

# REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8306140444 DOC. DATE: 83/06/09 NOTARIZED: NO DOCKET #  
 FACIL: 50-361 San Onofre Nuclear Station, Unit 2, Southern California 05000361  
 AUTH. NAME: AUTHOR AFFILIATION:  
 BASKIN, K.P. Southern California Edison Co.  
 RECIP. NAME: RECIPIENT AFFILIATION:  
 KNIGHTON, G.W. Licensing Branch 3

SUBJECT: Confirms mods to high pressure governor valves 2 & 4 & to provide analyses of valve opening force & adequacy of mechanical clamps per 830208 commitment. Analyses encl.

DISTRIBUTION CODE: B001S COPIES RECEIVED: LTR 1/ ENCL 1/ SIZE: 4/-----  
 TITLE: Licensing Submittal: PSAR/FSAR Amdts & Related Correspondence

NOTES: J Hanchett 1cy PDR Documents, ELD Chandler 1cy. 05000361  
 NRR Scaletti 1cy.

RECIPIENT		COPIES		RECIPIENT		COPIES	
ID	CODE/NAME	LTTR	ENCL	ID	CODE/NAME	LTTR	ENCL
NRR	DL/ADL	1	0	NRR	LB3 BC	1	0
NRR	LB3 LA	1	0	ROOD, H.	01	1	1
INTERNAL:	ELD/HDS2	1	0	IE	FILE	1	1
	IE/DEPER/EPB 36	3	3	IE/DEPER/IRB 35		1	1
	IE/DEQA/QAB 21	1	1	NRR/DE/AEAB		1	0
	NRR/DE/CEB 11	1	1	NRR/DE/EHEB		1	1
	NRR/DE/EB 13	2	2	NRR/DE/GB 28		2	2
	NRR/DE/MEB 18	1	1	NRR/DE/MTEB 17		1	1
	NRR/DE/SAB 24	1	1	NRR/DE/SGEB 25		1	1
	NRR/DE/SGEB 30	1	1	NRR/DHFS/HFEB40		1	1
	NRR/DHFS/LQB 32	1	1	NRR/DHFS/PSRB		1	1
	NRR/DL/SSPB	1	0	NRR/DSI/AEB 26		1	1
	NRR/DSI/ASB	1	1	NRR/DSI/CPB 10		1	1
	NRR/DSI/CSB 09	1	1	NRR/DSI/ICSB 16		1	1
	NRR/DSI/METB 12	1	1	NRR/DSI/PSB 19		1	1
	NRR/DSI/RAB 22	1	1	NRR/DSI/RSB 23		1	1
	REG FILE 04	1	1	RGNS		3	3
	RM/DDAMI/MIB	1	0				
EXTERNAL:	ACKS 41	6	6	BNL (AMDTs ONLY)		1	1
	DMB/DSS (AMDTs)	1	1	FEMA-REP DIV 39		1	1
	LPDR 03	1	1	NRC PDR 02		1	1
	NSIC 05	1	1	NTIS		1	1
NOTES:		3	3				

TOTAL NUMBER OF COPIES REQUIRED: LTTR 57 ENCL 50

*Southern California Edison Company*



P. O. BOX 800  
2244 WALNUT GROVE AVENUE  
ROSEMEAD, CALIFORNIA 91770

K. P. BASKIN  
MANAGER OF NUCLEAR ENGINEERING,  
SAFETY, AND LICENSING

June 9, 1983

TELEPHONE  
(213) 572-1401

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 No. 50-361  
San Onofre Nuclear Generating Station (SONGS)  
Unit 2

SCE's letter of February 8, 1983 committed to provide details of General Electric Company Limited (GEC) analyses of the turbine high pressure (HP) governor valve opening force and of the adequacy of the mechanical clamps (gags) to maintain the stop valves in the affected leads in the closed position. SCE also committed prior to proceeding to 100% power to modify HP governor valves #2 and #4 with new valve heads to minimize the inadvertent openings encountered previously. The purpose of this letter is to satisfy these commitments.

Due to the inadvertent opening of the #2 and #4 HP governor valves experienced in January and February, 1983, mechanical clamps were fabricated by SCE and installed to block the stop valves in the closed position during operation. At that time, GEC performed analyses of the possibility of the turbine HP governor valves opening and of the capability of the mechanical clamps to hold the valves closed during operation. The GEC analyses are included as Enclosures 1 and 2.

The #2 and #4 HP governor valves were subsequently replaced in February with valves modified to the same valve head configuration as the #1 and #3 HP governor valves. The mechanical clamps were removed since they were no longer needed. New valve heads were designed by GEC which are expected to eliminate the instabilities encountered previously. This new design has been approved by SCE and was installed in April 1983 for the #2 and #4 HP governor valves. To date, inadvertent openings due to valve head operational instabilities have

8306140444 830609  
PDR ADOCK 05000361  
P PDR

3001  
1/1

Mr. G. W. Knighton

-2-

June 9, 1983

not occurred. SCE plans to modify and reinstall the #1 and #3 HP governor valves during the next outage of sufficient duration and after the necessary parts are received from GEC.

If you have any questions or comments, please contact me.

Very truly yours,

*K P Buskin*

Enclosures

cc: Mr. H. Rood, Project Manager  
Licensing Branch No. 3

## ENCLOSURE 1

### MAXIMUM VALVE OPENING FORCE

The valve loading is derived from a summation of steam forces. The steam pressure drop across the valve head in the closed position is effective on the difference between the balance piston area and the valve seat area. The downstream pressure acts on the spindle area. The total opening force is a maximum with a closed stop valve. Minimum upstream pressure is assumed to be zero due to possible venting by the steam chest drain. A downstream pressure of 706 psi has been taken as the basis of the calculation, corresponding to the condition with the two cut-back valves fully opened and giving approximately 90 percent power.

Maximum opening force is calculated as follows:

Seat area	265.9 sq. in.
Balance piston area	232.9 sq. in.
Thus effective area	33 sq. in.
Spindle area	9.6 sq. in.
Steam force on valve	$706 (33 + 9.6) = 30,100 \text{ lbs.}$

The above relates to a fault condition or possible on load test condition when the stop valve closes and the space between the two valves is vented by the drain. The intended operating regime was with an open stop valve thus admitting supply pressure to the inlet of the valve. This would generate a closing force on the valve resulting in a net closing force and therefore no force on the gag.

The bolt stress quoted of 14,800 psi is a direct stress resulting from carrying the full horizontal thrust on the gag through the bolts.

Reference: GEC Communication No. 5492, dated March 22, 1983.

ENCLOSURE 2

MAXIMUM STRESS IN CLAMPS (GAGS)

Gags are fitted to valves 2 and 4. For each valve, the maximum valve loading occurs when the pressure after the governor valves is maximum and when the associated stop valve is closed and the governor valve chest drain open. Maximum down stream pressure occurs when valves 1 and 3 are fully open.

Under these conditions, the margins are as follows:

1. Total upward (opening) steam force on valve spindle	30,100 lbs.
2. Downward (closing) spring force on valve spindle	9,300 lbs.
3. Net vertical force on valve spindle	20,800 lbs.
4. Net horizontal force on gag	13,700 lbs.
5. Maximum stress in gag (bolts)	14,800 psi
6. Margin on gag material yield	1.97

Reference: GEC Communication No. 5479, dated March 14, 1983.