

TEXAS UTILITIES GENERATING COMPANY
SKYWAY TOWER • 400 NORTH OLIVE STREET, L.B. 81 • DALLAS, TEXAS 75201

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July 19, 1985

WILLIAM G. COUNCIL
EXECUTIVE VICE PRESIDENT

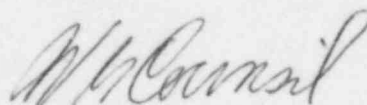
Director of Nuclear Reactor Regulation
Attention: Mr. Vince S. Noonan, Director
Comanche Peak Project
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION
DOCKET NOS. 50-445 AND 50-446
SPDS PARAMETER CONVENTIONS

Dear Mr. Noonan:

Attached is the table of parameters on the SPDS displays as requested
by your staff during the June 25 and 26, 1985, audit of the SPDS at
Comanche Peak Steam Electric Station.

Sincerely,



W. G. Council

DRW/grr
Attachment

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PARAMETER NAME	METHOD OF DETERMINATION	DISPLAYS	NOTE
AUCT HI T _{AVE}	HIGHEST VALUE OF 4 LOOP'S T _{AVE} ; WHERE EACH LOOP'S T _{AVE} IS DETERMINED BY $CL_i + .312 N_{16} \text{ Power}_i$ FOR > 15% PWR. IF PWR IS <15% THEN T _{AVE} IS DETERMINED BY $\frac{\sum CL(i) + \sum HL(j)}{\sum (1 + j)}$	MESSAGE AREA PRESS TEMP (TREND)	HIGHEST OF CALCULATED T _{AVE} IS DISPLAYED.
COLD LEG TEMPERATURE (CL)	ONE WIDE RANGE SENSOR FOR EACH LOOP	NORM HU/CD LOOP TR 1 & 2 (TREND) LOOP TR 3 & 4 (TREND) AUCT HI T _{AVE} (INDIRECT)	SINGLE INPUT CRITERIA USED
CONDENSER OFF GAS RADIATION	ONE SENSOR	RAD MON (TREND) SGTR (AIDS) SEC RAD TARGET (INDIRECT)	SUSPECT, BAD or GOOD INDICATION determined by RM-11 and Range checking
CONTAINMENT HUMIDITY	$PV = P(2) - \frac{(PRESS - P(2))(T - TWB)}{2800 - TWB}$ % RH = 100 * PV / P(1) WHERE P(1) = SATURATION PRESSURE AT CONTAINMENT TEMP P(2) = SATURATION PRESSURE AT DEW POINT TEMP PRESS = CONTAINMENT PRESSURE PARAMETER T = CONTAINMENT TEMPERATURE PARAMETER TWB = DEWPOINT TEMPERATURE	LOCA (AIDS) SGTR (AIDS) LOSC (AIDS) LVL PRESS (TREND) CNTMT ATMOS TARGET (INDIRECT)	CALCULATED HUMIDITY. If CNTMT TEMP or PRESS are SUSPECT, then SUSPECT VALIDITY shown
CONTAINMENT PRESSURE	AVERAGE OF FOUR NARROW RANGE SENSORS	LOCA (AIDS) SGTR (AIDS) LOSC (AIDS) LVL PRESS (TREND) HUMIDITY (INDIRECT) CNTMT ATMOS TARGET (INDIRECT)	USES <u>≥</u> 3 CRITERIA
CONTAINMENT RADIATION	AVERAGE OF TWO WIDE RANGE SENSORS	NORM HU/CD LOCA (AIDS) LVL PRESS (TREND)	USES 2 INPUT CRITERIA
CONTAINMENT SUMP LEVEL	ONE SENSOR	SUMP (TREND)	USES SINGLE INPUT CRITERIA
CONTAINMENT TEMPERATURE	THE AVERAGE OF 5 SENSORS	LOCA (AIDS) SGTR (AIDS) LOSC (AIDS) H2 HUMID (TREND) CNTMT ATMOS TARGET (INDIRECT) HUMIDITY (INDIRECT)	CNTMT TEMP USES <u>≥</u> 3 CRITERIA

<u>PARAMETER NAME</u>	<u>METHOD OF DETERMINATION</u>	<u>DISPLAYS</u>	<u>NOTE</u>
CONTAINMENT WATER LEVEL	THE AVERAGE OF 2 SENSORS	LOCA (AIDS) SGTR (AIDS) LOSC (AIDS) TK LVL (TREND) LVL PRESS (TREND) CNTMT ATMOS TARGET (INDIRECT)	USES 2 INPUT CRITERIA
CORE EXIT TEMPERATURE	THE HIGHEST VALUE OF THE PARAMETER LABELED HOTTEST TC FROM EITHER CCM-A OR CCM-B. THE HIGHEST OF TWO PARAMETERS RECEIVED FROM CORE COOLING MONITOR	NORM HU/CD CLD SHUTDN ICC (AIDS) RCS (TREND) CORE CLG (TREND)	DATA VALIDATION DETERMINED BY CORE COOLING MONITOR AND RANGE CHECKING
CONDENSATE STORAGE TANK LEVEL	THE AVERAGE OF TWO SENSORS	TK LVL (TREND)	USES 2 INPUT CRITERIA
DEWPOINT TEMPERATURE	THE AVERAGE OF 5 DISTRIBUTED SENSORS	HUMIDITY (INDIRECT)	USES ≥ 3 CRITERIA
FEEDWATER ISOLATION	ISOLATED IF EITHER OF TWO SENSORS INDICATE ISOLATION	MESSAGE AREA ALL TRENDS (TREND TICKS)	SEE EVENT MESSAGE NOTE
HYDROGEN CONCENTRATION	THE AVERAGE OF 2 SENSORS	H2 HUMID (TREND)	USES 2 INPUT CRITERIA
HOT LEG TEMPERATURE	ONE WIDE RANGE SENSOR FOR EACH LOOP	LOOP TR 1 & 2 (TREND) LOOP TR 3 & 4 (TREND)	SINGLE INPUT CRITERIA
INTERMEDIATE RANGE POWER	AVERAGE OF TWO SENSORS	NIS (TREND) SUBCRITICALITY (CSFM) POWER (INDIRECT) (MESSAGE AREA)	USES 2 INPUT CRITERIA
INTERMEDIATE	AVERAGE OF TWO SENSORS	MESSAGE AREA	USES 2 INPUT CRITERIA
MAIN STEAMLINE ISOLATION	ISOLATED IF EITHER OF TWO SENSORS INDICATE ISOLATION	MESSAGE AREA ALL TRENDS (TREND TICKS)	SEE EVENT MESSAGE NOTE
MAIN STEAMLINE RADIATION	THE HIGHEST VALUE OF 4 LOOP'S MAIN STEAMLINE RADIATION	SGTR (AIDS) RAD MON (TREND) SEC RAD TARGET (INDIRECT)	DATA VALIDATION DETERMINED BY RM-11 & Range Checking
POWER (MESSAGE AREA)	POWER = POWER RANGE IF SENSORS ARE GOOD AND POWER GREATER THAN 1% POWER = SOURCE RANGE IF SR HI VOLT IS ON AND SR FLUX IS GOOD POWER = INTERMEDIATE RANGE IN ALL OTHER CASES	MESSAGE AREA	CACULATION, USES PWR INPUT AS EXPLAINED
POWER RANGE POWER	THE AVERAGE OF 4 NIS POWER RANGE POWER SENSORS	NIS (TREND) POWER (INDIRECT) (MESSAGE AREA)	USES ≥ 3 CRITERIA
PRESSURE RELIEF TANK PRESSURE	ONE SENSOR	LOCA (AIDS)	USES SINGLE INPUT CRITERIA

<u>PARAMETER NAME</u>	<u>METHOD OF DETERMINATION</u>	<u>DISPLAYS</u>	<u>NOTE</u>
PRESSURIZER LEVEL	THE AVERAGE OF THREE SENSORS	NORM HU/CD LOCA (AIDS) SGTR (AIDS) LOSC (AIDS) RCS (TREND)	USES ≥ 3 CRITERIA
PRESSURIZER PORV POSITION	ANY ONE OF THE TWO PORVS OPEN, OPEN WILL BE DISPLAYED, OTHERWISE CLOSED WILL BE DISPLAYED	LOCA (AIDS)	If PORV indication contradict each other, open displayed as SUSPECT
PRZR SAFETY VALVE	ANY ONE OF THE THREE SAFETY VALVES OPEN, OPEN WILL BE DISPLAYED, OTHERWISE CLOSED WILL BE DISPLAYED	LOCA (AIDS)	If any valve contradicts each other, open display is suspect.
RCP STATUS	EACH PUMP'S STATUS WILL BE DISPLAYED AS ON OR OFF ONE CONTACT FOR EACH PUMP	ICC (AIDS)	
RCS PRESSURE	THE AVERAGE OF TWO NR SENSORS IF THE AVERAGE IS BETWEEN 1716 & 2484 PSIG, OTHERWISE THE AVERAGE OF TWO WIDE RANGE SENSORS IS DISPLAYED	NORM HU/CD CLD SHTDN LOCA (AIDS) SGTR (AIDS) RCS (TREND) PRESS TEMP (TREND)	USES TWO INPUT CRITERIA FOR PARAMETER. WHICH PARAMETER DISPLAYED IS DEPENDENT ON CURRENT CONDITION.
RHR FLOW A&B	ONE SENSOR FOR EACH TRAIN	CLD SHTDN	SINGLE INPUT CRITERIA
RHP HX INLET TEMP A & B	ONE SENSOR FOR EACH TRAIN	CLD SHTDN	SINGLE INPUT CRITERIA
RHR HX OUTLET TEMP A & B	ONE SENSOR FOR EACH TRAIN	CLD SHTDN	SINGLE INPUT CRITERIA
RX LVL	TBD WILL BE DETERMINED WHEN RVLIS INTERFACE IS IMPLEMENTED	NORM HU/CD CLD SHTDN ICC (AIDS) RCS (TREND)	Data received from RVLIS computer. Validation of parameter determined by RVLIS. Range Checking performed.
REACTOR WATER STORAGE TANK LEVEL	THE AVERAGE OF FOUR SENSORS	TANK LVL (TREND)	USES ≥ 3 CRITERIA
RX TRIP	TRIPPED IF EITHER OF TWO SENSORS INDICATE TRIP	MESSAGE AREA ALL TRENDS (TREND TICKS)	SEE EVENT MESSAGE NOTE
STEAM FLOW FEED FLOW MISMATCH	DIFFERENCE IN LBS/HR OF SG STEAM FLOW AND SG FEED FLOW FOR EACH LOOP	LOSC (AIDS)	IF SUSPECT PARAMETER USED, SUSPECT DISPLAY CONVENTION USED.
SG AUX FEED FLOW	THE AVERAGE OF TWO SENSORS FOR EACH LOOP	SGTR (AIDS) AFW FLO (TREND)	AFW DETERMINED BY TWO INPUT CRITERIA
SG BLOWDOWN RADIATION	ONE SENSOR	RAD MON (TREND) SGTR (AIDS) SEC RAD TARGET (INDIRECT)	RM-11 determines validity. Range checking performed.

PARAMETER NAME	METHOD OF DETERMINATION	DISPLAYS	NOTE
STEAM GENERATOR LEVEL (NR) LOOPS 1-4	THE AVERAGE OF FOUR SENSORS FOR EACH LOOP	NORM HU/CD SGTR (ALL-HIGHEST) (AIDS) LOSC (AIDS) ICC (AIDS) NR LVL (TREND)	SG LVL USES ≥ 3 INPUT CRITERIA
STEAM GENERATOR LEVEL (WR) LOOPS 1-4	ONE SENSOR FOR EACH LOOP	WR LVL (TREND)	SINGLE INPUT CRITERIA
STEAM GENERATOR PRESSURE LOOPS 1-4	THE AVERAGE OF 3 SENSORS FOR EACH LOOP	NORM HU/CD LOSC (ALL-LOWEST) (AIDS) PRESS (TREND)	USES ≥ 3 CRITERIA
STEAM GENERATOR STEAM FLOW LOOPS 1-4	ONE SENSOR FOR EACH LOOP	STM FLOW (TREND)	SINGLE INPUT CRITERIA
SI ACTUATION	ACTUATED IF EITHER OF TWO SENSORS INDICATE ACTUATED	MESSAGE AREA ALL TRENDS (TREND TICKS)	SEE EVENT MESSAGE NOTE
SOURCE RANGE POWER	CLD SHTDN: EACH SOURCE RANGE IS DISPLAYED SEPARATELY ICC : THE AVERAGE OF THE TWO SOURCE RANGE SENSORS IS DISPLAYED IF THE SR HI VOLTAGE IS ON, OTHERWISE OFF IS DISPLAYED NIS : THE AVERAGE OF TWO SENSORS	CLD SHTDN ICC (AIDS) NIS (TREND)	CLD SHTDN USES SINGLE INPUT CRITERIA ICC USES TWO INPUT CRITERIA NIS USES 2 INPUT CRITERIA
SOURCE RANGE HI VOLTAGE	SR HI VOLTAGE IS ASSUMED TO BE ON IF EITHER OF THE SENSORS INDICATES ON. THIS PARAMETER IS USED ONLY INDIRECTLY IN THE SR POWER ON ICC (AIDS) AND IN THE DETERMINATION OF POWER IN THE MESSAGE AREA.	MESSAGE AREA ICC (AIDS)	DIGITAL INDICATION NOT ACTUALLY DISPLAYED BUT USED IN ALGORITHMS FOR POWER
SUBCOOLING	THE HIGHEST VALUE OF THE TWO CALCULATED PARAMETERS LABELED "MARGIN OF SATURATION" FROM CCH _A & CCM _B	NORM HU/CD CORE COOLING (CSFM) CORE COOLING (TREND) RCS (TREND)	IF EITHER OF THE PARAMETERS ARE SUSPECT, CONVENTION FOR DISPLAY IS SUSPECT. VALIDATION IS DETERMINED BY CCM AND RANGE CHECKING.
CONTAINMENT ATMOSPHERIC TARGET	TARGET TURNS RED IF ANY OF THE FOLLOWING PARAMETERS EXCEED THEIR SETPOINTS: (1) CONTAINMENT TEMP (2) CONTAINMENT PRESS (3) CONTAINMENT HUMIDITY (4) CONTAINMENT H ₂ O LEVEL	NORM HU/CD	IF ANY OF THE PARAMETERS ARE UNAVAILABLE, THE TARGET WILL BE ENCLOSED WITH SUSPECT INDICATION

<u>PARAMETER NAME</u>	<u>METHOD OF DETERMINATION</u>	<u>DISPLAYS</u>	<u>NOTE</u>
SECONDARY RADIATION TARGET	TARGET TURNS RED IF ANY OF THE FOLLOWING PARAMETERS EXCEED THEIR SETPOINTS: (1) MAIN STEAM LINE RADIATION (2) STEAM GENERATOR BLOWDOWN RADIATION (3) CONDENSER OFF GAS RADIATION	NORM HU/CD	SAME AS CONTAINMENT ATMOSPHERIC TARGET

Note: The event message parameters (RX TP, MSL ISO, FW ISO, SI ACT) displayed in the message area are displayed with time/date and a good validation convention if both inputs have occurred within 5 seconds of each other. It is displayed with a suspect convention if the inputs do not occur within 5 seconds of each other or if the inputs are in opposite states.