

November 18, 1982

LS05-82-11-072

Mr. O. D. Kingsley, Chairman  
Westinghouse Owner's Group  
Alabama Power Company  
P. O. Box 2641  
Flint Ridge Building  
Birmingham, Alabama 35291

DISTRIBUTION

Docket	DEisenhut
NRC PDR	OELD
ORB Reading	ELJordan
NSIC	JMTaylor
DCrutchfield	ACRS (10)
HSmith	SEPB
JShea	MWilliams
MRushbrook	TDunning
JYoungblood	TSpeis
TNovak	LRubenstein
GLainas	BSheron
SVarga	FRosa
FMiraglia	JRosenthal
	CRossi
	RMattson

Dear Mr. Kingsley:

SUBJECT: REGULATORY GUIDE 1.97, REV. 2  
REQUIREMENTS FOR REACTOR COOLANT TEMPERATURE INDICATION

The purpose of this letter is to solicit comments from the Westinghouse Owner's Group with regard to the requirements of Regulatory Guide 1.97 for reactor coolant temperature indication. Table 2 of R. G. 1.97 identifies RCS hot and cold leg temperature as Type B variables to meet Category 1 requirements. Based on recent operating license reviews, the staff concludes these requirements are not, at the present, met by the Westinghouse design. Further it is of concern that based on responses from some NTOL applicants, this conflict with the requirements of R.G.1.97 is not recognized.

Thus, rather than review this issue on an individual plant basis, we would welcome your comments, such that an informed decision can be made on this matter.

Enclosed is a summary of the staff's view of this issue.

Sincerely,

Original signed by  
Darrell G. Eisenhut

Darrell G. Eisenhut, Director  
Division of Licensing  
Office of Nuclear Reactor Regulation

8212030229 821118  
PDR TOPRP EMVWEST  
C PDR

Enclosure:  
As stated

cc w/enclosure:

- Licensees, CP Holders and OL Applicants for Westinghouse Electric Corporation plants
- Service Lists

DL:ORB#1	AD/OR	DL:DIR
SVarga*	GLainas*	DEisenhut
11/ /82	11/ /82	11/18/82

\*Please see previous concurrence page.

OFFICE	DL:ORB#5	DL:LB#1	DL:ORB#5	DL:ORB#5	DL:LB#1	AD/L	DL:AD-SA
SURNAME	HSmith:ajs*	MRushbrook*	JShea*	DCrutchfield*	JYoungblood*	TNovak*	FMiraglia*
DATE	11/ /82	11/ /82	11/ /82	11/ /82	11/ /82	11/ /82	11/ /82

DISTRIBUTION

Docket	DEisenhut
NRC PDR	OELD
ORB Reading	ELJordan
NSIC	JMTaylor
DCrutchfield	ACRS (10)
HSmith	SEPB
JShea	MWilliams
MRushbrook	TDunning
JYoungblood	TSpeis
TNovak	LRubenstein
GLainas	BSheron
SVarga	FRosa
FMiraglia	JRosenthal
	CROSSI
	RMattson

Mr. O. D. Kingsley, Chairman  
 Westinghouse Owner's Group  
 Alabama Power Company  
 P. O. Box 2641  
 Flint Ridge Building  
 Birmingham, Alabama 35291

Dear Mr. Kingsley:

SUBJECT: REGULATORY GUIDE 1.97, REV. 2  
 REQUIREMENTS FOR REACTOR COOLANT TEMPERATURE INDICATION

The purpose of this letter is to solicit comments from the Westinghouse Owner's Group with regard to the requirements of Regulatory Guide 1.97 for reactor coolant temperature indication. Table 2 of R. G. 1.97 identifies RCS hot and cold leg temperature as Type B variables to meet Category 1 requirements. Based on recent operating license reviews, the staff concludes these requirements are not, at the present, met by the Westinghouse design. We expect that licensees and applicants may take exception to these requirements. Further it is of concern that based on responses from some NTOL applicants, this conflict with the requirements of R.G.1.97 is not recognized.

Thus, rather than review this issue on an individual plant basis, we would welcome your comments, such that an informed decision can be made on this matter.

Enclosed is a summary of the staff's view of this issue.

Sincerely,

Darrell G. Eisenhut, Director  
 Division of Licensing  
 Office of Nuclear Reactor Regulation

Enclosure:  
 As stated

cc w/enclosure:

- Licensees, CP Holders and OL Applicants for Westinghouse Electric Corporation plants
- Service Lists

\*Please see previous concurrence page.

*Revised 11/11/82  
 See time diary  
 with my file copy  
 Dm*

DL:ORB#1 SVarga 11/9/82	AD/OR GLainas 11/10/82	DL:DIR DEisenhut 11/11/82
-------------------------------	------------------------------	---------------------------------

OFFICE	DL:ORB#5	DL:LR#1	DL:ORB#5	DL:ORB#5	DL:LR#1	AD/OR	DL:DIR
SURNAME	HSmith:ajs*	MRushbrook*	JShea*	DCrutchfield	JYoungblood	TNovak	FMiraglia
DATE	11/ /82	11/ /82	11/ /82	11/9/82	11/9/82	11/ /82	11/11/82

DISTRIBUTION

Docket  
NRC PDR  
~~Local PDR~~  
ORB Reading  
NSIC  
DCrutchfield  
HSmith  
JShea  
MRushbrook  
JYoungblood  
TNovak  
FMiraglia  
DEisenhut  
OELD  
ELJordan  
JMTaylor  
ACRS(10)  
SEP8

Mr. O. D. Kingsley, Chairman  
Westinghouse Owner's Group  
Alabama Power Company  
P. O. Box 2641  
Flint Ridge Building  
Birmingham, Alabama 35291

Dear Mr. Kingsley:

SUBJECT: REGULATORY GUIDE 1.97, REV. 2  
REQUIREMENTS FOR REACTOR COOLANT TEMPERATURE INDICATION

The purpose of this letter is to solicit comments from the Westinghouse Owner's Group with regard to the requirements of Regulatory Guide 1.97 for reactor coolant temperature indication. Table 2 of R.G.1.97 identifies RCS hot and cold leg temperature as Type B variables to meet Category 1 requirements. Based on recent operating license reviews, the staff concludes these requirements are not, at the present, met by the Westinghouse design. We expect that licensees and applicants may take exception to these requirements. Further it is of concern that based on responses from some NTOL applicants, this conflict with the requirements of R.G.1.97 is not recognized.

Thus, rather than review this issue on an individual plant basis, we would welcome your comments, such that an informed decision can be made on this matter.

Enclosed is a summary of the staff's view of this issue.

Sincerely,

Darrell G. Eisenhut, Director  
Division of Licensing, NRR

Enclosure:  
As stated

cc w/enclosure:

- 1. Licensees, CP Holders and OL Applicants for Westinghouse Electric Corporation plants
- 2. Service List

DL:DIR  
DEisenhut  
11/ /82

OFFICE	DL:ORB#5	DL:LB#1	DL:ORB#5	DL:ORB#5	DL:LB#1	AD/OR	DL:AD-SA
SURNAME	HSmith:ajs	MRushbrook	JShea	DCrutchfield	JYoungblood	TNovak	FMiraglia
DATE	11/18/82	11/19/82	11/9/82	11/ /82	11/ /82	11/ /82	11/ /82

STAFF VIEWS ON R.G.1.97 REQUIREMENTS  
FOR RCS HOT AND COLD LEG  
WATER TEMPERATURE INDICATION

Table 2 of R.G.1.97 identifies the wide range (50-750F) RCS hot and cold leg water temperature measurements as Type B variables to meet Category 1 requirements. The present Westinghouse design provides a single point hot and cold temperature measurement for each RCS loop. Further, all cold leg temperature measurements are dependent upon one power source and all hot leg temperature measurements are dependent on another power source. Thus the loss of a single power source could result in the loss of all hot leg or cold leg temperature indication. Faced with this situation, there are a number of alternatives which could be considered to achieve reliable temperature indication.

Alternative 1:

Install an additional thermowell and temperature sensor in each hot and cold leg and power temperature signal conditioning equipment from an instrument-bus which is independent of the present temperature indication. This alternative may be costly and difficult to implement, since it would appear to require a hydro test following installation of new thermowells in the hot and cold leg of the RCS.

Alternative 2:

Utilize dual element temperature sensors mounted in the existing thermowells and provide separate signal conditioning equipment powered from an instrument-bus which is independent of the present indication. This alternative has the disadvantage that it compromises the independence (separation) of redundant temperature indication at the temperature sensor.

Alternative 3:

Change the power sources for the present temperature indication such that all cold leg (similarly all hot leg) temperature measurements are not dependent on a single power source. The requirement for redundancy would be met on a system basis rather than on a loop basis. Thus from the single failure standpoint, a loss of a power source may result in the inability to determine T-hot and T-cold for one or more RCS loops, but not all RCS loops. For this alternative, consideration would have to be given low temperature over pressure protection systems that use these RCS temperature signals.

During a recent operating license review, the staff raised the concern of the power source dependence of T-hot and T-cold from the standpoint of being able to confirm natural circulation cooling based on hot and cold leg temperature measurements. In this case the applicant proposed to change the power source dependence of the system. The approach taken for this four loop plant was to use one power source for T-hot in two loops and for T-cold in the remaining two loops. The other T-hot and

T-cold instruments were powered from an independent power source. Thus, while T-hot and T-cold for a given loop were powered from different power sources, it was concluded that T-cold measured for one loop should be a valid indication for all loops. Further this change did not significantly impact the low temperature over pressure protection system design, since the redundant portions of this system still received independent loop temperature signal.

The disadvantage of this alternative is that the loss of one of the instrument buses will result in the loss of either the hot or cold leg temperature measurements in every RCS loop.

Summary:

The above discussion addresses three alternatives for which some improvement in the reliability and fault tolerance of RCS temperature indication could be provided for Westinghouse plants. These considerations have touched mainly on the hardware aspects in contrast to the safety significance of the parameters for post event recovery. There may be other alternatives worthy of consideration in addition to those noted above. Clearly alternative 1 above would be acceptable since it reflects explicit application of the requirements of R.G.1.97. With regards to alternatives 2 and 3 the staff has not made this judgement. Therefore, comments on these alternatives are welcome and will be considered in the resolution of this matter. An estimate of the cost impact of alternative 1 and any justifications for alternative 2 and 3 would be of specific help.