Admin JPM
RO-A1.1

Examinee: _____ **Date:** _____

Examiner: _____

Facility: Davis-Besse **JPM No**: OPS-JPM-316

Task Title: Calculate Steam Generator Tube Leak Rate

Task No: 000-044-05-0100 **System:** _____

K/A Reference: 2.1.19 (3.9) R3 **Safety Function**: _____

Time Critical Task: No **Alternate Path:** _____

Validation Time: 15 minutes

Method of testing:

Simulated Performance ___ Actual Performance _X_

Classroom _X_ Simulator ___ Plant ___

Task Standard:
Determine SG Tube leak rate

Required Materials:
- DB-OP-02531 R25 Attachment 1, RCS Leak Rate Calculation
- Pictures of RE 1003A and RE 1003B
- Chemistry Data Sheet
- Calculator

General References:
None

Notes:
None

Initiating Cue:
The Initiating Cues are specified in the Examiner/Student Copy Performance Measure pages.

EXAMINER COPY

INITIAL CONDITIONS:

The unit is at 100% power

SG 1 has a tube leak

Pressurizer level is 220 inches and steady

The Computer Calculation for RCS Leakage is NOT available

EO reports Steam Jet Air Ejector flow is 15 scfm

INITIATING CUE:

The Shift Manager directs you to manually calculate the leak rate.
REFER TO DB-OP-02531, STEAM GENERATOR TUBE LEAK

- Attachment 1, RCS LEAK RATE CALCULATION
- Section 4, Leak Rate Estimation Using RE 1003A, OR RE 1003B

Provide the examinee a copy of

- **DB-OP-02531 Attachment 1, RCS Leak Rate Calculation**
- **Pictures of RE 1003A and RE 1003B**
- **Chemistry Data Sheet**

CANDIDATE COPY

INITIAL CONDITIONS:

The unit is at 100% power

SG 1 has a tube leak

Pressurizer level is 220 inches and steady

The Computer Calculation for RCS Leakage is NOT available

EO reports Steam Jet Air Ejector flow is 15 scfm

INITIATING CUE:

The Shift Manager directs you to manually calculate the leak rate.
REFER TO DB-OP-02531, STEAM GENERATOR TUBE LEAK

- Attachment 1, RCS LEAK RATE CALCULATION
- Section 4, Leak Rate Estimation Using RE 1003A, OR RE 1003B

PERFORMANCE INFORMATION

NOTE: Critical steps denoted with a "C". Failure to meet any one of these standards for this item constitutes failure. Sequence is assumed unless denoted in the "Comments".

START TIME:_____

1. PERFORMANCE STEP: Record Date and time

   STANDARD: Correct date and time used

   CUE: **None**

SAT UNSAT

2. PERFORMANCE STEP: Record Steam Jet Air Ejector radiation levels
   .....C.....

   STANDARD: Correctly read RE 1003A (1.02E4 cpm) and RE 1003B (3.97E3 cpm)

   CUE: **None**

SAT UNSAT

3. PERFORMANCE STEP: Convert RE readings (cpm) to µCi/cc
   .....C.....

   STANDARD: Correctly multiply SJAE reading by conversion factor:

   RE 1003A = 6.63E-05 µCi/cc
   RE 1003B = 1.27E-04 µCi/cc

   COMMENT: Acceptable Range

   RE 1003A = 6.6E-05 to 6.7E-05µCi/cc
   RE 1003B = 1.2E-04 to 1.3E-04µCi/cc

   CUE: **None**

SAT UNSAT

4. PERFORMANCE STEP: Record Steam Jet Air Ejector (SJAE) flow from FI1002
.....C.....

STANDARD: Correctly record 15 scfm, as given in the initial cue by an EO

CUE: **None**

SAT UNSAT

5. PERFORMANCE STEP: Record the latest RCS Xe-133 activity from Chemistry
.....C.....

STANDARD: Refers to the Chemistry Data Sheet, correctly record
RCS Xe-133 activity (6.66E-03 µCi/cc)

CUE: **None**

SAT UNSAT

6. PERFORMANCE STEP: Calculate primary-to-secondary tube leak using RE 1003B
.....C.....

STANDARD: Correctly calculate tube leak using RE 1003B (2.14 gpm)

COMMENT: Acceptable Range 2 to 2.2 gpm

CUE: **None**

SAT UNSAT

TERMINATING CUES: This JPM is complete (Terminated by the examinee)

END TIME_____

ATTACHMENT 1: RCS LEAK RATE CALCULATION
Page 1 of 3

NOTE 1

This attachment provides four methods to quickly estimate Reactor Coolant System to Steam Generator leak rate using readily available Control Room indications. This attachment is used if the Computer Calculation for RCS Leakage is not available.

- Section 1, Leak Rate Estimation Using RE1003A OR 1003B Readings and Chemistry Data.
- Section 2, Leak Rate Estimation Using RCS Inventory Parameters - This method assumes PZR level is relatively constant and Tave is not changing.
- Section 3, Leak Rate Estimation Using Pressurizer and Makeup Tank Level Change – This method will allow leak rate determination when Pressurizer Level is NOT constant.
- Section 4, Leak Rate Estimation Using RE 1003A OR RE 1003B

To simplify the calculations, errors associated with density corrections, known existing leakage, and other variables are not considered. A more accurate leak rate can be obtained by performing DB-SP-03357, RCS Water Inventory Balance.

N/A 1. Leak Rate Estimation Using RE1003A or RE1003B Readings and Chemistry Data

Compare current RE1003A or RE1003B reading to the Chemistry Data provided table of SG Tube Leakage Rates. Estimate the leak rate based on the readings. Method 4 expands the range of using RE 1003A/B beyond the pre-calculated values provided in the Chemistry Data.

N/A 2. Leak Rate Estimation Using RCS Inventory Parameters

(MU Flow + Seal Injection Flow) – (Letdown Flow + Seal Return Flow) = SGTL Rate

(_____ gpm + _____ gpm) – (_____ gpm + _____ gpm) = _____gpm

ATTACHMENT 1: RCS LEAK RATE CALCULATION
Page 2 of 3

NOTE 3

This leakrate calculation assumes an addition to the Makeup Tank is NOT in progress during the calculation.

N/A 3. Leak Rate Estimation Using Pressurizer and Makeup Tank Level Change

Initial RCS Inventory Conditions Time = _____ hr: min

Pressurizer Level = _____ in

Makeup Tank Level = _____ in

Final RCS Inventory Conditions Time = _____ hr: min

Pressurizer Level = _____ in

Makeup Tank Level = _____ in

Initial RCS Inventory

(30 x Initial MU Tank Level) + (24 x Initial Pressurizer Level) = Initial RCS Inventory

(30 x _____ in) + (24 x _____ in) = _____ gal

Final RCS Inventory

(30 x Initial MU Tank Level) + (24 x Initial Pressurizer Level) = Final RCS Inventory

(30 x _____ in) + (24 x _____ in) = _____ gal

SG Tube Leak Rate

$$\frac{\text{Initial RCS Inventory - Final RCS Inventory}}{\text{Time Period}} = SGTL\ Rate$$

$$\frac{(_____\ gal - _____\ gal)}{_____\ min} = _____\ \text{gal/min}$$

ATTACHMENT 1: RCS LEAK RATE CALCULATION
Page 3 of 3

RO 4.0 Leak Rate Estimation Using RE 1003A or RE 1003B

(a.)	Record the date and time. Date Today Time Now	
(b.)	Record Xe-133 activity from the Steam Jet Air Ejector (SJAE) monitors	RE1003A reading 1.02E4 CPM RE1003B reading 3.97E3 CPM
(c.)	SJAE activity - convert CPM to µCi/cc Xe-133; (RE1003A, from (b.) 1.02E4 CPM) (6.5 E-9)= 6.63E-5 µCi/cc (RE1003B, from (b.) 3.97E3 CPM) (3.2 E-8)= 1.27E-4 µCi/cc	
(d.)	Record SJAE flow from FI1002 (must be greater than 0)	15 FT³/MIN
(e.)	Record the latest Xe-133 concentration in the Reactor Coolant System from Chemistry.	6.66E-3 µCi/cc
(f.)	Using the highest value from (c.), calculate the primary to secondary tube leak as follows: $L.R. = \frac{7.48 \frac{GAL}{FT^3} \text{ (Step c.)(Step d.)}}{\text{(Step e.)}}$	$\frac{7.48 \frac{GAL}{FT^3} (1.27E^{-4})(15)}{(6.66E^{-3})} = 2.14$ GPM

Admin JPM
RO-A1.2

Examinee: _____ **Date:** _____

Examiner: _____

Facility: Davis-Besse **JPM No**: OPS-JPM-276

Task Title: Perform 1/M Plot

Task No: 115-033-01-0100 **System:** _____

K/A Reference: 2.1.43 (4.1) **Safety Function:** _____

Time Critical Task: No **Alternate Path:** _____

Validation Time: 15 minutes

Method of testing:

Simulated Performance ___ Actual Performance __X__

Classroom __X__ Simulator ___ Plant ___

Task Standard:
Perform the calculations and 1/M Plot and recommend no further rod withdrawal.
Also, acceptable to recommend inserting Control Rod Groups 2-7

Required Materials:
DB-OP-06912 R22, Approach to Criticality
Straight edge
Calculator

General References:
None

Notes:
None

Initial Conditions:
The plant conditions are specified in the Initial Conditions and Initiating Cues.

Initiating Cue:
The Initiating Cues are specified in the Examiner/Student Copy Performance Measure pages.

EXAMINER COPY

INITIAL CONDITIONS:

The Plant is in Mode 2.
A reactor startup is in progress.
Group 1-4 rods are withdrawn
Regulating Rods are pulled to 100 Rod Index

INITIATION CUE:

The Shift Manager directs you to perform a peer check of the Reactor Engineer performing the 1/M Plot by performing a separate 1/M Plot using the Source Range count rate data provided on Attachment 1 of DB-OP-06912, Approach to Criticality.

- Compare the 1/M data with the predicted ECP data
- Make a recommendation for further rod withdrawal.

Document recommendation below.

(Hand Candidate a copy of DB-OP-06912, Approach to Criticality, Calculator, and a Straight Edge)

CANDIDATE COPY

INITIAL CONDITIONS:

The Plant is in Mode 2.
A reactor startup is in progress.
Group 1-4 rods are withdrawn
Regulating Rods are pulled to 100 Rod Index

INITIATION CUE:

The Shift Manager directs you to perform a peer check of the Reactor Engineer performing the 1/M Plot by performing a separate 1/M Plot using the Source Range count rate data provided on Attachment 1 of DB-OP-06912, Approach to Criticality.

- Compare the 1/M data with the predicted ECP data
- Make a recommendation for further rod withdrawal

Document recommendation below.

PERFORMANCE INFORMATION

NOTE: Critical steps denoted with a "C". Failure to meet any one of these standards for this item constitutes failure. Sequence is NOT required unless denoted in the "Comments".

START TIME: _____

1. PERFORMANCE STEP: Refer to data on Attachment 1

   STANDARD: Refer to data on Attachment 1 for count rate data

   CUE: **None**

SAT UNSAT

---

2. PERFORMANCE STEP: Plots data SR data on 1/M Plot
   .....C.....

   STANDARD: Evaluates count rate data on attachment 1 and plots this data on the 1/M Plot for 25, 50, 75, and 100 Rod Index

   COMMENTS: Calculated 1/M values are critical
   25: .92
   50: .76
   75: .52
   100: .16

   Predicted Critical Positions on Answer Key are not critical

   CUE: **None**

SAT UNSAT

---

3. PERFORMANCE STEP: Evaluate 1/M Plot data
   .....C.....

   STANDARD:
   - Plot the 1/M by connecting the last two data points on the graph and extending the line down to meet the horizontal (Rod index) axis.
   - Determines that the 1/M Plot predicts criticality before reaching the Lower Rod Index limit of the ECP listed as 125 (- 0.5%Δk/k)

   CUE: **None**

SAT UNSAT

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4. PERFORMANCE STEP: **.....C.....** Notify SRO that the 1/M Plot predicts criticality before reaching the Lower Rod Index limit of the ECP and recommend no further rod withdrawal.

   STANDARD: Notify SRO that the 1/M Plot predicts criticality before reaching the Lower Rod Index limit of the ECP and recommend no further rod withdrawal.

   May also recommend inserting Control Rod Groups 2-7.

   CUE: **None – Verify that the candidate makes the recommendation for no further rod withdrawal or ask a follow-up question.**

SAT UNSAT

TERMINATING CUES: This JPM is complete (Terminated by examinee).

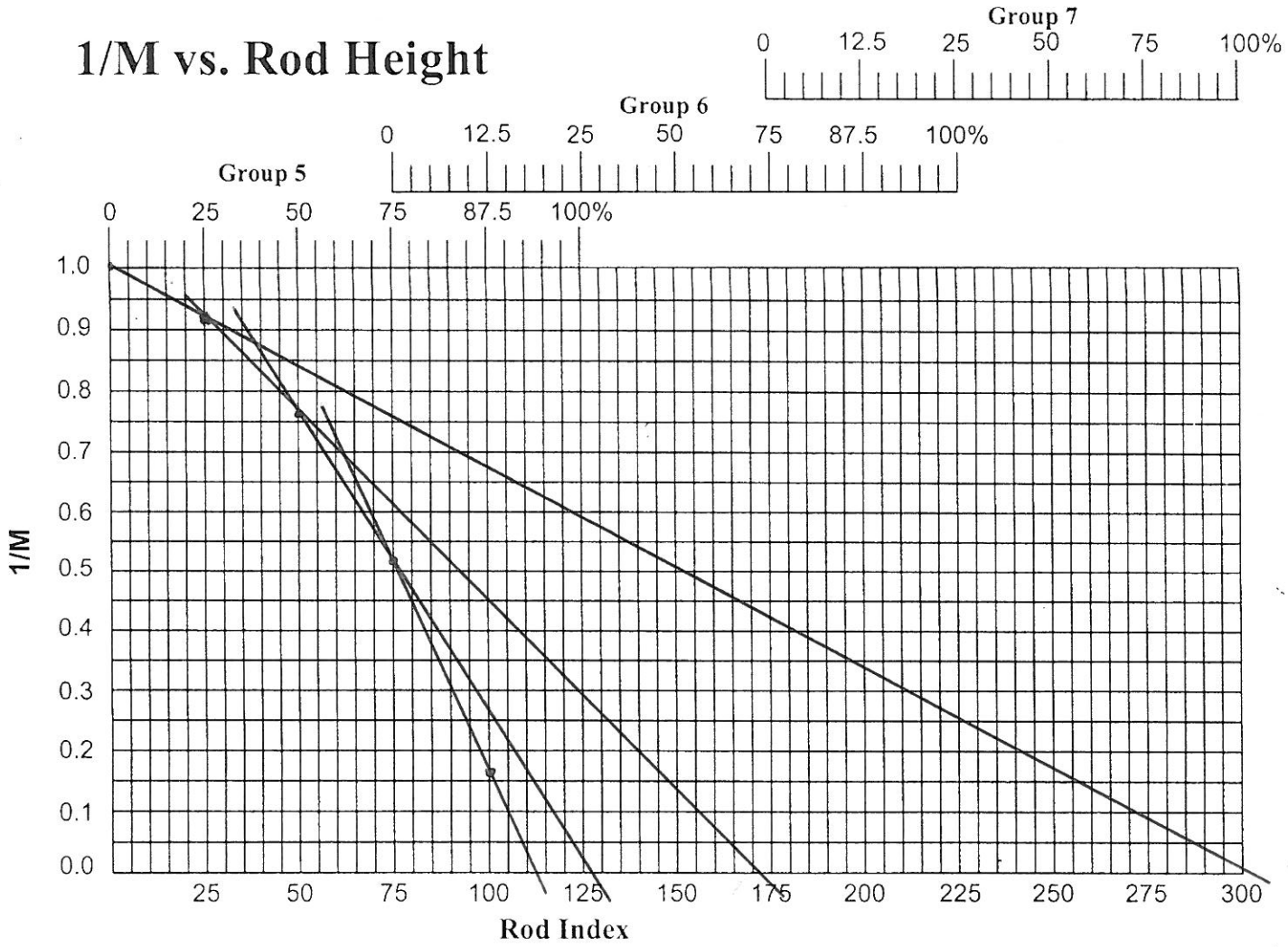
END TIME: _____

Answer Key

49

ATTACHMENT 1: 1/M PLOT
Page 1 of 4

1/M vs. Rod Height



Lower Limit 121.7 ECP 165.3 Upper Limit 237.9

Date: Today

Time: Now

Performed By: Applicant

RCS Boron Concentration: 1720 ppmB

PZR Boron Concentration: 1710 ppmB

MUT Boron Concentration: 1710 ppmB

ATTACHMENT 1: 1/M PLOT
Page 2 of 4

Count Rate Source NI1 (NI2) Computer Point R796 R805
(Circle Source Used)

Base Count Rate 266 cps

1/M = (Base Count Rate)/(Present Count Rate)

Rod Index	Count Rate	1/M	Pred Critical Pos.
25	289	.92	>300
50	350	.76	160-180
75	512	.52	117-137
100	1662	.16	102-122
125-127 (_____) Record actual R.I.			
150			
175			
200			
225-227(_____) Record actual R.I.			
250			
275			

Not Critical

Admin JPM
RO-A2

Examinee: _____ **Date:** _____

Examiner: _____

Facility: Davis-Besse **JPM No**: OPS-JPM-NEW (335)

Task Title: Perform a Leak Isolation

Task No: 119-035-0100 **System:** 008 Component Cooling Water System

K/A Reference: G2.2.15 (3.9) R3 **Safety Function**: _____

Time Critical Task: No **Alternate Path:** No

Validation Time: 25 minutes

Method of testing / Location:

Simulated Performance ___ Actual Performance _X_

Classroom _X_ Simulator ___ Plant ___

Task Standard:
Identify valves to isolate a CCW break using mechanical prints

Required Materials:
OS Drawings Book
OS21 Sheet 1 – Operational Schematic Component Cooling Water System (Rev. 39)
OS21 Sheet 3 - Operational Schematic Component Cooling Water System (Rev. 12)
(24in X 36in)
Magnifying Glass
Highlighter
DB-OP-06262 one copy made available if asked for

General References:
None

Notes:
This Admin JPM is a 2-part JPM and will require two classrooms to facilitate it.

Initial Conditions:
The plant conditions are specified in the Initial Conditions and Initiating Cues.

Initiating Cue:
The Initiating Cues are specified in the Examiner/Student Copy Performance Measure pages.

.

EXAMINER COPY

INITIAL CONDITIONS:

All plant systems are in a normal alignment.

Component Cooling Water (CCW) Pump 1 is running.

Component Cooling Water (CCW) Pump 2 is in STBY.

CCW Pump 3 is lined-up Spare as Pump 2

The Control Room receives a call reporting a leak from the CCW System located on the inlet weld to the Component Cooling Heat Exchanger 1-1.

INITIATING CUES:

The crew has completed the following items

- Started CCW Pump 2
- Stopped CCW Pump 1
- Entered DB-OP-02523, CCW System Malfunctions
- Opened DW2643, CCW Surge Tank Demin Water Makeup Valve to maintain normal CCW Surge Tank level

You are a Spare Reactor Operator.

The Unit Supervisor directs you to identify the valves required to isolate the leak.

List valves required for isolation on this page.

(Provide examinee with a set of Operational Schematics)

CANDIDATE COPY

INITIAL CONDITIONS:

All plant systems are in a normal alignment.

Component Cooling Water (CCW) Pump 1 is running.

Component Cooling Water (CCW) Pump 2 is in STBY.

CCW Pump 3 is lined-up Spare as Pump 2

The Control Room receives a call reporting a leak from the CCW System located on the inlet weld to the Component Cooling Heat Exchanger 1-1.

INITIATING CUES:

The crew has completed the following items

- Started CCW Pump 2
- Stopped CCW Pump 1
- Entered DB-OP-02523, CCW System Malfunctions
- Opened DW2643, CCW Surge Tank Demin Water Makeup Valve to maintain normal CCW Surge Tank level

You are a Spare Reactor Operator.

The Unit Supervisor directs you to identify the valves required to isolate the leak.

List valves required for isolation on this page.

PERFORMANCE INFORMATION

NOTE: Critical steps denoted with a "C". Failure to meet any one of these standards for this item constitutes failure. Sequence is NOT critical unless denoted in the "Comments".

START TIME: _____

1. PERFORMANCE STEP: Identify prints needed.
.....C.....

   STANDARD: Identifies correct print for where the CCW System leak is located: OS-021 SH 1.

   CUE: **None**

_____
SAT UNSAT

---

2. PERFORMANCE STEP: Identify valves required to isolate CCW leak.
.....C.....

   STANDARD: Uses identified prints to stop and isolate CCW leak.

   - Close CC32, CCW Heat Exchanger 1 Outlet Butterfly
   - Close CC1, CCW Pump 1 Suction Butterfly Valve

   NOTE: Other components/actions may be identified for equipment protection such as CCW Pump 1, HPI and LPI train 1 pumps, or EDG 1, these are to be treated as NON-CRITICAL.

   CUE: **Once the candidate identifies the equipment that must be manipulated, role play as the Unit Supervisor as required.**

   - **IF the isolation plan includes CC1,**
     "The operator in the field is unable to close CC1 and the CCW leak continues. Identify additional components which MUST be manipulated to isolate the CCW leak."

   - **IF the candidate has already expanded the isolation points, evaluate the boundary to ensure the leak has been isolated (See JPM Step 3).**

_____
SAT UNSAT

---

3. PERFORMANCE STEP: Identify valves required to isolate CCW leak
.....C.....

STANDARD: Uses identified prints to isolate CCW leak.

NOTE: Other components may be identified, if that is the case, these are to be treated as NON-CRITICAL portions of this step.

NOTE: The following valves are not required to be listed for the following reasons.

- The Non-Essential valves will Auto Transfer. CC5095, CC5097, and CC2645 will Auto close when CCW Pump 1 is stopped.
- SW233, CC121, CC662, CC244 are Normally Closed (NC) valves.
- When CCW Pump 3 is aligned as 2, CC35 and CC4 are NC.
- CC248, CCW Corrosion Test Piping Line 1 Outlet Isolation is not a credible pressure source. This line is normally fed from CCW Train 1 discharge header. However, with CCW Pump 1 off, there could be backflow from MUP 1 Cooler, through a throttled valve (CC129), HPI 1 Bearing, test coupons, small diameter piping, and elevation changes.
- CC32, CCW Heat Exchanger 1 Outlet Butterfly should be identified in JPM Step 2.

The following identify the additional MINIMUM valves to be closed to isolate the leak based on **CC1** failing to close.

- CC123, CCW Surge Tank Isolation (from Sheet 3)
- CC172, CCW From Decay Heat Cooler 1 Outlet Iso
- CC661, CCW From HPI & DH Pump 1 Normal Source Outlet
- CC162, CCW From EDG 1 Outlet Iso
- CC243, CTMT Gas Analyzer 1 Normal Source Outlet

The following identify the MINIMUM valves to be closed to isolate the leak if **CC32** was NOT used as an isolation.

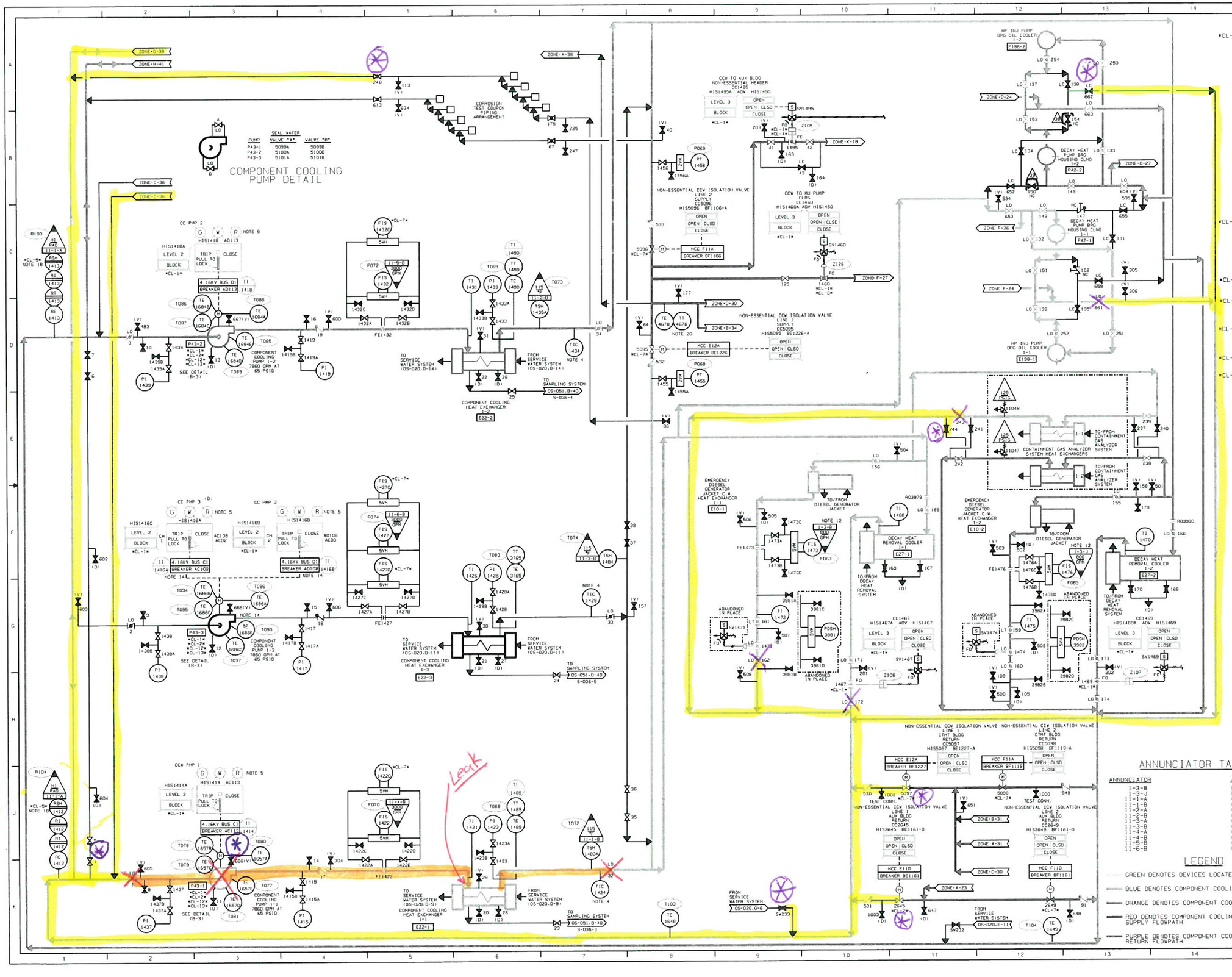
- CC653, CCW to HPI & DH Pump 1 Normal Source
- CC165, CCW to EDG 1 Inlet Iso
- CC156, CCW to Decay Heat Cooler 1 Inlet Iso
- CC239, Containment Gas Analyzer 1 Normal Source Inlet

CUE: **None**

_____
SAT UNSAT

TERMINATING CUES: This JPM is complete (Terminated by the examinee)

END TIME:_____



CONTROL LOGICS

×CL-1× WITH REGARD TO THE COMPONENT COOLING WATER SYSTEM, THE FOLLOWING ACTIONS WILL OCCUR IN THE EVENT OF A SAFETY FEATURES ACTUATION SYSTEM (SFAS) SIGNAL:

COMPONENT	SIGNAL	ZONE	ACTION	REMARKS
	LEVEL 2 SIGNAL			
PUMP 1-1	SA231A	K-3	STARTS	BLOCK PUSHBUTTON
PUMP 1-2	SA232A	D-3	STARTS	BLOCK PUSHBUTTON
PUMP 1-3	SA231B•SA232B	G-3	STARTS	BLOCK PUSHBUTTON
	LEVEL 3 SIGNAL			
VALVE 1460	SA322A	C-10	CLOSES	BLOCK PUSHBUTTON
VALVE 1467	SA311C	H-10	OPENS	BLOCK PUSHBUTTON
VALVE 1469	SA312C	H-13	OPENS	BLOCK PUSHBUTTON
VALVE 1495	SA321A	B-9	CLOSES	BLOCK PUSHBUTTON
	LEVEL 4 SIGNAL			
VALVE 1328	SA421D	B-34	CLOSES	BLOCK PUSHBUTTON IF VALVE >20% OPEN.
VALVE 1338	SA422D	C-34	CLOSES	BLOCK PUSHBUTTON IF VALVE >20% OPEN.
VALVE 1407A	SA421B	C-27	CLOSES	BLOCK PUSHBUTTON
VALVE 1407B	SA422B	C-29	CLOSES	BLOCK PUSHBUTTON
VALVE 1411A	SA421A	D-27	CLOSES	BLOCK PUSHBUTTON
VALVE 1411B	SA422A	D-29	CLOSES	BLOCK PUSHBUTTON
VALVE 1567A	SA421C	B-29	CLOSES	BLOCK PUSHBUTTON IF VALVE >20% OPEN.
VALVE 1567B	SA422C	B-30	CLOSES	BLOCK PUSHBUTTON IF VALVE >20% OPEN.

TO STOP A COMPONENT COOLING WATER PUMP OR TO CHANGE POSITION OF A COMPONENT COOLING WATER VALVE DURING AN SFAS, EACH COMPONENT'S "BLOCK" PUSHBUTTON MUST BE DEPRESSED FIRST.

×CL-2× COMPONENT COOLING PUMP 1-1 (ZONE K-3) WILL TRIP IF ANY OF THE FOLLOWING CONDITIONS EXIST:

- PHASE A OR C TIME DELAY OVERCURRENT SENSED BY RELAY CO (SEE NOTE 5) AND PHASE A OR C INSTANTANEOUS OVERCURRENT SENSED BY RELAY ITT
- INSTANTANEOUS GROUND OVERCURRENT SENSED BY 50GS RELAY
- PHASE A OR C INSTANTANEOUS OVERCURRENT SENSED BY RELAY IIT

LOGIC FOR PUMPS 1-2 AND 1-3 (ZONES D-3 AND G-3) ARE SIMILIAR.

×CL-3× COMPONENT COOLING WATER VALVE 1460 (ZONE C-10) WILL AUTOMATICALLY CLOSE IF COMPONENT COOLING WATER SURGE TANK LEVEL SIDE 2 ≤35 IN AS SENSED BY LSLL3758A (ZONE F-44).

×CL-4× COMPONENT COOLING WATER AUXILIARY EQUIPMENT INLET VALVE 1495 (ZONE B-9) WILL AUTOMATICALLY CLOSE IF COMPONENT COOLING WATER SURGE TANK LEVEL SIDE 1 ≤47 IN AS SENSED BY LSLL3757A (ZONE F-38).

×CL-5× COMPONENT COOLING WATER SURGE TANK ATMOSPHERIC VENT VALVE 1412 (ZONE A-43) WILL AUTOMATICALLY SHIFT TO THE MISC WASTE DRAIN TANK IF HIGH RADIATION IS SENSED BY RSH1412 OR RSH1413 (ZONES J-1 AND C-1).

×CL-6× DELETED

×CL-7× COMPONENT COOLING WATER LINE 1 VALVE 2645 (ZONE K-11) WILL AUTOMATICALLY CLOSE IF IT IS ≥ 20% OPEN AND COMPONENT COOLING WATER SURGE TANK LEVEL SIDE 1 IS ≤ 37.125 IN AS SENSED BY LSLL3757B (ZONE E-38) AND ≤ 37.25 IN AS SENSED BY LSLL3757C (ZONE D-38) OR THE BREAKERS FOR PUMPS 1-1 AND 1-3 ARE BOTH OPEN.

VALVE 2645 WILL AUTOMATICALLY OPEN IF

CONDITIONS I, II, III AND (IV OR V) EXIST:

I. VALVE ≤ 20% OPEN.
II. SURGE TANK LEVEL SIDE 1 ≥ 37.125 IN AS SENSED BY LSLL3757B AND LSLL3757C.
III. COMPONENT COOLING WATER FLOW ≤1000 GPM AS SENSED BY FIS1432C (ZONE C-5).
IV. BREAKER FOR PUMP 1-1 IS IN THE TEST OR RACKED OUT POSITION.
V. COMPONENT COOLING WATER FLOW ≤ 1000 GPM AS SENSED BY FIS1427C (ZONE F-5).

LOGIC FOR COMPONENT COOLING WATER HEADER DISCHARGE LINE 1 INLET ISOLATION VALVE 5095 (ZONE D-8) AND COMPONENT COOLING WATER HEADER INTAKE LINE 1 RETURN ISOLATION VALVE 5097 (ZONE J-11) IS SIMILAR.

LOGIC FOR COMPONENT COOLING WATER LINE 2 VALVE 2649 (ZONE K-12), COMPONENT COOLING WATER HEADER DISCHARGE LINE 2 INLET ISOLATION VALVE 5096 (ZONE C-8) AND COMPONENT COOLING WATER HEADER INTAKE LINE 2 RETURN ISOLATION VALVE 5098 (ZONE J-12) IS SIMILAR EXCEPT SURGE TANK LEVEL SIDE 2 IS ≤36.25 IN AS SENSED BY LSLL3758B (ZONE E-44) AND ≤36.75 IN AS SENSED BY LSLL3758C (ZONE D-44), COMPONENT COOLING WATER FLOW IS SENSED BY FIS1422D AND FIS1427D (ZONES J-5 AND F-5) AND COMPONENT COOLING WATER PUMP IS 1-2.

NOTES

1. ALL VALVES ARE PREFIXED WITH "CC" UNLESS OTHERWISE NOTED.
2. FOR GENERAL NOTES, PIPING SYMBOLS, INSTRUMENTATION SYMBOLS AND OPERATIONAL SCHEMATIC INDEX, SEE INDEX SHEET DWG OS-000.
3. DELETED
4. FOR THE OPERATION OF TIC1424, TIC1429 AND TIC1434 (ZONES K-7, G-7 AND D-7) SEE SERVICE WATER SYSTEM DWG OS-020, ×CL-7×.
5. WHITE INDICATING LIGHT ON HANDSWITCHES HIS1414, HIS1416A, HIS1416B AND HIS141B (ZONES J-3, F-2, F-4 AND C-3) ONLY ILLUMINATES WHEN TIME DELAYED OVERCURRENT ALARM RELAY HAS OPERATED.
6. WHENEVER THE COMPONENT COOLING WATER SYSTEM IS INOPERABLE, THE OPERATOR IS TO PLACE HANDSWITCH HS4801 (ZONE H-16) IN "NOT OPER" AS INDICATED BY THE "BYPASS" LIGHT (ZONE H-16).

CCW NORM / NOT OPER — BYPASS — IL4801 — HS4801 — NOTE 6

NOTES CONT'D ON SH. 2

ANNUNCIATOR TABLE

ANNUNCIATOR	ANNUNCIATOR ENGRAVING
1-3-B	EDG 1 CCW FLOW LO
1-3-J	EDG 2 CCW FLOW LO
1-1-A	CCW RETURN RAD HI
1-1-B	CCW HX 1 OUTLET TEMP HI
1-2-A	CCW SURGE TK LVL LO-LO
1-2-B	CCW HX 2 OUTLET TEMP HI
1-3-A	CCW SURGE TK LVL LO
1-3-B	CCW HX 3 OUTLET TEMP HI
1-4-A	CCW SURGE TK LVL HI
1-4-B	CCW PMP 1 FLOW LO
1-5-B	CCW PMP 2 FLOW LO
1-6-B	CCW PMP 3 FLOW LO

LEGEND

- GREEN DENOTES DEVICES LOCATED IN THE CONTROL ROOM
- BLUE DENOTES COMPONENT COOLING WATER LINE 1 FLOWPATH
- ORANGE DENOTES COMPONENT COOLING WATER LINE 2 FLOWPATH
- RED DENOTES COMPONENT COOLING WATER SYSTEM COMMON SUPPLY FLOWPATH
- PURPLE DENOTES COMPONENT COOLING WATER SYSTEM COMMON RETURN FLOWPATH

FOR CONTROL LOGICS, NOTES AND REFERENCES SEE OS-021 SH 2 AND SH 3

NO	DATE	REVISIONS	BY	CHK	ENGR	SUPV	ENGR	SUPV
39	6/16	INC: DUN 15-0040-001 -005 & 15-0041-001 -005 BOTH REV.0	SBW	SAP		BTR		
38	6/16	INC: DUN 15-0293-001 -002 REV.00	SBW	SAP		CDA		
37	3/16	INC: DUN 11-0614-001 -005 REV.00	SBW	SAC		SSK		
0	11/88	INFORMATION ONLY	HB	EWT	HRB	CHL	JLL	HP
								JAM VSM

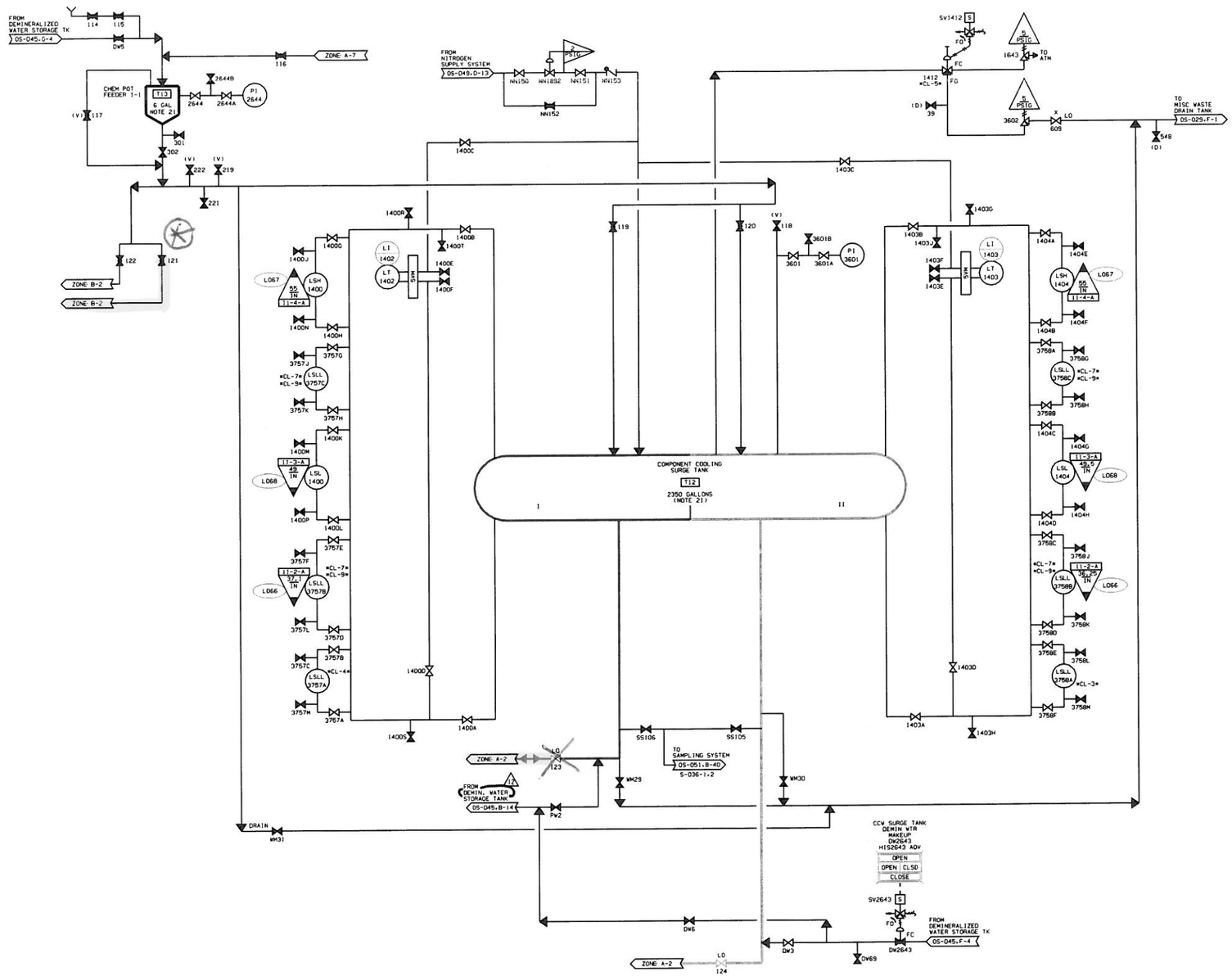
SCALE NONE | DESIGNED RSH | DRAWN ATR | DATE 11-4-88

DAVIS-BESSE NUCLEAR POWER STATION UNIT NO 1

OPERATIONAL SCHEMATIC ⊗ COMPONENT COOLING WATER SYSTEM

DRAWING NO OS-021 SH 1 | REV 39

DB 04-04-16
DFN= /OPSCH/OS21S1.DGN


FROM DEMINERALIZED WATER STORAGE TK
OS-045.G-4
ZONE A-7
CHEM POT FEEDER 1-1
T13
6 GAL
NOTE 21
FROM NITROGEN SUPPLY SYSTEM
OS-049.D-13
TO MISC WASTE DRAIN TANK
OS-029.F-1
COMPONENT COOLING SURGE TANK
T12
2350 GALLONS
(NOTE 21)
ZONE B-2
ZONE B-2
ZONE A-2
ZONE A-2
TO SAMPLING SYSTEM
OS-051.B-4D
S-036-1.2
FROM DEMIN. WATER STORAGE TANK
OS-045.B-14
DRAIN
CCW SURGE TANK DEMIN WTR MAKEUP
DW2643
HIS2643 ADV
OPEN
OPEN CLSD
CLOSE
FROM DEMINERALIZED WATER STORAGE TK
OS-045.F-4
LSH 1400
LSH 1404
LSL 1400
LSL 1404
LSLL 3757A
LSLL 3757C
LSLL 3757E
LSLL 3758A
LSLL 3758C
LSLL 3758E
LT 1402
LT 1403
PI 3601
PI 2644
LO 123
LO 124
LO 609
LO 548
SV1412
SV2643
DW2643
DW3
DW6
DW69
PW2
1400A
1400C
1400D
1400E
1400F
1400G
1400H
1400J
1400K
1400L
1400M
1400N
1400P
1400R
1400T
1403A
1403B
1403C
1403D
1403E
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3758P
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3758SSSSSSSSSSSSSSSSSSSSSSSSSSSSS
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3758CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
3758DDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDD
3758EEEEEE

Admin JPM
RO-A3

Examinee: _____ **Date:** _____

Examiner: _____

Facility: Davis-Besse **JPM No**: OPS-JPM-305

Task Title: Stay Time Calculation

Task No: 115-035-01-0100 **System:** _____

K/A Reference: 2.3.12 (3.2) **Safety Function:** _____

Time Critical Task: No **Alternate Path:** _____

Validation Time: 20 minutes

Method of testing:

Simulated Performance ___ Actual Performance __X__

Classroom __X__ Simulator ___ Plant ___

Task Standard:
Determine the total dose received and the time required to receive an EAD Dose Alarm.

Required Materials:
Survey Map DB-M-2018-TRG
Calculator

General References:
None

Notes:
None

Initial Conditions:
The plant conditions are specified in the Initial Conditions and Initiating Cues.

Initiating Cue:
The Initiating Cues are specified in the Examiner/Student Copy Performance Measure pages.

EXAMINER COPY

INITIAL CONDITIONS:

The plant is in procedure DB-OP-02527 Loss of Decay Heat Removal

- Refer to the Decay Heat Pump area Rad Pro Survey Map.
- You are to stage yourself **inside** the radiologically controlled area while awaiting directions.
- You are to remain in the area identified on the survey map with the lowest possible dose during the wait time.
- Your task will be to vent Decay Heat Pump 2 using vent valve DH56, DH PUMP 2 CASING VENT when directed.
- Your RWP has the following limits:
  - Dose Rate Alarm = 75 mrem/hr
  - Dose Alarm = 40 mrem

Aux Building 545 ECCS Room 2 is posted as a Radiation Area

Time line:
0800 – You enter ECCS Room 2 room and wait in the area identified on the survey map with the lowest possible dose
0830 – Wait time is complete, you start venting Decay Heat Pump 2
0855 – Venting is complete, you immediately exit the room and report back to the CTRM

INITIATING CUE:

Based upon the above timeline, the information from your RWP and the Aux Building 545 ECCS Room 2 survey map:

1. Determine the total amount of dose that was received from room entry to exit. Use the highest potential dose rate in the area of the pump in determining your dose for the actual venting portion of the entry.

2. Assuming no dose was received until you entered ECCS Room 2, determine the MAXIMUM time (including the wait time) you could take to vent the Decay Heat Pump 2 until you would receive an EAD Dose Alarm.

You do not have to include any dose received while transiting from the waiting area through the room to and from the pump.

(Provide examinee a copy of Survey Map DB-M-2018-TRG)

CANDIDATE COPY

INITIAL CONDITIONS:

The plant is in procedure DB-OP-02527 Loss of Decay Heat Removal

- Refer to the Decay Heat Pump area Rad Pro Survey Map.
- You are to stage yourself **inside** the radiologically controlled area while awaiting directions.
- You are to remain in the area identified on the survey map with the lowest possible dose during the wait time.
- Your task will be to vent Decay Heat Pump 2 using vent valve DH56, DH PUMP 2 CASING VENT when directed.
- Your RWP has the following limits:
  - Dose Rate Alarm = 75 mrem/hr
  - Dose Alarm = 40 mrem

Aux Building 545 ECCS Room 2 is posted as a Radiation Area

Time line:
0800 – You enter ECCS Room 2 room and wait in the area identified on the survey map with the lowest possible dose
0830 – Wait time is complete, you start venting Decay Heat Pump 2
0855 – Venting is complete, you immediately exit the room and report back to the CTRM

INITIATING CUE:

Based upon the above timeline, the information from your RWP and the Aux Building 545 ECCS Room 2 survey map:

1. Determine the total amount of dose that was received from room entry to exit. Use the highest potential dose rate in the area of the pump in determining your dose for the actual venting portion of the entry.

2. Assuming no dose was received until you entered ECCS Room 2, determine the MAXIMUM time (including the wait time) you could take to vent the Decay Heat Pump 2 until you would receive an EAD Dose Alarm.

You do not have to include any dose received while transiting from the waiting area through the room to and from the pump.

PERFORMANCE INFORMATION

NOTE: Critical steps denoted with a "C". Failure to meet any one of these standards for this item constitutes failure. Sequence is NOT required unless denoted in the "Comments".

START TIME: _____

1. PERFORMANCE STEP: Determine the dose that will be received while waiting in the lowest dose waiting area in the radiologically controlled area.
.....C.....

STANDARD: Calculates the dose received for the duration of the time in the low dose area Map location DR12.

Based on a 30-minute wait at the area with a dose rate of 5 mrem/hr:

Low Dose Wait Area Dose: 5 mrem/hr X 0.5 hr = 2.5 mrem

CUE: **None**

SAT UNSAT

2. PERFORMANCE STEP: Determine the dose that will be received while venting the pump.
.....C.....

STANDARD: Calculates the dose received for the duration of the time venting the pump. Per the Survey Map location DR10 has the highest dose at 50 mrem/hr.

Based on a 25 minute task duration at the pump with a dose rate of 50 mrem/hr:

Pump Venting Dose: 50 mrem/hr X (25/60) hr = 20.83 mrem

COMMENT: Acceptable range is 20.8 to 21 mrem.

CUE: **None**

SAT UNSAT

3. PERFORMANCE STEP: Determine the Total dose that will be received while in the area performing the task.
.....C.....

STANDARD: Calculate the dose received for the duration of the task.

TOTAL Dose: 2.5 mrem + 20.83 mrem = 23.33 mrem

COMMENT: Acceptable range is 23.3 to 24.0 mrem

CUE: **None**

SAT UNSAT

4. PERFORMANCE STEP: Determine the maximum time to complete the task before reaching the EAD Dose Alarm setpoint.
.....C.....

STANDARD: Calculates the maximum time until Dose Alarm.

The RWP Dose Alarm setpoint is 40 mrem.

Subtract the low dose waiting area dose from the total allowed:
40 mrem – 2.5 mrem = 37.5 mrem

Vent Time Dose Rate is 50 mrem / hr:
37.5 mrem/ 50 mrem / hr = 0.75 hrs or 45 minutes

TOTAL Time is 45 minutes

CUE: **None**

SAT UNSAT

TERMINATING CUES: This JPM is complete (Terminated by examinee)

END TIME: _____

FOR TRAINING USE ONLY
VSDS Standard Map Survey Report
Survey DB-M-2018-TRG

General Information

Title: M-24 #2 ECCS

Survey Date/Time: 10/24/2017 12:58
Lead Surveyor: Tyler Brown
Survey Type: Monthly
Work Order/Task #: 1
Counted By:
SAP/Contract ID: C33087
RWP #: 2017-0001
Rx % Pwr: 100%
Status: Approved by: Tom Purdue, 10/31/2017 12:50:32
SAP/Contract ID: 10908
Ready for Review by: Tyler Brown, 10/24/2017 13:12:28
SAP/Contract ID: C33087

Dose Rate (DR) Object Prefixes/Suffixes

Dose Rates with Prefixes:	Dose Rates with No Prefixes:	Default Prefixes:	Default Suffixes:
* = Contact + = 30cm	Gen Area	HS = Hot Spot	"n" = Neutron "b" = Beta "c" = Corrected

Postings Legend

CA=Contaminated Area
RA=Radiation Area

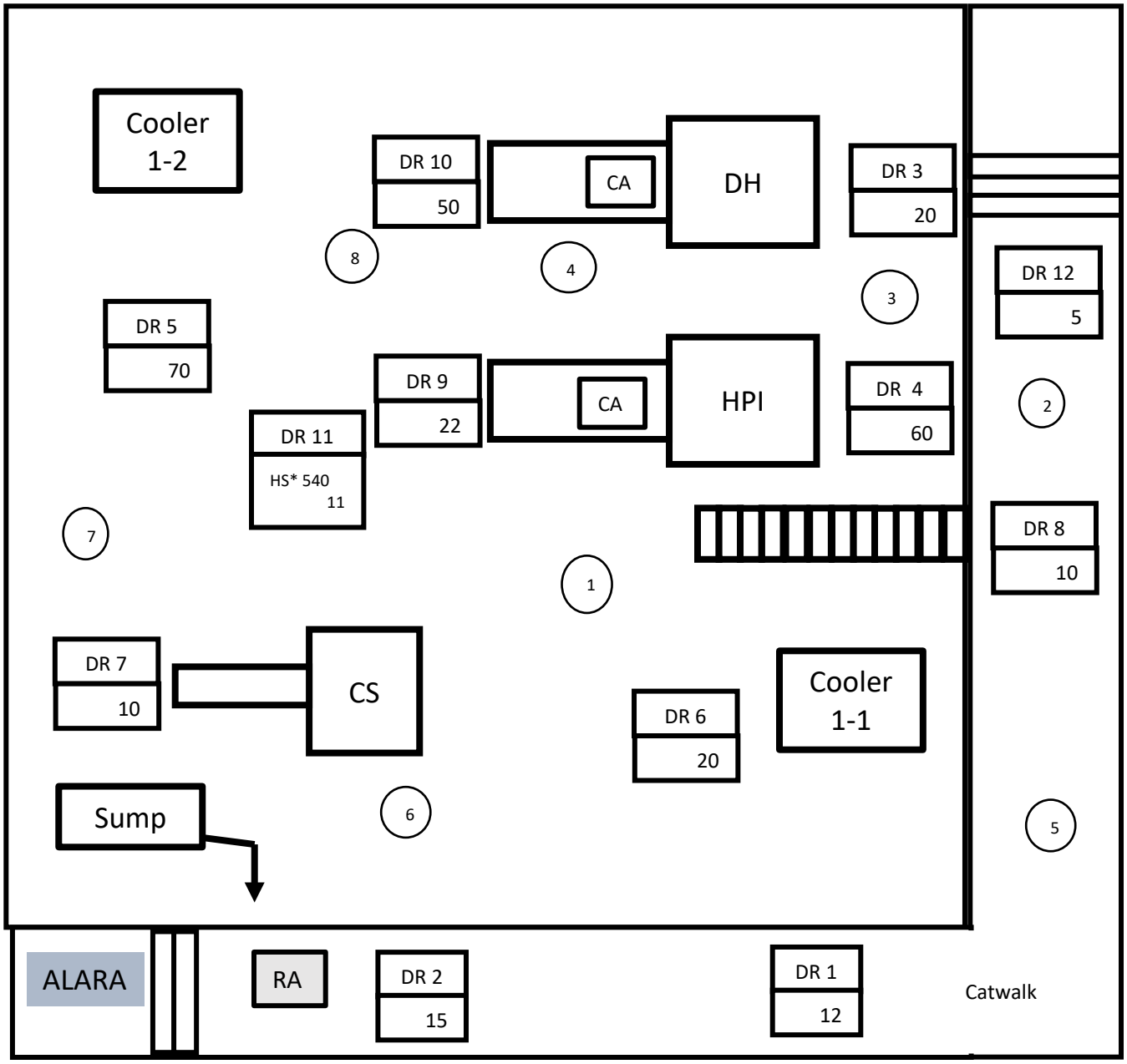
Map Location

File Name	Image Description	Location Code	Bldg/Area Name	Location Description
AX\AUX545_Rm115ECCS2_M24	AUX545_Rm115ECCS2_M24	Auxiliary Building	AUX545	Rm115ECCS2_M24

Instruments Used

#	Instrument Model	Instrument Serial #	Calibration Date
1	S5XLB	2.12.56	4/16/2018
2	451B	2.7.535	1/19/2018

FOR TRAINING USE ONLY
VSDS Standard Map Survey Report
Survey DB-M-2018-TRG



Comments: S5XLB MDA: Alpha 17 dpm, Beta 21 dpm

Smears 12-16: Post decon on and around drain cover. All <MDA alpha/beta.

Room was wet mopped and LAS of entire room passed SAM-11 tmp 10/31/2017

Type: Monthly

Symbol Legend (for example only)

Dose Rate
150 Contact Reading
75 30 cm Reading
20 General Area
HS-50 Hot Spot
RCA Posting
Drip Bag
15 Smear 15 Air Sample RM 15 Wipe

RWP #: 2017-0001
Reactor Power = 100%

Unless otherwise noted, dose rates in mrem/hr.

Lead Surveyor: Tyler Brown
Location Code: Auxiliary Building
Location Description: Rm115ECCS2_M24

Summary of Highest Readings
(All available values may not be listed)

Smears	Air Samples & Wipes
7) 587 DPM/100 cm2 β/γ	
10) <MDA DPM/100 cm2 α	

Status: Approved by: Tom Purdue, 10/31/2017 12:50:32
Bldg/Area Name: AUX545

Image File: AX\AUX545_Rm115ECCS2_M24

FOR TRAINING USE ONLY
VSDS Standard Map Survey Report
Survey DB-M-2018-TRG

#	Type	Inst.	Value	Units	Position	Notes
1	DR γ	N/A	12	mrem/hr		
2	DR γ	N/A	15	mrem/hr		
3	DR γ	N/A	20	mrem/hr		
4	DR γ	N/A	60	mrem/hr		
5	DR γ	N/A	70	mrem/hr		
6	DR γ	N/A	20	mrem/hr		
7	DR γ	N/A	10	mrem/hr		
8	DR γ	N/A	10	mrem/hr		
9	DR γ	N/A	22	mrem/hr		
10	DR γ	N/A	50	mrem/hr		
11	DR γ HS	N/A	HS * 540	mrem/hr	Hot Spot # 1	Elbow, placard reads *540 /11/@ 30 CM
		N/A	+11	mrem/hr		
12	DR γ	N/A	5	mrem/hr		

#	Type	Inst.	Value	Units	Position	Notes
1	Smear	N/A	β/γ 22	DPM/100 cm2	floor	
		N/A	α < MDA	DPM/100 cm2		
2	Smear	N/A	β/γ 47	DPM/100 cm2	floor	
		N/A	α < MDA	DPM/100 cm2		
3	Smear	N/A	β/γ 62	DPM/100 cm2	floor	
		N/A	α < MDA	DPM/100 cm2		
4	Smear	N/A	β/γ <MDA	DPM/100 cm2	floor	
		N/A	α < MDA	DPM/100 cm2		
5	Smear	N/A	β/γ 38	DPM/100 cm2	floor	
		N/A	α < MDA	DPM/100 cm2		
6	Smear	N/A	β/γ 38	DPM/100 cm2	floor	
		N/A	α < MDA	DPM/100 cm2		
7	Smear	N/A	β/γ 587	DPM/100 cm2	floor	
		N/A	α < MDA	DPM/100 cm2		
8	Smear	N/A	β/γ MDA	DPM/100 cm2	floor	
		N/A	α < MDA	DPM/100 cm2		