

✓ 405/JK/87/01/09?

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JAN 16 1987

MEMORANDUM FOR: John J. Linehan, Acting Chief  
Repository Projects Branch, DWM

FROM: James E. Kennedy, Section Leader  
Repository Projects Branch, DWM

SUBJECT: SUMMARY OF MANAGEMENT MEETING WITH DOE HEADQUARTERS,  
DECEMBER 22, 1986

NRC management met with DOE Headquarters and contractor personnel on Monday December 22, 1986 from 9 a.m. - 12 noon to review power reactor QA program lessons learned and improved inspection programs now being utilized by the NRC for power reactors. In attendance were the following personnel:

NRC	DOE
R. Browning, DWM	S. Kale, OGR
M. Bell, DWM	J. Knight, OGR
J. Linehan, DWM	M. Frei, OGR
H. Miller, IE	A. Jelacic, OGR
R. Heishman, IE	C. Newton, OGR
J. Kennedy, DWM	M. Langston, OCRWM
S. Coplan, DWM	D. Brown, Weston
R. Johnson, DWM	L. Skoblar, Weston
J. Donnelly, IE	

Summary:

The attached handouts summarize the presentation made at the meeting.

**ORIGINAL SIGNED BY**

James E. Kennedy, Section Leader  
Repository Projects Branch, DWM

Enclosure:  
As stated

WM Record File 405 WM Project 1  
 Docket No. \_\_\_\_\_  
 PDR  \_\_\_\_\_  
 LPDR \_\_\_\_\_

Distribution: \_\_\_\_\_  
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**POWER REACTOR  
LESSONS LEARNED  
AND NRC TECHNICAL  
INSPECTION  
TECHNIQUES**

**DECEMBER 22, 1986**

**H. MILLER  
R. HEISHMAN  
F. HAWKINS**

## POWER REACTOR EXPERIENCE

IN RECENT YEARS, QUALITY OR QUALITY ASSURANCE PROBLEMS HAVE BEEN IDENTIFIED AT A NUMBER OF POWER REACTORS UNDER CONSTRUCTION OR IN OPERATION.

- ZIMMER
- MIDLAND
- MARBLE HILL
- SOUTH TEXAS
- DIABLO CANYON
- COMANCHE PEAK
- TVA - WATTS BAR
- TVA - SEQUOYAH
- TVA - BROWNS FERRY
- TMI
- RANCHO SECO
- DAVIS BESSE

### THE IMPACT OF THESE PROBLEMS INCLUDES:

- DELAYED PROJECTS
- CANCELLED PROJECTS
- INCREASED COSTS
- SHUT DOWN PLANTS
- EROSION OF PUBLIC AND CONGRESSIONAL CONFIDENCE IN THE NUCLEAR INDUSTRY AND ITS REGULATORS

## POWER REACTOR EXPERIENCE

QUALITY AND QUALITY ASSURANCE PROBLEMS SUCH AS THESE HAVE BEEN THE SUBJECT OF EXTENSIVE REVIEW, ANALYSIS, AND CORRECTIVE ACTION BY THE NRC AND THE INDUSTRY.

- KEMENY COMMISSION
- SALEM ATWS TASK FORCE
- FORD AMENDMENT STUDY
- TVA LESSONS LEARNED REPORT

### COMMON THREADS RUNNING THROUGH THESE ANALYSES:

- WRITTEN QA PROGRAM BASICALLY ADEQUATE, IMPLEMENTATION INADEQUATE
- FOCUS OF QA IMPLEMENTATION ON PAPER AND PROGRAMMATIC ISSUES, NOT ON HARDWARE AND SAFETY ISSUES
- FAILURE OF MANAGEMENT TO ASSUME RESPONSIBILITY FOR QUALITY AND TO USE THE QA PROGRAM AS A MANAGEMENT TOOL
- LENGTHY REPORTING CHAINS THAT ATTENUATED BAD NEWS AS IT TRAVELED UPWARD
- FALSE SENSE OF SECURITY BASED ON PAST SUCCESS IN FOSSIL AND ALTERNATE ENERGY SOURCES

## GENERAL APPLICABILITY OF POWER REACTOR EXPERIENCE

THE LESSONS OF THE FORD AMENDMENT STUDY APPLY MORE BROADLY THAN JUST TO POWER REACTOR DESIGN AND CONSTRUCTION

THE LESSONS APPLY TO ANY PROJECT WITH THE FOLLOWING CHARACTERISTICS:

- LARGE
- COMPLICATED
- INVOLVES HIGH TECHNOLOGY
- HAS SEVERAL PHASES
- INVOLVES DIVERSITY OF TECHNICAL SPECIALTIES
- INVOLVES A NUMBER OF INTERFACES
- COST AND SCHEDULE PRESSURES

## FORD STUDY FINDINGS

### INEXPERIENCE

- LACK OF UNDERSTANDING OF PROJECT, OF REGULATORY REQUIREMENTS
- FAILURE TO TREAT NUCLEAR DIFFERENT FROM PAST PROJECTS
- INADEQUATE STAFFING
- OVER RELIANCE ON CONTRACTORS
- FAILURE TO RECOGNIZE SYMPTOMS
- MANY INTERFACES, COMPLEX FIRST OF A KIND PROJECT
- UTILITIES IN ROLES THEY HAD NOT ASSUMED BEFORE
- GLUT OF NEW ORDERS STRETCHED EXPERIENCE BASE -- MANY APPLICANTS FORCED TO USE INEXPERIENCED CONTRACTORS

### MANAGEMENT

- LACK OF INVOLVEMENT
- VIEW OF QA AS ANOTHER REGULATORY REQUIREMENT, NOT AS MANAGEMENT TOOL TO ASSURE COMPLETION OF COMPLEX PROJECT AND AS NECESSARY FOR LICENSING
- FALSE SENSE OF SECURITY, UTILITY INERTIA
- SLOW TO DIAGNOSE PROBLEMS, TAKE EFFECTIVE CORRECTIVE ACTION
- RELIANCE ON NRC TO DETECT PROBLEMS
- FAILURE TO RECOGNIZE ACHIEVEMENT OF QUALITY IS MANAGEMENT'S (LINE) RESPONSIBILITY
- FAILURE TO MANAGE ALL ASPECTS OF THE PROJECT

## FORD STUDY FINDINGS

### CHANGING ENVIRONMENT

- BIGGER, MORE COMPLEX PLANTS
- LONG CONSTRUCTION PERIOD
- DIFFICULT FINANCING FORCED STRETCHOUT
- CHANGING STATE OF ART
- CHANGING DESIGN REQUIREMENTS
- EVENTS
- CHANGING PUBLIC PERCEPTION OF NUCLEAR POWER
- MORE ACTIVE OPPOSITION - QA AND DOCUMENTATION AN ISSUE

### NRC

- SLOW TO DIAGNOSE PROBLEMS AND TAKE ACTION
- SPORADIC, NON-CONSTANT PRESENCE OF INSPECTORS
- PROGRAMMATIC QA ORIENTATION
- CHANGING REQUIREMENTS
- QA CAME ACROSS AS A PAPER REQUIREMENT, NOT AS A MANAGEMENT TOOL
- FAILURE TO ADEQUATELY SCREEN FOR EXPERIENCE, MANAGEMENT CAPABILITY
- ASSUMPTION OF UNIFORM LEVEL OF INDUSTRY COMPETENCE

## TVA LESSONS LEARNED

- ALL TVA FIVE OPERATING PLANTS SHUT DOWN; WATTS BAR UNLICENSED
- SOME FEATURES OF BREAKDOWN
  - INADEQUATE TECHNICAL PERFORMANCE; E.G.
    - DESIGN CONTROL
    - STRUCTURAL WELDING
    - EQUIPMENT QUALIFICATION
  - MANAGEMENT FAILED TO TAKE CORRECTIVE ACTION ON IDENTIFIED PROBLEMS
  - NUMEROUS EMPLOYEE CONCERNS (WATTS BAR)
    - IDENTIFIED IN PROCESS BUT NOT ADEQUATELY ADDRESSED
    - MAJORITY CONFIRMED AFTER PLANT NEARLY COMPLETE
- CONTRIBUTING FACTORS  
(PRELIMINARY NRC STAFF VIEWS IN SECY-86-334):
  1. TVA
    - LACK OF LEADERSHIP AND BREAKDOWN IN TVA MANAGEMENT CONTROL OF AND COMMUNICATION WITH ITS EMPLOYEES
    - PRACTICES THAT CONTRIBUTED TO PAST SUCCESSES IN OTHER AREAS DID NOT APPLY TO NUCLEAR
    - FRAGMENTED ORGANIZATIONAL STRUCTURE
    - SIGNIFICANT QA/QC PROBLEMS

**TVA LESSONS LEARNED**

**(CONTINUED)**

**2. NRC DEFICIENCIES WITH RESPECT TO:**

- **EARLY DETECTION AND ACTION WITH SENIOR LICENSEE MANAGEMENT ON POOR PERFORMANCE**
- **ASSESSMENT OF LICENSEE MANAGEMENT COMPETENCE AND PERFORMANCE**
- **ASSESSMENT OF BROAD IMPLICATIONS AND CUMULATIVE SIGNIFICANCE OF SPECIFIC TECHNICAL DEFICIENCIES**
- **CHECKING PROGRAM IMPLEMENTATION AND TECHNICAL PRODUCT AS OPPOSED TO JUST PROGRAM PLANS**
- **ALLOCATION OF RESOURCES TO PROBLEM AREAS**
- **ASSESSMENT OF LICENSEE CORRECTIVE ACTION PROGRAMS ONLY AFTER EXTENDED PERIOD OF FOLLOWUP**
- **NOT ACCEPTING PERFUNCTORY LICENSEE RESPONSES AND PERMITTING SLOW ACTION**

## NRC TECHNICAL INSPECTIONS

- **EXAMPLES OF NRC HQ TECHNICAL INSPECTIONS**
  - INDEPENDENT DESIGN INSPECTIONS
  - INDEPENDENT DESIGN VERIFICATION PROGRAM
  - ENGINEERING ASSURANCE PROGRAM
  - SAFETY SYSTEM FUNCTION INSPECTION
  - SAFETY SYSTEM OUTAGE MODIFICATION INSPECTION
  - CONSTRUCTION APPRAISAL TEAM INSPECTIONS
  
- **TECHNICAL EXPERTISE/EXPERIENCE**
  - INSPECTORS/AUDITORS HAVE EXTENSIVE EXPERIENCE AND EXPERTISE IN AREAS BEING REVIEWED
  
- **EXTENSIVE/DETAILED REVIEW**
  - VERTICAL SLICE TO EXAMINE DESIGN DETAILS
  - 10-15 PEOPLE ON TEAM
  - MULTIPLE WEEK/MONTH EFFORT
  
- **MULTI-DISCIPLINARY**
  - SAMPLE COVERS FULL SPECTRUM OF DESIGN ACTIVITIES
  - SCRUTINY OF INTERFACES AND PROGRAM INTEGRATION
  
- **HARD EXPERIENCE INDICATES TECHNICAL AUDITING IN ADDITION TO TECHNICAL VERIFICATIONS (QC) IS REQUIRED**
  
- **IDENTIFY BROAD IMPLICATIONS OF SPECIFIC FINDINGS; ADDRESS TO SENIOR UTILITY MANAGEMENT**

## READINESS REVIEW PROGRAM EXPERIENCE

- VOGTLE AND WNP-3 OBJECTIVE: PREDICTABILITY AND STABILITY IN LICENSING PROCESS
- STRUCTURED SYSTEMATIC SELF-ASSESSMENT PROGRAM
- FORCES EARLY AND ONGOING SENIOR MANAGEMENT INVOLVEMENT
- INCREMENTAL ACCEPTANCE OF WORK BY NRC AT PREDETERMINED KEY PROGRAM MILESTONES. FOR EXAMPLE, FOR EACH DISCRETE WORK ACTIVITY
  - PROGRAM PLAN/PROCEDURE STAGE
  - 10% IMPLEMENTATION
  - IN-PROCESS REVIEWS
  - FINAL REVIEW
- LICENSEE (GEORGIA POWER) VERY POSITIVE ON READINESS REVIEW CONCEPT