

LEAKAGE REDUCTION PROGRAM TEST RESULTS

FOR THE

SOUTHERN CALIFORNIA EDISON COMPANY

SAN ONOFRE NUCLEAR GENERATING STATION

UNIT 2

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## I. INTRODUCTION

NUREG 0737, Item III.D.1.1 (Reference A), established requirements for developing a program to reduce leakage from Engineered Safety Features (ESF) systems outside containment which could potentially contain radioactive fluids during a serious transient or accident. The program requirements addressed measures for both immediate and continuing leakage reduction. Immediate measures within the program scope are: (1) to implement all practical measures to reduce leakage in systems that could carry radioactive fluids outside containment, and (2) to measure actual leakage rates with systems in operation. Reference A further required that these leakage rates be reported to the NRC staff.

Southern California Edison, in the FSAR response to NUREG 0660, Item III.D.1.1 (Reference B), has reported the establishment of a leakage reduction program meeting the requirements of Reference A. As reported in Reference B, all practical measures to immediately reduce system leakage have been implemented. Approved station procedures have been developed and executed to measure actual system leakage rates. This report augments the information previously provided in Reference B and reports the ESF system leakage measurement results.

## II. OBJECTIVE

The objective of the leakage reduction program outlined in Reference B is to maintain ESF system leakage to as low as practical. The program objective is met in part, by conducting measurements on the individual components in the ESF systems outside containment. These leakage measurement test results then provide a basis for planning maintenance on excessively leaking components. The first cycle of leakage measurement tests have been completed on the systems designated for leakage testing in Reference B utilizing approved station procedures (References C through F).

Components that exhibited significant leakage were repaired and retested. The total measured ESF system leakage from all components in the systems tested is 873 cc/hour.

## III. TEST RESULTS

This section provides a discussion of the criteria used to select systems requiring leakage testing and describes the leakage measurement test results.

The NRC test program requirements identified in Reference A specified leak testing the following generic plant systems:

- o Residual Heat Removal (RHR)
- o Containment Spray Recirculation
- o High Pressure Injection Recirculation
- o Containment and Primary Coolant Sampling

- o Reactor Core Isolation Cooling
- o Makeup and Letdown
- o Waste Gas System

In response to this listing, a review was conducted of the corresponding San Onofre systems. Also included in the review were all plant systems having similar post accident functions. The following San Onofre systems outside containment as described in Reference (B) could potentially contain highly radioactive fluids following a serious accident. These systems are:

- o High Pressure Safety Injection System - Recirculating Portion Only
- o Low Pressure Safety Injection System - Shutdown Cooling Portion Only
- o Reactor Coolant Sampling System - Post Accident Sampling Piping Only
- o Containment Spray System
- o Radioactive Waste Gas System - Post Accident Sampling Return Piping Only
- o Liquid Radwaste System - Post Accident Sampling Return Piping Only

Systems were excluded from the review if such systems were not required to pump post-accident radioactive fluids. A listing of these systems, together with a summary justification for exclusion, is provided in Table I.

The requirements established for the two phase program outlined in Reference B include efforts to immediately reduce system leakage and establishment of a continuing leakage reduction program. Part I of the two phase program involved the following immediate measures:

- o Capping vent and drain lines to contain seat leakage.
- o Visual inspection of the packing of all valves (except packless diaphragm valves) for evidence of leakage.
- o Visual inspection of packless diaphragm valves.
- o Visual inspection of the seals and packing on all pumps for evidence of leakage.
- o Inspection (snooping) of valves, fittings and compressor seals in gaseous systems for leakage.

Maintenance was performed on individual components as reported in Reference B.

The remaining aspect of Part I involved pressurization of the systems and measurement of component leakage rates. The individual components leak tested included valve stem packing, pump seals and non-welded connections. Leakage measurements were taken using simulated conditions as close to normal operation as possible in accordance with approved station procedures (Reference C through F). Table II illustrates the portions of the systems identified above which were leak tested. For the purposes of this evaluation, leakage is defined as all valve stems, valve packing, pipe fitting, valve seat and equipment leakage that allows fluids or gases to leak beyond the system boundaries both to the environment or to other plant systems. Those components and/or valves comprising the system boundary are shown in Table III.

Part II of the two phase program involves a continuing leak reduction program to ensure that leakage rates remain as low as practical. As defined in Reference B, system leak rate testing measurements will be conducted at intervals not to exceed each refueling outage. Observable leakage discovered during these intervals would be identified in the semiannual walkdowns of the ESF systems and would subsequently be corrected.

The measured leakage from the ESF systems outside containment identified for testing in Table II is 873 cc/hour. This total leakage rate is less than the FSAR expected value of 1,243 cc/hour and less than the value of 2486 cc/hour used in the safety analysis. Table IV identifies twenty-six components tested which exhibited leakage greater than 10 cc/hour. Direct methods to measure system leakage as well as inferred methods such as pressure decay were utilized. Leakage less than 1 cc/hour was not included and components with less than 10 cc/hour leakage were grouped together as other components or other valves in Table IV. Table V shows the physical plant location of the components listed in Table IV and the drainage path of any leakage. Repairs were conducted as necessary and leak testing of the components was completed on a basis not to interfere with plant operations. Five of the components have not been retested because of system unavailability. Retesting for these items will be conducted as plant conditions allow. The total leakage rate for the reworked and retested components was reduced by 82% from 2,604 cc/hour to 471 cc/hour.

TABLE I

SYSTEMS EXCLUDED FROM THE  
LEAKAGE MEASUREMENT PROGRAM

System	Basis for Exclusion
Liquid Radwaste System - except post-accident sampling return piping.	This is not utilized when high coolant activity exists. Samples are taken by the Post Accident Sampling System (which is leak tested) and returned to the containment. Also, the LRS has been excluded by the NRC in a regional meeting.
Radioactive Waste Gas System - except post accident sampling return piping.	This system is not required for use under post accident conditions. Post accident degassing of the reactor coolant system is accomplished by the reactor coolant gas vent system.
Reactor Coolant Letdown System	This system is not required to function under post accident conditions. The plant can be brought to a cold shutdown condition without the letdown system. The letdown system is isolated on Safety Injection and Containment Isolation actuation signals.
Reactor Coolant Pump Seal Bleedoff System	This system is not required to function outside containment under post accident conditions. The system is isolated outside containment on a Containment Isolation actuation signal and remains isolated. If seal bleedoff is required post accident, a header relief valve will lift providing a flow path to the quench tank.
Charging System	The charging system does not contain radioactive fluid under post accident conditions since the letdown system is isolated. The charging system switches suction from the Refueling Water Tank upon receipt of a Safety Injection Signal.

## TABLE II

### ESF SYSTEMS LEAK TESTED

#### Low Pressure Safety Injection System

- o Pump P-015 suction and discharge piping.
- o Pump P-016 suction and discharge piping.
- o Pumps P-015 and P-016 common discharge piping to containment.
- o Pumps P-015 and P-016 common suction piping.
- o Heat exchanger E-003 inlet and outlet piping.
- o Heat exchanger E-004 inlet and outlet piping.
- o Heat exchangers E-003 and E-004 common return piping.

#### High Pressure Safety Injection System

- o HPSI pump number 1 - Train A.
- o HPSI pump number 2 - Train B.
- o HPSI pump number 3.
- o Piping common to Trains A and B (between the closed HPSI header isolation valves and containment).

#### Containment Spray System

- o Pump P-012 suction piping.
- o Pump P-012 discharge piping.
- o Pump P-013 suction piping.
- o Pump P-013 discharge piping.

#### Post Accident Sampling System

- o Reactor Coolant System sample piping to PASS.
- o HPSI pump miniflow piping to PASS.
- o PASS sample station high pressure piping.
- o PASS sample station low pressure piping.
- o Return piping from PASS sample station.
- o PASS gaseous sample piping.

TABLE III

List of components\* outside containment which may contain post-LOCA recirculation fluids.

LPSI System

P-015 Suction & Discharge

S21201MU015  
S21204MU022  
S21204MU022 Bypass  
2PP-9433  
Flange by S21204MR266  
S21204MR266  
2PI-9434  
Flange-Pump Suction  
Pump Seals  
Flange-Pump Discharge  
2FO-9311  
S21204MR273  
S21204MU037  
S21204MU024  
S21204MR091  
S21204MR371

P-016 Suction & Discharge

S21201MU018  
S21201MU018 Bypass  
S21204MU023  
S21204MU023 Bypass  
2PI-9435  
Flange by S21204MR111  
S21204MR111  
2PP-9436  
Flange-Pump Suction  
Pump Seals  
Flange-Pump Discharge  
2FO-9312  
S21204MR112  
S21204MU063  
S21204MU025

P-015 & P-016 Common  
Discharge to Containment

S21204MU081  
S21204MU081 Bypass  
S21204MR099  
2FV-0306  
2PI-0307  
S21204MR102  
S21204MU153  
S21204MU082  
S21204MR368  
S21204MU194  
2FE-0306  
S21204MR095  
2PSV-9318  
S21201MR081  
S21201MR124  
S21201MR078  
S21201MR272

P-015 & P-016 Common Suction

S21201MU037  
Flange by S21201MU037  
2HV-9336  
S21204MR080  
S21201MR079  
S21201MR024  
2HV-9379  
S21201MU036  
Flange by S21201MU036  
2PSV-9387  
S21201MU017  
S21201MR087  
S21201MR091  
S21201MU031  
S21201MU033  
S21201MR020  
S21201MR995

\* Check valves and packless diaphragm valves are not listed. Valve seat leakages from packless valves were measured but the valves were not reworked.

LPSI System (cont.)

P-015 & P-016 Common  
Discharge to Containment

S21201MR271  
2HV-9359  
2HV-9353  
S21204MR259  
S21204MR258  
2FO-9428  
S21204MR257  
S21204MR255  
2HV-9328  
S21204MR362  
2FO-9410  
2HV-9325  
S21204MR361  
2FO-9400  
2HV-9322  
S21204MR360  
2HV-9331  
S21204MR363

P-015 & P-016 Common Suction

S21201MR120  
S21201MR031

E-003 Inlet & Outlet

2HV-8153  
2HV-8153 Bypass  
2FO-9426  
S21206MU014  
2FE-0348  
2PT-0303-2  
S21206MU019  
S21206MU021  
S21206MU020  
S21206MR041  
S21206MR056  
S21206MU005  
2HV-8151

E-004 Inlet & Outlet

2HV-8152  
2HV-8152 Bypass  
2FO-9427  
S21206MU012  
2FE-0338  
2PT-0303-1  
S21206MU022  
S21206MU023  
S21206MU024  
S21206MR040  
S21206MU003  
S21206MR021  
2HV-8150

E-003 & E-004 Common Return

S21204MU162  
S21206MU018  
S21212MU205  
2AP-9317  
S21206MR022  
S21204MU078  
S21204MU078 Bypass  
S21206MR001  
S21204MU079  
2HV-9316  
S21204MR162  
S21204MU080  
S21204MU079 Bypass



## HPSI System

### HPSI Pump #1 - Train A

S21204MR372	2F09314A	S21204MU065
S21204MU190	S21204MU184	S21204MR174
S21204MR365	S21204MU012	2F09423
2PSV8155	S21204MR103	2HV9327
S21204MU007	S21204MR001 (PI 0314)	2PSV9320
S21204MR212 (PP 9437)	S21204MR353 (PP 9438B)	S21204MR021
6" flange by PP 9437	S21204MR167	2F09401
S21204MR088	S21204MR171	2HV9324
S21204MR213	2F09402	2HV9333
P017 suction flange	2HV9330	
P017 seals	S21204MU154	
P017 discharge flange	2FE9421	
4" flange by PP 9438A	S21204MR199	
S21204MR352 (PP 9438A)	S21204MR200	
S21204MR279	S21204MP173	
2F09314	S21204MU064	
S21204MU034	2HV9420	

### HPSI Pump #2 - Train B

S21204MU189	S21204MR356	S21204MR030
2PSV8154	S21204MR094	S21204MR026
S21204MU364	2PSV9319	2FE9435
S21204MU009	S21204MU017	S21204MR201
S21204MR127 (PP 9431)	S21204MR292	S21204MR202
6" flange by 2PP9431	S21204MR004 (PI 0315)	S21204MU044
S21204MR089	S21204MR172	2HV9434
S21204MR128 (PI 9432)	2F09425	S21204MU045
P019 suction flange	2HV9329	2HV9332
P019 seals	S21204MR354 (PP 9438C)	S21204MU017
P019 discharge flange	S21204MR176	
4" flange on pump discharge	2F09403	
2F09315	2HV9326	
2F09315A	S21208MU005	
S21204MU185	2PV9321	
S21204MR105	2F09424	
S21204MU015	S21204MR023	
	2HV9323	

# HPSI System (cont.)

## HPSI Pump #3

## Common To Train A&B\*

S21204MU010	S21204MR170
S21204MR367	2FE0331
S21204MR028	S21204MR009
S21204MR096	S21204MR010
S21204MU011	S21204MR175
S21204MU191	2FE0321
S21204MR214 (PP 9439)	S21204MR007
2PSV8156	S21204MR008
8" flange by PI 9440	S21204MR027
S21204MR215 (PI 9440)	S21204MR022
P018 suction flange	2FE0311
P018 seals	S21204MR005
P018 discharge flange	S21204MR006
S21204MR032	2FE341
4" flange on P018 discharge	S21204MR011
2F09313 up stream flange	S21204MR012
S21204MU036	
S21204MU104	
2F09313A	
S21204MU186	
S21204MU016	
S21204MR106	
S21204MR100	
S21204MU013	
S21204MR104	
S21204MU014	

\*Items to be inspected located between closed HPSI header isolation valves and containment.

## Containment Spray System

### P-012 Suction Lines

2HV-9300  
S21204MU115  
Flanges on S21204MU001  
S21204MU109  
S21204MR357  
S21204MR075 (2AP9401)  
S21204MR161  
Flanges on S21204MU003  
S212045MU062  
S21204MR205 (2PP9411)  
Flange by S21204MU088  
2" Flange by 2HV9399  
2HV9399  
S21204MR083  
S2PI9420  
S21206MU188  
Flange by S21206MU188  
S21206MU193  
2PSV8158  
Flange at P012 Inlet

### P-012 Discharge Lines\*

P012 Seals  
Flange at P012 Outlet  
S21206MR010  
2F09384  
S21206MU010  
2HV9307  
S21206MU012  
S21206MU003  
S21206MR008  
2F09413  
S21206MU008  
Flange by S21206MU008  
2HV9367  
S21206MU025  
Flange by S21206MU025

\*All items between valves S21206MU012 and S21206MU003 were included in the LPSI System test.

### P-013 Suction Lines

2HV-9301  
S21204MU114  
Flanges on S21204MU002  
S21204MU110  
S21204MR074 (2AP9400)  
S21204MR109  
Flanges on S21204MU004  
S21204MR029  
S21204MU005  
Flange by S21204MU087  
S21204MR084 (2PP9412)  
2" Flange by 2HV9398  
S21204MR355  
2HV9398  
S21204MR206  
2PI9419  
S21204MU187  
Flange by S21204MU187  
S21204MU192  
2PSV8157  
Flange at P013 Inlet

### P-013 Discharge Lines\*

P013 Seals  
Flange at P013 Outlet  
2F09385  
S21206MU011  
2HV9348  
S21206MR011  
S21206MR786  
S21206MR017  
S21206MU014  
S21206MU005  
2F09414  
S21206MU009  
Flange by S21206MU009  
S21206MR052  
2HV9368  
S21206MU017  
Flange by S21206MU017

\*All items between valves S21206MU014 and S21206MU005 were included in the LPSI System test.

Post-Accident Sampling System

RCS Sample Lines to PASS

S21212MR161  
2HV-0513  
S21212MU269  
2HV-0518B  
2HV-0518A  
S21212MU024  
2HV-0584  
AX-0494  
2HV-0587A  
2HV-0587B  
S21212MR162  
2HV-0509  
S21212MU268  
2HV-0519B  
2HV-0519A  
S21212MU070  
2HV-0582  
2AX-0492  
2HV-0586A  
2HV-0586B  
S21212MU304

HPSI Pump Mini-Flow Lines to PASS

S21204MU061  
S21204MU151  
S21212MR106  
S21212MR173  
S21212MR168  
S21212MR180  
S21212MR208  
2HV-0588A  
2HV-0588B  
2PSV-0589

PASS SAMPLE STATION  
HIGH PRESSURE LINES\*

2HV-0535A  
Inlet Strainer  
2HV-0535C  
2HV-0535B  
2HV-0536  
PS-241  
PS-219  
PS-220  
PS-205 (Closed)  
Sample Vessel/HX  
PS-213 (Closed)  
PS-204  
Gas Residence Chamber  
PS-215  
PS-129  
PS-217  
PS-216 (Sample Path)  
PS-208 (Closed)  
A-502  
A-503  
PS-206

PASS SAMPLE STATION  
LOW PRESSURE LINES\*

PS-213 (Open)	Burette
PS-100	PS-121
PS-101	PS-131
P-504	PS-122
PS-128	L-502
PS-221	PS-205 (Open)
Sample Circ. Pump	PS-242
PS-218 (Open)	PS-108
PS-248	PS-309
PS-216 (Sample Flask)	Surge Vessel
Depress Liquid Sample Vessel	PS-123
PS-119	PS-132
PS-130	PS-124
PS-120	L-504
L-503	Surge Vessel Pump
PS-247	PS-208 (Open)
PS-246	
PS-227	
PS-103	
P-505	

\*Fittings on PASS High Pressure and Low Pressure Lines were also leak tested.

Post-Accident Sampling System (cont.)

RETURN LINES FROM  
PASS SAMPLE STATION

PASS GASEOUS SAMPLE LINES\*

2RE-7891B	S21212MU248	PS-235
2HV-0535E	2HV-7800	Containment Sample Vessel
2HV-0535D	2HV-7816	PS-236
3HV-7532C	3HV-7816	PS-237
2HV-7532C	3HV-7835A	F-503
S21901MR639	2HV-7835A	PS-238
2HV-7532D	2RE-7891A	PS-116
S21901MR429	2HV-7835C	PS-228
S21901MU372	2HV-7835B	PS-229
S21901MU607	3HV-7261	PS-102
2HV-7513	2HV-7261	P-502
S21901MU606	2HV-7262	PS-249
	S21212MR074	PS-245
	S21212MU012	PS-221
	2HV-7259	Surge Bulb
	S21902MU108	PS-126
	S21902MU109	PS-223
	PS-226	Gas Sample Vessel
	PS-209	PS-224
	PS-535	PS-222
	PS-308	A-504
	PS-309	A-505
	A-506	PS-225
	Containment Sample Pump	

\*Fittings on PASS Gaseous Sample Lines were also leak tested.

TABLE IV

ESF COMPONENT LEAKAGE RATES<sup>(1)</sup>  
(cc/hour)

System	Component	Initial Leakage	Test Date	First Retest Leakage	First Retest Date	Second Retest Leakage	Second Retest Date	Third Retest Leakage	Third Retest Date
LPSI	1204MU022	18	7/3/82						
	P-016 (both seals)	108 <sup>(2)</sup>	7/3/82						
	2FV-0306	54	7/3/82	0	10/14/82				
	2FE-0306	21	7/3/82	51	8/13/82	9	10/14/82		
	2HV-9359	75	7/3/82	15	8/13/82	6	10/14/82		
	2HV-9353	75	7/3/82	0	8/13/82				
	1204MR257	12	7/3/82						
	2FO-9426	15	7/3/82	0	11/19/82				
	2FE-0348	36	7/3/82	0	8/13/82				
	2HV-8152	36	7/3/82	0	8/13/82				
	2FO-9427	12	7/3/82	0	10/14/82				
	1206MU018 Flange	12	7/3/82	0	8/13/82				
	Other Valves <sup>(3)</sup>	60	7/3/82	51	11/4/82				
	534 cc/hour - 330 cc/hour retest reduction = 204 cc/hr								
HPSI	P-017 (casing drain)	300	7/28/82	0	8/11/82				
	1204MU012	60	7/29/82	75	8/11/82	0	10/21/82		
	1204MR103	12	7/29/82	0	8/11/82				
	P-019 (seals & vent)	708	7/30/82	783	8/11/82	126	10/22/82	24	2/10/83
	1204MR105	180 <sup>(4)</sup>	7/30/82						
	1204MR094	120	7/29/82	375 <sup>(4)</sup>	8/11/82				
	1204MR030	42	7/29/82	57 <sup>(4)</sup>	8/11/82				
	1204MU016	18 <sup>(4)</sup>	7/29/82						
	1204MR104	204	7/29/82	0	4/21/83				
	1204MU014	165 <sup>(4)</sup>	7/28/82						
	1,809 cc/hour - 1,170 cc/hour for retest reductions = 639 cc/hour								
CS	1206MR008	180	7/21/82	0	12/30/82				
	Other Components <sup>(3)</sup>	18	7/21/82						
	198 cc/hour - 180 cc/hour for retest reductions = 18 cc/hour								
PASS <sup>(5)</sup>	1212MR162	402	7/31/82	36	10/21/82	0	12/29/82		
	Inlet Strainer	36	8/12/82	0	9/1/82				
	2HV-0535B	15	7/31/82	0	1/12/83				
	Other Valves <sup>(3)</sup>	12	7/31/82						
	465 cc/hour - 453 cc/hour for retest reductions = 12 cc/hour								

- Notes (1) These components demonstrated significant leakage during the first system test and were repaired/reworked as plant conditions allowed.
- (2) Not scheduled for retest due to uncertainty of producing further leak reduction; 100 cc/hr is leak rate parameter for pump seals.
- (3) Measured leakage for these valves was  $\leq 10$  cc/hr each per inch of valve stem diameter.
- (4) These components will be reworked and retested as plant conditions allow.
- (5) Baseline data has not changed significantly since physical changes were made to PASS.

Summary of Leakage Rates

<u>System</u>	<u>Initial Leakage</u>	<u>Final Leakage</u>
LPSI	534 cc/hour	204 cc/hour
HPSI	1,809	639
CS	198	18
PASS	465	12
Total	3,006 cc/hour	873 cc/hour

TABLE V

ESF COMPONENT LEAKAGE LOCATIONS

SYSTEM	COMPONENT	PHYSICAL PLANT LOCATION OF COMPONENT	LEAKAGE DRAINS TO
LPSI	1204MU022	LPSI Pump Room 005 (P-015)	SIS <sup>a</sup>
	P-016	LPSI Pump Room 002 (P-016)	SIS
	2FV-0306	HX Room 018 (E-004); Elev. (-) 14'-0"	SIS
	2FE-0306	Pump Room 005; Elev. 1'-0"	SIS
	2HV-9359	PPA <sup>(b)</sup> [111] near Pen. #9; Elev. 34'-0"	PAS <sup>c</sup>
	2HV-9353	PPA, Piping Room 207	PAS
	1204MR257	PPA, [113]	PAS
	2FO-9426	HX Room 016 (E-003); Elev. 2'-8"	SIS
	2FE-0348	HX Room 003	SIS
	2HV-8152	HX Room 003	SIS
	2FO-9427	HX Room 018 (E-004); Elev. 5'-7"	SIS
	1206MU018	HPSI Pump Room 002 (P-019)	SIS
	Flange		
HPSI	P-017	HPSI Pump Room 005 (P-017)	SIS
	1204MU012	HPSI Pump Room 005 (P-017); Elev. (-) 14'-0"	SIS
	1204MR103	HPSI Pump Room 005 (P-017)	SIS
	P-019	HPSI Pump Room 002 (P-019)	SIS
	1204MR105	HPSI Pump Room 002 (P-019)	SIS
	1204MR094	Piping Room 013; Elev. 10'-6"	SIS
	1204MR030	PPA [110] near Column 13.2 & P6; Elev. 12'-0"	PAS
	1204MU016	HPSI Pump Room 015 (P-018); Elev. (-) 14'-0"	SIS
	1204MR104	HPSI Pump Room 015 (P-018); Elev. (-) 14'-0"	SIS
	1204MU014	HPSI Pump Room 015 (P-018); Elev. (-) 14'-0"	SIS
CSS	1206MR008	Piping Room 013; Elev. 12'-0"	SIS
PASS	1212MR162	PPA [110] near Pen. #4; Elev. 33'-0"	PAS
	Inlet Strainer	PASS Room (Rm #215); Elev. 24'-0"	RWS <sup>d</sup>
	2HV-0535B	PASS Room (Emergency Sample Station C)	RWS

(a) SIS - Safety Injection Sump

(b) PPA - Piping Penetration Area

(c) PAS - Penetration Area Sump

(d) RWS - Rad. Waste System Sump



#### IV. REFERENCES

- A. NUREG 0737, Item III.D.1.1: "Integrity of Systems Outside Containment Likely to Contain Radioactive Materials for Pressurized Water Reactors"
- B. Response to NRC Action Plan, NUREG 0660, San Onofre Nuclear Generating Station, Units 2 and 3; Item III.D.1.1: "Primary Coolant Sources Outside the Containment Structure"
- C. San Onofre Nuclear Generating Station, Unit 2, Special Procedure S02-SP-201-01, Revision 0: Low Pressure Safety Injection System Leak Rate Measurement
- D. San Onofre Nuclear Generating Station, Unit 2, Special Procedure S02-SP-201-02, Revision 0: High Pressure Safety Injection System Leak Rate Measurement
- E. San Onofre Nuclear Generating Station, Unit 2, Special Procedure S02-SP-202-01, Revision 0: Containment Spray System Leak Rate Measurement
- F. San Onofre Nuclear Generating Station, Unit 2, Special Procedure S02-SP-243-01, Revision 0: Post Accident Sampling System Leak Rate Measurement