

COMANCHE PEAK STEAM ELECTRIC STATION UNITS 1 & 2
TECHNICAL REQUIREMENTS MANUAL

INSTRUCTION SHEET
(Page 1 of 1)

The following instructional information and checklist is being furnished to help insert Revision 21 into the Comanche Peak Steam Electric Station TRM. A description of this revision is provided in TXX-96027, dated January 24, 1996.

Discard the old sheets and insert the new sheets, as listed below.

Remove

Insert

Section 1

1-2
1-3
1-6
1-7
1-8
1-9
1-11

1-2
1-3
1-6
1-7
1-8
1-9
1-11

Section 2

2-3
2-7
2-9
2-25

2-3
2-7
2-9
2-25

List of Effective Pages

EPL-1 through EPL-4

EPL-1 thru EPL-4

NOTE: Please complete the entry for insertion of Revision 21 on the "Record of Changes" form located at the beginning of the TRM.

TECHNICAL REQUIREMENT 1.1Table 1.1.1REACTOR TRIP SYSTEM INSTRUMENTATION RESPONSE TIMES

<u>FUNCTIONAL UNIT</u>	<u>RESPONSE TIME</u>	
1. Manual Reactor Trip	N.A.	
2. Power Range, Neutron Flux	≤ 0.5 second*	
3. Power Range, Neutron Flux High Positive Rate	N.A.	
4. Not Used		19
5. Intermediate Range, Neutron Flux	N.A.	
6. Source Range, Neutron Flux	N.A.	21
7. Overtemperature N-16	≤ 7 seconds*#	
8. Overpower N-16	≤ 7 seconds*#	
9. Pressurizer Pressure-Low	≤ 2 seconds	
10. Pressurizer Pressure-High	≤ 2 seconds	
11. Pressurizer Water Level-High	N.A.	

*Neutron/gamma detectors are exempt from response time testing. Response time of the neutron/gamma flux signal portion of the channel shall be measured from detector output or input of first electronic component in a channel.

#Response time includes the thermal well response time.

TECHNICAL REQUIREMENT 1.1 (continued)Table 1.1.1 (continued)REACTOR TRIP SYSTEM INSTRUMENTATION RESPONSE TIMES

<u>FUNCTIONAL UNIT</u>	<u>RESPONSE TIME</u>
12. Reactor Coolant Flow-Low	
a. Single Loop (Above P-8)	≤ 1 second
b. Two Loops (Above P-7 and below P-8)	≤ 1 second
13. Steam Generator Water Level--Low-Low	≤ 2 seconds
14. Undervoltage - Reactor Coolant Pumps	≤ 1.1 seconds*
15. Underfrequency - Reactor Coolant Pumps	≤ 0.6 second
16. Turbine Trip	
a. Low Fluid Oil Pressure	N.A.
b. Turbine Stop Valve Closure	N.A.
17. Safety Injection Input from ESFAS	N.A.
18. Reactor Trip System Interlocks	N.A.
19. Reactor Trip Breakers	N.A.
20. Automatic Trip and Interlock Logic	N.A.

* An additional of 0.4 seconds maximum calculated voltage decay time from the opening of RCP breaker until voltage reaches the undervoltage set-point provides an overall time ≤ 1.5 seconds.

BASES1.1 REACTOR TRIP SYSTEM RESPONSE TIMES

The bases for the Reactor Trip System are contained in the CPSES Technical Specifications. The measurement of response time at the specified frequencies provides assurance that the Reactor trip actuation associated with each channel is completed within the time limit assumed in the safety analyses. No credit was taken in the analyses for those channels with response times indicated as not applicable. Response time may be demonstrated by any series of sequential, overlapping, or total channel test measurements provided that such tests demonstrate the total channel response time as defined. Sensor response time verification may be demonstrated by either: (1) in place, onsite, or offsite test measurements, or (2) utilizing replacement sensors with certified response time.

TECHNICAL REQUIREMENT 1.2 (continued)TABLE 1.2.1 (continued)ENGINEERED SAFETY FEATURES RESPONSE TIMES

<u>INITIATION SIGNAL AND FUNCTION</u>		<u>RESPONSE TIME IN SECONDS</u>	
2. Containment Pressure--High-1			
a.	Safety Injection (ECCS)	$\leq 27^{(1.5a.10)} / 27^{(4.5b.10)}$	21
b.	Reactor Trip	$\leq 2^{(11)}$	
c.	Feedwater Isolation	≤ 7	
d.	Phase "A" Isolation	$\leq 17^{(2)} / 27^{(1)}$	
e.	Containment Ventilation Isolation	N.A.	
f.	Motor-Driven Auxiliary Feedwater	$\leq 60^{(1)}$	21
g.	Station Service Water	N.A.	
h.	Component Cooling Water	N.A.	
i.	Essential Ventilation Systems	N.A.	
j.	Emergency Diesel Generator Operation	≤ 12	
k.	Turbine Trip	N.A.	
l.	Control Room Emergency Recirculation	N.A.	
m.	Containment Spray Pump	$\leq 32^{(1.7)}$	11

CPSES/TRM
TECHNICAL REQUIREMENT 1.2 (continued)

TABLE 1.2.1 (continued)

ENGINEERED SAFETY FEATURES RESPONSE TIMES

<u>INITIATION SIGNAL AND FUNCTION</u>		<u>RESPONSE TIME IN SECONDS</u>	
3. Pressurizer Pressure--Low			
a.	Safety Injection (ECCS)	$\leq 27^{(1.5a,10)} / 27^{(4.5,10b)}$	21
b.	Reactor Trip	$\leq 2^{(11)}$	
c.	Feedwater Isolation	≤ 7	
d.	Phase "A" Isolation	$\leq 17^{(2)} / 27^{(1)}$	
e.	Containment Ventilation Isolation	$\leq 5^{(6)}$	9
f.	Motor-Driven Auxiliary Feedwater	$\leq 60^{(1)}$	21
g.	Station Service Water	N.A.	
h.	Component Cooling Water	N.A.	
i.	Essential Ventilation Systems	N.A.	
j.	Emergency Diesel Generator Operation	≤ 12	
k.	Turbine Trip	N.A.	
l.	Control Room Emergency Recirculation	N.A.	
m.	Containment Spray Pump	N.A.	9

TECHNICAL REQUIREMENT 1.2 (continued)TABLE 1.2.1 (continued)ENGINEERED SAFETY FEATURES RESPONSE TIMES

<u>INITIATION SIGNAL AND FUNCTION</u>		<u>RESPONSE TIME IN SECONDS</u>	
4. Steam Line Pressure--Low			
a.	Safety Injection (ECCS)	$\leq 37^{(3.5b.10)}/27^{(4.5b.10)}$	21
b.	Reactor Trip	$\leq 2^{(11)}$	
c.	Feedwater Isolation	≤ 7	
d.	Phase "A" Isolation	$\leq 17^{(2)}/27^{(1)}$	
e.	Containment Ventilation Isolation	N.A.	21
f.	Motor-Driven Auxiliary Feedwater	$\leq 60^{(1)}$	
g.	Station Service Water	N.A.	
h.	Component Cooling Water	N.A.	
i.	Essential Ventilation Systems	N.A.	
j.	Emergency Diesel Generator Operation	≤ 12	
k.	Turbine Trip	N.A.	9
l.	Control Room Emergency Recirculation	N.A.	
m.	Containment Spray Pump	N.A.	
n.	Steam Line Isolation	≤ 7	

TECHNICAL REQUIREMENT 1.2 (continued)TABLE 1.2.1 (continued)ENGINEERED SAFETY FEATURES RESPONSE TIMES

<u>INITIATION SIGNAL AND FUNCTION</u>		<u>RESPONSE TIME IN SECONDS</u>	
5.	Containment Pressure--High-3		
a.	Containment Spray Pump	N.A.	
b.	Phase "B" Isolation	N.A.	
c.	Containment Spray Pump Discharge Valve	≤ 119	9
6.	Containment Pressure--High-2		
	Steam Line Isolation	≤ 7	21
7.	Steam Line Pressure - Negative Rate-High		
	Steam Line Isolation	≤ 7	9
8.	Steam Generator Water Level - High-High		
a.	Turbine Trip	N.A.	
b.	Feedwater Isolation	≤ 11	
9.	Steam Generator Water Level - Low-Low		
a.	Motor-Driven Auxiliary Feedwater	≤ 60	21
b.	Turbine-Driven Auxiliary Feedwater	≤ 85	
10.	Loss-of-Offsite Power		
	Motor-Driven Auxiliary Feedwater Pumps	$\leq 58^{(1)}$	21
11.	Trip of All Main Feedwater Pumps		
	All Auxiliary Feedwater Pumps	N.A.	

TECHNICAL REQUIREMENT 1.2 (continued)TABLE 1.2.1 (continued)TABLE NOTATIONS

- (1) Diesel generator starting and sequence loading delays included.
- (2) Diesel generator starting delay not included. Offsite power available.
- (3) Diesel generator starting delay included. Only centrifugal charging pumps are included.
- (4) Diesel generator starting delay not included. Only centrifugal charging pumps are included. | 11
- (5a) Sequential transfer of charging pump suction from the VCT to the RWST (RWST valves open, then VCT valves close) is not included.
- (5b) Sequential transfer of charging pump suction from the VCT to the RWST (RWST valves open, then VCT valves close) is included.
- (6) Includes containment pressure relief line isolation only.
- (7) This is a bounding response time for all scenarios. | 11
- (8) Response time measured to output of undervoltage channel only.
- (9) Two additional seconds allowable for alternate offsite source breaker trip functions.
- (10) Excludes stroke times of RHR mini-flow valves (FCV-610 and FCV-611). | 21
- (11) The response time of ≤ 2 seconds is applicable for MODES 1 and 2 and is measured to the loss of stationary gripper coil voltage only. The response time is not applicable (N.A.) for MODES 3 and 4.

BASES1.2 ENGINEERED SAFETY FEATURES ACTUATION SYSTEM RESPONSE TIMES

The bases for the Engineered Safety Features Actuation System are contained in the CPSES Technical Specifications. The measurement of response time at the specified frequencies provides assurance that the Engineered Safety Features actuation associated with each channel is completed within the time limit assumed in the safety analyses. No credit was taken in the analyses for those channels with response times indicated as not applicable. Response time may be demonstrated by any series of sequential, overlapping, or total channel test measurements provided that such tests demonstrate the total channel response time as defined. Sensor response time verification may be demonstrated by either: (1) in place, onsite, or offsite test measurements, or (2) utilizing replacement sensors with certified response time.

TECHNICAL REQUIREMENT 2.1 (continued)TABLE 2.1.1 (continued)CONTAINMENT ISOLATION VALVES

<u>VALVE NO.</u>	<u>FSAR TABLE REFERENCE NO.*</u>	<u>LINE OR SERVICE</u>	<u>MAXIMUM ISOLATION TIME (Seconds)</u>	<u>NOTES AND LEAK TEST REQUIREMENTS</u>	
1. Phase "A" Isolation Valves (continued)					
8881	43	SI to RC System Hot Loops #2 & #3 Test Line	10	N.A.	8
					2
8824	44	SI to RC System Hot Leg Loops #1 & #4 Test Line	10	N.A.	8
					2
8823	45	SI to RC System Cold Leg Loops #1, #2, #3 & #4 Test Line	10	N.A.	8
					2
8100	51	Seal Water Return and Excess Letdown	10	C	8
8112	51	Seal Water Return and Excess Letdown	10	C	8
7136	52	RCDT Heat Exchanger to Waste Hold Up Tank	10	C	8
LCV-1003	52	RCDT Heat Exchanger to Waste Hold Up Tank	10	C	
HV-5365	60	Demineralized Water Supply	10	C	21
HV-5366	60	Demineralized Water Supply	10	C	21
HV-5157	61	Containment Sump Pump Discharge	5	C	8
HV-5158	61	Containment Sump Pump	5	C	8
HV-3487	62	Instrument Air to Containment	5	C	8

TECHNICAL REQUIREMENT 2.1 (continued)TABLE 2.1.1 (continued)CONTAINMENT ISOLATION VALVES

<u>VALVE NO.</u>	<u>FSAR TABLE REFERENCE NO. *</u>	<u>LINE OR SERVICE</u>	<u>MAXIMUM ISOLATION TIME (Seconds)</u>	<u>NOTES AND LEAK TEST REQUIREMENTS</u>	
1. Phase "A" Isolation Valves (continued)					
HV-4725	114	Containment CCW Drain Tank Pumps Discharge	10	C	21
HV-4726	114	Containment CCW Drain Tank Pumps Discharge	10	C	21
8027	116	Nitrogen Supply to PRT	10	C	8
8026	116	Nitrogen Supply to PRT	10	C	8
HV-6084	120	Chilled Water Supply to Contain- ment Coolers	15	C	21
HV-6082	121	Chilled Water Return From Containment Coolers	15	C	21
HV-6083	121	Chilled Water Return From Containment Coolers	15	C	21
HV-4075B	124	Fire Protection System Isolation	10	C	8
HV-4075C	124	Fire Protection System Isolation	10	C	8
2. Phase "B" Isolation Valves					
HV-4708	117	CCW Return From RCP's Motors	30	C	21
HV-4701	117	CCW Return From RCP's Motors	30	C	21
HV-4700	118	CCW Supply to RCP's Motors	30	C	21

TECHNICAL REQUIREMENT 2.1 (continued)TABLE 2.1.1 (continued)CONTAINMENT ISOLATION VALVES

<u>VALVE NO.</u>	<u>FSAR TABLE REFERENCE NO.*</u>	<u>LINE OR SERVICE</u>	<u>MAXIMUM ISOLATION TIME (Seconds)</u>	<u>NOTES AND LEAK TEST REQUIREMENTS</u>	
3. Containment Ventilation Isolation Valves (continued)					
HV-5548	122	Containment Pressure Relief	5	C Note 8	21
HV-5549	122	Containment Pressure Relief	5	C Note 8	21
4. Manual Valves					
MS-711#	4a	TDAFW Pump Bypass Warm-up Valve	N.A.	N.A.	8
MS-390	5a	N ₂ Supply to Steam Generator #1	N.A.	N.A.	8
MS-387	9a	N ₂ Supply to Steam Generator #2	N.A.	N.A.	8
MS-384	13a	N ₂ Supply to Steam Generator #3	N.A.	N.A.	8
MS-712#	17a	TDAFW Pump Bypass Warm-up Valve	N.A.	N.A.	8
MS-393	18a	N ₂ Supply to Steam Generator #4	N.A.	N.A.	8
FW-106	20b	N ₂ Supply to Steam Generator #1	N.A.	N.A.	8
FW-104	22b	N ₂ Supply to Steam Generator #2	N.A.	N.A.	8
FW-102	24b	N ₂ Supply to Steam Generator #3	N.A.	N.A.	8
FW-108	26b	N ₂ Supply to Steam Generator #4	N.A.	N.A.	8
7135#	52	RCDT Heat Exchanger to Waste Holdup Tank	N.A.	C	8

TECHNICAL REQUIREMENT 2.1 (continued)

TABLE 2.1.1 (continued)

TABLE NOTATIONS

* Identification code for containment penetration and associated isolation valves in FSAR Tables 6.2.4-1, 6.2.4-2, and 6.2.4-3.

May be opened on an intermittent basis under administrative control.

The table does not list local vent, drain and test connections as they are a special class of containment isolation valves and are locked closed to meet containment isolation criteria when located within the penetration boundary. These valves are subject to the same leak rate testing as the other containment isolation valves in the associated penetration, including all applicable leak testing exceptions (see FSAR Table 6.2.4-2, including notes). In addition, if these valves are capped (or isolated by blind flange) and under administrative controls they are not required to be leak rate tested.

14

Note 1: All four MSIV bypass valves are locked closed in Mode 1. During Mode 2, 3, and 4 one MSIV bypass valve may be opened provided the other three MSIV bypass valves are locked closed and their associated MSIVs are closed.

Note 2: These valves require steam to be tested and are thus not required to be tested until the plant is in MODE 3.

Note 3: These valves are included for table completeness; the requirements of Specification 3.6.3 do not apply. Instead, the requirements of Specification 3.7.1.1, 3.7.1.5, 3.7.1.6 and 3.7.1.7 apply for main steam safety valves, main steam isolation valves, feedwater isolation valves and steam generator atmospheric relief valves, respectively.

3

Note 4: These valves are leak tested in accordance with Technical Specification Surveillance Requirement 4.6.1.2.

2

Note 5: 10 CFR 50 Appendix J, Type C testing of these valves is satisfied by the testing of the airlock under Technical Specification Surveillance Requirement 4.6.1.3b.

6

Note 6: These valves are considered an integral part of the airlock associated with their respective airlock door. Therefore, they are subject to the controls of Specification 3.6.1.3.

6

Note 7: These valves are secured in position by hydraulic system locks and/or interlocks and do not require separate locks.

6

Note 8: Including the instrumentation delays of the containment ventilation isolation signal from Pressurizer Pressure Low.

21

COMANCHE PEAK STEAM ELECTRIC STATION UNITS 1 & 2
TECHNICAL REQUIREMENTS MANUAL (TRM)

EFFECTIVE PAGE LISTING

BELOW IS A LEGEND FOR THE EFFECTIVE PAGE LISTING:

Original	Submitted July 21, 1989
Revision 1	September 15, 1989
Revision 2	January 15, 1990
Revision 3	July 20, 1990
Revision 4	April 24, 1991
Revision 5	September 6, 1991
Revision 6	November 22, 1991
Revision 7	March 18, 1992
Revision 8	June 30, 1992
Revision 9	December 18, 1992
Revision 10	January 22, 1993
Revision 11	February 3, 1993
Revision 12	July 15, 1993
Revision 13	September 14, 1993
Revision 14	November 30, 1993
Revision 15	April 15, 1994
Revision 16	May 11, 1994
Revision 17	February 24, 1995
Revision 18	April 14, 1995
Revision 19	May 15, 1995
Revision 20	June 30, 1995
Revision 21	January 24, 1996

COMANCHE PEAK STEAM ELECTRIC STATION UNITS 1 & 2
TECHNICAL REQUIREMENTS MANUAL (TRM)

EFFECTIVE PAGE LISTING

TRM-Tab	Original
Record of Changes	February 24, 1995
TRM-Title Page	June 30, 1992
Table of Contents-Tab	Original
i	February 24, 1995
Administrative Controls-Tab	Original
Administrative Controls-Title Page	June 30, 1995
0-1	Revision 20
0-2	Revision 20
0-3	Revision 20
0-4	Revision 20
Technical Requirements-Tab	Original
Section 1-Tab	Original
1-1	Revision 20
1-2	Revision 21
1-3	Revision 21
1-4	Revision 20
1-5	June 30, 1995
1-6	Revision 21
1-7	Revision 21
1-8	Revision 21
1-9	Revision 21
1-10	June 30, 1995
1-11	Revision 21
1-12	June 30, 1995
1-13	June 30, 1995
1-14	June 30, 1995
1-15	June 30, 1995
1-16	June 30, 1995
1-17	June 30, 1995
1-18	June 30, 1995
1-19	June 30, 1995
Sec. 2-Tab	Original
2-1	Revision 20
2-2	June 30, 1995
2-3	Revision 21
2-4	June 30, 1995
2-5	June 30, 1995
2-6	June 30, 1995
2-7	Revision 21
2-8	June 30, 1995
2-9	Revision 21

COMANCHE PEAK STEAM ELECTRIC STATION UNITS 1 & 2
TECHNICAL REQUIREMENTS MANUAL (TRM)

EFFECTIVE PAGE LISTING

2-10	June 30, 1995
2-11	June 30, 1995
2-12	June 30, 1995
2-13	June 30, 1995
2-14	June 30, 1995
2-15	June 30, 1995
2-16	June 30, 1995
2-17	June 30, 1995
2-18	June 30, 1995
2-19	June 30, 1995
2-20	June 30, 1995
2-21	June 30, 1995
2-22	June 30, 1995
2-23	June 30, 1995
2-24	June 30, 1995
2-25	Revision 21
2-26	June 30, 1995
2-27	Revision 20
2-28	June 30, 1995
Sec. 3-Tab	Original
3-1	Revision 20
3-2	June 30, 1995
3-3	June 30, 1995
3-4	June 30, 1995
3-5	June 30, 1995
3-6	June 30, 1995
3-7	June 30, 1995
3-8	June 30, 1995
3-9	June 30, 1995
3-10	June 30, 1995
Sec. 4-Tab	Original
4-1	Revision 20
4-2	June 30, 1995
4-3	June 30, 1995
4-4	June 30, 1995
4-5	June 30, 1995
4-6	June 30, 1995
4-7	June 30, 1995
4-8	June 30, 1995
4-9	June 30, 1995
4-10	June 30, 1995
4-11	June 30, 1995

COMANCHE PEAK STEAM ELECTRIC STATION UNITS 1 & 2
TECHNICAL REQUIREMENTS MANUAL (TRM)

EFFECTIVE PAGE LISTING

4-12	June 30, 1995
4-13	June 30, 1995
4-14	June 30, 1995
4-15	June 30, 1995
4-16	June 30, 1995
4-17	June 30, 1995
4-18	June 30, 1995
4-19	June 30, 1995
4-20	June 30, 1995
4-21	June 30, 1995
4-22	June 30, 1995
4-23	June 30, 1995
4-24	June 30, 1995
4-25	June 30, 1995
4-26	June 30, 1995
4-27	June 30, 1995
4-28	June 30, 1995
4-29	June 30, 1995
EPL-Tab	Original
EPL-1	January 24, 1996
EPL-2	January 24, 1996
EPL-3	January 24, 1996
EPL-4	January 24, 1996