

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

TO : H. G. Parris, Manager of Power, 500A CST2-C

GNS

0 1 050

FROM : H. N. Culver, Director of Nuclear Safety Review Staff, 249A HBB-K

DATE : JAN 18 1983

SUBJECT: NUCLEAR SAFETY REVIEW STAFF (NSRS) FOLLOW UP REVIEW OF THE DIVISION OF
NUCLEAR POWER (NUC PR) FIRE PROTECTION PROGRAM - NSRS REPORT NO. R-82-28-NPS

Attached is the report of a follow up to a special review of the NUC PR fire protection program. The original review was conducted in March and April of 1982. Seventeen items were considered open after that review. All 17 were closed as a result of this follow up.

One administrative concern was noted while at Browns Ferry involving control of temporary structures, but plant personnel appeared to be prepared to take appropriate corrective action.

If you have any questions concerning this report, please contact Ronald W. Travis at extension 4814 in Knoxville.

K. W. Whitt
for H. N. Culver

RWT:BJN

Attachment

cc (Attachment):

G. F. Dilworth, E12D46 C-K
MEDS, W5B63 C-K

NSRS FILE



TENNESSEE VALLEY AUTHORITY

NUCLEAR SAFETY REVIEW STAFF

REVIEW

NSRS REPORT NO. R-82-28-NPS

SUBJECT: FOLLOW UP REVIEW OF THE DIVISION OF NUCLEAR POWER
FIRE PROTECTION

DATES OF
REVIEW:

BFN - December 7-9, 1982
SQN - December 13-14, 1982
WBN - December 16-17, 1982
NCO - December 20, 1982

REVIEWERS

Ronald W. Travis
RONALD W. TRAVIS

1/18/83
DATE

Ronald W. Travis
for DUSTIN L. BAILEY

1/18/83
DATE

APPROVED BY:

K. W. Whitt
KERMIT W. WHITT

1/18/83
DATE

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I. SCOPE

This review is a follow up to the evaluation of the administrative control and implementation of the fire protection and prevention programs at the Browns Ferry Nuclear Plant (BFN), Sequoyah Nuclear Plant (SQN), Watts Bar Nuclear Plant (WBN), and the Division of Nuclear Power (NUC PR) Central Office (NCO) conducted by the Nuclear Safety Review Staff (NSRS) and documented in report No. R-82-05-NPS dated May 11, 1982 (GNS 820511 050).

In that report several items were reported as being inadequate in meeting requirements established by higher tier documents. For this review the responses to NSRS recommendations and implementation of corrective action by NUC PR were evaluated.

II. STATUS OF PREVIOUSLY IDENTIFIED ITEMS

A. General

1. Organization and Responsibilities for Fire Protection

R-82-05-NCO-01

DPM N82FP1, R0, is considered sufficiently responsive in the area of follow up and resolution of audit findings to close this item. (See section III.A.1 for details.)

2. Control of Ignition Sources

R-82-05-NCO-02

DPM N82FP1, R0, meets or exceeds all NSRS recommendations for requiring a torch cutting, welding, open flame, grinding, and spark producing work permit in a nuclear plant. This item is closed. (See section III.A.2 for details.)

R-82-05-NCO-03

DPM N82FP1, R0, is fully responsive to the NSRS recommendation concerning the review of maintenance request by onsite personnel for fire protection considerations. This item is closed. (See section III.A.2 for details.)

3. Control of Combustibles

R-82-05-NCO-04

The NSRS and NUC PR interpret 10CFR50, Appendix R, differently in regard to the storage of contaminated clothing in safety-related areas of the plant. NSRS considers this a program enhancement which NUC PR doesn't wish to implement. It has been brought to the attention of the proper level of management for consideration and is closed on this basis. (See section III.A.3 for details.)

B. Browns Ferry Nuclear Plant

1. Organization and Responsibilities for Fire Protection

R-82-05-BFN-01

The NSRS considers the revision to Standard Practice BF 1.2 requiring PORC review of all standard practices implementing technical specification requirements to be sufficiently responsible to close this item. (See section III.B.1 for details.)

2. Control of Ignition Sources

R-S2-BFN-02

Browns Ferry had implemented DPM N78S2 by reference. DPM N82FP1 was only recently issued but comments on the new DPM had been drafted. After reviewing these comments, NSRS believes that all concerns will be adequately addressed by BFN concerning requirements for torch cutting, welding, open flame, grinding, and spark producing work permit. This item is closed. (See section III.B.2 for details.)

R-82-05-BFN-03

The NSRS considers this a program enhancement which NUC PR does not wish to incorporate into their control of open flames in the cable spreading room. This item is closed. (See section III.B.2 for details.)

3. Control of Combustibles

R-82-05-BFN-04

NSRS considers this a program enhancement which NUC PR does not wish to incorporate into their program to control combustibles. This item is closed. (See section III.B.3 for details.)

R-82-05-BFN-05

NUC PR considers its program for the control of combustible temporary structures adequate. NSRS still believes the temporary combustible structures should be removed; however, with the present inclusion of all such structures in the tracking system, the NSRS believes NUC PR is aware of all risks involved and considers this item closed. (See section III.B.3 for details.)

C. Sequoyah Nuclear Plant

1. Control of Ignition Sources

R-82-05-SQN-01

NSRS considers the administrative controls instituted to ensure fire doors are closed to adequately address the concern expressed. This item is closed (See section III.C.1 for details.)

R-82-05-SQN-02

Corrective action to place or to replace "No Smoking" signs as required satisfies the NSRS concern. This item is closed. (See section III.C.1 for details.)

2. Fire Fighting Procedures

R-82-05-SQN-03

The NUC PR revision to PHYSI-13 to clarify requirements for field placement of operating instructions satisfies the NSRS recommendation. This item is closed. (See section III.C.2 for details.)

D. Watts Bar Nuclear Plant

1. Qualifications and Training of the Fire Brigade

R-82-05-WBN-01

The NUC PR revisions to PHYSI-2 corrected the deficiencies in this document in the area of qualifications and training. This item is closed. (See section III.D.1 for details.)

2. Surveillance Testing of Fire Protection

R-82-05-WBN-02

The NUC PR revisions to PHYSI-2 and SI 4.7.11.2.b. (now SI-7.18) corrected the deficiencies in these documents. This item is closed. (See section III.D.2 for details.)

3. Control of Ignition Sources

R-82-05-WBN-03

The proposed revision of AI-9.9, when issued, will meet all NSRS recommendations or requirements for torch cutting, welding, open flame, grinding, and spark producing work permits. This item is closed. (See section III.D.3 for details.)

R-82-05-WBN-04

NUC PR reinforcement of the importance of following the instructions for extending the torch cutting, welding, open flame, grinding, and spark producing work permits adequately meets the NSRS recommendations. This item is closed. (See section III.D.3 for details.)

4. Control of Combustibles

R-82-05-WBN-05

NSRS and NUC PR interpret 10CFR50, Appendix R, differently in regard to the limitation of combustible materials in areas containing safety-related equipment. The NSRS considers this a program enhancement which NUC PR doesn't wish to implement. It has been brought to the attention of the proper level of management for consideration and is closed on this basis. (See section III.D.4 for details.)

III. DETAILS

A. General

1. Organization and Responsibilities for Fire Protection

R-82-05-NCO-01

NSRS recommended that NUC PR include in corporate policy the requirement to follow up and resolve audit findings identified by NCO FPES audits. NUC PR responded that DPM N78S2 would be revised to reflect the requirements of this recommendation. DPM N82FP1, "Division of Nuclear Power Fire Protection Manual," was issued subsequent to this recommendation to replace the fire protection portions of DPM N78S2. Section FP-16, "Audits," contained the statement that the Nuclear Safety Staff was responsible for annual, biennial, and triennial audits and that the EP&P Branch, Fire Protection Engineer (FPE) Section, would provide technical assistance for each audit to the NSS or the Power Quality Assurance and Audit Staff upon request. It also required a written response on the part of NUC PR. The Office of Power Quality Assurance and Audit Staff required tracking and follow up on any audit performed by its staff. NSRS finds the response by NUC PR acceptable for this concern. In reviewing recent OPQA&A audits and NUC PR responses, the implementation of the response also appears adequate.

2. Control of Ignition Sources

R-82-05-NCO-02

NSRS recommended that NUC PR should require in corporate procedures that all torch cutting, welding, open flame,

grinding, and spark producing work be authorized by issuance of a permit (form TVA 6561). At BFN, and at WBN the recommendation was made that a permit be required in or near any safety-related area. Sequoyah already had this requirement in Hazard Control Instruction HCI-M6. Section FP-15 of DPM N82FP1 requires the permit for all plant locations outside designated shop areas. NSRS found this response and its implementation acceptable for this concern. NSRS would accept either a permit being required for the entire plant (except designated shop areas) or for areas in or near safety-related equipment areas as adequately defined. Of course, the plant procedure must be at least as restrictive as the DPM.

R-82-05-NCO-03

NSRS recommended that NUC PR should require in corporate procedures that onsite personnel be designated to review work activities proposed by maintenance requests for fire protection considerations. NUC PR responded that DPM N78S2 would be revised to meet this recommendation. DPM N82FP1, section FP-8, paragraph 4, requires that maintenance requests/trouble reports be reviewed by the foreman or supervisor for potential fire hazards. The NSRS finds this response to be acceptable for this concern.

3. Control of Combustibles

R-82-05-NCO-04

NSRS recommended that NUC PR revise corporate procedures to restrict storage of contamination zone clothing to specified storage locations adequately protected by fire suppression systems. NUC PR responded that the transient fire load section of the DPM addresses all types of combustible storage which includes C-zone clothing. NUC PR believes it is acting in accordance with NRC requirements. Thus, there is a difference of interpretation of 10CFR50, Appendix R, requirements. NSRS believes this is a recommendation which should be followed by NUC PR but since there is not a clear regulatory requirement and since NUC PR management is aware of the concern and willing to take the inherent risk involved, the NSRS is dropping this concern.

B. Browns Ferry Nuclear Plant

1. Organization and Responsibilities for Fire Protection

R-82-05-BFN-01

NSRS recommended that all procedures establishing the fire protection and prevention program be reviewed by PORC. This concern was specifically directed toward Standard Practice Section 14. NUC PR responded that the detailed written

procedures implementing the fire protection program for BFN are reviewed by PORC. The standard practices are not reviewed by PORC and are not required to be reviewed by PORC. Again, there is a difference of interpretation of requirements. Since NUC PR management is aware of the concern and is willing to take any risk involved, NSRS is dropping this concern.

While at the plant site, Standard Practice BF 1.2 was reviewed. It now requires PORC review of all standard practices which implement technical specification requirements. Standard practices pertaining to fire protection were included in the change to BF 1.2. This is also required by N-OQAM, Part III, Section 1.1, paragraph 4.2. For whatever reason this change was made, NSRS is in agreement with it.

2. Control of Ignition Sources

R-82-05-BFN-02

NSRS recommended that a revision be made to plant procedures controlling work involving torch cutting, welding, open flame, grinding, and spark production to require that all such work in or near safety-related areas be authorized by a permit (form TVA 6561). NUC PR responded that the applicable DPM (at that time N78S2) was implemented by reference and the DPM was being revised. When the new DPM (N82FP1) was issued, Standard Practice BF 14.1 should have been revised to reflect the change if the implementation by reference were still to be used. The new DPM had been issued to the plant for such a short time that they had only reviewed it and drafted comments to be sent to the NCO. It was also stated by the plant staff that the DPM would no longer be implemented by reference but that a new plant document would be issued. The NSRS is satisfied that the plant staff is prepared to meet this recommendation.

R-82-05-BFN-03

NSRS recommended that the plant should revise its procedures to include the technical specification precaution prohibiting the use of open flame in cable spreading rooms unless the plant is in the cold shutdown condition. NUC PR replied that a review by the shift engineer is required for all torch cutting welding, or open flame work performed outside designated shop areas and that this review is adequate control for this technical specification requirement. NUC PR management is aware of this concern and any risks involved in not following the recommendation. On this basis this concern is being dropped.

3. Control of Combustibles

R-82-05-BFN-04

NSRS recommended that the plant should revise BF 14.14, "Storage of Material in Safety-Related Areas," to include a limitation of quantities of combustibles which may be stored and to specify storage locations. NUC PR responded that periodic inspections and evaluations of temporary fire loads are required to be performed and that this meets all requirements. The NSRS believes this is still a valid recommendation but is satisfied that NUC PR management is aware of our concern and is willing to take any risks involved and therefore is dropping this concern.

R-82-05-BFN-05

NSRS recommended that the plant should either limit the time that a temporary structure constructed of combustible material may remain erected or replace the temporary structures with noncombustible materials. NUC PR responded that plant procedures currently require that temporary structures be constructed of fire retardant or noncombustible materials. NUC PR also stated that authorization for these structures is documented by issue of a temporary structure permit form BF 103, as required by Standard Practice BF 8.5 and that the expected duration of the structure is required to be shown on this permit. The permit and extension to the permit require the review and approval of the plant safety staff and the plant superintendent.

NSRS on this review compared the plant's list of temporary structures as tracked by Plant Services and documented on BF 103 forms with structures actually in the plant. Only one temporary structure of combustible material was listed by Plant Services. On a plant inspection, NSRS reviewers located six structures of treated wood and Herculite that were not on the list. Subsequently, the plant fire protection engineer found four more temporary structures made of combustible materials which were not listed by Plant Services and for which a form BF 103 did not exist. It was noted that all except one of these temporary structures built of combustible materials were in place before the requirements of BF 8.5 were established. Plant personnel stated that they would update their plant tracking system and BF 103 forms to show all temporary structures presently in place. BF 8.5 also contained a requirement that all temporary structures be shown on a set of drawings kept by Management Services. This requirement was not being met. Plant personnel stated that this would be reviewed and that BF 8.5 would probably be changed to eliminate this requirement. Since the printout from the plant's tracking system was very explicit as to the location of the temporary structures, NSRS considers that

the requirement to keep a set of drawings to be redundant. NSRS believes the plant staff now has adequate control over combustible temporary structures and considers the recommendations of this concern as being met.

C. Sequoyah Nuclear Plant

1. Control of Ignition Sources

R-82-05-SQN-01

NSRS recommended that the operation of the fire doors should be corrected to ensure proper closure of normally closed doors. NUC PR responded that they were aware of this problem and were taking certain administrative controls to ensure that technical specifications were not violated. NSRS is satisfied that this action is adequate. NSRS also reviewed SI-261, "Visual Inspection of Fire Doors," data sheets for the fire doors which were not automatically closing. The SI indicated that the doors operated properly when in actuality they did not. NSRS recommended that when SI 261 is conducted in the future, that the operation of the doors be recorded as unacceptable but in the remarks section indicate that administrative controls are being implemented to ensure that technical specifications requirements are being met. NUC PR agreed to this recommendation.

R-82-05-SQN-02

NSRS recommended that the proper posting of "No Smoking" signs be made in all areas listed in PHYSI-13. NUC PR responded that the "No Smoking" signs had been in place but were removed when doors were painted or removed or when temporary access hatches had been removed. In touring the plant the NSRS reviewers noted only one area that needed a "No Smoking" sign. This was reported to the Safety Section supervisor. All other areas requiring them had the "No Smoking" signs. NSRS considers the actions of the plant adequate for this concern.

2. Fire Fighting Procedures

R-82-05-SQN-03

NSRS recommended that plaques containing detailed operating instructions for CO₂ control stations be posted at all CO₂ control stations as required by PHYSI-13. It was also recommended that the section of PHYSI-13 containing this requirement be rewritten for clarity. NUC PR responded that instructions were in place for all CO₂ control stations but that some were on a separate plaque beside the panels and others were on the backing plate behind the manual pilot valve actuation levers. NSRS reviewers were able to locate all instructions for operating the CO₂ system during this

review but it did appear that the ones with the separate plaques beside the panels were much easier to find and understand. NUC PR also reviewed the latest revision of PHYSI-13 and NSRS found this revision to be adequate.

D. Watts Bar Nuclear Plant

1. Qualification and Training of the Fire Brigade

R-82-05-WBN-01

NSRS recommended that six deficiencies in PHYSI-2 in the area of qualification and training of the fire brigade be resolved. Three of these deficiencies were resolved in a draft revision (R13) to PHYSI-2 and it was understood that if the revision was approved as written the concerns would be adequately addressed. In reviewing revision 13 of PHYSI-2 it was determined that additional changes were made in the new revision in order to cover all NSRS concerns. NSRS is satisfied that revision 13 to PHYSI-2 is adequate to meet all recommendations in the area of qualification and training.

2. Surveillance Testing of Fire Protection Systems

R-82-05-WBN-02

NSRS recommended that three deficiencies of PHYSI-2 be resolved in the area of surveillance testing of fire protection systems and that one surveillance instruction be revised to meet the requirement of DPM N78S2 (changed to N82FP2).

PHYSI-13, R13, was reviewed and it was found to be adequate in meeting the NSRS concerns. Item a. of this item noted that Technical Specification 4.7.13.a pertaining to fire barrier inspections was not listed in PHYSI-2. There is now a requirement for a visual fire barrier inspection every 18 months in PHYSI-2. Items c. and d. concerned surveillance instructions that were not listed or that had been deleted and were still listed. Revision 13 to PHYSI-2 deleted references to specific surveillance instructions so that each future change in an SI would not require a revision to PHYSI-2. This response adequately meets all NSRS recommendations since technical specification requirements and the appropriate SI are cross referenced in SI-1, "Surveillance Program." Item b. concerned an inadequacy in SI-4.7.11.2.6.2, "Examine Fire Spray and/or Sprinkler System Located in the Reactor Building, Auxiliary Building, Control Building, and the Diesel Generator Building," in meeting DPM N78S2 requirements. SI-4.7.11.2.b.2 will be replaced by SI-7.18. A draft of this SI was reviewed by NSRS and was found to meet the requirements of DPM N82FP1.

3. Control of Ignition Sources

R-82-05-WBN-03

NSRS recommended that plant procedures controlling work involving torch cutting, welding, open flames, grinding, and spark production should be revised to require that all such work in or near safety-related areas be authorized by a permit (form TVA 6561). DPM N82FP1 has since been issued requiring that all such work on the plantsite be authorized by a permit. The plant is implementing this by revising AI 9.9. This instruction has not been issued but it appears to be adequate as drafted.

R-82-05-WBN-04

NSRS recommended that plant management should further instruct applicable personnel as to the requirements of PHYSI-2 for shift engineers approval of extension of torch cutting, welding, open flame, grinding, and spark producing work permits (form TVA 6561). The plant responded that they would request that DPM N781S2 be revised to require extension approval from the responsible foreman rather than the shift engineer. This requested revision was denied by the Central Office. The plant is following the original NSRS recommendation of reinforcing the importance of following the instructions exactly.

4. Control of Combustibles

R-82-05-WBN-05

NSRS recommended that the plant should establish plant procedures to require the storage of combustible materials only in areas designated combustible material storage areas with adequate fire protection. Storage of combustible material should be prohibited in areas containing safety-related equipment. NUC PR disagrees with this finding. A difference of interpretation of 10CFR50, Appendix R, exists between NSRS reviewers and NUC PR. It doesn't appear that enough definition is given in Appendix R for NSRS to proceed with this concern. NSRS is satisfied that NUC PR management is aware of the potential risk involved and has agreed to take those risks. However, changes have been made in PHYSI-2 to limit the storage of combustible materials in safety-related areas.

IV. LIST OF PERSONNEL CONTACTED

A. Division of Nuclear Power

<u>Name</u>	<u>Organization/Title</u>	<u>Attended Entrance Meeting</u>	<u>Contacted During Review</u>	<u>Attended Exit Meeting</u>
L. C. Ellis	Industrial Safety Supervisor		X	
V. L. Dudley	Fire Protection Engineer		X	

B. Browns Ferry Nuclear Plant

L. W. Jones	BFN Quality Assurance			X
T. L. Chinn	BFN Compliance Supervisor	X		X
Ray Phifer	BFN Safety/Fire Protection Supervisor		X	X
T. J. Keckeisen	BNP Fire Protection Engineer	X	X	X
Ray Cole	OQAB			X
J. R. Pittman	BFN Assistant Superintendent			X
Steve Logan	FSG Safety Engineer		X	
Gable Campbell	Plant Services Supervisor		X	
Leo Turner	Management Services Supervisor		X	

C. Sequoyah Nuclear Plant

E. A. Craigge	Safety Supervisor	X	X	X
Mike Harding	Compliance Supervisor	X		
C. R. Stutz	SQN QA Engineer	X		X
W. H. Baker	Fire Protection Engineer			X
A. M. Carver	Compliance Engineer		X	X

D. Watts Bar Nuclear Plant

W. L. Byrd	Compliance Supervisor	X	X	X
W. T. Cottle	Plant Superintendent			X
W. F. Hawkins	Fire Protection Engineer	X	X	
J. J. Loud	Safety Supervisor	X	X	X
J. Englehart	Compliance Engineer	X	X	

V. DOCUMENTS REVIEWED

A. Division of Nuclear Power

1. Division Procedure Manual Procedure N82FP1, RO

B. Browns Ferry Nuclear Plant

1. Standard Practice Section 14
2. Standard Practice BF 1.2
3. Standard Practice BF 8.5

4. **Technical Specifications**
5. **Office of Power Quality Assurance and Audit Staff, Audit No. BF-82SP-03**

C. Sequoyah Nuclear Plant

1. **Administrative Instruction 15, "Torch Cutting, Welding, Open Flame, Grinding, Spark Producing Work Permit"**
2. **PHYSI-13, "Fire," R34**
3. **Technical Specifications**
4. **Hazard Control Instructions**
5. **Surveillance Instruction
SI-261 "Visual Inspection of Fire Doors"**
6. **Office of Power Quality Assurance and Audit Staff, Audit No. SQ-82TS-03**
7. **Memorandum from C. C. Mason to T. G. Campbell, Response to Audit No. SQ-82TS-03**
8. **Surveillance Instructions data packages
SI-261 "Visual Inspection of Fire Doors"**

D. Watts Bar Nuclear Plant

1. **Administrative Instruction 9.9, "Torch Cutting, Welding, Open Flame, Grinding, and Spark Producing Work Permit"**
2. **PHYSI-2, "Fire Protection Plan," R13**
3. **Technical Specifications**
4. **Surveillance Instructions**

SI-4.7.11.2.b.2 "Examine Fire Spray and/or Sprinkler System Located in the Reactor Building, Auxiliary Building, Control Building, and the Diesel Generator Building"

SI-1 "Surveillance Program"

SI-7.18 "Examine Fire Spray and/or Sprinkler System Located in the Reactor Building, Auxiliary Building, Control Building, and the Diesel Generator Building"

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

TO : [REDACTED] Bellefonte CONST

FROM : H. N. Culver, Director of Nuclear Safety Review Staff, 249A HBB-K

DATE : March 22, 1983

SUBJECT: BELLEFONTE NUCLEAR PLANT - EMPLOYEE CONCERN RELATED TO WELDING QUALIFICATION/
CERTIFICATION PRACTICES - NUCLEAR SAFETY REVIEW STAFF REPORT NO. E-83-05-BLN

The Nuclear Safety Review Staff (NSRS) has completed an investigation of the concerns you had expressed in confidence to a member of my staff on February 16, 1983. The results and details of the investigation are included in the attached report.

In summary, our investigation substantiates four of the seven concerns. Of these, two had been previously addressed by the NRC as items for management consideration. Project management intends to take corrective action in these areas. Of the other two, one has resulted in a recommendation to BLN management for improved management control, and the other, while substantiated, is determined to be a cost-effective management prerogative which does not adversely impact nuclear safety.

Your desire to improve the quality, safety, and management control at Bellefonte, as well as the cooperation you extended the investigators, is greatly appreciated. A copy of the report will be provided to the Manager of the Office of Engineering Design and Construction for information and corrective action.

Please read the attached report. If you have any questions, call M. A. Harrison at extension 4816 in Knoxville. Should you feel your concerns are still not resolved, in accordance with TVA Code II, you may choose to bring this matter to the attention of the TVA General Manager and Board of Directors or to go directly to the U.S. Nuclear Regulatory Commission. Very truly yours.

H. N. Culver
H. N. Culver

MAH:LML
Attachment
cc: W. F. Willis, E12B16 C-K (Attachment)

ADMIN.
CONFIDENTIAL

NSRS FILE

*This Report
is closed - All
required C/A is complete
4/24/83 [signature]*

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

TO : G. H. Kimmons, Manager of Engineering Design and Construction, W12A9 C-K

FROM : H. N. Culver, Director of Nuclear Safety Review Staff, 249A HBB-K

DATE : March 22, 1983

SUBJECT: BELLEFONTE NUCLEAR PLANT - EMPLOYEE CONCERN RELATED TO WELDING QUALIFICATION/
CERTIFICATION PRACTICES - NUCLEAR SAFETY REVIEW STAFF REPORT NO. I-83-05-BLN

Attached are the NSRS report of an investigation conducted at Bellefonte Nuclear Plant and my recommendations for management consideration. The investigation was conducted at the request of an employee concerned with the welder qualification/certification program and excessive amounts of rework required on production welds.

The results of the investigation indicate that of seven expressed concerns none adversely impacted nuclear safety. However, four of the concerns were substantiated. Two of those substantiated, i.e., no limit to a welder's test attempts, and certified welders lacking necessary qualification or experience, had been previously identified by the NRC with resolution already under consideration. The other two substantiated concerns, i.e., excessive rework, and failure to perform "background investigations" of welders, were not considered to be conditions adverse to nuclear safety, since the programs controlling rework and welder hiring and performance appear to be functioning effectively and within requirements. However, two recommendations (attachment 1) are provided for corrective action by your office. Please provide a response to these findings to this office by April 23, 1983.

If you have any questions concerning the investigation report or the recommendations, please call M. A. Harrison at extension 4816.

H. N. Culver
H. N. Culver

MAH

MAH:KRW

Attachments

cc: G. F. Dilworth, E12D49 C-K (Attachments)

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ATTACHMENT 1

NSRS REPORT I-83-05-BLN
RECOMMENDATIONS FOR MANAGEMENT CONSIDERATION
OF CORRECTIVE ACTION/PROGRAM IMPROVEMENT

1. I-83-05-BLN-01, Excessive Rework on Certain Safety-Related Systems

Finding: According to the Weld Monitoring Program computer printout, some safety-related riping systems indicated in excess of 30 percent rework to welds. Two systems had over 50 percent rework. One system had over 100 percent rework. This amount of rework appears to be excessive. Site management did not have a method whereby information pertaining to rework could be trended or reported for evaluation and action, if warranted.

Recommendation: Determine the amount of rework to systems which is considered to be acceptable. Provide reports to appropriate BLN management personnel of systems requiring rework in excess of that amount for evaluation and action.

2. I-83-05-BLN-02, Weld Test Supervisor Qualification Requirements not Prescribed

Finding: Qualification requirements for the position of weld test shop supervisor have not been prescribed by job description or procedure.

Recommendation: Determine and prescribe the minimum qualification and experience requirements for the position of weld test shop supervisor.

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TENNESSEE VALLEY AUTHORITY
NUCLEAR SAFETY REVIEW STAFF
INVESTIGATION

NSRS REPORT NO. I-83-05-BLN

SUBJECT: EMPLOYEE CONCERN RELATED TO WELDING QUALIFICATION/
CERTIFICATION PRACTICES

DATES OF
INVESTIGATION: FEBRUARY 22 - MARCH 1, 1983

INVESTIGATORS:

M. A. Harrison
M. A. HARRISON

3/17/83
DATE

D. L. Bailey
D. L. BAILEY

3/17/83
DATE

APPROVED BY:

K. W. Whitt
K. W. WHITT

3/18/83
DATE

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I. SUMMARY

The Nuclear Safety Review Staff (NSRS) was made aware of a series of employee concerns related to welding qualification/certification practices at Bellefonte Nuclear Plant (BLN), as a result of a routine visit to the site by an NSRS nuclear engineer on February 16, 1983. The following concerns were provided by the employee:

- The amount of rework required on welds performed by certified welders is excessive.
- To become a certified welder, a craftsman need only pass the applicable test required by ASME III, section IX. The welders experience or ability to perform acceptable work in the field, i.e., his "qualifications" are not sufficiently considered when certifying him/her.
- There was no check on the qualification of craftsmen sent from a union hall (in response to a requisition for welders).
- There is apparently no limit to the number of times a craftsman could take a welding test. Some had tried and failed as many as six times.
- Quality control could not, or would not, give crafts specific identification of reasons for a weld's rejection, resulting in excessive weld replacement (cutouts).
- Excessive grinding of welds could possibly alter the base metal.
- Welder's certifications were not signed by the appropriate testing authority.

NSRS determined to investigate the concerns although some of them appeared to be management practice prerogatives within code and procedural allowances. An investigation team was assigned, began the investigation on February 22, 1983, at Bellefonte, and concluded on March 1, 1983. The team concluded that welding certification, inspection, and rework programs are adequate and are generally implemented as required. While the extent of rework to some systems appears excessive, it is adequately controlled and does not adversely impact nuclear safety

II. SCOPE

NSRS investigators reviewed each of the concerns, concentrating on those which may have had safety significance, i.e., failure to identify defects to crafts for rework, potential alteration of base metal by grinding, and unauthorized signatures on welders' certifications. During the investigation, cognizant personnel were interviewed; pertinent requirements, records, and documentation were reviewed; and routine practices observed.

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III. FACTS

A. Background

On February 16, 1983, during a routine biweekly visit to BLN, an NSRS nuclear engineer, was approached by an individual who expressed in confidence the concerns summarized in section I. When contacted by the investigation team by telephone on February 18, 1983, this individual emphasized that his basic concern was that too much repair work was occurring because some welders, although certified, weren't really qualified to do their jobs in the construction environment. He also stated that excessive grinding of welds was common place, and he thought the practice could degrade the base material.

He was asked at that time to provide a written statement of all of his concerns to NSRS investigators when they arrived on site February 22, 1983. He agreed to prepare a written statement. The unsigned statement of concerns was given to the investigators during a meeting with the employee on February 22, 1983, identifying only three concerns listed below:

- Some welds had to be cut out or repaired more than once.
- Grinding could overheat base metal causing warping or changing the composition of the metal.
- Unqualified (apprentice) welders were welding.

When questioned about some of the other concerns he had conveyed to NSRS, he acknowledged that some problems existed, but the three items listed above were his main concerns. He then produced a welder's certification card, signed by an individual other than a welding test supervisor, stating that he also felt that only the test supervisors should sign the certification cards.

NSRS investigators determined at this time to review the original seven concerns previously identified and described in section I.

B. Investigation of Employee Concerns

1. Excessive Rework/Welds Repaired More Than Once

NSRS investigators reviewed the BLN unit 1 weld monitoring program--a computerized listing of the history of all individual welds sorted by system--and tabulated the percentage of rework for 50 selected safety-related as well as nonsafety-related systems. Those listings appear as attachments 1 and 2. The range of percentage rework from the printout of February 11, 1983, was from a high of 106 percent (incore monitoring tubing; see "Note" below) to a low of 0 percent (several systems). It was apparent, as expected, that system welds requiring the more stringent inspection, averaged more rework than system welding requiring only visual examination.

It was also apparent from review of the printout that many welds had been reworked more than once. Some had been repaired as many as nine times, others were cut out and replaced as many as three times.

BNP-QCP 10.18 (R7, March 5, 1982), "Weld and Base Material Repairs," describes the requirements for requesting, authorizing, classifying, and documenting repair of welds and base material. NSRS reviewed this procedure to independently determine whether or not welding rework controls appeared adequate. Additionally, interviews with five welding QC inspectors and a welding inspection supervisor were conducted. All personnel interviewed appeared knowledgeable of the various rework control processes described in BNP-QCP 10.18. BNP-QCP 10.18 R7 did not prescribe units or provide guidance on what "acceptable" rework percentages should be maintained, nor did it require a trend review for determination of potentially excessive amounts of rework. A review of monthly trend reports confirmed that rework percentages were not reported.

NOTE: Incore monitoring tubing was welded by an automatic process using preset machines run by welding operators not necessarily certified welders. As such, it is not considered representative of welding activity performed by certified welders.

2. Certification versus Qualification of Welders

Welder performance qualification testing at BLN is performed in accordance with ASME III, section IX; General Construction Specification G-29, "Fabrication, Welding, and Inspection Specification"; and BNP-QCP 10.24 (Revision 5 dated October 22, 1980), "Welder, Welding Operator, and Peening Operator Performance Qualification," through addendum 2 dated December 28, 1981. These requirements stipulate that a welder is authorized to weld a specific prequalified welding process upon satisfactory completion of a controlled test in that process. There are no age limit or experience restrictions required and no limit has been given for the number of times a craftsman may attempt to pass the test.

In an interview with the BLN site personnel manager, he stated that applications/resumes from craft welders are reviewed by his office to verify that the applicant has at least the qualifications of a TVA welding apprentice, i.e., four years experience. Additionally, applicants are interviewed by personnel officers to determine if the applicant has at least a basic knowledge of welding principles prior to permitting a welding test. Additionally, applicants are not hired until satisfactory completion of the performance test.

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From interviews with QC welding inspectors, NSRS learned that craft foremen sometimes reassign welders to less critical systems if they produce excessive rejectable welds. BNP-QCP 10.24 (R5, Add 2) gives the welding engineering unit authority to require retesting of or to disqualify welders from a process if their ability is questionable.

During the period September 20 - October 22, 1982, a general construction appraisal was conducted at BLN by the NRC. The results of this appraisal were documented in the Construction Appraisal Inspection Report 50-438/82-32, 50-439/82-34 dated January 13, 1983. Section VI, "Welding and NDE," of this report identifies as an observation for management consideration the fact that, ". . . many of the welders now employed at BNP, while having passed the entry test, may have limited experience or skills consistent with that required for welding at a nuclear power plant." In a telephone conversation with an NSRS investigator on March 4, 1983, the BLN OEDC Project Manager stated that each of the NRC welding observations (as well as all others in the report) is under active consideration by the Division of Construction (CONST) or BLN management for correction or improvement. According to the BLN OEDC Project Manager, proposed action includes:

- Limiting the number of qualification attempts.
- Additional staffing of the Weld Training Group.
- Use of a field welder evaluator with authority to require retests of suspect welders or revoke their certifications. The BLN OEDC Project Manager indicated that this action has already been accomplished.

3. Background Check on Craft Qualifications

From an interview with the BLN site personnel manager, NSRS learned that only infrequently, and for cause, is the craftsman's background information and experience supplied on an application checked. Some prescreening of welding applicants is done, as previously stated in section III.B.2, and falsification of application information is a termination offense. Further, the personnel manager stated he had not noticed a tendency on the part of union locals to attempt to supply unqualified candidates, although he acknowledged that there were differences in the various union-sponsored training programs.

A prescribed requirement to check on the background/qualification of all welder applicants was not identified during the review.

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4. No Limit on Test Attempts

Welder performance qualification testing is controlled at BLN by BNP-QCP 10.24 (Rev 5, Add 2), which does not limit the number of attempts of a welder to pass a test.

From an interview with the site personnel manager, NSRS learned that applicants who fail the welding test must wait approximately one month before reapplying. Although this restriction was not noted to be a prescribed requirement, it was described as routine practice. Per QCP 10.24, CCNST supervision is responsible for the selection of employed craftsmen to take welding tests. If a test is failed, the weld test supervisor may authorize a retest after an additional two hours of training. If the retest is also failed, a compulsory 14-day waiting period is prescribed prior to attempting the next test.

ASME III, section IX, does not specify a limit to the number of attempts of a welder to pass a test, nor did the investigation identify any upper-tier TVA requirement which did so. However, the NRC Construction Appraisal Investigation Report of January 13, 1983, identified the absence of a limit as an observation for management consideration. In a telephone conversation with the BLN OEDC Project Manager, he confirmed that CONST is considering limiting the number of attempts to two.

5. Failure to Identify Defects to Craftsmen

The welding engineering unit at BLN is responsible for assigning weld procedures and inspection requirements for individual welded joints in accordance with BNP-QCP 10.13 (Rev 5 dated August 16, 1979). These instructions are conveyed to craft and inspection personnel using, primarily, the automated process control (APC) card system. Welding of a joint must be performed per the process specification identified on the card. Inspections, i.e., fitup, visual, liquid penetrant, magnetic particle, radiography, or ultrasonic, or combinations must be performed by the Welding QC Unit as assigned on the APC card. If a weld is rejected during inspection, reason for the rejection is to be documented on the card. The Welding Engineering Unit is then responsible for determining the extent of the repair or replacement of the weld based on the documented inspection results. From interviews with QC inspectors and welding engineers, it was learned that, invariably, craftsmen are present when surface inspections are performed, and defects are identified to the craftsmen immediately. In the radiographic inspection, plastic overlays are produced from the exposed film and defects are marked on the overlay. Welders physically align the overlay with the weld and identify the specific location of the defect(s) to be repaired. For all repairs or replacements, the Welding Engineering Unit issues new instruc-

tions (e.g., a revised APC card) for the welding process and nondestructive examination requirements prior to starting the repair. If nondestructive examination rejects the repaired weld, the process described above is repeated.

Most defects requiring full cut-out and replacement of a weld appeared to have been discovered by the radiographic inspection method according to the Weld Monitoring Program printout of February 11, 1983.

In an interview with the concerned employee, he stated that communications between engineering and craft personnel regarding this issue were much better and no longer appeared to be a problem.

6. Grinding of Welds Could Alter Base Metal

General Construction Specification G-29M permits grinding of welds and base material. Weld and base material surface preparation is required for some NDE inspections, such as ultrasonic testing, and is routinely performed. In interviews with a BLN welding engineer and an NSRS AWS certified welding inspector, both confirmed that grinding operations do not generate sufficient heat to alter base material properties.

Bellefonte craft management had attempted to minimize grinding operations by issuing a series of directive memoranda, one dated February 9, 1982, which NSRS investigators reviewed. During an inspection tour on February 23, 1983, of reactor building No. 1, NSRS investigators did not observe "excessive" grinding, although grinding operations were observed in four areas.

7. Welders Certifications not Signed by an Authorized Weld Test Supervisor

The concerned employee told NSRS investigators that anyone who became certified to BNP-QCP 10.24, would be authorized to sign a welder's certification record. He produced a certification card signed by an individual other than the weld test supervisor ". . . for I. W. Towl" (a Weld Test Supervisor.)

Interviews with Welding Engineering Unit personnel disclosed that although personnel certified to QCP 10.24 would be eligible to sign for welder's certification, in practice, only the test supervisors did so or in their absence a designated appointee. An NSRS investigator reviewed a random sample of 100 Welder Certification Records (QA records) all of which had been signed by one of the two authorized weld test supervisors.

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It was noted by the investigators and Welding Engineering Unit personnel that qualification requirements for the position of Weld Test Supervisor were not prescribed by procedure nor did the job descriptions (form TVA 12A) indicate qualification requirements for the position of Weld Test Supervisor.

IV. ANALYSIS

A. Excessive Rework/Welds Repaired More Than Once

The average rework percentage for the 30 ASME III systems reviewed was 24.8 percent and for 29 ASME III systems, excluding incore monitoring for reasons described in III.B.1, was 22 percent. The rework percentage for non-ASME III systems requiring only visual inspection was 5.1 percent. In other words, on average, each Code weld must be completed 1.25 times and each non-Code weld completed 1.05 times before they are acceptable. The extent to which design changes and "interference" modifications caused rework as opposed to workmanship problems was not precisely determined but two of five QC inspectors responsible for the inspection of systems requiring the most rework felt it was a significant factor. A comparison with other nuclear projects was not made.

The repair program defined in BNP-QCP 10.18 appears to be comprehensive, well controlled, and administered properly by knowledgeable personnel. The fact that some rework due to workmanship is required is to be expected and is a positive indicator that QC inspection and corrective action programs are effective. Nuclear safety and quality are not compromised by rework performed in accordance with existing requirements.

B. Certification versus Qualification of Welders

The Bellefonte welder certification program as prescribed by BNP-QCP 10.24 (Rev 5, Add 2) is in accordance with requirements of ASME III, section IX. However, as identified in the NRC BLN Construction Appraisal, and in support of the employee concern, NSRS agrees that the ability to pass the performance test in a controlled test environment does not categorically prove the welder's ability to consistently perform satisfactorily in the harsher construction environment. Preemployment screening, QC inspection, prescribed disqualification processes, and reassignment practices should work in conjunction to minimize the effects of unqualified but certified (or certifiable) welders.

C. Background Check on Craft Qualifications

Due to the high craft turnover rate associated with power plant construction, a background qualification check of every applicant may not be cost effective. The screening efforts of Personnel at BLN are considered adequate.

D. No Limit on Test Attempts

While it is true that an absolute limit to the number of times a welder may attempt to pass a certification test is neither required by upper-tier documents nor prescribed by site procedures, it has not been conclusively demonstrated that such a limit would enhance nuclear safety or quality. The limitations imposed by site practice and prescribed in BNP-QCP 10.24 (Rev 5, Add 2) appear to sufficiently reduce the frequency of attempts and can act to provide the welder with training time if authorized by his supervision rather than permit "training by testing."

E. Failure to Identify Defects To Craftsmen

Information obtained during the investigation, including the concerned employee's statement that identification of defects to craftsmen was no longer a problem, conclusively demonstrated that weld defects are identified by QC and engineering personnel to craft personnel. NSRS has no further concern in this area.

F. Grinding of Welds Could Alter Base Metal

Since grinding operations are required for surface preparation for some nondestructive examinations by ASME III and permitted by Construction Specification G-29, and in that temperatures generated during grinding are not sufficient to degrade or alter base metal structure, NSRS has no safety concern in this area.

CONST supervision had been aware of excessive cosmetic grinding, which although not a safety concern, may have impacted productivity, and took appropriate steps to control it. These steps (directive memoranda) appear to have been effective.

G. Welders' Certifications not Signed by an Authorized Weld Test Supervisor

After review of the randomly selected 100 Welder Certification Records, all of which were signed by one of the two Weld Test Supervisors, the investigators are in agreement that this specific concern is unsubstantiated. However, during this phase of the investigation, it was identified that qualification requirements for the position of Weld Test Supervisor were not prescribed. In that the test supervisor is the individual authorized to certify a welder's ability to perform ASME III code welding satisfactorily, the minimum qualification standards prerequisite to holding that position should be defined.

It was determined to be true that any individual certified to BNP-QCP 10.24 would be authorized or eligible to sign welder's certifications although this was not a site practice. Again, there is no apparent program or procedure that addresses this authority.

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It is emphasized that current site practice appears to be adequate. The current weld test supervisors both appeared to be knowledgeable, experienced, and capable, but their job descriptions (form TVA 12A) reflected only qualification requirements for positions as welding inspectors.

V. CONCLUSIONS

A. Employee Concerns

1. The average amount of rework was not judged to be excessive since it was not compared with rework for other plants under construction. Management should be cognizant of excessive rework since root causes for such may indicate quality problems. The fact that some rework occurs is not in itself a safety issue, but indicates that inspection and correction programs are functioning.
2. BLN management is aware of employee concerns identified and described in this report as sections III.B.2 and .4 as a result of the NRC observations from the Construction Appraisal Investigation Report. The BLN OEDC Project Manager is preparing responses and corrective actions for those concerns identified in the NRC report.
3. The preemployment screening process is considered adequate. Additional in-place prescribed controls minimize the effect of an unqualified but certified welder.
4. See (2) above.
5. This concern about failure to identify defects to craftsmen was not substantiated.
6. Material properties of base metal are not degraded by grinding. Site construction management has taken actions to minimize excessive grinding for cosmetic purposes.
7. Welders' certification records are signed by the appropriate authority. The card provided to NSRS investigators is considered an example of a designee signature, not disallowed by procedure, and does not indicate a general breakdown in compliance with the requirement.

B. Summary Conclusion

The employee concerns which may have adversely impacted nuclear safety (items 5, 6, and 7) were not substantiated by this investigation. The other concerns are considered by NSRS to be the employee's sincere desire for enhancements to the efficiency and effectiveness of construction management controls. Recommendations for improvements are under consideration by BLN management.

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VI. JUDGEMENT OF NEEDS

Division of Construction management needs to review this report and take those actions determined appropriate to assure that: (1) Responsible management personnel are cognizant of trends in rework and (2) experience and qualification requirements for the position of Weld Test Supervisor are identified and prescribed.

VII. REFERENCES

A. Bellefonte Quality Control Procedures

1. ENP-QCP 10.13, "Weld Procedure Assignment," R5
2. BNP-QCP 10.18, "Weld and Base Material Repairs," R7 through Addendum 3
3. BNP-QCP 10.19, "Arc Strike Removal," R2
4. BNP-QCP 10.24, "Welder, Welding Operator, and Peening Operator Performance Qualification," R3 through Addendum 1
5. BNP-QCP 10.35, "Sequence Control Chart," R1

B. ASME III Code, Section IX-1974, "Welding and Brazing Qualifications"

C. General Construction Specification G-29M, "Fabrication, Welding, and Examination Specification and Procedures"

D. USNRC Report 50-438/82-32; 50-439/82-32 dated January 13, 1983, "Construction Appraisal Inspection"

E. BLN Organization Charts for Construction Engineer and Quality Manager

F. Welder Status Report of February 21, 1983

G. Weld Monitoring Program of February 11, 1983

H. Memoranda

1. R. Carpenter to Those listed dated August 30, 1979, "Interview Guide for T&L Craftsmen Candidates"
2. G. K. Blackburn to Craft Superintendent, et al, dated February 9, 1982, "Grinding on Completed Welds"

ATTACHMENT 1

ASME

System	Predominant	Rework	NDE	
<u>ID Code</u>	<u>ASME III Class</u>	<u>Percentage</u>	<u>Requirement</u>	<u>System Description</u>
CA	2/3	9.9	VPR	Auxiliary Feedwater
CF	2	16.5	VPR	Feedwater
CR	2	39.3	VPR	Startup and recirculation
FF	3	21.6	V	Fuel oil
GN	3	14.5	VP	Nitrogen purge
IM	1	106.9	VPR	Incore monitoring
IO	2	3.5	VPR	Inst & control (various systems)
KC	3	13.7	VPM	Component cooling
KD	2	63.6	VPR	CRD cooling water
KE	3	26.2	VP	ERCW
NB	3	51.0	V	Chemical addition/boron recovery
NC	1	9.7	VPRM	Rx cooling system
ND	2	23.9	VPR	DHR system
NF	2	0.8	VPU	Fuel handling
NK	2	25.7	VPR	RC Drn, vent, & misc piping
NL	1/2	28.8	VPR	Core flooding
NM	2/3	24.4	VPR	Spend fuel cooling
NS	2	35.7	VPR	Rx Building spray
NV	2	31.7	VPR	Makeup & purification
RE	2/3	22.2	VP	Dem. water
RF	2/3	29.3	VPMR	Fire protection
RG	3	22.5	V	Diesel generator starting air
RH	2/3	13.7	VPR	Service air
RI	2	0	VPR	Control air
RJ	3	19.0	V	Essential air
RK	3	17.1	VP	Compressed air
RT	3	5.0	VM	Standard Diesel Generator & Control System
SA	3	9.0	V	Auxiliary steam
SM	2	40.2	VPM	Main steam
SV	2/3	18.1	VPR	Safety vent. & misc steam

Mean = 24.78%/22.0%(-106.9)

Estimated standard deviation = 20.74

V = Visual

M = Magnetic particle

U = Ultrasonic

P = Liquid penetrant

R = Radiographic

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ATTACHMENT 2

NON-ASME

<u>System ID Code</u>	<u>Rework Percentage</u>	<u>NDE Requirement</u>
1A3	23.3	V
1A4	1.8	V
1A5	4.7	V
1A6	2.1	V
1A7	2.7	V
C5	1.8	V
C6	1.9	V
D4	2.9	V
D6	11.0	V
FD	0	V
G7	0	V
KS	0	V
NO	3.4	V
NR	3.0	V
NX	0	V
RU	0.8	VM
RV	11.4	V
R4	20.4	VPM
R9	1.8	V
VA	10.0	V

Mean = 5.12%

Estimated standard deviation = 6.54

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

TO : G. H. Kimmons, Manager of Engineering Design and Construction, W12A9 C-K

FROM : H. N. Culver, Director of Nuclear Safety Review Staff, 249A HBB-K

DATE : April 1, 1983

SUBJECT: BELLEFONTE NUCLEAR PLANT - EMPLOYEE CONCERN RELATING TO UNDUE PRESSURE ON QUALITY CONTROL INSPECTORS - NUCLEAR SAFETY REVIEW STAFF (NSRS) REPORT NO. I-83-06-BLN

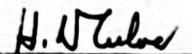
On February 16, 1983, NSRS was requested by a TVA employee to examine concerns relating to undue pressure on quality control (QC) inspectors at the Bellefonte Nuclear Plant (BLN).

As indicated in the attached report, the NSRS investigation did not find support to the allegation that there was undue pressure on QC inspectors at BLN. The investigation did reveal that there are root problems with the procedural control of work at the site that contribute in a significant way to some of the problems brought to our attention by the TVA employee.

Further, the investigation reveals the existence of improper actions by craft management in their relations to QC inspectors which, if not controlled, can be interpreted as a form of intimidation. Even if such actions are not intended to harass or intimidate inspectors, the unofficial allowance of such actions weakens the QC inspection program as well as impedes cooperation at the interface between crafts and inspectors that needs to be encouraged.

Three recommendations (attachment 1) for corrective actions are provided for consideration by your office. Please inform NSRS within 30 days of receipt of this memorandum of the actions you have taken or plan to take to correct the identified deficiencies.

If you have any questions about the content of this memorandum or the attachments, please contact Ron Travis at extension 4814.



H. N. Culver

HNC:RWT:LML

Attachments

cc (Attachments):

G. F. Dilworth, E12D46 C-K

H. S. Sanger, Jr., E11B33 C-K



UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

TO : [REDACTED] Bellefonte Nuclear Plant CONST

FROM : H. N. Culver, Director of Nuclear Safety Review Staff, 249A HBB-K

DATE : April 1, 1983

SUBJECT: BELLEFONTE NUCLEAR PLANT - EMPLOYEE CONCERN RELATING TO UNDUE PRESSURE ON QUALITY CONTROL INSPECTORS - NUCLEAR SAFETY REVIEW STAFF (NSRS) REPORT NO. I-83-06-BLN

The Nuclear Safety Review Staff has evaluated your concerns provided to members of our staff on February 22, 1983. Our investigation indicates that actions were taken by craft management that are improper and could be interpreted as a form of intimidation or harassment of QC inspectors. There was, however, no information provided to the investigators upon which to conclude that actions by craft management were intended to unduly pressure the QC inspectors into acceptance of unacceptable work.

The NSRS investigators have identified a number of problem areas which need to be addressed by OEDC management involving both the proper communication channels for problem solving as well as clarification of procedural controls over the work at BLN. It is our belief that action by OEDC on the recommendations contained in the report will provide resolution to the concerns you have raised. A copy of the investigation report and recommendations to OEDC are attached for your information.

Your interest in the quality and safety of construction activities at BLN is appreciated. In accordance with TVA Code II, Expression of Staff Views, you may bring your safety concerns to the attention of the General Manager and the TVA Board of Directors if you are not satisfied with the evaluation provided by NSRS.



H. N. Culver

HNC:RWT:LML

Attachments

cc: W. F. Willis, E12B16 C-K (Attachments)

NSRS FILE

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NSRS REPORT I-83-06-BLN

RECOMMENDATIONS FOR MANAGEMENT CONSIDERATION
OF CORRECTIVE ACTION/PROGRAM IMPROVEMENT

A. I-83-06-BLN-01, Concrete Pour Card

Finding: The use of the concrete pour card, especially the significance of the foreman's signature, is not clear. This contributes to confusion and misunderstanding between the crafts and the inspectors.

Recommendation: The significance of the foreman's signature on the concrete pour card should be clearly defined in a quality procedure. The reason for the signature should be clearly explained so that the crafts and inspectors both understand with as little interpretation as possible.

B. I-83-06-BLN-02, Use of QCIR

Finding: The QCIR is not used in a consistent manner. Consequently, conditions under which it will be implemented are not always understood by the crafts and inspectors.

Recommendation: The proper use of the QCIRs by QC inspectors should be clearly defined in writing and consistently implemented by QC personnel. If the "give back" inspection system is to be permitted, plant management should incorporate it into the quality program and define the boundaries within which it may function so that it can be controlled.

C. I-83-06-BLN-03, Inspector Notification

Finding: The method of informing the QC inspectors that work is complete and ready for inspection is inconsistent among craft management personnel.

Recommendation: The method of informing QC inspectors that work is ready for inspection should be standardized and documented for all craft management.

TENNESSEE VALLEY AUTHORITY
NUCLEAR SAFETY REVIEW STAFF
INVESTIGATION

NSRS REPORT NO. I-83-06-BLN

SUBJECT: INVESTIGATION OF EMPLOYEE CONCERN - UNDUE PRESSURE ON
QUALITY CONTROL INSPECTORS

DATE OF
INVESTIGATION: FEBRUARY 22-25, 1983

INVESTIGATOR: R. W. Travis 4/1/83
R. W. TRAVIS DATE

C. M. Key 4/1/83
C. M. KEY DATE

APPROVED BY: K. W. Whitt 4/1/83
K. W. WHITT DATE

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I. SUMMARY

Through the routine program for identifying and evaluating employee concerns, the Nuclear Safety Review Staff (NSRS) became aware of allegations made by a Division of Construction (CONST) employee at the Bellefonte Nuclear Plant (BLN) which could affect nuclear safety. The employee was concerned that there was undue pressure on quality control inspectors by personnel in the craft portion of the CONST organization. The two examples specifically identified by the employee were not in areas that directly affect nuclear safety but he thought that these two examples were representative of the pressure that was also being applied in other parts of the plant. The employee alleged that he was harassed by a member of crafts supervision. The harassment consisted of public humiliation by the supervisor in accusing him of being too lazy to inspect concrete pour preparations quickly enough to prevent damage to the forms and other areas of preparation.

The NSRS investigation team was established and began its investigation on February 22, 1983, and concluded on February 25, 1983. The team concluded that there was some uncertainty as to the use of concrete pour cards and Quality Control Investigation Reports (QCIRs) and some pressure resulting from schedule requirements on both construction management and inspectors.

II. SCOPE

The investigation included a general examination of the allegation that there was undue pressure on quality control inspectors by craft personnel in the craft portion of the CONST organization. The investigation also included a detailed examination of the two specific examples of this alleged pressure provided by the employee. It was conducted by interviewing personnel, reviewing procedures and documents, and using established investigation techniques. Nine individuals in the crafts and inspection organizations were interviewed during the investigation.

III. FACTS

A. Background

On February 16, 1983, an inspector from one of the quality control units at BLN made his concern known to the NSRS reviewer onsite at BLN. He had prepared a written statement and given it to his supervisor who had passed it up the line to the Quality Manager. The employee was informed of the NSRS activities onsite by his supervisor and chose to bring his concern to the NSRS representative.

The employee had a general concern that there was undue pressure being exerted on the quality control inspectors by craft personnel in the CONST organization. In support of this concern the employee cited alleged intimidation of an inspector by a member

of CONST management. There were two particular incidents which provoked the alleged intimidation. In the first incident a concrete form had been prepared for a pour and the pour card had been signed by the foreman as ready to be inspected. Before the inspector arrived at the location to perform the inspection, portions of the form were covered with dirt by another operation and could not be adequately inspected.

In the second incident, a heavy rain occurred after the form had been completed but before the inspection was performed. When the inspector arrived to do the inspection, part of the form had been moved by the flow of water, again precluding the acceptance of the form and signing of the pour card.

Later in the afternoon several craft personnel, including a number of the general foremen, had gathered in the administrative building in preparation for shift change. The inspector that had rejected the forms in the two above incidents (concerned employee) was preparing the QCIRs in the presence of the craft personnel in the general foreman office area. The general foreman responsible for the forms questioned the reasons for the QCIRs. He was given the reasons and started to leave the area; but upon hearing further discussions of the subject between the inspector and other craft personnel, he loudly stated his view that the reason for the rejection was that the inspector was too lazy to get out and inspect work on a timely basis. This encounter constitutes the basis for the allegation of harassment or intimidation. No apology was made by the general foreman either privately or publicly following the incident.

B. General Discussions

The concerned employee provided the two specific incidents described above as examples of perceived undue pressure exerted on inspectors by the crafts. In addition, he stated that he believed the practice was widespread, particularly for activities with which the specific general foreman in the previously described incidents was involved. The names of three other inspectors that he believed would support this position were provided. These inspectors were interviewed and all supported the position that pressure existed to get the work done and for the inspectors to accept the work. However, these three inspectors did not indicate that there was undue pressure for acceptance of work that had been rejected. Two of the inspectors had experienced some type of problem with the foreman named in the allegation. All three had experienced some type of problem with some foreman or general foreman. One interpreted the trouble as attempted intimidation by the craft or thought it could have been identified as intimidation and one looked at it only as a disagreement in which some anger was expressed. This information was

provided verbally. None of the inspectors would provide signed statements. The remainder of the discussion in this section pertain to general conditions at BLN and are not restricted to the specific incidents described above or to only this particular concern.

1. Concrete Pour Card

The concrete pour card has spaces on it for the foreman to sign off. Section 6.5.1 of BNP-QCP-5.3 R3 has the following statement. "A concrete pour card, Attachment A, shall be utilized as an inspection and control record for each pour. The front side of the card will function as a release when signed by the appropriate engineers and the shift engineer. The craft foreman column is for information only and does not serve as a QA release. . ." It is not certain what "information" is conveyed by the signature of the craft foreman. In interviews with CONST personnel, two differing uses of the signoff were identified. Some people said that the blank, when signed, meant that the work was completed from the craft's point of view; others said that the signoff meant that the work would probably be completed sometime the day it was signed.

The method of informing the inspector that the work was ready to be inspected also varied. Sometimes the foreman would call the inspector and tell him that an inspection could be made; other times the general foreman might call. At other times the inspector was expected to come by the table where the pour cards are laid out and get one for inspection. Even if the signoff signifies work completion, the inspector didn't know when to go out and pick up the card if he wasn't called. The work could be done for hours before he decided to check the cards. This third method of notification was fine if the signoff means the work has been completed; but if the signoff only means that the work may be completed that day, then there was a good likelihood that without further investigation or calls the work would not be ready for inspection. If the inspector elected to inspect the work and the work was not completed, then the inspector faced the dilemma of whether or not to write a QCIR. Of interest here is the fact that there was a coordination meeting every morning before the normal day shift begins to review pour cards for that day. This meeting should finalize what inspections would take place during the coming day.

2. Quality Control Investigation Report

A QCIR theoretically can be issued anytime anything is even questionable. If the inspector goes to the identified work area and the work is not completed or if work

is not satisfactorily performed, a QCIR may be issued. At one point the inspectors were instructed by their supervisor to write a QCIR whenever the work was not completed. Some inspectors were lenient and allowed the crafts a second chance before writing the QCIR. This is a version of the generally accepted practice in CONST which is usually referred to as the "give back" system. Sometimes the crafts even ask the inspectors how the work is to be performed. Of course, if the inspector tells the crafts how to do their work, the objectivity of an independent inspection is then lost. On the other hand, if the inspector does not help the craft, there is the complaint that the inspectors are uncooperative.

Recently, strict verbal orders were issued from inspection management that a QCIR must be written for each item of uncompleted work. The crafts disagreed with this and protested to inspection and craft management. Inspection management decided the crafts were right and rescinded the order. The change in the order was issued verbally, and apparently the crafts received the message before the inspectors. At this point, crafts and inspectors were operating according to different rules, all of which were verbally communicated. At the time of the investigation, the inspectors were functioning under the concept that QCIRs were written when it was discovered that work was not completed or was not satisfactorily performed.

3. Work Control and Schedule

There is almost always some degree of pressure to increase productivity--measured in yards of concrete poured, feet of conduit installed, number of welds performed, feet of cable pulled, etc. The crafts usually feel the pressure to perform the activity. The craft performance requirements cannot always be satisfied. NSRS reviews have indicated that the crafts sometimes turn in work as complete with the knowledge that it has not actually been performed in its entirety. Thus, the QC group becomes the holdup. When deficiencies are identified and written up by QC, they can be corrected as rework although the original required work was never actually completed. While this practice was not identified in the two specific incidents evaluated, the procedures provide very little direction to prevent such actions. The inspectors had the perception that quantity took preference over quality in some cases.

IV. ANALYSIS

The allegation that a general foreman became irritated because of the rejection of concrete pour form preparations and publicly blamed

the rejection on the untimely action of the inspector appears valid. The foreman evidently believed that he had performed his work well and there was no data to indicate that he had not. Circumstances beyond his control had altered the pour forms between the time of completion and inspection. The foreman was under pressure to meet the production schedule, and it is not surprising that he was disappointed that the work was rejected. It is, of course, desirable to solve problems in a controlled and agreeable manner. A certain amount of loud and gruff language is generally accepted at any construction site; however, the incident cited appears to have exceeded that acceptable limit.

The verbal outburst by the general foreman against the inspector appears to be more because the inspector did not inspect when the foreman thought he should than intimidation to get the inspector to sign off on work that was unsatisfactory. There did not appear to be a disagreement between the foreman and inspector about the position that the forms were unsatisfactory.

The exact time that the inspector became aware the concrete pour forms were ready for inspection could not be determined. However, the foreman said that one of them had been alright when he checked it in the afternoon of the day it was completed. This would put the time of completion sometime after 12 noon. The inspection was made at 2:30 p.m. Therefore, the maximum time appears to have been 2-1/2 hours and it could have been much less. Considering that the inspector had other work to perform and the inconsistent and ineffective inspector notification system, even the 2-1/2 hour maximum time does not constitute untimeliness by the inspector. Thus, there was no valid basis for the general foreman to either privately or publicly accuse the inspector of being lazy or of making untimely inspections. The pour forms were completed, but not adequately protected, and were rejected. The system worked as it should have to prevent a concrete pour when the concrete forms were not adequate.

The root cause of the problem appears to be inadequate procedures for control of work. The use of the concrete pour card, identified in attachment A to Quality Control Procedure BNP-QCP-5.3, "Concrete Placement," has not been sufficiently described. Confusion is created by the lack of consistent understanding of when a QCIR is to be issued. Failure to protect work after completion also indicates inadequate procedural control. Ambiguous and inconsistent use of the concrete pour card and QCIRs and inadequate protection of completed work, coupled with schedule pressure, were the primary contributors to the specific incident identified by the concerned employee. An additional root cause is the lack of adequate interfacing communication between management of the QC units and the crafts. If craft management has a problem with QC inspectors, these problems should be directed to QC management.

V. CONCLUSIONS

A verbal outburst by a member of craft management occurred on February 7, 1983, in which an inspector was accused of being lazy

and for failure to inspect work on a timely basis. The accusation was made in the presence of several other craft personnel. Accusations against QC inspectors by the crafts, in particular craft management, either privately or publicly can be construed as a form of intimidation whether intended or not. Consequently, it should be controlled by management. There was no information in the investigation to support the contention that the intimidation was for the purpose of providing undue pressure on QC inspectors at Bellefonte to accept work that is unacceptable. The instances cited in the employee concern are valid examples of poor working relationships between the crafts and inspection, inadequate control of organizational units, and poor communication. The primary reason for the deterioration in working relations appears to be the lack of concise written instructions to define the responsibilities of each group involved in work activities that require close coordination and cooperation. This basic conclusion is supported by the following conditions.

- A. The use of the concrete pour card, especially the significance of the foreman's signature, is not clear. This contributes to confusion and misunderstanding between the crafts and inspectors.
- B. The QCIR is not used in a consistent manner. Consequently, conditions under which it will be implemented are not always understood by the crafts or inspectors.
- C. The method of informing the QC inspectors that work is complete and ready for inspection is inconsistent among craft management personnel.

VI. JUDGMENT OF NEEDS

- A. The meaning of the foreman's signature on the pour card should be defined in BNP-QCP-5.3. The reason for the signature should be clearly explained so that the crafts and the inspectors can both understand it with minimum latitude for different interpretations.
- B. The proper use of QCIRs by QC inspectors should be clearly defined in writing and consistently implemented by QC personnel.
- C. The method of informing QC inspectors that work is ready for inspection should be standardized and documented for all craft management.

VII. REFERENCES

- A. Quality Control Procedure BNP-QCP-5.3 R3, "Concrete Placement"
- B. Quality Control Procedure BNP-QCP-3.1 R4, "Embedded Conduit and Ground"

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

GNS 33 0303 050

TO : H. J. Green, Director of Nuclear Power, 1750 CST2-C

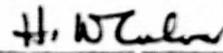
FROM : H. N. Culver, Director of Nuclear Safety Review Staff, 249A HBB-K

DATE : March 3, 1983

SUBJECT: WATTS BAR NUCLEAR PLANT - FOLLOW UP ON OPEN ITEMS - NUCLEAR SAFETY REVIEW
STAFF REPORT R-83-07-WBN

Attached is the NSRS report of a follow up on open items at WBN. The items had been reported over the last two years. The review for this report was conducted through a document search and by telephone conversations with appropriate personnel. Five open items have been closed in this report.

If you have any questions regarding this report, please contact R. W. Travis at extension 4814-K.


H. N. Culver

RWT:LML
Attachment
cc (Attachment):
G. F. Dilworth, E12D46 C-K
MEDS, W5B63 C-K

NSRS FILE



TENNESSEE VALLEY AUTHORITY
NUCLEAR SAFETY REVIEW STAFF

ROUTINE REVIEW

NSRS REPORT NO. R-83-07-WBN

SUBJECT: WATTS BAR NUCLEAR PLANT - FOLLOW-UP ON OPEN ITEMS
FROM PREVIOUS REPORTS R-81-03-WBN AND R-81-16-WBN

DATE OF
REVIEW: FEBRUARY 7-11, 1983

REVIEWER:

Ronald W. Travis
RONALD W. TRAVIS

3/1/83
DATE

APPROVED BY:

K. W. Whitt
KERMIT W. WHITT

3/1/83
DATE

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I. SCOPE

This review examined five NSRS open items that had been reported at Watts Bar Nuclear Plant. No plantsite visit was made for this review. It was conducted through a document search in the NSRS files and by telephone conversations. The items closed were from NSRS reports R-81-03-WBN and R-81-16-WBN.

II. BACKGROUND

NSRS report No. R-81-03-WBN was written as a first step in the NSRS operational preparedness review sequence. The schedule had at that time indicated that fuel would be loaded in approximately one year. If that schedule were correct, NSRS was concerned that certain basic items, such as organizations and procedures, should have been in place. Of course, as time advanced, it became apparent that fuel would not be loaded at the prescribed date thus making some concerns less urgent.

NSRS was evaluating the plant's ability to operate safely and attempting to do this in a time frame that would support the construction and operational schedules. This evaluation, as it turned out, was probably conducted about two years too early. Consequently, many of the actions incomplete at that time have now been appropriately accomplished.

III. STATUS OF ITEMS REVIEWED

A. R-81-03-WBN-01, Inaccurate Plant Staffing Representation

The FSAR has been revised to reflect the approved plant organization. Figures 13.1-6 and 16.6.2-2 have been deleted. Technical Specifications have not been issued. DPM 74A20 has been cancelled. DPM N82A12 was issued to reference the Personnel Administration Program which has the approved organizational structure. This item is closed.

B. R-81-03-WBN-02, Revision of Station Documents to Correspond with Current Organizational Structure

Part III, section 6.1, of the OQAM has been revised to reflect the NSRS recommendations. This item is closed.

C. R-81-03-WBN-03, Revision of Station Qualification Criteria for Assistant Superintendent

FSAR section 13.1.3.2.1 and OQAM section 1.4.2.2 have been revised to meet the requirements of ANSI N18.1-1971. The FSAR and OQAM are now in agreement for positions at WBN. This item is closed.

D. R-81-03-WBN-05, Completion of Station Procedures Required for Operation and Testing

The surveillance tests required for plant operation have been written and issued. This item is closed.

E. R-81-16-WBN-03, Test Record Information

Responsibility for this concern should have been assigned to the Division of Construction (CONST). This item is closed for the Division of Nuclear Power (NUC PR).

IV. DETAILS

A. R-81-03-WBN-01, Inaccurate Plant Staffing Representation

During the original review it was found that there were major differences between the FSAR organizational chart and description and the DPM 74A20 organizational chart. There was no written organizational structure which described the organization actually in place.

NSRS reviewed the FSAR with amendment 46. The FSAR had been revised to reflect the approved plant organization structure. Figures 13.1-6 and 16.6.2-2 were deleted from the FSAR. Since the Technical Specifications had not been issued for the plant, that document could not be reviewed. DPM 74A20 had been deleted and DPM N82A12 has been issued to replace it. DPM N82A12 only references the Division Procedure Manual. A review of this manual was conducted and the organization chart was in agreement with other documents and generally in agreement with the actual plant structure.

It is understood by NSRS that WBN will not fill the third plant assistant superintendent's position. According to plant management, revisions to required documents are being drafted to reflect the changes brought on by this decision.

B. R-81-03-WBN-02, Revision of Station Documents to Correspond with Current Organization Structures

The OQAM was originally incorrect in its representation of the plant organization structure. The OQAM, revised September 21, 1982, was reviewed for this report. Part III, section 6.1, of the manual is now correct in its job descriptions and responsibilities and organizational structure.

C. R-81-03-WBN-03, Revision of Station Qualification Criteria for Assistant Superintendent

The FSAR and OQAM originally required only eight years applicable experience for the assistant plant superintendent. The FSAR, with amendment 46, section 13.1.3.1.2, has been revised to require ten years of applicable experience. Also, the OQAM revised September 21, 1982, had made this change. Both are now in agreement with ANSI N18.1-1971.

D. R-81-03-WBN-05, Completion of Station Procedures Required for Operation and Testing

In the original review it was determined that procedures for Containment Leak-Rate Tests and Containment Local Detection Tests had not been written. Since that time, five surveillance tests have been written and approved for the leak-rate and leak detection tests. The following procedures were reviewed:

1. SI-6.1, "Airlock Operability," R1
2. SI-6.2, "Overall Airlock Leakage," R2
3. SI-6.31, "Testable Penetrations," R0
4. SI-6.33, "Primary Containment Isolation Valves Leak Rate," R0
5. SI-6.34, "Primary Containment Leak Rate Test," R0

These instructions were not reviewed for technical adequacy but only for general format and subject matter. In this respect, the instructions effectively addressed the NSRS concerns.

E. R-81-16-WBN-03, Test Record Information

In observing the conduct of Preoperation Test, 10.7B, Containment Spray System, an error was noticed in the revision level of a test record drawing. There was a disagreement between drawing revision level and the listing of incomplete ECNs in the test prerequisites. In a telephone conversation between K. W. Whitt of this staff and an individual in NUC PR, it was decided that this was a CONST problem and should not be an open item against NUC PR. Therefore, NUC PR should remove this item from their tracking system.

V. PERSONNEL CONTACTED

W. Byrd, WBN Compliance Section Supervisor (telephone)

VI. DOCUMENTS REVIEWED

- A. Watts Bar Nuclear Plant, "Final Safety Analysis Report," Amendment 46
- B. Watts Bar Nuclear Plant, "Operational Quality Assurance Manual," revised September 21, 1982
- C. Division Procedure Manual - "Nuclear Plant Organization and Staffing," DPM N74A20, cancelled August 6, 1982
- D. Division Procedure Manual, "Personnel Administration Program," DPM N82A12, revised September 2, 1982
- E. Surveillance Instruction, SI-6.1, "Airlock Operability," R1

- F. Surveillance Instruction, SI-6.2, "Overall Airlock Leakage," R2
- G. Surveillance Instruction, SI-6.31, "Testable Penetrations," R0
- H. Surveillance Instruction, SI-6.33, "Primary Containment Isolation Valves Leak Rate," R0
- I. Surveillance Instruction, SI-6.34, "Primary Containment Integrated Leak Rate Test," R0

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

GNS 830315 050

TO : ██████████ Bellefonte Nuclear Plant, CONST

FROM : H. N. Culver, Director of Nuclear Safety Review Staff, 249A HBB-K

DATE : March 14, 1983

SUBJECT: BELLEFONTE NUCLEAR PLANT - EMPLOYEE CONCERN REGARDING CABLE TERMINATIONS ON SOLENOID VALVES - NUCLEAR SAFETY REVIEW STAFF REPORT NO. I-83-10-BLN

The Nuclear Safety Review Staff (NSRS) has examined the concern you raised regarding cable terminations on solenoid valves. Our findings are contained in the attached report.

Your interest in nuclear safety, as indicated by your concern, is appreciated. As indicated in our report, we have concluded that your concern has merit. We will follow EN DES actions in response to our recommendations as a result of this investigation.

If you have questions concerning this report, please contact J. D. Smith at extension 6590 in Knoxville.

H. N. Culver
H. N. Culver

JDS:LML

Attachment

cc: W. F. Willis, E12B16 C-K (Attachment)

NSRS FILE

~~ADMIN.~~~~CONFIDENTIAL~~

TENNESSEE VALLEY AUTHORITY

NUCLEAR SAFETY REVIEW STAFF

INVESTIGATION

NSRS REPORT NO. I-83-10-BLN

SUBJECT: INVESTIGATION OF EMPLOYEE CONCERN REGARDING CABLE
TERMINATION ON SOLENOID VALVES

DATE OF
INVESTIGATION: MARCH 7, 1983

INVESTIGATOR:

Jerry D. Smith
JERRY D. SMITH

3-11-83
DATE

REVIEWED BY:

W. C. Burke
W. C. BURKE

3/11/83
DATE

APPROVED BY:

K. W. Whitt
KERMIT W. WHITT

3/11/83
DATE

ADMIN.
CONFIDENTIAL

I. SCOPE

The investigation was performed to evaluate a concern relating to the Bellefonte Nuclear Plant (BLN) regarding cable termination on solenoid valves. This concern had been identified to the Nuclear Safety Review Staff (NSRS) by an employee of the Division of Construction (CONST) at BLN.

II. BACKGROUND

In November 1982, an engineer in the Electrical Engineering Unit at BLN expressed a concern regarding the method used in terminating cables on solenoid valves. The concern is outlined as follows:

At the interface point between the plant's flexible conduit and solenoid valves on various valves, a conduit is used as a "splice box." This appears to be an effective method to perform the splicing operation, but the weight of the conduit on the solenoid cover, and in some cases the solenoid valves proper, is excessive and is causing distortion and deflection of the components. When the systems involved are operable, system induced vibrations will cause failures which will affect safety and availability since this installation technique has been used on both safety class and nonsafety class systems.

NSRS made a site visit to ascertain the degree and scope of the problem and took Polaroid pictures of some typical installations. Pictures were taken of IVE-1FSV-008, IKE-1FSV-188, OVF-1FSV-216, and INV-VEAB-385. The conduit to solenoid valve situation also exists on valves INV-1FSV-239, -250, -251, -269, -271, -289, -291, -321, -339, and -340; all of which are safety class valves.

III. CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions

1. There are many solenoid valves at BLN, as presently installed, that will not survive a seismic event or even normal system-induced vibrations. The problem exists on both safety class and nonsafety class systems.
2. Electrical Standard Drawing SD-E12.5.7-1 as revised by FCR E2775 does not contain enough guidance to ensure a proper installation. The judgment call as to whether a quality-related component is properly supported should be a design controlled judgment not a production controlled judgment. This problem has surfaced in different forms since 1979, but apparently not to a degree sufficient to trigger action by line management.

B. Recommendations

R-83-10-ELN-1 - Improve the General Specification G-40 significantly and generate specific standard installation guidance

(Standard Drawings) so that prior to installation the method used will be one that is EN DES approved.

R-83-10-BLN-2 - In accordance with 1. above, reinspect and rework any previous installations that don't meet the EN DES standard installation guidance.

R-83-10-BLN-3 - Prohibit the use of condulets on solenoid valves that have sheetmetal covers.

R-83-10-BLN-4 - As part of 2. above, verify that safety class installations still meet seismic requirements.

IV. DETAILS

The following paragraphs contain a discussion of the NSRS findings based on the review of related documents and discussions with individuals in BLN CONST, BLP Design Project, and the Electrical Engineering Branch.

General Construction Specification G-40, "Specification for Installing Electrical Conduit Systems and Conduit Boxes," was reviewed to determine the general guidance for this type of installation. Specification G-40 at 3.2.6.1 states, in part:

Unless otherwise noted on design drawing, flexible conduit shall be used to interface the rigid conduit system with electric equipment and components that rotate, vibrate, are subject to thermal movement, or where seismic considerations must be taken into account. It shall be used for connecting flush and recessed lighting fixtures to rigid conduit systems when so indicated on design drawings.

The caveat concerning details on design drawings excepted, this specification precludes use of intervening components.

To determine the exceptions allowed to the G-40 General Specification, and to obtain background on the subject, discussions were held with C. L. Butler, Supervisor, Equipment Conduit and Grounding Section, and section staff members C. E. Rochat and T. G. Hughes, Jr. Polaroid pictures of the condulet and installation on valves IVE-1FSV-008, IKT-1FSV-188, OVF-1FSV-216, and INV-VEAB-385 were discussed. Though not a new and unique problem, NSRS is of the opinion that the project was not totally aware of its magnitude. Design Information Requests (DIRs) had been generated at the construction site addressing the conduit to solenoid valve interface. DIR E-049 prepared on October 8, 1979, requested moving the splice boxes (tees and condulets) to the rigid conduit from their original position on the solenoid valves or limit switches. DIR I-024 prepared on February 16, 1981, requested

(and received) clarification for the situations where it is permissible to attach condulets to solenoid valves for use as "splice boxes" and where it is permissible to splice within a "conduit body." In addition to this background information on the subject, the project had some Polaroid pictures of problem conduit to solenoid valve installation where the weight of the condulets were collapsing the solenoid valve covers.

During the same time frame the field submitted FCR E2775 dated December 19, 1982. This FCR requested (and was approved) to add the following note to Electrical Standard Drawing SDE12.5.7-1 R1, "CA Termination of 600V (or less) Insulated CA to Eqpt Furnished w/Pigtail":

When terminating 120-volt equipment, one of the following options may be exercised if there is insufficient room to accommodate bolted connections using the in-line method or one of the options permitted by note 11.

Option 1 - When practical, the design project may be requested to provide a termination box large enough to accommodate bolted connections.

Option 2 - Except where the conduit must be sealed at the equipment, the pigtails may be extended outside the termination compartment or equipment housing and bolted connections made in a conduit body (such as a condulet) located directly adjacent to the equipment.

Option 3 - The bolted connections may be made in a conduit body (such as a condulet) located between the rigid conduit and the flexible conduit connecting to the equipment.

To exercise this option, a butt splice connector shall be used to splice on conductors extending the pigtails to the conduit body. The pigtail extension shall be made using the same type cable as the incoming field cable. The splice shall be insulated in accordance with SD-E12.5.6. It is acceptable for this splice to be pulled out of the termination compartment or equipment housing and back into the flexible conduit.

As part of our follow-up on the employee concern, discussions were held with Ralph Swallows who is the EEB cognizant engineer for the standard drawing this FCR changes. The Polaroid pictures showing the questionable installation at BLN were also discussed. Mr. Swallows

agreed that some additional guidance is needed in Option 2 of the FCR and indicated that an additional sentence should be added to caution the field to provide proper support of a conduit when one is used at a solenoid valve. NSRS believes additional guidance is required as listed in the conclusions of this report.

V. PERSONS CONTACTED

- C. Butler, BLN Design Project, Supervisor, Equipment Conduit and Grounding Section
- C. E. Rochat, BLN Design Project, Electrical Engineer
- T. G. Hughes, Jr., BLN Design Project, Electrical Engineer
- R. L. Swallows, Electrical Engineering Branch, Electrical Engineer
- S. P. Hornbaker, Electrical Engineering Branch, Electrical Engineer



VI. DOCUMENTS REVIEWED

- A. Electrical Standard Drawing SD-E12.5.7-1
- B. General Construction Specification G-40, "Specification for Installing Electrical Conduit System and Conduit Boxes"
- C. DIR E-049 dated October 8, 1979
- D. DIR I-026 dated February 16, 1981
- E. FCR E2775 dated December 29, 1982

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

TO : G. H. Kimmons, Manager of Engineering Design and Construction, W12A9 C-K

FROM : H. N. Culver, Director of Nuclear Safety Review Staff, 249A HBB-K

DATE : March 18, 1983

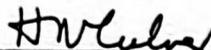
SUBJECT: FOLLOWUP REPORT R-83-11-BLN TO INVESTIGATION OF ALLEGED IMPROPER TERMINATION OF SERVICES OF A PERSONAL SERVICES CONTRACT EMPLOYEE (NSRS REPORT R-82-16-BLN)

Reference: Your memorandum to me dated September 24, 1982 (OEDC response to findings of NSRS Report R-82-16-BLN)

Attached is the followup report of verification of completion of corrective action taken as a result of the referenced memorandum. The followup was performed March 8-11, 1983.

Of the six findings identified in NSRS report R-82-16-BLN, five have been verified to have been satisfactorily corrected and are closed. Finding R-82-16-BLN-04, Lack of Supervisory Training for Group Leaders, remains open. The recommended training has not been fully accomplished, although one phase--Indoctrination into TVA Code II, Expression of Staff Views--has been completed. NSRS understands from conversation with the Assistant to the Manager of Construction that a pilot supervisory training program for group leaders will be implemented in the near future. It is requested that a revised response to R-82-16-BLN-04 be submitted to this office by April 20, 1983 for evaluation.

If you have any questions, please call M. A. Harrison at extension 4816.


H. N. Culver

Attachment

MAH:KRW

cc (Attachment):

G. F. Dilworth, E12D46 C-K

H. S. Sanger, Jr., E11B33 C-K

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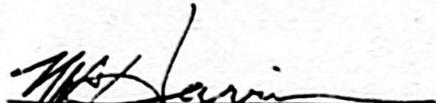
TENNESSEE VALLEY AUTHORITY
NUCLEAR SAFETY REVIEW STAFF

NSRS REPORT R-83-11-BLN

Subject: Investigation of Alleged Improper Termination of Services
of a Personal Services Contract Employee - Followup to
Report R-82-16-BLN

Dates of
Investigation: March 8-11, 1983

Investigator:


M. A. Harrison

3/18/83
Date

Approved by:


K. W. Whitt

3/18/83
Date

ADMIN.
CONFIDENTIAL

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I. SCOPE

This review examined corrective action initiated at Bellefonte Nuclear Plant and the Office of Engineering Design and Construction in Knoxville in response to the Nuclear Safety Review Staff (NSRS) Investigation Report R-82-16-BLN, Investigation into Alleged Improper Termination of a Personal Services Contract Employee. NSRS concluded in R-82-16-BLN that the termination of services of the contract employee did not violate the Energy Reorganization Act, as amended. However, as a result of the investigation, NSRS identified six findings associated with the termination of the contract employee. G. H. Kimmons' memorandum to H. N. Culver, dated September 24, 1982, responded to these findings; and the proposed corrective action was determined by NSRS to be appropriate and responsive. On March 8-11, 1983, an NSRS investigator performed a followup to verify that corrective action had been taken effectively.

II. CONCLUSIONS

A total of six items were examined during this review. Of those items, five were determined to be satisfactorily resolved and are closed in this report. One item, R-82-16-BLN-04, Lack of Supervisory Training for Group Leaders, is still open since corrective action has not been completed.

III. STATUS OF PREVIOUSLY IDENTIFIED ITEMS

A. R-82-16-BLN-01, Lack of Documentation of Document Review Effort

The scope and results of this effort have been verified as satisfactorily documented. This item is closed.

B. R-82-16-BLN-02, Inconsistent Administration of Contract Employee

An OEDC policy memorandum standardizes administration of contract employees. This item is closed.

C. R-82-16-BLN-03, Potential for Bias in Investigating Employee Concerns

Revision 1 to BNP-QCP-10.3E issued January 3, 1983 establishes a requirement for independent conduct of investigations. This item is closed.

D. R-82-16-BLN-04, Lack of Supervisory Training for Group Leaders

With the exception of a presentation on TVA Code II, Expression of Staff Views, group leaders have not received training in general supervisory practices, authorities, and responsibilities. This item remains open, and revised response from the Division of Construction is requested (see paragraph IV.D for details.)

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- E. R-82-16-BLN-05, Lack of Awareness of TVA Code II, Expression of Staff Views

Formal training sessions on this subject were conducted on March 8 and 9, 1983 at BLN for group leaders. Additional presentations are planned. This item is closed.

- F. R-82-16-BLN-06, Need for Independent Investigation and Documentation of Significant Matters

Significant or controversial situations such as potential violations of Severity Level I, II, or III will be investigated by the Nuclear Safety Review Staff, unless otherwise directed by the General Manager's office. This item is closed.

IV. DETAILS

The following paragraphs describe the NSRS findings from R-82-16-BLN and the associated corrective actions taken to resolve the findings.

- A. R-82-16-BLN-01, Lack of Documentation of Document Review Effort

QCIR 12486 required review of all QCIRs written by MEU in 1981. NSRS was unable to substantiate during the investigation that results of the review were adequately documented.

To resolve this finding, the disposition to QCIR 12486 was revised on August 11, 1982 to describe the scope of the review effort as well as the results. NSRS has reviewed the revised QCIR and has no additional questions. This item is closed.

- B. R-82-16-BLN-02, Inconsistent Administration of Contract Employees

During the investigation many inconsistencies in the administrative handling of contract employees, especially in the details by which their services are terminated, were revealed.

The Manager of Engineering Design and Construction has issued a procedural memorandum dated September 22, 1982 (EDC 820924 010) concerning contract employees' removal from TVA assignments. NSRS has reviewed these guidelines and has no additional questions. This item is closed.

- C. R-82-16-BLN-03, Potential for Bias in Investigating Employee Concerns

NSRS found that employee concerns/differing opinions were being investigated at the site by the unit most involved with the concern in accordance with BLNP-QCP-10.35, Employee Concerns and Differing Opinions.

BLNP-QCP-10.35, revision 1, was issued January 3, 1983 to provide for independent evaluation of an employee concern. It

now requires that the site Construction Quality Manager investigate, or as an alternative the site Quality Assurance Unit. NSRS has no further questions regarding this finding. This item is closed.

D. R-82-16-BLN-04, Lack of Supervisory Training for Group Leaders

Personnel interviews had revealed a lack of supervisory training for group leaders.

The response to this item (reference VI.B) indicated that because of the existence of an organization manual defining responsibilities, the Construction Management Program-Nuclear (CMP-N), and the 1982 Quality Improvement Action Plan, additional formal training would not be necessary. Subsequent conversation and contact with an Assistant to the Manager, Construction, established that supervisory training programs for group leaders were provided for and required by the CMP-N. As of March 11, 1983, the CMP-N had not been issued and training programs had not been implemented; nor had a "replacement" or temporary program been implemented. One subject, "TVA Code II, Expression of Staff Views," was presented to group leaders on March 8 and 9, 1983 and partially resolves this concern. This item remains open pending development and implementation of a training program for group leaders addressing general supervisory practices and authorities and responsibilities of supervisors.

E. R-82-16-BIN-05, Lack of Awareness of TVA Code II, Expression of Staff Views

During the initial investigation, NSRS investigators determined a lack of awareness of the intent, use, and/or existence of TVA Code II, Expression of Staff Views, on the part of some individuals interviewed, including some in a supervisory capacity.

The Division of Construction has prepared a training plan on TVA Code II, Expression of Staff Views. This training was presented at BLN to approximately 100 M- and S-scale personnel on March 8 and 9, 1983. An NSRS investigator observed two presentations of the training which were videotaped by site personnel. They appeared to be effective and well received. In conversation with the Assistant to the Manager of Construction, he stated that additional presentations of the session would be made, possibly with the videotape supplemented by an instructor to answer questions.

Selected unit training records were reviewed to determine if personnel were receiving training in BNP QCP-10.28, Handling Allegations, and BNP QCP-10.35, Employee Concerns and Differing Opinions. No problems were identified. This item is closed.

F. R-82-16-BLN-06, Need for Independent Investigation and Documentation of Significant Matters

The response to this item (reference VI.B) agreed that independent investigation was necessary and that a coordinated investigation policy among NSRS, OGM, OGC, and OQA would be developed by December 31, 1982. This policy has not been developed. NSRS has determined that this office will investigate potential violations of Severity Level I, II, or III (NRC classifications) unless otherwise directed by the Office of the General Manager or TVA Board of Directors. This item is closed.

V. LIST OF PERSONS CONTACTED

- L. Cox, Bellefonte Project Manager
- R. Thomas, Bellefonte Quality Manager
- J. Walker, Assistant Bellefonte Quality Manager
- B. Fischer, Supervisor, QC&RU
- R. Yost, Supervisor, Construction Training Office
- P. Mann, Supervisor, Bellefonte NLS

Ten Selected Group Leaders, SC and SE Scales

- A. Kelley, Assistant to the Manager of Construction
- E. Beasley, Assistant to the Manager of Engineering Design and Construction

VI. REFERENCES

- A. NSRS Investigation Report R-82-16-BLN, Investigation of Alleged Improper Termination of Services of a Personal Services Contract Employee (Memorandum from H. N. Culver to G. H. Kimmons dated August 19, 1982)
- B. Memorandum from G. H. Kimmons to H. N. Culver dated September 24, 1982, same subject as item A (Response)
- C. Memorandum from H. N. Culver to G. H. Kimmons dated September 24, 1982, same subject as item A (Comments on Response)
- D. Construction Management Program-Nuclear (CMP-N) - Revision Q Draft
- E. Construction QAB activity transition plan of February 17, 1983
- F. TVA Code II, Expression of Staff Views
- G. BLN Procedures
 - 1. BNP-QCP-10.28, Handling Allegations
 - 2. BNP-QCP-10.35, Revision 1, Employee Concerns and Differing Opinions

- H. BNP Employee Concern and Differing Opinion Log and File of Reports
- I. BNP Allegation Report File and Log
- J. Lesson Plan for "Guidelines for Expressing Health and Safety Concerns" and videotape of same produced March 9, 1983