



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

PDR

July 10, 1985

The Honorable Morris K. Udall, Chairman
Subcommittee on Energy and the Environment
Committee on Interior and Insular Affairs
United States House of Representatives
Washington, D. C. 20515

Dear Mr. Chairman:

This is in response to your letter to me of April 26, 1985, which called attention to a Tennessee Valley Authority (TVA) internal report. The TVA report, NSRS Investigation of Concerns Related to Failures of the High Pressure Coolant Injection (HPCI) System at Browns Ferry Nuclear Plant, NSRS Report No. I-84-16-BFN, concluded that employee concerns about this system were valid and "plant safety, in the event of a LOCA at Browns Ferry (BFN), was in jeopardy." You expressed concern that plant safety would have been in such jeopardy through the eleven-year period of difficulties with this system and raised a number of questions in four general groups.

To ensure completeness of response and provide clarity, we have listed each of your questions separately and provided specific responses in the enclosure. As our responses therein indicate, the NRC has been monitoring TVA's activities related to the HPCI in the three plants at Browns Ferry, has conducted many inspections on HPCI-related problems, and has cited the licensee a number of times for violations concerning the HPCI system. As our detailed responses indicate, the Browns Ferry HPCI is not exceptionally unreliable for a system of this type and we do not believe the present situation with the HPCI at Browns Ferry represents an undue risk to the health and safety of the public. Nevertheless, we are continuing to provide close scrutiny of HPCI-related activities at TVA, where work to resolve HPCI problems still goes on.

Although the HPCI concern at Browns Ferry is important, and is receiving appropriate NRC attention, you should understand that our concern and efforts regarding TVA are much broader. TVA presently has five plants with operating licenses (3 at Browns Ferry and 2 at Sequoyah), four plants under operating license review (2 at Bellefonte and 2 at Watts Bar), and eight additional plants for which construction permits were granted, but for which TVA has announced cancellation. In spite of increased NRC involvement, SALP ratings continue to be low and escalated enforcement actions against TVA are often necessary. Because of this, the NRC is focusing sharply on management and technical problems at all TVA facilities. Considerable time has already been spent analyzing TVA's specific and broader

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difficulties and the NRC will continue to closely monitor TVA's performance.

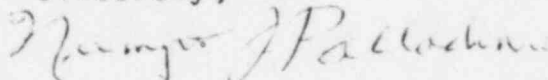
During the past 5-6 years, TVA has lost several key high level managers. The Commission and NRC staff believe that salary and fringe benefit limits attached to TVA's federal compensation schedule, as well as previous TVA policies which failed to single out persons with nuclear experience for promotion to upper management, are contributors to this loss. Although we believe the TVA hiring and salary policies have affected the TVA nuclear program, we recognize that the solutions to these problems are not a panacea for all TVA's problems.

In summary, we have underway a coordinated comprehensive review of TVA's nuclear program. This activity is receiving Commission level attention and appropriate regulatory actions are being considered.

Commissioner Asselstine does not agree with the Commission's responses to your questions. He is not yet convinced that TVA's handling of the NSRS report did not violate applicable NRC reporting requirements. He notes that some NRC reporting requirements are not discussed in the Commission's responses. If TVA's handling of the NSRS report did not violate applicable NRC reporting requirements, Commissioner Asselstine believes that there may well be a need to strengthen the regulatory requirements for reporting and correcting safety deficiencies in reactor systems.

We hope this information is responsive to your request.

Sincerely,



Nunzio J. Palladino

Enclosure:
As stated

cc: Rep. Manuel Lujan

ENCLOSURE

RESPONSES TO CONGRESSMAN UDALL'S QUESTIONS

QUESTION 1. WHEN WAS I-84-16-BFN SUBMITTED TO THE NRC?

ANSWER.

THE NRC (REGION II) RECEIVED A COPY OF I-84-16-BFN ON SEPTEMBER 24, 1984, TWO DAYS BEFORE AN ARTICLE CONCERNING THE REPORT APPEARED IN THE SEPTEMBER 26, 1984 CHATTANOOGA TIMES. TVA PROVIDED A COPY OF THE REPORT TO THE CHATTANOOGA TIMES UPON THEIR REQUEST. TVA THEN PROVIDED NRC WITH THE REPORT.

QUESTION 2. ~~WERE~~ NRC STAFF AWARE OF THE I-84-16-BFN CONCLUSIONS PRIOR TO SUBMISSION OF THE REPORT ITSELF? IF SO, ON WHAT DATE WERE SUCH CONCLUSIONS PROVIDED TO THE NRC?

ANSWER.

THE NRC STAFF WAS NOT AWARE OF THE I-84-16-BFN CONCLUSIONS PRIOR TO TVA'S SUBMISSION OF THE REPORT. HOWEVER, NRC WAS AWARE THAT PROBLEMS EXISTED WITH THE HIGH PRESSURE COOLANT INJECTION (HPCI) SYSTEM. EIGHTEEN INSPECTIONS CONDUCTED AT THE BROWNS FERRY NUCLEAR PLANT (BFNP) FROM 1983 TO 1985 INVOLVED HPCI-RELATED PROBLEMS. VIOLATIONS WERE ISSUED CONSISTENT WITH REGULATORY REQUIREMENTS. OF THE EIGHTEEN INSPECTIONS, THREE WERE SPECIAL INSPECTIONS SPECIFICALLY DEALING WITH HPCI ISSUES. A MAJOR OBJECTIVE OF THESE INSPECTIONS WAS TO REVIEW HPCI OPERABILITY TO ENSURE THAT THE BFNP TECHNICAL SPECIFICATION ACTION STATEMENTS HAD BEEN TAKEN WHEN REQUIRED.

QUESTION 3. ~~Did~~ TVA PROVIDE NRC I-84-16-BFN IN THE MANNER
REQUIRED BY APPLICABLE NRC REGULATIONS?

ANSWER.

NSRS REPORTS ARE INTERNAL TVA REPORTS AND ARE NOT REQUIRED TO BE
SUBMITTED TO THE NRC. NO REPORTING REQUIREMENTS EXIST RELATIVE TO
NSRS REPORTS. HOWEVER, IF A SIGNIFICANT SAFETY CONCERN WERE
IDENTIFIED, TVA WOULD BE REQUIRED TO REPORT THE CONCERN IN ACCORD-
ANCE WITH THE APPLICABLE NRC REGULATIONS. TVA TREATED THE NSRS
DOCUMENT AS NOT BEING REPORTABLE. AS DISCUSSED UNDER QUESTIONS 4
AND 5, WE, IN RETROSPECT, BELIEVE THAT TVA DID NOT NEED TO REPORT
THIS DOCUMENT TO THE NRC.

QUESTION 4. — DID TVA FULFILL ITS REPORTING OBLIGATIONS PURSUANT TO APPLICABLE NRC REGULATIONS TO REPORT HPCI DEFICIENCIES IN THE 1983-1984 TIME PERIOD?

ANSWER.

WE BELIEVE THAT TVA HAS MET NRC REPORTING REQUIREMENTS RELATED TO THE HPCI SYSTEM DURING 1983 AND 1984. TVA SUBMITTED TWELVE LICENSEE EVENT REPORTS (LERs) FOR THE HPCI-RELATED EVENTS THAT OCCURRED DURING 1983 AND 1984 IN ACCORDANCE WITH LICENSEE EVENT REPORTING REQUIREMENTS OF 10CFR50.73 AND THE BFPN TECHNICAL SPECIFICATIONS. ALL OF THE HPCI SYSTEM PROBLEMS DESCRIBED IN THE NSRS REPORT HAVE BEEN REPORTED IN LERs EXCEPT FOR THE DAMAGE TO THE PIPING RESTRAINTS FOUND IN 1984.

WITH REGARD TO THE REPORTABILITY OF HPCI FAILURES IN LERs, THE NRC STAFF BELIEVES THAT SUCH FAILURES ARE REPORTABLE, IF, FOR EXAMPLE, (A) THE SYSTEM WOULD NOT BE CAPABLE OF MEETING DESIGN REQUIREMENTS, (B) POTENTIALLY SERIOUS GENERIC PROBLEMS ARE IDENTIFIED, OR (C) POSSIBLE SYSTEMS INTERACTION PROBLEMS ARE IDENTIFIED. THE LER REPORTING REQUIREMENTS OF 10CFR50.73 (EFFECTIVE JANUARY 1, 1984) PERMIT LICENSEE ENGINEERING JUDGMENT REGARDING EVENTS OF THIS NATURE.

QUESTION 4. (CONTINUED)

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THE FAILURE ASSOCIATED WITH RESTRAINT R-23 WAS FORMALLY EVALUATED FOR REPORTABILITY BY TVA AND WAS DETERMINED TO BE NOT REPORTABLE BECAUSE: (1) THE "UPSTREAM KICKER AND SUPPORT BRACE AT R-23 WERE STILL INTACT" (REF. 1), AND (2) SECTION 3.6.H.2 OF THE BFPN TECHNICAL SPECIFICATIONS PERMITS ONE SEISMIC RESTRAINT TO BE INOPERABLE FOR 72 HOURS BEFORE THE SYSTEM IS REQUIRED TO BE CONSIDERED INOPERABLE. TVA DID NOT CONSIDER THE LOOSE NUTS ON RESTRAINT R-24 TO BE A SUFFICIENTLY SIGNIFICANT DEGRADATION TO REQUIRE A FORMAL REPORTABILITY DETERMINATION. REPAIRS TO BOTH RESTRAINTS WERE COMPLETED WITHIN THE 72 HOURS PERMITTED BY TECHNICAL SPECIFICATION 3.6.H.2. IN VIEW OF THE NATURE OF THE EVENTS, THE ACTION TAKEN BY THE LICENSEE AND THE REVIEW PERFORMED BY REGION II, HEADQUARTERS BELIEVES THAT NO VIOLATIONS OR DEVIATIONS OF LER REPORTING REQUIREMENTS OCCURRED.

QUESTION 5. DOES NRC HEADQUARTERS STAFF AGREE WITH REGION II CONCLUSIONS STATED IN INSPECTION REPORT 50-259/84-41 THAT THE CONDITIONS FOUND BY NRC INSPECTORS AND DESCRIBED IN I-84-16-BFN DID NOT REPRESENT REGULATORY VIOLATIONS OR DEVIATIONS?

ANSWER.

REGION II PERFORMED AN INDEPENDENT INSPECTION OF THE HPCI SYSTEM AT THE BROWNS FERRY NUCLEAR PLANT IN OCTOBER 1984, IN RESPONSE TO THE CONCERNS RAISED IN NSRS REPORT I-84-16-BFN (REFERENCE 2) WITH RESPECT TO SYSTEM INTEGRITY AND OPERABILITY. AS NOTED IN THE INSPECTION REPORT AND TRANSMITTAL LETTER (REFERENCE 3), THE INSPECTION INVOLVED SELECTIVE EXAMINATION OF PROCEDURES AND REPRESENTATIVE RECORDS, SELECTIVE INTERVIEWS WITH PLANT PERSONNEL, AND OBSERVATIONS OF ACTIVITIES IN PROGRESS. NO VIOLATIONS OR DEVIATIONS WERE IDENTIFIED WITHIN THE SCOPE OF THE INSPECTION.

THE NRC HEADQUARTERS STAFF REVIEWED THE NSRS REPORT AND THE REGION II INSPECTION REPORT AND INTERVIEWED TWO MEMBERS OF THE NSRS AT TVA AND SOME REGION II PERSONNEL IN RESPONSE TO YOUR QUESTION. HOWEVER, THEY DID NOT REVIEW ALL OF THE DOCUMENTS LISTED AS REVIEWED BY THE REGION II INSPECTORS. ON THE BASIS OF THE HEADQUARTER'S REVIEW WHICH INCLUDED STAFF REVIEWS OF LER DATA AND ECCS OUTAGES AND THE LER REPORTING CONSIDERATIONS DISCUSSED IN THE RESPONSE TO QUESTION 4, HEADQUARTERS AGREES WITH THE REGION II CONCLUSION THAT NO VIOLATIONS OR DEVIATIONS WERE IDENTIFIED.

ALTHOUGH NO VIOLATIONS WERE IDENTIFIED IN THIS INSPECTION, IT IS NOTED THAT THE REGION II STAFF WAS AWARE OF PROBLEMS WITH THE HPCI SYSTEMS AT THE BROWNS FERRY FACILITY AND HAD CONDUCTED NUMEROUS PLANT INSPECTIONS OF THIS SYSTEM. THESE INSPECTIONS, WHICH RESULTED IN SEVERAL VIOLATIONS, ARE ADDRESSED IN THE RESPONSE TO QUESTION 2.

DURING OUR RECENT CONVERSATION WITH THE TWO MEMBERS OF THE NSRS AT TVA WE LEARNED OF A REPORT FROM UNITED ENGINEERS AND CONSTRUCTORS, INC., WHICH WAS MADE AT THE REQUEST OF TVA. A COPY OF THIS REPORT WAS SENT TO THE NSRS ON MAY 5, 1985. THIS REPORT (REFERENCE 5) PROVIDES STILL ANOTHER INDICATION THAT HPCI PROBLEMS ARE NOT YET RESOLVED, PARTICULARLY WITH RESPECT TO WATER HAMMER AND ITS EFFECTS ON PIPE SUPPORTS. BOTH THE REGIONAL AND HEADQUARTERS NRC STAFF ARE REVIEWING THIS REPORT AND TVA'S RESPONSE TO IT.

THE STAFF, IN COORDINATION WITH THE NRC'S OFFICE FOR ANALYSIS AND EVALUATION OF OPERATIONAL DATA, HAS BEEN CONDUCTING A REVIEW OF LICENSEE EVENT REPORT DATA INVOLVING THE HPCI SYSTEM AT THE BROWNS FERRY UNITS AND OF BFNP ECCS OUTAGES REPORTED IN REFERENCE 4. ON THE BASIS OF THE ONGOING STAFF REVIEW, WE CAN MAKE THE FOLLOWING GENERAL COMMENTS ON THE HPCI SYSTEM AT BROWNS FERRY:

- A) THE RELIABILITY/AVAILABILITY OF THE SYSTEM IS ADEQUATE TO ENSURE PUBLIC HEALTH AND SAFETY AND APPEARS COMPARABLE TO THE HPCI SYSTEMS AT OTHER BWR PLANTS.
- B) SEVERAL PROBLEMS WITH THE SYSTEM HAVE RECURRED. THE NRC STAFF, HOWEVER, IS NOT AWARE OF ANY SIGNIFICANT PROBLEMS THAT ARE NOT BEING CORRECTED.
- C) EXCLUDING THE LOSS OF HPCI WHICH OCCURRED DURING THE BROWNS FERRY FIRE ON MARCH 22, 1975, THERE HAS BEEN ONLY ONE SYSTEM FAILURE ON DEMAND IN ALL BROWNS FERRY UNITS IN COMMERCIAL OPERATION THROUGH THE END OF 1984 (END OF SURVEY RESULTS).

IT SHOULD BE NOTED THAT THE HPCI SYSTEM IS A SINGLE TRAIN SYSTEM WITH A STEAM-TURBINE-DRIVEN PUMP. THE SYSTEM IS NORMALLY SHUT DOWN AND EXPECTED TO START ON DEMAND. THE HPCI STEAM SYSTEM, WHICH INVOLVES A TWO-PHASE FLUID, IS NOT EXPECTED TO ACHIEVE THE RELIABILITY OF A DUAL OR EVEN SINGLE TRAIN SAFETY INJECTION SYSTEM INCORPORATING AN ELECTRIC-MOTOR-DRIVEN PUMP. THE HPCI SYSTEM IS BACKED UP BY THE AUTOMATIC DEPRESSURIZATION SYSTEM (ADS). THE ADS AT BROWNS FERRY IS SEPARATE AND DIVERSE FROM THE HPCI SYSTEM. IF THE HPCI SYSTEM IS INOPERABLE, ADS ENABLES DEPRESSURIZATION OF THE

REACTOR COOLANT ~~SYSTEM~~ SO THAT INVENTORY LOSSES FROM THE REACTOR COOLANT SYSTEM CAN BE MADE UP BY THE LOW PRESSURE EMERGENCY CORE COOLING SYSTEMS. THIS DESIGN REFLECTS THE SAFETY PHILOSOPHY OF DEFENSE IN DEPTH THROUGH DIVERSITY WHICH IS CHARACTERISTIC OF THE BOILING WATER REACTOR (BWR) DESIGN.

QUESTION 6. IN THE EVENT THAT NRC STAFF BELIEVE TVA DID FULFILL ITS OBLIGATIONS WITH RESPECT TO REPORTING AND CORRECTING HPCI DEFICIENCIES, DOES THE COMMISSION BELIEVE THERE EXISTS A NEED TO STRENGTHEN THE REGULATORY REQUIREMENTS VIS-A-VIS REPORTING AND CORRECTING SIGNIFICANT SAFETY DEFECTS IN REACTOR SYSTEMS?

ANSWER.

WITH REGARD TO THE NEED TO STRENGTHEN THE REGULATORY REQUIREMENTS FOR REPORTING SIGNIFICANT SAFETY DEFECTS IN REACTOR SYSTEMS, THE NRC DID IMPROVE AND STRENGTHEN THE REPORTING REQUIREMENTS IN 1984.

WE CONTINUE TO MONITOR LER REPORTING UNDER THE NEW RULE (10CFR50.73) AND TO DATE WE HAVE NOT IDENTIFIED ANY DEFICIENCY WARRANTING A

CHANGE IN THESE ~~RE~~QUIREMENTS. HOWEVER, WE HAVE ISSUED SUPPLEMENTAL CLARIFICATIONS TO GAIN IMPROVEMENTS IN LICENSEE REPORTING AND WE PLAN TO ISSUE FURTHER GUIDANCE AS NEEDED IN THE FUTURE. AT THE SAME TIME, WE BELIEVE THAT A REPORTING REQUIREMENT FOR THE SUBMITTAL OF DOCUMENTS SUCH AS THE NSRS REPORT WOULD REDUCE THE EFFECTIVENESS OF THE LICENSEE'S INTERNAL PROBLEM SOLVING SYSTEM. NRC HAS THE REVIEW AUTHORITY NOW AND RESIDENT INSPECTORS ROUTINELY REVIEW INTERNAL AUDIT REPORTS LIKE THE NSRS REPORT.

WE NOTE THAT THE NSRS PROGRAM IS A VOLUNTARY TVA PROGRAM THAT TVA USES INTERNALLY TO REVIEW POSSIBLE NUCLEAR SAFETY ISSUES. THE NSRS EXISTS IN ADDITION TO THE NRC APPROVED QUALITY ASSURANCE PROGRAM. THERE ARE NO NRC REQUIREMENTS FOR TVA TO HAVE AN NSRS, OR TO SUBMIT TO THE NRC ANY INTERNAL REPORTS WRITTEN BY NSRS. THE NRC ENCOURAGES LICENSEES TO DEVELOP INTERNAL REVIEW GROUPS LIKE NSRS. NSRS PROVIDES TVA EMPLOYEES AN AVENUE TO EXPRESS NUCLEAR SAFETY CONCERNS. THE LICENSEE MUST STILL COMPLY WITH NRC REGULATIONS.

THE NRC STAFF DOES NOT PERCEIVE OF A NEED AT THIS TIME TO STRENGTHEN THE REGULATORY REQUIREMENTS THAT GOVERN THE CORRECTING OF SIGNIFICANT SAFETY DEFECTS IN REACTOR SYSTEMS. HOWEVER, WE BELIEVE THERE

ARE CHANGES WHICH ~~TH~~ COULD BE MADE TO IMPROVE THE RELIABILITY OF THE HPCI SYSTEM AT BROWNS FERRY AS WELL AS OTHER BWR PLANTS. WE BELIEVE THESE RELIABILITY IMPROVEMENTS CAN BE EFFECTED WITHIN THE PRESENT REGULATORY REQUIREMENTS.

FOR EXAMPLE, THE PRESENT REGULATORY REQUIREMENTS DO NOT IMPOSE MINIMUM SYSTEM RELIABILITY LIMITS FOR INDIVIDUAL SAFETY SYSTEMS ON OPERATING REACTORS. THE STAFF HAS RECENTLY BEGUN TO EXAMINE AREAS IN WHICH RELIABILITY STANDARDS MIGHT BE USEFUL IN THE REGULATORY PROCESS. THE STAFF'S STANDARD REVIEW PLAN NOW CONTAINS RELIABILITY REQUIREMENTS FOR AUXILIARY FEEDWATER SYSTEMS. WE ANTICIPATE THAT AS WE CONTINUE TO ACQUIRE MORE KNOWLEDGE TO QUANTIFY RISK CONTRIBUTORS AS A RESULT OF ONGOING PRA EFFORTS, RELIABILITY STANDARDS MAY INCREASINGLY BE FACTORED INTO THE REGULATORY PROCESS, INCLUDING CRITERIA FOR OPERATING PLANTS.

IN SUMMARY, WITHIN THE FRAMEWORK OF EXISTING REGULATIONS, THE BROWNS FERRY LICENSEE HAS BEEN CITED A NUMBER OF TIMES BY THE NRC STAFF FOR VIOLATIONS RELATED TO THE HPCI SYSTEM. THERE HAVE BEEN IMPROVEMENTS IMPLEMENTED FOR THIS SYSTEM AND MORE ARE ANTICIPATED. WE ALSO BELIEVE THAT THERE IS ROOM FOR FURTHER IMPROVEMENT WITHIN THE PRESENT REGULATORY REQUIREMENTS AND WE INTEND TO CONTINUE TO PURSUE THIS MATTER. WE DO NOT BELIEVE THE PRESENT SITUATION AT BROWNS FERRY NUCLEAR PLANT REPRESENTS AN UNDUE RISK TO THE HEALTH AND SAFETY OF THE PUBLIC.

REFERENCES

1. BROWNS FERRY NUCLEAR PLANT FORM BF-19, "LICENSEE REPORTABLE EVENT DETERMINATION," MARCH 21, 1984.
2. MEMORANDUM FROM M. N. CULVER, DIRECTOR OF NUCLEAR SAFETY REVIEW STAFF, 243A HBB-K, TO W. G. PARRIS, MANAGER OF POWER, "BROWNS FERRY NUCLEAR PLANT (BFN) - NUCLEAR SAFETY REVIEW STAFF (NSRS) INVESTIGATION OF CONCERNS RELATED TO FAILURES OF THE HIGH PRESSURE COOLANT INJECTION (HPCI) SYSTEM - NSRS REPORT NO. 1-84-16-BFN," JUNE 27, 1984.
3. LETTER FROM D. VERRELLI, DIVISION OF REACTOR PROJECTS, NRC, TO W. G. PARRIS, MANAGER OF POWER AND ENGINEERING, TVA, "REPORT NOS. 50-259/84-41, 50-260/84-41, AND 50-296/84-41," NOVEMBER 6, 1984.

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4. LETTER FROM D. VASSALLO, NRC, TO H. PARRIS, TVA, "REVIEW OF NUREG-0737, ITEM II.K.3.17, REPORT ON OUTAGES OF ECC SYSTEMS," AUGUST 24, 1983.
 5. LETTER FROM ROBERT H. BRYANS OF UNITED ENGINEERS AND CONSTRUCTORS INC. TO T.L. CHINN, BROWNS FERRY NUCLEAR PLANT, TVA, APRIL 2, 1985 WITH ATTACHED EVALUATION REPORT "HIGH PRESSURE COOLANT INJECTION PUMP DISCHARGE PIPING SUPPORTS EVALUATION."