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SUBJECT: Forwards table of all ESF actuation sys subgroup relays categorized per NRC 821007 request,ESF actuation trains not defeated for testing subgroup relays,Procedure considered unsafe operating practice.

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December 17, 1982

Director, Office of Nuclear Reactor Regulation
Attention: Mr. George W. Knighton, Branch Chief
Licensing Branch No. 3
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Gentlemen:

Subject: Docket Nos. 50-361 and 50-362
San Onofre Nuclear Generating Station
Units 2&3

SCE's letter of July 23, 1982 submitted Amendment Application No. 8 consisting of Proposed Change NPF-10-4 to San Onofre Unit 2 Facility Operation License No. NPF-10, Technical Specifications. The Proposed Change requested an extension of the surveillance interval for the Engineered Safety Feature Actuation System (ESFAS) subgroup relays from the present six month interval, as shown in Table 4.3-2 of the Technical Specifications, to an 18 month (refueling) interval.

SCE met with the Staff in Bethesda, Maryland on July 29, 1982 to discuss the proposed change and also submitted additional clarification by letter dated August 16, 1982. SCE has provided the Staff with information which demonstrates that:

1. The physical and design characteristics of the Potter-Brumfeld rotary relays used for the ESFAS actuation relays support an 18 month surveillance interval.

2. System availability, based on a reliability analysis was not significantly affected by increasing the surveillance interval to 18 months.

3. CE plants with ESF actuation systems similar or identifical to San Onofre Units 2 and 3 conducted surveillances at 18 month intervals and that there was no evidence of problems or relay failures associated with the 18 month surveillance interval.

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Additionally, SCE has provided information to show that the ESF subgroup relays are only a part of the overall ESF accident mitigation system whose function is achieved by a series of actuations from channel sensor inputs through equipment actuation and that the operability of the overall system is varified by combining results of the following:

1. Separate tests on individual actuated components (for example, by the routine Section XI testing of pumps and valves);

2. Channel checks and channel functional tests (for example, on setpoints and actuation logic);

3. Channel calibrations and response time measurements (for example, on sensors or valve closing or opening); and

4. Tests that exercise individually or in combination with one of the above objectives, all the components not otherwise routinely tested in the ESF system.

Subsequently the NRC's letter of October 7, 1982 requested that SCE provide a listing of ESFAS subgroup relays divided into the following categories in order for the Staff to complete their review:

1. Cannot be tested at power;

2. Can be tested at power but only by manually defeating (bypassing) and subsequently restoring the ESFAS train; or

3. Can be tested at power without defeating the ESFAS train, but are operationally burdensome to test.

Consistent with the Staff's October 7, 1982 request, enclosed for your information is a table of all the ESFAS subgroup relays categorized as follows:

1. Cannot be tested at power;

2. Can be tested, but are burdensome;

3. Can be easily tested; or

4. Spare relays.

It should be noted that SCE does not defeat ESFAS trains in order to test subgroup relays because it is considered to be an unsafe operating practice, which has the potential for decreasing the reliability of the ESFAS in excess of any benefit which could be derived from increased testing of the relays.

SCE considers that sufficient information has already been provided to allow the Staff to substantiate the acceptability of the requested 18 month surveillance interval, and that the Staff should approve the requested extension of the surveillance interval to 18 months. In particular, SCE's letter of August 16, 1982 provided a comparison with the provision delineated in IEEE 338-1977 for "Change of Test Interval," which justified extension of the surveillance interval for all ESFAS subgroup relays from six months to 18 months.

If you have any questions or comments, please let me know.

Very truly yours,

K P Baskin

ESF SUBGROUP RELAYS
SAN ONOFRE UNITS 2&3

Category 1: SUBGROUP RELAYS THAT CANNOT BE TESTED AT POWER (includes all relays for which actuation of connected equipment would result in unsafe plant conditions and/or reactor trip)

Relay	ESFAS	Train	Tag No.	Component Description	Status		Justification
					Normal	Actuated	
K301	SIAS	A	HV9205	Letdown Line Isolation	Open	Closed	Note 1
			TV0221	Letdown Line Isolation	Open	Closed	Note 1
			HV9218	RCP Bleedoff Isolation	Open	Closed	Note 2
K202	CIAS	A	HV9205	Letdown Line Isolation	Open	Closed	Note 1
			HV9218	RCP Bleedoff Isolation	Open	Closed	Note 2
K301	SIAS	B	HV9204	Letdown Line Isolation	Open	Closed	Note 1
			TV9267	Letdown Line Isolation	Open	Closed	Note 1
			HV9217	RCP Bleedoff Isolation	Open	Closed	Note 2
K202	CIAS	B	TV9267	Letdown Line Isolation	Open	Closed	Note 1
			HV9217	RCP Bleedoff Isolation	Open	Closed	Note 2
K101	SIAS	B	HV9235	Boric Acid Gravity Feed	Closed	Open	Note 3
			HV9240	Boric Acid Gravity Feed	Closed	Open	Note 3
			LV0227B	VCT Outlet	Open	Closed	Note 3
			HV7800	Cntmt Air Mon Isol.	Open	Closed	--
			HV7803	Cntmt Air Mon Isol.	Open	Closed	--
			P504	Aux. Feed Pump	Off	Delay	--
K201	CIAS	B	HV4051	S/G-S Feedwater Block	Open	Closed	Note 4
			HV1105	S/G-S Feedwater Bypass	Auto	Closed	Note 5

Category 1 (cont'd)

Relay	ESFAS	Train	Tag No.	Component Description	Status		Justification
					Normal	Actuated	
K208	CIAS	A&B	HV4048	S/G-N Feedwater Isol.	Open	Closed	Note 4
			HV8205	S/G-N Main Stm. Isol.	Open	Closed	Note 6
K209	CIAS	A&B	HV4052	S/G-S Feedwater Isol.	Open	Closed	Note 4
			HV8204	S/G-S Main Stm Isol.	Open	Closed	Note 6
K212	CIAS	A	HV4047	S/G-N Feedwater Bypass	Open	Closed	Note 4
			HV1106	S/G-N Feedwater Bypass	Auto	Closed	Note 5
K305	MSIS	A	HV8205	S/G-N Main Stm. Isol.	Open	Closed	Note 6
K305	MSIS	B	HV8204	S/G-S Main Stm Isol.	Open	Closed	Note 6
K313	MSIS	A&B	HV4048	S/G-N Feedwater Isol.	Open	Closed	Note 4
K406	MSIS	A&B	HV4052	S/G-S Feedwater Isol.	Open	Closed	Note 4
K106	MSIS	A	HV8204	S/G-S Main Stm. Isol.	Open	Closed	Note 6
K106	MSIS	B	HV8205	S/G-N Main Stm. Isol.	Open	Closed	Note 6

Category 1 (cont'd)

Relay	ESFAS	Train	Tag No.	Component Description	Status		Justification
					Normal	Actuated	
K102	SIAS	A	HV5388	Inst. Air Cntmt Isol.	Open	Closed	Note 7
			P024	CCW Pump	Run/Stdby	Run	--
			P025	CCW Pump	Run/Stdby	Run	--
			HV7816	Cntmt. Air Emer. Sample	Closed	Closed	--
			E-417	Emer. Clr (Rm 005)	Off	Run	--
			E-453	Emer. Clr. (Rm 008)	Off	Run	--
			E-454	Emer. Clr. (Rm 007)	Off	Run	--
			E-517	Emer. Clr. (Rm 015)	Off	Run	--
K205	CIAS	A	HV5388	Inst. Air Cntmt Isol.	Open	Closed	Note 7
K412	SIAS	A	HV6218	CCW Non-Crit Loop Isol.	Open	Closed	Note 2
			HV6212	CCW Non-Crit Loop Isol.	Open	Closed	Note 2
			HV6497	Saltwater to Circ. Wtr.	Open	Open	--
K412	SIAS	B	HV6213	CCW Non-Crit Loop Isol.	Open	Closed	Note 2
			HV6219	CCW Non-Crit Loop Isol.	Open	Closed	Note 2
			HV6495	Saltwater to Circ. Water	Open	Open	--
K302	SIAS	B	HV6211	CCW Non-Crit. Loop Isol.	Open	Closed	Note 2
			HV6216	CCW Non-Crit. Loop Isol.	Open	Closed	Note 2
K213	CIAS	B	HV6211	CCW Non-Crit. Loop. Isol.	Open	Closed	Note 2
			HV6216	CCW Non-Crit. Loop Isol.	Open	Closed	Note 2
K304	CSAS	A	HV6501	CCW to SDchx	Closed	Open	Note 9
			FV0318	Spray chem. add cont. vlv	Auto/ Closed	Auto/ Open	Note 8
			HV9367	Spray Hdr. Isol.	Closed	Open	--

Category 1 (cont'd)

Relay	ESFAS	Train	Tag No.	Component Description	Status		Justification
					Normal	Actuated	
K304	CSAS	B	HV6500	CCW to SDCHX	Closed	Open	Note 9
			FV0328	Spray chem. add cont. vlv	Auto/ Closed	Auto/ Open	Note 8
			HV9368	Spray Hdr. Isol.	Closed	Open	--
K306	CCAS	A	HV6366	CCW to CNTMT Emer. Clr.	Open	Open	--
			HV6367	CCW to CNTMT Emer. Clr.	Closed	Open	Note 10
			HV6370	CCW to CNTMT Emer. Clr.	Open	Open	--
			HV6371	CCW to CNTMT Emer. Clr.	Closed	Open	Note 10
K306	CCAS	B	HV6368	CCW to CNTMT Emer. Clr.	Open	Open	--
			HV6369	CCW to CNTMT Emer. Clr.	Closed	Open	Note 10
			HV6372	CCW to CNTMT Emer. Clr.	Open	Open	--
			HV6373	CCW to CNTMT Emer. Clr.	Closed	Open	Note 10

Notes for Category 1 ESF Subgroup Relays

1. Closing of valve will result in loss of pressurizer level control and also cause unacceptable thermal transient on charging line piping downstream of Regenerative HX.

2. Closing of valve can result in RCP seal damage.

3. Closing of LV0227B and opening of HV9235, HV9240 will result in injection of concentrated boric acid to reactor coolant system; closing of block valves for HV9235, HV9240 to perform test will necessitate alignment of charging pump suction to RWST, which will also result in injection of boric acid to reactor coolant system.

4. Closing of valve will result in loss of steam generator level.

5. Closing of valve will result in loss of steam generator level control.

6. Closing of valve will result in unacceptable decrease in reactor coolant system heat removal, increase in reactor coolant system pressure, and assymetrical steam generator pressures.

7. Closing of valve will result in loss of pressurizer pressure control and level control.

8. Relay actuation causes change in valve controller setpoint; observation of setpoint change requires either abnormal lineup (to test change in flow) or temporary modification of controller.

9. Opening valve in operating CCW loop abruptly reduces RCP seal cooling flow, which can damage RCP seals.

10. Relay will open valves together; opening valves together in operating CCW loop abruptly reduces RCP seal cooling flow, which can damage RCP seals.

FN:6195

ESF SUBGROUP RELAYS
SAN ONOFRE UNITS 2&3

Category 2: SUBGROUP RELAYS THAT CAN BE TESTED AT POWER ONLY BY ESFAS BYPASS

There are no SONGS 2/3 ESF subgroup relays in this Category. All ESF subgroup relays that are testable at power are listed as Category 3 (burdensome) or Category 4 (easy), and do not require ESFAS bypass to test. It is noted that routine use of contact jumpers or lead lifting to effect ESFAS bypass, were there any Category 2 ESF subgroup relays, would be an unsafe operating practice which by potential for unremoved jumpers or unterminated leads would decrease the reliability of ESFAS actuation in excess of any gain due to increased relay exercising.

ESF SUBGROUP RELAYS
SAN ONOFRE UNITS 2&3

Category 3: SUBGROUP RELAYS THAT CAN BE TESTED AT POWER BUT ARE BURDENSOME (includes all relays for which continuity must be tested in lieu of equipment actuation, abnormal prior lineup is required, cumulative equipment damage may result, or test plus system restoration may exceed Tech. Spec. Action time limits; relays are included as Category 3 vice Category 1 based on equipment normally in the safe state remaining in the safe state while the relay is cycled.)

Relay	ESFAS	Train	Tag No.	Component Description	Status		Justification
					Normal	Actuated	
K311	SIAS	A	E336	Emergency Chiller	Off	Run	Note 11
			HV9823	Cntmt. Mini Purge Isol.	Closed	Closed	--
			P162	Emer. Chilled Wtr. Pump	Off	Run	--
			E439	BAMU Rm Clr.	Off	Run	--
			E440	BAMU Rm Clr.	Off	Run	--
			HV7810	Cntmt. Air Mon. Isol.	Open	Closed	--
			HV9825	Cntmt. Mini Purge Isol.	Closed	Closed	--
			HV7811	Cntmt Air Mon.	Open	Closed	--
			HV7259	Cntmt. Vent Hdr. Isol.	Closed	Closed	--
			HV7512	RCDT Isol.	Closed	Closed	--
K311	SIAS	B	E335	Emergency Chiller	Off	Run	Note 11
			HV9821	Cntmt. Mini Purge Isol.	Closed	Closed	--
			P-160	Emer. Chilled Wtr. Pump	Off	Run	--
			HV7805	Cntmt. Air Mon. Isol.	Open	Closed	--
			HV9824	Cntmt. Mini Purge Isol.	Closed	Closed	--
			HV7806	Cntmt. Air Mon. Isol.	Open	Closed	--
			HV7258	Cntmt. Vent Hdr. Isol.	Closed	Closed	--
			HV7513	RCDT. Isol.	Closed	Closed	--
K110	SIAS	A	P017/P018	HPSI Pump	Off	Run	Note 12
K110	SIAS	B	P019/P018	HPSI Pump	Off	Run	Note 12

Category 3 (cont'd)

Relay	ESFAS	Train	Tag No.	Component Description	Status		Justification
					Normal	Actuated	
K408	SIAS	A	HV9825	Cntmt. Mini Purge Isol.	Closed	Closed	--
			E-438	Chg. Pump Rm. Cooler	Off	Run	--
			E-437	Chg. pump Rm. Cooler	Off	Run	--
			E-255	ESF Swgr. Rm. Cooler	Off	Run	--
			CRIS	Trip input to CRIS Cab.	Reset	Trip	Note 13
K408	SIAS	B	HV9824	Cntmt. Mini Purge Isol.	Closed	Closed	--
			E-436	Chg. Pump Rm. Cooler	Off	Run	--
			E-435	Chg. Pump Rm. Cooler	Off	Run	--
			E-257	ESF Swgr. Rm. Cooler	Off	Run	--
			CRIS	Trip input to CRIS Cab.	Reset	Trip	Note 13
K401	SIAS	A	G-002	Emer. Diesel Generator	Off	Run	Note 14
			2A0413	G-002 to 04 tie brkr.	Open	Open	--
			-	Pzr. B/U Htrs	Auto	Off	--
			-	HP Computer	On	Off	Note 15
			-	TSC Computer	On	Off	Note 15
			E-654	EDG Immersion htr.	Auto	Off	--
			E-655	EDG Immersion htr.	Auto	Off	--
K401	SIAS	B	G-003	Emer. Diesel Generator	Off	Run	Note 14
			2A0613	G-003 to 2A06 tie brkr.	Open	Open	--
			-	Pzr. B/U Htrs	Auto	Off	--
			-	Fire Det. Sys.	On	Off	Note 15, 16
			-	Emer. Lighting	Off	Off	--
			E-656	EDG Immersion Htr.	Auto	Off	--
			E-657	EDG Immersion Htr.	Auto	Off	--
			P-145	LP Turbine Emer. Spr.	Off	Off	--

Category 3 (cont'd)

Relay	ESFAS	Train	Tag No.	Component Description	Status		Justification
					Normal	Actuated	
K623	MSIS	A	HV4730	Aux. FW. to E089	Closed	Closed	Note 17
			HV4731	Aux. FW. to E089	Closed	Closed	Note 17
K723	MSIS	A	HV4705	Aux. FW. to E088	Closed	Closed	Note 17
			HV4713	Aux. FW. to E088	Closed	Closed	Note 17
K623	MSIS	B	HV4706	Aux. FW. to E089	Closed	Closed	Note 17
			HV4712	Aux. FW. to E088	Closed	Closed	Note 17
K723	MSIS	B	HV4714	Aux. FW. to E088	Closed	Closed	Note 17
			HV4715	Aux. FW. to E089	Closed	Closed	Note 17
K405	RAS	A	FV0318	Spray Chem. Add. Cont. vlv	Auto/ Closed	Auto/ Open	Note 18
K405	RAS	B	FV0328	Spray Chem. Add. Cont. vlv	Auto/ Closed	Auto/ Open	Note 18
K409	SIAS	A	HV9433	Loop 2 Hotleg SI. Drain	Closed	Closed	Note 17
			HV0509	RCS Sample Isol.	Closed	Closed	Note 17
			HV0511	Pzr. Stm. Sample Isol.	Closed	Closed	Note 17
			HV0513	Pzr. Surge Line Sample	Closed	Closed	Note 17
			HV0514	Quench tk. Sample	Closed	Closed	Note 17
			HV0516	RCDT Vapor Sample	Closed	Closed	Note 17
			HV5803	CNTMT. Sump Pump Isol.	Closed	Closed	Note 17
			HV9334	SI Drain to RWST	Closed	Closed	Note 17

Category 3 (cont'd)

Relay	ESFAS	Train	Tag No.	Component Description	Status		Justification
					Normal	Actuated	
K409	SIAS	B	HV9437	Loop 1 Hotleg SI. Drain	Closed	Closed	Note 17
			HV0508	RCS Sample Loop 1	Closed	Closed	Note 17
			HV0510	Pzr. Stm. Sample Isol.	Closed	Closed	Note 17
			HV0512	Pzr. Surge Line Sample	Closed	Closed	Note 17
			HV0515	Quench Tk. Sample	Closed	Closed	Note 17
			HV0517	RCS Sample Loop 2	Closed	Closed	Note 17
			HV5804	CNTMT. Sump Pump Isol.	Closed	Closed	Note 17
K210	CIAS	A	HV0509	RCS Sample Isol.	Closed	Closed	Note 17
			HV0511	Pzr. Stm. Sample Isol.	Closed	Closed	Note 17
			HV0513	Pzr. Surge Line Sample	Closed	Closed	Note 17
			HV0514	Quench Tk. Sample	Closed	Closed	Note 17
			HV0516	RCDT Vapor Sample	Closed	Closed	Note 17
			HV5803	CNTMT. Sump Pump Isol.	Closed	Closed	Note 17
			HV9334	SI. Drain to RCDT	Closed	Closed	Note 17
K210	CIAS	B	HV0508	RCS Sample Loop 1	Closed	Closed	Note 17
			HV0510	Pzr. Stm. Sample Isol.	Closed	Closed	Note 17
			HV0512	Pzr. Surge Line Sample	Closed	Closed	Note 17
			HV0515	Quench Tk. Sample	Closed	Closed	Note 17
			HV0517	RCS Sample Loop 2	Closed	Closed	Note 17
			HV5804	CNTMT. Sump Pump Isol.	Closed	Closed	Note 17
K205	CIAS	B	HV5437	CNTMT. N_2 Isol.	Closed	Closed	Note 17
			HV5434	SIT CNTMT. N_2 Isol.	Closed	Closed	Note 17
			HV5686	CNTMT. Fire Prot. Isol.	Closed	Closed	Note 17
			HV7911	CNTMT. Serv. Wtr. Isol.	Closed	Closed	Note 17

Category 3 (cont'd)

Relay	ESFAS	Train	Tag No.	Component Description	Status		Justification
					Normal	Actuated	
K113	EFAS-1	B	-	Pzr. B/U Htrs.	Auto	Off	Note 17
			P145	LP Turbine Emer. Spr.	Off	Off	Note 17
			LT35	Essential Lighting Panel	On	Off	Note 19
K402	EFAS-1	A	-	Pzr. B/U Htrs.	Auto	Off	Note 17
K310	EFAS-2	A	-	Pzr. B/U Htrs.	Auto	Off	Note 17
K310	EFAS-2	B	-	Pzr. B/U Htrs.	Auto	Off	Note 17
			P145	LP Turbine Emer. Spr.	Off	Off	Note 17

Notes for Category 3 ESF Subgroup Relays

11. Unnecessary starting of the emergency chillers (i.e., no valid SIAS, CRIS or TGIS) will cause cumulative equipment damage, which may result in plant shutdown per Tech. Specs.

12. Unnecessary starting and miniflow operation of the HPSI pumps (i.e., no valid SIAS, or not on pump test path) will cause cumulative equipment damage, which may result in plant shutdown per Tech Specs.

13. Actuation of CRIS will result in start of emergency chillers (see Note 11, above) and cumulative inactivation of control room charcoal filter media, which may result in plant shutdown per Tech Specs.

14. Unnecessary starting and no-load operation of the emergency diesel generators (i.e., no valid SIAS, or LOV) will cause cumulative equipment damage (particularly since start from SIAS relay will disable normal protective trips of diesel generator), which may result in plant shutdown per Tech Specs.

15. Interruption of normal computer power may cause cumulative equipment damage which could result in unavailability for plant emergencies.

16. Interruption of power to tne fire protection computer and other portions of the fire detection and actuation system may require increases in shift manning to establish fire watches and backup fire protection.

17. Components normally in safe position. Abnormal lineup or continuity check must be used to test relay.

18. Relay actuation causes change in valve controller setpoint; observation of setpoint change requires either abnormal lineup (to test change in flow) or temporary modification of controller.

19. Relay actuation will interrupt power to panel which supplies lighting in essential plant areas (such as control room), causing temporary loss of illumination and cummulative cycling damage to backup batteries.

FNandy:6195

ESF SUBGROUP RELAYS
SAN ONOFRE UNITS 2&3

Category 4: SUBGROUP RELAYS THAT CAN BE EASILY TESTED AT POWER

Relay	ESFAS	Train	Tag No.	Component Description	Status		Justification
					Normal	Actuated	
K101	SIAS	A	P-174	Boric Acid Makeup Pump	Off	On	--
			P-175	Boric Acid Makeup Pump	Off	On	--
			HV7801	CNTMT. Air Mon. Isol.	Open	Closed	--
			HV7802	CNTMT. Air Mon. Isol.	Open	Closed	--
			HV7816	CNTMT. Emer. Air Sample	Closed	Closed	--
			P-141	Aux. Feed Pump	Off	Delay	--
K108	SIAS	A	P-190	Charging Pump	Run/Stdby	Run	--
			P-191	Charging Pump	Run/Stdby	Run	--
			P-012	CNTMT. Spray Pump	Off	Run	--
K108	SIAS	B	P-191	Charging Pump	Run/Stdby	Run	--
			P-192	Charging Pump	Run/Stdby	Run	--
			P-013	CNTMT. Spray Pump	Off	Run	--
K109	SIAS	A	P-015	LPSI Pump	Off	Run	--
K109	SIAS	B	P-016	LPSI Pump	Off	Run	--
K302	SIAS	A	HV9231	BAMU Pump Recir.	Open	Closed	--
			HV9236	BAMU Pump Recir.	Open	Closed	--
			FV9253	VCT Makeup	Closed	Closed	--
			HV9247	Boric Acid Bypass	Closed	Open	--

Category 4 (cont'd)

Relay	ESFAS	Train	Tag No.	Component Description	Status		Justification
					Normal	Actuated	
K102	SIAS	B	P-025	CCW Pump	Run/Stdby	Run	--
			P-026	CCW Pump	Run/Stdby	Run	--
			E-416	Emer. Clr. (ECCS Pump Rm)	Off	Run	--
			E-445	Emer. Clr. (HPSI Pump Rm)	Off	Run	--
			E-455	Emer. Clr. (CCW Pump Rm)	Off	Run	--
			E-518	Emer. Clr. (CCW Pump Rm)	Off	Run	--
			HV5437	CNTMT. N_2 Isol.	Closed	Closed	--
			HV5434	SIT CNTMT. N_2 Isol.	Closed	Closed	--
			HV5686	CNTMT. Fire Prot. Isol.	Closed	Closed	--
			HV7911	CNTMT. Serv. Wtr. Isol.	Closed	Closed	--
K308	SIAS	A	HV9350	SIT Outlet Isol.	Open	Open	Note 20
			HV9351	SI. Hdr. Drain Isol.	Closed	Closed	Note 21
			HV9325	LPSI to loop 1B	Closed	Open	--
			HV9327	HPSI to loop 1B	Closed	Open	--
			HV9333	HPSI to loop 2B	Closed	Open	--
K308	SIAS	B	HV9370	SIT Outlet Isol.	Open	Open	Note 20
			HV9371	SI. Hdr. Drain Isol.	Closed	Closed	Note 21
			HV9326	HPSI to loop 1B	Closed	Open	--
			HV9331	LPSI to loop 2B	Closed	Open	--
			HV9332	HPSI to loop 2B	Closed	Open	--
K403	SIAS	A	HV9360	SIT Outlet Isol.	Open	Open	Note 20
			HV9361	SI. Hdr. Drain Isol.	Closed	Closed	Note 21
			HV9324	HPSI to loop 1A	Closed	Open	--
			HV9328	LPSI to loop 2A	Closed	Open	--
			HV9330	HPSI to loop 2A	Closed	Open	--

Category 4 (cont'd)

Relay	ESFAS	Train	Tag No.	Component Description	Status		Justification
					Normal	Actuated	
K403	SIAS	B	HV9340	SIT Outlet Isol.	Open	Open	Note 20
			HV9341	SI. Hdr. Drain Isol.	Closed	Closed	Note 21
			HV9322	LPSI to loop 1A	Closed	Open	--
			HV9323	HPSI to loop 1A	Closed	Open	--
			HV9329	HPSI to loop 2A	Closed	Open	--
K410	SIAS	A	HV9920	CNTMT. Chill Wtr.	Open	Closed	--
			HV9921	CNTMT. Chill Wtr.	Open	Closed	--
			--	Emer. Evac. Siren	Off	On	--
K410	SIAS	B	HV9900	CNTMT. Chill Wtr.	Open	Closed	--
			HV9971	CNTMT. Chill Wtr.	Open	Closed	--
K103	SIAS	A	P-112	Saltwater Pump	Run/Stdby	Run	Note 22
			HV6200	P112 Disch Isol.	Open/ Closed	Open	--
			HV6376	P112 Clg. Wtr.	Open/ Closed	Open	--
			P-307	Saltwater Pump	Run/Stdby	Run	--
			HV6202	P307 Disch. Isol.	Open/ Closed	Open	--
			HV6378	P307 Clg. Wtr.	Open/ Closed	Open	--

Category 4 (cont'd)

Relay	ESFAS	Train	Tag No.	Component Description	Status		Justification
					Normal	Actuated	
K103	SIAS	B	P-113	Saltwater Pump	Run/Stdby	Run	Note 22
			HV6201	P113 Disch Isol.	Open/ Closed	Open	--
			HV6377	P113 Clg. Wtr.	Open/ Closed	Open	--
			P-114	Saltwater Pump	Run/Stdby	Run	Note 22
			HV6203	P114 Disch Isol.	Open/ Closed	Open	--
			HV6379	P114 Clg. Wtr.	Open/ Closed	Open	--
K203	CIAS	A	HV9920	CNTMT. Chill Wtr.	Open	Closed	--
			HV9921	CNTMT. Chill Wtr.	Open	Closed	--
K203	CIAS	B	HV9900	CNTMT. Chill Wtr.	Open	Closed	--
			HV9971	CNTMT. Chill Wtr.	Open	Closed	--
K204	CIAS	A	HV7801	CNTMT. Air Mon. Isol.	Open	Closed	--
			HV7802	CNTMT. Air Mon. Isol.	Open	Closed	--
			HV7816	CNTMT. Air Emer. Sample	Closed	Closed	--
K204	CIAS	B	HV7800	CNTMT. Air Mon. Isol.	Open	Closed	--
			HV7803	CNTMT. Air Mon. Isol.	Open	Closed	--
			HV7815	CNTMT. Air Emer. Sample	Closed	Closed	--

Category 4 (cont'd)

Relay	ESFAS	Train	Tag No.	Component Description	Status		Justification
					Normal	Actuated	
K206	CIAS	A	HV7810	CNTMT. Air Mon. Isol.	Open	Closed	--
			HV7811	CNTMT. Air Mon. Isol.	Open	Closed	--
			HV9823	CNTMT. Mini Purge Isol.	Closed	Closed	--
			HV9825	CNTMT. Mini Purge Isol.	Closed	Closed	--
			HV7259	CNTMT. Vent Hdr. Isol.	Closed	Closed	--
			HV7512	RCDT Isol.	Closed	Closed	--
K206	CIAS	B	HV7805	CNTMT. Air Mon. Isol.	Open	Closed	--
			HV7806	CNTMT. Air Mon. Isol.	Open	Closed	--
			HV9821	CNTMT. Mini Purge Isol.	Closed	Closed	--
			HV9824	CNTMT. Mini Purge Isol.	Closed	Closed	--
			HV7258	CNTMT. Vent Hdr. Isol.	Closed	Closed	--
			HV7513	RCDT Isol.	Closed	Closed	--
K309	RAS	A	HV9303	CNTMT. SI. Sump Isol.	Closed	Open	--
			HV9306	SI. Miniflow Isol.	Open	Closed	--
K309	RAS	B	HV9302	CNTMT. SI. Sump Isol.	Closed	Open	--
			HV9347	SI. Miniflow Isol.	Open	Closed	--
K104	RAS	A	P-015	LPSI Pump	Off	Run	--
K104	RAS	B	P-016	LPSI Pump	Off	Run	--
K312	RAS	A	HV9305	CNTMT. SI. Sump Isol.	Open	Open	--
			HV9307	SI. Miniflow Isol.	Open	Closed	--

Category 4 (cont'd)

Relay	ESFAS	Train	Tag No.	Component Description	Status		Justification
					Normal	Actuated	
K312	RAS	B	HV9304	CNTMT. SI. Sump Isol.	Open	Open	--
			HV9348	SI. Miniflow Isol.	Open	Closed	--
K411	MSIS	A	HV4054	S/G Blowdown Isol.	Open	Closed	--
			HV4058	S/G Sample Isol.	Closed	Closed	--
K411	MSIS	B	HV4053	S/G Blowdown Isol.	Open	Closed	--
			HV4057	S/G Sample Isol.	Closed	Closed	--
K105	MSIS	A	HV8201	Aux FW. Pump Stm.	Open	Closed	--
			HV8419	Atm. Stm. Dump	Closed	Closed	Note 20
K105	MSIS	B	HV8200	Aux FW. Pump Stm.	Open	Closed	--
			HV8421	Atm. Stm. Dump	Closed	Closed	Note 20
K404	MSIS	A	HV8203	MSIV Bypass	Closed	Closed	Note 20
			HV8248	Stm. Drain Isol.	Open	Closed	--
K404	MSIS	B	HV8202	MSIV Bypass	Closed	Closed	Note 20
			HV8249	Stm. Drain Isol.	Open	Closed	--
K111	CSAS	A	P-020	NaOH Pump	Off	Run	--
K111	CSAS	B	P-021	NaOH Pump	Off	Run	--
K114	CSAS	A	HV9399	NaOH Blk. vlv	Closed	Open	--

Category 4 (cont'd)

Relay	ESFAS	Train	Tag No.	Component Description	Status Normal	Status Actuated	Justification
K114	CSAS	B	HV9398	NaOH Blk. vlv	Closed	Open	--
K107	CCAS	A&B	QSPDS	Alarm	Off	On	--
K413	CCAS	A	A-071	CNTMT. Dome Circ. Fan.	Off	Run	--
			A-074	CNTMT. Dome Circ. Fan.	Off	Run	--
			E-399	CNTMT. Emer. Clr.	Off	Run	--
			E-401	CNTMT. Emer. Clr.	Off	Run	--
K413	CCAS	B	A-072	CNTMT. Dome Circ. Fan.	Off	Run	--
			A-073	CNTMT. Dome Circ. Fan.	Off	Run	--
			E-400	CNTMT. Emer. Clr.	Off	Run	--
			E-402	CNTMT. Emer. Clr.	Off	Run	--
K211	EFAS-1	A	P-141	Aux. FW Pump (AC)	Off	Run	--
			A-394	AFW Pump Rm. Fan.	Off	Run	--
			HV4713	S/G Aux. FW Contrl.	Closed	(Permissive)	Note 23
			HV4731	S/G Aux. FW Isol.	Closed	(Permissive)	Note 23
K211	EFAS-1	B	HV8200	Main Stm. to P-140	Open	Open	--
			HV4053	S/G Blowdown Isol.	Open	Closed	--
			A-443	AFW Pump Rm. Fan.	Off	Run	--
K112	EFAS-2	A	HV4705	S/G Aux. FW Cntrl.	Closed	(Permissive)	Note 23
			HV4716	P-140 Stm Isol.	Closed	Open	Note 24
			HV4730	S/G Aux. FW Isol.	Closed	(Permissive)	Note 23

Category 4 (cont'd)

Relay	ESFAS	Train	Tag No.	Component Description	Status		Justification
					Normal	Actuated	
K112	EFAS-2	B	P-504	Aux. FW Pump (AC)	Off	Run	--
			A-443	AFW Pump Rm. Fan.	Off	Run	--
			HV4712	S/G Aux. FW Contrl.	Closed	(Permissive)	Note 23
			HV4714	S/G Aux. FW Isol.	Closed	(Permissive)	Note 23
K303	EFAS-2	A	HV8201	Main Stm. to P-140	Open	Open	--
			HV4054	S/G Blowdown Isol.	Open	Closed	--
K402	EFAS-1	B	HV4706	S/G Aux. FW Cntrl.	Closed	(Permissive)	Note 23
			HV4715	S/G Aux. Isol.	Closed	(Permissive)	Note 23
			HV4716	P-140 Stm. Isol.	Closed	Open	Note 24
K624	EFAS-1	A	HV4713	S/G Aux. FW Cntrl.	Closed	Open	--
K624	EFAS-1	B	HV4706	S/G Aux. FW Cntrl.	Closed	Open	--
K724	EFAS-1	A	HV4731	S/G Aux. FW Isol.	Closed	Open	--
K625	EFAS-2	A	HV4730	S/G Aux. FW Isol.	Closed	Open	--
K724	EFAS-1	B	HV4715	S/G Aux. FW Isol.	Closed	Open	--
K725	EFAS-2	A	HV4705	S/G Aux. FW Cntrl.	Closed	Open	--

Category 4 (cont'd)

Relay	ESFAS	Train	Tag No.	Component Description	Status		Justification
					Normal	Actuated	
K625	EFAS-2	B	HV4712	S/G Aux. FW Cntrl.	Closed	Open	--
K725	EFAS-2	B	HV4714	S/G Aux. FW Isol.	Closed	Open	--

Notes for Category 4 - ESF Subgroup Relays

20. Valve normally in safe position; relay must be changed to Category 1 (unsafe plant condition) if valve movement required for relay test.

21. Valve normally in safe position; relay must be changed to category 3 (abnormal lineup) if valve movement required for relay test.

22. Only one (1) pump may be racked in at a time.

23. Relay contacts permissive only; valve actuation does not occur unless cycling relay also actuated.

24. Valve opening will start P-140; valve will open on either Train A (EFAS-2) or Train B (EFAS-1) actuation since either Train A or Train B control power will close breaker for this C-Train powered component.

FNandy:6195

ESF SUBGROUP RELAYS
SAN ONOFRE UNITS 2&3

Category 5: SPARE SUBGROUP RELAYS

Relay	ESFAS	Train	Tag No.	Component Description	Status		Justification
					Normal	Actuated	
K201	CIAS	A	--	--	--	--	--
K212	CIAS	B	--	--	--	--	--
K213	CIAS	A	--	--	--	--	--
K113	EFAS-1	A	--	--	--	--	--
K303	EFAS-2	B	--	--	--	--	--