PUBLIC

April 9, 1997

IE36

See Reports

Mr. J. S. Perry
Site Vice President
Dresden Station
Commonwealth Edison Company
6500 North Dresden Road
Morris, IL 60450

SUBJECT: DRESDEN CONFIRMATORY ACTION LETTER MEETING

Dear Mr. Perry:

This refers to the meeting conducted at the NRC Region III Office in Lisle, Illinois on February 28, 1997. This meeting was to discuss the status of your actions related to the NRC Confirmatory Action Letter (CAL) No. RIII-96-016.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosures (the agenda and handouts provided by your staff at the meeting) will be placed in the NRC's Public Document Room.

We appreciate your cooperation in this matter. If you have any questions regarding this meeting, please contact me at 630/829-9603.

Sincerely,

/s/ W. J. Kropp

Wayne J. Kropp, Chief
Reactor Projects Branch 1

Docket No. 50-237
Docket No. 50-349

Enclosure:
1. Attendance List
2. Licensee Presentation, Dresden Station Presentation to NRC on Status of CAL Action Items

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NAME	Kropp/co for							
DATE	04/9/97							

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cc w/encl: T. J. Maiman, Senior Vice President
Nuclear Operations Division
D. A. Sager, Vice President,
Generation Support
H. W. Keiser, Chief Nuclear
Operating Officer
T. Nauman, Station Manager Unit 1
M. Heffley, Station Manager Units 2 and 3
F. Spangenberg, Regulatory Assurance
Manager
I. Johnson, Acting Nuclear
Regulatory Services Manager
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Nathan Schloss, Economist
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50-237 CEC DRESDEN 1

DRESDEN CONFIRMATORY ACTION LETTER MEETING.

REC'D W/LTR DTD 04/09/97....9704220327

- NOTICE -

Enclosure 1

ATTENDANCE LIST

Commonwealth Edison (ComEd)

J. S. Perry, Dresden Station Site Vice President
J. M. Heffley, Dresden Station Manager
K. W. Frehafer, Dresden Engineering Assurance Group
R. D. Freeman, Dresden Station Site Engineering Manager
F. A. Spangenberg, Dresden Regulatory Assurance Manager
E. Connell, Dresden Station Design Engineering Superintendent

Nuclear Regulatory Commission

G. E. Grant, Director, Division of Reactor Safety (DRS), RIII
W. J. Kropp, Chief, DRS, Engineering Specialists Branch 1, RIII
R. N. Gardner, Chief, DRS, Engineering Specialists Branch 2, RIII
M. A. Ring, Chief, DRS, Lead Engineers Branch, RIII
P. L. Hiland, Chief, Reactor Projects Branch 1, RIII
R. A. Capra, Director, Project Directorate III-2, NRR
J. S. Stang, Dresden Senior Project Manager, NRR

ENCLOSURE 2

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Dresden Station Presentation To NRC on Status of CAL Action Items

February 28, 1997

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AGENDA

Russell Freeman	-	Introduction / Opening Remarks
Kenneth Frehafer	-	Update of Activities for the Dresden Engineering Assurance Group (DEAG)
	-	Duties & Expectations for an Independent EAG
Edward Connell	-	Status of Key Parameter Screening for Twelve Systems
	-	A Walk-Through of One System Key Parameter Screening
	-	Evaluation of Significance of Calculational Errors Including Operability
	-	Significance and Scope of Reduced Margin Design Calculation Discrepancies Found In The Sargent & Lundy Calculations
Robert Renuart	-	Corporate Engineering Activity
	-	Status of The Sargent & Lundy Review of ECCS, HVAC, and Service Water Calculations At Other Six Sites...
	-	EAG Peer Group Charter
	-	NEP and Flow Chart for a Design Basis Documentation Conflict

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AGENDA (continued)

Carl Richards/ Edward Netzel	-	Corporate Quality Verification Activity
	-	Siemens Audit
	-	Bechtel Audit
Russell Freeman	-	Closing Remarks
All	-	Open Discussion

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Engineering

R. D. Freeman

Site Engineering Manager

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DRESDEN STATION

Dresden Engineering Assurance Group

Ken Frehafer

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DEAG Status

- Revised Procedure to Include PIFs.
- Significant Work Activities.
  - Twelve System Parameter Screening Review.
  - Finished review of open mod 50.59s.
  - D3R14 modification review on-going.
  - Instrument Uncertainty Issues.
  - Provided input to ISI report.
  - Reviewed inputs to D3R14 reload analysis.

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DEAG Status (continued)

- 32 Engineering Products Reviewed.
  - 12 system screen Operabilities.
  - Torus water level instrument Operability.
  - Elevated Torus temp Operability.
- Nine Products Required Re-Work.
  - Inputs not referenced.
  - Math errors (in conservative direction).

DEAG Status (continued)

- Positive Observations.
  - Intra-discipline communications improving.
- Areas for Improvement.
  - Safety Evaluations.
  - Attention to detail.

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Screening of Key Parameters For Twelve Risk Significant Systems

E. C. Connell, III

Design Engineering Superintendent

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ComEd Commitments

- Screening of key operating parameters on the twelve systems most important from a risk perspective to verify that calculations exist to support those parameters by February 28, 1997
- The NRC will be immediately informed if critical parameters on any of the twelve systems are discovered to be outside of normal acceptance values
- Results of the screening will be provided to the NRC on a monthly basis through a meeting and docketed response

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Presentation Outline

- **Walk Through CCSW Key Parameter Matrix**
- **Discrepancy Summary**
- **Summary of Findings**
- **Use and Maintenance of Key Parameters**

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Walk Through CCSW Key Parameter Matrix

- System Description
- Key System Components
- Operational Modes
- Key Parameters and Basis
- Discrepancies
- References
- Calculation List

CONTAINMENT COOLING SERVICE WATER (CCSW)

System Description

The CCSW system provides cooling water to tube side of the LPCI/CCSW Heat Exchangers to remove heat from the primary containment. The function of cooling the water in the suppression pool, thereby limiting the temperature of the suppression pool water, assures the following:

- cooling of the Containment.
- no radioactive release through the containment heat exchanger

The CCSW system is an open loop system consisting of pumps, heat exchangers, valves, and associated piping and controls. The pumps take suction from the crib house bay and circulate water through the containment heat exchanger to cool suppression pool water. The water is then discharged to the Service Water main header. The CCSW system circulates water through room coolers to maintain the temperature inside a watertight vault that contains two of the four CCSW pumps for flood protection. The CCSW system also provides a safety related source of cooling water to the control room air conditioning condensers.

Key System Components

Component EPN	Description
2(3)-1501-44A	CCSW A Pump
2(3)-1501-44B	CCSW B Pump
2(3)-1501-44C	CCSW C Pump
2(3)-1501-44D	CCSW D Pump
2(3)-1503A	LPCI/CCSW A Heat Exchanger
2(3)-1503B	LPCI/CCSW B Heat Exchanger
2(3)-5700-30A	CCSW Vault Room A Coil
2(3)-5700-30B	CCSW Vault Room B Coil
2(3)-5700-30C	CCSW Vault Room C Coil
2(3)-5700-30D	CCSW Vault Room D Coil
2(3)-1543-A	Pressure Differential Sensor
2(3)-1543-B	Pressure Differential Sensor
2(3)-1501-3A	CCSW Flow Control Valve
2(3)-1501-3B	CCSW Flow Control Valve

Operational Modes

Containment Spray Mode

Initiation

Manually initiated

Function

CCSW provides cooling water to the tube side of heat exchangers 2(3)-1503A,B to cool the water in the suppression pool. Suppression pool water is circulated through the shell side of the heat exchangers by the Low Pressure Coolant Injection (LPCI) system to spray nozzles in the containment. Minimum number of pumps in operation: 2 CCSW and 1 LPCI.

Suppression Pool Cooling Mode

No unique requirements except; pumps in operation are: 2 CCSW and 2 LPCI pumps and LPCI flow is returned to the suppression pool.

Station Blackout Mode

No additional requirements

Appendix R Mode

No additional requirements

Dam Failure Mode

Similar to modes above except USFAR section 9.2.5.3.2 implies only 1 CCSW pump is required. This is contrary to Section 9.2.1.3 which calls for a minimum of 2 CCSW pumps. See Potential Discrepancy item 5.

Cold Shutdown using Safety Grade Systems Mode

The CCSW system and pressure relief system are used in conjunction with the LPCI system to provide a means of achieving cold shut down using safety grade systems. See UFSAR Section 6.3.1.2.

Key Operation Parameters

Parameter	Value	Parameter Reference	Calculation Reference
Maximum service inlet water temperature	75 °F	26	No calc. is required. This is a boundary condition on the system. Note: A licensing amendment was submitted to the NRC on Feb 17, 1997 which will raise the maximium temperature to 95° F.
Minimum Water Source Elevation	500 FT Mean Sea Level	2 Sec. (3.8 C)	No calc. is required. This is a boundary condition on the system Note: See Potential Discrepancy item 1.

Containment Spray Mode

Pump

2(3)-1501-44 A,B,C,D

Parameter	Value	Parameter Reference	Calculation Reference
Flow (Two Pumps)	5600 gpm	26	DRE96-0214Rev.0 11/12/96 Unit 2/3 "Minimum Available CCSW flow to maintain a 20 pi differential between LPCI and CCSW in CCSW Heat Exchanger" Note: A licensing amendment was submitted to the NRC on Feb 17, 1997 which will lower the flow rate to 5000 gpm.
Net Positive Suction Head Required	18 ft @3,500 gpm/pump	9	No calculation was found. Note: See Potential Discrepancy item 2.

Parameter	Value	Parameter Reference	Calculation Reference
CCSW Pump Motor			
Rating	500 HP	17	No calculation was found. Note: See Potential Discrepancy item 3.
Terminal Voltage	4000 Volts	18	No calculation was found. Note: See Potential Discrepancy item 3.
Suppression Pool Cooling Mode			
Flow (Two Pumps)	5600 gpm	26	Same as Containment Spray Mode Flow shown above. The hydraulic conditions are the same.
Heat Exchanger 2(3)-1501-44 A,B,C,D			
Heat Transfer Duty	98.6 MBtu/hr	27	S. Mintz to S. L. Eldridge et al " Dresden LPCI/Containment Cooling System - Comparison of Heat Exchanger Heat Transfer Rates." 12/28/92
@Tube Side Inlet	95° F	27	
@Tube Side Flow	7,000 gpm	27	
@Shell Side Temp	165° F	27	
@Shell Side Inlet	10,700 gpm	27	
Note: These parameters and the physical data characterize the heat exchanger performance and are used to determine the heat transferred under actual operating conditions. For the design basis calculations the LPCI flow is 5000gpm and the CCSW flow is 5600 gpm.			
Vault Room			
Maximum Temperature	120° F	See Note	VV-13 Rev 0 5/7/93 Units 2/3 "CCSW vault cooler performance and effectiveness" Note: The calculation VV-13 shows that the max. vault temperature will be well below 120° F. This then became the de facto temperature limit.
Vault Room Coil 2(3)-5700-30A,B,C,D			
Cooler Coils /Cooler	2	1 Sec.9.2 (Fig. 9.2-1, 9.2-2)	No calc. is required. This is a statement of fact.

Parameter	Value	Parameter Reference	Calculation Reference
Total Flow For Two Coils	110 gpm	7	ATD-0253 Rev.0 Units 2&3 Mar 5,1993 "Determination of Flow Restricting Orifices for CCSW Pump Room Coolers and CR Refrigeration Condenser in the CCSW System" Note: Flow does not pass through flow meter
Fans			
2-5700-30 A,B			
Min.Terminal Voltage			9198-18-19-1 Rev. 1 "Starting and Running Voltages" Note: This calculation determines the terminal voltages under starting and run conditions and shows that these voltages are acceptable.
2-5700-30 C,D			
Min.Terminal Voltage			9198-18-19-2 Rev. 1 "Starting and Running Voltages" Note: This calculation determines the terminal voltages under starting and run conditions and shows that these voltages are acceptable.
3-5700-30 A,B			
Min.Terminal Voltage			9198-18-19-3 Rev. 1 "Starting and Running Voltages" Note: This calculation determines the terminal voltages under starting and run conditions and shows that these voltages are acceptable.
3-5700-30 C,D			
Min.Terminal Voltage			9198-18-19-4 Rev. 1 "Starting and Running Voltages" Note: This calculation determines the terminal voltages under starting and run conditions and shows that these voltages are acceptable. Except as noted below.

Parameter	Value	Parameter Reference	Calculation Reference
			Note: The running terminal voltage was found to be 89 % instead of 90 %. To reconcile this difference calculation 9198-18-19-6 Rev. 0 was prepared to justify accepting the lower voltage
Control Room HVAC Refrigeration Condensing Unit (RCU) Flow	102 gpm (Unit 2 only)	8	ATD-0253 Rev.0 Units 2&3 Mar 5,1993 "Determination of Flow Restricting Orifices for CCSW Pump Room Coolers and CR Refrigeration Condenser in the CCSW System" Note: This calculation shows that the room cooler and CR Refrigeration orifices were sized for 55 gpm per cooler and 102 gpm respectively. Note: Flow does not go through CCSW flow meter. It can be measured by a meter in the CR. HVAC System. However, during surveillance testing there is no HVAC condenser flow. Therefore, to have a valid test, the flow required must include the actual HVAC condenser flow. This is reported to be 121 gpm.
CCSW/LPCI Differential Pressure Sensor 2(3)-1543-A,B	20 psi	6 1 (Sec. 6.2.2)	DRE96-0214Rev.0 11/12/97 Unit 2/3 "Minimum Available CCSW flow to maintain a 20 psi differential between LPCI and CCSW in CCSW Heat Exchanger" Note: Calculation DRE 96-214 demonstrates that for the 1 LPCI /2 CCSW case the CCSW pressure differential can be maintained 20 psi above LPCI for a range of containment pressures. These calculations should be extended to cover the 2 LPCI / 2 CCSW case. It can be shown that the 20 psi can be maintained for these cases but quantitatively the flow rates are not known and hence the effectiveness of the containment heat exchanger is not known. All of which means that the long term temperature and pressure of the containment cannot be predicted. The analyzed case covers the limiting containment cooling case from a licensing standpoint. However, the other cases are shown in section 6.2 of the USFAR as illustrations of capability and should be corrected. See Potential Discrepancy item 8 of LPCI Key Parameters-(Table 2a).

Parameter	Value	Parameter Reference	Calculation Reference
			The reason why a 20 psi differential is adequate can not be found in a calculation. A calculation has been performed by C. B. Johnson and F. J. Mollerus that shows the 20 psi is adequate. This calc should be reviewed and adopted by ComEd. See Potential Discrepancy item 4.
CCSW Flow Control Valve 2(3)-1501-3A,B Min. Operator Terminal Voltage		24	004-MN-344, Rev 8, 5/6/93 "Thrust Windows Calculation for Functional Group LPCI 1,"
Unit 2 Valve A	425 Volts		
Unit 2 Valve B	424 Volts		
Unit 3 Valve A	431 Volts		
Unit 3 Valve B	434 Volts		

Potential Discrepancies

1. Section 3.19.2 of the Dresden Technical Administrative Requirements (DATR) identifies the minimum water level in cribhouse CCSW suction bay of 499' - 0". However, section 3.8.C.1 of the TSUP identifies the minimum water level as 500' - 0". Furthermore, the RUFSAR references drawing M-10 which states the normal operating low water level in the suction bay is 501' - 0", and this value was used in calculation DRE96-0214.

2. No formal calculations exist that demonstrate adequate Net Positive Suction Head (NPSH) is available to the CCSW pumps.

3. No calculations could be found that demonstrate there is sufficient motor terminal voltage for the CCSW pumps so the pumps can perform adequately. In addition, no calculations have been found that show the CCSW pump motors are matched for power and speed requirements to the CCSW pumps.

4. There is a requirement that the CCSW side of the containment cooling heat exchanger be maintained at 20 psi above the LPCI side of the heat exchanger to preclude leakage from LPCI to CCSW. A report was generated by F. J. Mollerus and C. B. Johnson that shows why maintaining this pressure differential is adequate. This report should be formalized into a calculation.

5. Section 9.2.1.3 of the RUFSAR specifies the minimum requirements for containment cooling include 2 CCSW pumps. However, section 9.2.5.3.2 indicate only 1 CCSW pump will be available during a postulated dam failure. Currently there are no containment cooling or heat exchanger differential pressure calculations for a 1 CCSW pump scenario.

Parameter References

1. Dresden Rebaseline Updated Final Safety Analysis Report (UFSAR)

2. Dresden Station Unit 2 & 3 Technical Specifications Upgrade (TSUP)

3. Dresden Station Unit 2 & 3 Technical Specifications Upgrade Basis (TSUP Basis) January 13, 1997

4. Dresden Administrative Technical Requirements (DATR) September

5. Dresden Technical Specifications December, 1996

6. Memo.: J. W. Dingler to R. J. Goebbert 02-19-93 "20 psid Differential Pressure Setpoint Between CCSW and LPCI Across LPCI HX " Ref 06.028 to Design Basis Document 172:

7. VV-11 Rev 0 Feb/8/92,"Determine CCSW cooler cooling coil's new capacity using test data."

8. D. H. Lagler to C. W. Schroeder Nov 9, 1992 "Dresden - Unit 2 Finalized Operability Determination of the CCSW Pumps" Ref 06.055 to Design Basis Document 172:

9. "CCSW pump curve - NPSH" Ref 03.014 to Design Basis Document 172:

10. K. W. Hess to D. P. Galle Aug. 13, 1974 "Containment Cooling Water Pumps(CCSW) Technical Specification Change" Ref 06.004 to Design Basis Document 172:

11. LPCI Pump Curve by Bingham Pump Co. Jan 10, 1968

12. EMF-89-065 Rev. 3 July 1995 "Dresden Units 2 and 3 Principal LOCA Analysis Parameters"

13. 729E583 Rev 1 1968 "Process Diagram LPCI Containment Cooling System"

14. 257HA654 Rev. 3 April 15, 1969 "Auxiliary System Data Book"

15. Memo to DBD DRF by W. G. Myers et al March 4, 1992 "BWR 2, 3, 4, & 5 RHR-Containment Spray Cooling (CSC) Requirements" Ref 06.100 to Design Basis Document 172"

16. NED-EIC-MOV-DR-0003 Rev. 0 Sept. 1, 94 "MOV Terminal Voltage Calculation"

17. "MOV Terminal Voltage Calculation"C. N. Mathewson to R. J. Ascheral Feb. 25, 1971 "Containment Cooling Service Water Pumps- Motor Ratings Ref 06.008 to Design Basis Document 172:

18. Memo of Data Transmittal GE to S &L 4/8/68 S&L P.O. N0. 3447-134

19. 21A5580 Rev 4 Oct. 31 1972 "Motor General Requirements"

20. Containment Cooling Heat Exchanger Specification Sheet. March 29 1967 By Berlin Chapman Inc.

21. CHRON # 0306316 K. Simmons to R.L.Bax et al March 24, 1995 "Orifice In Min Flow Lines / LPCI and Core Spray Systems"

22 257HA350AM Rev. 10 11/9/71 "Nuclear Boiler System - Data Sheets.

23. DRE96-0010 Rev.0 1/16/96"Motor Terminal Voltage Calc. for Dresden Unit 2 MOV's 2-0202-5A/B"

24 NED-EIC-MOV-DR-0001 REV 0 8/2/94"Valve Actuator Motor Voltage Calculation for Dresden 1501 System Units 2&3"

25. DRE96-0127 REV 0 7/8/96"Motor Terminal Voltage Calculation for Dresden Unit 3 MOVs 3-1501-21A/B"

26. Amendment No. 152 to Facility Operating License No. DPR-19 and Amendment No. 147 to Facility Operating License No. DPR-25. Jan 1997

27 S. Mintz to S. L. Eldridge / B. M. Viehl "Dresden LPCI/Containment Cooling System - Comparison of Haet Exchanger Heat Transfer Rates." Dec. 28,1992

Calculation References

1. UFSAR Log # DFL-96-140 1/13/97

2. DRE96-0214Rev.0 11/12/97 Unit 2/3"Minimum Available CCSW flow to maintain a 20 psi differential between LPCI and CCSW in CCSW Heat Exchanger"

3. NED-M-MSD-45 Rev. 0 12/31/92 Units 2/3"Dresden Unit 2 LPCI Heat Exchanger Mode C Heat Exchanger Duty Calculation"

4. VV-13 Rev 0 5/7/93 Units 2/3"CCSW vault cooler performance and effectiveness"

5. ATD-0253 Rev.0 Units 2&3 Mar 5,1993"Determination of Flow Restricting Orifices forCCSW Pump Room Coolers and CR Refrigeration Condenser in the CCSW System"

6. 9198-18-19-1 Rev. 1 "Starting and Running Voltages"

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CCSW: Discrepancy #1

- Minimum water level in the crib house is 499'-0" in DATR, 500'-0" in TSUP, 501'-0" in Drw M-10 referenced in the UFSAR and 501'-0" in Calculations DRE96-0214 Rev. 0 performed to support ISI response
  - The current water level in the crib house is >501'-0"
  - 2/17/97 licensing amendment calculations (DRE96-0214 Rev. 1) uses 500'-0"
  - DATR and M-10 will be revised (NTS #237-140-97-00901)

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CCSW: Discrepancy #2

- No formal Calculations to Demonstrate Adequate NPSH is Available for CCSW Pumps
  - Surveillance Testing has been performed for pump flow of approximately 3,500 gpm. The design basis flow is 2,800 gpm
  - The pumps are located at E 495' and with the 500' min water level. Based on engineering judgement, there is adequate NPSH available to meet the 18' required NPSH
  - Corrective Action will be implemented under NTS

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CCSW: Discrepancy #3

- No calculations to show that adequate terminal voltage for the CCSW motor is available and that the motor is sized correctly for the CCSW pump
  - The surveillance tests to 3,500 gpm vs 2,800 gpm for the design basis, verifies the adequacy of the pump motor size
  - The surveillance tests also verify that adequate voltage is available at the terminals to drive the motor when off site power is available
  - DGA-12 lists manual operator actions to ensure availability of CCSW system during LOOP and LOCA
  - The correction action will be tracked under NTS

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CCSW: Discrepancy #4

- The basis for the 20 psi differential pressure for the LPCI/CCSW Hx to prevent out leakage not available
  - An evaluation was prepared which shows that 20 psi differential pressure is adequate
  - Corrective action under NTS

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CCSW: Discrepancy #5

- The Dam break case postulates the simultaneous occurrence of an earthquake, a dam failure, a LOOP and a LOCA in one unit. No calculation exists for containment cooling or differential pressure requirements for this case.
  - Section 9.2.5.3.2 describes this scenario and a coping mechanism for it which requires the flooding of the containment
  - Corrective action tracked under NTS

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Summary of Findings

- **For the Twelve Systems reviewed a total of 56 Ifs were initiated. Only one resulted in Degraded Plant Operability or System Being Declared Inoperable.**
- **Discrepancies identified during the Key Parameter Screening are similar to those identified during the Dresden self assessment and the NRC ISI**

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Summary of Findings (Continued)

- **ISI Corrective Actions are adequate to address the finding**
  - Engineering Assurance Group Overview
  - NEPs Revisions
  - Review of UFSAR requirement against Design Basis Documents
  - For the 12 Risk Significant Systems, Reconstitution or Validation of Calculations:
    - Portions of systems affected by modifications
    - Missing or incomplete key calculations

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Use and Maintenance of Key Parameter Matrices

- ESP Training on 12 Systems Key Parameters in March '97 for all Dresden Engineering staff

- Procedure for Key Parameter Matrix Maintenance and its use by System Engineers and Design Engineers will be Developed

- The Key Parameter Results will be the starting point for the 'Adequacy and Retrievability of Design Basis' Project

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Disposition of S&L Calculation Audit Findings

E. C. Connell, III

Design Engineering Superintendent

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Significance Level

- Significance

Level	Description
– 0	Editorial
– 1	No Impact on Design Margin
– 2	Potential Impact on Design Margin
– 3	Design Margin Eroded
– 4	Design Margin Exceeded

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Significance and Trending Matrix

		Accurate			Organized		Usable		Complete									Technical					Legible				
Area	Observation	Numerical	Computer Programs	Grammar	Logical	Continuity	Clear & Self-Explanatory	Self-Sufficient	Purpose & Scope	Assumptions	Procedurally Complete	Design Input	References	Engineering Judgment	Results & Conclusions	Limitations	Affected Documents	Methodology	Formulas	Checklist	Computations	Acceptance Criteria	Readable	Reproducible	S&L Division	Significance Level	Remarks
	ComEd Design Control Process Audit																										
	8982-64-19-1, Rev. 0									X																0	
	8982-17-19-1, Rev. 0																									N/A	No Comments
	8982-64-19-2, Rev. 0																									N/A	No Comments
	M12-3-95-003																									N/A	No Comments
	5569-31-19-1, Rev. 0																									N/A	No Comments
	8256-11-19-1, Rev. 0																									N/A	No Comments
	5569-31-19-1, Rev. 1																									N/A	No Comments
	VR-10, Rev. 1	X										X			X						X	X				3	Calc Revised & Issued
	VR-17, Rev. 0									X		X	X					X	X							1	Documentation
	MPED 9621-95-00, Rev. 0																		X							1	Documentation
	PMED 8982-62-02, Rev. 0						X	X	X																	1	Graph revised by ComEd
	0591-387-003, Rev. 2								X	X					X	X		X								3	Duke Revising Base Calc
	DRE96-0134, Rev. 0									X		X						X								2	Calc being revised by S&L
	PMED 8549 62-01, Rev. 0								X	X		X	X													1	Documentation
	9215-111-02, Rev. 0									X																1	Documentation, calc being superseded by S&L
	D3515		X									X														1	Documentation, calc revised by S&L
	8706-05-EO-S, Rev. 7																									N/A	No Comments
	8900-15-EO-S, Rev. 4					X						X	X			X										1	Documentation
	DRE-MOV-5, Rev. 0								X																	1	Documentation
	MPED 9621-100-00, Rev. 0								X	X			X						X		X					2	No further action required
	EMD 067487, Rev. 0																									N/A	No Comments
	ATD-0216, Rev. 0								X	X		X			X	X						X				3	Calc Voided by S&L per ComEd
	ATD-0191, Rev. 2											X														1	Documentation, Calc revised by S&L, conclusion unaffected
	ATD-0253, Rev. 1											X														3	Calc revised by S&L, conclusion unaffected

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Calculation Review Summary

- **24 Calculations Reviewed by SQV**
  - **6 Pre-identified with Errors**
  - **18 Randomly Selected**
- **6 Pre-identified Calculations - Significance Level**
  - **0 Level 4s**
  - **4 Level 3s**
  - **0 Level 2s**
  - **2 Level 1s**
- **18 Random Sample Calculations - Significance Level**
  - **0 Level 4s**
  - **0 Level 3s**
  - **2 Level 2s**
  - **7 Level 1s**
  - **1 Level 0s**
  - **8 No Errors**

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Calculation ATD-0253 Rev. 1

- Size Orifices for CCSW Room Coolers
- Used LPCI Pump Curves
- Affected Calculations Only

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Calculation ATD-0216 Rev. 0

- CCSW Pipe Losses for 1992 Amendment
- Used LPCI Pump Curve
- Calculation Cancelled

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Calculation VR-10 Rev. 1

- Secondary Containment Volume Error
- SBGT Air Changes / Day
- Minimum Charcoal Filter Efficiency 93%

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Review of Impell Calculation 0591-387-003, Rev. 2

- Switchover From SBGT to Hardened Vent
- Concluded Ductwork Overpressurized at 25 psi
- Affected DEOP

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Conclusions

- No Significant Safety Impact
- Greater Care Warranted in Future

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Corporate Engineering Activities

Bob Renuart

Chief Engineering, Configuration Management and Engineering Assurance

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Status of S&L Expanded Calculation Review

- Reviewed all System Calculations Involving ECCS, SW, HVAC at all stations
- Reviewed Past Five Years
- Total Population = 150 calculations
- Random sample of 50 calculations

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Status of S&L Expanded Calculation Review

- Level 4 = Design Margin Exceeded
- Level 3 = Erosion of Design Margin
- Level 2 = Potential Erosion on Design Margin
- Level 1 = No Impact on Design Margin
- Level 0 = Editorial

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Status of S&L Expanded Calculation Review

- Level 4 = 0 findings
- Level 3 = 0
- Level 2 = 0
- Level 1 = 20
- Level 0 = 10
- No Findings = 20

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Status of S&L Expanded Calculation Review

- Level 1 Findings include:
  - Undocumented assumptions
  - Undocumented acceptance criteria
  - Undocumented design inputs
  - Math Errors (No significant impact)
  - Misc. Discrepancies with Current Procedure Requirements

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Status of S&L Expanded Calculation Review

- Level 0 Findings include:
  - Format
  - Attachments
  - References

<u>Conclusion</u> - Findings from expanded sample are similar in nature to ComEd's Random Audit. Corrective actions taken following the ComEd Audit address these findings. S&L EA Function, as well as ComEd follow-up Audit will confirm effectiveness of S&L's Corrective Actions

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Common Site EA Group Charter

Common Purpose of the EA Group

The purpose of the EAG is to provide oversight of engineering activities that validate, maintain, and if necessary, reconstitute the Station's s design bases. The EAG will also assure that engineering products are in compliance with current license and design bases and are consistent with industry standards and methods.

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Site EA Group Charter
Common Oversight Roles

- Design Change Activities (mods, temp alts, setpoint changes)
- Operability Determinations
- Safety Evaluations
- Licensee Event Reports
- Calculations

Sampling varies from site to site; however, all will review both ComEd and Contractor Products

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EA Peer Group Goals

- Champion Self Assessment
- Establish minimum sampling of Oversight Activities
- Self Assess the EA Groups Across the Seven Sites
- Facilitate Establishment of Common Performance Standards and Metrics
- Support technical evaluation of Supplier Audits.

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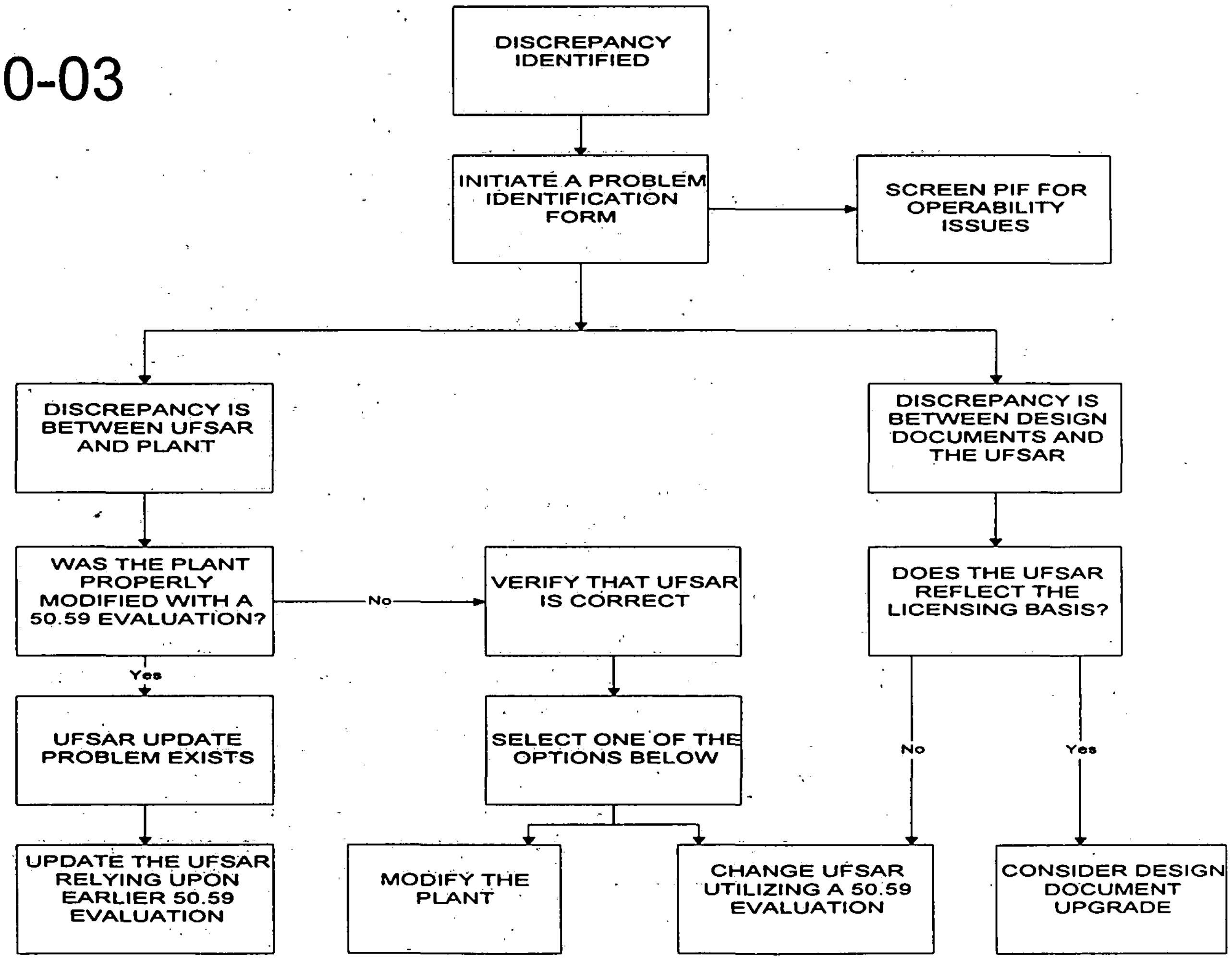
Disposition of Design Bases Discrepancies

ComEd NEP 10-03



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Supplier Evaluation Services

E. R. Netzel

Supplier Evaluation Services Director

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Audits of AE's focused on:

- Design control process with focus on calculations
- Problem identification & notification
- Interface between ComEd and the vendor

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1997 AE Audits

Bechtel	Offsite	1st Qtr	Complete
	Site(s)	3rd Qtr	
Duke	Offsite	2nd Qtr	
	Site(s)	3rd Qtr	
GE (NSSS)	Offsite	3rd Qtr	
	Site(s)	4th Qtr	

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1997 AE Audits (Cont.)

Siemens (Fuel)	Part 1	1st Qtr	Complete
	Part 2	3rd Qtr	
Westinghouse (NSSS)	Offsite	2nd Qtr	
	Site(s)	3rd Qtr	
Westinghouse (Fuel)	Part 1	2nd Qtr	
	Part 2	3rd Qtr	
S&L	C/A Follow up	2nd Qtr	

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Siemens Audit

Scope: 23 Calculations

- Reload Specific Calculations for QC 2C15 and L2C8
- Q2C15 extended operating domain/equipment out of Service Calcs
- Criticality & fuel handling accident calcs for Dresden & LaSalle
- SUBTIP & LPRM Out of Service calcs for Dresden/Quad Cities
- Calcs associated with Power Plex/MICROBURN development & testing for LaSalle

Results: No calculational quality issues

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Bechtel Audit

Scope: 17 Byron/Braidwood Steam Generator Replacement Project Calculations

- 6-Structural
- 1-Mechanical
- 2-HVAC
- 8-Shielding

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Bechtel Audit (Continued)

Results:

- 1-Finding
- 1-Unresolved Item

Significance:

- 6-Level 0
- 8-No Errors
- 3-Unresolved