

REVISIONS	
76	EC 11951 A/R 01121715 DWN: JWP 3-5-08 CHK: BJR 3-11-08 APPR: RMG 3-12-08
77	EC 12513 A/R 01121399 DWN: JWP 6-25-08 CHK: BAL 6-26-08 APPR: BJR 6-26-08
78	EC 12835 DWN: JWP 7-15-08 CHK: BAL 7-21-08 APPR: ERF 7-21-08
79	EC 14626 DWN: JWP 8-5-09 CHK: BAL 8-6-09 APPR: SRR 8-26-09
80	EC 21222 DWN: JWP 12-6-12 CHK: BAL 12-10-12 APPR: CLT 12-10-12

- NOTES:**
- SLOPE 1/8" PER FOOT UNLESS OTHERWISE INDICATED.
 - DEPTH OF LOOP SEALS TO BE A MINIMUM OF 36".
 - AIR SUPPLY TO STACK SAMPLE STATION.....AI-65
 - AIR SUPPLY TO STACK STOP.....AI-62
 - AIR SUPPLY TO STACK DILUTION FAN DAMPERS.....AI-64
 - VENDOR DRAWING NX-9288-14

COLOR LEGEND	
	ASME CLASS 1/QUALITY GROUP A
	ASME CLASS 2/QUALITY GROUP B
	ASME CLASS 3/QUALITY GROUP C
	QUALITY GROUP D
	SAFETY RELATED MECHANICAL
	SAFETY RELATED ELECTRICAL
	SPECIAL CONCERNS ITEM

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M-142

MONTICELLO CAD DWG "P"

P&ID
OFF-GAS SYSTEM

MONTICELLO NUCLEAR GENERATING PLANT

NORTHERN STATES POWER COMPANY

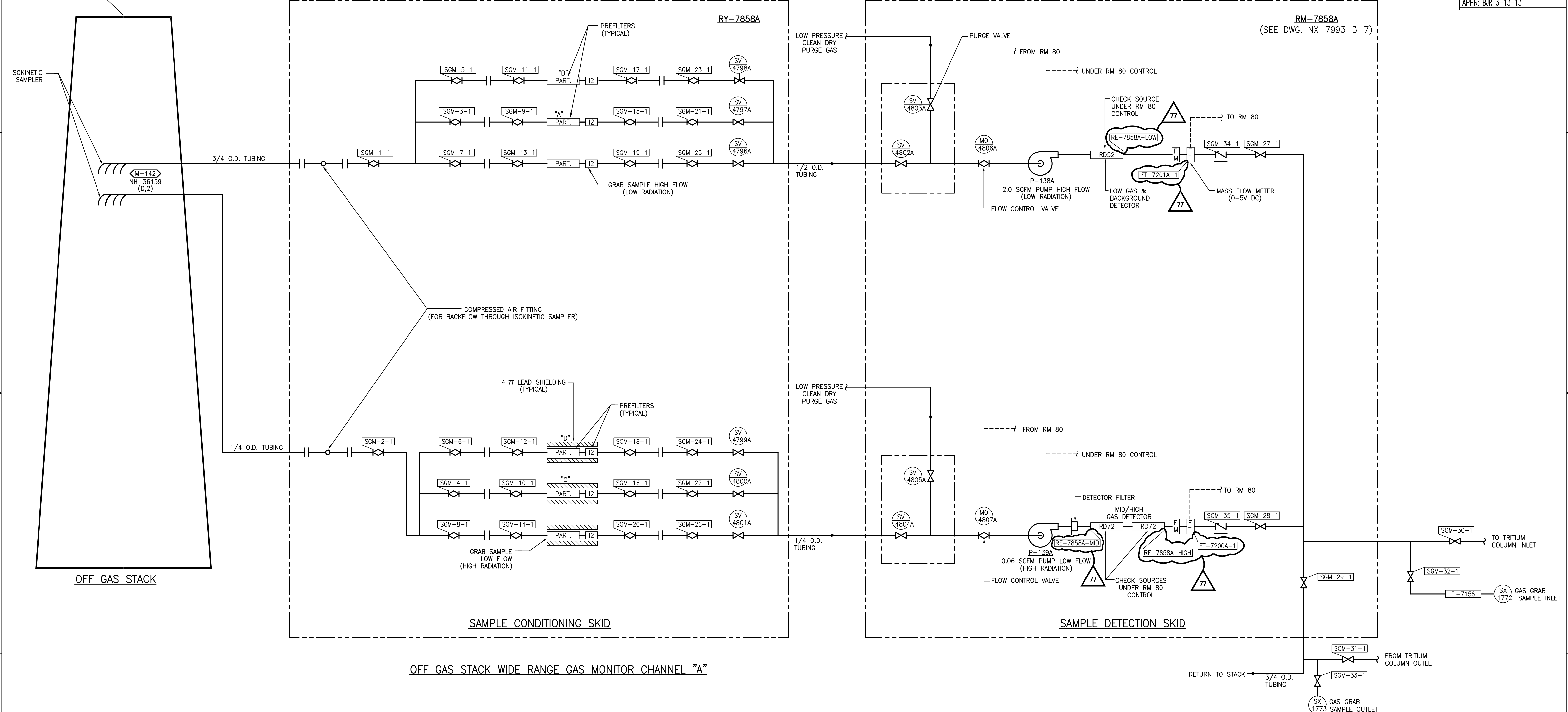
SCALE: NONE

REV 80

NH-36159

NH-36159-2

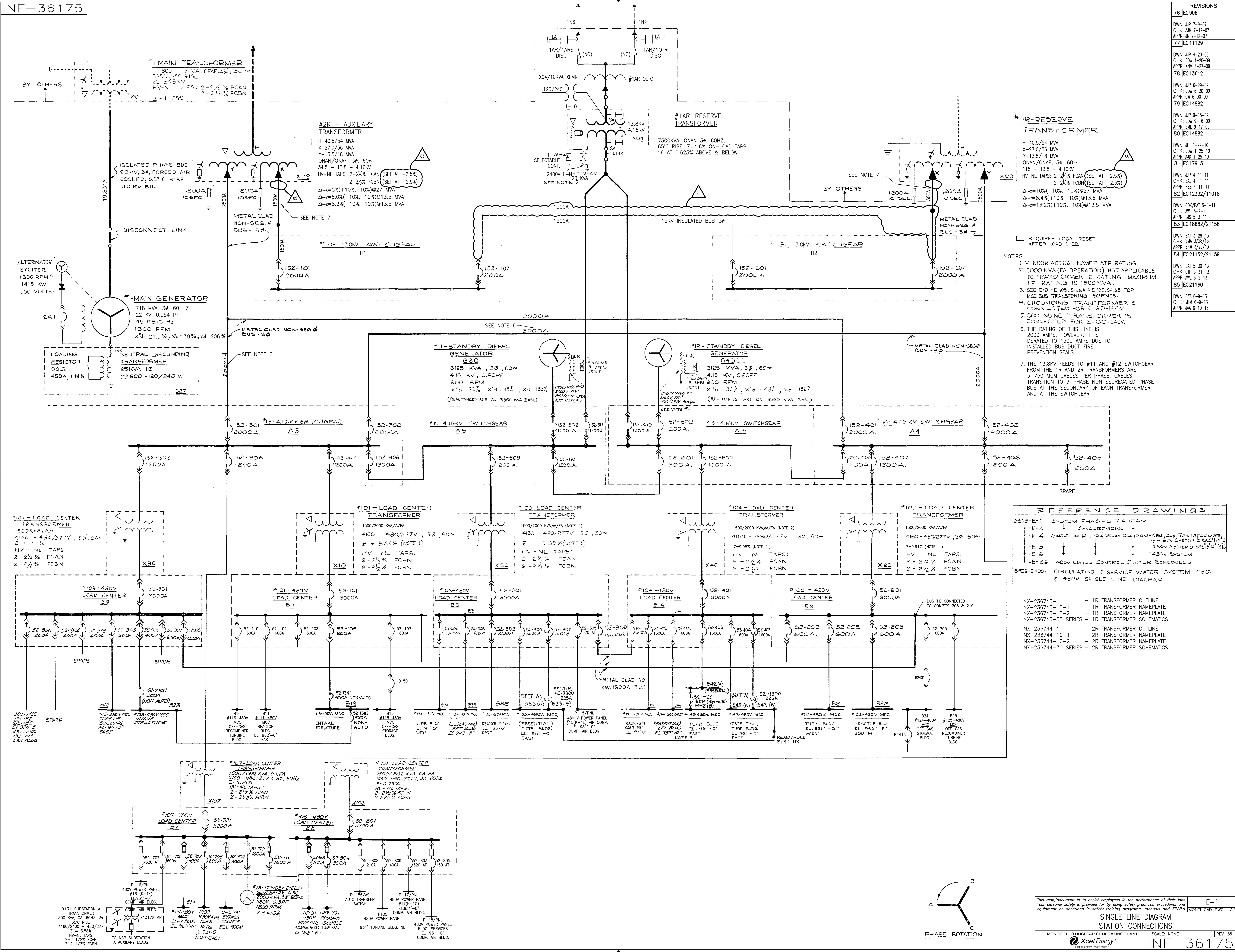
REVISIONS	
76	EC 11951 A/R 01121715 DWN: JJP 3-5-08 CHK: BJR 3-11-08 APPR: RMG 3-12-08
77	EC 20719 DWN: JJP 3-8-13 CHK: BAL 3-11-13 APPR: BJR 3-13-13

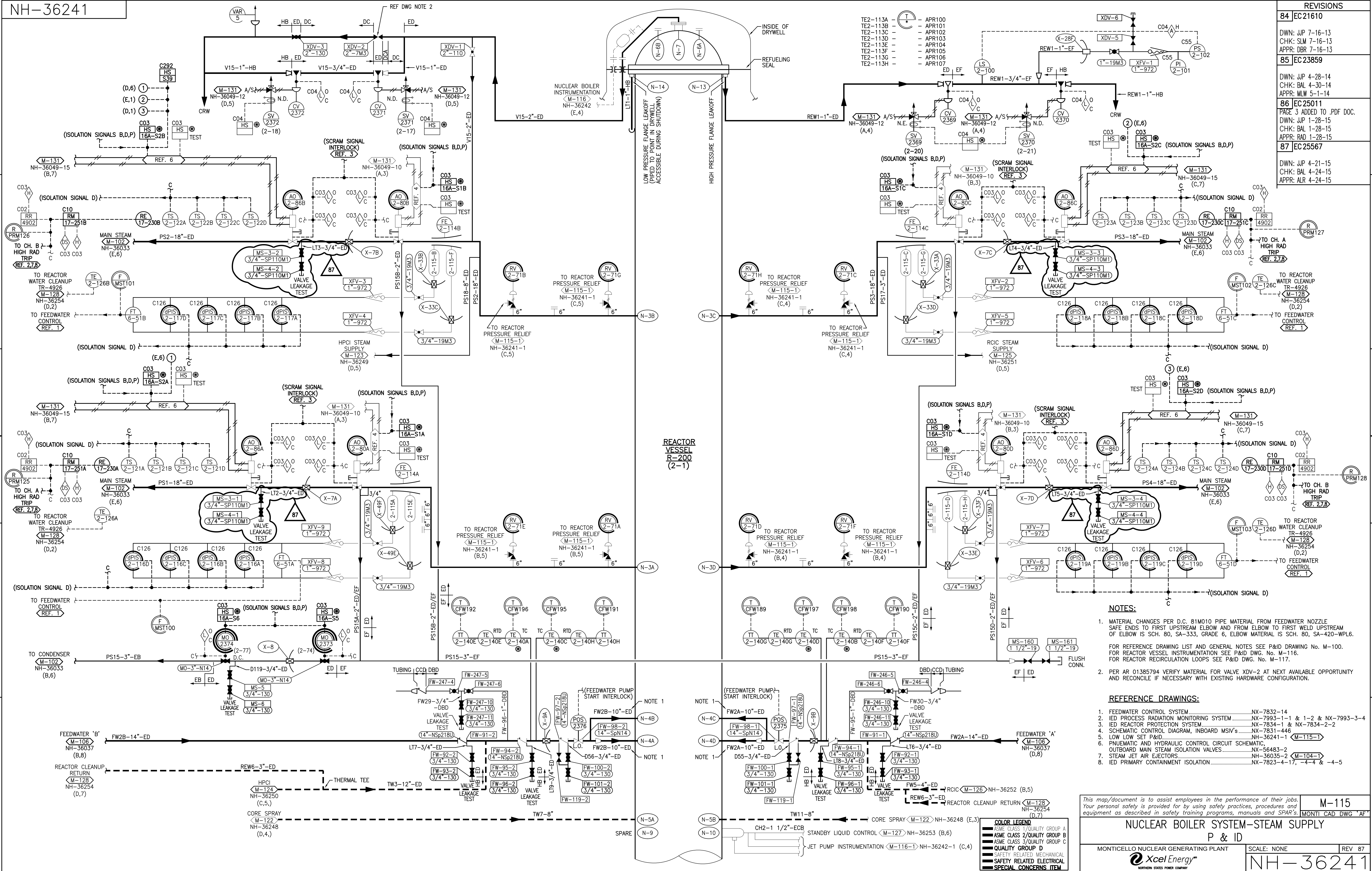


COLOR LEGEND	
■	ASME CLASS 1/QUALITY GROUP A
■	ASME CLASS 2/QUALITY GROUP B
■	ASME CLASS 3/QUALITY GROUP C
■	QUALITY GROUP D
■	SAFETY RELATED MECHANICAL
■	SAFETY RELATED ELECTRICAL
■	SPECIAL CONCERNS ITEM

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OFF GAS STACK GAS MONITOR CH. 'A'		MONTICELLO CAD DWG 'B'
MONTICELLO NUCLEAR GENERATING PLANT	SCALE: NONE	REV 77
Xcel Energy NORTHERN STATES POWER COMPANY		NH-36159-2

REVISONS	
76	EC906
DWN: JP 7-7-07/ CHK: AM 12-12-07/ APPR: JR 7-12-07	
77	EC11129
DWN: JP 4-20-09 CHK: DOW 4-20-09 APPR: KM 4-27-09	
78	EC13612
DWN: JP 4-29-09 CHK: DOW 3-30-09 APPR: JR 6-30-09	
79	EC14882
DWN: JP 9-15-09 CHK: DOW 9-15-09 APPR: JR 1-17-09	
80	EC14882
DWN: JL 1-22-10 CHK: DOW 1-25-10 APPR: AD 1-25-10	
81	EC17951
DWN: JP 4-11-11 CHK: DAL 4-11-11 APPR: RJS 4-11-11	
82	EC12332/11018
DWN: GOK/AP 5-1-11 CHK: MAL 5-1-11 APPR: LJS 5-3-11	
83	EC18682/21158
DWN: BT 3-28-13 CHK: SM 2-27-13 APPR: TSW 3/29/13	
84	EC21152/21159
DWN: BT 3-30-13 CHK: CP 3-31-13 APPR: MAL 6-2-13	
85	EC21610
DWN: BT 4-10-13 CHK: MAL 6-10-13 APPR: JA 6-10-13	





REVISIONS	
84	EC21610
DWN: JWP 7-16-13 CHK: SLW 7-16-13 APPR: DBR 7-16-13	
85	EC23859
DWN: JWP 4-28-14 CHK: BAL 4-30-14 APPR: MLW 5-1-14	
86	EC25011
PAGE 3 ADDED TO .PDF DOC. DWN: JWP 1-28-15 CHK: BAL 1-28-15 APPR: RAD 1-28-15	
87	EC25567
DWN: JWP 4-21-15 CHK: BAL 4-24-15 APPR: ALR 4-24-15	

- NOTES:**
- MATERIAL CHANGES PER D.C. 81M010 PIPE MATERIAL FROM FEEDWATER NOZZLE SAFE ENDS TO FIRST UPSTREAM ELBOW AND FROM ELBOW TO FIRST WELD UPSTREAM OF ELBOW IS SCH. 80, SA-333, GRADE 6, ELBOW MATERIAL IS SCH. 80, SA-420-WPL6.
 - FOR REFERENCE DRAWING LIST AND GENERAL NOTES SEE P&ID DRAWING No. M-100. FOR REACTOR VESSEL INSTRUMENTATION SEE P&ID DWG. No. M-116. FOR REACTOR RECIRCULATION LOOPS SEE P&ID DWG. No. M-117.
- REFERENCE DRAWINGS:**
- FEEDWATER CONTROL SYSTEM NX-7832-14
 - IED PROCESS RADIATION MONITORING SYSTEM NX-7993-1-1 & 1-2 & NX-7993-3-4
 - IED REACTOR PROTECTION SYSTEM NX-7834-1 & NX-7834-2-2
 - SCHEMATIC CONTROL DIAGRAM, INBOARD MSIVs NX-7831-446
 - LOW LOW SET P&ID NH-36241-1 (M-115-1)
 - PNEUMATIC AND HYDRAULIC CONTROL CIRCUIT SCHEMATIC, OUTBOARD MAIN STEAM ISOLATION VALVES NX-56483-2
 - STEAM JET AIR EJECTORS NH-36035-2 (M-104-1)
 - IED PRIMARY CONTAINMENT ISOLATION NX-7823-4-17, -4-4 & -4-5

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NUCLEAR BOILER SYSTEM-STEAM SUPPLY

P & ID

MONTICELLO NUCLEAR GENERATING PLANT

SCALE: NONE

REV 87

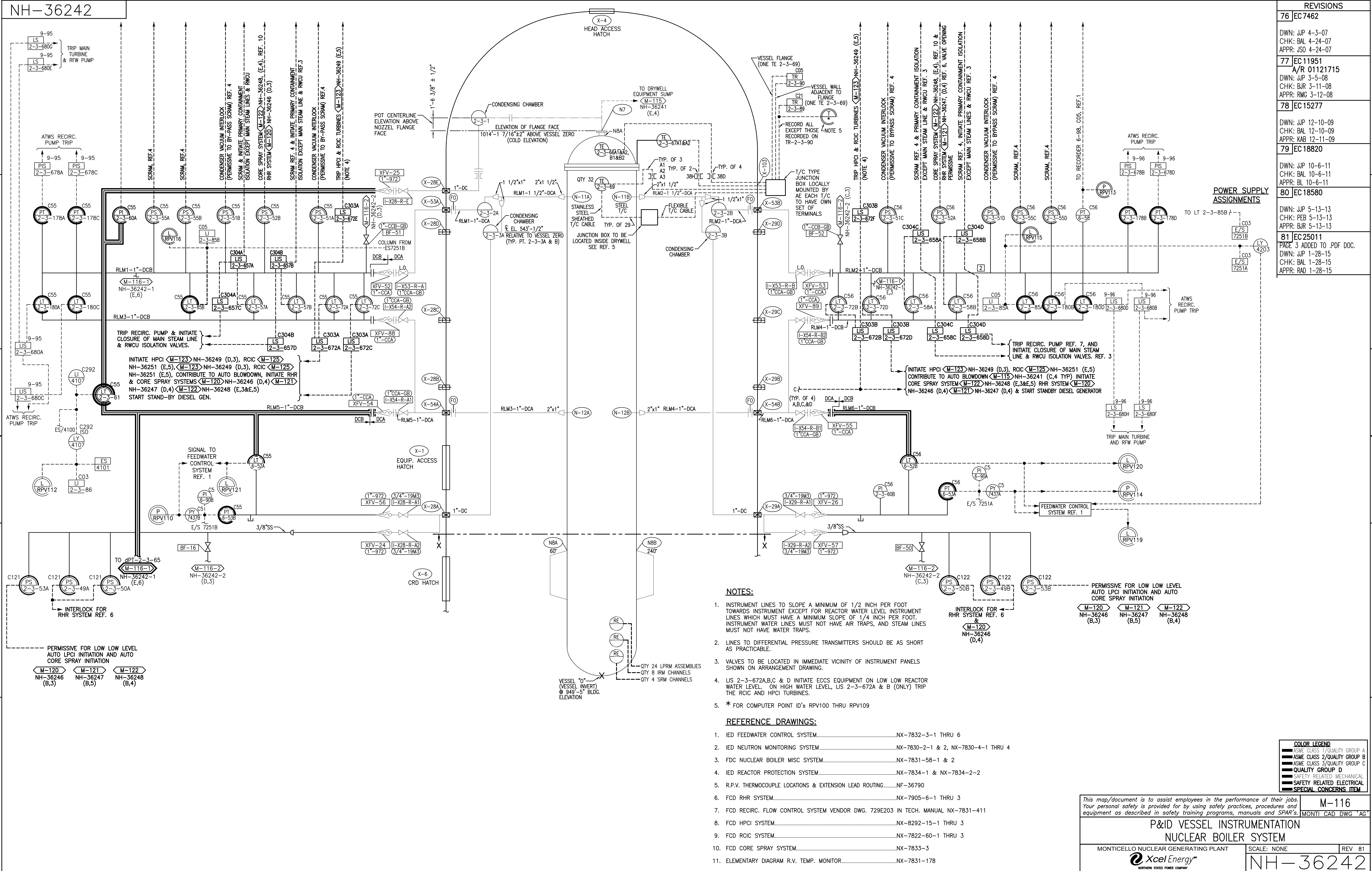
Xcel Energy

NORTHERN STATES POWER COMPANY

NH-36241

M-115

MONTICAD DWG "AF"



REVISIONS	
76	EC 7462
DWN: JWP 4-3-07 CHK: BAL 4-24-07 APPR: JSO 4-24-07	
77	EC 11951
A/R 01121715 DWN: JWP 3-5-08 CHK: BUR 3-11-08 APPR: RMG 3-12-08	
78	EC 15277
DWN: JWP 12-10-09 CHK: BAL 12-10-09 APPR: KAB 12-11-09	
79	EC 18820
DWN: JWP 10-6-11 CHK: PEB 5-13-13 APPR: BUR 5-13-13	
80	EC 18580
DWN: JWP 5-13-13 CHK: PEB 5-13-13 APPR: BUR 5-13-13	
81	EC 25011
PAGE 3 ADDED TO .PDF DOC. DWN: JWP 1-28-15 CHK: BAL 1-28-15 APPR: RAD 1-28-15	

NOTES:

- INSTRUMENT LINES TO SLOPE OF A MINIMUM OF 1/2 INCH PER FOOT TOWARDS INSTRUMENT EXCEPT FOR REACTOR WATER LEVEL INSTRUMENT LINES WHICH MUST HAVE A MINIMUM SLOPE OF 1/4 INCH PER FOOT. INSTRUMENT WATER LINES MUST NOT HAVE AIR TRAPS, AND STEAM LINES MUST NOT HAVE WATER TRAPS.
- LINES TO DIFFERENTIAL PRESSURE TRANSMITTERS SHOULD BE AS SHORT AS PRACTICABLE.
- VALVES TO BE LOCATED IN IMMEDIATE VICINITY OF INSTRUMENT PANELS SHOWN ON ARRANGEMENT DRAWING.
- LIS 2-3-672A,B,C & D INITIATE ECCS EQUIPMENT ON LOW LOW REACTOR WATER LEVEL. ON HIGH WATER LEVEL, LIS 2-3-672A & B (ONLY) TRIP THE ROIC AND HPCI TURBINES.
- * FOR COMPUTER POINT ID'S RPV100 THRU RPV109

REFERENCE DRAWINGS:

- IED FEEDWATER CONTROL SYSTEM.....NX-7832-3-1 THRU 6
- IED NEUTRON MONITORING SYSTEM.....NX-7830-2-1 & 2, NX-7830-4-1 THRU 4
- FDC NUCLEAR BOILER MISC SYSTEM.....NX-7831-58-1 & 2
- IED REACTOR PROTECTION SYSTEM.....NX-7834-1 & NX-7834-2-2
- R.P.V. THERMOCOUPLE LOCATIONS & EXTENSION LEAD ROUTING.....NF-36790
- FCD RHR SYSTEM.....NX-7905-6-1 THRU 3
- FCD RECIRC. FLOW CONTROL SYSTEM VENDOR DWG. 729E203 IN TECH. MANUAL NX-7831-411
- FCD HPCI SYSTEM.....NX-8292-15-1 THRU 3
- FCD ROIC SYSTEM.....NX-7822-60-1 THRU 3
- FCD CORE SPRAY SYSTEM.....NX-7833-3
- ELEMENTARY DIAGRAM R.V. TEMP. MONITOR.....NX-7831-178

COLOR LEGEND	
ASME CLASS 1/QUALITY GROUP A	
ASME CLASS 2/QUALITY GROUP B	
ASME CLASS 3/QUALITY GROUP C	
QUALITY GROUP D	
SAFETY RELATED MECHANICAL	
SAFETY RELATED ELECTRICAL	
SPECIAL CONCERNS ITEM	

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P&ID VESSEL INSTRUMENTATION
NUCLEAR BOILER SYSTEM

MONTICELLO NUCLEAR GENERATING PLANT

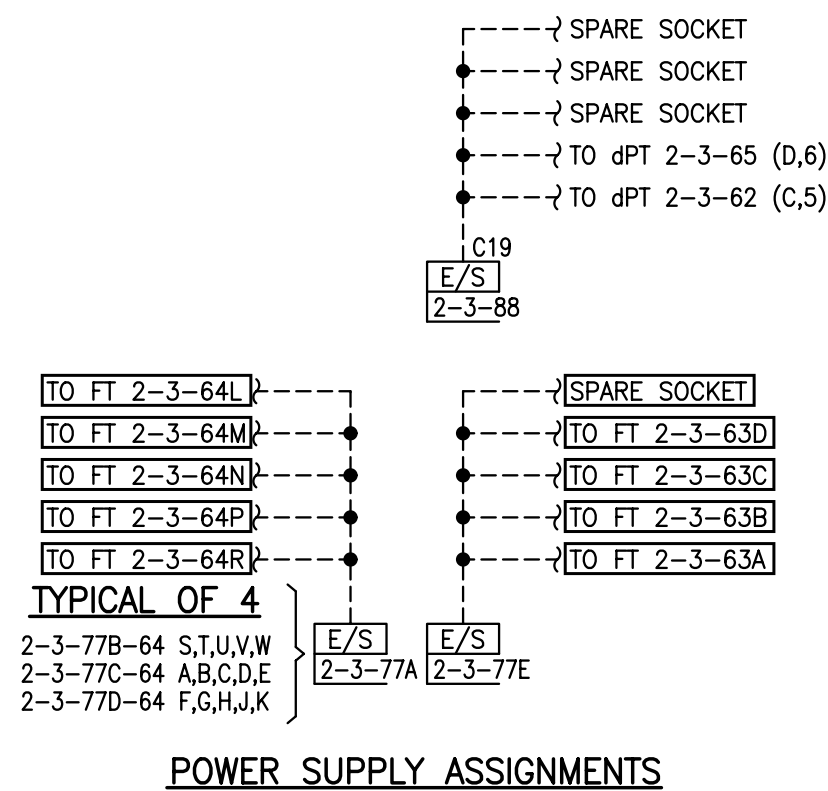
Xcel Energy
NORTHERN STATES POWER COMPANY

M-116
MONTI CAD DWG "AG"

SCALE: NONE

REV 81

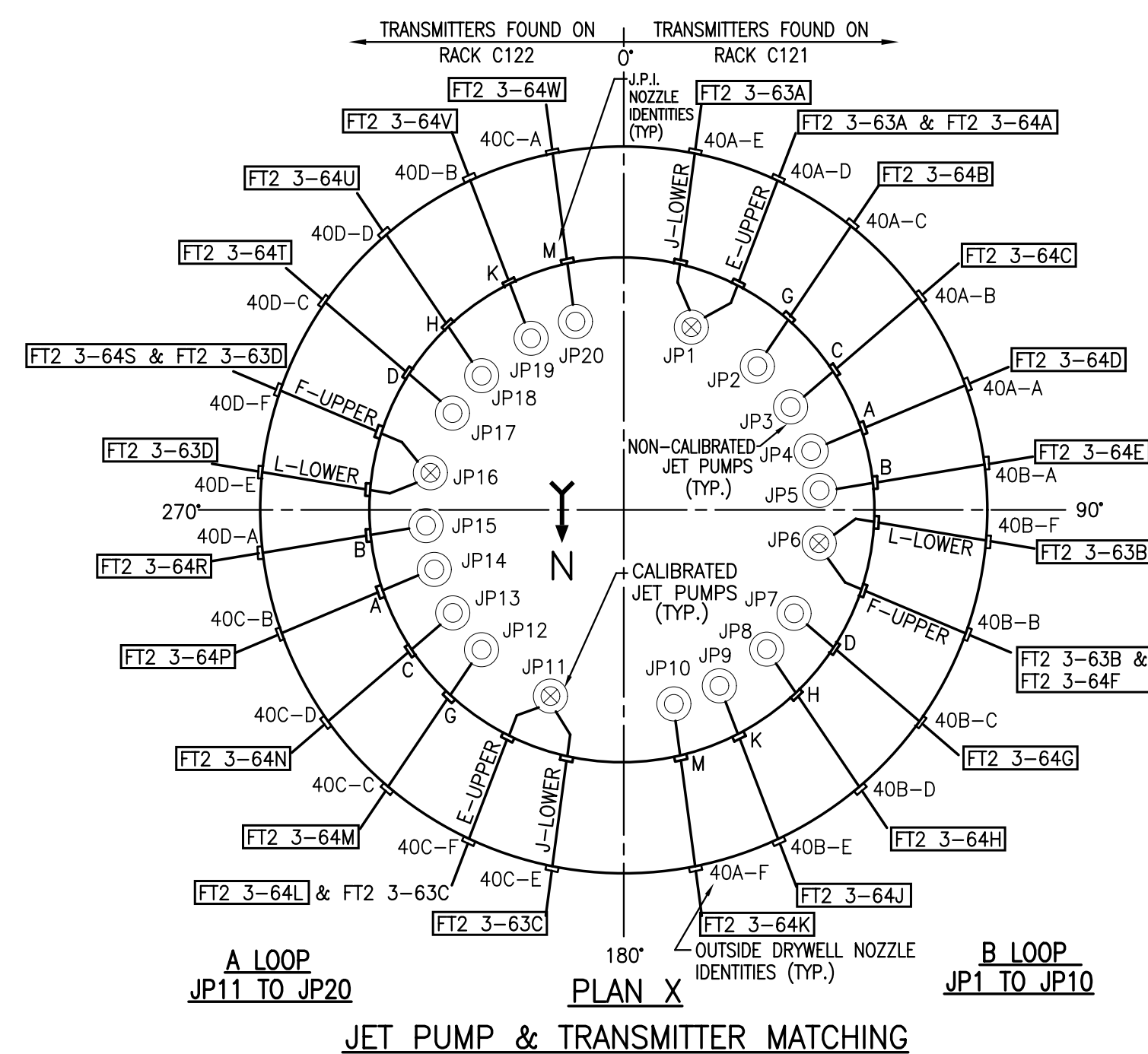
NH-36242



- NOTES:**
- INSTRUMENT LINES TO SLOPE A MINIMUM OF 1/2 INCH PER FOOT TOWARDS INSTRUMENT EXCEPT FOR REACTOR WATER LEVEL INSTRUMENT LINES WHICH MUST HAVE A MINIMUM SLOPE OF 1/4 INCH PER FOOT. INSTRUMENT WATER LINES MUST NOT HAVE AIR TRAPS, AND STEAM LINES MUST NOT HAVE WATER TRAPS.
- LINES TO DIFFERENTIAL PRESSURE TRANSMITTERS SHOULD BE AS SHORT AS PRACTICABLE.
- VALVES TO BE LOCATED IN IMMEDIATE VICINITY OF INSTRUMENT PANELS SHOWN ON ARRANGEMENT DRAWING.
- ALL INSTRUMENT LINES FROM JET PUMPS 1 TO 10 EXIT THRU PENETRATIONS N8A & X-40AB, LINES 11 TO 20 EXIT THRU PENETRATIONS N8B & X-40CD. SEE PLAN X.
- FT 2-3-63A -- COMPUTER POINT REC142
FT 2-3-63B -- COMPUTER POINT REC143
FT 2-3-63C -- COMPUTER POINT REC144
FT 2-3-63D -- COMPUTER POINT REC145
- X PREFIX IS NOT SHOWN FOR PENETRATIONS ON PLAN X

REFERENCE DRAWINGS:

1. IED FEEDWATER CONTROL SYSTEM.....NX-7832-3-1 THRU 4
2. IED NEUTRON MONITORING SYSTEM.....NX-7830-2-1 & 2, NX-7830-4-1 THRU 4
3. FDC NUCLEAR BOILER MISC SYSTEM.....NX-7831-58-1 & 2
4. IED REACTOR PROTECTION SYSTEM.....NX-7834-1 & NX-7834-2-2
5. R.P.V. THERMOCOUPLE LOCATIONS & EXTENSION LEAD ROUTING.....NF-36790
6. FCD RHR SYSTEM.....NX-7905-6-1 THRU 3
7. FCD RECIRC. FLOW CONTROL SYSTEM VENDOR DWG. 729E203 IN TECH. MANUAL NX-7831-411
8. FCD HPCI SYSTEM.....NX-8292-15-1 THRU 3
9. FCD RCIC SYSTEM.....NX-7822-60-1 THRU 3
10. FCD CORE SPRAY SYSTEM.....NX-7833-3
11. ELEMENTARY DIAGRAM R.V. TEMP. MONITOR.....NX-7831-178



(SEE NOTE 6 FOR TABLE EXPLANATION)			
JP INST. LINE PENETRATION TO EXCESS FLOW CHECK VALVE (XFV) TABLE			
PEN.	XFV	PEN.	XFV
X-40A-A	XFV-27	X-40C-D	XFV-42
X-40A-B	XFV-28	X-40C-E	XFV-43
X-40A-C	XFV-29	X-40C-F	XFV-44
X-40A-D	XFV-30	X-40D-A	XFV-45
X-40A-E	XFV-31	X-40D-B	XFV-46
X-40A-F	XFV-32	X-40D-C	XFV-47
X-40B-A	XFV-33	X-40D-D	XFV-48
X-40B-B	XFV-34	X-40D-E	XFV-49
X-40B-C	XFV-35	X-40D-F	XFV-50
X-40B-D	XFV-36		
X-40B-E	XFV-37		
X-40B-F	XFV-38		
X-40C-A	XFV-39		
X-40C-B	XFV-40		
X-40C-C	XFV-41		

COLOR LEGEND

- ASME CLASS 1/QUALITY GROUP A
- ASME CLASS 2/QUALITY GROUP B
- ASME CLASS 3/QUALITY GROUP C
- QUALITY GROUP D
- SAFETY RELATED MECHANICAL
- SAFETY RELATED ELECTRICAL
- SPECIAL CONCERNS ITEM

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	M-116-1 MONTI CAD DWG

P & ID JET PUMP INSTRUMENTATION

NUCLEAR BOILER SYSTEM

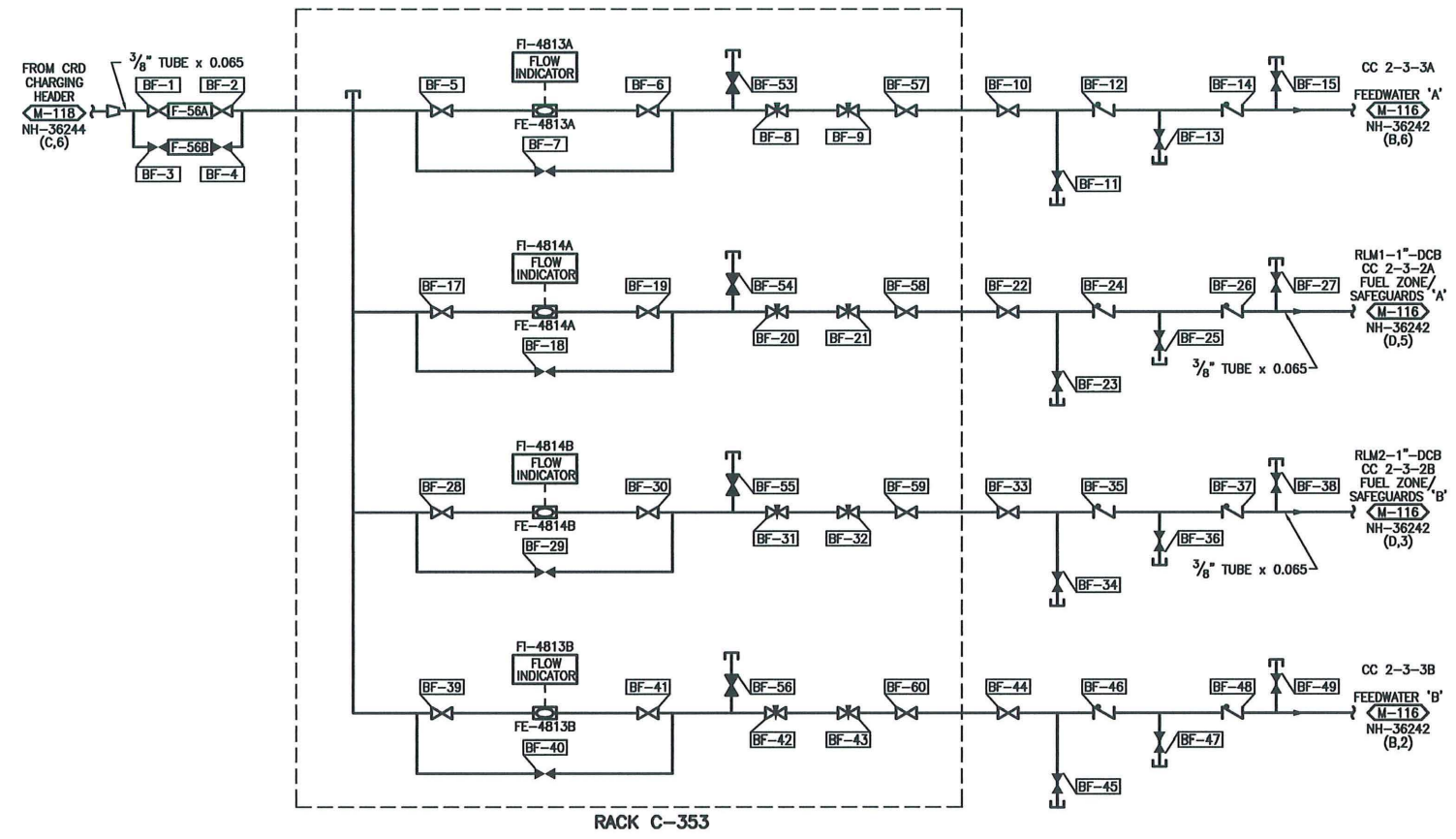
MONTICELLO NUCLEAR GENERATING PLANT

SCALE: NONE	REV 8
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NORTHERN STATES POWER COMPANY

NH-36242-



- NOTES:**
- INSTRUMENT LINES TO SLOPE A MINIMUM OF 1/2 INCH PER FOOT TOWARDS INSTRUMENT EXCEPT FOR REACTOR WATER LEVEL INSTRUMENT LINES WHICH MUST HAVE A MINIMUM SLOPE OF 1/4 INCH PER FOOT. INSTRUMENT WATER LINES MUST NOT HAVE AIR TRAPS, AND STEAM LINES MUST NOT HAVE WATER TRAPS.
 - LINES TO DIFFERENTIAL PRESSURE TRANSMITTERS SHOULD BE AS SHORT AS PRACTICABLE.
 - VALVES TO BE LOCATED IN IMMEDIATE VICINITY OF INSTRUMENT PANELS SHOWN ON ARRANGEMENT DRAWING.
- REFERENCE DRAWINGS:**
- IED FEEDWATER CONTROL SYSTEM.....NX-7832-3-1 THRU 6
 - IED NEUTRON MONITORING SYSTEM.....NX-7830-2-1 & 2, NX-7830-4-1 THRU 4
 - FDC NUCLEAR BOILER MISC SYSTEM.....NX-7831-58-1 & 2
 - IED REACTOR PROTECTION SYSTEM.....NX-7834-1 & NX-7834-2-2
 - R.P.V. THERMOCOUPLE LOCATIONS & EXTENSION LEAD ROUTING.....NF-36790
 - FCD RHR SYSTEM.....NX-7905-6-1 THRU 3
 - FCD RECIRC. FLOW CONTROL SYSTEM VENDOR DWG. 729E203 IN TECH. MANUAL NX-7831-411
 - FCD HPCI SYSTEM.....NX-8292-15-1 THRU 3
 - FCD ROC SYSTEM.....NX-7822-60-1 THRU 3
 - FCD CORE SPRAY SYSTEM.....NX-7833-3
 - ELEMENTARY DIAGRAM R.V. TEMP. MONITOR.....NX-7831-178

COLOR LEGEND

- ASME CLASS 1/QUALITY GROUP A
- ASME CLASS 2/QUALITY GROUP B
- ASME CLASS 3/QUALITY GROUP C
- QUALITY GROUP D
- SAFETY RELATED MECHANICAL
- SAFETY RELATED ELECTRICAL
- SPECIAL CONCERNS ITEM

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NSP
MONTICELLO NUCLEAR
GENERATING PLANT
UNIT 1

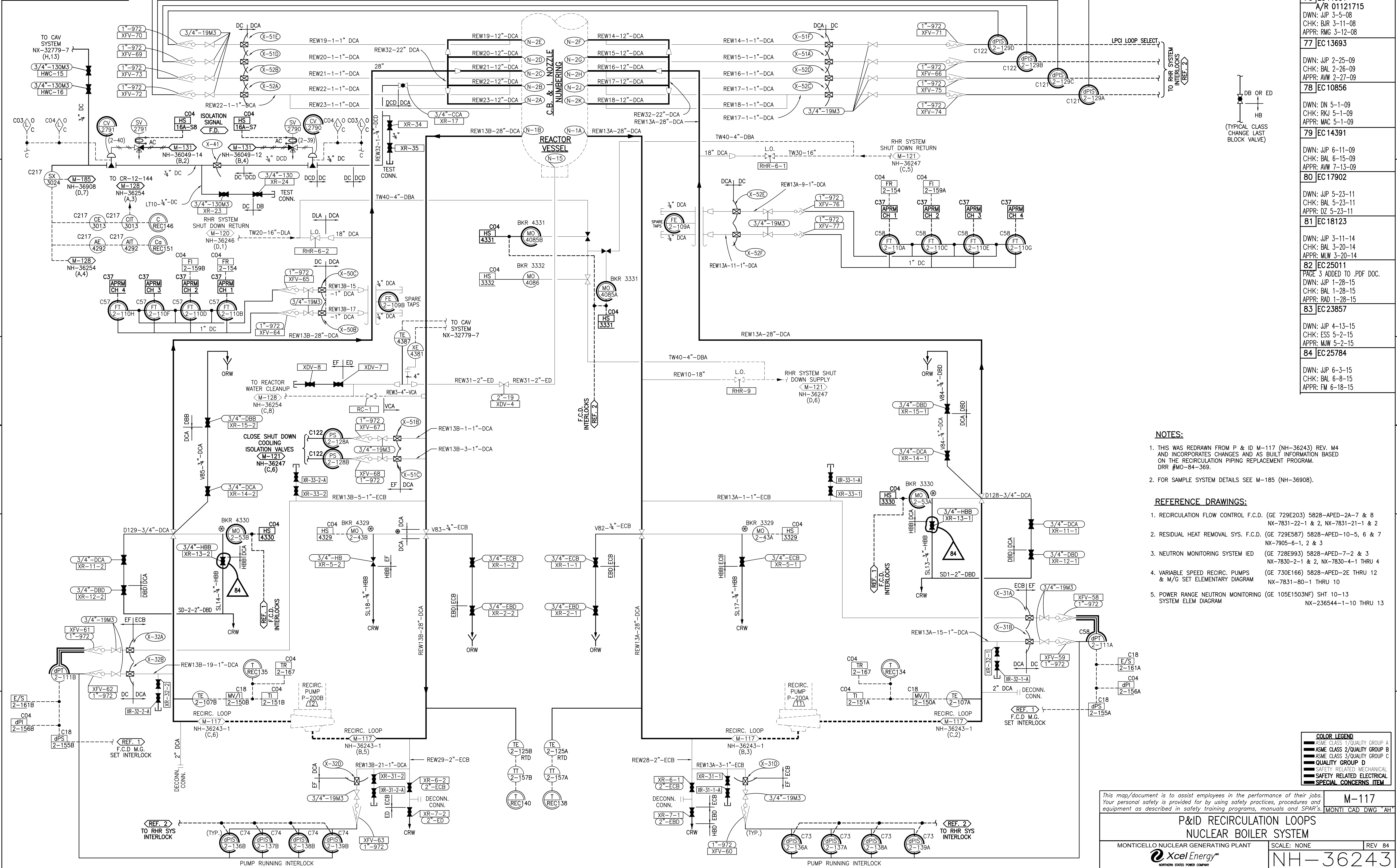
SIGNIFICANT NUMBER	8700	--	RX	1	4420	1	--
GROUP	1	2	3	4	5	CL	6

**MONTICELLO NUCLEAR GENERATING PLANT
P & ID REFERENCE LEG BACKFILL SYSTEM
NUCLEAR BOILER SYSTEM**

NORTHERN STATES POWER COMPANY MINNEAPOLIS	SCALE: NONE	REV 76
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M-116-2
MONTI CAD DWG 'A'

NH-36242-2



NOTES:

- 1. THIS WAS REDRAWN FROM P & ID M-117 (NH-36243) REV. M4 AND INCORPORATES CHANGES AND AS BUILT INFORMATION BASED ON THE RECIRCULATION PIPING REPLACEMENT PROGRAM. DRR #MO-84-369.
- 2. FOR SAMPLE SYSTEM DETAILS SEE M-185 (NH-36908).

REFERENCE DRAWINGS:

- 1. RECIRCULATION FLOW CONTROL F.C.D. (GE 729E203) 5828-APED-2A-7 & 8 NX-7831-22-1 & 2, NX-7831-21-1 & 2
- 2. RESIDUAL HEAT REMOVAL SYS. F.C.D. (GE 729E587) 5828-APED-10-5, 6 & 7 NX-7905-6-1, 2 & 3
- 3. NEUTRON MONITORING SYSTEM IED (GE 728E993) 5828-APED-7-2 & 3 NX-7830-2-1 & 2, NX-7830-4-1 THRU 4
- 4. VARIABLE SPEED RECIRC. PUMPS & M/G SET ELEMENTARY DIAGRAM (GE 730E166) 5828-APED-2E THRU 12 NX-7831-80-1 THRU 10
- 5. POWER RANGE NEUTRON MONITORING (GE 105E1503NF) SHT 10-13 NX-236544-1-10 THRU 13

COLOR LEGEND	
ASME CLASS 1/QUALITY GROUP A	
ASME CLASS 2/QUALITY GROUP B	
ASME CLASS 3/QUALITY GROUP C	
QUALITY GROUP D	
SAFETY RELATED ELECTRICAL	
SPECIAL CONCERNS ITEM	

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P&ID RECIRCULATION LOOPS
NUCLEAR BOILER SYSTEM

MONTICELLO NUCLEAR GENERATING PLANT

Xcel Energy
NORTHERN STATES POWER COMPANY

SCALE: NONE

REV 84

NH-36243

M-117

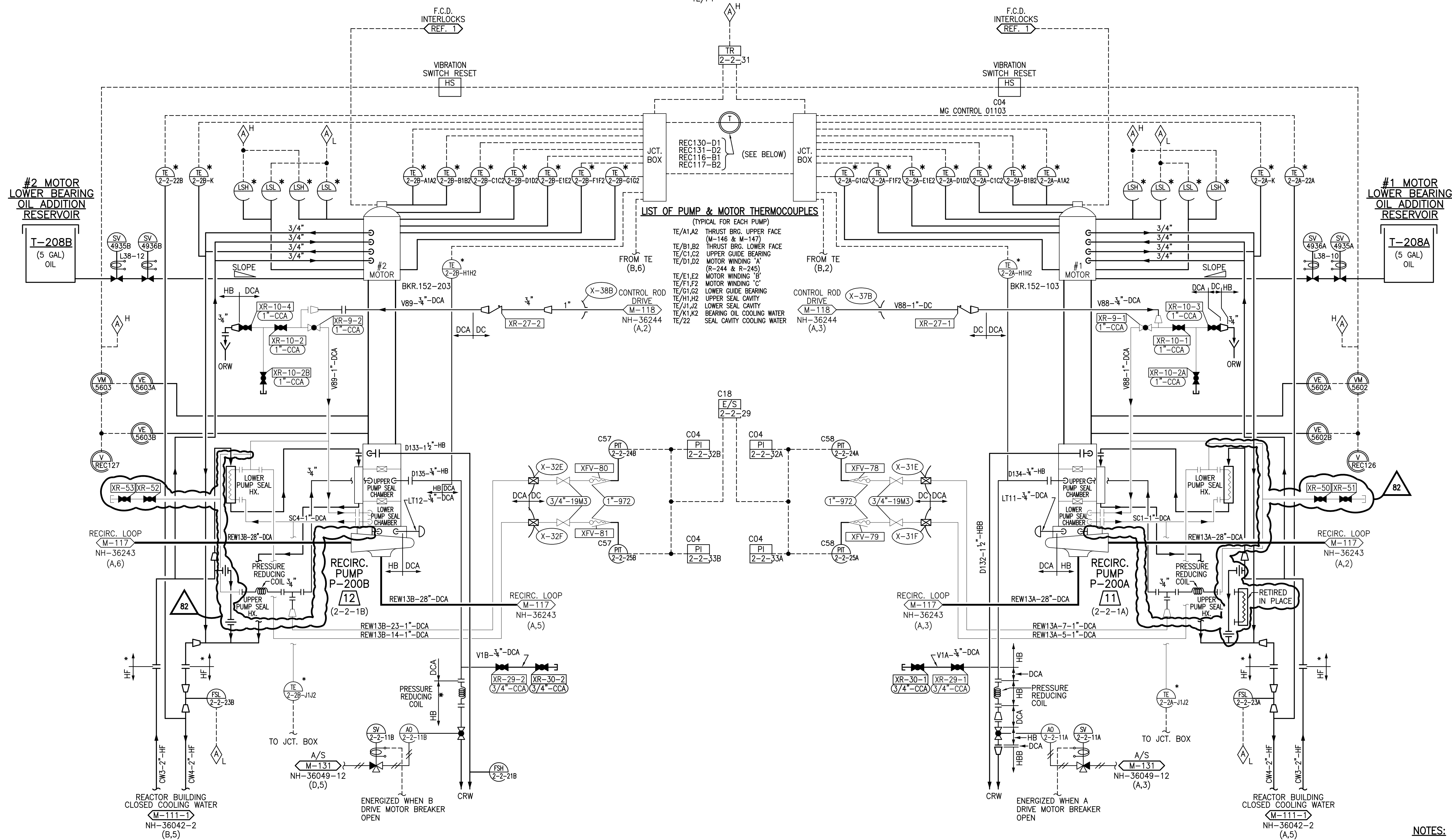
MONTI CAD DWG "AH"

THERMOCOUPLES RECORDED
PER PUMP-MOTOR UNIT

TE/A1
TE/B1
TE/C1
TE/D1
TE/E1
TE/F1

TE/G1
TE/H1
TE/J1
TE/K1
TE/L1
TE/M1

*NOTE 2



NOTES:

- THIS WAS REDRAWN FROM P&ID M-117 (NH-36243) REV. M2 AND INCORPORATES CHANGES AND AS BUILT INFORMATION BASED ON THE RECIRCULATION PIPING REPLACEMENT PROGRAM.
- THE PRIMARY THERMOCOUPLE FOR THE B RECIRC #1 SEAL CAVITY FAILED A NEW WIRE WAS INSTALLED IN J10 SUCH THAT THE B RECIRC IS NOW FED FROM THE SPARE THERMOCOUPLE J2.

REFERENCE DRAWINGS:

- RECIRCULATION FLOW CONTROL F.C.D. (GE 729E203) 5828-APED-2A-7 8C8 (DRAWING IS IN TECH. MANUAL NX-7831-411)

COLOR LEGEND

ASME CLASS 1/QUALITY GROUP A
ASME CLASS 2/QUALITY GROUP B
ASME CLASS 3/QUALITY GROUP C
QUALITY GROUP D
SAFETY RELATED MECHANICAL
SAFETY RELATED ELECTRICAL
SPECIAL CONCERNS ITEM

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equipment as described in safety training programs, manuals and SPAR's.

M-117

MONTI CAD DWG 'D'

P&ID RECIRC LOOPS, PUMPS & MOTORS
NUCLEAR BOILER SYSTEM

MONTICELLO NUCLEAR GENERATING PLANT

SCALE: NONE

REV 82

Xcel Energy
NORTHERN STATES POWER COMPANY

NH-36243-1