<u>NRC Resolution of Post-Exam Comments</u>
<u>2016 Beaver Valley Unit 1 Initial Exam</u>

Question 35

<u>NRC Resolution:</u>

Accept two answers. Choice B and original Key Choice A are both correct answers. No other choices are correct.

<u>Discussion:</u>

Eight applicants chose the original Key Answer A whereas 13 applicants chose Choice B. One applicant chose Choice C and none chose D.

There was only one question asked by the applicants on Question 35 and it was about whether Choice A was referring to one feedwater pump or two. There were no questions asked about Choice B.

This was a new question.

The licensee proposed accepting two answers (Choices A and B), based upon the fact that if the turbine lube oil cooler outlet temperature was 177°F, then the turbine bearing lube oil temperature would be approximately 207°F. This would be above the 195°F limit which would require immediate action to trip the reactor according to 1OM-53C.4.1.28.1, Loss of Secondary Component Cooling Water, step 4 and the AOP Left Hand Page "Parameter Limits for Immediate Action" Table.

The NRC agrees that both Choices A and B are correct answers because both choices describe conditions requiring actions directed by AOP 1.28.1 in response to a high secondary component cooling water temperature condition.

<u>Justification for Choice A as a correct answer</u>:

Choice A was the originally designated correct choice based upon the criteria set forth in AOP 1.28.1. Specifically, with main feedwater pump bear temperature at 224°F, it exceeds the 220°F limit and therefore requires the immediate action of tripping the affected pump. Tripping the pump is supported by 1OM-53C.4.1.28.1, Loss of Secondary Component Cooling Water, step 8 and the AOP Left Hand Page "Parameter Limits for Immediate Action" Table.

<u>Justification for Choice B as a correct answer</u>:

If the turbine lube oil cooler outlet temperature was 177°F, then the corresponding turbine bearing lube oil temperature would be approximately 207°F. This is substantiated by plant data provided by the licensee. The average delta-T between the turbine lube oil cooler outlet temperature and the turbine bearing oil temperature is about 29.7°F based upon data from the recent Unit 1 power ascension following 1R24. Thus, with the turbine lube oil cooler outlet temperature at 177°F, the corresponding bearing lube oil temperature would be approximately 207°F (177°F + 30°F). This exceeds the 195°F limit as stated in 1OM-53C.4.1.28.1, Loss of Secondary Component Cooling Water, step 4 and the AOP Left Hand Page "Parameter Limits for Immediate Action" Table. The required immediate action is to trip the turbine. According to NOP-OP-1002, Conduct of Operations, operators are to "Anticipate automatic trips and equipment protective features, and take manual actions, if possible without haste, to avoid challenging automatic actuations." With the plant conditions provided in the question (65% power), with reactor power above the P-9 setpoint (49%), the automatic actuation that the operator is to avoid would be the automatic Reactor Trip caused by the Turbine Trip. Thus, although the AOP directs the operators to trip the turbine, the operators would trip the reactor in accordance with their conduct of operations procedure. Therefore, Choice B, which directs tripping the reactor, contains the correct actions for the conditions provided in the question.

<u>Summary:</u>

The NRC has determined that Question 35 has two valid answers, Choices A and B, given that both choices provide correct actions for the given conditions.

<u>References:</u>

1OM-53C.4.1.28.1, Loss of Secondary Component Cooling Water, Rev 3
NOP –OP-1002 Conduct of Operations, Rev 11
Various plant data logs and trends

Question 42

<u>NRC Resolution:</u>

Accept two answers. Choice B and original Key Choice C are both correct answers. No other choices are correct.

<u>Discussion:</u>

Seventeen applicants chose the original Key Choice C while four applicants chose Choice B. One applicant chose Choice A and none chose D.

There were no questions asked by the applicants on Question 42.

This was a new question.

The licensee proposed accepting two answers (Choices C and B), based upon the fact that, in addition to C being correct, Choice B was a condition that did not meet an LCO. Specifically, LCO 3.7.3, Main Feedwater Isolation Valves and Main Feedwater Regulation Valves and MFRV Bypass Valves, is only applicable in Modes 1, 2, and 3, whereas LCO 3.6.3, Containment Isolation Valves, is applicable in Modes 1, 2, 3, and 4. Thus, a main feed water containment isolation valve with a broken stem while in Mode 4, would not meet the LCO for TS 3.6.3. while LCO 3.7.3 is not applicable.

The NRC agrees that both Choices C and B are correct answers because both choices describe conditions that fail to meet an LCO.

Justification for Choice C as a correct answer:

The question tested an applicant's knowledge of determining which of the four provided conditions would not meet an LCO. The condition in Choice C of "SV-1MS-105 A, 'A' Steam Generator Safety Valve lift setpoint is out of tolerance in Mode 3" does not meet LCO 3.7.1 as five main steam safety valves per steam generator shall be operable in Modes 1, 2, and 3. With a safety valve lift setpoint out of tolerance in Mode 3, it is inoperable and thus the LCO is not met.

Justification for Choice B as a correct answer:

When Choice B (HYV-1FW-100B, 1B Main Feedwater CNMT Isolation Valve has a broken stem in Mode 4) was developed as a replacement distractor, it was recognized that LCO 3.7.3 was not applicable in Mode 4 as a feedwater isolation valve. However, it was not recognized that the condition in Choice B was applicable in Mode 4 for LCO 3.6.3 for containment isolation. HYV-1FW-100B, 1B Main Feedwater CNMT Isolation Valve is specifically listed as a containment isolation valve in Licensing Requirements Manual Table 3.6.1-1.

Summary:

The NRC has determined that Question 42 has two valid answers, Choices C and B, given that both choices provide conditions that do not meet LCOs.

References:

Beaver Technical Specifications 3.6.3, Containment Isolation Valves
Beaver Technical Specifications 3.7.1, Main Steam Safety Valves
Beaver Technical Specifications 3.7.3, Main Feedwater Isolation Valves and Main Feedwater Regulation Valves and MFRV Bypass Valves
Licensing Requirements Manual Table 3.6.1-1, Rev 56

Question 71

NRC Resolution:

Change the answer key from Choice A to Choice C because, upon further review, it was determined that Choice C is the only correct answer. No other choices are correct.

Discussion:

Seventeen applicants chose Choice C while three chose the original Key Choice A. Two applicants chose Choice D and none chose B.

There was only one question asked by the applicants on this question. The applicant asked if Rad Pro did an assessment of the entry.

This was a bank question that was used on Question 71 of the 2015 Beaver Valley Unit 2 NRC Exam.

The licensee proposed changing the correct answer to Choice C. This is because when airborne contamination concentrations exceed 1.0 DAC, ½-ADM-1601, Radiation Protection Standards, section 7.4, requires the donning of respirators. The airborne contamination concentration provided in the question was 10 DAC. Thus, the originally designated correct answer (Choice A) is incorrect because it stated that one should NOT wear a respirator.

The NRC agrees that Choice A is incorrect and that Choice C is the correct answer.

Justification for Choice A being incorrect:

The intent of the question was to have the applicants assess the given conditions and then perform a calculation to determine whether wearing a respirator or not wearing a respirator would result in a lower TEDE. However, the airborne contamination concentration provided in the question (10 DAC) exceeded the limit (1.0 DAC) set forth in ½-ADM-1601, section 7.4. Therefore, it was a requirement to wear a respirator. Thus, because Choice A (and B) stated that one should NOT wear a respirator, it is not a correct response.

Justification for Choice C being the correct answer:

Due to the clear requirement in ½-ADM-1601, Radiation Protection Standards, section 7.4, a respirator must be worn if the airborne contamination concentrations exceed a value/limit of 1.0 DAC. With the airborne contamination concentration of 10 DAC as stated in the question, it is a requirement to wear a respirator even though for the given conditions the TEDE would be lower (993 mRem vs 998 mRem) if a respirator was not worn. Choice D also stated that one must wear a respirator but the reason provided is incorrect. Thus, Choice C is the only correct answer.

Summary:

The NRC has determined that Question 71 has only one valid answer. Choices C is the correct answer instead of A given the requirements of ½-ADM-1601, Radiation Protection Standards, section 7.4.

References:
½-ADM-1601, Radiation Protection Standards, Rev 23

ATTACHMENT A

Proposed Answer Key Changes

Question 35

Question 35

Recommendation: The facility recommends accepting two correct answers for question #35.

Reason: Technical information and actual plant operation data available that supports an additional answer.

35. The plant is at 65% power with all systems in normal alignment for this power level when the crew enters AOP 1.28.1, Loss of Secondary Component Cooling Water.

    Which of the following conditions, and required action will be directed by AOP 1.28.1 due to the high Secondary Component Cooling Water temperature condition?

    A. Main Feedwater Pump Bearing temperature is 224°F, trip the Main Feedwater pump.

    B. Turbine Lube Oil Cooler Outlet temperature is 177°F, trip the Reactor.

    C. Turbine Journal Bearing Metal temperature is 221°F, trip the Turbine.

    D. Main Condensate Pump Bearing temperature is 175°F, trip the Condensate pump.

Question 35 tested knowledge of component operating temperature limits as listed in Abnormal Operating Procedure (AOP) 1.28.1 "Loss of Secondary Component Cooling Water" (attached).

AOP 1.28.1, Continuous Action Step 8, and AOP Left Hand Page "Parameter Limits for Immediate Action" Table both support securing a Main Feedwater Pump with bearing temperatures greater than 220°F. This supports original answer 'A' as being correct.

Answer 'B', Turbine Lube Oil Cooler Outlet temperature of 177°F, is also correct, as this would result in Turbine Bearing Oil return temperatures of ~207°F. This exceeds the Main Bearing Lube Oil temperature limit of 195°F in both AOP-1.28.1, Continuous Action Step 4, and the AOP Left Hand Page "Parameter Limits for Immediate Action" Table.

The average delta T between Turbine Lube Oil Cooler Outlet temperature and Turbine Bearing Oil temperature is ~29.7°F. This is supported by the attached data as summarized below. Note this data is taken with the Unit at 100% power. The question initial conditions are at 65% power. Turbine Lube Oil Cooler Outlet and Turbine Bearing Oil temperatures do not change appreciably from 65% to 100% Power. This is validated by the attached PI Data from the recent Unit 1 power ascension following 1R24.

Per operator rounds data taken on 11/16/16 at 0800 (attached), the difference between Turbine Lube Oil Cooler Outlet temperature (119.9°F) and Turbine Bearing Oil return temperatures, ranged between 22.1°F (142°F return temp) and 34.1°F (154°F return temp), with an average of 29.7°F. All of which, if added to Answer 'B' Turbine Lube Oil Cooler Outlet temperature of 177°F results in Turbine Bearing Oil return temperatures exceeding trip criteria.

Additional supporting data was obtained by conducting Beaver Valley Simulator scenarios with a Loss of Secondary Component Cooling Water. When Turbine Lube Oil Cooler temperature was allowed to rise to 177°F, all Turbine Bearing Oil return temperatures exceeded trip criteria of 195°F. (See Attached)

With Turbine Bearing Oil return temperatures of ~207°F, AOP-1.28.1, Continuous Action Step 4, Response Not Obtained (RNO) column, requires verification of a Turbine Trip. Question initial conditions of 65% (>P-9 setpoint of 49%), requires a Reactor Trip prior to a Turbine Trip. Therefore, Answer 'B' Turbine Lube Oil Cooler Outlet temperature is 177°F, trip the Reactor, is also a correct answer to this question.

Based on the above information the facility recommends accepting two answers for question 35, the original correct answer "A", and answer "B".

Number	Title	
1.28.1	Loss of Secondary Component Cooling Water	Revision 3

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8	<u>Main Feedwater Pump Bearing Temperatures - LESS THAN 220F</u> • [T2320A through T2325A], Main Feedwater Pump 1A bearing temperatures. • [T2380A through T2385A], Main Feedwater Pump 1B bearing temperatures.	Secure affected pump(s). <u>IF</u> all main feedwater is lost, <u>THEN</u> perform the following: 1) Trip the reactor. 2) GO TO E-0, "Reactor Trip Or Safety Injection" 3) <u>WHEN</u> immediate actions of E-0 are complete, perform this procedure in parallel with EOPs.
9	<u>Main Condensate Pump Bearing Temperatures - LESS THAN 180F</u> • [T2508A, T2509A], CN-P-1A MTR INBD (OUT) BRG T/C-1CN-200A1(A2) • [T2518A, T2519A], CN-P-1B MTR INBD (OUT) BRG T/C-1CN-200B1(B2)	Secure affected pump(s). <u>IF</u> all main condensate is lost, <u>THEN</u> perform the following: 1) Trip the reactor. 2) GO TO E-0, "Reactor Trip Or Safety Injection" 3) <u>WHEN</u> immediate actions of E-0 are complete, perform the following: a) Open [MOV-1AS-100], Main Cnds Vac Break MOV. b) Perform this procedure in parallel with EOPs.
10	<u>Heater Drain Pump Bearing Temperatures - LESS THAN 180F</u> • [T2360A, T2361A], HD-P-1A MTR INBD (OUT) BRG T/C-1SD-200A1 (A2) • [T2370A, T2371A], HD-P-1B MTR INBD (OUT) BRG T/C-1SD-200B1 (B2)	Secure affected pump(s).

PARAMETER LIMITS FOR IMMEDIATE ACTION

AOP 1.28.1 (Revision 3)

Step	Parameter	Limit
3	Turbine Lube Oil Cooler Outlet Temperature	180F
3	Turbine Journal & Thrust Bearing Metal Temperature	225F
3	Main Generator Cold Gas Temperatures	56C
3	Turbine Vibration	14 mils
4	Main Bearing Lube Oil Temperatures	195F
4	Both Main Condensate Pumps	OFF
8	Main Feedwater Pump Bearing Temperatures	220F
9	Main Condensate Pump Temperatures	180F
10	Heater Drain/Separator Drain Pump Temperatures	180F

TURBINE

ain Logs/Reports Applications Alarms Groups/Trends Point List P&IDs Print Help

OWER OPS PRIM/BACK | Main Menu | NSSS | PID's | Ops Groups | Group | AOP Groups | Trends | Plant Stat | SPDS

LARM | S | C | H | P | Z | I | CURRENT FUNCTION: TURB 11/18/16 10:50:48

HP TURBINE 1ST STAGE PRESS			IMPULSE CHAMBER TEMP		
702.3	702.3	PSIG	479.4	507.9	DEGF

HP TURBINE STM CHEST TEMPS

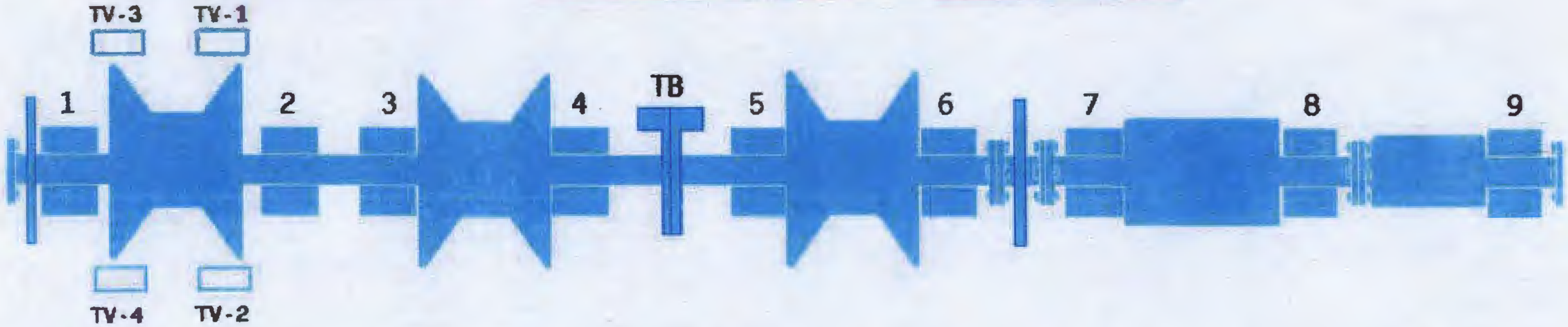
SHALLOW	512.8	512.8	DEGF
DEEP	512.8	512.8	DEGF

LP EXHAUST	124.6	124.6	124.2	124.2	DEGF

TURBINE SPEED
1800 RPM

TURBINE LOAD REF
92.0 PC

TURB VLV POS STPT
93.6 PC



THRUST BEARING

TURBINE BEARING STATUS		1	2	3	4	FRONT	REAR	5	6	7	8	9	
	LUBE OIL	152.5	149.1	158.7	152.0	150.4	143.2	156.1	152.9	146.5	148.4	148.6	DEGF
	GOV METAL	170.1	164.9	179.7	169.3	165.0	165.6	175.7	170.7	160.9	163.8	164.1	DEGF
						165.0	164.3						DEGF

TURBINE LUBE OIL HDR STATUS

COOLER IN	147.5	DEGF
COOLER OUT	120.0	DEGF
HDR PRESS	21.00	PSIG

EH FLUID HDR PRESS
2075 PSIG

TURBINE LATCH STATUS
NOT TRIP

TURBINE GEAR STATUS

SHAFT SPEED	NOT TRIP
MOTOR STATUS	OFF

Canc | Prev | Back | Fore | PID'S | GROUPS | GEN TEMP | PLSTAT | ELECT | PID LIST

ady BVI SIPC CPU S TT038 WK=007/WIN=03 SEC LVL=05

TURBINE

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POWER OPS PRIM/BACK | Main Menu | NSSS | PID's | Ops Groups | Group | AOP Groups | Trends | Plant Stat | SPDS

ALARM | S | C | H | P | Z | I | CURRENT FUNCTION: TURB

HP TURBINE 1ST STAGE PRESS

702.3 702.3 PSIG

IMPULSE CHAMBER TEMP

479.4 507.9 DEGF

HP TURBINE STM CHEST TEMPS

SHALLOW	512.8	512.8	DEGF
DEEP	512.8	512.8	DEGF

LP EXHAUST	124.4	124.4	124.1	124.1	DEGF

TURBINE SPEED

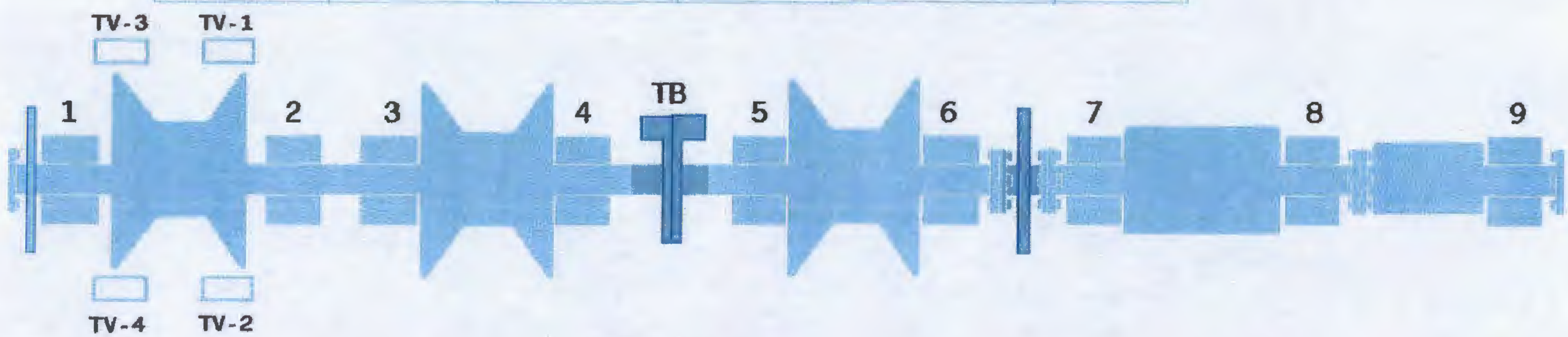
1800 RPM

TURBINE LOAD REF

92.0 PC

TURB VLV POS STPT

93.6 PC



THRUST BEARING

TURBINE BEARING STATUS		1	2	3	4	FRONT	REAR	5	6	7	8	9	
	LUBE OIL	200.3	205.1	214.4	207.0	216.2	199.1	211.9	200.6	202.4	204.2	204.6	DEGF
	GOV METAL	225.5	220.5	234.9	224.8	213.0	210.9	231.1	220.2	216.6	219.2	210.6	DEGF
						213.0	212.2						DEGF

TURBINE LUBE OIL HDR STATUS

COOLER IN	*****	DEGF
COOLER OUT	177.0	DEGF
HDR PRESS	21.00	PSIG

EH FLUID HDR PRESS

2075 PSIG

TURBINE LATCH STATUS

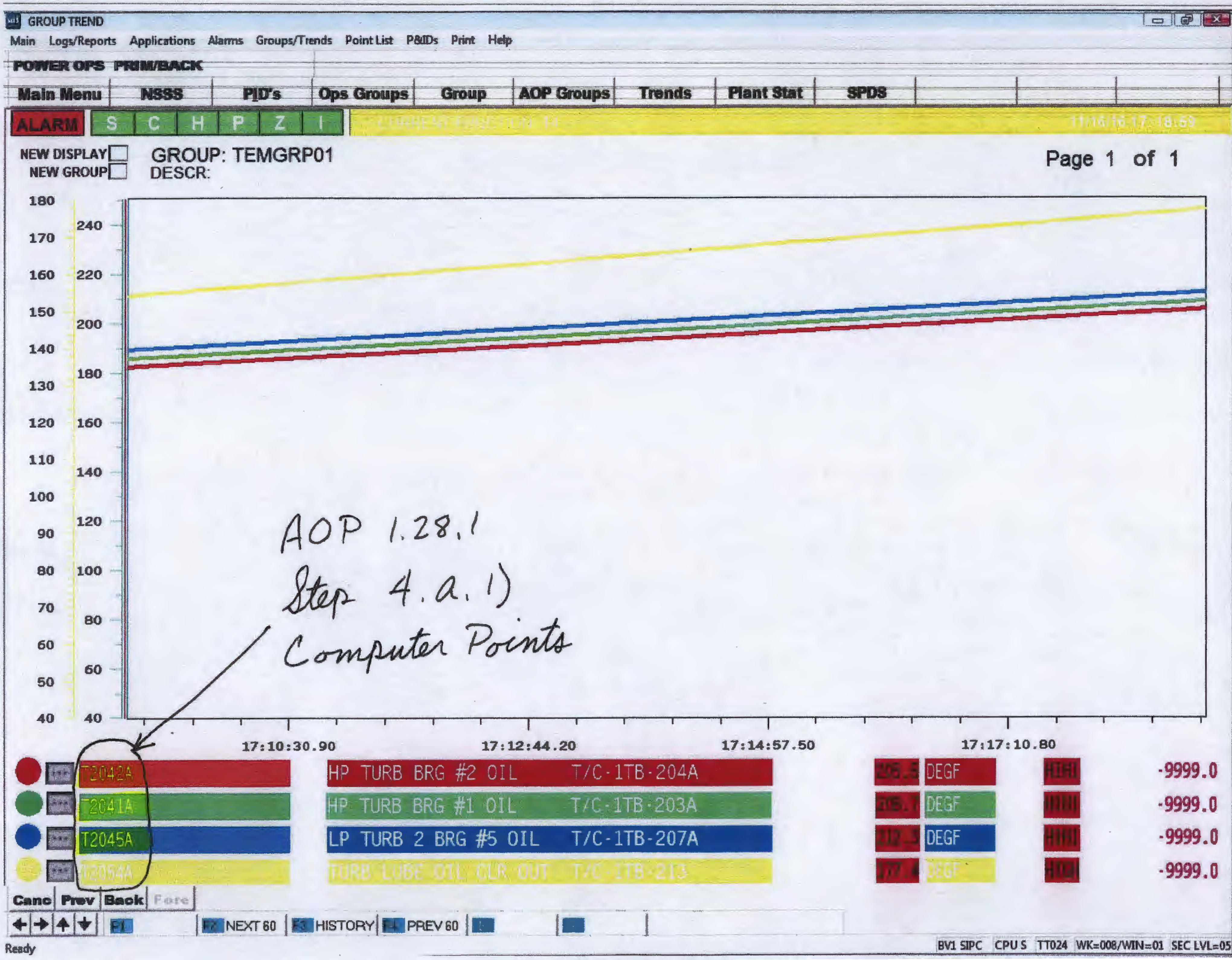
NOT TRIP

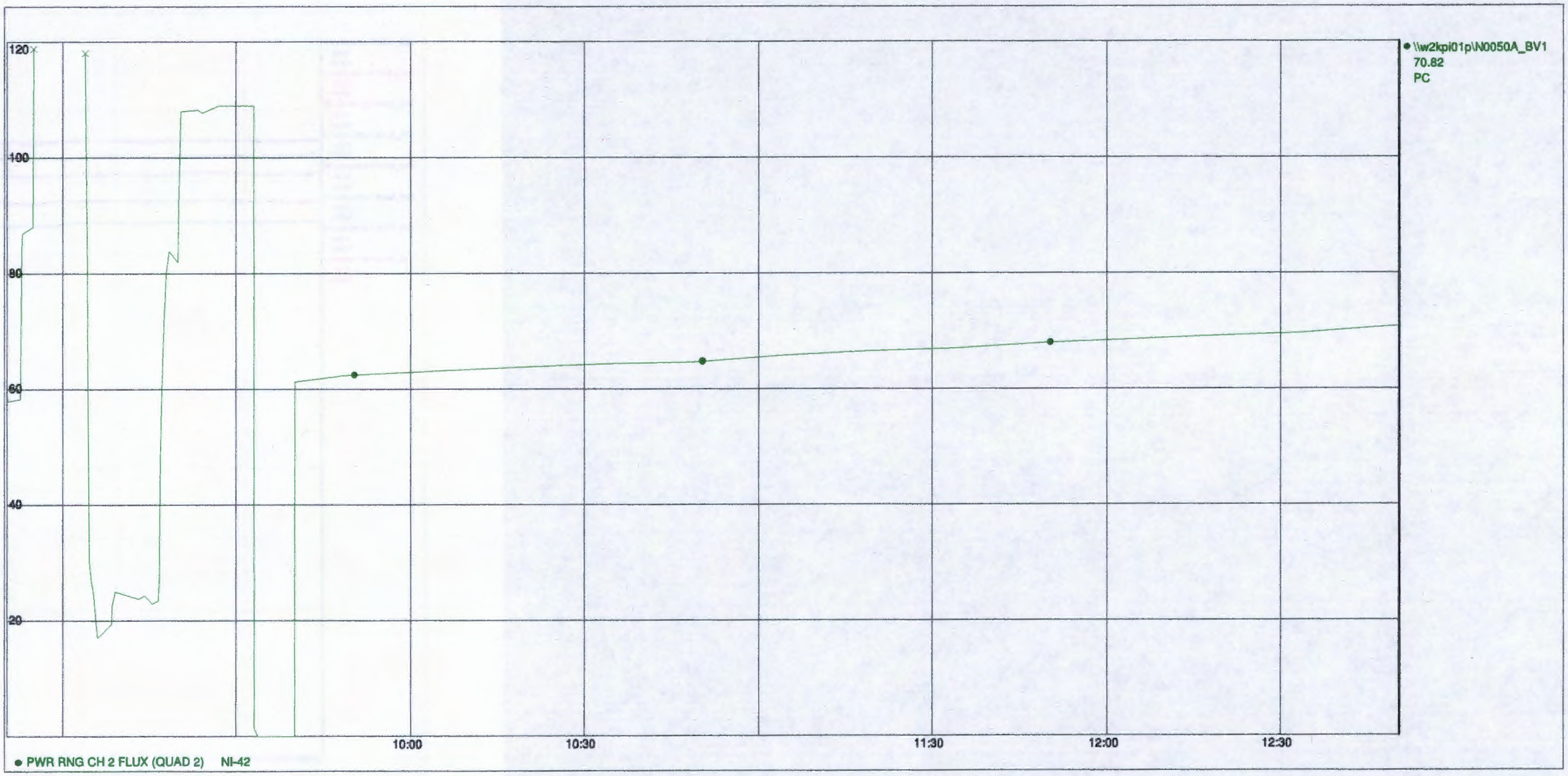
TURBINE GEAR STATUS

SHAFT SPEED	NOT TRIP
MOTOR STATUS	OFF

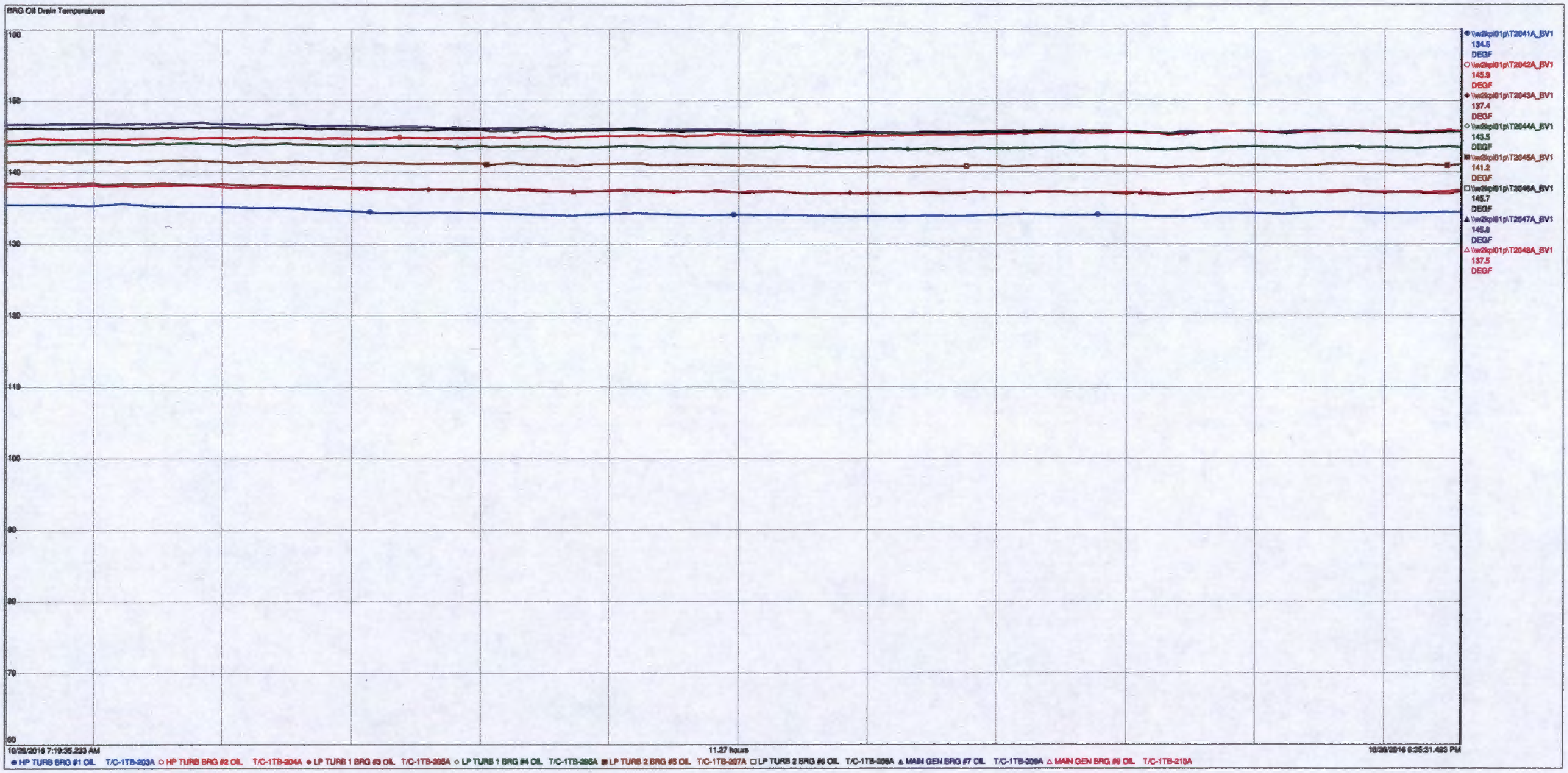
Canc | Prev | Back | Fore | F1 PID'S | F2 GROUPS | F3 GEN TEMP | F4 PLSTAT | F5 ELECT | F6 PID LIST

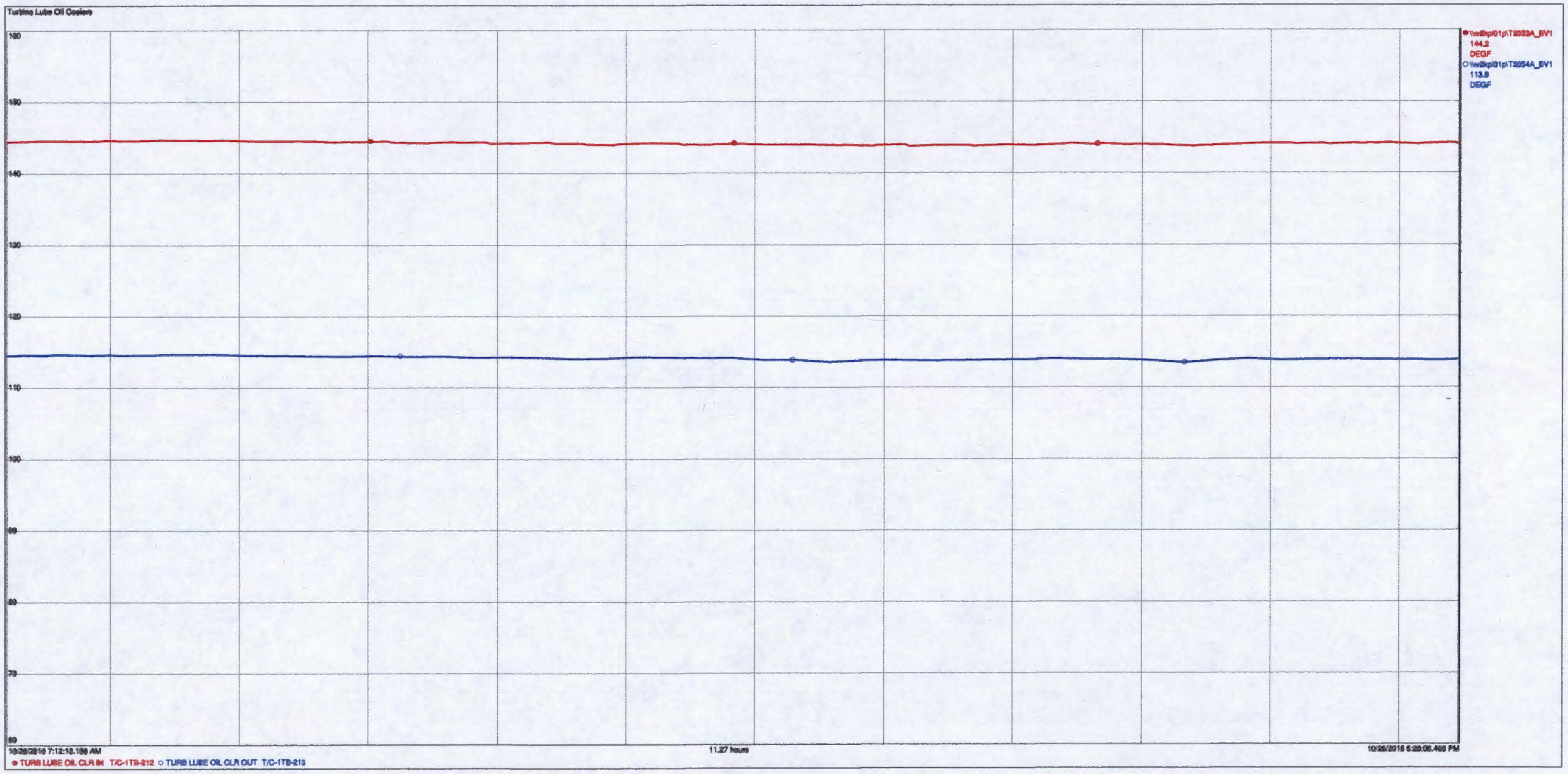
BV1 SIPC | CPU S | TT035 | WK=009/WIN=02 | SEC LVL=05


GROUP TREND
Main Logs/Reports Applications Alarms Groups/Trends Point List P&IDs Print Help
POWER OPS PRIM/BACK
Main Menu NSSS PID's Ops Groups Group AOP Groups Trends Plant Stat SPDS
ALARM S C H P Z I
NEW DISPLAY
NEW GROUP
GROUP: TEMGRP01
DESCR:
Page 1 of 1
180 170 160 150 140 130 120 110 100 90 80 70 60 50 40
240 220 200 180 160 140 120 100 80 60 40
AOP 1.28.1
Step 4.a.1)
Computer Points
17:10:30.90
17:12:44.20
17:14:57.50
17:17:10.80
T2042A HP TURB BRG #2 OIL T/C-1TB-204A DEGF HIHI -9999.0
T2041A HP TURB BRG #1 OIL T/C-1TB-203A DEGF HIHI -9999.0
T2045A LP TURB 2 BRG #5 OIL T/C-1TB-207A DEGF HIHI -9999.0
DEGF HIHI -9999.0
Canc Prev Back Fore
F2 NEXT 60 F3 HISTORY F4 PREV 60
Ready
BV1 SIPC CPU S TT024 WK=008/WIN=01 SEC LVL=05



120
100
80
60
40
20
10:00
10:30
11:30
12:00
12:30
\\w2kpi01p\N0050A_BV1
70.82
PC
PWR RNG CH 2 FLUX (QUAD 2) NI-42


BRG Oil Drain Temperatures
160
150
140
130
120
110
100
90
80
70
60
11.27 hours
134.5
DEGF
145.9
DEGF
137.4
DEGF
143.5
DEGF
141.2
DEGF
137.5
DEGF
HP TURB BRG #1 OIL T/C-1TB-203A
HP TURB BRG #2 OIL T/C-1TB-204A
LP TURB 1 BRG #3 OIL
LP TURB 1 BRG #4 OIL
LP TURB 2 BRG #5 OIL T/C-1TB-207A
LP TURB 2 BRG #6 OIL
MAIN GEN BRG #7 OIL
MAIN GEN BRG #8 OIL T/C-1TB-210A


Turbine Lube Oil Coolers
140
130
120
110
100
144.2
DEGF
113.9
DEGF
11.27 hours
TURB LUBE OIL CLR IN T/C-1TB-212
TURB LUBE OIL CLR OUT T/C-1TB-213

RECORD IPC POINT T2053A — TURB LUBE OIL CLR IN T/C-1TB-212

Min: <EXPR> Max: 160 Units: F - - -- - - Seq: 288 STA: 166

11/14/2016 08:00	149.8	Librich, Michael N	
11/14/2016 00:00	149.3	Hart,Sean M	

RECORD IPC POINT T2054A — TURB LUBE OIL CLR OUT T/C-1TB-213

Min: <EXPR> Max: <EXPR> Units: F - - -- - - Seq: 289 STA: 167

11/16/2016 08:00	119.9	Snodgrass, Steven W	
11/16/2016 00:00	119.5	Hart,Sean M	
11/15/2016 16:00	119.1	Mandich,Pete (Jr)	
11/15/2016 08:00	119.8	Williams,Jonathan D	
11/15/2016 00:00	119.4	McCrory,Timothy W	
11/14/2016 16:00	119.1	Snodgrass, Steven W	
11/14/2016 08:00	120.3	Librich, Michael N	US informed.
11/14/2016 00:00	119.8	Hart,Sean M	

TURBINE LUBE OIL COOLERS D/T

Units: F - - -- - - Seq: 290 STA: 247

11/16/2016 08:00	29.4	Snodgrass, Steven W
11/16/2016 00:00	29.5	Hart,Sean M
11/15/2016 16:00	29.4	Mandich,Pete (Jr)
11/15/2016 08:00	29.6	Williams,Jonathan D
11/15/2016 00:00	29.6	McCrory,Timothy W
11/14/2016 16:00	29.4	Snodgrass, Steven W
11/14/2016 08:00	29.5	Librich, Michael N
11/14/2016 00:00	29.5	Hart,Sean M

VERIFY VCT LEVELS WITHIN 5% — VERIFY VCT LEVELS INDICATE WITHIN 5% OF EACH OTHER

Min: Y Max: Y Units: Y OR N - - -- - - Seq: 291 STA: 346

11/16/2016 08:00	Y	Snodgrass, Steven W
11/16/2016 00:00	Y	Hart,Sean M
11/15/2016 16:00	Y	Mandich,Pete (Jr)
11/15/2016 08:00	Y	Williams,Jonathan D
11/15/2016 00:00	Y	McCrory,Timothy W
11/14/2016 16:00	Y	Snodgrass, Steven W
11/14/2016 08:00	Y	Librich, Michael N
11/14/2016 00:00	Y	Hart,Sean M

TEST ALL ANNUNCIATOR ALARMS

Min: Y Max: Y Units: Y OR N - - -- - - Seq: 292 STA: 159

11/16/2016 00:00	Y	Hart,Sean M
11/15/2016 00:00	Y	McCrory,Timothy W
11/14/2016 00:00	Y	Hart,Sean M

ENSURE ALL CR CHARTS HAVE ADVANCED — SEE INSTRUCTIONS

Min: Y Max: Y Units: Y OR N - - -- - - Seq: 293 STA: 345

11/16/2016 04:00	Y	Hart,Sean M
11/15/2016 20:00	Y	Mandich,Pete (Jr)
11/15/2016 12:00	Y	Williams,Jonathan D
11/15/2016 04:00	Y	McCrory,Timothy W
11/14/2016 20:00	Y	Hart,Sean M
11/14/2016 12:00	Y	Librich, Michael N
11/14/2016 04:00	Y	Hart,Sean M

REQUEST 2ND VERIFY CONTAINMENT VAC PP — 1CV-P-1A. SEE INSTRUCTIONS

Min: <EXPR> Max: Y Units: Y OR N - - -- - - Seq: 294 STA: 339

11/16/2016 00:00	Y	Hart,Sean M
11/15/2016 00:00	Y	McCrory,Timothy W
11/14/2016 00:00	Y	Hart,Sean M

REQUEST 2ND VERIFY CONTAINMENT VAC PP — 1CV-P-1B. SEE INSTRUCTIONS

Min: <EXPR> Max: Y Units: Y OR N - - -- - - Seq: 296 STA: 342

11/16/2016 00:00	Y	Hart,Sean M
11/15/2016 00:00	Y	McCrory,Timothy W

CHECK FIRE DOOR S35-24 CLOSED AND LATCHED

1S35-24 | Min: Y Max: Y Units: Y or N | 1-TRBB-735--TURB BLDG TO EFFLUENT CO Seq: 41 | STA: 592

11/14/2016 00:00	Y	Pratchenko,Fred A

CHECK FIRE DOOR S35-26 CLOSED AND LATCHED

1S35-26 | Min: Y Max: Y Units: Y or N | 1-TRBB-735 - -MEN'S LOCKER RI Seq: 42 | STA: 593

11/14/2016 00:00	Y	Pratchenko,Fred A

VERIFY APPROPRIATE UNIT 1 PROTECTED TRAIN SIGN POSTED IN THI

Min: Y Max: Y Units: Y OR N | Seq: 43 | STA: 660

11/16/2016 08:00	Y	Seligsohn,William
11/15/2016 08:00	Y	Cotter,William G
11/14/2016 08:00	Y	Cotter,William G

VERIFY APPROPRIATE UNIT 2 PROTECTED TRAIN SIGN POSTED IN SHI

Min: Y Max: Y Units: Y OR N | Seq: 44 | STA: 661

11/16/2016 08:00	Y	Seligsohn,William
11/15/2016 08:00	Y	Cotter,William G
11/14/2016 08:00	Y	Cotter,William G

CHECK FIRE DOOR S35-29 CLOSED AND LATCHED

1S35-29 | Min: Y Max: Y Units: Y or N | 1-TRBB-735 - -TURB BLDG TO SI Seq: 45 | STA: 594

11/14/2016 00:00	Y	Pratchenko,Fred A

CCT SURGE TANK LEVEL

LG-1CC-103A | Min: 20 Max: 70 Units: % | -CCT | Seq: 46 | STA: 6

11/16/2016 08:00	70	Seligsohn,William
11/16/2016 00:00	55	Pratchenko,Fred A
11/15/2016 08:00	40	Cotter,William G
11/15/2016 00:00	40	Pratchenko,Fred A
11/14/2016 08:00	45	Cotter,William G
11/14/2016 00:00	45	Pratchenko,Fred A

GENERATOR BEARING #8 OIL RETURN TEMP

TI-1TB-210 | Min: 100 Max: 160 Units: F | 1-TURB--- | Seq: 47 | STA: 7

11/16/2016 08:00	146	Seligsohn,William
11/16/2016 00:00	146	Pratchenko,Fred A
11/15/2016 16:00	145	Quaka,Daniel
11/15/2016 08:00	146	Cotter,William G
11/15/2016 00:00	146	Pratchenko,Fred A
11/14/2016 16:00	147	Quaka,Daniel
11/14/2016 08:00	147	Cotter,William G
11/14/2016 00:00	146	Pratchenko,Fred A

GEN AIR SIDE SEAL OIL PRESS EXCITR END

PI-1TB-300A | Units: PSIG | Seq: 48 | STA: 362

11/16/2016 08:00	88	Seligsohn,William
11/16/2016 00:00	88	Pratchenko,Fred A
11/15/2016 16:00	87	Quaka,Daniel
11/15/2016 08:00	87	Cotter,William G
11/15/2016 00:00	87	Pratchenko,Fred A
11/14/2016 16:00	87	Quaka,Daniel
11/14/2016 08:00	87	Cotter,William G
11/14/2016 00:00	87	Pratchenko,Fred A

GEN COLD GAS H2 TEMP

TIC-1CC-201 | Max: 120 Units: F | Seq: 49 | STA: 361

11/16/2016 08:00	117.5	Seligsohn,William
11/16/2016 00:00	117.5	Pratchenko,Fred A
11/15/2016 16:00	117.5	Quaka,Daniel
11/15/2016 08:00	117.5	Cotter,William G
11/15/2016 00:00	120	Pratchenko,Fred A
11/14/2016 16:00	120	Quaka,Daniel
11/14/2016 08:00	117.5	Cotter,William G

GEN COLD GAS H2 TEMP

TIC-1CC-201	Max: 120 Units: F		Seq: 49	STA: 361
11/14/2016 00:00	117.5	Pratchenko,Fred A		

GEN AIR SIDE SEAL OIL PRESS TURB END

PI-1TB-300B	Units: PSIG		Seq: 50	STA: 360
11/16/2016 08:00	87.5	Seligsohn,William		
11/16/2016 00:00	87.5	Pratchenko,Fred A		
11/15/2016 16:00	87.5	Quaka,Daniel		
11/15/2016 08:00	87.5	Cotter,William G		
11/15/2016 00:00	87.5	Pratchenko,Fred A		
11/14/2016 16:00	87.5	Quaka,Daniel		
11/14/2016 08:00	87.5	Cotter,William G		
11/14/2016 00:00	87.5	Pratchenko,Fred A		

TURB BEARING #7 OIL RETURN TEMPERATURE

TI-1TB-209	Min: 100 Max: 160 Units: F		Seq: 51	STA: 363
11/16/2016 08:00	152	Seligsohn,William		
11/16/2016 00:00	151	Pratchenko,Fred A		
11/15/2016 16:00	150	Quaka,Daniel		
11/15/2016 08:00	151	Cotter,William G		
11/15/2016 00:00	151	Pratchenko,Fred A		
11/14/2016 16:00	150	Quaka,Daniel		
11/14/2016 08:00	151	Cotter,William G		
11/14/2016 00:00	151	Pratchenko,Fred A		

TURB BEARING #6 OIL RETURN TEMPERATURE

TI-1TB-208	Min: 100 Max: 160 Units: F		Seq: 52	STA: 364
11/16/2016 08:00	152	Seligsohn,William		
11/16/2016 00:00	152	Pratchenko,Fred A		
11/15/2016 16:00	152	Quaka,Daniel		
11/15/2016 08:00	152	Cotter,William G		
11/15/2016 00:00	152	Pratchenko,Fred A		
11/14/2016 16:00	152	Quaka,Daniel		
11/14/2016 08:00	153	Cotter,William G		
11/14/2016 00:00	153	Pratchenko,Fred A		

TURNING GEAR OIL SUPPLY PRESSURE

PI-1TB-235	Min: 10 Max: 30 Units: PSIG		Seq: 53	STA: 365
11/16/2016 08:00	17.8	Seligsohn,William		
11/16/2016 00:00	17.8	Pratchenko,Fred A		
11/15/2016 16:00	17.8	Quaka,Daniel		
11/15/2016 08:00	17.8	Cotter,William G		
11/15/2016 00:00	17.8	Pratchenko,Fred A		
11/14/2016 16:00	17.8	Quaka,Daniel		
11/14/2016 08:00	17.8	Cotter,William G		
11/14/2016 00:00	17.8	Pratchenko,Fred A		

#2 LP TURB GEN END GLAND STEAM PRESSURE

PI-1MS-205B	Min: 1 Max: 5 Units: PSIG		Seq: 54	STA: 366
11/16/2016 08:00	4.0	Seligsohn,William		
11/16/2016 00:00	4.0	Pratchenko,Fred A		
11/15/2016 16:00	4.0	Quaka,Daniel		
11/15/2016 08:00	4.0	Cotter,William G		
11/15/2016 00:00	4.0	Pratchenko,Fred A		
11/14/2016 16:00	4.0	Quaka,Daniel		
11/14/2016 08:00	3.8	Cotter,William G		
11/14/2016 00:00	4	Pratchenko,Fred A		

TURB BEARING #5 OIL RETURN TEMPERATURE

TI-1TB-207	Min: 100 Max: 160 Units: F		Seq: 55	STA: 8
11/16/2016 08:00	150	Seligsohn,William		
11/16/2016 00:00	150	Pratchenko,Fred A		

TURB BEARING #5 OIL RETURN TEMPERATURE

TI-1TB-207 Min: 100 Max: 160 Units: F Seq: 55 STA: 8

11/15/2016	16:00	150	Quaka,Daniel
11/15/2016	08:00	150	Cotter,William G
11/15/2016	00:00	150	Pratchenko,Fred A
11/14/2016	16:00	150	Quaka,Daniel
11/14/2016	08:00	150	Cotter,William G
11/14/2016	00:00	150	Pratchenko,Fred A

#2 LP TURB GOVERNOR END GLAND STM PRESS

PI-1MS-205A Min: 1 Max: 5 Units: PSIG Seq: 56 STA: 9

11/16/2016	08:00	4.25	Seligsohn,William
11/16/2016	00:00	4.25	Pratchenko,Fred A
11/15/2016	16:00	4.5	Quaka,Daniel
11/15/2016	08:00	4.1	Cotter,William G
11/15/2016	00:00	4.4	Pratchenko,Fred A
11/14/2016	16:00	4.5	Quaka,Daniel
11/14/2016	08:00	4.0	Cotter,William G
11/14/2016	00:00	4.25	Pratchenko,Fred A

THRUST BEARING OIL RETURN TEMPERATURE

TI-1TB-202 Min: 100 Max: 160 Units: F Seq: 57 STA: 10

11/16/2016	08:00	141	Seligsohn,William
11/16/2016	00:00	141	Pratchenko,Fred A
11/15/2016	16:00	141	Quaka,Daniel
11/15/2016	08:00	141	Cotter,William G
11/15/2016	00:00	141	Pratchenko,Fred A
11/14/2016	16:00	141	Quaka,Daniel
11/14/2016	08:00	142	Cotter,William G
11/14/2016	00:00	142	Pratchenko,Fred A

THRUST BEARING OIL RETURN TEMPERATURE

TI-1TB-201 Min: 100 Max: 160 Units: F Seq: 58 STA: 11

11/16/2016	08:00	141	Seligsohn,William
11/16/2016	00:00	141	Pratchenko,Fred A
11/15/2016	16:00	141	Quaka,Daniel
11/15/2016	08:00	142	Cotter,William G
11/15/2016	00:00	141	Pratchenko,Fred A
11/14/2016	16:00	140	Quaka,Daniel
11/14/2016	08:00	142	Cotter,William G
11/14/2016	00:00	141	Pratchenko,Fred A

TURB BEARING #4 OIL RETURN TEMPERATURE

TI-1TB-206 Min: 100 Max: 160 Units: F Seq: 59 STA: 12

11/16/2016	08:00	154	Seligsohn,William
11/16/2016	00:00	153	Pratchenko,Fred A
11/15/2016	16:00	154	Quaka,Daniel
11/15/2016	08:00	154	Cotter,William G
11/15/2016	00:00	154	Pratchenko,Fred A
11/14/2016	16:00	154	Quaka,Daniel
11/14/2016	08:00	154	Cotter,William G
11/14/2016	00:00	154	Pratchenko,Fred A

#1 LP TURB GLAND STM PRESS GENERATOR END

PI-1MS-204B Min: 1 Max: 5 Units: PSIG Seq: 60 STA: 13

11/16/2016	08:00	3.3	Seligsohn,William
11/16/2016	00:00	3.3	Pratchenko,Fred A
11/15/2016	16:00	3.5	Quaka,Daniel
11/15/2016	08:00	3.2	Cotter,William G
11/15/2016	00:00	3.4	Pratchenko,Fred A
11/14/2016	16:00	3.5	Quaka,Daniel
11/14/2016	08:00	3.0	Cotter,William G
11/14/2016	00:00	3.3	Pratchenko,Fred A

TURB BEARING #3 OIL RETURN TEMPERATURE

TI-1TB-205 Min: 100 Max: 160 Units: F Seq: 61 STA: 14

11/16/2016	08:00	155	Seligsohn,William
11/16/2016	00:00	155	Pratchenko,Fred A
11/15/2016	16:00	155	Quaka,Daniel
11/15/2016	08:00	155	Cotter,William G
11/15/2016	00:00	155	Pratchenko,Fred A
11/14/2016	16:00	154	Quaka,Daniel
11/14/2016	08:00	155	Cotter,William G
11/14/2016	00:00	155	Pratchenko,Fred A

TURB BEARING #2 OIL RETURN TEMPERATURE

TI-1TB-204 Min: 100 Max: 160 Units: F Seq: 62 STA: 15

11/16/2016	08:00	146	Seligsohn,William
11/16/2016	00:00	146	Pratchenko,Fred A
11/15/2016	16:00	146	Quaka,Daniel
11/15/2016	08:00	147	Cotter,William G
11/15/2016	00:00	147	Pratchenko,Fred A
11/14/2016	16:00	147	Quaka,Daniel
11/14/2016	08:00	147	Cotter,William G
11/14/2016	00:00	147	Pratchenko,Fred A

#1 LP TURB GLAND STM PRESS GOVENOR END

PI-1MS-204A Min: 1 Max: 5 Units: PSIG Seq: 63 STA: 16

11/16/2016	08:00	3.4	Seligsohn,William
11/16/2016	00:00	3.5	Pratchenko,Fred A
11/15/2016	16:00	3.5	Quaka,Daniel
11/15/2016	08:00	3.5	Cotter,William G
11/15/2016	00:00	3.5	Pratchenko,Fred A
11/14/2016	16:00	3.4	Quaka,Daniel
11/14/2016	08:00	3.4	Cotter,William G
11/14/2016	00:00	3.4	Pratchenko,Fred A

HIGH PRESS TURBINE GLAND STEAM PRESSURE

PI-1TB-232 Min: 1 Max: 5 Units: PSIG Seq: 64 STA: 17

11/16/2016	08:00	2.6	Seligsohn,William
11/16/2016	00:00	2.7	Pratchenko,Fred A
11/15/2016	16:00	2.7	Quaka,Daniel
11/15/2016	08:00	2.5	Cotter,William G
11/15/2016	00:00	2.6	Pratchenko,Fred A
11/14/2016	16:00	2.6	Quaka,Daniel
11/14/2016	08:00	2.4	Cotter,William G
11/14/2016	00:00	2.5	Pratchenko,Fred A

GLAND STEAM SYSTEM SUPPLY PRESSURE

PI-1MS-206A Min: 100 Max: 150 Units: PSIG Seq: 65 STA: 18

11/16/2016	08:00	150	Seligsohn,William
11/16/2016	00:00	149	Pratchenko,Fred A
11/15/2016	16:00	149	Quaka,Daniel
11/15/2016	08:00	149	Cotter,William G
11/15/2016	00:00	150	Pratchenko,Fred A
11/14/2016	16:00	150	Quaka,Daniel
11/14/2016	08:00	150	Cotter,William G
11/14/2016	00:00	150	Pratchenko,Fred A

TURB BEARING #1 OIL RETURN TEMPERATURE

TI-1TB-203 Min: 100 Max: 160 Units: F Seq: 66 STA: 19

11/16/2016	08:00	142	Seligsohn,William
11/16/2016	00:00	142	Pratchenko,Fred A
11/15/2016	16:00	142	Quaka,Daniel
11/15/2016	08:00	142	Cotter,William G
11/15/2016	00:00	143	Pratchenko,Fred A
11/14/2016	16:00	142	Quaka,Daniel

TURB BEARING #1 OIL RETURN TEMPERATURE

TI-1TB-203	Min: 100 Max: 160 Units: F		Seq: 66	STA: 19
11/14/2016 08:00	143	Cotter,William G		
11/14/2016 00:00	143	Pratchenko,Fred A		

MAIN TURBINE BEARING LUBE OIL SUPPLY PRE

PI-1TB-1	Min: 10 Max: 30 Units: PSIG		Seq: 67	STA: 20
11/16/2016 08:00	17.6	Seligsohn,William		
11/16/2016 00:00	17.6	Pratchenko,Fred A		
11/15/2016 16:00	17.6	Quaka,Daniel		
11/15/2016 08:00	17.6	Cotter,William G		
11/15/2016 00:00	17.6	Pratchenko,Fred A		
11/14/2016 16:00	17.6	Quaka,Daniel		
11/14/2016 08:00	17.6	Cotter,William G		
11/14/2016 00:00	17.6	Pratchenko,Fred A		

MAIN LUBE OIL PUMP SUCTION PRESSURE

PI-1TB-2	Min: 10 Max: 45 Units: PSIG		Seq: 68	STA: 21
11/16/2016 08:00	27	Seligsohn,William		
11/16/2016 00:00	27	Pratchenko,Fred A		
11/15/2016 16:00	27	Quaka,Daniel		
11/15/2016 08:00	27	Cotter,William G		
11/15/2016 00:00	27	Pratchenko,Fred A		
11/14/2016 16:00	27	Quaka,Daniel		
11/14/2016 08:00	27	Cotter,William G		
11/14/2016 00:00	27	Pratchenko,Fred A		

MAIN LUBE OIL PUMP DISHARGE PRESSURE

PI-1TB-3	Min: 320 Max: 390 Units: PSIG		Seq: 69	STA: 22
11/16/2016 08:00	382.5	Seligsohn,William		
11/16/2016 00:00	382.5	Pratchenko,Fred A		
11/15/2016 16:00	382.5	Quaka,Daniel		
11/15/2016 08:00	382.5	Cotter,William G		
11/15/2016 00:00	382.5	Pratchenko,Fred A		
11/14/2016 16:00	382.5	Quaka,Daniel		
11/14/2016 08:00	382.5	Cotter,William G		
11/14/2016 00:00	382.5	Pratchenko,Fred A		

TURBINE AUTO STOP OIL PRESSURE NOTIFY US OF A DOWNWARD TREND

PI-1TB-231A	Min: 100 Max: 125 Units: PSIG	- - - -	Seq: 70	STA: 452
11/16/2016 08:00	113	Seligsohn,William		
11/16/2016 00:00	113	Pratchenko,Fred A		
11/15/2016 16:00	113	Quaka,Daniel		
11/15/2016 08:00	113	Cotter,William G		
11/15/2016 00:00	113	Pratchenko,Fred A		
11/14/2016 16:00	113	Quaka,Daniel		
11/14/2016 08:00	113	Cotter,William G		
11/14/2016 00:00	113	Pratchenko,Fred A		

CHECK FIRE DOOR S35-35 CLOSED AND LATCHED

1S35-35	Min: Y Max: Y Units: Y or N	1-SRVB-735 -MECH SHOP -TURB BLDG	Seq: 75	STA: 595
11/14/2016 00:00	Y	Pratchenko,Fred A		

FIRE DOOR S35-38 CHECK

1S35-38	Min: Y Max: Y Units: Y or N	1-SRVB-735 - -SLIDING DOOR T\	Seq: 76	STA: 596
11/14/2016 00:00	Y	Pratchenko,Fred A		

CHECK FIRE DOOR S35-40 CLOSED AND LATCHED

1S35-40	Min: Y Max: Y Units: Y or N	1-SRVB-735 - -CLEAN SHOP TO \	Seq: 77	STA: 597
11/14/2016 00:00	Y	Pratchenko,Fred A		

CHECK FIRE DOOR S35-45 CLOSED AND LATCHED

1S35-45	Min: Y Max: Y Units: Y or N	1-TRBB-735 - -TURB BLDG TO W	Seq: 78	STA: 598
11/14/2016 00:00	Y	Pratchenko,Fred A		

CHECK FIRE DOOR S35-46 CLOSED					
1S35-46	Min: Y Max: Y Units: Y or N		1-SRVB-735 -	-TURB BLDG TO W Seq: 79	STA: 599
11/14/2016 00:00	Y	Pratchenko,Fred A			
FIRE DOOR S35-52 CHECK					
1S35-52	Min: Y Max: Y Units: Y or N		1-TRBB- -	-SLIDING DOOR TUF Seq: 80	STA: 600
11/14/2016 00:00	Y	Pratchenko,Fred A			
FIRE DOOR S35-54 CHECK					
1S35-54	Min: Y Max: Y Units: Y or N		1-TRBB- -	-SLIDING DOOR TUF Seq: 81	STA: 601
11/14/2016 00:00	Y	Pratchenko,Fred A			
CHECK FIRE DOOR S35-55 CLOSED AND LATCHED					
1S35-55	Min: Y Max: Y Units: Y or N		1-SRVB-735 -	-STOREROOM TO / Seq: 82	STA: 602
11/14/2016 00:00	Y	Pratchenko,Fred A			
FIRE DOOR S35-56 CHECK					
1S35-56	Min: Y Max: Y Units: Y or N		1-SRVB-735 -	-SLIDING DOOR TI Seq: 83	STA: 603
11/14/2016 00:00	Y	Pratchenko,Fred A			
CHECK FIRE DOOR S35-53 CLOSED AND LATCHED					
1S35-53	Min: Y Max: Y Units: Y or N		1-SRVB-735 -	-CORRIDOR TO AU Seq: 84	STA: 604
11/14/2016 00:00	Y	Pratchenko,Fred A			
FIRE DOOR S35-65 CHECK					
1S35-65	Min: Y Max: Y Units: Y or N		1-SRVB-735 -	-SLIDING DOOR TI Seq: 85	STA: 605
11/14/2016 00:00	Y	Pratchenko,Fred A			
FIRE DOOR S35-66 CHECK					
1S35-66	Min: Y Max: Y Units: Y or N		1-TRBB- -	-SLIDING DOOR TUF Seq: 86	STA: 606
11/14/2016 00:00	Y	Pratchenko,Fred A			
DIESEL AIR COMP ALIGNED FOR AUTO START			SEE SPECIAL INSTRUCTIONS		
1IA-C-4	Min: Y Max: Y Units: Y or N		1-WTBX-735 -AUX BLR ROOM -	Seq: 87	STA: 579
11/16/2016 00:00	Y	Pratchenko,Fred A			
11/15/2016 00:00	Y	Pratchenko,Fred A			
11/14/2016 00:00	Y	Pratchenko,Fred A			
DIESEL AIR COMP BATTERY CHARGER			Record Battery Charger Voltage		
BAT-CHG-1IA-1	Min: 24 Units: Volts		1-WTBX-735 -AUX BLR ROOM -	Seq: 88	STA: 580
11/16/2016 00:00	26.1	Pratchenko,Fred A			
11/15/2016 00:00	26.1	Pratchenko,Fred A			
11/14/2016 00:00	26.1	Pratchenko,Fred A			
DIESEL AIR COMPRESSOR AIR RECEIVER			Record 1IA-TK-2 pressure		
PI-1IA-233	Min: 95 Units: PSIG		1-WTBX-735 -AUX BLR ROOM -	Seq: 89	STA: 581
11/16/2016 00:00	104	Pratchenko,Fred A			
11/15/2016 00:00	104	Pratchenko,Fred A			
11/14/2016 00:00	104	Pratchenko,Fred A			
DIESEL AIR COMPRESSOR AIR DRYER			Air Dryer "STAND-BY" Light Illuminated.		
1IA-D-1C	Min: Y Max: Y Units: Y or N		1-WTBX-735 -AUX BLR ROOM -	Seq: 91	STA: 583
11/16/2016 00:00	Y	Pratchenko,Fred A	"AUTO START STOP"		
11/15/2016 00:00	Y	Pratchenko,Fred A	"AUTO START STOP"		
11/14/2016 00:00	Y	Pratchenko,Fred A	"AUTO START STOP"		
DIESEL AIR COMPRESSOR AIR DRYER TOWER 1			Record the Diesel Air Compressor Air Dryer Tower Pressure		
PI-1IA-234	Min: 80 Units: PSIG		1-WTBX-735 -AUX BLR ROOM -	Seq: 92	STA: 585
11/16/2016 00:00	97.5	Pratchenko,Fred A			
11/15/2016 00:00	95	Pratchenko,Fred A			
11/14/2016 00:00	95	Pratchenko,Fred A			
DIESEL AIR COMPRESSOR AIR DRYER TOWER 2			Record the Diesel Air Compressor Air Dryer Tower Pressure		
PI-1IA-235	Min: 80 Units: PSIG		1-WTBX-735 -AUX BLR ROOM -	Seq: 93	STA: 584
11/16/2016 00:00	97.5	Pratchenko,Fred A			
11/15/2016 00:00	95	Pratchenko,Fred A			
11/14/2016 00:00	95	Pratchenko,Fred A			

A9.330B

Beaver Valley Power Station

Unit 1

1OM-28.4.AAC

Secondary Comp Cool Water Heat Exchanger Disch Temp High

GENERAL SKILL REFERENCE

Revision 1

Prepared by	Date	Pages Issued	Effective Date
C. Eberle	08/13/09	1 through 3	10/23/09
Reviewed by	Date	Validated by	Date
J. P. Keegan	08/20/09		
PORC Meeting No.	Date		
PORC not required		PAF-09-01759	

CONTROLLED
BVPS UNIT 1

SECONDARY COMP COOL WATER HEAT EXCHANGER DISCH TEMP HIGH

A6-59

SETPOINTS: 100 F

DISCONNECT SWITCH: 2-1067, BAY 3

SER POINT NUMBER: 0354

SER POINT ID: TP COMP COOL WTR HX DISCH TEMP HIGH

INITIATING DEVICE: TS-CCT-200

PROBABLE CAUSE NO. 1

Overload of CCT system or high river water temperature.

CORRECTIVE ACTIONS

1. GO TO 1OM-53C.4.1.28.1, Loss of Secondary Component Cooling Water.

PROBABLE CAUSE NO. 2

Inoperative Temperature Control Valve.

CORRECTIVE ACTIONS

1. GO TO 1OM-53C.4.1.28.1, Loss of Secondary Component Cooling Water.

PROBABLE CAUSE NO. 3

Malfunction of [TS-CCT-200], CCT HX Discharge Temp Switch.

CORRECTIVE ACTIONS

1. Verify actual temperature on [TI-1CC-200B], Combined CCT Heat Exchangers Outlet Temp. (SE Turb Bsmt Ovhd)

2. Initiate corrective maintenance on [TS-CCT-200], CCT HX Discharge Temp Switch.

REFERENCES:

A. TECHNICAL SPECIFICATIONS

None

B. UPDATED FINAL SAFETY ANALYSIS REPORT

None

C. COMMITMENTS

None

D. ADMINISTRATIVE

None

E. VENDOR INFORMATION

None

F. DRAWING

1. 8700-RM-130A-16 - VOND Turbine Plant Component Cool Water
2. 11700-LSK-12-1B - Secondary Component Cooling Water Pump
3. 8700-RE-21-PZ - Elementary Diagram Annunciator A6

G. OPERATING MANUAL

1. 1OM-28 - Turbine Plant Component Cooling Water System
2. 1OM-28.4.D - Placing Standby Heat Exchangers in Service

H. PLANT MODIFICATION

None

I. OTHER

1. PAF-09-01759, RAD 09-03394-00. The following changes were made: (Revision 1)
    a. Added level-of-use, General Skill Knowledge, in accordance with NOP-LP-2601, Procedure Use and Adherence.
    b. Replaced instructions with direction to "GO TO 1OM-53C.4.1.28.1, Loss of Secondary Component Cooling Water".

- Maintain systems and parameters within established limits to ensure systems are not operated outside of the intended design and that operating margins are not eroded. Clearly establish parameters and limits, and control parameters within the specified bands and at specified rates.

- Use sound judgment when deciding to take manual actions prior to automatic actions in response to parameter trends. Take manual actions (in accordance with procedure direction, if available) when automatic actions do not occur. Verify and report automatic system actuations or response, which include operator actions if the plant has not responded as expected.

- Anticipate automatic trips and equipment protective features, and take manual actions, if possible without haste, to avoid challenging automatic actuations. Examples of protective features are turbine trips, reactor scrams, and other features intended to prevent damage to equipment. Manual action of safety system operation, such as closing isolation valves and starting safety systems, should be governed by emergency and abnormal operating procedures.

- Set limits, establish supplemental monitoring, and determine contingent actions when operating automatic systems in manual.

3. Teamwork - The operating crew works together effectively to monitor and control the plant.

    - Maintain broad awareness of plant conditions through all members of the crew. Communicate clearly and regularly to share important information and clarify priorities. Communicate the status of parameters to the operating crew when needed by describing the parameter, value, and trend, including any action taken or needed.

    - Perform shift briefings and updates to keep all crewmembers aware of plant conditions and upcoming operations. Coordinate field and Control Room activities to achieve intended results.

VI. INSTRUCTIONS

A. Reactor Protection and Safety System Philosophy[V.A.1]

1. Licensed operators are responsible to initiate a reactor trip or safety feature actuation if, in their judgment, such actions are warranted. This authorization and responsibility is, and shall remain, the overriding philosophy.

2. **IF** a plant parameter associated with an automatic protective feature actuation is trending toward its actuation setpoint, and it has been determined in the best judgment of the operator that the trend is valid and will **NOT** be reversed by actions in progress, the operator is expected to manually initiate the protective feature without waiting for the automatic actuation to occur.

3. Operators shall attempt to validate abnormal indications with at least two other instruments or parameters. **IF** validation is **NOT** possible **OR** can **NOT** be performed in a timely manner, the operators shall act based on the most conservative indication.

4. **WHEN** valid plant conditions indicate the need for reactor protection system or safety system actuation, and the actuation fails to automatically occur, the operator is required to manually initiate the protective action.

5. **IF** it has been determined that the reactor protection system is incapable of performing its automatic reactor trip function, and valid plant conditions indicate no need for reactor protection system actuation, operators shall immediately commence a controlled reactor shutdown to a condition with the reactor trip breakers open. It is expected that the Unplanned Power Reduction procedure will be used to complete a controlled shutdown as expeditiously as possible. During the period of automatic reactor protection system inoperability with the reactor trip breakers closed, control room personnel must continuously monitor reactor trip parameters and initiate a manual reactor trip if trip setpoints are approached.

6. **IF** it has been determined that the solid state protection system is incapable of initiating automatic safety system actuation, and valid plant conditions indicate no need for safety system actuation, operators shall immediately take action to place the plant in a mode or condition where automatic safety system actuation is **NOT** required. It is expected that the Unplanned Power Reduction procedure will be used, if necessary, to complete a controlled shutdown as expeditiously as possible. Until the plant is placed in a mode or condition where automatic safety system actuation is not required, control room personnel must continuously monitor SSPS initiating parameters and initiate manual actuations if setpoints are approached.

- Know the bases of plant design, licensing requirements, and technical specifications. Regularly review system drawings and bases documents with the intention of refreshing fundamental knowledge.

- Have a solid understanding of engineering principles and sciences. Know system and component purposes, design and limitations of equipment, operating limits, and how operator actions affect margins to limits.

- Understand how core reactivity coefficients vary with core life and the actions you can implement to properly control the reactor, giving special attention to coefficients that add positive reactivity.

- Establish a learning environment (culture of intellectual curiosity) among crewmembers that encourages questioning, challenging, and knowledge reviews.

- Include plant design, engineering principles, and sciences in operator continuing training. Ask for simulator scenarios that challenge fundamental knowledge of plant design, engineering principles, and sciences. Regularly evaluate crewmember knowledge of plant design, engineering principles, and sciences.

5. Conservatism - Operators have a conservative bias.

   - Follow procedures and processes, with a thorough understanding and focus on the tasks. Control operating bands and rates to create and maintain sufficient operating margins.

   - Take action based on sound operational principles, not solely on compliance with rules. Understand plant conditions, effectively control the plant and know the appropriate action to take when control of the plant or a component cannot be maintained, including stopping the evolution, involving supervision, tripping the component, and scramming the reactor.

Number	Title	
1.28.1	**Loss of Secondary Component Cooling Water**	**Revision 3**

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3	<u>Plant - MODE 1</u>	GO TO Step 6.
	a. Check the following parameters: 1) Turbine Bearing Oil Discharge Temperature – LESS THAN 180F • [T2054A], TURB LUBE OIL CLR OIL OUT T/C-1TB-213 2) Turbine Journal & Thrust Bearing Metal Temperature – LESS THAN 225F • [T2061A through T2069A], TURB BRG METAL TEMP • [T2071A through T2074A], LP TURB THR BRG METAL TEMP 3) Main Generator Cold Gas Temperatures - LESS THAN 56C • [T2811A through T2814A], GEN COLD H2 GAS TEMP, less than 56C. 4) Turbine Vibration – LESS THAN 14 MILS • [VR-TR-001], Vibration Brg. No. 1, 2, 3 • [VR-TR-002], Vibration Brg. No. 4, 5, 6 • [VR-TR-003], Vibration Brg. No. 7, 8, 9	a. Perform the following: <u>IF</u> power ≥P9, perform the following: a) Trip the reactor. b) GO TO E-0, "Reactor Trip or Safety Injection". c) <u>WHEN</u> immediate actions of E-0 are complete, perform this procedure in parallel with EOPs. <u>IF</u> power <P9, perform the following: a) Trip the turbine. b) GO TO AOP 1.26.1, "Turbine And Generator Trip". c) <u>WHEN</u> immediate actions of AOP 1.26.1 are complete, perform this procedure in parallel with AOPs.

Number	Title	
1.28.1	**Loss of Secondary Component Cooling Water**	**Revision 3**

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	<u>Check The Following Parameters</u>	
	a. Check the following: 1) Main Bearing Lube Oil Temperatures – LESS THAN 195F • [T2041A through T2046A], TURB BRG OIL TEMP • [T2047A, T2048A], MAIN GEN BRG OIL TEMP • [T2049A], EXCITER BRG #9 OIL T/C-1TB-211A • [T2051A, T2052A], LP TURB THR BRG OIL TEMP 2) [1CN-P-1A, 1B], Condensate Pumps – AT LEAST ONE RUNNING	a. Perform the following: a) Verify turbine tripped. b) <u>WHEN</u> turbine speed drops to ≤600 rpm, Open [MOV-1AS-100], Main Cnds Vac Break MOV c) Secure gland steam: • Verify Closed [MOV-1MS-201] Main Turb Gland Steam Control Vlv. • <u>IF</u> supplied by Auxiliary Steam, Close [1MS-42], Aux Stm to Gland Stm Isol. (Turb Bldg, Mezz, Overhead SW, El 713) • Place [1CN-SC-2A **AND** 2B], control switches in PULL-TO-LOCK. • Refer to Attachment A for additional actions. d) Open tarps at condenser bay <u>AND</u> start turbine building fans. e) Start [1LO-M-7], Turning Gear Oil Pump f) <u>WHEN</u> turbine speed drops to zero Verify turbine engaged on turning gear. g) <u>IF</u> possible, Maintain turbine on turning gear for 6 – 8 hours.

ATTACHMENT A

Proposed Answer Key Changes

Question 42

Question 42

Recommendation: The facility recommends accepting two correct answers for question #42

Reason: Technical information available that supports an additional answer.

42. Which of the following conditions does **NOT** meet the applicable Limiting Condition for Operation (LCO)?

A. TV-1MS-101C, Main Steam Trip Valve lost DC control power in MODE 4.

B. HYV-1FW-100B, 1B Main Feedwater CNMT Isolation Valve has a broken stem in MODE 4.

C. SV-1MS-105A, 'A' Steam Generator Safety Valve lift setpoint is out of tolerance in MODE 3.

D. HCV-1MS-104, Residual Heat Release Control Valve broken air line on actuator in MODE 1.

Question 42 tested knowledge of Technical Specification section 3.7 Plant Systems, specifically LCO 3.7.1 "Main Steam Safety Valves (MSSVs)". TS 3.7.1 and Bases (attached) support the original correct answer of "C".

For answer "B", the Explanation/Justification references only LCO 3.7.3 "Main Feedwater Isolation Valves (MFIVs) and Main Feedwater Regulation Valves (MFRVs) and MFRV Bypass Valves (attached), which is only applicable in MODES 1, 2 and 3 and was the justification for why this answer is not correct.

The Explanation/Justification does not consider the fact that HYV-1FW-100B is also a containment isolation valve and is required to be operable by LCO 3.6.3 "Containment Isolation Valves", with an applicability of MODES 1, 2, 3 AND 4 (attached).

HYV-1FW-100B, 1B Main Feedwater CNMT Isolation Valve, is specifically listed as containment isolation valve in LRM Table 3.6.1-1 "Containment Penetrations" (attached). The condition of HYV-1FW-100B described in answer "B" does not meet LCO 3.6.3 (Containment Isolation Valves). Therefore, answer "B" should also be considered to be a correct answer to question 42.

The facility recommends accepting two correct answers for question 42, the original correct Answer "C" and Answer "B", based on LCO 3.6.3 not being met by the condition described.

3.7 PLANT SYSTEMS

3.7.1 Main Steam Safety Valves (MSSVs)

LCO 3.7.1 Five MSSVs per steam generator shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

- NOTE -

Separate Condition entry is allowed for each MSSV.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more steam generators with one MSSV inoperable and the Moderator Temperature Coefficient (MTC) zero or negative at all power levels.	A.1 Reduce THERMAL POWER to $\leq$ 57% RTP.	4 hours
B. One or more steam generators with two or more MSSVs inoperable. OR One or more steam generators with one MSSV inoperable and the MTC positive at any power level.	B.1 Reduce THERMAL POWER to less than or equal to the Maximum Allowable % RTP specified in Table 3.7.1-1 for the number of OPERABLE MSSVs. AND	4 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
	B.2	- NOTE - Only required in MODE 1. Reduce the Power Range Neutron Flux - High reactor trip setpoint to less than or equal to the Maximum Allowable % RTP specified in Table 3.7.1-1 for the number of OPERABLE MSSVs.	 36 hours
C. Required Action and associated Completion Time not met. <u>OR</u> One or more steam generators with $\geq$ 4 MSSVs inoperable.	C.1 <u>AND</u> C.2	Be in MODE 3. Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.1.1	- NOTE - Only required to be performed in MODES 1 and 2. Verify each required MSSV lift setpoint per Table 3.7.1-2a (Unit 1), Table 3.7.1-2b (Unit 2) in accordance with the Inservice Testing Program. Following testing, lift setting shall be within $\pm$ 1%.	 In accordance with the Inservice Testing Program

Table 3.7.1-1 (page 1 of 1)
OPERABLE Main Steam Safety Valves versus
Maximum Allowable Power

NUMBER OF OPERABLE MSSVs PER STEAM GENERATOR	MAXIMUM ALLOWABLE POWER (% RTP)
4	$\leq$ 50
3	$\leq$ 34
2	$\leq$ 19

3.6 CONTAINMENT SYSTEMS

3.6.3 Containment Isolation Valves

LCO 3.6.3 Each containment isolation valve shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

- NOTES -

1. Penetration flow path(s) except for 42-inch purge and exhaust valve flow paths may be unisolated intermittently under administrative controls.
2. Separate Condition entry is allowed for each penetration flow path.
3. Enter applicable Conditions and Required Actions for systems made inoperable by containment isolation valves.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. **- NOTE -** Not applicable to penetration flow paths addressed by Condition C. One or more penetration flow paths with one containment isolation valve inoperable.	A.1 Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured. <u>AND</u>	4 hours

3.6 CONTAINMENT

3.6.1 Containment Isolation Valves

LR 3.6.1 Each containment isolation valve listed in [redacted] shall be maintained in the manner specified in Technical Specification (TS) 3.6.3.

APPLICABILITY: As specified in TS 3.6.3.

[redacted] (Page 9 of 15)
CONTAINMENT PENETRATIONS

PENT. No.	IDENTIFICATION DESCRIPTION	INSIDE VALVE	MAXIMUM STROKE TIME (SEC)	OUTSIDE VALVE	MAXIMUM STROKE TIME (SEC)
[redacted]	[redacted]	Closed System	N/A	[redacted]	10(15)
	Auxiliary Feedwater Loop 1B	Closed System	N/A	(2)FW-43	N/A
78	FW Loop 1C	Closed System	N/A	(2)HYV-1FW-100C	10(15)
	Auxiliary Feedwater Loop 1C	Closed System	N/A	(2)FW-44	N/A
79	RW to 1A RSP Hx	Closed System	N/A	(2)MOV-1RW-104A	N/A
80	RW to 1C RSP Hx	Closed System	N/A	(2)MOV-1RW-104C	N/A
81	RW to 1B RSP Hx	Closed System	N/A	(2)MOV-1RW-104B	N/A
82	RW to 1D RSP Hx	Closed System	N/A	(2)MOV-1RW-104D	N/A
83	RW from 1A RSP Hx	Closed System	N/A	(2)MOV-1RW-105A	N/A
				(2)1RW-615	N/A
				(2)RV-1RW-101A	N/A
84	RW from 1C RSP Hx	Closed System	N/A	(2)MOV-1RW-105C	N/A
				(2)1RW-627	N/A
				(2)RV-1RW-101C	N/A
85	RW from 1B RSP Hx	Closed System	N/A	(2)MOV-1RW-105B	N/A
				(2)1RW-621	N/A
				(2)RV-1RW-101B	N/A
86	RW from 1D RSP Hx	Closed System	N/A	(2)MOV-1RW-105D	N/A
				(2)1RW-633	N/A
				(2)RV-1RW-101D	N/A

ATTACHMENT A

Proposed Answer Key Changes

Question 71

Question 71

Recommendation: The facility recommends changing the correct answer from "A" to "C" for #71.

Reason: Technical information available that supports C as the correct answer.

71. You are going into a contaminated area, which has the following radiological characteristics to perform a valve lineup:

- Your current exposure for the year is 938 mrem
- The RWP states:
  - General area dose rate = 30 mrem/hr
  - Airborne contamination concentration = 10.0 DAC

- The valve lineup will take you 2 hours if you wear a full-face respirator.
- The valve lineup will only take you 1 hour if you do **NOT** wear the respirator

1) Which of the following choices for completing this job would maintain your exposure within the station administrative requirements and the principles of ALARA?
2) Why is this action appropriate?

A. 1) You should **NOT** wear the respirator
2) Your calculated TEDE dose received will be less than if you do wear a respirator

B. 1) You should **NOT** wear the respirator
2) Your dose received wearing a respirator will exceed the site annual personnel dose limits.

C. 1) You must wear the respirator.
2) You will exceed the DAC limits if you do **NOT** wear a respirator

D. 1) You must wear the respirator
2) Your calculated TEDE dose received will be less than if you do **NOT** wear a respirator

Answer "C" is correct based on ½-ADM-1601, Radiation Protection Standards, section 7.4, "Airborne Radiation Control", subsection 7.4.1.5, "Protective Actions" (attached).
Subsection 7.4.1.5, states:

Protective actions (e.g., stopping work, evacuation, donning respirators) shall be taken in occupied areas in which particulate and / or iodine airborne activity exceeds 1.0 DAC, if internal dose control measures have not already been implemented.

The stem of question 71 states that the Airborne Contamination = 10 DAC which exceeds the airborne activity of 1.0 DAC identified in Subsection 7.4.1.5.

Based on the information given in the stem of the question, internal dose control measures have not been implemented, and stopping work or evacuation is not provided as an alternative answer.

Since the given Airborne contamination concentration of 10 DAC exceeds the limit in Subsection 7.4.1.5 of ½-ADM-1601, Radiation Protection Standards, respiratory protection must be worn. If respiratory protection is not worn, the worker will exceed the 1.0 DAC limit identified in ½-ADM-1601.

Based on the above information the facility recommends changing the correct answer of question 71 to "C" 1) You must wear the respirator. 2) You will exceed the DAC limits if you do NOT wear a respirator.

ALARA Plan

ALARA Plan #: **Rev. #:**
Work Order #: **RWP #:**

RWP TASK ANALYSIS

	Task/Work Order	Risk	P-Hrs	Eff. Dose Rate	Dose	Dose Alarm	80% Stop Work Dose	D/R Alarm
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
		Estimated Duration in person hours			**Estimated Dose (mrem)**			

SPECIFIC HIGH RISK TASKS / ACTIVITIES

ASSUMPTIONS USED DURING TASK PLANNING (e.g., Exposure Challenge Goals)

DOSE REDUCTION TOOLS AND TECHNIQUES TO BE USED *(highlight or circle controls)*

DOSE CONTROL	Install Shielding	Fill With Water	System Flush	Isotopic Decay	Move Item to Low Dose	Remote Tooling	Robotics	OTHER Specify in Dose Reduction Section
CONTAM CONTROL	Pre-Job Decon	Job Step Decon	Strip Coat	Glovebag / Containment	DPZ Controls	Knee Walls	Double Step-Off-Pads	OTHER Specify in Contam Control Section
AIRBORNE CONTROL	Planned Intake	HEPA Ventilation	HEPA Vacuum	Dampen Surfaces	Use Fixatives	Gen Area Air Sampler	Breathing Zone A/S	OTHER Specify in Airborne Control Section
WORK CONTROL	Mockup Training	Dry-Run Practice	Experienced Workers	Reduce Crew Size	Use Special Tooling	ALARA Briefing	External MG Alarms	OTHER Specify in Dose Reduction Section

RTL #A5.800B

Beaver Valley Power Station

Unit 1/2

1/2-ADM-1601

Radiation Protection Standards

Document Owner
Manager, Radiation Protection

Revision Number	23
Level Of Use	General Skill Reference
Safety Related Procedure	No
Effective Date	07/31/15

7.4.1.2 Applicability

7.4.1.2.1 Excluded Sources: - Airborne radioactivity criteria do not apply to naturally occurring sources of radon gas (Rn-222) or its particulate decay products (radon daughters) because these radionuclides are not occupational sources of exposure.

7.4.1.2.2 Noble Gases: - Airborne radioactivity criteria for noble gases (Ar, Kr, Xe) apply to external dose control only. The internal dose associated with exposure to noble gases is insignificant compared to the external dose.(3.1.18)

7.4.1.2.3 Transuranics: - Airborne transuranic (TRU) fission products are controlled by monitoring and controlling particulate alpha airborne activity. Monitoring for alpha airborne activity is necessary only when transuranics are present or suspected (e.g., removable alpha contamination detected, beta-gamma or gamma air concentration in excess of the level at which transuranic airborne activity is predicted to be significant based on scaling factors).

7.4.1.3 Airborne Activity

Measurements or estimates of airborne activity shall be based on applicable Derived Air Concentrations (DACs)

7.4.1.3.1 Mixtures: The airborne activity for a mixture of radionuclides is:

7.4.1.3.1.1 If the identity of each radionuclide in the mixture is known, but the concentration of one or more of the radionuclides is not known, the ratio of the total (gross) air concentration to the DAC for the limiting radionuclide,(3.1.1) or

7.4.1.3.1.2 If the identity and concentration of each radionuclide in the mixture is known,

7.4.1.3.1.2.1 The sum of the ratios of the air concentration to the DAC for each radionuclide in the mixture,(3.1.1) or

7.4.1.3.1.2.2 The ratio of the total of the air concentrations for the nuclides in the mixture to the most restrictive DAC for any radionuclide in the mixture.(3.1.1)

7.4.1.4 Radiological Controls

Appropriate radiological controls shall be implemented in occupied Airborne Radioactivity Areas (see Section 7.2.4), including:

7.4.1.4.1 Air sampling per NOP-OP-4702. (3.1.19)

7.4.1.4.2 Process and engineering controls per NOP-OP-4107. (3.1.15)

7.4.1.4.3 Internal dose monitoring and control per Section 7.4.3 for exposure to airborne activity other than noble gases

7.4.1.5 Protective Actions

Protective actions (e.g., stopping work, evacuation, donning respirators) shall be taken in occupied areas in which particulate and/or iodine airborne activity exceeds 1.0 DAC, if internal dose control measures have not already been implemented.

7.4.2 **Processing and Engineering Controls**

7.4.2.1 Process or other engineering controls shall be used to the extent practical to control airborne radioactivity in occupied areas.(3.1.1)

7.4.2.2 NOP-OP-4107(3.1.15) provides for use of processing and engineering controls.

7.4.3 Internal Dose Control

7.4.3.1 When process or engineering controls are not practical or effective, internal dose controls shall be used as necessary to limit intakes, consistent with maintaining Total Effective Dose Equivalent (TEDE) as low as is reasonably achievable (ALARA). If performing an ALARA evaluation to determine whether or not respirators should be used, safety factors other than radiological factors (e.g., heat stress, impaired vision) may be considered. The impact of respirator use on the worker(s) industrial health and safety should be considered.(3.1.1)

7.4.3.2 NOP-OP-4301(3.1.20) and NOP-OP-4107(3.1.15) provide for internal dose control.

7.4.4 Determination of External Dose From Airborne Radioactive Material

7.4.4.1 When determining worker dose from airborne radioactive material, the contribution to DDE, LDE and SDE from the radioactive cloud shall be included when monitoring for the dose quantity is required.(3.1.1)

7.4.4.2 NOP-OP-4204(3.1.21) provides the methodology and means to determine dose from exposure to Xe-133. This may be applied to other external airborne radionuclide exposures.

7.5 **Monitoring and Surveys**

7.5.1 External Dose Monitoring

7.5.1.1 Exposures to external sources of radiation shall be monitored to assess occupational doses and to provide information to assist in maintaining doses as low as is reasonably achievable (ALARA). NOP-OP-4201(3.1.11) and NOP-OP-4204(3.1.21) provide for external dose monitoring.