



NS-EPR-2935

Westinghouse
Electric CorporationWater Reactor
Divisions

Nuclear Technology Division

Box 355
Pittsburgh Pennsylvania 15230

July 9, 1984

NS-TA-84-003

Mr. D. Eisenhut, Director
Division of Licensing
U.S. Nuclear Regulatory Commission
2920 Norfolk Avenue
Washington, D.C. 20555

Dear Mr. Eisenhut:

NUMBER OF OPERATING REACTOR COOLANT PUMPS IN MODE 3

This letter formalizes the material presented on June 15, 1984, with respect to the consistency between the Technical Specifications and the safety analysis for the number of operating reactor coolant pumps in Mode 3. This meeting was held at the request of the NRC staff in order to discuss the Westinghouse determination of a potential unreviewed safety question for three and four loop plants for this issue. Enclosed are ten (10) proprietary copies of the slides and ten (10) non-proprietary copies. Also enclosed are one (1) copy of Application for Withholding, AW-84-63 (non-proprietary) and one (1) copy of Affidavit (non-proprietary).

As part of an informal review of a utility's Tech Specs by the NRC Reactor Systems Branch, the staff asked what the safety analysis assumptions were concerning the number of operating reactor coolant pumps, particularly at or near zero power. Although the question was never formally asked, Westinghouse reviewed the analysis assumptions with respect to the Tech Specs.

The requirement for operating reactor coolant pumps under these conditions is contained in Specification 3.4.1.2 of the Standard Tech Specs. In non-Standard Tech Specs, the requirement is contained in Specification 3.1. These Specs state that when the plant is subcritical by the shutdown margin between 350°F (RHR cut-in) and 547°F or 557°F (no-load conditions), there must be two loops operable, but only one loop has to be actually operating.

However, the safety analysis in the FSARs assumes that either two or all of the reactor coolant pumps are operating, not just one. (At the staff's request, the assumptions made concerning the number of operating pumps have been noted for those plants within Westinghouse scope in the attachment). The accidents which are limiting at zero power are steamline break, rod ejection, and bank withdrawal from subcritical. Westinghouse has reviewed these accidents under the reduced flow conditions of one pump. For the rod ejection and steamline break events, Westinghouse has determined that the inconsistency between the safety analysis

8407230200 840709
PDR TOPRP EMVWEST
C PDR

G007
~~YET~~ 1/1

Change: LPDR
NRC PDR
NSIC
NTIS

} Non
Prop
Only

and the Tech Spec will not impact the conclusions presented in the FSAR. For the bank withdrawal from subcritical event, Westinghouse has performed calculations which show that the DNB design basis may not be met when only one pump is in operation. Thus, the margin of safety as defined in the basis of the Tech Specs is reduced.

Westinghouse has also performed calculations for one pump operation assuming more realistic, but still conservative, reactivity insertion rates. The results of these calculations show that the DNB design basis is met. Other assumptions and models used in these analyses are identical to the FSAR methods of analysis for this event. Thus, Westinghouse feels that no significant safety hazard exists.

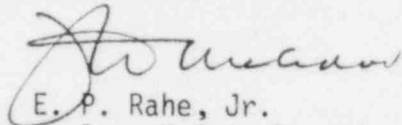
Westinghouse is currently considering long term analytical solutions to this issue which will show that the DNB design basis can be met when only one reactor coolant pump is in operation so that the Tech Specs will not need to be changed. However, in the short term, Westinghouse recommends that the plants be operated with the same number of reactor coolant pumps in operation as was assumed in the analysis. Note that this is not a realistic requirement when the plant is cooling down prior to going into Mode 4 (RHR operation), particularly for those plants for which the analysis assumes all pumps in operation. Thus, an alternative to having more than one pump in operation is to prevent rod withdrawal. This will preclude the accident from taking place. Although physical prevention of withdrawal will accomplish this, administrative procedures may be preferable. The ability to cock the rods partway out of the core during Mode 3 provides desired operating flexibility. Furthermore, there is no mechanism by which the control rods can be automatically withdrawn in Mode 3 due to a control system error. Increased operator awareness during this time and adherence to procedures will also prevent the accident from occurring.

Finally, while Westinghouse feels that it is appropriate to consider bank withdrawal when in Mode 3, Westinghouse does not intend to address this event in other modes of operation (Standard Tech Spec Modes 4 and 5). Bank withdrawal from subcritical is a valid scenario when going from Mode 3 to Mode 2. However, consideration of bank withdrawal in Modes 4 and 5 is unrealistic and it is questionable as to whether it is applicable or if it is a Condition II event. Again, increased operator awareness must be considered when evaluating the appropriateness of the event.

Correspondence with respect to the Westinghouse affidavit or application for withholding should reference AW-84-63, and should be addressed to Mr. R. A. Wieseemann, Manager, Regulatory and Legislative Affairs, P.O. Box 355, Pittsburgh, Pennsylvania 15230. Other correspondence or questions should be directed to Mr. J. L. Little, Manager, Operating Plant Licensing Support, 412/374-5054.

Very truly yours,

WESTINGHOUSE ELECTRIC CORPORATION



E. P. Rahe, Jr.
Nuclear Safety Department

M. P. Osborne/ds

Enclosures

STS PLANTS

OPERATING

D. C. COOK 1
* SALEM 1 & 2
* BEAVER VALLEY 1
DIABLO CANYON 1
MC GUIRE 1 & 2
* SUMMER
* FARLEY 1 & 2
* SEQUOYAH 1 & 2
* TROJAN

NON-OPERATING

SEABROOK 1 & 2
CATAWBA 1 & 2
BYRON/BRAIDWOOD
* BEAVER VALLEY 2
VOGTLE 1 & 2
MILLSTONE 3
COMANCHE PEAK 1 & 2
* WATTS BAR 1 & 2
SOUTH TEXAS 1 & 2
SHEARON HARRIS 1 & 2
MARBLE HILL 1 & 2

NON-STS PLANTS

* TURKEY POINT 3 & 4
* ZION 1 & 2
* INDIAN POINT 2 & 3

* assumes all pumps
operating

PLANTS NOT AFFECTED

SNUPPS

SAN ONOFRE

GINNA

POINT BEACH 1 & 2

KEWAUNEE

PRAIRIE ISLAND 1 & 2

PLANTS OUTSIDE W SCOPE

D. C. COOK 2

SURRY 1 & 2

ROBINSON 2

NORTH ANNA 1 & 2

HADDAM NECK

YANKEE ROWE