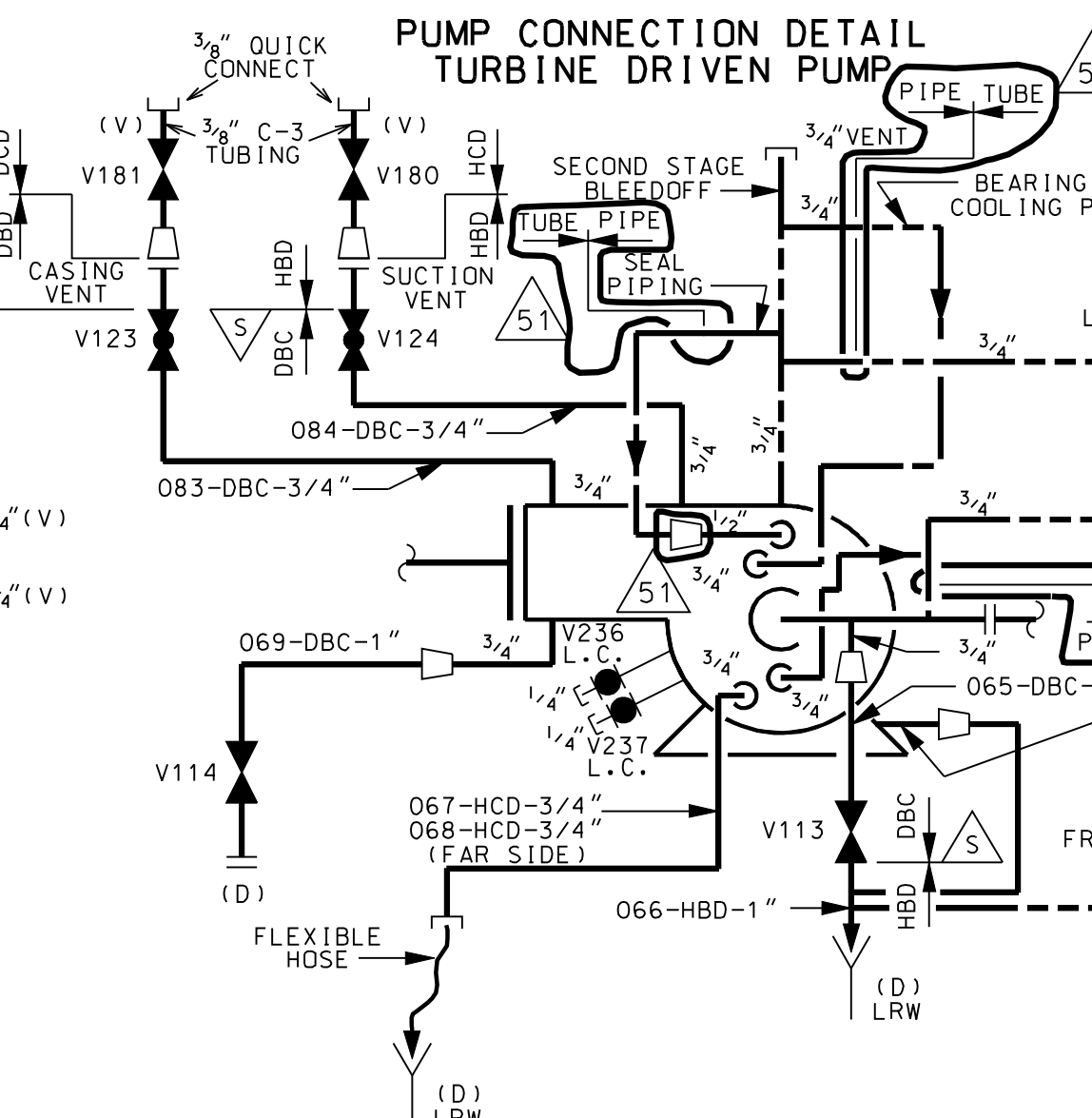
A	LSH77	C031	C032	C025	C026
	LSL76	C029	C030	C023	C024
	LG75	C027	C028		

NOTES:
1. FOR GENERAL NOTES SEE DRAWING M-22BM01.

AS-BUILT CLASS 1			
DRAWING (DATE)			
CHKD.	N/A	(DATE)	
SUPV.	N/A	(DATE)	
APPD.	N/A	(DATE)	
UNION ELECTRIC COMPANY		ST. LOUIS, MO	
M-22BM04		REV.	10

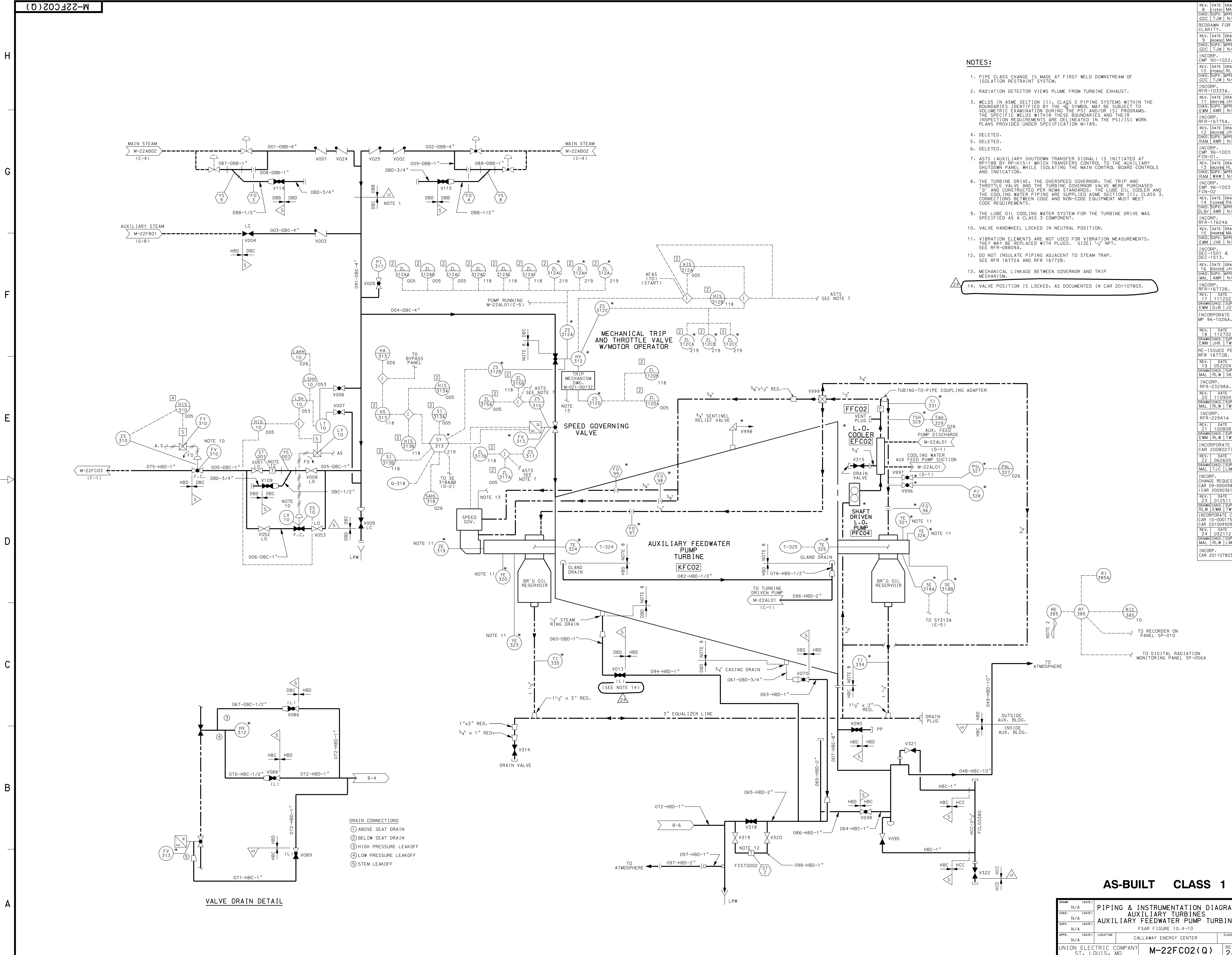
PIPING AND INSTRUMENTATION DIAGRAM
STEAM GENERATOR BLOWDOWN SYSTEM
FSAR FIGURE 10.4-8 SHEET 4
CALLAWAY ENERGY CENTER





AS-BUILT CLASS 1

DRWN	DATE	PIPING & INSTRUMENTATION DIAGRAM AUXILIARY FEEDWATER SYSTEM FSAR FIGURE 10.4-9		
N/A				
CHD:	DATE			
N/A				
SUPV:	DATE			
N/A				
APPD:	DATE	LOCATION	CLASS	
N/A		CALLAWAY ENERGY CENTER		
UNION ELECTRIC COMPANY ST. LOUIS, MO		M-22AL01(O)		REV. 51



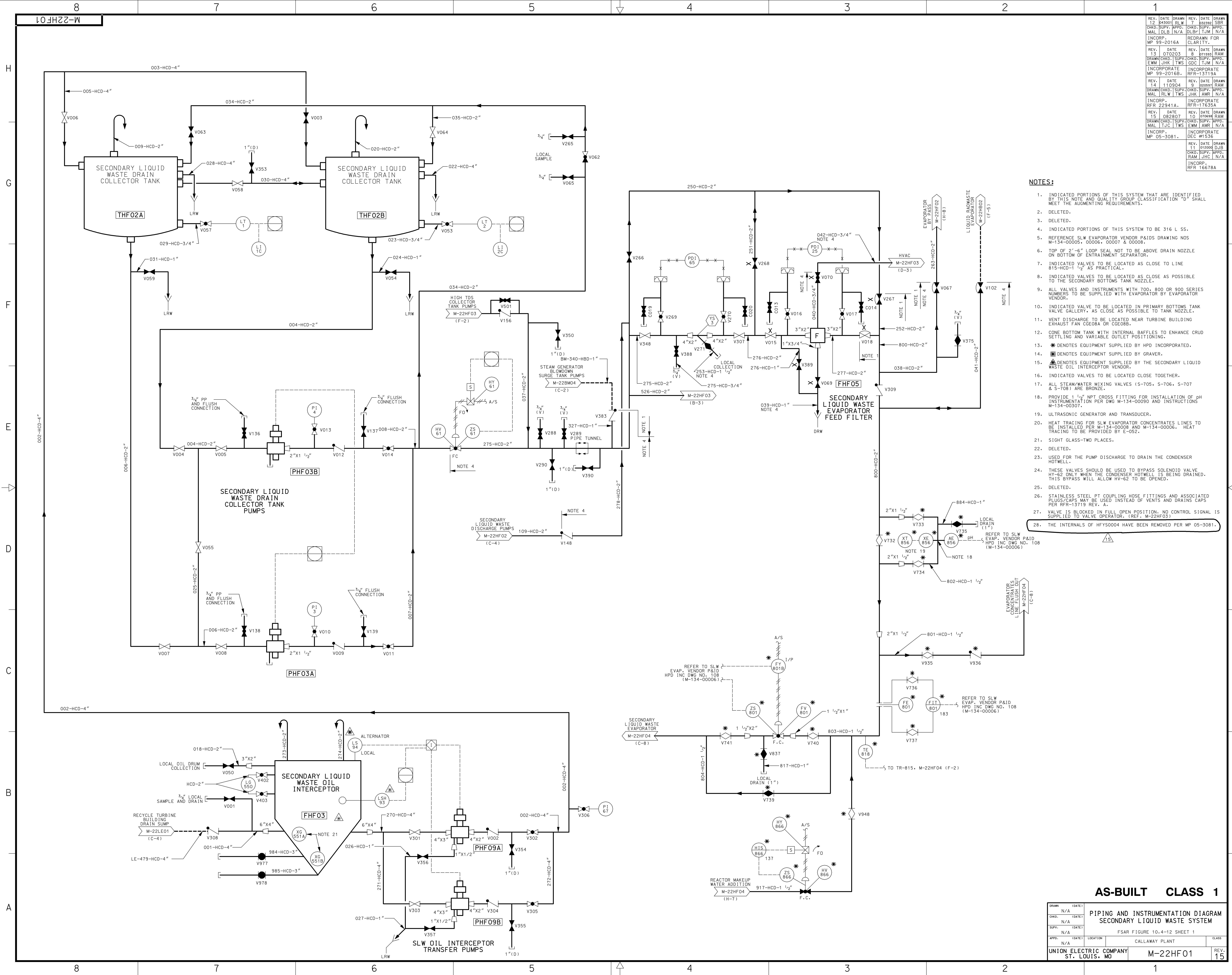
- NOTES:**
- PIPE CLASS CHANGE IS MADE AT FIRST WELD DOWNSTREAM OF ISOLATION RESTRAINT SYSTEM.
 - RADIATION DETECTOR VIEWS PLUME FROM TURBINE EXHAUST.
 - WELDS IN ASME SECTION III, CLASS 2 PIPING SYSTEMS WITHIN THE BOUNDARIES IDENTIFIED BY THE SYMBOL MAY BE SUBJECT TO VOLUMETRIC EXAMINATION DURING THE PSI AND/OR ISI PROGRAMS. THE SPECIFIC WELDS WITHIN THESE BOUNDARIES AND THEIR INSPECTION REQUIREMENTS ARE DELINEATED IN THE PSI/ISI WORK PLANS PROVIDED UNDER SPECIFICATION M-189.
 - DELETED.
 - DELETED.
 - DELETED.
 - ASTS (AUXILIARY SHUTDOWN TRANSFER SIGNAL) IS INITIATED AT RP118B BY RP-HIS-1 WHICH TRANSFERS CONTROL TO THE AUXILIARY SHUTDOWN PANEL WHILE ISOLATING THE MAIN CONTROL BOARD CONTROLS AND INDICATION.
 - THE TURBINE DRIVE, THE OVERSPEED GOVERNOR, THE TRIP AND THROTTLE VALVE AND THE TURBINE GOVERNOR VALVE WERE PURCHASED 'O' AND CONSTRUCTED PER NEMA STANDARDS. THE LUBE OIL COOLER AND THE COOLING WATER PIPING ARE SUPPLIED ASME SECTION III, CLASS 3. CONNECTIONS BETWEEN CODE AND NON-CODE EQUIPMENT MUST MEET CODE REQUIREMENTS.
 - THE LUBE OIL COOLING WATER SYSTEM FOR THE TURBINE DRIVE WAS SPECIFIED AS A CLASS 3 COMPONENT.
 - VALVE HANDWHEEL LOCKED IN NEUTRAL POSITION.
 - VIBRATION ELEMENTS ARE NOT USED FOR VIBRATION MEASUREMENTS. THEY MAY BE REPLACED WITH PLUGS. SIZE: 1/2" NPT. SEE RFR-080904.
 - DO NOT INSULATE PIPING ADJACENT TO STEAM TRAP. SEE RFR 16772A AND RFR 16772B.
 - MECHANICAL LINKAGE BETWEEN GOVERNOR AND TRIP MECHANISM.
 - VALVE POSITION IS LOCKED, AS DOCUMENTED IN CAR 201107803.

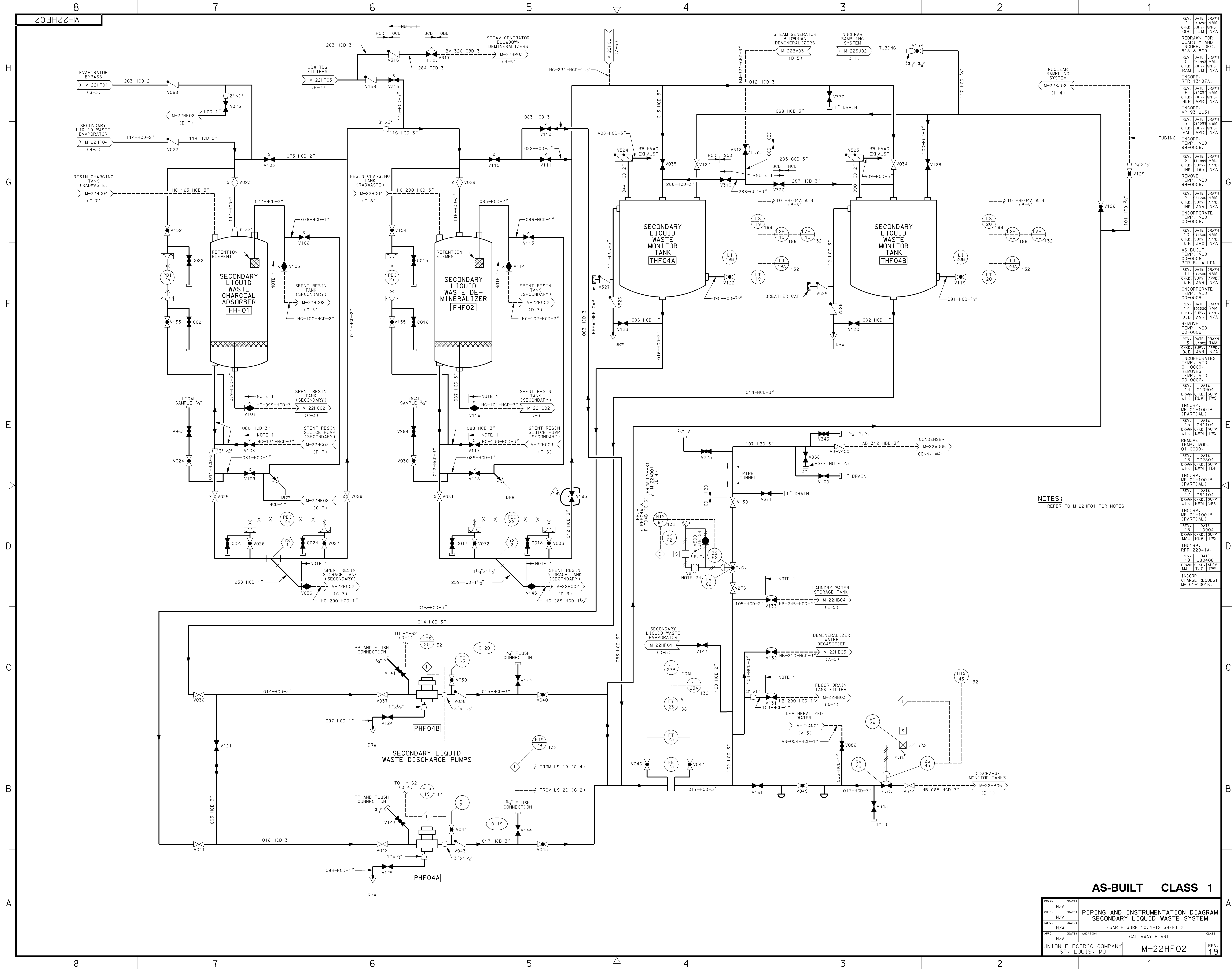
DRAWN		DATE	PIPING & INSTRUMENTATION DIAGRAM										
N/A			AUXILIARY TURBINES										
CHKD.		DATE	AUXILIARY FEEDWATER PUMP TURBIN										
N/A			FSAR FIGURE 10.4-10										
SUPV.		DATE											
N/A													
APPD.		DATE	LOCATION	CALLAWAY ENERGY CENTER							CLASS		
N/A													
UNION ELECTRIC COMPANY			M-22FC02(Q)								RE 2		
ST. LOUIS, MO													

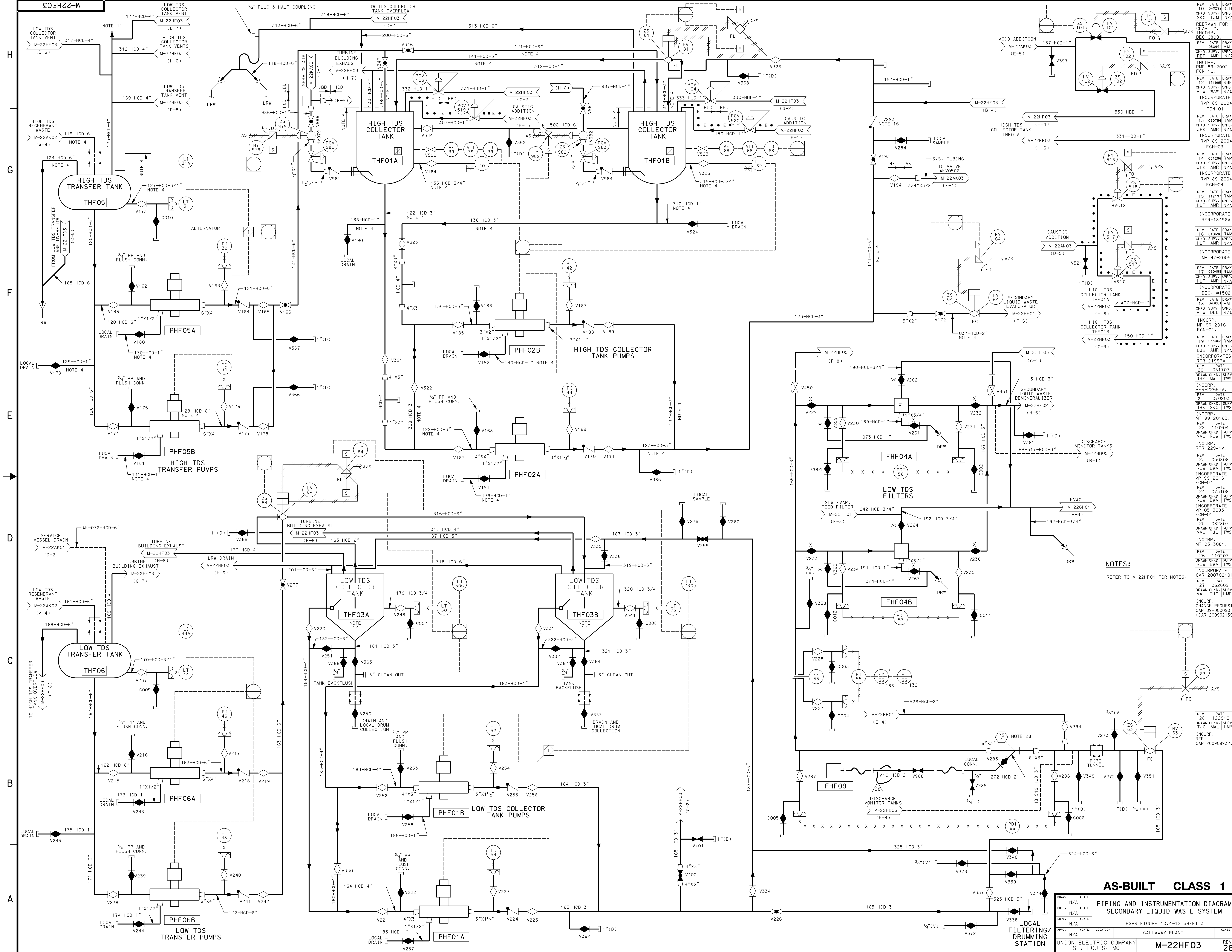
CALLAWAY - SP

FIGURE 10.4-11 is deleted

Rev. OL-10
11/98







NOTES:
REFER TO M-22HF01 FOR NOTES.

AS-BUILT CLASS 1

PIPING AND INSTRUMENTATION DIAGRAM
SECONDARY LIQUID WASTE SYSTEM

DRWN: N/A

DATE: (DATE)

CHKD: N/A

DATE: (DATE)

SUPV: N/A

DATE: (DATE)

APPV: N/A

DATE: (DATE)

LOCATION: CALLAWAY PLANT

CLASS: M-22HF03

REV: 28

REV. DATE DRAWN 0 040324 DJB
CHKD: SUPV: APPV: SKC TJM N/A
REDRAWN FOR CLARITY
INCORP: DEC-0809
REV. DATE DRAWN 11 080994 MAL
CHKD: SUPV: APPV: RBF AMR N/A
INCORP: RMP 89-2002 FCN-01
REV. DATE DRAWN 12 121998 RBF
CHKD: SUPV: APPV: RLW WAM N/A
INCORP: RMP 89-2004 FCN-01
REV. DATE DRAWN 13 020796 RAM
CHKD: SUPV: APPV: JHK AMR N/A
INCORP: RMP 89-2004 FCN-04
REV. DATE DRAWN 15 112191 RAM
CHKD: SUPV: APPV: HLP AMR N/A
INCORP: RFR-18496A
REV. DATE DRAWN 16 010898 RAM
CHKD: SUPV: APPV: HLP AMR N/A
INCORP: MP 97-2005
REV. DATE DRAWN 17 020498 RAM
CHKD: SUPV: APPV: HLP AMR N/A
INCORP: DEC. #1502
REV. DATE DRAWN 18 040300 MAL
CHKD: SUPV: APPV: RLW DLB N/A
INCORP: MP 99-2016 FCN-01
REV. DATE DRAWN 19 040300 RAM
CHKD: SUPV: APPV: DJB AMR N/A
INCORP: RFR-21397A
REV. DATE DRAWN 20 031703
CHKD: SUPV: APPV: JHK MAL TWS
REV. DATE DRAWN 21 070203
CHKD: SUPV: APPV: JHK SKC TWS
INCORP: MP 99-2016B
REV. DATE DRAWN 22 110904
CHKD: SUPV: APPV: MAL RLW TWS
INCORP: RFR 22941A
REV. DATE DRAWN 23 050806
CHKD: SUPV: APPV: RLW LHM TWS
INCORP: MP 99-2016 FCN-01
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INCORP: MP 05-3083
REV. DATE DRAWN 25 082807
CHKD: SUPV: APPV: MAL TJC LMR
INCORP: MP 05-3081
REV. DATE DRAWN 26 110207
CHKD: SUPV: APPV: MAL TJC LMR
INCORP: CAR 200702191
REV. DATE DRAWN 27 062609
CHKD: SUPV: APPV: MAL TJC LMR
INCORP: CHANGE REQUEST CAR 09-000090
REV. DATE DRAWN 28 122910
CHKD: SUPV: APPV: TJC MAL LMP
INCORP: RFR CAR 200909932

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