Byron
June 2000 Examination

Final, As-Administered
Operating Tests

Byron
June 2000 Examination

NRC-Developed Admin JPMs

Final, As-Administered

Facility: _____BYRON_____ Date of Examination: ____06/20/00___
Examination Level (circle one): (RO)/ SRO Operating Test Number: _00-301____

Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	CONDUCT OF OPERATIONS	Perform a SDM Calculation
	CONDUCT OF OPERATIONS	Perform a Shift Turnover
A.2	EQUIPMENT CONTROL TAGGING AND CLEARANCE	Perform a Tagout of CS Pump
A.3	RADIATION CONTROL	Perform a Containment Purge
A.4	EMERGENCY PLAN	Communication of NAR's Form

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility: BYRON Task No: _____

Task Title: SDM CALCULATION Job Performance Measure No: A. 1.1
K/A Reference: 1A4.11 3.5/4.1

Examinee: _____ NRC Examiner: _____

Date: _____

Method of testing:

Simulated Performance _____X_____ Actual Performance _____

Classroom _____X_____ Simulator _____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions: You are an extra person on shift
Unit 1 is shutdown, in mode 3
RCS AVG TEMP 540F
Core AVG Burnup 397.4 EFPH,
RCS Boron Conc 1046 ppm
All controls rods are operable
Xenon equivalent power is 99.9%
COLR required SDM is (-1300 pcm)
Bounding assumptions for SDM: Temp 520-557F, Time 10 hours from start of JPM

Task Standard: SDM CALCULATION

Required Materials: COLR
1BOSR 1.1.1-1
1BGP 100-7T1
1BCB-1
1BOSR NR-1

General References: COLR
1BOSR 1.1.1-1
1BGP 100-7T1
1BCB-1
1BOSR NR

Initiating Cue: UNIT 1 SRO DIRECTS YOU TO PERFORM A SDM SURVEILLANCE IAW 1BOSR 1.1.1-1. THIS IS NOT THE FIRST PERFORMANCE OF THIS SURVEILLANCE FOLLOWING ENTRY INTO MODE 3.

Time Critical Task: NO

Validation Time: 30 minutes

PERFORMANCE INFORMATION

START TIME: _____

(Denote critical steps with a **BOLD** *)

Performance step: 1

ENTER 1BOSR 1.1.1-1

Standard: LOCATE AND OPEN 1BOSR 1.1.1-1

CUE: HAND APPLICANT 1BOSR 1.1.1-1 AND ASSOCIATED BCB PAGES

Comment: ----------

NOTE: SEE ATTACHED SDM SHEET FOR CORRECT ANSWERS

Performance step: 2

*** ENTER PRESENT CONDITIONS FROM TURNOVER AND COLR ***

Standard: *PRESENT CONDITIONS ENTERED *

Comment: ----------

Performance step: 3

POST RX TRIP ASSESSMENT

Standard: POST RX TRIP ASSESSMENT ENTERED

Comment: ----------

Performance step: 4

BOUNDING ASSUMPTIONS

Standard: BOUNDING ASSUMPTIONS ENTERED

Comment: ----------

Performance step: 5

*** ENTER MINIMUM BORON CONCENTRATION ***

Standard: *** MINIMUM BORON CONCENTRATION ENTERED ***

Comment: ----------

Performance step: 6

*** ENTER REACTIVITY WORTH OF BORON ***

Standard: *** REACTIVITY WORTH OF BORON ENTERED ***

Comment: ----------

Performance step: 7

ENTER REACTIVITY WORTH OF UNTRIPPABLE RODS

Standard: REACTIVITY WORTH OF UNTRIPPABLE RODS ENTERED

Comment: ----------

Performance step: 8

*** ENTER REACTIVITY CHANGE DUE TO XENON ***

Standard: *** REACTIVITY CHANGE DUE TO XENON ENTERED ***

Comment: ----------

Performance step: 9

ENTER REACTIVITY WORTH OF SAMARIUM

Standard: REACTIVITY CHANGE DUE TO SAMARIUM ENTERED

Comment: ----------

Performance step: 10

*** ENTER CORRECTIONS FOR BORON EFFECTS ON XENON AND SAMARIUM ***

Standard:***CORRECTIONS FOR BORON EFFECTS ON XENON AND SAMARIUM ENTERED***

Comment: ----------

Performance step: 11

*** ENTER TOTAL SDM ***

Standard: *** TOTAL SDM ENTERED ***

Comment: ----------

TERMINATING CUE: SRO I HAVE COMPLETED 1BOSR 1.1.1-1

TIME STOP_____

Initial Conditions:

You are an extra person on shift
Unit 1 is shutdown, in mode 3
RCS AVG TEMP 540F
Core AVG Burnup 397.4 EFPH,
RCS Boron Conc 1046 ppm
All controls rods are operable
Xenon equivalent power is 99.9%
COLR required SDM is (-1300 pcm)
Bounding assumptions for SDM: Temp 520-557F, Time 10 hours from start of JPM

Initiating Cue: UNIT 1 SRO DIRECTS YOU TO PERFORM A SDM SURVEILLANCE IAW 1BOSR 1.1.1-1. THIS IS NOT THE FIRST PERFORMANCE OF THIS SURVEILLANCE FOLLOWING ENTRY INTO MODE 3.

UNIT ONE
SHUTDOWN MARGIN SURVEILLANCE

A. STATEMENT OF APPLICABILITY:

1. This procedure applies to the verification of Shutdown Margin in Mode 2 with K_{eff} < 1.0 and Modes 3, 4, and 5.

   a. Daily when the Present RCS Boron Concentration is greater than the Minimum Required Boron Concentration.

   b. Shiftly when the Present RCS Boron Concentration is less than or equal to the Minimum Required Boron Concentration.

   c. More frequently, as appropriate, when the bounding assumptions are due to expire or be exceeded.

2. The procedure applies to the verification of shutdown margin during the following infrequent conditions:

   a. Within one hour after detection of one or more inoperable shutdown or control rod(s) in Modes 1 and 2. (LCO 3.1.4)

   b. Within one hour after detection of one shutdown or control rod not within alignment limits and at least once per 12 hours thereafter while the rod is not within alignment limits. (LCO 3.1.4)

   c. Within one hour after detection of more than one shutdown or control rod not within alignment limits. (LCO 3.1.4)

   d. Within one hour after detection of one or more shutdown banks not within the insertion limits specified in the COLR in Mode 1 and 2 with any control bank not fully inserted. (LCO 3.1.5)

   e. Within one hour after detection of one or more control banks not within the insertion, sequence or overlap limits specified in the COLR in Modes 1 and 2 with $k_{eff} \geq 1.0$. (LCO 3.1.6)

   f. Within one hour after detection of two trains of the Boron Dilution Protection System being inoperable in Modes 3, 4, and 5. (LCO 3.3.9)

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B. REFERENCES:

1. Tech Spec Surveillance Requirements:

   a. LCO 3.1.1

   b. LCO 3.1.4

   c. LCO 3.1.5

   d. LCO 3.1.6

   e. LCO 3.1.8

   f. LCO 3.3.9

   g. SR 3.1.1.1

   h. SR 3.1.8.4

2. TRM:

   a. LCO 3.1.h

3. UFSAR:

   a. Section 4.3.1.5, Shutdown Margin.

   b. Section 15.1, Increase in Heat Removal by the Secondary System.

   c. Section 15.4, Reactivity and Power Distribution Anomalies.

4. Station Procedures:

   a. BCB-1, Byron Curve Book - Unit One.

   b. 1BGP 100-7T1, Reference Reactivity Data Worksheet.

   c. 1BOSR NR-1, Unit One Power History Hourly Surveillance.

   d. 1BOL 1.1, Shutdown Margin (SDM).

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B.4. continued

e. 1BOL 1.h, Shutdown Margin (SDM) - Mode 1 and Mode 2 with $K_{eff} \geq 1.0$.

5. Byron On Site Review 92-089, Review of ENC-QE-40.1 for BDPS Operability.

6. Core Operating Limits Report (COLR).

7. Station Commitments:

a. 454-402-90-01702-01

b. 454-251-88-15100

8. NDIT No. NFM9800254, Byron and Braidwood Shutdown Margin within four (4) hours after Reactor Trip (or Shutdown).

C. PREREQUISITES:

1. Receive permission from the Shift Manager or designated SRO licensed assistant prior to performing the surveillance by having the Data Package Cover Sheet signed and dated.

2. Reference Reactivity Data (RRD) Worksheet, 1BGP 100-7T1, is available. If the unit is in Mode 1 or 2, the RRD shall be completed assuming the reactor trips from its present condition.

D. PRECAUTIONS:

1. None.

E. LIMITATIONS AND ACTIONS:

1. As stated in Technical Specification LCO 3.1.1 and TRM LCO 3.1.h.

2. In the event the Acceptance Criteria is not met during the performance of this surveillance, IMMEDIATELY NOTIFY the Shift Manager or designated SRO licensed assistant to initiate LCOAR procedure 1BOL 1.1, Shutdown Margin (SDM), or 1BOL 1.h, Shutdown Margin (SDM) - Mode 1 and Mode 2 with $K_{eff} \geq 1.0$, as applicable.

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E. continued

3. The RCS Average Temperature shall be determined using the following:

a. If in Mode 1 or 2, use 557°F.

b. If any RCP's are running:

1). At $\geq$ 530°F, loop average temperature on unisolated loops with RCP(s) running.

2). At < 530°F, WR T_{hot} and T_{cold} temperature on unisolated loops with RCP(s) running.

c. If on Natural Circulation:

1). WR T_{hot} and T_{cold} temperature on unisolated loops.

d. If RH is providing Shutdown Cooling, and if no RCP's are running:

1). RH pump discharge temperature (to represent hot leg) and RH HX return temperature (to represent cold leg) of the RH train providing shutdown cooling for core average temperature.

4. If RH is providing Shutdown Cooling, and if no RCP's are running, temporarily stabilize RCS temperature during heatup or cooldown to obtain a more accurate core average temperature.

F. MAIN BODY:

0. Method of Calculation

This procedure calculates the available shutdown margin by comparing the existing or anticipated core conditions to a reference condition based on BCB-1, Table 1-1. This table lists the boron concentration required to provide the shutdown margin specified in the COLR at various core burnups and RCS temperatures. The table was derived by using the following assumptions:

a. No Xenon.

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F.0. continued

b. Equilibrium Samarium (i.e. Time = 0).

c. All rods at bottom with the exception of the highest worth rod, which is assumed to be stuck out.

d. Boron concentrations listed in BCB-1, Table 1-1, include 100 ppm factor of safety.

Deviations from each of the base assumptions and from the reference boron value given in the table are calculated in the procedure, and the sum of these effects is added to the required SDM to arrive at the actual shutdown margin available.

Note that in the event that a control rod is known to be untrippable, this is adjusted for in addition to the rod assumed to be stuck in the table.

NOTE
Use Reference Reactivity Data (RRD) Worksheet, 1BGP 100-7T1, for reactivity information prior to the shutdown.

1. PRESENT CONDITIONS

a. **RECORD** Time and Date.

1400, 6-22-00
Time Date

b. **RECORD** the Core Average Burnup in EFPH (RRD, step F.2.b).

397.4 EFPH

*

NOTE
The minimum temperature that can be used when performing a shutdown margin calculation is 60°F. Notify the Shift Manager and a Qualified Nuclear Engineer if the RCS temperature is less than 60°F.

*, 7.a

c. **RECORD** the RCS Average Temperature (if in Mode 1 or 2, use 557°F).

540 °F

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F.1. continued

NOTE
If a trend of the RCS Boron Concentration indicates an unexpected decrease, then determine the cause of the trend and either increase the RCS boron or request additional boron samples.

If boration/dilution processes have occurred since the most recent sample, consider requesting a new boron concentration sample to determine present boron concentration.

d. **RECORD** the Present RCS Boron Concentration (from most recent sample of the RCS or RH Train if it is providing shutdown cooling). Include the sample time and date.

1400 / 6-22-00 1046 ppm
Time Date

NOTE
A control rod is considered to be inoperable for purposes of Shutdown Margin determination if it is untrippable or fails to fully insert upon a reactor trip.

e. **RECORD** the Total Number of Inoperable Control Rods. 0

NOTE
If one or more control rod(s) is (are) inoperable or not within alignment limits, then perform this surveillance within one hour and at least once per 12 hours thereafter.

If the inoperable control rod(s) is (are) untrippable, then this surveillance must be performed in its entirety.

f. **RECORD** the required SDM from the COLR.

(-)1300 pcm

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F. continued

> **NOTE**
> 1% Δk/k = 1000 pcm = 0.01 Δk/k

2. POST REACTOR TRIP ASSESSMENT

> **NOTE**
> If this surveillance is being performed immediately after entry into Mode 3 via the opening of the reactor trip breakers AND there are no inoperable control rods AND all control rods are within their applicable alignment limits (alignment, insertion, sequence, and overlap), then this step (F.2) can be used to verify adequate SDM for the first 4 hours after the reactor shutdown. This assumes that Core Average Temperature remains at nominal 557°F and no dilution has occurred. Should a dilution or a cooldown be desired to be performed, the balance of this procedure, (F.3 to the end), shall be performed prior to initiating those actions.

a. Is this the first performance of this surveillance following Mode 3 entry via opening of the reactor trip breakers?

Yes ------> Continue with step F.2.b.
(No) -------> Go to Step F.3.

b. Are all control rods operable? (LCO 3.1.4)

Yes ------> Continue with step F.2.c.
No -------> Go to Step F.3.

c. Were all control rods within their alignment (LCO 3.1.4), insertion (LCOs 3.1.5 and 3.1.6), sequence (LCO 3.1.6), and overlap (LCO 3.1.6) limits?

Yes ------> Continue with step F.2.d.
No -------> Go to Step F.3.

d. Has the Core Average Temperature remained at nominal 557°F?

Yes ------> Continue with step F.2.e.
No -------> Go to Step F.3.

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F.2. continued

e. Has the RCS boron concentration NOT been diluted since the reactor trip breakers were opened?

Yes ------> Continue with step F.2.f.
No -------> Go to Step F.3.

f. **RECORD** the time and date at which the reactor trip breakers were opened.

_____/_____
Time Date

g. Add 4 hours to the time and date recorded in step F.2.f.

_____/_____
Time Date

¢ h. Shutdown Margin is acceptable until the time recorded in step F.2.g as long as the conditions listed in step F.2 are maintained. The performance of this step satisfies the performance of verification of adequate Shutdown Margin pursuant to LCO 3.3.9, Required Action D.2. The balance of this procedure shall be performed prior to the time and date recorded in step F.2.g or prior to initiating a plant cooldown or RCS dilution.

_____ _____ _____ _____¢
NSO Date SRO Date

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F. continued

10. TOTAL SHUTDOWN MARGIN

a. **CALCULATE** the Total Shutdown Margin, in "pcm", by adding:

BORON WORTH (step F.5.b) -186 pcm

\+ UNTRIPPABLE CONTROL ROD WORTH (Step F.6.b)

(+) 0 pcm

\+ FISSION PRODUCT WORTH (step F.9.d)

(-) 3248.4 pcm

= TOTAL SHUTDOWN MARGIN -3434.4 pcm

b. **RECORD** the present Operating Mode (1-5). Mode 3

NOTE

For Modes 1-5, the Total Shutdown Margin (F.8.a) must be equal to or more Negative than the Shutdown Margin specified in the COLR (F.1.f).

¢ c. **ANSWER** whether the Acceptance Criteria is satisfied or not and **INITIAL**. (YES or NO)

_____¢

NSO	Date	SRO	Date

If the Acceptance Criteria is not satisfied, **IMMEDIATELY** notify the Shift Manager and **INITIATE** LCOAR 1BOL 1.1, Shutdown Margin (SDM), or 1BOL 1.h, Shutdown Margin (SDM) - Mode 1 and Mode 2 with $K_{eff} \geq 1.0$.

If the Acceptance Criteria is satisfied, this surveillance should be performed each shift provided the bounding assumptions in step F.3 remain satisfied.

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G. ACCEPTANCE CRITERIA:

1. For Modes 1-5, SDM shall be within the limits of the COLR (SR 3.1.1.1). This is verified by one of the following methods:

   a. For the first 4 hours following a reactor trip by having the following conditions met (F.2.h):

      1). All RCCAs operable.

      2). All RCCAs within alignment, insertion, sequence, and overlap limits prior to trip.

      3). RCS T_{ave} at nominal 557°F.

      4). No RCS dilutions since reactor trip.

   OR

   b. At any time when the Present RCS Boron Concentration is greater than or equal to the Minimum Required Boron Concentration with no untrippable control rods (F.4.d).

   OR

   c. At any time when the Total Shutdown Margin (F.10.a) is equal to or more negative than the SDM specified in the COLR (F.1.f).

F.8. continued

b. **CALCULATE** the worth of Samarium from BCB-1, Table 1-4 by determining the Sm at the equivalent power from step 1 above, with the number of hours shutdown based on the present time and **SUBTRACTING** the Sm worth at time of shutdown (t=0). (A bounding value would be 0 pcm for Sm Worth. If zero is entered, mark other blanks N/A.)

N/A pcm	-	N/A	=	(-) N/A 0 pcm
Sm Worth at present time for % Sm Pwr		Sm Worth at S/D (time = 0) for % Sm Pwr (F.8.a)		Sm Worth

9. CORRECTION FOR BORON EFFECTS ON XENON AND SAMARIUM WORTHS

a. From step F.5.a.1) **RECORD** the integral worth of boron.

(-) 9786.8 pcm

b. From BCB-1, Figure 8b **DETERMINE** the correction factor at the integral boron worth recorded in F.9.a.

0.878

c. **ADD** the Xenon worth from Step F.7.c and the Samarium worth from step F.8.b.

(-) 3700 pcm	+	(-) 0 pcm	=	(-) 3700 pcm
(F.7.c)		(F.8.b)		

d. **MULTIPLY** the sum of the fission product poison worths (step F.9.c) by the correction factor (F.9.b). This is the net value of fission product adjusted for competition effects of boron.

(-) 3700 pcm	x	0.878 pcm	=	(-) 3248.4 pcm
(F.9.c)		(F.9.b)		

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F. continued

7. REACTIVITY CHANGE DUE TO XENON

a. **RECORD** the Xenon Equivalent Power from RRD, step F.2.d.

99.9 % Xe Pwr

b. **RECORD** the Shutdown Time and Date from RRD, step F.2.a.

S/D Time _____ S/D Date _____

c. **DETERMINE** the Xenon Worth using the Xe Equivalent Power (F.7.a) and "Time After Shutdown". From BCB-1, Figure 8C, select the time within the "bounding time" from step F.3.c that corresponds to the least negative (most positive) amount of reactivity. **RECORD** the respective Xe Worth and **RECORD** the associated "Time after Shutdown". Choosing the least negative (most positive) Xe Worth over the shift will yield a bounding SDM calculation.

Number of Hours Shutdown 1.1 hrs (-) 3700 pcm
Xe Worth

8. REACTIVITY WORTH OF SAMARIUM

NOTE
For accumulated burnup less than 600 EFPH, make no adjustments for Samarium. Mark steps F.8.a and F.8.b N/A.

a. **RECORD** the Samarium equivalent power from the RRD step F.2.c.

N/A % Sm Pwr

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F.5.a. continued

2). **RECORD** the Integral Boron Worth from BCB-1, Table 1-5 at the limiting core average temperature (F.3.b) and minimum required boron concentration from Table 1-1 (F.4.a). (A bounding value would be the most negative number.)

520 °F (Core Tavg (F.3.b)) 1178.6 ppm (C_b from (F.4.a) or bounding C_B used in Table 1-5) 10900.7 (-) pcm

3). **SUBTRACT** the result of step F.5.a.2) from step F.5.a.1).

1113.9 (+) pcm

b. **CALCULATE** the net worth of boron by **ADDING** the result of step F.5.a.3) to the required SDM (F.1.f).

1113.9 (+) pcm (F.5.a.3)) + 1300 (-) pcm (F.1.f) = -186 pcm

6. REACTIVITY WORTH OF UNTRIPPABLE RODS

a. **RECORD** the Total Number of Untrippable Control Rods from step F.1.e.

0 Total Rods

b. **CORRECT** for untrippable control rods by **MULTIPLYING** the Total Number of Stuck Rods (F.6.a) by the Predicted Worth of the Most Reactive Rod from BCB-1, Table 1-6.

_____ (F.6.a) Total Rods x _____ (Predicted Worth) pcm/rod = (+) 0 pcm

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F.4. continued

b. Is the Present RCS Boron Concentration (F.1.d) ≥ Minimum Required Boron Concentration (F.4.a)?

Yes ------> Continue with step F.4.c.
(No) ------> Go to Step F.5.

c. Are all control rods operable? (LCO 3.1.4)

Yes ------> Continue with step F.4.d.
No -------> Go to Step F.5.

¢ d. The SDM requirement is satisfied and this surveillance may be performed on a daily basis, provided the bounding assumption is step F.3 remain satisfied. Mark the remainder of this procedure N/A.

_____	_____	_____	_____¢
NSO	Date	SRO	Date

5. REACTIVITY WORTH OF BORON

a. **CALCULATE** the reactivity difference between the current boron concentration and the concentration specified in Table 1-1.

1). **RECORD** the Integral Boron Worth from BCB-1, Table 1-5 at the limiting core average temperature (F.3.b) for the time period specified in F.3.c and current boron concentration (F.1.d). (A bounding value would be the least negative number.)

520 °F	1046 ppm	(-)9786.8 pcm
Core Tavg (F.3.b)	C_b from (F.1.d) or bounding C_B used in Table 1-5	

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F.3. continued

c. **DETERMINE** the bounding Time and Date for this verification.

1400 / 6-22-00 to 2400 / 6-22-00

NOTE
When obtaining values from the Byron Curve Book, either interpolation may be performed between the various parameters or a bounding value may be obtained. Each individual step will include guidance on what constitutes a bounding value.

4. MINIMUM REQUIRED BORON CONCENTRATION

NOTE
The minimum required boron concentration may be obtained from either BCB-1, Table 1-1, directly from a QNE, or from a QNE signed document written for this specific application. For the latter case, the minimum required boron concentration may be determined from a curve or table as a function of time, RCS temperature, or both. Independent verification is required for determining the minimum required boron concentration from the QNE supplied document to ensure the value is bounded by the assumptions recorded in step F.3.

a. **OBTAIN** the Minimum Required Boron Concentration from either BCB-1, Table 1-1 (bounding value would be the largest number), a QNE, or a QNE supplied document, as appropriate.

- o BCB-1, Table 1-1, at the following statepoints (record value used from Table): 1178.6 ppm
  - Burnup (F.1.b) 397.4 EFPH
  - Core Average Temperature (F.3.b) 520 °F
- o _____ ✓ ppm
  Qualified Nuclear Engineer
- o QNE supplied document ✓ ppm

NSO	Date	NSO or SRO	Date

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F. continued

3. BOUNDING ASSUMPTIONS

NOTE

The Shutdown Margin verification is inherently dependent on the assumptions made for Core Average Temperature and time after shutdown. These bounding assumptions provide validity for the verification only as long as they are satisfied. For this reason, this procedure shall be reperformed if these bounding assumptions are either due to expire or are to be exceeded.

These assumptions should be made broad so as to bound the normal time period for performance (Step A.1) so that this procedure need not be repeated unnecessarily. (i.e. if a temperature range is chosen too narrow, another performance of this procedure would be required prior to cooling down below the bottom of the temperature range.) These assumptions, however, should also be specific enough to allow operational flexibility with regards to plant cooldowns. (i.e. if a timeframe of 4 to 10 hours after a reactor trip were chosen to take credit for Xenon buildin, another SDM would be required to be performed by 10 hours after the trip.) A Qualified Nuclear Engineer may be requested to provide guidance of making these assumptions.

The actual conditions recorded in step F.1 shall lie within the bounding values recorded in step F.3.

a. **DETERMINE** and **RECORD** the bounding Core Average Temperature for this verification.

520 °F to 557 °F

b. **RECORD** the most Limiting Core Average Temperature within the above temperature range. This is the temperature from BCB-1, Table 1-1, with the largest minimum required boron concentration at the current core burnup.

520 °F

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BYRON UNIT 1 CYCLE 10

Xenon Worth vs Time After Shutdown

BOL 568.6 EFPH

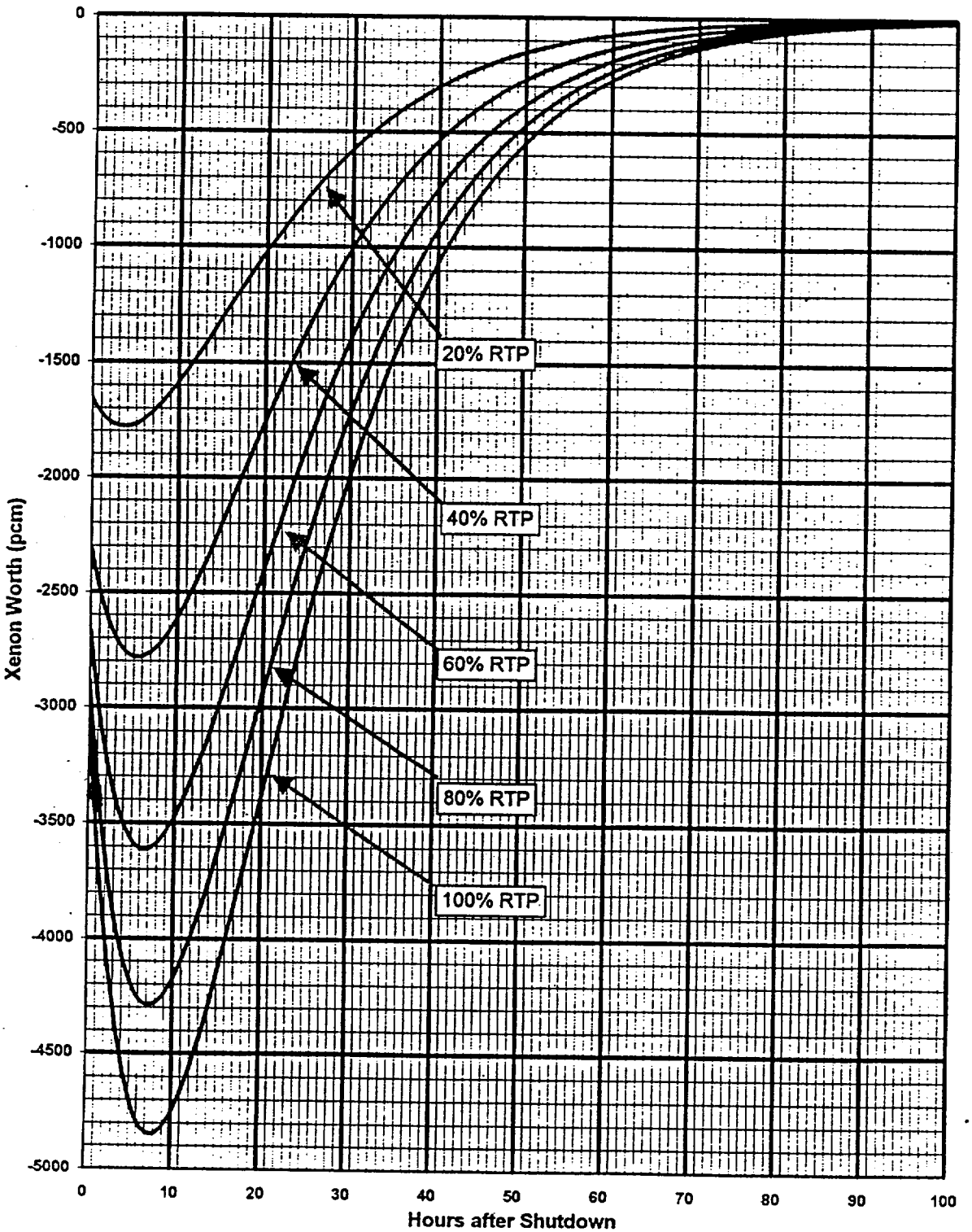

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Table 1-1
Byron Unit 1 Cycle 10
Minimum Required Boron Concentration (ppm) for Shutdown Margin
As a Function of Temperature and Burnup
SDM = 1.3%

Burnup (EFPH)	Temperature (F)												
	60	80	100	120	140	160	180	200	220	240	260	280	300
0	1363	1341	1322	1306	1293	1283	1275	1270	1266	1263	1261	1260	1259
500	1346	1324	1306	1291	1279	1270	1263	1258	1255	1253	1252	1252	1252
1000	1329	1308	1291	1277	1266	1257	1251	1247	1244	1243	1243	1243	1243
1500	1312	1292	1276	1263	1252	1245	1239	1235	1233	1233	1233	1234	1235
2000	1295	1276	1261	1248	1239	1231	1227	1224	1222	1222	1223	1224	1225
2500	1279	1260	1245	1233	1224	1218	1213	1211	1210	1210	1211	1213	1214
3000	1261	1243	1229	1218	1209	1203	1199	1197	1197	1197	1199	1200	1202
3500	1243	1226	1212	1201	1193	1188	1184	1182	1182	1183	1185	1187	1189
4000	1224	1207	1194	1183	1176	1171	1167	1166	1166	1167	1169	1171	1173
4500	1204	1187	1174	1164	1157	1152	1149	1148	1148	1149	1151	1153	1155
5000	1181	1165	1153	1143	1136	1131	1128	1127	1127	1128	1130	1133	1135
5500	1157	1142	1129	1119	1113	1108	1105	1104	1104	1105	1107	1109	1112
6000	1131	1116	1103	1094	1087	1082	1079	1078	1079	1080	1081	1083	1085
6500	1102	1087	1075	1065	1058	1054	1051	1050	1050	1051	1052	1054	1056
7000	1071	1055	1043	1034	1027	1022	1019	1018	1017	1018	1019	1021	1022
7500	1036	1021	1008	999	992	987	984	982	981	982	983	984	985
8000	998	983	970	960	953	948	944	942	942	942	942	943	943
8500	957	941	928	918	910	905	901	899	897	897	897	897	897
9000	911	895	882	871	863	858	853	851	849	848	847	847	846
9500	861	845	831	821	812	806	801	798	795	794	792	791	790
10000	807	790	776	765	756	749	744	740	737	734	732	731	728
10500	748	730	716	704	695	687	681	676	673	670	667	664	661
11000	684	666	651	638	628	620	613	608	603	599	596	592	588
11514	612	593	578	564	553	544	537	531	525	520	516	511	506

Note: Boron concentrations include a 100 ppm factor of safety.

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(1bcb/1tab1-1/xls/040199)

Table 1-1 (Continued)
Byron Unit 1 Cycle 10
Minimum Required Boron Concentration (ppm) for Shutdown Margin
As a Function of Temperature and Burnup
SDM = 1.3%

Burnup (EFPH)	Temperature (F)													
	300	320	340	360	380	400	420	440	460	480	500	520	540	557
0	1259	1259	1258	1256	1254	1250	1244	1237	1227	1215	1200	[illegible]	1159	1137
500	1252	1251	1251	1250	1248	1245	1239	1232	1223	1211	1196	[illegible]	1156	1134
1000	1243	1244	1244	1243	1242	1239	1234	1227	1218	1206	1192	1173	1152	1130
1500	1235	1236	1236	1236	1234	1232	1227	1221	1212	1200	1186	1168	1146	1124
2000	1225	1226	1227	1227	1226	1224	1220	1213	1204	1193	1178	1160	1139	1117
2500	1214	1216	1217	1217	1217	1214	1210	1204	1195	1184	1169	1151	1130	1108
3000	1202	1204	1206	1206	1205	1203	1199	1193	1184	1173	1158	1140	1118	1096
3500	1189	1191	1192	1193	1192	1190	1186	1179	1171	1159	1144	1126	1104	1082
4000	1173	1175	1177	1177	1176	1174	1170	1164	1155	1143	1128	1109	1087	1065
4500	1155	1157	1159	1159	1158	1156	1152	1145	1136	1124	1109	1090	1067	1044
5000	1135	1137	1138	1138	1137	1135	1130	1123	1114	1102	1086	1067	1043	1020
5500	1112	1113	1115	1115	1113	1111	1106	1098	1089	1076	1060	1040	1016	993
6000	1085	1087	1088	1088	1086	1083	1077	1070	1060	1046	1030	1009	985	961
6500	1056	1057	1057	1057	1055	1051	1045	1037	1027	1013	995	974	949	925
7000	1022	1023	1023	1022	1020	1016	1009	1001	989	975	957	935	909	884
7500	985	985	985	983	980	976	969	959	947	932	913	891	864	838
8000	943	943	942	940	936	931	923	913	901	885	865	842	814	787
8500	897	896	895	892	888	882	873	862	849	832	811	787	759	731
9000	846	845	842	839	834	827	818	806	791	774	752	727	697	669
9500	790	788	785	780	775	767	757	744	728	709	687	661	630	601
10000	728	725	721	716	709	701	690	676	659	639	616	588	557	526
10500	661	657	652	646	638	629	617	602	584	563	538	509	476	445
11000	588	583	577	570	561	550	537	521	502	480	454	424	389	357
11514	506	500	493	485	475	463	448	431	411	387	360	328	292	258

Note: Boron concentrations include a 100 ppm factor of safety.

(Final)

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(1bcb/1tab1-1/xls/040199)

Table 1-5

Byron Unit 1 Cycle 10

BOL ARI Integral Boron Worth (pcm) as a Function of
Boron Concentration and Temperature
BU = 85.3 EFPH, NoXe, No Samarium

Boron Concentration (ppm)	Core Average Temperature (F)												
	60	80	100	120	140	160	180	200	220	240	260	280	300
75	-1102	-1097	-1092	-1086	-1079	-1071	-1062	-1052	-1041	-1029	-1016	-1002	-987
150	-2171	-2162	-2152	-2140	-2126	-2110	-2093	-2074	-2053	-2030	-2005	-1978	-1950
225	-3224	-3211	-3196	-3178	-3157	-3133	-3108	-3079	-3048	-3014	-2978	-2939	-2897
300	-4262	-4244	-4223	-4199	-4171	-4140	-4106	-4068	-4027	-3982	-3934	-3883	-3828
375	-5284	-5261	-5235	-5204	-5170	-5131	-5088	-5041	-4990	-4935	-4875	-4812	-4744
450	-6291	-6264	-6231	-6194	-6152	-6106	-6054	-5998	-5937	-5871	-5801	-5725	-5645
525	-7284	-7251	-7213	-7169	-7120	-7065	-7005	-6940	-6869	-6792	-6711	-6623	-6531
600	-8262	-8224	-8179	-8129	-8072	-8010	-7941	-7866	-7785	-7699	-7606	-7507	-7402
675	-9226	-9182	-9131	-9074	-9010	-8939	-8862	-8778	-8687	-8590	-8486	-8376	-8258
750	-10176	-10126	-10069	-10004	-9933	-9854	-9768	-9675	-9574	-9467	-9352	-9230	-9101
825	-11113	-11056	-10992	-10921	-10841	-10754	-10660	-10557	-10447	-10329	-10204	-10071	-9930
900	-12036	-11973	-11902	-11823	-11736	-11641	-11537	-11426	-11306	-11178	-11042	-10898	-10745
975	-12946	-12877	-12799	-12712	-12617	-12514	-12401	-12281	-12151	-12013	-11867	-11711	-11548
1050	-13843	-13767	-13682	-13588	-13485	-13373	-13252	-13122	-12983	-12835	-12678	-12512	-12337
1125	-14728	-14645	-14553	-14451	-14339	-14219	-14089	-13950	-13801	-13643	-13476	-13300	-13114
1200	-15601	-15511	-15411	-15301	-15181	-15052	-14913	-14765	-14607	-14439	-14262	-14075	-13878
1275	-16462	-16364	-16256	-16138	-16010	-15873	-15725	-15567	-15400	-15222	-15035	-14838	-14631
1350	-17312	-17206	-17090	-16964	-16827	-16681	-16524	-16358	-16181	-15993	-15796	-15589	-15371
1425	-18150	-18036	-17912	-17777	-17632	-17477	-17312	-17136	-16949	-16753	-16545	-16328	-16100
1500	-18977	-18855	-18722	-18579	-18426	-18262	-18087	-17902	-17706	-17500	-17283	-17056	-16818
1575	-19793	-19663	-19522	-19370	-19208	-19035	-18851	-18657	-18452	-18236	-18010	-17773	-17525
1650	-20599	-20460	-20310	-20150	-19979	-19797	-19604	-19400	-19186	-18961	-18725	-18479	-18221
1725	-21395	-21247	-21088	-20919	-20738	-20547	-20346	-20133	-19909	-19676	-19430	-19174	-18907
1800	-22180	-22023	-21856	-21677	-21488	-21288	-21077	-20855	-20622	-20379	-20124	-19859	-19583
1875	-22956	-22790	-22613	-22426	-22227	-22018	-21797	-21566	-21325	-21072	-20809	-20534	-20249
1950	-23723	-23548	-23361	-23164	-22956	-22738	-22508	-22268	-22017	-21755	-21483	-21200	-20906
2025	-24481	-24296	-24100	-23893	-23676	-23448	-23209	-22960	-22700	-22429	-22148	-21856	-21553
2100	-25230	-25035	-24829	-24613	-24386	-24148	-23900	-23642	-23373	-23094	-22803	-22503	-22192
2175	-25971	-25765	-25550	-25323	-25087	-24840	-24583	-24315	-24037	-23749	-23450	-23141	-22822
2250	-26703	-26487	-26261	-26025	-25779	-25522	-25256	-24979	-24692	-24395	-24088	-23771	-23443
2325	-27428	-27201	-26965	-26719	-26463	-26196	-25920	-25635	-25339	-25033	-24717	-24392	-24056
2400	-28145	-27907	-27660	-27404	-27138	-26862	-26577	-26282	-25977	-25663	-25339	-25005	-24662
2475	-28854	-28606	-28348	-28081	-27805	-27520	-27225	-26921	-26607	-26284	-25952	-25611	-25260
2500	-29089	-28837	-28576	-28305	-28026	-27737	-27439	-27132	-26815	-26490	-26155	-25811	-25458

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Table 1-5 (Cont.)

Byron Unit 1 Cycle 10

MOL ARI Integral Boron Worth (pcm) as a Function of
Boron Concentration and Temperature
BU = 1705.8 EFPH, NoXe, No Samarium

Boron Concentration (ppm)	← Core Average Temperature (F) →												
	60	80	100	120	140	160	180	200	220	240	260	280	300
75	-1073	-1069	-1064	-1058	-1052	-1044	-1035	-1025	-1015	-1003	-990	-976	-962
150	-2116	-2108	-2098	-2086	-2072	-2057	-2040	-2021	-2000	-1977	-1953	-1927	-1899
225	-3144	-3132	-3116	-3098	-3078	-3055	-3029	-3001	-2970	-2937	-2901	-2862	-2821
300	-4158	-4141	-4120	-4096	-4069	-4038	-4004	-3966	-3925	-3881	-3834	-3783	-3729
375	-5158	-5136	-5109	-5079	-5044	-5006	-4963	-4917	-4866	-4811	-4753	-4690	-4623
450	-6145	-6117	-6085	-6048	-6006	-5960	-5909	-5853	-5792	-5727	-5657	-5583	-5504
525	-7117	-7084	-7046	-7002	-6953	-6899	-6840	-6775	-6704	-6629	-6548	-6462	-6370
600	-8076	-8038	-7993	-7943	-7887	-7825	-7757	-7682	-7603	-7517	-7425	-7327	-7223
675	-9022	-8978	-8927	-8870	-8807	-8736	-8660	-8577	-8487	-8391	-8288	-8179	-8063
750	-9955	-9905	-9848	-9784	-9713	-9635	-9549	-9457	-9358	-9252	-9138	-9018	-8891
825	-10876	-10819	-10756	-10685	-10606	-10520	-10426	-10325	-10216	-10100	-9976	-9844	-9705
900	-11784	-11721	-11651	-11573	-11486	-11392	-11290	-11179	-11061	-10934	-10800	-10658	-10507
975	-12680	-12611	-12534	-12448	-12354	-12251	-12140	-12021	-11893	-11757	-11612	-11459	-11298
1050	-13564	-13488	-13404	-13311	-13209	-13098	-12979	-12850	-12713	-12567	-12412	-12248	-12076
1125	-14436	-14354	-14262	-14162	-14052	-13933	-13805	-13667	-13521	-13365	-13200	-13026	-12843
1200	-15297	-15208	-15109	-15001	-14883	-14756	-14619	-14472	-14317	-14151	-13976	-13792	-13598
1275	-16147	-16051	-15945	-15828	-15702	-15567	-15421	-15266	-15101	-14926	-14741	-14547	-14342
1350	-16987	-16883	-16769	-16645	-16510	-16366	-16212	-16048	-15873	-15689	-15495	-15290	-15076
1425	-17816	-17704	-17582	-17450	-17307	-17155	-16992	-16818	-16635	-16441	-16237	-16023	-15799
1500	-18633	-18514	-18384	-18244	-18093	-17932	-17760	-17578	-17386	-17183	-16969	-16745	-16511
1575	-19441	-19314	-19176	-19028	-18868	-18699	-18518	-18327	-18126	-17914	-17691	-17457	-17213
1650	-20240	-20104	-19958	-19801	-19633	-19455	-19266	-19066	-18855	-18634	-18402	-18159	-17906
1725	-21028	-20884	-20730	-20564	-20388	-20201	-20003	-19794	-19575	-19345	-19103	-18852	-18589
1800	-21807	-21655	-21492	-21318	-21133	-20937	-20730	-20513	-20284	-20045	-19795	-19534	-19262
1875	-22578	-22416	-22244	-22062	-21868	-21663	-21448	-21221	-20984	-20736	-20477	-20208	-19927
1950	-23339	-23169	-22988	-22796	-22594	-22380	-22156	-21921	-21675	-21418	-21150	-20872	-20583
2025	-24092	-23912	-23722	-23522	-23310	-23088	-22855	-22611	-22356	-22091	-21814	-21528	-21230
2100	-24836	-24647	-24448	-24238	-24018	-23786	-23545	-23292	-23029	-22755	-22470	-22175	-21868
2175	-25572	-25374	-25166	-24946	-24717	-24477	-24226	-23964	-23692	-23410	-23117	-22813	-22499
2250	-26300	-26093	-25875	-25646	-25407	-25158	-24898	-24628	-24348	-24057	-23756	-23444	-23122
2325	-27021	-26804	-26576	-26338	-26090	-25831	-25563	-25284	-24995	-24696	-24387	-24067	-23737
2400	-27735	-27507	-27269	-27022	-26764	-26497	-26219	-25932	-25635	-25327	-25010	-24682	-24345
2475	-28441	-28203	-27956	-27698	-27431	-27155	-26868	-26572	-26266	-25951	-25626	-25291	-24946
2500	-28675	-28434	-28183	-27922	-27652	-27372	-27083	-26784	-26475	-26157	-25829	-25492	-25145

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(1bcb/1tab1-5/xls/040599)

Table 1-5 (Cont.)

Byron Unit 1 Cycle 10

MOL ARI Integral Boron Worth (pcm) as a Function of
Boron Concentration and Temperature
BU = 5686.1 EFPH, NoXe, No Samarium

Boron Concentration (ppm)	Core Average Temperature (F)												
	60	80	100	120	140	160	180	200	220	240	260	280	300
75	-1089	-1083	-1077	-1069	-1061	-1052	-1043	-1032	-1021	-1008	-995	-981	-967
150	-2144	-2135	-2124	-2111	-2097	-2081	-2063	-2044	-2023	-2000	-1975	-1949	-1921
225	-3186	-3173	-3158	-3140	-3119	-3096	-3070	-3042	-3011	-2978	-2942	-2903	-2862
300	-4217	-4199	-4179	-4155	-4128	-4097	-4063	-4026	-3985	-3941	-3894	-3843	-3789
375	-5235	-5213	-5187	-5157	-5123	-5085	-5043	-4996	-4946	-4891	-4833	-4770	-4703
450	-6241	-6215	-6183	-6147	-6105	-6060	-6009	-5953	-5893	-5828	-5758	-5683	-5604
525	-7236	-7204	-7166	-7123	-7075	-7021	-6961	-6897	-6827	-6751	-6670	-6583	-6492
600	-8219	-8181	-8137	-8087	-8031	-7969	-7901	-7827	-7747	-7661	-7569	-7470	-7366
675	-9190	-9146	-9095	-9038	-8974	-8904	-8827	-8744	-8654	-8557	-8454	-8344	-8228
750	-10150	-10099	-10042	-9977	-9905	-9827	-9741	-9648	-9548	-9441	-9326	-9205	-9077
825	-11099	-11041	-10976	-10904	-10824	-10736	-10641	-10539	-10429	-10311	-10186	-10053	-9913
900	-12036	-11971	-11899	-11818	-11730	-11633	-11529	-11417	-11297	-11169	-11033	-10889	-10737
975	-12962	-12890	-12809	-12721	-12623	-12518	-12404	-12282	-12152	-12013	-11867	-11712	-11548
1050	-13878	-13797	-13708	-13611	-13505	-13390	-13267	-13135	-12995	-12846	-12688	-12522	-12348
1125	-14782	-14694	-14596	-14490	-14374	-14250	-14117	-13976	-13825	-13666	-13498	-13321	-13135
1200	-15676	-15579	-15472	-15357	-15232	-15098	-14956	-14804	-14643	-14473	-14295	-14107	-13910
1275	-16560	-16453	-16337	-16212	-16078	-15935	-15782	-15620	-15449	-15269	-15079	-14881	-14673
1350	-17433	-17317	-17191	-17056	-16912	-16759	-16596	-16424	-16243	-16052	-15852	-15643	-15425
1425	-18296	-18170	-18034	-17889	-17735	-17572	-17399	-17216	-17025	-16824	-16613	-16394	-16165
1500	-19148	-19012	-18866	-18711	-18546	-18373	-18189	-17997	-17795	-17583	-17363	-17133	-16893
1575	-19991	-19844	-19687	-19522	-19347	-19162	-18969	-18765	-18553	-18331	-18100	-17860	-17610
1650	-20824	-20666	-20498	-20322	-20136	-19941	-19736	-19523	-19300	-19068	-18827	-18576	-18316
1725	-21647	-21477	-21298	-21111	-20914	-20708	-20493	-20269	-20035	-19793	-19541	-19281	-19011
1800	-22460	-22279	-22088	-21889	-21681	-21464	-21238	-21003	-20759	-20507	-20245	-19975	-19695
1875	-23264	-23070	-22868	-22657	-22438	-22209	-21972	-21727	-21472	-21209	-20938	-20657	-20368
1950	-24068	-23862	-23638	-23415	-23184	-22944	-22696	-22439	-22174	-21901	-21619	-21329	-21031
2025	-24844	-24625	-24397	-24162	-23919	-23668	-23408	-23141	-22865	-22582	-22290	-21990	-21682
2100	-25620	-25387	-25147	-24900	-24644	-24381	-24110	-23832	-23546	-23252	-22950	-22641	-22324
2175	-26387	-26141	-25887	-25627	-25359	-25084	-24802	-24512	-24215	-23911	-23600	-23281	-22955
2250	-27145	-26885	-26618	-26344	-26064	-25777	-25483	-25182	-24874	-24560	-24239	-23911	-23576
2325	-27895	-27620	-27339	-27052	-26759	-26459	-26153	-25841	-25523	-25198	-24867	-24530	-24187
2400	-28635	-28346	-28051	-27750	-27444	-27132	-26814	-26490	-26161	-25826	-25486	-25140	-24788
2475	-29368	-29063	-28754	-28439	-28119	-27794	-27464	-27129	-26789	-26444	-26094	-25739	-25379
2500	-29610	-29300	-28986	-28666	-28342	-28013	-27679	-27340	-26997	-26648	-26295	-25937	-25574

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Table 1-5 (Cont.)

Byron Unit 1 Cycle 10

MOL ARI Integral Boron Worth (pcm) as a Function of
Boron Concentration and Temperature
BU = 5686.1 EFPH, NoXe, No Samarium

Boron Concentration (ppm)	Core Average Temperature (F)													
	300	320	340	360	380	400	420	440	460	480	500	520	540	557
75	-967	-951	-935	-918	-900	-881	-861	-841	-819	-797	-774	-751	-726	-705
150	-1921	-1892	-1860	-1827	-1792	-1756	-1717	-1678	-1636	-1592	-1547	-1501	-1452	-1409
225	-2862	-2818	-2772	-2724	-2672	-2618	-2562	-2503	-2442	-2378	-2311	-2242	-2170	-2107
300	-3789	-3732	-3671	-3607	-3540	-3469	-3395	-3318	-3237	-3153	-3065	-2975	-2880	-2798
375	-4703	-4632	-4558	-4478	-4395	-4308	-4217	-4121	-4022	-3918	-3811	-3699	-3583	-3481
450	-5604	-5520	-5431	-5337	-5239	-5135	-5027	-4914	-4797	-4674	-4547	-4415	-4278	-4158
525	-6492	-6394	-6292	-6183	-6070	-5951	-5826	-5696	-5561	-5420	-5274	-5123	-4966	-4828
600	-7366	-7256	-7140	-7017	-6889	-6755	-6615	-6468	-6316	-6157	-5993	-5823	-5646	-5491
675	-8228	-8105	-7975	-7839	-7697	-7548	-7392	-7230	-7061	-6885	-6703	-6514	-6319	-6148
750	-9077	-8941	-8799	-8649	-8493	-8329	-8158	-7981	-7796	-7604	-7405	-7199	-6985	-6799
825	-9913	-9765	-9610	-9447	-9277	-9100	-8914	-8721	-8521	-8313	-8098	-7875	-7645	-7443
900	-10737	-10577	-10409	-10234	-10050	-9859	-9660	-9452	-9237	-9014	-8783	-8544	-8297	-8081
975	-11548	-11377	-11197	-11009	-10812	-10608	-10395	-10173	-9944	-9706	-9460	-9206	-8943	-8713
1050	-12348	-12164	-11972	-11772	-11563	-11345	-11119	-10885	-10641	-10389	-10129	-9860	-9582	-9340
1125	-13135	-12940	-12736	-12524	-12303	-12073	-11834	-11586	-11330	-11064	-10790	-10507	-10215	-9960
1200	-13910	-13704	-13489	-13265	-13032	-12790	-12539	-12278	-12009	-11731	-11444	-11147	-10842	-10575
1275	-14673	-14456	-14230	-13995	-13750	-13496	-13233	-12961	-12680	-12389	-12090	-11781	-11462	-11185
1350	-15425	-15197	-14960	-14713	-14458	-14193	-13918	-13635	-13342	-13039	-12728	-12407	-12077	-11789
1425	-16165	-15926	-15678	-15421	-15155	-14879	-14594	-14299	-13995	-13682	-13359	-13027	-12686	-12388
1500	-16893	-16644	-16386	-16118	-15841	-15555	-15259	-14954	-14640	-14316	-13983	-13641	-13289	-12982
1575	-17610	-17351	-17083	-16805	-16518	-16222	-15916	-15601	-15277	-14943	-14600	-14248	-13886	-13571
1650	-18316	-18047	-17769	-17481	-17185	-16879	-16563	-16239	-15905	-15562	-15210	-14848	-14478	-14165
1725	-19011	-18732	-18444	-18147	-17841	-17526	-17202	-16868	-16526	-16174	-15813	-15443	-15064	-14735
1800	-19695	-19407	-19109	-18803	-18488	-18164	-17831	-17489	-17138	-16778	-16410	-16032	-15645	-15310
1875	-20368	-20070	-19764	-19449	-19125	-18792	-18451	-18101	-17743	-17375	-16999	-16615	-16222	-15880
1950	-21031	-20724	-20408	-20085	-19752	-19412	-19063	-18706	-18340	-17966	-17583	-17192	-16793	-16447
2025	-21682	-21367	-21043	-20711	-20370	-20022	-19666	-19302	-18929	-18549	-18160	-17764	-17359	-17009
2100	-22324	-21999	-21667	-21327	-20979	-20624	-20261	-19890	-19511	-19125	-18731	-18330	-17921	-17567
2175	-22955	-22622	-22281	-21934	-21579	-21216	-20847	-20470	-20086	-19695	-19296	-18891	-18478	-18121
2250	-23576	-23234	-22886	-22531	-22169	-21801	-21425	-21043	-20654	-20258	-19856	-19446	-19030	-18671
2325	-24187	-23837	-23481	-23119	-22751	-22376	-21995	-21608	-21215	-20815	-20409	-19997	-19578	-19218
2400	-24788	-24430	-24067	-23698	-23323	-22943	-22557	-22166	-21768	-21365	-20957	-20542	-20122	-19761
2475	-25379	-25014	-24643	-24268	-23888	-23502	-23112	-22716	-22315	-21910	-21499	-21083	-20662	-20300
2500	-25574	-25206	-24833	-24456	-24074	-23687	-23295	-22898	-22496	-22090	-21678	-21262	-20841	-20480

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(1bcb/1tab1-5/xls/040599)

Table 1-5 (Cont.)

Byron Unit 1 Cycle 10

EOL ARI Integral Boron Worth (pcm) as a Function of
Boron Concentration and Temperature
BU = 11514.4, EFPH, NoXe, No Samarium

Boron Concentration (ppm)	Core Average Temperature (F)												
	60	80	100	120	140	160	180	200	220	240	260	280	300
75	-1204	-1193	-1182	-1170	-1157	-1144	-1131	-1116	-1102	-1086	-1070	-1054	-1037
150	-2366	-2349	-2331	-2311	-2290	-2268	-2244	-2219	-2192	-2164	-2135	-2104	-2072
225	-3514	-3490	-3465	-3437	-3407	-3375	-3340	-3304	-3265	-3225	-3182	-3137	-3090
300	-4648	-4617	-4583	-4547	-4507	-4465	-4420	-4372	-4322	-4268	-4212	-4153	-4091
375	-5768	-5729	-5687	-5641	-5592	-5539	-5483	-5424	-5361	-5295	-5226	-5152	-5076
450	-6874	-6826	-6775	-6720	-6661	-6598	-6530	-6459	-6384	-6305	-6222	-6135	-6044
525	-7966	-7910	-7849	-7784	-7714	-7640	-7561	-7478	-7391	-7299	-7203	-7102	-6997
600	-9045	-8979	-8908	-8832	-8751	-8666	-8576	-8481	-8381	-8276	-8166	-8052	-7933
675	-10110	-10034	-9952	-9865	-9774	-9676	-9574	-9467	-9354	-9237	-9114	-8986	-8853
750	-11162	-11075	-10982	-10884	-10780	-10671	-10557	-10437	-10312	-10181	-10045	-9904	-9757
825	-12201	-12102	-11998	-11888	-11772	-11651	-11524	-11392	-11254	-11110	-10961	-10806	-10645
900	-13227	-13116	-12999	-12877	-12749	-12615	-12475	-12330	-12179	-12023	-11860	-11692	-11518
975	-14240	-14116	-13987	-13852	-13711	-13564	-13411	-13253	-13089	-12919	-12744	-12563	-12376
1050	-15240	-15103	-14960	-14812	-14658	-14498	-14332	-14161	-13983	-13801	-13612	-13418	-13218
1125	-16228	-16077	-15920	-15758	-15590	-15417	-15237	-15053	-14862	-14666	-14465	-14257	-14045
1200	-17203	-17037	-16866	-16690	-16508	-16321	-16128	-15929	-15726	-15517	-15302	-15082	-14856
1275	-18166	-17985	-17799	-17608	-17411	-17210	-17003	-16791	-16574	-16352	-16124	-15891	-15653
1350	-19116	-18920	-18718	-18512	-18301	-18085	-17864	-17638	-17407	-17172	-16931	-16686	-16435
1425	-20055	-19842	-19624	-19402	-19176	-18945	-18710	-18470	-18225	-17976	-17723	-17465	-17203
1500	-20981	-20751	-20517	-20279	-20037	-19791	-19541	-19287	-19029	-18767	-18500	-18230	-17955
1575	-21896	-21648	-21397	-21143	-20885	-20623	-20358	-20090	-19817	-19542	-19263	-18980	-18694
1650	-22798	-22533	-22264	-21993	-21718	-21441	-21161	-20878	-20592	-20303	-20011	-19716	-19418
1725	-23690	-23405	-23119	-22830	-22539	-22245	-21950	-21652	-21351	-21049	-20744	-20437	-20128
1800	-24570	-24266	-23961	-23654	-23345	-23035	-22724	-22411	-22097	-21781	-21463	-21144	-20824
1875	-25438	-25114	-24790	-24465	-24139	-23812	-23485	-23157	-22828	-22499	-22168	-21837	-21506
1950	-26296	-25951	-25607	-25263	-24919	-24575	-24232	-23888	-23545	-23202	-22859	-22517	-22174
2025	-27142	-26776	-26412	-26048	-25686	-25325	-24965	-24606	-24249	-23892	-23537	-23182	-22829
2100	-27977	-27590	-27205	-26821	-26441	-26062	-25685	-25311	-24938	-24568	-24200	-23834	-23470
2175	-28802	-28392	-27985	-27582	-27182	-26785	-26392	-26001	-25614	-25230	-24850	-24472	-24098
2250	-29616	-29183	-28755	-28331	-27911	-27496	-27085	-26679	-26277	-25879	-25486	-25097	-24713
2325	-30419	-29963	-29512	-29067	-28627	-28193	-27765	-27343	-26926	-26514	-26109	-25709	-25314
2400	-31212	-30732	-30258	-29791	-29331	-28878	-28432	-27993	-27561	-27136	-26718	-26307	-25903
2475	-31995	-31490	-30992	-30504	-30023	-29551	-29087	-28631	-28184	-27745	-27315	-26892	-26478
2500	-32254	-31740	-31235	-30738	-30251	-29772	-29302	-28841	-28389	-27945	-27511	-27085	-26668

(1bcb/1tab1-5/xls/040599)

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Table 1-5 (Cont.)

Byron Unit 1 Cycle 10

EOL ARI Integral Boron Worth (pcm) as a Function of
Boron Concentration and Temperature
BU = 11514.4 EFPH, NoXe, No Samarium

Boron Concentration (ppm)	Core Average Temperature (F)													
	300	320	340	360	380	400	420	440	460	480	500	520	540	557
75	-1037	-1019	-1001	-982	-963	-943	-923	-902	-881	-859	-836	-813	-789	-768
150	-2072	-2038	-2003	-1967	-1929	-1890	-1850	-1808	-1765	-1720	-1674	-1627	-1578	-1536
225	-3090	-3041	-2989	-2936	-2880	-2822	-2762	-2700	-2636	-2570	-2501	-2431	-2358	-2294
300	-4091	-4026	-3959	-3889	-3815	-3739	-3661	-3579	-3495	-3407	-3317	-3225	-3129	-3045
375	-5076	-4996	-4913	-4826	-4736	-4642	-4545	-4445	-4341	-4233	-4123	-4008	-3891	-3788
450	-6044	-5950	-5851	-5748	-5641	-5530	-5416	-5297	-5174	-5048	-4917	-4783	-4644	-4523
525	-6997	-6887	-6773	-6655	-6532	-6404	-6273	-6136	-5996	-5851	-5701	-5547	-5389	-5251
600	-7933	-7809	-7680	-7546	-7407	-7264	-7116	-6963	-6805	-6642	-6475	-6302	-6125	-5971
675	-8853	-8714	-8571	-8422	-8269	-8110	-7946	-7776	-7602	-7422	-7238	-7048	-6853	-6683
750	-9757	-9605	-9447	-9284	-9115	-8941	-8762	-8577	-8387	-8192	-7991	-7784	-7573	-7388
825	-10645	-10479	-10308	-10131	-9948	-9759	-9565	-9366	-9161	-8950	-8734	-8512	-8284	-8086
900	-11518	-11339	-11154	-10963	-10766	-10564	-10356	-10142	-9923	-9697	-9467	-9230	-8988	-8777
975	-12376	-12183	-11984	-11780	-11570	-11355	-11133	-10906	-10673	-10434	-10190	-9939	-9683	-9461
1050	-13218	-13012	-12801	-12583	-12361	-12132	-11898	-11658	-11412	-11160	-10903	-10640	-10372	-10139
1125	-14045	-13826	-13602	-13372	-13137	-12896	-12650	-12397	-12140	-11876	-11607	-11332	-11052	-10809
1200	-14856	-14625	-14389	-14147	-13900	-13647	-13389	-13125	-12856	-12582	-12302	-12016	-11725	-11474
1275	-15653	-15410	-15162	-14908	-14649	-14385	-14116	-13841	-13562	-13277	-12987	-12692	-12391	-12132
1350	-16435	-16180	-15920	-15655	-15385	-15110	-14831	-14546	-14257	-13962	-13663	-13359	-13050	-12783
1425	-17203	-16936	-16664	-16388	-16108	-15823	-15533	-15239	-14941	-14638	-14330	-14018	-13701	-13429
1500	-17955	-17677	-17394	-17108	-16817	-16522	-16224	-15921	-15614	-15303	-14988	-14669	-14346	-14068
1575	-18694	-18404	-18111	-17814	-17514	-17210	-16902	-16592	-16277	-15959	-15638	-15313	-14984	-14702
1650	-19418	-19117	-18813	-18507	-18197	-17885	-17569	-17251	-16930	-16606	-16279	-15948	-15616	-15330
1725	-20128	-19816	-19503	-19187	-18868	-18548	-18225	-17900	-17572	-17243	-16911	-16577	-16240	-15953
1800	-20824	-20502	-20178	-19853	-19527	-19198	-18869	-18538	-18205	-17871	-17535	-17198	-16859	-16570
1875	-21506	-21174	-20841	-20507	-20172	-19837	-19501	-19165	-18827	-18489	-18151	-17811	-17471	-17181
1950	-22174	-21832	-21490	-21148	-20806	-20464	-20123	-19781	-19440	-19099	-18758	-18418	-18077	-17788
2025	-22829	-22477	-22126	-21776	-21427	-21080	-20733	-20388	-20043	-19700	-19358	-19017	-18678	-18390
2100	-23470	-23108	-22749	-22392	-22036	-21683	-21332	-20984	-20637	-20293	-19950	-19610	-19272	-18986
2175	-24098	-23727	-23359	-22995	-22634	-22276	-21921	-21569	-21221	-20876	-20534	-20196	-19861	-19578
2250	-24713	-24333	-23957	-23586	-23219	-22857	-22499	-22145	-21796	-21451	-21111	-20776	-20444	-20165
2325	-25314	-24925	-24542	-24165	-23793	-23427	-23066	-22711	-22362	-22018	-21680	-21348	-21021	-20748
2400	-25903	-25505	-25115	-24732	-24355	-23986	-23623	-23268	-22919	-22577	-22242	-21916	-21594	-21326
2475	-26478	-26073	-25676	-25287	-24906	-24534	-24170	-23814	-23467	-23128	-22797	-22475	-22161	-21901
2500	-26668	-26259	-25860	-25469	-25087	-24714	-24350	-23994	-23648	-23310	-22981	-22660	-22349	-22091

(Final)

(1bcb/1tab1-5/xls/040599)

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Table 1-5 (Cont.)

Byron Unit 1 Cycle 10

BOL ARI Integral Boron Worth (pcm) as a Function of
Boron Concentration and Temperature
BU = 85.3 EFPH, NoXe, No Samarium

Boron Concentration (ppm)	Core Average Temperature (F)													
	300	320	340	360	380	400	420	440	460	480	500	520	540	557
75	-987	-971	-954	-937	-918	-898	-877	-856	-833	-809	-785	-759	-733	-709
150	-1950	-1920	-1888	-1854	-1819	-1781	-1742	-1701	-1658	-1613	-1567	-1519	-1469	-1425
225	-2897	-2853	-2806	-2757	-2705	-2650	-2593	-2533	-2470	-2405	-2337	-2267	-2194	-2130
300	-3828	-3770	-3709	-3644	-3576	-3504	-3429	-3351	-3269	-3184	-3096	-3004	-2909	-2825
375	-4744	-4673	-4597	-4517	-4433	-4345	-4253	-4156	-4056	-3951	-3843	-3730	-3613	-3511
450	-5645	-5560	-5470	-5375	-5276	-5172	-5063	-4949	-4830	-4707	-4578	-4445	-4308	-4187
525	-6531	-6432	-6329	-6220	-6105	-5985	-5860	-5729	-5592	-5451	-5303	-5151	-4992	-4854
600	-7402	-7290	-7173	-7050	-6921	-6785	-6644	-6496	-6343	-6183	-6017	-5846	-5668	-5512
675	-8258	-8135	-8004	-7867	-7723	-7573	-7416	-7252	-7082	-6905	-6721	-6531	-6334	-6161
750	-9101	-8965	-8821	-8671	-8513	-8348	-8176	-7996	-7810	-7616	-7416	-7207	-6991	-6803
825	-9930	-9781	-9625	-9461	-9290	-9111	-8924	-8729	-8527	-8317	-8099	-7873	-7640	-7436
900	-10745	-10585	-10416	-10239	-10054	-9861	-9660	-9451	-9233	-9007	-8773	-8531	-8281	-8062
975	-11548	-11375	-11195	-11005	-10807	-10600	-10385	-10161	-9929	-9688	-9438	-9180	-8914	-8680
1050	-12337	-12153	-11960	-11759	-11548	-11328	-11099	-10862	-10615	-10359	-10095	-9821	-9538	-9291
1125	-13114	-12919	-12714	-12500	-12277	-12045	-11803	-11552	-11291	-11021	-10742	-10454	-10156	-9895
1200	-13878	-13672	-13456	-13230	-12995	-12750	-12496	-12232	-11958	-11674	-11381	-11079	-10766	-10493
1275	-14631	-14413	-14186	-13949	-13702	-13446	-13179	-12902	-12615	-12319	-12012	-11695	-11370	-11085
1350	-15371	-15143	-14905	-14657	-14399	-14130	-13852	-13563	-13264	-12955	-12636	-12306	-11967	-11670
1425	-16100	-15862	-15613	-15354	-15085	-14805	-14515	-14215	-13904	-13583	-13251	-12910	-12557	-12250
1500	-16818	-16570	-16311	-16041	-15761	-15471	-15170	-14858	-14536	-14203	-13860	-13506	-13142	-12824
1575	-17525	-17267	-16998	-16718	-16428	-16127	-15815	-15493	-15160	-14816	-14462	-14097	-13721	-13393
1650	-18221	-17953	-17674	-17385	-17084	-16773	-16452	-16119	-15775	-15421	-15056	-14681	-14294	-13957
1725	-18907	-18630	-18341	-18042	-17732	-17411	-17080	-16737	-16384	-16020	-15645	-15259	-14863	-14517
1800	-19583	-19296	-18999	-18690	-18371	-18041	-17700	-17348	-16985	-16612	-16227	-15832	-15426	-15073
1875	-20249	-19953	-19647	-19329	-19001	-18662	-18312	-17951	-17580	-17197	-16804	-16400	-15985	-15624
1950	-20906	-20601	-20286	-19960	-19623	-19275	-18916	-18547	-18167	-17776	-17375	-16963	-16540	-16172
2025	-21553	-21240	-20916	-20581	-20236	-19880	-19514	-19136	-18749	-18350	-17941	-17521	-17090	-16716
2100	-22192	-21870	-21538	-21195	-20842	-20478	-20104	-19719	-19324	-18918	-18502	-18075	-17637	-17257
2175	-22822	-22492	-22152	-21801	-21440	-21069	-20688	-20296	-19893	-19481	-19058	-18624	-18181	-17795
2250	-23443	-23105	-22758	-22400	-22032	-21653	-21265	-20866	-20458	-20039	-19610	-19170	-18721	-18331
2325	-24056	-23711	-23356	-22991	-22616	-22231	-21836	-21431	-21016	-20592	-20157	-19713	-19259	-18865
2400	-24662	-24309	-23947	-23576	-23193	-22802	-22401	-21990	-21570	-21141	-20701	-20252	-19793	-19396
2475	-25260	-24900	-24531	-24152	-23764	-23367	-22961	-22545	-22120	-21685	-21241	-20788	-20326	-19926
2500	-25458	-25096	-24724	-24343	-23953	-23554	-23146	-22728	-22302	-21866	-21421	-20967	-20503	-20102

Eq step 95
9258.4 pcm
9786.8 pcm
Step 5a2
10900.7

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(1bcb/1tab1-5/xls/040599)

Table 1-5 (Cont.)

Byron Unit 1 Cycle 10

MOL ARI Integral Boron Worth (pcm) as a Function of
Boron Concentration and Temperature
BU = 1705.8 EFPH, NoXe, No Samarium

Boron Concentration (ppm)	Core Average Temperature (F)													
	300	320	340	360	380	400	420	440	460	480	500	520	540	557
75	-962	-946	-929	-912	-893	-873	-853	-831	-808	-785	-760	-734	-708	-684
150	-1899	-1869	-1837	-1804	-1769	-1732	-1693	-1652	-1610	-1566	-1520	-1472	-1422	-1379
225	-2821	-2778	-2731	-2682	-2631	-2577	-2520	-2461	-2400	-2335	-2268	-2199	-2127	-2064
300	-3729	-3672	-3611	-3547	-3480	-3410	-3336	-3258	-3178	-3094	-3007	-2916	-2822	-2740
375	-4623	-4553	-4478	-4399	-4316	-4229	-4139	-4044	-3945	-3842	-3735	-3624	-3509	-3408
450	-5504	-5420	-5331	-5238	-5140	-5037	-4929	-4817	-4701	-4579	-4453	-4322	-4186	-4067
525	-6370	-6273	-6171	-6063	-5950	-5832	-5709	-5580	-5445	-5306	-5161	-5011	-4855	-4719
600	-7223	-7114	-6998	-6877	-6749	-6616	-6476	-6331	-6180	-6023	-5860	-5691	-5516	-5362
675	-8063	-7941	-7813	-7677	-7536	-7388	-7233	-7072	-6904	-6730	-6549	-6362	-6168	-5999
750	-8891	-8756	-8615	-8466	-8311	-8148	-7978	-7802	-7618	-7427	-7230	-7025	-6813	-6627
825	-9705	-9559	-9405	-9243	-9074	-8897	-8713	-8521	-8322	-8115	-7901	-7679	-7450	-7249
900	-10507	-10349	-10183	-10008	-9826	-9636	-9438	-9231	-9017	-8795	-8564	-8326	-8080	-7864
975	-11298	-11128	-10949	-10763	-10567	-10364	-10152	-9931	-9702	-9465	-9219	-8965	-8702	-8472
1050	-12076	-11895	-11705	-11506	-11298	-11081	-10856	-10622	-10378	-10127	-9866	-9596	-9318	-9075
1125	-12843	-12650	-12449	-12238	-12018	-11789	-11550	-11303	-11046	-10780	-10505	-10221	-9927	-9671
1200	-13598	-13395	-13182	-12959	-12727	-12486	-12235	-11975	-11705	-11425	-11137	-10838	-10530	-10261
1275	-14342	-14128	-13904	-13671	-13427	-13174	-12911	-12638	-12355	-12063	-11761	-11449	-11127	-10846
1350	-15076	-14851	-14617	-14372	-14117	-13852	-13578	-13293	-12998	-12693	-12378	-12053	-11718	-11425
1425	-15799	-15564	-15319	-15063	-14798	-14522	-14236	-13939	-13633	-13316	-12989	-12651	-12303	-12000
1500	-16511	-16266	-16011	-15745	-15469	-15182	-14885	-14578	-14260	-13931	-13593	-13243	-12883	-12569
1575	-17213	-16959	-16694	-16418	-16131	-15834	-15527	-15209	-14880	-14540	-14190	-13830	-13458	-13134
1650	-17906	-17642	-17367	-17081	-16785	-16478	-16160	-15832	-15492	-15143	-14782	-14411	-14029	-13695
1725	-18589	-18315	-18031	-17736	-17430	-17113	-16786	-16448	-16098	-15739	-15368	-14986	-14594	-14252
1800	-19262	-18980	-18686	-18382	-18067	-17741	-17404	-17056	-16698	-16329	-15948	-15557	-15155	-14805
1875	-19927	-19635	-19333	-19020	-18696	-18361	-18015	-17659	-17291	-16913	-16524	-16123	-15712	-15355
1950	-20583	-20283	-19972	-19650	-19317	-18974	-18619	-18254	-17878	-17491	-17094	-16685	-16266	-15901
2025	-21230	-20921	-20602	-20272	-19931	-19579	-19217	-18843	-18459	-18065	-17659	-17243	-16816	-16444
2100	-21868	-21552	-21224	-20886	-20537	-20178	-19808	-19427	-19035	-18633	-18220	-17796	-17362	-16985
2175	-22499	-22174	-21839	-21493	-21137	-20770	-20392	-20004	-19606	-19196	-18777	-18346	-17905	-17522
2250	-23122	-22790	-22447	-22093	-21730	-21356	-20971	-20576	-20171	-19755	-19329	-18893	-18446	-18058
2325	-23737	-23397	-23047	-22687	-22316	-21935	-21544	-21143	-20732	-20310	-19878	-19436	-18984	-18592
2400	-24345	-23998	-23641	-23273	-22896	-22509	-22112	-21705	-21288	-20861	-20424	-19977	-19520	-19124
2475	-24946	-24592	-24228	-23854	-23470	-23077	-22674	-22262	-21840	-21408	-20966	-20514	-20053	-19654
2500	-25145	-24788	-24422	-24046	-23660	-23265	-22861	-22446	-22023	-21589	-21146	-20693	-20231	-19830

(1bcb/1tab1-5/xls/040599)

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Table 1-6

Byron Unit 1 Cycle 10

Summary of Control Rod Worths (pcm)

HZP NoXe

Burnup		Control Banks	Shutdown Banks	Control and Shutdown Banks
BOL	0 EFPH	2739.0	3624.0	6363.0
MOL	1707.7 EFPH	2828.3	3679.7	6508.0
MOL	5692.2 EFPH	3019.2	3133.7	6152.9
LFPC	11526.7 EFPH	3314.9	3195.7	6510.6

HFP EqXe

Burnup		Control Banks	Shutdown Banks	Control and Shutdown Banks
BOL	85.4 EFPH	3065.4	4034.9	7100.3
MOL	1707.7 EFPH	3124.0	4084.5	7208.5
MOL	5692.2 EFPH	3380.4	4141.2	7521.6
LFPC	11526.7 EFPH	3837.9	4760.7	8598.6

Most Reactive Stuck Rod Worth To Use in the Event of An Untrippable RCCA(s) with RCCAs Withdrawn

Rod Worth (pcm) = 2000 pcm / Untrippable RCCA

Highest (ARI-1) Stuck Rod Worths for Cycle 10

Burnup		Rod Location	Temperature	Rod Worth (pcm)
BOL	0 EFPH	K-6	200 F	869.6
MOL	1707.7 EFPH	K-6	200 F	839.7
MOL	5692.2 EFPH	K-6	350 F	1029.1
LFPC	11526.7 EFPH	K-6	200 F	1290.6

The EFPH to MWD/MTU conversion factor is 1.75679 MWD/MTU.

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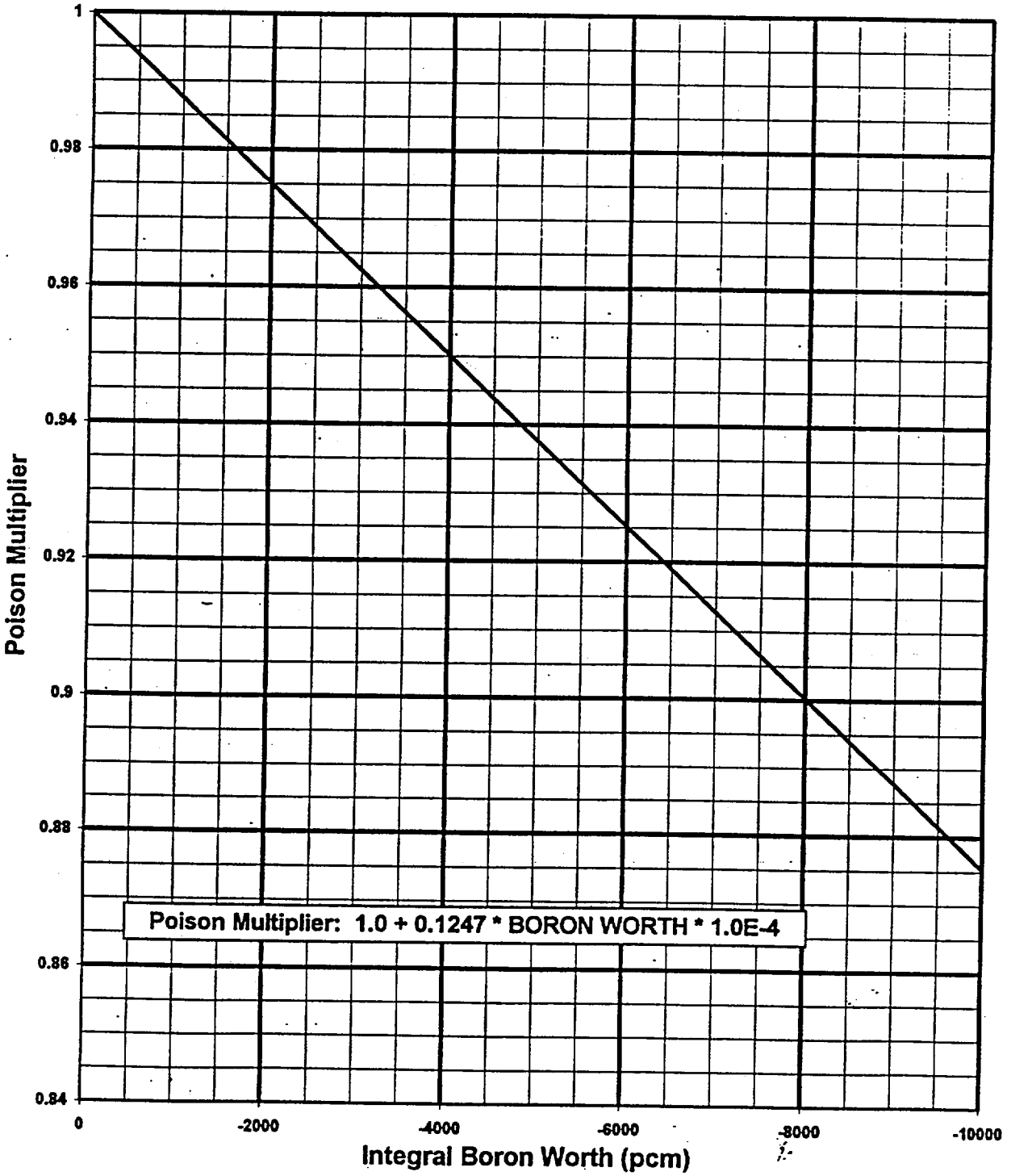
BYRON UNIT 1 CYCLE 10

Poison Correction Factor for RCS Boron



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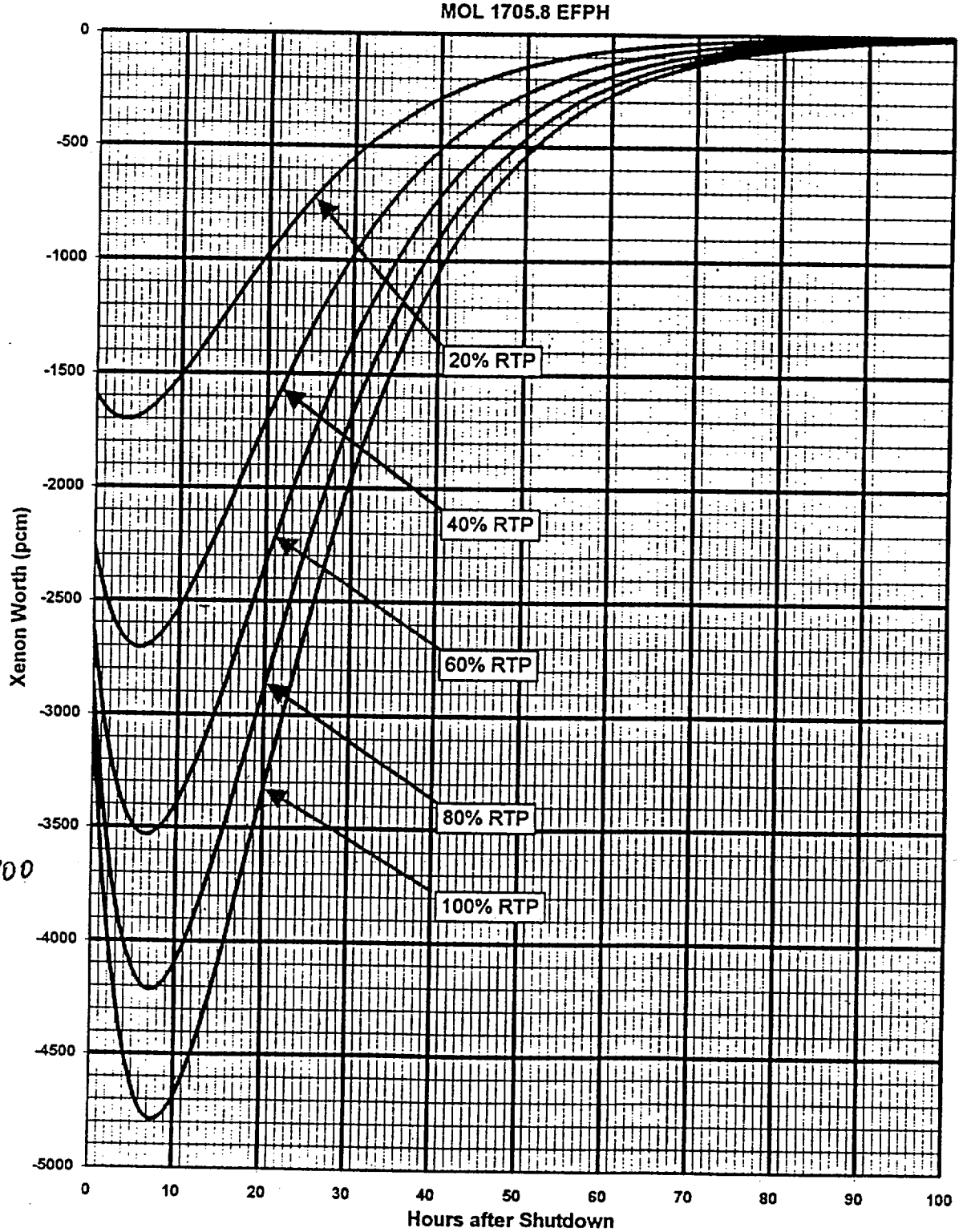
BYRON UNIT 1 CYCLE 10

Xenon Worth vs Time After Shutdown

MOL 1705.8 EFPH



-3700

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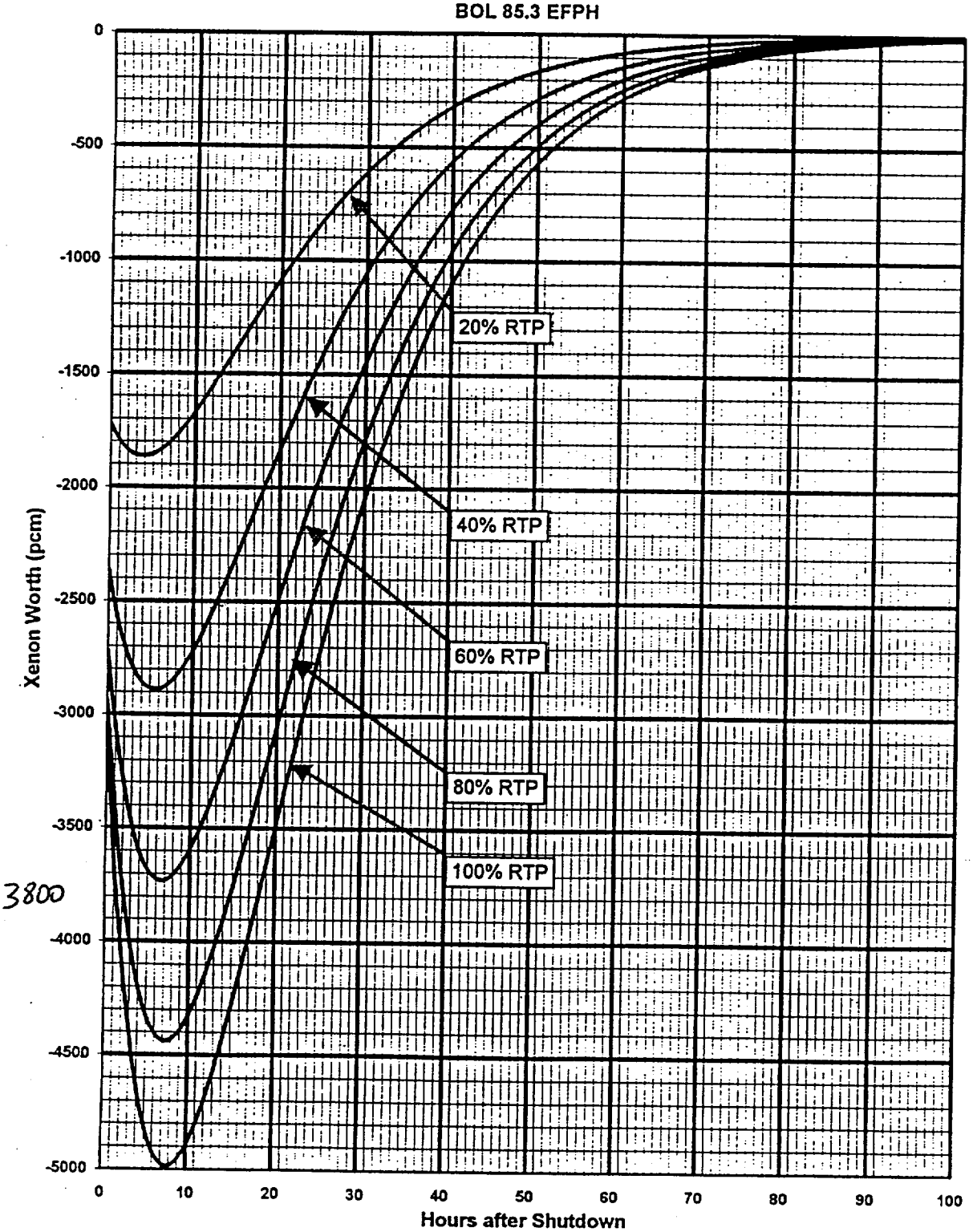
BYRON UNIT 1 CYCLE 10

Xenon Worth vs Time After Shutdown

BOL 85.3 EFPH



-3800

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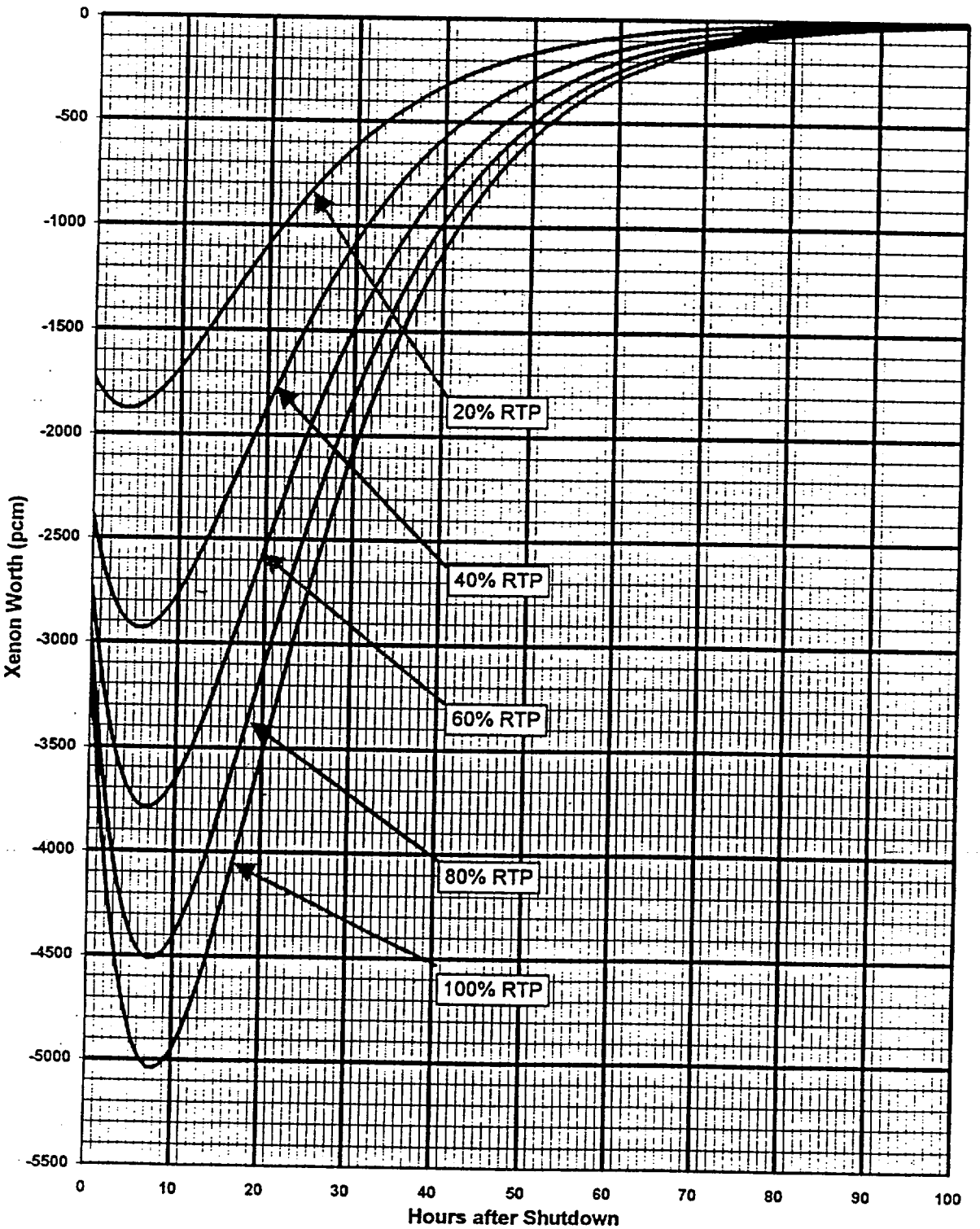
BYRON UNIT 1 CYCLE 10

Xenon Worth vs Time After Shutdown

MOL 5686.1 EFPH



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BYRON UNIT 1 CYCLE 10

Xenon Worth vs Time After Shutdown

EOL 11514.4 EFPH

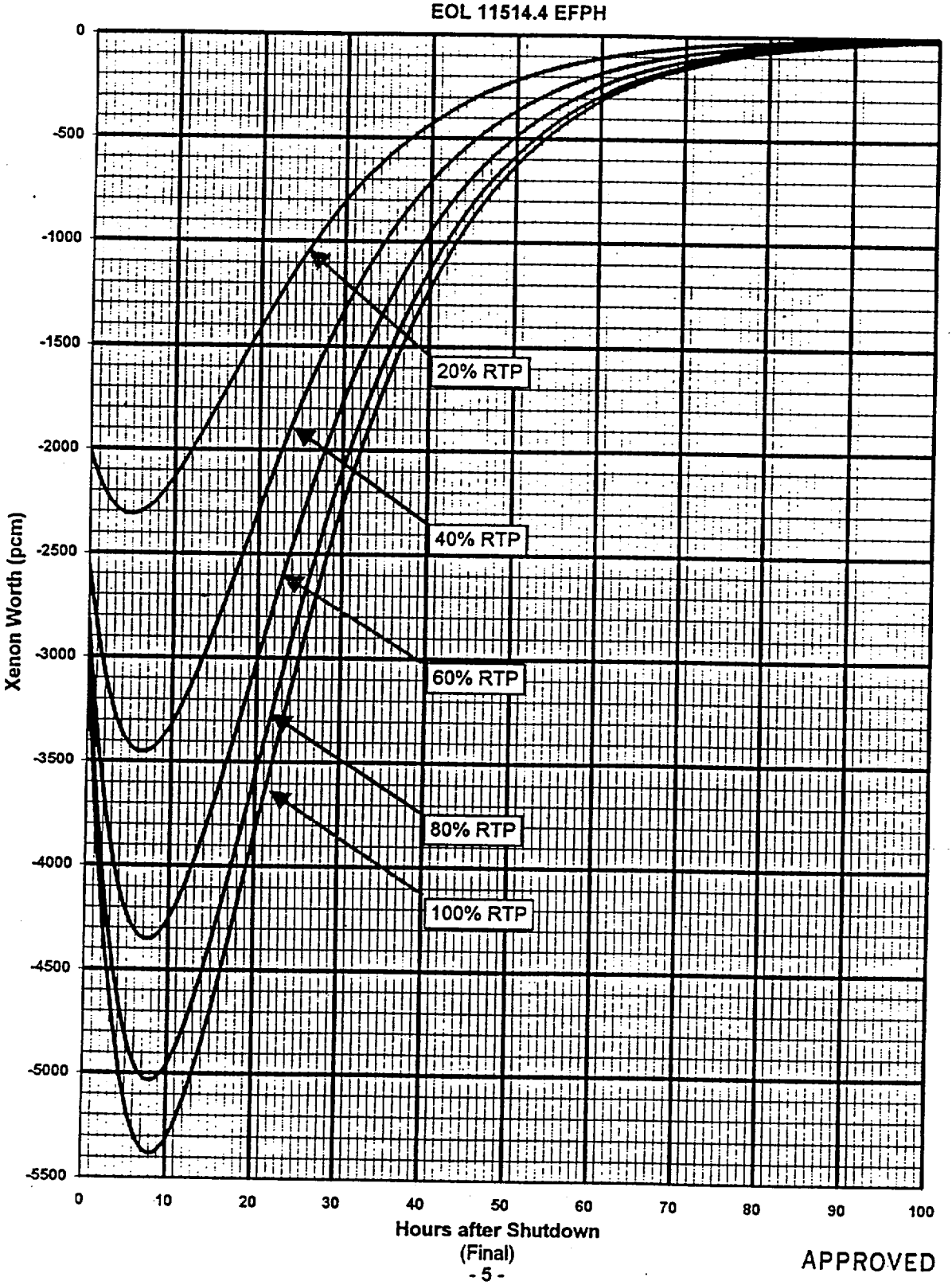

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Table 1-5 (Cont.)

Byron Unit 1 Cycle 10

BOL ARI Integral Boron Worth (pcm) as a Function of
Boron Concentration and Temperature
BU = 85.3 EFPH, NoXe, No Samarium

Boron Concentration (ppm)	Core Average Temperature (F)													
	300	320	340	360	380	400	420	440	460	480	500	520	540	557
75	-987	-971	-954	-937	-918	-898	-877	-856	-833	-809	-785	-759	-733	-709
150	-1950	-1920	-1888	-1854	-1819	-1781	-1742	-1701	-1658	-1613	-1567	-1519	-1469	-1425
225	-2897	-2853	-2806	-2757	-2705	-2650	-2593	-2533	-2470	-2405	-2337	-2267	-2194	-2130
300	-3828	-3770	-3709	-3644	-3576	-3504	-3429	-3351	-3269	-3184	-3096	-3004	-2909	-2825
375	-4744	-4673	-4597	-4517	-4433	-4345	-4253	-4156	-4056	-3951	-3843	-3730	-3613	-3511
450	-5645	-5560	-5470	-5376	-5276	-5172	-5063	-4949	-4830	-4707	-4578	-4445	-4308	-4187
525	-6531	-6432	-6329	-6220	-6105	-5985	-5860	-5729	-5592	-5451	-5303	-5151	-4992	-4854
600	-7402	-7290	-7173	-7050	-6921	-6785	-6644	-6496	-6343	-6183	-6017	-5846	-5668	-5512
675	-8258	-8135	-8004	-7867	-7723	-7573	-7416	-7252	-7082	-6905	-6721	-6531	-6334	-6161
750	-9101	-8965	-8821	-8671	-8513	-8348	-8176	-7996	-7810	-7616	-7415	-7207	-6991	-6803
825	-9930	-9781	-9625	-9461	-9290	-9111	-8924	-8729	-8527	-8317	-8099	-7873	-7640	-7436
900	-10745	-10585	-10416	-10239	-10054	-9861	-9660	-9451	-9233	-9007	-8773	-8531	-8281	-8062
975	-11548	-11375	-11195	-11005	-10807	-10600	-10385	-10161	-9929	-9688	-9438	-9180	-8914	-8680
1050	-12337	-12153	-11960	-11759	-11548	-11328	-11099	-10862	-10615	-10359	-10095	-9821	-9538	-9291
1125	-13114	-12919	-12714	-12500	-12277	-12045	-11803	-11552	-11291	-11021	-10742	-10454	-10156	-9895
1200	-13878	-13672	-13456	-13230	-12995	-12750	-12496	-12232	-11958	-11674	-11381	-11079	-10766	-10493
1275	-14631	-14413	-14186	-13949	-13702	-13446	-13179	-12902	-12615	-12319	-12012	-11696	-11370	-11085
1350	-15371	-15143	-14905	-14657	-14399	-14130	-13852	-13563	-13264	-12955	-12636	-12306	-11967	-11670
1425	-16100	-15862	-15613	-15354	-15086	-14805	-14515	-14215	-13904	-13583	-13251	-12910	-12557	-12250
1500	-16818	-16570	-16311	-16041	-15761	-15471	-15170	-14858	-14536	-14203	-13860	-13506	-13142	-12824
1575	-17525	-17267	-16998	-16718	-16428	-16127	-15815	-15493	-15160	-14816	-14462	-14097	-13721	-13393
1650	-18221	-17953	-17674	-17385	-17084	-16773	-16452	-16119	-15775	-15421	-15056	-14681	-14294	-13957
1725	-18907	-18630	-18341	-18042	-17732	-17411	-17080	-16737	-16384	-16020	-15645	-15259	-14863	-14517
1800	-19583	-19296	-18999	-18690	-18371	-18041	-17700	-17348	-16985	-16612	-16227	-15832	-15426	-15073
1875	-20249	-19953	-19647	-19329	-19001	-18662	-18312	-17951	-17580	-17197	-16804	-16400	-15985	-15624
1950	-20906	-20601	-20286	-19960	-19623	-19275	-18916	-18547	-18167	-17776	-17375	-16963	-16540	-16172
2025	-21553	-21240	-20916	-20581	-20236	-19880	-19514	-19136	-18749	-18350	-17941	-17521	-17090	-16716
2100	-22192	-21870	-21538	-21195	-20842	-20478	-20104	-19719	-19324	-18918	-18502	-18075	-17637	-17257
2175	-22822	-22492	-22152	-21801	-21440	-21069	-20688	-20296	-19893	-19481	-19058	-18624	-18181	-17795
2250	-23443	-23105	-22758	-22400	-22032	-21653	-21265	-20866	-20458	-20039	-19610	-19170	-18721	-18331
2325	-24056	-23711	-23356	-22991	-22616	-22231	-21836	-21431	-21016	-20592	-20157	-19713	-19259	-18865
2400	-24662	-24309	-23947	-23575	-23193	-22802	-22401	-21990	-21570	-21141	-20701	-20252	-19793	-19396
2475	-25260	-24900	-24531	-24152	-23764	-23367	-22961	-22545	-22120	-21685	-21241	-20788	-20326	-19926
2500	-25458	-25096	-24724	-24343	-23953	-23554	-23146	-22728	-22302	-21866	-21421	-20967	-20503	-20102

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Table 1-1 (Continued)
Byron Unit 1 Cycle 10
Minimum Required Boron Concentration (ppm) for Shutdown Margin
As a Function of Temperature and Burnup
SDM = 1.3%

Burnup (EFPH)	Temperature (F)													
	300	320	340	360	380	400	420	440	460	480	500	520	540	557
0	1259	1259	1258	1256	1254	1250	1244	1237	1227	1215	1200	1181	1159	1137
500	1252	1251	1251	1250	1248	1245	1239	1232	1223	1211	1196	1178	1156	1134
1000	1243	1244	1244	1243	1242	1239	1234	1227	1218	1206	1192	1173	1152	1130
1500	1235	1236	1236	1236	1234	1232	1227	1221	1212	1200	1186	1168	1146	1124
2000	1225	1226	1227	1227	1226	1224	1220	1213	1204	1193	1178	1160	1139	1117
2500	1214	1216	1217	1217	1217	1214	1210	1204	1195	1184	1169	1151	1130	1108
3000	1202	1204	1206	1206	1205	1203	1199	1193	1184	1173	1158	1140	1118	1096
3500	1189	1191	1192	1193	1192	1190	1186	1179	1171	1159	1144	1126	1104	1082
4000	1173	1175	1177	1177	1176	1174	1170	1164	1155	1143	1128	1109	1087	1065
4500	1155	1157	1159	1159	1158	1156	1152	1145	1136	1124	1109	1090	1067	1044
5000	1135	1137	1138	1138	1137	1135	1130	1123	1114	1102	1086	1067	1043	1020
5500	1112	1113	1115	1115	1113	1111	1106	1098	1089	1076	1060	1040	1016	993
6000	1085	1087	1088	1088	1086	1083	1077	1070	1060	1046	1030	1009	985	961
6500	1056	1057	1057	1057	1055	1051	1045	1037	1027	1013	995	974	949	925
7000	1022	1023	1023	1022	1020	1016	1009	1001	989	975	957	935	909	884
7500	985	985	985	983	980	976	969	959	947	932	913	891	864	838
8000	943	943	942	940	936	931	923	913	901	885	865	842	814	787
8500	897	896	895	892	888	882	873	862	849	832	811	787	759	731
9000	846	845	842	839	834	827	818	806	791	774	752	727	697	669
9500	790	788	785	780	775	767	757	744	728	709	687	661	630	601
10000	728	725	721	716	709	701	690	676	659	639	616	588	557	526
10500	661	657	652	646	638	629	617	602	584	563	538	509	476	445
11000	588	583	577	570	561	550	537	521	502	480	454	424	389	357
11514	506	500	493	485	475	463	448	431	411	387	360	328	292	258

Note: Boron concentrations include a 100 ppm factor of safety.

(Final)

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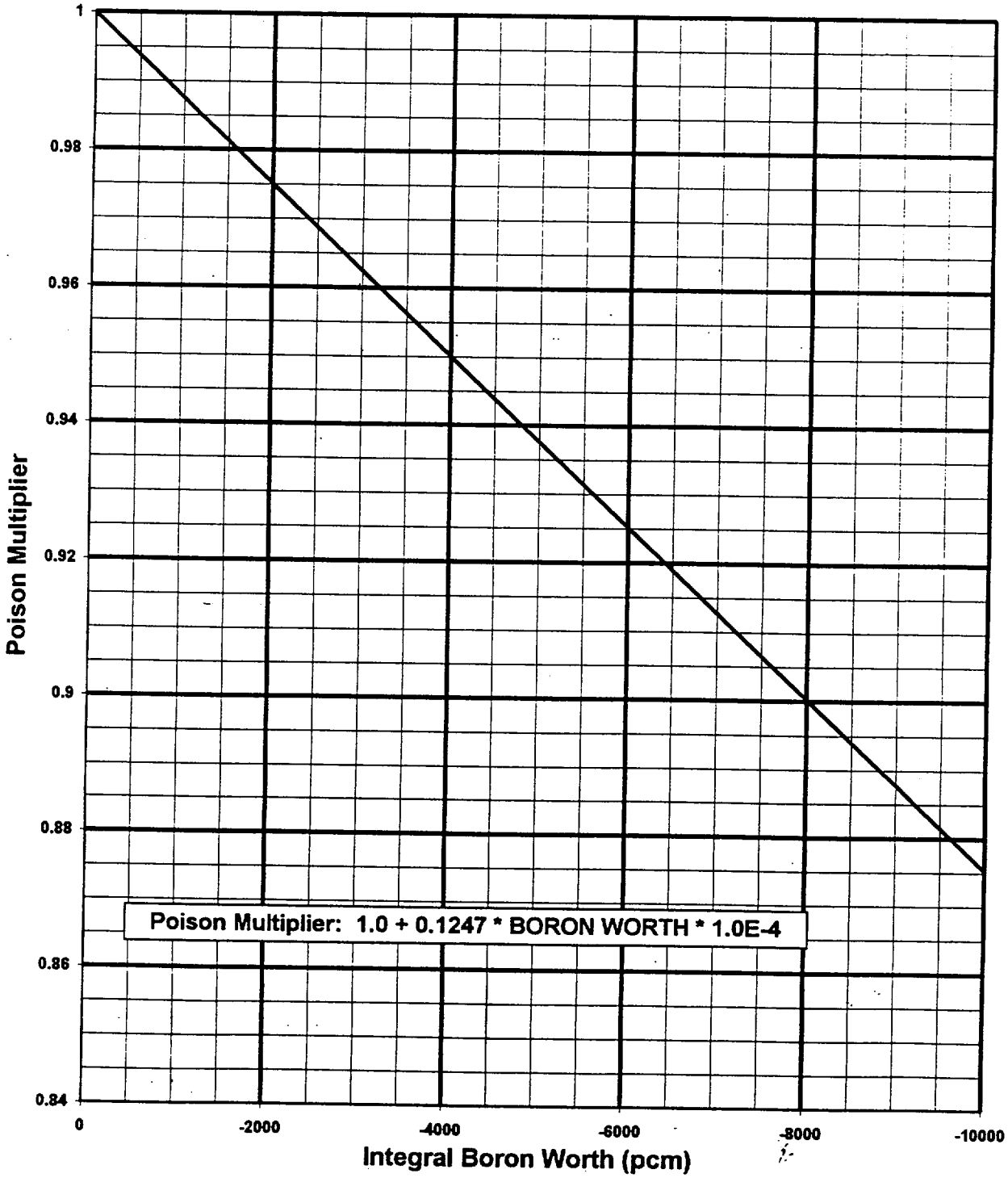
BYRON UNIT 1 CYCLE 10

Poison Correction Factor for RCS Boron



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Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility: BYRON Task No: _____

Task Title: SHIFT TURNOVER Job Performance Measure No: A.1.2

K/A Reference: 2.1.3 3.0/3.4

Examinee: _____ NRC Examiner: _____

Date: _____

Method of testing:

Simulated Performance _____X_____ Actual Performance _____

Classroom _____ Simulator _____x_____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions
You are the relieving Unit SRO/RO
You stood watch yesterday
Unit 1 is in mode 1
All controls are in automatic

Task Standard: PERFORM A SHIFT TURNOVER

Required Materials: BAP 300-1T9
OP-AA-101-401

General References: BAP 300-1T9
OP-AA-101-401

Initiating Cue: PERFORM A COMPLETE SHIFT TURNOVER OF YOUR APPROPRIATE WATCH STATION, INCLUDING LOG REVIEW . THE BOARD WALK DOWN THAT YOU PERFORM WILL BE ONLY ON PANELS 1PM05J, 6J. YOU WILL BE GIVEN 15 MINUTES FOR THE WALK DOWN. WHEN YOU ARE FINISHED WE WILL DISCUSS ANY DISCREPANCIES OR PROBLEMS NOTED.

Time Critical Task: NO

Validation Time: 20 MINUTES

PERFORMANCE INFORMATION

START TIME: _____

(Denote critical steps with a **BOLD ***)

Performance step: 1

ENTER BAP 300-1T9

Standard: LOCATE AND OPEN BAP 300-1T9 FOR RO'S AND BAP 300-1T5 FOR SRO'S

CUE: HAND BAP 300-1T9 TURNOVER SHEET TO APPLICANT

Comment: ----------

Performance step: 2

REVIEW THE APPLICABLE UNIT LOGS SINCE THE LAST WATCH STOOD (YESTERDAY)

Standard: UNIT LOGS REVIEWED

NOTE: THE CREW LOGS MUST BE REVIEWED ALONG WITH ANY REVIEWS REQUIRED BY ATTACHED TURNOVER SHEET

Comment: ----------

Performance step: 3

*** TOUR THE MAIN CONTROL ROOM/ WALK DOWN THE BOARDS ***

Standard: *** CONTROL ROOM BOARDS WALKED DOWN AND 5 ERRORS FOUND RO'S WILL ADVISE OF TECH SPECS, SRO'S WILL EVALUATE TECH SPECS AND MAKE EP CALL***

ANSWER: THE FOLLOWING 5 ITEMS ARE WRONG
ACCUMULATOR #1 PRESSURE 500 PSIG
1 HOUR T.S. 3.5.1 RESTORE ACCUMULATOR PRESSURE $\geq$ 602 PSIG

ANNUNCIATOR SYSTEM IS BROKEN, LIGHTS AND HORN
EVALUATE POTENTIAL EP MS6 MATRIX - CALL IS NOUE
ALARM PRINTER STILL OPERATES

CONTROL RODS 18 STEPS OUT OF ALIGNMENT FOR A1
1 HOUR T.S. 3.1.4 SDM VERIFY, > 12 STEPS OUT

RHR CROSS CONNECT VALVE IS SHUT 1RH8716B
T.S. 3.0.3 7 HOURS MODE 3

RWST LEVEL 70%
1 HOUR T.S. 3.5.4 VERIFY WATER SOURCE, RWST $\geq$ 89%.

NOTE: THE SAFETY SIGNIFICANCE AND TECH SPEC ISSUE OF THE PROBLEMS MUST BE DISCUSSED BY RO'S AND ANALYZED BY SRO'S TO RECEIVE FULL CREDIT FOR EACH FAULT THAT IS IDENTIFIED. 4 OUT 0F 5 FAULTS MUST BE FOUND TO PASS

Comment: ----------

Performance step: 4

COMPLETE TURNOVER

Standard: REFUSE TO TAKE THE TURNOVER UNTIL ITEMS ARE FIXED OR ADDRESSED

Comment: ----------

TERMINATING CUE: TO RELIEF I REFUSE TO TAKE THE WATCH UNTIL THE ITEMS ARE FIXED

TIME STOP_____

Initial Conditions

You are the relieving Unit SRO/RO
You stood watch yesterday
Unit 1 is in mode 1
All controls are in automatic

Initiating Cue: PERFORM A COMPLETE SHIFT TURNOVER OF YOUR APPROPRIATE WATCH STATION, INCLUDING LOG REVIEW . THE BOARD WALK DOWN THAT YOU PERFORM WILL BE ONLY ON PANELS 1PM05J, 6J. YOU WILL BE GIVEN 15 MINUTES FOR THE WALK DOWN. WHEN YOU ARE FINISHED WE WILL DISCUSS ANY DISCREPANCIES OR PROBLEMS NOTED.

Commonwealth Edison Company
Byron Station
SHIFT MANAGER LOG

R. Williams **DATE: 0 / /2000** **SHIFT: 1**

Shift Personnel
R.Williams Shift Manager, D.Lyon Unit 1 Sup/STA, M.Cichon Unit 2 Sup , S.Dresser WEC Sup, B.Jacobsen Field Sup, R.Gilner U-1 NSO, A.Cwiklo U-2 NSO, S.Hollis CD NSO, M.Tooze NSO, L.Weed NLO, K.Gunderson NLO, S.Lender NLO, N.Barfknecht NLO, J.Bratko NLO, E.Hipp NLO, J.Russian NLO, T.VanBriesen NLO, S.Albert NLO, T.Jorgenson NLO, M.Smeltzer NLO

Unit Status	Unit 1	Unit 2
Reactor Power	99.9%	99.9%
MWe	1198	1198

Comments	Unit 1
Comment Text	Steady State

Comments	Unit 2
Comment Text	Steady State

Date Time	Event/Action	Unit No.	Author ID
0 / /2000 1727	Opened ACB 1413 per 1BOSR 8.1.2-1.	1	BYRYW
1738	Shutdown 1A DG per 1BOSR 8.1.2-1.	1	BYRYW
1750	Took U-1 CV Cation Demin off-line using BOP CV-8 per Chemistry request following a 2.5 hour run.	1	BYRYW
1810	Filled 1A and 1C DOSTs to 97.5% after running 1A DG.	1	BYRYW
1811	Completed 1BOSR 8.1.2-1, 1A DG Operability Monthly Surveillance.	1	BYRYW
1823	Increased U-2 Main Generator Output 1 MWe at 0.2 MW/min to maximize unit output.	2	BYRYW
2010	Increased U-2 Main Generator Output 1 MWe at 0.2 MW/min to maximize unit output.	2	BYRYW
2052	Started 1B CC Pp and secured 1A CC Pp for a pending OOS on 1A pump.	1	BYRYW
2143	0A MUD to U-2 CST.	0	BYRYW
2208	Completed 2BOSR SX-SA1, Unit 2 DG SX Water Crosstie Line Semi-Annual Flush.	2	BYRYW
2222	Increased U-2 Main Generator Output 1 MWe at 0.2 MW/min to maximize unit output.	2	BYRYW
2334	Completed 2BOSR 8.6.1-2, Battery 212 Weekly Surveillance.	2	BYRYW
0 / /2000 0000	0A MUD secured to U-2 CST and exhausted.	0	BYRYW
0000	Entered 2BOL 7.5 (No LOSF) for 2A AF Pump in PTL for an IM Surveillance.	2	BYRYW
0015	Entered 2BOL 3.j and 2BOL 3.3 (No LOSF) for Train A Hydrogen Monitor Surveillance 2BISR 3.J.2-002.	2	BYRYW
0015	Entered 2BOL 3.2 (No LOSF) for deenergizing 2AF006A and 17A for IM Surveillance.	2	BYRYW
0020	Entered 1BOL 7.8 on 1B SX Pp (No LOSF) pump is OOS for seal piping repair. This changes U-1 and U-2 online risk to yellow.	1	BYRYW
0033	Pumped down U-2 PRT from 78% to 74% to reduce PRT pressure.	2	BYRYW
0038	Swapped PWST's. Now going from 0A to 0B.	0	BYRYW
0041	Completed 1BOSR 3.4.1-1, Remote Shutdown Instrumentation Monthly Surveillance.	1	BYRYW
0041	Exited 2BOL 3.2 for 2AF006A and 17A and exited 2BOL 7.5 for 2A AF Pump.	2	BYRYW

Commonwealth Edison Company
Byron Station
SHIFT MANAGER LOG

R. Williams **DATE: 0 / /2000** **SHIFT: 1**

Date Time	Event/Action	Unit No.	Author ID
0055	Completed 5 psig bleed and feed of H2 to the U-1 Main Generator.	1	BYRYW
0134	Completed 1BOSR 7.7.2-1, Unit 1/0 CC HX SX Water Availability Monthly Surveillance.	1	BYRYW
0140	Exited 2BOL 3.j and 2BOL 3.3 for Train A Hydrogen Monitor.	2	BYRYW
0151	Completed 2BOSR 8.9.1-2, ESF Onsite Power Distribution Weekly Surveillance.	2	BYRYW
0200	Increase Nitrogen flow to U-1 Condenser from 0 to 4 scfm to address increasing DO.	0	BYRYW
0213	Increased U-1 Main Generator Output 1 MWe at 0.5 MW/min to maximize unit output.	1	BYRYW
0248	Entered LCOAR 1/2 BOL 4.15 (No LOSF) on both units for 1/2PR11J filter changes.	0	BYRYW
0310	Exited LCOAR 1/2 BOL 4.15 on both units. 1/2PR11J filter changes complete. Channel checks SAT.	0	BYRYW
0320	U-1 DO continues to rise. Nitrogen flow increased to 8 scfm.	0	BYRYW
0405	U-2 RWSTand Boric Acid Tank placed on recirculation for sampling per Chemistry request	2	BYRYW
0410	Completed 2BOSR 10.5.5.8-1, Seal Injection Check Valve Surveillance.	2	BYRYW
0445	Applying 20 psig Nitrogen to 1B CD Suction Strainer Drain Valve.	0	BYRYW

Signature: _____

Commonwealth Edison Company
Byron Station
SHIFT MANAGER LOG

J. Printz **DATE: 0 /. /2000** **SHIFT: 2**

Shift Personnel
J.Printz Shift Manager, S.Boomgarden Shift Manager - Training, M.Wolfe WEC Sup, E.Fane Field Sup, E.Lamken U-1 Sup, L.Wehner U-2 Sup/STA, M.Seal U-1 NSO, S.Miller U-2 NSO, M.Mikos CD NSO, D.Cork NSO, M.Saunders NSO, C.Herman NSO, J.Zura NLO, D.Dill NLO, S.Clark NLO, B.Peters NLO, S.Blackbourn NLO, L.Lindgren NLO, R.Walker NLO, J.Orbison NLO, D.Edwards NLO, J.Ebens NLO, L.Lacoursiere NLO, M.Hoffman NLO

Unit Status	Unit 1	Unit 2	
Reactor Power	99.96%	99.96%	
MWe	1202	1201	

Comments	Unit 1
Comment Text	Steady State

Comments	Unit 2
Comment Text	Steady State

Date Time	Event/Action	Unit No.	Author ID
0./ /2000 1315	Exited LCOAR 1BOL 3.i on 2PR30J - IM's completed work and skid working properly.	1	BYRBP
1315	Exited LCOAR 2BOL 3.i for 2PR30J , channel check sat.	2	BYRBP
1333	Entered LCOAR 2BOL 5.2 no LOSF to close 2SI8821A for 2A SI pump ASME 2BVSR 5.2.4-1.	2	BYRBP
1335	2A SI pump started on recirc for ASME.	2	BYRBP
1354	Secured 2A SI pump.	2	BYRBP
1356	Exited LCOAR 2BOL 5.2 now that 2SI8821A is reopened.	2	BYRBP
1455	Started liquid release 00179 on 0WX01T.	0	BYRBP
1519	Placed the CV Cation Demin on-line BOP CV-8 per Chemistry request for lithium control of RCS.	1	BYRBP
1540	Exited 0BOL PR-1 on 2PR27J.	0	BYRBP
1607	Decreased Generator Output by 1 MW @ .5 MW/min.	1	BYRBP
1619	Completed liquid release 00179 on 0WX01T.	0	BYRBP
1630	Completed 2BOSR 4.13.1-1 RCS LEAKRATE with gross = .7359gpm , ident = .5026gpm , unid = .2333gpm.	2	BYRBP
1640	Exited 1BOL 6.3 & 7.4 on 1MS018A - work completed & 1MS019A open. On-line Risk is now GREEN.	1	BYRBP

Signature: _____

Commonwealth Edison Company
Byron Station
SHIFT MANAGER LOG

R. Williams **DATE: 0 ./ /2000** **SHIFT: 1**

Shift Personnel
R.Williams Shift Manager, D.Lyon Unit 1 Sup/STA, M.Cichon Unit 2 Sup , S.Dresser WEC Sup, B.Jacobsen Field Sup, R.Gilner U-1 NSO, A.Cwiklo U-2 NSO, S.Hollis CD NSO, M.Tooze NSO, L.Weed NLO, K.Gunderson NLO, S.Lender NLO, N.Barfknecht NLO, J.Bratko NLO, E.Hipp NLO, J.Russian NLO, T.VanBriesen NLO, S.Albert NLO, T.Jorgenson NLO, M.Smeltzer NLO

Unit Status	Unit 1	Unit 2
Reactor Power	99.9%	99.9%
MWe	1198	1198

Comments	Unit 1
Comment Text	Steady State

Comments	Unit 2
Comment Text	Steady State

Date Time	Event/Action	Unit No.	Author ID
0 ./.. ./2000 1258	Late Entry - Started 1A DG for 1BOSR 8.1.2-1.	1	BYRYW
1308	Late Entry - Closed ACB 1413 per 1BOSR 8.1.2-1.	1	BYRYW

Signature: _____

INFO ONLY

Facsimile

BAP 300-1T9
Revision 1

Unit 1 Nuclear Station Operator Turnover

PLANT STATUS	MODE: 1	% Pwr: 99.9	MW: 1186
	Grp: D @: 216 steps	C_B: 590	Xe: Steady State

LCOAR	OOS / RTS	Surveillances	Maint / AR
1VQ001/2 A&B			1HD103D- furmanited (~50% open) SER BETA keypad

ADMINISTRATIVE	
1. Temporary Procedures	X
2. Temporary Alterations	X
3. Caution Cards	X
4. Unit 1 Logbook	X
5. Unit Routine	X
6. Aux Elec Equip Rm General Inspection	X
7. Daily Orders	X
8. SE Notes	X
9. Control Board Walkdown	X
10. Abnormal Valve Line-ups	X
11. 1st Shift Annun Check Completed	X
12. AMS Panel Check Completed	X

IN PROGRESS	PENDING

Exceptional OOS's Req plant cond:

TURNOVER ITEMS	Normal	
1. No Major Procedures in Progress	Yes	
2. NSO Shiftly and Daily Surveillance	Yes	
3. SSPS Channels / Bistables	Yes	
4. ALARMS- SER / Annunciators	No	Cnmt Drns Leak Det Flow Alarm - SER PT 1313 leads lifted (T-MOD) - C.C.'d on 1PM12J / AMS 24V P/S Trouble Alarms - AR
5. ALARMS- Process / RM-11	Yes	
6. SER / Alarm Typer / Trend Typer	No	BETA keypad blows fuses -AR
7. Alarms- FP / Other	No	SAT 142-1 detection alarm - T-mod installed to clear alarm - C.C.
8. Tank Capacity	Yes	
9. Chemistry	Yes	
10. Radiation Precautions	Yes	
11. Nuclear Instrumentation	Yes	
12. MCB Instrumentation	NO	1PI-CD054 - CD Pump Discharge Pressure - Failed High - AR Written
13. MCB Controllers	Yes	
14. Electrical Distribution- AC	Yes	
15. Electrical Distribution- DC	Yes	
16. SYS - Safeguards	No	1CC9422B leaks - by (relief around 1CC9412B)
17. SYS - Primary	No	1B CV Pp - small water leaks on inbd-outbd seals - AR's / 1A CV Pp gear changer oil pressure at 11# - min is 12# - US, IPSS, & SM informed
18. SYS - Balance of Plant	Yes	
19.	No	1C FW Pp sluggish to reset after overspeed test (1BOSR FW-M3) - abnormal noise noted when reset button depressed - SED evaluating - Notify SED prior to performing next surv
20.	No	1A CD/CB Pp has temp fix on IA to 1CB113A - C.C. on C/S / 1A CD/CB Pp high D.O. when run
21.		10gal boron = 0.5 °F / 100 gal PW = 0.3 °F

FOR INFORMATION ONLY

Shift: 2 to 1 on

Unit Supervisor Turnover

PLANT STATUS				
Grid Status: Green	"B" Train Week	WWM: J. Cook	Shift: 92 to 93	Date: 0 / /2000

Unit 1		
Mode: 1	% Pwr: 99.9	MW: 1190
CB: 595	Xenon: Steady State	Rod Height: 216

IN PROGRESS

OLR is Green

LCOAR

LCOAR's Exited:
1B DG (3/15)
0B H2 Monitor (3/15)

MAINTENANCE

1A GC pp (Noisy brg)

MAJOR PROC.

None

OOS / T/L / RTS

§§ OOS's §§
1B letdown Hx OOS (2/22)
U-1 boiler (3/4)
1B FW pp (3/13)
0A FP/jockey pp (3/15)

§§ RTS's §§
1B DG (3/15)

§§ T/L's §§
0HC03G FHB (2/8)

PENDING

Log Heavy loads SPP 00-001 prior to FHB crane use!! If pulling material out of the SFP, log that AR55 or AR56 may cause spike and vent fans to start

1A CV Pp Gear Changer has low oil pressure at 11 psi it usually is 16 #s. SED aware. Sched 4/3/00.

1B L/D Hx RTS/Fill & Vent with BOP CV-22 - . Proc rev

3/17 0100 WE WILL BE RAMPING TO 900 MW AT 5 MW/MIN TO PERFORM
TV/GV AND PUTTING ON THE 1B FW PP

Days:
IM cals
IV/RV surveillance

Unit 2		
Mode: 1	% Pwr: 99.96	MW: 1190
CB: 1157	Xenon: Steady State	Rod Height: 217

IN PROGRESS

OLR is Green

LCOAR

LCOAR's Exited:

MAINTENANCE

U-2 flume temp detectors ; DEHC scaler counter

MAJOR PROC.

None

OOS / T/L / RTS

§§ OOS's §§
2SX173 IA sup
2A VP Chiller [2/28]
Turb Bearing FP (3/15)

§§ RTS's §§

§§ T/L's §§

PENDING

Thursday
- RCFC Auto Actuation Test 2BVSR 6.6.7-1

U-2 SD Isolation for work on 0PR18J/19J and Slave Relay Surveillances:
- 2BOSR 3.2.7-613B
- 2BOSR 3.2.7-620B
- 2BOSR 3.2.7-614B

RCS LKRT

Unit Supervisor Turnover

ADMINISTRATIVE		COMMENTS
Temporary Alterations	1	1) Installed 2SX147A
Unit 0 Logbook	2	2) Need to log RM-11 reboots, HOT/HAT alarms to justify Bypass cond.
Unit 1 Logbook	X	
Unit 2 Logbook	X	
Train Inop Status Board	X	
Degraded Equipment Log	X	
Daily Orders	7	7) Daily order RSH Traveling Screens Features.
* PIFs	X	
Abnormal Component Posit.	X	

Comment from SOS - Operator logs need more detail - see Standing order.

TURNOVER ITEMS	Normal YES/NO	COMMENTS
NSO Shiftly and Daily Surv	No/1	1) 2LI-PC003
SYS - Primary	No/2	2) 1D SI Accum line- approx. 5.5cu. ft. gas @ 3/10/00 (limit: 32 cu ft)
SYS - Balance of Plant	No/3	3) Diesel SAC UNIT ONE
Nuclear Instrumentation	Yes	
MCB Instrumentation	Yes	
MCB Controllers	Yes	
Electrical Distribution- AC	Yes	
Electrical Distribution- DC	Yes	
Electric Operations	Yes	
Blowdown (CW/SD)	No/10	10) SD is isolated
Alarms (MCB)	Yes	11) 1B FW Pp, U-2 Turb Bearing FP
Chemistry	No/12	12) CW Blowdown target is 13,000 +/- 1000 gpm, W/U line is off.
Radiation Precautions	Yes	

Long term repairs: 1B MSR 1D 2nd stg RDT normal/emergency drain, 1RF009, 1CC9422B(7/10)
U0 SAC, Fin team said vibs still spiking up to .7 mils.
U-2 SPDS: LI-PC003 removed from scan
A- OWAs: PW flow dev., _FW016s, Inst bus inv, SRNIs, Rod misalignments. Contingencies proceduralized.

U-1 Reactivity: Dilute 100 Gallons= 0.3 °F **Nuke Engineer:** Ron Niederer (X3443) **Boron to ramp to 780 MW:** 80 **700 MW:** 100 **gals**

Fuel depletion 200 gal PW/shift
S/G lowdown isolated

Assuming 50% for rods and 35% for xenon

U-2 Reactivity: Dilute 25 Gallons= 0.25 °F **Nuke Engineer:** Brian Arnholt (X2247) **Boron to ramp to 780 MW:** 85 **700 MW:** 110 **gals**

Assuming 50% for rods and 35% for xenon

Exceptional OOS's Requiring Special Plant Conditions

NONE

MISCELLANEOUS

VACATION picks (WOLFE) STAs (Childers)

Post Review: FS, US, Unit NSO, Turnovers, Logs, MCR Tour, Daily Orders and Standing Orders

OFF-GOING		ON-COMING
	U-1 Unit Supervisor	
	U-2 Unit Supervisor	
	STA	

(Final)

Commonwealth Edison Company
Byron Station
CONTROL ROOM LOG - UNIT 1

Rocky J. Gilner **DATE: 0 / /2000** **SHIFT: 1**

Unit Status	Value
Mode	One
Rx Pwr	99.9%
MWe	1195 MWe
Boron	337 ppm
Rods	D @ 220
RCS Temp	582 °F
RCS Press	2235 psig

Plant Equipment Status	A	B	C	D	S/U	Unit 0	
AF	Stby	Stby					
SX	Run	OOS					
CC	Stby	Run				PTL/ Bus 242	
CS	Stby	Stby					
RCFC's	High	High	High	Stby			
SI	Stby	Stby					
RH	Stby	Stby					
Letdown(8149)	Open	Closed	Open				
CV	Run	Stby					
RCP's	Run	Run	Run	Run			
FW	Stby	Run	Run		Stby		
HD	Run	Stby	Run				
CD/CB	Stby	Run	Run	Run			
CW	Run	Run	Run				
GC	Stby	Run					
EH	Run	Stby					

Date Time	Event/Action	Author ID
0 / /2000 2052	Started 1B CC pp and secured 1A CC pp for a pending OOS on 1A pump.	BYRHJ
0 / /2000 0020	Enter 1BOL 7.8 on 1B SX pp (no losf) pump is OOS for seal piping repair. This changes online risk to yellow.	BYRHJ
0041	Completed 1BOSR 3.4.1-1 Remote shutdown instrumentation monthly surveillance.	BYRHJ
0055	5# bleed and feed of H2 to the main generator has been completed.	BYRHJ
0134	Completed 1BOSR 7.7.2-1 Unit 1/0 CC HX SX water availability monthly surveillance.	BYRHJ
0213	Main generator output was raised by 1 MW at 0.5 MW/min per 1BGP 100-3T5 Power Ascension. This was done in order to maintain unit at maximum production limit as indicated on computer calorimetric.	BYRHJ

Signature: _____

Commonwealth Edison Company
Byron Station
CONTROL ROOM LOG - UNIT 1

M.SEAL **DATE: 0 / /2000** **SHIFT: 2**

Date Time	Event/Action	Author ID
	Risk is now GREEN.	
1727	Opened ACB 1413 per 1BOSR 8.1.2-1 Surveillance.	BYRMV
1738	Shutdown 1A DG per 1BOSR 8.1.2-1 Surveillance.	BYRMV
1750	Took CV Cation Demin off-line using BOP CV-8, per Chemistry request for a 2.5 hour run.	BYRMV
1810	Filled 1A & 1C DOST's to 97.5% after running 1A DG.	BYRMV
1811	Completed 1BOSR 8.1.2-1, 1A DG Operability Monthly Surveillance.	BYRMV

Signature: _____

Commonwealth Edison Company
Byron Station
CONTROL ROOM LOG - UNIT 1

T. Gale **DATE: 0 / /2000** **SHIFT: 1**

Unit Status	Value
Mode	One
Rx Pwr	99.9%
MWe	1195 MWe
Boron	337 ppm
Rods	D @ 219
RCS Temp	582 °F
RCS Press	2235 psig

Plant Equipment Status	A	B	C	D	S/U	Unit 0	
AF	Stby	Stby					
SX	Run	Stby					
CC	Run	Stby				PTL/ Bus 242	
CS	Stby	Stby					
RCFC's	High	High	High	Stby			
SI	Stby	Stby					
RH	Stby	Stby					
Letdown(8149)	Open	Closed	Open				
CV	Run	Stby					
RCP's	Run	Run	Run	Run			
FW	Stby	Run	Run		Stby		
HD	Stby	Run	Run				
CD/CB	Run	OOS	Run	Run			
CW	Run	Run	Run				
GC	PTL	Run					
EH	Run	Stby					

Date Time	Event/Action	Author ID
0 / /2000 2117	Completed 1BOSR CC-2, Component Cooling Water Pump Monthly Operability.	BYRYG
2144	Electrical Arcing found on 1W MPT Fan Bank #1. The No. 2 Fan cable was being cut by the No. 1 Fan causing a short circuit. Subsequently breaker No. 8-1 was opened which isolated power to Bank 1 Fans and oil pumps. Electrical arcing has now been terminated.	BYRYG
2155	Entered 1BOL 7.4 and 1BOL 6.3, No Losf, on 1A S/G PORV for work window and IM Calibration. Online risk is determined to be YELLOW.	BYRYG
0 / /2000 0033	Entered 1BOL 3.3, No Losf, and 1BOL 3.j on A Train H2 Monitor per 1BISR 3.J.2-002.	BYRYG
0108	Completed 1BOSR 8.1.1-1, Normal and Offsite weekly.	BYRYG
0114	Completed 5# H2 Feed and Bleed on U1 Main Generator.	BYRYG
0146	Exited 1BOL 3.3 and 1BOL 3.j on A Train H2 Monitor per 1BISR 3.J.2-002.	BYRYG
0502	Started 1A GC Pump for vibration test run.	BYRYG
0526	Shutdown 1B GC Pump. 1A GC Pump vibration is normal and running satisfactory.	BYRYG

Signature: _____

Commonwealth Edison Company
Byron Station
CONTROL ROOM LOG - UNIT 1

M.SEAL **DATE: 0 /. ./2000** **SHIFT: 2**

Unit Status	Value
Mode	One
Rx Pwr	99.9%
MWe	1195 MWe
Boron	337 ppm
Rods	D @ 219
RCS Temp	582 °F
RCS Press	2235 psig

Plant Equipment Status	A	B	C	D	S/U	Unit 0	
AF	Stby	Stby					
SX	Run	Stby					
CC	Run	Stby				PTL/ Bus 242	
CS	Stby	Stby					
RCFC's	High	High	High	Stby			
SI	Stby	Stby					
RH	Stby	Stby					
Letdown(8149)	Open	Closed	Open				
CV	Run	Stby					
RCP's	Run	Run	Run	Run			
FW	Stby	Run	Run		Stby		
HD	Stby	Run	Run				
CD/CB	Run	OOS	Run	Run			
CW	Run	Run	Run				
GC	Run	Stby					
EH	Run	Stby					

Date Time	Event/Action	Author ID
0 /. ./2000 0804	Increased Generator Output by 1 MW @ .5 MW/min rate per BGP 100-3T5 to maximize Unit power output.	BYRMV
0943	M.Winter relieved E.Lamken as U-1 US.	BYRMV
0952	Chemistry reports RCS CB = 330 ppm.	BYRMV
1145	Turned Unit over to D.Cork for break.	BYRMV
1210	E.Lamken relieved M.Winter as U-1 US	BYRMV
1230	Relieved D.Cork from Unit.	BYRMV
1258	Started 1A DG for 1BOSR 8.1.2-1 Surveillance.	BYRMV
1308	Closed ACB 1413 per 1BOSR 8.1.2-1 Surveillance.	BYRMV
1315	Exited LCOAR 1BOL 3.i on 2PR30J - IM's completed work and skid working properly.	BYRMV
1519	Placed the CV Cation Demin on-line BOP CV-8 per Chemistry request for lithium control of RCS.	BYRMV
1538	Performed 5# Bleed & Feed of H2 on the Main Generator.	BYRMV
1607	Decreased Generator Output by 1 MW @ .5 MW/min rate per 1BGP 100-4T3 to maintain RX power < 100%.	BYRMV
1640	Exited 1BOL 6.3 & 7.4 on 1MS018A - work completed & 1MS019A open. On-line	BYRMV

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility: BYRON Task No: _____

Task Title: TAGOUT Job Performance Measure No: A.2

K/A Reference: 2.2.13 3.6/3.8

Examinee: _____ NRC Examiner: _____

Date: _____

Method of testing:

Simulated Performance _____X_____ Actual Performance _____

Classroom _____X_____ Simulator _____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions: You are an extra SRO/RO on shift
Unit 1 is in mode 1
All controls are in automatic
Maintenance will be performed on the 1B CS pump

Task Standard: REVIEW AND APPROVE A TAGOUT

Required Materials: BAP 300-1T9
OP-AA-101-401

General References: BAP 300-1T9
OP-AA-101-401

Initiating Cue: THE SM DIRECTS YOU TO REVIEW AND APPROVE A PREVIOUSLY GENERATED OOS ON THE UNIT 1 1B CONTAINMENT SPRAY PUMP FOR UPCOMING MAINTENANCE ON THE NEXT SHIFT. WORK IS PLANNED ON THE 1B CS PUMP, VALVES 1CS003B, 1CS011B, AND 1CS020B.

Critical Task: NO

Validation Time: 25 MINUTES

PERFORMANCE INFORMATION

START TIME: _____

(Denote critical steps with a **BOLD** *)

Performance step: 1

ENTER BAP 330-1

Standard: LOCATE AND OPEN BAP 330-1

CUE: HAND APPLICANT MARKED UP PNID'S

Comment: ----------

Performance step: 2

REVIEW THE APPLICABLE PORTION OF BAP 330-1

Standard: BAP 330-1 REVIEWED

Comment: ----------

Performance step: 3

*** REVIEW THE CLEARANCE ***

Standard: *** CLEARANCE REVIEWED AND 5 ERRORS FOUND ***

ANSWER: FOLLOWING 5 ITEMS ARE WRONG
Hang tag 5 for 1CS009B should be an OOS card, not an INFO card
1CS01PB FU TAG MISSING 1AP06E-H-FU-14
1AP06E-H LISTED AS CS PP 1A BRKR
1CS001B CS PP RWST SUCT VALVE LEFT OPEN
1CS016B 1B CS PP HDR DRN VLV LISTED HANG 001

NOTE: 4 OUT OF THE 5 FAULTS MUST BE FOUND TO PASS

Comment: *Candidate may stated that the discharge valves need to be taken out before the suction valves. However, the OOS used in this JPM is also correct. ----------
---

Performance step: 4

CORRECT CLEARANCE

Standard: 5 ERRORS CORRECTED ON CLEARANCE

Comment: ----------

TERMINATING CUE: SM I HAVE REVIEWED THE CLEARANCE AND FOUND 5 ERRORS AND THE CORRECTIONS HAVE BEEN MADE

TIME STOP_____

Initial Conditions: You are an extra SRO/RO on shift
Unit 1 is in mode 1
All controls are in automatic
Maintenance will be performed on the 1B CS pump

Initiating Cue: THE SM DIRECTS YOU TO REVIEW AND APPROVE A PREVIOUSLY GENERATED OOS ON THE UNIT 1 1B CONTAINMENT SPRAY PUMP FOR UPCOMING MAINTENANCE ON THE NEXT SHIFT. WORK IS PLANNED ON THE 1B CS PUMP, VALVES 1CS003B, 1CS011B, AND 1CS020B.

SPECIAL INSTRUCTIONS FOR OOS

NEED ELECT OOS TO CHANGE OIL

PERFORM CHECK VALVE INSPECTIONS (1CS003B, 1CS011B, 1CS020B)

REMOVE CAP FROM TEST TAP, CONNECT TEMPORARY PUMP FOR PERFORMING TEST. (DOWNSTREAM OF 1CS043B)

EXCEPTIONAL OOS: NOT ALL SIDES OF CHECK VALVE CAN BE DRAINED, MAY GET SOME BORATED WATER WHEN THE CHECK VALVES REMOVED

ADD CARD ON VENT TO OPEN AS NEEDED

EPN: 1CS01PB ALT EPN: NAME: ASSY - 1B CS PP
ASMBLY/EQUIP: PMPA 01PB WORK DESC: 1B CS TRAIN-WINDOW WORK (MM,FH,OA)

MC LOC: 01 A 22
PREPARED BY: B E BUZA
1ST APPR: B E BUZA
2ND APPR:
AUTH BY:

SPECIAL INST: SEE SPECIAL INSTRUCTIONS PAGE

TECH SPEC : ITS 3.6.6
ITS 3.6.7

APPLIC MODE : 1 2 3 4
REQUIRED MODE : 1 2 3 4 5 6

HANG SEQ	HANG POS	HANG BY	HANG IV	ISOLATION POINT LOCATION & DESCRIPTION	LIFT SEQ	LIFT POS	LIFT BY	LIFT IV
HANG 001	INFO-I INFO		N/A	1CS016B 343 -W 14 RXB1 1B CS PP SUCT HDR DRN VLV +1 OPEN TO DRAIN, THEN RECLOSE				N/A
ECODE: 0000226127								
HANG 001	OOS-S PTL			1HS-CS002 1CS01PB C/S 451 -L 15 AB1 MCR CONTAINMENT SPRAY PP 1B MCB C/S BUS 142				
ECODE: 0000225983								
HANG 001	OOS-S AUT/CL			1HS-CS008 1CS001B C/S 451 -L 15 AB1 MCR CS PP 1B SUCT VLV MCB C/S 1PM06J				
	(SEE NOTES)							
ECODE: 0000226002				CLOSING 1CS001B WITH 1B RH SUCTION ALIGNED TO THE RCS M				
HANG 001	OOS-S AUT/CL			1HS-CS010 1CS009B C/S 451 -L 15 AB1 MCR CS PP 1B RECIRC SUMP SUCT VLV MCB C/S 1PM06J				
ECODE: 0000226018								

COMPLETED BY: DATE: TIME:

HANG SEQ	HANG POS	HANG BY	HANG IV	ISOLATION POINT LOCATION & DESCRIPTION					LIFT SEQ	LIFT POS	LIFT BY	LIFT IV
HANG 005	INFO-I INFO			1CS009B ASSY - MOV 1B CS PP CNMT RECIRC SUMP SUCT VLV +01 (EOP VLV), CONTROLLED AT - 1PM06J	343	-W	14	RXB1				
ECODE: 0000225966												
HANG 006	INFO-I INFO			1CS012B 1B CS EDUC DSCH HDR DRN VLV +1 OPEN TO DRAIN, THEN RECLOSE	343	-W	14	RXB1				
ECODE: 0000226088												
HANG 006	INFO-I INFO			1CS043B 1B CS EDUC INLET HDR DRN CONN ISOL VLV +4 OPEN TO DRAIN, THEN RECLOSE	343	-W	14	RXB1				
ECODE: 0000226380												
HANG 007	NO-CARD N/A			1CS01PB-M 1B CS PP MTR +05	343	-W	13	RXB1				
ECODE: 0000226691												
HANG 007	NO-CARD N/A			1CS003B 1B CS PP 1CS01PB DSCH NOZL CHK VLV +1	343	-W	14	RXB1				
ECODE: 0000225993												
HANG 007	NO-CARD N/A			1CS011B 1B CS EDUC 1CS01SB OUTLET CHK VLV	343	-W	14	RXB1				
ECODE: 0000226078												
HANG 007	NO-CARD N/A			1CS020B 1B CS EDUC 1CS01SB INLET CHK VLV +7	343	-W	14	RXB1				
ECODE: 0000226157												

* * * * END OF ISOLATION POINTS * * * *

HANG SEQ	HANG POS	HANG BY	HANG IV	ISOLATION POINT LOCATION & DESCRIPTION					LIFT SEQ	LIFT POS	LIFT BY	LIFT IV
HANG 003	OOS-R R/O			1AP05E-H 1CS01PA BKR CONTAINMENT SPRAY PP 1A BRKR BUS 141 CUB 09	426	-L	06					
ECODE: 0000216060												
HANG 004	OOS-R OFF			1AP24E-B2-10 1CS01PB MTR HTR CS PP 1B MOTOR HEATER BRKR MCC 132X3 CUB B2-10	383	-P	16					
ECODE: 0000213594												
HANG 004	OOS-R OFF			1AP28E-A3 1CS001B BKR CS PP 1B SUCT VLV BRKR MCC 132X4 CUB A3	426	-S	13	RXB1				
ECODE: 0000213866												
HANG 004	OOS-R OFF			1AP23E-G1 1CS009B BKR CS PP 1B RECIRC SUMP SUCT VLV BRKR MCC 132X1 CUB G1	364	-N	17	AB1				
ECODE: 0000213574												
HANG 005	OOS-R CLOSED			1CS046B 1B CS EDUC INLET ISOL VLV +7	343	-W	14	RXB1				
ECODE: 0000226392												
HANG 005	OOS-R CLOSED			1CS004B 1B CS PP 1CS01PB DSCH ISOL VLV +1	343	-W	14	RXB1				
ECODE: 0000225997												
HANG 005	OOS-R CLOSED			1CS035B 1B CS PP DSCH TO EDUC ISOL VLV +1	434	-W	14	RXB1				
ECODE: 0000226335												
HANG 005	OOS-R OPEN			1CS001B ASSY - MOV 1B CS PP RWST SUCT VLV +03 (EOP VLV), CONTROLLED AT - 1PM06J	364	-W	14	RXB1				
ECODE: 0000225954												

BYRON STATION MASTER CHECKLIST: 001 990015055 UNIT 01

FIRST HANG EXCEPTIONAL

MASTER KEY

EPN: 1CS01PB ALT EPN: NAME: ASSY - 1B CS PP

ASMBLY/EQUIP: PMPA 01PB WORK DESC: 1B CS TRAIN-WINDOW WORK (MM,FH,OA)

MC LOC: 01 A 22
PREPARED BY: B E BUZA
1ST APPR: B E BUZA
2ND APPR:
AUTH BY:

SPECIAL INST: SEE SPECIAL INSTRUCTIONS PAGE

TECH SPEC : ITS 3.6.6
ITS 3.6.7

APPLIC MODE : 1 2 3 4
REQUIRED MODE : 1 2 3 4 5 6

HANG SEQ	HANG POS	HANG BY	HANG IV	ISOLATION POINT LOCATION & DESCRIPTION	LIFT SEQ	LIFT POS	LIFT BY	LIFT IV
HANG 001 → 006	INFO-I INFO → INCOMG		N/A	1CS016B 343 -W 14 RXB1 1B CS PP SUCT HDR DRN VLV +1 OPEN TO DRAIN, THEN RECLOSE				N/A
ECODE: 0000226127								
HANG 001	OOS-S PTL			1HS-CS002 1CS01PB C/S 451 -L 15 AB1 MCR CONTAINMENT SPRAY PP 1B MCB C/S BUS 142 → INCORRECT 1PM06J				
ECODE: 0000225983								
HANG 001	OOS-S AUT/CL (SEE NOTES)			1HS-CS008 1CS001B C/S 451 -L 15 AB1 MCR CS PP 1B SUCT VLV MCB C/S 1PM06J CLOSING 1CS001B WITH 1B RH SUCTION ALIGNED TO THE RCS M				
ECODE: 0000226002								
HANG 001	OOS-S AUT/CL			1HS-CS010 1CS009B C/S 451 -L 15 AB1 MCR CS PP 1B RECIRC SUMP SUCT VLV MCB C/S 1PM06J				
ECODE: 0000226018								
HANG 002	OOS-R OAF			1APOGE-H-FU-14 1CS01PB FU 426 -N 10 CONTAINMENT SPRAY PP 1B CIP FU BUS 142 CUB 08 FU-14				

INCORRECT MISSING

COMPLETED BY: DATE: TIME:

HANG SEQ	HANG POS	HANG BY	HANG IV	ISOLATION POINT LOCATION & DESCRIPTION					LIFT SEQ	LIFT POS	LIFT BY	LIFT IV
HANG 003	OOS-R R/O			1AP05E-H 1CS01PA BKR CONTAINMENT SPRAY PP 1A BRKR BUS 141 CUB 09	426	-L	06					
ECODE: 0000216060												
HANG 004	OOS-R OFF			1AP24E-B2-10 1CS01PB MTR HTR CS PP 1B MOTOR HEATER BRKR MCC 132X3 CUB B2-10	383	-P	16					
ECODE: 0000213594												
HANG 004	OOS-R OFF			1AP28E-A3 1CS001B BKR CS PP 1B SUCT VLV BRKR MCC 132X4 CUB A3	426	-S	13	RXB1				
ECODE: 0000213866												
HANG 004	OOS-R OFF			1AP23E-G1 1CS009B BKR CS PP 1B RECIRC SUMP SUCT VLV BRKR MCC 132X1 CUB G1	364	-N	17	AB1				
ECODE: 0000213574												
HANG 005	OOS-R CLOSED			1CS046B 1B CS EDUC INLET ISOL VLV +7	343	-W	14	RXB1				
ECODE: 0000226392												
HANG 005	OOS-R CLOSED			1CS004B 1B CS PP 1CS01PB DSCH ISOL VLV +1	343	-W	14	RXB1				
ECODE: 0000225997												
HANG 005	OOS-R CLOSED			1CS035B 1B CS PP DSCH TO EDUC ISOL VLV +1	434	-W	14	RXB1				
ECODE: 0000226335												
HANG 005	OOS-R OPEN			1CS001B ASSY - MOV 1B CS PP RWST SUCT VLV +03 (EOP VLV), CONTROLLED AT - 1PM06J	364	-W	14	RXB1				
ECODE: 0000225954												

Should be 1BCS.

HANG SEQ	HANG POS	HANG BY	HANG IV	ISOLATION POINT LOCATION & DESCRIPTION					LIFT SEQ	LIFT POS	LIFT BY	LIFT IV
HANG 005	INFO-I INFO	should be	005 closed	1CS009B ASSY - MOV 1B CS PP CNMT RECIRC SUMP SUCT VLV +01 (EOP VLV), CONTROLLED AT - 1PM06J	343	-W	14	RXB1				
ECODE: 0000225966												
HANG 006	INFO-I INFO			1CS012B 1B CS EDUC DSCH HDR DRN VLV +1 OPEN TO DRAIN, THEN RECLOSE	343	-W	14	RXB1				
ECODE: 0000226088												
HANG 006	INFO-I INFO			1CS043B 1B CS EDUC INLET HDR DRN CONN ISOL VLV +4 OPEN TO DRAIN, THEN RECLOSE	343	-W	14	RXB1				
ECODE: 0000226380												
HANG 007	NO-CARD N/A			1CS01PB-M 1B CS PP MTR +05	343	-W	13	RXB1				
ECODE: 0000226691												
HANG 007	NO-CARD N/A			1CS003B 1B CS PP 1CS01PB DSCH NOZL CHK VLV +1	343	-W	14	RXB1				
ECODE: 0000225993												
HANG 007	NO-CARD N/A			1CS011B 1B CS EDUC 1CS01SB OUTLET CHK VLV	343	-W	14	RXB1				
ECODE: 0000226078												
HANG 007	NO-CARD N/A			1CS020B 1B CS EDUC 1CS01SB INLET CHK VLV +7	343	-W	14	RXB1				
ECODE: 0000226157												

* * * * END OF ISOLATION POINTS * * * *

BYRON | 6E-1-4030 CS02

4160V. ESF SWGR. BUS142 (1AP06EH) CUB # 8

A B C

[ACB]

DEV. ARCSPBX DC CONTACTOR W TYPE WME10-10 AT 4.16KV SWGR BUS 142 CUB#3 (1AP06EH)

THIS DWG

PRIGA,C-450/451 OVERCURRENT RLYS. TYPE CO-5A @ SWGR. [JJ-CS047] WATTHOUR METER @ SWGR.

[CT-1] 2 CT'S 150-5A

[CT-3] 1AP06EH

ITEM NO 158 AMMETER @ MCB PNL. IPM06J [III-CS002]

IPM06J CS1BCO ATS-3 CS1BCO1 1AP06EH

[XS-SX157]

PRI7-450N GRD. OVERCURRENT RLY. TYPE "SSC-T" @ SWGR.

[CT] ICT 50-5A

20A [ACB-10] 1AP24E CKT #10

120V AC @ 4160V ESF SWGR BUS 142 PT'S (E-1-4016A.)

ΦA WHM B42P1 B42P2 B42P3 ΦC RTM 52 a

120V AC DIST. PNL. @ 480V MCC13243 COMPT 82 E-1-4008V K/D DWG.

X Y

1AP06EH CS1BHX 52 b 1AP06EH CS1BH H1 MOTOR SPACE HEATER KCS01PB H2 CS1BHY 1AP06EH 1AP24E

T1 T2 T3 600 HP ICS01PB-M

NORMAL TEST F.V.

CONTACT	SYM	POSITION NORM	TEST	
A11 - B11	T		X	*
A12- B12	N	X		*
A1 - B1	T		X	*
A5 - B5	T		X	
A6 - B6	N	X		*
A7 - B7	T		X	*
C11- D11	T		X	
C12- D12	N	X		
C1 - D1	T		X	
C5- D5	T		X	
C6- D6	N	X		
C7- D7	T		X	

INSTR NO. IHS-CS032 (ITEM A1-181)

PINS B R B

JUMPERS A1, A12

SPARE

MODULE TYPE MW2

WESTINGHOUSE TYPE W-2 TEST TRANSFER SWITCH MAINTAINED CONTACT S# 505A670G01 PISTOL GRIP NAMEPLATE # 502A054H05 X-DENOTES CONTACT CLOSED * SWITCH CONTACT USED

TRANSFER SWITCH DEVELOPMENT "43TS" @ MCB PNL IPM06J

[FU-14] FU-14P 30A

125 V. DC @ 4160V. ESF SWGR BUS 142 (AP39)

[IHS-CS049] [IHS-CS048]

[FU-14] FU-14N 30A

[ACB]

ARCSPBX

DEV CS1BX (TDE) AGA E7012-PD RLY @ SWGR

SPARE AUTO START FAILURE ALM. THIS DWG. SPARES

[IHS-CS049-ILT] TRIP

[IHS-CS002-ILAT] [IHS-CS002-ILT] [IHS-CS002-ILC]

IPM06J CS1BP CS1BC CS1BC7 CS1BC4 CS1BC3 CS1BC2 CS1BC1 CS1BC5 CS1BC8 CS1BC9 IPA14J

IPA10J KG44 CLOSED ON CNTMT. SPRAY ACTUATION (EF60)

IPA10J 1S188B11B (CSI4) 1AP28E 1AP23E 1AP06EH

ICS007B (CS05) ICS040B (CS07) ICS001B (SI37) ICS019B (CS06) ICS009B (CS04) R38 CLOSE ON SI (INST) OR LOSS OFF SITE PWR (TD) (EF02)

DG1BEH2 (DG02)

CS1BT CS1BTI CS1BN CS1BX

IPM06J IPA32J CB6 CS1BX (TDE) 30 SEC

[ACB] SPARES MOVABLE AUXILIARY SWITCHES IN [ACB]

IPA10J KG44 CLOSED ON CNTMT SPRAY ACTUATION (EF60)

[IHS-CS049-ILC]

PRIGA-450/451(ΦA) OVERCURRENT RLY. CO-5A

PRIGC-450/451(ΦC) PRI7-450N OVERCURRENT RLY. GND. O.C. RLY. "SSC-T"

ICS CO IIT 427-B142X2 (AP39) SSC-T 2496 IPA32J CB21 CB6 IPM06J 2269B 2268A 2269 2268 IPA32J

AUTO-START ALM WINDOW 11DC2 (AN008)

TRIP ALARM WINDOW 11A01 (AN008)

AUTO-START FAILURE ALARM WINDOW 11B02 (AN008)

INTLK ICS007B (CS05) INTLK ICS019B (CS06) SPARE SPARE

IPA32J CB6 IPM06J 2270A 2270 IPA32J

INSTR. NO. IHS-CS002 (ITEM A1-180)

PINS B D A

CLOSE A TRIP

JUMPERS A1, A11, A12, C6, F12

DG, D12

A6, C5

SPACE

MODULE TYPE MW3

TRIP CLOSE PULL OUT (F.V.)

CONTACT	SYM.	POSITION PULL OUT	TRIP	OFF AFT TRIP	OFF AFT CLOSE	CLOSE	
A11 – B11	TP	X	X				*
A12 – B12	O			X	X		
A1 – B1	C					X	*
A5 – B5	TP	X	X				
A6 – B6	O			X	X		
A7 – B7	C					X	
C11 – D11	TP	X	X				
C12 – D12	O			X	X		*
C1 – D1	C					X	
C5 – C6	STP	X	X	X			*
C6 – C7	SC				X	X	*
D5 – D6	STP	X	X	X			*
D6 – D7	SC				X	X	*
E12 – E1	P	X					*
F12 – F1	CTO		X	X	X	X	*
E6 – E7	P	X					*
F6 – F7	CTO		X	X	X	X	*

WESTINGHOUSE TYPE W-2 CONTROL SWITCH, 3 POSITIONS, SPRING RETURN TO CENTER, BASIC SWITCH S# 50BA264G02, PISTOL GRIP FIXED HANDLE.

X-DENOTES CONTACT CLOSED

*-SWITCH CONTACT USED

CONTROL SW. DEVELOPMENT "CS" @ MCB PNL. IPM06J

CONTAINMENT SPRAY PUMP 1B ESF DIV. 12

P & I M-46 LOGIC M-404G-1CS01

STATIONARY AUXILIARY SWITCH-52

RTM THIS DWG TRIP ALARM THIS DWG AUTO START ALARM THIS DWG AUTO-START FAILURE ALM. THIS DWG MONITOR LIGHT GROUP 6 # 2.4 ICS019B MOTOR SPACE HTR. THIS DWG MONITOR LIGHT GROUP 4 # 8.3 INTLK ICS007B (CS05) INTLK IVA03CE (VA10)

STATIONARY AUXILIARY SWITCH-S1

INTLK IVA03CH (VA10) INTLK K643 THRU SNPD TEST CAB. 1PA12J (EF58) SPARES

D. P. GALANIS 062-041891 REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS D.P.G. 12-22-92

B. G. TREECE 17830 REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS

MPD OK MPD PT M

NUCLEAR SAFETY RELATED
EQUIPMENT IS SHOWN ON THIS DRAWING.

REFERENCE DWGS. DWG. NO.	DESCRIPTION
E-1-4054 SERIES	INT/EXT W/D MCB ENG. SAFETY FEATURES IPM06J
E-1-4116 SERIES	INT/EXT W/D SOLID STATE (RX@ESF) PROT. SYS. CAB. TRA'N B IPA10J
E-1-4156 SERIES	INT/EXT W/D ANNUNCIATOR INPUT CAB. (ESF 12.) IPA32J
E-1-4613 SERIES	INT/EXT W/D 4160V ESF SWGR. 142 1AP06E
E-1-4030 SERIES	S/D NOTES, LEGENDS REFERENCE DWGS

DRAWING RELEASE RECORD REV.	DATE	DESCRIPTION	DRAWN / CHECKED / ENGR. APPROVAL
U	12/22/92	INCORP. DCR #92-208 FCN #06 00212F ENCL: EWG-1-89-021-A1 REL. FOR REC. ONLY PROJ. #8893-53	E. Lagedrou M.B. Peter A. A. Galanis
V	9/8/97	F/R RECORD - ENCL'D P. TW NUR ABEL SPECIFIED	Robert P. Wedler David Allred Tom Schilling
T	10-1-98	DWG MADE UNIQUE FOR BYRON REL. FOR RECORD ONLY PROJ NO B200-01	Paul Langlois R. Spill
		SEE ABOVE	

NUCLEAR SAFETY RELATED
EQUIPMENT IS SHOWN ON THIS DRAWING.

SCHEMATIC DIAGRAM CONTAINMENT SPRAY PUMP 1B 1CS01PB

BYRON/~~BRAIDWOOD~~ STATION - UNIT 1
COMMONWEALTH EDISON CO.
CHICAGO, ILLINOIS

SCALE NONE
DRAWN Tracy Bridewell 9-26-74
CHECKED [illegible] 3-26-75
ENG. [illegible] A. Allred 3-30-77
APPROVED [illegible] 3/30/77
JOB NO. 4391

SARGENT & LUNDY ENGINEERS CHICAGO

DRAWING NO.
BYRON 6E-1-4030 CS02
BRAIDWOOD

SCHEMATIC DIAGRAM CONTAINMENT SPARY PUMP 1B 1CS01PB

BRAIDWOOD
BYRON
6E-1-4030 CS03

480VAC MCC 131X1(1AP21E) COMPT. (B4)
L1 L2 L3
[ACB]
CONT. TRANSF. 480-120V
FU 3A
O.L
T1 T2 T3
[1CS001A-LØ5] 1-3 HP 1CS001A
CSIAVX1
CSIAVC
CSIAVO
CSIAVY
CSIAVC1 IPM06J
CSIAVO1 IPM06J
CSIAVG IPM06J
CSIAVR IPM06J
CSIAVO2 1AP21E 1CS009A 5 LS C 5C (CS04) 1AP21E
[IHS-CS007-ILC] CLOSE OPEN [IHS-CS007-ILØ]
"F" (SEAL-IN) PA0329
IPA311 CA21
0329 IPA317
INTLK 1S1881IA (S114)
SPARE
SPARES
M.O. VALVE LIMIT SWITCH
SPARE
MONITOR LIGHT GR.4 J7 (AN060)
SPARES
MONITOR LIGHT GR.1 J3 (AN055)
M.O.VALVE LIMIT SWITCH
CONTAINMENT SPRAY PUMP 1A SUCTION VALVE
ESF DIV. 11
P&I MG1-4
LOGIC M-4046-1CS02

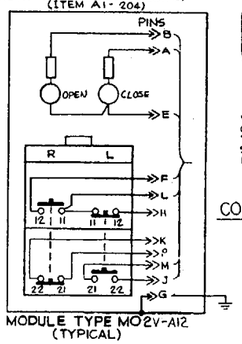
480VAC MCC 132X4 (1AP28E) COMPT. (A3)
L1 L2 L3
[ACB]
CONT. TRANSF. 480-120V
FU 3A
O.L
T1 T2 T3
[1CS001B-LØ5] 1-3 HP 1CS001B
CSIBVX1
CSIBVC
CSIBVO
CSIBVY
CSIBVC1 IPM06J
CSIBVO1 IPM06J
CSIBVG IPM06J
CSIBVR IPM06J
CSIBVO2 1AP23E 1CS009B 5 LS C 5C (CS04) 1AP23E
[IHS-CS008-ILC] CLOSE OPEN [IHS-CS008-ILØ]
"F" (SEAL-IN) PB2499
IPA323 CB21
2499 IPA327
INTLK 1S1881IB (S114)
SPARE
SPARES
M.O. VALVE LIMIT SWITCH
SPARE
MONITOR LIGHT GR.4 J6 (AN060)
SPARES
MONITOR LIGHT GR.1 J4 (AN055)
M.O.VALVE LIMIT SWITCH
CONTAINMENT SPRAY PUMP 1B SUCTION VALVE
ESF DIV. 12
P&I MG1-4
LOGIC M-4046-1CS02

ROTOR	CONTACTS	SYM.	VALVE POSITION: FULL OPEN	INTER	FULL CLOSE
1	1-1C	O			
	2-2C	O			
	3-3C	1C			
	4-4C	1C			
2	5-5C	C			
	6-6C	C			
	7-7C	10			
	8-8C	10			
3	9-9C	O			
	10-10C	O			
	11-11C	1C			
	12-12C	1C			
4	13-13C	C			
	14-14C	C			
	15-15C	10			
	16-16C	10			
	17-17C	TSC TORQUE SW. OPENS ON MECH. OVERLOAD IN CLOSING DIRECTION.			
	18-18C	TSO TORQUE SW. OPENS ON MECH. OVERLOAD IN OPENING DIRECTION.			

ROTORS 3 & 4 CAN BE SET TO OPERATE CONTACTS AT VALVE POSITION FULL OPEN, FULL CLOSED OR ANY POSITION IN BETWEEN. THESE ROTOR ARE ADJUSTABLE INDEPENDENTLY FROM EACH OTHER.

M.O. VALVE LIMIT SWITCH DEVELOPMENT (TYPICAL)

INSTR NO. IHS-CS007(1CS001A) (ITEM A1-203)
INSTR. NO. IHS-CS008(1CS001B) (ITEM A1-204)



MODULE TYPE MO2V-A12 (TYPICAL)

AUTO CLOSE OPEN (F.V)

CONTACTS	NO.	SYM.	POSITION: CLOSE	AUTO	OPEN
1st BLOCK 11 12 11 12	L	A0		X	X
	R	O			X
2nd BLOCK 21 22 21 23	L	C	X		
	R	AC	X	X	

WESTINGHOUSE TYPE OT2 CONTROL SWITCH, OT2V6W OPERATOR, 3 POSITIONS, SPRING RETURN LEFT & RIGHT TO CENTER, LEVER HANDLE, STANDARD LEGEND PLATE SIMILAR TO S# 1B7P038H01 TWO CONTACT BLOCKS- 1ST BLOCK-OT2A ROTATED 180° 2ND BLOCK-OT2A

'X-DENOTES CONTACT CLOSED

CONTROL SW. DEVELOPMENT 'CS' @ MCB PNL. 1PM06J TYPICAL FOR 1CS001A & B

NO.	NOTES

REFERENCE DRAWINGS	
DWG. NO.	DESCRIPTION
E-1-4661 SERIES	INT/EXT W/D 480V AUX. BLDG. ESF MCC 131X1 1AP21E
E-1-4687 SERIES	INT/EXT W/D 480V AUX. BLDG. ESF MCC 132X4 1AP28E
E-1-4054 SERIES	INT/EXT W/D MCB ENG. SAFETY FEATURES 1PM06J
E-1-4030 SERIES	S/D NOTES, LEGENDS REFERENCE DWGS

DRAWING RELEASE RECORD			DRAWN	CHECKED	ENGR. APPROVAL
REV.	DATE	DESCRIPTION			
E	7-24-86	DWG MADE UNIQUE; REL FOR RECORD ONLY			
F	8/8/97	P & P'S ADD - 2 AGCM 1 & 2 (REP 4966 & 85)			
E	01-17-86	ADV DRG TO MOD. 4 INSTR. NO'S. REL FOR REC ONLY SPEC L-2750			

MPD OK | MPD PT | D

B.G. TRECE 17830 REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS

NUCLEAR SAFETY RELATED EQUIPMENT IS SHOWN ON THIS DRAWING.

SCHEMATIC DIAGRAM
CONTAINMENT SPRAY PUMPS 1A & 1B SUCTION VALVES-1CS001A & B

BYRON/~~BRAIDWOOD~~ STATION — UNIT 1
COMMONWEALTH EDISON CO.
CHICAGO, ILLINOIS

SCALE NONE
DRAWN P. Mastera 8-30-74
CHECKED [illegible] 3-20-78
ENGINEER A. Ahmad 3-30-78
APPROVED [illegible] 8/9/88
JOB NO. 4391

SARGENT & LUNDY ENGINEERS CHICAGO

DRAWING NO.
BYRON 6E-1-4030 CS03
BRAIDWOOD

FILM

PECN# P-1084 (REV. F1)
BYH-5236(E), BBH-7836(D) BBHE-[illegible](E)

07

REPRODUCTION CONSULTANTS LTD.

SCHEMATIC DIAGRAM CONTAINMENT SPRAY PUMPS 1A & 1B SUCTION VALVES

480VAC MCC 131X1 (1AP21E) COMPT. C1

480VAC MCC 132X1 (1AP23E) COMPT. G1

CONTAINMENT SPRAY PUMP 1A SUMP SUCTION VALVE
ESF DIV. 11
P&I M41-4
LOGIC M-4046-1CS02

CONTAINMENT SPRAY PUMP 1B SUMP SUCTION VALVE
ESF DIV. 12
P&I M41-4
LOGIC M-4046-1CS02

M.O. VALVE LIMIT SWITCH

M.O. VALVE LIMIT SWITCH

ROTOR	CONTACTS	SYM.	VALVE POSITION: FULL OPEN	INTER	FULL CLOSE
1	1-1C	O			
	2-2C	O			
	3-3C	IC			
	4-4C	IC			
2	5-5C	C			
	6-6C	C			
	7-7C	IO			
	8-8C	IO			
3	9-9C	O			
	10-10C	O			
	11-11C	IC			
	12-12C	IC			
4	13-13C	C			
	14-14C	C			
	15-15C	IO			
	16-16C	IO			
	17-17C	TSC-TORQUE SW. OPENS ON MECH. OVERLOAD IN CLOSING DIRECTION			
	18-18C	TSO-TORQUE SW. OPENS ON MECH. OVERLOAD IN OPENING DIRECTION			

ROTORS 3 & 4 CAN BE SET TO OPERATE CONTACTS AT VALVE POSITIONS FULL OPEN, FULL CLOSED OR ANY POSITION IN BETWEEN. THESE ROTORS ARE ADJUSTED INDEPENDENTLY FROM EACH OTHER.

M.O. VALVE LIMIT SWITCH DEVELOPMENT
(TYPICAL)

INSTR NO IHS-CS009(1CS009A)
(ITEM AI-225)
INSTR. NO. IHS-CS010(1CS009B)
(ITEM AI-222)

MODULE TYPE MO2V-A12

CONTACTS	NO.	SYM.	POSITION: CLOSE	AUTO	OPEN
1st BLOCK	L	AO		X	X
	R	O			X
2nd BLOCK	L	C	X		
	R	AC	X	X	

(F.V)

WESTINGHOUSE TYPE OT2 CONTROL SWITCH, OT2VGW OPERATOR, 3 POSITIONS, SPRING RETURN LEFT & RIGHT TO CENTER, LEVER HANDLE, STANDARD LEGEND PLATE SIMILAR TO 5 #187P038H01, TWO CONTACT BLOCKS: 1st BLOCK-OT2 ROTATED 180° 2nd BLOCK-OT2A

X-DENOTES CONTACT CLOSED

CONTROL SW. DEVELOPMENT "CS"
@ MCB PNL. 1PM06J
TYPICAL FOR 1CS009A & B

NO.	NOTES
1	⊗ - DENOTES ELECTRICAL PENETRATION

REFERENCE DRAWINGS

DWG. NO.	DESCRIPTION
E-1-4661 SERIES	INT/EXT W/D 480V AUX. BLDG. ESF MCC 131X1 1AP21E
E-1-4681 SERIES	INT/EXT W/D 480V AUX. BLDG. ESF MCC 132X1 1AP23E
E-1-4054 SERIES	INT/EXT W/D MCB ENG. SAFETY FEATURES 1PM06J
E-1-4030 SERIES	S/D NOTES, LEGENDS REFERENCE DWGS

REV.	DATE	DESCRIPTION
F	10-29-85	DWG RESTORED FOR RECORD ONLY RELEASE TO DMS FOR INFO.
G	01-17-86	ADDED INSTR. NOS REL FOR REF ONLY SPEC. L-2790
G	7-24-86	DWG MADE UNIQUE REL FOR RECORD ONLY
H	5/30/89	INCORP. DCR # 89-172, REL. FOR REC. ONLY PKG. # 7725-33
J	8/8/97	INCORP. DCR # 97-0466 (1CV 97466218)

DRAWN
CHECKED
ENGR. APPROVAL

MPD OK | MPD PT

NUCLEAR SAFETY RELATED
EQUIPMENT IS SHOWN ON THIS DRAWING.

SCHEMATIC DIAGRAM
CONTAINMENT SPRAY PUMPS 1A & 1B SUMP SUCTION VALVES - 1CS009A & B

BYRON/~~BRAIDWOOD~~ STATION — UNIT 1
COMMONWEALTH EDISON CO.
CHICAGO, ILLINOIS

SCALE NONE
DRAWN 9-24-74
CHECKED 3-11-75
ENGINEER 3-11-75
APPROVED 3/9/98
JOB NO. 4391

SARGENT & LUNDY ENGINEERS CHICAGO

DRAWING NO.
BYRON 6E1-4030 CS04
BRAIDWOOD

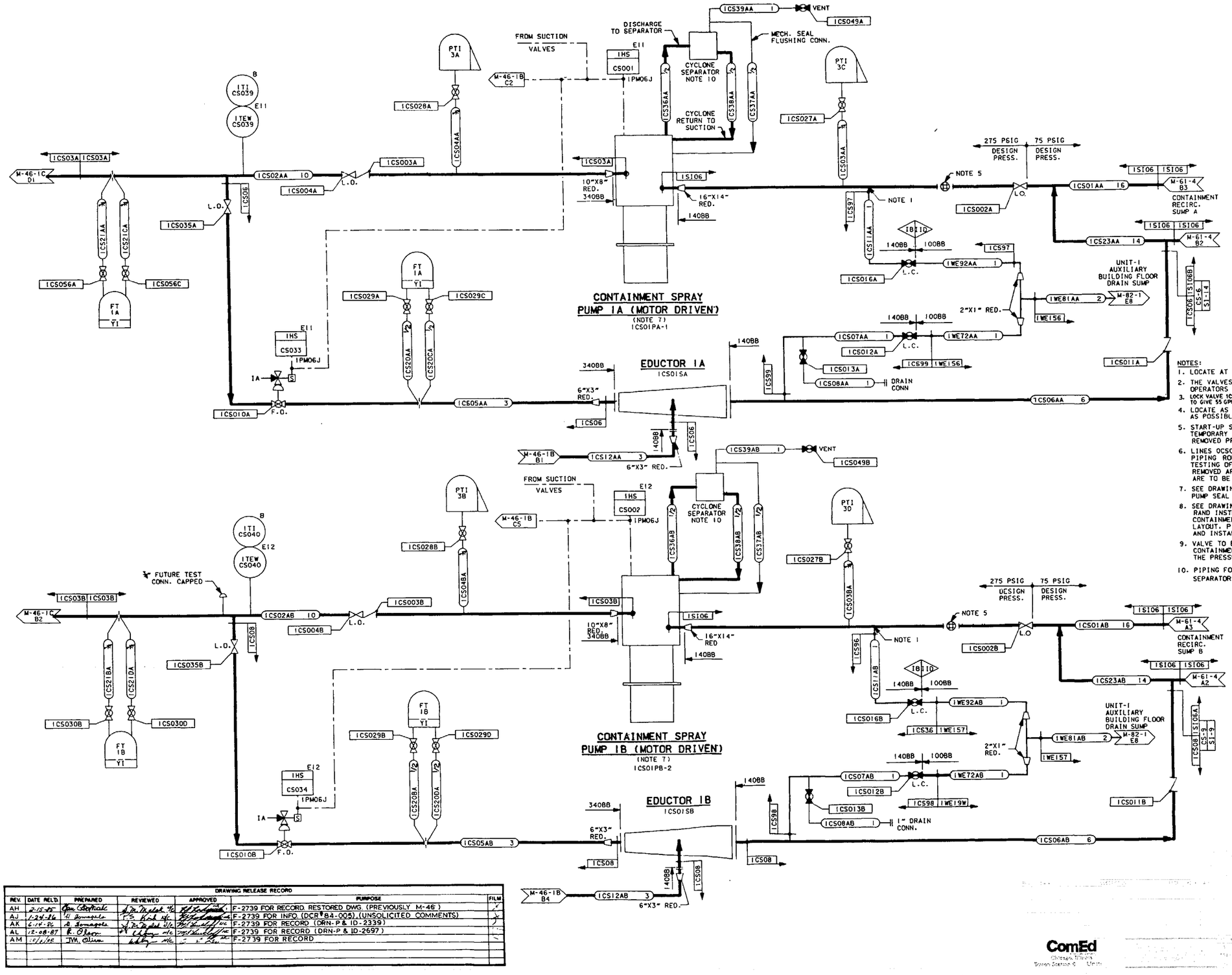
B.B. TREECE 17830 REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS

BYH-5236(G)
BYH-6764(H)

C7

REPRODUCTION CONSULTANTS LTD.

SCHEMATIC DIAGRAM CONTAINMENT SPRAY PUMPS 1A & 1B SUCTION VALVES



NOTES:

1. LOCATE AT LOW POINT FOR DRAIN AFTER PUMP TEST.
2. THE VALVES MUST BE EQUIPPED WITH FAST OPERATORS HAVING TEST POSITION.
3. LOCK VALVE 1CS018A & B OR 1CS021A & B IN POSITION TO GIVE 55 GPM.
4. LOCATE AS CLOSE TO MOTOR OPERATED VALVE AS POSSIBLE.
5. START-UP STRAINERS 1CS05MA & 1CS05MB ARE TEMPORARY CATEGORY IID STRAINERS AND MUST BE REMOVED PRIOR TO PLANT OPERATION.
6. LINES OCS01A-10" & OCS02A-10" ARE TEMPORARY PIPING ROUTED TO THE REFUELING CAVITY DURING TESTING OF THE PUMPS. ALL TEMP. PIPING IS TO BE REMOVED AFTER TESTING AND ALL BLIND FLANGES ARE TO BE INSTALLED. FOR ROUTING, SEE M-195.
7. SEE DRAWING M-82-1 FOR CONTAINMENT SPRAY PUMP SEAL VENT & DRAIN CONNECTIONS.
8. SEE DRAWING C-8X23W.D.F321X3B IN INGERSOLL RAND INSTRUCTION BOOKLET FOR CONTAINMENT SPRAY PUMP SEAL PIPING LAYOUT. PIPING IS SUPPLIED BY F-2758 AND INSTALLED BY F-2739.
9. VALVE TO BE THROTTLED DURING TEST OF CONTAINMENT SPRAY SYSTEM TO SIMULATE THE PRESSURE AT THE SPRAY RINGS.
10. PIPING FOR VENT VALVE FOR CS PUMP AND CYCLONE SEPARATOR PER PIPING DESIGN TABLE 340BB

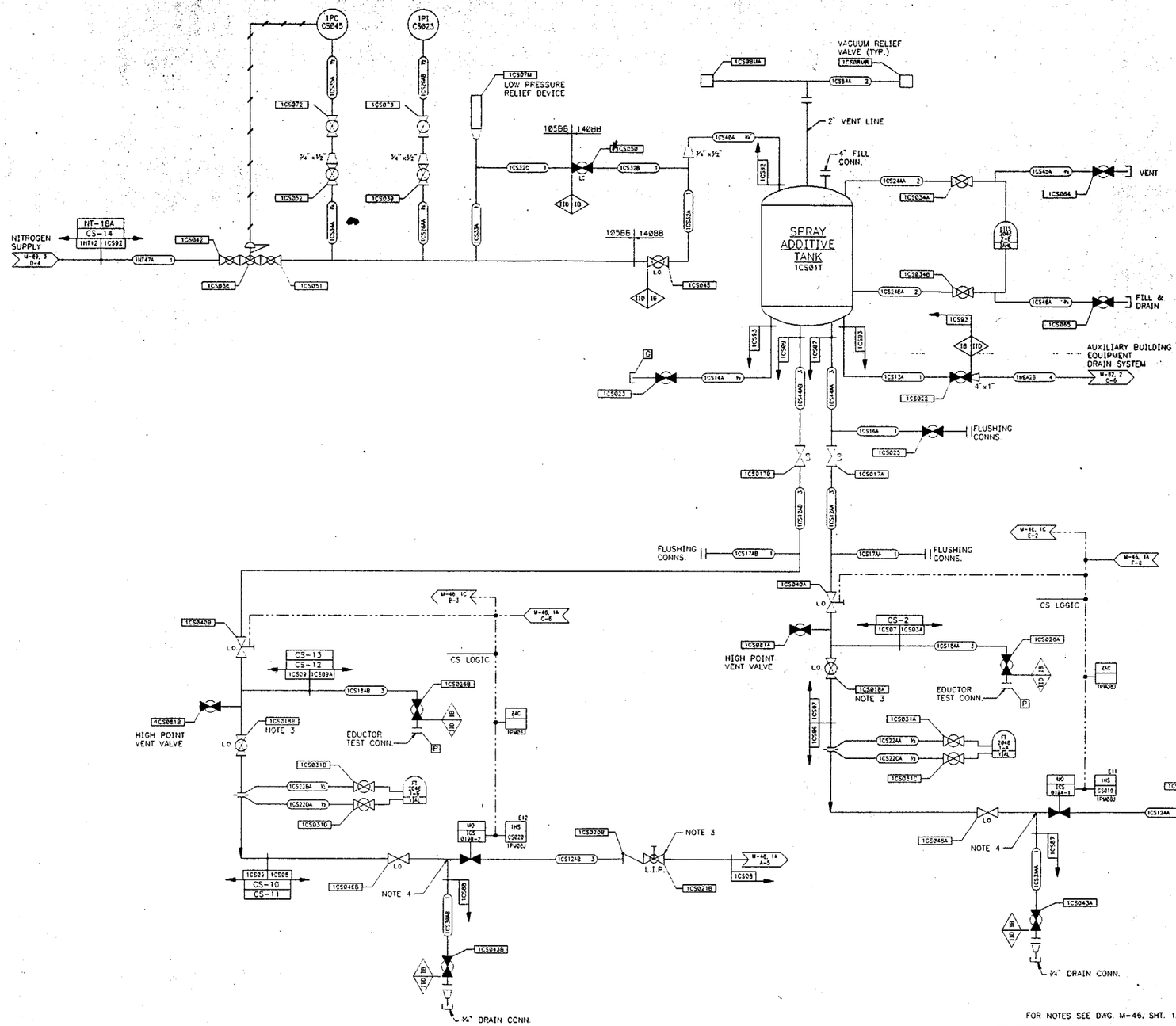
DRAWING RELEASE RECORD

REV.	DATE REL'D	PREPARED	REVIEWED	APPROVED	PURPOSE	FILM
AH	2-15-85	Dan Bertucci			F-2739 FOR RECORD RESTORED DWG. (PREVIOUSLY M-46')	
AJ	1-24-86	A Domagala			F-2739 FOR INFO (DCR 84-005).(UNSOLICITED COMMENTS)	
AK	6-19-86	A Domagala			F-2739 FOR RECORD (DRN-P & ID-2339)	
AL	12-08-87	R. Olson			F-2739 FOR RECORD (DRN-P & ID-2697)	
AM	1/5/88	JW Olson			F-2739 FOR RECORD	

ComEd
Chicago, Illinois
Byron Station 0 Units

DIAGRAM OF CONTAINMENT SPRAY UNIT 1 (CRITICAL CONTROL ROOM DRAWIN

CRITICAL CONTROL ROOM DRAWING M-46 SHT. 1B



FOR NOTES SEE DWG. M-46, SHT. 1A

(FOR SAFETY CLASSIFICATION SEE PIPING EQUIPMENT, VALVE, OR INSTRUMENT LISTS)

DRAWING CONTAINS ISI LAYERS
CONTACT ISI GROUP PRIOR TO REVISING

REV	DATE	DESCRIPTION	PREP.	REVR.	APPR
AN	09/29/96	FOR RECORD-INCORP. OF AS-BUILT DCR #980063	JLR	CRH	WTP
AP	01/06/97	FOR RECORD-INCORP. OF TO #433 (DCP #980070)	CMC	SCW	DRM
AR	04/07/00	FOR RECORD-INCORP. OF DCR #990322 (ADDED ISI INFORMATION)	RGM	SK	DRM
--	--		--	--	--

ComEd
Chicago, Illinois
Byron Station 6 Unit: 1

NUCLEAR SAFETY RELATED EQUIPMENT IS SHOWN ON THIS DRAWING

DIAGRAM OF CONTAINMENT SPRAY

SCALE: NONE
DATE: 09/17/98
DRAWN BY: JLR
ORG. BY: SRMB

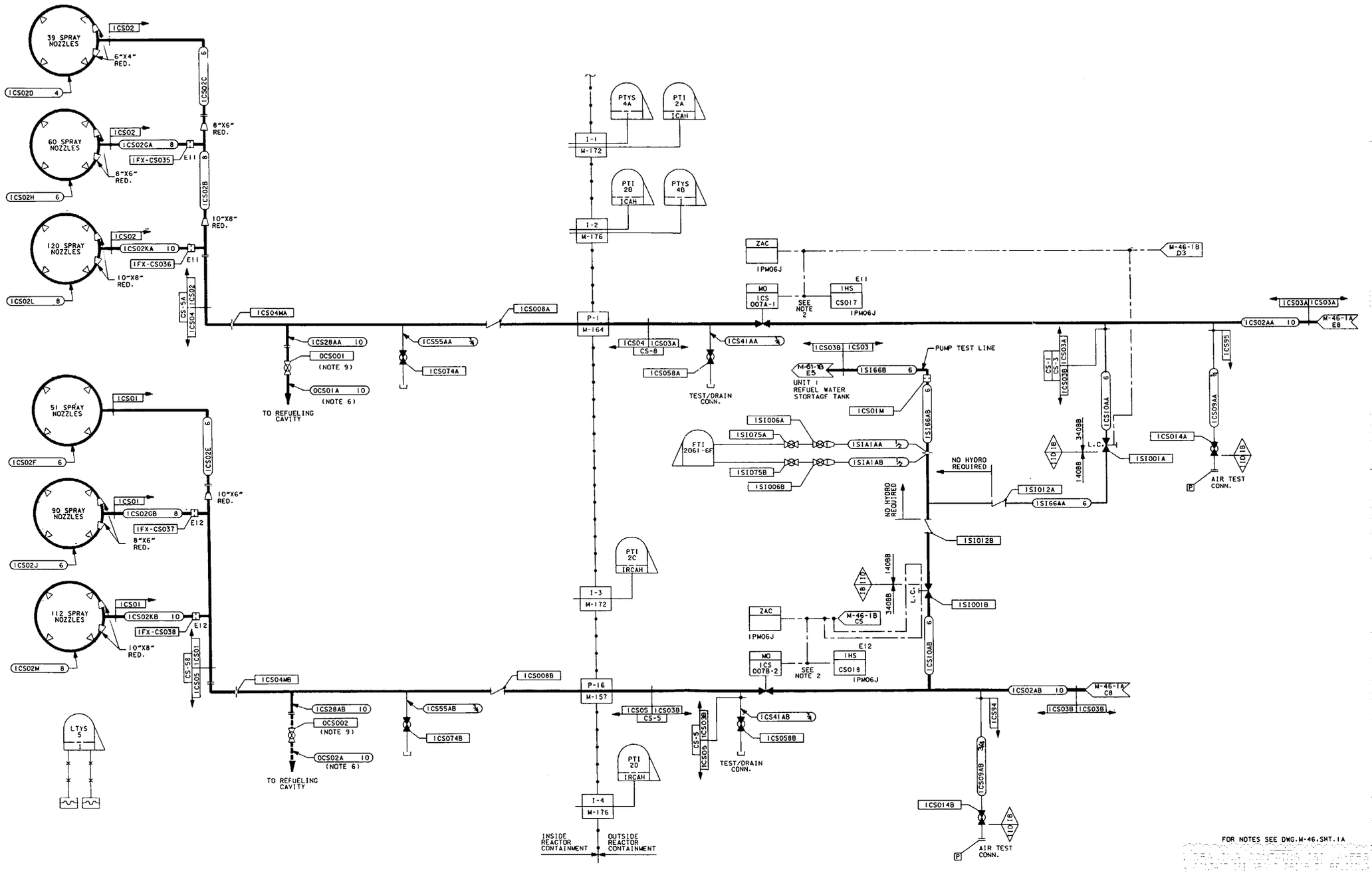
M-46

SHEET NUMBER: 1B SIZE: F M05

UFSAR FIGURE: 06.05-01 SHT: 02 CRITICAL CONTROL ROOM DRAWING

06 01 AR 07AP00 A D CR

DIAGRAM OF CONTAINMENT SPRAY UNIT 1 (CRITICAL CONTROL ROOM DRAWIN



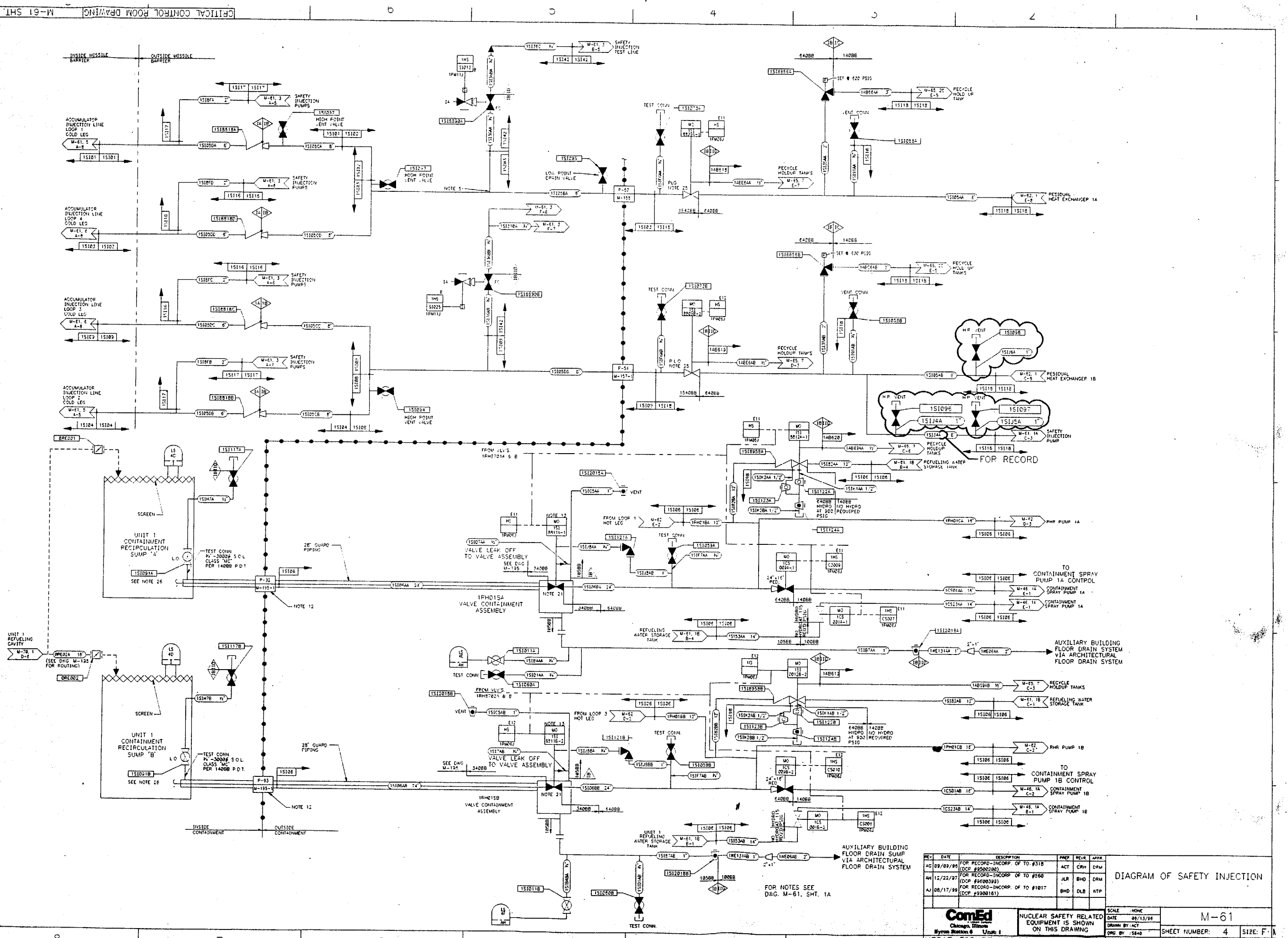
FOR NOTES SEE DWG.M-46.SHT.1A

DRAWING RELEASE RECORD

REV.	DATE REL'D.	PREPARED	REVIEWED	APPROVED	PURPOSE	FILM
AH	4-15-15	Jon Cantrick	L.A. Rudek	H. Sadowski	F-2739 FOR RECORD RESTORED DWG (PREVIOUSLY M-46)	X
AJ	10/1/19	Jon Cantrick	L.A. Rudek	H. Sadowski	F-2739 FOR RECORD (UNSOLICITED COMMENTS)	

ComEd
Chicago, Illinois
Byron Station 6 Units 1

DIAGRAM OF CONTAINMENT SPRAY UNIT 1 (CRITICAL CONTROL ROOM DRAWIN



FOR NOTES SEE DWG. M-61, SHT. 1A

REV.	DATE	DESCRIPTION	PREP.	REVR.	APPR.
AG	09/09/96	FOR RECORD-INCORP. OF TO #318 (DCP #9500280)	ACT	CRH	DRM
AH	12/22/97	FOR RECORD-INCORP. OF TO #560 (DCP #9800392)	JLR	BHD	DRM
AJ	08/17/99	FOR RECORD-INCORP. OF TO #1017 (DCP #9900161)	BHD	DLB	WTP

DIAGRAM OF SAFETY INJECTION

ComEd — An Exelon Company — Byron Station 6 Units 1

NUCLEAR SAFETY RELATED EQUIPMENT IS SHOWN ON THIS DRAWING

SCALE	NONE
DATE	06/13/96
DRAWN BY: ACT	
CHK BY: SB40	
SHEET NUMBER:	4
SIZE:	F

M-61

UFSAR FIGURE: 06.03-01 SHT: 05

CRITICAL CONTROL ROOM DRAWING

DIAGRAM OF SAFETY INJECTION UNIT 1 (CRITICAL CONTROL ROOM DRAWING

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility: BYRON Task No: _____

Task Title: CONTAINMENT PURGE Job Performance Measure No: A.3 (RO)

K/A Reference: 2.3.9 2.5

Examinee: _____ NRC Examiner: _____

Date: _____

Method of testing:

Simulated Performance _____X_____ Actual Performance _____

Classroom _____ Simulator _____X_____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions: You are the Unit NSO
Unit 1 is in mode 1
All controls are in automatic, 1PB111 IS OOS

Task Standard: PERFORM A CONTAINMENT PURGE

Required Materials: BCP 400-TCNMT/ROUTINE
CNMT NOBLE GAS ACTIVITY - RADIOCHEMISTRY ANALYSIS
CNMT TRITIUM ACTIVITY - RADIOCHEMISTRY ANALYSIS

General References:
BCP 400 - TCNMT/ROUTINE

Initiating Cue: THE SM DIRECTS YOU (THE EXTRA NSO) TO PERFORM A CONTAINMENT PURGE FROM UNIT 1 CONTAINMENT FOR A ROUTINE GAS RELEASE #00094. THE PURGE WILL BE FOR 15 MINUTES.

Time Critical Task: NO

Validation Time: 15 minutes

PERFORMANCE INFORMATION

START TIME: _____

(Denote critical steps with a **BOLD** *)

NOTE: COMPLETED MASTER KEY OF BCP 400-TCNMT/ROUTINE COMPLETED

Performance step: 1

ENTER BCP 400-TCNMT AT STEP E.1 OPERATOR RESPONSIBILITY

Standard: AFFECTED UNIT 1 CNMT ENTERED, EXPIRATION TIME AND INITIAL CNMT PRESSURE ENTERED

CUE: HAND APPLICANT BCP 400-TCNMT

CUE: WHEN ASKED YOU WILL PERFORM SRO SIGN OFFS

Comment: ----------

Performance step: 2

LOCATE BOP VQ-6 CNMT MINI-PURGE SYSTEM OPERATION FOR ISOLATION DAMPER ALIGNMENT

Standard: BOP VQ-6 CNMT MINI-PURGE SYSTEM OPERATION ENTERED

CUE: HAND APPLICANT BOP VQ-6

Comment: ----------

Performance step: 3

VERIFY GASEOUS EFFLUENT RELEASE FORM IS APPROVED

Standard: GASEOUS RELEASE FORMED APPROVED

CUE: IF ASKED GASEOUS RELEASE HAS BEEN APPROVED

Comment: ----------

Performance step: 4

VERIFY THAT OVA02A/B, VA EXH FAN 0A/B TRN 0A IS IN OPERATION

Standard: OVA02A/B VA EXH FAN 0B TRN 0A IS RUNNING FOR UNIT 1, GREEN LIGHT

Comment: ----------

Performance step: 5

RECORD INITIAL CONTAINMENT PRESSURE (PREVIOUSLY PERFORMED)

Standard: INITIAL CONTAINMENT PRESSURE RECORDED

Comment: ----------

CUE: IF ASKED BY THE APPLICANT WE WILL VENT CONTAINMENT WITH NO MINI-PURGE FANS

Performance step: 6

*** OPEN 1VQ005A MINI-FLOW PRG EXH INSIDE ISOL VLV***

Standard: ***1VQ005A OPEN, RED LIGHT***

Comment: ----------

Performance step: 7

*** OPEN 1VQ005B MINI-FLOW PRG EXH OUTSIDE ISOL VLV***

Standard: ***1VQ005B OPEN, RED LIGHT***

Comment: ----------

Performance step: 8

*** OPEN 1VQ005C MINI-FLOW PRG EXH OUTLET ISOL VLV***

Standard: ***1VQ005A OPEN, RED LIGHT***

Comment: ----------

Performance step: 9

RECORD TIME WHEN VLVS WERE OPENED AND RELEASE BEGAN ON RELEASE FORM

Standard: TIME RELEASE BEGAN RECORDED

CUE: TIME COMPRESSION: 15 MINUTES HAVE ELAPSED

Comment: ----------

Performance step: 10

CLOSE ALL ISOLATION DAMPERS IAW 1BOP VQ-6

*** STEP 1 CLOSE 1VQ005A MINI-FLOW PRG EXH INSIDE ISOL VLV***

Standard: ***1VQ005A CLOSED, GREEN LIGHT***

Comment: ----------

Performance step: 11

*** CLOSE 1VQ005B MINI-FLOW PRG EXH OUTSIDE ISOL VLV***

Standard: ***1VQ005B CLOSED, GREEN LIGHT***

Comment: ----------

Performance step: 12

*** CLOSE 1VQ005C MINI-FLOW PRG EXH OUTLET ISOL VLV***

Standard: ***1VQ005C CLOSED, GREEN LIGHT***

CUE: WHEN ASKED PERFORM DUAL VERIFICATION

Comment: ----------

Performance step: 13

RECORD RELEASE TERMINATION TIME AND FINAL CONTAINMENT PRESSURE

Standard: RELEASE TERMINATION TIME AND FINAL CONTAINMENT PRESSURE RECORDED

Comment: ----------

Performance step: 14

REMOVE PLACARD FOR GASEOUS RELEASE FROM 0PM02J

Standard: PLACARD REMOVED

Comment: ----------

TERMINATING CUE: SM I HAVE COMPLETED THE CONTAINMENT PURGE FOR THE GAS RELEASE

TIME STOP_____

Initial Conditions: You are the Unit NSO
Unit 1 is in mode 1
All controls are in automatic, 1PB111 IS OOS

Initiating Cue: THE SM DIRECTS YOU THE EXTRA NSO TO PERFORM A CONTAINMENT PURGE FROM UNIT 1 CONTAINMENT FOR A ROUTINE GAS RELEASE #00094. THE PURGE WILL BE FOR 15 MINUTES.

GASEOUS EFFLUENT RELEASE FORM

TYPE: ROUTINE CONTAINMENT RELEASE

Release Number 00094

Expiration Time/Date 0902/

A. GASEOUS RELEASE TYPE (CIRCLE ONE):

1. Containment Release Unit - 1.

2. Containment Release Unit - 2.

NOTE
It is permissible to simultaneously release from multiple sources (i.e., other CNMT and Gas Decay Tank etc.) provided that each release meets its respective release rate limits as documented on separate release forms.

B. RADIATION PROTECTION RESPONSIBILITY:

NOTE
Analyzed samples are valid for a period of 30 hours provided:

1. The noble gas trend on the 1(2) RE-PR011B has remained stable since sampling or
2. If the 1(2)RE-PR011B is out of service and the reactor has NOT started-up, shutdown or exceeded a power change of 15% in a 1 hour period since sampling.

During this 30 hour period, more than (1) one containment release package may be prepared using a single set of samples provided a separate release package and 1(2) BRSR 11.f.1-4 surveillance are initiated for each package.

1. OBTAIN radiochemistry analyses and ATTACH to the release package for the following:

   a. Containment Noble Gas Activity MA/___

   b. Containment Tritium Activity MA/___

APPROVED

FEB 21 2000

B. continued

2. Release Rate and Monitor Setpoint Determination

a. VERIFY that the release does not exceed the 10CFR20 release limits by comparing the calculated total μCi/sec values to their stated μCi/sec limits. In either case, the total noble gas release rate must be ≤4E4 μCi/sec and the tritium release rate ≤6E5 μCi/sec.

NOTE

The release rate calculation assumes a containment purge rate of 43,900 CFM (2.07E7 cc/sec) which is associated with main purge.

If the release is not acceptable with the main purge flowrate, terminate this form and refer to BCP 400-TCNMT/POST LOCA. The mini-purge flowpath cannot be used because there is no way to control the release rate.

b. DETERMINE noble gas and tritium release rate using the equation below and RECORD on the table.

μCi/sec = Noble gas activity (μCi/cc) x 2.07E7 cc/sec

ISOTOPE	1 CNMT ACTIVITY (μCi/cc)	RELEASE RATE (μCi/sec)
Xe 133	5.77E-7	1.19E1
TOTAL		1.19E1

RELEASE RATE LIMIT 4E4 μCi/sec

μCi/sec = Tritium activity (μCi/cc) x 2.07E7 cc/sec

H-3	2.68E-7	1.59E1	6E5 μCi/sec

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FEB 21 2000

B.2. continued

c. Is the TOTAL NOBLE GAS RELEASE RATE less than or equal to 4E4 µCi/sec and the TRITIUM RELEASE RATE less than or equal to 6E5 µCi/sec?

[✓] YES This package is acceptable for release using the Main Purge or Mini-Purge flowpaths, not to exceed 43,900 CFM. GO TO Step d.

[ ] NO Release is not acceptable under this procedure. Refer to BCP 400-TCNMT/POST LOCA.

MN/___

d. Determination of monitor setpoints for the CNMT Purge gas Detector.

1). The CNMT purge monitor gas detector [1(2)PB101] setpoints will be determined by using the current CNMT atmosphere monitor gas detector [1(2)PB111] value. The current [1(2)PB111] value can be obtained from the RM-11 in the control room or GSEP Point Analysis Trend ID #RP0076 (Unit 1) or RP0114 (Unit 2). See below:

NT
MN

Calculated setpoint =
Current 1(2)PB111 value _____(µCi/cc) X 1.25

Calculated monitor setpoint = _____(µCi/cc)

Verify that the noble gas trend from the 1(2)PB111 has remained stable (factor of 5) since sampling. (N/A this step if the 1(2)PB111 is not in service.)

___/___

NOTE:
per ODS@
1PB111 ES 005.

2). PERFORM THIS STEP ONLY IF [1(2)PB111] IS OUT OF SERVICE. If the containment atmosphere monitor gas detector is out of service, the calculated monitor setpoint will be set at a value of 50% above the total analyzed containment noble gas activity plus the current containment purge monitor gas detector [1(2)PB101] background (GSEP Point Analysis Trend ID #RP0066 (Unit 1) or RP0104 (Unit 2).

Calculated setpoint =
[Total CNMT noble gas activity 5.77E-7 (µCi/cc)
x 1.5] + [1(2)PB101 background 2.89E-6 (µCi/cc)]

Calculated monitor setpoint = 3.75E-6 (µCi/cc)

MN/___

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FEB 21 2000

B.2.d. continued

3). Compare the calculated monitor setpoint from step B.2.d.1 or B.2.d.2 to the current 1(2)PB101 monitor setpoints. These setpoints are:

4.83E-4 µCi/cc for the HIGH setpoint

3.75E-6 2.42E-4 µCi/cc for the ALERT setpoint

µCi/cc CHECK SETPOINTS

Circle the correct response:

MR

a). If the calculated 1(2)PB101 setpoint is less than the current Alert and High setpoints, use the current setpoints for the Alert and High setpoints.

b). If the calculated 1(2)PB101 setpoint is greater than the current Alert setpoint but less than the current High setpoint, use the current High setpoint and the calculated setpoint for the Alert setpoint.

c). If the calculated 1(2)PB101 setpoint is greater than both the current Alert and High setpoints, use the calculated setpoint for both the Alert and High setpoints.

MR/___

e. Release Summary Information:

1(2)PB101 Monitor Setpoints For This Release:

HIGH Alarm Setpoint 4.83E-4 µCi/cc

ALERT Alarm Setpoint 2.42E-4 µCi/cc

MR/___

NOTE
Particulate and iodine setpoints need not be addressed on the CNMT purge monitor; the setpoints for these channels have been previously determined and placed in the data base.

Approved for release _____ 0905/___
R.P. Supervision Time/Date

MR
IV

APPROVED
FEB 21 2000

(9598SS/WPF/013100)

C. OPERATING DEPARTMENT RESPONSIBILITY (CONTAINMENT RELEASE):

NOTE
If any of the below instruments are inoperable then refer to Technical Requirement Manual T3.11.b-1 for appropriate action.

1. Perform the appropriate instrumentation operability checks and required TRM surveillances on applicable monitors.

   Containment Releases

   a. VERIFY/COMPLETE daily Channel check on 1(2)RE-PR001 performed during _BOSR 0.1-0. XX/H

   b. Perform 1_BOSR 11.b.5-1, Radioactive Gaseous Effluent Monitoring Instrumentation Surv. CNMT Purge Effluent (1(2)PR01J Source/Channel Check). XX/XX

   c. VERIFY that the noble gas trend from the _PB111 has not increased by more than 10% from the value found in Step B.2.d.1). If the value has increased by more than 10%, but the trend has remained stable (factor of 5) reperform step B.2.d. and B.2.e. or notify Radiation Protection. (NA this step if 1PB111 is out of service). N/A

   d. Record the "As Found" Setpoints of _RE-PR001 Gas Channel PB101 (Grid 2).

      1PB101 - HIGH Alarm Setpoint 4.83E-4 µCi/cc

      ALERT Alarm Setpoint 2.42E-4 µCi/cc XX/XX

APPROVED
FEB 21 2000

C.1. continued

NOTE
Steps e-i should be completed only if the setpoints calculated in Step B.2.e. are different than the current setpoints of 1 RE-PR001 Gas Channel. Otherwise mark N/A.

NOTE
When the RM-11 is in SUPERVISOR MODE, some actions may have serious detrimental effects on system operation. Use CAUTION and DO NOT leave the RM-11 console unattended when it is in the SUPERVISOR MODE. If any unusual conditions occur then contact the System Engineer.

e. PLACE the RM-11 console in SUPERVISOR MODE. N/A

f. SELECT the required Rad Monitor using the appropriate RM-11 address and depressing the SEL key.

Grid 2 N/A PB101 N/A

g. DEPRESS the CHANNEL ITEM Key. Then SELECT the High Alarm Setpoint Channel Item by keying in "9" and then depressing the SEL key.

N/A

h. Enter the High Alarm Setpoint documented in Section B.2.e. using the format XYZ ± AB for XYZE ± AB. (i.e. A value of 5.36E-12 would be entered as 536-12). The new setpoint will be displayed after a short period of time. Record the new setpoint.

1 PB101 N/A HIGH ALARM SETPOINT N/A

i. ENTER the Alert Alarm Setpoint for PB101 documented in Section B.2.e. using the method described in steps e, f, g, and h. In order to select the ALERT Alarm Channel Item in step f, a "10" must be keyed in.

1 PB101 N/A ALERT ALARM SETPOINT N/A

APPROVED

FEB 21 2000

C. continued

NOTE
Stopping or starting a VA Exhaust Fan will significantly change flow rates to the Plant Vent Stack which in turn affect release rate calculations.

2. ENSURE the 0A or 0B Aux Bldg. Exhaust Fan is in operation for U-1 Containment releases, and 0C or 0D Exhaust Fan is in operation for U-2 Containment releases.

   (This requirement may be deleted at the discretion of the Shift Manager and Radiation Protection Dept.)

XXXX

D. UNIT SUPERVISOR OR SRO RESPONSIBILITY

1. If the 1(2)REPRO11B is out of service then, VERIFY that the reactor has NOT started-up, shutdown or exceeded a power change of 15% in a 1 hour period since sampling.

2. PLACE the placard "Gaseous Release in Progress" somewhere on 0PM02J where the placard will be visible. This is to prevent changing the ventilation flow path and flow rate during the release.

3. VERIFY 1 BOSR 11.b.5-1, Radioactive Gaseous Effluent Monitoring Instrumentation Surveillance Cnmt Purge Effluent (1 (2) PR01J Source/Channel Check), completed and reviewed.

4. REVIEW information and ENSURE the form is filled out properly.

Approval for Release _____ / XX
US or SRO Date

APPROVED
FEB 21 2000

E. OPERATOR RESPONSIBILITY:

1. To initiate the release, refer to BOP VQ-5 for Normal Containment Purge System, or refer to BOP VQ-6 to release through the Containment Mini Purge System.

> **NOTE**
> Containment purge system (1VQ01CA/B and 1VQ02CA/B) may be used during Modes 5 & 6 only per Improved Technical Specification 3.6.3.

	OPERATOR	SRO
a. Affected CNMT Unit ____	____/____	____/____
Record Expiration Time from page 1 ____/____ time date		____/____
b. Initial CNMT Pressure: ____ psig		____/____
c. Start time of Release (all isolation dampers and valves open per BOP VQ-5 or BOP VQ-6) ____/____ time date		____/____
d. Start time of fans (NA if venting only) ____/____ time date		____/____

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E. continued

NOTE
The RP department should be notified of interruptions of purging operations so contamination control alternatives can be implemented if needed. If an individual interruption lasts greater than 4 hours, contact RP to determine if a new release form should be initiated prior to restoration of purging operations (i.e. due to a change in conditions or updated samples).

2. To temporarily suspend release and then reinitiate with this package, perform the following: (otherwise NA this step).

   a. Shutdown the purge system per BOP VQ-5 or BOP VQ-6 as applicable.

   b. RECORD time periods for interruptions in purging operations, (including changes in purge fan status). If an individual interruption in purging operations exceeds 4 hours, contact RP to determine if an updated release package is needed. Containment pressure does not need to be documented during the interruption.

Date/Time period of interruption: (i.e. 1200 1/1/96 to 1300 1/1/96)	RP Dept notified	Initials/Date	Comments (purge isolated, fan secured etc.)
_____	Y / N	_____/_____	_____
_____	Y / N	_____/_____	_____
_____	Y / N	_____/_____	_____
_____	Y / N	_____/_____	_____
_____	Y / N	_____/_____	_____
_____	Y / N	_____/_____	_____
_____	Y / N	_____/_____	_____

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E. continued

3. Terminate the release as follows:

a. Stop purge fans per BOP VQ-5 or BOP VQ-6 as applicable _____ / _____ Dual Verf

b. Close all isolation dampers per BOP VQ-5 or BOP VQ-6 as applicable. _____ / _____ Dual Verf

c. Release termination time _____ / _____ time date _____ / _____

d. Final containment pressure: _____ psig _____ / _____

4. RETURN the Rad Monitor _RE-PR001 for the affected release path to the below listed Setpoints. (This Step is NOT APPLICABLE if setpoints were not changed in step C.1).

	High Alarm As Left Setpoint		
__ PB101	4.83E-4	_____	_____ Dual Verf

	Alert Alarm As Left Setpoint		
__ PB101	2.42E-4	_____	_____ Dual Verf

5. REMOVE the placard "Gaseous Release in Progress" from 0PM02J.

6. RETURN this release form to the US or SRO.

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F. SHIFT MANAGER OR SRO RESPONSIBILITY (CONTAINMENT RELEASE):

/1. REVIEW the discharge data and ENSURE that the form is filled out properly. If the release was cancelled REVIEW the form and VERIFY plant configuration has been restored to normal. Consideration should be given to the following items, however this is not an all-inclusive list:

1/2-PR001 Radiation Monitor Activity Setpoints
VQ damper and fan status

Reviewed by:_____/_____
Shift Manager or SRO Date

2. Forward this form to Radiation Protection Supervision.

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3. Verify compliance with 10CFR50 dose limits as specified in the Technical Requirements Manual 3.11.g and 3.11.h by entering release data into the ACTUAL MODE or PROJECTED MODE of the 10CFR50 0DCM gaseous release program per BRP 6110-9.

NOTE
Notify the Radiation Protection Supervisor if greater than 25% of any quarterly 10CFR50 limit is reached.

Entry completed _____/_____
Radiation Protection Supervision Date

CURRENT DATE: 2000 03:59:52.65 FILE LOC: 2.12.1322
STATION NAME: BYRON

1REPR011 GAS SAMPLE ANALYSIS

COLLECTOR....:	FP	NUCLIDE LIBRARY..:	GENGAS
ANALYST.....:	EJS	GEOMETRY.....:	1PGAS250
SAMPLE TIME..:	-2000 03:07:00.00	COUNT TIME.....:	0 00:17:00.00
ANALYSIS TIME:	-2000 03:41:19.71	SAMPLE VOL/MASS..:	2.50000E+02 CC
DETECTOR.....:	23P067B	DEADTIME.....:	0.0%
TIME ON.....:		FLOW ON.....:	0.00 CFM
TIME OFF.....:	-2000 03:07:00.00	FLOW OFF.....:	0.00 CFM

SAMPLE POINT.:
REMARK.....:
CONFIG FILE..: 1DIA4:[CRU.SAMP]23P067B_SAMP_4854.CNF;1

AREA IN SPECTRUM = 1585. IF AREA = ZERO, TAG DETECTOR OOS & RECOUNT

Brief Report

Nuclide	Activity UCI/CC	1-Sigma Error
XE-133	5.772E-07	3.332E-07
Total Activity :	5.772E-07	

BRP 6021-20T1
Revision 1

ATMOSPHERIC TRITIUM CALCULATION FORM

SAMPLE LOCATION IRE-PRO11 START TIME/DATE: 0126 / ____

SAMPLE TYPE Bubbler STOP TIME/DATE: 0302 / ____

COUNTER USED: MODEL # 2SOUTR

SERIAL # 936 ANALYST: EP

DEHUMIDIFIER:

WET BULB TEMPERATURE _____ °F W. B. GRAINS OF MOISTURE _____

DRY BULB TEMPERATURE _____ °F D. B. GRAINS OF MOISTURE _____

HUMIDITY _____ lbs H_2O/lbs DRY AIR N/A SDR

SAMPLE ACTIVITY _____ µCi/ml (in liquid)

TRITIUM CONCENTRATION = (DEHUMIDIFIER)

(_____ lbs H_2O/lbs DRY AIR)(_____ µCi/ml)(454g/lb)

(2.83E04 cc/ft^3)(13 ft^3/lb DRY AIR)(.987 g/ml)

= _____ µCi/cc (in air)

BUBBLER:

TRITIUM CONCENTRATION = (Bubbler)

(1.97E-4 µCi/ml)(150 ml) = 2.95E-2 µCi (2)

(400 cc/min)(1) (96 min) 38400 cc

= 7.68E-7 µCi/cc (in air)

(3)

DAC's (in air) = $\frac{7.68E-7 \text{ µCi/cc}}{2E-5 \text{ (µCi/cc)/DAC}}$ = 3.84E-2 DAC's (in air)

(1) Flow Rate of 100-500 cc/min

(2) 6000 cc minimum

(3) Notify Duty RPLS if >0.3 DAC

REVIEWED BY _____
RADIATION PROTECTION SUPERVISION / DATE

RECOMMENDATIONS _____

(Final)

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JAN 0 1 1994

(0784SS/WPF/100293)

CONTAINMENT MINI-PURGE SYSTEM OPERATION

A. STATEMENT OF APPLICABILITY:

This procedure describes the steps required to startup and shutdown the Containment Mini-Purge System.

B. REFERENCES:

1. Station Procedures:

   a. BOP VQ-M1/M2, Primary Containment Purge System Valve Lineup.

   b. BOP VQ-E1/E2, Containment Purge Electrical Lineup.

   c. BCP 400-TCNMT/ROUTINE, Gaseous Effluent Release Form, Type: Routine Containment Release.

   d. BCP 400-TCNMT/CONTINUOUS, Gaseous Effluent Release Form, Type: Continuous Containment Release.

   e. BCP 400-TCNM1/ALT, Gaseous Effluent Release Form, Type: _PR001 Not operable.

2. P&ID's:

   a. M-105, Containment Purge System.

   b. M-106, Containment Purge System.

3. UFSAR:

   a. Section 9.4.9

   b. Section 11.5.2

4. Technical Specifications:

   a. 3/4.6.1.4 (ITS 3.6.4)

   b. 3/4.6.1.7 (ITS 3.6.3)

   c. 3/4.9.9 (ITS 3.3.6)

C. PREREQUISITES:

1. The system is lined up in accordance with BOP VQ-M1/M2, Primary Containment Purge System Valve Lineup.

2. The system is lined up in accordance with BOP VQ-E1/E2, Containment Purge Electrical Lineup.

3. Necessary Gaseous Effluent Release Form information has been completed by the Radiation Protection Department.

D. PRECAUTIONS:

1. Containment air temperature should be maintained above 70°F to ensure the following component limitations are maintained.

   a. SI Accumulator temperature 60°F if pressurized.

   b. RX Vessel Flange temperature 60°F if RX vessel head is tensioned.

2. Startup and Shutdown of the Containment Mini-Purge System may impact Spent Fuel Pool Level if the Spent Fuel Pool is connected to the Refueling Cavity via the Transfer Canal. If the "Spent Fuel Pit Level High Low" annunciator is not operable, direct communications between the Control Room and the Spent Fuel Pool MUST be maintained until conditions stabilize.

E. LIMITATIONS AND ACTIONS:

1. Containment internal pressure shall be maintained between -0.1 and +1.0 psig in Modes 1, 2, 3 and 4, in accordance with Technical Specification 3/4.6.1.4. (ITS 3.6.4).

2. MANUALLY STOP Containment Purge upon reaching Alert Setpoint, on _RE-PR001 (_PB101) Cnmt Purge Effluent Monitor.

3. The following Containment Mini-purge valves will close upon a Containment Ventilation Isolation Signal:

   a). _VQ003, Mini-flow to Post LOCA Purge Isol Vlv.

   b). _VQ005A, Mini-flow Prg Exh Inside Isol Vlv.

   c). _VQ005B, Mini-flow Prg Exh Outside Isol Vlv.

   d). _VQ005C, Mini-flow Prg Exh Inside Isol Vlv.

   e). _VQ004A, Mini-flow Prg Sup Inside Isol Vlv.

   f). _VQ004B, Mini-flow Prg Sup Outside Isol Vlv.

4. The 8" containment purge supply and exhaust isolation valve(s) shall be closed, except when permitted to be open for PURGING or VENTING operations under administrative control per Technical Specification 3.6.1.7.b. (ITS 3.6.3).

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F. MAIN BODY:

NOTE

Steps F.4, F.5, F.6, F.7, F.8, F.9, and F.10 can be performed independent of each other.
Steps F.4 and F.5, Vent the CNMT with No Mini-purge Fans.
Steps F.6 and F.7, Operate CNMT Mini-purge Supply Fans.
Steps F.8 and F.9, Operate CNMT Mini-purge Exhaust Fans.
Step F.10, Operates CNMT Mini-purge Supply and Exhaust Fans simultaneously.

1. VERIFY the Gaseous Effluent Release Form is approved by the Shift Manager or designated SRO Licensed Assistant.

2. VERIFY when starting Unit 1 Containment Mini-purge system that 0VA02A/B, VA Exh Fan 0A/B Trn 0A is in operation. (This requirement may be deleted at the direction of the Shift Manager and Radiation Protection Department.)

3. VERIFY when starting Unit 2 Containment Mini-purge system that 0VA02C/D, VA Exh Fan 0C/D Trn 0B is in operation. (This requirement may be deleted at the discretion of the Shift Manager and Radiation Protection Department.)

4. To VENT CONTAINMENT WITH NO MINI-PURGE FANS, PERFORM the following at 0PM02J;

   a. RECORD Containment initial pressure on the Gaseous Effluent Release Form.

   b. OPEN _VQ005A, Mini-flow Prg Exh Inside Isol Vlv.

   c. OPEN _VQ005B, Mini-flow Prg Exh Outside Isol Vlv.

   d. OPEN _VQ005C, Mini-flow Prg Exh Outlet Isol Vlv.

   e. RECORD the time when Vlvs were opened and Release began on the Gaseous Effluent Release Form.

5. To SECURE VENTING CONTAINMENT WITH NO MINI-PURGE FANS, PERFORM the following;

   a. CLOSE _VQ005A, Mini-flow Prg Exh Inside Vlv.

   b. CLOSE _VQ005B, Mini-flow Prg Exh Outlet Vlv.

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F.5. continued

c. CLOSE _VQ005C, Mini-flow Prg Exh Outlet Vlv.

d. RECORD the time when Release was secured on the Gaseous Effluent Release Form.

e. RECORD containment final pressure on the Gaseous Effluent Release Form.

6. To STARTUP CONTAINMENT MINI-PURGE SUPPLY FAN, PERFORM the following at 0PM02J;

NOTE
WHEN starting _VQ04C, CNMT Mini-flow Prg Supply Fan, the Control Switch must be held in the start position until the fan suction damper _VQ01Y is in the open position. The fan will not start until that interlock is satisfied.

NOTE
NOTIFY Radiation Protection to address any radiological concerns when starting Cnmt Mini-Purge Supply when Cnmt Integrity is set.

a. OPEN _VQ004A, Mini-flow Prg Sup Inside Isol Vlv.

b. OPEN _VQ004B, Mini-flow Prg Sup Outside Isol Vlv.

c. START _VQ04C, Cnmt Mini-flow Prg Supply Fan.

d. MONITOR containment pressure.

7. To SECURE CONTAINMENT MINI-PURGE SUPPLY FAN, PERFORM the following at 0PM02J;

a. STOP _VQ04C, Cnmt Mini-flow Prg Supply Fan.

b. CLOSE _VQ004A, Mini-flow Prg Sup Inside Isol vlv.

c. CLOSE _VQ004B, Mini-flow Prg Sup Outside Isol vlv.

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F. continued

8. To STARTUP CONTAINMENT MINI-PURGE EXHAUST FAN, PERFORM the following at 0PM02J;

   a. OPEN _VQ005A, Mini-flow Prg Exh Inside Isol Vlv.

   b. OPEN _VQ005B, Mini-flow Prg Exh Outside Isol Vlv.

   c. OPEN _VQ005C, Mini-flow Prg Exh Outside Isol Vlv.

   d. RECORD time valves were opened and the Release began on the Gaseous Effluent Release Form.

   e. START _VQ05C, Cnmt Mini-flow Prg Exh Fan.

   f. RECORD start time of fan on the Gaseous Effluent Release Form.

   g. MONITOR containment pressure.

9. To SECURE CNMT MINI-PURGE EXHAUST FAN, PERFORM the following at 0PM02J;

   a. STOP _VQ05C, Cnmt Mini-flow Prg Exh Fan.

   b. RECORD fan stop time on the Gaseous Effluent Release Form.

   c. CLOSE _VQ005A, Mini-flow Prg Exh Inside Isol Vlv.

   d. CLOSE _VQ005B, Mini-flow Prg Exh Outside Isol Vlv.

   e. CLOSE _VQ005C, Mini-flow Prg Exh Outside Isol Vlv.

   f. RECORD containment final pressure on the Gaseous Effluent Release Form.

10. To STARTUP and OPERATE CONTAINMENT MINI-PURGE SUPPLY and EXHAUST FANS simultaneously, PERFORM the following at 0PM02J;

   a. OPEN _VQ005A, Mini-flow Prg Exh Inside Isol Vlv.

   b. OPEN _VQ005B, Mini-flow Prg Exh Outside Isol Vlv.

   c. OPEN _VQ005C, Mini-flow Prg Exh Inside Isol vlv.

   d. RECORD time valves were opened and the Release began on the Gaseous Effluent Release Form.

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F.10. continued

e. OPEN _VQ004A, Mini-flow Prg Sup Inside Isol Vlv.

f. OPEN _VQ004B, Mini-flow Prg Sup Outside Isol Vlv.

g. START _VQ04C, Cnmt Mini-flow Prg Sup Fan.

h. START _VQ05C, Cnmt Mini-flow Prg Exh Fan.

i. RECORD start time of _VQ05C on the Gaseous Effluent Release Form.

NOTE
Cycle either the supply or exhaust fan, as necessary, to maintain containment pressure within Technical Specification limits of -0.1 and +1.0 psig in Modes 1, 2, 3, and 4. Tech Spec 3.6.1.4 (ITS 3.6.4).

j. MONITOR containment pressure.

k. PERFORM steps F.9 and F.7 to secure VQ System when purging operations are complete.

G. CHECKOFF LISTS:

1. None.

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RO

MASTER Key

CONTINUOUS USE

BCP 400-TCNMT/ROUTINE
Revision 5

GASEOUS EFFLUENT RELEASE FORM

TYPE: ROUTINE CONTAINMENT RELEASE

Release Number 00094

Expiration Time/Date 0902/___

A. GASEOUS RELEASE TYPE (CIRCLE ONE):

1. Containment Release Unit - 1.

2. Containment Release Unit - 2.

NOTE
It is permissible to simultaneously release from multiple sources (i.e., other CNMT and Gas Decay Tank etc.) provided that each release meets its respective release rate limits as documented on separate release forms.

B. RADIATION PROTECTION RESPONSIBILITY:

NOTE
Analyzed samples are valid for a period of 30 hours provided:
1. The noble gas trend on the 1(2) RE-PR011B has remained stable since sampling or
2. If the 1(2)RE-PR011B is out of service and the reactor has NOT started-up, shutdown or exceeded a power change of 15% in a 1 hour period since sampling.

During this 30 hour period, more than (1) one containment release package may be prepared using a single set of samples provided a separate release package and 1(2) BRSR 11.f.1-4 surveillance are initiated for each package.

1. OBTAIN radiochemistry analyses and ATTACH to the release package for the following:

   a. Containment Noble Gas Activity N/A/___

   b. Containment Tritium Activity N/A/___

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(9598SS/WPF/013100)

B. continued

2. Release Rate and Monitor Setpoint Determination

a. VERIFY that the release does not exceed the 10CFR20 release limits by comparing the calculated total μCi/sec values to their stated μCi/sec limits. In either case, the total noble gas release rate must be ≤4E4 μCi/sec and the tritium release rate ≤6E5 μCi/sec.

NOTE

The release rate calculation assumes a containment purge rate of 43,900 CFM (2.07E7 cc/sec) which is associated with main purge.

If the release is not acceptable with the main purge flowrate, terminate this form and refer to BCP 400-TCNMT/POST LOCA. The mini-purge flowpath cannot be used because there is no way to control the release rate.

b. DETERMINE noble gas and tritium release rate using the equation below and RECORD on the table.

μCi/sec = Noble gas activity (μCi/cc) x 2.07E7 cc/sec

ISOTOPE	1 CNMT ACTIVITY (μCi/cc)	RELEASE RATE (μCi/sec)
XE 133	5.728-7	1.191
TOTAL		1.191

RELEASE RATE LIMIT 4E4 μCi/sec

μCi/sec = Tritium activity (μCi/cc) x 2.07E7 cc/sec

H-3	2.688-7	1.591	6E5 μCi/sec

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B.2. continued

c. Is the TOTAL NOBLE GAS RELEASE RATE less than or equal to 4E4 µCi/sec and the TRITIUM RELEASE RATE less than or equal to 6E5 µCi/sec?

[✓] YES This package is acceptable for release using the Main Purge or Mini-Purge flowpaths, not to exceed 43,900 CFM. GO TO Step d.

[ ] NO Release is not acceptable under this procedure. Refer to BCP 400-TCNMT/POST LOCA.

MN/___

d. Determination of monitor setpoints for the CNMT Purge gas Detector.

1). The CNMT purge monitor gas detector [1(2)PB101] setpoints will be determined by using the current CNMT atmosphere monitor gas detector [1(2)PB111] value. The current [1(2)PB111] value can be obtained from the RM-11 in the control room or GSEP Point Analysis Trend ID #RP0076 (Unit 1) or RP0114 (Unit 2). See below:

NT
MN

Calculated setpoint =
Current 1(2)PB111 value _____(µCi/cc) X 1.25

Calculated monitor setpoint = _____(µCi/cc)

Verify that the noble gas trend from the 1(2)PB111 has remained stable (factor of 5) since sampling. (N/A this step if the 1(2)PB111 is not in service.)

___/___

NOTE: per OPS @ 1PB111 is OOS.

2). PERFORM THIS STEP ONLY IF [1(2)PB111] IS OUT OF SERVICE. If the containment atmosphere monitor gas detector is out of service, the calculated monitor setpoint will be set at a value of 50% above the total analyzed containment noble gas activity plus the current containment purge monitor gas detector [1(2)PB101] background (GSEP Point Analysis Trend ID #RP0066 (Unit 1) or RP0104 (Unit 2).

Calculated setpoint =
[Total CNMT noble gas activity 5.77E-7 (µCi/cc)
x 1.5] + [1(2)PB101 background 2.59E-6 (µCi/cc)]

Calculated monitor setpoint = 3.75E-6 (µCi/cc)

MN/___

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B.2.d. continued

3). Compare the calculated monitor setpoint from step B.2.d.1 or B.2.d.2 to the current 1(2)PB101 monitor setpoints. These setpoints are:

4.83E-4 µCi/cc for the HIGH setpoint

3.75E-6 2.42E-4 µCi/cc for the ALERT setpoint

µCi/cc CALC SETPOINTS

Circle the correct response:

MA

a). If the calculated 1(2)PB101 setpoint is less than the current Alert and High setpoints, use the current setpoints for the Alert and High setpoints.

b). If the calculated 1(2)PB101 setpoint is greater than the current Alert setpoint but less than the current High setpoint, use the current High setpoint and the calculated setpoint for the Alert setpoint.

c). If the calculated 1(2)PB101 setpoint is greater than both the current Alert and High setpoints, use the calculated setpoint for both the Alert and High setpoints.

MA

e. Release Summary Information:

1(2)PB101 Monitor Setpoints For This Release:

HIGH Alarm Setpoint 4.83E-4 µCi/cc

ALERT Alarm Setpoint 2.42E-4 µCi/cc

MA

NOTE
Particulate and iodine setpoints need not be addressed on the CNMT purge monitor; the setpoints for these channels have been previously determined and placed in the data base.

Approved for release _____ 0905 / _____
R.P. Supervision Time/Date

MA

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FEB 21 2000

(9598SS/WPF/013100)

C. OPERATING DEPARTMENT RESPONSIBILITY (CONTAINMENT RELEASE):

NOTE
If any of the below instruments are inoperable then refer to Technical Requirement Manual T3.11.b-1 for appropriate action.

1. Perform the appropriate instrumentation operability checks and required TRM surveillances on applicable monitors.

   Containment Releases

   a. VERIFY/COMPLETE daily Channel check on 1(2)RE-PR001 performed during _BOSR 0.1-0. XX, XX

   b. Perform _BOSR 11.b.5-1, Radioactive Gaseous Effluent Monitoring Instrumentation Surv. CNMT Purge Effluent (1(2)PR01J Source/Channel Check). XX, XX

   c. VERIFY that the noble gas trend from the _PB111 has not increased by more than 10% from the value found in Step B.2.d.1). If the value has increased by more than 10%, but the trend has remained stable (factor of 5) reperform step B.2.d. and B.2.e. or notify Radiation Protection. (NA this step if _PB111 is out of service). JIA

   d. Record the "As Found" Setpoints of _RE-PR001 Gas Channel PB101 (Grid 2).

   _PB101 - HIGH Alarm Setpoint 4.83E-4 µCi/cc

   ALERT Alarm Setpoint 2.42E-4 µCi/cc XX, XX

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C.1. continued

NOTE
Steps e-i should be completed only if the setpoints calculated in Step B.2.e. are different than the current setpoints of 1 RE-PR001 Gas Channel. Otherwise mark N/A.

NOTE
When the RM-11 is in SUPERVISOR MODE, some actions may have serious detrimental effects on system operation. Use CAUTION and DO NOT leave the RM-11 console unattended when it is in the SUPERVISOR MODE. If any unusual conditions occur then contact the System Engineer.

e. PLACE the RM-11 console in SUPERVISOR MODE. N/A

f. SELECT the required Rad Monitor using the appropriate RM-11 address and depressing the SEL key.

Grid 2 N/A PB101 N/A

g. DEPRESS the CHANNEL ITEM Key. Then SELECT the High Alarm Setpoint Channel Item by keying in "9" and then depressing the SEL key.

N/A

h. Enter the High Alarm Setpoint documented in Section B.2.e. using the format XYZ ± AB for XYZE ± AB. (i.e. A value of 5.36E-12 would be entered as 536-12). The new setpoint will be displayed after a short period of time. Record the new setpoint.

1 PB101 N/A HIGH ALARM SETPOINT N/A

i. ENTER the Alert Alarm Setpoint for PB101 documented in Section B.2.e. using the method described in steps e, f, g, and h. In order to select the ALERT Alarm Channel Item in step f, a "10" must be keyed in.

1 PB101 N/A ALERT ALARM SETPOINT N/A

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C. continued

NOTE
Stopping or starting a VA Exhaust Fan will significantly change flow rates to the Plant Vent Stack which in turn affect release rate calculations.

2. ENSURE the 0A or 0B Aux Bldg. Exhaust Fan is in operation for U-1 Containment releases, and 0C or 0D Exhaust Fan is in operation for U-2 Containment releases.

   (This requirement may be deleted at the discretion of the Shift Manager and Radiation Protection Dept.)

D. UNIT SUPERVISOR OR SRO RESPONSIBILITY XX XX

1. If the 1(2)REPRO11B is out of service then, VERIFY that the reactor has NOT started-up, shutdown or exceeded a power change of 15% in a 1 hour period since sampling.

2. PLACE the placard "Gaseous Release in Progress" somewhere on 0PM02J where the placard will be visible. This is to prevent changing the ventilation flow path and flow rate during the release.

3. VERIFY 1 BOSR 11.b.5-1, Radioactive Gaseous Effluent Monitoring Instrumentation Surveillance Cnmt Purge Effluent (1 (2) PR01J Source/Channel Check), completed and reviewed.

4. REVIEW information and ENSURE the form is filled out properly.

Approval for Release _____ XX
US or SRO Date

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FEB 21 2000

E. OPERATOR RESPONSIBILITY:

1. To initiate the release, refer to BOP VQ-5 for Normal Containment Purge System, or refer to BOP VQ-6 to release through the Containment Mini Purge System.

> **NOTE**
> Containment purge system (1VQ01CA/B and 1VQ02CA/B) may be used during Modes 5 & 6 only per Improved Technical Specification 3.6.3.

		OPERATOR	SRO
a.	Affected CNMT Unit 1	RO, X	XX

you must sign for SRO

Record Expiration Time from page 1

0902 / XX
time date

b.	Initial CNMT Pressure: ____ psig		X, X

Valve in Sim

c.	Start time of Release (all isolation dampers and valves open per BOP VQ-5 or BOP VQ-6) XX / XX time date		X, X
d.	Start time of fans (NA if venting only) ~ / A time date	RO must perform	X, X

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FEB 21 2000

E. continued

NOTE

The RP department should be notified of interruptions of purging operations so contamination control alternatives can be implemented if needed. If an individual interruption lasts greater than 4 hours, contact RP to determine if a new release form should be initiated prior to restoration of purging operations (i.e. due to a change in conditions or updated samples).

2. To temporarily suspend release and then reinitiate with this package, perform the following: (otherwise NA this step).

   a. Shutdown the purge system per BOP VQ-5 or BOP VQ-6 as applicable.

   b. RECORD time periods for interruptions in purging operations, (including changes in purge fan status). If an individual interruption in purging operations exceeds 4 hours, contact RP to determine if an updated release package is needed. Containment pressure does not need to be documented during the interruption.

Date/Time period of interruption: (i.e. 1200 1/1/96 to 1300 1/1/96)	RP Dept notified	Initials/Date	Comments (purge isolated, fan secured etc.)
_____	Y / N	_____/_____	_____
_____	Y / N	_____/_____	_____
_____	Y / N	_____/_____	_____
_____	Y / N	_____/_____	_____
_____	Y / N	_____/_____	_____
_____	Y / N	_____/_____	_____
_____	Y / N	_____/_____	_____

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E. continued

3. Terminate the release as follows:

   a. Stop purge fans per BOP VQ-5 or BOP VQ-6 as applicable — N/A — N/A (Dual Verf)

   b. Close all isolation dampers per BOP VQ-5 or BOP VQ-6 as applicable. — RO / XX — XX, XX (Dual Verf) — you must DO Dual Verification

   c. Release termination time — X / X (time / date) — XX, XX

   d. Final containment pressure: _____ psig (value in Sim) — XX, XX

4. RETURN the Rad Monitor 1RE-PR001 for the affected release path to the below listed Setpoints. (This Step is NOT APPLICABLE if setpoints were not changed in step C.1).

	High Alarm As Left Setpoint		
1 PB101	4.83E-4	N/A	N/A (Dual Verf)

	Alert Alarm As Left Setpoint		
1 PB101	2.42E-4	N/A	N/A (Dual Verf)

5. REMOVE the placard "Gaseous Release in Progress" from 0PM02J.

6. RETURN this release form to the US or SRO.

APPROVED

FEB 21 2000

F. SHIFT MANAGER OR SRO RESPONSIBILITY (CONTAINMENT RELEASE):

1. REVIEW the discharge data and ENSURE that the form is filled out properly. If the release was cancelled REVIEW the form and VERIFY plant configuration has been restored to normal. Consideration should be given to the following items, however this is not an all-inclusive list:

   1/2-PR001 Radiation Monitor Activity Setpoints
   VQ damper and fan status

   Reviewed by:_____/_____
   Shift Manager or SRO Date

2. Forward this form to Radiation Protection Supervision.

APPROVED

FEB 21 2000

3. Verify compliance with 10CFR50 dose limits as specified in the Technical Requirements Manual 3.11.g and 3.11.h by entering release data into the ACTUAL MODE or PROJECTED MODE of the 10CFR50 0DCM gaseous release program per BRP 6110-9.

NOTE
Notify the Radiation Protection Supervisor if greater than 25% of any quarterly 10CFR50 limit is reached.

Entry completed _____/_____
Radiation Protection Supervision Date

CURRENT DATE: 2000 03:59:52.65 FILE LOC: 2.12.1322
STATION NAME: BYRON

1REPR011 GAS SAMPLE ANALYSIS

COLLECTOR....:	FP	NUCLIDE LIBRARY..:	GENGAS
ANALYST.....:	EJS	GEOMETRY.....:	1PGAS250
SAMPLE TIME..:	-2000 03:07:00.00	COUNT TIME.....:	0 00:17:00.00
ANALYSIS TIME:	-2000 03:41:19.71	SAMPLE VOL/MASS..:	2.50000E+02 CC
DETECTOR.....:	23P067B	DEADTIME.....:	0.0%
TIME ON.....:		FLOW ON.....:	0.00 CFM
TIME OFF.....:	-2000 03:07:00.00	FLOW OFF.....:	0.00 CFM

SAMPLE POINT.:
REMARK.....:
CONFIG FILE..: 1DIA4:[CRU.SAMP]23P067B_SAMP_4854.CNF;1

AREA IN SPECTRUM = 1585. IF AREA = ZERO, TAG DETECTOR OOS & RECOUNT

Brief Report

Nuclide	Activity UCI/CC	1-Sigma Error
XE-133	5.772E-07	3.332E-07
Total Activity :	5.772E-07	

BRP 6021-20T1
Revision 1

ATMOSPHERIC TRITIUM CALCULATION FORM

SAMPLE LOCATION IRE-PRO11 START TIME/DATE: 0126 / ____

SAMPLE TYPE Bubbler STOP TIME/DATE: 0302 / ____

COUNTER USED: MODEL # 2SDUTR

SERIAL # 936 ANALYST: EP

DEHUMIDIFIER:

WET BULB TEMPERATURE _____ °F W. B. GRAINS OF MOISTURE _____

DRY BULB TEMPERATURE _____ °F D. B. GRAINS OF MOISTURE _____

HUMIDITY _____ lbs H_2O/lbs DRY AIR

SAMPLE ACTIVITY _____ µCi/ml (in liquid) N/A SDR

TRITIUM CONCENTRATION = (DEHUMIDIFIER)

$$\frac{(\_\_\_\_\text{ lbs } H_2O/\text{lbs DRY AIR})(\_\_\_\_\ \mu\text{Ci/ml})(454\text{g/lb})}{(2.83\text{E04 cc/ft}^3)(13\ \text{ft}^3/\text{lb DRY AIR})(.987\ \text{g/ml})}$$

= _____ µCi/cc (in air)

BUBBLER:

TRITIUM CONCENTRATION = (Bubbler)

$$\frac{(1.97\text{E-4}\ \mu\text{Ci/ml})(150\ \text{ml})}{(400\ \text{cc/min})^{(1)}(96\ \text{min})} = \frac{2.95\text{E-2}\ \mu\text{Ci}}{38400\ \text{cc}}$$ (2)

= 7.68E-7 µCi/cc (in air)

(3)

DAC's (in air) = $\frac{7.68\text{E-7}\ \mu\text{Ci/cc}}{2\text{E-5}\ (\mu\text{Ci/cc})/\text{DAC}}$ = 3.84E-2 DAC's (in air)

(1) Flow Rate of 100-500 cc/min

(2) 6000 cc minimum

(3) Notify Duty RPLS if >0.3 DAC

REVIEWED BY _____
RADIATION PROTECTION SUPERVISION / DATE

RECOMMENDATIONS _____

(Final)

APPROVED
JAN 0 1 1994

(0784SS/WPF/100293)

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility: BYRON Task No: _____

Task Title: COMMUNICATION OF NARS FORM Job Performance Measure No: A.4 (RO)

K/A Reference: 2.4.43 2.8

Examinee: _____ NRC Examiner: _____

Date: _____

Method of testing:

Simulated Performance _____ Actual Performance ____X____

Classroom _____ Simulator _____X_____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions: You are an extra RO. There has been an General Emergency event classification. The Unit SRO has directed you to make all appropriate communications/transmittals of the NARS form.

Task Standard: Emergency Communications

Required Materials: BZP 200-A1, BZP 200-1, BZP 300-A2, BZP 310-2T1, BZP 310-2

General References:
BZP 200-A1
BZP 300-A2
BZP 310-2T1
BZP 310-2

Initiating Cue: SHIFT MANAGER/EMERGENCY DIRECTOR DIRECTS YOU TO PERFORM THE COMMUNICATION/TRANSMITTAL OF THE NARS FORM AND PROVIDE THE REQUIRED INFORMATION. YOU ARE TO PERFORM STEP 3 o-r AND STEP 4a-g OF BZP 310-2, ALSO FILL OUT THE APPLICABLE SECTIONS OF BZP 310-2T1.

Time Critical Task: 15 minutes to complete

Validation Time: 10 MINUTES

PERFORMANCE INFORMATION

START TIME: _____

(Denote critical steps with a **BOLD** *)

NOTE: EXAMINER FILL OUT STEP 4 ACCIDENT CLASSIFIED USING TODAY'S DATE AND START TIME OF JPM

Performance step: 1

ENTER BZP 310-2

Standard: LOCATE AND OPEN BZP 310-2

CUE: GIVE APPLICANT PARTIALLY COMPLETED BZP 310-2T1 FORM

Comment: ----------

NOTE: SIMULATE USE OF NARS PHONE IT IS ON A REAL RING DOWN BRIDGE

CUE: WHEN CANDIDATE DIALS INFORM THEM THE NARS PHONE IS INOPERABLE

Performance step: 2

CONTACT THE AGENCIES PER STEP 4 a USING NARS PHONE

Standard: CANDIDATE SIMULATES DAILING '37' ON THE NARS PHONE

NOTE: THE APPLICANT WILL DIAL CODE 37 FOR CALL SINCE GENERAL EMERGENCY

Comment: ----------

Performance step: 3

CONTACT THE AGENCIES IAW STEP 4a USING OUTSIDE PHONE NUMBERS

STANDARD: ***THE FOLLOWING AGENCIES WERE CONTACTED IN ORDER IEMA, IDNS, THEN ELECTRIC OPERATIONS USING OUTSIDE PHONE NUMBERS***

CUE: WHEN ASKED ANSWER CALL AS IEMA, IDNS, AND ELECTRIC OPERATIONS

NOTE: SEQUENTIAL ORDER LISTED IN PROCEDURE, ALSO OUTSIDE PHONE NUMBERS ARE LISTED ON BOTTOM OF BZP 310-2T1 FORM

Comment: ----------

Performance step: 4

PERFORM INITIAL ROLL CALL

STANDARD: *** INITIAL ROLL CALL COMPLETED***

CUE: WHEN ASKED ANSWER THE ROLL CALL AS THE AGENCIES

Comment: ----------

Performance step: 5

*** MESSAGE COMMUNICATED AND TRANSMITTED IAW STEP 4 b-g ***

Standard: *** THE NARS FORM DATA IS COMMUNICATED AND TRANSMITTED TO AGENCIES ***

NOTE: CRITICAL INFORMATION EVENT CLASSIFICATION AND PARS

NOTE: 15 MINUTE TIME LIMIT FOR COMPLETION

Comment: ----------

CUE: WHEN ASKED GIVE NAME AS JOHN SMITH FOR IEMA PERSON RECEIVING DATA

Performance step: 6

RECORD IEMA INDIVIDUAL'S NAME IN BLOCK 13 AND PERFORM FINAL ROLL CALL

*STANDARD: ***JOHN SMITH PUT IN BLOCK 13 AND FINAL ROLL CALL COMPLETED***

NOTE: JOHN SMITH WILL BE PLACED IN BLOCK 13 OF BZP 310-2T1

Comment: ----------

Performance step: 7

*** COMPLETE APPLICABLE PORTIONS OF BZP 310-2T1 IAW STEP 3 o-r AND GIVE TO SUPPORT STAFF***

Standard: *** STEP 3 o-r COMPLETED , BZP 310-2T1 COMPLETED AND GIVEN TO SUPPORT STAFF ***

CUE: WHEN ASKED TAKE THE COMPLETED BZP 310-2T1 FORM AS SUPPORT STAFF

NOTE: COMPLETED BZP 310-2T1 FORM WILL BE ATTACHED

Comment: ----------

TERMINATING CUE: SED I HAVE COMPLETED THE TRANSMISSION OF THE NARS FORM

TIME STOP_____

Initial Conditions: You are an extra RO. There has been an General Emergency event classification. The Unit SRO has directed you to make all appropriate communications/transmittals of the NARS form.

Initiating Cue: SHIFT MANAGER/EMERGENCY DIRECTOR DIRECTS YOU TO PERFORM THE COMMUNICATION/TRANSMITTAL OF THE NARS FORM AND PROVIDE THE REQUIRED INFORMATION. YOU ARE TO PERFORM STEP 3 o-r AND STEP 4a-g OF BZP 310-2, ALSO FILL OUT THE APPLICABLE SECTIONS OF BZP 310-2T1.

APPROVED 04/18/99

Facsimile

BZP 310-2T1
Revision 1

(UTILITY FORM)

UTILITY MESSAGE NO. 1

STATE OF ILLINOIS
NUCLEAR ACCIDENT REPORTING SYSTEM FORM
JULY, 1998

STATE MESSAGE NO. N/A

INITIAL ROLL CALL
- ELECTRIC OPER. ☐
- IEMA ☐
- IDNS ☐
- WEM (Zion Only) ☐
- IOWA EMD (QC Only) ☐

UTILITY USE ONLY
MESSAGE INITIATED
TIME: _____
DATE: _____

1. STATUS
- [X] ACTUAL
- [B] EXERCISE
- [C] DRILL
- [D] TERMINATION

2. STATION
- [A] DRESDEN
- [B] LASALLE
- [C] QUAD CITIES
- [D] ZION
- [X] BYRON
- [F] BRAIDWOOD
- [G] CLINTON

3. ON-SITE ACCIDENT CLASSIFICATION
- [A] UNUSUAL EVENT
- [B] ALERT
- [C] SITE EMERGENCY
- [X] GENERAL EMERGENCY
- [E] RECOVERY
- [F] NOT APPLICABLE

4. ACCIDENT CLASSIFIED
TIME: _____
DATE: _____
EAL#: FG1

ACCIDENT TERMINATED
TIME: N/A
DATE: N/A

5. RELEASE TO ENVIRONMENT
- [A] NONE
- [X] POTENTIAL
- [C] OCCURRING
- [D] TERMINATED

6. TYPE OF RELEASE
- [A] NOT APPLICABLE
- [X] RADIOACTIVE GAS
- [C] RADIOACTIVE LIQUID

7. WIND DIRECTION:
FROM 222 (DEGREES)
DOWNWIND SECTOR: C

8. WIND SPEED
- [A] METERS/SEC.: N/A
- [X] MILES/HR.: 10

9. RECOMMENDED ACTIONS
- [A] NONE
- [B] PREPARE FOR POSSIBLE ACTION INVOLVING THE PUBLIC
- [X] INITIATE PUBLIC NOTIFICATION PROCEDURES. INSTRUCT THE PUBLIC TO TAKE THE FOLLOWING ACTIONS:

SHELTER	EVACUATE	UTILITY ONLY
[D]	[X]	0 - 2 MILE RADIUS
[E]	[I]	0 - _ MILE RADIUS
[F]	[X]	2 - 5 MILES FOR SECTORS B,C,D
[X]	[K]	5 - 10 MILES FOR SECTORS B,C,D

[L] SHELTER SUB-AREAS: _____ (STATE USE ONLY)
[M] EVACUATE SUB-AREAS: _____ (STATE USE ONLY)

- [N] RECOMMEND POTASSIUM IODIDE (KI) IN ACCORDANCE WITH PROCEDURES (STATE USE ONLY)
- [O] CONFINE MILK-PRODUCING ANIMALS ON STORED FEED AND PROTECTED WATER OUT TO____ MILE RADIUS (STATE USE ONLY)
- [P] COMMENCE RETURN OF PUBLIC (STATE USE ONLY)
- [Q] OTHER _____

10. ADDITIONAL INFORMATION: NONE

11. MESSAGE TRANSMITTED BY:
_____ (NAME)
ComEd - Byron (ORGANIZATION)
_____ (OUTSIDE PHONE NUMBER)

12. MESSAGE TRANSMITTED:
CURRENT TIME: _____
CURRENT DATE: _____

13. MESSAGE RECEIVED BY:
_____ (NAME)
☐IEMA ☐COMED

OUTSIDE PHONE NUMBERS

		FINAL ROLL CALL
ELECTRIC OPER.	630-691-4730	☐
IEMA	217-782-7860	☐
IDNS	217-785-0600	☐
WEM	800-943-0003 (ZION ONLY)	☐
IOWA EMD	515-281-3231 (QC ONLY)	☐

UTILITY USE ONLY
APPROVED BY: XXXX XX (EMERGENCY DIRECTOR (NAME)) XX:XX (TIME)
NDO NOTIFIED: _____ _____
(ELECTRIC OPER. ONLY) NDO (NAME) (TIME/DATE)

(9492AA/DOC/040399)

NARS FORM
INSTRUCTIONS FOR USE
(UTILITY FORM)

Complete the NARS as follows:

UTILITY MESSAGE NUMBER - For use by Utility personnel only. Number Messages sequentially, starting with 1, for the Event described. Enter "N/A" if this is a State NARS.

STATE MESSAGE NUMBER - Enter State Message Number when receiving a NARS message from the State. Enter "N/A" if this is a Utility NARS.

INITIAL ROLL CALL - Mark the box by the applicable agencies that are included in the initial roll call.

MESSAGE INITIATED (Utility Only) - Document the time and date at the completion of the initial roll call.

1. **STATUS** - Mark the letter corresponding to the appropriate status description.
2. **STATION** - Mark the letter corresponding to the affected Station.
3. **ON-SITE ACCIDENT CLASSIFICATION** - Mark the letter corresponding to the classification issued by the Utility.
4. **ACCIDENT CLASSIFIED** - Fill in the time and date at which the most recent accident classification was determined by the Utility. Also fill in the applicable On-Site Emergency Action Level (EAL) code number. Enter "N/A" if this is an accident termination message.

   ACCIDENT TERMINATED - Fill in the time and date of the accident termination, if applicable. Enter "N/A" if this is an accident classified message.
5. **RELEASE TO ENVIRONMENT** - Mark the letter corresponding to the appropriate description.
6. **TYPE OF RELEASE** - Mark the letter corresponding to the appropriate release type.
7. **WIND DIRECTION** - Fill in the direction from which the wind is coming, in degrees.

   DOWNWIND SECTOR - Fill in the letter corresponding to the Downwind Sector. Use environmental sampling maps or the following table:

DOWNWIND SECTOR	WIND FROM		WIND FROM DEGREES	DOWNWIND SECTOR	WIND FROM		WIND FROM DEGREES
J	N	___	349-11	A	S	___	169-191
K	NNE	___	12-33	B	SSW	___	192-213
L	NE	___	34-56	C	SW	___	214-236
M	ENE	___	57-78	D	WSW	___	237-258
N	E	___	79-101	E	W	___	259-281
P	ESE	___	102-123	F	WNW	___	282-303
Q	SE	___	124-146	G	NW	___	304-326
R	SSE	___	147-168	H	NNW	___	327-348

8. **WIND SPEED** - Fill in the wind speed under meters/second or miles/hour. For Quad Cities Station only, fill in both meters/seconds and miles/hour.
9. **RECOMMENDED ACTIONS** - Mark the letter corresponding to the appropriate protective action. Add additional information if [C] is chosen. If recommending shelter or evacuation for letters [F][G][J] or [K], provide the center line sector and at least one sector on each side of center line. Letters [L-P] are for State use only.
10. **ADDITIONAL INFORMATION** - Additional information should be included when:
    * An equal or lesser classification is made on the other unit,
    * A wind shift which results in additional downwind sectors,
    * A change is made in PARs,
    * Corrections to the current NARS are made.

    If the NARS is not being issued for one of the above reasons, this block should read "none".
11. **MESSAGE TRANSMITTED BY** - Fill in name, organization and outside phone number of person transmitting the NARS Form information.
12. **MESSAGE TRANSMITTED** - Fill in the current time and date that the message was transmitted by the person listed in step 11.
13. **MESSAGE RECEIVED BY** - Fill in name, and mark the applicable organization (IEMA or ComEd), of the person receiving the NARS message and filling out the NARS Form.

FINAL ROLL CALL - Mark the box by the applicable agencies that are included in the final roll call.

(Final)

APPROVED 04/18/99

Facsimile

BZP 310-2T1
Revision 1

(UTILITY FORM)

UTILITY MESSAGE NO. 1

STATE OF ILLINOIS
NUCLEAR ACCIDENT REPORTING SYSTEM FORM
JULY, 1998

STATE MESSAGE NO. N/A

INITIAL ROLL CALL
- ELECTRIC OPER. ☑
- IEMA ☑
- IDNS ☑
- WEM (Zion Only) ☐
- IOWA EMD (QC Only) ☐

UTILITY USE ONLY
MESSAGE INITIATED
TIME: _____
DATE: _____

1. **STATUS**
   - [X] ACTUAL
   - [B] EXERCISE
   - [C] DRILL
   - [D] TERMINATION
2. **STATION**
   - [A] DRESDEN
   - [B] LASALLE
   - [C] QUAD CITIES
   - [D] ZION
   - [E] BYRON
   - [F] BRAIDWOOD
   - [G] CLINTON

3. **ON-SITE ACCIDENT CLASSIFICATION**
   - [A] UNUSUAL EVENT
   - [B] ALERT
   - [C] SITE EMERGENCY
   - [D] GENERAL EMERGENCY
   - [E] RECOVERY
   - [F] NOT APPLICABLE

4. **ACCIDENT CLASSIFIED**
   TIME: _____
   DATE: _____
   EAL#: F61

   ACCIDENT TERMINATED
   TIME: N/A
   DATE: N/A

DATE FROM START OF JPM

5. **RELEASE TO ENVIRONMENT**
   - [A] NONE
   - [B] POTENTIAL
   - [C] OCCURRING
   - [D] TERMINATED

6. **TYPE OF RELEASE**
   - [A] NOT APPLICABLE
   - [B] RADIOACTIVE GAS
   - [C] RADIOACTIVE LIQUID

7. **WIND DIRECTION:**
   FROM 222 (DEGREES)
   DOWNWIND SECTOR: C

8. **WIND SPEED**
   - [A] METERS/SEC.: N/A
   - [B] MILES/HR.: 10

9. **RECOMMENDED ACTIONS**
   - [A] NONE
   - [B] PREPARE FOR POSSIBLE ACTION INVOLVING THE PUBLIC
   - [C] INITIATE PUBLIC NOTIFICATION PROCEDURES. INSTRUCT THE PUBLIC TO TAKE THE FOLLOWING ACTIONS:

SHELTER	EVACUATE	UTILITY ONLY
[D]	[H]	0 - 2 MILE RADIUS
[E]	[I]	0 - _ MILE RADIUS
[F]	[J]	2 - 5 MILES FOR SECTORS B, C, D
[G]	[K]	5 - 10 MILES FOR SECTORS B, C, D

[L] SHELTER SUB-AREAS: _____ (STATE USE ONLY)
[M] EVACUATE SUB-AREAS: _____ (STATE USE ONLY)

- [N] RECOMMEND POTASSIUM IODIDE (KI) IN ACCORDANCE WITH PROCEDURES (STATE USE ONLY)
- [O] CONFINE MILK-PRODUCING ANIMALS ON STORED FEED AND PROTECTED WATER OUT TO____ MILE RADIUS (STATE USE ONLY)
- [P] COMMENCE RETURN OF PUBLIC (STATE USE ONLY)
- [Q] OTHER _____

10. **ADDITIONAL INFORMATION:** NONE

11. **MESSAGE TRANSMITTED BY:**
    APPLICANTS NAME (NAME)
    ComEd - Byron (ORGANIZATION)
    1-815-234-5441 EXT 2205 (OUTSIDE PHONE NUMBER)

12. **MESSAGE TRANSMITTED:**
    CURRENT TIME: _____
    CURRENT DATE: _____

13. **MESSAGE RECEIVED BY:**
    JOHN SMITH (NAME)
    ☑ IEMA ☐ COMED

FROM DAY AND TIME OF JPM

OUTSIDE PHONE NUMBERS		FINAL ROLL CALL
ELECTRIC OPER.	630-691-4730	☑
IEMA	217-782-7860	☑
IDNS	217-785-0600	☑
WEM	800-943-0003 (ZION ONLY)	☐
IOWA EMD	515-281-3231 (QC ONLY)	☐

UTILITY USE ONLY
APPROVED BY: XX XX XX XX:XX
EMERGENCY DIRECTOR (NAME) (TIME)
NDO NOTIFIED: _____ _____
(ELECTRIC OPER. ONLY) NDO (NAME) (TIME/DATE)

(9492AA/DOC/040399)

KEY

NARS FORM
INSTRUCTIONS FOR USE
(UTILITY FORM)

Complete the NARS as follows:

UTILITY MESSAGE NUMBER - For use by Utility personnel only. Number Messages sequentially, starting with 1, for the Event described. Enter "N/A" if this is a State NARS.

STATE MESSAGE NUMBER - Enter State Message Number when receiving a NARS message from the State. Enter "N/A" if this is a Utility NARS.

INITIAL ROLL CALL - Mark the box by the applicable agencies that are included in the initial roll call.

MESSAGE INITIATED (Utility Only) - Document the time and date at the completion of the initial roll call.

1. **STATUS** - Mark the letter corresponding to the appropriate status description.
2. **STATION** - Mark the letter corresponding to the affected Station.
3. **ON-SITE ACCIDENT CLASSIFICATION** - Mark the letter corresponding to the classification issued by the Utility.
4. **ACCIDENT CLASSIFIED** - Fill in the time and date at which the most recent accident classification was determined by the Utility. Also fill in the applicable On-Site Emergency Action Level (EAL) code number. Enter "N/A" if this is an accident termination message.

   ACCIDENT TERMINATED - Fill in the time and date of the accident termination, if applicable. Enter "N/A" if this is an accident classified message.
5. **RELEASE TO ENVIRONMENT** - Mark the letter corresponding to the appropriate description.
6. **TYPE OF RELEASE** - Mark the letter corresponding to the appropriate release type.
7. **WIND DIRECTION** - Fill in the direction from which the wind is coming, in degrees.

   DOWNWIND SECTOR - Fill in the letter corresponding to the Downwind Sector. Use environmental sampling maps or the following table:

DOWNWIND SECTOR	WIND FROM		WIND FROM DEGREES	DOWNWIND SECTOR	WIND FROM		WIND FROM DEGREES
J	N	___	349-11	A	S	___	169-191
K	NNE	___	12-33	B	SSW	___	192-213
L	NE	___	34-56	C	SW	___	214-236
M	ENE	___	57-78	D	WSW	___	237-258
N	E	___	79-101	E	W	___	259-281
P	ESE	___	102-123	F	WNW	___	282-303
Q	SE	___	124-146	G	NW	___	304-326
R	SSE	___	147-168	H	NNW	___	327-348

8. **WIND SPEED** - Fill in the wind speed under meters/second or miles/hour. For Quad Cities Station only, fill in both meters/seconds and miles/hour.
9. **RECOMMENDED ACTIONS** - Mark the letter corresponding to the appropriate protective action. Add additional information if [C] is chosen. If recommending shelter or evacuation for letters [F][G][J] or [K], provide the center line sector and at least one sector on each side of center line. Letters [L-P] are for State use only.
10. **ADDITIONAL INFORMATION** - Additional information should be included when:
    - An equal or lesser classification is made on the other unit,
    - A wind shift which results in additional downwind sectors,
    - A change is made in PARs,
    - Corrections to the current NARS are made.

    If the NARS is not being issued for one of the above reasons, this block should read "none".
11. **MESSAGE TRANSMITTED BY** - Fill in name, organization and outside phone number of person transmitting the NARS Form information.
12. **MESSAGE TRANSMITTED** - Fill in the current time and date that the message was transmitted by the person listed in step 11.
13. **MESSAGE RECEIVED BY** - Fill in name, and mark the applicable organization (IEMA or ComEd), of the person receiving the NARS message and filling out the NARS Form.

FINAL ROLL CALL - Mark the box by the applicable agencies that are included in the final roll call.

(Final)

NUCLEAR ACCIDENT REPORTING SYSTEM FORM
(Primary Responsibility - Station Director)

A. STATEMENT OF APPLICABILITY:

This procedure specifies the information required by the Illinois Emergency Management Agency (IEMA) when reporting a nuclear accident. Steps are provided for completing, transmitting, and receiving a NARS message.

B. REFERENCES:

1. BZP 310-5, "Acting Station Director or Station Director".

2. BZP 310-2T1, "State of Illinois - Nuclear Accident Reporting System Form".

3. BZP 300-1, "Protective Action Recommendation (PAR) Determination".

C. MAIN BODY:

> **NOTE**
> The NARS Form is a State of Illinois controlled form. Instructions for the completion of the form are attached to or included on the back of the form. If any information required on the NARS Form cannot be determined, record that information as "UNKNOWN" and continue completing the form.
>
> Each NARS message must be approved, prior to transmittal, by the individual in charge of the Emergency Response Facility which has Command and Control authority (Acting Station Director/Station Director/MEO).

1. A NARS form (BZP 310-2T1 or similar) shall be issued when an event is initially classified and subsequently when conditions change, such as:

   a. The classification level changes
   b. A change in radioactive release condition
   c. A wind shift causes a change in the affected sectors when the release status is POTENTIAL or OCCURRING
   d. A change is made in the Protective Actions Recommendations
   e. Additional information is available which may affect a change in the State or local protective action response

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APR 18 1999

2. The "Accident Classified" time logged and provided on the NARS form should be the time that the Station Director concludes that the conditions meet or exceed a Threshold Value of an EAL.

3. NARS Form Completion. Complete the NARS Form in accordance with the instructions located attached to, or on the back of the form (BZP 310-2T1).

   a. UTILITY MESSAGE NUMBER: For use by utility personnel only. Number NARS Forms sequentially, starting with 1, for the event described. Enter "N/A" in this block if you are receiving a State NARS message.

   b. STATE MESSAGE NUMBER: Enter State NARS Message number when receiving a NARS message from the State. Enter "N/A" if this is a Utility NARS.

   c. INITIAL ROLL CALLS: Mark the box by the applicable agencies as they respond to the initial roll call. For Byron Station, the applicable agencies are Electric Operations, IEMA and IDNS.

   d. MESSAGE INITIATED: Document the time and date at the completion of the initial roll call. Do not transmit this information where transmitting the NARS message.

   e. 1. STATUS: Mark the letter corresponding to the appropriate status description. Actual for real GSEP events, Exercise for NRC evaluated exercises, Drill for all other training evolutions and Termination for exiting the GSEP classification.

   f. 2. STATION: Mark the letter corresponding to the affected Station ([E] Byron).

   g. 3. ON-SITE ACCIDENT CLASSIFICATION: Mark the letter corresponding to the classification issued by the utility. Check [F] NOT APPLICABLE when issuing a NARS Termination message.

APPROVED

APR 1 8 1999

h. 4. ACCIDENT CLASSIFIED: Fill in the time and date at which the most recent accident classification was determined by the Utility. Also fill in the applicable On-Site Emergency Action Level (EAL) code number. Enter "N/A" if this is an accident termination message.

ACCIDENT TERMINATED: Fill in the time and date of the accident termination, if applicable. Enter "N/A" if this is an accident classified message.

i. 5. RELEASE TO ENVIRONMENT: Mark the letter corresponding to the appropriate description. Check [B] POTENTIAL, if the criteria of EAL FS1 is met. Check [C] OCCURRING, if the total station release rate is greater than 4.9E+4 uci/sec, or if an Unmonitored Release (BZP 300-1) is occurring.

j. 6. TYPE OF RELEASE: Mark the letter corresponding to the appropriate release type. Check [A] NOT APPLICABLE, if block 5. [A] NONE was checked.

k. 7. WIND DIRECTION: Fill in the direction from which the wind is coming, in degrees. The recommended Point History data point for wind direction is AM004, 15 minute average 30 foot direction, in degrees. DOWNWIND SECTOR is the single centerline downwind sector. The sector is determined by using the table on page 2 of BZP 310-2T1, the back of the NARS Form, or environmental sampling maps.

l. 8. WINDSPEED: Fill in the wind speed and check the applicable box under [A] METERS/SEC or [B] MILES/HR. The recommended Point History data point for windspeed is AM001, 15 minute average 30 foot wind velocity, in meters/sec.

m. 9. RECOMMENDED ACTIONS: Mark the letter corresponding to the appropriate protective action. Add additional information if [C] is chosen. If recommending shelter or evacuation for letters [F] [G] [J] or [K], provide the centerline affected sector and at least one sector on each side of centerline. Letters [L] through [P] are for State Use only. Byron Station PARs shall be determined by referring to BZP 300-1, "Protective Action Recommendations (PARs)" and BZP 300-A2, "Figure 6.3-1, Protective Action Recommendation (PAR) Determination".

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n. 10. ADDITIONAL INFORMATION: Only provide additional information that will be helpful to personnel evaluating the event. Examples include Unit number, change in release status, change in affected sectors, change in PARs, or correction to Item # _____. Otherwise, write "NONE". A change in classification does not require additional information.

o. 11. MESSAGE TRANSMITTED BY: Fill in name, organization and outside phone number of person transmitting the NARS Form information. For example: John Doe, ComEd - Byron, 815-234-5441, extension 2785.

p. 12. MESSAGE TRANSMITTED: Fill in the current time and date that the message was transmitted by the person listed in Block 11.

q. 13. MESSAGE RECEIVED BY: Fill in the name, and mark the applicable organization (IEMA or ComEd), of the person receiving the NARS message and filling out the NARS Form.

r. FINAL ROLL CALL: Mark the box by the applicable agencies that are included in the final roll call. For Byron Station, the applicable agencies are Electric Operations, IEMA, and IDNS.

s. "UTILITY USE ONLY" BOX: The NARS Form must be approved by the Acting Station Director, Station Director, or Manager of Emergency Operations of the facility that is in Command and Control. Fill in the name or initials of the Emergency Director, and the time the NARS Form is approved. The "NDO NOTIFIED:" line is for Electric Operations use only.

4. NARS Form Transmittal:

a. Using the dedicated NARS phone, dial the applicable two digit NARS code:

Code 20 - Normal code for event notifications.
Code 37 - Code used if the INITIATING EVENT is a General Emergency

If the NARS phone is inoperable, contact the agencies using the outside telephone numbers. The priority for calls is IEMA, IDNS, then Electric Operations.

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b. Read the following, or similar information over the NARS line:

"This is the Byron Station Control Room/TSC. Please stand by for transmission of a NARS message. A roll call will be conducted at the beginning and end of this call. Remain on the line until all information is complete. I will repeat any information, or answer any questions after the final roll call."

c. Conduct an initial roll call of Electric Operations, IEMA, and IDNS.

d. Transmit the NARS message. For example, "1, STATUS, A, Alpha, Actual, 2, STATION, E, Echo, Byron, 3 ON-SITE ACCIDENT CLASSIFICATION, C, Charlie, Site Area Emergency, ...". Transmit all information on the form including utility and state NARS message numbers. Do not transmit the information recorded in the "Utility Use Only - Message Initiated" block or "Utility Use Only - Approved by:" block.

e. Record the name of the IEMA individual receiving the NARS message in Block 13, and conduct a final roll call. Following the roll call, repeat any requested information, or answer any questions.

f. If any of the agencies do not respond to the initial or final roll call, contact that organization on their outside telephone number following completion of the NARS transmittal. The outside telephone numbers are listed on the front of the NARS Form or in the ERF Telephone Directory. Priority should be given to contacting IEMA, IDNS, then Electric Operations.

g. When you are done transmitting the NARS message, give the NARS Form to the Administrative Support Staff so that the form can be faxed to the other Emergency Response Facilities and applicable agencies.

h. After you have transmitted a NARS message, you will normally be called by IEMA on the outside telephone number you provided. The purpose of this call is to verify the authenticity of the NARS message.

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5. Receiving a NARS Message: After we have transmitted a NARS message to the State of Illinois, they will re-transmit the NARS message back to the local governmental agencies.

   a. The State of Illinois will typically transmit their NARS message using NARS code 37. Copy the State NARS message and state message number on to a blank NARS Form. Review the State NARS message for obvious errors.

   b. The State's PARs may be different than the Station recommended PARs. Ensure that the Station Director and Radiation Protection Director are informed of the State's Protective Actions.

   c. Give the State NARS message to the Administrative Support Staff for copying and distribution.

6. If an error is found on a Utility NARS form, complete a new NARS form, assign a new Utility NARS number, and retransmit the NARS message. These actions should be completed by the facility in Command and Control.

7. TSC NARS Communicator:

   a. Update the "Notification Summary" status board with the latest NARS message information.

   b. Update the "Protective Actions" status board with the latest ComEd recommended, and State issued protective actions.

2. The "Accident Classified" time logged and provided on the NARS form should be the time that the Station Director concludes that the conditions meet or exceed a Threshold Value of an EAL.

3. NARS Form Completion. Complete the NARS Form in accordance with the instructions located attached to, or on the back of the form (BZP 310-2T1).

   a. UTILITY MESSAGE NUMBER: For use by utility personnel only. Number NARS Forms sequentially, starting with 1, for the event described. Enter "N/A" in this block if you are receiving a State NARS message.

   b. STATE MESSAGE NUMBER: Enter State NARS Message number when receiving a NARS message from the State. Enter "N/A" if this is a Utility NARS.

   c. INITIAL ROLL CALLS: Mark the box by the applicable agencies as they respond to the initial roll call. For Byron Station, the applicable agencies are Electric Operations, IEMA and IDNS.

   d. MESSAGE INITIATED: Document the time and date at the completion of the initial roll call. Do not transmit this information where transmitting the NARS message.

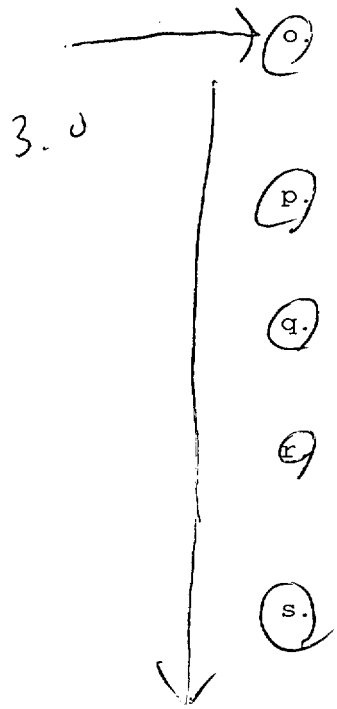
   e. 1. STATUS: Mark the letter corresponding to the appropriate status description. Actual for real GSEP events, Exercise for NRC evaluated exercises, Drill for all other training evolutions and Termination for exiting the GSEP classification.

   f. 2. STATION: Mark the letter corresponding to the affected Station ([E] Byron).

   g. 3. ON-SITE ACCIDENT CLASSIFICATION: Mark the letter corresponding to the classification issued by the utility. Check [F] NOT APPLICABLE when issuing a NARS Termination message.

Key

n. 10. ADDITIONAL INFORMATION: Only provide additional information that will be helpful to personnel evaluating the event. Examples include Unit number, change in release status, change in affected sectors, change in PARs, or correction to Item # _____. Otherwise, write "NONE". A change in classification does not require additional information.



o. 11. MESSAGE TRANSMITTED BY: Fill in name, organization and outside phone number of person transmitting the NARS Form information. For example: John Doe, ComEd - Byron, 815-234-5441, extension 2785.

p. 12. MESSAGE TRANSMITTED: Fill in the current time and date that the message was transmitted by the person listed in Block 11.

q. 13. MESSAGE RECEIVED BY: Fill in the name, and mark the applicable organization (IEMA or ComEd), of the person receiving the NARS message and filling out the NARS Form.

r. FINAL ROLL CALL: Mark the box by the applicable agencies that are included in the final roll call. For Byron Station, the applicable agencies are Electric Operations, IEMA, and IDNS.

s. "UTILITY USE ONLY" BOX: The NARS Form must be approved by the Acting Station Director, Station Director, or Manager of Emergency Operations of the facility that is in Command and Control. Fill in the name or initials of the Emergency Director, and the time the NARS Form is approved. The "NDO NOTIFIED:" line is for Electric Operations use only.

4. NARS Form Transmittal:

a. Using the dedicated NARS phone, dial the applicable two digit NARS code:

Code 20 - Normal code for event notifications.
Code 37 - Code used if the INITIATING EVENT is a General Emergency

If the NARS phone is inoperable, contact the agencies using the outside telephone numbers. The priority for calls is IEMA, IDNS, then Electric Operations.

b. Read the following, or similar information over the NARS line:

"This is the Byron Station Control Room/TSC. Please stand by for transmission of a NARS message. A roll call will be conducted at the beginning and end of this call. Remain on the line until all information is complete. I will repeat any information, or answer any questions after the final roll call."

c. Conduct an initial roll call of Electric Operations, IEMA, and IDNS.

d. Transmit the NARS message. For example, "1, STATUS, A, Alpha, Actual, 2, STATION, E, Echo, Byron, 3 ON-SITE ACCIDENT CLASSIFICATION, C, Charlie, Site Area Emergency, ...". Transmit all information on the form including utility and state NARS message numbers. Do not transmit the information recorded in the "Utility Use Only - Message Initiated" block or "Utility Use Only - Approved by:" block.

e. Record the name of the IEMA individual receiving the NARS message in Block 13, and conduct a final roll call. Following the roll call, repeat any requested information, or answer any questions.

f. If any of the agencies do not respond to the initial or final roll call, contact that organization on their outside telephone number following completion of the NARS transmittal. The outside telephone numbers are listed on the front of the NARS Form or in the ERF Telephone Directory. Priority should be given to contacting IEMA, IDNS, then Electric Operations.

g. When you are done transmitting the NARS message, give the NARS Form to the Administrative Support Staff so that the form can be faxed to the other Emergency Response Facilities and applicable agencies.

h. After you have transmitted a NARS message, you will normally be called by IEMA on the outside telephone number you provided. The purpose of this call is to verify the authenticity of the NARS message.

Facility: _____BYRON_____ Date of Examination: ____06/20/00___
Examination Level (circle one): RO / (SRO) Operating Test Number: __00-301____

Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	CONDUCT OF OPERATIONS	Perform a SDM Calculation
	CONDUCT OF OPERATIONS	Perform a Shift Turnover
A.2	EQUIPMENT CONTROL TAGGING AND CLEARANCE	Perform a Tagout of CS Pump
A.3	RADIATION CONTROL	Authorize a Gas Release
A.4	EMERGENCY PLAN	Classify Event and Complete NAR's Form

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility: BYRON Task No: _____

Task Title: GASEOUS RELEASE Job Performance Measure No: A.3 (SRO)

K/A Reference: 2.3.6 3.1

Examinee: _____ NRC Examiner: _____

Date: _____

Method of testing:

Simulated Performance _____X_____ Actual Performance _____

Classroom _____ Simulator _____X_____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions: You are the Unit SRO
Unit 1 is in mode 1
All controls are in automatic, 1PB111 IS OOS

Task Standard: AUTHORIZE A GASEOUS EFFLUENT RELEASE

Required Materials: BCP 400-TCNMT/ROUTINE
CNMT NOBLE GAS ACTIVITY - RADIOCHEMISTRY ANALYSIS
CNMT TRITIUM ACTIVITY - RADIOCHEMISTRY ANALYSIS

General References:
BCP 400 - TCNMT/ROUTINE

Initiating Cue: THE SM DIRECTS YOU, THE UNIT SUPERVISOR, TO AUTHORIZE A ROUTINE GASEOUS EFFLUENT RELEASE FROM UNIT 1 CONTAINMENT

Time Critical Task: NO

Validation Time: 15 minutes

PERFORMANCE INFORMATION

START TIME: _____

(Denote critical steps with a **BOLD** *)

NOTE: REFER TO MASTER KEY RELEASE FORMS FOR ANSWERS TO BE FILLED OUT BY SRO

Performance step: 1

ENTER BCP 400-TCNMT AT STEP C.1 CHANNEL CHECK ON 1RE-PR001

Standard: STEP C.1 CHANNEL CHECK OF 1RE-PR001 COMPLETED

CUE: HAND APPLICANT BCP 400-TCNMT STARTS AT STEP C.1.a
WHEN ASKED DAILY CHANNEL CHECK ON 1RE-PR001 WAS PERFORMED SATISFACTORILY DURING 1BOSR 0.1-0.

NOTE: SRO WILL PERFORM STEP C AND D EXCEPT FOR C.1.b WHICH IS PERFORMANCE STEP 2 BELOW

Comment: ----------

Performance step: 2

PERFORM 1BOSR 11.b.5-1 1PR01J SOURCE/CHANNEL CHECK

Standard: INFORM NSO TO PERFORM 1BOSR 11.b.5-1 1PR01J SOURCE/CHANNEL

CUE: WHEN ASKED TELL APPLICANT THAT NSO WILL BE PERFORMING 1BOSR 11.b.5-1 1PR01J SOURCE/CHANNEL
PLEASE CONTINUE WITH JPM WHILE THIS IS BEING PERFORMED

Comment: ----------

Performance step: 3

VERIFY NOBLE GAS TREND ON 1PB111 HAS NOT INCREASED

STANDARD: MARK AS N/A, 1PB111 OOS PER INITIAL CONDITIONS

NOTE: INITIAL CONDITIONS

Comment: ----------

Performance step: 4

*** RECORD 1PB101 DATA ***

Standard: * **1PB101 AS FOUND HIGH SETPOINT AND LOW SETPOINT DATA RECORDED ***

ACTUAL DATA HIGH _____ LOW_____

CUE: AFTER APPLICANT HAS FOUND DATA FOR 1PB101 ON GRID 2 HAVE THEM RECORD THE FOLLOWING AS THE DATA:
HIGH IS 4.83 E-4 UCI/CC AND
LOW IS 2.42 E-4 UCI/CC

NOTE: MAKE APPLICANT SHOW THAT THE SETPOINT CAN BE FOUND ON GRID 2

Comment: ----------

Performance step: 5

PERFORM STEPS e-i

Standard: STEPS e-i SHOULD BE N/A'D

NOTE: SETPOINTS WERE NOT CHANGED FOR 1RE-PR001 SO N/A STEPS e-i

Comment: ----------

Performance step: 6

VERIFY FAN RUNNING

Standard: OB AUX BLDG EXHAUST FAN IS RUNNING

Comment: ----------

Performance step: 7

*** PLACE PLACARD "GASEOUS RELEASE IN PROGRESS" SOMEWHERE ON 0PM02J THAT IS VISIBLE***

Standard: * **PLACARD PLACED ON 0PM02J ***

CUE: WHEN ASKED FOR PLACARD INFORM APPLICANT THAT THEY HAVE ONE

NOTE: THE PLACARD PLACEMENT WILL BE SIMULATED

Comment: ----------

CUE: HAND APPLICANT THE COMPLETED 1BOSR 11.b.5-1 1PR01J SOURCE/CHANNEL CHECK

Performance step: 8

*** REVIEW 1BOSR 11.b.5-1 1PR01J SOURCE/CHANNEL CHECK***

Standard: * **1BOSR 11b.5-1 REVIEW IS UNACCEPTABLE, RELEASE NOT AUTHORIZED ***

NOTE: NO COVER SHEET WAS USED, TELL APPLICANT TO ASSUME ONE IS THERE

NOTE: APPLICANT WILL FIND ON STEP 8 THE CURSOR COLOR FOR 1PA201 WILL BE DARK BLUE WHICH IS UNACCEPTABLE PER ACCEPTANCE CRITERIA

Comment: ----------

Performance step: 9

*** INFORM SM TO INITIATE LCOAR 0BOL 11.b RADIAOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION ***

Standard: * **SM INFORMED OF LCOAR 0BOL 11.b ***

CUE: WHEN ASKED SM WILL INITIATE LCOAR 0BOL 11.B

Comment: ----------

TERMINATING CUE: SM I WILL NOT AUTHORIZE THE GAS RELEASE DUE TO 1BOSR 11.b.5-1

TIME STOP_____

Initial Conditions: You are the Unit SRO
Unit 1 is in mode 1
All controls are in automatic, 1PB111 IS OOS

Initiating Cue: THE SM DIRECTS YOU THE UNIT SUPERVISOR TO AUTHORIZE A ROUTINE GASEOUS EFFLUENT RELEASE FROM UNIT 1 CONTAINMENT

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE CNMT PURGE EFFLUENT (1PR01J SOURCE/CHANNEL CHECK)

A. STATEMENT OF APPLICABILITY:

This surveillance applies to the source and channel check of the Radioactive Gaseous Effluent Monitor 1PR01J. This surveillance is performed prior to each containment purge release and is applicable at all times.

B. REFERENCES:

1. TRM:
   a. LCO 3.11.b
   b. SR 3.11.b.5
   c. SR 3.11.b.6
   d. Table T3.11.b-1, Item 5
2. Station Procedures:
   a. 0BOL 11.b, Radioactive Gaseous Effluent Monitoring Instrumentation.
3. P&IDs:
   a. M-78-1, Process Radiation Monitoring
   b. M-105-1, Primray Containment Purge

C. PREREQUISITES:

1. Receive permission from the Shift Manager or designated SRO licensed assistant prior to performing this surveillance by having the Data Package Cover Sheet signed and dated.

D. PRECAUTIONS:

1. None.

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E. LIMITATIONS AND ACTIONS:

1. As stated in TRM LCO 3.11.b.

2. In the event the Acceptance Criteria is not met during the performance of this surveillance, IMMEDIATELY NOTIFY the Shift Manager to initiate LCOAR 0BOL 11.b, Radioactive Gaseous Effluent Monitoring Instrumentation.

F. MAIN BODY:

XX 1. **DETERMINE** Release Number from Rad Protection and applicable release package.

RELEASE # 00094

XX 2. From flowmeter 1FI-PR100 at monitor skid (475' S-17), **RECORD** the flowrate 3.35CFM. Received local flow reading from: YY/XX

XX 3. At the RM-11 Console (1PM14JB-1), **VERIFY/SELECT** Grid 2.

XX 4. **SELECT** channel 1PA201 Status Display and **RECORD** Current Channel Activity 3.23E-15.

XX 5. **DEPRESS** "C/S" key and **VERIFY** "C/S" key is backlit.

XX 6. **VERIFY** channel 1PA201 Status Display indicates "C/S Energized".

¢ XX 7. After the "C/S" key's backlight extinguishes (after one minute), **VERIFY** the following indication on the Status Display for channel 1PA201.

a. "C/S" Test Fail NOT Indicated.

¢ XX 8. **VERIFY** the channel check is acceptable for channel 1PA201 using status cursor and **RECORD** highest cursor color DARK BLUE.

XX 9. **SELECT** Channel 1PB101 Status Display and **RECORD** Current Channel Activity 2.81E-06.

XX 10. **DEPRESS** "C/S" key and **VERIFY** "C/S" key is backlit.

XX 11. **VERIFY** Channel 1PB101 Status Display indicates "C/S Energized".

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'. continued

¢ XX 12. After the "C/S" key's backlight extinguishes (after one minute), **VERIFY** the following indication on the Status Display for Channel 1PB101.

a. "C/S" Test Fail NOT indicated.

¢ XX 13. **VERIFY** the channel check is acceptable for channel 1PB101 using status cursor and **RECORD** highest cursor color Green.

XX 14. **SELECT** Channel 1PC301 Status Display and **RECORD** Current Channel Activity 3.67E-14.

XX 15. **DEPRESS** "C/S" key and **VERIFY** "C/S" key is backlit.

XX 16. **VERIFY** Channel 1PC301 Status Display indicates "C/S Energized".

¢ XX 17. After the "C/S" key's backlight extinguishes (after one minute), **VERIFY** the following indication on the Status Display for Channel 1PC301.

a. "C/S" Test Fail NOT indicated.

¢ XX 18. **VERIFY** the channel check is acceptable for Channel 1PC301 using status cursor and **RECORD** highest cursor color Green.

G. ACCEPTANCE CRITERIA:

1. This surveillance is acceptable if the cursor status is NOT white, magenta, or dark blue for each channel check and if "C/S" TEST FAIL is NOT indicated after completion of each channels' "C/S" Test. (TRM SR 3.11.b.5 and SR 3.11.b.6)

(Final)

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MASTER KEY

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE CNMT PURGE EFFLUENT (1PR01J SOURCE/CHANNEL CHECK)

A. STATEMENT OF APPLICABILITY:

This surveillance applies to the source and channel check of the Radioactive Gaseous Effluent Monitor 1PR01J. This surveillance is performed prior to each containment purge release and is applicable at all times.

B. REFERENCES:

1. TRM:
   a. LCO 3.11.b
   b. SR 3.11.b.5
   c. SR 3.11.b.6
   d. Table T3.11.b-1, Item 5
2. Station Procedures:
   a. 0BOL 11.b, Radioactive Gaseous Effluent Monitoring Instrumentation.
3. P&IDs:
   a. M-78-1, Process Radiation Monitoring
   b. M-105-1, Primray Containment Purge

C. PREREQUISITES:

1. Receive permission from the Shift Manager or designated SRO licensed assistant prior to performing this surveillance by having the Data Package Cover Sheet signed and dated.

D. PRECAUTIONS:

1. None.

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E. LIMITATIONS AND ACTIONS:

1. As stated in TRM LCO 3.11.b.

2. In the event the Acceptance Criteria is not met during the performance of this surveillance, IMMEDIATELY NOTIFY the Shift Manager to initiate LCOAR 0BOL 11.b, Radioactive Gaseous Effluent Monitoring Instrumentation.

F. MAIN BODY:

XX 1. **DETERMINE** Release Number from Rad Protection and applicable release package

RELEASE # 00094

XX 2. From flowmeter 1FI-PR100 at monitor skid (475' S-17), **RECORD** the flowrate 3.3 CFM. Received local flow reading from: XX/XX

XX 3. At the RM-11 Console (1PM14JB-1), **VERIFY/SELECT** Grid 2.

XX 4. **SELECT** channel 1PA201 Status Display and **RECORD** Current Channel Activity 3.23E-15.

XX 5. **DEPRESS** "C/S" key and **VERIFY** "C/S" key is backlit.

XX 6. **VERIFY** channel 1PA201 Status Display indicates "C/S Energized".

¢ XX 7. After the "C/S" key's backlight extinguishes (after one minute), **VERIFY** the following indication on the Status Display for channel 1PA201.

a. "C/S" Test Fail NOT Indicated.

¢ XX 8. **VERIFY** the channel check is acceptable for ~~channel 1PA201~~ using status cursor and **RECORD** highest cursor color (GREEN) → SAO COPY HAS DARK BLUE WRONG

XX 9. **SELECT** Channel 1PB101 Status Display and **RECORD** Current Channel Activity 2.81E-06.

XX 10. **DEPRESS** "C/S" key and **VERIFY** "C/S" key is backlit.

XX 11. **VERIFY** Channel 1PB101 Status Display indicates "C/S Energized".

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. continued

¢ XX 12. After the "C/S" key's backlight extinguishes (after one minute), **VERIFY** the following indication on the Status Display for Channel 1PB101.

a. "C/S" Test Fail NOT indicated.

¢ XX 13. **VERIFY** the channel check is acceptable for channel 1PB101 using status cursor and **RECORD** highest cursor color Green.

XX 14. **SELECT** Channel 1PC301 Status Display and **RECORD** Current Channel Activity 3.67E-14.

XX 15. **DEPRESS** "C/S" key and **VERIFY** "C/S" key is backlit.

XX 16. **VERIFY** Channel 1PC301 Status Display indicates "C/S Energized".

¢ XX 17. After the "C/S" key's backlight extinguishes (after one minute), **VERIFY** the following indication on the Status Display for Channel 1PC301.

a. "C/S" Test Fail NOT indicated.

¢ XX 18. **VERIFY** the channel check is acceptable for Channel 1PC301 using status cursor and **RECORD** highest cursor color Green.

G. ACCEPTANCE CRITERIA:

1. This surveillance is acceptable if the cursor status is NOT white, magenta, or dark blue for each channel check and if "C/S" TEST FAIL is NOT indicated after completion of each channels' "C/S" Test. (TRM SR 3.11.b.5 and SR 3.11.b.6)

(Final)

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GASEOUS EFFLUENT RELEASE FORM

TYPE: ROUTINE CONTAINMENT RELEASE

Release Number 00094

Expiration Time/Date 0902/

A. GASEOUS RELEASE TYPE (CIRCLE ONE):

1. Containment Release Unit - 1.

2. Containment Release Unit - 2.

NOTE

It is permissible to simultaneously release from multiple sources (i.e., other CNMT and Gas Decay Tank etc.) provided that each release meets its respective release rate limits as documented on separate release forms.

B. RADIATION PROTECTION RESPONSIBILITY:

NOTE

Analyzed samples are valid for a period of 30 hours provided:

1. The noble gas trend on the 1(2) RE-PR011B has remained stable since sampling or
2. If the 1(2)RE-PR011B is out of service and the reactor has NOT started-up, shutdown or exceeded a power change of 15% in a 1 hour period since sampling.

During this 30 hour period, more than (1) one containment release package may be prepared using a single set of samples provided a separate release package and 1(2) BRSR 11.f.1-4 surveillance are initiated for each package.

1. OBTAIN radiochemistry analyses and ATTACH to the release package for the following:

   a. Containment Noble Gas Activity N/A

   b. Containment Tritium Activity N/A

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(9598SS/WPF/013100)

B. continued

2. Release Rate and Monitor Setpoint Determination

a. VERIFY that the release does not exceed the 10CFR20 release limits by comparing the calculated total μCi/sec values to their stated μCi/sec limits. In either case, the total noble gas release rate must be ≤4E4 μCi/sec and the tritium release rate ≤6E5 μCi/sec.

NOTE

The release rate calculation assumes a containment purge rate of 43,900 CFM (2.07E7 cc/sec) which is associated with main purge.

If the release is not acceptable with the main purge flowrate, terminate this form and refer to BCP 400-TCNMT/POST LOCA. The mini-purge flowpath cannot be used because there is no way to control the release rate.

b. DETERMINE noble gas and tritium release rate using the equation below and RECORD on the table.

μCi/sec = Noble gas activity (μCi/cc) x 2.07E7 cc/sec

ISOTOPE	1 CNMT ACTIVITY (μCi/cc)	RELEASE RATE (μCi/sec)
Xe 133	5.77E-7	1.19E1
TOTAL		1.19E1

RELEASE RATE LIMIT 4E4 μCi/sec

μCi/sec = Tritium activity (μCi/cc) x 2.07E7 cc/sec

H-3	2.68E-7	1.59E1	6E5 μCi/sec

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B.2. continued

c. Is the TOTAL NOBLE GAS RELEASE RATE less than or equal to 4E4 µCi/sec and the TRITIUM RELEASE RATE less than or equal to 6E5 µCi/sec?

[✓] YES This package is acceptable for release using the Main Purge or Mini-Purge flowpaths, not to exceed 43,900 CFM. GO TO Step d.

[ ] NO Release is not acceptable under this procedure. Refer to BCP 400-TCNMT/POST LOCA.

MA/___

d. Determination of monitor setpoints for the CNMT Purge gas Detector.

1). The CNMT purge monitor gas detector [1(2)PB101] setpoints will be determined by using the current CNMT atmosphere monitor gas detector [1(2)PB111] value. The current [1(2)PB111] value can be obtained from the RM-11 in the control room or GSEP Point Analysis Trend ID #RP0076 (Unit 1) or RP0114 (Unit 2). See below:

NA
MA

Calculated setpoint =
Current 1(2)PB111 value _____(µCi/cc) X 1.25

Calculated monitor setpoint = _____(µCi/cc)

Verify that the noble gas trend from the 1(2)PB111 has remained stable (factor of 5) since sampling. (N/A this step if the 1(2)PB111 is not in service.)

___/___

NOTE: per ODCM 1PB111 ES 005.

2). PERFORM THIS STEP ONLY IF [1(2)PB111] IS OUT OF SERVICE. If the containment atmosphere monitor gas detector is out of service, the calculated monitor setpoint will be set at a value of 50% above the total analyzed containment noble gas activity plus the current containment purge monitor gas detector [1(2)PB101] background (GSEP Point Analysis Trend ID #RP0066 (Unit 1) or RP0104 (Unit 2).

Calculated setpoint =
[Total CNMT noble gas activity 5.77E-7 (µCi/cc)
x 1.5] + [1(2)PB101 background 2.89E-6 (µCi/cc)]

Calculated monitor setpoint = 3.75E-6 (µCi/cc)

MA/___

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FEB 21 2000

B.2.d. continued

3). Compare the calculated monitor setpoint from step B.2.d.1 or B.2.d.2 to the current 1(2)PB101 monitor setpoints. These setpoints are:

4.83E-4 µCi/cc for the HIGH setpoint

3.75E-6 2.42E-4 µCi/cc for the ALERT setpoint

µCi/cc CHCC SETPOINTS

Circle the correct response:

MA

a). If the calculated 1(2)PB101 setpoint is less than the current Alert and High setpoints, use the current setpoints for the Alert and High setpoints.

b). If the calculated 1(2)PB101 setpoint is greater than the current Alert setpoint but less than the current High setpoint, use the current High setpoint and the calculated setpoint for the Alert setpoint.

c). If the calculated 1(2)PB101 setpoint is greater than both the current Alert and High setpoints, use the calculated setpoint for both the Alert and High setpoints.

MA

e. Release Summary Information:

1(2)PB101 Monitor Setpoints For This Release:

HIGH Alarm Setpoint 4.83E-4 µCi/cc

ALERT Alarm Setpoint 2.42E-4 µCi/cc

MA

NOTE

Particulate and iodine setpoints need not be addressed on the CNMT purge monitor; the setpoints for these channels have been previously determined and placed in the data base.

Approved for release _____ / 0905 /
R.P. Supervision Time/Date

MA

APPROVED

FEB 21 2000

C. OPERATING DEPARTMENT RESPONSIBILITY (CONTAINMENT RELEASE):

NOTE
If any of the below instruments are inoperable then refer to Technical Requirement Manual T3.11.b-1 for appropriate action.

1. Perform the appropriate instrumentation operability checks and required TRM surveillances on applicable monitors.

Containment Releases

a. VERIFY/COMPLETE daily Channel check on 1(2)RE-PR001 performed during _BOSR 0.1-0. _____/_____

b. Perform _BOSR 11.b.5-1, Radioactive Gaseous Effluent Monitoring Instrumentation Surv. CNMT Purge Effluent (1(2)PR01J Source/Channel Check). _____/_____

c. VERIFY that the noble gas trend from the _PB111 has not increased by more than 10% from the value found in Step B.2.d.1). If the value has increased by more than 10%, but the trend has remained stable (factor of 5) reperform step B.2.d. and B.2.e. or notify Radiation Protection. (NA this step if _PB111 is out of service). _____

d. Record the "As Found" Setpoints of _RE-PR001 Gas Channel PB101 (Grid 2).

_PB101 - HIGH Alarm Setpoint _____ µCi/cc

ALERT Alarm Setpoint _____ µCi/cc _____/_____

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C.1. continued

NOTE
Steps e-i should be completed only if the setpoints calculated in Step B.2.e. are different than the current setpoints of _____ RE-PR001 Gas Channel. Otherwise mark N/A.

NOTE
When the RM-11 is in SUPERVISOR MODE, some actions may have serious detrimental effects on system operation. Use CAUTION and DO NOT leave the RM-11 console unattended when it is in the SUPERVISOR MODE. If any unusual conditions occur then contact the System Engineer.

e. PLACE the RM-11 console in SUPERVISOR MODE.

f. SELECT the required Rad Monitor using the appropriate RM-11 address and depressing the SEL key.

Grid 2 ____PB101

g. DEPRESS the CHANNEL ITEM Key. Then SELECT the High Alarm Setpoint Channel Item by keying in "9" and then depressing the SEL key.

h. Enter the High Alarm Setpoint documented in Section B.2.e. using the format XYZ ± AB for XYZE ± AB. (i.e. A value of 5.36E-12 would be entered as 536-12). The new setpoint will be displayed after a short period of time. Record the new setpoint.

__ PB101 _____ HIGH ALARM SETPOINT _____

i. ENTER the Alert Alarm Setpoint for __PB101 documented in Section B.2.e. using the method described in steps e, f, g, and h. In order to select the ALERT Alarm Channel Item in step f, a "10" must be keyed in.

__ PB101 _____ ALERT ALARM SETPOINT _____

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FEB 21 2000

C. continued

NOTE
Stopping or starting a VA Exhaust Fan will significantly change flow rates to the Plant Vent Stack which in turn affect release rate calculations.

2. ENSURE the 0A or 0B Aux Bldg. Exhaust Fan is in operation for U-1 Containment releases, and 0C or 0D Exhaust Fan is in operation for U-2 Containment releases.

   (This requirement may be deleted at the discretion of the Shift Manager and Radiation Protection Dept.)

D. UNIT SUPERVISOR OR SRO RESPONSIBILITY

1. If the 1(2)REPRO11B is out of service then, VERIFY that the reactor has NOT started-up, shutdown or exceeded a power change of 15% in a 1 hour period since sampling.

2. PLACE the placard "Gaseous Release in Progress" somewhere on 0PM02J where the placard will be visible. This is to prevent changing the ventilation flow path and flow rate during the release.

3. VERIFY ___BOSR 11.b.5-1, Radioactive Gaseous Effluent Monitoring Instrumentation Surveillance Cnmt Purge Effluent (1 (2) PR01J Source/Channel Check), completed and reviewed.

4. REVIEW information and ENSURE the form is filled out properly.

Approval for Release _____/_____
US or SRO Date

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FEB 21 2000

E. OPERATOR RESPONSIBILITY:

1. To initiate the release, refer to BOP VQ-5 for Normal Containment Purge System, or refer to BOP VQ-6 to release through the Containment Mini Purge System.

> **NOTE**
> Containment purge system (1VQ01CA/B and 1VQ02CA/B) may be used during Modes 5 & 6 only per Improved Technical Specification 3.6.3.

	OPERATOR	SRO
a. Affected CNMT Unit ____	____/____	____/____
Record Expiration Time from page 1 time ____/date ____		____/____
b. Initial CNMT Pressure: ____ psig		____/____
c. Start time of Release (all isolation dampers and valves open per BOP VQ-5 or BOP VQ-6) time ____/date ____		____/____
d. Start time of fans (NA if venting only) time ____/date ____		____/____

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FEB 21 2000

E. continued

NOTE
The RP department should be notified of interruptions of purging operations so contamination control alternatives can be implemented if needed. If an individual interruption lasts greater than 4 hours, contact RP to determine if a new release form should be initiated prior to restoration of purging operations (i.e. due to a change in conditions or updated samples).

2. To temporarily suspend release and then reinitiate with this package, perform the following: (otherwise NA this step).

   a. Shutdown the purge system per BOP VQ-5 or BOP VQ-6 as applicable.

   b. RECORD time periods for interruptions in purging operations, (including changes in purge fan status). If an individual interruption in purging operations exceeds 4 hours, contact RP to determine if an updated release package is needed. Containment pressure does not need to be documented during the interruption.

Date/Time period of interruption: (i.e. 1200 1/1/96 to 1300 1/1/96)	RP Dept notified	Initials/Date	Comments (purge isolated, fan secured etc.)
_____	Y / N	_____/_____	_____
_____	Y / N	_____/_____	_____
_____	Y / N	_____/_____	_____
_____	Y / N	_____/_____	_____
_____	Y / N	_____/_____	_____
_____	Y / N	_____/_____	_____
_____	Y / N	_____/_____	_____

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FEB 21 2000

E. continued

3. Terminate the release as follows:

a. Stop purge fans per BOP VQ-5 or BOP VQ-6 as applicable _____ / _____ Dual Verf

b. Close all isolation dampers per BOP VQ-5 or BOP VQ-6 as applicable. _____ / _____ Dual Verf

c. Release termination time _____ / _____ time date _____ / _____

d. Final containment pressure: _____ psig _____ / _____

4. RETURN the Rad Monitor _RE-PR001 for the affected release path to the below listed Setpoints. (This Step is NOT APPLICABLE if setpoints were not changed in step C.1).

	High Alarm As Left Setpoint		
__ PB101	4.83E-4	_____	_____ Dual Verf

	Alert Alarm As Left Setpoint		
__ PB101	2.42E-4	_____	_____ Dual Verf

5. REMOVE the placard "Gaseous Release in Progress" from 0PM02J.

6. RETURN this release form to the US or SRO.

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FEB 21 2000

F. SHIFT MANAGER OR SRO RESPONSIBILITY (CONTAINMENT RELEASE):

1. REVIEW the discharge data and ENSURE that the form is filled out properly. If the release was cancelled REVIEW the form and VERIFY plant configuration has been restored to normal. Consideration should be given to the following items, however this is not an all-inclusive list:

   1/2-PR001 Radiation Monitor Activity Setpoints
   VQ damper and fan status

   Reviewed by:_____/_____
   Shift Manager or SRO Date

2. Forward this form to Radiation Protection Supervision.

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FEB 21 2000

3. Verify compliance with 10CFR50 dose limits as specified in the Technical Requirements Manual 3.11.g and 3.11.h by entering release data into the ACTUAL MODE or PROJECTED MODE of the 10CFR50 0DCM gaseous release program per BRP 6110-9.

> **NOTE**
> Notify the Radiation Protection Supervisor if greater than 25% of any quarterly 10CFR50 limit is reached.

Entry completed _____/_____
Radiation Protection Supervision Date

CURRENT DATE: 2000 03:59:52.65 FILE LOC: 2.12.1322
STATION NAME: BYRON

1REPR011 GAS SAMPLE ANALYSIS

COLLECTOR....:	FP	NUCLIDE LIBRARY..:	GENGAS
ANALYST.....:	EJS	GEOMETRY.....:	1PGAS250
SAMPLE TIME..:	-2000 03:07:00.00	COUNT TIME.....:	0 00:17:00.00
ANALYSIS TIME:	-2000 03:41:19.71	SAMPLE VOL/MASS..:	2.50000E+02 CC
DETECTOR.....:	23P067B	DEADTIME.....:	0.0%
TIME ON.....:		FLOW ON.....:	0.00 CFM
TIME OFF.....:	-2000 03:07:00.00	FLOW OFF.....:	0.00 CFM

SAMPLE POINT.:
REMARK.....:
CONFIG FILE..: 1DIA4:[CRU.SAMP]23P067B_SAMP_4854.CNF;1

AREA IN SPECTRUM = 1585. IF AREA = ZERO, TAG DETECTOR OOS & RECOUNT

Brief Report

Nuclide	Activity UCI/CC	1-Sigma Error
XE-133	5.772E-07	3.332E-07
Total Activity :	5.772E-07	

BRP 6021-20T1
Revision 1

ATMOSPHERIC TRITIUM CALCULATION FORM

SAMPLE LOCATION IRE-PR011 START TIME/DATE: 0126 / ____

SAMPLE TYPE Bubbler STOP TIME/DATE: 0302 / ____

COUNTER USED: MODEL # 2SOUTR

SERIAL # 936 ANALYST: EP

DEHUMIDIFIER:

WET BULB TEMPERATURE _____ °F W. B. GRAINS OF MOISTURE _____

DRY BULB TEMPERATURE _____ °F D. B. GRAINS OF MOISTURE _____

HUMIDITY _____ lbs H_2O/lbs DRY AIR

SAMPLE ACTIVITY _____ µCi/ml (in liquid) N/A SDR

TRITIUM CONCENTRATION = (_____ lbs H_2O/lbs DRY AIR)(_____ µCi/ml)(454g/lb) / (2.83E04 cc/ft^3)(13 ft^3/lb DRY AIR)(.987 g/ml)

= _____ µCi/cc (in air)

BUBBLER:

TRITIUM CONCENTRATION = (1.97E-4 µCi/ml)(150 ml) = 2.95E-2 µCi (2)

(Bubbler) (400 cc/min)(1) (96 min) 38400 cc

= 7.68E-7 µCi/cc (in air)

(3)

DAC's (in air) = 7.68E-7 µCi/cc / 2E-5 (µCi/cc)/DAC = 3.84E-2 DAC's (in air)

(1) Flow Rate of 100-500 cc/min

(2) 6000 cc minimum

(3) Notify Duty RPLS if >0.3 DAC

REVIEWED BY _____
RADIATION PROTECTION SUPERVISION / DATE

RECOMMENDATIONS _____

(Final)

APPROVED
JAN 0 1 1994

(0784SS/WPF/100293)

SRO

MASTER

Key

CONTINUOUS USE

BCP 400-TCNMT/ROUTINE
Revision 5

GASEOUS EFFLUENT RELEASE FORM

TYPE: ROUTINE CONTAINMENT RELEASE

Release Number 00094

Expiration Time/Date 0902/___

A. GASEOUS RELEASE TYPE (CIRCLE ONE):

1. Containment Release Unit - 1.

2. Containment Release Unit - 2.

NOTE

It is permissible to simultaneously release from multiple sources (i.e., other CNMT and Gas Decay Tank etc.) provided that each release meets its respective release rate limits as documented on separate release forms.

B. RADIATION PROTECTION RESPONSIBILITY:

NOTE

Analyzed samples are valid for a period of 30 hours provided:

1. The noble gas trend on the 1(2) RE-PR011B has remained stable since sampling or
2. If the 1(2)RE-PR011B is out of service and the reactor has NOT started-up, shutdown or exceeded a power change of 15% in a 1 hour period since sampling.

During this 30 hour period, more than (1) one containment release package may be prepared using a single set of samples provided a separate release package and 1(2) BRSR 11.f.1-4 surveillance are initiated for each package.

1. OBTAIN radiochemistry analyses and ATTACH to the release package for the following:

   a. Containment Noble Gas Activity MA/___

   b. Containment Tritium Activity MA/___

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FEB 21 2000

B. continued

2. Release Rate and Monitor Setpoint Determination

a. VERIFY that the release does not exceed the 10CFR20 release limits by comparing the calculated total μCi/sec values to their stated μCi/sec limits. In either case, the total noble gas release rate must be ≤4E4 μCi/sec and the tritium release rate ≤6E5 μCi/sec.

NOTE

The release rate calculation assumes a containment purge rate of 43,900 CFM (2.07E7 cc/sec) which is associated with main purge.

If the release is not acceptable with the main purge flowrate, terminate this form and refer to BCP 400-TCNMT/POST LOCA. The mini-purge flowpath cannot be used because there is no way to control the release rate.

b. DETERMINE noble gas and tritium release rate using the equation below and RECORD on the table.

μCi/sec = Noble gas activity (μCi/cc) x 2.07E7 cc/sec

ISOTOPE	1 CNMT ACTIVITY (μCi/cc)	RELEASE RATE (μCi/sec)
Xe 133	5.728-7	1.191
TOTAL		1.191

RELEASE RATE LIMIT 4E4 μCi/sec

μCi/sec = Tritium activity (μCi/cc) x 2.07E7 cc/sec

H-3	7.688-7	1.591	6E5 μCi/sec

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FEB 21 2000

(9598SS/WPF/013100)

B.2. continued

c. Is the TOTAL NOBLE GAS RELEASE RATE less than or equal to 4E4 µCi/sec and the TRITIUM RELEASE RATE less than or equal to 6E5 µCi/sec?

[✓] YES This package is acceptable for release using the Main Purge or Mini-Purge flowpaths, not to exceed 43,900 CFM. GO TO Step d.

[ ] NO Release is not acceptable under this procedure. Refer to BCP 400-TCNMT/POST LOCA.

MS / ____

d. Determination of monitor setpoints for the CNMT Purge gas Detector.

1). The CNMT purge monitor gas detector [1(2)PB101] setpoints will be determined by using the current CNMT atmosphere monitor gas detector [1(2)PB111] value. The current [1(2)PB111] value can be obtained from the RM-11 in the control room or GSEP Point Analysis Trend ID #RP0076 (Unit 1) or RP0114 (Unit 2). See below:

NT
MS

Calculated setpoint =
Current 1(2)PB111 value _____(µCi/cc) X 1.25

Calculated monitor setpoint = _____(µCi/cc)

Verify that the noble gas trend from the 1(2)PB111 has remained stable (factor of 5) since sampling. (N/A this step if the 1(2)PB111 is not in service.)

____ / ____

NOTE:
PER ODS @
1PB 111 IS OOS.

2). PERFORM THIS STEP ONLY IF [1(2)PB111] IS OUT OF SERVICE. If the containment atmosphere monitor gas detector is out of service, the calculated monitor setpoint will be set at a value of 50% above the total analyzed containment noble gas activity plus the current containment purge monitor gas detector [1(2)PB101] background (GSEP Point Analysis Trend ID #RP0066 (Unit 1) or RP0104 (Unit 2).

Calculated setpoint =
[Total CNMT noble gas activity 5.77E-7 (µCi/cc)
x 1.5] + [1(2)PB101 background 2.89E-6 (µCi/cc)]

Calculated monitor setpoint = 3.75E-6 (µCi/cc)

MS / ____

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FEB 21 2000

B.2.d. continued

3). Compare the calculated monitor setpoint from step B.2.d.1 or B.2.d.2 to the current 1(2)PB101 monitor setpoints. These setpoints are:

4.83E-4 µCi/cc for the HIGH setpoint

3.75E-6 2.42E-4 µCi/cc for the ALERT setpoint

~ Ci/cc CALC SETPOINTS

Circle the correct response:

MR

a). If the calculated 1(2)PB101 setpoint is less than the current Alert and High setpoints, use the current setpoints for the Alert and High setpoints.

b). If the calculated 1(2)PB101 setpoint is greater than the current Alert setpoint but less than the current High setpoint, use the current High setpoint and the calculated setpoint for the Alert setpoint.

c). If the calculated 1(2)PB101 setpoint is greater than both the current Alert and High setpoints, use the calculated setpoint for both the Alert and High setpoints.

MR

e. Release Summary Information:

1(2)PB101 Monitor Setpoints For This Release:

HIGH Alarm Setpoint 4.83E-4 µCi/cc

ALERT Alarm Setpoint 2.42E-4 µCi/cc

MR

NOTE

Particulate and iodine setpoints need not be addressed on the CNMT purge monitor; the setpoints for these channels have been previously determined and placed in the data base.

Approved for release _____ 0905
R.P. Supervision Time/Date

MR

APPROVED

FEB 21 2000

(9598SS/WPF/013100)

C. OPERATING DEPARTMENT RESPONSIBILITY (CONTAINMENT RELEASE):

NOTE
If any of the below instruments are inoperable then refer to Technical Requirement Manual T3.11.b-1 for appropriate action.

1. Perform the appropriate instrumentation operability checks and required TRM surveillances on applicable monitors.

   Containment Releases

   a. VERIFY/COMPLETE daily Channel check on 1(2)RE-PR001 performed during 1BOSR 0.1-0. XX/XX

   b. Perform 1BOSR 11.b.5-1, Radioactive Gaseous Effluent Monitoring Instrumentation Surv. CNMT Purge Effluent (1(2)PR01J Source/Channel Check). XX/XX

   c. VERIFY that the noble gas trend from the 1PB111 has not increased by more than 10% from the value found in Step B.2.d.1). If the value has increased by more than 10%, but the trend has remained stable (factor of 5) reperform step B.2.d. and B.2.e. or notify Radiation Protection. (NA this step if 1PB111 is out of service). NA

   d. Record the "As Found" Setpoints of 1RE-PR001 Gas Channel PB101 (Grid 2).

      1PB101 - HIGH Alarm Setpoint 4.83E-4 µCi/cc → Have Applicant Show you on Grid

      ALERT Alarm Setpoint 2.42E-4 µCi/cc XX/XX Then Tell them those values for release

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FEB 21 2000

C.1. continued

NOTE
Steps e-i should be completed only if the setpoints calculated in Step B.2.e. are different than the current setpoints of 1 RE-PR001 Gas Channel. Otherwise mark N/A.

NOTE
When the RM-11 is in SUPERVISOR MODE, some actions may have serious detrimental effects on system operation. Use CAUTION and DO NOT leave the RM-11 console unattended when it is in the SUPERVISOR MODE. If any unusual conditions occur then contact the System Engineer.

e. PLACE the RM-11 console in SUPERVISOR MODE. N/A

f. SELECT the required Rad Monitor using the appropriate RM-11 address and depressing the SEL key.

Grid 2 N/A PB101 N/A

g. DEPRESS the CHANNEL ITEM Key. Then SELECT the High Alarm Setpoint Channel Item by keying in "9" and then depressing the SEL key.

N/A

h. Enter the High Alarm Setpoint documented in Section B.2.e. using the format XYZ ± AB for XYZE ± AB. (i.e. A value of 5.36E-12 would be entered as 536-12). The new setpoint will be displayed after a short period of time. Record the new setpoint.

1 PB101 N/A HIGH ALARM SETPOINT N/A

i. ENTER the Alert Alarm Setpoint for PB101 documented in Section B.2.e. using the method described in steps e, f, g, and h. In order to select the ALERT Alarm Channel Item in step f, a "10" must be keyed in.

1 PB101 N/A ALERT ALARM SETPOINT N/A

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C. continued

NOTE
Stopping or starting a VA Exhaust Fan will significantly change flow rates to the Plant Vent Stack which in turn affect release rate calculations.

2. ENSURE the 0A or 0B Aux Bldg. Exhaust Fan is in operation for U-1 Containment releases, and 0C or 0D Exhaust Fan is in operation for U-2 Containment releases.

(This requirement may be deleted at the discretion of the Shift Manager and Radiation Protection Dept.)

XXXX

D. UNIT SUPERVISOR OR SRO RESPONSIBILITY

XX 1. If the 1(2)REPRO11B is out of service then, VERIFY that the reactor has NOT started-up, shutdown or exceeded a power change of 15% in a 1 hour period since sampling.

XX 2. PLACE the placard "Gaseous Release in Progress" somewhere on 0PM02J where the placard will be visible. This is to prevent changing the ventilation flow path and flow rate during the release.

XX 3. VERIFY 1 BOSR 11.b.5-1, Radioactive Gaseous Effluent Monitoring Instrumentation Surveillance Cnmt Purge Effluent (1 (2) PR01J Source/Channel Check), completed and reviewed.

4. REVIEW information and ENSURE the form is filled out properly.

Approval for Release _____ / _____
US or SRO Date

1 BOSR 11.b.5-1 will NOT Be Completed SRO will NOT Be Able to Authorize Release

See Attached Copy of 1 BOSR 11.b.5-1

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E. OPERATOR RESPONSIBILITY:

1. To initiate the release, refer to BOP VQ-5 for Normal Containment Purge System, or refer to BOP VQ-6 to release through the Containment Mini Purge System.

> **NOTE**
> Containment purge system (1VQ01CA/B and 1VQ02CA/B) may be used during Modes 5 & 6 only per Improved Technical Specification 3.6.3.

	OPERATOR	SRO
a. Affected CNMT Unit ____	____/____	____/____
Record Expiration Time from page 1 ____/____ time date		____/____
b. Initial CNMT Pressure: ____ psig		____/____
c. Start time of Release (all isolation dampers and valves open per BOP VQ-5 or BOP VQ-6) ____/____ time date		____/____
d. Start time of fans (NA if venting only) ____/____ time date		____/____

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FEB 21 2000

E. continued

NOTE

The RP department should be notified of interruptions of purging operations so contamination control alternatives can be implemented if needed. If an individual interruption lasts greater than 4 hours, contact RP to determine if a new release form should be initiated prior to restoration of purging operations (i.e. due to a change in conditions or updated samples).

2. To temporarily suspend release and then reinitiate with this package, perform the following: (otherwise NA this step).

   a. Shutdown the purge system per BOP VQ-5 or BOP VQ-6 as applicable.

   b. RECORD time periods for interruptions in purging operations, (including changes in purge fan status). If an individual interruption in purging operations exceeds 4 hours, contact RP to determine if an updated release package is needed. Containment pressure does not need to be documented during the interruption.

Date/Time period of interruption: (i.e. 1200 1/1/96 to 1300 1/1/96)	RP Dept notified	Initials/Date	Comments (purge isolated, fan secured etc.)
_____	Y / N	____/____	_____
_____	Y / N	____/____	_____
_____	Y / N	____/____	_____
_____	Y / N	____/____	_____
_____	Y / N	____/____	_____
_____	Y / N	____/____	_____
_____	Y / N	____/____	_____

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FEB 21 2000

E. continued

3. Terminate the release as follows:

   a. Stop purge fans per BOP VQ-5 or BOP VQ-6 as applicable ____/____ ____/____ Dual Verf

   b. Close all isolation dampers per BOP VQ-5 or BOP VQ-6 as applicable. ____/____ ____/____ Dual Verf

   c. Release termination time ____/____ (time / date) ____/____

   d. Final containment pressure: _____ psig ____/____

4. RETURN the Rad Monitor _RE-PR001 for the affected release path to the below listed Setpoints. (This Step is NOT APPLICABLE if setpoints were not changed in step C.1).

	High Alarm As Left Setpoint		
__ PB101	4.83E-4	_____	_____ Dual Verf

	Alert Alarm As Left Setpoint		
__ PB101	2.42E-4	_____	_____ Dual Verf

5. REMOVE the placard "Gaseous Release in Progress" from 0PM02J.

6. RETURN this release form to the US or SRO.

APPROVED

FEB 21 2000

F. SHIFT MANAGER OR SRO RESPONSIBILITY (CONTAINMENT RELEASE):

1. REVIEW the discharge data and ENSURE that the form is filled out properly. If the release was cancelled REVIEW the form and VERIFY plant configuration has been restored to normal. Consideration should be given to the following items, however this is not an all-inclusive list:

   1/2-PR001 Radiation Monitor Activity Setpoints
   VQ damper and fan status

   Reviewed by:_____/_____
   Shift Manager or SRO Date

2. Forward this form to Radiation Protection Supervision.

APPROVED

FEB 21 2000

3. Verify compliance with 10CFR50 dose limits as specified in the Technical Requirements Manual 3.11.g and 3.11.h by entering release data into the ACTUAL MODE or PROJECTED MODE of the 10CFR50 0DCM gaseous release program per BRP 6110-9.

NOTE
Notify the Radiation Protection Supervisor if greater than 25% of any quarterly 10CFR50 limit is reached.

Entry completed _____/_____
Radiation Protection Supervision Date

CURRENT DATE: 2000 03:59:52.65 FILE LOC: 2.12.1322
STATION NAME: BYRON

1REPR011 GAS SAMPLE ANALYSIS

COLLECTOR....:	FP	NUCLIDE LIBRARY..:	GENGAS
ANALYST.....:	EJS	GEOMETRY.....:	1PGAS250
SAMPLE TIME..:	-2000 03:07:00.00	COUNT TIME.....:	0 00:17:00.00
ANALYSIS TIME:	-2000 03:41:19.71	SAMPLE VOL/MASS..:	2.50000E+02 CC
DETECTOR.....:	23P067B	DEADTIME.....:	0.0%
TIME ON.....:		FLOW ON.....:	0.00 CFM
TIME OFF.....:	-2000 03:07:00.00	FLOW OFF.....:	0.00 CFM

SAMPLE POINT.:
REMARK.....:
CONFIG FILE..: 1DIA4:[CRU.SAMP]23P067B_SAMP_4854.CNF;1

AREA IN SPECTRUM = 1585. IF AREA = ZERO, TAG DETECTOR OOS & RECOUNT

Brief Report

Nuclide	Activity UCI/CC	1-Sigma Error
XE-133	5.772E-07	3.332E-07
Total Activity :	5.772E-07	

BRP 6021-20T1
Revision 1

ATMOSPHERIC TRITIUM CALCULATION FORM

SAMPLE LOCATION IRE-PRO11 START TIME/DATE: 0126 / ____

SAMPLE TYPE Bubbler STOP TIME/DATE: 0302 / ____

COUNTER USED: MODEL # 2SOUTR

SERIAL # 936 ANALYST: EP

DEHUMIDIFIER:

WET BULB TEMPERATURE _____ °F W. B. GRAINS OF MOISTURE _____

DRY BULB TEMPERATURE _____ °F D. B. GRAINS OF MOISTURE _____

HUMIDITY _____ lbs H_2O/lbs DRY AIR

SAMPLE ACTIVITY _____ µCi/ml (in liquid) N/A SDR

TRITIUM CONCENTRATION = (DEHUMIDIFIER)

(_____ lbs H_2O/lbs DRY AIR)(_____ µCi/ml)(454g/lb)

(2.83E04 cc/ft^3)(13 ft^3/lb DRY AIR)(.987 g/ml)

= _____ µCi/cc (in air)

BUBBLER:

TRITIUM CONCENTRATION = (1.97E-4 µCi/ml)(150 ml) = 2.95E-2 µCi (2)

(Bubbler) (400 cc/min)(1) (96 min) 38400 cc

= 7.68E-7 µCi/cc (in air)

(3)

DAC's (in air) = $\frac{7.68E-7 \text{ µCi/cc}}{2E-5 \text{ (µCi/cc)/DAC}}$ = 3.84E-2 DAC's (in air)

(1) Flow Rate of 100-500 cc/min

(2) 6000 cc minimum

(3) Notify Duty RPLS if >0.3 DAC

REVIEWED BY _____
RADIATION PROTECTION SUPERVISION / DATE

RECOMMENDATIONS _____

(Final)

APPROVED
JAN 0 1 1994

(0784SS/WPF/100293)

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility: BYRON Task No: _____

Task Title: NARS FORM (CLASSIFY EVENT) Job Performance Measure No: A.4 (SRO)

K/A Reference: 2.4.41 4.1

Examinee: _____ NRC Examiner: _____

Date: _____

Method of testing:

Simulated Performance _____ Actual Performance ____X____

Classroom _____X_____ Simulator _____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions: You are the Unit 1 SRO. Reactor Power was at 100% power. Maintenance was being performed sequentially on the inboard and outboard airlock for the Emergency Escape Hatch. Actions in accordance with LCO 3.6.2 were entered. A Steam Generator tube rupture occurred on 1A S/G and containment was evacuated via the Emergency Escape Hatch. The Escape Hatch airlocks failed to close. The Unit is cooling down in accordance with 1BEP-3. The chemistry results showed a 350 uCi/g I-131. The wind is blowing at 10 miles/hr from 222 degrees.

Task Standard: CLASSIFY EVENT AND MAKE PARS IF NECESSARY

Required Materials: BZP 200-A1, BZP 200-1, BZP 300-A2, BZP 310-2T1

General References:
BZP 200-A1
BZP 200-1
BZP 300-A2
BZP 310-2T1

Initiating Cue: CLASSIFY THE EVENT BASED ON THE INITIAL CONDITIONS AND FILL OUT ALL ASSOCIATED PAPERWORK. (15 MINUTE TIME LIMIT AFTER CLASSIFICATION)

Time Critical Task: NO

Validation Time: 10 MINUTES

PERFORMANCE INFORMATION

START TIME: _____

(Denote critical steps with a **BOLD** *)

Performance step: 1

ENTER 1BZP 200-A1

Standard: LOCATE AND OPEN 1BZP 200-A1

Comment: ----------

Performance step: 2

CLASSIFY EVENT

Standard: EVENT IS A GENERAL EMERGENCY BASED ON LOSS OF 3 BARRIERS

NOTE: COMPLETED CHART FOR CLASSIFICATION ATTACHED

Comment: ----------

Performance step: 3

ENTER 1BZP 300-A2

Standard: LOCATE AND OPEN 1BZP 300-A2

Comment: ----------

Performance step: 4

*** MAKE PARS ***

Standard: *** PARS H, F, & G MADE ***

NOTE: COMPLETED FLOW CHART OF PARS ATTACHED

Comment: ----------

Performance step: 5

*** FILL OUT BZP 310-2T1 ***

Standard: *** BZP 310-2T1 FILLED IN WITH ABOVE DATA ***

NOTE: COMPLETED BZP 310-2T1 ATTACHED

Comment: ----------

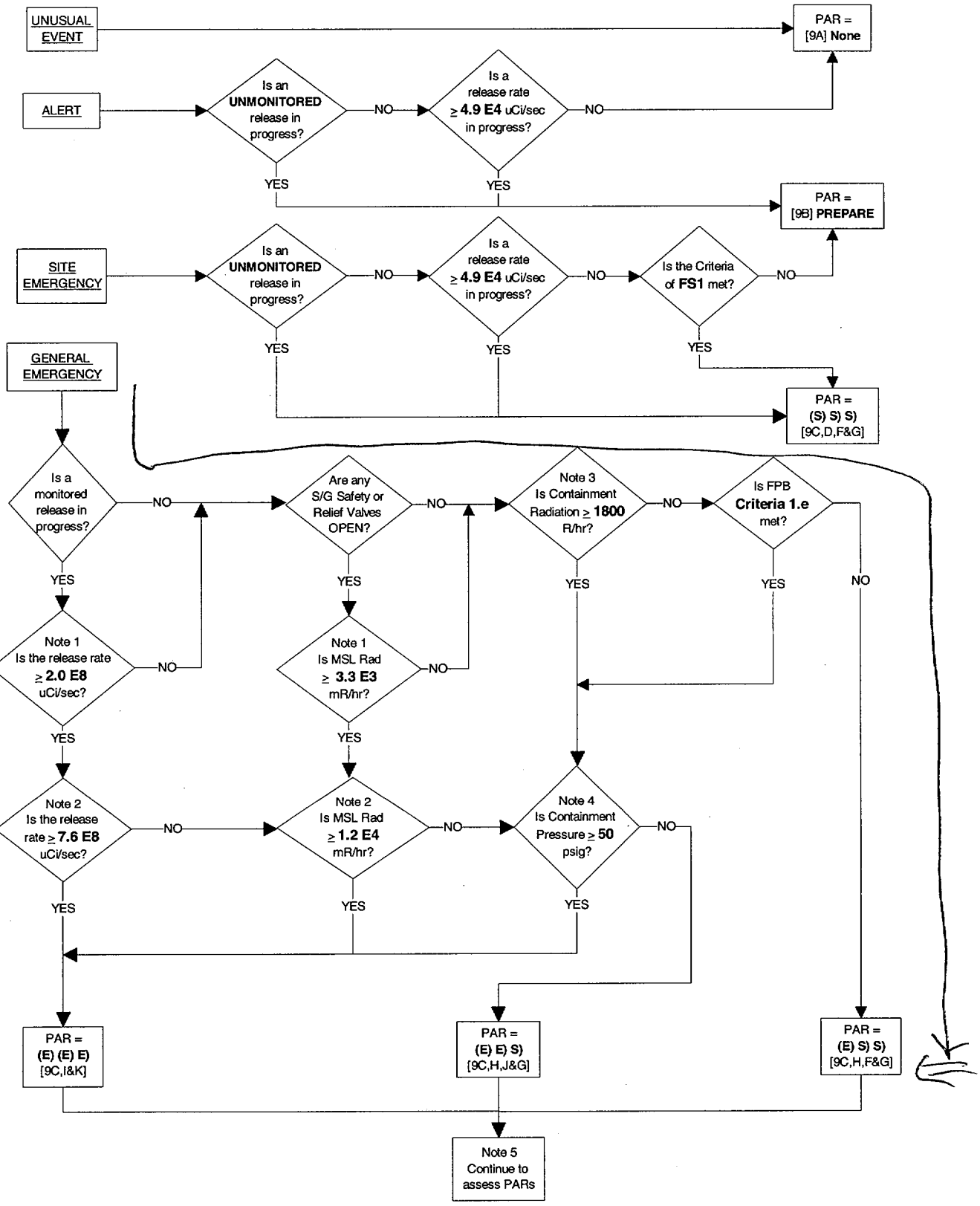
TERMINATING CUE: THE EVENT CLASSIFICATION AND PARS ARE MADE WITH BZP 310-2T1 FILLED OUT

TIME STOP_____

Initial Conditions: You are the Unit 1 SRO. Reactor Power was at 100% power. Maintenance was being performed sequentially on the inboard and outboard airlock for the Emergency Escape Hatch. Actions in accordance with LCO 3.6.2 were entered. A Steam Generator tube rupture occurred on 1A S/G and containment was evacuated via the Emergency Escape Hatch. The Escape Hatch airlocks failed to close. The Unit is cooling down in accordance with 1BEP-3. The chemistry results showed a 350 uCi/g I-131. The wind is blowing at 10 miles/hr from 222 degrees.

Initiating Cue: CLASSIFY THE EVENT BASED ON THE INITIAL CONDITIONS AND FILL OUT ALL ASSOCIATED PAPERWORK. (15 MINUTE TIME LIMIT AFTER CLASSIFICATION)

FIGURE 6.3-1
PROTECTIVE ACTION RECOMMENDATION (PAR) DETERMINATION



BYRON STATION
FISSION PRODUCT BARRIER MATRIX

GENERAL EMERGENCY	SITE EMERGENCY	ALERT	UNUSUAL EVENT
FG1 -Loss of TWO Fission Product Barriers AND Potential Loss of the Third	**FS1** - Any TWO of the following: a)Loss or Potential Loss of Fuel Clad, b)Loss or Potential Loss of RCS, c)Loss of any Additional Barrier	**FA1** - Loss OR Potential Loss of Either Fuel Clad or RCS	**FU1** - Loss OR Potential Loss of Containment

1. CONTAINMENT BARRIER	LOSS	POTENTIAL LOSS
a. Containment Radiation (p.16)	None	≥ 1800 R/hr.
b. Containment Critical Safety Function (p.17)	None	RED **OR** ORANGE AND No Containment Spray Available.
c. Containment Hydrogen (p.18)	None	> 5%.
d. Containment Breached / Bypassed (p.19)	Unisolable breach of Containment, **OR** Rapid unexplained pressure decrease following initial pressure increase, **OR** Containment pressure/sump level response not consistent with LOCA conditions.	None
e. Core Cooling Critical Safety Function (p.20)	None	RED **AND** restoration procedures not effective within 15 minutes, **OR** Core Exit Thermocouple Temp. > 700°F **AND** 0% RVLIS,**AND** restoration procedures are NOT effective within 15 minutes.
f. SG Leakage (p.21)	Primary to Secondary Leakage Rate > 10 gpm **AND** an uncontrolled release of Secondary coolant from the associated Steam Generator to the environment is occurring.	None

2. FUEL CLAD	LOSS	POTENTIAL LOSS
a. Core Cooling Critical Safety Function Core Exit Thermocouple Temperature (p.22)	RED **OR** Core Exit TCs ≥ 1200 °F	ORANGE **OR** Core Exit TCs ≥ 700 °F
b. Heat Sink Critical Safety Function (p.23)	None	RED AND BFR-H.1 has been implemented.
c. Containment Radiation (p.24)	≥ 450 R/hr.	None
d. Primary Coolant Activity (p.25)	Coolant Activity ≥ 300 uCi/gm I-131 Dose Equivalent.	None

3. REACTOR COOLANT SYSTEM	LOSS	POTENTIAL LOSS
a. Containment Radiation (p.26)	≥ 10 R/hr.	None
b. RCS Integrity Critical Safety Function (p.27)	None	RED
c. Heat Sink Critical Safety Function (p.28)	None	RED AND BFR-H.1 has been implemented.
d. RCS Leakage (p.29)	Greater than makeup capability as indicated by a Core Cooling CSF Orange or Red path.	Unisolable leak > capacity of one centrifugal charging pump in normal charging lineup.
e. SG Leakage (p.30)	Entry into SGTR (BEP-3) **AND** a non-isolable secondary line break resulting in a radioactive release to the environment from the affected S/G.	Ruptured SG > capacity of one centrifugal charging pump in the normal charging lineup.

MATRIX DESCRIPTION

CONTAINMENT 1.d Containment Breached/Bypassed

THRESHOLD VALUE

LOSS: One of the following:

1. UNISOLABLE breach of Containment with a release path to the environment,

OR

2. Rapid unexplained pressure decrease following initial pressure increase,

OR

3. Containment pressure/sump level response not consistent with LOCA conditions.

POTENTIAL LOSS: NONE

MODE APPLICABILITY

1, 2, 3, 4

BASIS (References)

UNISOLABLE - A breach that cannot be isolated from the Control Room.

LOSS - An unisolable breach of containment includes open manways, escape hatches and any other unisolable containment penetration which opens a release path to the environment. A breach of containment has also occurred if an inboard and outboard pair of isolation valves fails to close on an automatic actuation signal or from a manual action in the control room and opens a release path to the environment.

The breach is NOT isolable from the Control Room OR an attempt for isolation from the Control Room has been made and was unsuccessful. An attempt for isolation should be made prior to the accident classification. If isolable upon identification this Initiating Condition is not applicable.

The rapid pressure decrease following an initial pressure increase indicates a failed containment. Failure of containment pressure to elevate or containment sumps level to increase is indicative of a containment bypass or loss of containment scenario.

POTENTIAL LOSS - None

loss

1.d

MATRIX DESCRIPTION

REACTOR COOLANT SYSTEM 3.e Steam Generator Leakage

THRESHOLD VALUE

LOSS: Entry into SGTR (BEP-3) **AND** a non-isolable secondary line break resulting in a radioactive release to the environment from the affected S/G.

POTENTIAL LOSS: Ruptured Steam Generator greater than the capacity of one centrifugal charging pump in the NORMAL CHARGING LINEUP.

MODE APPLICABILITY

1, 2, 3, 4

BASIS (References)

NORMAL CHARGING LINEUP- The normal charging system flow path through the volume control system including normal and design alternate flow paths, and flow to reactor coolant pump seals.

LOSS - This is intended to address the full spectrum of Steam Generator tube rupture events and addresses the direct release of radioactive material to the environment. Dose assessment is required when there is indication that the fuel matrix/clad is potentially lost. This EAL encompasses steam breaks, feed breaks, and stuck open safety or relief valves.

POTENTIAL LOSS - Leakage in excess of the capacity of one centrifugal charging pump in the normal charging lineup through a ruptured Steam Generator tube is considered to be the inability to maintain normal liquid inventory in the RCS and assures that any event that results in a significant inventory loss or shrinkage will result in an ALERT classification.

POTENTIAL LOSS

MATRIX DESCRIPTION

REACTOR COOLANT SYSTEM 3.d RCS Leakage

THRESHOLD VALUE

LOSS: UNISOLABLE RCS leakage > makeup capability as indicated by a Core Cooling CSF Orange OR Red path.

POTENTIAL LOSS: UNISOLABLE RCS leakage > capacity of one centrifugal charging pump in a NORMAL CHARGING LINEUP.

MODE APPLICABILITY

1, 2, 3, 4

BASIS (References)

UNISOLABLE - A leak that cannot be isolated from the Control Room.

NORMAL CHARGING LINEUP - The normal charging system flow path through the volume control system including normal and design alternate flow paths, and flow to reactor coolant pump seals.

LOSS - Leakage that results in an Orange or Red path in Core Cooling is a fundamental indication that the inventory control systems are inadequate for maintaining RCS pressure and inventory.

POTENTIAL LOSS - Unisolable leakage in excess of the capacity of one centrifugal charging pump in the normal charging lineup is considered to be the inability to maintain normal liquid inventory in the RCS and assures that any event that results in a significant inventory loss or shrinkage will result in an ALERT classification.

The leak is NOT isolable from the Control Room OR an attempt for isolation from the Control Room has been made and was unsuccessful. An attempt for isolation should be made prior to the accident classification. If isolable upon identification this Initiating Condition is not applicable.

MATRIX DESCRIPTION

FUEL CLAD 2.d

Primary Coolant Activity

THRESHOLD VALUE

LOSS: Coolant Activity ≥ 300 μCi/g I-131.

POTENTIAL LOSS: NONE

MODE APPLICABILITY

1, 2, 3, 4

BASIS (References)

LOSS - This value corresponds to 0.6% clad failure (S&L calculation BB-ER-02, rev 0) and is well above that expected for iodine spikes. This amount of clad damage is considered significant enough to consider the fuel clad barrier lost.

POTENTIAL LOSS - None

Loss

2.d

APPROVED 04/18/99

Facsimile

BZP 310-2T1
Revision 1

(UTILITY FORM)

UTILITY MESSAGE NO._____

STATE OF ILLINOIS
NUCLEAR ACCIDENT REPORTING SYSTEM FORM
JULY, 1998

STATE MESSAGE NO._____

INITIAL ROLL CALL
ELECTRIC OPER. ☐
IEMA ☐
IDNS ☐
WEM (Zion Only) ☐
IOWA EMD (QC Only) ☐

UTILITY USE ONLY
MESSAGE INITIATED
TIME: _____
DATE: _____

1. STATUS
[A] ACTUAL
[B] EXERCISE
[C] DRILL
[D] TERMINATION

2. STATION
[A] DRESDEN
[B] LASALLE
[C] QUAD CITIES
[D] ZION
[E] BYRON
[F] BRAIDWOOD
[G] CLINTON

3. ON-SITE ACCIDENT CLASSIFICATION
[A] UNUSUAL EVENT
[B] ALERT
[C] SITE EMERGENCY
[D] GENERAL EMERGENCY
[E] RECOVERY
[F] NOT APPLICABLE

4. ACCIDENT CLASSIFIED
TIME: _____
DATE: _____
EAL#: _____

ACCIDENT TERMINATED
TIME: _____
DATE: _____

5. RELEASE TO ENVIRONMENT
[A] NONE
[B] POTENTIAL
[C] OCCURRING
[D] TERMINATED

6. TYPE OF RELEASE
[A] NOT APPLICABLE
[B] RADIOACTIVE GAS
[C] RADIOACTIVE LIQUID

7. WIND DIRECTION:
FROM _____ (DEGREES)
DOWNWIND SECTOR: ____

8. WIND SPEED
[A] METERS/SEC.: _____
[B] MILES/HR.: _____

9. RECOMMENDED ACTIONS
[A] NONE
[B] PREPARE FOR POSSIBLE ACTION INVOLVING THE PUBLIC
[C] INITIATE PUBLIC NOTIFICATION PROCEDURES. INSTRUCT THE PUBLIC TO TAKE THE FOLLOWING ACTIONS:

SHELTER	EVACUATE	UTILITY ONLY
[D]	[H]	0 - 2 MILE RADIUS
[E]	[I]	0 - __ MILE RADIUS
[F]	[J]	2 - 5 MILES FOR SECTORS_____
[G]	[K]	5 - 10 MILES FOR SECTORS_____

[L] SHELTER SUB-AREAS: _____ (STATE USE ONLY)
[M] EVACUATE SUB-AREAS: _____ (STATE USE ONLY)

[N] RECOMMEND POTASSIUM IODIDE (KI) IN ACCORDANCE WITH PROCEDURES (STATE USE ONLY)
[O] CONFINE MILK-PRODUCING ANIMALS ON STORED FEED AND PROTECTED WATER OUT TO____ MILE RADIUS (STATE USE ONLY)
[P] COMMENCE RETURN OF PUBLIC (STATE USE ONLY)
[Q] OTHER _____

10. ADDITIONAL INFORMATION: _____

11. MESSAGE TRANSMITTED BY:
_____ (NAME)
ComEd - Byron (ORGANIZATION)
_____ (OUTSIDE PHONE NUMBER)

12. MESSAGE TRANSMITTED:
CURRENT TIME: _____
CURRENT DATE: _____

13. MESSAGE RECEIVED BY:
_____ (NAME)
☐IEMA ☐COMED

OUTSIDE PHONE NUMBERS

		FINAL ROLL CALL
ELECTRIC OPER.	630-691-4730	☐
IEMA	217-782-7860	☐
IDNS	217-785-0600	☐
WEM	800-943-0003 (ZION ONLY)	☐
IOWA EMD	515-281-3231 (QC ONLY)	☐

UTILITY USE ONLY
APPROVED BY: _____ _____
EMERGENCY DIRECTOR (NAME) (TIME)
NDO NOTIFIED: _____ _____
(ELECTRIC OPER. ONLY) NDO (NAME) (TIME/DATE)

(9492AA/DOC/040399)

NARS FORM
INSTRUCTIONS FOR USE
(UTILITY FORM)

Complete the NARS as follows:

UTILITY MESSAGE NUMBER - For use by Utility personnel only. Number Messages sequentially, starting with 1, for the Event described. Enter "N/A" if this is a State NARS.

STATE MESSAGE NUMBER - Enter State Message Number when receiving a NARS message from the State. Enter "N/A" if this is a Utility NARS.

INITIAL ROLL CALL - Mark the box by the applicable agencies that are included in the initial roll call.

MESSAGE INITIATED (Utility Only) - Document the time and date at the completion of the initial roll call.

1. **STATUS** - Mark the letter corresponding to the appropriate status description.
2. **STATION** - Mark the letter corresponding to the affected Station.
3. **ON-SITE ACCIDENT CLASSIFICATION** - Mark the letter corresponding to the classification issued by the Utility.
4. **ACCIDENT CLASSIFIED** - Fill in the time and date at which the most recent accident classification was determined by the Utility. Also fill in the applicable On-Site Emergency Action Level (EAL) code number. Enter "N/A" if this is an accident termination message.

   ACCIDENT TERMINATED - Fill in the time and date of the accident termination, if applicable. Enter "N/A" if this is an accident classified message.
5. **RELEASE TO ENVIRONMENT** - Mark the letter corresponding to the appropriate description.
6. **TYPE OF RELEASE** - Mark the letter corresponding to the appropriate release type.
7. **WIND DIRECTION** - Fill in the direction from which the wind is coming, in degrees.

   DOWNWIND SECTOR - Fill in the letter corresponding to the Downwind Sector. Use environmental sampling maps or the following table:

DOWNWIND SECTOR	WIND FROM		WIND FROM DEGREES	DOWNWIND SECTOR	WIND FROM		WIND FROM DEGREES
J	N	___	349-11	A	S	___	169-191
K	NNE	___	12-33	B	SSW	___	192-213
L	NE	___	34-56	C	SW	___	214-236
M	ENE	___	57-78	D	WSW	___	237-258
N	E	___	79-101	E	W	___	259-281
P	ESE	___	102-123	F	WNW	___	282-303
Q	SE	___	124-146	G	NW	___	304-326
R	SSE	___	147-168	H	NNW	___	327-348

8. **WIND SPEED** - Fill in the wind speed under meters/second or miles/hour. For Quad Cities Station only, fill in both meters/seconds and miles/hour.
9. **RECOMMENDED ACTIONS** - Mark the letter corresponding to the appropriate protective action. Add additional information if [C] is chosen. If recommending shelter or evacuation for letters [F][G][J] or [K], provide the center line sector and at least one sector on each side of center line. Letters [L-P] are for State use only.
10. **ADDITIONAL INFORMATION** - Additional information should be included when:
    - An equal or lesser classification is made on the other unit,
    - A wind shift which results in additional downwind sectors,
    - A change is made in PARs,
    - Corrections to the current NARS are made.

    If the NARS is not being issued for one of the above reasons, this block should read "none".
11. **MESSAGE TRANSMITTED BY** - Fill in name, organization and outside phone number of person transmitting the NARS Form information.
12. **MESSAGE TRANSMITTED** - Fill in the current time and date that the message was transmitted by the person listed in step 11.
13. **MESSAGE RECEIVED BY** - Fill in name, and mark the applicable organization (IEMA or ComEd), of the person receiving the NARS message and filling out the NARS Form.

FINAL ROLL CALL - Mark the box by the applicable agencies that are included in the final roll call.

(Final)

APPROVED 04/18/99

Facsimile

BZP 310-2T1
Revision 1

(UTILITY FORM)

UTILITY MESSAGE NO. 01

STATE OF ILLINOIS
NUCLEAR ACCIDENT REPORTING SYSTEM FORM
JULY, 1998

STATE MESSAGE NO. N/A

INITIAL ROLL CALL
ELECTRIC OPER. ☐
IEMA ☐
IDNS ☐
WEM (Zion Only) ☐
IOWA EMD (QC Only) ☐

UTILITY USE ONLY
MESSAGE INITIATED
TIME: _____
DATE: _____

1. **STATUS**
[A] ACTUAL
[X] EXERCISE
[C] DRILL
[D] TERMINATION

2. **STATION**
[A] DRESDEN
[B] LASALLE
[C] QUAD CITIES
[D] ZION
[E] BYRON
[F] BRAIDWOOD
[G] CLINTON

3. **ON-SITE ACCIDENT CLASSIFICATION**
[A] UNUSUAL EVENT
[B] ALERT
[C] SITE EMERGENCY
[X] GENERAL EMERGENCY
[E] RECOVERY
[F] NOT APPLICABLE

4. **ACCIDENT CLASSIFIED**
TIME: _____
DATE: _____
EAL#: FG1

ACCIDENT TERMINATED
TIME: N/A
DATE: N/A

5. **RELEASE TO ENVIRONMENT**
[A] NONE
[X] POTENTIAL
[C] OCCURRING
[D] TERMINATED

6. **TYPE OF RELEASE**
[A] NOT APPLICABLE
[X] RADIOACTIVE GAS
[C] RADIOACTIVE LIQUID

7. **WIND DIRECTION:**
FROM 222 (DEGREES)
DOWNWIND SECTOR: C

8. **WIND SPEED**
[A] METERS/SEC.: N/A
[B] MILES/HR.: 10

9. **RECOMMENDED ACTIONS**
[A] NONE
[B] PREPARE FOR POSSIBLE ACTION INVOLVING THE PUBLIC
[C] INITIATE PUBLIC NOTIFICATION PROCEDURES. INSTRUCT THE PUBLIC TO TAKE THE FOLLOWING ACTIONS:

SHELTER	EVACUATE	UTILITY ONLY
[D]	[H]	0 - 2 MILE RADIUS
[E]	[I]	0 - _ MILE RADIUS
[F]	[J]	2 - 5 MILES FOR SECTORS B, C, D
[G]	[K]	5 - 10 MILES FOR SECTORS B, C, D

[L] SHELTER SUB-AREAS: _____ (STATE USE ONLY)
[M] EVACUATE SUB-AREAS: _____ (STATE USE ONLY)

[N] RECOMMEND POTASSIUM IODIDE (KI) IN ACCORDANCE WITH PROCEDURES (STATE USE ONLY)
[O] CONFINE MILK-PRODUCING ANIMALS ON STORED FEED AND PROTECTED WATER OUT TO____ MILE RADIUS (STATE USE ONLY)
[P] COMMENCE RETURN OF PUBLIC (STATE USE ONLY)
[Q] OTHER _____

10. **ADDITIONAL INFORMATION:** _____

11. **MESSAGE TRANSMITTED BY:**
_____ (NAME)
ComEd - Byron (ORGANIZATION)
_____ (OUTSIDE PHONE NUMBER)

12. **MESSAGE TRANSMITTED:**
CURRENT TIME: _____
CURRENT DATE: _____

13. **MESSAGE RECEIVED BY:**
_____ (NAME)
☐IEMA ☐COMED

OUTSIDE PHONE NUMBERS

		FINAL ROLL CALL
ELECTRIC OPER.	630-691-4730	☐
IEMA	217-782-7860	☐
IDNS	217-785-0600	☐
WEM	800-943-0003 (ZION ONLY)	☐
IOWA EMD	515-281-3231 (QC ONLY)	☐

UTILITY USE ONLY
APPROVED BY: _____ _____
EMERGENCY DIRECTOR (NAME) (TIME)
NDO NOTIFIED: _____ _____
(ELECTRIC OPER. ONLY) NDO (NAME) (TIME/DATE)

(9492AA/DOC/040399)

Key

NARS FORM
INSTRUCTIONS FOR USE
(UTILITY FORM)

Complete the NARS as follows:

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INITIAL ROLL CALL - Mark the box by the applicable agencies that are included in the initial roll call.

MESSAGE INITIATED (Utility Only) - Document the time and date at the completion of the initial roll call.

1. **STATUS** - Mark the letter corresponding to the appropriate status description.
2. **STATION** - Mark the letter corresponding to the affected Station.
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4. **ACCIDENT CLASSIFIED** - Fill in the time and date at which the most recent accident classification was determined by the Utility. Also fill in the applicable On-Site Emergency Action Level (EAL) code number. Enter "N/A" if this is an accident termination message.

   ACCIDENT TERMINATED - Fill in the time and date of the accident termination, if applicable. Enter "N/A" if this is an accident classified message.
5. **RELEASE TO ENVIRONMENT** - Mark the letter corresponding to the appropriate description.
6. **TYPE OF RELEASE** - Mark the letter corresponding to the appropriate release type.
7. **WIND DIRECTION** - Fill in the direction from which the wind is coming, in degrees.

   DOWNWIND SECTOR - Fill in the letter corresponding to the Downwind Sector. Use environmental sampling maps or the following table:

DOWNWIND SECTOR	WIND FROM		WIND FROM DEGREES	DOWNWIND SECTOR	WIND FROM		WIND FROM DEGREES
J	N	___	349-11	A	S	___	169-191
K	NNE	___	12-33	B	SSW	___	192-213
L	NE	___	34-56	C	SW	X	214-236
M	ENE	___	57-78	D	WSW	___	237-258
N	E	___	79-101	E	W	___	259-281
P	ESE	___	102-123	F	WNW	___	282-303
Q	SE	___	124-146	G	NW	___	304-326
R	SSE	___	147-168	H	NNW	___	327-348

8. **WIND SPEED** - Fill in the wind speed under meters/second or miles/hour. For Quad Cities Station only, fill in both meters/seconds and miles/hour.
9. **RECOMMENDED ACTIONS** - Mark the letter corresponding to the appropriate protective action. Add additional information if [C] is chosen. If recommending shelter or evacuation for letters [F][G][J] or [K], provide the center line sector and at least one sector on each side of center line. Letters [L-P] are for State use only.
10. **ADDITIONAL INFORMATION** - Additional information should be included when:
    * An equal or lesser classification is made on the other unit,
    * A wind shift which results in additional downwind sectors,
    * A change is made in PARs,
    * Corrections to the current NARS are made.

    If the NARS is not being issued for one of the above reasons, this block should read "none".
11. **MESSAGE TRANSMITTED BY** - Fill in name, organization and outside phone number of person transmitting the NARS Form information.
12. **MESSAGE TRANSMITTED** - Fill in the current time and date that the message was transmitted by the person listed in step 11.
13. **MESSAGE RECEIVED BY** - Fill in name, and mark the applicable organization (IEMA or ComEd), of the person receiving the NARS message and filling out the NARS Form.

FINAL ROLL CALL - Mark the box by the applicable agencies that are included in the final roll call.

(Final)

Byron
June 2000 Examination

NRC-Developed
Walk-through JPMs

Final, As-Administered

Facility: _____BYRON_____ Date of Examination: ___06/20/00___
Exam Level (circle one): (RO) / SRO(I) / SRO(U) Operating Test No.: __00-301_____

B.1 Control Room Systems

System / JPM Title	Type Code*	Safety Function
a. Transfer to Hot Leg Recirculation (Alt Failure of 1A RHR Pump)	M,A,S,L	IV
b. Manual Makeup to VCT (Alt Normal Borate Valve Fails)	M,A,S	I
c. Control PZR Pressure in Manual (Alt PZR Press Control Switch Broke)	M,A,S	III
d. Control Steam Dumps in Various Modes	N,S,L	IV
e. Start up the 1A D/G (Alt Runaway D/G, Keeps Loading Uncontrolled)	M,A,S	VI
f. Channel Check of WRGM	D,C	VII
g. Cool the PRT	N,S	V

B.2 Facility Walk-Through

a. S/U Rod Drive M/G Set	D	I
b. Manual Bypass Control of Charging	N,R	II
c. Unsteam Bound MD AFW Pump	N,R	IV

* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA

Facility: _____BYRON_____ Date of Examination: ___06/20/00___
Exam Level (circle one): RO / (SRO(I)) / SRO(U) Operating Test No.: __00-301_____

B.1 Control Room Systems

System / JPM Title	Type Code*	Safety Function
a. Transfer to Hot Leg Recirculation (Alt Failure of 1A RHR Pump)	M,A,S,L	IV
b. Manual Makeup to VCT (Alt Normal Borate Valve Fails)	M,A,S	I
c. Control PZR Pressure in Manual (Alt PZR Press Control Switch Broke)	M,A,S	III
d. Control Steam Dumps in Various Modes	N,S,L	IV
e. Start up the 1A D/G (Alt Runaway D/G, Keeps Loading Uncontrolled)	M,A,S	VI
f. Channel Check of WRGM	D,C	VII
g. Cool the PRT	N,S	V

B.2 Facility Walk-Through

a. S/U Rod Drive M/G Set	D	I
b. Manual Bypass Control of Charging	N,R	II
c. Unsteam Bound MD AFW Pump	N,R	IV

* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA

Appendix C | Job Performance Measure Worksheet | Form ES-C-1

Facility: BYRON Task No: IV

Task Title: ALIGN ECCS TO HOT LEG RECIRC Job Performance Measure No: 1

K/A Reference: 6A4.07 4.4/4.4

Examinee: _____ NRC Examiner: _____

Date: _____

Method of testing:

Simulated Performance _____ Actual Performance ____X____

Classroom _____ Simulator _____X_____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions: You are the Unit NSO.
Unit 1 is in the process of transferring to Hot Leg Recirculation.

Task Standard: ECCS ON HOT LEG RECIRCULATION

Required Materials: NONE

General References: BEP ES-1.4 TRANSFER TO HOT LEG RECIRCULATION

Initiating Cue: THE UNIT SUPERVISOR HAS DIRECTED YOU TO TRANSFER TO HOT LEG RECIRCULATION USING BEP ES-1.4.

Time Critical Task: NO

Validation Time: 10 MINUTES

PERFORMANCE INFORMATION

START TIME: _____

(Denote critical steps with a **BOLD AND** *)

Performance step: 1

REFER TO BEP ES-1.4 TRANSFER TO HOT LEG RECIRCULATION

Standard: LOCATE AND OPEN BEP ES-1.4

Comment: ----------

Performance step: 2 ALIGN RH FLOWPATH FOR HOT LEG RECIRCULATION

*** CLOSE RH TO COLD LEGS ISOL VALVES ***

Standard: *** VALVES SI8809A, SI8809B CLOSED RED LIGHTS ***

Comment: ----------

Performance step: 3 ALIGN RH FLOWPATH FOR HOT LEG RECIRCULATION

CHECK 1A RH PUMP RUNNING

Standard: 1A RH PUMP RUNNING RED LIGHT

Comment: ----------

Performance step: 4 ALIGN RH FLOWPATH FOR HOT LEG RECIRCULATION

*** OPEN TRAIN A RH HX DISCHARGE CROSSTIE HEADER VALVE ***

Standard: *** VALVE 1RH8716A OPEN GREEN LIGHT ***

Comment: ----------

Performance step: 5 ALIGN RH FLOWPATH FOR HOT LEG RECIRCULATION

*** 1A RH PUMP TRIPS *** (CAUSES BACKING OUT OF PROCEDURE AND GOING TO STEP 3 RNO)

Standard: *** VERIFIES 1A RH PUMP TRIP GREEN LIGHT AND BACKS OUT ***
(Could take pump to pull to lock)

Comment: ----------

Performance step: 6 ALIGN RH FLOWPATH FOR HOT LEG RECIRCULATION

*** CLOSE TRAIN A RH HX DISCHARGE CROSSTIE HEADER VALVE ***

Standard: *** VALVE 1RH8716A CLOSED RED LIGHT ***

not critical
AMS 6/29/00

Comment: ----------

Performance step: 7 ALIGN RH FLOWPATH FOR HOT LEG RECIRCULATION

*** OPEN TRAIN B RH HX DISCHARGE CROSSTIE HEADER VALVE ***

Standard: *** VALVE 1RH8716B OPEN GREEN LIGHT ***

Comment: ----------

_Performance step:8 ALIGN RH FLOWPATH FOR HOT LEG RECIRCULATION

*** OPEN RH TO HOT LEGS ISOL VALVE ***

Standard: *** VALVE 1SI8840 OPEN RED LIGHT ***

Comment: ----------

Performance step: 9 ALIGN SI FLOWPATH FOR HOT LEG RECIRCULATION

*** STOP SI PUMP 1A ***

Standard: *** SI PUMP 1A STOPPED GREEN LIGHT ***

Comment: ----------

Performance step: 10 ALIGN SI FLOWPATH FOR HOT LEG RECIRCULATION

*** CLOSE SI PUMP 1A TO COLD LEGS ISOL VALVE ***

Standard: *** VALVE 1SI8821A CLOSED RED LIGHT ***

Comment: ----------

Performance step: 11 ALIGN SI FLOWPATH FOR HOT LEG RECIRCULATION

*** OPEN SI PUMP 1A TO HOT LEGS ISOL VALVE ***

Standard: *** VALVE 1SI8802A OPEN RED LIGHT ***

Comment: ----------

Performance step: 12 ALIGN SI FLOWPATH FOR HOT LEG RECIRCULATION

*** START SI PUMP 1A ***

Standard: ANNOUNCE IN PLANT, *** THEN SI PUMP 1A STARTED RED LIGHT ***

Comment: ----------

Performance step: 13 ALIGN SI FLOWPATH FOR HOT LEG RECIRCULATION

*** STOP SI PUMP 1B ***

Standard: *** SI PUMP 1B STOPPED GREEN LIGHT ***

Comment: ----------

Performance step: 14 ALIGN SI FLOWPATH FOR HOT LEG RECIRCULATION

*** CLOSE SI PUMP 1B TO COLD LEGS ISOL VALVE 1SI8821B ***

Standard: *** VALVE 1SI8821B CLOSED RED LIGHT ***

Comment: ----------

Performance step: 15 ALIGN SI FLOWPATH FOR HOT LEG RECIRCULATION

*** OPEN SI PUMP 1B TO HOT LEGS ISOL VALVE ***

Standard: *** VALVE 1SI8802B OPEN RED LIGHT ***

Comment: ----------

Performance step: 16 ALIGN SI FLOWPATH FOR HOT LEG RECIRCULATION

*** START SI PUMP 1B ***

Standard: ANNOUNCE IN PLANT,*** THEN SI PUMP 1B STARTED RED LIGHT ***

Comment: ----------

Performance step: 17 ALIGN SI FLOWPATH FOR HOT LEG RECIRCULATION

CHECK SI PUMPS TO HOT LEGS ISOL VALVES OPEN

Standard: VALVES OPEN 1SI8802A, 1SI8802B RED LIGHTS

Comment: ----------

Performance step: 18 ALIGN SI FLOWPATH FOR HOT LEG RECIRCULATION

*** CLOSE SI PUMPS TO COLD LEGS ISOL VALVE ***

Standard: *** VALVE 1SI8835 CLOSED RED LIGHT ***

Comment: ----------

Terminating cue: TO SRO HAVE COMPLETED THE TRANSFER TO HOT LEG RECIRCULATION ON UNIT 1

STOP TIME: _____

Initial Conditions: You are the Unit NSO.
Unit 1 is in the process of transferring to Hot Leg Recirculation.

Initiating Cue: THE UNIT SUPERVISOR HAS DIRECTED YOU TO TRANSFER TO HOT LEG RECIRCULATION USING BEP ES-1.4.

Appendix C | Job Performance Measure Worksheet | Form ES-C-1

Facility: BYRON Task No: 1

Task Title: MANUAL MAKEUP TO VCT Job Performance Measure No: 2

K/A Reference: 4A4.07 3.9/3.7

Examinee: _____ NRC Examiner: _____

Date: _____

Method of testing:

Simulated Performance _____ Actual Performance ____X____

Classroom _____ Simulator _____X_____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions: You are the UNIT NSO.
Unit 1 is in mode 1.
The VCT has to be made up to on Unit 1.

Task Standard: MANUALLY MAKE UP TO VCT ON UNIT 1

Required Materials: NONE

General References:
BOP CV-7 OPERATION OF THE REACTOR MAKEUP SYSTEM IN AUTO OR MANUAL MODE
BAR 1-9-A6 BA FLOW DEVIATION
1BOA PRI-2 EMERGENCY BORATION

Initiating Cue: THE UNIT SUPERVISOR HAS DIRECTED YOU TO MANUALLY MAKEUP 100 GALLONS TO THE VCT ON UNIT 1

Time Critical Task: NO

Validation Time: 15 MINUTES

PERFORMANCE INFORMATION

START TIME: _____

(Denote critical steps with a **BOLD** *)

Performance step: 1

REFER TO BOP CV-7 OPERATION OF THE REACTOR MAKEUP SYSTEM IN AUTO OR MANUAL MODE

Standard: LOCATE AND OPEN BOP CV-7

Comment: ----------

Performance step: 2

*** DETERMINE EXISTING RCS BORON CONCENTRATION FROM CHEMISTRY ***

Standard: *** BORON CONCENTRATION VALUE OBTAINED ***

CUE: GIVE CURRENT SETTINGS OF PPM BORON RCS 529 PPM, BAT 7000 PPM

Comment: ----------

Performance step: 3

*** DETERMINE FLOW RATES FOR BORIC ACID FLOW ***

Standard: *** FLOW RATES DETERMINED ***

NOTE: PRIMARY WATER FLOW IS SET AT 120 GPM

Comment: ----------

Performance step: 4

PLACE MAKE-UP CONTROL SWITCH IN STOP POSITION

Standard: MAKE-UP CONTROL SWITCH IN STOP POSITION, OFF RED LIGHT

Comment: ----------

Performance step: 5

*** SET FK-110, BORIC ACID FLOW TO BLENDER TO ESTABLISH THE FLOW DETERMINED BY STEP F.2 WITH CONTROLLER IN AUTO ADJUST POTENTIOMETER CONSIDERING THAT 1 TURN EQUALS 4 GPM ***

Standard: *** FLOW SET ON FK-110 TO REQUIRED GPM FLOW ***

NOTE: CALCULATION (529 X 120) / 7000 = 9.07 9.07/4 = 2.27 turns

Comment: ----------

Performance step: 6

*** MANUAL RMCS ENTER GALLONS OF BORIC ACID TO BORIC ACID TOTALIZER FY-110 PRESS ENTER ON COUNTER, INSERT DESIRED GALLONS TO TENTH DECIMAL, PRESS RESET ON COUNTER, AND PRESS DISPLAY TO VERIFY CORRECT GALLONS. ***

Standard: *** TOTAL GALLONS ENTERED ON FY-110 AND VERIFIED ***

NOTE: SET > 10 GPM DUE TO 9 GPM FLOW (RED DOT IS DECIMAL POINT)

Comment: ----------

Performance step: 7

*** SET FK-111A PW/TOTAL FLOW CONTROLLER TO DESIRED FLOW WITH CONTROLLER IN MANUAL ADJUST POTENTIOMETER CONSIDERING THAT 1 TURN EQUALS 16 GPM (AUTO RMCS 120 GPM PRESET) ***

Standard: *** FK-111A SET TO PROPER GPM ***

NOTE: 7.5 = 120 GPM

Comment: ----------

Performance step:8

*** MANUAL RMCS ENTER GALLONS OF PRIMARY WATER TO BE ADDED ON TOTALIZER FY-111, PRESS ENTER ON COUNTER, INSERT DESIRED GALLONS TO TENTH DECIMAL, PRESS RESET ON COUNTER, AND PRESS DISPLAY TO VERIFY CORRECT GALLONS. ***

Standard: ***100 TOTAL GALLONS ENTERED ON FY1-111 AND VERIFIED ***

NOTE: SET TO 100 THEN RESET TO 0

Comment: ----------

Performance step: 9 AUTO MAKEUP

*** MANUAL MAKEUP PLACE MAKE-UP MODE SELECTOR SWITCH IN MANUAL ***

Standard: *** MAKEUP MODE SWITCH IN MANUAL ***

Comment: ----------

Performance step: 10

*** ALIGN OUTLET OF BLENDER TO CHARGING PUMP SUCTION BY OPENING CV110B BORIC ACID BLENDER TO CHARGING PUMP VALVE ***

Standard: *** CV110B OPEN RED LIGHT ***

Comment: ----------

Performance step: 11

*** PLACE MAKEUP CONTROL SWITCH IN START ***

Standard: *** MAKEUP CONTROL SWITCH IN START ***

Comment: ----------

Performance step: 12

VERIFY CONTROL SWITCH FOR CV110A IN AUTO BORIC ACID BLENDER TO BLENDER VALVE AND CV111A PW TO BORIC ACID BLENDER VALVE IN AUTO

Standard: CV110A IN AUTO AND CV111A IN AUTO

Comment: ----------

Performance step: 13

VERIFY/ START 0A/0B PW PUMP IF DILUTION OR BLENDED FLOW IS DESIRED

Standard: PW PUMP IS RUNNING, TOTALIZER COUNTING

Comment: ----------

Performance step: 14

VERIFY/START AB03P, BA TRANSFER PUMP IF BORATION OR BLENDED FLOW IS DESIRED

Standard: BORIC ACID TRANSFER PUMP RUNNING TOTALIZER COUNTING

Comment: ----------

Performance step: 15

*** ENSURE THAT DESIRED BORIC ACID FLOW RATE AND /OR PW FLOW RATE IS OBTAINED FR-110***

Standard:*** RECOGNIZES IMPROPER FLOW RATES FOR BORIC ACID AND PRIMARY WATER.**

Comment: ----------

Performance step: 16

STOPS THE DILUTION

Standard: ***TAKES MAKEUP CONTROL SWITCH TO STOP TO STOP DILUTION, VERIFIES CV-111A WENT SHUT, AND PRIMARY WATER TOTALIZER TO 0 (BORIC ACID FLOW DEVIATION ALARM 1-9-A6, BAR 1-9-A6 VALVE 1CV110A IS SHUT THE ALARM HAS A 30 SECOND TIME DELAY) ***

NOTE: VALVE 1CV110A IS SHUT CAN'T OPEN IF THEY GET DEVIATION ALARM COULD GO TO BAR 1-9-A6

CUE: IF THE APPLICANT GOES TO BAR 1-9-A6 ASK STATUS OF BAR AS US

Comment: ----------

STOP TIME: _____

Terminating cue: TO THE SRO I HAVE TERMINATED THE MAKE UP OF 100 GALLONS TO THE RCS

Initial Conditions: You are the UNIT NSO.
Unit 1 is in mode 1.
The RCS has to be made up to on Unit 1.

Initiating Cue: THE UNIT SUPERVISOR HAS DIRECTED YOU TO MANUALLY MAKEUP 100 GALLONS TO THE VCT ON UNIT 1

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility: BYRON Task No: III

Task Title: MANUAL PZR PRESS CONTROL Job Performance Measure No: 3

K/A Reference: 27AA2.16 3.6/3.9

Examinee: _____ NRC Examiner: _____

Date: _____

Method of testing:

Simulated Performance _____ Actual Performance ____X____

Classroom _____ Simulator _____X_____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions: You are the Unit NSO
Unit 1 is in mode 1
All control are in automatic
ANNUNCIATOR 1-12-A1 PZR PRESS LOW RX TRIP STPT ALERT
1-12-B1 PZR PRESS LOW

Task Standard: CONTROL PZR PRESSURE IN MANUAL AFTER PT 455 FAILS LOW

Required Materials: NONE

General References:
BAR 1-12-A1 PZR PRESS LOW RX TRIP STPT ALERT
BAR 1-12-B1 PZR PRESS LOW
1BOA INST-2 OPERATION WITH A FAILED INSTRUMENT CHANNEL

Initiating Cue: TAKE THE NECESSARY ACTIONS ASSOCIATED WITH THIS ALARM

Time Critical Task: NO

Validation Time: 10 MINUTES

PERFORMANCE INFORMATION

START TIME: _____

(Denote critical steps with a **BOLD** *)

Performance step: 1

ENTER 1BOA INST-2

Standard: LOCATE AND OPEN 1BOA INST-2

Comment: ----------

Performance step: 2 PZR PRESS

*** CHECK PZR PRESS CHANNEL NORMAL ***

Standard: *** PI-455 FAILED LOW, 456, 457, 458 2260 PSIG ***

Comment: ----------

Performance step: 3 PZR PRESS

SELECT OPERABLE PZR PRESSURE CONTROL CHANNEL

Standard: PZR PRESS CONTROL SWITCH IN CHANNEL 457/458 FOR CONTROL
BUT SWITCH IS BROKEN AS IS

NOTE: SWITCH BROKEN AS IS

Comment: ----------

Performance step: 4 PZR PRESS

*** TAKE MANUAL CONTROL OF PZR PRESS ***

Standard: *** SWITCH IS IN MANUAL AND PRESSURE RESTORED ***

Comment: ----------

Performance step: 5 PZR PORVS, SPRAYS, HTRS

CHECK PORVS CLOSED

Standard: PORVS 1RY455A AND 1RY456 CLOSED GREEN LIGHTS

Comment: ----------

Performance step: 6 PZR PORVS, SPRAYS, HTRS

CHECK PZR SPRAY VALVES NORMAL

Standard: PZR SPRAY VALVES 1RY455B AND 1RY455C INTERMEDIATE

Comment: ----------

Performance step: 7 PZR PORVS, SPRAYS, HTRS

CHECK PZR HTRS NORMAL

Standard: PZR HTRS 2 SETS OF B/U HTRS ON GREEN LIGHTS

CUE: AS THE US DIRECT APPLICANT TO TAKE ACTIONS IAW 1BOA INST-2

Comment: ----------

Performance step: 8

*** CHECK PZR PRESS CONTROL IN AUTO ***

Standard: * **PZR PRESS CONTROL STAYS IN MANUAL DUE TO FAILED SWITCH ***

CUE: IF ASKED BY APPLICANT TO PLACE PZR PRESS IN AUTO, PLACE IN AUTO. THE FAILED CHANNEL WILL BE REINSERTED DUE TO FAILED SWITCH

Comment: ----------

Performance step: 9

SELECT OPERABLE CHANNEL TO RECORDERS PZR PRESS AND LOOP DELTA T

Standard: CHANNEL 456, 457, OR 458 ON PZR PRESS RECORDER SELECTOR SWITCH AND LOOP DELTA T

Comment: ----------

Performance step: 10

REVIEW LOGICS TO ENSURE REACTOR TRIP WON'T OCCUR PRIOR TO TRIPPING BISTABLES PLACE ORANGE DOTS ON ASSOCIATED ITEMS

Standard: ORANGE DOTS ON PI-455, BISTABLES PB455A, B, C, D, AND TB 411C,D AND ANNUNCIATOR

Comment: ----------

Performance step: 11

LOCALLY TRIP BISTABLES (EXTRA NSO WILL TRIP BISTABLES)

Standard: EXTRA NSO NOTIFIED OF BISTABLES PB455A, B, C, D, AND TB 411C, D FOR 1PT-455 NEEDING TO BE TRIPPED

CUE: EXTRA NSO WILL TRIP THE BISTABLES

Comment: ----------

Performance step: 12

CHECK P-11 INTERLOCK

Standard: P-11 BYPASS PERMISSIVE WINDOW DARK NOT LIT PRESSURE >1930 PSIG

Comment: ----------

Performance step: 13

CHECK TECH SPECS

Standard: NOTIFY NSS TO CHECK TECH SPECS

CUE: NSS WILL CHECK TECH SPECS

Comment: ----------

TERMINATING CUE: SRO I HAVE MANUAL PRESSURE CONTROL OF THE PZR

TIME STOP_____

Initial Conditions: You are the Unit NSO
Unit 1 is in mode 1
All control are in automatic
ANNUNCIATOR 1-12-A1 PZR PRESS LOW RX TRIP STPT ALERT
1-12-B1 PZR PRESS LOW

Initiating Cue: TAKE THE NECESSARY ACTIONS ASSOCIATED WITH THIS ALARM

Appendix C | Job Performance Measure Worksheet | Form ES-C-1

Facility: BYRON | Task No: IV

Task Title: CONTROL OF STEAM DUMPS | Job Performance Measure No: 4

K/A Reference: 41A4.08 3.0/3.1

Examinee: _____ | NRC Examiner: _____

Date: _____

Method of testing:

Simulated Performance _____ | Actual Performance ____X____

Classroom _____ | Simulator _____X_____ | Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions: You are the extra NSO
Unit 1 is in mode 1 at 16% power
The plant is shutting down per 1BGP 100-4

Task Standard: CONTROL STEAM DUMPS VALVES

Required Materials: NONE

General References:
1BGP 100-4 POWER DESCENSION

Initiating Cue: THE UNIT SUPERVISOR DIRECTS YOU TO TRANSFER CONTROL OF THE STEAM DUMPS FROM TAVE MODE TO PRESSURE MODE. THE TURBINE WILL BE MANUALLY TRIPPED FROM 15% POWER

Time Critical Task: NO

Validation Time: 10 MINUTES

PERFORMANCE INFORMATION

START TIME: _____

(Denote critical steps with a **BOLD** *)

Performance step: 1

ENTER 1BGP 100-4

Standard: LOCATE AND OPEN 1BGP 100-4 AT STEP 20

Comment: ----------

Performance step: 2

*** ENSURE PRESSURE MODE CONTROLLER 1PK-507, IN MANUAL WITH 0% DEMAND ***

Standard: *** 1PK-507, IN MANUAL WITH 0% DEMAND***

Comment: ----------

Performance step: 3

*** SELECT STM PRESS MODE ON STEAM DUMP MODE SELECT SWITCH ***

Standard: *** STEAM DUMP MODE SELECT SWITCH IN STM PRESS MODE ***

Comment: ----------

Performance step: 4

ENSURE MANUAL/AUTO PRESSURE CONTROLLER IS SET FOR 1092 PSIG

Standard: MANUAL CONTROL SET AT 1092 PSIG

CUE: 7.28 SET POINT

Comment: ----------

Performance step: 5

DEPRESS AUTO PUSHBUTTON AT MANUAL/AUTO PRESSURE CONTROLLER

Standard: PRESSURE CONTROLLER IN AUTO

Comment: ----------

Performance step: 6

MONITOR STEAM DUMPS DURING TURBINE SHUTDOWN (MANUALLY TRIPPING AT 15%)

Standard: *** SLOWLY DECREASE THE PRESSURE SETPOINT ON 1PK-507 UNTIL THE STEAM DUMP CONTROLLER OUTPUT JUST BEGINS TO INCREASE***

CUE: BLUE LIGHT OUT (OUTPUT) NEEDLE SLIGHTLY MOVES

Comment: ----------

TERMINATING CUE: SRO I HAVE THE STEAM DUMPS IN STEAM PRESSURE MODE READY TO TRIP THE TURBINE.

TIME STOP_____

Initial Conditions: You are the extra NSO
Unit 1 is in mode 1 at 16% power
The plant is shutting down per 1BGP 100-4

Initiating Cue: THE UNIT SUPERVISOR DIRECTS YOU TO TRANSFER CONTROL OF THE STEAM DUMPS FROM TAVE MODE TO PRESSURE MODE. THE TURBINE WILL BE MANUALLY TRIPPED FROM 15% POWER

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility: BYRON Task No: VI

Task Title: SYNCHRONIZE D/G TO A BUS Job Performance Measure No: 5

K/A Reference: 64A2.09 3.1/3.3

Examinee: _____ NRC Examiner: _____

Date: _____

Method of testing:

Simulated Performance _____ Actual Performance ____X____

Classroom _____ Simulator _____X_____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions: You are the extra NSO.
Unit 1 is in mode 1.
The 1A D/G needs to be paralleled and loaded.
The 1A D/G has been running at 0 load for 5 minutes,
It is ready to be loaded.

Task Standard: SYNCHRONIZE A D/G TO A BUS AND LOAD TO >5500 KW

Required Materials: NONE

General References:
BOP DG-11 DIESEL GENERATOR START UP

Initiating Cue: THE UNIT SUPERVISOR DIRECTS YOU TO PARALLEL AND LOAD THE 1A DG TO > 5500 KW PER STEP 5 OF BOP DG-11. THE 1A D/G WILL BE RUN FOR 4 HOURS.

Time Critical Task: NO

Validation Time: 15 minutes

PERFORMANCE INFORMATION

START TIME: _____

(Denote critical steps with a **BOLD** *)

Performance step: 1

ENTER BOP DG-11

Standard: LOCATE AND OPEN BOP DG-11(STEP 5A)

CUE: ALL PREREQUISITES AND PRECAUTIONS HAVE BEEN MET

Comment: ----------

Performance step: 2

NOTIFY ELECTRIC OPERATIONS OF PENDING D/G PARALLEL OPERATION, ESTIMATED RUN TIME, AND LOADING

Standard: ELECTRIC OPERATIONS NOTIFIED

CUE: WHEN ASKED ANSWER AS ELECTRIC OPERATIONS NOTIFIED

Comment: ----------

Performance step: 3

*** PLACE THE AUTO RE-CLOSE CIRCUIT ARM SELECTOR SWITCH TO THE SURV TEST POSITION ***

Standard: *** SWITCH IN SURV TEST POSITION ***

Comment: ----------

Performance step: 4

VERIFY D/G IS OPERATING PROPERLY FREQUENCY 60 HZ AND VOLTAGE 4160 VOLTS

Standard: D/G FREQ 60 HZ AND VOLTAGE 4160 VOLTS

Comment: ----------

Performance step: 5

VERIFY APPROXIMATELY THE SAME VOLTAGE EXIST ACROSS EACH PHASE USING THE D/G VOLTMETER SELECT SWITCH

Standard: PHASE VOLTAGES ALL EQUAL

Comment: ----------

Performance step: 6

*** ESTABLISH CONDITIONS TO SYNCHRONIZE THE DG TO ESF BUS 41, SYNC SELECTOR SWITCH FOR DG A FEED TO 4KV BUS 41 IS ON, INCOMING VOLTAGE IS 2 VOLTS HIGHER THAN RUNNING VOLTAGE(VOLT ADJUST), THE SYNCHROSCOPE IS ROTATING IN THE FAST DIRECTION (GOV ADJUST) ***

Standard: ***SYNC SWITCH ON IN 41 POSITION, INCOMING VOLTAGE 2 VOLTS HIGHER, SYNCHROSCOPE MOVING SLOWLY IN FAST DIRECTION ***

Comment: ----------

Performance step:7

*** SYNCHRONIZE THE D/G SLIGHTLY BEFORE THE 12 O'CLOCK POSITION CLOSE ACB 413/423, VERIFY SYNCHROSCOPE LOCKED IN 12 O'CLOCK POSITION, IMMEDIATELY LOAD D/G TO 1000 KW BY GOING TO RAISE ON GOV ADJUST ***

Standard: *** BKR SHUT, SYNCHROSCOPE LOCKED IN 12 O'CLOCK POSITION, D/G LOADED TO 1000KW BY ADJUSTING GOV ***

CUE: WHEN ASKED BY APPLICANT AFTER D/G LOADED, TELL THEM THAT THE 1A D/G LOG BOP DG-11T1 WILL BE LOGGED

Comment: ----------

Performance step:8

*** D/G CONTINUES TO LOAD RAPIDLY WITHOUT CONTROL UNTIL ANNUNCIATOR 1-21-D8 DG 1A DIFF LOCKOUT/OVERSPEED ***

Standard: *** THE APPLICANT WILL USE BAR 1-21-D8 AND OPEN THE OUTPUT BREAKER ACB 1413***

Comment: ----------

TERMINATING CUE: SRO I HAVE TRIPPED 1A D/G OUTPUT BREAKER.

CUE: I WILL HAVE SOMEONE INVESTIGATE THE 1A D/G.

TIME STOP_____

Initial Conditions: You are the extra NSO.
Unit 1 is in mode 1.
The 1A D/G needs to be paralleled and loaded.
The 1A D/G has been running at 0 load for 5 minutes.

Initiating Cue: THE UNIT SUPERVISOR DIRECTS YOU TO PARALLEL AND LOAD THE 1A DG TO > 5500 KW PER STEP 5 OF BOP DG-11. THE 1A D/G WILL BE RUN FOR 4 HOURS.

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility: BYRON Task No: VII

Task Title: CHANNEL CHECK ON WRGM Job Performance Measure No: 6

K/A Reference: 73A4.02 3.7/3.7

Examinee: _____ NRC Examiner: _____

Date: _____

Method of testing:

Simulated Performance _____X_____ Actual Performance _____

Classroom _____ Simulator (Control Room) ___X___ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions: You are an extra NSO
Unit 2 is in mode 1
A work package needs a channel check on 2RIU-PR030 to be closed out

Task Standard: CHANNEL CHECK ON WRGM (RAD MONITOR)

Required Materials: 2BOSR 3.3.1-1

General References:
2BOSR 3.3.1-1

Initiating Cue: THE UNIT SUPERVISOR DIRECTS YOU TO PERFORM APPLICABLE STEPS OF 2BOSR 3.3.1-1 ON 2RIU-PR030 UNIT 2 AUX BLDG VENT STACK MONITORS (WRGM) TO CLOSE OUT WORK PACKAGE

Time Critical Task: NO

Validation Time: 20 minutes

PERFORMANCE INFORMATION

START TIME: _____

(Denote critical steps with a **BOLD** *)

CUE: IF ASKED, KEY HAS BEEN OBTAINED

Performance step: 1

ENTER 2BOSR 3.3.1-1

Standard: LOCATE AND OPEN 2BOSR 3.3.1-1 AT MONTHLY CHANNEL CHK STEP 2

CUE: ALL PREREQUISITES HAVE BEEN MET, PER SM A PARTIAL SURVEILLANCE WILL BE PERFORMED

Comment: ----------

Performance step: 2

VERIFY AND RECORD GREEN AVAIL LIGHT IS ILLUMINATED

Standard: LOW RANGE AND EFF LEVEL LITE LIT

CUE: LOW RANGE AVAIL AND EFF LEVEL AVAL LIT

Comment: ----------

Performance step: 3

VERIFY FOLLOWING LIGHT PUSH BUTTONS ARE NOT ILLUMINATED

Standard: LIGHTS NOT ILLUMINATED

CUE: ITEM, MON, ERROR, SUPV MODE, KYBD LOCK OUT LIGHTS NOT LIT

Comment: ----------

Performance step: 4

DEPRESS "EFF LEVEL AND VERIFY IT ILLUMINATES

Standard: EFF LEVEL PUSHBUTTON DEPRESSED AND LED DISPLAY RECORDED

CUE: EFF LEVEL PUSH BUTTON LIT AND LED DISPLAY READS 1.98+1

Comment: ----------

Performance step: 5

DEPRESS LOW RANGE CHANNEL AND PUSHBUTTON AND RECORD LED DISPLAY

Standard: PUSHBUTTONS DEPRESSED AND LED DISPLAY RECORDED

CUE: LOW RANGE PUSHBUTTON IS LIT AND LED DISPLAY READS 3.47 E-7

Comment: ----------

Performance step: 6

*** VERIFY THE AS FOUND PUMP CONTROL POINT ***

Standard: *** DEPRESS PUSHBUTTONS 0,2,3 AND DEPRESS ITEM AND RECORD ***

CUE: LED DISPLAY 023 AND LED DISPLAY 5.00 E-7

Comment: ----------

Performance step:7

*** PLACE THE RM-23 IN SUPERVISORY MODE ***

Standard: *** RM-23 IN SUPV MODE (KEY #5533) INSERT KEY AND SELECT SUPERVISOR AND VERIFY LIGHT ILLUMINATED ***

CUE: IF ASKED KEY HAS BEEN OBTAINED, KEY IS IN SUPERVISOR POSITION AND SUPV MODE LIGHTS ARE LIT

Comment: ----------

Performance step: 8

*** START THE MID AND HIGH RANGE PUMPS ***

NOTE: (THE LIGHTS ONLY ILLUMINATE IF THE SETPOINT ENTERED IS A VALUE LESS THAN RAD LEVEL)

Standard: *** DEPRESS DESIRED SETPOINT ###-##, (123-04)**
DEPRESS ENTER BUTTON
RECORD GREEN AVAIL LIGHT ILLUMINATED *

CUE: LED DISPLAY NUMBER ENTERED AND AVAIL LIGHTS ARE LIT FOR MID RANGE AND HIGH RANGE

Comment: ----------

Performance step: 9

*** RESTORE PUMP CONTROL POINT TO AS FOUND ***

Standard: * **VERIFY LOW RANGE BUTTON IS LIT,**
DEPRESS BUTTONS 0,2,3
DEPRESS ITEM PUSHBUTTON
ENTER AS FOUND POINT VALUE
RECORD AS LEFT VALUE *

CUE: LOW RANGE PUSHBUTTON IS LIT, LED DISPLAYS 023, LED DISPLAYS SETPOINT ENTERED, LED DISPLAYS NUMBERED ENTERED, IV WAS PERFOMED

Comment: ----------

Performance step: 10

RESTORE SUPERVISORY CONTROL TO NORMAL

Standard: SELECT NORMAL ON KEY SWITCH
AFTER 2 MINUTES VERIFY GREENAVAIL IS OFF FOR MID AND HIGH RANGE
ACKNOWLEDGE ALARMS ON RM-23 FOR MID AND HIGH RANGE
ACKNOWLEDGE LOSS OF FLOW ALARM ON THE RM-11 FOR THE MID AND HIGH RANGE
VERIFY LOSS OF FLOW-SELECT PROPER CHANNEL
DEPRESS STATUS ON RM-11

CUE: KEY SWITCH IS IN NORMAL, GREEN AVAIL LIGHTS ARE OFF FOR MID AND HIGH RANGE AND BUTTONS FLASHING, MID AND HIGH RANGE BUTTONS ARE OFF, THE MID AND HIGH RANGE ARE DARK BLUE, CHANNEL LOSS OF SAMPLE FLOW IS INDICATED

Comment: ----------

Performance step: 11

*** VERIFY NUMBER OF OPERABLE CHANNELS ***

Standard: *** MARK CHANNEL CHECK SPACE OF THE BOS AND GREATER THAN CHANNELS OPERABLE ***

CUE: ALL CHANNELS OPERABLE

Comment: ----------

TERMINATING CUE: SRO I HAVE COMPLETED THE CHANNEL CHECK ON 2RIU-PRO3O

TIME STOP_____

Initial Conditions: You are an extra NSO
Unit 2 is in mode 1
A work package needs a channel check on 2RIU-PR030 to be closed out

Initiating Cue: THE UNIT SUPERVISOR DIRECTS YOU TO PERFORM APPLICABLE STEPS OF 2BOSR 3.3.1-1 ON 2RIU-PR030 UNIT 2 AUX BLDG VENT STACK MONITORS (WRGM) TO CLOSE OUT WORK PACKAGE

UNIT TWO
ACCIDENT MONITORING INSTRUMENTATION
MONTHLY CHANNEL CHECKS

A. STATEMENT OF APPLICABILITY:

This procedure outlines the steps necessary to verify the Operability of the Accident Monitoring Instrumentation by performing a Channel Check of the required instruments and indications and verifying the required number of channels are Operable. This procedure shall be performed once per 31 days and is applicable in Modes 1, 2 & 3.

B. REFERENCES:

1. Technical Specifications:

   a. LCO 3.3.3

   b. SR 3.3.3.1

   c. Table 3.3.3-1

2. TRM:

   a. LCO 3.3.i

   b. LCO 3.3.j

   c. SR 3.3.i.1

   d. SR 3.3.j.1

   e. Table T3.3.i-1

3. Station Procedures:

   a. BOP RC-12, Placing RVLIS/HJTC/CETC in Service.

   b. BOP RC-12T1, Table 1 RVLIS Error Codes Train A and B.

   c. 2BOL 3.3, Post Accident Monitoring (PAM) Instrumentation.

   d. 2BOL 3.i, Post Accident Monitoring (PAM) Instrumentation.

   e. 2BOL 3.j, Hydrogen Monitors.

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B. continued

4. OSR No. 97-106, Reactor Vessel Level Indicating System Error Code 32.

5. Station Commitments:

a. 454-251-90-15900

b. 454-251-88-62300

c. 454-180-95-0002-01

C. PREREQUISITES:

1. Receive permission from the Shift Manager or designated SRO licensed assistant prior to performing this surveillance by having the Data Package Cover Sheet signed and dated.

2. This procedure may be performed in Modes 1, 2, 3, or 4.

D. PRECAUTIONS:

1. None.

E. LIMITATIONS AND ACTIONS:

1. As stated in Technical Specification LCO 3.3.3 and TRM LCOs 3.3.i and 3.3.j.

2. The parameters do not have to be checked in sequence.

3. In the event the Acceptance Criteria (¢) is not met during the performance of this surveillance, IMMEDIATELY NOTIFY the Shift Manager or designee to initiate LCOAR 2BOL 3.3, Post Accident Monitoring (PAM) Instrumentation, 2BOL 3.i, Post Accident Monitoring (PAM) Instrumentation and/or 2BOL 3.j, Hydrogen Monitors, for the affected parameter(s) if in Modes 1, 2 or 3.

4. Instrument readings that exceed the "Maximum Allowed Deviation" guidelines shall be referred to an SRO for further evaluation. The SRO shall evaluate the readings against all other available indications and parameters that may assist in determining channel OPERABILITY and RECORD the evaluation of the results in the comments section of each data sheet.

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E. continued

5. A partial surveillance may be performed at the discretion of the Shift Manager or designee to demonstrate operability of individual instruments in the data tables provided all Prerequisites, Precautions, and Limitations and Actions are observed. The Shift Manager or designee shall determine the steps to be performed. The Data Package Cover Sheet must indicate that a partial surveillance was performed and the reason why listed in the Comments section.

6. A CHANNEL CHECK shall be the qualitative assessment of channel behavior during operation by observation. This determination shall include, where possible, comparison of the channel indication and/or status with other indications and/or status derived from independent instrument channels measuring the same parameter.

   a. Tolerances should be based on expected operating range pertaining to plant status, however, deviation $\geq$ 3% of scale shall be referred to an SRO for further evaluation for acceptability.

   b. Indicating parameters are not expected to be exactly the same, since frequently the instruments being compared are not exposed to identical conditions.

   c. A Channel Check is a judgement as to whether an instrument properly reflects the conditions it is monitoring rather than a simple comparison of readings.

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F. MAIN BODY:

NOTE

IF it is desired, some or all of the Channel Checks may be accomplished from the RM-23 as indicated on the data sheets. IF the RM-23 is used, the checks need not be performed using the RM-11. IF a parameter is NOT checked using the RM-23, it MUST be checked using the RM-11.

1. **PERFORM** the Channel Checks of the Radiation Monitoring Instrumentation as follows:

   a. To perform the Channel Checks of the Rad Monitoring Instrumentation on Data Sheet D2, using the RM-11 console, the following steps apply:

      1). **SELECT** the grid indicated on the Data Sheet using the appropriate pushbutton.

      2). **ENTER** the channel number from the Data Sheet.

      3). **DEPRESS** the SEL pushbutton and **VERIFY** the channel is outlined.

      4). **DEPRESS** the STATUS pushbutton.

      5). **VERIFY** the Monitor status using the status cursor and **RECORD** the highest cursor color.

      6). **RECORD** the Rad level.

      7). **INDICATE** the acceptability of the Channel Check of each instrument by placing an "X" in the "Y" or "N" space provided (channels that were circled as suspect are to be marked "Y" or "N" based on the SRO evaluation).

      ¢ 8). **INDICATE** whether or not the Acceptance Criteria is met by placing an "X" in the "Y" or "N" and **INITIAL** in the space provided.

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F.1. continued

b. To perform the Channel Checks of the Rad Monitoring Instrumentation on Data Sheet D3, using the RM-23 at 2PM10J, the following steps apply:

1). **VERIFY** the green "AVAIL" light is ILLUMINATED.

2). **DEPRESS** the channel DISPLAY/CONTROL top row pushbuttons, labeled as shown on page D3 for such rad monitor.

3). **VERIFY** the following light/pushbutton is NOT ILLUMINATED:

a). ITEM

b). MON

c). ERROR

d). SUPV MODE

e). KYBD LOCK OUT

4). **RECORD** the Rad level from the LED digital readout.

5). **INDICATE** the acceptability of the Channel Check of each instrument by placing an "X" in the "Y" or "N" space provided (channels that were circled as suspect are to be marked "Y" or "N" based on the SRO evaluation).

¢ 6). **INDICATE** whether or not the Acceptance Criteria is met by placing an "X" in the "Y" or "N" and **INITIAL** in the space provided.

NOTE

Channel Checks of the Aux Bldg Vent Stack Wide Range Gas Monitor (WRGM) _RE-PR030, must be performed on the RM-23. Mid Range and High Range channels require Pump Control Point (0,2,3,ITEM) setpoint be lowered, which may only be performed on the RM-23.

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F. continued

CAUTION

When the RM-23 is in SUPERVISOR Mode, some actions may have serious detrimental effects on system operation. Use caution and do not leave the RM-23 panel unattended when it is in this mode. If any unusual conditions occur contact the System Engineer.

2. To perform the Channel Checks of the Unit 1 and Unit 2 Aux Bldg Vent Stack Monitors on Data Sheet D-4, using the RM-23 (_RIU-PR030) at 1PM10J and 2PM10J, **PERFORM** the following:

   a. **VERIFY** and **RECORD** the following Green "AVAIL" light is ILLUMINATED:

      1). LOW RANGE

      2). EFF LEVEL

   b. **VERIFY** the following light/pushbuttons are NOT ILLUMINATED:

      1). ITEM

      2). MON

      3). ERROR

      4). SUPV MODE

      5). KYBD LOCK OUT

   c. **DEPRESS** the "EFF LEVEL" channel pushbutton and **VERIFY** it ILLUMINATES.

   d. **RECORD** the Rad Level from the LED digital display as EFF LEVEL, Instr Value.

   e. **DEPRESS** the "LOW RANGE" channel pushbutton and **VERIFY** it ILLUMINATES.

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F.2. continued

f. **RECORD** the Rad Level from the LED digital display as LOW RANGE, Instr Value.

g. **VERIFY** the "As Found" Pump Control Point by Selecting Item #23 as follows:

1). **DEPRESS** pushbuttons: 0,2,3

2). **DEPRESS** the "ITEM" pushbutton.

3). **RECORD** the "As Found" Pump Control Point value from the digital display.

h. **PLACE** RM-23 in Supervisory Mode:

1). **OBTAIN** Key #5533.

2). **INSERT** key and **SELECT** "SUPERVISOR".

3). **VERIFY** "SUPV MODE" light ILLUMINATES.

i. **START** the MID and HIGH Range pumps by Entering a Pump Control Point value less than Rad Level recorded in step F.2.f, LOW RANGE by **PERFORMING** the following:

1). **DEPRESS** desired setpoint in the form of: (123-04).

2). **DEPRESS** the "ENTER" pushbutton.

3). **VERIFY** and **RECORD** the following Green "AVAIL" lights ILLUMINATE after a slight delay:

a). MID RANGE

b). HIGH RANGE

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F.2. continued

j. **RESTORE** Pump Control Point to "As Found" value recorded in step F.2.g.3).

1). **VERIFY** the "LOW RANGE" pushbutton ILLUMINATED.

2). **DEPRESS** pushbuttons: 0,2,3

3). **DEPRESS** the "ITEM" pushbutton.

4). **ENTER** "As Found" pump control point value in the form of: (123-04).

5). **RECORD** the "As Left" Pump Control Point.

6). **OBTAIN** Independent Verification of Pump Control Point returned to "As Found" value from step F.2.g.3).

k. **RETURN** Supervisory control to NORMAL Mode as follows:

1). **SELECT** "NORMAL" on Key Switch.

2). **REMOVE** and **RETURN** key.

l. After approximately 2 min, **PERFORM** the following:

1). **VERIFY** the following Green "AVAIL" lights on RM-23 EXTINGUISHES:

a). MID RANGE

b). HIGH RANGE

2). **ACKNOWLEDGE** alarm (flashing push buttons) on RM-23 by **DEPRESSING** the following pushbuttons:

a). MID RANGE

b). HIGH RANGE

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F.2. continued

m. **VERIFY** and **ACKNOWLEDGE** loss of flow alarm on RM-11 for the following Channels.

1). MID RANGE

2). HIGH RANGE

n. **INDICATE** the acceptability of the Channel Check of each instrument by placing an "X" in the "Y" or "N" space provided (channels that were circled as suspect are to be marked "Y" or "N" based on the SRO evaluation).

¢ o. **INDICATE** whether or not the Acceptance Criteria is met by placing an "X" in the "Y" or "N" and **INITIAL** in the space provided.

NOTE
The RVLIS Channel Checks are in two groups. Those in the Head region with Minimum 1/2 Sensors per channel, and those in the Plenum region with Minimum 3/6 Sensors per channel Required for Channel Operability.

3. **PERFORM** the Channel Checks of the Reactor Vessel Water Level System on Data Sheet D5 from 2LI-RC019 and 2LI-RC020 as follows:

a. **RECORD** the RVLIS instrument readings for both the Head, and the Plenum regions of each channel in the space provided.

NOTE
An error code 32 ERROR MESSAGE does NOT denote an inoperability code.

b. **RECORD** the Error Message by **CIRCLING** the number in the space provided, using the procedure BOP RC-12, Placing RVLIS/HJTC/CETC In Service, and BOP RC-12T1, Table 1 RVLIS Error Codes Train A and B. If an error code 32 ERROR MESSAGE is observed, then **REPERFORM** steps as necessary to verify correct indication from RVLIS.

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F.3. continued

c. **ACCEPTABILITY** of a Sensors Channel Check is indicated by the absence of ERROR MESSAGES affecting that Sensor. This criterion does not apply to an error code 32 ERROR MESSAGE, which does NOT denote inoperability. **INDICATE** the acceptability of the Channel Check of each instrument by placing an "X" in the "Y" or "N" space provided.

¢ d. **INDICATE** whether or not the Acceptance Criteria is met by placing an "X" in the "Y" or "N" and **INITIAL** in the space provided.

NOTE

The Core Exit Thermocouple Channel Checks are divided into two groups: (1) Symmetric CETCs having a "Maximum Allowed Deviation" of $\leq$ 20°F difference between the highest and lowest reading, and (2) CETCs having no core symmetry with a "Maximum Allowed Deviation" of $\leq$ 60°F between the highest and lowest reading. See ATTACHMENT A for CETC core locations.

4. **PERFORM** the Channel Check of the Core Exit Thermocouples (CETCs) on Data Sheet D6 from 2TI-IT001 and 2TI-IT002 as follows:

a. **RECORD** the instrument reading for each Core Exit Thermocouple that is not known inoperable using procedure BOP RC-12, Placing RVLIS/HJTC/CETC In Service, (**RECORD** "INOP" for channels that are known inoperable).

b. **CALCULATE** and **RECORD** the "Maximum Actual Deviation" between OPERABLE Core Exit Thermocouples by subtracting the lowest CETC reading from the highest CETC reading on each line. **COMPARE** to the stated "Maximum Allowed Deviation".

c. IF the "Maximum Actual Deviation" exceeds the stated "Maximum Allowed Deviation", **CIRCLE** the readings that are suspect and **REFER** the deviation to an SRO for evaluation of the channel Operability status.

¢ d. **RECORD** the total number of Operable Core Exit Thermocouples per core quadrant and **INDICATE** whether or not the total is $\geq$ 4 by placing an "X" in the "Y" or "N" and **INITIAL** in the space provided.

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F. continued

NOTE
The Channel Checks of the Subcooling Margin Monitor consist of determining the "Maximum Actual Deviation" of the two channels of Core Exit Thermocouples with a "Maximum Allowed Deviation" of ≤ 20°F, AND the two RCS Loop W/R Pressure channels with a "Maximum Allowed Deviation" of ≤ 210 psig.

5. **PERFORM** the Channel Checks of the Reactor Coolant Subcooling Margin Monitor on Data Sheet D7 as follows:

   a. **RECORD** the instrument readings for all channels that are not known inoperable (**RECORD** "INOP" for channels that are known inoperable).

   b. **CALCULATE** and **RECORD** the "Maximum Actual Deviation" between OPERABLE readings and **COMPARE** to the stated "Maximum Allowed Deviation".

   c. IF the "Maximum Actual Deviation" exceeds the stated "Maximum Allowed Deviation", **CIRCLE** the readings that are suspect and **REFER** the deviation to an SRO for evaluation of the channel Operability status.

   d. **INDICATE** the acceptability of the Channel Check of each instrument by placing an "X" in the "Y" or "N" space provided (channels that were circled as suspect are to be marked "Y" or "N" based on the SRO evaluation).

¢ e. **INDICATE** whether or not the Acceptance Criteria is met by placing an "X" in the "Y" or "N" and **INITIAL** in the space provided.

* 6. **PERFORM** the Channel Checks of the Post Accident Neutron Monitors on Data Sheet D8 as follows:

   a. **RECORD** the instrument reading for each PANM indicator that is not known inoperable (**RECORD** "INOP" for channels that are known to be inoperable).

   b. **PERFORM** a 10 minute calorimetric and **RECORD** on the Data Sheet if in Mode 1.

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F.6. continued

c. **CALCULATE** and **RECORD** the deviation between the Operable Wide Range readings and the calorimetric power if in Mode 1, otherwise **RECORD** the deviation between the channels.

d. **CALCULATE** and **RECORD** the "Maximum Actual Deviation" between OPERABLE Source Range readings.

e. **CIRCLE** the readings that are suspect (greater than 1/2 decade deviation) and **REFER** the deviation to an SRO for evaluation of the channel Operability status.

f. **INDICATE** the acceptability of the Channel Check of each instrument by placing an "X" in the "Y" or "N" and **INITIAL** in the space provided (channels that were circled as suspect are to be marked "Y" or "N" based on the SRO evaluation).

*, 5.a

7. **PERFORM** the Channel Checks of the Remaining Accident Monitoring Instrumentation on Data Sheets D9 through D12 as follows:

a. **RECORD** the instrument readings for all channels that are not known inoperable (**RECORD** "INOP" for channels that are known inoperable).

b. **CALCULATE** and **RECORD** the "Maximum Actual Deviation" between OPERABLE channels and **COMPARE** to the stated "Maximum Allowed Deviation".

c. IF the "Maximum Actual Deviation" exceeds the stated "Maximum Allowed Deviation", **CIRCLE** the readings that are suspect and **REFER** the deviation to an SRO for evaluation of the channel Operability status.

d. **INDICATE** the acceptability of the Channel Check of each instrument by placing an "X" in the "Y" or "N" space provided (channels that were circled as suspect are to be marked "Y" or "N" based on the SRO evaluation).

¢ e. **INDICATE** whether or not the Acceptance Criteria is met by placing an "X" in the "Y" or "N" and **INITIAL** in the space provided.

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F. continued

* 8. For each of the Hydrogen Monitors on Data Sheet D-13, **PERFORM** the following:

> **NOTE**
> Valves 2PS230A & B have solenoid operators with a limited EQ life. These valves should be energized (open) for a minimum length of time.

a. **VERIFY/OPEN** H_2 monitor Cnmt Isol Vlvs 2PS228A & B, 2PS229A & B and 2PS230A & B.

b. **PLACE** the ON-OFF selector switch on the Hydrogen Monitor Panels located at 2PM12J to the ON position and **VERIFY** the Green "ON" light comes on. **RECORD** the time the Hydrogen Monitor was turned on. Allow Train A and Train B to run for 20 minutes prior to taking readings to allow adequate sample line purging and to ensure a complete purge cycle is performed without receiving unexpected hydrogen monitor alarms.

c. **VERIFY** the H_2 and System Status lights are not on after 4 minutes and **RECORD** light status on Data Sheet D-13 by placing an 'X' in the appropriate box.

d. **RECORD** Containment Hydrogen Concentration from Computer points U8014 and U8015 or meters 2PS343 and 2PS344 and **VERIFY** they are reading in the expected range pertaining to plant status. **PLACE** an 'X' in the appropriate box for either the computer point or the meter reading depending on which one is used. **RECORD** the time the readings were taken and **VERIFY** time greater than or equal to 20 minutes from the time the Hydrogen Monitor was turned on.

e. **PLACE** the ON-OFF switch at 2PM12J to the OFF position for each hydrogen monitor.

f. **VERIFY** the Hydrogen monitor off/standby switch is in the STANDBY position and the Amber Standby light is LIT. **INDICATE** YES on Data Sheet if the switch is in the correct position.

g. **CLOSE** 2PS230A & B Cnmt Isol Vlvs.

*, 5.c

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F.8. continued

¢ h. **INDICATE** whether or not the Acceptance Criteria is met by placing an "X" in the "Y" or "N" and **INITIAL** in the space provided.

G. ACCEPTANCE CRITERIA:

1. When performing this surveillance as a complete, routinely scheduled surveillance, the following criteria apply: (Tech Spec SR 3.3.3.1, TRM SR 3.3.i.1 and TRM SR 3.3.j.1)

   a. The required number of channels are OPERABLE for each instrument or indication listed on the data sheets.

   b. A Channel Check was Satisfactorily performed for each OPERABLE instrument or indication listed on the data sheets.

2. When performing this surveillance as a partial to meet the retest criteria to exit a LCOAR, this surveillance shall be considered Satisfactorily Completed if the following criteria are met:

   a. A Channel Check was Satisfactorily performed for the parameter(s) being restored.

   b. The Data Package Cover Sheet indicates that a partial surveillance was performed and the reason why listed in the Comments section.

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ATTACHMENT A
CORE EXIT THERMOCOUPLE LOCATIONS

QUADRANT 3

R P N M L K J H G F E D C B A

180°

1				44			39								
2			30		61				8		21				
3				16			13		11				36	52	2
4										57		4			
5		33	47		63		42		24		55				51
6												5			
7			32					25					53		
8	90°	49		64		45			40	23		37		34		1
9				17		62			58	9	22		20			50
10		65			15			41				6			3
11			48				26		59	10	56					18
12					29	14					38			19	
13				31	46		27		12					35	
14						28			60			54			
15							43				7				

270°

0°

Q U A D R A N T

2 4

QUADRANT 1

(Final)

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UNIT TWO
ACCIDENT MONITORING INSTRUMENTATION
SURVEILLANCE DATA SHEET

The Rad Monitoring Channel Checks on this page are performed using the RM-11.

PARAMETER	INSTRUMENT	CURSOR COLOR $$	INSTR VALUE	CH CHK ACCEPT	UNITS	CHANNEL CHK OK?	ACCEPTANCE CRITERIA	ACCEPTANCE CRITERIA MET?	APPLICABLE LCO
CONTAINMENT HIGH RANGE AREA RAD	2RE-AR020 (G4 5AS120)			###	R/HR	[ ]Y [ ]N	≥ 1 OPERABLE CHAN WITH CHAN CHKS SAT	¢ [ ]Y [ ]N	3.3.3
	2RE-AR021 (G4 5AS121)					[ ]Y [ ]N		INIT _____	
MAIN STEAM LINE 2A RADIATION	2RE-AR022A (G1 5AA122)			###	MR/HR	[ ]Y [ ]N	≥ 1 OPERABLE CHAN WITH CHAN CHKS SAT	¢ [ ]Y [ ]N	3.3.3
	2RE-AR023A (G1 5AA123)					[ ]Y [ ]N		INIT _____	
MAIN STEAM LINE 2B RADIATION	2RE-AR022B (G1 5AB222)			###	MR/HR	[ ]Y [ ]N	≥ 1 OPERABLE CHAN WITH CHAN CHKS SAT	¢ [ ]Y [ ]N	3.3.3
	2RE-AR023B (G1 5AB223)					[ ]Y [ ]N		INIT _____	
MAIN STEAM LINE 2C RADIATION	2RE-AR022C (G1 5AC322)			###	MR/HR	[ ]Y [ ]N	≥ 1 OPERABLE CHAN WITH CHAN CHKS SAT	¢ [ ]Y [ ]N	3.3.3
	2RE-AR023C (G1 5AC323)					[ ]Y [ ]N		INIT _____	
MAIN STEAM LINE 2D RADIATION	2RE-AR022D (G1 5AD422)			###	MR/HR	[ ]Y [ ]N	≥ 1 OPERABLE CHAN WITH CHAN CHKS SAT	¢ [ ]Y [ ]N	3.3.3
	2RE-AR023D (G1 5AD423)					[ ]Y [ ]N		INIT _____	

Cursor status is not White, Magenta, or Dark Blue.
$$ Color may be indicated as follows: G = Green Y = Yellow DB = Dark Blue R = Red
W = White M = Magenta LB = Light Blue C = Cyan

COMMENTS: _____

(2BOSR/2-3311/WPF/042000/16)

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UNIT TWO
ACCIDENT MONITORING INSTRUMENTATION
SURVEILLANCE DATA SHEET

The Rad Monitoring Channel Checks on this page are performed using the RM-23.

PARAMETER	INSTRUMENT	AVAIL LIGHT	INSTR VALUE	CH CHK ACCEPT	UNITS	CHANNEL CHK OK?	ACCEPTANCE CRITERIA	ACCEPTANCE CRITERIA MET?	APPLICABLE LCO
CONTAINMENT HIGH RANGE AREA RAD	2RIU-AR020 (R/HR Key)	[ ] ON [ ] OFF		###	R/HR	[ ]Y [ ]N	≥ 1 OPERABLE CHAN WITH CHAN CHKS SAT	c [ ]Y [ ]N INIT _____	3.3.3
	2RIU-AR021 (R/HR Key)	[ ] ON [ ] OFF				[ ]Y [ ]N			
MAIN STEAM LINE 2A RADIATION	2RIU-AR022A (MR/HR Key)	[ ] ON [ ] OFF		###	MR/HR	[ ]Y [ ]N	≥ 1 OPERABLE CHAN WITH CHAN CHKS SAT	c [ ]Y [ ]N INIT _____	3.3.3
	2RIU-AR023A (MR/HR Key)	[ ] ON [ ] OFF				[ ]Y [ ]N			
MAIN STEAM LINE 2B RADIATION	2RIU-AR022B (MR/HR Key)	[ ] ON [ ] OFF		###	MR/HR	[ ]Y [ ]N	≥ 1 OPERABLE CHAN WITH CHAN CHKS SAT	c [ ]Y [ ]N INIT _____	3.3.3
	2RIU-AR023B (MR/HR Key)	[ ] ON [ ] OFF				[ ]Y [ ]N			
MAIN STEAM LINE 2C RADIATION	2RIU-AR022C (MR/HR Key)	[ ] ON [ ] OFF		###	MR/HR	[ ]Y [ ]N	≥ 1 OPERABLE CHAN WITH CHAN CHKS SAT	c [ ]Y [ ]N INIT _____	3.3.3
	2RIU-AR023C (MR/HR Key)	[ ] ON [ ] OFF				[ ]Y [ ]N			
MAIN STEAM LINE 2D RADIATION	2RIU-AR022D (MR/HR Key)	[ ] ON [ ] OFF		###	MR/HR	[ ]Y [ ]N	≥ 1 OPERABLE CHAN WITH CHAN CHKS SAT	c [ ]Y [ ]N INIT _____	3.3.3
	2RIU-AR023D (MR/HR Key)	[ ] ON [ ] OFF				[ ]Y [ ]N			

GREEN CHANNEL AVAIL Light is ON.

COMMENTS: _____

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UNIT TWO
ACCIDENT MONITORING INSTRUMENTATION
SURVEILLANCE DATA SHEET

The Rad Monitoring Channel Checks on this page are performed using the RM-23.

PARAMETER		INSTRUMENT	INSTR VALUE	AS FOUND CNTRL PT	UNITS	AVAIL LIGHT	AS LEFT CNTRL PT	CHANNEL CHK OK?	ACCEPTANCE CRITERIA	ACCEPTANCE CRITERIA MET?	APPLICABLE LCO
UNIT ONE AUX BLDG VENT STACK WRGM	LOW RANGE	1RE-PR030 LOW RANGE			µc/ml	[ ] ON [ ] OFF		[ ] Y [ ] N ###	1RE-PR030 IS OPERABLE WITH CHANNEL CHECKS SAT ###	c [ ]Y [ ]N INIT _____	3.3.i
	MID RANGE	1RE-PR030 MID RANGE	N/A	N/A		[ ] ON [ ] OFF	IND VERIF INIT. _____	[ ] Y [ ] N ###			
	HIGH RANGE	1RE-PR030 HIGH RANGE	N/A			[ ] ON [ ] OFF		[ ] Y [ ] N ###			
	EFF LEVEL	1RE-PR030 EFF LEVEL			µc/sec	[ ] ON [ ] OFF		[ ] Y [ ] N ###			
UNIT TWO AUX BLDG VENT STACK WRGM	LOW RANGE	2RE-PR030 LOW RANGE			µc/ml	[ ] ON [ ] OFF		[ ] Y [ ] N ###	2RE-PR030 IS OPERABLE WITH CHANNEL CHECKS SAT ###	c [ ]Y [ ]N INIT _____	3.3.i
	MID RANGE	2RE-PR030 MID RANGE	N/A	N/A		[ ] ON [ ] OFF	IND VERIF INIT. _____	[ ] Y [ ] N ###			
	HIGH RANGE	2RE-PR030 HIGH RANGE	N/A			[ ] ON [ ] OFF		[ ] Y [ ] N ###			
	EFF LEVEL	2RE-PR030 EFF LEVEL			µc/sec	[ ] ON [ ] OFF		[ ] Y [ ] N ###			

GREEN CHANNEL AVAIL LIGHT is on.

COMMENTS: _____

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UNIT TWO
ACCIDENT MONITORING INSTRUMENTATION
SURVEILLANCE DATA SHEET

PARAMETER CHANNEL A	INSTRUMENT VALUE	INSTRUMENT (2LI-RC019)	ERROR MESSAGE CODES ###			CHANNEL CHK OK?	ACCEPTANCE CRITERIA	ACCEPTANCE CRITERIA MET?	APPLICABLE LCO
REACTOR VESSEL WATER LEVEL MEASUREMENT HEAD REGION	_____%	SENSOR #1	E01, E02, E03	E29	E25 E26 E27 E28	[ ]Y[ ]N	$$ 2 CHANNELS OPERABLE EACH WITH 1/2 HEAD SENSORS (#1 and #2) AND 3/6 PLENUM SENSORS (#3 through #8)	c [ ]Y [ ]N	3.3.3
		SENSOR #2	E04, E05, E06			[ ]Y[ ]N			
REACTOR VESSEL WATER LEVEL MEASUREMENT PLENUM REGION	_____%	SENSOR #3	E07, E08, E09, E31	E30		[ ]Y[ ]N			
		SENSOR #4	E10, E11, E12			[ ]Y[ ]N			
		SENSOR #5	E13, E14, E15		E32	[ ]Y[ ]N			
		SENSOR #6	E16, E17, E18			[ ]Y[ ]N			
		SENSOR #7	E19, E20, E21			[ ]Y[ ]N			
		SENSOR #8	E22, E23, E24			[ ]Y[ ]N			
PARAMETER CHANNEL B	INSTRUMENT VALUE	INSTRUMENT (1LI-RC020)							
REACTOR VESSEL WATER LEVEL MEASUREMENT HEAD REGION	_____%	SENSOR #1	E01, E02, E03	E29	E25 E26 E27 E28	[ ]Y[ ]N		INIT _____	
		SENSOR #2	E04, E05, E06			[ ]Y[ ]N			
REACTOR VESSEL WATER LEVEL MEASUREMENT PLENUM REGION	_____%	SENSOR #3	E07, E08, E09, E31	E30		[ ]Y[ ]N			
		SENSOR #4	E10, E11, E12		E32	[ ]Y[ ]N			
		SENSOR #5	E13, E14, E15			[ ]Y[ ]N			
		SENSOR #6	E16, E17, E18			[ ]Y[ ]N			
		SENSOR #7	E19, E10, E21			[ ]Y[ ]N			
		SENSOR #8	E22, E23, E24			[ ]Y[ ]N			

$$ A channel is considered OPERABLE if one of two (1/2) sensors in the HEAD region and three of six (3/6) sensors in the PLENUM region are OPERABLE. The operability of a sensor may be determined by review of the ERROR Messages on the Control Board indicator. BOP RC-12T1, RVLIS Error Codes Train A and B, provides the ERROR Message code meanings.

Error Code 32 does NOT affect operability of RVLIS channels provided the Main Control Board indicators are working properly.

NOTE: Some ERROR Codes may affect more than one sensor.

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UNIT TWO
ACCIDENT MONITORING INSTRUMENTATION
SURVEILLANCE DATA SHEET

The table below separates Core Exit Thermocouples by core position. (Core positions are represented on ATTACHMENT A.) Symmetric CETCs are listed on the same line. MAXIMUM ALLOWED DEVIATION between symmetric Core Exit Thermocouples is less than or equal to 20°F.

NO QUADRANT	IN QUADRANT 1	IN QUADRANT 2	IN QUADRANT 3	IN QUADRANT 4	DEVIATION
		49	39	1	°F
			30	2	°F
	14	63	4		°F
	26 56		42 55	5 6	°F
	7 43	65			°F
		32	8		°F
	9		25		°F
	10	62			°F
	12	64	11	34	°F
	27		13		°F
	35	31	16	52	°F
		33	44	18	°F
	46		36	19	°F
			57	53 20	°F
	54 28	47 48	21 61	51	°F
	41			22	°F
	58			23	°F
	59	45	24	37	°F
	38	15			°F
The following Core Exit Thermocouples do NOT have symmetric CETCs. MAXIMUM ALLOWED DEVIATION between all 8 is less than or equal to 60°F.					
40	60	17 29		3 50	°F
RECORD the total number of OPERABLE Core Exit Thermocouples in each Quadrant and VERIFY the total is greater than or equal to 4 per Quadrant.					
	(≥4) ¢[ ]Y [ ]N INIT _____	(≥4) ¢[ ]Y [ ]N INIT _____	(≥4) ¢[ ]Y [ ]N INIT _____	(≥4) ¢[ ]Y [ ]N INIT _____	Applicable LCO 3.3.3

COMMENTS: _____

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UNIT TWO
ACCIDENT MONITORING INSTRUMENTATION
SURVEILLANCE DATA SHEET

RCS SUBCOOLING MARGIN MONITOR $$	PARAMETER MEASURED		INSTRUMENT $$	INSTR VALUE	MAXIMUM DEVIATION ACTUAL	MAXIMUM DEVIATION ALLOWED	UNITS	CHANNEL CHK OK?	ACCEPTANCE CRITERIA	ACCEPTANCE CRITERIA MET?	APPLICABLE LCO
	AVE. 10 HIGH CORE EXIT THERMOCOUPLES		2TI-IT001			20	°F	[ ]Y [ ]N	2 CHANNELS OPERABLE$$	c [ ]Y [ ]N INIT _____	3.3.i
			2TI-IT002				°F	[ ]Y [ ]N			
	RC LOOP W/R PRESSURE	2A	2PI-403A			210	psig	[ ]Y [ ]N	2 OPERABLE CHAN WITH CHAN CHKS SAT	c [ ]Y [ ]N INIT _____	3.3.3 3.3.i
		2C	2PI-405				psig	[ ]Y [ ]N			

COMMENTS: _____

$$ A channel of Subcooling Margin Monitor will be considered acceptable if, a channel of AVE. 10 HIGH CETC's and a Wide Range RCS Pressure channel are OPERABLE from above. Failure of both RCS W/R Pressure, channels or both AVE. 10 HIGH CORE EXIT THERMOCOUPLE channels, renders both RCS SUBCOOLING MARGIN MONITOR channels INOPERABLE.

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UNIT TWO
ACCIDENT MONITORING INSTRUMENTATION
SURVEILLANCE DATA SHEET

The Post Accident Neutron Monitor Wide Range channel checks are performed by comparing the meter indication to the calorimetric power if in Mode 1 or between the channels if in Modes 2, 3, or 4.

PARAMETER	INSTRUMENT	INSTR VALUE	MAXIMUM DEVIATION		UNITS	CHANNEL CHK OK?	ACCEPTANCE CRITERIA	ACCEPTANCE CRITERIA MET?	APPLICABLE LCO
			ACTUAL	ALLOWED					
POST ACCIDENT NEUTRON MONITOR WIDE RANGE	2NI-NR005A			1/2 Decade	%	[ ]Y [ ]N INIT ____	N/A	N/A	N/A
	2NI-NR006A					[ ]Y [ ]N INIT ____			
CALORIMETRIC POWER	Plant Computer		N/A	N/A	%	N/A	N/A	N/A	N/A
POST ACCIDENT NEUTRON MONITOR SOURCE RANGE	2NI-NR005B			1/2 Decade	cps	[ ]Y [ ]N INIT ____	N/A	N/A	N/A
	2NI-NR006B					[ ]Y [ ]N INIT ____			

COMMENTS: _____

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UNIT TWO
ACCIDENT MONITORING INSTRUMENTATION
SURVEILLANCE DATA SHEET

PARAMETER		INSTRUMENT	INSTR VALUE	MAXIMUM DEVIATION ACTUAL	MAXIMUM DEVIATION ALLOWED	UNITS	CHANNEL CHK OK?	ACCEPTANCE CRITERIA	ACCEPTANCE CRITERIA MET?	APPLICABLE LCO
CONTAINMENT PRESSURE		2PI-PC004			4.8	PSIG	[ ]Y [ ]N	2 OPERABLE CHAN WITH CHAN CHKS SAT	c [ ]Y [ ]N INIT _____	3.3.3
		2PI-PC005					[ ]Y [ ]N			
S/G 2A AUX FEED FLOW	PP 2A	2FI-AF011A			11.25 (Note)	GPM	[ ]Y [ ]N	2 OPERABLE CHAN WITH CHAN CHKS SAT	c [ ]Y [ ]N INIT _____	3.3.i
	PP 2B	2FI-AF012A					[ ]Y [ ]N			
S/G 2B AUX FEED FLOW	PP 2A	2FI-AF013A			11.25 (Note)	GPM	[ ]Y [ ]N	2 OPERABLE CHAN WITH CHAN CHKS SAT	c [ ]Y [ ]N INIT _____	3.3.i
	PP 2B	2FI-AF014A					[ ]Y [ ]N			
S/G 2C AUX FEED FLOW	PP 2A	2FI-AF015A			11.25 (Note)	GPM	[ ]Y [ ]N	2 OPERABLE CHAN WITH CHAN CHKS SAT	c [ ]Y [ ]N INIT _____	3.3.i
	PP 2B	2FI-AF016A					[ ]Y [ ]N			
S/G 2D AUX FEED FLOW	PP 2A	2FI-AF017A			11.25 (Note)	GPM	[ ]Y [ ]N	2 OPERABLE CHAN WITH CHAN CHKS SAT	c [ ]Y [ ]N INIT _____	3.3.i
	PP 2B	2FI-AF018A					[ ]Y [ ]N			
CONTAINMENT WATER LEVEL		2LI-PC006			7.2	IN	[ ]Y [ ]N	2 OPERABLE CHAN WITH CHAN CHKS SAT	c [ ]Y [ ]N INIT _____	3.3.3
		2LI-PC007					[ ]Y [ ]N			
CNMT FLOOR DRN SUMP WATER LEVEL		2LI-PC002			4	IN	[ ]Y [ ]N	2 OPERABLE CHAN WITH CHAN CHKS SAT	c [ ]Y [ ]N INIT _____	3.3.i
		2LI-PC003					[ ]Y [ ]N			
RWST LEVEL		2LI-930			7	%	[ ]Y [ ]N	$\geq$ 2 OPERABLE CHAN WITH CHAN CHKS SAT	c [ ]Y [ ]N INIT _____	3.3.3
		2LI-931					[ ]Y [ ]N			
		2LI-932					[ ]Y [ ]N			
		2LI-933					[ ]Y [ ]N			

* NOTE: When process is not in use the reading may range from slightly above to slightly below zero but should not be pegged low on scale (contact IM Dept. for assistance as necessary).

*, 5.b

COMMENTS: _____

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UNIT TWO
ACCIDENT MONITORING INSTRUMENTATION
SURVEILLANCE DATA SHEET

PARAMETER		INSTRUMENT	INSTR VALUE	MAXIMUM DEVIATION ACTUAL	MAXIMUM DEVIATION ALLOWED	UNITS	CHANNEL CHK OK?	ACCEPTANCE CRITERIA	ACCEPTANCE CRITERIA MET?	APPLICABLE LCO
REACTOR COOLANT HOT LEG WIDE RANGE TEMPERATURE	2A	2TI-413A			49	°F	[ ]Y [ ]N	≥ 2 OPERABLE CHAN WITH CHAN CHKS SAT	c [ ]Y [ ]N INIT _____	3.3.3
	2B	2TI-423A					[ ]Y [ ]N			
	2C	2TI-433A					[ ]Y [ ]N			
	2D	2TI-443A					[ ]Y [ ]N			
REACTOR COOLANT COLD LEG WIDE RANGE TEMPERATURE	2A	2TI-413B			49	°F	[ ]Y [ ]N	≥ 2 OPERABLE CHAN WITH CHAN CHKS SAT	c [ ]Y [ ]N INIT _____	3.3.3
	2B	2TI-423B					[ ]Y [ ]N			
	2C	2TI-433B					[ ]Y [ ]N			
	2D	2TI-443B					[ ]Y [ ]N			
PRESSURIZER WATER LEVEL		2LI-459A			7	%	[ ]Y [ ]N	≥ 2 OPERABLE CHAN WITH CHAN CHKS SAT	c [ ]Y [ ]N INIT _____	3.3.3
		2LI-460A					[ ]Y [ ]N			
		2LI-461					[ ]Y [ ]N			

COMMENTS: _____

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UNIT TWO
ACCIDENT MONITORING INSTRUMENTATION
SURVEILLANCE DATA SHEET

PARAMETER	INSTRUMENT	INSTR VALUE	MAXIMUM DEVIATION		UNITS	CHANNEL CHK OK?	ACCEPTANCE CRITERIA	ACCEPTANCE CRITERIA MET?	APPLICABLE LCO
			ACTUAL	ALLOWED					
PZR PORV VALVE POSITION IND ###	2RY-455A	###	N/A	N/A	AVAIL	N/A	1 OPERABLE INDICATION PER VALVE ###	c [ ]Y [ ]N INIT _____	3.3.i
	2RY-456	###							
PZR PORV ISOLATION VALVE POS IND $$	2RY-8000A	$$	N/A	N/A	AVAIL	N/A	1 OPERABLE INDICATION PER VALVE $$	c [ ]Y [ ]N INIT _____	3.3.i
	2RY-8000B	$$							
PZR SAFETY VALVE POS IND	2RY-8010A		N/A	N/A	AVAIL	N/A	1 OPERABLE INDICATION PER VALVE	c [ ]Y [ ]N INIT _____	3.3.i
	2RY-8010B								
	2RY-8010C								
S/G 2A PRESSURE	2PI-514A			91	PSIG	[ ]Y [ ]N	≥ 2 OPERABLE CHAN WITH CHAN CHKS SAT	c [ ]Y [ ]N INIT _____	3.3.3
	2PI-515A					[ ]Y [ ]N			
	2PI-516A					[ ]Y [ ]N			
S/G 2B PRESSURE	2PI-524A			91	PSIG	[ ]Y [ ]N	≥ 2 OPERABLE CHAN WITH CHAN CHKS SAT	c [ ]Y [ ]N INIT _____	3.3.3
	2PI-525A					[ ]Y [ ]N			
	2PI-526A					[ ]Y [ ]N			
S/G 2C PRESSURE	2PI-534A			91	PSIG	[ ]Y [ ]N	≥ 2 OPERABLE CHAN WITH CHAN CHKS SAT	c [ ]Y [ ]N INIT _____	3.3.3
	2PI-535A					[ ]Y [ ]N			
	2PI-536A					[ ]Y [ ]N			
S/G 2D PRESSURE	2PI-544A			91	PSIG	[ ]Y [ ]N	≥ 2 OPERABLE CHAN WITH CHAN CHKS SAT	c [ ]Y [ ]N INIT _____	3.3.3
	2PI-545A					[ ]Y [ ]N			
	2PI-546A					[ ]Y [ ]N			

PORV PI CHANNEL CHECK NOT APPLICABLE for valve(s) with the associated block valve in the closed position.
$$ BLOCK VALVE PI CHANNEL CHECK NOT APPLICABLE IF valve is verified closed AND power is removed (INDICATE status in comments section below). IF power is available to the valve, the PI CHANNEL CHECK is required.

COMMENTS: _____

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UNIT TWO
ACCIDENT MONITORING INSTRUMENTATION
SURVEILLANCE DATA SHEET

PARAMETER		INSTRUMENT	INSTR VALUE	MAXIMUM DEVIATION ACTUAL	MAXIMUM DEVIATION ALLOWED	UNITS	CHANNEL CHK OK?	ACCEPTANCE CRITERIA	ACCEPTABLE CRITERIA MET?	APPLICABLE LCO
S/G 2A NARROW RNG WATER LEVEL		2LI-517			7	%	[ ]Y [ ]N	≥ 1 OPERABLE CHAN WITH CHAN CHKS SAT	c [ ]Y [ ]N INIT _____	3.3.3
		2LI-518					[ ]Y [ ]N			
		2LI-519					[ ]Y [ ]N			
		2LI-556					[ ]Y [ ]N			
S/G 2B NARROW RNG WATER LEVEL		2LI-527			7	%	[ ]Y [ ]N	≥ 1 OPERABLE CHAN WITH CHAN CHKS SAT	c [ ]Y [ ]N INIT _____	3.3.3
		2LI-528					[ ]Y [ ]N			
		2LI-529					[ ]Y [ ]N			
		2LI-557					[ ]Y [ ]N			
S/G 2C NARROW RNG WATER LEVEL		2LI-537			7	%	[ ]Y [ ]N	≥ 1 OPERABLE CHAN WITH CHAN CHKS SAT	c [ ]Y [ ]N INIT _____	3.3.3
		2LI-538					[ ]Y [ ]N			
		2LI-539					[ ]Y [ ]N			
		2LI-558					[ ]Y [ ]N			
S/G 2D NARROW RNG WATER LEVEL		2LI-547			7	%	[ ]Y [ ]N	≥ 1 OPERABLE CHAN WITH CHAN CHKS SAT	c [ ]Y [ ]N INIT _____	3.3.3
		2LI-548					[ ]Y [ ]N			
		2LI-549					[ ]Y [ ]N			
		2LI-559					[ ]Y [ ]N			
S/G W/R WATER LEVEL	2A	2LI-501A		N/A	N/A	%	[ ]Y [ ]N	4 OPERABLE CHAN WITH CHAN CHKS SAT	c [ ]Y [ ]N INIT _____	3.3.3
	2B	2LI-502A		N/A	N/A		[ ]Y [ ]N			
	2C	2LI-503A		N/A	N/A		[ ]Y [ ]N			
	2D	2LI-504A		N/A	N/A		[ ]Y [ ]N			

COMMENTS: _____

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UNIT TWO
HYDROGEN MONITOR CHANNEL CHECK

HYDROGEN MONITOR 1HSU-PS345 ##	//////////	ACCEPTANCE CRITERIA $$	ACCEPTANCE CRITERIA MET	APPLICABLE LCO
TIME ON		2 OPERABLE CHANNELS WITH CHANNEL CHECK SAT IN MODES 1 AND 2	¢ [ ]Y [ ]N INIT _____	3.3.3 3.3.j
H_2 LIGHT OFF (YES/NO)	[ ]Y [ ]N			
SYSTEM STATUS LIGHT OFF (YES/NO)	[ ]Y [ ]N			
CURRENT READING FROM: METER COMPUTER POINT	_____ [ ]2PS343 [ ] U8014			
TIME READING TAKEN				
(TIME READING TAKEN - TIME ON) ≥ 20 MINUTES	[ ]Y			
SYSTEM IN STANDBY (YES/NO)	[ ]Y [ ]N			
HYDROGEN MONITOR 2HSU-PS346 ##	//////////			
TIME ON				
H_2 LIGHT OFF (YES/NO)	[ ]Y [ ]N			
SYSTEM STATUS LIGHT OFF (YES/NO)	[ ]Y [ ]N			
CURRENT READING FROM: METER COMPUTER POINT	_____ [ ] 2PS344 [ ] U8015			
TIME READING TAKEN				
(TIME READING TAKEN - TIME ON) ≥ 20 MINUTES	[ ]Y			
SYSTEM IN STANDBY (YES/NO)	[ ]Y [ ]N			

*, 5.c

To successfully complete this channel check the H_2 monitor Cnmt Isol Vlvs 2PS228A & B, 2PS229A & B and 2PS230A & B must be open.

$$ If the current reading is obtained from the computer point, the signal scale corresponds to 0 - 30% so the maximum allowed deviation is 0.9%.

(Final)

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Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility: BYRON Task No: V

Task Title: COOL THE PRT Job Performance Measure No: 7

K/A Reference: 7A1.03 2.6/2.7

Examinee: _____ NRC Examiner: _____

Date: _____

Method of testing:

Simulated Performance _____ Actual Performance ____X____

Classroom _____ Simulator _____X_____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions: You are the Extra NSO
Unit 1 is in mode 1
The PRT needs to be cooled.

Task Standard: COOL THE PRT

Required Materials: NONE

General References:
BOP RY-6 TEMPERATURE CONTROL OF THE PRT
BOP RY-4, DRAINING THE PRT

Initiating Cue: THE UNIT SUPERVISOR DIRECTS YOU TO COOL THE PRT TO 114F

Time Critical Task: NO

Validation Time: 15 MINUTES

PERFORMANCE INFORMATION

START TIME: _____

(Denote critical steps with a **BOLD** *)

Performance step: 1

ENTER BOP RY-6

Standard: LOCATE AND OPEN BOP RY-6

Comment: ----------

Performance step: 2 (1)

VERIFY/OPEN AT PMO5J AOV-RY8028, PW TO PRT CNMT ISOL VLV

Standard: AOV-RY8028 OPEN GREEN LIGHT

NOTE: ANNUNCIATOR 1-12-A7 MAY COME IN

Comment: ----------

Performance step: 3 (2)

***OPEN AT PM05J AOV-RY8030, PW TO PRT CNMT ISOL VLV ***

Standard: *** AOV-RY8030 OPEN RED LIGHT ***

CUE: WHEN ASKED RECYCLE HOLD UP TANKS LEVEL A 12%, B 15%

Comment: ----------

Performance step: 4 (3)

*** CLOSE AT PM05J AOV-RY8030, PW TO PRT CNMT ISOL VLV WHEN PRT LEVEL IS ABOUT 80% AS INDICATED IN LI470 ***

Standard: *** AOV-RY8030 CLOSED WHEN LEVEL IS 80% GREEN LIGHT ***

Comment: ----------

Performance step: 5 (4)

DRAIN PRT TO APPROXIMATELY 69% PER BOP RY-4, DRAINING THE PRT

Standard: LOCATE AND OPEN BOP RY-4

Comment: ----------

Performance step: 6 BOP RY-4

VERIFY/CLOSE RY469, PRT TO GW ISOL VLV AT PM05J

Standard: RY469 CLOSED GREEN LIGHT

Comment: ----------

Performance step: 7

VERIFY/ADJUST RY8034, N2 TO PRT REG VLV TO 3 PSIG

Standard: LOCAL OPERATOR ASKED TO ENSURE RY8034 ADJUSTED TO 3 PSIG

CUE: RY8034 ADJUSTED TO 3 PSIG

Comment: ----------

Performance step: 8

VERIFY/OPEN AOV-RY8033, N2 SUPPLY TO PRT ISOL VLV AT PM05J

Standard: AOV-RY8033 OPEN GREEN LIGHT

Comment: ----------

Performance step: 9

VERIFY/OPEN AOV-RE9170, RCDT PUMP DISCHARGE HEADER OUTSIDE CNMT ISOL VLV AT PM11J

Standard: AOV-RE9170 O OPEN GREEN LIGHT

Comment: ----------

Performance step: 10

VERIFY/OPEN AOV-RE1003, RCDT PUMP DISCHARGE HEADER INSIDE CNMT ISOL VLV AT PM11J

Standard: AOV-RE1003 OPEN GREEN LIGHT

Comment: ----------

Performance step: 11

*** OPEN AOV-RY8031, PRT DRN ISOL VLV AT PM05J ***

Standard: *** AOV-RY8031 OPEN RED LIGHT ***

Comment: ----------

Performance step: 12

VERIFY/START RE01PA/B RCDT PUMP A/B

Standard: RCDT PUMP A/B RUNNING RED LIGHT

Comment: ----------

Performance step: 13

ENSURE PRT PRESSURE REMAINS >0 PSIG

Standard: PRT PRESSURE >0 PSIG

Comment: ----------

Performance step: 14

*** CLOSE AOV-RY8031, PRT DRN ISOL VLV WHEN DESIRED PRT LEVEL IS REACHED AT PM05J ***

Standard: *** AOV-RY8031 CLOSED GREEN LIGHT ***

Comment: ----------

Performance step: 15

VERIFY/STOP RE01PA/B RCDT PUMP A/B

Standard: RCDT PUMP A/B STOPPED GREEN LIGHT

Comment: ----------

Performance step: 16

*** CLOSE AOV-RE1003, RCDT PUMP DISCHARGE HEADER INSIDE CNMT ISOL VLV AT PM11J ***

Standard: *** AOV-RE1003 CLOSED GREEN LIGHT ***

Comment: ----------

Performance step: 17

REPEAT STEPS (1-4) UNTIL TEMPERATURE IS REDUCED BELOW 114F

Standard: PRT TEMP 114 AOV-RE1003 CLOSED GREEN LIGHT

Comment: ----------

TERMINATING CUE: SRO I HAVE COOLED THE PRT TO 114F

TIME STOP_____

Initial Conditions: You are the Extra NSO
Unit 1 is in mode 1
The PRT needs to be cooled.

Initiating Cue: THE UNIT SUPERVISOR DIRECTS YOU TO COOL THE PRT TO 114F

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility: BYRON
Task Title: S/U ROD DRIVE M/G SET

Task No: 1
Job Performance Measure No: 8

K/A Reference: 1A4.08 3.7/3.4

Examinee: _____

NRC Examiner: _____

Date: _____

Method of testing:

Simulated Performance _____X_____ Actual Performance _____

Classroom _____ Simulator _____ Plant __X____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions: You are an equipment operator.
Unit 1 is in the process of being started up per BGP 100-2
No Rod Drive MG Sets are running

Task Standard: S/U ROD DRIVE MG SET

Required Materials: NONE

General References:
BOP RD-1 STARTUP OF ROD DRIVE M/G SET

Initiating Cue: THE UNIT SUPERVISOR DIRECTS YOU TO START UNIT 1 1A ROD DRIVE M/G SET

Time Critical Task: NO

Validation Time: 15 Minutes

PERFORMANCE INFORMATION

START TIME: _____

(Denote critical steps with a **BOLD** *)

Performance step: 1

ENTER BOP RD-1

Standard: LOCATE AND OPEN BOP RD-1

Comment: ----------

Performance step: 2

PROCEED TO THE ROD DRIVE MG SET ROOM

Standard: ARRIVE AT MG SET ROOM 451 MISC ELECT EQUIP ROOM

CUE: B MG GENERATOR OUTPUT BREAKER IS RACKED IN AND OPEN
T.S. 3/4.3.1 TABLE 4.3-1 SURV ARE IN FREQUENCY

Comment: ----------

Performance step: 3

VERIFY/SET THE VOLTAGE ADJUST POTENTIOMETER

Standard: LOCKING SCREW LOOSENED THEN THE VOLTAGE ADJUST POTENTIOMETER IS SET IN THE MID POSITION - 5.0

CUE: VOLTAGE ADJUST POTENTIOMETER IS IN THE MID POSITION - 5.0

Comment: ----------

Performance step: 4

VERIFY/PLACE THE SYNC SWITCH IN OFF

NOTE:(SYNC SWITCH REMOVABLE HANDLE IS NORMALLY REMOVED AND LOCATED IN THE BREAKER CABINET. DO NOT OPEN CABINET OF RUNNING MG SET)

Standard: SYNC SWITCH IN OFF

CUE: SYNC SWITCH IN OFF

Comment: ----------

Performance step: 5 VERIFY BRKRS OPEN AT CONTROL CABINET OR LOCALLY

ENSURE MOTOR BRKR IS TRIPPED

Standard: MOTOR BRKR TRIPPED, MOTOR BRKR OPEN, RED OPEN LITE IS LIT

CUE: MOTOR BRKR RED OPEN LITE IS LIT

Comment: ----------

Performance step: 6 VERIFY BRKRS OPEN AT CONTROL CABINET OR LOCALLY

ENSURE GEN BRKR IS TRIPPED

Standard: GEN BRKR TRIPPED GENERATOR BRKR OPEN, RED OPEN LITE IS LIT

CUE: GEN BRKR RED OPEN LITE IS LIT

Comment: ----------

Performance step: 7

VERIFY/PLACE MOTOR BKR OP SWITCH IN AFTER/TRIP

Standard: MOTOR BKR OP SWITCH IN AFTER/TRIP

CUE: MOTOR BKR OPERATION SWITCH IS IN AFTER/TRIP POSITION

Comment: ----------

Performance step: 8

VERIFY/PLACE GEN BKR OP SWITCH IN AFTER/TRIP

NOTE: (BKR SWITCH LOCATED IN THE B MG SET CONTROL CABINET. DO NOT OPEN CABINET OF RUNNING MG SET)

Standard: GEN BRKR OP SWITCH IN AFTER/TRIP

CUE: GEN BKR OPERATION SWITCH IS IN AFTER/TRIP POSITION

Comment: ----------

Performance step: 9

VERIFY/PLACE AMMETER AND VOLTMETER SELECTOR SWITCHES IN THE PROPER POSITION

NOTE: (ANY SWITCH POSITION EXCEPT OFF IS ACCEPTABLE)

Standard: AMMETER SELECT SWITCH IS IN A, B, OR C AND VOLTMETER SELECT SWITCH IS IN 1-2, 2-3 , OR 3-1

CUE: AMMETER SELECT SWITCH IS IN THE A, B, C POSITION
VOLTMETER SELECT SWITCH IS IN THE 1-2, 2-3 , OR 3-1 POSITION

Comment: ----------

Performance step: 10

VERIFY/OPEN THE INTERNAL GROUNDING SWITCH

Standard: B MG SET CONTROL CAB INTERNAL GROUNDING SWITCH 1KS IS OPEN

CUE: SWITCH 1KS IS IN THE OPEN POSITION

NOTE: (GROUNDING SWITCH LOCATED IN THE B MG SET CONTROL CABINET. DO NOT OPEN CABINET OF RUNNING MG SET)

Comment: ----------

Performance step: 11

Verify/CLOSE THE LOCAL DISCONNECTS ABOVE THE ROD DRIVE POWER CABINETS

Standard: ALL 16 DISCONNECT SWITCHES ARE CLOSED

CUE: ALL DISCONNECT SWITCH POINTERS INDICATE ON

NOTE: DISCONNECT SWITCHES LOCATED ON TOP OF ROD CONTROL CABINETS

Comment: ----------

Performance step: 12

VERIFY/OPEN THE RX TRIP AND BYPASS BRKRS

Standard: BOTH RX TRIP AND BYPASS BRKRS OPEN

CUE: RTA AND RTB INDICATE OPEN ON FRONT OF BRKRS
BYA AND BYB ARE RACKED OUT

Comment: ----------

Performance step: 13

ENSURE NO GROUND OR OVERCURRENT FLAGS ARE UP FOR CABINETS A AND B

Standard: POINTS/ DISCUSSES THAT NO RELAY TARGETS ARE PRESENT ON CABINETS A AND B

CUE: NO TARGETS ARE UP FOR CABINETS A AND B

Comment: ----------

Performance step: 14

*** CLOSE THE A MOTOR BRKR ***

Standard: *** A MOTOR BKR CLOSED ***

CUE: THE A MOTOR BKR GREEN CLOSED LITE IS LIT. SOUNDS FROM THE A MOTOR STARTING ARE HEARD 15 SECS HAVE ELASPED AND THE A MOTOR IS RUNNING NORMALLY

Comment: ----------

Performance step: 15

*** DEPRESS AND HOLD THE GENERATOR FIELD FLASH PUSHBUTTON ***

Standard: ***FIELD FLASHED FOR " A" GENERATOR, VOLTAGE STEADY AT 235 V ***

CUE: VOLTMETER INCREASES TO 235 VOLTS AND STABLE

Comment: ----------

Performance step: 16

CHECK THE RANGE OF THE MG SET VOLTAGE ADJUST POTENTIOMETER BY ROTATING POTENTIOMETER TO CHECK RANGE OF CONTROL

Standard: RANGE OBSERVED FROM 230 TO 300 VOLTS RETURNED TO 230V

CUE: THE VOLTMETER INDICATION CHANGES BETWEEN 230 AND 300 VOLTS
THE VOLTMETER INDICATES 230 VOLTS AFTER FINAL ADJUSTMENT

Comment: ----------

Performance step: 17

ADJUST THE GENERATOR VOLTAGE

Standard: GENERATOR VOLTAGE INDICATES 260 VOLTS

CUE: GENERATOR VOLTAGE INDICATES 260 VOLTS

Comment: ----------

Performance step: 18

TIGHTEN LOCKING SCREW

Standard: LOCKING SCREW TIGHTENED

CUE: LOCKING SCREW TIGHTENED

Comment: ----------

Performance step: 19

*** CLOSE THE A MG SET GENERATOR BREAKER ***

Standard: *** A MG SET GENERATOR BRKR GREEN CLOSED LITE LIT ***

CUE: A MG SET GENERATOR BRKR GREEN CLOSED LITE LIT

Comment: ----------

TERMINATING CUE: SRO THE UNIT 1 A ROD DRIVE M/G SET IS RUNNING

TIME STOP_____

Initial Conditions: You are an equipment operator.
Unit 1 is in the process of being started up per BGP 100-2
No Rod Drive MG Sets are running

Initiating Cue: THE UNIT SUPERVISOR DIRECTS YOU TO START UNIT 1 1A ROD DRIVE M/G SET

CONTROL ROD DRIVE MG SET START UP

A. STATEMENT OF APPLICABILITY:

This procedure describes the method to be used to start the first Control Rod Drive MG Set in preparation for a Reactor Startup, or to energize the Rod Drive logics for maintenance activities.

B. REFERENCES:

1. Vendor Manual:

   a. Westinghouse Rod Control Power Supply Manual. (F-2076)

2. Station Procedures:

   a. BOP RD-5, Control Rod Drive MG Set Paralleling to Operating MG Set.

   b. BOP RD-E1/E2, Electrical Lineup.

3. Station Drawings:

   a. 6E-1/2-4030 RD10

   b. 6E-1/2-4030 RD11

   c. 6E-1/2-4030 RD12

C. PREREQUISITES:

1. BOP RD-E1/E2, Electrical Lineup complete.

D. PRECAUTIONS:

1. Operation of energized switchgear requires the use of proper electrical protective clothing.

2. Caution should be taken if opening MG set cabinet doors to prevent inadvertant MG set trips. The relays on the cabinet doors are sensitive to bumps and vibration.

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E. LIMITATIONS AND ACTIONS:

1. The Control Rod Drive MG Sets will trip on the following:

   a. Generator Overvoltage.

   b. Generator Reverse Current.

   c. Generator Ground.

2. This procedure shall be used only to start the first Control Rod Drive MG Set. To start the second Control Rod Drive MG Set, use BOP RD-5, Control Rod Drive MG Set Paralleling to Operating MG Set.

3. The generator output breakers are interlocked, such that the opposite breaker must be RACKED IN and OPEN, to allow closing the inservice MG set's generator breaker using the local control switch.

4. Tech Spec table 3.3.1-1, requires surveillances for manual and automatic Reactor Trip as well as the Reactor Trip and Bypass breakers in Modes 1-5 with Rod Drive capable of Rod withdrawal.

F. MAIN BODY:

1. **ADJUST** Voltage Adjust Potentiometer as follows:

   a. **LOOSEN** locking screw on _A/B Control Rod Drive MG Set Voltage Adjust Potentiometer.

   b. **SET** _A/B Control Rod Drive MG Set Voltage Adjust Potentiometer to a setting of 5.0.

2. **VERIFY/PLACE** the Synchronizer Switch in the OFF position.

3. **ENSURE** the Motor Breaker is Tripped and the OPEN light is ENERGIZED.

4. **ENSURE** the Generator Breaker is Tripped and the OPEN light is ENERGIZED.

5. **VERIFY/PLACE** the Motor Breaker Operation Switch in AFTER/TRIP.

6. **VERIFY/PLACE** the Generator Breaker Operation Switch in AFTER/TRIP.

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F. continued

7. **VERIFY/PLACE** the Ammeter Selector Switch in position A, B, or C.

8. **VERIFY/PLACE** the Voltmeter Selector Switch in position 1-2, 2-3, or 3-1.

9. **VERIFY/OPEN** the internal grounding switch (inside of the B Control Cabinet labeled 1KS)

10. **ALIGN** the Rod Drive Power cabinets as directed by the Shift Manager.

    a. For Reactor Start-up:

        1). **VERIFY/CLOSE** all local disconnects above the Rod Drive Power cabinets.

    b. For Maintenance Activities:

        1). **VERIFY/OPEN** all local disconnects above the Rod Drive Power Cabinets.

11. **VERIFY/OPEN** both Reactor Trip Breakers at _PM05J.

12. **VERIFY/OPEN** both Reactor Trip Bypass Breakers.

13. **ENSURE** no targets indicated on the ground and over current relays for both the A and B cabinets. **RESET** if required.

> **NOTE**
> Allow 15 seconds for the Control Rod Drive MG Set to reach rated speed.

14. **PLACE** _A/B Control Rod Drive MG Set Motor Breaker control switch to AFTER CLOSE at _RD03E.

15. **DEPRESS** and **HOLD** the _A/B MG set GENERATOR FIELD FLASH pushbutton until voltage is steady.

16. **ROTATE** the _A/B Control Rod Drive MG Set Voltage Adjust Potentiometer to check the range of control from ~230 Volts to ~300 Volts and back to ~230 Volts.

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F. continued

17. **ADJUST** the _A/B Control Rod Drive MG Set Voltage Adjust Potentiometer to 260 Volts.

18. **TIGHTEN** locking screw on _A/B Control Rod Drive MG Set Voltage Adjust Potentiometer to prevent voltage setting from drifting.

19. **CLOSE** the _A/B MG set Generator Breaker using one of the following:

    a. With the opposite generator breaker RACKED IN and OPEN, **PLACE** _A/B Control Rod Drive MG Set Generator Breaker control switch for the MG Set being placed in service to AFTER CLOSE at _RD03E.

    b. With the opposite generator breaker RACKED OUT, **CLOSE** the breaker for the MG Set being placed inservice using the "CLOSE" plunger on the switchgear.

> **NOTE**
> To start a second Control Rod Drive MG Set refer to BOP RD-5, Control Rod Drive MG Set Paralleling to Operating MG Set.

20. **VERIFY/CLOSE** Logic control power breakers 1CB and 2CB at _RD03E. (Inside the B control cabinet.)

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility: BYRON Task No: II
Task Title: LOCAL CONTROL OF CHARGING Job Performance Measure No: 9

K/A Reference: 4A4.08 3.8/3.4

Examinee: _____ NRC Examiner: _____

Date: _____

Method of testing:

Simulated Performance _____X_____ Actual Performance _____

Classroom _____ Simulator _____ Plant __X____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions: You are an equipment operator.
Unit 2 is in mode 1.
2CV121 is not controlling properly.

Task Standard: LOCAL CONTROL OF CHARGING

Required Materials: NONE

General References:
BOP CV-26 CV VALVES 121, 131, 182 BYPASSING, ISOLATING, AND RESTORATION

Initiating Cue: THE UNIT SUPERVISOR DIRECTS YOU TO TAKE LOCAL CONTROL OF CHARGING AND BYPASS 2CV121

Critical Task: NO

Validation Time: 20 MINUTES

PERFORMANCE INFORMATION

START TIME: _____

(Denote critical steps with a **BOLD** *)

Note to Examiner:

The 2CV-121 valve is located in a high radiation area. In order to facilitate the licensee's request for minimal dose and to practice ALARA principles, the candidate will be expected to LOCATE the valve, then mimic the performance of the JPM on a valve located in a low dose area.

Mimic tags will be provided to allow the candidate to self-check (STAR principle).

Performance step: 1

ENTER BOP CV-26

Standard: LOCATE AND OPEN BOP CV-26

Comment: ----------

Performance step: 2

PROCEED TO THE 2CV-121

Standard: ARRIVE AT 2CV-121 AND ESTABLISH COMMUNICATIONS WITH MCR

NOTE: Perform this JPM as follows:

1. **When the candidate locates the area, tell the candidate that the valve has been located.**

2. **Have the candidate demonstrate establishing communication with the control room.**

3. **Instruct the candidate to go to the Hydrogen Side Seal Oil Cooler Temperature Control Valve (1WS215) [located on the 426' turbine building by seal oil skid.**

4. **When at this "mimic" valve, had the candidate identify the inlet, outlet and bypass valves. Place the "mimic" tags near these valves and proceed with the JPM. INLET ISOL-1WS214, OUTLET ISOL -1WS216, BYPASS-1WS217**

CUE: COMMUNICATIONS ESTABLISHED

Comment: ----------

Performance step: 3

*** SLOWLY OPEN 2CV8387A (364 U15 AB1) CV PUMP DISCHARGE BYPASS VALVE, WHILE CLOSING 2CV121, TO MAINTAIN CHARGING FLOW ***

NOTE: (WHEN 2CV121 IS BYPASSED CHARGING FLOW INDICATION WILL BE UNAVAILABLE. IF 2CV182 IS NOT ADJUSTED SEAL INJECTION FLOWS WILL PROVIDE REPRESENTATION OF CHARGING)

Standard: *** 2CV121 IS CLOSED AND 2CV8387A IS OPEN ***

CUE: 2CV121 IS CLOSING AND 2CV8387A IS OPENING

Comment: ----------

Performance step: 4

VERIFY M/A STATION 2FK121, IN MANUAL, WITH DEMAND 0%

Standard: 2FK121 IN MANUAL WITH 0% DEMAND

CUE: 2FK121, IN MANUAL, WITH DEMAND 0%

Comment: ----------

Performance step: 5

ADJUST 2CV182, CHARGING HEADER BACKPRESSURE CONTROL VALVE TO MAINTAIN ADEQUATE CHARGING HEADER FLOW FOR REGEN HEAT EXCHANGER, RCP SEAL INJECTION FLOW, DESIRED TRENDS ON VCT AND PZR LEVEL

Standard: COORDINATES WITH RO IN MCR THE POSITIONING OF 2CV182 POSITIONED PROPERLY FOR CURRENT CONDITIONS

CUE: RO IN MCR INFORMS AUO THAT 2CV182 DOES NOT NEED TO BE ADJUSTED

Comment: ----------

Performance step: 6

*** CLOSE 2CV8483A AND 2CV8483B ISOLATION VALVES FOR 1CV121 ***

Standard: * **2CV8483A AND 2CV8483B CLOSED** *

CUE: 2CV8483A AND 2CV8483B CLOSED

Comment: ----------

Performance step: 7

PLACE A CAUTION CARD ON 2CV121, M/A STATION TO INFORM PERSONNEL THAT 2CV121 IS ISOLATED AND BYPASSED

Standard: CAUTION TAG ON 2CV121 M/A STATION

CUE: A CAUTION TAG IS PLACED ON 2CV121 M/A STATION

Comment: ----------

TERMINATING CUE: SRO I HAVE BYPASSED 2CV121

TIME STOP _____

Initial Conditions: You are an equipment operator.
Unit 2 is in mode 1.
2CV121 is not controlling properly.

Initiating Cue: THE UNIT SUPERVISOR DIRECTS YOU TO TAKE LOCAL CONTROL OF CHARGING AND BYPASS 2CV121

CV VALVES (121, 131, 182)
BYPASSING, ISOLATING, AND RESTORATION

A. STATEMENT OF APPLICABILITY:

This procedure provides the steps necessary to bypass and isolate the following CVCS control valves:

_CV121, CV Pps Dsch Hdr FCV

_CV131, Ltdwn Hxs Outlet Hdr PCV

_CV182, Seal Inj Chg Flow FCV

B. REFERENCES:

1. P&IDs:

   a. M-64 (M-138), Diagram of Chemical and Volume Control and Boron Thermal Regeneration Unit 1 and Unit 2.

2. Technical Specifications:

   a. 3/4.4.6.2 (ITS 3.5.5), Seal Injection flow

C. PREREQUISITES:

1. Unit is maintained steady state so that charging and letdown can be maintained balanced.

2. Reactivity adjustments (boration or dilution) are pre-planned as to minimize any perturbations.

3. Equipment staged for expected and potential needs. These should include a valve bar, funnel, hoses.

D. PRECAUTIONS:

1. As flow paths are aligned, the following must be monitored concurrently to ensure a controlled transition:

   a. Charging header flow rate (temporary installed instruments may be used if installed).

   b. Pressurizer level and trend (128 gallons per percent).

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D. continued

c. VCT level and trend (19.3 gallons per percent).

2. Monitor filter differential pressures frequently during the evolution, since alternate flowpaths may introduce material to filters inservice. Seal injection filter DP is limited to 29 psi.

3. Monitor the RCP seal injection flowrates. They should be maintained 8 to 10 gpm.

4. _CV121 should not be bypassed unless the unit is at normal operating pressure due to the bypass valves being extremely difficult to operate due to the high differential pressure.

E. LIMITATIONS AND ACTIONS:

1. Maintain Letdown pressure between 180 psig and 400 psig.

2. DO NOT exceed 120 gpm flow through the CV Mixed Bed Demins or 75 gpm through the CV cation Demin.

3. Letdown will automatically divert to the HUT at 73% VCT level.

4. Bypass of the _CV121 should provide adequate flow to both the RCP seals and the Regen Heat exchanger. If this is not the case, then letdown may be isolated and excess letdown established at the discretion of the Shift Manager.

5. Maintain RCP Seal Injection Flow within the limits of Tech Spec 3.5.5.

6. While in AUTO, the controller for the _CV121 has a minimum flowrate of 52 gpm.

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F. MAIN BODY:

NOTE

Steps F.1, F.2 and F.3 may be performed independent of each other.
Step F.1: Bypasses, Isolates, and Restores _CV121, CV Pps Dsch Hdr FCV.
Step F.2: Bypasses, Isolates, and Restores _CV131, Ltdwn Hxs Outlet Hdr PCV.
Step F.3: Bypasses, Isolates, and Restores _CV182, Seal Inj Chg Flow FCV.

1. _CV121, CV Pps Dsch Hdr FCV.

   a. To isolate _CV121 CV Pps Discharge Header Flow Control Valve, perform the following:

NOTE

When _CV121 is bypassed, Charging flow indication will be unavailable. If _CV182 is not adjusted, Seal Injection flows will provide a representative indication of Charging flow.

   1). Establish communications between the MCR and the operator at _CV8387A/B.

   2). Slowly **OPEN** _CV8387A/B, CV Pp Discharge FCV Bypass valve, while concurrently closing _CV121, to maintain normal charging flow.

   3). **VERIFY** M/A station _FK121, in MANUAL, with demand at 0%.

   4). **ADJUST** _CV182, Charging Header backpressure control valve, to maintain:

      a). Adequate charging header flow for regen heat exchanger cooling.

      b). Adequate RCP seal injection flow.

      c). Desired trends on VCT and PZR levels.

   5). **CLOSE** _CV8483A and _CV8483B, Isolation valves for _CV121.

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F.1.a. continued

6). Place a Caution Card on _CV121, M/A station to inform personnel that _CV121 is isolated and bypassed.

b. To restore _CV121, CV Pps Discharge Header Flow Control Valve, perform the following:

1). Establish communications between the MCR and the operator in the field.

2). **VERIFY/CLOSE** _CV121, CV Pps Discharge Header Flow Control Valve.

3). Slowly **OPEN** _CV8483A and _CV8483B, Isolation valves for _CV121.

4). Slowly **CLOSE** _CV8387A/B, CV Pp Discharge FCV Bypass valve, while concurrently opening _CV121.

5). **ADJUST** _CV182, Charging Header backpressure control valve.

6). Establish automatic Pressurizer level control.

7). Remove Caution Card from _CV121 M/A station.

2. _CV131, Ltdwn Hxs Outlet Hdr PCV.

a. To ISOLATE the _CV131, Ltdwn HXs Outlet Hdr PCV, **PERFORM** the following:

1). Establish communications between the Main Control Room and the Operator at the _CV8409, Ltdwn HX Outlet HDR PCV _CV131 Byp Vlv.

NOTE
The next step may be performed with _CV131 in AUTO or MANUAL. Letdown header pressure should be maintained ~ 360 psig on _PI-131 during the performance of this step.

2). Slowly **THROTTLE OPEN** _CV8409, Ltdwn HX Outlet HDR PCV _CV131 Byp Vlv, until _CV131, Ltdwn HXs Outlet Hdr PCV, is full closed.

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F.2.a. continued

3). When _CV131, Ltdwn HXs Outlet Hdr PCV, indicates full closed, **VERIFY/PLACE** _PK131 in MANUAL and demand at 0%.

4). **CLOSE** _CV8408A, Ltdwn HXs Outlet Hdr PCV _CV131 Upst Isol Vlv.

5). **CLOSE** _CV8408B, Ltdwn HXs Outlet Hdr PCV _CV131 Dwst Isol Vlv.

6). **ADJUST** _CV8409, Ltdwn HX Outlet HDR PCV _CV131 Byp Vlv, to maintain letdown header pressure at approximately 360 psig.

7). Place a Caution Card on _PK131 stating that _CV131 is isolated and bypassed and pressure is being maintained in manual through _CV8409.

b. To RESTORE the _CV131, Ltdwn HXs Outlet Hdr PCV, **PERFORM** the following:

1). Establish communications between the Main Control Room and the Operator at the _CV8409, Ltdwn HX Outlet Hdr PCV _CV131 Byp Vlv.

2). **VERIFY/PLACE** _CV131, Ltdwn HXs Outlet Hdr PCV, in MANUAL with demand set to 0% at _PM05J.

3). **OPEN** _CV8408A, Ltdwn HXs Outlet Hdr PCV _CV131 Upst Isol Vlv.

4). **OPEN** _CV8408B, Ltdwn HXs Outlet Hdr PCV _CV131 Dwst Isol Vlv.

5). **PLACE** _CV131, Ltdwn HXs Outlet Hdr PCV, in AUTO or MANUAL at _PK131.

6). Slowly **CLOSE** _CV8409, Ltdwn HX Outlet HDR PCV _CV131 Byp Vlv, while monitoring letdown pressure at _PI-131, maintaining ≈ 360 psig.

7). **VERIFY** _CV131 is maintaining letdown header pressure in AUTO at approximately 360 psig.

8). **REMOVE** the Caution Card from _PK131.

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F. continued

3. _CV182, Seal Inj Chg Flow FCV.

a. To ISOLATE _CV182, Seal Inj Chg Flow FCV **PERFORM** the following:

1). Establish communications between the MCR and the operator at _CV8403, Seal Inj FCV _CV182 Bypass Vlv.

2). **SLOWLY THROTTLE OPEN** _CV8403 while simultaneously adjusting _CV182 at _PM05J to maintain seal injection flowrates approximately 8-10 gpm.

3). WHEN _CV182 is FULL CLOSED, **VERIFY** seal injection flowrates ~8 to 10 gpm.

4). **CLOSE** _CV8402A, Seal Inj Chg FCV _CV182 Dwst Isol Vlv.

5). **CLOSE** _CV8402B, Seal Inj Chg FCV _CV182 Upst Isol Vlv.

6). **PLACE** a Caution Card on _CV182 controller on _PM05J to inform personnel _CV182 is isolated and bypassed and seal injection adjustments must be made at _CV8403.

b. To RESTORE _CV182, Seal Inj Chg Flow FCV, **PERFORM** the following:

1). Establish communications between the MCR and the operator in the field.

2). **OPEN** _CV8402A, Seal Inj Chg FCV _CV182 Dwst Isol Vlv.

3). **OPEN** _CV8402B, Seal Inj Chg FCV _CV182 Upst Isol Vlv.

4). **SLOWLY THROTTLE CLOSED** _CV8403, Seal Inj _CV182 Bypass Vlv while simultaneously adjusting _CV182 at _PM05J to maintain seal injection flows ~8 to 10 gpm.

5). **VERIFY CLOSED** _CV8403, Seal Inj FCV _CV182 Byp Vlv.

6). **REMOVE** Caution Card from _CV182, Seal Inj Chg Flow FCV.

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G. CHECKOFF LIST:

EPN	DESCRIPTION	LOCATION
1CV131	Ltdwn HXs Outlet Hdr PCV, +30'	364' S14 RXB1
1CV8387A	1A CV Pp Dsch FCV Byp Vlv, (EOP Vlv) +9'	364' U15 AB1
1CV8387B	1B CV Pp Dsch FCV Byp Vlv, (EOP Vlv) +9'	364' Y13 RXB1
1CV8402A	U-1 Seal Inj Chg FCV 1CV182 Dwst Isol Vlv, (EOP Vlv), +6'	374' V13 RXB1
1CV8402B	U-1 Seal Inj Chg FCV 1CV182 Upst Isol Vlv, (EOP Vlv), +16'	364' V13 RXB1
1CV8403	U-1 Seal Inj FCV 1CV182 Byp Vlv, 8' W of V, +6'	374' V13 RXB1
1CV8408A	Ltdwn HXs Outlet Hdr PCV 1CV131 Upst Isol Vlv, +30'	364' S14 RXB1
1CV8408B	Ltdwn HXs Outlet Hdr PCV 1CV131 Dwst Isol Vlv, +30'	364' S14 RXB1
1CV8409	Ltdwn HX Outlet HDR PCV 1CV131 Byp Vlv, +30'	364' S14 RXB1
1CV8483A	U-1 CV Pps Dsch FCV 1CV121 Upst Isol Vlv, (EOP Vlv), +7'	364' U14 RXB1
1CV8483B	U-1 CV Pps Dsch FCV 1CV121 Dwst Isol Vlv, (EOP Vlv), +7'	364' U14 RXB1
1CV8485A	1A CV Pp 1CV01PA Dsch Isol Vlv, +6'	364' U15 AB1
1CV8485B	1B CV Pp 1CV01PB Dsch Isol Vlv, +7'	364' Y13 RXB1
2CV8387A	2A CV Pp Dsch FCV Byp Vlv, (EOP Vlv) +6'	364' U20 AB2
2CV8387B	2B CV Pp Dsch FCV Byp Vlv, (EOP Vlv), +10'	364' Y21 RXB2
2CV8408A	Ltdwn HXs Outlet Hdr PCV 2CV131 Upst Isol Vlv, +30'	364' S21 RXB2

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G. CHECKOFF LIST: (cont'd)

EPN	DESCRIPTION	LOCATION
2CV8408B	Ltdwn HXs Outlet Hdr PCV 2CV131 Dwst Isol Vlv, +30'	364' S21 RXB2
2CV8409	Ltdwn HX Outlet HDR PCV 2CV131 Byp Vlv, +30'	364' S21 RXB2
2CV8483A	U-2 CV Pps Dsch FCV 2CV121 Upst Isol Vlv, (EOP Vlv), +7'	364' U21 RXB2
2CV8483B	U-2 CV Pps Dsch FCV 2CV121 Dwst Isol Vlv, (EOP Vlv), +7'	364' U21 RXB2
2CV8485A	2A CV Pp 2CV01PA Dsch Isol Vlv, 2A CV Pp Rm, +7'	364' U20 AB2
2CV8485B	2B CV Pp 2CV01PB Dsch Isol Vlv, +5'	364' Y22 RXB2
2CV8402A	U-2 Seal Inj Chg FCV 2CV182 Dwst Isol Vlv, (EOP Vlv), +6'	374' U23 RXB2
2CV8402B	U-2 Seal Inj Chg FCV 2CV182 Upst Isol Vlv, (EOP Vlv), +15'	364' U23 RXB2
2CV8403	U-2 Seal Inj FCV 2CV182 Byp Vlv, 8' W of V, +15'	374' U23 RXB2

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Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility: BYRON Task No: IV
Task Title: UNSTEAM BIND A MD AFW PUMP Job Performance Measure No: 10

K/A Reference: 61A2.06 2.7/3.0

Examinee: _____ NRC Examiner: _____

Date: _____

Method of testing:

Simulated Performance _____X_____ Actual Performance _____

Classroom _____ Simulator _____ Plant __X____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions: You are an equipment operator.
Unit 1 is in mode 1.
There is indication of AFW check valve leakage on Unit 1.

Task Standard: UNSTEAM BIND A MD AFW PUMP

Required Materials: NONE

General References:
1BOA SEC-7 AUXILIARY FEEDWATER CHECK VALVE LEAKAGE

Initiating Cue: THE UNIT SUPERVISOR DIRECTS YOU TO USE 1BOA SEC-7 TO UNSTEAM BIND A AFW PUMP

Critical Task: NO

Validation Time: 25 MINUTES

PERFORMANCE INFORMATION

START TIME: _____

(Denote critical steps with a **BOLD *)**

Performance step: 1

ENTER 1BOA SEC-7

Standard: LOCATE AND OPEN 1BOA SEC-7

CUE: HAND APPLICANT 1BOA SEC-7

Comment: ----------

Performance step: 2

PROCEED TO THE A MD AFW PUMP TO LOCALLY CHECK AF PIPING TEMP

Standard: TRAIN A 1AF005A,B,C,D READING 145F(364 P10 AB)
TRAIN B 1AF005E,F,G,H READING AS IS NORMAL <130F

CUE: ALL TRAIN A TEMPERATURES READING 145F
ALL TRAIN B TEMPERATURES READING AS IS

Comment: ----------

Performance step: 3

*** REFER TECH SPEC 3.7.5 AND CLOSE AFFECTED SG AF ISOL VALVE FOR TRAIN A ***

NOTE: (THE VALVES ARE INACCESSIBLE DURING OPERATION OF PLANT DUE TO LCO ASPECTS. GO TO TUNNEL AND SIMULATE GOING IN)

Standard: *** INFORM SRO OF T.S. , 1AF013A,B,C,D CLOSED ***

CUE: TECH SPEC ENTERED WHEN AF013 SHUT AND TRAIN A
1AF013A,B,C,D CLOSED

Comment: ----------

Performance step: 4

VERIFY TEMPERATURES COOL TO <130F TRAIN AND PUMP DISCHARGE

Standard: TEMP < 130F FOR 1AF005A,B,C,D AND 1TI-AF126,127

CUE: TEMP < 130F FOR 1AF005A,B,C,D A TRAIN AFW

Comment: ----------

Performance step: 5 FLUSH AFW PIPING ON TRAIN A

CHECK AF ISOLATION VALVES CLOSED

Standard: 1AF013A,B,C,D CLOSED

CUE: VALVES PREVIOUSLY CLOSED

Comment: ----------

Performance step: 6 FLUSH AFW PIPING ON TRAIN A

START AF PUMP 1A PER BOP AF-5 S/U OF A MD AFW PUMP ON RECIRC

Standard: LOCATE AND OPEN BOP AF-5

CUE: HAND APPLICANT 1BOP AF-5

Comment: ----------

Performance step: 7 FLUSH AFW PIPING ON TRAIN A

VERIFY RECIRC PATH 1AF022A AOV 1A AF PUMP RECIRC TO CST, 1AF009A AF PUMP DSCH TO CST RECIRC ISOL, 1AF024A AOV AF PUMP RECIRC ISOL TO SX

Standard: 1AF022A OPEN, 1AF009A LOCKED OPEN, AND 1AF024A CLOSED

CUE: 1AF022A OPEN 1AF009A LOCKED OPEN AND 1AF024A CLOSED

Comment: ----------

Performance step: 8 FLUSH AFW PIPING ON TRAIN A

VERIFY/OPEN OIL COOLER PATH 1SX2103A MD AFW PUMP 1A OIL CLR INLET ISOL VLV, 1SX2102 MD AFW PUMP 1A OIL CLR OUTLET VLV

Standard: 1SX2103A AND 1SX2102 OPEN

CUE: 1SX2103A AND 1SX2102 OPEN

Comment: ----------

Performance step: 9 FLUSH AFW PIPING ON TRAIN A

CHECK LUBE OIL INVENTORY IN MOTOR BEARINGS AND PUMP SUMP

Standard: LUBE OIL LEVELS GOOD

CUE: ALL LEVELS NORMAL AND WITHIN ACCEPTABLE RANGE

Comment: ----------

Performance step: 10 FLUSH AFW PIPING ON TRAIN A

*** START AUX FW PUMP 1A LUBE OIL PUMP AT 1AF01PA-A ***

Standard: *** 1A LUBE OIL PUMP RUNNING ***

CUE: 1A LUBE OIL PUMP RUNNING

Comment: ----------

Performance step: 11 FLUSH AFW PIPING ON TRAIN A

PERFORM APPLICABLE STEPS OF BOP AF-5TI FOR PUMP RUN

Standard: AF-5T1 BEING FILLED OUT

CUE: EQUIPMENT OPERATOR WILL FILL OUT AF-5T1

Comment: ----------

Performance step: 12 FLUSH AFW PIPING ON TRAIN A

NOTIFY SM TO INITIATE LCOAR 1BOL7.5 AF

Standard: SM NOTIFIED

CUE: SM IS NOTIFIED

Comment: ----------

Performance step: 13 FLUSH AFW PIPING ON TRAIN A

PERFORM ONE OF FOLLOWING CLOSE 1AF013A,B,C,D 1A AFW PUMP DSCH HDR MOV OR 1AF004A,B,C,D

Standard: 1AF013A,B,C,D OR 1AF004A,B,C,D CLOSED

CUE: 1AF013A,B,C,D CLOSED

Comment: ----------

Performance step: 14 FLUSH AFW PIPING ON TRAIN A

*** START 1AF01PA, 1A AFW PUMP AT 1PM06J ***

Standard: *** 1A AFW PUMP IS RUNNING ***

CUE: 1A AFW PUMP IS STARTED AND RUNNING

Comment: ----------

Performance step: 15 FLUSH AFW PIPING ON TRAIN A

CONTROL MONITOR MOTOR AND PUMP BRG TEMPS

Standard: MCR NOTIFIED TO MONITOR MOTOR AND BRGS TEMPS

CUE: MCR IS MONITORING

Comment: ----------

Performance step: 16 FLUSH AFW PIPING ON TRAIN A

*** OPEN AF PUMP 1A DISCHARGE VALVE 1AF004A ***

Standard: *** 1AFOO4A OPEN ***

CUE: 1AF004A OPEN

Comment: ----------

Performance step: 17 FLUSH AFW PIPING ON TRAIN A

ESTABLISH 15 GPM TO 20 GPM FLOW BY THROTTLING 1AF013A,B,C,D FOR 10 MIN

Standard: 1AF013A,B,C,D THROTTLED 15 GPM AND MAINTAIN FLOW FOR 10 MINUTES

CUE: 1AF013A,B,C,D THROTTLED 15 GPM FLOW FOR 10 MINUTES

Comment: ----------

TERMINATING CUE: SRO THE A MDAFW PUMP IS NO LONGER STEAM BINDED, 1BOA SEC-7 IS COMPLETE

TIME STOP_____

Initial Conditions: You are an equipment operator.
Unit 1 is in mode 1.
There is indication of AFW check valve leakage on Unit 1.

Initiating Cue: THE UNIT SUPERVISOR DIRECTS YOU TO USE 1BOA SEC-7 TO UNSTEAM BIND A AFW PUMP

MOTOR DRIVEN AUXILIARY FEEDWATER PUMP _A STARTUP ON RECIRC

A. STATEMENT OF APPLICABILITY:

The purpose of this procedure is to describe the steps required to startup the Auxiliary Feedwater Motor Driven Pump.

B. REFERENCES:

1. P&IDs:
   a. M-37/122, Auxiliary Feedwater System.
   b. M-42-3, Essential Service Water.
2. UFSAR:
   a. Chapter 10.4.9.
3. Technical Specification:
   a. LCO 3.7.5, Auxiliary Feedwater (AF) System.
   b. LCO 3.7.6, Condensate Storage Tank (CST).
4. Letter from J.T. Westemeier to R.E. Querio 8/24/83, MRS 833292 file location 5.003.300.
5. Station Commitment:
   a. 454-251-81-01600
6. Westinghouse Vendor Manual F-2023, Auxiliary Feedwater Pump Motors.
7. Station Procedures:
   a. _BOL 7.6, Condensate Storage Tank (CST).
   b. BOP AF-3a, 3b, Unit 1, 2 Filling and Venting the Auxiliary Feedwater System.
   c. _BOL 7.5, Auxiliary Feedwater (AF) System.
   d. BOP AF-5T1, Motor Driven Auxiliary Feedwater Pump Operating Log.

C. PREREQUISITES:

1. Auxiliary Feedwater System has been filled and vented in accordance with BOP AF-3a, Unit 1 Filling and Venting the Auxiliary Feedwater System, or BOP AF-3b, Unit 2 Filling and Venting the Auxiliary Feedwater System.

2. CST has sufficient level to support Auxiliary Feedwater Pump Operation.

3. Essential Service Water system is capable of supporting Auxiliary Feedwater Pump Operation.

D. PRECAUTIONS:

1. None.

E. LIMITATIONS AND ACTIONS:

* 1. The Auxiliary Feedwater pumps are not to be utilized for normal startup and shutdown of the unit.

*, 5.a

2. To avoid serious damage to the motor windings, adhere to the following starting duty:

   a. Two successive starts, then

   b. Allow the motor to cool; either by running for fifteen minutes or by standing idle for forty-five minutes, at which time the full duty cycle may be repeated.

3. When pump is being operated in the recirculation mode for test purposes, valve _AF004A, _A AF Pp Dsch Vlv OR valves _AF013A,B,C and D, _A AF Pp Dsch Hdr MOV's will be used for discharge isolation. Isolating the discharge flowpath by either method makes the AF train inoperable. Notify the Shift Manager to initiate LCOAR _BOL 7.5, Auxiliary Feedwater (AF) System, when discharge flowpath is isolated.

4. Starting operations can be accomplished from the Main Control Board _PM06J or the Remote Shutdown Panel _PL04J.

5. Maximum bearing oil temperatures are: Bearing Inlet 128°F, Oil Drain 155°F.

E. continued

6. If Unit _ CST level falls below the minimum level in Modes 1, 2, or 3, NOTIFY the Shift Manager to initiate LCOAR _BOL 7.6, Condensate Storage Tank (CST).

F. MAIN BODY:

1. **VERIFY** recirc path:

   a. **VERIFY/OPEN** _AF022A, AOV _A AF Pp Recirc to CST.

   b. **VERIFY/LOCK OPEN** _AF009A, AF Pp Dsch to CST Recirc Isol Vlv.

   c. **VERIFY/CLOSE** _AF024A, AOV AF Pps Recirc Isol to SX.

2. **VERIFY** _A Motor Driven AF PP Oil Cooler flow path:

   a. **VERIFY/OPEN** _SX2103A, Motor Driven AF Pp _A Oil Clr Inlet Isol Vlv.

   b. **VERIFY/LOCK OPEN** _SX2102, Motor Driven AF Pp _A Oil Clr Outlet Vlv.

3. **CHECK** lube oil inventory in the motor bearings and pump sump.

4. **START** Aux FW Pp _A Lube Oil Pp, at _AF01PA-A local control panel to verify operation and prime bearings.

5. **PERFORM** the applicable steps of BOP AF-5T1, Motor Driven Auxiliary Feedwater Pump Operating Log, after the start of the pump, one half hour after the start of the pump, and continuing every one hour thereafter until the pump is shutdown. Forward the completed BOP AF-5T1, Motor Driven Auxiliary Feedwater Pump Operating Log, to the AF System Engineer, SED Thermal Group.

6. **NOTIFY** Shift Manager or Designee to initiate LCOAR _BOL 7.5, Auxiliary Feedwater (AF) System, when _AF004A, _A AF Pp Dsch Vlv OR valves _AF013A,B,C, and D, _A AF Pp Dsch Hdr MOV's are closed.

F. continued

7. **PERFORM** one of the following to isolate the discharge flowpath of the _A AF Pp:

   o **CLOSE** _AF004A, _A AF Pp Dsch Valve

   o **CLOSE** _AF013A,B,C, and D, _A AF Pp Dsch Hdr MOV's.

8. **START** _AF01PA, _A Auxiliary Feedwater Pump, at _PM06J.

9. **NOTIFY** the Control Room to MONITOR Motor and pump Bearing temperatures.

G. CHECKOFF LISTS:

1. None.

(Final)

A. PURPOSE

This procedure provides actions required to prevent steam binding of AF Pumps and potential waterhammer of AF piping due to check valve leakage.

B. SYMPTOMS OR ENTRY CONDITIONS

1) The following conditions may cause entry into this procedure:

- o AF piping temperature greater than 130°F
- o AF pump discharge temperature greater than 130°F

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

****
* NOTE *
* With this procedure in effect, *
* notify the Station Director who will *
* evaluate for GSEP conditions per BZP *
* 200-A1, BYRON EMERGENCY ACTION *
* LEVELS. *
****

1 DETERMINE AF LINE WITH LEAKAGE:

a. Locally check AF piping temperatures - ANY GREATER THAN 130°F:

a. RETURN TO procedure and step in effect.

- **Train A:**
  - 1AF005A (364' P10 AB)
  - 1AF005B (364' P10 AB)
  - 1AF005C (364' N10 AB)
  - 1AF005D (364' P10 AB)
- **Train B:**
  - 1AF005E (364' N10 AB)
  - 1AF005F (364' N10 AB)
  - 1AF005G (364' N10 AB)
  - 1AF005H (364' N10 AB)

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION
Closing an AF013 valve makes the associated AF pump inoperable.

2 ISOLATE AFFECTED LINE(S):

a. Refer to Tech Spec 3.7.1.2 (ITS 3.7.5)

b. Close affected SG AF isol valve(s):

- **Train A:**
  - 1AF013A
  - 1AF013B
  - 1AF013C
  - 1AF013D
- **Train B:**
  - 1AF013E
  - 1AF013F
  - 1AF013G
  - 1AF013H

c. Allow piping to cool to less than 130°F before continuing with this procedure:

- Affected AF piping temperatures:
  - **Train A:**
    - 1AF005A (364 P10)
    - 1AF005B (364 P10)
    - 1AF005C (364 N10)
    - 1AF005D (364 P10)
  - **Train B:**
    - 1AF005E (364 N10)
    - 1AF005F (364 N10)
    - 1AF005G (364 N10)
    - 1AF005H (364 N10)
- Affected AF pump discharge temperatures:
  - 1TI-AF126 (383 L17 AB1)
  - 1TI-AF127 (383 L16 AB1)

c. IF piping temperature will NOT decrease, THEN close the associated 1AF004 valve.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

3 FLUSH AUXILIARY FEEDWATER PIPING ON AFFECTED TRAIN:

o **Train A:**

1) Check AF isolation valves - CLOSED:

   - 1AF013A
   - 1AF013B
   - 1AF013C
   - 1AF013D

   1) Manually close valve(s).

2) Start AF pump 1A per BOP AF-5, MOTOR DRIVEN AUXILIARY FEEDWATER PUMP _A STARTUP ON RECIRC

3) Open AF pump 1A discharge valve:

   - 1AF004A

4) Establish 15 GPM to 20 GPM flow by throttling the AF valves for the affected line(s):

   o 1AF013A
   o 1AF013B
   o 1AF013C
   o 1AF013D

   4) Throttle flow with the associated AF005 valve.

5) Maintain flow for a minimum of - 10 MINUTES

6) Shutdown AF pump 1A per BOP AF-6, MOTOR DRIVEN AUXILIARY FEEDWATER PUMP _A SHUTDOWN

Step continued on next page

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

Step 3a (continued)

7) Restore AF alignment:

a) Open the AF isolation valves:

- 1AF013A
- 1AF013B
- 1AF013C
- 1AF013D

b) Set AF005A-D flow control potentiometers at - 6.5

8) After 6 HOURS locally check AF piping temperature - LESS THAN 130°F:

- 1AF005A (364' P10 AB)
- 1AF005B (364' P10 AB)
- 1AF005C (364' N10 AB)
- 1AF005D (364' P10 AB)

8) RETURN TO Step 2 (Page 3).

o **TRAIN B:**

1) Check Train B AF isolation valves - CLOSED:

- 1AF013E
- 1AF013F
- 1AF013G
- 1AF013H

1) Manually close valve(s).

2) Start AF pump 1B per BOP AF-7, DIESEL DRIVEN AUXILIARY FEEDWATER PUMP _B STARTUP ON RECIRC

3) Open AF pump 1B discharge valve:

- 1AF004B

Step continued on next page

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

Step 3b (continued)

4) Establish 15 GPM to 20 GPM flow by throttling the AF valves for the affected lines:

   - o 1AF013E
   - o 1AF013F
   - o 1AF013G
   - o 1AF013H

   4) Throttle flow with the associated AF005 valve.

5) Maintain flow for a minimum of - 10 MINUTES

6) Shutdown AF pump 1B per BOP AF-8, DIESEL DRIVEN AUXILIARY FEEDWATER PUMP _B SHUTDOWN

7) Restore AF alignment:

   a) Open the AF isolation valves:

      - 1AF013E
      - 1AF013F
      - 1AF013G
      - 1AF013H

   b) Set AF005E-H flow control potentiometers at - 6.5

8) After 6 HOURS locally check AF piping temperatures - LESS THAN 130°F:

   - 1AF005E (364' N10 AB)
   - 1AF005F (364' N10 AB)
   - 1AF005G (364' N10 AB)
   - 1AF005H (364' N10 AB)

   8) RETURN TO Step 2 (Page 3).

4 RETURN TO PROCEDURE AND STEP IN EFFECT

-END-

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FINAL