

# NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

SOUTHERN CALIFORNIA EDISON COMPANY
SAN DIEGO GAS AND ELECTRIC COMPANY
THE CITY OF RIVERSIDE, CALIFORNIA
THE CITY OF ANAHEIM, CALIFORNIA
DOCKET NO. 50-361

# SAN ONOFRE NUCLEAR GENERATING STATION, UNIT NO. 2 AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No.110 License No. NPF-10

- 1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Southern California Edison Company, et al. (SCE or the licensee) dated April 7, 1992, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C(2) of Facility Operating License No. NPF-10 is hereby amended to read as follows:

### (2) <u>Technical Specifications</u>

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 110, are hereby incorporated in the license. Southern California Edison Company shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

 This license amendment is effective as of the date of its issuance and must be fully implemented no later than 30 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Mucha Si Duray

Theodore R. Quay, Director Project Directorate V Division of Reactor Projects III/IV/V Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: February 4, 1994

### ATTACHMENT TO LICENSE AMENDMENT

## AMENDMENT NO. 110TO FACILITY OPERATING LICENSE NO. NPF-10

#### DOCKET NO. 50-361

Revise Appendix A Technical Specifications by removing the pages identified below and inserting the enclosed pages. The revised pages are identified by the captioned amendment number and contain marginal lines indicating the areas of change. The corresponding overleaf pages are also provided to maintain document completeness.

REMOVE	INSERT
3/4 3-15	3/4 3-15
3/4 3-23	3/4 3-23
3/4 3-27	3/4 3-27
3/4 3-31	3/4 3-31

TABLE 3.3-3 (Continued)

OFRE - I	FUNC	TIONA	AL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
LING	4.	MAIN	STEAM LINE ISOLATION					
2		à.	Manual (Trip Buttons)	2/steam generator	1/steam generator	2/operating steam generator	1, 2, 3	11
		b.	Steam Generator Pressure - Low	4/steam generator	2/steam generator	3/steam generator	1, 2, 3	9*, 10*
3/4		с.	Automatic Actuation Logic	4/steam generator	2/steam generator	3/steam generator	1, 2, 3	9*, 10*
₩ 3	5.	RECI	RCULATION (RAS)					
15		a.	Refueling Water Storage Tank - Low	4	2	3	1, 2, 3, 4	9*, 10*
		b.	Automatic Actuation Logic	4	2	3	1, 2, 3, 4	9*, 10*
	6.	CONT	AINMENT COOLING (CCAS)					
A		à.	Manual CCAS (Trip Buttons)	2 sets of 2	1 set of 2	2 sets of 2	1, 2, 3, 4	8
Q		b.	Deleted intentionally					
AMC"DMENT NO		c.	Automatic Actuation Logic	4	2	3	1, 2, 3, 4	9*, 10*

# TABLE 3.3-3 (Continued)

1017	NAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION	
LO:	SS OF POWER (LOV)						
а.	4.16 kV Emergency Bus Undervoltage (Loss of Voltage and Degraded Voltage)	4/Bus	2/Bus	3/Bus	1, 2, 3, 4	9*, 10*	
EMERGENCY FEEDWATER (EFAS)							
a.	Manual (Trip Buttons)	2 sets of 2 per S/G	1 set of 2 per S/G	2 sets of 2 per S/G	1, 2, 3	11	
b.	Automatic Actuation Logic	4/SG	2/SG	3/SG	1, 2, 3	9*, 10*	
с.	SG Level (A/B) - Low and AP (A/B) - High	4/SG	2/SG	3/SG	1, 2, 3	9*, 10*	
d.		4/SG	2/SG	3/SG	1, 2, 3	9*, 10*	
	LOS a. EME a. b.	of Voltage and Degraded Voltage)  EMERGENCY FEEDWATER (EFAS)  a. Manual (Trip Buttons)  b. Automatic Actuation Logic  c. SG Level (A/B) - Low and AP (A/B) - High  d. SG Level (A/B) - Low and No S/G Pressure -	LOSS OF POWER (LOV)  a. 4.16 kV Emergency Bus    Undervoltage (Loss    of Voltage and    Degraded Voltage) 4/Bus  EMERGENCY FEEDWATER (EFAS)  a. Manual (Trip Buttons) 2 sets of 2    per S/G  b. Automatic Actuation    Logic 4/SG  c. SG Level (A/B) - Low    and AP (A/B) - High 4/SG  d. SG Level (A/B) - Low    and No S/G Pressure -	LOSS OF POWER (LOV)  a. 4.16 kV Emergency Bus    Undervoltage (Loss    of Voltage and    Degraded Voltage) 4/Bus 2/Bus  EMERGENCY FEEDWATER (EFAS)  a. Manual (Trip Buttons) 2 sets of 2 per S/G  b. Automatic Actuation    Logic 4/SG 2/SG  c. SG Level (A/B) - Low    and AP (A/B) - Low    and No S/G Pressure -	TOTAL NO. CHANNELS TO TRIP OPERABLE  LOSS OF POWER (LOV)  a. 4.16 kV Emergency Bus Undervoltage (Loss of Voltage and Degraded Voltage) 4/Bus 2/Bus 3/Bus  EMERGENCY FEEDWATER (EFAS)  a. Manual (Trip Buttons) 2 sets of 2 per S/G per S/G  b. Automatic Actuation Logic 4/SG 2/SG 3/SG  c. SG Level (A/B) - Low and AP (A/B) - High 4/SG 2/SG 3/SG  d. SG Level (A/B) - Low and No S/G Pressure -	TOTAL NO. OF CHANNELS TO TRIP OPERABLE APPLICABLE MODES  LOSS OF POWER (LOV)  a. 4.16 kV Emergency Bus Undervoltage (Loss of Voltage and Degraded Voltage) 4/Bus 2/Bus 3/Bus 1, 2, 3, 4  EMERGENCY FEEDWATER (EFAS)  a. Manual (Trip Buttons) 2 sets of 2 per S/G per S/G  b. Automatic Actuation Logic 4/SG 2/SG 3/SG 1, 2, 3  c. SG Level (A/B) - Low and AP (A/B) - Low and No S/G Pressure - A/SG 2/SG 3/SG 1, 2, 3	

TABLE 3.3-4 (Continued)

# ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP VALUES

FUN	CTIONAL UNIT	TRIP VAL	ALLOWABLE VALUES
6.	CONTAINMENT COOLING (CCAS)		
	a. Manual CCAS (Trip Buttons)	Not Applicable	Not Applicable
	b. deleted intentionally		
	c. Automatic . stuation Logic	Not Applicable	Not Applicable
7.	LOSS OF POWER (LOV)		
	a. 4.16 kv Emergency Bus Undervoltage (Loss of Voltage and Degraded Voltage)	See Fig. 3.3-1 (4)	See Fig. 3.3-1 (4)
8.	EMERGENCY FEEDVATER (EFAS)		
	a. Manual (Trip Buttons)	Not Applicable	Not Applicable
	b. Steam Generator (A&B) Level-Low	≥ 21% (3)	≥ 20% (3)
	c. Steam Generator $\Delta P$ -High (SG-A > SG-B)	≤ 125 psi	≤ 140 psi
	d. Steam Generator AP-High (SG-B > SC 4)	≤ 125 psi	≤ 140 psi
	e. Steam Generator (A&B) Pressure	≥ 741 psia (2)	≥ 729 psia (2)
	f. Automatic Actuation Logic	Not Applicable	Not Applicable

## PARLE 3.3-4 (Continued)

## ENCINEFPED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP VALUES

FUNCTIONAL UNIT	TRIP_VALUE	ALLOWABLE VALUES
9. CONTROL ROOM ISOLATION (CRIS)		
a. Manual CRIS (Trip Buttons)	Not Applicable	Not Applicable
b. Manual SIAS (Trip Buttons)	Not Applicable	Not Applicable
c. Airborne Radiation		
1. Particulate/Iodine	≤ 5.7 x 10 <sup>4</sup> cpm**	≤ 6.0 x 10 <sup>4</sup> cpm**
11. Gaseous	≤ 3.8 x 10* cpm**	≤ 4.0 x 10 <sup>2</sup> cpm**
d. Automatic Actuation Logic	Not Applicable	Not Applicable
10. TOXIC GAS ISOLATION (TGIS)		
a. Manual (Trip Buttons)	Not Applicable	Not Applicable
b. Chlorine - High	≤ 14.3 ppm	≤ 15.0 ppm
c. Ammonia - High	≤ 97 ppm	≤ 100 ppm
d. Butane/Propane - High	≤ 193 ppm	≤ 200 ppm
e. Automatic Actuation Logic	Not Applicable	Not Applicable

### TABLE 3.3-5

## ENGINEERED SAFETY FEATURES RESPONSE TIMES

INI	TIA	ING SIGNAL AND FUNCTION	RESPONSE TIME (SEC)
1.	Mar	nual	
	à.	SIAS	
		Safety Injection Control Room Isolation Containment Isolation (3)	Not Applicable Not Applicable Not Applicable
	b.	CSAS	
		Containment Spray	Not Applicable
	С.	CIAS	
		Containment Isolation	Not Applicable
	d.	MSIS	
		Main Steam Isolation	Not Applicable
	е.	RAS	
		Containment Sump Recirculation	Not Applicable
	f.	CCAS	
		Containment Emergency Cooling	Not Applicable
	9.	EFAS	
		Auxiliary Feedwater	Not Applicable
	h.	CRIS	
		Control Room Isolation	Not Applicable
	i.	TGIS	
		Toxic Gas Isolation	Not Applicable
	j.	FHIS	
		Fuel Handling Building Isolation	Not Applicable
	k.	CPIS	
		Containment Purge Isolation	Not Applicable

## Table 3.3-5 (continued)

IN	LLIAL	ING S	IGNAL AND FUNCTION	RESPONSE TIME (SEC)
2.	Pre	ssuri	zer Pressure-Low	
	a.	SIAS	S	
		(1)	Safety Injection (a) High Pressure Safety Injection (b) Low Pressure Safety Injection (c) Charging Pumps	31.2* 41.2* 31.2*
		(2)	Control Room Isolation	Not Applicable
		(3)	Containment Isolation (NOTE 3)	11.2* (NOTE 2)
		(4)	Containment Spray (Pumps)	25.6*
		(5)	Containment Emergency Cooling (a) CCW Pumps (b) CCW Valves (Note 4b) (c) Emergency Cooling Fans	31.2* 23.2* 21.2*
3.	Cont	ainme	ent Pressure-High	
	a.	SIAS		
		(1)	Safety Injection (a) High Pressure Safety Injection (b) Low Pressure Safety Injection	41.0* 41.0*
		(2)	Control Room Isolation	Not Applicable
		(3)	Containment Spray (Pumps)	25.4*
		(4)	Containment Emergency Cooling (a) CCW Pumps (b) CCW Valves (Note 4b) (c) Emergency Cooling Fans	31.0* 23.0* 21.0*
	b.	CIAS		
		(1)	Containment Isolation	10 3* (NOTE 2)
		(2)	Mzin Feedwater Isolation and Backup Isolation Valves (HV 4048, HV 4052, HV 1105, HV 1106, HV 4047, HV 4051)	10.9
		(3)	CCW Valves (Note 4a)	20.9
		(4)	Mainsteam Isolation Valves (Hr _204, HV 8205)	8.9
		(5)	Minipurge Isolation Valves	5.9
4.	Cont	ainme	nt Pressure - High-High	
		CSAS		
		Cont	ainment Spray	23.0*

TABLE 4.3-2

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
1. SAFETY INJECTION (SIAS) a. Manual (Trip Buttons) b. Containment Pressure - I c. Pressurizer Pressure - I d. Automatic Actuation Log	LOW S	N.A. (6) (6) N.A.	(6) Q Q Q(3), SA(4)	1, 2, 3, 4 1, 2, 3 1, 2, 3, 1, 2, 3, 4
a. Manual (Trip Buttons) b. Containment Pressure High - High c. Automatic Actuation Log	N.A. S N.A.	N.A. (C) N.A.	(6) Q Q(3), SA(4)	1, 2, 3 1, 2, 3 1, 2, 3
3. CONTAINMENT ISOLATION (CIAS) a. Manual CIAS (Trip Buttor b. Manual SIAS (Trip Buttor c. Containment Pressure - F d. Automatic Actuation Logi	ns)(5) N.A. ligh S	N.A. N.A. (6) N.A.	(6) (6) Q Q(3), SA(4)	1, 2, 3, 4 1, 2, 3, 4 1, 2, 3 1, 2, 3, 4
4. MAIN STEAM ISOLATION (MSIS) a. Manual (Trip Buttons) b. Steam Generator Pressure c. Automatic Actuation Logi		N.A. (6) N.A.	(6) Q Q(3), SA(4)	1, 2, 3 1, 2, 3 1, 2, 3
5. RECIRCULATION (RAS) a. Refueling Water Storage Tank - Low b. Automatic Actuation Logi	S N.A.	R N.A.	Q Q(3), SA(4)	1, 2, 3, 4 1, 2, 3, 4
6. CONTAINMENT COOLING (CCAS) a. Manual CCAS (Trip Button b. deleted intentionally		N.A.	(6)	1, 2, 3, 4
c. Automatic Actuation Logi	c N.A.	N.A.	Q(3), SA(4)	1, 2, 3, 4

TABLE 4.3-2 (Continued)

# ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT		CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
7.	LOSS OF POWER (LOV)  a. 4.16 kV Emergency Bus Undervoltage (Loss of Voltage and Degraded Voltage)	5	(6)	(6)	1, 2, 3, 4
8.	EMERGENCY FEEDWATER (EFAS)				
	a. Manual (Trip Buttons)	N.A.	N.A.	(6)	1, 2, 3
	b. SG Level (A/B)-Low and AP (A/B) - High	S	163		
	c. SG Level (A/B) - Low and No	3	(6)	Q	1, 2, 3
	Pressure - Low Trip (A/B)	5	(6)	Q	1, 2, 3
	d. Automatic Actuation Logic	N.A.	N.A.	Q(3) SA(4)	1, 2, 3
	CONTROL ROOM ISOLATION (CRIS)				
	a. Manual CRIS (Trip Buttons)	N.A.	N.A.	R	N.A.
	b. Manual SIAS (Trip Buttons)	N.A.	N.A.	R	N.A.
	c. Airborne Radiation				
	i. Particulate/Iodine ii. Gaseous	2 2	R R	M	A11
	d. Automatic Actuation Logic	N.A.	N.A.	R(3)	All All
0.	TOXIC GAS ISOLATION (TG15)				
	a. Manual (Trip Buttons)	N.A.	N.A.	R	N.A.
	b. Chiorine - High	\$	R	M	A11
	c. Ammonia - High	5	R	М	A11
	d. Butane/Propane - High	S	R	M	A11
	e. Automatic Actuation Logic	N.A.	N.A.	R(3)	All



# UNITED STATES NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

SOUTHERN CALIFORNIA EDISON COMPANY
SAN DIEGO GAS AND ELECTRIC COMPANY
THE CITY OF RIVERSIDE, CALIFORNIA
THE CITY OF ANAHEIM, CALIFORNIA
DOCKET NO. 50-362

# SAN ONOFRE NUCLEAR GENERATING STATION UNIT NO. 3 AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 99 License No. NPF-15

- 1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Southern California Edison Company, et al. (SCE or the licensee) dated April 7, 1992, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C(2) of Facility Operating License No. NPF-15 is hereby amended to read as follows:

### (2) Technical Specifications

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 99 , are hereby incorporated in the license. Southern California Edison Company shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of its issuance and must be fully implemented no later than 30 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Thurden of Thay

Theodore R. Quay, Director
Project Directorate V
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: February 4, 1994

### ATTACHMENT TO LICENSE AMENDMENT

### AMENDMENT NO. 99 TO FACILITY OPERATING LICENSE NO. NPF-15

#### DOCKET NO. 50-362

Revise Appendix A Technical Specifications by removing the pages identified below and inserting the enclosed pages. The revised pages are identified by the captioned amendment number and contain marginal lines indicating the areas of change. The corresponding overleaf pages are also provided to maintain document completeness.

REMOVE	INSERT
3/4 3-15	3/4 3-15
3/4 3-23	3/4 3-23
3/4 3-27	3/4 3-27
3/4 3-31	3/4 3-31

TABLE 3.3-3 (Continued)

FUN	ICT I ON	AL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
4.	MAI	N STEAM LINE ISOLATION					
	a.	Manual (Trip Buttons)	2/steam generator	1/steam generator	2/operating steam generator	1, 2, 3	11
	b.	Steam Generator Pressure - Low	4/steam generator	2/steam generator	3/steam generator	1, 2, 3	9*, 10*
	c.	Automatic Actuation Logic	4/steam generator	2/steam generator	3/steam generator	1, 2, 3	9*, 10*
5.	REC	IRCULATION (RAS)					
	a.	Refueling Water Storage Tank - Low	4	2	3	1, 2, 3, 4	9*, 10*
	b.	Automatic Actuation Logic	4	2	3	1, 2, 3, 4	9*, 10*
6.	CON	TAINMENT COOLING (CCAS)					
	a.	Manual CCAS (Trip Buttons)	2 sets of 2	1 set of 2	2 sets of 2	1, 2, 3, 4	8
	b.	Deleted intentionally					
	с.	Automatic Actuation Logic	1	2	3	1, 2, 3, 4	9*, 10*

## TABLE 3.3-3 (Continued)

FUNC	CTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
7.	LOSS OF POWER (LOV)					
	a. 4.16 kV Emergency Undervoltage (L of Voltage and Degraded Voltage	.055	2/Bus	3/Bus	1, 2, 3, 4	9*, 10*
8.	EMERGENCY FEEDWATER (	EFAS)				
	a. Manual (Trip Butt	ons) 2 sets of 2 per S/G	1 set of 2 per S/G	2 sets of 2 per S/G	1, 2, 3	11
	<ul> <li>Automatic Actuati Logic</li> </ul>	on 4/SG	2/SG	3/SG	1, 2, 3	9*, 10*
	c. SG Level (A/B) - and AP (A/B) -		2/SG	3/SG	1, 2, 3	9*, 10*
	d. SG Level (A/B) - and No S/G Pres Low Trip (A/B)		2/SG	3/SG	1, 2, 3	9*, 10*

TABLE 3.3-4 (Continued)

m	FUNCTIONAL UNIT			TRIP VALUE	ALLOWABLE VALUES				
LIND	6.	CON	NTAINMENT COOLING (CCAS)						
ω		а.	Manual CCAS (Trip Buttons)	Not Applicable	Not Applicable				
		b.	deleted intentionally						
		с.	Automatic Actuation Logic	Not Applicable	Not Applicable				
	7.	LOS	SS OF POWER (LOV)						
3/4		а.	4.16 kV Emergency Bus Undervoltage (Loss of Voltage and Degraded Voltage)	See Fig. 3.3-1 (4)	See Fig. 3.3-1 (4)				
(A)	8.	EME	EMERGENCY FEEDWATER (EFAS)						
		a.	Manual (Trip Buttons)	Not Applicable	Not Applicable				
		b.	Steam Generator (A&B) Level-Low	≥ 21% (3)	≥ 20% (3)				
		с.	Steam Generator AP-High (SG-A > SG-B)	≤ 125 psi	≤ 140 psi				
		d.	Steam Generator &P-High (SG-B > SG-A)	≤ 125 psf	≤ 140 psi				
Ds.		е.	Steam Generator (A&B) Pressure - Low	≥ 741 psia (2)	≥ 729 psia (2)				
AMFNDMF		f.	Automatic Actuation Logic	Not Applicable	Not Applicable				

## TABLE 3.3-4 (Continued)

FUNCTIONAL UNIT	TRIP VALUE	ALLOWABLE VALUES
9. CONTROL ROOM ISOLATION (CRIS)		
a. Manual CRIS (Trip Buttons)	Not Applicable	Not Applicable
b. Manual SIAS (Trip Buttons)	Not Applicable	Not Applicable
c. Airborne Radiation		
i. Particulate/Isdine	< 5.7 x 10 <sup>4</sup> cpm**	≤ 6.0 x 10 <sup>4</sup> cpm**
11. Gaseous	≤ 3.8 x 10 <sup>2</sup> cpm**	< 4.0 x 10 <sup>2</sup> cpm**
d. Automatic Actuation Logic	Not Applicable	Not Applicable
10. TOXIC GAS ISOLATION (TGIS)		
a. Manual (Trip Buttons)	Not Applicable	Not Applicable
b. Chlorine - High	≤ 14.3 ppm	≤ 15.0 ppm
c. Ammonia - High	≤ 97 ppm	≤ 100 ppm
d. Butane/Propane - High	≤ 193 ppm	≤ 200 ppm
e. Automatic Actuation Logic	Not Applicable	Not Applicable

### TABLE 3.3-5

### ENGINEERED SAFETY FEATURES RESPONSE TIMES

INI	TIAT	ING SIGNAL AND FUNCTION	RESPONSE TIME (SEC)						
1.	Mai	nual							
	а.	SIAS							
		Safety Injection Control Room Isolation Containment Isolation (3)	Not	Applicable Applicable Applicable					
	b.	CSAS							
		Containment Spray	Not	Applicable					
1.	С.	CIAS							
		Containment Isolation	Not	Applicable					
	d.	MSIS							
		Main Steam Isolation	Not	Applicable					
	е.	RAS							
		Containment Sump Recirculation	Not	Applicable					
	f.	CCAS							
		Containment Emergency Cooling	Not	Applicable					
	g.	EFAS							
		Auxiliary Feedwater	Not	Applicable					
	h.	CRIS							
		Control Room Isolation	Not	Applicable					
	i.	TGIS							
		Toxic Gas Isolation	Not	Applicable					
	÷	FHIS							
		Fuel Handling Building Isolation	Not	Applicable					
	k.	CPIS							
		Containment Purge Isolation	Not	Applicable					

## Table 3.3-5 (continued)

IN	TAITI	ING SI	IGNAL AND FUNCTION	RESPONSE TIME (SEC)				
2.	Pr	essuri	zer Pressure-Low					
	SI	AS						
		(1)	Safety Injection (a) High Pressure Safety Injection (b) Low Pressure Safety Injection (c) Charging Pumps	31.2* 41.2* 31.2*				
		(2)	Control Room Isolation	Not Applicable				
		(3)	Containment Isolation (NOTE 3)	11.2* (NOTE 2)				
		(4)	Containment Spray (Pumps)	25.6*				
		(5)		31.2* 23.2* 21.2*				
3.	Cor	tainm	ent Pressure-High					
	a.	SIAS						
		(1)	Safety Injection (a) High Pressure Safety Injection (b) Low Pressure Safety Injection	41.0* 41.0*				
		(2)	Control Room Isolation	Not Applicable				
		(3)	Containment Spray (Pumps)	25.4*				
		(4)	Containment Emergency Cooling (a) CCW Pumps (b) CCW Valves (NOTE 4b) (c) Emergency Cooling Fans	31.0* 23.0* 21.0*				
	b.	CIAS						
		(1)	Containment Isolation	10.9* (NOTE 2)				
		(2)	Main Feedwater Backup Isolation and Backup Isolation Valves (HV 4048, HV 4052, HV 1105, HV 1106, HV 4047, HV 4051)	10.9				
		(3)	CCW Valves (Note 4a)	20.9				
		(4)	Mainsteam Isolation Valves (HV 8204, HV 8205)	8.9				
		(5)	Minipurge Isolation Valves	5.9				
4.	Con	tainme	nt Pressure - High-High					
	CSA	CSAS						
		Conta	inment Spray	23.0*				

TABLE 4.3-2

# ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUN	CTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
1.	SAFETY INJECTION (SIAS)				
	a. Manual (Trip Buttons)	N.A.	M.A.	(6)	1, 2, 3, 4
	b. Containment Pressure - High	S	(6)	Q	1, 2, 3
	c. Pressurizer Pressure - Low	S	(6)	0	1, 2, 3
	d. Automatic Actuation Logic	N.A.	N.A.	Q(1)(3), SA(4)	1, 2, 3, 4
2.	CONTAINMENT SPRAY (CSAS)				
	a. Manual (Trip Buttons)	N.A.	N.A.	(6)	1, 2, 3
	b. Containment Pressure			10/	1, 2, 3
	High - High	S	(6)	Q	1, 2, 3
	c. Automatic Actuation Logic	N.A.	N.A.	Q(1)(3), SA(4)	1, 2, 3
2	CONTAINING TOOLS				
3.	CONTAINMENT ISOLATION (CIAS)				
	a. Manual CIAS (Trip Buttons)	N.A.	N.A.	(6)	1, 2, 3, 4
	b. Manual SIAS (Trip Buttons)(5)	N.A.	N.A.	(6)	1, 2, 3, 4
	c. Containment Pressure - High	5	(6)	Q	1, 2, 3
	d. Automatic Actuation Logic	N.A.	N.A.	Q(1)(3), SA(4)	1, 2, 3, 4
4.	MAIN STEAM ISOLATION (MSIS)				
	a. Manual (Trip Buttons)	N.A.	N.A.	(6)	1 2 2
	b. Steam Generator Pressure - Lov		(6)	0	1, 2, 3
	c. Automatic Actuation Logic	N.A.	N.A.	Q(1)(3), SA(4)	1, 2, 3 1, 2, 3
				41.1(2), 20(4)	1, 2, 3
5.	RECIRCULATION (RAS)				
	a. Refueling Water Storage				
	Tank - Low	S	R	0	1, 2, 3, 4
	b. Automatic Actuation Logic	N.A.	N.A.	Q(1)(3), SA(4)	1, 2, 3, 4
6.	CONTAINMENT COOLING (CCAS)				
0.	a. Manual CCAS (Trip Buttons)	N.A.		101	
	b. collections (irrip buttons)	N.A.	N.A.	(6)	1, 2, 3, 4
	c. Automatic Actuation Logic	N.A.	N.A.	0/11/21 58/41	
	The sound of the code to the code to	11.75.	N.A.	Q(1)(3), SA(4)	1, 2, 3, 4

REQUIREMENTS	SURVEILLANCE	RUMENTATION	SYSTEM	ACTUATION	FEATURES	SAFETY	ENGINEERED

FUNC	TIONAL UNIT	CHANNELCHECK_	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
7.	LOSS OF POWER (LOV)  a. 4.16 kV Emergency Bus Undervoltage (Loss of Voltage and Degraded				
	Voltage)	S	(6)	(6)	1, 2, 3, 4
8.	EMERGENCY FEEDWATER (EFAS)				
	a. Manual (Trip Buttons) b. SG Level (A/B)-Low and	N.A.	N.A.	(6)	1, 2, 3
	ΔP (A/B) - High c. SG Level (A/B) - Low and No	S	(6)	Q	1, 2, 3
	Pressure - Low Trip (A/B)	S	(6)	Q	1, 2, 3
	d. Automatic Actuation Logic	N.A.	N.A.	Q(3) SA(4)	1, 2, 3
9.	CONTROL ROOM ISOLATION (CRIS)				
	a. Manual CRIS (Trip Buttons)	N.A.	N.A.	R	N.A.
	<ul><li>b. Manual SIAS (Trip Buttons)</li><li>c. Airborne Radiation</li></ul>	N.A.	N.A.	R	N.A.
	i. Particulate/Iodine	S	R	H	A11
	11. Gaseous	S	R	M	A11
	d. Automatic Actuation Logic	N.A.	N.A.	R(3)	A11
10.					
	a. Manual (Trip Buttons)	N.A.	N.A.	R	N.A.
	b. Chlorine - High	2	R	М	A11
	c. Ammonia - High	S	R	M	All
	d. Butane/Propane - High	S	R		All
	e. Automatic Actuation Logic	N.A.	N.A.	R(3)	A11