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

August 5, 1992

Docket Nos. 50-259, 50-260,
and 50-296

LICENSEE: Tennessee Valley Authority

FACILITY: Browns Ferry Nuclear Plant, Units 1, 2, and 3

SUBJECT: SUMMARY OF THE JULY 15, 1992 MEETING WITH THE TENNESSEE VALLEY AUTHORITY REGARDING THE REACTOR VESSEL INSPECTIONS AT THE BROWNS FERRY NUCLEAR PLANT, UNITS 1, 2, AND 3

On July 15, 1992, representatives of the NRC staff and the Tennessee Valley Authority (TVA) met at the NRC headquarters in Rockville, Maryland. This meeting was held to discuss TVA's planned augmented reactor vessel inspections at the three reactors at the Browns Ferry Nuclear Plant (BFN). TVA plans to inspect BFN Unit 3 late this year. BFN Unit 1 will be inspected in early 1993, and BFN Unit 2 will be inspected thereafter during it's upcoming refueling outage, which is scheduled to begin January 29, 1993. Meeting attendees are listed in Enclosure 1. A copy of the handouts used for TVA's presentation is provided in Enclosure 2.

TVA requested this meeting because of their concern that the planned inspections may be premature, considering that there is a forthcoming rule that will require similar inspections. TVA does not wish to perform an extensive and expensive inspection campaign, and then be compelled to repeat the inspections in order to comply with the rule. The staff noted that the new requirements are expected to be published in about a month.

John Self, of General Electric (GE), outlined the technique planned for the inspections, using the GERIS 2000 inspection machine. This machine can perform inspections of about 80 percent of the reactor vessel welds. This estimate is based on a GE review of the vessel and its internal equipment. The staff noted that the proposed rule requires essentially 100 percent weld inspection, but the rule provides a mechanism for granting relief.

The attendees then discussed the schedular requirements. For BFN Units 1 and 3, the planned augmented inspections fall at the end of the current 10-year inservice inspection (ISI) interval. It is not expected that TVA will be required to repeat these extensive inspections in the near term, assuming the inspections meet regulatory requirements. Future inspections will be performed during the upcoming intervals in accordance with the appropriate sections of the ASME code.

BFN Unit 2 is currently early in its second 10-year ISI interval. The planned augmented inspections may be a sufficient substitute for the routine

inspections. TVA will need to submit a relief request for staff approval of this substitution. It is not expected that TVA will be required to repeat the augmented BFN Unit 2 inspection in the near term. TVA representatives stated they would submit a description of their inspection plans for all three BFN units in the near future.

Joseph F. Williams

Joseph F. Williams, Project Manager
Project Directorate II-4
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosure:
1. Attendance List
2. TVA's Presentation Handouts

cc w/enclosures:
See next page

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Original signed by

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Enclosure 1

ATTENDEES

BROWNS FERRY REACTOR VESSEL INSPECTION

JULY 15, 1992

NAME	ORGANIZATION
Ike Zeringue	TVA/VP Browns Ferry Operations
Raul R. Baron	TVA/Browns Ferry Licensing
Gerald Turner	TVA/Site Quality Manager
Fd Hartwig	TVA/Browns Ferry Project Mgmt.
Ricky Seals	General Electric
John W. Self	General Electric
B. D. Liaw	NRC/NRR/DET
Gus Lainas	NRC/NRR/DRPE/ADR2
W. Bateman	NRC/NRR/DET/EMCB
R. Crlenjak	NRC/OEDO
George Johnson	NRC/NRR/DET/EMCB
Martin Hum	NRC/NRR/DET/EMCB
David E. Smith	NRC/NRR/DET/EMCB
Gil Millman	RES/DE/EMEB
Thierry Ross	NRC/NRR/DRPE/PD II-4
Joe Williams	NRC/NRR/DRPE/PD II-4

GE Inspection Services

Reactor Pressure Vessel Examination Program ...

The Browns Ferry Plan

July 15, 1992

Technology Challenges for BWR ID Examinations

The BWR Vessel was not designed to be examined from the inside surface

- Ultrasonic technology advances are required.
  - Clad surface roughness
  - Accurate flaw detectability & signal characterization

- Application of underwater robotics
  - Difficulty working around vessel internals remotely underwater
  - Tool reliability

The Challenge is:

- ***Assuring the accuracy of recorded data***
- ***Being prepared to manage findings***
- ***Reliability of tooling***

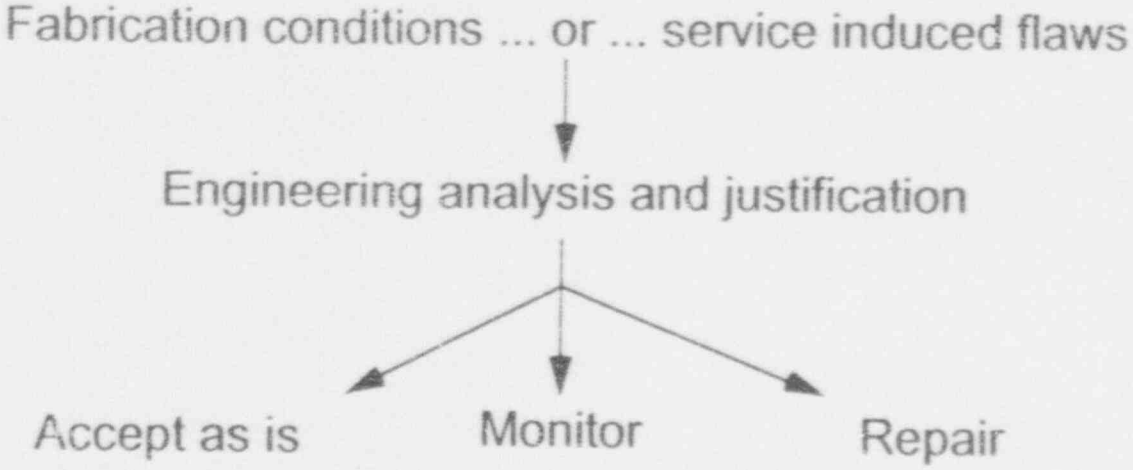
Data Management Challenges

Primarily the previous examinations of these RPVs were their Preservice examinations

The quality and completeness of older data is questionable

..... Indications will probably be recorded

The QUALITY of data will be the primary factor in the proper dispositioning reportable indications, determining:



Technical Approach

1 - Define and specify System capability and performance requirements.
Examples:

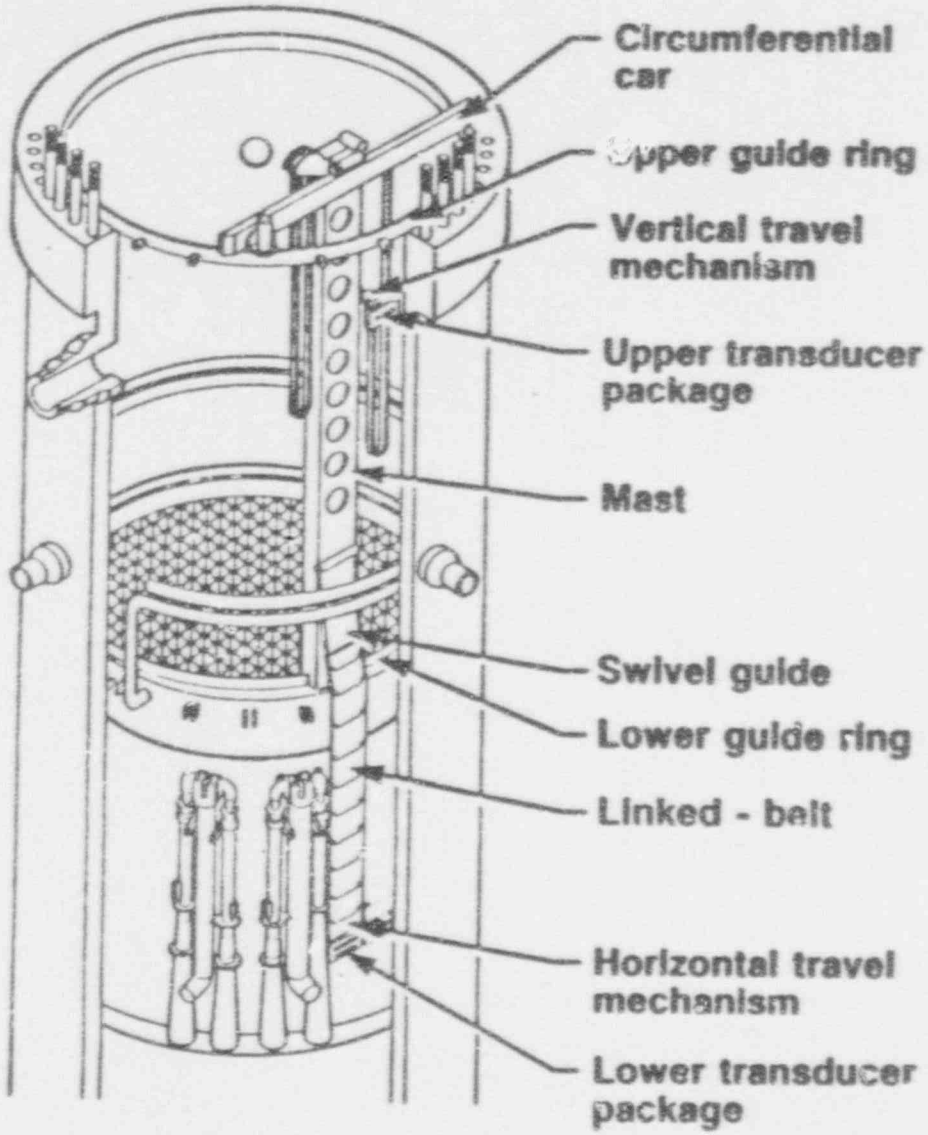
- Completely record all RF data and store on optical disks
- Capable of operation by experienced UT operators not computer experts
- Offline data analysis with separate software tools for analysis
- Able to examine all accessible shell welds in ten days
- Size of inspection head to meet access restrictions (<2" height)
- Capable of operation in parallel with refueling
- Perform complete examination without removing manipulator from reactor vessel
- Versatility for future internal component examinations

2 - Select sources of new technology

- ID Manipulator - MAN Energie
- Ultrasonics - GE CR&D
- Data Acquisition & Analysis - GE Nuclear

System designed to meet Plant needs with "World-Class" technology

ID Manipulator



UT Imaging System

FEATURES:

- Complete digital control of ultrasonics & manipulator
- Optical disk data storage
- High resolution, user friendly data analysis
- GE designed low noise ultrasonics
- 16 UT channels available for efficient data collection
- Digital recording of RF waveforms for all channels

BENEFITS:

- Fast data collection, critical path savings
- Efficient data analysis

- Images improve quality and reliability of analysis

- Operation is reliable and designed for UT operators

- Manipulator & UT Data acquisition components integrated into an efficient system

Browns Ferry Plan for RPV Examination

Objective: To meet RPV examination requirements in a manner that assures high quality data and minimizes plant impact

Our Approach:

1 - Inspectability Study

2 - Examination Plan

3 - Examination & Evaluation

Phase 1 - Inspectability Study

- Review available RPV drawings
- Determine preliminary examination access

Site Trip

- On-site study
  - Perform in-vessel study to determine restrictions / obstructions
  - Assess general clad condition
  - Determine logistics of performing examination
- Prepare report
  - Color-coded vessel map showing expected examination coverage
  - Logistics plan for equipment entry, assembly, & use
  - Determine extent of examination coverage

Inspectiability studies have been completed for all three Units

Phase 2 - Examination Plan - Description

- Assemble history of vessel
  - Review original construction records
  - Review original inspection records (including radiographs)
  - Review PSI / ISI data
  - Identify vessel repair areas
  - Review surveillance sample results
- Establish integrated vessel examination program
  - Identify specific Plant regulatory requirements & commitments
  - Incorporate examination procedures and scan plans
  - Develop schedule that integrates examinations with other Plant activities
  - Prepare relief requests for the inaccessiable weld areas
- Prepare evaluation plan to resolve examination findings
  - Flow chart for decision analysis and action plan
  - Flaw evaluation handbook

Phase 2 - Examination Plan - Goals

- Identifies areas with high potential for UT reflectors
- Identifies areas with repair histories requiring examination
- Integrates planned RPV inspections with other Plant activities
- Establishes a path for retrievability of records
- Provides a logical approach to handling indications
  - Flaw evaluation models contingency program
- Provides a vehicle to communicate plans with the NRC

Provides a tools for planning & managing the Vessel Examinations

Phase 3 - Integrated Examination

- Examinations to be conducted in accordance with Examination Plan
- Examinations will be performed with best available technology to assure high quality of data and reliability of equipment
- Meet all examination requirements with minimal impact on other plant activities
- Position ourselves to efficiently address indications & dispositions

Nuclenor Qualification

- Blind block qualification test conducted prior to the Utility allowing examinations to begin

- Test conducted in a vessel mockup with a test specimen containing underclad, mid-wall, and OD flaws of various depths

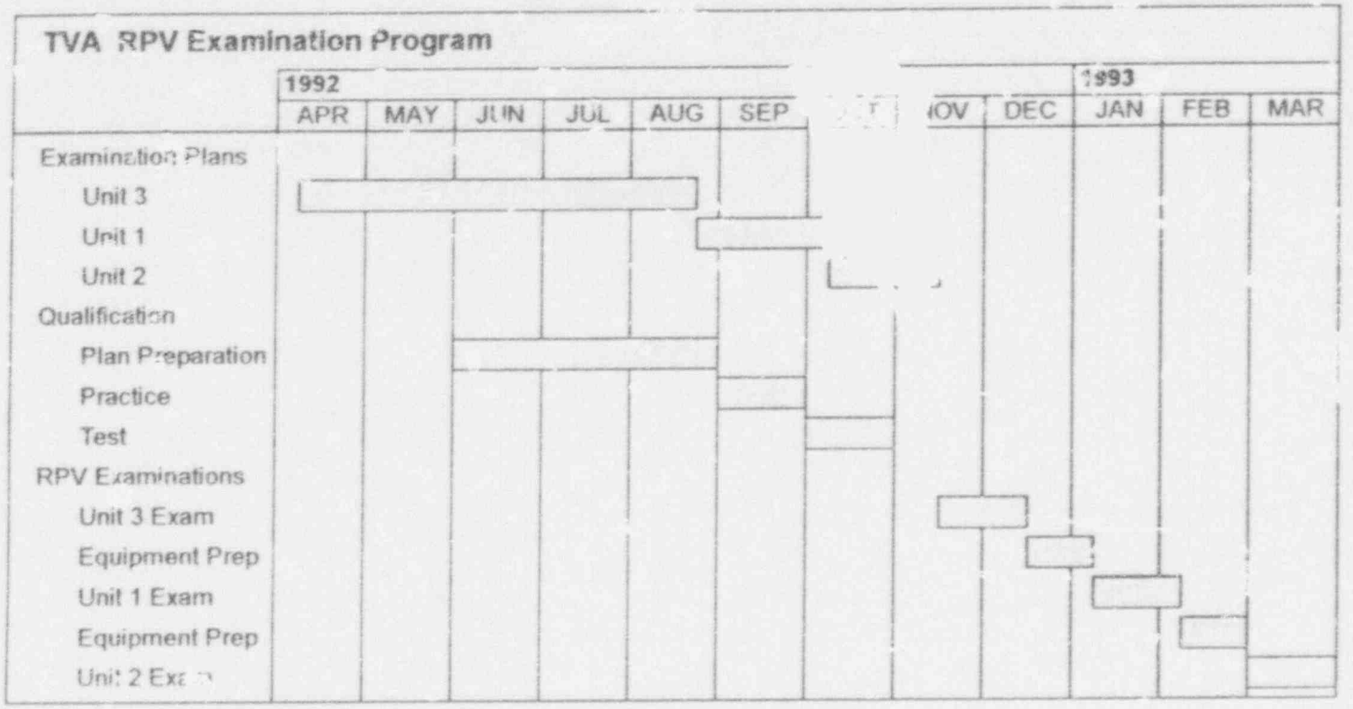
- Test specimen had eighteen flaws, test result correlated extremely well
  - Detection exceeded Appendix VIII acceptance requirements
  - Depth sizing met Appendix VIII
  - Had difficultly with length sizing of OD flaws

TVA Qualification Plan

- Written Qualification plan being prepared to meet the technical intent of Appendix VIII:
  - Test specimens & procedure
  - Essential variables for procedures & equipment
- Qualification will include performance demonstration using "blind test specimens
  - Test specimens
    - Utilize EPRI blocks for underclad (Supplement 4)
    - GE to purchase blocks with mid and outter wall flaws (Supplement 6)
  - TVA will administer test
  - TVA / EPRI will control keys to flaw locations
  - TVA will evaluate pass / fail
- Practice will occur during September and testing in October
- Report will be prepared to document results

Goal: Assure adequacy of examination data through a successful performance demonstration

Projected Schedule



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