



## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
Rancho Seco Nuclear Generating Station	05000312	87	025	01	02	OF	05

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

This report is of an event where a single cause or condition caused at least one independent train or channel to become inoperable in multiple systems or two independent trains or channels to become inoperable in a single system designed to remove residual heat.

During cold shutdown conditions, three thermal relief valves on the decay heat system were found to be outside of the acceptance criterion for pressure relief. Technical Specification 4.5.1.2.A commits the District to ASME Section XI, except where specific relief was granted. Because the plant was shutdown with both steam generators operable, and the decay heat system trains were in a planned outage during this event, Technical Specifications LCOs 3.3.1.A.4 and 3.1.1.5.A for decay heat system operability did not apply. The three thermal relief valves have safety significance. Two valves did, in fact, relieve below the rated hydrostatic test pressure of the decay heat system. One valve did not lift during the as-found test. Failure of those valves to properly relieve pressure, technically render both trains of decay heat removal inoperable by a common failure mode. (10 CFR Part 50.73(a)(2)(vii))

The method of discovery of each component or system failure or procedural error (testing, investigating, troubleshooting, tour, observation).

ASME Section XI testing of decay heat system relief valves was in progress on May 10, 1987, at which time the as-found data for the three subject valves was taken.

Dates and approximate times of occurrences.

This event was documented on ODR (87-540) and NCR (S-6700), both dated May 11, 1987.

Plant operating conditions before the event.

The plant was in cold shutdown for over fifteen months with no significant decay heat emanating from the core.

Status of structures, components, or systems that were inoperable at the start of the event and that contributed to the event.

Both decay heat systems were already removed from service during this event for maintenance and testing.

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APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/88

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The Energy Industry Identification System component function identifier and system name of each component or system referred to in the LER. The manufacturer and model number (or other identification) of each component that failed during the event.

<u>Valve Number</u>	<u>Manufacturer</u>	<u>Model/Type</u>	<u>NRC LER System, Component, and Manufacture Codes</u>
PSV-20004	Dresser Industrial Valve	1900/TC71102	BP, RV, D243
PSV-26101	Dresser Industrial Valve	1975/TC71106	BP, RV, D243
PSV-26102	Dresser Industrial Valve	1975C/TC71105	BP, RV, D243
PSV-20004	is the overpressure protection relief valve on the decay heat drop line between DHS isolation valve HV-20002 and HV-20005 and HV-20006		
PSV-26101	is the overpressure protection relief valve between valve DHS-011 and valve SFV-26039		
PSV-26102	is the overpressure protection relief valve between valve DHS-012 and SFV-26040		

The failure mode [undesirable state of a system or component], mechanism, (i.e., immediate cause) and effect [the consequence or major concern resulting from the failure] of each failed component, if known.

Each of the subject valves failed to lift during as-found testing at test pressures within an acceptable deviation from the system design setpoint of the valves. These valves are of a design that places the spring which controls the opening setpoint, inside the discharge chamber. Valve PSV-20004 (which did not lift during as-found testing) had boron crystals built up on the spring and valve disc guide. The valve was cleaned and a new spring installed. Valve PSV-26101 (Ser. No. TC 71106) was erratic when tested and was disassembled, cleaned and reassembled with a new adjusting spring. Valve PSV-26102 (Mfg. Ser. No. TC 71105) lifted above its designated setpoint. It was adjusted, and performed satisfactorily. A failure of this type of valve would allow pressure to build up beyond the limits established by design (reflected in Process Standard AP.103 and Surveillance Procedure SP.214.01) at Rancho Seco. This failure would result from a temperature rise of the water in the Decay Heat Removal System or leakage past dropline isolation valves.

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For failure that rendered a train of safety system inoperable, an estimate of the elapsed time from the discovery of the failure until the train was returned to service.

Because the decay heat removal system was inoperable for other planned reasons during this event, the thermal relief valve problem described in this report was resolved prior to the decay heat removal trains being returned to service.

The [intermediate and root] cause[s] of each component or system failure or personnel error, if known.

As committed to in Revision 0 of this LER, the Independent Investigation/Review Group reviewed this event. The apparent cause for the high lift pressure of the relief valves was boric acid crystal interference between the valve disc holder and the valve disc holder guide. When the valves were disassembled corrosion on the valve spring was noted. Corrosion of the spring will reduce the cross sectional area of the spring thereby reducing the force that the spring exerts against the disc and seat. This would result in a lower lift pressure. There was no evidence that the original set pressure was incorrect.

An assessment of the safety consequences and implications of the event [e.g., implication of the event if it occurred during other plant conditions, especially power operations - or why it could not have happened during power operations]. This includes the availability of other systems or components that can perform the same function as the components and systems that failed during the event [or why there were not any safety implications referring to the USAR analysis].

Regarding low-flow-capacity thermal relief valves PSV-26101 and PSV-26102, the highest opening pressure did not exceed the system hydrostatic test pressure. Therefore, no unacceptable consequences of the relief valve malfunction would have occurred.

Low-flow-capacity thermal relief valve PSV-20004, which did not open during as-found testing, is on the decay heat pump suction piping. PSV-20004 was successfully tested last on May 15, 1985. The mechanism for significant pressurizing of a normally (during power operation) dead ended section of pipe where PSV-20004 is located would be from leakage through the dropline valves. During two leak rate tests conducted during the past month, the leakage through the two dropline valves (normal high/low pressure boundary) was significantly less than leakage through other test boundaries (e.g., HV-20005 and HV-20006). Pressure due to leakage past the dropline isolation valves would be relieved by packing and/or seat leakage of the other normally closed valves upstream of PSV-20004.

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A description of any corrective actions planned as a result of the event, including those to reduce the probability of similar event occurring in the future.

These relief valve problems were uncovered during the normal course of ASME Section XI testing performed on the required plant systems. As a direct result of this event, two other valves in the designated group were tested (RE: WR #127426 and 133367) and found to be unacceptable. The grouping of valves is plant system based. The valve that was functioning as PSV-26101 during this event will be repaired prior to returning the "B" train of decay heat to operable status.

Each of the other systems' pressure relief valves have either already been tested or are scheduled to be tested, according to the In-Service Testing Plan.

Reference to any previous similar events at the same plant that are known to the licensee.

A similar problem with PSV-26102 (decay heat pump "B" discharge) was reported in ODR 86-21 found during execution of SP 214.02 along with eight other pressure relief valves. ODR 86-598 reported an as-found test failure (third out of three tries) for valve PSV-21507 (pressurizer relief). ODR 87-286 reported valve PSV-35804A (condensate storage tank relief) opening above the process standard listed setpoint.



**SMUD**

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AN ELECTRIC SYSTEM SERVING THE HEART OF CALIFORNIA

GCA 88-048

JAN 27 1988

U. S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, DC 20555

Docket No. 50-312  
Rancho Seco Nuclear Generating Station  
License No. DPR-54  
LICENSEE EVENT REPORT 87-25, REVISION 1: DECAY HEAT THERMAL RELIEF VALVES  
DID NOT MEET ACCEPTANCE CRITERIA DURING AS-FOUND TESTING

Dear Sirs:

In our initial submittal of LER 87-25 we committed to provide you a supplemental report. The attached revision is that supplement.

LER 87-25 Revision 0 stated that the Incident Analysis Group would review LER 87-25 and update the LER, as required. This revision contains the results of that review.

Please contact me if you have any questions. Members of your staff with questions requiring additional information or clarification may contact Mr. Paul Lavelly at (916) 452-3211, extension 4674.

Sincerely,

G. Carl Andognini  
Chief Executive Officer,  
Nuclear

Attachment

cc w/atch:

G. Kalman, NRC, Bethesda (2)  
A. D'Angelo, NRC, Rancho Seco  
J. B. Martin (2)  
INPO

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