

ATTACHMENT 1

LIMERICK GENERATING STATION
UNITS 1 and 2

Docket Nos. 50-352
50-353

License Nos. NPF-39
NPF-85

TECHNICAL SPECIFICATIONS CHANGE REQUEST

"Reduced Testing of Reactor Protection System,
Emergency Core Cooling System and Common Instrumentation"

Supporting Information for Changes - 7 pages

Philadelphia Electric Company (PECo), Licensee under Facility Operating Licenses NPF-39 and NPF-85 for Limerick Generating Station (LGS), Unit 1 and Unit 2, respectively, hereby requests that the Technical Specifications (TS) contained in Appendix A of the Operating Licenses be amended as proposed herein to extend surveillance test intervals (STIs) and allowable out-of-service times (AOTs) for the actuation instrumentation supporting Reactor Protection System (RPS), Emergency Core Cooling System (ECCS), including instrumentation common to the Control Rod Block Function (CRBF), the Reactor Core Isolation Cooling (RCIC) system, End-of Cycle Recirculation Pump Trip (EOC-RPT) system, and the isolation instrumentation common to RPS and/or ECCS. The proposed changes will minimize unnecessary testing and remove excessively restrictive AOTs that could potentially degrade overall plant safety and availability.

We request the changes proposed herein to be effective fifteen (15) days after issuance of the Amendments.

This Change Request provides a discussion and description of the proposed TS changes, a safety assessment of the proposed TS changes, information supporting a finding of No Significant Hazards Consideration, and information supporting an Environmental Assessment.

Discussion and Description of Proposed Changes

Licensing Topical Report (LTR), "BWR Owners' Group Response to NRC Generic Letter 83-28, Item 4.5.3," (Reference 1) provided justification for the acceptability of current PPS STIs. In addition, Reference 1 established a basis for extending STIs and AOTs for RPS based on reliability analyses which estimate RPS failure frequency. The analyses were further developed in other LTRs (References 2 through 5) to provide justification for extending TS STIs and AOTs for the RPS and ECCS, including common instrumentation. References 2 through 5 also included proposed TS changes to facilitate implementation of the analyses results. References 2 through 5 were submitted to the NRC by the Boiling Water Reactor Owners' Group (BWROG) and subsequently approved as detailed in NRC Safety Evaluation Reports (SERs) (References 6 through 10). These SERs describe the acceptability of both the analyses and the proposed TS changes provided to the NRC. In addition, References 6 through 10 provided criteria for plant specific implementation of the generically approved TS changes. Our compliance with these criteria is discussed in the Safety Assessment of this Change Request.

This Change Request proposes TS changes to the actuation instrumentation supporting the RPS and ECCS, including instrumentation common to the CRBF and the isolation instrumentation common to the RPS and/or ECCS. These changes are specifically designated in the TS mark-ups of References 6 through 10 and therefore are not further discussed here. We are also proposing TS changes to instrumentation common to RPS and/or ECCS but which are not specifically designated in References 6 through 10. These proposed changes are addressed in the analyses of References 2 through 5 but were not specifically designated in the TS mark-ups submitted as part of References 2 through 5. These changes will provide a complete consideration of all systems/components initiated by RPS or ECCS instrumentation which are tested on a monthly schedule and are NRC approved

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for testing on a quarterly schedule as detailed in References 6 through 10. All changes are shown in Attachment 3. However, only those changes not specifically designated in References 6 through 10 are described below.

1. Trip Function 6.h, "Drywell Pressure-High/Reactor Pressure-Low," listed on TS page 3/4 3-30 is a combined trip function composed of two individual ECCS trip functions whose STIs were evaluated and found acceptable for being changed from "M" (monthly) to "Q" (quarterly) as detailed in Reference 4. Since Trip Function 6.h uses common trip instrumentation, we propose to change the STI to quarterly. As discussed in Enclosure 1, GE Document No. OG9-1219-32D, letter W. P. Sullivan, General Electric (GE) Company to BWROG Technical Specification Committee (TSC), dated December 22, 1989, "Clarification of Limerick 1 and 2 Proposed Technical Specification Changes Common to Reactor Protection System or ECCS Actuation Instrumentation," this change is bounded by the analysis of Reference 4.
2. The EOC-RPT system uses trip functions common to RPS. Therefore, we propose to change the EOC-RPT system STIs and AOTs on TS pages 3/4 3-46, 3/4 3-48, and 3/4 3-51 to conform to the TS changes made for RPS instrumentation. Enclosure 1 details the fact that the analysis of Reference 4 bounds the proposed TS changes for EOC-RPT.
3. The RCIC system uses trip functions common to ECCS and therefore we propose changes to TS pages 3/4 3-53, 3/4 3-54, and 3/4 3-56 to be consistent with other TS changes for ECCS instrumentation. Due to an oversight, changes to these TS were not specifically included in the TS mark-ups provided to the NRC in Reference 5, although they are addressed in the Reference 5 analysis. Enclosure 2, GE document No. OG9-749-32D, letter from W. P. Sullivan, GE, to BWROG Technical Specification Committee, dated August 7, 1989, "Clarification of Technical Specification Changes Given in ECCS Actuation Instrumentation Analysis," provided mark-ups for these changes to the RCIC system TS to the BWROG TSC. Enclosure 5, GE Document No. OG90-319-32D, letter from W. P. Sullivan, GE to U.S. NRC, dated March 22, 1990, "Clarification of Technical Specification Changes Given in ECCS Actuation Instrumentation Analysis," provided justification and TS mark-ups to the NRC for these changes to the RCIC TS.
4. The proposed TS changes to TS Section 3/4 3.3.3 on page 3/4 3-36 provide a 24 hour AOT for ECCS instrumentation which is consistent with the analysis in Reference 5. The proposed wording differs from the TS mark-up of Reference 5 which implies an allowance of 24 hours before taking the action of TS Table 3.3.3-1. Enclosures 2 and 5 provide a clarification on the intent of the Reference 5 TS mark-up and also provide revised wording. We have proposed a TS change consistent with Enclosures 2 and 5.
5. An administrative change to a TS Index page is also proposed. We propose a change to index page "xix" to reflect additions to the TS Bases which reference the appropriate LTR(s) and accompanying SER(s). Each of the TS Instrumentation Bases pages changes are proposed either

to make additions, as just described, or to accommodate carryover from a previous page (as a result of the additions).

Safety Assessment

The effect on safety of the proposed extensions to the STIs and AOTs of the actuation instrumentation supporting the RPS, and the ECCS including the instrumentation common to the CRBF, and the isolation instrumentation common to the RPS and/or ECCS has been addressed in References 2 through 5. Further, the NRC has detailed their acceptance of the analyses and conclusions of References 2 through 5 in SERs (References 6 through 10). The SERs conclude that implementation of the TS changes proposed in References 2 through 5 would provide an overall enhancement to plant safety and that the proposed changes to TS are acceptable subject to the Licensee documenting 1) plant-specific applicability, 2) that instrument drift is bounded by the generic analysis assumptions, and 3) confirmation that differences between plant-specific and generic RPSs were included in the plant-specific analysis. These acceptance conditions are addressed below.

1. A plant-specific review of the LTRs' (References 2 through 5) applicability to LGS has been conducted. For the RPS, the review compared the LGS RPS configuration and surveillance test procedure with the generic RPS evaluated in the LTR. The differences between the two were identified and the reliability effect of the differences was assessed. The differences and their effect are documented in a separate GE report, Enclosure 3, document No. MDE-93-0485-1, "Technical Specification Improvement Analysis for the Reactor Protection System for Limerick Generating Station Units 1 and 2," dated October 1987. The report identifies seven differences which were dispositioned by either an engineering assessment or additional analyses. The report concluded that these differences would not significantly affect the improvement in plant safety which would be obtained through the TS changes evaluated in the generic analysis and that the generic analysis is applicable to LGS Units 1 and 2.

For ECCS, a similar review was conducted. The results are documented in a separate GE report, Enclosure 4, document No. RE-019, "Technical Specification Improvement Analysis for Emergency Core Cooling System Actuation Instrumentation for Limerick Generating Station Units 1 and 2," dated December 1986. The report concludes that the ECCS configuration for LGS is similar to the generic analysis with only one significant difference. The difference was modeled by envelope case 4A of Reference 5, Part 1, which shows that the proposed changes to ECCS instrumentation would meet the 4% acceptance criterion of Reference 5, Part 2. In addition there have been no modifications to the RPS or ECCS since issuance of Enclosures 3 and 4 which would invalidate the conclusions of these reports. Therefore, the generic analysis is applicable to LGS.

2. In 1988, the NRC issued additional guidance regarding instrument drift (Reference 11). This letter states that "licensees need only confirm that the setpoint drift which could be expected under the extended STIs has been studied and either (1) has been shown to remain within the existing allowance in the RPS (for BWRs)... instrument setpoint calculation or (2)

that the allowance and setpoint have been adjusted to account for the additional expected drift." Present setpoint calculations for LGS are based on an eighteen (18) month calibration interval. Therefore, drift occurring during a three month STI falls within the existing drift allowance. To further verify this, instrument drift data was examined over three (3) consecutive monthly test intervals. Enclosure 6, "Limerick Generating Station, Unit 1, Instrument Drift Data for RPS, and ECCS, Including Common Instrumentation," provides the as-found drift data on a ten percent (10%) sample of LGS Unit 1 RPS and ECCS instrumentation (this includes common instruments). Since identical instrumentation is used on LGS Unit 2, the Unit 1 sample is considered representative. The data provides actual verification that the drift occurring over 3 consecutive test intervals (one calendar quarter) is within acceptable limits.

3. We have reviewed the GE plant-specific report for LGS and have verified that the differences between the LGS and generic RPS were included in the plant-specific analysis. Therefore, the generic analysis in Reference 2 is applicable to LGS.

As discussed above we have conformed to the guidance provided in References 6 through 10 in the three areas to be addressed by Licensees to ensure the acceptability of proposed TS changes. As noted previously, several changes are also proposed which are not specifically referenced in the NRC SERs (References 6 through 10). The following discussion addresses the acceptability of these proposed changes.

1. Reactor low water level and high drywell pressure were identified in Reference 4 as the primary and secondary isolation trip functions common to either the RPS or ECCS actuation trip functions. In the LGS Units 1 and 2 TS, the combined high drywell pressure and low reactor pressure trip function for primary containment isolation is also common to the ECCS actuation trip function. The STI for this combined trip function was not changed in the sample modified isolation actuation TS in Table 4.3.2.1.1, Item 6.h, of the NRC SER (Reference 8). Although this change was not explicitly identified in the Reference 4 analysis as a common instrumentation trip function, the change is still bounded by the NRC approved Reference 4 analysis. In the Reference 4 analysis, the effect of changing a single isolation trip function STI (either reactor low water level or high drywell pressure) was evaluated to have an acceptably low effect on the isolation actuation failure frequency. Since the combined high drywell pressure and low reactor pressure trip function is backed up by the low reactor water level trip function, the effect of changing the STI for this combined trip function is also acceptably low. For this reason, changing the STI from one month to three months for the combined high drywell and low reactor pressure trip function is bounded by the NRC SER.
2. The EOC-RPT is initiated by signals common to the RPS. These signals (turbine stop valve closure and turbine control valve low hydraulic pressure) were not identified as common trip functions in the RPS TS improvement analysis (Reference 2). Although STI changes to the common EOC-RPT trip functions were not explicitly identified in the Reference 2 analysis, the changes can be considered bounded by this analysis. The basis

for this conclusion is similar to the basis established in Reference 3 for the control rod block instrumentation common to the RPS. Failure of the EOC-RPT trip function could lead to exceeding the Minimum Critical Power Ratio (MCPR) similar to the consequences of an unmitigated rod withdrawal error. The slight increase in risk of a MCPR violation due to extending EOC-RPT STIs is offset by the benefits associated with the similarly approved STIs for the RPS. This is the same reasoning that was used in Reference 3 and approved by the NRC in Reference 7.

3. Analysis of the effects of extending AOTs and STIs for the RCIC system instrumentation was completed and found acceptable as detailed in Reference 5. However, due to an oversight, proposed changes to the TS were not specifically requested in Reference 5 and therefore not specifically addressed in Reference 9. This oversight does not affect the acceptability of these proposed changes, since the methods and results of Reference 5 were found acceptable as documented in Reference 9.

Recognizing that mark-ups to the RCIC system instrumentation TS had not been previously included in Reference 5, GE provided TS mark-ups for all GE BWR product lines, incorporating the extended STIs and AOTs for RCIC system instrumentation. The mark-ups were provided to the BWROG TSC members under cover letter dated August 7, 1989 (Enclosure 2), and discussed and described in Enclosure 5.

4. Also discussed in Enclosure 2 and Enclosure 5 is a clarification of the applicability of the 24 hour TS AOT for ECCS Actuation Instrumentation. The change provides a 24 hour AOT in those TS Action Statements which are applicable to specific instrumentation. The intent of the change is to preclude the allowance of 24 hours before taking the Action specified in TS Table 3.3.3.1. Action "b" of TS paragraph 3/4 3.3, as written in Reference 5, implies a 24 hour AOT before taking any action in TS Table 3.3.3-1. The change we have proposed accurately reflects the intent of the Reference 5 analysis. This change therefore is necessary to obtain the overall enhancement to safety that is possible by extending STIs and AOTs.
5. The proposed administrative change to Index page "xix" is necessary to accurately reflect the location of various Sections in the TS Bases. This change has no impact on safety.

References 6 through 10 provided TS changes based on review of the LTRs (References 2 through 5). We have proposed TS changes consistent with those previously approved and specifically designated in References 6 through 10. In addition, several changes are proposed which are not explicitly referenced in the NRC SERs, but are covered by the analyses detailed in References 2 through 5 and Enclosures 3 and 4, and are acceptable as discussed above.

In summary, the NRC criteria for demonstrating the applicability and acceptability of all proposed changes has been shown to be met, as detailed above. We therefore conclude that the changes proposed will minimize unnecessary testing and relax excessively restrictive AOTs, and will provide an overall enhancement to plant safety.

Information Supporting a Finding of
No Significant Hazards Consideration

We have concluded that the proposed changes to the LGS TS, which extend STIs and AOTs for the RPS and ECCS instrumentation, and instrumentation common to RPS and/or ECCS, do not constitute a Significant Hazards Consideration. In support of this determination, an evaluation of each of the three standards set forth in 10 CFR 50.92 is provided below.

- 1) The proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed TS changes increase the STIs and AOTs for actuation instrumentation supporting RPS, and ECCS, including instrumentation common to the CRBF, RCIC system, EOC-RPT, and isolation functions. In addition, an Index page revision is necessary to reflect the addition of LTR and SER references in the TS Bases, which caused the location of several TS Bases sections to change. There are no changes in any of the affected systems themselves. Since there are no such changes, there can be no change in the probability of occurrence of an accident or the consequences of an accident or the consequences of malfunction of equipment. Regarding the probability of malfunction of equipment, LTRs prepared by GE showed that for the RPS there is a reduction in scram frequency, but that in the ECCS case, there is a small increase in the unavailability of the water injection function. This increase in unavailability was judged acceptable by GE. The NRC, in its review of the LTRs (References 2 through 5), concurred with this conclusion. The changes proposed are consistent with these SERs (References 6 through 10) with several additions. These additional changes are bounded by the analyses of References 2 through 5 as detailed in this Change Request and in Enclosures 1, 2, and 5. Therefore the proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

- 2) The proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

The proposed TS changes do not create the possibility for an accident or malfunction of a different type than any evaluated previously in the Final Safety Analysis Report (FSAR). The proposed changes increase the STIs and AOTs for the RPS and ECCS instrumentation, and common instrumentation, and revise an Index page to reflect the addition of references to the TS Bases. There are no changes in the RPS, ECCS or common systems themselves. Since there are no such changes, there is no possibility for an accident or malfunction of a different type than any evaluated previously.

- 3) The proposed changes do not involve a significant reduction in a margin of safety.

The proposed TS changes do not reduce the margin of safety as defined in the basis for any TS. The proposed TS changes do not change any

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setpoints in the RPS or ECCS instrumentation, or common systems, or their levels of redundancy. Setpoints are based upon the drift occurring during the 18 month calibration interval. The proposed changes extend STIs and AOTs. The Bases in the TS either do not discuss STIs, or state "... one channel may be inoperable for brief intervals to conduct required surveillance." The proposed TS changes discussed in References 2 through 5, as well as the additional changes discussed in this Change Request and Enclosures 1, 2, and 5 are bounded by the analyses in References 2 through 5. These analyses (References 2 through 5) prepared by GE and reviewed and approved by the NRC examined the effects of extending STIs and AOTs and found that the proposed changes would not involve a significant reduction in a margin of safety.

Information Supporting an Environment Assessment

An environmental assessment is not required for the changes proposed by this Change Request because the requested changes conform to the criteria for "actions eligible for categorical exclusion," as specified in 10 CFR 51.22(c)(9). The requested changes will have no impact on the environment. The proposed changes do not involve a significant hazards consideration as discussed in the preceding section. The proposed changes do not involve a significant change in the types or significant increase in the amounts of any effluents that may be released offsite. In addition, the proposed changes do not involve a significant increase in individual or cumulative occupational radiation exposure.

Conclusion

The Plant Operations Review Committee and the Nuclear Review Board have reviewed these proposed changes to the TS and determined that they do not involve an Unreviewed Safety Question and will not endanger the health and safety of the public.

REFERENCES

1. S. Wisweswaran, et al., "BWR Owners' Group Response to NRC Generic Letter 83-28, Item 4.5.3," General Electric Company, NEDC-30844, January 1985.
2. W. P. Sullivan, et al., "Technical Specification Improvement Analyses for BWR Reactor Protection System," General Electric Company, NEDC-30851P, May 1985.
3. S. Wisweswaran, et al., "Technical Specification Improvement Analysis for BWR Control Rod Block Instrumentation," General Electric Company, NEDC-30851P, Supplement 1, June 1986.
4. L. G. Frederick, et al., "Technical Specification Improvement Analysis for BWR Isolation Instrumentation Common to RPS and ECCS Instrumentation," General Electric Company, NEDC-30851P, Supplement 2, July 1986.
5. D. B. Atcheson, et al., "BWR Owners' Group Technical Specification Improvement Methodology (with Demonstration for BWR ECCS Actuation Instrumentation)," Parts 1 and 2, General Electric Company, NEDC-30936P, November 1985.
6. Safety Evaluation by the Office of Nuclear Reactor Regulation - "Review of BWR Owners Group Reports NEDC-30844 and NEDC-30851P on Justification for an Extension of On-Line Test Intervals and Allowable Out-of-Service Time for BWR Reactor Protection Systems," July 15, 1987.
7. Safety Evaluation by the Office of Nuclear Reactor Regulation - "Review of BWR Owners Group Report NEDC-30851P, Supplement 1 on Justification for Extension of On-Line Test Intervals for BWR Control Rod Block Instrumentation," September 22, 1988.
8. Safety Evaluation by the Office of Nuclear Reactor Regulation - "Review of BWR Owners Group Report NEDC-30851P, Supplement 2 on Justification for Extension of Surveillance Test Intervals and Allowed Outage Times for BWR Isolation Instrumentation Common to RPS and ECCS Instrumentation," January 6, 1989.
9. Safety Evaluation by the Office of Nuclear Reactor Regulation - "Review of BWR Owners Group Report NEDC-30936P on Justification for Extending On-Line Test Intervals and Allowable Out-of-Service Times for BWR Emergency Core Cooling System Instrumentation," December 9, 1988.
10. Safety Evaluation by the Office of Nuclear Reactor Regulation - "Review of BWR Owners Group Report NEDC-30936P (Part 2) on Justification for Extending On-Line Test Intervals and Allowable Out-of-Service Times for BWR Emergency Core Cooling System Instrumentation," December 9, 1988.
11. C. E. Rossi, NRC, to R. F. Janacek, BWROG, "Staff Guidance for Licensee Determination that the Drift Characteristics for Instrumentation Used in RPS Channels are Bounded by NEDC-30851P Assumptions when the Functional Test Interval is Extended from Monthly to Quarterly," April 27, 1988.