

MEMO TO Chris Grimes

June 19, 1984

DATE PREPARED

SUBJECT: Pipe Support Status Information

San Onofre Unit 1

Attached is a summary table identifying the status of pipe supports for one stress problem (FW-04). The information on this table in combination with a piping isometric should tell you everything you want to know about the pipe supports on this line. We are proceeding to prepare similar tables for the other stress problems in the Return to Service scope. If you have any comments on this table, please let me know as soon as possible.

  
Jack Rainsberry

8506180165 850326  
PDR FOIA  
BELL84-885 PDR

From

C/16

Summary Table Listing All Active Supports  
For Line No. FW-04

## ATTACHMENT 1

SUPPORT I.D. NUMBER is a unique hanger mark number used to identify each support. For example, the support I.D. number S1-02-0326-H005 refers to:

- S1 - Support at SONGS-1
- 02 - Identifies general area of location in plant
- 0326 - Identifies piping line number or which support is located
- H005 - Designates the hanger number.

DATA POINT is the nodal point used in modeling each support on the piping isometric (mathematical model).

TYPE defines the type and direction of each support such as Y rigid or X, Z snubber.

STATUS refers to construction status. The following statuses are used:

- CX = Completed new support
- CM = Completed modification
- CR = Completed repair
- CN = Completed no change
- IX = Incomplete new support
- IM = Incomplete modification
- IR = Incomplete repair

MAXIMUM STRESS RATIO defines the ratio of the capacity of the support to which it is loaded and hence, provides an indication of the margin of safety for each support. The support capacities are evaluated based on the design requirements as defined in the ASME Code for Level D loads (attached as Table 1). In cases where departure from code allowables are taken for Return to Service conditions, an asterisk notation is provided by the support classification.

SUPPORT CLASSIFICATION refers to the categorization of the active supports. This is described below:

- Type A: Those supports which will remain below functionality limit through the DBE event.
- Type B: Those supports which will yield but will maintain load carrying capability.
- Type C: Those supports which will fail in a brittle manner and will provide no load carrying capability.

ATTACHMENT 1

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For those existing supports which are classified as Types B and C, no stress ratio is provided indicating that these supports have either yielded (Type B) or failed (Type C). However, it is explicitly shown by means of the energy balance method that the yielding or failure of these supports will not impair the functionality of the piping and of the other Type A (qualified) supports.

NOTES In this column, various notes are provided pertaining to whether the as-installed support is sufficient or further construction work is required. For those supports where construction is required, it is also indicated whether the existing designs are adequate or redesign or modification to existing designs is required.

# **LISTING OF ALL ACTIVE SUPPORTS REQUIRED TO MAINTAIN PIPE FUNCTIONALITY**

LINE No. FW-04

SUPPORT ID.	DATA POINT	TYPE	STATUS	MAXIMUM STRESS RATIO	SUPPORT CLASSIFICATION	ATTACHED TO INELASTIC BEAMS	NOTES
S1-06-321-H010	255	X SNB	IM	0.46	A	no	(1)
-H011	255	Z RGD	IM	0.62	A	no	(1)
-H008	260	Y RGD	IX	0.38	A	no	(2)
S1-05-322-H006	220	Y RGD	IM	0.93	A	no	(2)
S1-05-325-H005	536	X,Z SNB	IX	0.76	A	no	(2)
S1-02-325-H017	540	Y SPR	IX	0.93	A	no	(1)
-H021	550	X,Y,Z SNB	IX	---	A	no	(5)
-H005	604	Y RGD	CX	---	B	yes	(1)
-H004	606	Y RGD	CX	0.99	A*	no	(1)
-H010	608	X,Y,Z SNB	IX	0.20	A	yes	(2)
-H020	613	Y,Z RGD	CX	0.17	A	no	(1)
-H008	614	Y,Z RGD	CR	0.29	A	no	(1)
-H007	616	Y SPR	CN	0.96	A*	no	(1)

## **NOTES:**

- 1- Construction is not required. As-installed support is sufficient.
- 2- Construction is required. Modification to and/or installation as per Rev. 0 design is adequate.
- 3- Construction is required. Existing Rev. 0 design is not adequate/Rev. 0 design does not exist. Redesign or modification to existing design is required.
- 4-\*Indicates higher than code allowables have been used for return to service conditions.
- 5- Support is qualified as per Rev. 0 analysis. Requalification not performed.

# **LISTING OF ALL ACTIVE SUPPORTS REQUIRED TO MAINTAIN PIPE FUNCTIONALITY**

LINE No. FW-04 (Continued)

SUPPORT ID.	DATA POINT	TYPE	STATUS	MAXIMUM STRESS RATIO	SUPPORT CLASSIFICATION	ATTACHED TO INELASTIC BEAMS	NOTES
S1-02-325-H323 (H524)	625 (667)	Y RGD	CX	0.93	A	no	(1)
-H013	639	Y, Z RGD	CM	0.85	A	yes	(1)
-H019	658	Y, Z RGD	IM	---	C	yes	(1)
-H011	682	Y, Z RGD	CM	0.45	A	yes	(1)
S1-02-326-H005	708	X, Y, Z SNB	IX	---	A	yes	(3)
-H012	713	Y, Z RGD	CX	0.24	A	yes	(1)
-H004	714	Y, Z RGD	CR	0.18	A	yes	(1)
-H003	716	Y SPR	CN	0.75	A*	yes	(1)
-H009	739	Y, Z RGD	CM	0.88	A	yes	(1)
-H015	758	Y, Z RGD	IM	---	C	yes	(1)
-H007	782	Y, Z RGD	CM	0.83	A	yes	(1)
S1-02-329-H001	804	Y RGD	IX (60% Comp)	0.96	A	no	(2)
-H006	808	X, Y, Z SNB	IX	0.21	A	yes	(2)

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# **LISTING OF ALL ACTIVE SUPPORTS REQUIRED TO MAINTAIN PIPE FUNCTIONALITY**

LINE No. FW-04 (Continued)

SUPPORT ID.	DATA POINT	TYPE	STATUS	MAXIMUM STRESS RATIO	SUPPORT CLASSIFICATION	ATTACHED TO INELASTIC BEAMS	NOTES
S1-02-329-H010	813	V,Z RGD	CX	0.24	A	yes	(1)
-H005	814	V,Z RGD	CR	0.33	A	yes	(1)
-H004	816	V SPR	CR	0.75	A	yes	(1)
-H007	838	V,Z RGD	CM	0.78	A	yes	(1)
-H011	858	V,Z RGD	IM	---	C	yes	(1)
-H012	882	V,Z RGD	CM	0.99	A	yes	(1)
-H013	890	V,Z RGD	CM	0.80	A	yes	(1)

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TABLE 1  
CRITERIA FOR ASSESSING LEVEL D SUPPORT CAPACITY

<u>Stress/Component</u>	<u>Criterion</u>
Bending, Tension	Min (1.2 $F_y$ , 0.7 $F_u$ and 2/3 critical buckling stress)
Shear	$F_v = 0.8F_y \leq 0.42F_u$
Stability (Compression)	$F_a = \frac{\text{Resultant compressive stress}}{F.S.}$ $1.66 \leq F.S. \leq 1.92$
Anchor	$F_{AB} = \frac{F_u}{F.S.}$  $F.S. = 4 *$
Welds	$F_w = 1.33 S_a$ where $S_a = 18$ ksi for E60 electrodes and $S_a = 21$ ksi for E70 electrodes If unknown, use $S_a = 18$ ksi
Standard Components	Use Manufacturer specified Level D load allowables.
where $F_y$ = yield stress at design temperature	
$F_u$ = ultimate strength at design temperature	
F.S. = factor of safety	

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\* On a case-by-case basis, a factor of safety of 2 is used for Return to Service allowables.



ATTACHMENT II

<u>STATUS</u>	<u>NOTES</u>	<u>EXPLANATION</u>
I	1	: Support qualifies as installed Support in plant prior to 1982 Construction on support may be incomplete
I	2	: Revision 0 design is required Support meets ASME Code for Level D loads Construction on support is required
I	3	: Revision 0 design must be upgraded New support, when designed, will meet ASME code for Level D loads Construction on support is required
C	1	: Support is complete

Any support with a "1" in the NOTES column does not require any construction and is therefore available for inspection. All other supports are in an incomplete condition.

## ROUTING AND TRANSMITTAL SLIP

Date

7/5/84

TO: (Name, office symbol, room number, building, Agency/Post)	Initials	Date
1. Larry Chandler, OELD		
2.		
3.		
4.		
5.		

Action	File	Note and Return
Approval	For Clearance	Per Conversation
As Requested	For Correction	Prepare Reply
Circulate	For Your Information	See Me
Comment	Investigate	Signature
Coordination	Justify	

## REMARKS

RE: SONGS 1 RESTART REQUIREMENTS

Attached are:

1. 8/11/82 Order, including California notice
2. Referenced 6/15/82 and 6/24/82 SCE letters
3. 2/8/84 SER and 3/7/84 update on the criteria for the "restart" scope of seismic upgrades
4. Figure depicting the scope of the Hot Standby system for restart

Please let me know when you will have a fair understanding of the findings and form required to support a restart decision.

Thanks.

DO NOT use this form as a RECORD of approvals, concurrences, disposals, clearances, and similar actions

FROM: (Name, org. symbol, Agency/Post)	Room No.—Bldg.
Chris Grimes, SEPB	
	Phone No. X27464

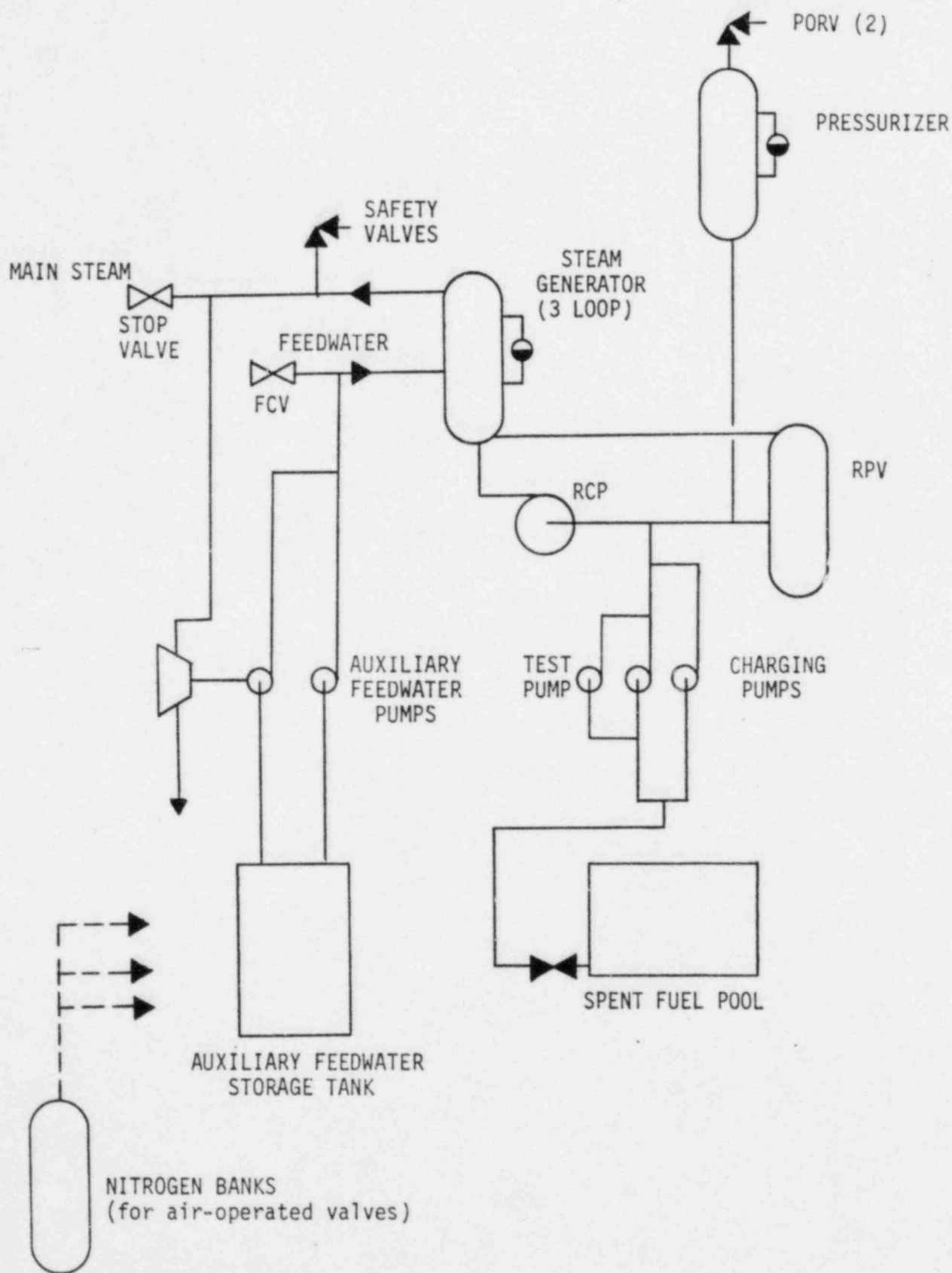
5041-102

OPTIONAL FORM 41 (Rev. 7-76)  
Prescribed by GSA  
FPMR (41 CFR) 101-11.206

\* GPO: 1983 O - 381-529 (232)

C/15

SAN ONOFRE UNIT 1  
SEISMIC HOT STANDBY SYSTEM



\* ALL SYSTEM ISOLATION VALVES, VENTS AND DRAINS

STATUS OF COMPLETION OF JUNE 24, 1982

COMMITMENTS - SAN ONOFRE 1

The June 24, 1982 letter outlined the activities for completion of seismic upgrading of San Onofre 1 to the 0.67g Housner spectra. The status of each aspect of this program is described below.

A. Site Ground Motion

By letter dated September 16, 1982, the staff concluded that the 0.67g Housner ground response spectrum with a 10% increase in the 0.07 to 0.25 second period range and the 0.44g Housner ground response spectrum with a 10% increase in the 0.05 to 0.15 second period range are the appropriate horizontal and vertical free motions for seismic reevaluation. On August 16, 1984, the staff reconfirmed its decision on the vertical ground motion. Therefore, this activity is complete.

B. In-situ Soil Conditions

The soil conditions have been characterized and the effects on structures, systems and components under seismic loading have been evaluated. Some modifications were made, such as to the auxiliary feed-water pump supports and the 480v room foundation as a result. The staff has concluded that the seawall will remain functional following the postulated earthquake. Review of the settlement aspects is still continuing; however, this issue does not need to be resolved for restart.

C. Structures

The analysis of safety-related structures has been completed. Modifications have been made to reactor auxiliary building connections, turbine building bracing and intake structure walls. The staff still

has some questions regarding the fuel storage building, but these questions are not of such significance as to require resolution prior to restart. The degradation of intake structure rebar will have to be assessed, but this structure is not required to maintain a hot standby condition. The licensee is proceeding to install steel plates on the intake structure walls to enable the structure to withstand a 0.67g earthquake with no credit for the rebar on the inside of the walls.

#### C.8 Masonry Walls

The analysis methodology has been validated by a test program to show that masonry walls will not catastrophically fail as a result of the postulated earthquake. Some modifications were made to connections and stiffening braces were installed in locations where excessive deflection of the wall might affect attached equipment. A letter describing the licensee actions relative to deflection of masonry walls will be provided in September 1984.

#### C.9 In-situ Response Spectra

This issue is resolved per the July 7, 1983 trip report.

#### D. Mechanical Equipment and Piping

Systems and components required to prevent accidents and to reach a hot standby condition have been upgraded. A new auxiliary feedwater storage tank and new AFW piping have been installed. The upgrading of supports of remaining systems and components normally used for cold shutdown and for accident mitigating systems have not yet been completed.

E. Electrical Raceways and Conduits

Most of the conduit and cable tray modifications have been completed. Based on the upgrading program being conducted by the licensee and the modifications to date, it is concluded that this equipment will survive the postulated earthquake.

F. Anchorage of Electrical Equipment

Licensee evaluation and modification of anchorages of safety-related electrical equipment is complete. Staff review is continuing.

G. Seismic Backfit Project

There are no open items on this review (see July 7, 1983 letter).