April 23, 1984

Dockets Nos. 50-269, 270
and 50-287

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Mr. Hal B. Tucker
Vice President - Steam Production
Duke Power Company
P. O. Box 33189
Charlotte, North Carolina 28242

SUBJECT: RESPONSE TO GENERIC LETTER 81-21, NATURAL CIRCULATION COOLDOWN

Dear Mr. Tucker:

The NRC staff has reviewed your response to the Generic Letter 81-21, and finds that the concerns regarding RCS voiding and subsequent operator actions during natural circulation cooldown are inadequately addressed. This letter transmits a request for information (see enclosure) which will be used by the staff to assure that the intent of Generic Letter 81-21 is met for your plant. The intent of the Generic Letter was to obtain assurance that a natural circulation cooldown could be effected in a reasonable time while maintaining the primary coolant in the liquid phase at all times.

We are currently reviewing an analysis from the licensee for TMI-1 which we find substantially addresses our concerns. We encourage you to use that analysis to the extent applicable to your plant. There may be an advantage also to adopting a Babcock & Wilcox Owners Group (BWOG) approach on this issue because this issue is similar on all B&W plants. A copy of the requests for information transmitted to the B&W licensees involved is being sent to the BWOG Steering Committee Chairman to expedite an Owners Group response in the event you wish to use that approach. Please provide your schedule for your response to the request within 30 days of the date of this letter. Please contact your NRC Project Manager if you have any questions on this subject.

Sincerely yours,

/S/

John F. Stolz, Chief
Operating Reactors Branch No. 4
Division of Licensing

Enclosures:
As stated

cc w/enclosure:
See next page

ORB#4:DL	ORB#4:DL	ORB#3:DL
HNicolaras;ef	JFStolz	R. Hattier
04/20/84	04/23/84	4/23/84

Duke Power Company

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ENCLOSURE 1

REQUEST FOR ADDITIONAL INFORMATION

FROM RANCHO SECO, OCONEE 1, 2 AND 3, AND ANO-1

In response to Generic Letter 81-21, dated May 5, 1981, all PWR licensees were required to demonstrate, by analyses and/or test, that a controlled natural circulation cooldown from operating conditions to cold shutdown conditions, conducted in accordance with their procedures, should not result in reactor vessel voiding. Your responses, as given in References 1 and 2, to our request did not provide the required demonstration. Instead you stated that your natural circulation cooldown procedures have not been constructed to attempt to preclude reactor vessel head void formation, but rather to mitigate a void should one form.

The staff has concluded that upper head voiding is not a safety concern provided the operator is equipped with adequate training and procedures. However, upper head voiding does make RCS pressure control more difficult during a natural circulation cooldown. Thus, it is the staff's position that the natural circulation cooldown procedure should be developed to prevent upper head voiding to the extent possible. The operator procedures must also address means of mitigating a reactor vessel head void should one form. We believe that the demonstration requested by the Generic Letter is required in order to develop these procedures.

We have also been examining the responses to the Generic Letter provided by other licensees with B&W plants. We are concerned about the wide range of cooldown rates, ranging from 1½°F/hr to 50°F/hr, utilized by B&W plants. We believe that a coordinated Owner's Group response may be best in providing the requested demonstration.

We would like to note that we are aware of the calculations which have been performed to assess the reactor vessel upper head cooldown rate. These calculations, References 3 and 4, show that the head cooldown rate is approximately 1 1/2°F/hr. We believe that the cooldown times implied by these calculations do not have sufficient technical justification and that they should not be used as the basis for operating procedures.

In summary, the staff requires that you provide the demonstration, via analysis and/or test data, requested in Generic Letter 81-21, to show that a natural circulation cooldown can be performed without formation of a reactor vessel head void. We believe this response can best be provided via the Owner's Group and are willing to discuss this with you at your earliest convenience.

REFERENCE

Duke Power Company

1. Letter, W. O. Parker, Duke Power Co, to H. R. Denton, NRC, 11/5/81.

2. Letter, H. B. Tucker, Duke Power Co., to H. R. Denton, NRC 2/19/83

SMUD

1. Letter, J. J. Mattimoe, SMUD, to J. F. Stolz, NRC, 11/16/81

2. Letter, W. K. Lathan, SMUD, to J. F. Stolz, NRC, 9/21/83

ANO 1

1. Letter, D. C. Trimble, AP&L, to D. G. Eisenhut, NRC, 11/13/81

2. Letter, J. R. Marshall, AP&L, to J. F. Stolz, NRC 7/13/83

All

3. Boman, B. L., "Reactor Vessel Head Cooldown During Natural Circulation Cooldown Prepared for Consumers Power Company," Babcock & Wilcox Utility Power Generation Division, February, 1983.

4. Tally, C. W., "Single Loop Natural Circulation Cooldown Prepared for Consumers Power Company," Babcock & Wilcox Nuclear Power Generation Division, August, 1982.