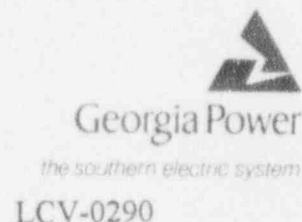


C. K. McCoy
Vice President, Nuclear
Vogtle Project

February 10, 1994



LCV-0290

Docket Nos. 50-424
50-425

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

Gentlemen:

VOGTLE ELECTRIC GENERATING PLANT
USE OF BYPASS TEST CAPABILITY
FOR INSTRUMENTATION MAINTENANCE

By letter dated September 30, 1993, the NRC approved changes to the Vogtle Electric Generating Plant (VEGP) Unit 1 and 2 Technical Specifications (TS) that allow routine testing of the engineered safety features actuation system (ESFAS) and reactor trip system (RTS) instrumentation in bypass without the use of temporary jumpers or lifted leads. Prior to the NRC approval of September 30, 1993, Georgia Power Company (GPC) responded to an NRC request for additional information by letter dated July 26, 1993. In that letter, GPC stated that "the BTI was designed with the intent to bypass a channel only for the purpose of the following:

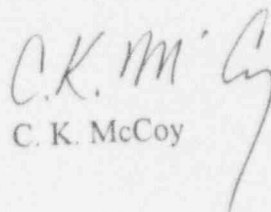
- Surveillance testing with the comparator outputs bypassed rather than tripped.
- Surveillance testing on an active channel in the presence of an existing channel failure which caused a redundant channel to be declared inoperable."

On February 2, 1994, a Unit 1 pressurizer pressure transmitter began to exhibit drift and it was taken out of service for maintenance. In keeping with the above statement from the July 26, 1993, letter, the affected channel was placed in the tripped condition rather than use the bypass capability. Subsequently, as the transmitter was being removed, an isolation valve on its associated reference leg was bumped and the reference leg was momentarily vented. This reference leg is shared by a second pressurizer pressure transmitter, and the momentary venting caused the second transmitter to sense a low pressure condition which, in the presence of the trip signal from the first channel, was sufficient to result in a reactor trip and safety injection. Had the inoperable channel been placed in bypass prior to the maintenance, a reactor trip and safety injection could have been avoided.

The existing VEGP TS allow 6 hours for placing an inoperable channel in the tripped condition. Therefore, in an effort to avoid another spurious reactor trip and safety injection, GPC proposes to use the bypass capability for maintenance as well as for surveillance testing of the RTS and ESFAS instrumentation. In accordance with the existing TS requirements, the inoperable channel could be placed in the bypassed condition for a maximum of 6 hours. If the channel cannot be restored to service in 6 hours, it will be placed in the tripped condition. This is supported by the NRC Safety Evaluation Report (SER) for Westinghouse Topical Reports WCAP-10271 Supplement 2 and WCAP-10271 Supplement 2, Revision 1, "Evaluation of Surveillance Frequencies and Out of Service Times for the Engineered Safety Features and Actuation Systems," dated February 22, 1989. Specifically, page 4 of enclosure 1 to that SER states that the analog channels may be in bypass for the duration of the maintenance AOT (6 hours) provided that they are placed in the tripped condition after 6 hours. (See enclosure for a copy of the subject SER.) All administrative controls that are presently applied to the use of the bypass capability will remain in effect as described to the NRC in our correspondence ELV-03878, dated March 1, 1993, and LCV-0061, dated July 26, 1993. Furthermore, we are not proposing to expand the use of the bypass capability to any other instrumentation other than that which has already been presented to the NRC in ELV-03878. Finally, the NRC SER supporting the September 30, 1993, issuance of amendments to the VEGP TS that allowed the implementation of the bypass capability states that the approved amendments would allow the licensee to test or maintain a channel without placing it in a tripped condition, thereby avoiding a spurious reactor trip or ESFAS actuation.

Therefore, based on our recent experience, existing administrative controls and TS requirements, and the fact the proposed use of the bypass capability is supported by the above referenced NRC SERs, GPC believes that the proposed use of the bypass capability is safe and prudent for the purpose of avoiding unnecessary reactor trips and ESFAS actuations. On February 10, 1994, a telephone conversation was held with NRC-Region II, NRC-NRR, and GPC and it is our understanding that the NRC staff agrees with the proposed use of the bypass capability. Therefore, GPC requests your written concurrence as soon as possible to facilitate future use of the bypass capability for maintenance purposes.

Sincerely,


C. K. McCoy

CKM/NJS

Enclosure

U. S. Nuclear Regulatory Commission
LCV-0290
Page 3

xc: Georgia Power Company
Mr. J. B. Beasley, Jr.
Mr. M. Sheibani
NORMS

U. S. Nuclear Regulatory Commission
Mr. S. D. Ebnetter, Regional Administrator
Mr. D. S. Hood, Licensing Project Manager, NRR
Mr. B. R. Bonser, Senior Resident Inspector, Vogtle



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

FEB 22 1989

Mr. Roger A. Newton
Westinghouse Owners Group
Wisconsin Electric Power Company
212 W. Michigan Avenue
Milwaukee, Wisconsin 53201-2909

SUBJECT: WESTINGHOUSE TOPICAL REPORTS WCAP-10271 SUPPLEMENT 2 AND
WCAP-10271 SUPPLEMENT 2, REVISION 1, "EVALUATION OF
SURVEILLANCE FREQUENCIES AND OUT OF SERVICE TIMES FOR THE
ENGINEERED SAFETY FEATURES ACTUATION SYSTEM"

Dear Mr. Newton:

We have completed our review of the subject topical reports submitted by the Westinghouse Owners Group by letters dated March 20, 1986 and May 12, 1987. Enclosure 1 provides our Safety Evaluation Report (SER), which was prepared after reviewing the Technical Evaluation Report (TER attached to the SER) developed under contract by Brookhaven National Laboratory. We concur with the findings contained in the TER.

As noted in the enclosed SER, applicants for proposed Technical Specification changes for individual plants must:

1. Confirm the applicability of the generic analyses of WCAP-10271 Supplement 2 and WCAP-10271 Supplement 2, Revision 1.
2. Confirm that any increase in instrument drift due to the extended STIs is properly accounted for in the setpoint calculation methodology. (For additional information on this issue, see letter from C. E. Rossi to R. F. Janecek, dated April 27, 1988.)

Enclosure 2 provides an acceptable format for proposed TS Changes based on WCAP-10271 Supplement 2 and WCAP-10271 Supplement 2, Revision 1. Our review of plant-specific changes will consider the applicabilities of the topical reports to the specific plant.

Licensees and applicants are encouraged to propose changes to TS that are consistent with the guidance provided in the enclosures. Proposed license amendments conforming to this guidance will be expeditiously reviewed by the NRC Project Manager for the facility. Proposed amendments that deviate from this guidance will require a longer, more detailed review. Please contact the Project Manager if you have questions on this matter.

8903030004

MAR 20 1989

... contribution to core melt frequency comes from three plant states described in Section 1.3.4.4.3. These plant states and their frequencies are: V21 - 1.2 x 10⁻⁹; V2E2 - 8.7 x 10⁻¹¹; and V2L - 1.3 x 10⁻⁶. The release categories associated with those plant states are well represented by the source term for release category 4 (described in Section 5), with timing as described in Section 1.3.4.4.3.

Bill: Exponential notation is indicated in abbreviated form: 1.2 x 10⁻⁹ = 1.2 x 10⁻⁹.

FEB 22 1989


-2-

Pursuant to 10 CFR 2.790, we have determined that the enclosed evaluation does not contain proprietary information. However, we will delay placing the evaluation in the Public Document Room for a period of ten (10) working days from the date of this letter to provide you with the opportunity to comment on the proprietary aspects only. If you believe that any information in the enclosure is proprietary, please identify such information line by line and define the basis pursuant to the criteria of 10 CFR 2.790.

In accordance with procedures established in NUREG-0390, "Topical Reports Review Status," we request that the Westinghouse Owners Group publish accepted revisions of WCAP-10271 Supplement 2 and WCAP-10271 Supplement 2, Revision 1, both proprietary and non-proprietary, within three months of receipt of this letter. The accepted versions should (1) incorporate this letter and the enclosed Safety Evaluation Report including the Technical Evaluation Report, between the title page and the abstract and (2) include an - A (designated accepted) following the report identification symbols.

Should our acceptance criteria or regulations change so that our conclusions as to the acceptability of the reports are no longer valid, the Westinghouse Owners Group and/or the applicants referencing these topical reports will be expected to revise and resubmit their respective documentation, or submit justification for the continued applicability of the topical reports without revision of their documentation.

Sincerely,


Charles E. Rossi, Director
Division of Operational Events
Assessment
Office of Nuclear Reactor Regulation

Enclosures:
As stated

F
E
C
S
f
J
f
t
3
b
A
e
ti
ci
F
fc
ch
wi
Th
an
La
ST
he
Ad
re

ENCLOSURE 1

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
REVIEW OF WESTINGHOUSE REPORT WCAP-10271 SUPPLEMENT 2 AND
WCAP-10271 SUPPLEMENT 2, REVISION 1 ON EVALUATION OF
SURVEILLANCE FREQUENCIES AND OUT OF SERVICE TIMES FOR THE
ENGINEERED SAFETY FEATURES ACTUATION SYSTEM

ew
ons
ie-

1.0 SUMMARY

The staff has reviewed the Westinghouse Topical Reports WCAP-10271, Supplement 2 and WCAP-10271 Supplement 2, Revision 1 "Evaluation of Surveillance Frequencies and Out of Service Times for the Engineered Safety Features Actuation System", supported by the Westinghouse Owners Group (WOG) for purposes of proposing extensions of surveillance test intervals (STIs) and test and maintenance allowed outage times (AOTs) for the Engineered Safety Features Actuation System (ESFAS).

Specifically, bases were provided for increasing the STI for the analog channels from 1 month to 3 months; no STI changes were requested for the combinational logic, or the master or slave relays.

It was also proposed that 1) the AOTs for test for the analog channels be increased from 2 hours to 4 hours for both solid state and relay systems, 2) the AOTs for test for all components be increased to 4 hours in solid state systems, and 3) in relay systems, the AOTs for test for the logic trains and master relays be increased to 8 hours and for the slave relays to 12 hours.

Additionally, it was requested that the AOT for maintenance for all components be extended to 12 hours for both relay and solid state systems. All components except the analog channels would be in bypass during the maintenance AOT, with an analog channel tripped after spending 6 hours in bypass.

Finally, it was requested that a staggered test requirement not be implemented for analog channels in the ESFAS and that this requirement be removed for analog channels in the Reactor Protection System (RPS) (Ref. 1), many of which are common with ESFAS channels.

The staff has concluded that the analyses presented in WCAP-10271 Supplement 2 and WCAP-10271 Supplement 2, Revision 1, augmented by a Brookhaven National Laboratory (BNL) technical evaluation report (TER) are acceptable for resolving the STI and AOT extension issues, subject to any limitations and conditions presented herein.

Additionally the staff concludes that a staggered test strategy is no longer required for RPS analog channel testing, as originally stipulated in Ref. 1.

2.0 BACKGROUND

Item 4.5.3 of Generic Letter B3-28 (Ref. 2) requested that all licensees and applicants review the existing RPS on-line functional test intervals required by Technical Specifications (TS). They are to ensure that current and proposed intervals (Ref. 1) for such testing are consistent with a goal of achieving high RPS availability. Extensions to RPS STIs have been granted for Westinghouse PWR plants.

The ESFAS shares some common instrumentation with the RPS. On the average, the number of ESFAS analog channels sensing either process or nuclear parameters is 58, with 20 channels dedicated to the ESFAS and 38 channels common between ESFAS and RPS. It is therefore worthwhile from an operational viewpoint to consider extensions of STIs for all ESFAS analog channels. Additionally, plant operational effectiveness is enhanced by considering STI extensions for the ESFAS logic cabinets and master and slave relays. At the same time, consideration of extension of test and maintenance AOTs will allow more effective test and maintenance operations. This will reduce human error rates in these activities and the number of inadvertent actuations of engineered safety features.

3.0 APPROACH

The Westinghouse Owners Group (WOG) approached resolution of this issue generically. The unavailabilities of the ESFAS signals were calculated by Westinghouse/WOG (Ref.'s 3 and 4) for both relay and solid state systems. The analyses show that the unavailabilities of the relay and solid state ESFAS signals are of similar magnitude.

The WOG originally evaluated the impact of the proposed STI and AOT changes on core damage frequency (CDF) and public health risk on the Millstone Unit 3 plant. This plant has a solid state ESFAS with 2-out-of-4 (2/4) logic. The staff and its contractor, Brookhaven National Laboratory (BNL), had a concern that Millstone Unit 3 might not fully bound the change in CDF due to the proposed STI and AOT changes for all Westinghouse plants. Some plants have either a 2-out-of-3 (2/3) logic or a combination which may have higher unavailability than that associated with a 2/4 logic such as at Millstone Unit 3. In response to this concern, Westinghouse performed an analysis, documented as WCAP-10271 Supplement 2, Revision 1, Addendum 2 to determine the effect on the change in the Millstone 3 CDF of an assumed change of the ESFAS logic from 2/4 to 2/3. This resulted in a CDF increase for the 2/3 logic over the 2/4 logic of less than 1 percent of the base case CDF for the solid state system. The staff concludes that the relay plants would exhibit similar relative CDF changes with respect to the impact of 2/3 vs. 2/4 logic.

4.0 NRC ACTION

The staff engaged the services of Brookhaven National Laboratory (BNL) to review the approach used and the analyses performed in the Westinghouse reports. This

re
th
Ne

Th
CD
th

BNL
res
tes
ass
pra

P

The
due
The
exp
to
acc

Base
ana
wou
a te
the

Addi
impl
anal
the
abil

5.0

Base
conc
repr
will
analy
Revis
STI f

Addit
may b
syste

review was performed to determine the adequacy of the methods used to establish the technical bases for the proposed modifications of STIs and AOTs for the Westinghouse PWR ESFAS instrumentation and actuation relays.

The BNL review calculations yielded, for the proposed ESFAS STI/AOT changes, a CDF increase of 2.8% for solid state plants, which is in good agreement with the 2.4% increase calculated by the WOG.

BNL performed a variety of parametric CDF increase calculations. Among the results was a relay plant CDF increase of 4% assuming concurrent slave relay testing. Another BNL sensitivity study yielded a CDF increase of 5.7%, assuming a very conservative sequential testing scheme which is not used in practice.

BNL also determined that use of Millstone Unit 3 as a reference plant may not fully bound the change in CDF due to the proposed STI/AOT changes because of its 2/4 ESFAS logic, which yielded the 2.4% CDF increase. The 2/3 ESFAS logic WOG analysis, discussed earlier, yielded a 3.3% CDF increase.

The staff concludes, therefore that an overall upper bound for the CDF increase due to the proposed STI/AOT changes is less than 6% for Westinghouse PWR plants. The staff also concludes that actual CDF increases for individual plants are expected to be substantially less than 6%. The staff considers this CDF increase to be small compared to the range of uncertainty in the CDF analyses and therefore acceptable.

Based on the Westinghouse/WOG analyses and the BNL audit and sensitivity analyses, the staff concludes that the proposed STI and AOT changes for the ESFAS would have only a small and therefore acceptable impact on plant risk. BNL issued a technical evaluation report (Enclosure to this Safety Evaluation) presenting the details and results of its reviews.

Additionally the staff concludes that a staggered test strategy need not be implemented for ESFAS analog channel testing and is no longer required for RPS analog channel testing, as originally stipulated in Ref. 1. This is based on the small relative contribution of the analog channels to RPS/ESFAS unavailability, process parameter signal diversity, and normal operational test spacing.

5.0 CONCLUSIONS

Based on a review of the BNL technical evaluation report (TER), the staff concludes that a 6% CDF increase due to the proposed STI/AOT extensions represents an upper bound. For realistic testing strategies, the CDF increase will be substantially less than this. The staff therefore concludes that the analyses presented in WCAP-10271 Supplement 2 and WCAP-10271 Supplement 2, Revision 1, augmented by the TER, form an acceptable basis for increasing the STI for ESFAS analog channels from 1 month to 3 months.

Additionally, the staff finds that 1) AOTs for test for the analog channels may be increased from 2 hours to 4 hours for both solid state and relay systems, 2) the AOTs for test for all components may be increased to 4 hours

in solid state systems, 3) The AOTs for test for the logic trains and master relays may be increased to 8 hours and the AOT for the slave relays to 12 hours in relay systems, and 4) the AOT for maintenance for all components may be extended to 12 hours for both relay and solid state systems. Additionally, all components except the analog channels are to be in bypass during the maintenance AOT, with an analog channel tripped after spending 6 hours in bypass.

Further, the staff will not require a staggered test strategy for ESFAS analog channel testing, and will no longer require a staggered test strategy for RPS analog channel testing, as stipulated in the staff SER of February 21, 1985 (Ref. 1). The removal of the staggered test requirement is based on the small relative contribution of the analog channels to RPS/ESFAS unavailability, process parameter signal diversity, and normal operational test spacing, which is neither staggered nor sequential, but yields some of the benefits of staggered testing.

Table 1 lists plant-specific conditions that each licensee or applicant must meet to make any proposed STI or AOT changes fully acceptable. Table 2 summarizes the approved changes.

6.0 REFERENCES

1. Safety Evaluation by the Office of Nuclear Reactor Regulation WCAP-10271, "Evaluation of Surveillance Frequencies and Out of Service Times for the Reactor Protection Instrumentation System," February 21, 1985.
2. Eisenhut, D. G., NRC Letter to All Licensees of Operating Reactors, Applicants for Operating License, and Holders of Construction Permits, "Requested Actions Based on Generic Implications of Salem ATWS Events," July 8, 1983.
3. Andre, G. R., Howard, R. C., Jansen, R. L., and Leonelli, K., "Evaluation of Surveillance Frequencies and Out of Service Times for the Engineered Safety Features Actuation System," WCAP-10271, Supplement 2, February 1986.
4. Andre, G. R., Howard, R. C., Jansen, R. L., and Leonelli, K., "Evaluation of Surveillance Frequencies and Out of Service Times for the Engineered Safety Features Actuation System," WCAP-10271, Supplement 2, Revision 1, March 1987.