August 4, 1989

Docket Nos. 50-269, 50-270, 50-287
50-369, 50-370, 50-413
50-414

LICENSEE: Duke Power Company

FACILITIES: Oconee Nuclear Station, Units 1, 2, and 3
McGuire Units 1 and 2
Catawba Units 1 and 2

SUBJECT: SUMMARY OF JULY 28, 1989 MEETING ON DESIGN BASIS DOCUMENTATION PROGRAM

On July 28, 1989, representatives of Duke Power Company (DPC) made a presentation to the NRC staff on the DPC Nuclear Plant Design Basis Documentation (DBD) program. The meeting was held at DPC's request. The DPC presentation described the historical background leading to the development of the program, the actual program development, program project management, and a problem resolution process.

A discussion was held on the appropriate method of reporting deficiencies and subsequent corrective actions resulting from the DBD program. It was agreed that a separate Licensee Event Report (LER) would be submitted for each reportable event resulting from the DBD with a single LER supplement submitted at the completion of the DBD covering the final resolution of each of the LER's. DPC agreed to submit details of this process to the NRC for review.

Meeting attendees are listed in Enclosure 1. Handouts distributed by DPC during the presentation are provided in Enclosure 2.

/s/

Leonard A. Wiens, Project Manager
Project Directorate II-3
Division of Reactor Projects I/II

Enclosures:
As stated

cc w/enclosures:
See next page

DISTRIBUTION
Docket File
NRC PDR
Local PDR
PDII-3 Reading

S. Varga	14-E-4
G. Lainas	14-H-3
D. Matthews	14-H-25
M. Rood	14-H-25
L. Wiens	14-H-25
K. Jabbour	14-H-25
D. Hood	14-H-25
OGC (For inform. Only)	15-B-18
E. Jordan	MNBB-3302
B. Grimes	9-A-2
ACRS (10)	P-315

PDII-3	PDII-3	PDII-3
MRood	LWiens	for DMatthews
8/ /89	8/14/89	8/14/89

DFO 1/1

Memo 4 Ca

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

August 4, 1989

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Enclosures:
As stated

cc w/enclosures:
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Mr. H. B. Tucker, Vice President
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Enclosure 1

ATTENDEES

NAME	ORGANIZATION
S. Varga	NRC/NRR/DRP
G. Lainas	NRC/NRR/DRP
J. Zwolinski	NRC/NRR/DRIS
D. Matthews	NRC/NRR/PDII-3
C. Haughney	NRC/NRR/DOEA
L. Wiens	NRR/NRR/PDII-3
G. Imbro	NRR/NRR/RSIB
M. Williams	NRC/AEOD/TPAB
S. Mazumdar	NRC/AEOD/TPAB
H. Tucker	Duke Power Company
B. Futrell	Duke Power Company
G. Grier	Duke Power Company
J. Peele	Duke Power Company
T. McMeeken	Duke Power Company
B. Gill	Duke Power Company
A. White	Bechtel

ENCLOSURE 2

Nuclear Plant Design Basis Documentation
Duke Power Company
and Nuclear Regulatory Commission
July 28, 1989 Meeting Agenda

HB Tucker	I.	Purpose
		A. Present our DBD Concepts
		B. Determine Best Avenue of Communication with NRC
TC McMeekin	II.	Duke Power Company Quality Initiatives
		A. Look Back
		B. Look Forward
BL Peele	III.	Design Basis Documentation
		A. Steering Committee and Pilots
		B. Format and Content
		C. Scope, Project Management and Schedule
GW Grier	IV.	Problem Resolution Process
		A. Duke Process
		B. NRC / Duke Interface
HB Tucker	V.	Summary

Duke Power/Design Engineering Dept.

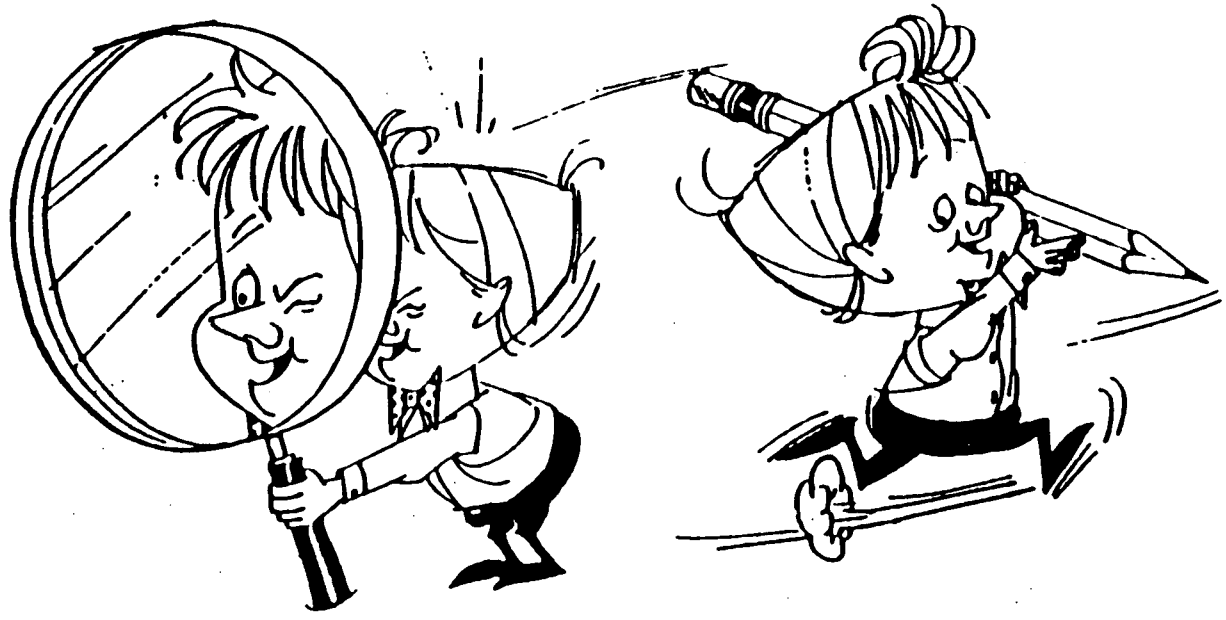
Transition:
New Construction ⟶ Station Support

Catawba 2 C. O.	-	**8/86**
TOPFORM (The Overall Plan for Organizational Review of Mods)	-	**3/87**
TOPFORM Refined	-	**2/88**
DE Site Offices	-	**4/88**
DE Project Organization	-	**11/88**
Design Basis Documentation Report	-	**5/89**

DUKE POWER INITIATIVES

LOOK BACK

- SSFI (NRC)
- SITA
- BWOC SPIP



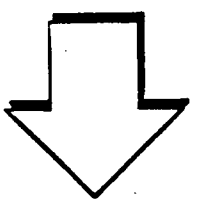
LOOK FORWARD

TOPFORM

- Initial & Final Scope Documents
- Interface Meetings
- Integrated Design Reviews
- Test Acceptance Criteria
- Design Input Documentation
- Enhanced 50.59 Reviews
- Document Upgrade & Dwg Legibility Program
- Analytical Model Reviews
- INPO Good Practice Reviews

NRC SSFI/DUKE SITA

- Technical
- Detailed Vertical Look at a System
- Multidiscipline



GENERIC PROBLEM REVIEW

Horizontal look at other systems for generic issues.

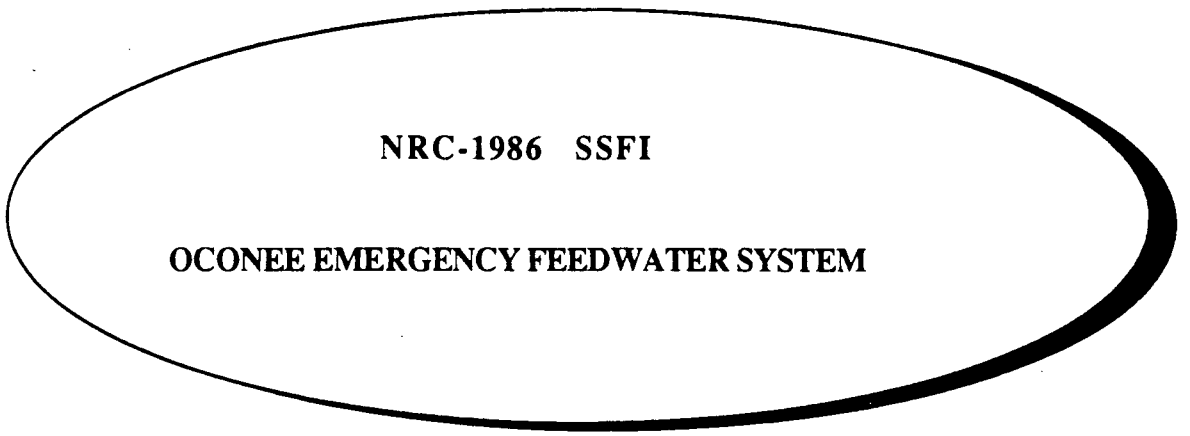
FINDINGS

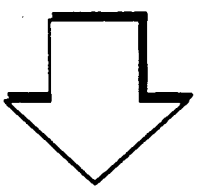
Specific items to be resolved for that system.

LESSONS LEARNED

Programs to help prevent future problems.

EXAMPLE

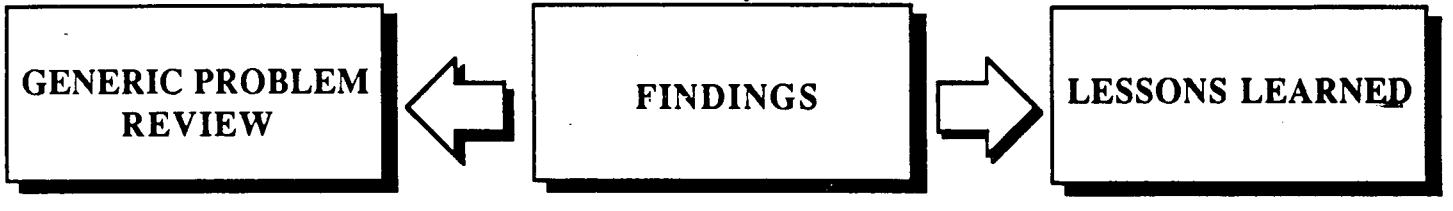




GENERIC PROBLEM REVIEW	FINDINGS	LESSONS LEARNED
• Calcs reviewed to ensure systems operating modes covered	• Design calcs not complete for all operating modes of EFW (runout)	• TOPFORM Program - Design Inputs - Analytical Model Reviews - Integrated Design Reviews - Test Acceptance Criteria - Interface Meetings
• Reviewed other electrical power distribution systems	• Keowee dynamic analysis incomplete	
• Overpressure Protection reviewed for all steam systems	• Overpressure Protection design not adequate for one steam relief valve supplying TDEFW pumps	• Overpressure Protection Training

DUKE - 1988 SITA

McGuire Diesel Generator Starting Air System



- Other Diesel Generator Support Systems Added to the Audit
  - Diesel Gen. System
  - Diesel Gen. Fuel Oil System
  - Diesel Gen. Lube Oil System
  - Diesel Gen. Control System

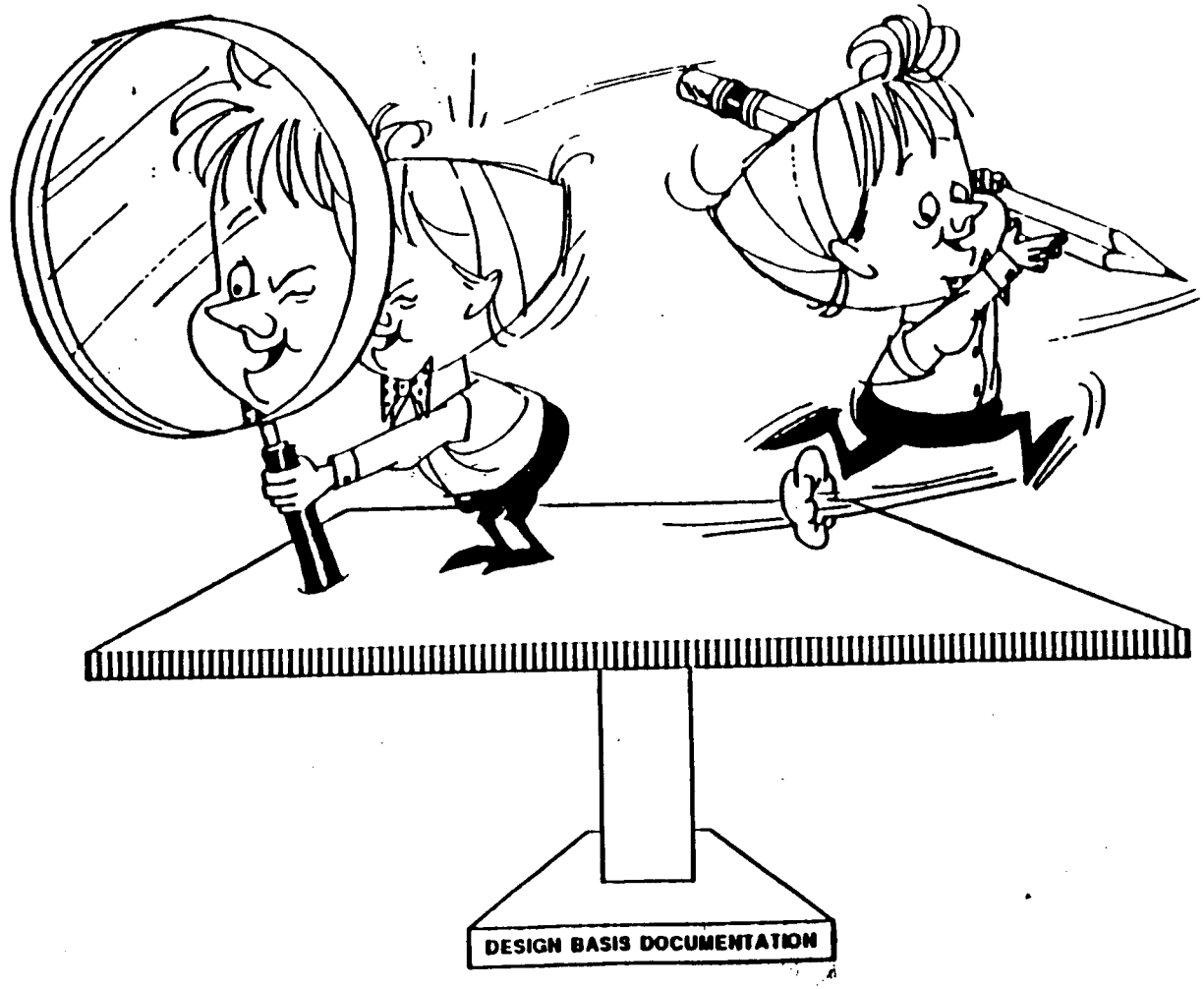
- Improper Isolation Between Safety and Non-Safety Components
- Improper Component Safety Classification
- System Expert Program Needs to Address Diesel Engine Reliability

- TOPFORM Program
  - Test Acceptance Criteria
- Design Basis Documentation
  - Steering Committee Formed
  - Membership from Design Engineering and Nuclear Production
  - Developed a Pilot DBD for each Nuclear Station
- Diesel Generator Reliability Team Established
- Enhanced Test Program

DUKE POWER INITIATIVES

LOOK BACK

- SSFI (NRC)
- SITA
- BWOG SPIP



LOOK FORWARD

TOPFORM

- Initial & Final Scope Documents
- Interface Meetings
- Integrated Design Reviews
- Test Acceptance Criteria
- Design Input Documentation
- Enhanced 50.59 Reviews
- Document Upgrade & Dwg Legibility Program
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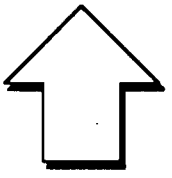
- INPO Good Practice Reviews

FUTURE ENGINEERING SUPPORT

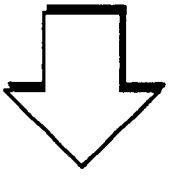
Facilitate Improved:

- Engineered Solutions to Problems
- 50.59 Evals. of Mods.
- Operability Evals.



DESIGN BASIS DOCUMENTATION

- Design Requirements
- Required Operating Modes
- System Descriptions
- NRC Commitments



DUKE SITA

- More productive audits/responses
- Better system design basis understanding
- Better able to identify generic issues

DBD PLAN

- ***January 30, 1989***
  - Vice Presidents Design Engineering and Nuclear Production formed DBD Steering Committee
  - Chaired by Design Engineering
  - Membership from Design Engineering and Nuclear Production
  - Liaison with Quality Assurance
  - Chartered to Produce DBD Report
- ***May 12, 1989***
  - Preliminary DBD Steering Committee Report Completed

Objectives of the Duke Power DBD Steering Committee

- Definition of the Scope, Content and Format of the Design Basis Documentation effort
- Definition of the Systems and Structures for which Design Basis Documents will be developed and the priority and schedule options for such work
- Definition of Administrative Processes Necessary for Initial Issue and to keep Design Basis Documents current
- Publication of Design Basis Document and associated documents (e.g., Test Acceptance Criteria) for the pilot system or structure selected for each plant
- Identification of automation tools which could be used and the impact on scope, cost and schedule

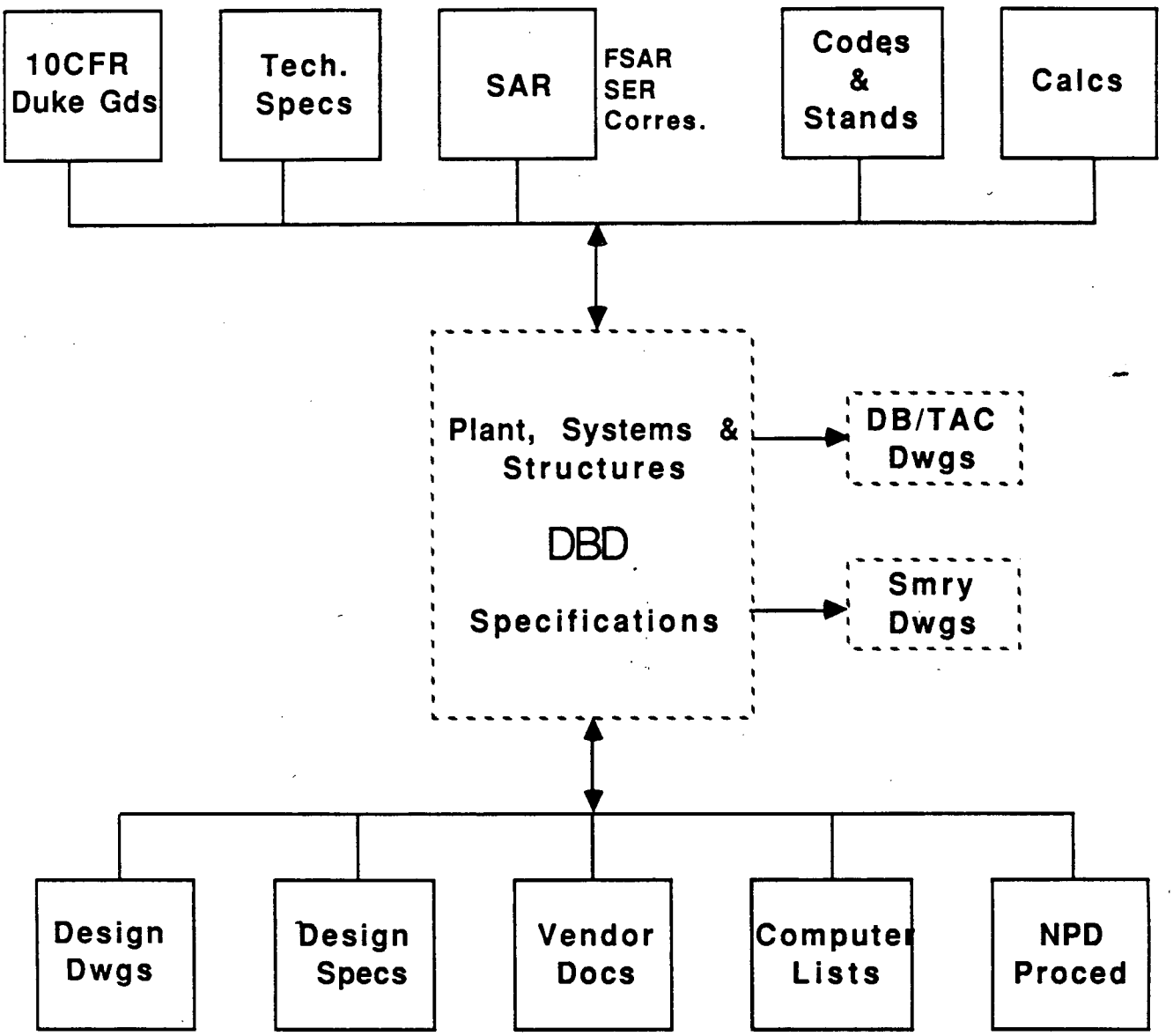
DBD Pilots

Oconee - Emergency Feedwater System (EFW)

McGuire - Emergency Diesel Generator Starting Air System (VG)

Catawba - Nuclear Service Water Pump Structure

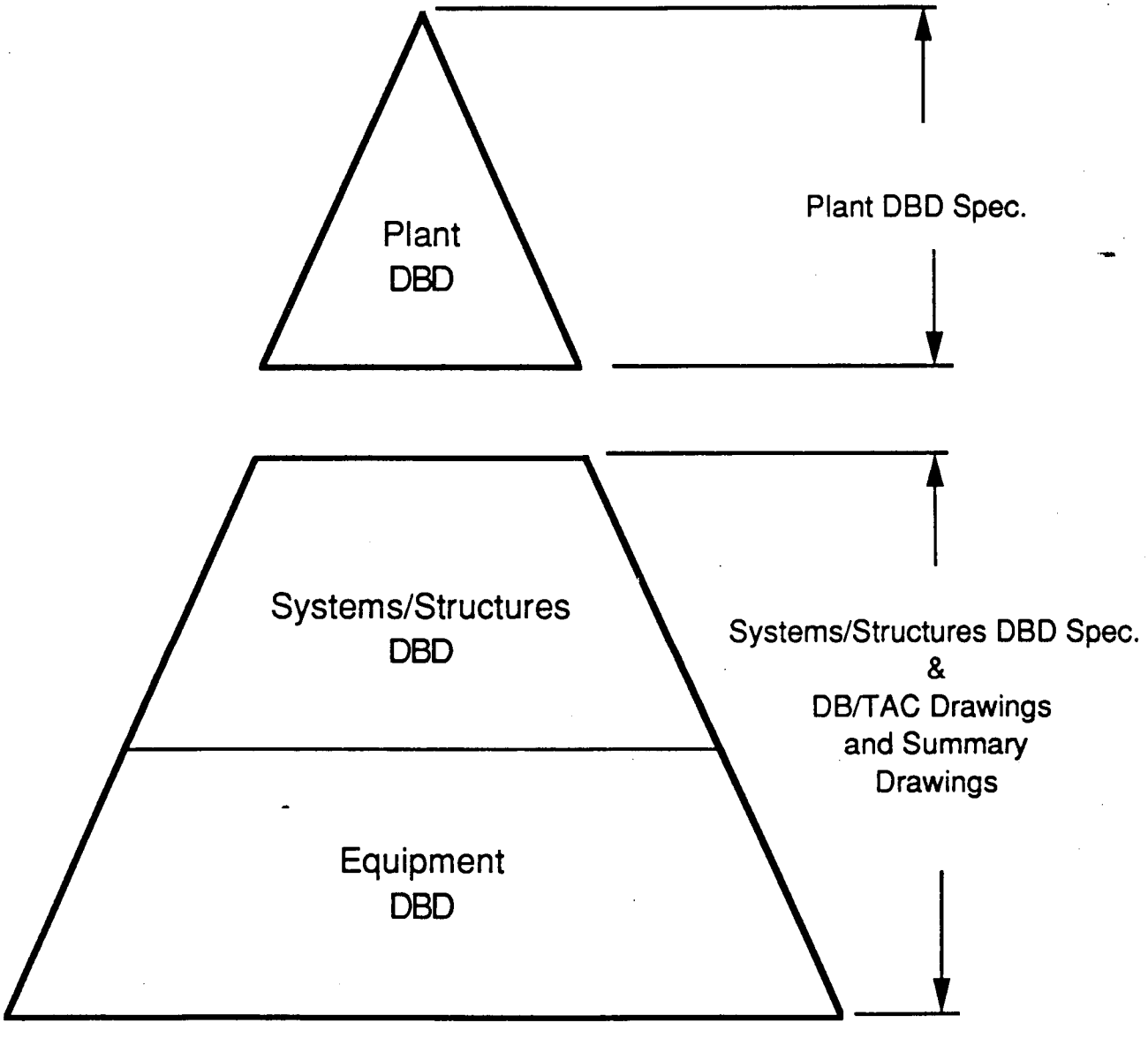
Relationship of DBD to Other Documents



Typical Documentation Reviewed for DBD

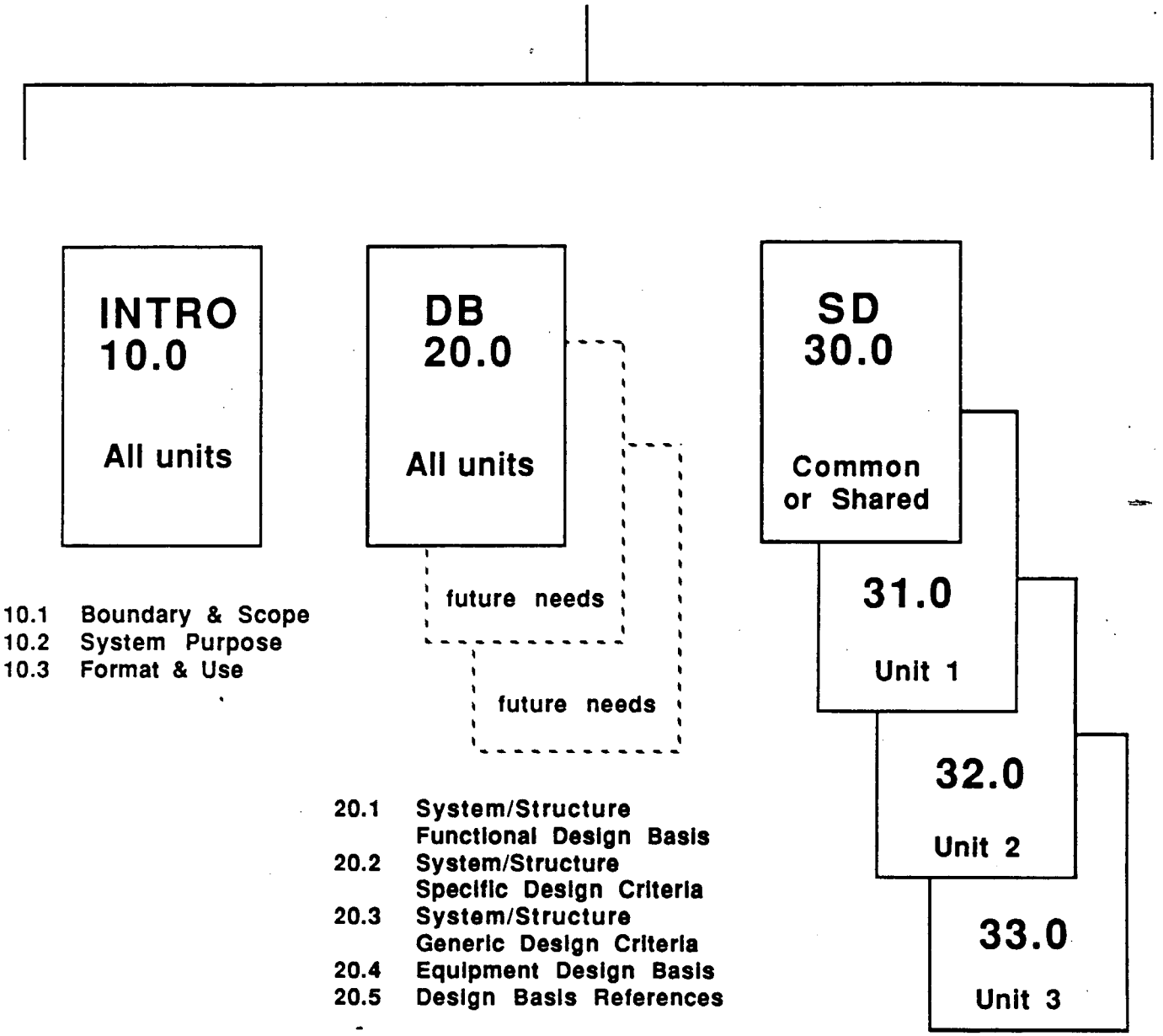
10CFR
FSAR
SER
Standard Review Plan
Branch Technical Positions
Tech. Specs.
Duke Nuclear Guides
Licensing Correspondence
ANS Standards
ANSI Standards
ASME Standards
IEEE Standards
SITA Audit Findings
INPO SOERs
NSSS Correspondence
Correspondence Files
Specifications
Calculations
Manufacturer Drawings and Manuals
Duke Drawings
PIR / LERs
Valve / Equipment Lists
I & C List
System Descriptions
Current NSM Packages
Fire Protection Safe Shutdown Review Manual
Fire Protection Review Manual
Response to TMI Concerns
Response to NUREG-0588
Plant Environmental Parameters Manual
EQRI Manual
Testing
- Station Task Force (testing)
- IWP/IWV Code (ASME Section XI)
- IWP/IWV Manual
- NPD Directives on Retest
- Station Procedures and Retest List
- Design Studies on Testing

DBD Hierarchy



Systems and Structures

Design Basis/System Description Specification Table of Contents



Form 45069 (R 10-88)

System Design Bases/Objectives

Design Basis: The VG system shall supply control air at sufficient pressure to keep the emergency diesel generator running (Reference section 20.1.2 of specification no. MCS-1609.VG-00-0001).

Objective: Verify that a control air pressure of no less than 90 psig and no greater than 135 psig is maintained, after the diesel starts, while the emergency diesel generator is running for 24 hours (Tech. Spec. 4.8.1.1.2e(8)). The starting air compressors shall be available to start during this test.

Test Frequency: The control air test shall be performed with the same frequency as the emergency diesel start test.

Operability: If a diesel fails this test, then it shall be declared inoperable.

Test Acceptance Criteria

Test/Measurement	Reference Document	Acceptable Value Including Tolerance
Control air pressure	TT/0B/9100/300 Tech. Spec. 4.8.1.1.2e (8) 2/15/89 letter from JR Hilley to F Schubert	$90 \leq P \leq 135$ psig

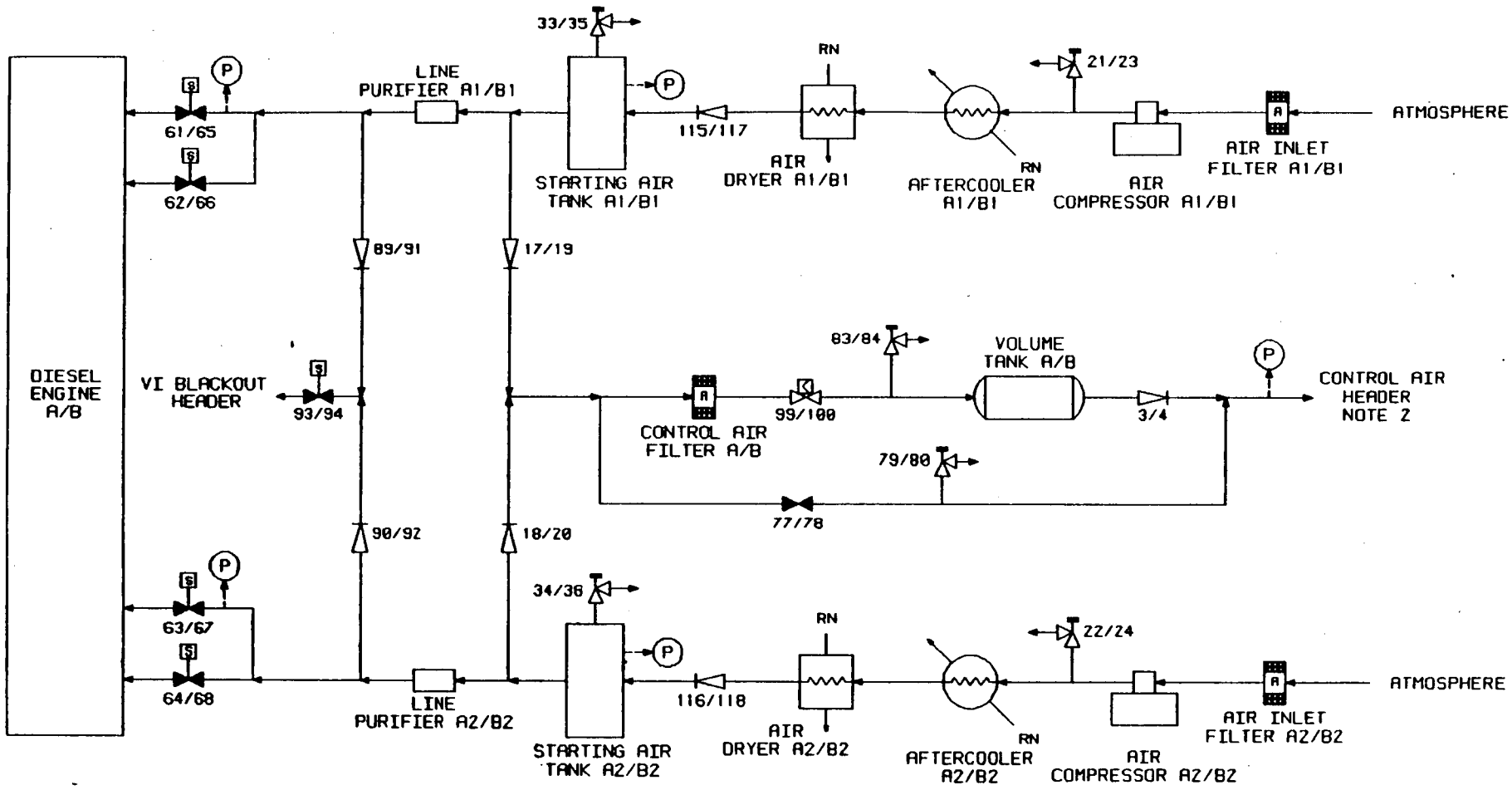
NO	REVISIONS	DSN	CHK	APR	DTE	C/E	ELE	M/N
C	ORIGINAL ISSUE	JMH	BTN	[illegible]	[illegible]	ABE	MEE	

DUKE POWER COMPANY | QA COND 1

McGuire Nuclear Station, Units 1 & 2
Design Basis/Test Acceptance Criteria
Emergency Diesel Generator Control Air

DSN/DTE JR Hilley 5-5-89 INS/DTE MEEfid 5/8/89
CHK/DTE BTN 5-8-89 INS/DTE AB Delightfully 5/9/89
APP/DTE JR Hilley 5-9-89 INS/DTE —

DWG NO MCDB-1609-VG.S002-01 | REV 0



NOTES :

1. EACH UNIT HAS TWO DIESEL ENGINES (A AND B). EACH ENGINE HAS TWO STARTING AIR SUBSYSTEMS (AS SHOWN ABOVE). BOTH A AND B SUBSYSTEMS EQUIPMENT TAG NUMBERS ARE DISPLAYED.
2. SOLENOID VALVES VGSV5160/5170,5161/5171,5162/5172 AND 5163/5173 ARE LOCATED ON THE CONTROL AIR HEADER. SEE I&C DETAILS MC-1499-VG3 AND MC-2499-VG3.

TYPICAL FOR UNITS 1 AND 2

LEGEND

- SHUTOFF VALVE
- FLOW CONTROL VALVE
- CHECK VALVE (ALL TYPES)
- RELIEF VALVE
- NORMALLY OPEN
- NORMALLY CLOSED
- NORMALLY THROTTLED
- (X) F-FLOW, L-LEVEL, P-PRESSURE, T-TEMPERATURE, A-ANALYSIS, R-RADIATION
- PNEUMATIC
- (X) E-ELECTRIC, H-HYDRAULIC, P-PISTON, S-SOLENOID
- (ES)-RECEIVES ENGINEERED SAFEGUARD SIGNAL

THIS DRAWING IS A SUMMARY FLOW DIAGRAM. FOR COMPLETE SYSTEM DESIGN INFORMATION, REFER TO FLOW DIAGRAMS LISTED BELOW.

MC-1609-4.0	VG SYSTEM (UNIT 1)
MC-2609-4.0	VG SYSTEM (UNIT 2)

NO.	REVISIONS	DRN	DATE	CHKD	DATE	APPR	DATE	REVIEWED INSPECTED

DUKE POWER COMPANY
MCGUIRE NUCLEAR STATION

SUMMARY
FLOW DIAGRAM OF
DIESEL GENERATOR ENGINE
STARTING AIR SYSTEM (VG)

DESIGNED ____ DATE ____ DRAWN ____ DATE ____
DRAWN ____ DATE ____ TRACED ____ DATE ____
CHECKED ____ DATE ____ APPROVED ____ DATE ____

Estimate of
DBD Systems and Structures Scope

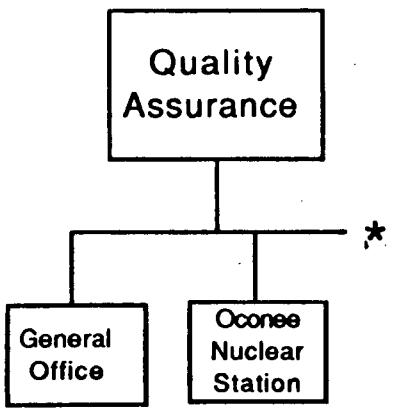
Criteria - Nuclear Safety Related, Technical Specification, or other selected systems

	Mech Systems	Elect Systems	Civil Structures
Oconee	45	26	6
McGuire	61	34	3
Catawba	60	34	3
Total DBD	**166**	**94**	**12**
Total Plant	**291**	**167**	**-**

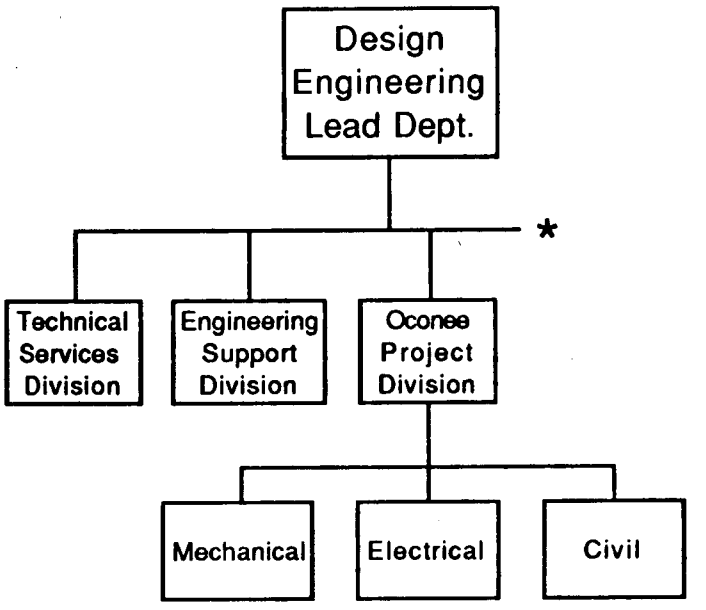
DBD Prioritization

- Risk Significance / Recent Experience
- Plant Testing Trends (performance degradation, wear, fouling, etc.)
- NRC Generic Issues
- INPO SOERs

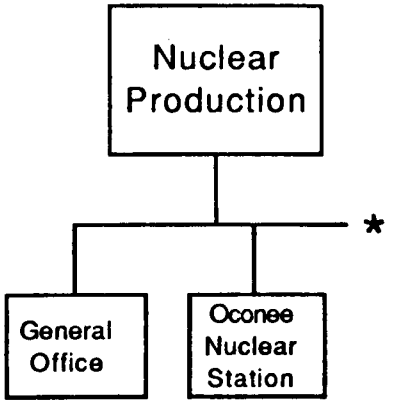
DBD Project Management



- Review DBD Specs.
- Normal Document Audit
- SITA Audit Lead



- Prepare & Transmit DBD Specs.
  - 1989 Scope Identified
  - Coordinate Remaining Scope Annually
- Prepare & Transmit Test Acceptance Criteria Drawings
- Initiate and Resolve PIRs



- Review DBD & TAC
- Initiate and Resolve PIRs
- Initiate LERs
- Revise Procedures

Same For McGuire and Catawba Nuclear Stations

DBD Schedule

Oconee Systems & Structures	~ 13/year
McGuire Systems & Structures	~ 16/year
Catawba Systems & Structures	~ 16/year
Total	~ 45/year

Project Completion - 1995

DBD Problem Resolution Process

Initial Action

- Document Utilizing PIR Process
  - Operability Evaluation
  - Reportability Evaluation
    10CFR21
    10CFR50.72
    10CFR50.73
    10CFR50.9
  - Immediate Action to Restore Operability and Comply with Tech Spec (current and future)
  - Continue DBD Review
- Report to NRC As Appropriate
  - Red Phone Notification As Required
  - LER, As Required
  - Initial Root Cause and Corrective Action
  - Safety Analysis
  - Schedule to Complete DBD Review and Past Operability Concerns
  - Resident Inspector Kept Informed

DBD Problem Resolution Process

Subsequent Action

- Complete DBD Project for System
- Review All Problems Identified
- Investigate Past Operability Collectively
- Final Root Cause and Corrective Action Determination
- Revise LERs as necessary
- Inform Resident Inspector of Status Periodically