



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

DEC 22 1982

Docket Nos.: 50-361  
50-362  
50-528  
50-529  
50-530

Applicants: Southern California Edison Company and Arizona Public Service Company

Facilities: San Onofre Nuclear Generating Station - Units 2 and 3 and Palo Verde Nuclear Generating Station - Units 1, 2, and 3

SUBJECT: SUMMARY OF MEETINGS HELD DECEMBER 7 AND 8, 1982 TO DISCUSS RAPID DEPRESSURIZATION AND DECAY HEAT REMOVAL CAPABILITY

On December 7 and 8, 1982, members of the NRC staff and their consultants met with representatives of: (1) the Southern California Edison Company at their San Onofre Nuclear Generating Station-Unit 3, and (2) the Arizona Public Service Company at their Palo Verde Nuclear Generating Station-Unit 1, respectively. The purpose of the meeting was to tour the respective facilities in the context of examining the rapid depressurization and decay heat removal capability for Combustion Engineering (CE) plants that do not have power operated relief valves (PORVs). A list of attendees is provided in Enclosure 1.

Background

The staff provided the following background for the participants at the meetings. The NRC's Unresolved Safety Issue A-45 program on, "Shutdown Decay Heat Removal Requirements," is examining the cost-benefit of various alternative means of decay heat removal that could substantially increase the plants capability to deal with a broader spectrum of transients and accidents and potentially could, therefore, significantly reduce the overall risk to the public. The A-45 program was recently restructured to expedite its planned evaluation of the need for a rapid depressurization and decay heat removal system (such as the so called, "feed and bleed" system) for CE plants without PORVs. This expedited evaluation will be provided in the same time frame as the Combustion Engineering Owners Group study of this issue, which is scheduled to be completed by June 30, 1983.

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### Tour of Facilities

In order to assess the feasibility, costs and operational impacts of backfitting a controlled depressurization capability (e.g., PORVs) into an already constructed PWR, the staff and its consultants examined the plant general arrangement of equipment and structural supports, particularly in terms of space availability, at both San Onofre-3 and Palo Verde-1. Those component and system areas which were examined are as follows: top of pressurizer, reactor drain tank, high pressure injection system, residual heat removal system, auxiliary feedwater system, main feedwater system and the diesel generators.

### Discussions

The benefits and detriments of adding PORVs were discussed. Adding PORVs might offer the following benefits: reduces challenges to the primary system safety valves, provides a more flexible low temperature overpressure protection method, provides a direct and rapid method of depressurization (which is backup to the preferred auxiliary pressurizer spray system) in the event of a steam generator tube rupture (SGTR) accident, and provides the potential for a "last-ditch" decay heat removal capability in a "feed and bleed" mode in the event of either loss of both steam generators or extended loss of all feedwater. The detriments of adding PORVs might be as follows: provides a potential failure mechanism for creating a small break LOCA; and use of PORVs to rapidly reduce primary system pressure results in the pressurizer becoming solid (accompanied by loss of pressurizer level control), voiding of the reactor vessel upper head region and radioactive liquid discharge to the containment building. If PORVs are added after the plant has been operated, the following drawbacks were identified: radiological dose to construction workers, impact on future outage schedule and attendant cost increases.

CE stated that they have performed preliminary calculations that indicate that in the event of loss of offsite power with a steam generator tube rupture, the auxiliary pressurizer spray is just as effective as PORVs in reducing pressure and minimizing releases. The staff indicated that it also is performing calculations in this regard and a meeting should be set up in early January 1983 to discuss interim results.

Both applicants have developed emergency procedures for coping with loss of all feedwater, station blackout, and steam generator tube ruptures. For the loss of all feedwater event, procedures for aligning of the condensate pumps as a potential means of decay heat removal are still under evaluation. The staff stated that it would like to examine such emergency procedures in the context of the A-45 program.

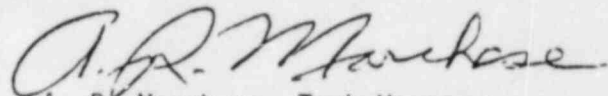
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Request for Information

The staff requested the following information from the Southern California Edison Company on San Onofre-2 and 3:

- (1) general arrangement drawings of the plant and isometric drawings of piping in the vicinity of the pressurizer;
- (2) latest version of CE's document, CEN-152, Revision 1, "Combustion Engineering Emergency Procedure Guidelines;"
- (3) verify any information that is in the FSAR regarding the effectiveness of steam generator water chemistry as related to the prevention of steam generator tube ruptures or tube leaks; and
- (4) emergency procedures for: (a) steam generator tube ruptures, (b) station blackout, and (c) loss of all feedwater.

The staff advised Arizona Public Service Company that it may request similar information from them on Palo Verde in the future.



A. R. Marchese, Task Manager  
Generic Issues Branch  
Division of Safety Technology

cc: H. Rood

[REDACTED]  
F. Schroeder  
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P. Norian  
R. Mattson  
T. Speis  
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A. Thadani  
A. Buslik  
P. Wagner  
E. McPeck  
M. Cunningham  
R. Lobel  
D. Ziemann  
A. Cappucci, ACRS  
D. Ward, ACRS

ENCLOSURE 1

ATTENDANCE LIST

MEETING HELD AT SAN ONOFRE NUCLEAR GENERATING STATION UNIT 3

DECEMBER 7, 1982

<u>NAME</u>	<u>ORGANIZATION</u>
F. R. Nandy	SCE
C. Williams	SCE
S. D. Root	SCE
D. A. Gerber	NUTECH
E. J. Gahan	Burns & Roe
G. A. Sanders	Sandia
E. J. Cosgrove	Burns & Roe
J. Robert	Bechtel
M. Gregovich	SCE
D. Gallup	Sandia
A. R. Marchese	USNRC
D. Berry	Sandia
H. Peters	SDG&E
M. Winsor	APS
R. S. Turk	CE
J. E. Aubrey	CE
W. D. Bennett	CE
B. R. Bunik	Bechtel
A. McSherry	NUTECH
H. Rood	USNRC

ENCLOSURE 2

MEETING HELD AT PALO VERDE NUCLEAR GENERATING STATION UNIT 1

DECEMBER 8, 1982

<u>NAME</u>	<u>ORGANIZATION</u>
M. Licitra	USNRC
G. Sanders	Sandia
B. A. Adney	APS Operations
E. J. Cosgrove	Burns & Roe
E. J. Gahan	Burns & Roe
R. Turk	CE
M. Winsor	APS-Nuclear Projects
T. F. Quan	APS-Nuclear Projects
D. Berry	Sandia
D. Gallup	Sandia
A. Marchese	USNRC
G. Fiorelli	USNRC-Resident
G. Johnston	USNRC-Resident
R. Kramer	APS-Operations

MEETING SUMMARY

Document Control (50-528/529/530)

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G. Knighton

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E. L. Jordon

Regional Administrator, Region V

J. M. Taylor

PARTICIPANTS (NRC):

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AMarchese  
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GJohnston