NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/85

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 2	0 5 0 0 0 3 6 1	1 OF 0 2

TITLE (4)
Decalibration of Calculated Static Thermal Power

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)
0 2	1 4	8 4	8 4	0 0 9	0 0	0 3	1 5	8 4	Unit 3	0 5 0 0 0 3 6 2
										0 5 0 0 0

OPERATING MODE (9)	3	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	0 1 0 0	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	X OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	Voluntary Report
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
	AREA CODE
J. G. Haynes, Station Manager	7 1 4 — 4 9 2 - 7 7 0 0

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	

SUPPLEMENTAL REPORT EXPECTED (14)

X YES (If yes, complete EXPECTED SUBMISSION DATE) ☐ NO

EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
	0 6	1 5	8 4

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

This submittal provides an informational Licensee Event Report on the decalibration of calculated Static Thermal Power for Units 2 and 3. An analysis of startup test data for Units 2 and 3 established that Calculated Thermal Power (BDT), calculated by the Core Protection Calculators (CPCs), may become decalibrated relative to secondary calorimetric power as a result of changes in radial core power distribution. This could result in the generation of nonconservative values of Local Power Density and Departure from Nucleate Boiling Ratio.

Combustion Engineering has explicitly evaluated the impact of decalibration of the CPC Static Thermal Power calculation, and has concluded that Unit 2 has operated within the bounds of its safety analysis. The evaluation of Unit 3 is not yet completed.

As corrective action to prevent decalibration, Procedure SO23-5-1.7 was changed to include provisions for verifying BDT calibration at 20 percent power intervals during power ascension and following movement of Control Element Assemblies (CEA's). This change will remain in effect until an interim change can be made to the appropriate CPC addressable constants so that any uncertainty in thermal power is grouped conservatively into the CEA deviation penalty.

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 2	0 5 0 0 0 3 6 1	8 4	— 0 0 9	— 0 0	0 2 OF 0 2

TEXT (If more space is required, use additional NRC Form 366A's) (17)

This submittal provides an informational Licensee Event Report on the decalibration of calculated Static Thermal Power for Units 2 and 3. An analysis of startup test data for Unit 2 and 3 established that Calculated Thermal Power (BDT), calculated by the Core Protection Calculators (CPC's), may become decalibrated relative to secondary calorimetric power as a result of changes in radial core power distribution. BDT is generated by using the mass flow rate of the reactor coolant and temperature rise across the core. Due to temperature stratification in the coolant leaving the reactor vessel, the hot leg temperature (T_H) detectors may provide signals to the CPC's which are not representative of average reactor coolant bulk temperature. The error in the calculation of BDT could result in nonconservative values of Local Power Density (LPD) and Departure from Nucleate Boiling Ratio (DNBR). Since changes in radial core power distribution directly affect the temperature stratification which occurs, once BDT has been calibrated with secondary calorimetric power, changes in power level or Control Element Assembly (CEA) configuration may result in the decalibration of BDT beyond the design allowance.

Combustion Engineering has evaluated the impact of decalibration of BDT and has concluded that Unit 2 has operated within the bounds of its safety analysis, and even under the most adverse decalibration effects, the specified Fuel Design Limits would not have been violated during an accident. The evaluation of Unit 3 is not yet completed.

It is important to note that BDT is only needed for certain CEA deviation events, and that a number of conditions are required to be present concurrently for thermal power decalibration to result in nonconservative values of LPD and DNBR. Although the probability of this combination of events is not within the definition of Anticipated Operational Occurrences, the following corrective actions will explicitly account for this decalibration effect. The Unit 2 and Unit 3 Procedure SO23-5-1.7 was changed to include provisions for verifying BDT calibration at 20 percent power intervals during power ascension and following movement of CEA's. The SO23-5-1.7 change will remain in effect until an interim change can be made to the appropriate CPC addressable constants so that any excess uncertainty beyond the design allowance in thermal power is grouped conservatively into the CEA deviation penalty; this is appropriate since BDT is only needed for CEA deviation events and for no other Anticipated Operational Occurrence. This program will be in effect until a final recommendation is received from Combustion Engineering.

A revision to this LER will be submitted to provide the results of the Unit 3 evaluation and the final recommendation from Combustion Engineering.

Southern California Edison Company

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STATION MANAGER

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March 15, 1984

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, D. C. 20555

Subject: Docket No. 50-361
30-Day Report
Licensee Event Report No. 84-009
San Onofre Nuclear Generating Station, Units 2 and 3

This submittal provides an informational Licensee Event Report (LER) on the decalibration of calculated Static Thermal Power for Units 2 and 3. Since this involves the same components, system, cause and method of discovery for Unit 2 and Unit 3, a single LER for Unit 2 is enclosed in accordance with NUREG-1022. The health and safety of plant personnel or the public were not affected by this event.

If you require any additional information, please so advise.

Sincerely,

J. G. Haynes

Enclosure: LER No. 84-009

cc: A. E. Chaffee (USNRC Resident Inspector, Units 1, 2 and 3)
J. P. Stewart (USNRC Resident Inspector, Units 2 and 3)

J. B. Martin (Regional Administrator, NRC Region V)

Institute of Nuclear Power Operations (INPO)

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