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

MAY 23 1983

Docket Nos. 50-352/353

Mr. Edward G. Bauer, Jr.
Vice President & General Counsel
Philadelphia Electric Company
2301 Market Street
Philadelphia, Pennsylvania 19101

Dear Mr. Bauer:

Subject: NUREG-0737, Item II.K.3.18, "Modification of Automatic Depressurization System Logic"

Your letter of April 27, 1983, indicated that PECo would take steps to make the required modifications to the ADS logic when the NRC completed its evaluation of the various proposals put forth by the BWR Owners Group in its generic response to NUREG Item II.K.3.18.

The staff has completed its evaluation of the proposals in the generic response of the BWR Owners Group. The results of our evaluation are contained in the enclosure to this letter. These results include the findings that two of the proposed options would be considered acceptable if supported by the appropriate plant-specific information and justification. Both of the approved options involve changes to permissive signals, the addition of a manual inhibit switch and some modification of procedures and surveillance plans. Neither of the approved options appears to require a large scale effort for implementation. Therefore, although Table 2 of NUREG-0737 would allow you up to the first refueling after staff approval to complete the ADS modifications, we ask that you consider the feasibility of completing an approved option prior to fuel loading which, using your estimates, would not be until August 1984 at the earliest.

We request that you respond to this letter and its enclosure by indicating your proposed resolution to Item II.K.3.18. Your response should include your proposed implementation schedule.

We request that your response, or your plans for responding to this letter, be provided within 21 days of receipt of this letter.

Sincerely,

A. Schwencer, Chief
Licensing Branch No. 2
Division of Licensing

Enclosure:
As stated

cc w/enclosure:
See next page

Limerick

Mr. Edward G. Bauer, Jr.
Vice President & General Counsel
Philadelphia Electric Company
2301 Market Street
Philadelphia, Pennsylvania 19101

cc: Troy B. Conner, Jr., Esquire
Conner and Wetterhahn
1747 Pennsylvania Avenue, N. W.
Washington, D. C. 20006

Mr. Thomas Y. Au
Assistant Counsel
Commonwealth of Pennsylvania, DER
505 Executive House
P. O. Box 2357
Harrisburg, Pennsylvania 17120

Honorable Lawrence Coughlin
House of Representatives
Congress of the United States
Washington, D. C. 20515

Roger B. Reynolds, Jr., Esquire
324 Swede Street
Norristown, Pennsylvania 19401

Frederic M. Wentz
County Solicitor
County of Montgomery
Courthouse
Norristown, Pennsylvania 19404

Eugene J. Bradley
Philadelphia Electric Company
Associate General Counsel
2301 Market Street
Philadelphia, Pennsylvania 19101

Mr. Vincent Boyer
Senior Vice President
Nuclear Operations
Philadelphia Electric Company
2301 Market Street
Philadelphia, Pennsylvania 19101

Mr. Marvin I. Lewis
6504 Bradford Terrace
Philadelphia, Pennsylvania 19149

Frank R. Romano, Chairman
Air & Water Pollution Patrol
61 Forest Avenue
Ambler, Pennsylvania 19002

Charles W. Elliott, Esquire
Brose & Poswistilo, 1101 Bldg.
11th & Northampton Streets
Easton, Pennsylvania 18042

Judith A. Dorsey, Esquire
Limerick Ecology Action
1315 Walnut Street, Suite 1632
Philadelphia, Pennsylvania 19107

Mr. Karl Abraham
Public Affairs Officer
Region I
U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19806

Mr. Suresh Chaudhary
Resident Inspector
U.S. Nuclear Regulatory Commission
P. O. Box 47
Sanatoga, PA 19464

Joseph H. White III
8 North Warner Avenue
Bryn Mawr, PA 19010

James M. Neill, Esquire
Associate Counsel for Del-Aware
Box 511
Dublin, PA 18917

Thomas Gerusky, Director
Bureau of Radiation Protection
Dept. of Environmental Resources
5th Floor, Fulton Bank Bldg.
Third & Locust Streets
Harrisburg, Pennsylvania 17120

Director, Pennsylvania Emergency
Management Agency
Basement, Transportation &
Safety Building
Harrisburg, Pennsylvania 17120

Robert L. Anthony
Friends of the Earth of the
Delaware Valley
103 Vernon Lane, Box 186
Moylan, Pennsylvania 19065

W. Wilson Goode
Managing Director
City of Philadelphia
Philadelphia, Pennsylvania 19107

David Wersan, Esquire
Assistant Consumer Advocate
Office of Consumer Advocate
1425 Strawberry Square
Harrisburg, Pennsylvania 17120

Steven P. Hershey, Esquire
Consumers' Education & Protective
Association
Sylvania House
Juniper & Locust Streets
Philadelphia, Pennsylvania 19107

Jacqueline I. Ruttenberg
The Keystone Alliance
3700 Chestnut Street
Philadelphia, Pennsylvania 19104

Sugarman & Denworth
Suite 510
North American Building
121 South Broad Street
Philadelphia, Pennsylvania 19107

Donald S. Bronstein, Esq.
The National Lawyers Guild
Third Floor
1425 Walnut Street
Philadelphia, Pennsylvania 19102

Lawrence Brenner, Esq.
Administrative Judge
Atomic Safety & Licensing Board
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dr. Peter A. Morris
Administrative Judge
Atomic Safety & Licensing Board
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dr. Richard F. Cole
Administrative Judge
Atomic Safety & Licensing Board
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

Mr. J. T. Robb, W2-1
Philadelphia Electric Company
2301 Market Street
Philadelphia, Pennsylvania 19101

EVALUATION OF BWR OWNERS' GROUP
GENERIC RESPONSE TO NUREG-0737
ITEM II.K.3.18, "MODIFICATION OF AUTOMATIC
DEPRESSURIZATION SYSTEM LOGIC--FEASIBILITY
FOR INCREASED DIVERSITY FOR SOME EVENT SEQUENCES"

Position

The automatic depressurization system (ADS) actuation logic should be modified to eliminate the need for manual actuation to assure adequate core cooling. A feasibility and risk assessment study is required to determine the optimum approach. One possible scheme that should be considered is ADS actuation on low reactor-vessel water level provided no high-pressure coolant injection (HPCI) or high pressure core spray (HPCS) flow exists and a low-pressure emergency core cooling (ECC) system is running. This logic would complement, not replace, the existing ADS actuation logic.

STAFF EVALUATION

The automatic depressurization system (ADS), through selected safety/relief valves, functions as a backup to the operation of the high pressure coolant systems. The ADS depressurizes the vessel so that low pressure systems may inject water into the reactor vessel. The ADS is typically activated automatically upon coincident signals of low water level in the reactor vessel, high drywell pressure, and any low pressure ECCS pump running. A time delay of approximately two minutes after receipt of the coincident signals allows time for the automatic blowdown to be bypassed manually if the operator believes the signals are erroneous or if the water level can be restored.

For transient and accident events which do not directly produce a high drywell pressure signal (e.g., stuck open relief valve or steam line break outside containment) and are degraded by a loss of high pressure coolant systems, manual actuation of the ADS is required to provide adequate core cooling. A reliability and risk assessment was requested so that the optimum approach to eliminate the need for manual actuation could be obtained. A further consideration is that proposed

permissive and changing the low RPV water level trip setpoint to the TAF; and 7) addition of a manual switch to inhibit automatic blowdown.

As indicated initially in the staff position, the present ADS logic design (except on those few plants which do not have the high drywell pressure permissive) does not satisfy the requirement to eliminate the need for operator action. This is because it has not been demonstrated that the high drywell pressure signal would be present for all situations requiring ADS actuation.

The second option, elimination of the high drywell pressure permissive and addition of a manual inhibit switch satisfies the requirement and is simple to implement. Further, the manual inhibit switch permits the operator to override the automatic blowdown logic if necessary. Therefore, the second option is acceptable.

The third option, elimination of the high drywell pressure permissive and changing the low RPV water level trip setpoint to the TAF satisfies the requirement to eliminate the need for manual action to blowdown the vessel but could require repeated operator action (approximately every 2 minutes) to reset the ADS timer for ATWS events where low water level is deliberately maintained to reduce power. Changing the low level trip setpoint may also be very expensive since installation of new water level instrumentation would be required for many plants. This option was therefore not recommended by the Owners Group.

The fourth option, addition of a timer that bypasses the high drywell pressure permissive if the reactor water level is low for a sustained period and addition of a manual inhibit switch also satisfies the requirement and is simple to implement. The time delay used must be justified by analysis if this option is chosen and the technical specifications must be modified to require testing of the timer. The fourth option is acceptable to the staff.

The fifth option, addition of a timer that bypasses the high drywell pressure permissive if the reactor water level is low for a sustained period and changing the low RPV water level trip setpoint was not recommended for same reasons discussed for option(3).

The sixth option, addition of a suppression pool temperature permissive in parallel with the high drywell pressure permissive and a manual inhibit switch would theoretically satisfy the requirements. However, temperature variations within the suppression pool would necessitate the use of many thermocouples connected through averaging circuits. This option was rejected by the Owners' Group because it is relatively impractical.

The seventh option, addition of a suppression pool temperature trip in parallel with the high drywell pressure trip and changing the low RPV water level trip setpoint to the TAF was rejected by the Owners Group for the same reason as the sixth option.

The eighth option, addition of a manual inhibit switch, does not satisfy the requirement since manual action would still be required for breaks which do not pressurize the drywell.

SUMMARY

The second, third, fourth, and fifth options effectively remove the high drywell pressure permissive for ADS actuation. Addition of the manual inhibit switch (options 2,4,8) enables the operator to override the ADS should this be necessary (as for some ATWS events). Suppression pool temperature permissives are judged to be impractical. Changes to the RPV low water level trip setpoint may not be sufficient to provide the operator with the flexibility needed to override the ADS when needed.

It is concluded therefore that 2 of the 8 options proposed are acceptable. They are: option 2, elimination of the high drywell permissive and the addition of manual inhibit switch, and option 4, bypass of the high drywell pressure permissive after sustained low water level and the addition of a manual inhibit switch. Licensees proposing option 4 modifications should include justification for the bypass timer setting and a periodic testing plan for the timer. Licensees proposing either option 2 or option 4 modifications must address the use of the manual inhibit switch in their emergency procedures and include a surveillance plan for the switch.

REFERENCES

1. Letter to Darrell G. Eisenhut (NRC) from T. J. Dente (BWR Owners' Group), BWROG-8260, NUREG-0737 Item II.K.3.18 "Modification of Automatic Depressurization System Logic", October 28, 1982