

NIAGARA MOHAWK POWER CORPORATION

07-189-91

NINE MILE POINT NUCLEAR STATION

UNIT II OPERATIONS

02-REQ-001-226-2-02 Revision 5

TITLE: SAFETY PARAMETER DISPLAY SYSTEM

PREPARER
TRAINING SUPPORT SUPERVISOR
TRAINING AREA SUPERVISOR
PLANT SUPERVISOR/
USER GROUP SUPERVISOR

MASTER CONTROLLED DOCUMENT
10-11-90
10/11/90
10/12/90

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Number of Pages: 30

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October 1990	1 - 30

THIS LESSON PLAN IS A GENERAL REWRITE

TRAINING DEPARTMENT RECORDS ADMINISTRATION ONLY:

VERIFICATION: _____

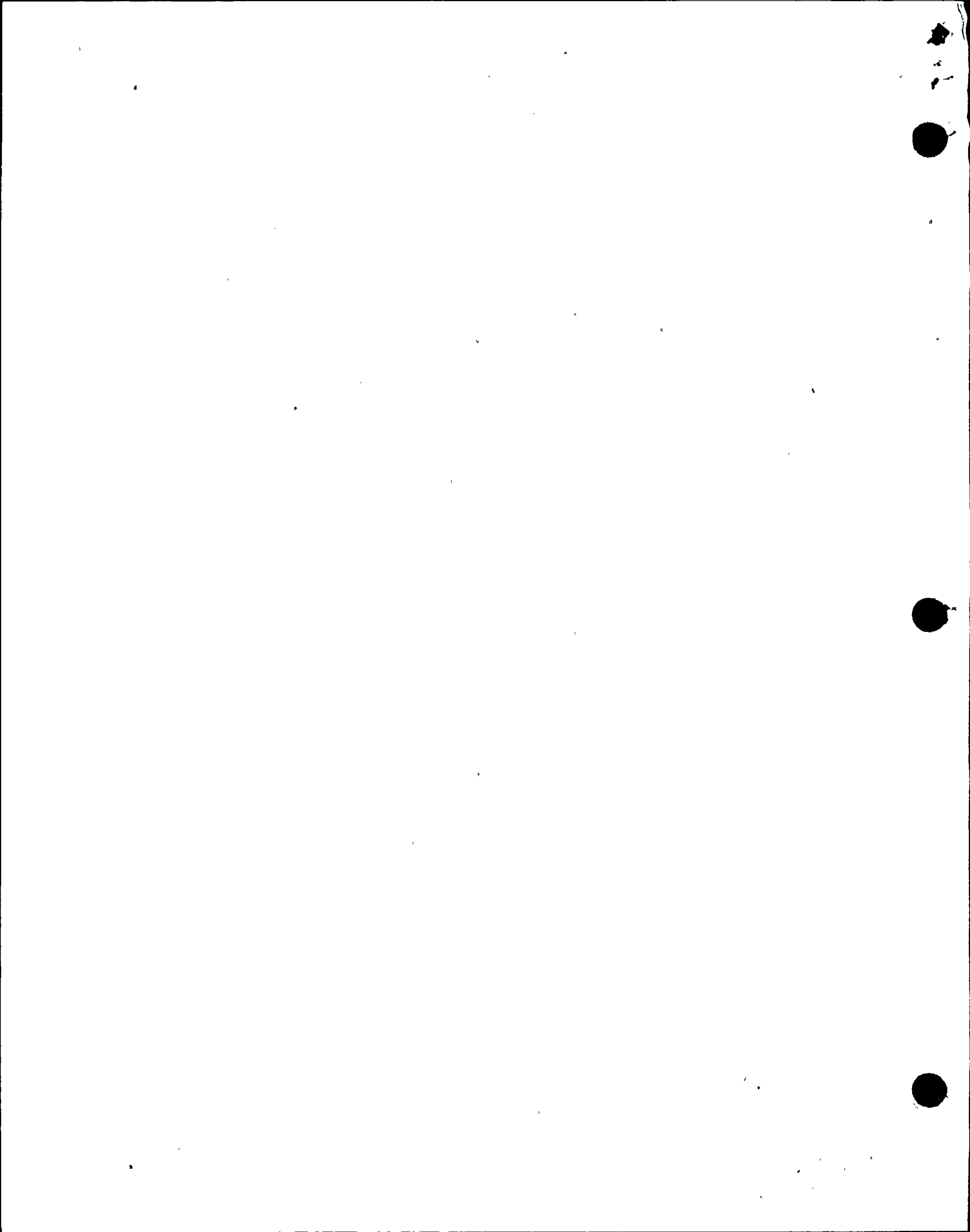
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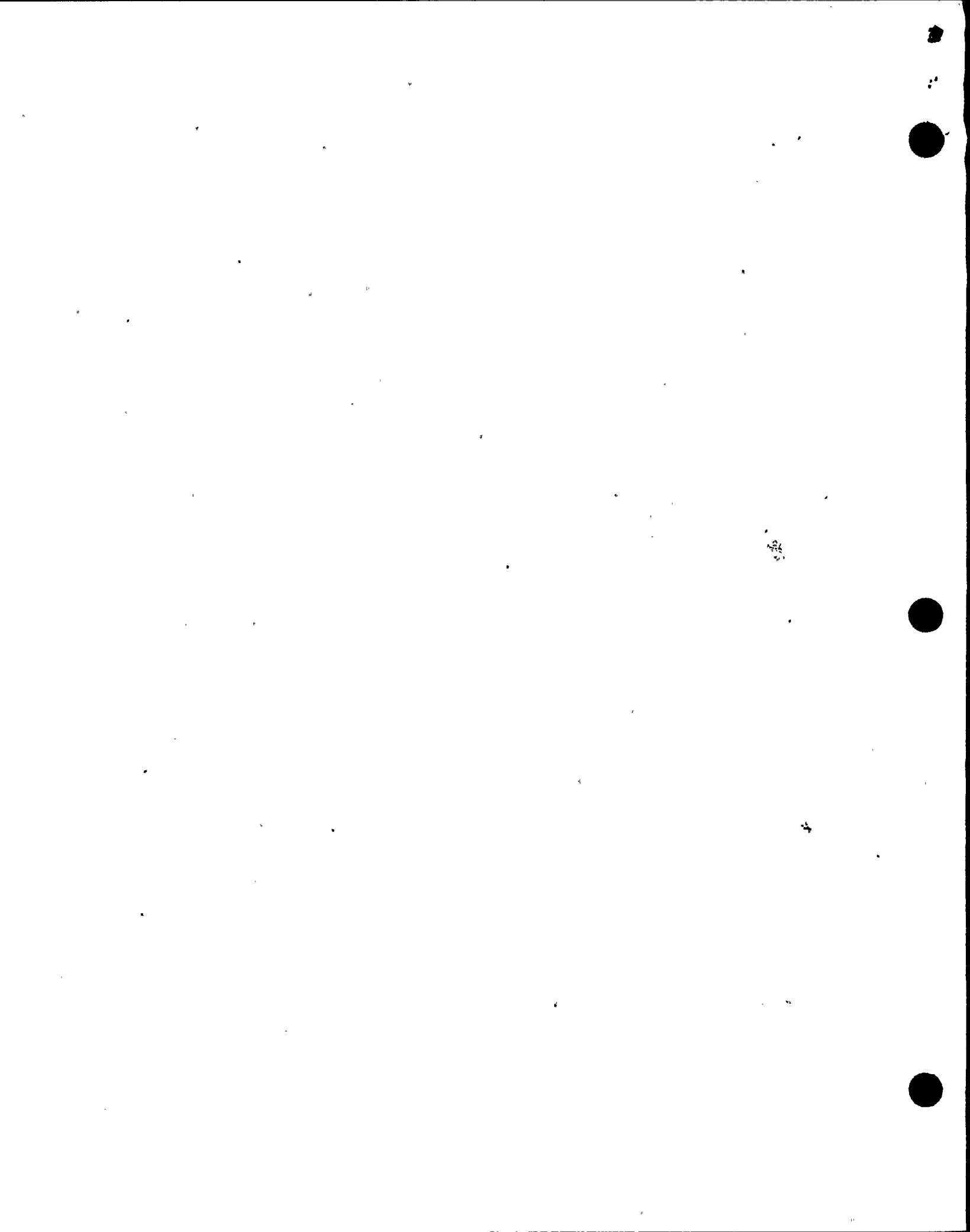
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I. TRAINING DESCRIPTION

- A. Title of Lesson: Safety Parameter Display System (SPDS)
- B. Lesson Description: In a lecture presentation, the instructor shall present information pertaining to the applications, characteristics, and limitations of the Safety Parameter Display System. The information presented shall meet each students learning objective and the instructor shall also provide sufficient explanation to facilitate the students understanding of the information.
- C. Estimate of the Duration of the Lesson: 1.5 hours
- D. Method of Evaluation, Grade Format, and Standard of Evaluation: Written exam, passing grade of 80% or greater.
- E. Method and Setting of Instruction: Classroom lecture
- F. Prerequisites:
 - 1. Instructor:
 - a. Qualified in instructional skills per NTP-16 and/or NTP-16.1.
 - 2. Trainee:
 - a. Meet eligibility requirements per 10CFR55, or
 - b. Be recommended for this training by the Operations Superintendent or his designee for the Training Superintendent.
- G. References:
 - 1. Technical Specifications
 - a. NMP-2 Facility Operating License
 - 2. Procedures
 - a. N2-OP-91B, Safety Parameter Display System
 - 3. Manuals
 - a. OEI Document 8809-1, Supplement 1 & 2, Bases for the Selection on Information to be Presented on the NMP-2 SPDS.



- b. OEI Document 8809-4, NMP-2 SPDS Setpoint Data.
- c. NUREG-1342, "A Status Report Regarding Industry Implementation of SPDS," transmitted under NRC Generic Letter 89-06, Task Action Plan Item I.D.2-SPDS- 10CFR 50.54(f)" dated April 12, 1989.
- d. Niagara Mohawk letter NMPIL 0419 to the NRC dated July 11, 1989 (Subject: Response to NRC Generic Letter 89-06).
- e. SPDS Hardware and Software Functional Requirements.
- f. Display Drawings and Behaviors 13IHC 23, 24, 25, 26, 27, 28, 29
- g. NUREG 0737 SUPP. 1

II. REQUIREMENTS AND PREREQUISITES

- A. AP-9, Administration of Training
- B. NTP-10, Training of Licensed Operator Candidates
- C. NTP-11, Licensed Operator Retraining and Continuing Training
- D. NTP-12, Unlicensed Operator Training

III. TRAINING MATERIALS

- A. Instructor Materials:
 - 1. Lesson Plan
 - 2. Transparency Package
 - 3. Whiteboard and Felt Tip Markers
 - 4. Classroom
 - 5. Applicable References (see section I.E)
- B. Trainee Materials:
 - 1. N2-OLT-31
 - 2. N2-OP-95B

IV. EXAM AND MASTER ANSWER KEYS

- A. Will be generated and administered as necessary. They will be on permanent file in the Records Room.



V. LEARNING OBJECTIVES

A. Terminal Objectives:

Upon completion of this lesson, the trainee will have obtained the knowledge necessary to:

TO-1.0 Use the SPDS computer to monitor plant parameters.

B. Enabling Objectives:

EO-37.1 State the purpose of the SPDS System.

EO-37.2 List the level 2 SPDS displays and identify which EOP they will be used with.

EO-37.3 Relate displayed colors on the SPDS screen to normal plant conditions, EOP entry conditions, EOP major path decisions, valid input status, questionable input status, and failed input status.

EO-37.4 For each SPDS parameter, identify the cause(s) which could cause the display to read as valid, questionable, or failed.

EO-37.5 Identify the parameters which will cause the safety status indicator blocks to change color.

EO-37.6 Be able to relate each SPDS displayed parameter with the associated safety related Control Room indication.

EO-37.7 For each displayed parameter be able to identify whether the displayed value is averaged or taken from the maximum value.

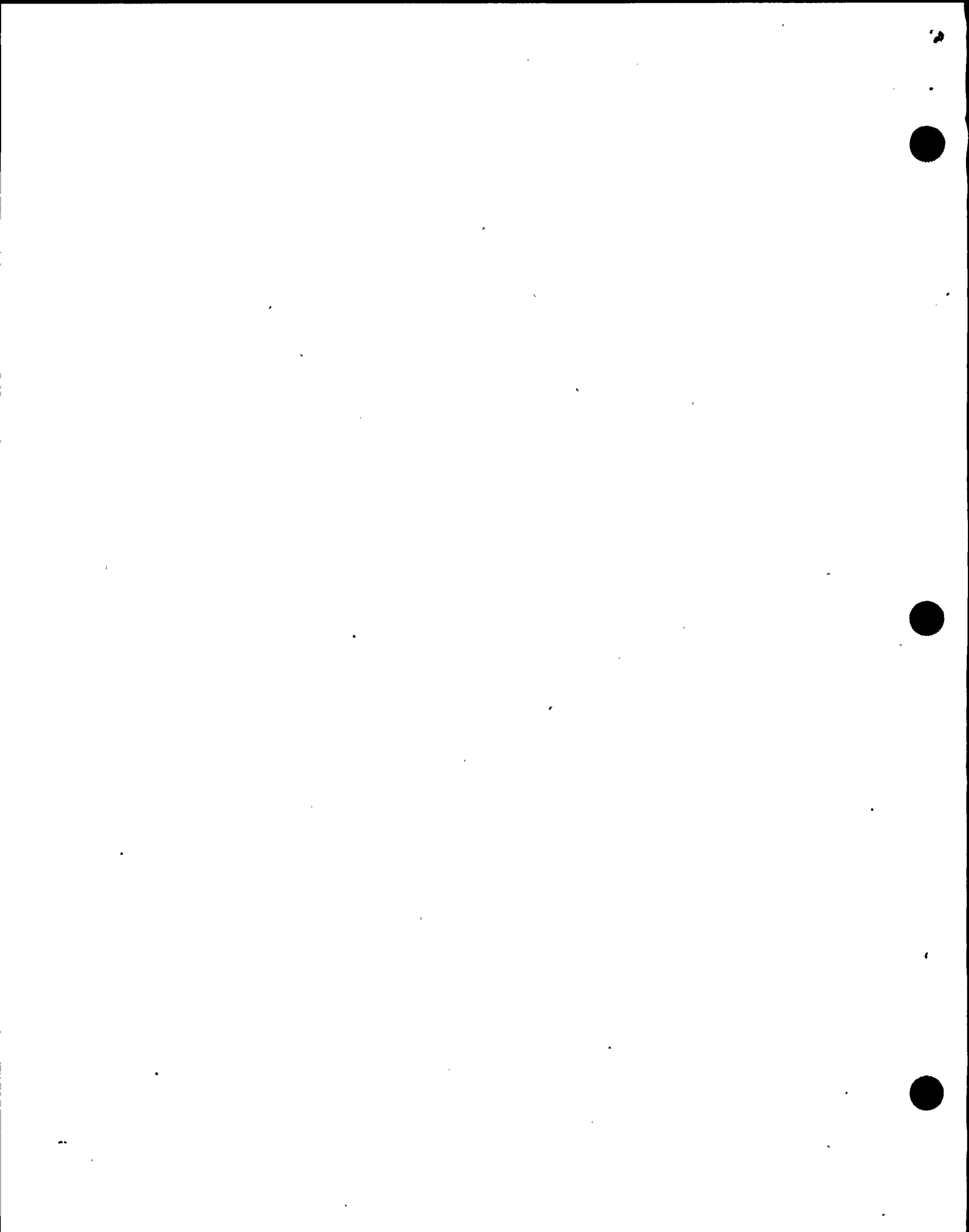
EO-37.8 Given N2-OP-91B, identify appropriate actions and/or locate information related to:

a. Start up

b. Normal operations

c. Off normal operations

d. Procedures for correcting alarm response.



LESSON CONTENT

DELIVERY NOTES

NOTES

I. INTRODUCTION

A. Purpose

The SPDS is used to aid the Control Room personnel during normal, abnormal, and emergency operations in determining the safety status of the plant and in assessing whether abnormal conditions warrant corrective action by operators to avoid a degraded core.

Parameters displayed on the SPDS relate directly to key parameters needed in implementation of the EOP's, however operators must verify SPDS information prior to taking corrective actions.

EO-37.1

B. General Description

1. The SPDS processes data from the Emergency Response Facilities (ERF) computer, and displays key safety parameters on two CRT's in the main Control Room.

Displays are also located at the EOF, TSC, and Radwaste Control Room.

2. The SPDS is comprised of 7 separate displays, separated into one level 1 and six level 2 displays.

Containment Integrity has two pages of displays.

a. Each display is called up by means of dedicated function keys on SPDS display keyboards.

b. Each display provides safety function status blocks at the bottom of the display for each of the five (5) safety functions:

- 1) Reactivity Controls
- 2) Reactor Core Cooling

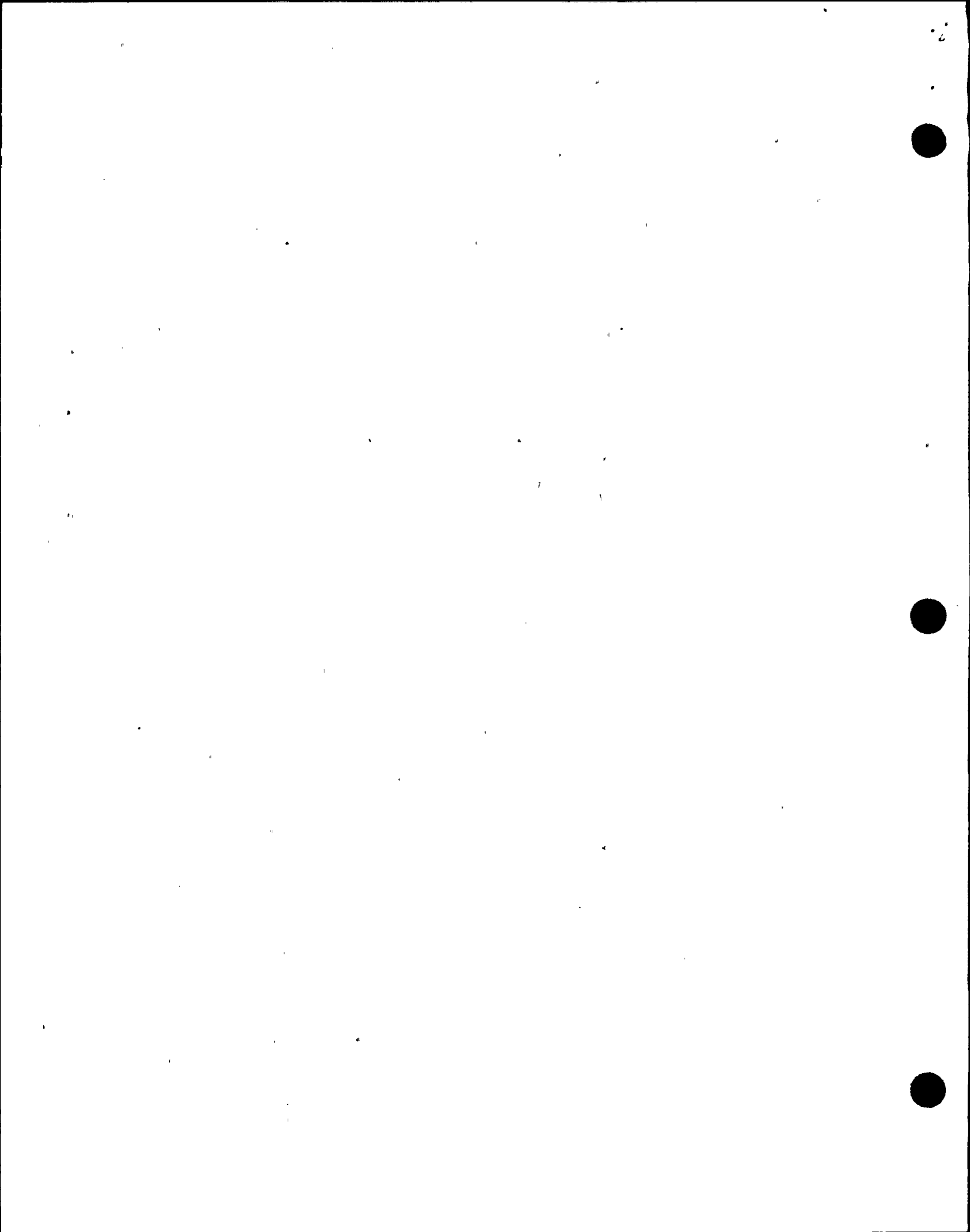


- 3) Reactor Coolant Integrity
- 4) Radioactivity Control
- 5) Containment Integrity

II. DETAILED DESCRIPTION

A. Display Overview

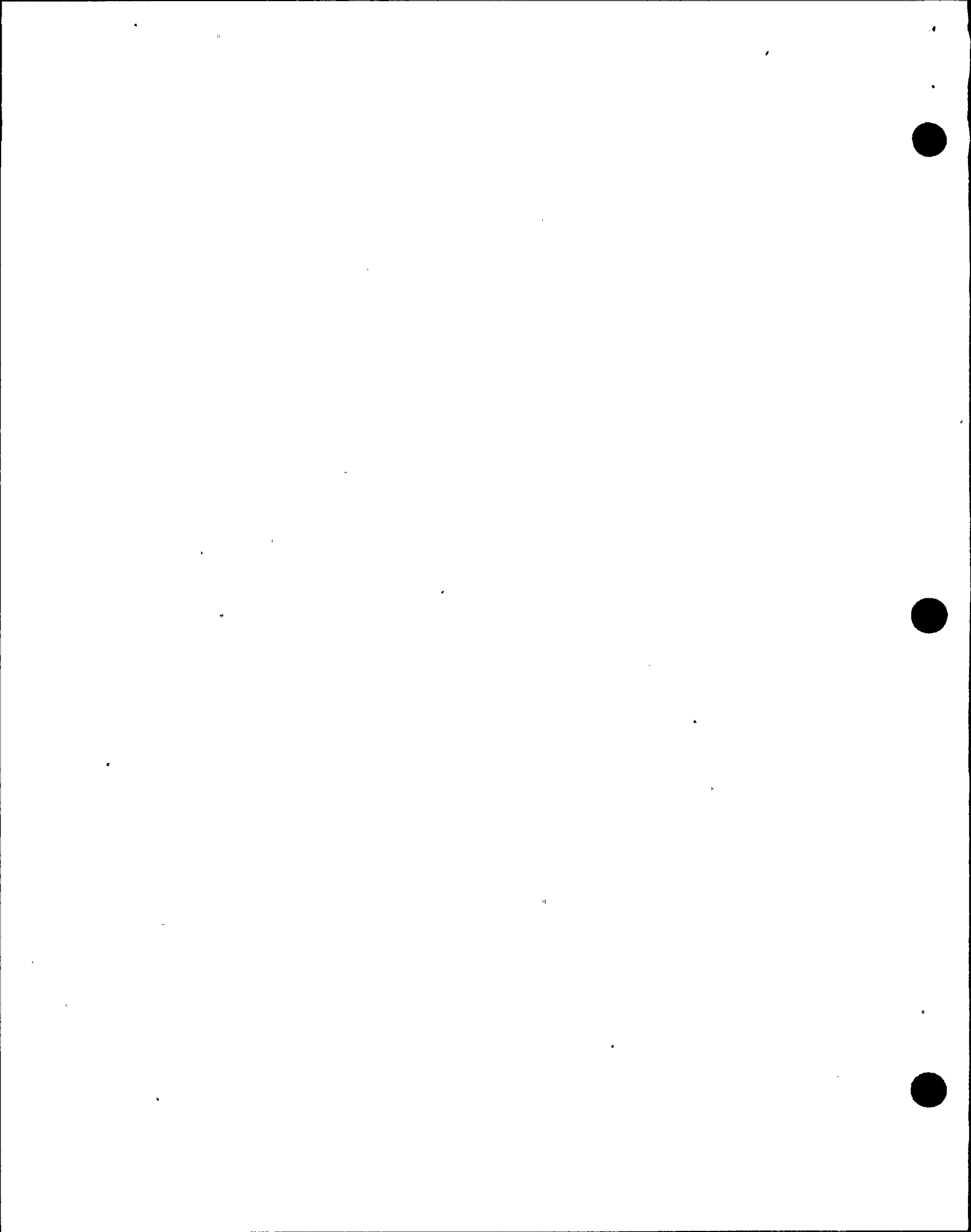
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|--|---|---------|
| 1. Safety Function Display - Provides an overview of the plant safety status in an easy to understand format consisting of a simplified sketch of the RPV, Primary and Secondary Containments, Turbine Bldg. and main stack. | Show TP-1
Point out indicated parameters on the display. | EO-37.2 |
| 2. Reactivity Control - Provides parameters associated the RPV control EOP. | Show TP-2
Point out indicated parameters and relate them to the RPV control EOP. | |
| 3. Core Cooling - Provides parameters associated with keeping the core covered. | Show TP-3
Point out indicated parameters and relate them to keeping the core covered. | |
| 4. Coolant System Integrity - Provides parameters associated with RPV Control EOP during a LOCA. | Show TP-4
Point out indicated parameters and relate them to recognizing and controlling a small LOCA. | |
| 5. Containment Integrity - Provides parameters associated with primary containment control EOP during a LOCA. | Show TP-5 & 6
Point out indicated parameters and relate them to emergency operations when a leak is present and control of containment parameters. | |



LESSON CONTENT

DELIVERY NOTES

- | LESSON CONTENT | DELIVERY NOTES | OBJECTIVES/
NOTES |
|---|--|----------------------|
| 6. Reactivity Control – Provides parameters associated with a radiation leak off site. Allows quick determination of possible release paths and containment levels. | Show TP-7
Point out indicated parameters and relate them to emergency operations when a off site radiation releases is taking place. | |
| B. Parameter Overview | | |
| 1. Basis for SPDS parameter selection. | | |
| a. The parameters for which information is presented on each of the level 2 display screens were determined through a detailed review of the operator actions specified in the plant Emergency Operating Procedures, as applicable for each of the individual Plant Safety Functions. | Discuss how the plotted curves on the SPDS display relate to monitor and control instructions in the EOP's and how non trended information (numerical values and status display features) relate to control of the trended parameters, use TP's of various displays to amplify this principle. | |
| 2. Parameter status indication – status information is represented on the SPDS displays by the use of different colors. | Discuss color convention – Yellow indication typically relates to EOP entry conditions. Red indication typically related to structural integrity design values that require contingency actions per the instructions specified in the EOP's. | EO-37.3 |
| a. Red – indicates a value has exceeded a high-high or low-low setpoint. | | |
| b. Yellow – indicates a value has exceeded a high or low setpoint. | | |



- | | | |
|--|---|----------------|
| <p>c. Green - indicates a value is within specified limits.</p> | <p>Point out that the setpoint values are displayed in yellow or red. Parameter labels are shaded in the appropriate color for the level 1 display and trended parameters of the level 2 displays. The border around non trended information is colored to indicate a setpoint or abnormal condition, under normal conditions the border is Green, light blue borders are used for static borders and outlines that have no behavior.</p> | |
| <p>3. Parameter indication validity - in addition to use of color to indicate setpoint status of parameters, colors are also indicative of indication validity of inputs.</p> | | <p>EO-37.4</p> |
| <p>a. White - indication is valid.</p> | | |
| <p>b. Magenta - indication is questionable. Questionable means that at least one input but not all inputs to the parameter computation is invalid, or all inputs to the computation are valid but differ by more than the specified deviation allowance.</p> | <p>The displayed parameter value will be either white or magenta.</p> | |
| <p>c. If a parameter is failed then the word "Failed" in white is in place of the parameter value. "Failed" is shaded white.</p> | <p>Invalid input is sensed by a loss of power to the instrument or a reading that is out of the defined range of the instrument.</p> | |



- d. Validity does not apply to safety status indicators.
- C. Constant parameters and description.
 - 1. Reactor Mode Display
 - a. Indicates Run, Startup, Shutdown or Refuel.
 - b. The mode is entered manually.
 - c. The indication will be white letters normally. If "run" or "startup" is entered and a plant condition is present which is inconsistent with the reactor being in one of these modes the letters will blink yellow. If in "shutdown" or "refuel" then the shading will not change with changes in plant conditions.
 - d. The mode may be shaded magenta if one of the conditions which detect a change in plant mode is invalid. The indication will still change to yellow if the parameter mode check is questionable.
 - 2. Time and Date Display
 - a. Displayed in the top right corner.

Constant parameters refers to parameters in the same position on every display.

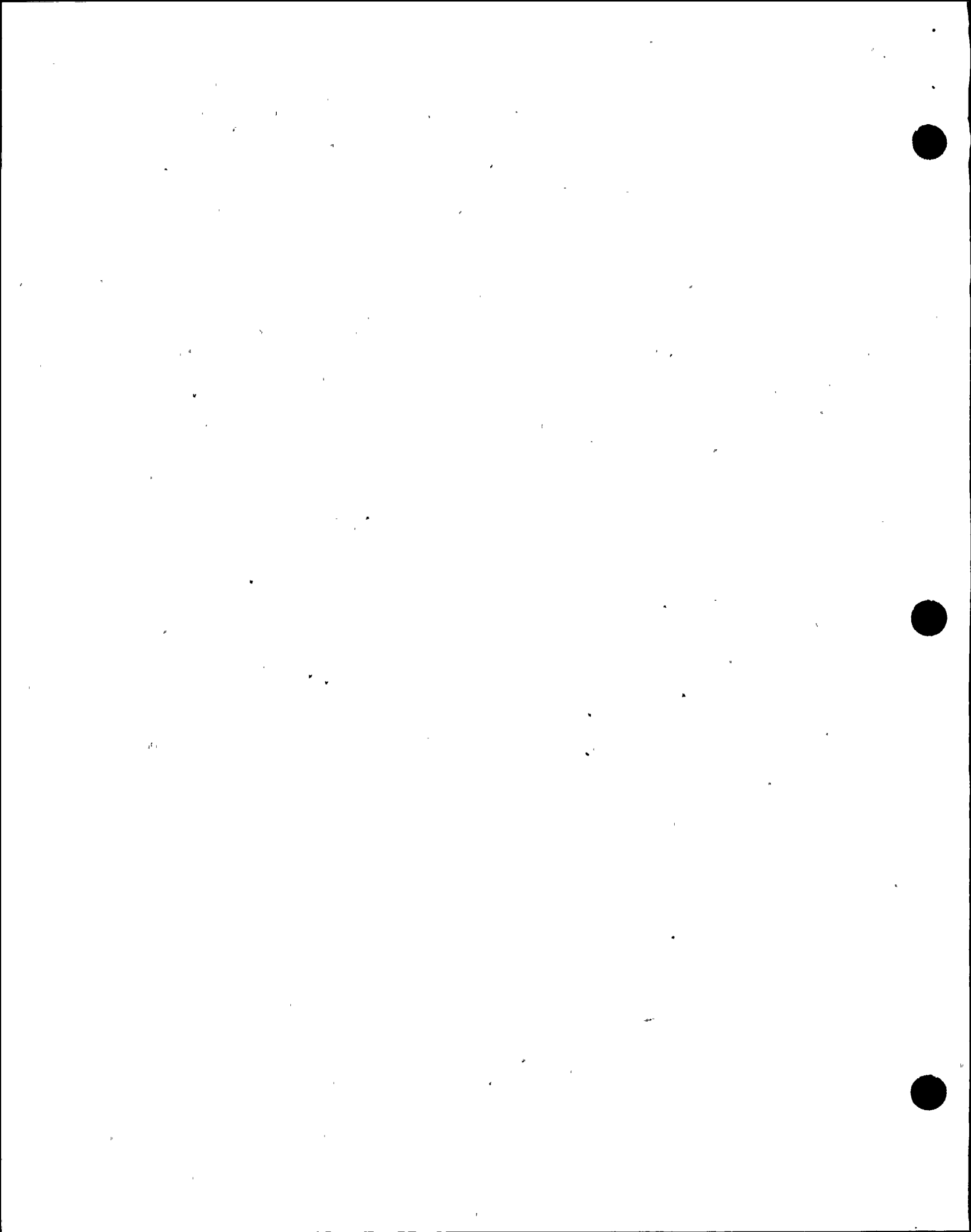
An example of a parameter change causing the mode shade to turn to yellow is "DW Pressure being sensed greater than 1.68.

Parameters which may cause the mode color to change are listed in table 4 of OP-91B.

Example:

DW Pressure failed at 0 psig will cause magenta shading.

DW Pressure failed at 10 psig will cause yellow shading.



- b. Time is updated every five (5) seconds unless the system is locked up.

Procedure a recommends periodic check of clock during normal operation to insure display generator is running.

3. Safety Status Indicator

- a. The safety status indicator is the five blocks at the bottom of the screen which are named the same as each level 2 display.
- b. The shading of the safety status indicator will change colors in accordance with inputs from the input parameters. If any input parameter input goes to yellow, the corresponding safety status indicator will also go to yellow. If any input parameter goes to red, the corresponding status will also go to red. If no input parameters are in an abnormal status then the safety status indicator will be green.

Parameters are listed in table 1 of OP-91B.

EO-37.5

Show TP-12

Trended parameters are the inputs to the safety status indicators.

D. Trended Parameter Characteristics

- 1. Trend graph displays over a period of five (5) minutes.



LESSON CONTENT

DELIVERY NOTES

2. Display is updated every 5 seconds.
3. Arrow beside trend value indicates if value is increasing, decreasing, or steady.
4. Setpoint levels are shown on the right hand side of the trend. (color coded)

Show TP-3

Use TP to demonstrate trended parameter graph characteristics using the Rx pressure trend curve.

Show TP-13

Discuss what condition will cause the arrow to be in each position. Even though a parameter may be slowly trending either up or down the trend arrow may be showing a steady trend (horizontal). A deadband is associated with each parameter and until the deadband is exceeded the arrow will show steady, however when a steady arrow is present the system memorizes the last value prior to the display arrow becoming steady and compares new values against this value to determine a changing trend. (System only memorizes the last value which caused an up or down trend and a new five (5) second reading must exceed this memorized value by more than the deadband in order to cause an up or down trend arrow). Therefore, in the event of a trend the arrow will show steady for some five (5) second intervals and then vertical for one five (5) second interval when deadband is exceeded and then steady again until another deadband margin is exceeded.



E. Trended Parameters

1. APRM Rx Power

a. Trended on reactivity control display and also indicated on safety function status display.

Show TP 1 & 2

EO-37.6

Show APRM power on displays.

EO-37.7

b. Averages all six APRM inputs to arrive at value. If any inputs are invalid the reading will be magenta (questionable).

Show TP-8

Show that SPDS input comes from same source as panel 603 recorder input.

2. Reactor Water Level

Show TP-1, 2, & 3

a. Trended on reactivity control and core cooling displays. Indicated on safety function status display.

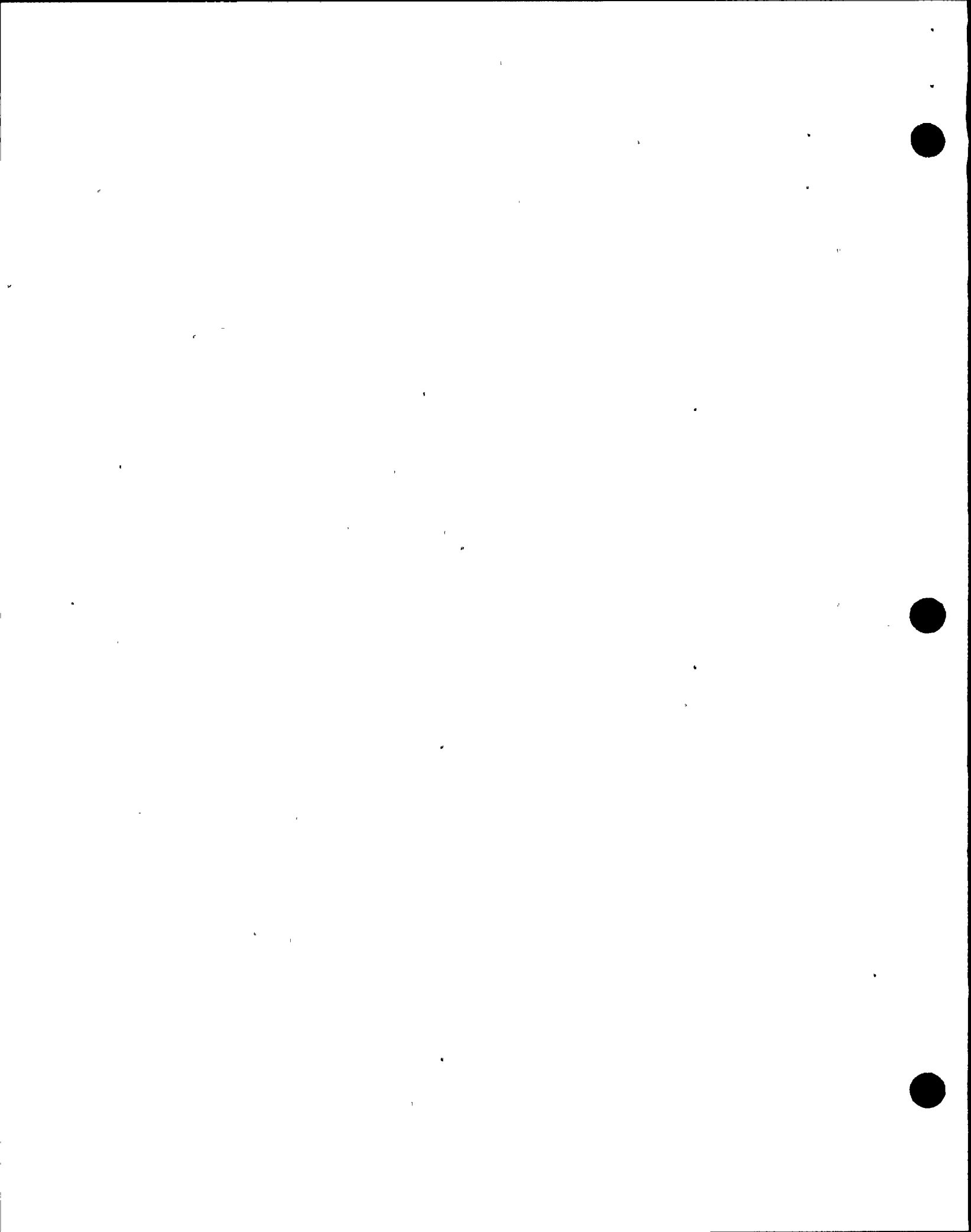
Show Rx water level trends and indications.

b. Uses two inputs from each narrow range, wide range, and fuel zone. The particular zone being plotted on the trend graphs is indicated on the graph title.

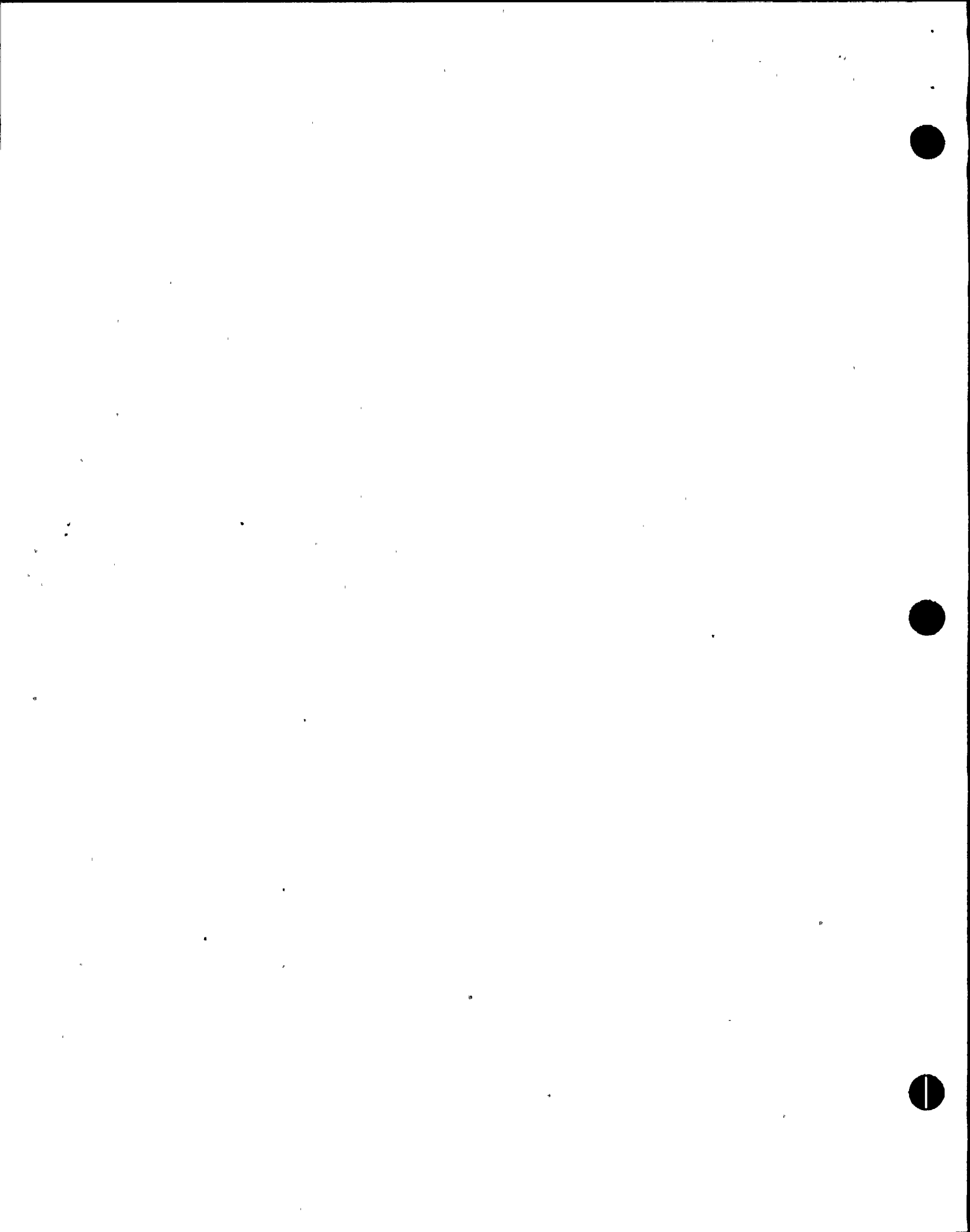
Show TP-8

Show Rx water level instrumentation.

c. The indicated level is the average between the two inputs of the level range being trended. Invalid inputs are not included.



- d. The level range automatically selected to be trended occurs in the following sequence.
- 1) If both narrow range inputs are valid and within the specified deviation allowance, the average of both narrow range inputs.
 - 2) If both wide range inputs are valid and within the specified deviation allowance, the average of both wide range inputs.
 - 3) If both fuel zone inputs are valid and within the specified deviation allowance, the average of both fuel zone inputs.
 - 4) If both narrow range inputs are valid but inputs exceed the specified deviation allowance, the average of both narrow range inputs.
 - 5) If both wide range inputs are valid but inputs exceed the specified deviation allowance, the average of both wide range inputs.



- 6) If both fuel zone inputs are valid but inputs exceed the specified deviation allowance, the average of both fuel zone inputs.
 - 7) If only one narrow range input is valid, the value of the valid fuel zone input.
 - 8) If only one wide range input is valid, the value of the valid wide range input.
 - 9) If only one fuel zone input is valid, the value of the valid fuel zone input.
3. RPV Pressure
- a. Trended on reactivity control, core cooling, and coolant system integrity displays. Indicated on safety function status display.
 - b. Pressure may be trended in two different ranges, the range trended depends solely on the pressure (wide range is selected automatically above or below a specified pressure).

Show TP-1, 2, 3, & 4

Show pressure trends and indications.

Point out pressure bands.



LESSON CONTENT

DELIVERY NOTES

- c. Receives pressure from two sensors and averages them. If either signal is invalid or deviation allowance is exceeded the value is displayed in magenta.
4. Drywell Pressure
- a. Trended on coolant system integrity and containment integrity displays. Indicated on safety function status display and reactivity control display.
- b. Uses two inputs from both narrow range and wide range DW Pressure instruments.
- c. Trends DW pressure in wide or narrow range. Range selected automatically for trending is selected according to the following sequence.
- 1) If both narrow range inputs are valid and within the specified deviation allowance, the average of both narrow range inputs.
 - 2) If both wide range inputs are valid and within the specified deviation allowance, the average of both wide range inputs.
- Show TP-8
Show Pressure instrumentation.
- Show TP-1, 2 & 4
Show DW Pressure trends and indications.
- Show TP-9
Show DW Pressure instrumentation.



- 3) If both narrow range inputs are valid but inputs exceed the specified deviation allowance, the average of both narrow range inputs.
- 4) If both wide range inputs are valid but inputs exceed the specified deviation allowance, the average of both wide range inputs.
- 5) If only one narrow range input is valid, the value of the valid narrow range input.
- 6) If only one wide range input is valid, the value of the valid wide range input.

5. Suppression Chamber Pressure

- | | |
|--|---|
| a. Trended on containment integrity display, indicated on safety function display. | Show TP-1 & 5
Show SP chamber pressure trend and indication. |
| b. The average of two suppression chamber instruments are used in determination of the indication. If an input is invalid then it is not used. | Show TP-9
Show SP chamber pressure instruments. |



6. Drywell Temperature
 - a. Trended on containment integrity display, indicated on safety function display, reactivity control display, core cooling display, and coolant system integrity display.

Show TP-1, 2, 3, 4 & 5
Show DW temperature trend and indication.
 - b. Reading is the average of all valid inputs. If the deviation allowance is exceeded then the reading will be questionable.

Show TP-9
Show DW temperature instruments.
7. Suppression Pool Temperature
 - a. Trended on containment integrity display, indicated on safety function display and reactivity control display.

Show TP-1, 2 & 5
Show SP temperature trend and indication.
 - b. Reading is the average of all valid inputs. If the deviation allowance is exceeded then the reading will be questionable.

Show TP-10
Show SP temperature instruments.
8. Suppression Pool Water Level
 - a. Trended on containment integrity display, indicated on safety function display.

Show TP-1 & 6
Show SP water level trend and indication.



- b. Uses two inputs from both narrow range and wide range SP water level instruments.
- c. Trends SP water level in wide in narrow range. Range selected automatically for trending is selected according to the following sequence.
- 1) If both narrow range inputs are valid and within the specified deviation allowance, the average of both narrow range inputs.
 - 2) If both wide range inputs are valid and within the specified deviation allowance, the average of both wide range inputs.
 - 3) If both narrow range inputs are valid but inputs exceed the specified deviation allowance, the average of both narrow range inputs.
 - 4) If both wide range inputs are valid but inputs exceed the specified deviation allowance, the average of both wide range inputs.

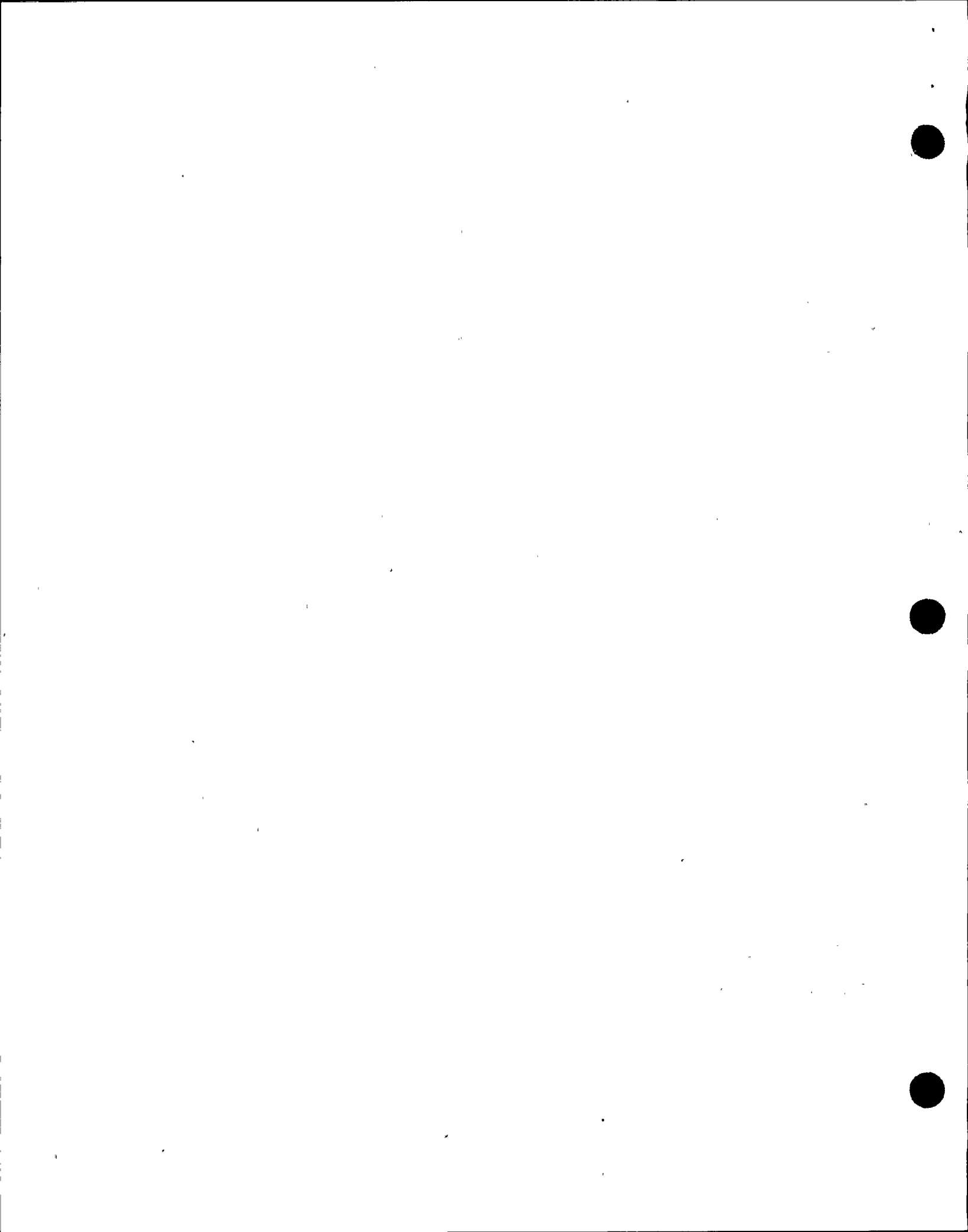
Show TP-10
Show SP water level instrumentation.



- 5) If only one narrow range input is valid, the value of the valid narrow range input.
- 6) If only one wide range input is valid, the value of the valid wide range input.
9. Containment Oxygen Concentration
- a. Trended on containment integrity display, indicated on safety function display. Show TP-1 & 6
Show oxygen concentration trend and indication.
- b. Highest reading is displayed. Show TP-10
- c. Suction alignment is displayed. Show instruments for oxygen concentration.
10. Containment Hydrogen Concentration
- a. Trended on containment integrity display, indicated on safety function display. Show TP-1 & 6
Show Hydrogen concentration trend and indication.
- b. Highest reading is displayed. Show TP-10
- c. Suction alignment is displayed. Show instruments for hydrogen concentration.
11. Main Stack Activity
- a. Trended on Radioactivity control display, indicated on safety function status display. Show TP-1 & 7
Show main stack activity trend and indication.
- b. The main stack activity reading is derived from a single computer point. Show TP-11
Show computer point ID.



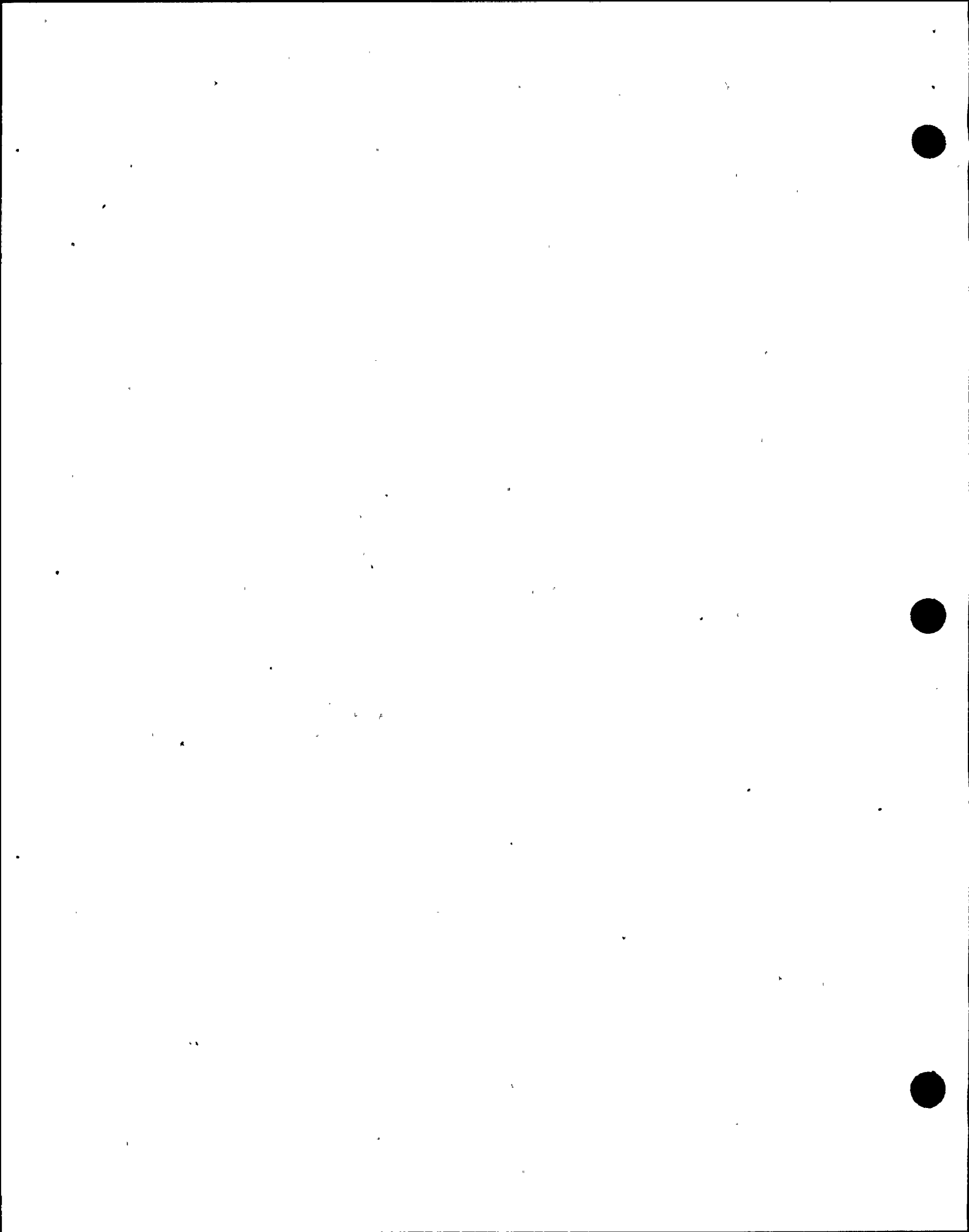
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| 12. Reactor Building Vent Activity | |
| a. Trended on Radioactivity control display, indicated on safety function status display. | Show TP-1 & 7
Show Rx Bldg. Vent activity trend and indication. |
| b. The Rx Bldg. Vent activity reading is derived from a single computer point. | Show TP-11
Show computer point ID. |
| 13. Off Gas Activity | |
| a. Trended on Radioactivity control display, indicated on safety function status display. | Show TP-1 & 7
Show off gas activity trend and indication. |
| b. Reading is derived from the average of all valid inputs. | Show TP-11
Show instruments for off gas activity. |
| 14. Main Steam Line Radiation | |
| a. Trended on Radioactivity control display, indicated on safety function status display. | Show TP-1 & 7
Show main steam line rad. trend and indication. |
| b. Reading is the average of all valid inputs. If the deviation allowance is exceeded then the reading will be questionable. | Show TP-11
Show main steam line radiation instruments. |
| F. Other Parameters and Indications (non trended parameters) | |
| 1. Reactor Core Flow | |
| a. Indicated on safety function status display. | Show TP-1
Show Core Flow Reading |
| | Non trended parameters are updated every 5 seconds like trended parameters. |



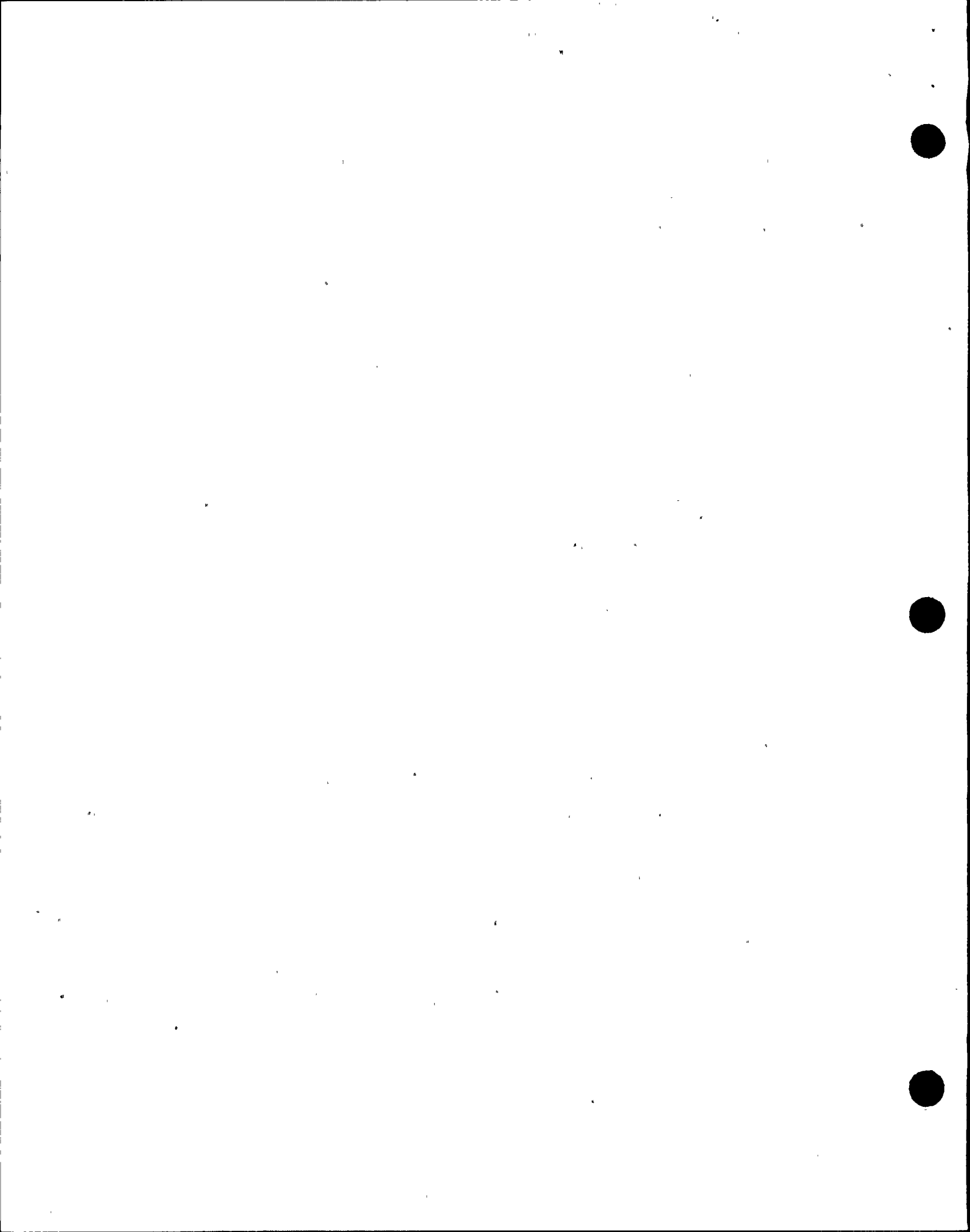
LESSON CONTENT

DELIVERY NOTES

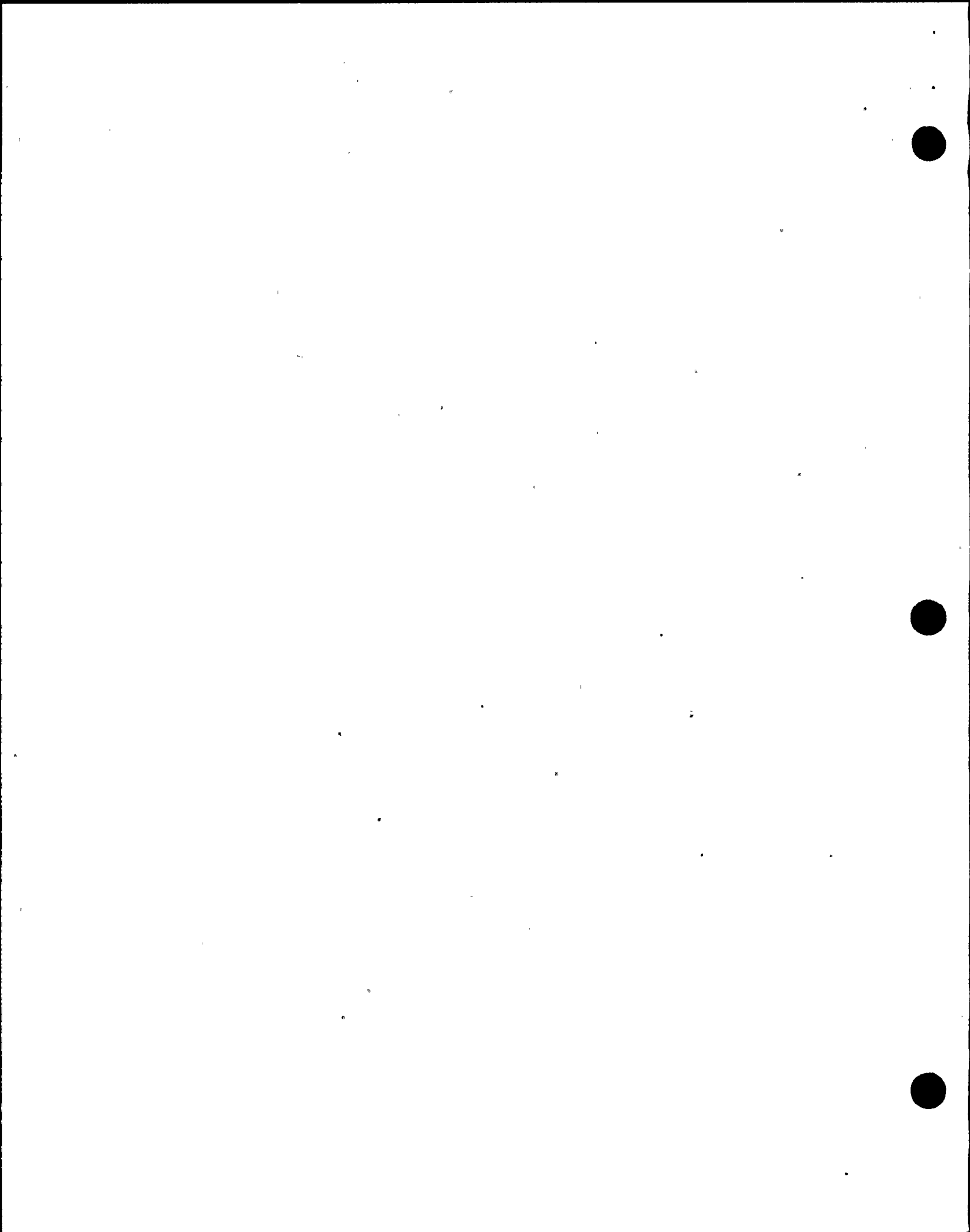
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| b. | Reading is derived from the sum of channel "A" and "B" jet pump flows. | Same as flow indicative on panel 602 added together. SPDS does not correct for reverse flow. |
| 2. Suppression Chamber Air Temperature | | |
| a. | Indicated on safety function status display. | Show TP-1
Show SP Air Temperature. |
| b. | Reading is derived from the average of all six SP Air temperature instruments. | Same temperature elements which read out on back panel recorders. |
| 3. Generator Output | | |
| a. | Indicated on safety function status display. | Show TP-1
Show Generator output indication. |
| b. | Reading is derived from process computer point which serves 603 panel digital readout. | |
| 4. Condenser Vacuum | | |
| a. | Indicated on safety function status display. | Show TP-1
Show Condenser Vacuum indication. |
| b. | Reading is derived from the average of three condenser vacuum instruments. | Same as condenser vacuum indicators on panel 851 averaged together. |
| 5. SRM Count Rate | | |
| a. | Indicated on reactivity control display. | Show TP-2
Show SRM reading. |
| b. | If no detector is fully in then the reading show "detectors out". | |



- c. Indicated reading is the highest reading detector.
- d. Reading is "questionable" if all detectors are not full in or any value in invalid.
6. Isolation Valved Groups - All Valves Closed
- a. Indicated on core cooling, coolant system integrity, containment integrity, and radioactivity control displays.
- b. Monitors position indication for each isolation valve.
- c. Displays "yes" if all inputs of the group are valid and all valves are closed.
- d. Displays "no" when all inputs of the group are valid and not all valves are closed.
- e. If any inputs are invalid the display shows "unk" for unknown.
7. ECCS Line Flow Rate
- a. Indicated on core cooling display.
- b. Reading comes from same inputs which feed the 601 panel.
- All detectors full in or full out for valid reading.
- Show TP-3, 4, 6 & 7
- Show indication blocks for isolation valve closure.
- Discuss how a loss of power to isolation valve circuitry or to optical isolators will show the valve as being closed.
- Show TP-3
- Show ECCS Line Flow indication.



8. ECCS Injection Valve Open
 - a. Indicated on core cooling display. Show TP-3
Show injection valve open block.
 - b. Monitors valve position and displays "yes" when open, "no" when shut, "unk" when input is invalid.
9. Number of SRV's Open
 - a. Indicated on core cooling display. Show TP-3
Show # of SRV's open block.
 - b. Will display number of SRV's open only if all inputs are valid, otherwise display will show "unk".
10. Drywell to Suppression Chamber Differential Pressure.
 - a. Indicated on the containment integrity display. Show TP-5
Show indication of DW to SP differential pressure.
 - b. If Drywell or Suppression Chamber pressure is failed this indication will be failed also.
 - c. If Drywell or Suppression Chamber pressure is questionable this indication will be questionable also.



11. Below Drywell Spray Initiation Pressure Limit.

- a. Indicated on the containment integrity display.
- b. Monitors drywell pressure and drywell temperature to inform user if he/she is in the acceptable region of curve PC-2.
- c. If in the acceptable region of the curve then display is "yes". If not in the acceptable region the display is "no".
- d. If drywell temperature or pressure is failed this indication will be failed also.
- e. If drywell temperature or pressure is questionable this indication will be questionable also.

Show TP-5

Show below DWSIPL curve on TP.

Relate this information to the Primary Containment Control EOP and basis for Spray limits.

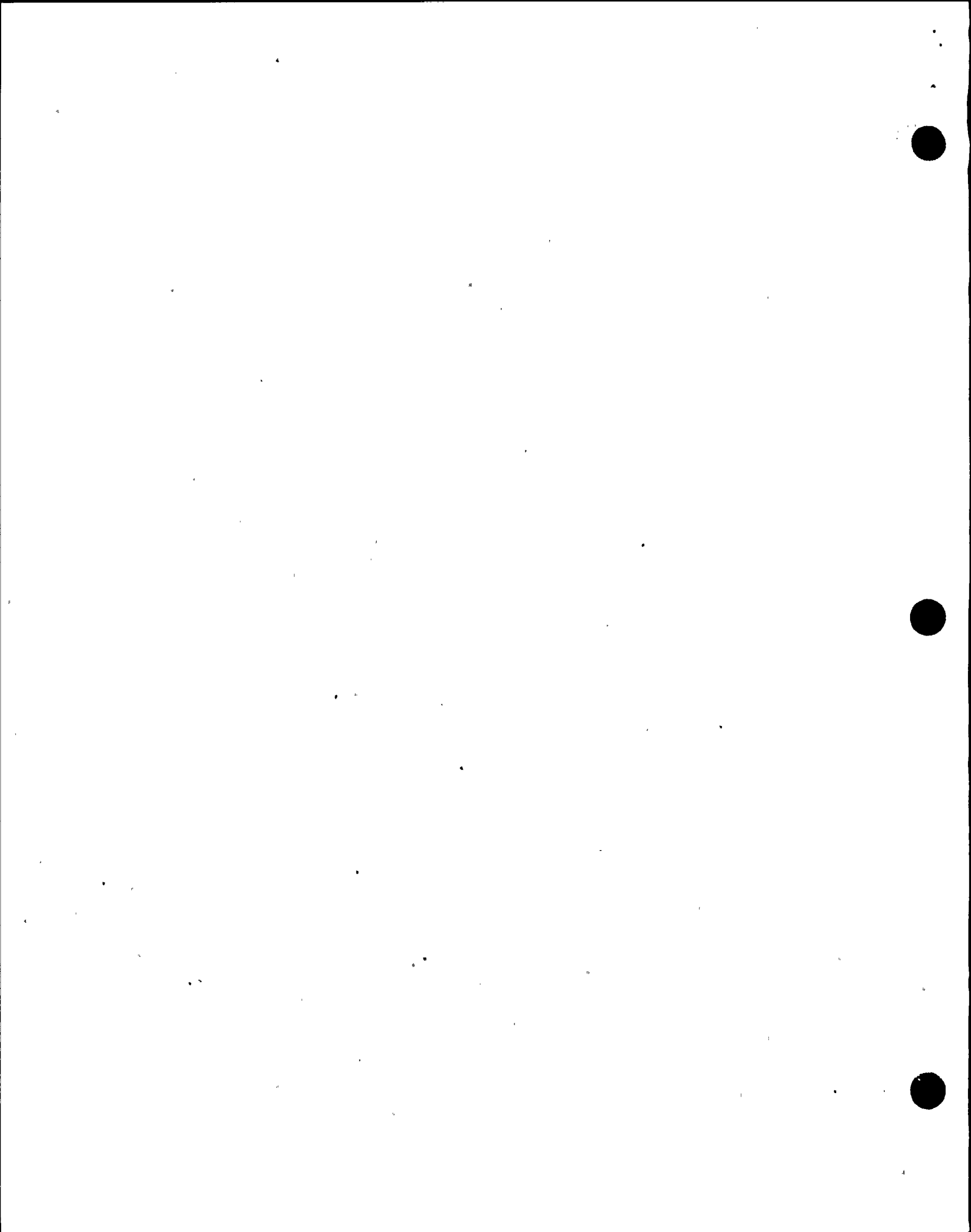
12. Suppression Chamber Pressure Margin to Pressure Suppression Pressure (PSP).

- a. Indicated on the containment integrity display.

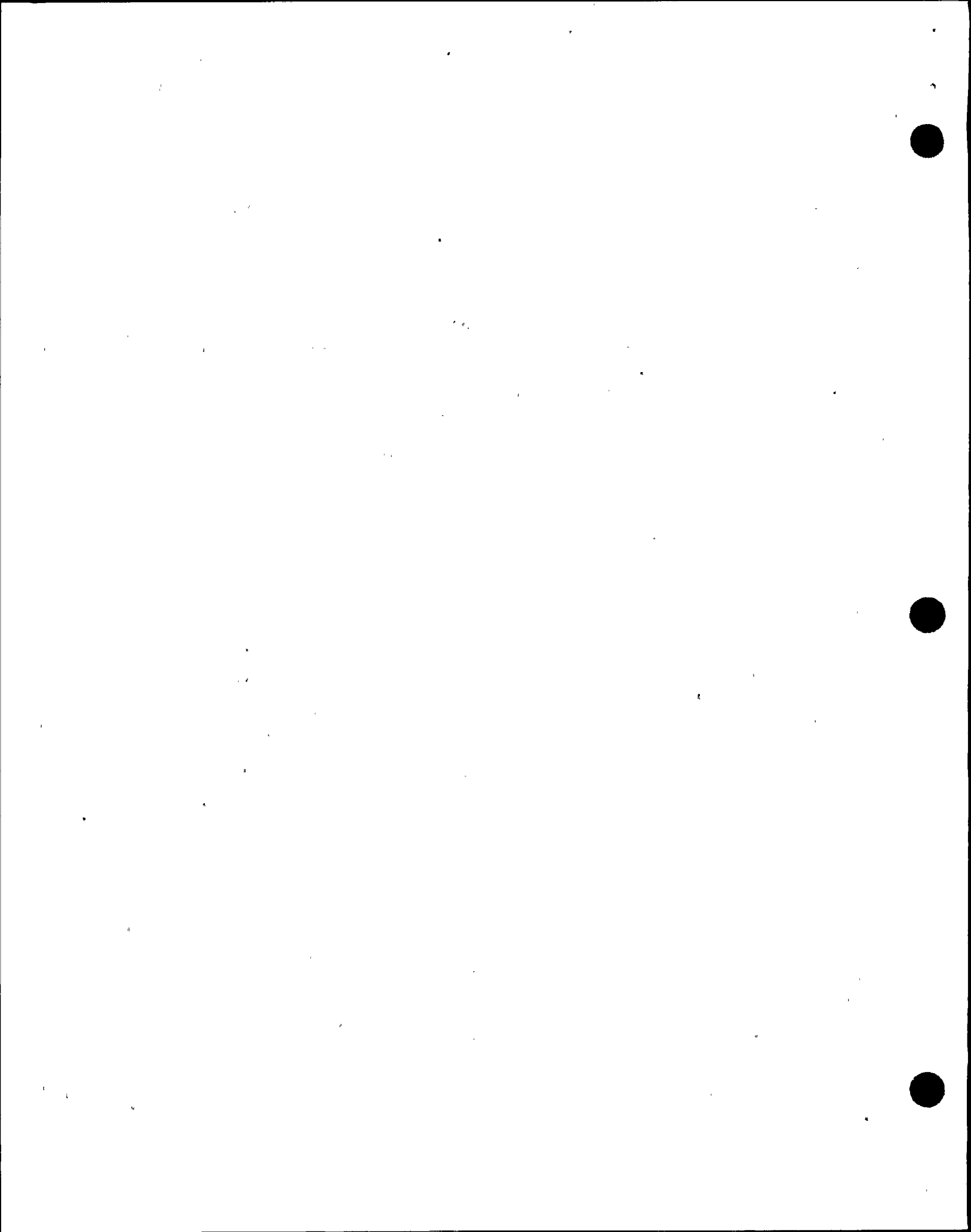
Show TP-5

Show indication SP

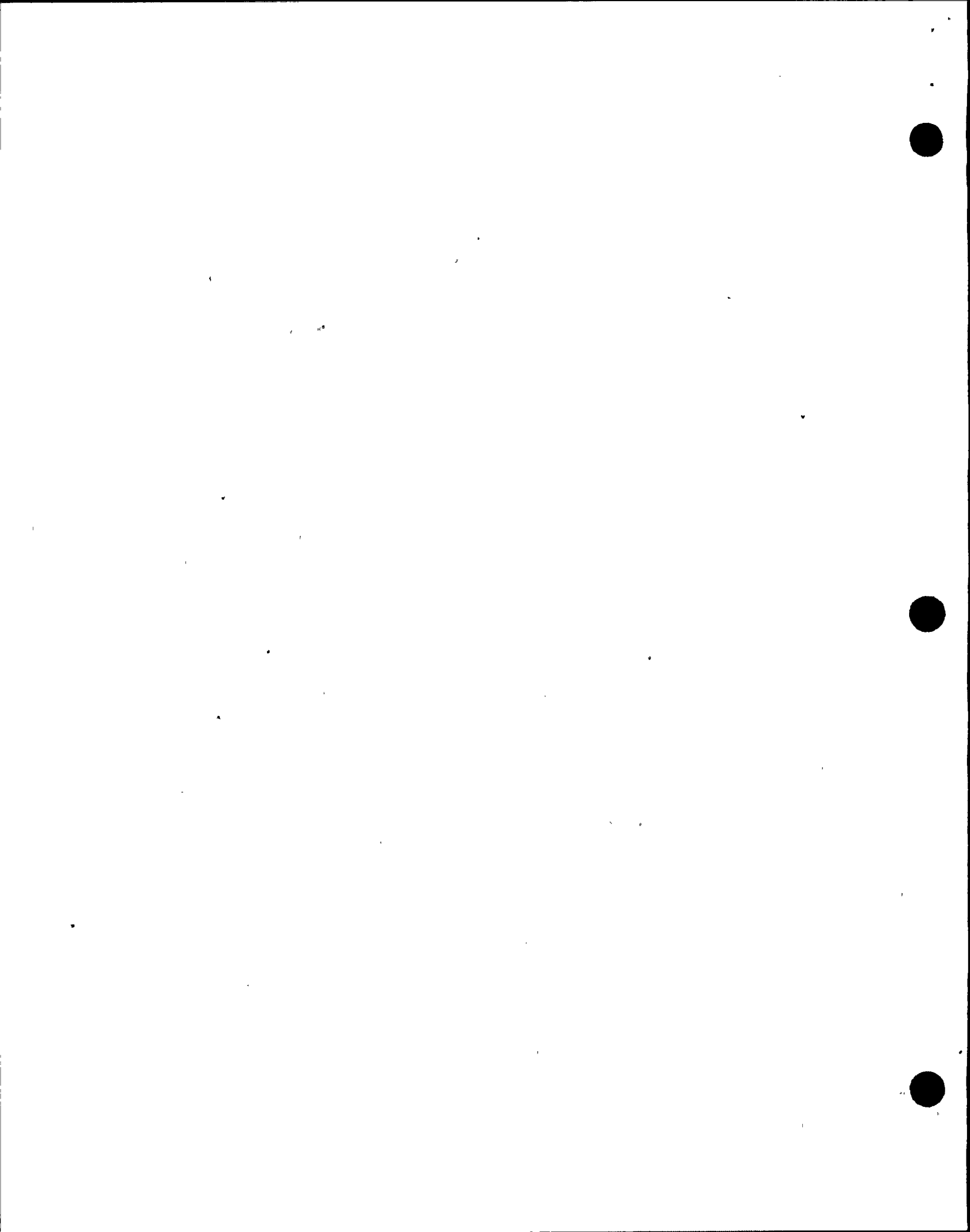
Pressure Margin to PSP



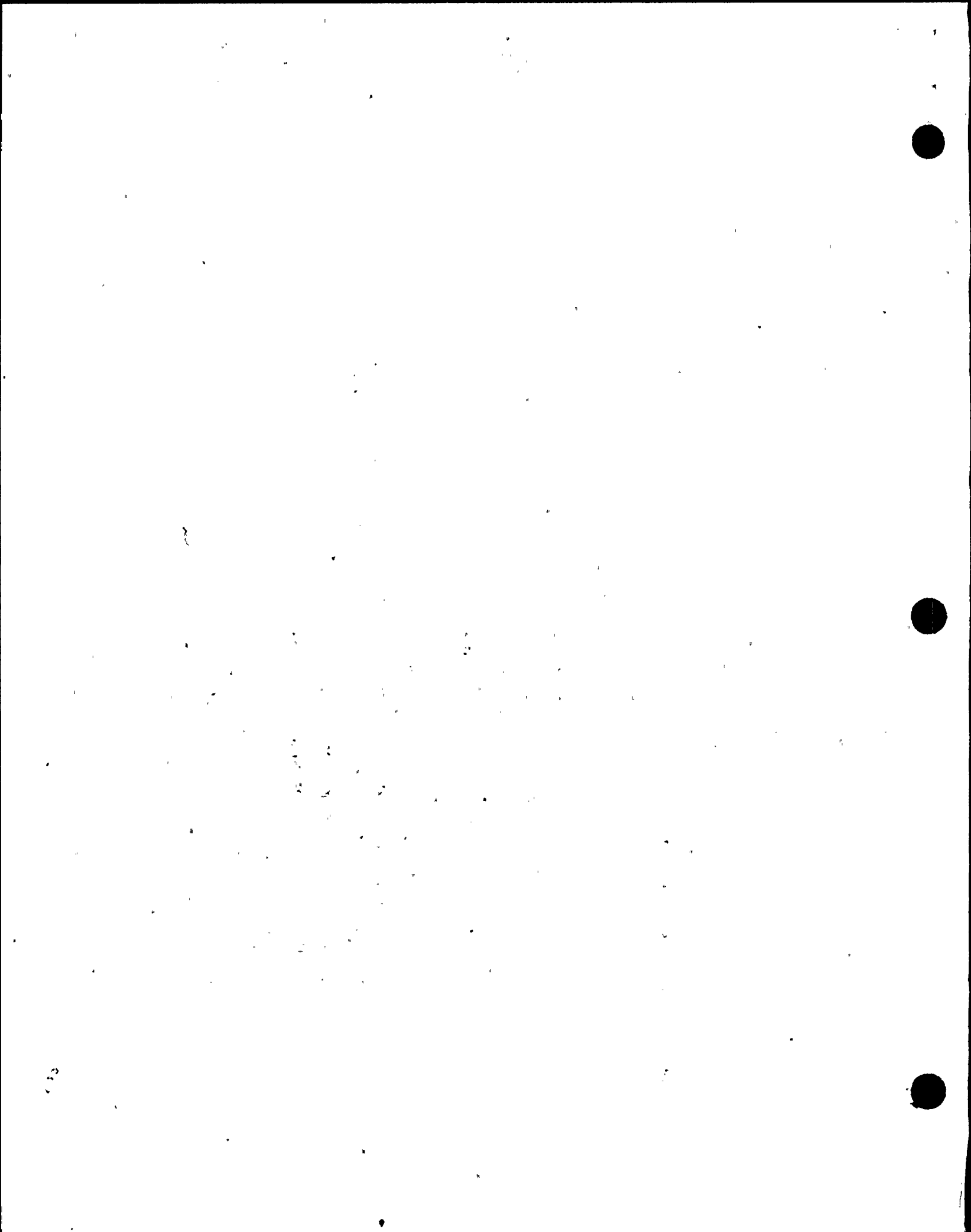
- b. Monitors SP water level in order to calculate PSP. Compares actual SP pressure to the calculated value of PSP to arrive at Margin to PSP.
- c. If SP level or pressure is failed this indication will be failed also.
- d. If SP level or pressure is questionable this indication will be questionable also.
13. Suppression Chamber Pressure Margin to Primary Containment Pressure Limit (PCPL).
- a. Indicates on the containment integrity display.
- b. Monitors Primary Containment water level (Suppression Pool level) in order to calculate the Primary Containment pressure limit. Compares suppression pressure to this limit in order to arrive at margin to PCPL.
- c. If SP level or pressure is failed this indication will be failed also.
- d. If SP level or pressure is questionable this indication will be questionable also.
- Relate this value to curve PC-s in the EOP's and basis for emergency depressurization when no margin to PSP exists.
- Show TP-5
Show indication of SP pressure margin to PCPL.
- Relate this value to PC-4 in the EOP'S and basis for containment venting when no margin to PCPL exists.



14. Pool Water Temperature Margin to Heat Capacity Temperature Limit (HCTL).
- a. Indicates on the containment integrity display.
Show TP-5
Show indication of SP water temp. to HCTL margin.
 - b. Monitors Reactor Pressure in order to calculate the heat capacity temperature limit (HCTL). Compares SP water temperature to this value in order to arrive at the margin to HCTL.
Relate this value to PC-1 in the EOP's and the basis for emergency depressurization when no margin exists.
 - c. If Rx Press. or SP water temp. is failed this indication will be failed also.
 - d. If Rx Press. or SP water temp. is questionable this indication will be questionable also.
15. Pool Water Level Margin to Heat Capacity Level Limit (HCLL)
- a. Indicates on the containment integrity display.
Show TP-6
Show indication of margin to HCLL.
 - b. Uses reactor pressure and SP water temperature to calculate the HCLL. Compares this value to the SP level in order to arrive at the margin to HCLL.
Relate this value to PC-5 of the EOP's and basis for emergency depressurization when no margin exists.



- c. IF Rx Pressure, SP water temperature, or SP level is failed this indication will be failed also.
 - d. If Rx Pressure, SP water temperature, or SP level is questionable this indication will be questionable also.
16. Pool Water Level Margin to SRV Tail Pipe Level Limit (SRVTPLL)
- a. Indicated on the containment integrity display. Show TP-6
Show indication of margin to SRVTPLL.
 - b. Uses Rx Pressure to calculate SSRVTPLL and compares this value to SP water level to arrive at the margin to SRVTPLL. Relate this value to PC-6 of the EOP's and basis for emergency depressurization when no margin exists.
 - c. If Rx. Press. or SP water level is failed this indication will be failed also.
 - d. If Rx. Press. or SP water level is questionable this indication will be questionable also.
17. Drywell High Radiation
- a. Indicated on radioactivity control and safety status functions display. Show TP-1 & 7
Show indication of Drywell High Rad.



- b. Monitors inputs from DRMS rad monitors RMS*1A, 1B, 1C, and 1D and selects the one with the highest reading for display.
 - c. Reading is questionable if any input is invalid, it is failed if all inputs are invalid.
18. Drywell Gaseous Activity
- a. Indicated on radioactivity control display. Show TP-7
Show indication of Drywell Gaseous Activity.
 - b. Monitors readings from CMS*1A, and CMS*1B and displays the highest reading channel.
 - c. Reading is questionable if any input is invalid, it is failed if all inputs are invalid. Reading will show failed if flowpath isolation valves are closed.
19. Drywell Particulate Activity
- a. Indicated on radioactivity control display. Show TP-7
Show indication of Drywell Particulate Activity.
 - b. Monitors readings from CSM*1A, and CMS*1B and displays the highest reading channel.
 - c. Reading is questionable if any input is invalid, it is failed if all inputs are invalid. Reading will show failed if flowpath isolation valves are closed.

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1. The first part of the document

describes the general situation

and

the main objectives of the

operation.

The second part of the document

describes the detailed plan of

the operation and the

roles of the various

units.

The third part of the document

describes the

conclusion of the

operation and the

lessons learned.

The

document

is classified

SECRET and should

be handled accordingly.

The document is

SECRET



LESSON CONTENT

DELIVERY NOTES

III. INSTRUMENTATION, CONTROL AND INTERLOCKS

- A. The SPDS System receives inputs from a wide range of instrumentation in the plant. Specific instrument inputs may be referenced using plant drawings and SPDS reference material.
- B. Displayed parameter setpoints can be found by referencing table 3 of N2-OP-91B.
- C. Control and Interlocks - Not Applicable to the SPDS System.

SPDS is a non safety related system, therefore EOP actions should not be taken without insuring that the safety related indications are consistent with SPDS indications.

IV. SYSTEM OPERATION

- A. The safety status function display should be maintained on at least one of the Main Control Room SPDS CRT's at all times except during computer maintenance outages or when the SPDS is actively being used by a member of the operating crew physically located at one of the Main Control Room SPDS keyboard stations.
- B. The SPDS should be periodically checked to insure that the clock is updating every five (5) seconds, and check for alarming or alert status on the safety status indicator.

Indicates display generator is functioning.

If a safety status indicator is alarming (red) or alert (yellow) then the appropriate second level display should be selected, and the cause of the Alert or Alarm evaluated.

Dear Mr. [Name]

I am writing to you regarding the [Subject]

As you know

the [Subject] is currently [Status]

and we are [Action]

to [Action]

I am sure you will [Action]

Very truly yours,

[Signature]

[Name]

[Address]

[City]

[State]

[Text]

[Text]

[Text]

[Text]

[Text]

[Text]

[Text]

[Text]

[Text]

[Text]

- C. The SPDS should be used to aid in implementation of the EOP's. The parameters monitored are specifically selected due to their relation to EOP decisions.

V. SYSTEM INTERRELATIONS

- A. The SPDS is an integral part of the Liquid Radwaste Computer System
- B. The SPDS System receives inputs from a wide range of instrumentation in the plant. Specific instrument inputs may be referenced using plant drawings and SPDS reference material.

VI. DETAILED SYSTEM REFERENCE REVIEW

- A. Review Selected Sections of N2-OP-91B with the class. At a minimum review section D, Precautions/Limitations and section H, Off Normal Conditions.

EO-37.8

VII. RELATED PLANT EVENTS

- A. The SPDS origin goes back to the TMI incident. Due to a backup in data coming to the process computer during the accident, data began to lag hours behind. The SPDS display involves itself only with parameters needed for emergency response and therefore maintain an updated status of the vital parameters.

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A. 2011-12-31 21:00:00

IX. 2011-12-31 21:00:00

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- B. Cover the following plant and industry events that are related to the SPDS.
 - 1. Presently no reports in this section.

VIII. SYSTEM HISTORY

- A. Presently no modifications against the SPDS System.

IX. WRAP-UP

- A. Review the student learning objectives.



[The page contains several paragraphs of extremely faint, illegible text. The text is scattered across the page and is too light to be transcribed accurately. Some faint words like "SECRET" and "CONFIDENTIAL" are barely visible.]

