ENCLOSURE 1

WATTS BAR NUCLEAR PLANT

HEAT CODE TRACEABILITY

CORRECTIVE ACTION PROGRAM PLAN

REVISION 1

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REVISION 1

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HEAT CODE TRACEABILITY

CORRECTIVE ACTION PROGRAM PLAN

REVISION LOG

REVISION LEVELS	DATE	AFFECTED PAGES	DESCRIPTION OF REVISION
1	06/17/89	2	To allow exception for NDE on piping being eliminated from system
		3	To delineate NDE requirements and incorporate statistical sampling
		3	To eliminate redundant discussion on ASTM piping material
		4	To include titles of specified procedures
		8, 9, 10	Updated flow charts to be consistent with the text

HEAT CODE TRACEABILITY

CORRECTIVE ACTION PROGRAM PLAN

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HEAT CODE TRACEABILITY
CORRECTIVE ACTION PROGRAM PLAN

1.0 INTRODUCTION

Potential traceability problems have been identified with the following pressure-retaining materials used in American Society of Mechanical Engineers (ASME) applications:

- loose piping
- fittings
- flange bolting

This Corrective Action Program (CAP) addresses traceability of loose piping and fittings for pressure-retaining materials, as well as welded attachments. Issues regarding traceability of flange bolting will be addressed in other Watts Bar Nuclear Plant (WBN) programs.

Traceability issues were identified and documented in 1985 at WBN during a review of ASME Section III N-5 data packages (see Exhibit A). Subsequently, these issues were identified through employee concerns and Conditions Adverse to Quality Reports (CAQRs). The Employee Concerns Special Program (ECSP) material control category report gives additional background information on these issues (Reference 1). Attachment 1 is a listing of employee concerns Corrective Action Tracking Documents (CATDs) and CAQRs that identify these material traceability issues.

Material traceability of applicable loose piping material and American Society for Testing and Materials (ASTM) attachment material installed in ASME piping systems is maintained by certified material test reports (CMTRs). CMTR information is recorded either in the WBN heat code data base (HCDB) (see Exhibit A) or on receipt inspection records (TVA form 209) (see Exhibit A).

The root causes of the issues identified are as follows:

- TVA procedures controlled ASME loose piping material by heat numbers rather than by code class. Since heat numbers are not unique to one class of material, it is not possible to determine the acceptability of material based solely on identification by heat code number.
- Adequate engineering requirements for reclassification of material were not provided, resulting in a reclassification program that did not address all required attributes.

This CAP considers results of a similar program implemented at the Sequoyah Nuclear Plant (SQN) which addressed material traceability concerns. This CAP accounts for lessons learned at SQN and the different licensing requirements for WBN.

2.0 OBJECTIVE

The objective of this CAP is to assure that WBN licensing requirements regarding traceability of loose piping material and ASTM attachment material installed in ASME applications are met. Changes to licensing commitments will be made only when technically justified.

3.0 SCOPE

The traceability concerns addressed in this CAP are limited to loose piping material and ASTM attachment material installed in WBN unit 1 and common ASME piping systems.

The traceability concerns are categorized as follows:

- ASME Class 1 systems that may contain ASME Class 2, ASME Class 3, and/or ASTM piping.
- ASME Class 2 systems that may contain Class 3 piping.
- ASME Class 2 and ASME Class 3 systems that may contain ASTM piping.
- ASME systems that may have ASTM plate material attached (welded).

4.0 PROGRAM DESCRIPTION

Activities to be performed during this program are outlined schematically in the flowcharts shown as Attachment 2. Specific activities required for closure of the CAQRs are detailed on the fragnet in Attachment 3. These activities are further described herein to address the concerns with heat code traceability.

4.1 Program Phases, Major CAP Elements, and Evaluations

Accuracy of the information currently contained in the HCDB will be verified by comparing information on CMTRs to that in the HCDB. Both the HCDB and the receipt inspection documents (TVA form 209s) will be used to determine applications where ASME material with different classifications has identical heat numbers, and ASTM material which was reclassified for ASME application.

4.1.1 ASME Code Class 1 Piping

Class 1 piping material is required to have 100 percent surface nondestructive examination (NDE) performed. Traceability to manufacturer's CMTRs (and, thus, verification of NDE) could not be demonstrated for those Class 1 materials with the same heat numbers as Class 2, Class 3, and/or ASTM materials. To satisfy Class 1 NDE requirements, liquid penetrant examinations have been or will be performed for all such material installed in Class 1 applications. Examinations will not be performed on Class 1 materials which will be eliminated or replaced before operation of WBN unit 1 (Reference 2).

For some examinations already performed, obstructions prevented examination of the entire outer surface of some piping. Inaccessible locations will be correlated with piping stress analyses to determine if alternate requirements of paragraph NB-3673 of Section III of the ASME Code are satisfied. NB-3673 permits the use of reduced allowable stresses in lieu of examination. For cases where the provisions of NB-3673 are satisfied, no further examination will be performed. Otherwise, the accessibility of the locations will be reassessed.

Where feasible, obstructions will be temporarily removed to afford 100-percent examination of Class 1 material. TVA CMTRs (see Exhibit A) will be initiated and submitted to the Authorized Nuclear Inspector (ANI) for cases where examinations were performed. Material rejected by examination will be replaced.

Material that cannot reasonably be made accessible for examination will be evaluated for acceptability. Deviations from ASME Code requirements that can be technically justified will be proposed as Final Safety Analysis Report (FSAR) changes. Material which cannot be justified for acceptability will be replaced.

4.1.2 ASME Code Class 2 and Class 3 Piping

Certain product forms, e.g., seam welded piping without filler metal, are required by either the Material Specification (ASME Code Section II) or ASME Code Section III to have NDE performed for use in ASME Class 2 and Class 3 applications. All materials installed in locations with stress ratios (as defined by the piping "Analysis of Record") exceeding 0.80 for welded carbon steel and 0.85 for welded stainless steel will have the required NDE reverified or performed in accordance with the appropriate ASME Section III requirements. In addition, ASTM, ASME Section II and ASME Section III materials which have been upgraded to ASME Section III Class 2 and Class 3 will be reverified as meeting all other requirements of the ASME Code (Section III) on a statistical sampling basis. If a particular technical attribute of a sampled item is found to be discrepant, that particular attribute will be isolated and verified for the entire population. The statistical sampling plan to be implemented will be in accordance with Watts Bar Engineering Procedure (WBEP) 3.15, "Reverification/Reinspection Sampling," and will verify with 95 percent confidence/95 percent reliability that the populations sampled meet the requirements of the ASME Code.

The following attributes will be considered in reverifying compliance with the ASME Code:

- Requirements of the material specification.
- The ASME Section III Code requirements related to Quality Assurance and design.

Statistical sampling will be applied to the following populations separately:

- Materials identified as "upgraded" in the HCDB, and identified in previously issued nonconformance reports (NCRs); population size approximately 1500.

- Materials upgraded upon receipt on TVA Forms 209; population size approximately 2000.

Heat numbers will be randomly selected from the two populations and will be considered sample items. CMTRS will be retrieved for the sample item heat numbers and evaluated using the following acceptance criteria:

- The requirements of Section III of the ASME Code shall be met, and

- The requirements of the Material Specifications in Section II of the ASME Code shall be met.

Provisions for the use of editions and addenda of the ASME Code later than the WBN Code of Record (1971 through Summer 1973 Addenda) and Code Cases will be used within the limitations of Subsection NA 1140, 1971 Edition through Summer 1973 Addenda, and in accordance with Watts Bar Engineering Procedure (WBEP) 3.18 "Use of Later Editions and Addenda and Code Cases to the ASME Code."

Engineering evaluations may be performed on noncomplying sample items in order to provide technical justification for acceptance of the material. Use of this material will be documented as an exception or deviation to the ASME Code and submitted as an FSAR revision request. Material determined to be unacceptable will be located and replaced.

4.1.3 ASTM Plate Material

ASTM plate attachment material used in ASME applications will be identified. The acceptability of ASTM material will be determined by verifying the material has an equivalent ASME specification, was supplied with an acceptable Quality Assurance program, and had the necessary NDE performed as applicable for the particular ASME applications. TVA CMTRs will be initiated when necessary and submitted to the ANI. Deviations from the ASME Code will be dispositioned as described in last paragraph of Section 4.1.1.

4.2 Recurrence Control

A programmatic review of documentation related to material traceability has been performed (reference 3). The following recurrence control measures have been taken to address the two root causes defined in Section 1.0:

- Site implementing procedures WBN-QCP-1.50 "Material Verification and Validation" (superseded by WBN-QCIP-U07-0001 "Heat Number Transfer and Material Verification/Validation") and WBN-CEP-1.46 "Material Upgrading" were revised to require CMTR traceability of material to be installed. The subject material markings will be verified to include ASME Code class and heat identification that is traceable to the CMTR. This applies to new procurements as well as existing warehouse inventory.

- General Construction Specification G-62 "Material Documentation and Acceptability Requirements for ASME Section III Applications" was revised to include specific WBN ASME Section III requirements for reclassification of material.

4.3 Licensing Assessment

Sections of the FSAR applicable to material traceability will be revised as necessary to clearly indicate WBN's Code of Record. Technically justified FSAR revisions will be submitted to the NRC, if required, to incorporate any exceptions to the ASME Code.

5.0 PROGRAM INTERFACES

Two types of program interfaces were considered: production and programmatic. Production interfaces are those interfaces with other programs where one program's output impacts the scope of another program, but does not impact program methodology. Programmatic interfaces with other programs are those interfaces where one program's methodology or progress is contingent upon or at risk with respect to another program.

5.1 Production Interfaces

Piping stresses calculated in the Hanger and Analysis Update Program (HAAUP) CAP will be used in the assessment of reduced allowable stresses in lieu of examination for ASME Class 1 material.

5.2 Programmatic Interfaces

None.

6.0 PROGRAM IMPLEMENTATION

Implementation of this program is the responsibility of Nuclear Engineering (NE). Nuclear Support (NS) will retrieve the necessary documents. Nuclear Construction (NC) and Nuclear Quality Assurance (NQA) will perform the necessary inspections as specified by NE. Verification of the heat code data base will be performed by NQA.

7.0 PROGRAM DOCUMENTATION

The CAP activities described in Section 4.0 will be performed according to detailed work plans. Material qualification documents will be maintained as QA records, and open CAQRs and CATDs will be processed according to existing TVA procedures. A final report will be prepared upon completion of all CAP activities.

8.0 CONCLUSIONS

This program will assure that the unit 1 piping and attachment materials of concern are in compliance with licensing requirements. Technically justified changes to the licensing commitments will be proposed where required and the FSAR will be revised accordingly. Improvements have been made to ensure material traceability is maintained for future installations of ASME Code and reclassified ASTM material.

9.0 REFERENCES

1. Memorandum from W. R. Brown, Jr. to Those listed, "Employee Concerns Task Group (ECTG) - Coordination Review of the Employee Concerns Special Program (ECSP) Material Control Category Report" (T25 880205 844).

2. Engineering Change Notice No. 6661 to Replace the Resistance Temperature Detector (RTD) Bypass System (B26 870615 500).

3. Memorandum from H. B. Bounds to R. A. Pedde, "Watts Bar Nuclear Plant - Programmatic Review for Material Control Employee Concerns" (B26 880614 013).

Exhibit A

GLOSSARY OF TERMS

TVA CMTR -	A TVA Certified Materials Test Report prepared in accordance with procedure WBN-CEP-1.46. TVA CMTRs are filed in the Document Control and Records Management (DCRM) section with a copy of the vendor Mill Test Report (MTR), Manufacturer's Certified Material Test Report (CMTR), and/or Certificate of Compliance (COC) attached thereto.
N-5 Data Package -	Documentation which demonstrates that nuclear piping systems have been constructed in accordance with requirements of Section III of the ASME Code.
Heat Code Data Base -	A computerized index of information obtained from CMTRs.
TVA Form 209 -	A report written upon receipt of materials to document that material received meets the contract requirements. Note: These reports also recorded material reclassified to a higher classification upon receipt.

Attachment 1

BASIS FOR CAP

CATDs	SUMMARY DESCRIPTION
80104-WBN-01	Unverified vendor QA program
40700-WBN-02	Material upgrade/reclassification
40700-WBN-03	
40700-WBN-04	
40700-WBN-05*	
40700-WBN-06	
40700-WBN-07*	
40700-WBN-08	Heat code traceability
40700-WBN-09*	
40700-WBN-10*	
40700-WBN-11	
40700-WBN-12	
40700-WBN-13	
40700-WBN-14*	
40700-WBN-15*	
40700-WBN-16*	
40700-WBN-17*	

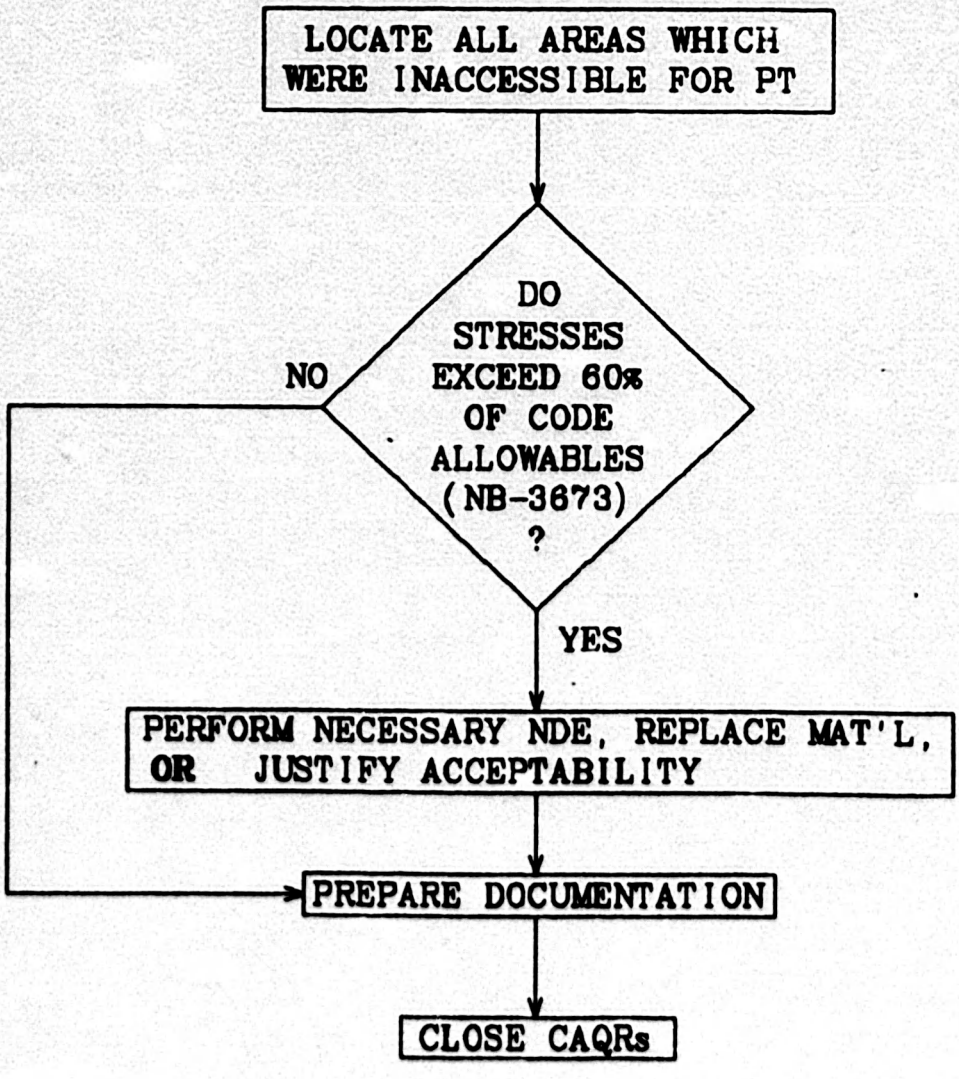
CAQRs	SUMMARY DESCRIPTION
WBP 880432	Non-Class 1 material installed in Class 1 applications
WBP 880431	Class 3 material installed in Class 2 applications
WBP 880433	ASTM material installed in ASME application without verifying acceptable ASME QA Program by manufacturer
WBP 880437	ASTM material installed as attachments to ASME piping

*CATD was closed upon completion of recurrence control activities and does not contribute to the basis for this CAP.

ASME CLASS 1 PIPING

Concern/Problem: ASME Class 1 systems may contain ASME Class 2 , ASME Class 3, and/or ASTM piping.

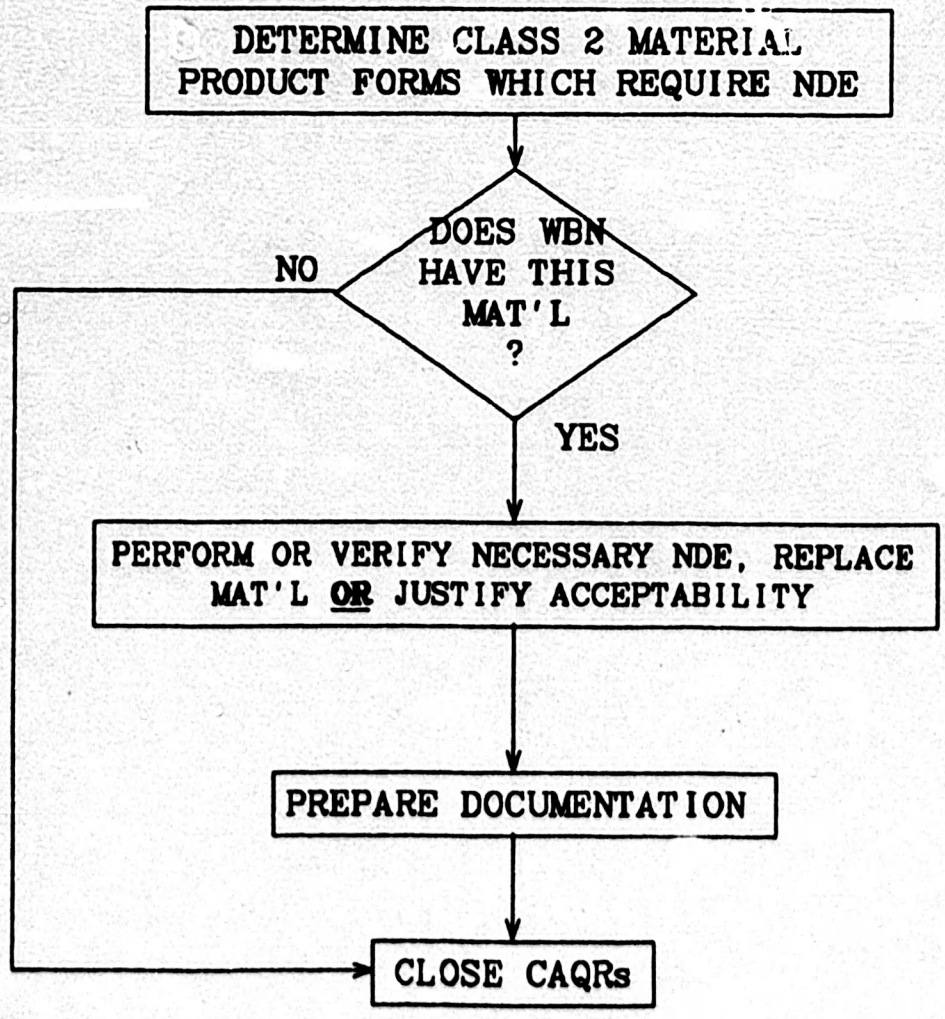
Approach:



ASME CLASS 2 PIPING

Concern/Problem: ASME Class 2 systems that may contain ASME Class 3 piping

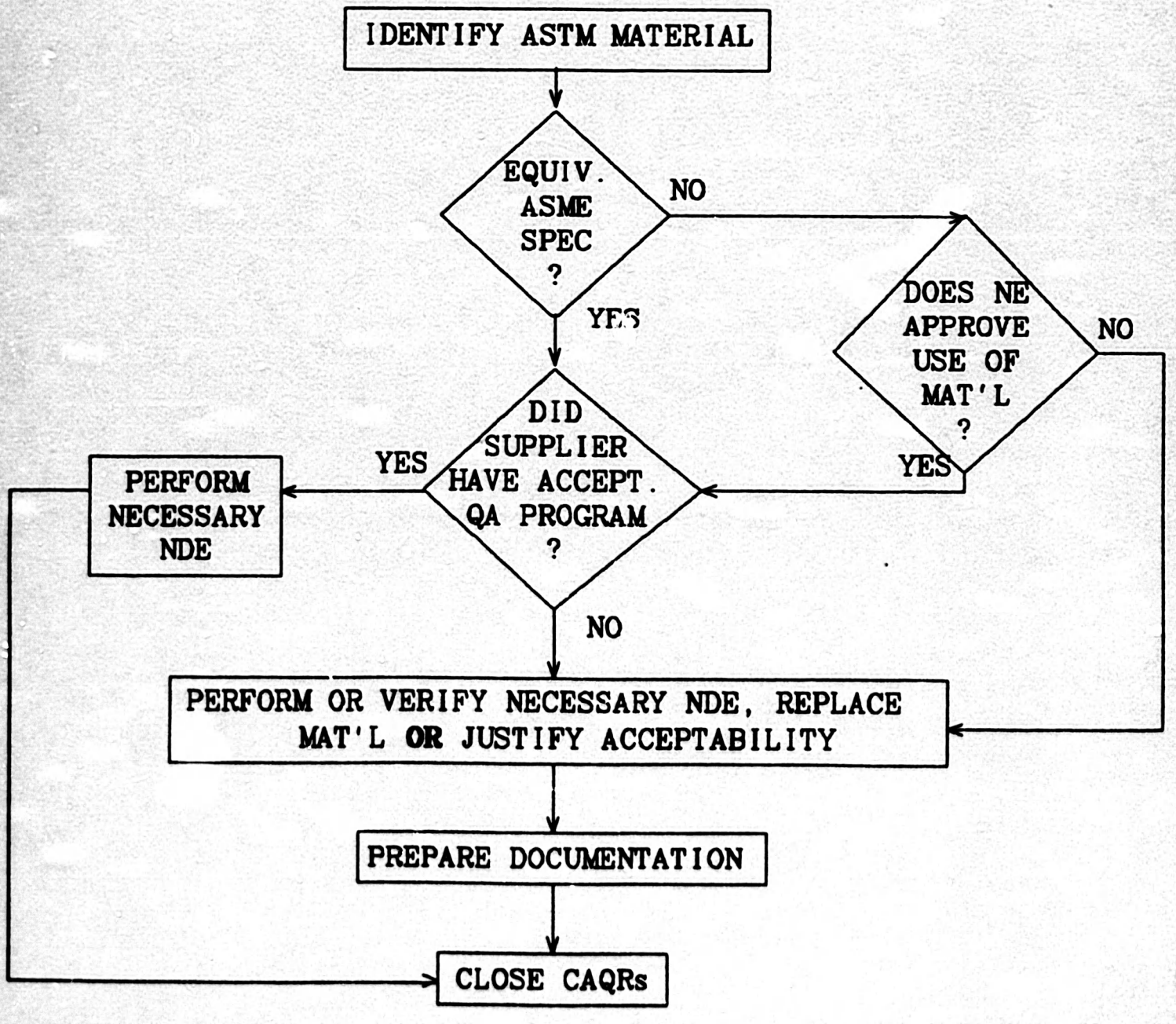
Approach:



ASTM PIPING

Concern/Problem: ASTM Piping material possibly installed in ASME Classes 2 and 3.

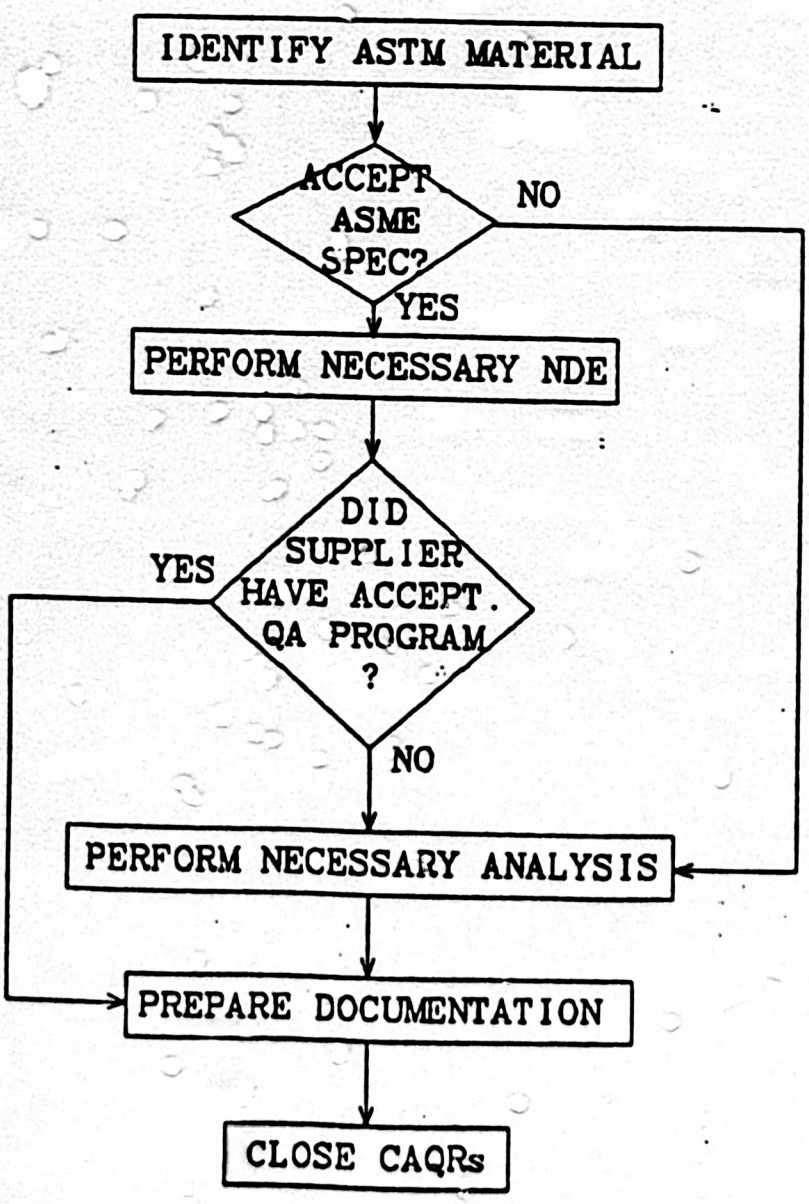
Approach:



ASTM ATTACHMENTS

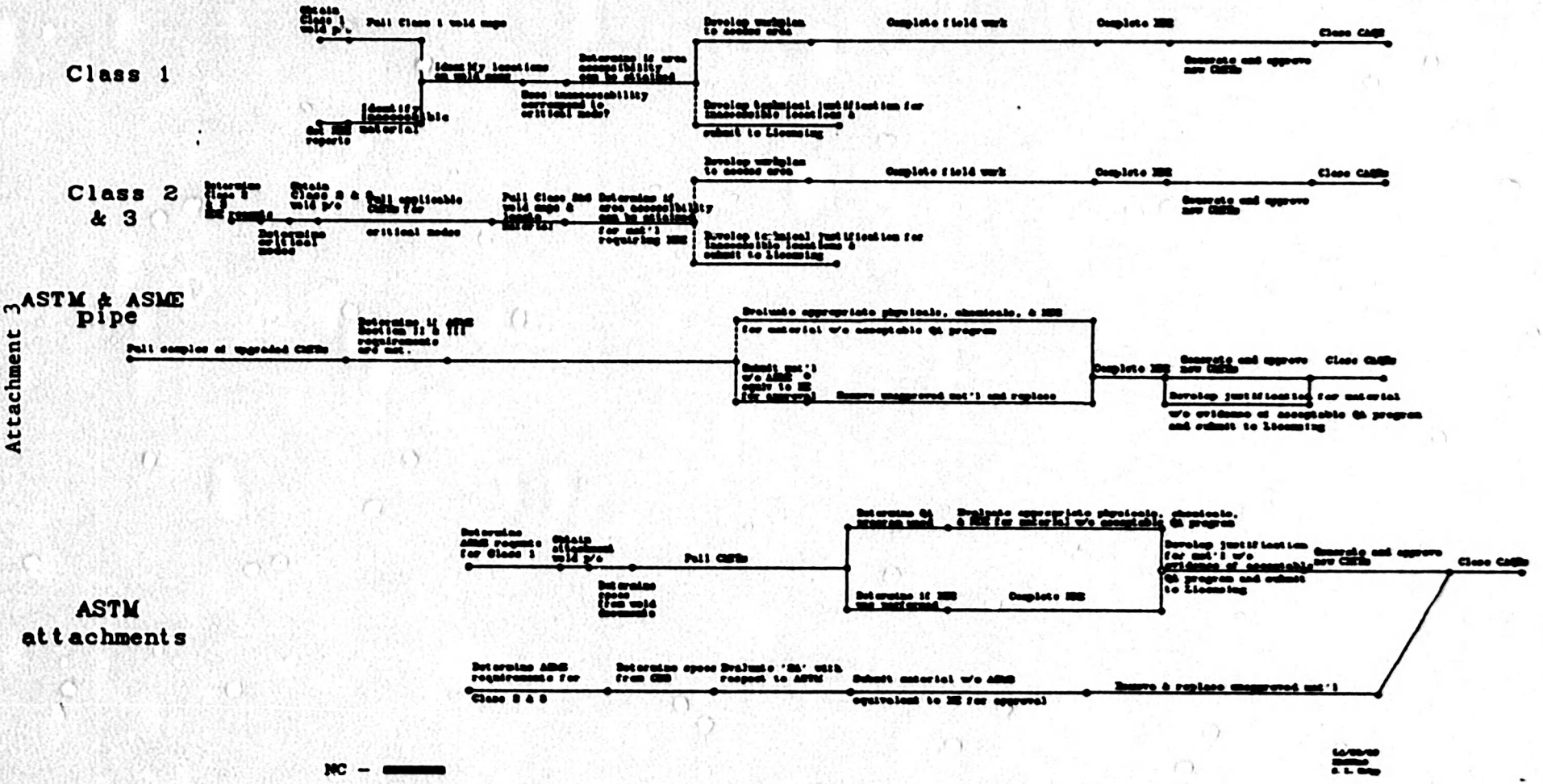
Concern/Problem: ASTM material used as attachments to ASME piping without proper upgrading

Approach:



MATERIAL TRACEABILITY

Attachment 3



ENCLOSURE 2

LIST OF COMMITMENTS

- Accuracy of the information currently contained in the heat code data base (HCDB) will be verified (see section 4.1 of the corrective action program [CAP] plan).

- Both the HCDB and the receipt inspection documents (forms TVA 209) will be used to determine applications where the American Society of Mechanical Engineers (ASME) material with different classifications has identical heat numbers and the American Society for Testing of Materials (ASTM) material which was reclassified for ASME application (see section 4.1 of the CAP).

- To satisfy class 1 nondestructive examination (NDE) requirements, liquid penetration examinations have been or will be performed for all such material installed in class 1 applications. Examinations will not be performed on class 1 materials which will be eliminated or replaced before operation of WBN unit 1 (see section 4.1.1 of the CAP).

- All materials installed in locations with stress ratios exceeding 0.80 for welded carbon steel and 0.85 for welded stainless steel will have the required NDE reverified or performed in accordance with the appropriate ASME Section III requirements (see section 4.1.2 of the CAP).

- ASTM, ASME Section II, and ASME Section III materials which have been upgraded to ASME Section III, class 2 and class 3, will be reverified as meeting all other requirements of the ASME Code (Section III) on a statistical sampling basis (see section 4.1.2 of the CAP).

- ASTM plate attachment material used in ASME applications will be identified. The acceptability of ASTM material will be determined by verifying the material has an equivalent ASME specification, was supplied with an acceptable quality assurance (QA) program, and had the necessary NDE performed, as applicable for the particular ASME applications (see section 4.1.3 of the CAP).

- Sections of the Final Safety Analysis Report (FSAR) applicable to material traceability will be revised as necessary to clearly indicate WBN's Code of Record (see section 4.3 of the CAP.)