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**EMPLOYEE  
CONCERNS  
SPECIAL PROGRAM**

**VOLUME 4  
MATERIAL CONTROL CATEGORY**

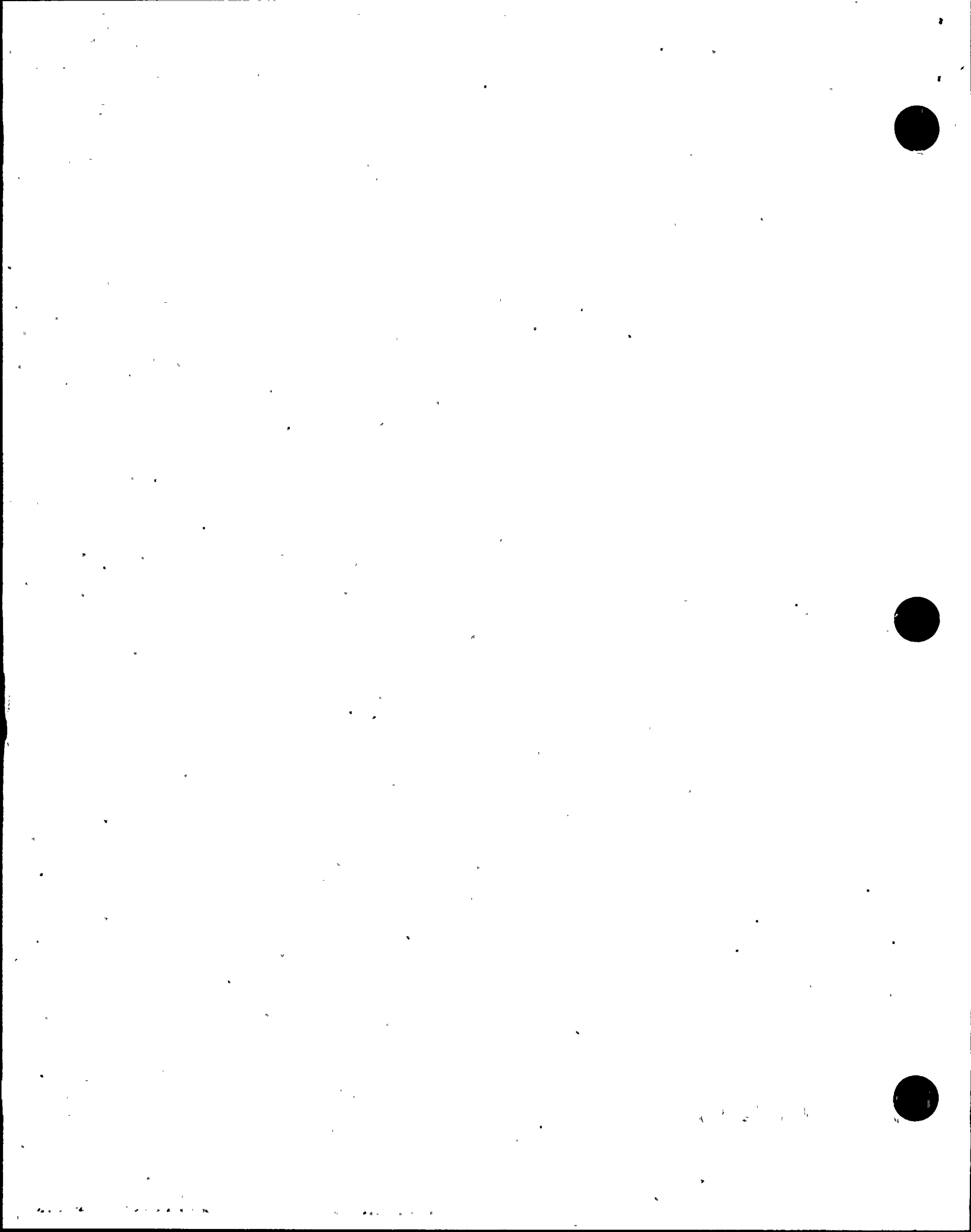
**SUBCATEGORY REPORT 40600  
QUALITY OF MATERIAL**

**UPDATED**

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**TVA  
NUCLEAR POWER**

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TVA EMPLOYEE CONCERNS  
SPECIAL PROGRAM

REPORT NUMBER: 40600

REPORT TYPE: Subcategory - Material Control (MC)

REVISION NUMBER: 2

|R2

TITLE: Quality of Material

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REASON FOR REVISION:

To incorporate Technical Assistance Staff (TAS) comments

|R1

To incorporate Senior Review Panel (SRP) comments

|R2

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MANAGER OF NUCLEAR POWER DATE  
CONCURRENCE (FINAL REPORT ONLY)

\*SRP Secretary's signature denotes SRP concurrences are in files.



Preface, Glossary, and List of Acronyms  
for ECTIG Subcategory Reports

HISTORY OF REVISION

REV NUMBER	PAGES REVISED	REASON FOR CURRENT REVISION
3	i	To clarify that one or more attachments will help the reader find where a particular concern is evaluated



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Preface

This subcategory report is one of a series of reports prepared for the Employee Concerns Special Program (ECSP) of the Tennessee Valley Authority (TVA). The ECSP and the organization which carried out the program, the Employee Concerns Task Group (ECTG), were established by TVA's Manager of Nuclear Power to evaluate and report on those Office of Nuclear Power (ONP) employee concerns filed before February 1, 1986. Concerns filed after that date are handled by the ongoing ONP Employee Concerns Program (ECP).

The ECSP addressed over 5800 employee concerns. Each of the concerns was a formal, written description of a circumstance or circumstances that an employee thought was unsafe, unjust, inefficient, or inappropriate. The mission of the Employee Concerns Special Program was to thoroughly investigate all issues presented in the concerns and to report the results of those investigations in a form accessible to ONP employees, the NRC, and the general public. The results of these investigations are communicated by four levels of ECSP reports: element, subcategory, category, and final.

Element reports, the lowest reporting level, will be published only for those concerns directly affecting the restart of Sequoyah Nuclear Plant's reactor unit 2. An element consists of one or more closely related issues. An issue is a potential problem identified by ECTG during the evaluation process as having been raised in one or more concerns. For efficient handling, what appeared to be similar concerns were grouped into elements early in the program, but issue definitions emerged from the evaluation process itself. Consequently, some elements did include only one issue, but often the ECTG evaluation found more than one issue per element.

Subcategory reports summarize the evaluation of a number of elements. However, the subcategory report does more than collect element level evaluations. The subcategory level overview of element findings leads to an integration of information that cannot take place at the element level. This integration of information reveals the extent to which problems overlap more than one element and will therefore require corrective action for underlying causes not fully apparent at the element level.

To make the subcategory reports easier to understand, three items have been placed at the front of each report: a preface, a glossary of the terminology unique to ECSP reports, and a list of acronyms.

Additionally, at the end of each subcategory report will be a Subcategory Summary Table that includes the concern numbers; identifies other subcategories that share a concern; designates nuclear safety-related, safety significant, or non-safety related concerns; designates generic applicability; and briefly states each concern.

Either the Subcategory Summary Table or another attachment or a combination of the two will enable the reader to find the report section or sections in which the issue raised by the concern is evaluated.

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The subcategories are themselves summarized in a series of eight category reports. Each category report reviews the major findings and collective significance of the subcategory reports in one of the following areas:

- management and personnel relations
- industrial safety
- construction
- material control
- operations
- quality assurance/quality control
- welding
- engineering

A separate report on employee concerns dealing with specific contentions of intimidation, harassment, and wrongdoing will be released by the TVA Office of the Inspector General.

Just as the subcategory reports integrate the information collected at the element level, the category reports integrate the information assembled in all the subcategory reports within the category, addressing particularly the underlying causes of those problems that run across more than one subcategory.

A final report will integrate and assess the information collected by all of the lower level reports prepared for the ECSP, including the Inspector General's report.

For more detail on the methods by which ECTG employee concerns were evaluated and reported, consult the Tennessee Valley Authority Employee Concerns Task Group Program Manual. The Manual spells out the program's objectives, scope, organization, and responsibilities. It also specifies the procedures that were followed in the investigation, reporting, and closeout of the issues raised by employee concerns.



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ECSP GLOSSARY OF REPORT TERMS\*

classification of evaluated issues the evaluation of an issue leads to one of the following determinations:

- Class A: Issue cannot be verified as factual
- Class B: Issue is factually accurate, but what is described is not a problem (i.e., not a condition requiring corrective action)
- Class C: Issue is factual and identifies a problem, but corrective action for the problem was initiated before the evaluation of the issue was undertaken
- Class D: Issue is factual and presents a problem for which corrective action has been, or is being, taken as a result of an evaluation
- Class E: A problem, requiring corrective action, which was not identified by an employee concern, but was revealed during the ECTG evaluation of an issue raised by an employee concern.

collective significance an analysis which determines the importance and consequences of the findings in a particular ECSP report by putting those findings in the proper perspective.

concern (see "employee concern")

corrective action steps taken to fix specific deficiencies or discrepancies revealed by a negative finding and, when necessary, to correct causes in order to prevent recurrence.

criterion (plural: criteria) a basis for defining a performance, behavior, or quality which ONP imposes on itself (see also "requirement").

element or element report an optional level of ECSP report, below the subcategory level, that deals with one or more issues.

employee concern a formal, written description of a circumstance or circumstances that an employee thinks unsafe, unjust, inefficient or inappropriate; usually documented on a K-form or a form equivalent to the K-form.

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evaluator(s) the individual(s) assigned the responsibility to assess a specific grouping of employee concerns.

findings includes both statements of fact and the judgments made about those facts during the evaluation process; negative findings require corrective action.

issue a potential problem, as interpreted by the ECTG during the evaluation process, raised in one or more concerns.

K-form (see "employee concern")

requirement a standard of performance, behavior, or quality on which an evaluation judgment or decision may be based.

root cause the underlying reason for a problem.

\*Terms essential to the program but which require detailed definition have been defined in the ECTG Procedure Manual (e.g., generic, specific, nuclear safety-related, unreviewed safety-significant question).

Acronyms

AI	Administrative Instruction
AISC	American Institute of Steel Construction
ALARA	As Low As Reasonably Achievable
ANS	American Nuclear Society
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWS	American Welding Society
BFN	Browns Ferry Nuclear Plant
BLN	Bellefonte Nuclear Plant
CAQ	Condition Adverse to Quality
CAR	Corrective Action Report
CATD	Corrective Action Tracking Document
CCTS	Corporate Commitment Tracking System
CEG-H	Category Evaluation Group Head
CFR	Code of Federal Regulations
CI	Concerned Individual
CMTR	Certified Material Test Report
COC	Certificate of Conformance/Compliance
DCR	Design Change Request
DNC	Division of Nuclear Construction (see also NU CON)

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DNE	Division of Nuclear Engineering
DNQA	Division of Nuclear Quality Assurance
DNT	Division of Nuclear Training
DOE	Department of Energy
DPO	Division Personnel Officer
DR	Discrepancy Report or Deviation Report
ECN	Engineering Change Notice
ECP	Employee Concerns Program
ECP-SR	Employee Concerns Program-Site Representative
ECSP	Employee Concerns Special Program
ECTG	Employee Concerns Task Group
EEOC	Equal Employment Opportunity Commission
EQ	Environmental Qualification
EMRT	Emergency Medical Response Team
EN DES	Engineering Design
ERT	Employee Response Team or Emergency Response Team
FCR	Field Change Request
FSAR	Final Safety Analysis Report
FY	Fiscal Year
GET	General Employee Training
HCI	Hazard Control Instruction
HVAC	Heating, Ventilating, Air Conditioning
II	Installation Instruction
INPO	Institute of Nuclear Power Operations
IRN	Inspection Rejection Notice

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L/R	Labor Relations Staff
M&AI	Modifications and Additions Instruction
MI	Maintenance Instruction
MSPB	Merit Systems Protection Board
MT	Magnetic Particle Testing
NCR	Nonconforming Condition Report
NDE	Nondestructive Examination
NPP	Nuclear Performance Plan
NPS	Non-plant Specific or Nuclear Procedures System
NQAM	Nuclear Quality Assurance Manual
NRC	Nuclear Regulatory Commission
NSB	Nuclear Services Branch
NSRS	Nuclear Safety Review Staff
NU CON	Division of Nuclear Construction (obsolete abbreviation, see DNC)
NUMARC	Nuclear Utility Management and Resources Committee
OSHA	Occupational Safety and Health Administration (or Act)
ONP	Office of Nuclear Power
OWCP	Office of Workers Compensation Program
PHR	Personal History Record
PT	Liquid Penetrant Testing
QA	Quality Assurance
QAP	Quality Assurance Procedures
QC	Quality Control
QCI	Quality Control Instruction

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QCP	Quality Control Procedure
QTC	Quality Technology Company
RIF	Reduction in Force
RT	Radiographic Testing
SN	Sequoyah Nuclear Plant
SI	Surveillance Instruction
SOP	Standard Operating Procedure
SRP	Senior Review Panel
SWEC	Stone and Webster Engineering Corporation
TAS	Technical Assistance Staff
T&L	Trades and Labor
TVA	Tennessee Valley Authority
TVTLC	Tennessee Valley Trades and Labor Council
UT	Ultrasonic Testing
VT	Visual Testing
WBECSP	Watts Bar Employee Concern Special Program
WBN	Watts Bar Nuclear Plant
WR	Work Request or Work Rules
WP	Workplans

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EXECUTIVE SUMMARY

MATERIAL CONTROL CATEGORY

SUBCATEGORY REPORT 40600 "QUALITY OF MATERIAL"

SUMMARY OF THE ISSUES

There are ten concerns in this subcategory. The ten concerns were grouped into three issues to facilitate effective evaluation of similar concerns. The issues addressed were: 1. structural steel of poor quality (i.e., laminated, delaminated, cracked, splitting) had been received for use at WBN; 2. carbon steel pipe of poor quality (i.e., lamination cracks, slag pockets, surface slag) had been received for use at WBN and questionable repair practices were used on piping material; and 3. valves were often reused, pitted, and/or remachined. Two of these issues were determined to be Class C issues and the other was determined to be a Class A issue.

MAJOR FINDINGS

1. Structural steel shapes that were laminated, delaminated, split, and/or cracked had been received for use at WBN. Procurement document originators (design engineers) were responsible for the selection and specification of adequate quality material (structural steel shapes) and took into account the fact that certain defects were allowable according to the applicable industry standards. Site procedures were in place which ensured that structural steel material which was received and did not meet contractual requirements was identified and properly dispositioned by NCR(s). Therefore, this was determined to be a Class C issue.
2. Carbon steel pipe of poor quality (lamination cracks, slag pockets, questionable repair practices, and surface slag) had been received for use at WBN. Noninjurious defects (maximum allowable by industry standards) were considered and addressed by the design engineer in the material selection and specification process. Injurious defects (those that exceeded the maximum allowable standards) had been addressed and dispositioned through NCRs. Linear indications in the Steam Generator Blowdown System piping had been identified and documented by NCRs; however, the piping was subsequently replaced, per ECNs, due to the need for increased fluid flow and the NCRs voided. Therefore, this was determined to be a Class C issue.

3. The issue raised was that valves had often been installed at WBN that were "used", pitted, and/or remachined. Information received from QTC indicated that during 1980-1981 various sizes and quantities of valves had bearing drives which were rusted and were not replaced; also, that approximately 2,000 small "used" valves were installed at WBN. This evaluation failed to reveal any known instances of valve reuse, pitting, and/or remachining, during the time period of 1980 through 1981. Therefore, this was determined to be a Class A issue. However, instances did occur outside the time frame specified by QTC where an indication, a surface defect, and a crack were identified by NCRs and the valves were remachined or replaced.

COLLECTIVE SIGNIFICANCE OF MAJOR FINDINGS

None

CAUSES OF THE MAJOR FINDINGS

None

CORRECTIVE ACTION ON MAJOR FINDINGS

None



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## 1.0 CHARACTERIZATION OF ISSUES

### 1.1 Introduction

There were 10 concerns, all dealing with WBN, in the Subcategory, Quality of Material. To aid in the evaluation effort the concerns were grouped into three major issues as follows:

#### 1.1.1 Structural Steel

IN-85-282-001  
IN-85-460-001  
IN-85-650-001  
IN-85-684-001  
IN-85-754-001  
IN-86-122-001

#### 1.1.2 Pipe

IN-85-368-001  
IN-85-454-002  
PH-85-035-006

#### 1.1.3 Valves

PH-85-003-024

### 1.2 Description of Issues

#### 1.2.1 Structural Steel

Structural Steel shapes of poor quality (laminated, delaminated, cracked, and splitting) have been received for use at WBN.

#### 1.2.2 Pipe

Carbon steel pipe of poor quality (lamination cracks, slag pockets, and surface slag) has been received for use at WBN and questionable repair practices were used on piping material.

#### 1.2.3 Valves

Valves were often reused, pitted, and/or remachined.

## 2.0 SUMMARY

### 2.1 Summary of Issues

The basic perceived problems expressed by the CIs and contained within this report were:

- laminations, delaminations, splits and cracks in structural steel shapes.
- lamination cracks, surface slag, slag pockets in pipe, and questionable repair practices of pipe.
- reused, pitted, and/or remachined valves.

There were 10 concerns, grouped into three issues, discussed in this subcategory report, two of which have been determined to be Class C issues and one determined to be a Class A issue.

#### 2.1.1 Class A Issue

This evaluation failed to reveal any wholesale quantities of valve reuse, pitting, or remachining, as related by the concern.

#### 2.1.2 Class C Issues

It was determined through this evaluation that both poor quality structural steel and piping material was received at WBN. However, this material was identified and nonconformed as required by site procedures and did not present a condition adverse to quality.

### 2.2 Summary of Evaluation Process

The concerns associated with this subcategory report were evaluated in accordance with the Material Control Category Evaluation Plan. The issues were evaluated independently. Therefore, the evaluation methodology utilized varied according to the nature of each issue. In general, the evaluation methodology consisted of the following:

#### 2.2.1 Contacted QTC for Additional Information

Contacted QTC for any additional information to assist in identifying specific items related to these concerns.

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2.2.2 Determined Procurement and Receiving Methods

Determined through reviews of DNE and DNC procedures in conjunction with applicable industry standards and interviews with cognizant engineering and warehouse personnel the methods employed to ensure that materials of adequate quality were procured for and received at WBN.

2.2.3 Determined any Specific Examples of Issues

Determined through review of the NCR Log and interviews with cognizant individuals, if specific examples of poor quality material exist or existed.

2.3 Summary of Findings

Of the three issues raised by the various employee concerns contained in this subcategory, two were determined to be Class C issues, (in which NCRs had been initiated to identify the discrepancies prior to this evaluation).

The following is a summary of all the findings and conclusions for each of the three issues contained within this subcategory report.

2.3.1 Structural Steel

The issue raised by the six concerns in this group was that structural steel shapes that were laminated, delaminated, split, and/or cracked had been received for use at WBN. Procurement document originators (design engineers) were responsible for the selection and specification of adequate quality material (structural steel shapes) and took into account the fact that certain defects were allowable according to the applicable industry standards. Site procedures were in place which ensured that structural steel material which was received and did not meet contractual requirements was identified and properly dispositioned by NCR(s). Therefore, this issue was determined to be a Class C issue.

2.3.2 Pipe

The issue raised by the three concerns in this group was that carbon steel pipe of poor quality (lamination cracks, slag pockets, questionable repair practices, and surface slag) had been received for use at WBN. Noninjurious defects (maximum allowable by industry standards) were considered and addressed by the design engineer in the material selection and specification process. Injurious defects (those that



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exceeded the maximum allowable standards) had been addressed and dispositioned through NCRs. This evaluation revealed that linear indications in the Steam Generator Blowdown System piping had been identified by an NCR and dispositioned through an ECN requiring a total piping changeout. Therefore, this issue was determined to be a Class C issue.

### 2.3.3 Valves

The issue raised by this concern was that valves had often been installed at WBN that were "used", pitted, and/or remachined. Information received from QTC indicated that during 1980-1981 various sizes and quantities of valves had bearing drives which were rusted and were not replaced; also, that approximately 2,000 small "used" valves were installed at WBN. Interviews with many cognizant individuals failed to reveal any known instances of valve reuse, pitting, and/or remachining, during the time period of 1980 through 1981. Therefore, this issue was determined to be a Class A issue. However, instances did occur outside the time frame specified by QTC where an indication, a surface defect, and a crack were identified by NCRs and the valves were remachined or replaced.

### 2.4 Summary of Collective Significance

None

### 2.5 Summary of Causes

None

### 2.6 Summary of Corrective Actions Taken

None

## 3.0 EVALUATION PROCESS

### 3.1 Evaluation Methodology

The various issues raised by the employee concerns within this subcategory were evaluated according to the Material Control Category Evaluation Plan.

The following is a summary of the specific evaluation methodology utilized in the evaluation of the issues contained within this subcategory.

3.1.1 Structural Steel

This issue was evaluated utilizing the following methodology:

3.1.1.1 Obtained Additional Information from QTC

Contacted QTC for any additional information to assist in identifying specific items related to these concerns.

3.1.1.2 Determined Procurement Methods

Determined through interviews and reviews of industry standards and DNE procedures the methods employed to ensure that structural steel shapes of adequate quality were procured for use at WBN.

3.1.1.3 Determined Receiving Methods

Determined through interviews and reviews of DNC procedures the methods employed to ensure that structural steel shapes of adequate quality were received at WBN.

3.1.1.4 Reviewed NCR Log

Reviewed NCR Log to determine if specific examples of laminated, delaminated, cracked, and/or splitting structural steel shapes were documented.

3.1.1.5 Conducted Interviews for Information

Conducted interviews with various cognizant individuals to determine if specific examples of laminated, delaminated, cracked, and/or splitting structural steel shapes exist or existed.

3.1.2 Pipe

This issue was evaluated utilizing the following methodology:

3.1.2.1 Obtained Additional Information from QTC

Contacted QTC for any additional information to assist in identifying specific items related to these concerns.

3.1.2.2 Reviewed NCR Log

Reviewed NCR log to determine if specific examples of lamination cracks, slag pockets, questionable repair practices and surface slag in pipe were documented.

3.1.2.3 Conducted Interviews for Information

Conducted interviews with various cognizant individuals to determine if specific examples of lamination cracks, slag pockets, questionable repair practices and surface slag in pipe exist or existed.

3.1.3 Valves

This issue was evaluated utilizing the following methodology:

3.1.3.1 Obtained Additional Information from QTC

Contacted QTC for any additional information to assist in identifying specific items related to this concern.

3.1.3.2 Determined Procurement Methods

Determined through interviews and reviews of industry standards and DNE procedures the methods employed to ensure that valves of adequate quality were procured for use at WBN.

3.1.3.3 Determined Receiving Methods

Determined through interviews and reviews of DNC procedures the methods employed to ensure that valves of adequate quality were received at WBN.

3.1.3.4 Reviewed NCR Log

Reviewed NCR log to determine if specific examples of valve reuse, pitting, and/or remachining were documented.

3.1.3.5 Conducted Interviews for Information

Conducted interviews with various cognizant individuals to determine if specific examples of valve reuse, pitting, and/or remachining exist or existed.

3.2 Requirement of Criteria Established for Individual Issues

3.2.1 Structural Steel

3.2.1.1 Procurement Procedure

Engineering Design Engineering Procedure, EN DES-EP 5.01, "PURCHASE REQUISITIONS-EVALUATION OF BIDS AND RECOMMENDATION/REJECTION OF CONTRACT AWARD-REVISIONS TO CONTRACTS", Revisions 9, dated August 8, 1979, and 14, dated July 14, 1983, through 16, dated November 27, 1984.

3.2.1.2 Receiving Procedure

WBN Quality Control Procedures, WBNP-QCP 1.6, "RECEIPT, INSPECTION, STORAGE, WITHDRAWAL, AND TRANSFER OF PERMANENT MATERIAL", Revision 8, dated December 6, 1978, QCP-1.06, "RECEIPT INSPECTION OF SAFETY-RELATED ITEMS", Revision 15, dated January 20, 1984, and WBNP-QCP-1.06, "RECEIPT INSPECTION OF SAFETY-RELATED ITEMS", Revision 16, dated May 10, 1984.

3.2.2 Pipe

None

3.2.3 Valves

3.2.3.1 Procurement Procedure

Engineering Design Engineering Procedure, EN DES-EP 5.01, "PURCHASE REQUISITIONS-EVALUATION OF BIDS AND RECOMMENDATION/REJECTION OF CONTRACT AWARD-REVISIONS TO CONTRACTS", Revisions 9 dated August 8, 1979, through 11, dated March 17, 1981.

3.2.3.2 Receiving Procedure

WBN Quality Control Procedure, WBNP-QCP 1.6, "RECEIPT, INSPECTION, STORAGE, WITHDRAWAL, AND TRANSFER OF PERMANENT MATERIAL", Revision 8, dated December 6, 1978.

Note: WBN Quality Control Procedures WBNP-QCP-1.6, QCP-1.06, and WBNP-QCP-1.06 are different designations of the procedure governing the receipt of construction material at WBN and are hereinafter referred to as WBN-QCP-1.06.

3.3 Justification of Evaluation Process

The evaluation process was designed to determine to the extent possible the circumstances surrounding the issues raised by the employee concerns contained within this subcategory and to determine the minimum requirements and procedural controls in place to ensure that material of adequate quality was procured and received for use at WBN. Interviews with cognizant individuals and reviews of corrective action logs were used to ascertain the factuality of the events related by the concerns.

4.0 FINDINGS

4.1 Structural Steel

4.1.1 Generic

Not applicable

4.1.2 Site-Specific

4.1.2.1 Information from QTC

The information supplied by QTC relative to the concerns in this element is summarized as follows:

Re: IN-85-282-001	See Attachment C
Re: IN-85-460-001	See Attachment D
Re: IN-85-650-001	See Attachment E
Re: IN-85-684-001	See Attachment F
Re: IN-85-754-001	See Attachment G
Re: IN-86-122-001	This concern was not added to this subcategory until April 15, 1986; consequently, no information was supplied by QTC.

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Evaluation of this information in conjunction with that contained in the concerns revealed time frames for the concerns as follows:

<u>Concern Number</u>	<u>Time Frame</u>
IN-85-282-001	February 1985
IN-85-460-001	February 1985
IN-85-650-001	January-February 1985
IN-85-684-001	March-September 1984
IN-85-754-001	March 1985
IN-86-122-001	April 1980

#### 4.1.2.2 Procurement Methods

The quality of structural steel shapes procured for use at WBN was dictated by the specifications contained in procurement documents. The preparation of these documents during April 1980 and March 1984 through February 1985, was governed by EN DES-EP 5.01, R9 and R14 - R16, respectively.

Knowledgeable engineers in DNE stated that the selection and specifications of adequate quality material (structural steel shapes) was the responsibility of the procurement document originator (design engineer). This selection and specification process took into account the fact that certain defects were allowed by the industry standards. These allowable defects include surface indentations, cracks and material laminations, resulting from inclusions, inherent in the manufacturing (rolling) process. Possible defects other than those allowable were not considered in the selection and specifications process.

The responsibility of the procurement document originator (design engineer) for the technical adequacy and accuracy of the procurement document was not clearly defined in EN DES-EP 5.01, R9; however, this definition was clearly evident in EN DES-EP 5.01, R14 through R16.

#### 4.1.2.3 Receiving Methods

Material (structural steel shapes) for use at WBN was received during the specified time frames in accordance with WBN-QCP 1.06, R8 and R15 through R16. This procedure required the receiving

individual(s) to ensure that the contract requirements for the material were met. Measures were provided for segregation and disposition of material not meeting contractual requirements. Interviews revealed this to be the actual practice of individuals involved in the receiving process.

4.1.2.4 Review of NCR Log

Review of the NCR log during the specified time frames for documented examples of structural steel shapes of poor quality (laminated, delaminated, cracked or splitting) revealed the following:

4.1.2.4.1 NCR 2257 RO

Repair of surface defects (cracks) on a structural steel beam, Wide Flange (WF) 33x240, located on the steam generator lower supports. This work was properly dispositioned on NCR 2257 RO. Weld repairs were performed and the beam was then determined to be acceptable for use.

4.1.2.4.2 NCR 5942 RO

Defective (laminated) structural steel beam, Wide Flange (WF) 6x20, found. This beam was properly dispositioned on NCR 5942 RO. The subject beam was destroyed and the remaining WF 6x20 beams received on that contract were deemed acceptable based on the results of an Ultrasonic Examination performed on a representative sample (approximately 585 of 4320 lineal feet) of the lot.

4.1.2.5 Interviews

Interviews with various cognizant individuals revealed the following information concerning the existence of laminated, delaminated, cracked and/or splitting structural steel shapes.

4.1.2.5.1 Laminated

The laminated structural steel beam (WF 6X20, Heat No. 61403) specified in NCR 5942 RO was the subject of concerns

IN-85-287-001 and IN-85-460-001. An adequate discussion of this beam's disposition (see section 4.1.2.4.2) is contained in a report prepared by WBN-Project Manager's Office (PMO) for concern IN-85-460-001 and included herein as Attachment D.

Note: This subcategory addressed only the portion of concern IN-85-460-001 that states, "POOR QUALITY 6" OR 8" BEAM STRUCTURAL STEEL FROM JAPAN THAT IS LAMINATED." The remaining portions of this concern were addressed in Material Control Subcategory MC-40300, "Installation".

#### 4.1.2.5.2 Splitting

In late February 1985, a section of large square tube steel was found to have a split in the longitudinal seam, when it was returned to the hanger fabrication shop from the sandblasting area.

The craftsmen surmized that the split had developed because of the cold weather (-10°F to -15°F) the previous night. Upon inspection of the subject tube steel, the foreman concluded that the longitudinal seam weld had not been properly fused during manufacture.

The foreman and craftsmen involved stated they had seen many pieces of steel in their careers and this was the only split fusion weld they had ever seen. They stated the incident was reported to the hanger engineers but did not know if any documentation (NCR, etc.) exists. The subject tube steel beam was cut up and destroyed by them. An inspection, by the craftsmen and foreman, of the other material in the hanger shop storage area revealed none similarly damaged.



Engineering personnel had no clear recollection of this incident and no documentation relating to it was found.

Based upon the preceding information, this is believed to be an isolated incident that nothing short of a 100 percent Ultrasonic or Radiographic Examination process would have detected.

4.1.2.5.3 Cracked

Hanger Engineering Unit and Craft personnel interviewed had no knowledge of instances of cracked 3"x3"x1/4" tube steel, during the time frame of concern number IN-85-684-001 (summer of 1984). Only two instances of problems relating to this size tube steel were discovered and these were documented on NCR 3821 RO (December 2, 1981) and NCR 6757 (March 26, 1986), both of which were outside the specified time frame. This information is consistent with that contained in the NSRS Investigation Report IN-85-250-WBN, prepared on this concern.

Another instance of a cracked structural steel shape (WF 33x240 beam) was addressed by NCR 2257 RO. The proper disposition of this NCR (see section 4.1.2.4.1) is adequately addressed by NSRS Investigation Report I-85-481-WBN, prepared for concern IN-86-122-001.

4.1.2.5.4 Delaminated

Interviews conducted with Hanger Engineering Unit and receiving personnel revealed no known instances of delaminated metal plate or tube steel during March 1985, as stated in concern number IN-85-754-001. This information is consistent with that contained in NSRS Investigation Report I-85-593-WBN, prepared on this concern.

4.1.2.6 Conclusion

The manufacturing processes utilized in the production of structural steel shapes introduce certain material defects that are manifested on the surface as indentations and/or linear indications and internally as inclusions and/or laminations. Industry standards have been established to minimize these defects via examination and/or repair. Noninjurious defects (maximum allowable by industry standards) were considered and addressed by the design engineer in the material selection and specification process. Early revisions of EN DES-EP 5.01 lacked clear definition of the design engineer's responsibility to ensure the technical adequacy and accuracy of procurement documents; however, no evidence was found to indicate any adverse effect on the quality of material procured and received for use, at WBN. Injurious defects (those that exceeded the maximum allowable standards) had been addressed and dispositioned through NCRs. Therefore, this was determined to be a Class C issue.

|R2

4.2 Pipe

4.2.1 Generic

Not Applicable

4.2.2 Site-Specific

4.2.2.1 Information from QTC

Information provided by QTC for the concerns in this element is summarized as follows:

IN-85-368-001  
IN-85-454-002  
PH-85-035-006

See Attachment H  
See Attachment I  
This concern was not added to this subcategory until March 27, 1986; consequently, no information was supplied by QTC.

4.2.2.2 Review of NCR Log

Review of the NCR log from January 1, 1971, through April 18, 1986, for documented examples, of poor quality (lamination cracks, slag pockets, questionable repair practices and surface slag) as stated on the concerns, revealed the following:

Linear indications on the Steam Generator Blowdown System pipe were identified on NCRs 3746R RO (October 28, 1981), R1 (December 30, 1981) and R2 (January 4, 1982). These NCRs were voided because the piping was subsequently replaced due to the need for increased fluid flow by the following ECNs:

ECN 3371 (unit 1)  
ECN 4859 (unit 2)

#### 4.2.2.3 Interviews

Interviews with various cognizant individuals (supervisors, engineering personnel, craftsmen, and a Westinghouse Representative) relative to specific examples of poor pipe quality (lamination cracks, slag pockets, questionable repair practices and surface slag) revealed the following:

##### 4.2.2.3.1 Lamination Cracks

Linear indications in the Steam Generator Blowdown System piping were noted and subsequently identified by NCR 3746R RO, R1 and R2. The evaluation of these NCRs was halted and they were voided with the issuance of ECN 3371 (August 23, 1982) for unit 1 and ECN 4859 (May 9, 1984) for unit 2 to effect a total piping change out because of the need for increased fluid flow. Individuals interviewed had no knowledge nor were any documented examples of similar problems in the piping system, subsequent to these piping modifications. It is believed that the lamination cracks referred to by the CI in concern number PH-85-035-006 were the linear indications addressed by NCR 3746R RO, R1 and R2.

##### 4.2.2.3.2 Slag Pockets and Questionable Repair Practices

The interviewees did not recall any examples of large slag pockets and/or questionable repair practices, as stated by concern number IN-85-368-001, on pipe supplied by Westinghouse for WBN unit 1 and unit 2 Turbo-generators, during their installation periods; however, on

February 22, 1977, backcharge number 2-WE-21 was issued covering work on the unit 1 and unit 2 turbine cross-over and cross-under pipe. This backcharge was to cover expenses incurred by Westinghouse in furnishing labor and material to correct out-of-round, out-of-square, and defective weld preparations on this piping.

It is believed that the CI had in mind these piping problems and their subsequent repair, as addressed by this backcharge.

#### 4.2.2.3.3 Surface Slag

No specific examples of pipe having surface slag, as stated in concern number IN-85-454-002, were discovered. The existence and consequences of surface slag on pipe is adequately addressed by a report prepared by the WBN PMO for this concern and included in this report as Attachment I.

#### 4.2.2.4 Conclusion

The manufacturing processes utilized in the production of pipe introduce certain material defects that are manifested on the surface as indentations and/or linear indications and internally as inclusions and/or laminations. Industry standards have been established to minimize these defects via examination and/or repair. Noninjurious defects (maximum allowable by industry standards) were considered and addressed by the design engineer in the material selection and specification process. Injurious defects (those that exceeded the maximum allowable standards) had been addressed and dispositioned through NCRs. Therefore, this was determined to be a Class C issue.

### 4.3 Valves

#### 4.3.1 Generic

Not Applicable

4.3.2 Site-Specific

4.3.2.1 Information from QTC

Information provided by QTC stated that this was a NU CON concern at WBN and that during 1980-1981 various sizes and quantities of installed valves have bearing drives that were rusted and not replaced; and approximately 2000 small valves installed at WBN were "used" and/or "remachined".

4.3.2.2 Procurement Methods

The quality of valves procured for use at WBN was dictated by the specifications contained in procurement documents. The preparation of these documents during 1980-1981 was governed by EN DES-EP 5.01, R9 - R11.

Knowledgeable engineers in DNE stated that the selection and specification of adequate quality material (valves) was the responsibility of the procurement document originator (design engineer). This selection and specification process took into account the fact that certain defects were allowed by the industry standards. Although, the responsibility of the procurement document originator (design engineer) for the technical adequacy and accuracy of the procurement document was not clearly defined in EN DES-EP 5.01, R9 - R11; subsequent revisions of this procedure do provide this responsibility definition.

4.3.2.3 Receiving Methods

Material (valves) for use at WBN was received during this period in accordance with WBN-QCP-1.6, R8. This procedure required the receiving individual(s) to ensure that the contract requirements for the material were met. Measures were provided for segregation and disposition of material not meeting contractual requirements. Interviews revealed this to be the actual practice of individuals involved in the receiving process.

4.3.2.4 Review of NCR Log

Review of the NCR log from January 1, 1980, through December 31, 1981, revealed no wholesale quantities (as indicated by information provided by QTC) of valve reuse, pitting, or remachining. However, three instances of valve repair work due to defective material were discovered and are as follows:

4.3.2.4.1 NCR 2068 RO

Remachining (grinding) of an indication on a System 3, 4" swing check valve. This work was properly dispositioned on NCR 2068 RO.

4.3.2.4.2 NCR 2932 RO

Remachining (grinding) of surface defects on a System 87 valve. This work was properly dispositioned on NCR 2932 RO.

4.3.2.4.3 NCR 3370 R

Replacement of valve due to a crack in the body. This work was properly dispositioned on NCR 3370 R.

4.3.2.5 Interviews

Interviews with many cognizant individuals in DNC, DNE, and ONP failed to reveal any known instances of valve reuse, pitting, and/or remachining during this time period. Several interviewees mentioned that possibly the CI had in mind the problems associated with the Kerotest valves, that occurred during the early 1980's. Research revealed that Kerotest valve problems affecting both units did exist during the time period covered by the concern; however, these problems and their solutions are well documented (e.g., NCR 2501 RO, NCR 2501 R1, WB-DCR-447, ECN 4061, ECN 4286). The Kerotest program is addressed for unit 0 and unit 1 valves in the OPERATIONS category, MECHANICAL EQUIPMENT RELIABILITY/DESIGN subcategory, KEROTEST VALVES element, Report number 301.01. These interviews also revealed that the Kerotest program for unit 2 is on going by DNC personnel.

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R2

4.3.2.6 Conclusion

This evaluation failed to reveal any wholesale quantities of valve reuse, pitting, or remachining, as related by the concern. Early revisions of EN DES-EP 5.01 lacked clear definition of the design engineer's responsibility to ensure the technical adequacy and accuracy of procurement documents; however, no evidence was found to indicate any adverse effect on the quality of material procured and received for use, at WBN. Therefore, this was determined to be a Class A issue.

5.0 COLLECTIVE SIGNIFICANCE

Three issues derived from ten employee concerns have been evaluated and discussed in this report. Of the issues evaluated, two were determined to be Class C issues and one was determined to be a Class A issue.

Class A issues require no corrective action; however, the necessary corrective actions for the two Class C issues were initiated previous to this evaluation. Therefore, no corrective actions were required as a result of this evaluation.

All material of suspect quality included in this evaluation, was dispositioned in a proper manner, except the single incident mentioned in section 4.1.2.5.2. Although this beam was not addressed and dispositioned via NCR; it was completely disposed of and did not result in a condition adverse to quality.

5.1 Management Effectiveness

No management ineffectiveness issues were identified.

5.2 Employee Effectiveness

No employee ineffectiveness issues were identified.

5.3 Technical Adequacy

No conditions adverse to quality were identified.

6.0 CAUSES

None

7.0 CORRECTIVE ACTIONS

7.1 Corrective Actions Already Taken or Planned

None

7.2 Corrective Actions Required as Result of Evaluation

None

8.0 ATTACHMENTS

Attachment A - List of Concerns by Concern Number Indicating Safety Relationship and Generic Applicability: 4 pages

Attachment B - List of Concerns by Issue: 1 page

Attachment C - QTC response (IN-85-282-001): 1 page

Attachment D - QTC response (IN-85-460-001): 2 pages

Attachment E - QTC response (IN-85-650-001): 1 page

Attachment F - QTC response (IN-85-684-001): 4 pages

Attachment G - QTC response (IN-85-754-001): 4 pages

Attachment H - QTC response (IN-85-368-001): 1 page

Attachment I - QTC response (IN-85-454-002): 2 pages





ATTACHMENT A  
 LIST OF CONCERNS INDICATING SAFETY RELATIONSHIP AND GENERIC APPLICABILITY  
 CATEGORY: MC SUBCATEGORY: 40600 QUALITY OF MATERIAL

CONCERN NUMBER	SUB CAT	PLT CAT	PLT LOC	GENERIC APPL B B S W F L Q B	QTC/NSRS INVESTIGATION REPORT	P# S R	CONCERN DESCRIPTION	REFERENCE SECTION # CATEGORY - MC SUBCATEGORY - 40600
IN-85-282-001 T50014	MC	40600	WBN	N N N N	REPORT	SR	A STRUCTURAL BEAM WAS CLEARED THROUGH QA/QC RECEIPT INSPECTION AND ISSUED TO THE FIELD FOR USE. ONCE DELIVERED TO FIELD, CRAFT PERSONNEL NOTED THAT THE BEAM WAS LAMINATED, AND DID NOT INSTALL THE BEAM. NO FURTHER DETAILS WERE AVAILABLE.	1.1.1, 1.2.1, 2.1, 2.2, 2.3.1, 3.1.1, 3.2.1, 3.3, 4.1.2.1, 4.1.2.2, 4.1.2.3, 4.1.2.4, 4.1.2.5.1, 4.1.2.6, 5.0, and 8.0
IN-85-368-001 T50101	MC	40600	WBN	N N N N	REPORT	SR	CI CONCERNED ABOUT POOR QUALITY OF WESTINGHOUSE PIPE. PIPESPOOLS WERE HARD TO WELD OR BEVEL BECAUSE OF LARGE SLAG POCKETS. THIS SLAG CAUSED "BLOWOUTS", AND MUCH GRINDING. PROBLEM WAS SO BAD THAT WESTINGHOUSE REPRESENTATIVE (UNKNOWN) HAD TO WITNESS REWORK FOR BACKCHARGE PURPOSES. ONE CASE INVOLVED GOING 13"-14" INTO BASEMETAL. (PIPE COMES OFF OF A 45 DEGREE ELBOW, BOTTOM OF HEATER. LINE RUNS DUE NORTH, UNIT 2). ALSO, 36" SCHEDULE 80 PIPE IN UNITS 1 & 2 HAD SLAG POCKETS. CI HAS NO MORE INFORMATION.	1.1.2, 1.2.2, 2.1, 2.2, 2.3.2, 3.1.2, 3.3, 4.2.2.1, 4.2.2.2, 4.2.2.3.2, 4.2.2.4, 5.0, and 8.0

ATTACHMENT A  
 LIST OF CONCERNS INDICATING SAFETY RELATIONSHIP AND GENERIC APPLICABILITY  
 CATEGORY: MC SUBCATEGORY: 40600 QUALITY OF MATERIAL

CONCERN NUMBER	SUB CAT	PLT LOC	GENERIC APPL B B S W F L Q B	QTC/NSRS INVESTIGATION REPORT	P# S R	CONCERN DESCRIPTION	REFERENCE SECTION # CATEGORY - MC SUBCATEGORY - 40600
IN-85-454-002 T50030	MC	40600	WBN	N N N N REPORT	IN-85-454-002	NO CARBON STEEL PIPE OFTEN HAS ALOT OF SLAG ON SEAMLINE. TOLD TO ACCEPT THE PIPE AS IT IS MILL SCALE.	1.1.2, 1.2.2, 2.1, 2.2, 2.3.2, 3.1.2, 3.3, 4.2.2.1, 4.2.2.2, 4.2.2.3.3, 4.2.2.4, 5.0, and 8.0
IN-85-460-001 T50035	MC MC	40300 40600	WBN	N N N N REPORT	IN-85-460-001	SR <u>POOR QUALITY 6" OR 8" BEAM STRUCTURAL STEEL FROM JAPAN THAT IS LAMINATED.</u> THIS STEEL WAS BEING USED IN NON-CODE SYSTEM WHEN THE LAMINATION WAS DISCOVERED. ALL OF THIS STEEL MAY NOT HAVE BEEN IDENTIFIED AND REMOVED.	1.1.1, 1.2.1, 2.1, 2.2, 2.3.1, 3.1.1, 3.2.1, 3.3, 4.1.2.1, 4.1.2.2, 4.1.2.3, 4.1.2.4, 4.1.2.5.1, 4.1.2.6, 5.0, and 8.0
IN-85-650-001 T50061	MC	40600	WBN	N N N N REPORT	IN-85-650-001	SR CI OBSERVED THAT TUBE STEEL OR OTHER TYPE OF STEEL PURCHASED FOR HANGER FABRICATION SPLIT AT THE SEAMS WHEN EXPOSED TO COLD WEATHER IN STORAGE YARD. STEEL IN STORAGE YARD WAS GOTTEN RID OF BUT SOME COULD HAVE BEEN USED TO ACTUALLY MAKE HANGERS.	1.1.1, 1.2.1, 2.1, 2.2, 2.3.1, 3.1.1, 3.2.1, 3.3, 4.1.2.1, 4.1.2.2, 4.1.2.3, 4.1.2.4, 4.1.2.5.2, 4.1.2.6, 5.0, and 8.0

ATTACHMENT A  
 LIST OF CONCERNS INDICATING SAFETY RELATIONSHIP AND GENERIC APPLICABILITY  
 CATEGORY: MC SUBCATEGORY: 40600 QUALITY OF MATERIAL

CONCERN NUMBER	SUB CAT	PLT CAT	PLT LOC	GENERIC APPL				QTC/NSRS INVESTIGATION REPORT	P* S R	CONCERN DESCRIPTION	REFERENCE SECTION # CATEGORY - MC SUBCATEGORY - 40600
				B	B	S	W				
IN-85-684-001 T50063	MC	40600	WBN	N	N	N	N	1-85-250-WBN REPORT	SR	IN THE SUMMER OF 1984 A SHIPMENT OF 3" X 3" X 1/4" TUBE STEEL WAS RECEIVED AND INSTALLED THROUGH-OUT THE SITE. THIS MATERIAL WAS DETERMINED TO BE DEFECTIVE. (CRACKED) AND NO EFFORT WAS MADE TO LOCATE AND/OR REPLACE IT. THE WHOLE MATTER WAS "HUSHED UP" AND NOTHING MORE WAS EVER HEARD. AT ONE TIME, SOME OF THIS MAT'L WAS SEGREGATED AT THE HGR. FAB SHOP.	1.1.1, 1.2.1, 2.1, 2.2, 2.3.1, 3.1.1, 3.2.1, 3.3, 4.1.2.1, 4.1.2.2, 4.1.2.3, 4.1.2.4, 4.1.2.5.3, 4.1.2.6, 5.0 and 8.0
IN-85-754-001 T50139	MC	40600	WBN	N	N	N	N	1-85-593-WBN REPORT	SR	IN MARCH 1985, FAULTY METAL PLATE AND TUBE STEEL WAS RECEIVED FOR USE. BOTH PLATE AND TUBE STEEL APPEARED TO BE COLD ROLLED AND SEPARATING WITH DELAMINATIONS. CI HAS NO FURTHER DETAILS. CONSTRUCTION DEPT. CONCERN. NO FOLLOW UP REQUIRED.	1.1.1, 1.2.1, 2.1, 2.2 2.3.1, 3.1.1, 3.2.1, 3.3, 4.1.2.1, 4.1.2.2, 4.1.2.3, 4.1.2.4, 4.1.2.5.4, 4.1.2.6, 5.0, and 8.0

ATTACHMENT A  
 LIST OF CONCERNS INDICATING SAFETY RELATIONSHIP AND GENERIC APPLICABILITY  
 CATEGORY: MC SUBCATEGORY: 40600 QUALITY OF MATERIAL

CONCERN NUMBER	SUB CAT	PLT LOC	GENERIC APPL				QTC/NSRS INVESTIGATION REPORT	P# S R	CONCERN DESCRIPTION	REFERENCE SECTION # CATEGORY - MC SUBCATEGORY - 40600	
			B	B	S	W					
IN-86-122-001 T50121	MC	40600	WBN	N	N	N	N	1-85-481-WBN	SR	CRACKS WERE NOTED IN A WF 33 BEAM. CI IS UNSURE IF THESE CRACKS WERE EVER FIXED. BEAM LOCATION IS BETWEEN 0 DEGREES AND 337 DEGREES 30' AT ELEVATION 723', UNIT 1 REACTOR BLDG. (APPROXIMATELY 37' RADIUS). STANDING AT 0 DEGREES RADIAL AND LOOKING TOWARD STEAM GENERATOR #4, ONE WOULD BE LOOKING AT THE WF IN QUESTION. DETAILS KNOWN TO QTC, WITHHELD DUE TO CONFIDENTIALITY. CI HAS NO FURTHER INFORMATION.	1.1.1, 1.2.1, 2.1, 2.2, 2.3.1, 3.1.1, 3.2.1, 3.3, 4.1.2.1, 4.1.2.2, 4.1.2.3, 4.1.2.4, 4.1.2.5.3, 4.1.2.6, and 5.0
PH-85-003-024 T50107	MC	40600	WBN	N	N	N	N		SR	VALVES ARE OFTEN RE-USED, PITTED, AND/OR RE-MACHINED. CI HAS NO MORE INFORMATION AVAILABLE. NO FOLLOW UP REQUIRED.	1.1.3, 1.2.3, 2.1, 2.2, 2.3.3, 3.1.3, 3.2.3, 3.3, 4.3.2, and 5.0
PH-85-035-006 T50259	MC	40600	WBN	N	N	N	N		SR	CI IS CONCERNED ABOUT THE QUALITY OF THE MATERIAL THAT IS USED IN THE STEAM GENERATOR BLOWDOWN PIPING. CI STATED THAT THE PIPE USED HAD LAMINATION CRACKS. CI HAS NO FURTHER INFORMATION. NO FURTHER INFORMATION IN THE FILE. CONSTRUCTION DEPARTMENT CONCERN. NO FOLLOW-UP REQUIRED.	1.1.2, 1.2.2, 2.1, 2.2, 2.3.2, 3.1.2, 3.3, 4.2.2.1, 4.2.2.2, 4.2.2.3.1, 4.2.2.4, and 5.0

\*PSR CODES:  
 SR - NUCLEAR SAFETY-RELATED  
 SS - NUCLEAR SAFETY SIGNIFICANT  
 NO - NOT NUCLEAR SAFETY-RELATED

ATTACHMENT B

List of Concerns by Issue

IN-85-282-001	STRUCTURAL STEEL
IN-85-460-001	STRUCTURAL STEEL
IN-85-650-001	STRUCTURAL STEEL
IN-85-684-001	STRUCTURAL STEEL
IN-85-754-001	STRUCTURAL STEEL
IN-86-122-001	STRUCTURAL STEEL
IN-85-368-001	PIPE
IN-85-454-002	PIPE
PH-85-035-006	PIPE
PH-85-003-024	VALVES



## QTC QUESTIONNAIRE

Concern No. IN-85-282-001Date: 3/17/86

1. Without revealing the identity of the CI, can a timeframe for the concern be identified, if so when?  
... NO TIME FRAME SPECIFIED
2. Without revealing the identity of the CI, can specific items be identified, if so when?  
NONE SPECIFIED.
3. Without revealing the identity of the CI, can any specific locations be identified, if so what are they?  
NONE SPECIFIED
4. Without revealing the identity of the CI, can any other individuals be identified, if so who? C/I STATED THAT JOHN LANDRUFF COULD SUPP  
ADDITIONAL INFORMATION RELATIVE TO THIS CONCERN.
5. Without revealing the identity of the CI, is there any other information in the QTC file that may be of aid in this investigation (such as, QTC, NSRS, NRC, Construction, Nuclear Power investigation, etc.), if so what?  
NONE
6. Is this a concern of the Office of Nuclear Power, Construction, or both?  
CONSTRUCTION DEPT. CONCERN.

Additional Comments:

THE CONCERNED INDIVIDUAL FOR THIS CONCERN IS ANONYMOUS. QTC DOES NOT KNOW THE IDENTITY OF C/I. NO FOLLOW-UP CONTACT COULD BE MADE WITH C/I TO GET ADDITIONAL DETAILS.

JPM 3-19-86





(1011)

Subcategory MC-600

ATTACHMENT D  
Page 1 of 2

Page 4 of 9

Subcategory MC-600  
Quality of Materials  
Material Control

QTC QUESTIONNAIRE

Concern No. IN-85-460-001

Date: 3/17/86

1. Without revealing the identity of the CI, can a timeframe for the concern be identified, if so when?  

SEE ATTACHED
2. Without revealing the identity of the CI, can specific items be identified, if so when?  

SEE ATTACHED
3. Without revealing the identity of the CI, can any specific locations be identified, if so what are they?  

SEE ATTACHED
4. Without revealing the identity of the CI, can any other individuals be identified, if so who?  

SEE ATTACHED
5. Without revealing the identity of the CI, is there any other information in the QTC file that may be of aid in this investigation (such as, QTC, NSRS, NRC, Construction, Nuclear Power investigation, etc.), if so what?  

WBP PMO INVESTIGATED THIS CONCERN,
6. Is this a concern of the Office of Nuclear Power, Construction, or both?  

~~WBP PMO~~ CONSTRUCTION DEPT. CONCERN.

Additional Comments:

THIS CONCERN (# IN-85-460-001) WAS CLOSED ON 12-18-85. TVA WBP PMO INVESTIGATED THIS CONCERN. COPY OF THEIR REPORT IS ATTACHED.

JPM 3-19-86

DELETED INFORMATION

111-85-460-001

REMOVED

CONCERN: Poor quality 6" or 8" beam structural steel from Japan that is laminated. This steel was being used in non-code system when the lamination was discovered. All of this steel may not have been identified and removed.

RESPONSE: This concern as stated did not contain sufficient information to be evaluated. A request was made of Bill Kemp, QIC, and the following additional information was provided by him: MATERIAL: 6-inch I beam, INSTALLATION LOCATION: Turbine generator building, DATE OF OCCURANCE: April 1985 (approximately), COMMENT: ". . . never actually saw material . . . heard that it (laminated material) had already been used . . . do not know when the material was actually identified as being nonconforming . . ."

The investigation of this concern was conducted through interviews with engineering, inspection, and craft personnel, research of various types of documentation and visual inspection in the field. The results were as follows:

The only I beam material found which has ever been in warehouse stock is heat number U02266, 64823, U40472 and 46236X. This material was purchased as QA Level 1 on purchase requisitions; 73233-3 (received 240 ft.), 65558-2 (received 240 ft.), 551635-1 (received 180 ft.) and 543371-2 (received 300 ft.). At present 180 ft. is left in warehouse storage. None of this material has been purchased from warehouse storage since November 2, 1981. The material as stated in this concern was not 6-inch I beam.

The material in question was heat number 61403 W6X20 WF. This condition has been documented and tracked on NCR 5942 (dated February 2, 1985). This NCR is attached with the OE evaluation approving a use-as-is disposition. In depth investigation provided the following information: For heat number 61403, 1,755 linear ft. is unaccounted for and is assumed to be installed. 585 linear ft. was tested by U.T. examination and no additional lamination was detected. No W6X20 WF which was installed has been located or removed (refer to OE memo attached to NCR 5942, this report). Out of 4,320 linear ft. which had been received only one 40 ft. stick was actually determined to have lamination. The material was determined to be of domestic manufacture from Siskin Steel. Your concern about possible laminations in beams is appreciated. If you have additional questions or concerns, please address them to your supervisor.

Principally prepared by Bruce Majors, extension 509.

BM  
BR

QTC QUESTIONNAIRE

Concern No. IN-85-650-001

Date: 3/17/86

1. Without revealing the identity of the CI, can a timeframe for the concern be identified, if so when?

JAN./FEB. 1985

2. Without revealing the identity of the CI, can specific items be identified, if so when?

N/A

3. Without revealing the identity of the CI, can any specific locations be identified, if so what are they?

TUBE STEEL WAS LOCATED BEHIND THE TUBE FAB SHOP.

4. Without revealing the identity of the CI, can any other individuals be identified, if so who?

STEAMFITTER FOREMAN NAMED HART (C/I DOES NOT KNOW FIRSTNAME).

5. Without revealing the identity of the CI, is there any other information in the QTC file that may be of aid in this investigation (such as, QTC, NSRS, NRC, Construction, Nuclear Power investigation, etc.), if so what?

NSRS WAS ASSIGNED THIS INVESTIGATION.

6. Is this a concern of the Office of Nuclear Power, Construction, or both?

CONSTRUCTION DEPT. CONCERN.

Additional Comments:

NO FURTHER INFORMATION IS AVAILABLE.

JPM 3-19-86



(1100)

Subcategory MC-600

ATTACHMENT F  
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Subcategory MC-600  
Quality of Materials  
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QTC QUESTIONNAIRE

Concern No. TN-85-684-001

Date: 3/17/86

~~1. Without revealing the identity of the CI, can a timeframe for the concern be identified, if so when?~~

~~2. Without revealing the identity of the CI, can specific items be identified, if so when?~~

3. Without revealing the identity of the CI, can any specific locations be identified, if so what are they? **SEE ATTACHED**

4. Without revealing the identity of the CI, can any other individuals be identified, if so who? **SEE ATTACHED**

5. Without revealing the identity of the CI, is there any other information in the QTC file that may be of aid in this investigation (such as, QTC, NSRS, NRC, Construction, Nuclear Power investigation, etc.), if so what?

**NSRS INVESTIGATED THIS CONCERN. SEE ATTACHED,**

6. Is this a concern of the Office of Nuclear Power, Construction, or both?

**CONSTRUCTION DEPT. CONCERN,**

Additional Comments:

**THIS CONCERN (# IN-85-684-001) WAS INVESTIGATED AND CLOSED BY NSRS. SEE ATTACHED REPORT.**

**JPM 3-19-86**

Subcategory MC-600  
Quality of Materials  
Material Control

TENNESSEE VALLEY AUTHORITY  
NUCLEAR SAFETY REVIEW STAFF  
INVESTIGATION REPORT NO. T-85-250-WBN

SUBJECT: ERT CONCERN NO: IN-85-684-001, "Defective Tube Steel"

LEAD INVESTIGATOR: Frederic J. Slagle DATE: 9/3/85  
F. J. SLAGLE

INVESTIGATOR: R. C. CUSHAW DATE: 9/3/85  
R. C. CUSHAW

APPROVED: M. A. Harrison DATE: 9/16/85  
M. A. HARRISON

FINAL

## I. BACKGROUND

The Nuclear Safety Review Staff (NSRS) investigated employee concern No. IN-85-684-001 which Quality Technology Company (QTC) had identified during the Watts Bar Employee Concern Program. The concern was worded as follows:

In the summer of 1984 a shipment of 3"x3"x1/4" tube steel was received and installed through-out the site. This material was determined to be defective (cracked) and no effort was made to locate and/or replace it. The whole matter was "hushed up" and nothing more was ever heard. At one time, some of this material was segregated at the hanger fabrication shop.

## II. SCOPE

NSRS has contacted a number of people associated with hanger fabrication and hanger material incoming inspection and has physically inspected the area around the hanger fabrication shop.

## III. SUMMARY OF FINDINGS

A. Interviews with personnel associated with hanger fabrication revealed no knowledge or memory of defective tube steel as described in the subject employee concern.

B. Interviews with personnel associated with hanger material incoming inspection revealed no record or memory of the defective tube steel as described in the subject employee concern.

C. A physical inspection of the hanger fabrication shop area revealed no defective tube steel as described in the subject employee concern.

An attempt was made through QTC to obtain additional information from the concerned individual. The concerned individual again described the tube steel as presented in the subject employee concern and identified a specific employee at the hanger fabrication shop that might have knowledge of the defective tube steel. This employee was contacted and had no knowledge of any defective tube steel. The concerned individual did not provide any location where this defective tube steel was utilized in hanger construction.

## IV. CONCLUSIONS/RECOMMENDATIONS

### Conclusion

The employee concern was not substantiated. This investigation revealed a lack of knowledge of the defective tube steel, and no locations where it was utilized in hanger fabrication were identified.



Recommendation

None

NSRS3:BB

1101

Subcategory MC-600

ATTACHMENT G  
Page 1 of 4

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Subcategory MC-600  
Quality of Materials  
Material Control

QTC QUESTIONNAIRE

Concern No. IN-85-754-001

Date: 3/17/86

~~1. Without revealing the identity of the CI, can a timeframe for the concern be identified, if so when?~~

2. Without revealing the identity of the CI, can specific items be identified, if so when? SEE ATTACHED

3. Without revealing the identity of the CI, can any specific locations be identified, if so what are they? SEE ATTACHED

4. Without revealing the identity of the CI, can any other individuals be identified, if so who? SEE ATTACHED

5. Without revealing the identity of the CI, is there any other information in the QTC file that may be of aid in this investigation (such as, QTC, NSRS, NRC, Construction, Nuclear Power investigation, etc.), if so what?  
NSRS INVESTIGATED THIS CONCERN. SEE ATTACHED REPORT.

6. Is this a concern of the Office of Nuclear Power, Construction, or both?  
CONSTRUCTION DEPT. CONCERN.

Additional Comments:

THIS CONCERN (# IN-85-754-001) WAS INVESTIGATED BY NSRS. SEE ATTACHED REPORT.

JRM 3-19-86

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Quality of Materials  
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TENNESSEE VALLEY AUTHORITY  
NUCLEAR SAFETY REVIEW STAFF  
NSRS INVESTIGATION REPORT NO. I-85-573-WBN  
EMPLOYEE CONCERN: IN-85-754-001  
MILESTONE 6

SUBJECT: LAMINATIONS IN PLATE AND TUBE STEEL

DATES OF INVESTIGATION: October 30-December 3, 1985

INVESTIGATOR:

C. R. White  
C. R. White

12/17/85  
Date

REVIEWED BY:

J. D. Smith  
C. D. Smith

12-24-85  
Date

APPROVED BY:

M. A. Harrison  
M. A. Harrison

1-6-86  
Date

Subcategory "MC-600  
Quality of Materials  
Material Control

## I. BACKGROUND

NSRS has investigated Employee Concern IN-85-754-001 which Quality Technology Company (QTC) had identified during the Watts Bar Employee Concern Program. The concern was worded as follows:

In March 1985, faulty metal plate and tube steel was received for use. Both plate and tube steel appeared to be cold rolled and separating with delaminations. CI has no further details. Construction dept. concern.

## II. SCOPE

The concern is very general. Attempts were made through QTC to obtain more specific information. The investigator was told by QTC that the concerned individual (CI) had departed the area and left no forwarding address. The summary is based on the programmatic aspects incorporated in the TVA construction processes.

## III. SUMMARY OF FINDINGS

- A. The plant material warehouse did not receive any plate or tubing in March 1985 as interpreted by the concern.
- B. Had the CI observed lamination during some fabricating process, the following assurances preclude the possibility of laminations being detrimental to plant safety.
  1. If welding was involved in the laminar-affected area, requirements for removal of the defects in the weld zone are made.
  2. Laminations are acceptable in weld areas up to specific sizes as outlined in the code.
  3. Certain plate and piping allow laminations, notably, mild steel.
  4. Almost all plate and tubing contain laminations. Acceptance of these is dependant on the use of the material. As an example, most of the steel used in the fabrication of reactor vessels made from plate contains laminations. These are acceptable when determined (usually by ultrasonic examination) to be within the acceptance standards of applicable codes and fabrication practices.
  5. Those plate and tubing not requiring examinations for laminar indications would be subject to repair in the areas requiring welding if the laminations exceeded specification requirements.
  6. Welds requiring ultrasonic examination have an area adjacent to the weld mapped to show the location of laminar flaws. Those that exceed the acceptance criteria either have the indications removed and repairs follow, or the material is scrapped.

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7. Concern IN-88-111-101 is indicative of laminar flaws found in "I" beams. These were removed in the mill zones and repaired prior to welding. Engineering concludes this is inherent to the rolling process at the mill and does not affect the structural integrity of the beam.

#### IV. CONCLUSIONS AND RECOMMENDATIONS

##### Conclusions

With no specific information available from the concerned individual, a generic resolution was made. The programmatic safeguards used in the manufacture, installation, and inspections of plate and tubing assure the probability of a major material problem is remote. Most plate whether used for structures or pressure vessels contains permissible laminations; and tubing, especially if it is mild steel, contains the same. Where these components are joined by welds, testing and inspection parameters assure that these comply with the applicable requirements of controlling documents. Records show where laminar indications have been found, marked, or removed to acceptable standards.

Due to the lack of specific information, this concern is considered unsubstantiated.

##### Recommendations

None.

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Subcategory MC-600

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Quality of Materials  
Material Control

QTC QUESTIONNAIRE

Concern No. IN-85-268-001

Date: 2/17/86

1. Without revealing the identity of the CI, can a timeframe for the concern be identified, if so when? No
2. Without revealing the identity of the CI, can specific items be identified, if so when? No
3. Without revealing the identity of the CI, can any specific locations be identified, if so what are they? SEE ERT K-FORM FOR LOCATIONS,
4. Without revealing the identity of the CI, can any other individuals be identified, if so who? No
5. Without revealing the identity of the CI, is there any other information in the QTC file that may be of aid in this investigation (such as, QTC, NSRS, NRC, Construction, Nuclear Power investigation, etc.), if so what?  
THIS CONCERN WAS ASSIGNED TO NSRS TO INVESTIGATE.
6. Is this a concern of the Office of Nuclear Power, Construction, or both?  
CONSTRUCTION DEPT.

Additional Comments: "Poor quality of Westing House piping coming off of Moisturizer Separators going back into Turbines; 785' EL. Turbine Bldg Unit 1 & 2. C.I. stated another location where this problem was particularly bad as described in K-Form. C.I. asserted that this was Japanese Pipe." This additional info is extracted from file.

When contacted, C.I. stated that C.I. does not want to talk any more to QTC, ERT and wants the concern to be dropped. This follow-up was done on 3-19-86.



(1076)

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Quality of Materials  
Material Control

QTC QUESTIONNAIRE

Concern No. IN-85-454-002

Date: 3/17/86

1. Without revealing the identity of the CI, can a timeframe for the concern be identified, if so when? NO DETAILS IN FILE.
2. Without revealing the identity of the CI, can specific items be identified, if so when? NO DETAILS IN FILE.
3. Without revealing the identity of the CI, can any specific locations be identified, if so what are they? NO DETAILS IN FILE.
4. Without revealing the identity of the CI, can any other individuals be identified, if so who? NONE.
5. Without revealing the identity of the CI, is there any other information in the QTC file that may be of aid in this investigation (such as, QTC, NSRS, NRC, Construction, Nuclear Power investigation, etc.), if so what?  
~~YES~~ WBP PMO INVESTIGATED THIS CONCERN
6. Is this a concern of the Office of Nuclear Power, Construction, or both?  
CONSTRUCTION DEPT. CONCERN.

Additional Comments:

THIS CONCERN # (IN-85-454-002) WAS CLOSED  
ON 12-6-85. ~~YES~~ TVA WBP PMO  
INVESTIGATED THIS CONCERN. COPY OF THEIR  
REPORT IS ATTACHED,

JPM 3-19-86



CONCERN NUMBER IN-85-454-002

CONCERN: Carbon steel pipe often has a lot of slag on seamline. Told to accept the pipe as it is mill scale.

RESPONSE: ERT was contacted on four different dates (July 11, 18, 25, and August 9, 1985) to try to obtain additional information, but as of August 9, 1985, has been unsuccessful. The specifics of this concern cannot be investigated without additional information. Therefore, we can respond only to the general aspects.

Carbon steel pipe having slag on the seamline would have to have been welded utilizing coated electrodes. The slag formed, while not detrimental to the quality of the weld, would have to be removed for NDE to be performed on the weld, which is required to be done by the vendor of QA pipe.

Mill scale is a product of heating the pipe after it has been manufactured, such as would be done in a heat treating operation. Some mill scale does appear "layered," similar to slag. We do not believe any pipe received with slag on the seamline would be QA piping used in QA applications, since all this piping requires NDE. Even B31.1 piping requires a visual inspection of the weld which could not be made properly if it were covered with slag. If after receiving this general information the employee has additional details or specific instances or examples, we will thoroughly investigate them.

Principally prepared by Shelton Johnson, extension 350 and Doug Spangler, extension 440.

TLR