



Commonwealth Edison
1400 Opus Place
Downers Grove, Illinois 60515

December 21, 1994

Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attn.: Document Control Desk

Subject: Commonwealth Edison 10 CFR Part 21 Final Report (File 94-14)
Turbine Bypass Valve Opening Time

The purpose of this letter is to notify the NRC Staff of Commonwealth Edison (ComEd) concerns regarding the non-conservative assumption of turbine bypass valve opening time in plant transient analyses for Unit 2 of the Quad Cities Station. These analyses were performed for each reload cycle by General Electric Company (GE).

It has been determined that this deviation created a potential substantial safety hazard for the following reason:

- ▶ The non conservative turbine bypass valve opening time affects the transient analyses that credits turbine bypass valve operation and potentially may result in a non-conservative Minimum Critical Power Ratio (MCPR) operating limit.

In September 1994, ComEd determined that there was not sufficient data to support the turbine bypass valve opening time assumed in reload transient analyses for Quad Cities and Dresden Stations. The only data available was from Cycle 1 startup tests conducted in the early 1970s. This test data show that the bypass valve opening time could be slower than the value used in Quad Cities' transient analyses; however, the test data could not be confirmed due to a lack of documentation retained at GE. Upon discovery of this defect, ComEd determined that the limiting transient for Quad Cities may be changed from Load Rejection Without Bypass (LRNBP) to Feed Water Controller Failure (FWCF). For Dresden, the FWCF would remain as the limiting transient, but the MCPR operating limit could change. While plans for bypass valve testing were being developed, Quad Cities Station implemented administrative controls to apply conservative MCPR operating limits corresponding to FWCF with no bypass valve operation. Dresden Station did not need to implement any administrative controls because both Units were in an outage.

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At this time, ComEd has concluded testing of bypass valve opening time for all units at the two Stations. The test results show that for Dresden Units 2 and 3, the measured turbine bypass system performance is bounded by the performance used for licensing calculations. The reload transient analyses for Dresden were performed by Siemens Power Corporation (SPC) and the analyses for Quad Cities were performed by GE.

For Quad Cities Unit 2, the test results indicated that the bypass system performance is degraded with respect to the licensing basis. Therefore, the Core Operating Limits Report for the current operating cycle of Unit 2 was conservatively revised to reflect the MCPR Operating Limit for the limiting transient of FWCF with no bypass valve operation. The Quad Cities Unit 2 test results were reported under 10 CFR 50.72 on December 5, 1994. The response of the Quad Cities Unit 1 bypass system complies with the design specifications and with the assumptions of the transient analysis.

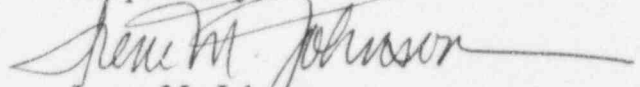
ComEd has incorporated the turbine bypass system performance analysis as a part of all future reload analyses.

GE has determined that Dresden and Quad Cities are the only two plants equipped with Mark I Electro-Hydraulic Control (EHC) System which do not have fast acting bypass valves. The Design Specification for other plants with similar EHC Systems requires them to have a rapid position opening rate following a turbine trip. GE stated that the fast acting bypass valves have an excellent reliability record and they have issued SIL No. 413 in 1984 which recommended the reduction in the frequency of surveillance testing for these valves. The SIL does not apply to Dresden and Quad Cities.

Provided as an attachment to this letter is ComEd's notification in accordance with the requirements of 10 CFR Part 21.

If there are any questions regarding this notification, please direct them to Karen Chromizky at (708) 663-3753.

Respectfully,



Irene M. Johnson
Licensing Operations Director

Attachment: 10 CFR Part 21 Final Report

cc: J.B. Martin, Regional Administrator - RIII
M. Leach, Senior Resident Inspector - Dresden
C. G. Miller, Senior Resident Inspector - Quad Cities
R.A. Capra, Directorate III-2 Director, NRR
J. Stang, Dresden Project Manager, NRR
R. M. Pulsifer, Quad Cities Project Manager, NRR
Office of Nuclear Facility Safety - IDNS

**Attachment
10 CFR Part 21 Notification
Turbine Bypass Valve Opening Time**

10 CFR Part 21 File No. 9414

Applicability

This notification is submitted in accordance with the requirements of 10 CFR 21, sections 21.1(a), 21.3a(3), and 21.3.d(1).

Identification of Facility and Component

This notification concerns the non-conservative assumption of turbine bypass valve opening time in plant transient analyses for Quad Cities Station Unit 2. No other ComEd Stations are affected by this Part 21 notification.

Identification of Component Manufacturer

Safety Analysis:
GE Nuclear Energy
175 Curtner Avenue
San Jose, CA 95125
Phone: (910) 675-6192

Nature of Defect

Tests performed on the Quad Cities Unit 2 turbine bypass valves confirmed that opening time used in the reload transient analysis is non-conservative. The non-conservative bypass valve opening time affects the analyses that credits turbine bypass valve operation and may result in a non-conservative Minimum Critical Power Ratio (MCPR) operating limit.

Time of Discovery

While Siemens Power Corporation (SPC) personnel were preparing the transient analysis parameters list for Quad Cities Station, to support post-1995 reloads under the new BWR Fuel Contract, a difference between Dresden and Quad Cities was identified in the main turbine bypass valves opening time. SPC notified ComEd/Nuclear Fuel Services (NFS) of this discrepancy via a letter on 8/26/94. The Feedwater Controller Failure (FWCF) transient is the only Safety Analysis to model turbine bypass valve opening time.

The Main Turbine System Engineers for Dresden and Quad Cities were contacted by ComEd Nuclear Fuel Services (NFS) department to confirm the valving associated with the bypass system was identical between the two stations. The equipment manual for both sites were identical. The equipment manual drawings indicate a specification on opening time of 0.15 seconds with a 10% error. To confirm the specification had been met, NFS reviewed Cycle 1 startup test reports for each Unit. These reports were, at that time, the only available source of information at ComEd that contains bypass valve opening times. They provided apparent bypass valve opening times, as a result of turbine and generator tests at power, that varied between 0.2 seconds and 1.6 seconds. The results show that the valve opening time is slower than the value used for Quad Cities' analysis but appears to be acceptable for Dresden. NFS contacted GE for more information on bypass valve performance and test data and learned that response time measurement was not part of the acceptance criteria for the initial startup tests. GE searched and failed to locate records of the initial startup test; hence the accuracy of the test data cannot be confirmed.

GE stated that Dresden and Quad Cities were the only GE Turbine EHC controlled plants that are built without a fast acting solenoid installed in the bypass valve control system. GE performed preliminary calculations of the expected bypass valve system response and determined that the valves should be capable of opening within the design specification of 0.15 seconds. However, GE agreed that there appears to be little plant data to support the calculated response time. Although the Dresden Unit 3 Cycle 1 startup data suggests that the valves opened within the prescribed time, the current opening time for the bypass valve could not be determined due to the lack of recent timing data.

Corrective Actions

Dresden

Dresden Units 2 and 3 performed bypass tests on 11/12/94 and 10/9/94, respectively. The test results showed that the measured turbine bypass system performance is bounded by the performance used for licensing calculations.

Quad Cities

Quad Cities Units 1 and 2 performed bypass tests on 12/5/94 and 11/30/94, respectively. For Quad Cities Unit 2 the bypass system performance is degraded with respect to the licensing basis. Therefore, the Core Operating Limits Report for the current operating cycle of Quad Cities Unit 2 was revised to reflect the MCPR Operating Limit for the limiting transient of FWCF without bypass valve operation.

A 50.59 safety evaluation for Quad Cities Unit 2 was completed after this corrective action. The response of the Quad Cities Unit 1 bypass system complies with the design specifications and with the assumptions of the transient analysis.

NFS has incorporated the turbine bypass system performance analysis as a part of all future reload analyses for both Dresden and Quad Cities.

Contacts

Questions pertaining to this notification should be addressed to:

Karen Chromizky

Part 21 Coordinator

Nuclear Engineering and Technology Services

ComEd

1400 Opus Place, Suite 400

Downers Grove, IL 60515.

(708) 663-3753

DESIGN GROUP
DEFECT OR NONCOMPLIANCE 10CFR PART 21 EVALUATION CHECKLIST

1. ENC Part 21 File Number 94-14
2. Document Generated By NFS
3. Date of Document 12/12/94
4. Document Identification Number(s) if any NFS:RSA: 94-188
5. Defect or Noncompliance Identified Non-conservative assumption of turbine bypass valve opening time in plant transient analyses for Quad Cities Unit 2.
6. Vendor notified : General Electric
Date : 9/12/94
Person Contacted: Richard Kingston
7. Will vendor assume responsibility for evaluating the defect or noncompliance for Part 21 applicability? Yes No X

Scheduled completion date 12/24/94

If YES, the evaluation is closed.

Richard Kingston
NED Engineer

12/13/94
Date

NED Superintendent/Supervisor

Date

If No, then proceed by completing the remainder of the checklist.

8. Did/Could a condition/event listed in Section 4.1 (Definitions) apply?
Yes X No

If yes, explain why and which item of paragraph 4.1 occurred/could occur.

The non-conservative turbine bypass valve opening time affects the transient analyses that credit turbine bypass valve operation and potentially may result in a non-conservative Minimum Critical Power Ratio (MCPR) Operating limit.
If yes, immediately notify NED Superintendent/Supervisor.
If no, provide reason.

9. Does the failure, defect or non-conformance have the potential for impacting plant or system operability as defined in the Technical Specification or FSAR/UFSAR? YES _____ NO X

If NO, provide reason Assumed values of the turbine bypass valve opening time affects only the results of transient analyses. The valves are still operable.

If YES, Notify the appropriate NED Design Supt./Supv. to determine if a ENC-QE-40.1 evaluation must be completed.

10. Is 10CFR21 notification to NRC required. Yes X No _____

If no, explain why? _____

11. Corrective Action which has been, is being, or will be taken.

See attachment to NPS, RSA: 94-188

12. This information is applicable to the following Station(s):

<u> </u> Braidwood	<u> X </u> Dresden	<u> X </u> Quad Cities
<u> </u> Byron	<u> </u> LaSalle	<u> </u> Zion

13. This evaluation was not performed for the following Stations:

<u> X </u> Braidwood	<u> </u> Dresden	<u> </u> Quad Cities
<u> X </u> Byron	<u> X </u> LaSalle	<u> X </u> Zion

Provide explanation for each station not evaluated.

This defect applies only to BWR transient analyses. Valve opening time for LaSalle is well established and confirmed periodically via Tech Spec required surveillance.

14. Evaluation conducted by Dennis Kong Date 12/13/94
NED Engineer

15. Concur with evaluation and evaluation is closed.

End Sheet for Dan Reiden 12/20/94
NED Superintendent/Supv. PER TELECON Date