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July 17, 1984

Docket Nos. 50-277
50-278

Mr. George W. Rivenbark, Acting Chief
Operating Reactors Branch #4
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUBJECT: NUREG-0737, Supplement 1, I.D.2,
Safety Parameter Display System,
Peach Bottom Atomic Power Station,
Units 2 and 3

REFERENCES: (1) Correspondence dated May 16, 1984,
G. W. Rivenbark, NRC, to E. G. Bauer, PECO
(2) Correspondence dated September 28, 1983,
J. W. Gallagher, PECO, to D. G. Eisenhut, NRC
(3) Correspondence dated February 2, 1983,
D. G. Eisenhut, NRC, to T. J. Dente,
Chairman, BWR Owners' Group, titled:
"Safety Evaluation Report on Emergency
Procedure Guidelines, Rev. 2,
NEDO 24934"
(4) Correspondence dated October 31, 1983,
S. L. Daltroff, PECO, to D. G. Eisenhut,
NRC, "PBAPS Program Plan for Control
Room Design Review (NUREG-0737, Supplement 1)"
(5) Correspondence dated September 14, 1983,
J. W. Gallagher, PECO, to D. G. Eisenhut, NRC,
Revision to April 15, 1983 Response to
NUREG-0737, Supplement 1, Requirements
for Emergency Response Capabilities for PBAPS

Dear Mr. Rivenbark:

This letter responds to your request for additional
information (reference 1) regarding our plans for the Safety

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Parameter Display System (SPDS) at Peach Bottom Atomic Power Station. In addition to a written response, you had suggested a meeting with the staff to discuss the Peach Bottom SPDS. Subsequently, in a telephone conversation on May 29, 1984, the NRC staff concluded that the meeting was not necessary at this time.

1. NRC Request

Provide conclusions regarding unreviewed safety questions or changes to Technical Specifications.

Response

The reference 2 letter transmitted a Safety Analysis describing the basis on which the selected parameters for the SPDS are sufficient to assess the safety status of each identified function for a wide range of events. The safety analysis identified one plant modification, the addition of reactor pressure indication. The engineering for this modification has progressed to the point where a safety evaluation as required by 10 CFR 50.59 has been performed. The safety evaluation concluded that an unreviewed safety question was not involved and that a change in the Technical Specifications was not required prior to installation of the modification. Since the instrumentation being added is also used to satisfy the Type A variable instrumentation recommendations of NRC Regulatory Guide 1.97, "Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident", we are reviewing the appropriateness of incorporating the new instruments into the Technical Specifications. A final decision will be deferred until the NRC issues guidance in the form of a Standard Technical Specifications.

2. NRC Request

Provide a description of the methods used to validate display data.

Response

The following parameters displayed on the SPDS are also displayed on at least one redundant indicator in the control room:

- a) Drywell temperature
- b) Suppression pool level
- c) Suppression pool temperature
- d) Drywell pressure
- e) Reactor water level
- f) Reactor pressure
- g) Neutron flux (APRM)

The operator can validate the SPDS display for the above parameters by observing the redundant indication. In the case of containment isolation valve positions, redundant indication is not provided for each valve, since each group I isolation valve is backed up by a redundant valve.

3. NRC Request

Provide a description of the human factors program and its implementation into the design of the SPDS to ensure that displayed information can be readily perceived and comprehended so that operators will not be misled.

Response

The first part of the human factors program, the functional analysis, which establishes those parameters which determine the safety status of the plant, is complete. As described in reference 2, the basis for SPDS parameter selection is the entry conditions for the upgraded emergency operating procedures. These new Peach Bottom procedures are designated as the Transient Response Implementation Plan (TRIP) procedures and are in conformance with Revision 2 of the BWR Owners' Group Emergency Procedure Guidelines (EPGs).

The emergency operating procedures are symptom oriented, that is, the safety status of the plant and correct operator responses are unambiguously defined on the basis of observed symptoms. The EPG development process analyzed a great multitude of conditions with a mixture of qualitative and

quantitative analysis to determine that the actions based on the occurring symptoms were appropriate for all events. The analytic basis for the EPGs and the EPG steps were extensively reviewed by the NRC and a safety evaluation report was issued (reference 3) on EPG Revision 2. This safety evaluation firmly supports the BWR symptomatic approach and the selection of the entry conditions.

Since the SPDS is to be used by control room personnel who are responsible for the avoidance of degraded and damaged core events, there are two emergency procedures of interest for the purpose of determining the SPDS parameters. These are the reactor control procedure and the containment control procedure. The plant parameters and their limits which trigger entry into these procedures are clearly defined and are few in number. The entry conditions for the reactor control procedure are:

- a) Scram condition with reactor power above three percent or unknown.
- b) Reactor level below minus 48 inches or unknown.
- c) Drywell pressure of two psig.
- d) Group I containment isolation.

The entry conditions for the containment control procedure are:

- a) Torus temperature above 95 degrees F.
- b) Torus level outside 14.6 feet to 14.9 feet.
- c) Drywell pressure above two psig.
- d) Drywell temperature above 145 degrees F.

The remainder of the human factors program for the SPDS is integrated into the control room design review. The program plan for the control room design was submitted to the NRC in reference 4. The schedule for completion of this program is contained in reference 5.

The control room design review has recently begun. Preliminary evaluation by our human factors consultant indicates that neutron flux should be a part of the SPDS. We have therefore revised the SPDS parameter list to include this variable. We have also limited the containment isolation valve position indication to those valves used in the emergency procedure entry condition, that is, the group I isolation valves. The revised list is shown in Table 1. The

responses to other requests for information contained in this letter reflect these changes to Table 1.

The location of the neutron flux indication is currently separated from the remainder of the SPDS. It is located conveniently to the control room operator and close to other reactivity indications and controls, including alarms for scram conditions, control rod position indication, control rod manual controls, scram pushbuttons, and standby liquid control system controls. The location of the neutron flux indicator and the desirability of a two-part SPDS will be closely scrutinized as part of the control room design review.

The results of the control room design review will be submitted to the NRC in a summary report by March 15, 1985. This report will outline proposed control room changes and their proposed schedule for implementation.

4. NRC Request

Describe the adequacy of the isolation devices used between the SPDS and sensors in use for safety systems.

Response

The circuits for the following parameters are treated as safety-related circuits from the sensors up to and including the SPDS indicators:

- a) Suppression pool level
- b) Suppression pool temperature
- c) Drywell pressure
- d) Reactor water level
- e) Reactor pressure
- f) Group I isolation valve position

No isolation devices are used in these circuits to separate the SPDS from the sensors.

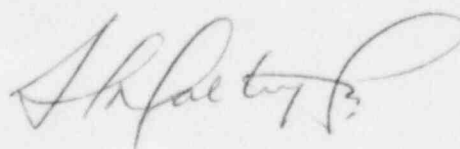
The circuit for drywell temperature is treated as a non-safety-related circuit from the sensor up to and including the SPDS indicator. No isolation devices are used in this circuit.

The sensors for neutron flux indication are safety-related and the recorder is non-safety-related. Isolation is provided by a voltage divider circuit and fuses in accordance with the original plant design.

All electrical separation is in accordance with the criteria described in Section 7.1.6 of the Peach Bottom Updated Final Safety Analysis Report.

Should you have any questions regarding this matter, please do not hesitate to contact us.

Very truly yours,

A handwritten signature in cursive script, appearing to read "J. H. Faltys".

Attachment

cc: A. R. Blough, Site Inspector

PEACH BOTTOM ATOMIC POWER STATION

TABLE 1

Revised SPDS Parameter List

Function Variable	Reactivity Control	Reactor Core Cooling And Heat Removal	Reactor Coolant System Integrity	Radio- activity Control	Contain- ment Conditions
Reactor Water Level	X	X			
Reactor Pressure	X		X		
Drywell Pressure	X		X	X	X
Drywell Temperature					X
Suppression Pool Temperature					X
Suppression Pool Level					X
Group I Containment Isolation Valve Position	X		X	X	
Neutron Flux (APRM)	X				