

## Attachment A Facility Comments for Question # 78

Comment:

The facility recommends accepting D as an alternate acceptable answer.

The initial power level for the question was 95% with a small fuel element failure and a Dose equivalent I-131 sample of  $40\mu\text{Ci/gm}$ . The SRO applicants were given a copy of Tech Spec 3.4.16 RCS Specific Activity and Tech Spec Figure 3.4.16-1 (Attachments 78-1 and 78-2). The applicants were asked to identify the Tech Spec required action and the bases for the action. LCO 3.4.16 Condition A is NOT met since the Dose equivalent I-131 sample of  $40\mu\text{Ci/gm}$  is greater than  $0.35\mu\text{Ci/gm}$ . Condition A has two required actions, A.1 Verify Dose equivalent I-131 within the acceptable region of Tech Spec Figure 3.4.16-1 AND A.2 Restore Dose equivalent I-131 to within limit within 48 hours. On Tech Spec Figure 3.4.16-1 the Dose equivalent I-131 of  $40\mu\text{Ci/gm}$  is NOT within the acceptable region. LCO 3.4.16 Condition C is also NOT met and the required action is to be in Mode 3 with  $T_{\text{avg}}$  less than  $500^\circ\text{F}$  within the next 6 hours. This was the answer key answer, choice B along with the correct bases. The intent of the question was to identify this required action.

However, IAW ITS section 1.3 "Completion Times" Pg 1.3-1 and Pg 1.3-11 (Attachments 78-3 and 78-4) when multiple conditions apply to a single LCO all action times must be tracked and monitored from time of discovery to meet said condition. Additionally, ITS Section 1.2 "Logical Connectors" page 1.2-1 (Attachment 78-5) states "both actions must be completed as long as the condition applies". Therefore LCO 3.4.16 Required Action A.2, Restore Dose equivalent I-131 to within limit within 48 hours is still a required action even though LCO 3.4.16 Condition C is more restrictive.

Restore Dose equivalent I-131 to within limit within 48 hours was choice D with the same bases as choice B.

Based on this information, the facility recommends accepting D as an alternate acceptable answer.

# Beaver Valley Unit 2 NRC Written Exam (2LOT7)

## SRO ONLY

78. Given the following plant conditions:

- The plant has been operating at 95% power with a small Fuel Element Failure.
- Chemistry reports that the latest sample has shown a sharp increase in dose equivalent I-131 currently reading 40  $\mu\text{Ci/gm}$ .

According to technical specification (TS) 3.4.16, which ONE of the following is the required action AND bases for this action?

The required TS 3.4.16 action is to \_\_\_\_ (1) \_\_\_\_ AND the bases for this action is to ensure TEDE at the site boundary and in the control room will NOT exceed \_\_\_\_ (2) \_\_\_\_.

- A. (1) be in Mode 3 with  $T_{\text{avg}} < 500^\circ\text{F}$  within 6 hours  
(2) 10 CFR 100 dose guideline limits during a Loss of Coolant Accident.
- B. (1) be in Mode 3 with  $T_{\text{avg}} < 500^\circ\text{F}$  within 6 hours  
(2) 10 CFR 50.67 dose guideline limits during a Steam Line Break or Steam Generator Tube Rupture.
- C. (1) restore Dose Equivalent I-131 to within limit within 48 hours  
(2) 10 CFR 100 dose guideline limits during a Loss of Coolant Accident.
- D. (1) restore Dose Equivalent I-131 to within limit within 48 hours  
(2) 10 CFR 50.67 dose guideline limits during a Steam Line Break or Steam Generator Tube Rupture.

**Answer: B**

### Explanation/Justification:

- A. Incorrect. Correct action statement. Incorrect bases, refer to correct answer explanation.
- B. Correct. At 40 microcuries/gm, I-131 is well above TS limits in the unacceptable region of Figure 3.4.16-1. TS 3.4.16 LCO is to be in Mode 3 and cool down to 500 F within 6 hours. The bases is based on a SGTR or SLB as opposed to LOCA. After BVPS power up-rate, the source term is now based on 10CFR50.67 as opposed to 10CFR100 dose guideline limits.
- C. Incorrect. Incorrect action statement. Incorrect bases.
- D. Incorrect. Incorrect action statement. Correct bases.

Sys #	System	Category	KA Statement
038	N/A	N/A	Knowledge of limiting conditions for operations and safety limits.
K/A#	2.2.22	K/A Importance 4.7	Exam Level SRO
References provided to Candidate		TS 3.4.16, Amend. 278/161 (BASES NOT PROVIDED)	Technical References: TS 3.4.16, Amend. 278/161 TS 3.4.16 Bases, Rev. 0
Question Source:	Modified Bank	Vision - 45836	Level Of Difficulty: (1-5)
Question Cognitive Level:	Higher - Application	10 CFR Part 55 Content:	(CFR 41.5 / 43.2 / 45.2)
Objective:	3SQS-ITS.007	2. State the purpose of each ITS 3.4 specification as describes in the applicable safety analyses section of the ITS bases. 3. Given plant conditions, determine the criteria necessary to ensure compliance with each TS 3.4 LCO in accordance with the bases, surveillance requirements and applicability.	

# ATTACHMENT 78-1

RCS Specific Activity  
3.4.16

## 3.4 REACTOR COOLANT SYSTEM (RCS)

### 3.4.16 RCS Specific Activity

LCO 3.4.16 The specific activity of the reactor coolant shall be within limits.

APPLICABILITY: MODES 1 and 2,  
MODE 3 with RCS average temperature ( $T_{avg}$ )  $\geq 500^{\circ}\text{F}$ .

#### ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. DOSE EQUIVALENT I-131 $> 0.35 \mu\text{Ci/gm}$ .	<b>- NOTE -</b> LCO 3.0.4.c is applicable.	
	A.1 Verify DOSE EQUIVALENT I-131 within the acceptable region of Figure 3.4.16-1.	Once per 4 hours
	<u>AND</u> A.2 Restore DOSE EQUIVALENT I-131 to within limit.	48 hours
B. Gross specific activity of the reactor coolant not within limit.	B.1 Be in MODE 3 with $T_{avg} < 500^{\circ}\text{F}$ .	6 hours
C. Required Action and associated Completion Time of Condition A not met.  <u>OR</u>  DOSE EQUIVALENT I-131 in the unacceptable region of Figure 3.4.16-1.	C.1 Be in MODE 3 with $T_{avg} < 500^{\circ}\text{F}$ .	6 hours

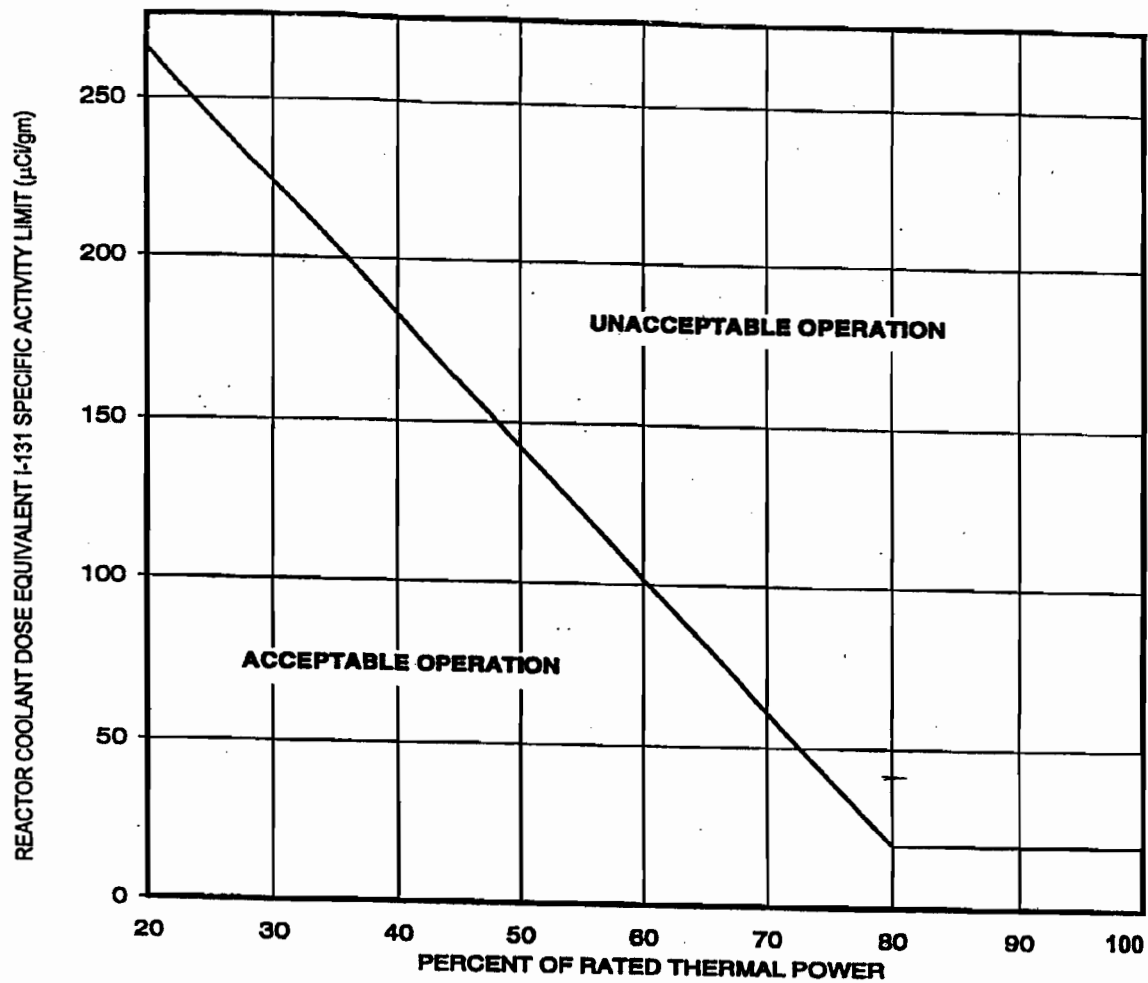


Figure 3.4.16-1 (Page 1 of 1)  
Reactor Coolant DOSE EQUIVALENT I-131 Specific Activity  
Limit Versus Percent of RATED THERMAL POWER

# ATTACHMENT 78-3

Completion Times  
1.3

## 1.0 USE AND APPLICATION

### 1.3 Completion Times

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PURPOSE	The purpose of this section is to establish the Completion Time convention and to provide guidance for its use.
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BACKGROUND	Limiting Conditions for Operation (LCOs) specify minimum requirements for ensuring safe operation of the unit. The ACTIONS associated with an LCO state Conditions that typically describe the ways in which the requirements of the LCO can fail to be met. Specified with each stated Condition are Required Action(s) and Completion Time(s).
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DESCRIPTION	<p>The Completion Time is the amount of time allowed for completing a Required Action. It is referenced to the time of discovery of a situation (e.g., inoperable equipment or variable not within limits) that requires entering an ACTIONS Condition unless otherwise specified, providing the unit is in a MODE or specified condition stated in the Applicability of the LCO. Required Actions must be completed prior to the expiration of the specified Completion Time. An ACTIONS Condition remains in effect and the Required Actions apply until the Condition no longer exists or the unit is not within the LCO Applicability.</p>
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If situations are discovered that require entry into more than one Condition at a time within a single LCO (multiple Conditions), the Required Actions for each Condition must be performed within the associated Completion Time. When in multiple Conditions, separate Completion Times are tracked for each Condition starting from the time of discovery of the situation that required entry into the Condition.

Once a Condition has been entered, subsequent trains, subsystems, components, or variables expressed in the Condition, discovered to be inoperable or not within limits, will not result in separate entry into the Condition, unless specifically stated. The Required Actions of the Condition continue to apply to each additional failure, with Completion Times based on initial entry into the Condition.

However, when a subsequent train, subsystem, component, or variable expressed in the Condition is discovered to be inoperable or not within limits, the Completion Time(s) may be extended. To apply this Completion Time extension, two criteria must first be met. The subsequent inoperability:

- a. Must exist concurrent with the first inoperability and



## 1.3 Completion Times

### EXAMPLES (continued)

#### EXAMPLE 1.3-7

##### ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One subsystem inoperable.	A.1 Verify affected subsystem isolated.	1 hour  <u>AND</u>  Once per 8 hours thereafter
	<u>AND</u>  A.2 Restore subsystem to OPERABLE status.	72 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	6 hours
	<u>AND</u>  B.2 Be in MODE 5.	36 hours

Required Action A.1 has two Completion Times. The 1 hour Completion Time begins at the time the Condition is entered and each "Once per 8 hours thereafter" interval begins upon performance of Required Action A.1.

If after Condition A is entered, Required Action A.1 is not met within either the initial 1 hour or any subsequent 8 hour interval from the previous performance (plus the extension allowed by SR 3.0.2), Condition B is entered. The Completion Time clock for Condition A does not stop after Condition B is entered, but continues from the time Condition A was initially entered. If Required Action A.1 is met after Condition B is entered, Condition B is exited and operation may continue in accordance with Condition A, provided the Completion Time for Required Action A.2 has not expired.

## 1.0 USE AND APPLICATION

### 1.2 Logical Connectors

#### PURPOSE

The purpose of this section is to explain the meaning of logical connectors.

Logical connectors are used in Technical Specifications (TS) to discriminate between, and yet connect, discrete Conditions, Required Actions, Completion Times, Surveillances, and Frequencies. The only logical connectors that appear in TS are AND and OR. The physical arrangement of these connectors constitutes logical conventions with specific meanings.

#### BACKGROUND

Several levels of logic may be used to state Required Actions. These levels are identified by the placement (or nesting) of the logical connectors and by the number assigned to each Required Action. The first level of logic is identified by the first digit of the number assigned to a Required Action and the placement of the logical connector in the first level of nesting (i.e., left justified with the number of the Required Action). The successive levels of logic are identified by additional digits of the Required Action number and by successive indentations of the logical connectors.

When logical connectors are used to state a Condition, Completion Time, Surveillance, or Frequency, only the first level of logic is used, and the logical connector is left justified with the statement of the Condition, Completion Time, Surveillance, or Frequency.

#### EXAMPLES

The following examples illustrate the use of logical connectors.

##### EXAMPLE 1.2-1

##### ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO not met.	A.1 Verify...	
	<u>AND</u>	
	A.2 Restore...	

In this example the logical connector AND is used to indicate that when in Condition A, both Required Actions A.1 and A.2 must be completed.

## Attachment A Facility Comments for Question # 90

Comment:

The facility recommends deleting this question from the exam.

The initial power level for question 90 was 75% NSA. The question then asked the SRO applicants to prioritize several VALID annunciators that were simultaneously received. The applicants were asked to perform this prioritization IAW the guidance provided in 1/2OM-48, "Adherence and Familiarization to Operating Procedures". The annunciators listed in the choices were either yellow bordered, or no bordered. IAW the guidance provided in 1/2OM-48, "Adherence and Familiarization to Operating Procedures" paragraph E.2.c on page 12 (Attachment 90-1) the priority is:

1. First out annunciators
2. Red bordered annunciators
3. Yellow annunciators
4. No bordered annunciators

The answer key answer, choice B was annunciator A5-8C, "US SERV TRMR 2C OVERCURRENT GEN TRIP since this is a First Out annunciator. The intent of the question was to simply apply this procedural requirement to the stated situation.

However, if annunciator A5-8C, "US SERV TRMR 2C OVERCURRENT GEN TRIP is received, initiating device 251-206G is activated (Attachment 90-2). This will initiate a turbine trip (Attachment 90-3), which will initiate a reactor trip (Attachment 90-4) and the EOP network will be entered.

IAW the guidance provided in 1/2OM-48, "Adherence and Familiarization to Operating Procedures" paragraph E.1 on page 11 (Attachment 90-5) the EOPs take priority over Alarm Response Procedures (ARPs), and the ARPs are only to be reviewed as time permits. Asking applicants for the priority of yellow bordered, or no bordered Annunciators during EOP implementation is NOT a valid question since ARPs have no priority and are to be addressed only as time permits.

Based on this information, the facility recommends deleting this question from the exam.



# Beaver Valley Unit 2 NRC Written Exam (2LOT7)

## SRO ONLY

90. Given the following plant conditions:

- The Unit is at 75% power with all systems in NSA.
- Train "B" is the Protected Train.
- Simultaneous annunciators are received.

In accordance with the guidance in 1/2OM-48.2.C, "Adherence and Familiarization To Operating Procedures", which ONE of these **VALID** annunciators (simultaneously received), will be addressed first?

- A. **A7-4G**, "GENERATOR PT BLOWN FUSE" (Yellow Border)
- B. **A5-8C**, "US SERV TRMR 2C OVERCURRENT GEN TRIP" (No Border)
- C. **A8-3B**, "4160V EMER BUS 2DF ACB2F7 OVERCURRENT TRIP" (No Border)
- D. **A7-2H**, "TURBINE E-H FLUID TROUBLE/LOSS OF DC CONTROL" (Yellow Border)

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**Answer: B**

**Explanation/Justification:**

- A. Incorrect. This is a plausible AC electrical alarm that has a lower priority than the A5 alarm.
- B. Correct. In accordance with 1/2 OM-48.2.C, First Out Annunciators (A5) take priority over red or yellow border annunciators. These alarms do not have special marking since they already have a red/white feature to identify their significance. It is the SRO responsibility to determine priority.
- C. Incorrect. This is a plausible AC electrical alarm that would be of lesser priority than the other alarms.
- D. Incorrect. This is a plausible alarm that would be of lesser priority than the A5 alarm.

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Sys #	System	Category	KA Statement
062	AC Electrical Distribution	N/A	Ability to prioritize and interpret the significance of each annunciator or alarm.
K/A#	2.4.45	K/A Importance 4.3	Exam Level SRO
References provided to Candidate		None	Technical References: 1/2OM-48.2.C, Rev. 16 2OM-36.4.AAC, Issue 1, Rev. 16
Question Source:	New	Level Of Difficulty: (1-5)	
Question Cognitive Level:	Lower - Memory	10 CFR Part 55 Content: (CFR 41.10 / 43.5 / 45.3 / 45.12)	
Objective:	3SQS-36.1	Given a 4KV alarm condition and using alarm response procedure(s), determine the appropriate alarm response, including automatic and operator actions in the control room.	

# ATTACHMENT 90-1

Beaver Valley Power Station  
Conduct of Operations  
Operating Procedures

Unit 1/2

1/2OM-48.2.C  
Revision 16  
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## ADHERENCE AND FAMILIARIZATION TO OPERATING PROCEDURES

- 6) DC Busses
  - 7) Instrument Air
  - 8) Deviation to turbine trip setpoint (below P-9)
  - 9) Imminent equipment damage
  - 10) Alarm that indicates cause for other alarms received
- b. Various annunciator windows are border color coded to assist the operator in responding to multiple alarm events (refer to Table 48.2.C-2, "Priority Annunciators") Color coding provides a visual indicator as a means to aid the operator in prioritizing alarm response. The color coding itself does not impact the actions performed by the operator in accordance with the ARP. This guidance does not eliminate the requirement to validate any alarm prior to taking required actions. Annunciator windows are color coded according to the following criteria:
- 1) **FIRST OUT ANNUNCIATORS A-5** - These alarms do not have special marking since they already have a flashing red/white feature to identify their significance.
  - 2) **RED BORDER ANNUNCIATORS** - These alarms indicate that the logic has been satisfied for a reactor trip, turbine trip, generator trip or a safeguards actuation.
  - 3) **YELLOW BORDER ANNUNCIATORS** - These alarms are the next highest priority after the **FIRST OUT ANNUNCIATORS** and **RED BORDER ANNUNCIATORS**.
- c. Color-coding is intended to be a tool to aid the operation crew when they have not already set priorities based on known plant conditions. In the absence of other direction from the SM/US during a multi-annunciator event, the panels are reviewed for **FIRST OUT ANNUNCIATORS** and **RED BORDER ANNUNCIATORS**. When the expected response has been obtained or verification is complete that no **FIRST OUT ANNUNCIATORS** or **RED BORDER ANNUNCIATORS** have been received, the next highest priority is to scan for **YELLOW BORDER ANNUNCIATORS**. After required actions are completed for **YELLOW BORDER ANNUNCIATORS**, all remaining annunciators are reviewed.
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# ATTACHMENT 90-2

Beaver Valley Power Station  
4KV Station Service System  
Description

Unit 2

2OM-36.1.E  
Revision 6  
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## SPECIFIC INSTRUMENTATION AND CONTROLS

### 4KV BUS 2AE ACB 2A10 CASP

Computer Address: Y5728D  
Disconnect Switch: 3187  
Initiating Device: 43-NNSACX

N/S

### 4KV BUS 2DF ACB 2D10 CASP

Computer Address: Y5729D  
Disconnect Switch: 3188  
Initiating Device: 43-NNSDCX

N/S

### UNIT STA SERV TFMR 2C DIFFERENTIAL GENERATOR TRIP

Window Number: A5-8A, associated with the following computer printout:

#### US SERV TFMR 2C DIFF TRIP

Computer Address: Y2817D  
Disconnect Switch: 635  
Initiating Device: 287-206 (Differential Protective Relay)

S

### UNIT STA SERV TFMR 2C OVEREXCITATION GEN TRIP

Window Number: A5-8B, associated with the following computer printout:

#### SERV TFMR 2C OVEREXC V/HZ TRIP

Computer Address: Y2818D  
Disconnect Switch: 636  
Initiating Device: 259-206 (Overvoltage Relay)

S

### UNIT STA SERV TFMR 2C OVERCURRENT GEN TRIP

Window Number: A5-8C, associated with the following computer printout:

#### US SERV TFMR 2C GND OC TRIP

Computer Address: Y2819D  
Disconnect Switch: 637  
Initiating Device: 251-206G (AC Time Overcurrent Relay)

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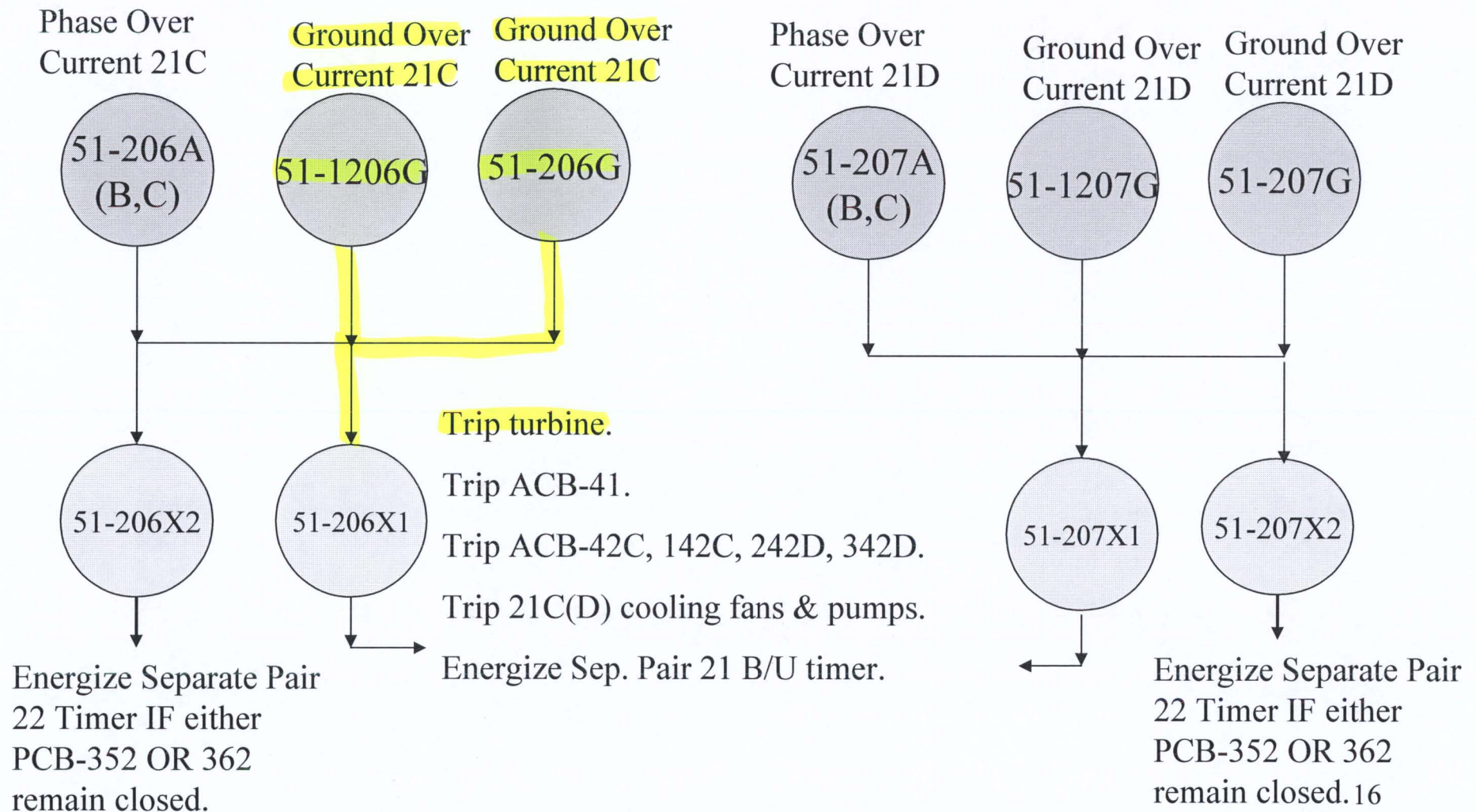
#### US SERV TFMR 2C GND OC TRIP

Computer Address: Y2820D  
Disconnect Switch: 638  
Initiating Device: 251-1206G (AC Time Overcurrent Relay)

S

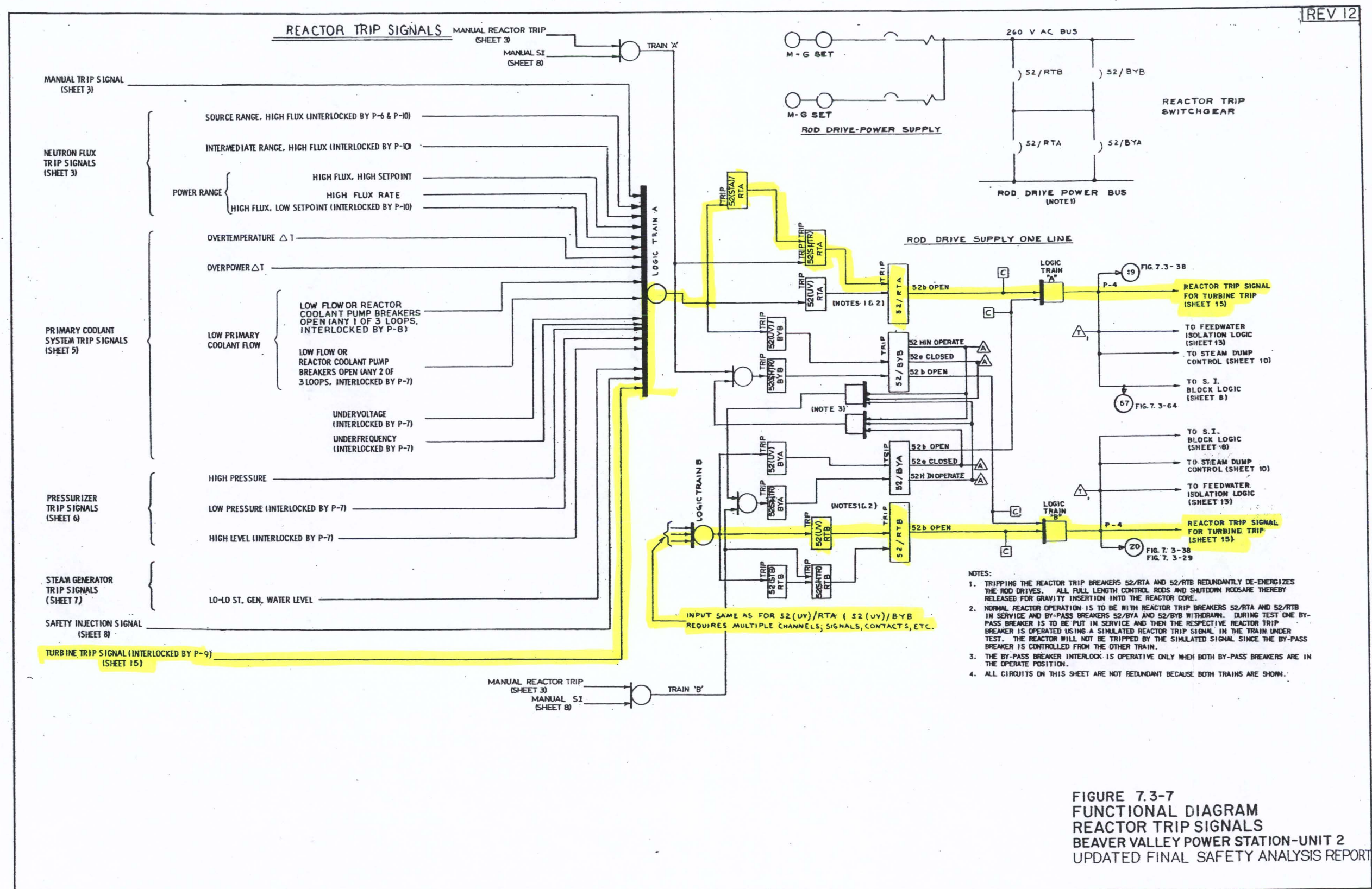


# USST Inputs to Generator Protection - Secondary (backup)



ATTACHMENT 90-3







# ATTACHMENT 90-5

Beaver Valley Power Station  
Conduct of Operations  
Operating Procedures

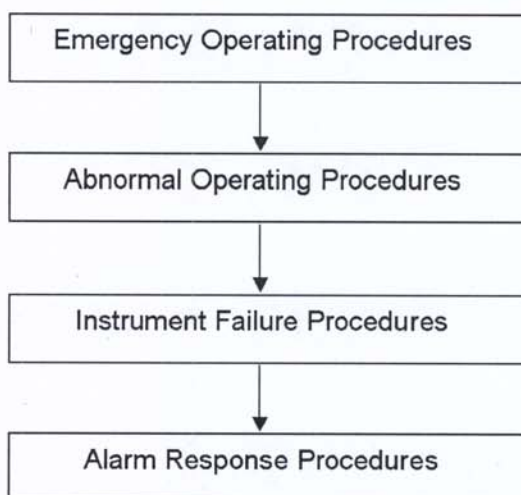
Unit 1/2

1/2OM-48.2.C  
Revision 16  
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## ADHERENCE AND FAMILIARIZATION TO OPERATING PROCEDURES

### E. Prioritizing Alarms

1. During Emergency/Abnormal conditions, EOPs and AOPs take priority over Alarm Response Procedures and Instrument Failure Procedures. As time permits, annunciator reviews are to be performed for unexpected conditions and Alarm Response Procedures are to be reviewed for plant response. The hierarchy of Emergency/Abnormal/Instrument Failure/Alarm Response Procedures is identified as follows:



When clearly evident that instrument failure has occurred and is causing single or multiple alarms, the Instrument Failure Procedure should be selected as the appropriate procedure to be entered. Individual Alarm Response Procedures should still be referenced after entry into the Instrument Failure Procedure to ensure all conditions are evaluated.

2. Prioritization of alarm annunciators shall occur in accordance with the following guidance:
  - a. Some situations require an integrated approach to rapidly organize and prioritize actions in response to events that generate multiple alarms. The following guidance is provided, based on technical grouping and judgement techniques used as standard industry practice, to aid operators in prioritizing multiple alarms for unrelated situations for which an AOP does not exist. The following alarm groups are listed in order of high to low priority.<sup>(C.7)</sup>
    - 1) First Out
    - 2) RPS/ESF signals
    - 3) Deviation to RPS/ESF signals
    - 4) Radiation Monitors
    - 5) Vital Busses