

JUN 28 1985

Docket Nos.: 50-445  
and 50-446

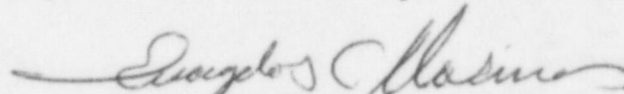
APPLICANT: Texas Utilities Generating Company (TUGCO)  
FACILITY: Comanche Peak Steam Electric Station, Units 1 and 2  
(CPSES)  
SUBJECT: SUMMARY OF MEETING BETWEEN NRC STAFF AND CYGNA ENERGY  
SERVICES TO DISCUSS PRELIMINARY RESULTS FROM A PORTION  
OF THE PHASE 4 INDEPENDENT ASSESSMENT PROGRAM REVIEW

On May 21, 22, and 23, 1985, the NRC staff and its consultants met with Cygna Energy Services to discuss the preliminary results from a portion of the Phase 4 Independent assessment Program review for Comanche Peak. The meetings were held at the Cygna offices in San Francisco. An attendance list is enclosed.

The objective of the meeting was to determine the depth and breadth to which Cygna reviewed the mechanical system hydraulics and the electrical systems, including instrumentation and controls, for the component cooling water system. Cygna had transmitted its preliminary checklists for this portion of the review to the NRC staff by letter number 84056.065 dated April 29, 1985. The NRC staff had transmitted questions collected from its review of these checklists to Cygna by a letter dated May 3, 1985. This letter is enclosed.

During the first part of the meeting the NRC staff sought responses to its previously transmitted questions. During the second part of the meeting, at the request of Cygna management, the NRC staff and its consultants provided further clarification of the remaining staff questions. Cygna indicated it would be prepared to respond to the unresolved questions in a future meeting with the NRC staff.

The meetings were transcribed and a transcript is also enclosed. The meeting extended over portions of three days; however, the transcript is provided in one volume. The transcript for the first day is contained on pages numbered 1 through 176; the second day is contained on pages numbered 177 through 308; and the third day is contained on pages numbered 309 through 323 with attachment 1 (3 pages).



Evangelos C. Marinos, Deputy  
Electrical/Operational Group  
Comanche Peak Project

Enclosures: As stated

cc: See next page

\* SEE PREVIOUS CONCURRENCES

LB#1/DL LB#1/DL  
\*SBurwell/mac BJYoungblood  
06/20/85 06/ /85

CP/TRT/DL  
\*CTrammell  
06/24/85

CP/TRT/DL  
VSNooan  
06/ /85

CP/TRT/DL RSB/D/DSI  
\*JCalvo EMarinos  
06/21/85 06/26/85

8507120600 850628  
PDR ADDCK 05000445  
A PDR



NRC Staff and Cygna Meeting (5/21-23/85)

Attendance List

NRC STAFF

J. A. Calvo  
E. C. Marinos  
J. Knox  
E. Tomlinson  
D. Norkin  
T. Ankrum

CYGNA

R. Stuart  
N. Williams  
J. Minichello  
R. Hess  
J. Killigh  
J. Foley  
R. Newmon  
A. Moersfelder  
R. Porter  
C. Oszewski  
L. Maggio  
T. Martin

TEXAS UTILITIES

D. Davis, TERA  
S. Kumar, G & H  
J. Redding, TUGCO

NRC CONSULTANTS

L. Stanley  
G. Overbeck  
G. Morris  
J. Neushemal  
V. Ferrarini

ORIGINAL

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TEXAS UTILITIES CPRT MEETING  
CYGNA ENERGY SERVICES

- - -

TUESDAY, MAY 21, 1985 - 9:15 A.M.

101 CALIFORNIA STREET, SUITE 1000  
SAN FRANCISCO, CALIFORNIA

- - -

1 MR. CALVO: THE MEETING BETWEEN CYGNA AND THE  
2 NUCLEAR REGULATORY COMMISSION, SUBJECT, THE -- OR RELATED TO  
3 COMANCHE PEAK PROJECT REVIEWING OF QUESTIONS SUBMITTED BY THE  
4 NRC TO CYGNA ON MAY THE 3RD, 1985.

5 MY NAME IS JOSE CALVO. I'M THE ELECTRICAL AND  
6 OPERATIONAL GROUP MANAGER OF COMANCHE PEAK PROJECT. TO MY  
7 RIGHT IS ANGELO MARINOS EO GROUP DEPUTY FOR THE COMANCHE PEAK  
8 PROJECT. OTHER MEMBER OF THE EO GROUP IS ED TOMLINSON AND  
9 JOHN KNOX.

10 ALSO, WE HAVE HERE DON NORKIN FROM THE OFFICE OF  
11 INSPECTION AND ENFORCEMENT. ALSO, TED ANKRUM FROM OFFICE OF  
12 INSPECTION AND ENFORCEMENT. WE ALSO HAVE CONSULTANTS, GARY  
13 OVERBECK, JOHN NEVSHEMAL.

14 MR. NEVSHEMAL: NEVSHEMAL.

15 MR. CALVO: GEORGE MORRIS, LOREN STANLEY.

16 AGAIN, THE PURPOSE OF THE MEETING IS TO DISCUSS THE  
17 QUESTIONS SUBMITTED TO CYGNA BY THE NRC ON MAY 3RD, 1985  
18 CONCERNING PHASE 4 OF THE INDEPENDENT EXAMINATION BEING  
19 CONDUCTED BY CYGNA. THE RESPONSES TO THESE QUESTIONS WILL BE  
20 DOCUMENTED AS PART OF THIS RECORD AND OF THIS MEETING AND,  
21 THEREFORE, THERE WILL BE NO FURTHER NEED TO RESPOND IN WRITING  
22 TO THE NRC CONCERNING THESE QUESTIONS.

23 AT THE END OF THE MEETING SESSIONS WHERE AN  
24 OPPORTUNITY WILL BE GIVEN TO THE TEXAS UTILITY ELECTRICAL  
25 COMPANY, INTERVENORS, AND OTHER PARTIES ATTENDING THIS MEETING  
26 TO INTRODUCE THEIR COMMENTS TO THE PUBLIC RECORD. ALSO, NOW,  
27 I REQUEST THE TRANSCRIPT OF THIS MEETING AND ATTACHMENTS WILL  
28 BE SENT TO THE NRC, ATTENTION TO VINCE NOONAN, DIRECTOR OF "



1 COMANCHE PEAK PROJECT.

2 THAT'S ALL I HAVE TO SAY NOW.

3 MS. WILLIAMS: I'LL BEGIN WITH INTRODUCING THE  
4 PEOPLE WHO WILL BE SPEAKING THE MOST. TO MY LEFT IS THE  
5 PROJECT ENGINEER, BOB HESS WHO WILL BE TALKING PRIMARILY ON  
6 MECHANICAL SYSTEMS QUESTIONS. TO HIS LEFT IS JIM FOLEY, ALSO  
7 MECHANICAL SYSTEMS. TO MY RIGHT IS TOM MARTIN, ELECTRICAL AND  
8 I&C. AND TO TOM'S RIGHT IS LARRY MAGGIO, ELECTRICAL.

9 BEFORE WE BEGIN, AFTER HAVING REVIEWED THE STAFF'S  
10 QUESTIONS TRANSMITTED TO CYGNA ON MAY 3RD, WE THINK IT WOULD  
11 BE PRODUCTIVE TO BEGIN THIS MEETING WITH AN OVERVIEW  
12 DISCUSSION OF THE MECHANICAL, ELECTRICAL, AND I&C REVIEW  
13 SCOPES.

14 IT SEEMS PARTICULARLY IMPORTANT IN LIGHT OF THE FACT  
15 THAT A COUPLE OF OUR RESPONSES TO THESE QUESTIONS WOULD BE,  
16 QUOTE, OUT OF SCOPE, UNQUOTE, AND WE WANT TO MAKE SURE THAT  
17 YOU UNDERSTAND WHY WE'RE SAYING THAT AND PERHAPS ELIMINATE  
18 SOME OF THE QUESTIONS BEFORE WE START THE MEETING.

19 TO BEGIN WITH, THE ELECTRICAL AND I&C SCOPE INCLUDED  
20 THE CCW TRAINING SAFEGUARDS LOOP, PUMP VALVES AND ACTIVE  
21 INSTRUMENTS AND ASSOCIATED EQUIPMENT. THE ELECTRICAL CIRCUIT  
22 REVIEW BEGAN WITH THE CLOSEST ELECTRICAL SOURCE BREAKER, SUCH  
23 AS 6.9 KV SWITCHGEAR AND CONTINUED OUT TO EACH TRAIN "A"  
24 COMPONENT. IN OTHER WORDS, THESE SOURCES WERE CONSIDERED  
25 INPUTS TO OUR REVIEW SCOPE. THE SAFEGUARDS, THUS, WOULD HAVE  
26 BEEN AN INPUT.

27 HOWEVER, TO INSURE THAT THE SYSTEM WAS ADEQUATELY  
28 DESIGNED AT THESE PROTECTIVE DEVICES, WE DID CHECK THE VOLTAGE

1 LEVELS, THE SHORT CIRCUIT CURRENT CAPACITY, AND PREFERRED  
2 ALTERNATE STANDBY POWER SOURCES TO INSURE THAT THEY WERE  
3 AVAILABLE.

4 CONVERSELY, THE MECHANICAL SYSTEMS REVIEW DID  
5 INCLUDE AN EVALUATION OF SOME PORTIONS OF THE NON-SAFEGUARDS  
6 LOOP AS IT INTERFACED WITH THE SAFEGUARDS FUNCTIONS.

7 WHAT I WOULD PROPOSE TO DO AT THIS POINT IN TIME IS  
8 TO PERHAPS PULL OUT ONE OR TWO OF THE FLOW DIAGRAMS AND HAVE  
9 BOB WALK YOU THROUGH PHYSICALLY WHAT OUR SCOPE WAS, IF YOU  
10 THINK THAT WOULD BE HELPFUL.

11 MR. CALVO: BEFORE YOU GO ANY FURTHER, I THINK WE  
12 CAN INTRODUCE THE WORKING MEMBERS. I WOULD ALSO LIKE TO --  
13 ALL THE PEOPLE IN THE ROOM, I WOULD LIKE FOR THEM TO COME UP  
14 AND INTRODUCE THEMSELVES. ANYBODY WHO HAS NOT BEEN INTRODUCED,  
15 AT THIS TIME I WOULD LIKE TO KNOW WHO THEY ARE AND WHICH  
16 COMPANY THEY REPRESENT.

17 MR. KUMAR: I'M SIVA KUMAR OF GIBBS & HILL.

18 MR. NEWMAN: RICH NEWMAN TENERA CORPORATION.

19 MR. DAVIS: DON DAVIS, TENERA.

20 MR. OSZEWSKI: JIM OSZEWSKI, CYGNA.

21 MR. MINICHIELLO: JOHN MINISHIELLO, CYGNA.

22 MR. STUART: DICK STUART, CYGNA.

23 MR. REDDING: JACK REDDING, TUGCO.

24 MS. WILLIAMS: WOULD YOU LIKE TO BEGIN, THEN, GOING  
25 THROUGH THE DRAWINGS?

26 WHO ARE THE PEOPLE SITTING HERE WHO MOST NEED TO SEE.

27 MR. MARINOS: MECHANICAL OVER HERE AND WE NEED ONE.

28 DO YOU HAVE MORE THAN ONE DRAWING, NANCY?

1 MS. WILLIAMS: NO.

2 MR. MARTIN: I HAVE GOT A FLOW DIAGRAM. DO YOU  
3 THINK THAT WOULD SIMPLIFY? DO YOU HAVE ONE.

4 MS. WILLIAMS: MAYBE YOU HAVE TWO OF THOSE.  
5 (OFF THE RECORD.)

6 MR. CALVO: BEFORE YOU START, MAKE A REFERENCE TO  
7 THE DIAGRAM, INDICATE REVISION NUMBER, AND DATE.

8 MR. HESS: I WOULD LIKE TO CLARIFY THAT WE USED  
9 VARIOUS REVISIONS OF THE SAME DIAGRAM. THE ONE THAT I HAVE UP  
10 HERE, I'LL GIVE YOU THE REVISION NUMBER OF.

11 MR. CALVO: THE ONES THAT HAVE BEEN USED IN THIS  
12 MEETING, WE WOULD LIKE TO KNOW WHAT THEY ARE AND THEY CAN BE  
13 IDENTIFIED LATER.

14 MR. HESS: THIS DRAWING NUMBER IS 2323-M1-0229 AND  
15 IT'S REVISION CP-2. THE BASIC MECHANICAL SCOPE --

16 MR. MARINOS: IS THIS THE SAME AS WE HAVE HERE?

17 MR. HESS: YES, BASICALLY THE SAME FIGURE, YES, SIR.

18 MR. MARINOS: BUT IT DOES HAVE A IDENTIFIED NUMBER.

19 MR. HESS: THAT'S RIGHT. IT HAS A FIGURE NUMBER IF  
20 IT'S FROM THE FSAR.

21 MR. CALVO: LET THE RECORD SHOW THAT FIGURE 9.2-3  
22 SHEET 103, 2 OUT OF 3 AND 3 OUT OF 3, IS A SIMILAR DRAWING  
23 THAN THE ONE YOU MENTIONED BEFORE..

24 MR. HESS: THAT'S CORRECT.

25 MR. CALVO: THANK YOU.

26 MR. HESS: OKAY, THE BASIC MECHANICAL SCOPE STARTED  
27 AT THE CCW SURGE TANK, TOOK THE FLOW PATH FROM THE SURGE TANK  
28 TO THE PUMP SUCTION. PUMP SUCTION THROUGH THE PUMP DISCHARGE,



1 CCW HEAT EXCHANGER. THE OUTLET OF THE CCW HEAT EXCHANGER TO  
2 THE NUCLEAR CHILLED WATER SYSTEM HEAT EXCHANGERS, THE CONTROL  
3 ROOM AIR CONDITIONER HEAT EXCHANGERS, THE CONTAINMENT SPRAY  
4 AND RHR HEAT EXCHANGERS UP TO THE OUTLET CONTROL VALVE ON BOTH  
5 OF THOSE HEAT EXCHANGERS.

6 WE ALSO CONSIDERED A FLOW PATH INTO THE  
7 NON-SAFEGUARDS LOOP THAT WENT TO THE REACTOR COOLANT PUMP  
8 THERMAL BARRIER COOLERS. AS THE SCOPE PROGRESSED, WE ALSO  
9 CONSIDERED A FLOW PATH UP TO THE NON-NUCLEAR CHILLER WHICH IS  
10 A DIVISION BETWEEN SEISMIC AND NONSEISMIC EQUIPMENT TO COVER  
11 THE SCOPE.

12 IN THE COURSE OF REVIEWING THIS LOOP AS FAR AS  
13 PRESSURE DROP AND FLOW REQUIREMENTS ARE CONCERNED, ALTHOUGH  
14 THE ORIGINAL SCOPE ENDED AT THE OUTLET, WE DID REVIEW PORTIONS  
15 OF THE PRESSURE DROP CALCS THAT COVERED THE ENTIRE RETURN LOOP  
16 SINCE THAT WAS THE WAY THE CALCULATIONS WERE PERFORMED.

17 OKAY, THE NEXT DRAWING WHICH COVERS THE SCOPE IS  
18 2323-M 1-0230, REV CP6, AND THAT WOULD BE EQUIVALENT TO YOUR  
19 9.2 --

20 MR. MARINOS: 9.2-3, SHEET 2 OF 3.

21 MR. HESS: THIS SHOWS THE FLOW PATH COMING FROM THE  
22 NON-SAFEGUARDS LOOP OVER TO THE NON-NUCLEAR CHILLER -- ALL  
23 RIGHT -- WHICH GOES THROUGH CONTROL VALVE 4460, IF I'M  
24 READING -- 4640 IS THE CONTROL VALVE GOING INTO THE  
25 NON-NUCLEAR CHILLERS.

26 AND THEN FROM THIS SHEET WE GO TO THE NEXT ONE FOR  
27 THE THERMAL BARRIER. THIS IS 2323-M1-0231, REV CP5. AND THIS  
28 SHOWS THE FLOW PATH INTO THE THERMAL BARRIER COOLER AND THE

1 OTHER COOLERS ON THE ONE REACTOR COOLANT PUMP.

2 OKAY. DURING THIS REVIEW WE DID ALSO LOOK SOMEWHAT  
3 AT THE RETURN FLOW PATH FROM THE REACTOR COOLANT THERMAL  
4 BARRIER AND BEARING OIL COOLERS, ET CETERA.

5 MR. MARINOS: WHICH REACTOR COOLANT PUMP?

6 MR. HESS: WE BASICALLY LOOKED AT -- FOR DIFFERENT  
7 REASONS, THE TWO DIFFERENT REACTOR COOLANT PUMPS. INITIALLY  
8 WE HAD SHOWN THE SCOPE AS TO 01, REACTOR COOLANT PUMP 01.  
9 DURING THE ANALYSIS REVIEW, ACTUALLY THE MOST DISTANT BARRIER  
10 COOLING PUMP WAS 03, SO WE LOOKED AT THE FLOW PATH TO THAT 03  
11 PUMP.

12 MR. OVERBECK: IS 03 THE MOST DISTANT LOAD ON THE  
13 SYSTEM?

14 MR. HESS: YES.

15 MR. OVERBECK: YOU MADE A STATEMENT TO THE EFFECT  
16 THAT IN DEVELOPING THE SCOPE, DID YOU HAVE A HAND AT CYGNA IN  
17 DEVELOPING THE SCOPE OR WAS IT PROVIDED TO YOU?

18 MR. HESS: WE HAD A HAND IN DEVELOPING THE SCOPE.

19 MS. WILLIAMS: WELL, I THINK I'D LIKE TO CLARIFY  
20 THAT A LITTLE BIT. THERE WAS ONE TELEPHONE DISCUSSION BETWEEN  
21 OURSELVES AND TEXAS UTILITIES WHERE WE SKETCHED OUT THE  
22 REASONABLE BOUNDS FOR THE SCOPE ON THE CCW SYSTEMS REVIEW.  
23 THE ACTUAL FINALIZATION OF WHERE THE REVIEW STOPPED AND START  
24 WAS LATER REFINED BY TEXAS UTILITIES.

25 MR. MARINOS: WHY DID YOU GO BEYOND THE SAFEGUARDS  
26 LOOP OF THE COMPONENT COOLING WATER SYSTEM INTO THE REACTOR?

27 MR. HESS: BASICALLY TO GET AN ASSESSMENT OF THE  
28 INTERFACE BETWEEN SAFEGUARDS AND NON-SAFEGUARDS DESIGN AS TO

1 HOW THAT INTERFACE HAD BEEN HANDLED IN THE DESIGN PROCESS.

2 MR. MARINOS: FOR THE SAFETY SIGNAL, THAT SYSTEM IS  
3 GOING TO BE ISOLATED.

4 MR. HESS: THAT'S CORRECT.

5 MR. MARINOS: SO WHAT WERE YOU TRYING TO GAIN?

6 MR. HESS: WELL, THE OTHER THING TO CONSIDER IS MANY  
7 OF THE COMPONENTS, TWO MAJOR COMPONENTS IN THE SAFEGUARDS LOOP  
8 WHICH WOULD CONTAIN THE SPRAY AND THE NON- -- AND THE RHR HEAT  
9 EXCHANGER ARE NOT NORMALLY IN OPERATION. SO WE WANTED  
10 EQUIPMENT THAT IS NORMALLY IN OPERATION ALSO WHEN WE LOOKED AT  
11 THOSE FLOW PATHS. AND THAT'S WHERE THE NON-SAFEGUARDS LOOP  
12 CAME IN.

13 OKAY, THAT BASICALLY COVERS THE SCOPE FROM THE  
14 MECHANICAL SYSTEMS.

15 MR. CALVO: DO YOU WANT TO CONTINUE WITH THE OTHER  
16 SCOPES TO GIVE US AN OVERVIEW AND THEN COME BACK WITH THE  
17 QUESTIONS IN EACH DISCIPLINE?

18 MS. WILLIAMS: THAT SOUNDS GOOD.

19 TOM, DO YOU WANT TO GO THROUGH THE ELECTRICAL?

20 MR. MARTIN: LOOKING AT THE SAME DRAWING,  
21 2323-M1-0229 REV CP2, THE ELECTRICAL SCOPE FOCUSED ON THE  
22 TRAIN "A" SAFEGUARD ELECTRICAL COMPONENTS. WE BASICALLY  
23 STARTED AT THE SURGE TANK REVIEWING INTERLOCKS WITH THE VENT  
24 VALVE AND FUNCTIONS OF THE LEVEL OF TRANSMITTER  
25 INSTRUMENTATION WITH  
26 THE --

27 MR. STANLEY: COULD YOU GIVE THE VENT NUMBER ON THE  
28 VENT VALVE YOU'RE TALKING ABOUT?



1 MR. MARTIN: THE VENT VALVE IS 4508, RV4508. MAYBE  
2 I'LL JUST GO THROUGH AND IDENTIFY THE MAJOR COMPONENTS WE  
3 LOOKED AT AND IF WE GET INTO QUESTIONS, I'LL IDENTIFY WHAT WE  
4 LOOKED AT LATER. COMING DOWN THE PATH, WE REVIEWED VALVES HB  
5 4512, MOTOR OPERATED VALVE HB 4524, THE COMPONENT COOLING PUMP  
6 MOTOR CIRCUITRY, WHICH IS CP1-CCAP CC-01 -

7 MR. CALVO: MAY I ASK A QUESTION?

8 MR. MARTIN: SURE.

9 MR. CALVO: MOST OF THE THINGS THAT YOU HAVE BEEN  
10 READING, THOSE ARE INCLUDED IN THE CHECKLIST ANYWAY.

11 MR. MARTIN: YES.

12 MR. CALVO: SO I GUESS MAYBE YOU CAN SAY THE  
13 COMPONENTS THAT WERE EVALUATED BY CYGNA, PHASE 4 AS PART OF  
14 THE COMPONENT COOLING WATER SYSTEM, THOSE ARE IDENTIFIED IN  
15 THE CHECKLIST. I FEEL THAT WE'RE REPEATING.

16 MR. MARTIN: OKAY.

17 MS. WILLIAMS: COULD YOU MAYBE GIVE THEM A FEEL, TOM,  
18 FROM A FUNCTIONAL STANDPOINT WHAT RELATES TO WHAT, WHAT  
19 INTERLOCKS WITH WHAT. I THINK THEY WANT TO GET A FEEL FOR THE  
20 DEPTH OF HOW YOU SET OUT TO TRACE YOUR WAY THROUGH THE SYSTEM  
21 AND THE KINDS OF CONCERNS THAT YOU CONSIDERED AND GIVE THEM A  
22 PHYSICAL FEEL FOR THE SYSTEM AND HOW YOU SAW IT.

23 MR. MARTIN: OKAY. ON THE --

24 MR. MARINOS: IT'S NOT EASY.

25 MS. WILLIAMS: IT'S NOT EASY.

26 MR. MARTIN: ON THE RELIEF VALVE ORIGINALLY THERE  
27 WAS A RADIATION INTERLOCK ON THE DESIGN WHICH IS BASICALLY WHY  
28 WE INCLUDED IT IN OUR REVIEW. SO IT PRIMARILY FOCUSED ON THE

1 INTERLOCKS WITH THE VALVES AND THEIR POWER SUPPLIES TO THEM.  
2 WE'VE GOT TRAIN "A" SEPARATION VALVES ON BOTH SIDES OF THE  
3 NON-SAFEGUARDS LOOP WHICH WE REVIEWED FOR BASICALLY ADEQUATE  
4 CIRCUIT DESIGN FOR ALL THE APPLICABLE REG GUIDES AND DESIGN  
5 CRITERIA.

6 AS WE STATED EARLIER, WE JUST LOOKED TO THESE THINGS  
7 TO THE NEAREST SOURCE BREAKER AND TRIED TO DO AN EVALUATION  
8 FROM THAT POINT AND THE REST OF THE DESIGNS WERE ADEQUATE TO  
9 THAT POINT. THE COMPONENT COOLING WATER PUMP, AGAIN WE  
10 REVIEWED FOR PROPER INTERLOCKS THAT START ON LOW PRESSURE.  
11 THE OTHER TRAIN, THAT IT STARTED ON LOW PRESSURE SERVICE WATER  
12 TRAIN FROM REDUNDANT DIVISION. THERE WERE INTERLOCKS BETWEEN  
13 THE SERVICE WATER PUMP AND THE COMPONENT COOLING WATER PUMP.

14 WE REVIEWED THE OUTLET -- OUR SCOPE STOPPED AT THE  
15 OUTLET OF THE CONTAINMENT SPRAY AND CONTROL ROOM HEAT  
16 EXCHANGERS AND WE VERIFIED THAT PROPER SIGNALS AND CIRCUITRY  
17 EXISTED, THAT INSURE THOSE HELD ON CONTAINMENT SPRAY AND SAFETY  
18 INJECTION SIGNALS.

19 BASICALLY, ON INSTRUMENTATION, WE REVIEWED ACTIVE  
20 FUNCTIONS OF INSTRUMENTATION, WHETHER IT DID THE PROPER  
21 INTERLOCKS WITH THE COMPONENT COOLING WATER PUMP, AND A LOT OF  
22 VERIFIED CONTROL ROOM INDICATION EXISTED WHERE IT WAS REQUIRED.

23 I THINK MAYBE TO PINPOINT SOME OF THIS STUFF, WE  
24 INITIATED A DOCUMENT DC-5 WHICH IS ELECTRICAL SYSTEM REVIEW  
25 CRITERIA, AND THE LAST SECTION OF IT DOES IDENTIFY THE KEY  
26 ITEMS THAT THE CHECKLISTS WERE DEVELOPED FROM.

27 MR. MARINOS: DO WE HAVE THIS CRITERIA LISTED IN THE  
28 MEMORANDUM -- IN THE LETTER THAT YOU SENT US, NANCY, WHEN WAS

1 THAT, MAY --

2 MS. WILLIAMS: THAT'S APRIL 29TH, '85.

3 MR. MARINOS: WE HAVE A DETAIL LIST OF THE CRITERIA  
4 THAT YOU ARE GOING TO TALK ABOUT?

5 MR. MARTIN: YES.

6 MR. MARINOS: YOU CAN REFER TO THAT LIKE WE ALREADY  
7 HAVE, YOU DON'T HAVE TO GO THROUGH EACH ITEM --

8 MR. MARTIN: OKAY.

9 MR. MARINOS: -- UNLESS YOU WANT TO HIGHLIGHT  
10 SOMETHING FROM THAT.

11 MR. MARTIN: WHAT I WAS CONSIDERING DOING WAS JUST  
12 HIGHLIGHTING WHAT WE DEVELOPED THE CHECKLIST FROM --

13 MR. MARINOS: FINE.

14 MR. MARTIN: -- WHICH IS BASICALLY THE SECTION FOR  
15 REVIEW CRITERIA.

16 MR. CALVO: FOR THE RECORD, WE HAVE BEEN TALKING  
17 ABOUT CHECKLIST AND CRITERIA. I THINK WE HAVE TO PUT THAT IN  
18 PERSPECTIVE. WE'RE TALKING ABOUT AN INDEPENDENT SYSTEM  
19 PROGRAM FOR ELECTRICAL SYSTEM REVIEW CRITERIA FOR THE COMANCHE  
20 PEAK ELECTRICAL STATION PREPARED BY CYGNA FOR PHASE 4. I  
21 GUESS REVISION 1, THE DATE IS -- DATE IS -- WAS SIGNED --

22 MR. NORKIN: AUGUST 29TH, '84.

23 MR. STANLEY: BEFORE YOU GO ON TO THAT, CAN I STOP  
24 YOU FOR A MINUTE AND ASK A QUESTION. YOU CONFINED YOUR REVIEW  
25 SCOPE IN THE ELECTRICAL AND ISC AREA. WAS THERE ANY ATTEMPT  
26 TO EXPAND IT TO COVER THE ENTIRE -- TO PICK UP THE POSSIBLE  
27 INTERACTIONS IN TRAIN B?

28 MR. MARTIN: THE INTERACTIONS WE'VE LOOKED AT WERE



1 THE INTERACTIONS OF SOMETHING HAPPENING IN TRAIN B THAT  
2 REQUIRED AN ACTION IN TRAIN "A". THAT -- THOSE WERE THE ONLY  
3 INTERLOCKS WE FOUND IN THE CONTROL CIRCUITRY OF TRAIN "A".

4 MR. STANLEY: WAS THERE ANY ATTEMPT AT EXPANDING TO  
5 TRAIN B AS WELL AS TRAIN "A" EVER.

6 MS. WILLIAMS: THERE MIGHT HAVE BEEN HAD WE FOUND  
7 SOME PROBLEMS WITH THE INTERLOCKS THAT WE DID LOOK AT. BUT  
8 OUR STANDARD APPROACH IS IF THERE WERE NO -- THERE WAS NO  
9 REASON OR EVIDENCE TO LOOK FURTHER OR EXPAND PHYSICALLY THE  
10 SCOPE, THEN WE GENERALLY WOULD NOT DO THAT. BUT I THINK THAT  
11 IN THE MECHANICAL SYSTEMS AREA, THERE WAS A LOT OF INTERPLAY  
12 BETWEEN THE ELECTRICAL AND MECHANICAL GROUPS AND PERHAPS,  
13 BOB, YOU --

14 MR. HESS: WELL, EVEN THOUGH THE ELECTRICAL SCOPE  
15 WAS LIMITED TO WHAT WAS JUST DESCRIBED IN CERTAIN AREAS WHERE  
16 MECHANICAL CAME UP WITH QUESTIONS AS TO HOW CERTAIN FUNCTIONS  
17 WERE CONTROLLED BECAUSE THEY HAD AN EFFECT ON THE MECHANICAL  
18 FLOW PATH, FOR EXAMPLE, CONTAINMENT ISOLATION, WE WERE  
19 INTERESTED IN THE MECHANICAL AREA AS TO WHEN CERTAIN VALVES  
20 CLOSED ON CONTAINMENT ISOLATION SIGNALS. AND THEN WE  
21 REQUESTED ELECTRICAL TO GO IN AND LOOK AT THE ICD'S. EVEN  
22 THOUGH THAT WAS NOT PART OF THEIR SPECIFIC SCOPE, THEY LOOKED  
23 AT IT TO GIVE US INPUT AS TO THE CONTROL FUNCTIONS AND WHETHER  
24 OR NOT SOMETHING CLOSED ON WHAT SIGNAL.

25 MR. CALVO: WHEN YOU SAY ICD, WHAT DO YOU MEAN?

26 MR. HESS: INTERFACE CONTROL DRAWINGS --  
27 INSTRUMENTATION CONTROL DRAWINGS.

28 MR. CALVO: ONE QUESTION. GO AHEAD, LOREN.

1 MR. STANLEY: IS IT SAFE THEN TO CONCLUDE THAT YOU  
2 NEVER PUT THE SYSTEMS PERSPECTIVE ON THIS, IT WAS ALWAYS TRAIN  
3 "A"?

4 MR. HESS: I DON'T THINK THAT THAT'S A TOTALLY TRUE  
5 CONCLUSION. FROM THE MECHANICAL SYSTEM STANDPOINT WE -- WE  
6 DID LOOK AT THE INTERRELATIONSHIP BETWEEN TRAIN "A" AND TRAIN  
7 B.

8 MR. STANLEY: INSTRUMENTATION. LET'S ASK THE  
9 QUESTION IN THAT DISCIPLINE.

10 MR. HESS: UM --

11 MR. STANLEY: SPECIFICALLY WHAT I AM FOCUSING IN ON  
12 IS THE INTERLOCK FROM TRAIN B TO TRAIN "A" AND THE INTERLOCK  
13 FROM TRAIN "A" TO TRAIN B.

14 MR. HESS: YES, WE HAVE REVIEWED THAT.

15 MR. STANLEY: BUT YOUR REVIEW DID NOT ADDRESS THE  
16 SYSTEMS ASPECT AS TO WHETHER THAT WAS A WISE INTERLOCK FROM AN  
17 OVERALL SYSTEMS PERSPECTIVE, WAS THAT A CORRECT INTERLOCK TO  
18 HAVE IN IT. THAT QUESTION NEVER GOT ASKED.

19 MR. CALVO: SUPPOSE THE INTERLOCK WOULD HAVE FAILED.  
20 WOULD IT DISABLE BOTH TRAINS?

21 MR. MARTIN: NO.

22 MR. STANLEY: YOU'RE SURE?

23 MR. MARTIN: YES.

24 MR. CALVO: SO YOU LOOK THEN -- YOU ELEVATE A LITTLE  
25 BIT FOR THE TRAIN TO-- THIS IS -- GUESS THAT'S WHAT YOU ARE  
26 TRYING TO GET AT.

27 MR. STANLEY: EXACTLY.

28 MR. MARTIN: THE ONLY INTER-TRAIN INTERLOCK WE

1 OBSERVED DURING THE REVIEW WAS THE PRESSURE SWITCH BETWEEN  
2 COMPONENT COOLING WATER, TRAIN "A" LOW PRESSURE AND TRAIN B  
3 LOW PRESSURE, AND STATION SERVICE WATER, TRAIN "A" LOW  
4 PRESSURE AND TRAIN B LOW PRESSURE.

5 MR. CALVO: ALL RIGHT, SIR.

6 MS. WILLIAMS: IS IT THE ONLY ONE BECAUSE THAT WAS  
7 THE ONLY ONE YOU CAME ACROSS?

8 MR. MARTIN: THAT WAS THE ONLY ONE WE CAME ACROSS IN  
9 REVIEWING THE TRAIN "A" THAT COULD POSSIBLY AFFECT THE TRAIN  
10 "A".

11 MR. CALVO: LET ME ASK ANOTHER QUESTION. IS THE  
12 COMPONENT COOLING WATER SYSTEM THAT'S NORMALLY INITIATED BY  
13 THE ENGINEER SAFETY FEATURES, ACTUATION SIGNALS, DO YOU ALSO  
14 CONSIDER THE INPUT FROM THE SYSTEM HOW THE COMPONENT COOLING  
15 WATER SYSTEM, HOW DO YOU CLOSE VALVES, HOW DO YOU OPEN VALVES?

16 MR. MARTIN: YES, WE HAVE REVIEWED SAFEGUARDS INPUTS  
17 TO THE CONTROL CIRCUITS IN THIS THING --

18 MR. MARINOS: SAFETY FEATURE IS IT ISOLATES THE  
19 NONSAFETY, THE COMPONENT COOLING WATER SYSTEM IS GOING ON  
20 DURING PLANT OPERATION.

21 MR. CALVO: I'M TRYING TO GET HOW MUCH OF THE  
22 SYSTEMS FLAVOR YOU CONSIDER AS PART OF THE PHASE 4 AND SOME  
23 KIND OF WAY YOU LOOK LIKE YOU TRYING TO COME DOWN TO THE  
24 COMPONENT LEVEL. IT LOOKS LIKE YOU HAD DONE SOME THINGS AT  
25 THE SYSTEM LEVEL AND I GUESS THAT'S WHAT WE'RE TRYING TO FIND  
26 OUT.

27 MR. HESS: TOM, IF YOU DON'T MIND I'LL JUMP IN.  
28 WE DID LOOK AT WHAT THE NORMAL OPERATION OF THE



1 SYSTEM WAS, WHAT HAPPENS WHEN A P SIGNAL AND AN S SIGNAL AS  
2 FAR AS VALVE POSITION CHANGES. WE LOOKED AT THE ISOLATION OF  
3 THE NON-SAFEGUARDS LOOP FROM A SYSTEMS STANDPOINT. WE LOOKED  
4 AT THE ISOLATION OF THE TRAIN "A" AND TRAIN B LOOPS FROM A  
5 SYSTEMS STANDPOINT.

6 MR. CALVO: OKAY.

7 MR. HESS: THE INTERLOCK THAT WE'RE DISCUSSING WITH  
8 THE PRESSURE SWITCH, BASICALLY WHAT THAT INTERLOCK DOES IS IF  
9 YOU GET LOW DISCHARGE PRESSURE ON THE PUMP INDICATING THAT THE  
10 DEMAND EXCEEDS THE CAPACITY OF THE PUMP, THAT IT STARTS THE  
11 SECOND PUMP UNDER NORMAL SYSTEM OPERATION NOT UNDER A P OR AN  
12 S SIGNAL BECAUSE ON A P AND S SIGNAL, BOTH PUMPS ARE RUNNING.

13 MR. CALVO: THE IMPLEMENTATION OF THAT PARTICULAR  
14 INTERLOCK REFLECTS CERTAIN DESIGN PHILOSOPHY, CERTAIN DESIGN  
15 PRINCIPLES. IF I AM TO CARRY THE THING HORIZONTALLY TO OTHER  
16 SYSTEMS, BECAUSE IF IT WAS DONE GOOD OR BAD ON THIS SYSTEM, IT  
17 MAY GIVE YOU SOME GOOD PERSPECTIVE HOW THE OTHER SYSTEM HAS  
18 BEEN DONE, BECAUSE THE ULTIMATE RESULT OF THE ALL THE EFFORTS  
19 IS TO DETERMINE HOW GOOD THE OTHER SYSTEMS ARE INSOFAR AS WHAT  
20 GOOD AND BAD, IF YOU FIND OUT FROM THE COMPONENT COOLING WATER  
21 SYSTEM.

22 MR. HESS: RIGHT.

23 MR. CALVO: AND WE'RE TRYING TO FIND OUT HOW FAR YOU  
24 WENT INTO THIS -- SUPPOSED TO GIVE YOU THOSE HORIZONTAL  
25 COMPONENTS FOR US TO ASSESS THE OVERALL DESIGN FOR THIS OTHER  
26 SAFETY RELATED SYSTEMS.

27 MR. HESS: I THINK AS WE GET FURTHER INTO THE  
28 DETAILS OF WHAT WE LOOKED AT IN RELATION TO YOUR QUESTIONS ON

1 MECHANICAL SYSTEMS AND ELECTRICAL SYSTEMS, I THINK A LOT OF  
2 THIS WILL CLARIFY. IT'S A LITTLE DIFFICULT TO EXPLAIN HOW WE  
3 GOT CERTAIN POINTS COVERED BECAUSE YOU LOOK AT THEM, SAY, AS  
4 AN ELECTRICAL REVIEW PROBLEM, BUT THEY REALLY, SAY, CAME UP  
5 FROM THE MECHANICAL QUESTIONS AND THEN WE HAD SPECIFICS THAT  
6 WE ASKED ELECTRICAL TO LOOK AT THAT CONCERNED US FROM AN  
7 OVERALL SYSTEM OPERATION POINT.

8 MR. CALVO: AND ONE GENERAL QUESTION. PHASE 3 --  
9 THIS IS PHASE 3 YOU CONSIDER THE RHR, RIGHT?

10 THE REPORTER: YOU CONSIDER --

11 MR. CALVO: THE RESIDUAL HEAT REMOVAL SYSTEM, RHR.

12 MS. WILLIAMS: RESIDUAL HEAT REMOVAL.

13 MR. CALVO: IN THE ELECTRICAL ASPECTS OF THE SYSTEM  
14 DO YOU CONSIDER THE B TRAIN OR DO YOU ALSO CONSIDER THE "A"  
15 TRAIN, WHEN YOU --

16 MS. WILLIAMS: THAT WAS JUST B TRAIN. IT WAS PHASE  
17 2.

18 MR. CALVO: OKAY. PHASE 2 WAS THE B AND PHASE 4 YOU  
19 DID CONSIDER THE "A" TRAIN.

20 MS. WILLIAMS: FOR CCW.

21 MR. CALVO: SO YOU DID SOME LOOKING INTO THE B  
22 TRAIN. OKAY. THAT'S ALL I WANT TO KNOW. GO AHEAD.

23 MR. STANLEY: ONE MORE QUESTION. CLARIFICATION AS  
24 FAR AS THE ENGINE SAFETY FEATURES ACTUATION SIGNALS, THE P  
25 SIGNAL AND S SIGNAL, DID YOU DO AN EXAMINATION INTO THE  
26 WESTINGHOUSE SCOPE, THE ORIGIN OF THOSE SIGNALS, THE POWER?

27 MR. MARTIN: THE DEVELOPMENT OF THOSE SIGNALS, NO,  
28 NO, WE --

1 MR. STANLEY: YOU TAKE THE SIGNAL AS A GIVEN --

2 MR. MARTIN: RIGHT.

3 MR. STANLEY: -- ACTUATING --

4 MR. MARTIN: WE TOOK THE CONTACT FROM THE CONTROL  
5 CIRCUITRY THAT'S INVOLVED IN THE COOLING WATER SYSTEM  
6 CIRCUITRY.

7 THE REPORTER: I'M SORRY, I CAN'T HEAR YOU.

8 MS. WILLIAMS: REPEAT WHAT YOU JUST SAID.

9 MR. MARTIN: WE TOOK THE CONTACT FROM THE SAFEGUARD  
10 SYSTEM AS A GIVEN IN OUR CONTROL CIRCUITRY.

11 MR. CALVO: KEEP IN MIND, ALL WE'RE TRYING TO DO IS  
12 TRY TO UNDERSTAND WHAT YOU DID. WE MAY TAKE YOU AROUND THE  
13 WORLD, BUT WE'RE TRYING TO UNDERSTAND WHAT YOU DID AND WHAT  
14 YOU DID AND THE PURPOSE OF IT, SO YOU FEEL YOU SAY YOU HAD NOT  
15 DONE IT, YOU SAID YOU HAD NOT DONE IT. WE'RE TRYING TO  
16 UNDERSTAND.

17 WHAT WE'RE GOING TO DO WITH THOSE LATER WILL BE  
18 ANOTHER THING. WE'RE TRYING TO UNDERSTAND. I'M NOT SAYING  
19 WHAT YOU DID WAS THE RIGHT THING OR THE WRONG THING, JUST  
20 TRYING TO UNDERSTAND. GO AHEAD.

21 MR. MARTIN: DO YOU WANT TO GO THROUGH THIS OR JUST  
22 START WITH QUESTIONS?

23 MR. CALVO: WELL, IT'S UP TO YOU. DO YOU FEEL THAT  
24 WE HAVE ENOUGH OF THE SCOPE OR DO YOU WANT TO GET -- GARY,  
25 GEORGE?

26 MS. WILLIAMS: I THINK THAT THERE'S ONE MAJOR  
27 DIFFERENCE AT LEAST SOMETHING THAT GOVERNED OUR ANSWERS TO A  
28 LOT OF THESE QUESTIONS THAT MAYBE THIS WOULD BE AN APPROPRIATE



1 TIME TO DISCUSS, AND THAT'S WHY DIDN'T WE GO BEYOND THE  
2 SAFEGUARDS BUS, WHAT'S INVOLVED WITH DOING THAT AND, OF  
3 COURSE, THEN PICKING UP THE DIESELS WHICH WOULD BE DOWNSTREAM  
4 THERE YET.

5 AND FROM -- WE HAD TO PICK A SCOPE AT SOME POINT IN  
6 TIME AND IT WAS CUT OFF AT THE SAFEGUARDS BUS OR THE POWER  
7 SOURCE, BECAUSE ONCE YOU GO BEYOND THAT -- I THINK WE  
8 DISCUSSED THAT IN THE APRIL MEETING -- YOU'RE REALLY HAVING TO  
9 LOOK AT EVERYTHING THAT GOES INTO AND OUT OF THAT IN ORDER TO  
10 ASSESS THE SIZING OF IT PROPERLY.

11 THE SAME GOES FOR THE DIESEL LOADING SEQUENCE. YOU  
12 HAVE TO LOOK AT A LOT OF THINGS THAT WOULD BE ON THE ORDER OF  
13 A 10-FOLD INCREASE IN SCOPE AND EQUALLY TIMEWISE.

14 AND WE WERE CURIOUS AS TO WHY YOU WERE ASKING  
15 QUESTIONS AGAIN AND MAYBE YOU CAN TELL US A LITTLE BIT MORE  
16 ABOUT THAT BECAUSE THERE ARE QUITE A FEW QUESTIONS THAT THAT  
17 HITS HOME ON.

18 MR. CALVO: FOR WHATEVER REASON YOU SELECTED WHAT  
19 YOU CALL A VERTICAL SLICE, YOU HAVE BEEN TAKING SMALL VERTICAL  
20 SLICES PHASE 1, PHASE 2, PHASE 3, A BIGGER VERTICAL SLICE.  
21 YOU ESTABLISHED SOME DATA POINTS, YOU ESTABLISH SOME BENCH  
22 MARKS. I GUESS IT'S NOT IMPORTANT WHAT YOU DID WITH THOSE.  
23 IT'S IMPORTANT WHAT YOU ARE GOING TO CONCLUDE AS A RESULT OF  
24 THE GOOD THINGS AND THE BAD THINGS THAT YOU FOUND WITH THOSE.

25 I MEAN, THE OVERALL CONCLUSIONS ARE GOING TO SAY  
26 THAT BASED ON WHAT I HAD LOOKED ON PHASE 1, PHASE 2, PHASE 3,  
27 FOR THE MECHANICAL AND ELECTRICAL INSTRUMENTATION THE ORIGINAL  
28 ASSURANCE THAT THE DESIGNS FOR COMANCHE PEAK IS "A"-OKAY, WE

1 WOULD LIKE TO KNOW HOW -- THE REASONS WHY YOU CONCENTRATED IN  
2 THIS CALCULATION AND THE REASON YOU DID THIS PARTICULAR PIECE  
3 OF A REVIEW, WHY, BECAUSE -- NOT BECAUSE YOU CAN EXTRAPOLATE  
4 MORE VERTICALLY, BUT BECAUSE YOU CAN EXTRAPOLATE HORIZONTAL.

5 SO WE'RE TRYING TO KNOW WHY YOU DID IT SO WHEN YOU  
6 GIVE US -- COME UP WITH THE OVERALL CONCLUSION, THEN WE CAN  
7 UNDERSTAND IT AND WE CAN SAY, HOW COULD YOU COME UP WITH THESE  
8 CONCLUSIONS BASED ON WHAT YOU DID. AND THAT'S WHY WE'RE  
9 ASKING THE QUESTIONS.

10 MS. WILLIAMS: OKAY. THEN THERE'S ONE PART BEFORE  
11 WE GET GOING, I GUESS I SHOULD CLARIFY AS TO WHAT'S NOT DONE  
12 YET, AND THAT IS THIS DESIGN PROCESS OVERVIEW WHICH I SPOKE  
13 BRIEFLY TO IN THE APRIL MEETING. THE PART THAT'S NOT DONE IS  
14 THE PROCESS FLOW DIAGRAMS WHERE WE HAVE DEVELOPED THE FLOW  
15 DIAGRAMS THAT GOVERN THE WORK AND MECHANICAL SYSTEMS AND IN  
16 THE ELECTRICAL AREA. WE ARE IN THE PROCESS NOW OF TYING THE  
17 PROCEDURES TO OUR UNDERSTANDING OF HOW THE PROCESS WORKED.

18 SO WHAT WE'LL BE DOING IS TAKING THE INFORMATION  
19 THAT WE GAINED, HAVING DONE THIS HARDWARE REVIEW AND OUR  
20 UNDERSTANDING OF HOW THE WORK IS PERFORMED IN GIBBS & HILL AND  
21 TRANSMITTED TO TEXAS UTILITIES AND INSTALLED ON DOWN THE LINE,  
22 BUT WE HAVE NOT COMPLETED THIS DESIGN PROCESS OVERVIEW SUCH  
23 THAT WE CAN'T TALK QUITE TO THE HORIZONTAL SLICE THAT YOU'RE  
24 THINKING OF TODAY. SO THESE GUYS HERE WILL BE TALKING ABOUT  
25 THE VERTICAL SLICE AND WE CAN TALK, YOU KNOW, AS MUCH AS YOU  
26 WANT ABOUT THAT. THAT'S FINE.

27 MR. CALVO: SOME OF THE REASONS WHY YOU DID THINGS  
28 THIS WAY, WHY YOU LIMITED TO THE SCOPE IS GOING TO BE

1        IMPORTANT NOT ONLY TO YOU, TO ALL OF US, EVERYBODY ELSE IS  
2        GOING TO SCRUTINIZE WHAT YOU HAVE DONE.

3                MS. WILLIAMS: I UNDERSTAND. BUT JUST SO THAT YOU  
4        UNDERSTAND THE HORIZONTAL PART'S NOT QUITE DONE YET.

5                MR. CALVO: DO YOU HAVE A PARTICULAR DATE FOR THE  
6        HORIZONTAL PART WHAT IT WOULD BECOME AVIALABLE. I'M NOT  
7        PRESSING, I'M JUST ASKING.

8                MS. WILLIAMS: WELL, THERE'S A LOT OF PARTS, TOO.  
9        ONE IS THE CUMULATIVE EFFECTS DATA BASE. THE OTHER IS THE  
10       TRAINING ANALYSIS ON THE ERRORS. WE'RE DOING ALL FOUR PHASES.  
11       AND THEN THE THIRD PART IS THE REVIEW PROCESS FLOW CHARTS.  
12       THE REVIEW PROCESS FLOW CHARTS ARE PROBABLY FURTHEST ALONG.  
13       AND WE NEED TO GET A COUPLE PROCEDURES FROM GIBBS & HILL YET  
14       AND COMPLETE THAT SOMETIME IN THE NEXT MONTH.

15               MR. CALVO: ARE YOU ALSO HOPING THAT SOME OF THE  
16       LESSONS LEARNED IN ONE DISCIPLINE LIKE IN THE PIPING SUPPORT,  
17       BECAUSE IT REFLECTS ON OTHER DISCIPLINES, SOMETHING THAT IS  
18       GENERIC, THAT IT CAN BE MOVED HORIZONTAL. THAT WILL BE PART  
19       OF YOUR CUMULATIVE EFFECTS.

20               MS. WILLIAMS: ABSOLUTELY. ABSOLUTELY.

21               MR. CALVO: OKAY.

22               MR. MARTIN: MAYBE BRIEFLY LET ME REVIEW, TRY TO  
23       JUST HIGHLIGHT IT AND WE'LL GET INTO MORE DETAIL AS WE GO  
24       THROUGH THE QUESTIONS.

25               WE REVIEWED ELECTRICAL POWER CIRCUIT DESIGNS, SOME  
26       THINGS HIGHLIGHTED IN THERE WERE ELECTRICAL AND PHYSICAL  
27       SEPARATION, REDUNDANT POWER SOURCES, CONTROL CIRCUITS  
28       PERFORMING REDUNDANT FUNCTIONS. WE DID VERIFY THAT THERE WAS



1 A TRAIN B FUNCTION, BUT THAT'S ABOUT AS FAR AS WE WANT TO TALK  
2 ABOUT TRAIN B.

3 MR. MARINOS: WHAT DO YOU MEAN BY A TRAIN B FUNCTION?

4 MR. MARTIN: WELL, LIKE YOU GOT A TRAIN B FUNCTION --  
5 FOR EACH FUNCTION THAT EXISTED IN THE TRAIN "A".

6 MR. MARINOS: IN BOTH "A" AND B.

7 MR. MARTIN: CORRECT. AND THEY WERE BASICALLY  
8 PERFORMING THE SAME THING. WE LOOKED AT VOLTAGES AVAILABLE AT  
9 THE SOURCE BREAKERS THAT CUT OUR SCOPE OFF, WE TRIED TO VERIFY  
10 THAT ADEQUATE SYSTEM VOLTAGE EXISTED THERE AND THAT DID HAVE  
11 REQUIRED OFFSIDE AND BACKUP POWER SOURCES OR STANDBY POWER  
12 SOURCES.

13 WE MATCHED -- WE REVIEWED PROCESS RANGES AND AS FAR  
14 AS THE INSTRUMENTATION THAT WAS PREPARED TO INSURE THAT THE  
15 INSTRUMENTATION SECURED WAS QUALIFIED FOR THE PROCESS RANGE IT  
16 WAS EXPECTED TO SENSE. BASICALLY, WENT THROUGH AND VERIFIED  
17 THAT EVERYTHING IN FSAR AS FAR AS CONTROL FUNCTIONS,  
18 INDICATION RECORDING WERE IN THE CIRCUIT DESIGN FOR THIS  
19 EQUIPMENT.

20 MR. CALVO: YOU DON'T HAVE THE INFORMATION, BUT  
21 SOMETIMES DURING THIS MEETING WHEN YOU SAID YOU LOOKED AT THE  
22 FSAR, IT WOULD BE APPROPRIATE TO FIND OUT WHICH -- UP TO WHICH  
23 AMENDMENT OF THE FSAR THAT YOU VERIFIED HERE FOR THE RECORD,  
24 FSAR.

25 MR. MARTIN: THAT COVERS IT IN AN OVERVIEW.

26 MR. NORKIN: I HAVE ONE QUESTION. YOU WERE TALKING  
27 ABOUT THE LIMITS OF YOUR REVIEW WHEN THE FACT THAT MAYBE OUR  
28 QUESTIONS DIDN'T REFLECT AN UNDERSTANDING OF THE LIMITS. I

1 THINK OUR QUESTIONS ARE SOMEWHAT BASED ON THE EXPERIENCE WE'VE  
2 HAD IN DOING THIS KIND OF REVIEW AND GOING BACK TO THE SOURCE  
3 A LITTLE BIT FURTHER.

4 NOW, IF WE WANT TO TEST THAT, I GUESS I'M SETTING  
5 THE STAGE FOR IT IN SOME CASES WHERE WE WOULD HAVE GONE A  
6 LITTLE FURTHER, WE MAY WANT TO REQUEST THAT KIND OF  
7 INFORMATION. AND I WANT TO SET THE STAGE FOR THAT HOPING THAT  
8 INFORMATION WILL BE AVAILABLE.

9 MR. MARINOS: WHAT DO YOU MEAN BY THAT AS TO  
10 INFORMATION, MORE IN-DEPTH REVIEW?

11 MR. NORKIN: RIGHT.

12 MR. MARINOS: CYGNA MAY NOT HAVE IT BECAUSE CYGNA'S  
13 SCOPE DID NOT COVER IT.

14 MR. NORKIN: I'M SAYING AN INDIVIDUAL REVIEW ON OUR  
15 TEAM WOULD PROBE THOSE AREAS AND THEY WOULD BE INTERESTED IN  
16 SAYING COULD YOU GET THAT INFORMATION.

17 MR. CALVO: WE ONLY TRYING TO ASCERTAIN WHAT CYGNA  
18 HAS DONE. IF SOME THINGS THAT WE FEEL THAT YOU SHOULD HAVE  
19 DONE AS PART OF THE IDI ACTIVITIES, THEN THE SER WILL BE  
20 REFLECTED SUCH.

21 MR. NORKIN: THE POINT IS THAT YOU CAN'T TELL.  
22 SOMETIMES IF YOU GO BACK THAT EXTRA STEP AND YOU FIND OUT THAT  
23 CYGNA USED AN ASSUMPTION THAT IS INCORRECT, BUT YOU GO BACK  
24 AND SEE HOW THAT WAS DERIVED BY LOOKING AT ANOTHER CALCULATION,  
25 SOURCE CALCULATION, YOU FIND OUT THAT NUMBER IS NO GOOD, WE  
26 CAN'T MAKE THAT POINT UNLESS WE LOOK AT THAT SOURCE  
27 CALCULATION.

28 MR. CALVO: THAT'S OKAY, BECAUSE THEN --

1 MR. NORKIN: AND THAT'S THE POINT. WE WOULD BE  
2 USELESS IF WE SAT HERE AND WE'RE CONJECTURING WHETHER CYGNA  
3 SHOULD HAVE GONE FURTHER.

4 MR. CALVO: CYGNA HAS A CALCULATION. AND THE INPUT  
5 TO THAT CALCULATION REQUIRED THE REVIEW OF THE CALCULATION.  
6 AND YOU FEEL THAT IT'S APPROPRIATE, YOU HAVE THE CHOICE, THAT  
7 THE CONSULTANT HAD THE CHOICE. IT'S APPROPRIATE TO SAY, WELL,  
8 I CAN'T REVIEW THAT CALCULATION BECAUSE I DON'T HAVE THIS  
9 INFORMATION AND YOUR SER SHOULD INDICATE THAT IT'S AN OPEN  
10 ISSUE.

11 OR IF YOU FEEL THAT IT'S RELEVANT AND IMPORTANT,  
12 THEN YOU CAN ASK, YES, I WOULD LIKE TO KNOW HOW THAT INCLUDES  
13 IN THE OTHER CALCULATION.

14 NOW, KEEP IN MIND THERE MAY BE ANOTHER CALCULATION  
15 THAT FITS INTO THAT ONE OR ANOTHER ONE THAT FITS INTO THAT ONE.  
16 SO SOMEWHERE -- SOME POINT IN TIME, A DECISION HAS TO BE  
17 MADE --

18 MR. NORKIN: I THINK WE HAVE A PRACTICAL CUT-OFF  
19 POINT.

20 MR. CALVO: AGAIN, THOSE WILL COME UP AS PART OF THE  
21 DISCUSSION AGAIN, AND WE CAN HIGHLIGHT THEM UP, AND WE'LL LET  
22 THE CONSULTANTS SO INDICATE, EITHER FEEL THEY WANT TO GO  
23 BACKWARDS TO REACH THE CONCLUSIONS.

24 MR. STUART: ADDRESSING THIS PARTICULAR POINT, WE  
25 HAVE JACK REDDING FROM TEXAS UTILITIES HERE TODAY AND I WOULD  
26 EXPECT THAT BY THE END OF THIS MEETING IF THERE WAS SOME ITEMS  
27 THAT THE TECHNICAL PEOPLE AGREE THAT ONE SHOULD PURSUE FURTHER  
28 BEYOND THE BUSES IN SOME LOGICAL FASHION, AND I THINK NANCY



1 EXPLAINED OUR BASIS FOR NOT GOING FURTHER, WAS WHERE DO YOU  
2 STOP WHEN YOU GO PAST THE BUS.

3 THEN I THINK WE'VE GOT THE PEOPLE REPRESENTED IN  
4 THIS MEETING TO REALLY ADDRESS THAT ISSUE FROM TEXAS POINT OF  
5 VIEW BY THE TIME THE MEETING'S DONE. AND I THINK IT'S TEXAS'S  
6 DECISION AS TO THEM EXPANDING OUR SCOPE OR WHETHER THEY TAKE  
7 THIS ON THEMSELVES TO ADDRESS THOSE CONCERNS.

8 MR. CALVO: I THINK WHAT'S IMPORTANT IS WHAT YOU ARE  
9 GOING TO DO WITH YOUR FINDINGS. WHAT ARE THE OVERALL  
10 CONCLUSIONS. OKAY, YOU SAY, BASED ON MY FINDINGS I CANNOT  
11 REACH THIS FOREGONE CONCLUSION OF THE SAME QUALITY, THAT'S  
12 PERFECTLY ALL RIGHT. BUT YOUR CONCLUSION IS FAR-REACHING.  
13 YOU SAY BASED ON WHAT I DID, ALL THESE OTHER THINGS ARE HERE  
14 THEN WE GOT TO KNOW THAT. MAYBE WHAT YOU ARE SAYING, WE GOT  
15 DOING DEEPER  
16 INTO --

17 MR. STUART: I THINK -- WE MADE SOME TENTATIVE  
18 FINDINGS WHICH TEND TO GO ALONG THE LINE OF GIVEN THESE DESIGN  
19 INPUTS, HERE'S WHAT WE LOOKED AT AND HERE'S WHAT WE FOUND.  
20 AND I THINK IF OUT OF THIS MEETING THE TECHNICAL PEOPLE DECIDE  
21 THAT SOME OF THOSE DESIGN INPUTS SHOULD BE SEARCHED FURTHER TO  
22 STRENGTHEN, REALLY, THE CONFIDENCE IN OUR REVIEW, THEN I THINK  
23 THAT THAT MIGHT BE AN APPROPRIATE CONCLUSION. AGAIN, TEXAS  
24 HAS GOT TO ENDORSE THAT.

25 MR. MARINOS: DICK, YOU HAD DEVELOPED A FEELING  
26 ABOUT BEFORE YOU EMBARK IN THE SCOPE WHETHER THIS ADDITIONAL  
27 RESEARCH WAS NECESSARY, SO IF YOUR STAFF CAN GIVE US PROBABLY  
28 SOME KIND OF AN UNDERSTANDING BECAUSE YOU DID AND YOU HAVE

1 DONE THE WORK. AND SO YOU MUST HAVE SOME CONCLUSIONS ABOUT  
2 HOW IMPORTANT IT WOULD HAVE BEEN AND HOW WELL YOU HAVE  
3 PERFORMED WITHOUT IT. AND, YOU KNOW, IF IT WAS IMPORTANT WE  
4 SHOULD HAVE THEM IN.

5 MR. STUART: I THINK THAT'S TRUE BUT I WANT TO THROW  
6 A CAVEAT IN THAT WE TRIED TO EXPRESS IN OUR APRIL MEETING.  
7 AND THAT IS THAT THE ORIGINAL SCOPE WAS SELECTED PRIMARILY  
8 FROM A MECHANICAL POINT OF VIEW, NOT AN ELECTRICAL POINT OF  
9 VIEW, AND IN RETROSPECT, NOW LOOKING FROM IT FROM WEARING AN  
10 I&C OR ELECTRICAL HAT, THAT MAY NOT HAVE BEEN THE BEST SYSTEM  
11 TO SELECT FROM AN ELECTRICAL I&C POINT OF VIEW.

12 AND WE ARE WHERE WE ARE FOR THE REASON THAT WAS  
13 BEING EMPHASIZED AT THAT POINT IN TIME. AND I THINK WE -- WE  
14 LOOKED AT THE OVERALL SYSTEMS IN ELECTRICAL AND I&C REVIEW OF  
15 THIS PARTICULAR SYSTEM, BUT AGAIN IT WAS ALMOST AN ADD-ON TO  
16 THE ORIGINAL MECHANICAL SELECTION BASED ON MECHANICAL.

17 NOW, IF THAT BECOMES AN IMPORTANT STEP IN THE  
18 PROCESS, THAT BECAUSE OF THE IDIOSYNCRACIES OF THIS PARTICULAR  
19 SYSTEM IT DOESN'T HAVE ENOUGH SOPHISTICATION, IF YOU WILL, TO  
20 REALLY TEST OUT WHETHER THE ELECTRICAL AND I&C DEPARTMENTS OF  
21 GIBBS & HILL, THIS WOULD TAX THEIR CAPABILITY AND, THEREFORE,  
22 TEST WHETHER, IN FACT, THIS WOULD BE A REPRESENTATIVE SYSTEM,  
23 THAT MAY BE A CONCLUSION FROM THIS MEETING, AS I ENVISION ONE  
24 OF THE OBJECTIVES.

25 MR. MARINOS: IN TERMS OF THE MECHANICAL SYSTEM, YOU  
26 ARE COMFORTABLE THAT YOU HAVE ADDRESSED A SUFFICIENT SCOPE TO  
27 GIVE YOU WHATEVER YOU ARE LOOKING FOR?

28 MR. CALVO: THE OVERALL CONCLUSIONS THAT THEY ARE

1 GOING TO COME UP IN THE FUTURE WILL DETERMINE WHAT THEY HAD  
2 DONE. I THINK WE ARE ASKING THEM TO REACH INTO THE FUTURE  
3 SOMETHING THAT THEY ARE NOT QUITE THERE YET.

4 MR. NORKIN: I'D LIKE TO ALSO SAY THAT THE KIND OF  
5 QUESTIONS THESE TEAM MEMBERS WILL BE ADDRESSING, GOING ONE  
6 STEP FURTHER, WILL BE BASED ON THEIR EXPERIENCE IN LOOKING AT  
7 A SIMILAR SYSTEM AND WHERE THEY FOUND THAT THE SOURCE  
8 CALCULATION MAY BE VERY PERTINENT. THEY WOULDN'T JUST BE  
9 ASKING THAT KIND OF QUESTION TO CYCLE YOU.

10 MR. STUART: YES.

11 MR. CALVO: NEXT. WHAT ARE WE GOING TO DO NEXT?

12 MR. MARINOS: SHOULD WE GO THROUGH THE QUESTIONS  
13 THEN. I GUESS WE'LL PUT THEM ON THE RECORD.

14 THE REPORTER: COULD WE TAKE A MINUTE?

15 MR. MARINOS: YES, PLEASE.

16 (RECESS.)

17 MR. CALVO: YOU READY?

18 MR. MARINOS: WHAT I AM GOING TO DO, I'M GOING TO  
19 READ THE QUESTIONS FROM THE DOCUMENT WE HAVE MAILED TO CYGNA  
20 ON MAY 3RD, '85 FROM NRC, AND I'M GOING TO START WITH  
21 QUESTIONS ON MECHANICAL SYSTEMS.

22 AND QUESTION NUMBER ONE, WE HAVE ASKED FOR A LIST OF  
23 DOCUMENTS USED TO DEVELOP THE CHECKLIST. AND I DO NOT KNOW  
24 WHETHER YOU HAVE A PREPARED LIST OR YOU HAVE THE DOCUMENTS  
25 HERE OR HOW WOULD YOU, NANCY, PROPOSE TO ANSWER THAT QUESTION  
26 FOR US.

27 MR. CALVO: WAIT A MINUTE. BEFORE SHE ANSWERS --  
28 THE ONE WHO HAD THE QUESTION, GARY, MAYBE -- DO YOU NEED TO



1 CLARIFY THAT THING ANY FURTHER?

2 MR. OVERBECK: WELL, WE WERE LOOKING AT THE  
3 CHECKLIST AND TRYING TO ASCERTAIN HOW YOU ARRIVED AT WHAT YOU  
4 WERE GOING TO WRITE IT OFF AGAINST. NEXT QUESTION, WHAT  
5 DOCUMENTS DID YOU USE TO GENERATE THE CHECKLIST, TO IDENTIFY  
6 WHAT IT IS THE DESIGN WAS SUPPOSED TO BE.

7 MS. WILLIAMS: OKAY. THE DOCUMENTS ARE ALL LISTED  
8 IN THE DESIGN CRITERIA DOCUMENT AND, YOU'RE RIGHT, YOU COULD  
9 NOT ASCERTAIN THAT FROM THE CHECKLIST. WE CAN GO THROUGH IT  
10 IF YOU WANT. IT'S SECTION 3.0 OF THE REVIEW CRITERIA DOCUMENT  
11 WHICH IS IN OUR LETTER NUMBER 65. AND THAT WOULD BE IN DESIGN  
12 CRITERIA DC-4, SECTION 3, IF YOU HAVE GOT IT IN FRONT OF YOU.

13 MR. MARINOS: WHICH LETTER WOULD THAT BE? DO WE  
14 HAVE A COPY OF THAT?

15 MS. WILLIAMS: IT'S THE APRIL 29TH LETTER 84056.065.  
16 AND IN IT IS THE MECHANICAL DESIGN REVIEW CRITERIA WHICH IS  
17 DOCUMENT NUMBER DC-4, REV 1, DATED 8-29-84. AND IF YOU TURN  
18 TO SECTION 3.0, YOU'LL SEE CODE STANDARDS AND REFERENCES THAT  
19 ARE LISTED WHICH ARE MADE UP OF REGULATORY DOCUMENTS, REG  
20 GUIDES, COMANCHE PEAK LICENSING DOCUMENTS, AND STANDARD  
21 INDUSTRY PRACTICE FROM OUR EXPERIENCE.

22 MR. CALVO: THE BALL IS IN YOUR COURT, GARY.

23 MR. OVERBECK: YES, I KNOW WHEN WE WERE GOING  
24 THROUGH HERE, SEEMED LIKE A HEAVY RELIANCE PLACED ON THE  
25 WESTINGHOUSE DOCUMENT, IS THAT A CORRECT, OR IS THAT A  
26 MISSTATEMENT?

27 MS. WILLIAMS: WHERE ARE YOU READING FROM NOW?

28 MR. OVERBECK: WHEN WE WERE GOING THROUGH THE

1 CHECKLIST. WE'VE BEEN THROUGH THE DESIGN CRITERIA. YOU  
2 MENTIONED A WESTINGHOUSE DOCUMENT SOMEWHERE ALONG IN HERE.

3 MR. HESS: BOP FR-1.

4 MS. WILLIAMS: WE DID TAKE THE WESTINGHOUSE DOCUMENT  
5 AS AN INPUT, AS THE REQUIREMENTS FOR THE SYSTEM DESIGN AND WE  
6 REEVALUATED GIBBS & HILL'S EXECUTION.

7 MR. OVERBECK: DOES GIBBS & HILL HAVE A SYSTEM  
8 DESCRIPTION?

9 MR. HESS: THEY HAD A TD0229 WHICH IS A SYSTEM  
10 DESCRIPTION WHICH THEY ORIGINALLY USED IN THE DESIGN OF THE  
11 SYSTEM THAT BY THEIR PROCEDURES HAS NOT BEEN KEPT UP TO DATE  
12 IN RECENT YEARS SINCE THE DESIGN HAS BEEN COMPLETED AS FAR AS  
13 THEY ARE CONCERNED. NOW THE DESIGN IS DOCUMENTED BY  
14 SPECIFICATIONS AND DRAWINGS.

15 MR. OVERBECK: SO INITIALLY GIBBS & HILL USES A  
16 SYSTEM DESCRIPTION DURING THE -- AT WHAT PHASE OF THE DESIGN  
17 DID THEY USE THE SYSTEM DESCRIPTION?

18 MR. HESS: THAT LAST UPDATE OF THAT THAT WE WERE  
19 AWARE OF ON THAT WAS 6 -- I'M SORRY, 3-1-79 WAS THE LAST  
20 REVISION THAT WE HAD SIGNED OFF.

21 MR. OVERBECK: WHAT REVISION WAS THAT?

22 MR. HESS: IT SAYS REVISION 1.

23 MR. OVERBECK: WHAT WAS THE PREVIOUS REVISION TO  
24 THAT DOCUMENT?

25 MR. HESS: THE ORIGINAL DATE OF THE THING WAS 6-4-76.

26 MR. OVERBECK: AND WHEN DID THIS PLANT DESIGN  
27 COMMENCE?

28 MS. WILLIAMS: YOU HAVE TO PULL OUT --

1 MR. HESS: YES, WE'D HAVE TO GO AND DOUBLE CHECK ON  
2 THE CALCULATIONS.

3 MR. OVERBECK: WHAT WAS THE REASON FOR THE REVISION  
4 FROM ZERO REV 1, DO YOU KNOW?

5 MR. HESS: NO, I CAN'T ANSWER THAT WITHOUT LOOKING  
6 BACK THROUGH WHAT THE REVISIONS WERE IN THAT DOCUMENT. THEY  
7 WERE BASICALLY AS I REMEMBER THEM BEING CORRECTIONS OR  
8 CLARIFICATIONS.

9 MR. OVERBECK: YOU ARE SAYING ACCORDING TO THE GIBBS  
10 & HILL PROCEDURE, THEY DO NOT NEED TO KEEP SYSTEM DESCRIPTIONS  
11 UP TO DATE?

12 MR. HESS: THAT WAS OUR UNDERSTANDING AT THE TIME WE  
13 WERE IN GIBBS & HILL'S --

14 MR. OVERBECK: DID YOU VERIFY THAT BY LOOKING AT  
15 THEIR PROCEDURES?

16 MS. WILLIAMS: THAT PART OF THE PROCESS IS STILL  
17 UNDER REVIEW. THAT GOES WITH THE DESIGN PROCESS OVERVIEW THAT  
18 I WAS TALKING ABOUT, ALL THE PROCEDURAL TYPE QUESTIONS.

19 MR. OVERBECK: IS THAT STANDARD PRACTICE THAT YOU  
20 FOUND IN YOUR REVIEW OF OTHER AREAS, OTHER PLANTS?

21 MS. WILLIAMS: THAT THEY WOULDN'T KEEP IT UP TO DATE?

22 MR. OVERBECK: UH-HUH.

23 MS. WILLIAMS: WELL, ONCE THE DESIGN IS DONE, I  
24 GUESS WE DIDN'T NECESSARILY SEE A REASON WHY OTHER THAN  
25 KEEPING THE DRAWINGS UP TO DATE, WHY YOU WOULD HAVE TO DO THAT.

26 MR. OVERBECK: OKAY. WHAT GRAVITATED YOU TO USE THE  
27 FUNCTIONAL REQUIREMENTS FROM WESTINGHOUSE?

28 MR. HESS: THOSE WERE THE INPUT TO GIBBS & HILL FOR



1 THE ORIGINAL SYSTEM DESIGN.

2 MR. OVERBECK: REPOSE MY QUESTION. DID YOU USE A  
3 DESIGN SYSTEM DESCRIPTION FROM CYGNA FOR THIS REVIEW, AND THE  
4 ANSWER I THINK IS NO, BECAUSE IT'S NOT UP TO DATE.

5 MR. HESS: NO, THE BASIC DOCUMENT THAT WE USED TO  
6 DEVELOP THE CHECKLIST FROM AS FAR AS A SYSTEM DESCRIPTION OR  
7 FUNCTIONAL REQUIREMENTS WAS THE WESTINGHOUSE BOP FR-1 DOCUMENT.  
8 WE LOOKED AT THE TD029 AFTER WE WERE AT GIBBS & HILL'S OFFICES  
9 IN NEW YORK.

10 MS. WILLIAMS: FOR COMPLIANCE.

11 MR. HESS: FOR COMPLIANCE.

12 MR. OVERBECK: WAS IT?

13 MR. HESS: IN ALL THE AREAS THAT WERE WITHIN OUR  
14 SCOPE.

15 THE ONLY AREA THAT MAY HAVE BEEN QUESTIONABLE WOULD  
16 HAVE BEEN ON THE TEMPERATURES OF THE MAX CCW WATER TEMPERATURE,  
17 BUT WE HAVE ITEMS ON THE CHECKLIST WHERE WE HAVE BEEN  
18 FOLLOWING UP ON THAT BASED ON OTHER CALCULATIONS SINCE THEN.  
19 THAT'S TYPICAL CCW DESIGN TEMPERATURES CHANGE AS LOADS CHANGE.

20 MR. FOLEY: THE WESTINGHOUSE DOCUMENT ALSO  
21 RECOMMENDED OR SPECIFIED SOME ISOLATION FUNCTIONS WHICH GIBBS  
22 & HILL DID A LITTLE BIT DIFFERENTLY. NOW WHETHER OR NOT THOSE  
23 WERE ACTUALLY IN THE GIBBS & HILL DESCRIPTION OR NOT, I'M NOT  
24 SURE, BUT THEY WERE BASICALLY THE SAME. THERE WERE SOME  
25 DIFFERENCES. EXACTLY WHICH DOCUMENTS THOSE DIFFERENCES BECAME  
26 EVIDENT IN, I CAN'T SAY THIS IS ONE OF THEM, BUT THERE WERE  
27 SOME OTHER DIFFERENCES.

28 MS. WILLIAMS: WE CAN GO OUT AND PULL THAT TOGETHER

1 FOR YOU BUT, IN FACT, WE HAVE ONE OBSERVATION WHICH NOTES  
2 DISCREPANCIES FROM THE ORIGINAL WESTINGHOUSE DOCUMENT TO THE  
3 FSAR AND THEN TO THE GIBBS & HILL CALCULATIONS. SO WE LOOKED  
4 FOR CONSISTENCY ACROSS FROM THE ORIGINAL DESIGN BASIS DOCUMENT  
5 THROUGH THE CALCULATIONS AND ANY INTERIM DOCUMENTS THAT GIBBS  
6 & HILL WAS OPERATING WITH. AND THE TEMPERATUARES THAT  
7 THEY'RE SPEAKING OF NOW IS THE MOST OBVIOUS EXAMPLE OF A  
8 DISCREPANCY.

9 MR. OVERBECK: MY QUESTION RIGHT NOW IS -- GO AHEAD.

10 MR. NEVSHEMAL: YOU MADE A STATEMENT EARLIER THAT  
11 THE SYSTEM DESCRIPTION IS NOT KEPT UP TO DATE AND YOU GAVE US  
12 A REV 1 DATE ON THAT.

13 CAN YOU RELATE THAT TO THE DESIGN PROCESS, THE STAGE  
14 IN THE DESIGN PROCESS THAT THAT REVISION WAS LAST MADE? IS  
15 IT -- IS IT AFTER PRELIMINARY CALCULATIONS, IS IT AFTER  
16 VERIFICATION CALCULATIONS, IS IT AFTER DRAWING -- I'M ASKING  
17 THIS AS A QUESTION. ON HAVING A DATE DOES NOT HELP ME. I  
18 HAVE TO KNOW WHEN WITHIN THE DESIGN PROCESS DID THEY STOP  
19 UPDATING THAT DOCUMENT.

20 MS. WILLIAMS: OKAY, YOU'RE ASKING A GOOD QUESTION A  
21 LITTLE EARLY, AND THE REASON IS BECAUSE WE NOW KNOW WHAT ALL  
22 OF OUR TECHNICAL ERRORS ARE. AND WE KNOW WHAT THE DATES ON  
23 THE CALCULATIONS ARE, WE KNOW WHAT CALCULATIONS WE FOUND THE  
24 ERRORS IN, WE KNOW WHAT STAGE THE DESIGN WAS IN, BUT WE  
25 HAVEN'T PUT IT ALL TOGETHER IN TERMS OF ASKING THE QUESTION  
26 WHICH YOU ARE ASKING WHICH IS, IS IT REASONABLE TO LET THE  
27 DOCUMENT LAPSE IN 1979 BECAUSE OF THE STAGE THE DESIGN WAS IN.  
28 AND HOW DID THE PROCEDURES GOVERN THE CONTROL OF THE

1 DOCUMENTS THAT CARRY THE INFORMATION HENCEFORTH IS ALL PART OF  
2 THE DESIGN PROCESS TYPE OVERVIEW. AND WE CAN REALLY ONLY  
3 SPEAK DIRECTLY TODAY ON TECHNICAL ASPECTS OF OUR REVIEW, BUT  
4 NOTHING THAT GETS DOWN TO THE CONTROL AREA WHICH IS I THINK  
5 WHAT YOU'RE GETTING AT. AND I THINK IT'S A GOOD QUESTION.

6 MR. OVERBECK: IN ESSENCE, IS THE FUNCTIONAL  
7 REQUIREMENTS BY WESTINGHOUSE, IS THAT A CONTROL DOCUMENT BY  
8 GIBBS & HILL? IS THAT IN A FORM PRINT FILE OR WHATEVER YOU  
9 CALL IT, A FORM PRINT FILE?

10 MS. WILLIAMS: I BELIEVE THAT WE CHECKED THE  
11 TRANSMITTAL OF THAT IN QA, IN OUR QA REVIEWS, AND WE CAN CHECK  
12 THAT FOR YOU.

13 MR. OVERBECK: OKAY.

14 MS. WILLIAMS: WE DID AN INTERFACE CONTROL,  
15 CORRESPONDENCE CONTROL REVIEW IN QA. WE ALSO DID A DESIGN  
16 VERIFICATION REVIEW WHICH GETS BACK TO YOUR QUESTION WHERE WE  
17 HAVE NOTED ON EVERY CALCULATION THAT THE TECHNICAL PEOPLE DID  
18 THEIR ASSESSMENT ON. WE SENT OUR QA PEOPLE IN TO CHECK ALL OF  
19 THE PAPER WORK, THE VERIFICATION STATUS, THE DATES ON IT, ANY  
20 COMMENTS IN THE VERIFICATIONS AND THIS SORT OF THING.

21 NOW, WHAT WE HAVEN'T QUITE FINISHED YET IS HAVING  
22 OUR QA WORK INTEGRATED WITH THE TECHNICAL WORK WHICH IS WHAT  
23 HAPPENS IN THIS DATA BASE WHERE WE'RE LOOKING FOR THE TRENDS,  
24 WE'RE LOOKING FOR THE DATES, WE'RE LOOKING FOR THE DIFFERENCES  
25 IN THE VERIFICATION FORMS AND THE TECHNICAL ERRORS.

26 AND WE'RE TRYING TO ASSESS, OKAY? -- IF A  
27 CALCULATION WAS VERIFIED, SHOULD THEY HAVE CAUGHT THE ERROR  
28 THAT WE FOUND. IS THERE A TREND IN THE VERIFICATION PROCESS



1 THAT'S NOT WORKING RIGHT. AND ALL PARTS OF THAT INCLUDE  
2 LOOKING AT THE DATES, THE CALCS, AND INTEGRATING OUR QA WITH  
3 OUR TECHNICAL, SO OTHER THAN GOING AND GETTING YOU SPECIFIC  
4 ANSWERS ON THE DATES THAT YOU WANT TODAY, I CAN'T ANSWER ANY  
5 OF THE CONTROL TYPE.

6 MR. NEVSEHAL: AT GIBBS & HILL IS WESTINGHOUSE  
7 CONSIDERED AS A VENDOR AND IS THERE INFORMATION IN  
8 CORRESPONDENCE INCLUDED IN VENDOR FILES?

9 MS. WILLIAMS: I NEED TO CHECK THAT, BUT I'M GOING  
10 TO TENTATIVELY SAY NO, BECAUSE I'M NOT AWARE OF GIBBS & HILL  
11 PERFORMING ANY AUDIT FUNCTIONS ON WESTINGHOUSE WHICH I WOULD  
12 EXPECT IF THEY WERE TREATING THEM AS A VENDOR.

13 MR. OVERBECK: THE COMPONENT COOLING WATER SYSTEM IS  
14 A GIBBS & HILL DESIGN SYSTEM?

15 MS. WILLIAMS: YES. GIBBS & HILL IMPLEMENTED IN THE  
16 DESIGN. IT'S A WESTINGHOUSE SYSTEM DESCRIPTION THAT THEY  
17 WORKED FROM.

18 MR. OVERBECK: CONTRACTUALLY WESTINGHOUSE WAS  
19 REQUIRED TO SUPPLY THE SYSTEM DESCRIPTION? YOU HAVE CONFUSED  
20 ME. TYPICALLY WESTINGHOUSE WILL SUPPLY THE REACTOR SYSTEM.  
21 THEY MAY SUPPLY RESIDUAL HEAT REMOVAL SYSTEM. THEY MAY SUPPLY  
22 THE CHARGING SYSTEM.

23 AT ONE POINT, SOME A/E'S GET IN THERE AND THEY SAY,  
24 OKAY, HEY, LOOK, WE CAN DO THE CONTAINMENT SPRAY SYSTEMS JUST  
25 AS WELL AS WESTINGHOUSE AND WE CAN DO THE COMPONENT COOLING  
26 WATER BETTER THAN WESTINGHOUSE. WE'LL TAKE THAT IN OUR SCOPE.  
27 THE QUESTION I HAVE IS THE COMPONENT COOLING WATER IN GIBBS &  
28 HILL'S SCOPE OF SUPPLY?

1 MR. MARINOS: THE HEAT REMOVAL REQUIREMENT WILL COME  
2 FROM WESTINGHOUSE.

3 MR. CALVO: GIBBS & HILL, TYPICAL WESTINGHOUSE  
4 CLAIM, THE COMPONENTS COOLING WATER SYSTEM USED TO BE  
5 WESTINGHOUSE, WITH THE TURNKEY, WHEN THE A/E TAKES OVER, THEY  
6 DESIGN THOSE SYSTEMS FOR THE FUNCTIONAL REQUIREMENTS PROVIDED  
7 BY WESTINGHOUSE, ALL THE FUNCTIONAL REQUIREMENTS SOMETIMES  
8 INCLUDE THE DESCRIPTION OF THE SYSTEM. IF IT IS INCLUDED IN  
9 COMANCHE PEAK OR NOT. THEY USED TO DO THAT IN THE DAYS WHEN I  
10 USED TO WORK FOR WESTINGHOUSE? I DON'T KNOW IF THEY DID AT  
11 COMANCHE PEAK?

12 MR. OVERBECK: THE FUNCTIONAL REQUIREMENTS MAY NOT  
13 NECESSARILY BE DESIGN INPUT TO THE SYSTEM. THAT'S MY  
14 QUESTION. I WANT TO KNOW WHETHER THE DESIGN INPUT IS FOR THE  
15 SYSTEM, MAY NOT BE WESTINGHOUSE FUNCTIONAL REQUIREMENTS.  
16 THERE MAY BE A LOT MORE REQUIREMENTS IN THE WESTINGHOUSE  
17 DOCUMENT THAT IS NOT NECESSARILY REQUIRED, BUT NICE TO HAVE  
18 FROM WESTINGHOUSE POINT OF VIEW. SO I WANT TO KNOW WHAT ARE  
19 THE REQUIREMENTS.

20 MR. HESS: WE DID PULL STUFF FROM THE --  
21 WESTINGHOUSE ON WHAT THE SCOPE OF SUPPLY WAS FROM ONE OF THEIR  
22 DOCUMENTS AND FOR THE COMPONENT COOLING WATER --

23 MR. OVERBECK: WHAT DOCUMENT ARE YOU LOOKING AT  
24 THERE?

25 MR. HESS: IT WAS OUT OF -- UNFORTUNATELY, THE PAGES  
26 I HAVE DO NOT HAVE A ACTUAL IDENTIFIER OTHER THAN S4PD07211  
27 SCOP 31 TEX. I'M NOT SURE WHAT THAT DOCUMENT NUMBER IS  
28 REFERRING TO. IT WAS GIVEN TO ME BY WESTINGHOUSE AS THEIR

1 SCOPE OF SUPPLY DOCUMENT FOR COMANCHE PEAK.

2 AND IN THE SECTION ON DESIGN MATERIAL AND EQUIPMENT  
3 SUPPLY RESPONSIBILITIES, UNDER COMPONENT COOLING WATER SYSTEM,  
4 IT LISTS DESIGN CRITERIA AS BEING OW WHICH IS, BY THEIR CODES,  
5 OWNER WESTINGHOUSE WITH OWNER HAVING RESPONSIBLE COORDINATING  
6 AUTHORITY.

7 AND THEN THERE IS A FOOTNOTE ON THAT THAT SAYS  
8 WESTINGHOUSE WILL PROVIDE DESIGN CRITERIA SUCH AS COOLING  
9 WATER REQUIREMENTS FOR RESIDUAL HEAT REMOVAL AND COMPONENT  
10 COOLING WATER. DETAIL DESIGN IS OWNER RESPONSIBILITY AND  
11 MATERIAL AND EQUIPMENT SUPPLY IS OWNER RESPONSIBILITY, SO...

12 MR. CALVO: SO THERE MUST BE A DOCUMENT SOMEWHERE  
13 FROM WESTINGHOUSE TO GIBBS & HILL OR FROM WESTINGHOUSE TO THE  
14 UTILITIES BACK TO GIBBS & HILL ABOUT THOSE CRITERIA.

15 MR. HESS: YES, THERE WAS SOME SCOPE OF SUPPLY  
16 DOCUMENT THAT THIS CAME OUT OF, ALL RIGHT. AND THAT NUMBER I  
17 READ YOU OFF IS THE ONLY THING THAT'S ON THE PAGES WHICH I  
18 XEROXED OUT OF THAT DOCUMENT IN WESTINGHOUSE'S OFFICE AT THE  
19 SITE.

20 MR. NORKIN: YOU REFERRED TO A WESTINGHOUSE FR  
21 DOCUMENT.

22 MR. OVERBECK: BOP FR-1.

23 MR. NORKIN: I REMEMBER WHEN WE REVIEWED THE  
24 AUXILIARY FEED WATER SYSTEM, WESTINGHOUSE HAD A RECOMMENDATION  
25 HOW SUCH A SYSTEM SHOULD BE DESIGNED. THE A/E DESIGN -- THERE  
26 WAS AN EXCHANGE OF CORRESPONDENCE FROM WESTINGHOUSE AND THE  
27 A/E AS TO WHAT WERE RECOMMENDATIONS AND WHAT WERE REQUIREMENTS.

28 AND FOR EXAMPLE, IN THE AUXILIARY FEED WATER SYSTEM



1 THEY RECOMMENDED A 3-PUMP SYSTEM BUT ONE A/E CHOSE TO MAKE IT  
2 A TWO PUMP SYSTEM. SO THERE'S THAT KIND OF INTERPLAY WHICH I  
3 MIGHT HAVE EXPECTED ON THIS SYSTEM.

4 MR. HESS: THERE WAS INTERPLAY SIMILAR TO THAT ON  
5 THIS SYSTEM. AND THERE WAS INTERPLAY ON THE BOP FR-1 AS FAR  
6 AS WHAT WESTINGHOUSE GAVE AS MAX TEMPERATURES FOR CERTAIN  
7 COMPONENTS AND LATER ALLOWED HIGHER TEMPERATURES BASED ON  
8 SPECIFIC CONDITIONS. ALL RIGHT, AND WE DID REVIEW SOME OF  
9 THAT DOCUMENTATION AND WHERE IT CAME INTO OUR SCOPE.

10 MR. MARINOS: BOB, CAN YOU TELL US, IF IT'S POSSIBLE,  
11 WHAT DOES THE BOP FR-1 INCLUDE IN TERMS OF COMPONENT  
12 REQUIREMENTS FROM WESTINGHOUSE TO GIBBS & HILL IF YOU CAN  
13 SUMMARIZE IT.

14 MR. HESS: IN SUMMARY, IT BASICALLY GIVES THE  
15 OVERALL FUNCTIONAL REQUIREMENTS FOR THE SYSTEM, WHAT IT'S  
16 SUPPOSED TO BE DESIGNED TO DO, WHICH IS PROVIDE COOLING FOR  
17 SAFEGUARDS LOADS, PROVIDING COOLING FOR NON-SAFEGUARDS LOADS,  
18 IT GIVES CERTAIN ISOLATION REQUIREMENTS, IT THEN GIVES MANY  
19 PAGES OF HEAT LOADS FOR DIFFERENT DESIGN PLANTS. AND THERE  
20 ARE MANY TABLES IN THERE FOR RHR FOUR HOURS AFTER SHUTDOWN,  
21 WHAT THE MAX EXPECTED HEAT LOAD IS FROM THE SYSTEM. IT  
22 GIVES --

23 MR. MARINOS: RATE OF REMOVALS, DO THEY SPECIFY  
24 RATES BY WHICH -- FOR REMOVAL.

25 MR. HESS: THEY GIVE FLOW RATES THROUGH THE  
26 EQUIPMENT, MINIMUM AND MAXIMUM FLOW RATES THROUGH EQUIPMENT  
27 AND EXPECTED PRESSURE DROPS AT THOSE FLOW RATES.

28 MR. MARINOS: WHAT ABOUT INPUT OUTPUT TEMPERATURES,

1 HEAT EXCHANGERS?

2 MR. HESS: YES, MOST OF THOSE ARE SPECIFIED IN THE  
3 MAXIMUM, IF I REMEMBER CORRECTLY, ARE JUST IN THE MAXIMUM.

4 MR. MARINOS: DO THEY GIVE YOU -- ALSO REMOVAL  
5 REQUIREMENTS FOR RHR AND CONTAINMENT SPRAY AND COMPONENTS SUCH  
6 AS THOSE?

7 MR. HESS: YES. AND THEY ALSO GIVE SOME CONTROL  
8 FUNCTIONS IN THERE OF HOW THINGS SHOULD BE CONTROLLED.

9 MR. MARINOS: THAT WAS THE DOCUMENT YOU USED IN  
10 ORDER TO CHECK THE ACTUAL DESIGN OF THE COMPONENT COOLING  
11 WATER AS GIBBS & HILL DESIGNED IT ON THE BASIS OF THIS  
12 CRITERIA ESTABLISHED AT WESTINGHOUSE BASICALLY?

13 MR. HESS: THAT WAS THE BASE DOCUMENT, BUT IT'S NOT  
14 THE ONLY DOCUMENT. WHAT I AM SAYING IN THE LIGHT WE USED THE  
15 GENERAL DESIGN CRITERIA REQUIREMENTS, YOU KNOW, THEY MAY OR  
16 MAY NOT HAVE BEEN SPECIFICALLY CALLED OUT IN THE BOP FR-1, BUT  
17 THEY WERE INFERRED AND THOSE ARE DESIGN CRITERIA --

18 MR. MARINOS: DESIGN CRITERIA, NRC DESIGN  
19 CRITERIA --

20 MR. HESS: CFR-50, APPENDIX A WERE ALSO USED, REG  
21 GUIDES THAT WERE APPLICABLE WERE ALSO USED.

22 MR. MARINOS: YOU WOULDN'T EXPECT WESTINGHOUSE TO  
23 HAVE THAT IN THEIR FUNCTIONAL REQUIREMENTS DOCUMENTS. THOSE  
24 ARE BEYOND THAT.

25 MR. HESS: THAT'S RIGHT. SO THOSE WERE THE BASIC  
26 DOCUMENTS THAT WERE USED TO DEVELOP THE CHECKLIST.

27 MR. STANLEY: DID THE WESTINGHOUSE THING CONTAIN  
28 REQUIREMENTS FOR MECHANICAL SEPARATION -- SEPARATION OF

1 MECHANICAL EQUIPMENT INCLUDING AS FAR DOWN AS INSTRUMENT LINES?

2 MR. HESS: NO, NOT AS FAR AS DOWN AS INSTRUMENT  
3 LINES. IT DID REQUIRE INDEPENDENT FLOW PATHS AND REDUNDANCY  
4 IN COMPONENTS, BUT IT DID NOT SPECIFY ANYTHING, TO MY  
5 KNOWLEDGE, ON AN INSTRUMENT LINE SEPARATION.

6 MR. STANLEY: I DIDN'T SEE THAT REFLECTED IN DC4 OR  
7 THE CHECKLIST, IS THAT CORRECT?

8 MR. FOLEY: SEPARATION?

9 MR. STANLEY: MECHANICAL SEPARATION FOR EQUIPMENT  
10 AND SENSING.

11 MR. HESS: WELL, WE DID LOOK AT SEPARATION OF  
12 EQUIPMENT SUCH AS THAT THE CCW PUMPS WERE IN SEPARATE ROOMS,  
13 THAT THE -- WE LOOKED AT -- IF YOU LOOK AT THE CHECKLIST, WE  
14 DID A HAZARDS ANALYSIS AS FAR AS LOOKING AT FLOODING AND  
15 INTERNAL AND EXTERNAL MISSILES. WE DID LOOK AT FIRE  
16 PROTECTION AS FAR AS WHETHER OR NOT THERE WERE FIRE PROTECTION  
17 EQUIPMENT SENSORS, DETECTORS, SUPPRESSION EQUIPMENT IN THE  
18 VARIOUS ROOMS. WE DID NOT BOUNCE THAT AND GO BACK TO THE FIRE  
19 HAZARDS ANALYSIS AS SUCH AND CHECK THE FIRE HAZARDS ANALYSIS.

20 MR. FOLEY: WE HAD THE SEPARATION AND THE  
21 INDEPENDENCE IN THIS MECHANICAL CHECKLIST INITIALLY AND I  
22 BELIEVE THAT WE MOVED IT TO THE FIELD WALKDOWN CHECKLIST. AND  
23 WE DID DEVELOP CRITERIA FOR SEPARATION AND PROTECTION OF  
24 REDUNDANT COMPONENTS WHICH WE MOVED TO THE FIELD WALKDOWN  
25 CHECKLIST AND VERIFIED IT AS PART OF THE PHYSICAL WALK-THROUGH  
26 OF THE PLANT.

27 MR. STANLEY: NOTICE NO ELECTRICAL IN THE FIELD  
28 WALKDOWN.



1 MR. OVERBECK: THERE IS SOME. I HAVE SOME QUESTIONS.

2 MR. FOLEY: GETTING BACK JUST TO THE INPUTS FROM THE

3 BOP FR-1 --

4 MR. CALVO: YOU IDENTIFIED THE FIELD WALKDOWN  
5 CHECKLIST. CAN YOU IDENTIFY THE DATE OF THAT?

6 MR. HESS: THE DATE OF THE WALKDOWN ITSELF? THE  
7 WALKDOWN OCCURRED --

8 MR. CALVO: NO.

9 MS. WILLIAMS: BETTER KNOWN AS CC7.

10 MR. MARINOS: MAY 3RD --

11 MR. NORKIN: BY THE WAY, ARE ANY OF US MISSING  
12 COPIES OF THAT DOCUMENT?

13 MR. MARINOS: YES.

14 MR. NORKIN: I'D LIKE TO GET A COPY, IF I CAN GET  
15 ONE TODAY OF THAT, IF POSSIBLE. I DON'T KNOW IF ANYBODY ELSE  
16 IS MISSING IT.

17 MR. CALVO: LET ME TRY AND -- I GUESS THE QUESTION,  
18 TRYING TO SUMMARIZE IT, WE ARE NOT ONLY CONCERNED HOW THE  
19 INTERFACE REQUIREMENT, HOW THE INPUT FROM WESTINGHOUSE OR  
20 WHATEVER ELSE THAT YOU HAD FOR USE IN GIBBS & HILL TO  
21 IMPLEMENT THE COMPONENT COOLING WATER SYSTEM.

22 I THINK WHAT IS SIGNIFICANT IS HOW YOU DID THE  
23 COMPONENT COOLING WATER SYSTEM IS AGAIN WHAT ARE YOU GOING TO  
24 INFER FROM THOSE DOCUMENTS ABOUT THE INTERFACE REQUIREMENTS  
25 ABOUT ALL THE SYSTEMS WITH WESTINGHOUSE ALSO SUPPLYING  
26 INFORMATION TO GIBBS & HILL AND ALSO IMPLEMENTED THOSE SYSTEMS.

27 AGAIN, THE HORIZONTAL COMPONENT. SO THAT'S WHY IT'S  
28 VERY SIGNIFICANT TO KNOW WHAT YOU DID AT THE FRONT END BECAUSE

1 YOU ARE GOING TO MAKE CONCLUSIONS IN TRYING TO UNDERSTAND WHAT  
2 YOU DID SO WE CAN AGREE OR DISAGREE WITH YOUR CONCLUSIONS.

3 MS. WILLIAMS: THE INTERFACE WITH WESTINGHOUSE IS  
4 PROBABLY ONE OF THE SMALLER PARTS OF OUR INTERFACES THAT WE  
5 LOOKED AT.

6 MR. CALVO: RIGHT. SO MAYBE SOME OTHER INTERFACES  
7 WITH OTHER SUPPLIERS HAS ALSO GOT TO BE OR MAYBE THE WAY THE  
8 INTERFACE WAS HANDLED BY GIBBS & HILL AND THEY GIVE YOU A CLUE  
9 THAT MAYBE IF YOU DID THE SAME THING WITH THE OTHERS, IT CAN  
10 BE GOOD OR IT CAN BE BAD.

11 SO MAYBE, I GUESS THE POINT I WAS TRYING TO MAKE, I  
12 THINK SOME KIND OF WAY WE NEED THAT KIND OF A ROAD MAP BECAUSE  
13 AT THE END YOU'RE GOING TO BRING IT BACK AGAIN TO DO THE  
14 DESIGN KEYWAY PROCESS TO MAKE THIS HORIZONTAL COMPONENT TO  
15 MOVE ACROSS. SO WITH THAT INFORMATION IS NEEDED, MAYBE YOU  
16 SHOULD CONSIDER WHEN YOU PREPARE YOUR REPORT TO ADDRESS THAT  
17 AREA.

18 AND INSOFAR AS WE'RE CONCERNED, WHAT DO WE NEED IF  
19 THIS WILL SATISFY THE ANSWER TO THE QUESTION, DOCUMENTED THAT  
20 INFORMATION WHEN YOU COME UP WITH THIS OVERALL CONCLUSION.

21 GARY?

22 MR. OVERBECK: SATISFY.

23 MR. CALVO: SATISFY. WHAT ELSE DO WE NEED SO YOU  
24 CAN --

25 MR. OVERBECK: YOU CALL OUT THE WESTINGHOUSE BOP  
26 FR-1 AS A WESTINGHOUSE GUIDELINE. TYPICALLY, GUIDELINES ARE  
27 SOMETHING THAT SHOULD BE FOLLOWED, BUT NOT NECESSARILY IF  
28 THERE IS ANOTHER WAY EQUALLY TO DO IT. AND I WOULD HAVE

1 THOUGHT THAT GIBBS & HILL MIGHT HAVE HAD A SYSTEM DESCRIPTION.  
2 THEY OBVIOUSLY DID AT SOME POINT. IT'S NOT KEPT UP TO DATE,

3 THEREFORE, ONE WHO IS DOING AN INDEPENDENT REVIEW OF  
4 THE SYSTEM HAS TO REALLY UNDERSTAND THE SYSTEM, ALL THE  
5 VARIOUS INPUTS THAT GO INTO IT TO UNDERSTAND WHAT IT IS THE  
6 SYSTEM IS SUPPOSED TO DO.

7 AND THAT MAKES THE JOB A LITTLE HARDER IF YOU DON'T  
8 HAVE AN UP-TO-DATE DESCRIPTION SYSTEM. AND I JUST WANTED TO  
9 KNOW WHERE YOUR STARTING POINT WAS. IT LOOKS LIKE -- I THINK  
10 I UNDERSTAND.

11 MR. MARINOS: ARE YOU SAYING WHAT IS THE SYSTEM  
12 DESCRIPTION -- THE FSAR HAS A SYSTEM DESCRIPTION.

13 MR. OVERBECK: THE FSAR -- THAT'S THE NEXT QUESTION.  
14 THE FSAR, HOW IS THE FSAR TREATED --

15 MS. WILLIAMS: LET ME CLARIFY ONE THING. I DON'T  
16 THINK THAT WE SAID THAT THE SYSTEM DESCRIPTION WAS OUT OF DATE  
17 AT THE TIME THEY WERE BEGINNING TO DO THE DESIGN OF THE SYSTEM.  
18 IT IS OUT OF DATE TODAY. I WANT TO MAKE SURE YOU'RE CLEAR.  
19 IT'S A 1979 DOCUMENT, BUT THEY STARTED THE DESIGN PRIOR TO '79.

20 MR. OVERBECK: I DIDN'T SAY IT WAS OUT OF DATE WHEN  
21 THEY WERE DOING IT.

22 MS. WILLIAMS: OKAY, THAT'S WHAT --

23 MR. OVERBECK: WHAT I'M TRYING TO SAY, IT'S OUT OF  
24 DATE NOW AND I DON'T KNOW IF THAT'S YOUR CONCLUSION OR GIBBS &  
25 HILL'S CONCLUSION.

26 MR. HESS: I GUESS I WOULD LIKE TO CLARIFY. WHAT I  
27 SAID WAS THAT IT HASN'T BEEN UPDATED SINCE 1979. ALL RIGHT,  
28 AS FAR AS A POINT BY POINT OF WHETHER OR NOT IT ACCURATELY



1 REFLECTS THE DESIGN, WE'D HAVE TO GO THROUGH A POINT BY POINT  
2 COMPARISON OF THAT DOCUMENT AT THIS POINT.

3 BASED ON THE THINGS THAT WE REVIEWED IN OUR SCOPE,  
4 WE DIDN'T FIND MAJOR DISCREPANCIES BETWEEN THAT TD0229 AND THE  
5 DESIGN AS REFLECTED BY THE CALCULATIONS, DRAWINGS, AND  
6 SPECIFICATIONS.

7 MR. OVERBECK: THIS OPENS THE QUESTION AGAIN -- GO  
8 AHEAD, JOHN.

9 MR. NEVSHEMAL: LET ME ASK THE QUESTION. YOU HAD  
10 INDICATED BEFORE THAT YOU FOUND SOME DISCREPANCIES BETWEEN THE  
11 WESTINGHOUSE DOCUMENT AND THE GIBBS & HILL DESIGN DESCRIPTION.

12 MR. HESS: RIGHT.

13 MR. NEVSHEMAL: DID YOU FIND THAT THOSE  
14 DISCREPANCIES WERE NOTED IN SOME WAY AND CORRESPONDENCE  
15 EXISTING BETWEEN GIBBS & HILL AND WESTINGHOUSE FOR RELIEF?

16 MR. HESS: IN SOME CASES, YES, BUT WE -- I GUESS THE  
17 ONLY WAY --

18 MR. NEVSHEMAL: SHAKING HER HEAD NO, AND YOU ARE  
19 SAYING YES.

20 MS. WILLIAMS: I'M THINKING OF THE TEMPERATURES.

21 MR. HESS: IN SOME CASES, YES, SUCH AS THE  
22 TEMPERATURES, THERE WAS CORRESPONDENCE BACK AND FORTH. IN ONE  
23 OTHER CASE THERE WAS A STATEMENT ON HOW A VALVE SHOULD BE  
24 CONTROLLED. AND THE WESTINGHOUSE DOCUMENT SAID THAT IT SHOULD  
25 BE CONTROLLED BASED ON FLOW. GIBBS & HILL DID IT BASED ON  
26 TEMPERATURE.

27 FUNCTIONALLY, THAT REALLY DOESN'T CHANGE THE  
28 FUNCTION OF THE VALVE BECAUSE IT WOULD SAVE -- SERVE THE SAME

1 FUNCTION. AND WE ACCEPTED THAT AS AN ACCEPTABLE MEANS OF  
2 DOING -- MEETING THE FUNCTIONAL REQUIREMENT THAT WAS IN THE  
3 BOP FR-1. THERE WAS -- OBVIOUSLY, ANY TIME YOU ARE INTO THIS  
4 TYPE OF DESIGN REVIEW, THERE ARE JUDGMENTS THAT HAVE TO BE  
5 MADE AS FAR AS WHAT THE INTENT OF SOMETHING IS.

6 MR. NEVSEHAL: DOES -- AS FAR AS YOU KNOW, DOES  
7 WESTINGHOUSE MAINTAIN ANY PROOF OF DESIGN RESPONSIBILITY  
8 CALCULATIONS ON THIS SYSTEM?

9 MS. WILLIAMS: WE DIDN'T CHECK THAT, DID WE?

10 MR. HESS: I SAID NONE THAT WE'RE AWARE OF. WE  
11 DIDN'T REALLY GO BACK IN TO --

12 MS. WILLIAMS: CHECK IT. I DON'T WANT TO LEAVE THE  
13 IMPRESSION THERE WAS OR WASN'T. WE DIDN'T CHECK IT.

14 MR. NEVSEHAL: AS FAR AS THE DESIGN IS CONCERNED,  
15 IS THERE A CONTROLLED DOCUMENT THAT CAN BE CONSIDERED AS THE  
16 BASIS FOR THIS DESIGN?

17 MR. OVERBECK: WHAT ARE THE DESIGN DOCUMENTS -- I  
18 GUESS I'LL REPHRASE IT.

19 WHAT ARE THE DESIGN DOCUMENTS FOR THIS SYSTEM?

20 MR. NEVSEHAL: BECAUSE WHAT I HEARD HERE IS THAT  
21 THE SYSTEM DESCRIPTION IS NOT CONTROLLED.

22 MR. OVERBECK: NO, HE HASN'T SAID THAT.

23 MR. NEVSEHAL: OH, YES, HE --

24 MR. OVERBECK: THIS ALL STARTED BECAUSE WE LOOKED AT  
25 THE CHECKLIST AND WE DIDN'T SEE A SYSTEM DESCRIPTION, SO WE  
26 KIND OF FIGURED IN, WELL, MAYBE THEY DON'T HAVE A SYSTEM  
27 DESCRIPTION. THEN WE FOUND OUT THEY HAVE A SYSTEM DESCRIPTION.  
28 IF YOU ASK THE QUESTION IF YOU DIDN'T USE IT, THE QUESTION IS

1 WHY. AND IF IT IS A DESIGN DOCUMENT AT GIBBS & HILL, AND IF  
2 IT'S NOT, WHAT IS.

3 OUR CONCERN IS THE DESIGN PROCESS HAS TO BE  
4 TRACEABLE FROM DESIGN INPUT THROUGH TO DESIGN OUTPUT, AND WE  
5 WANT TO KNOW -- I WOULD LIKE TO HAVE A FEELING FOR HOW THAT IS  
6 ACCOMPLISHED AT GIBBS & HILL AND YOU MUST KNOW THAT BY NOW BY  
7 HAVING DONE THIS MUCH OF THE SYSTEM REVIEW.

8 MR. CALVO: WHY DON'T WE MAKE NOTE OF THAT? NANCY,  
9 MAKE NOTE OF THAT.

10 MR. STUART: SPEAK UP PLEASE. BOB, ANSWER HIS  
11 QUESTION.

12 MR. HESS: THE TECHNICAL DESCRIPTION IS A NUCLEAR  
13 SAFETY RELATED DOCUMENT AND WAS CONTROLLED AS SUCH.

14 MR. OVERBECK: SO IT'S IN EFFECT NOW. IF I'M AN  
15 ENGINEER WORKING AT GIBBS & HILL, I COULD TAKE THIS DOCUMENT  
16 AND USE IT TO UNDERSTAND HOW THE SYSTEM WORKS.

17 MR. HESS: YES.

18 MR. OVERBECK: AND IT HASN'T BEEN UPDATED SINCE  
19 7- '79.

20 MR. HESS: THAT'S RIGHT. THAT'S THE ONE THAT HASN'T  
21 BEEN UPDATED SINCE '79.

22 MR. OVERBECK: BUT THAT'S NOT THE DOCUMENT USED TO  
23 GENERATE YOUR CHECKLIST.

24 MR. HESS: NO. THAT WAS NOT THE BASE DOCUMENT. THE  
25 BASE DOCUMENT WAS THE WESTINGHOUSE -- WE TOOK THE WESTINGHOUSE  
26 INPUT AS THE GIVEN.

27 MR. OVERBECK: IS THAT BASED ON YOUR UNDERSTANDING  
28 OF WHAT YOU SHOULD HAVE DONE OR WAS THAT INPUT FROM THE OWNER?



1 MR. HESS: THAT WAS --

2 MS. WILLIAMS: I'M LOOKING AT A DRAFT I HAVE OF THE  
3 DESIGN PROCESS OVERVIEW FLOW CHARTS. WE'VE CIRCULATED THESE  
4 AROUND TO GIBBS & HILL AND TEXAS UTILITIES AND THE APPROPRIATE  
5 PEOPLE TO SAY THIS IS OUR UNDERSTANDING OF WHAT CONTROLLED  
6 YOUR DESIGN PROCESS.

7 ONE OF THE QUESTIONS WE HAD WAS THE SYSTEM  
8 DESCRIPTIONS AND WHETHER THEY SERVED AS DESIGN BASES OR  
9 WHETHER THE FSAR SERVED AS THE DESIGN BASES. WHAT I HAVE BACK  
10 ARE GIBBS & HILL RESPONSES OR COMMENTS, AND ONE OF THEM IS THE  
11 SYSTEM DESCRIPTIONS ARE NOT DESIGN DOCUMENTS, DISCIPLINE  
12 CALCULATIONS INCLUDE ALL APPROPRIATE DESIGN CRITERIA UTILIZED.  
13 AND WE HAVE NOT ASSESSED WHAT THIS MEANS TO THE PROCESS YET,  
14 BUT THAT'S THE EXTENT OF THE COMMENTS WE GOT BACK.

15 AND YOU ARE ASKING SOME QUESTIONS THAT ARE RIGHT IN  
16 LINE WITH WHAT WE'RE GOING TO DO WITH THESE FLOW CHARTS.

17 MR. STANLEY: IS THERE AN ANSWER THERE WITH RESPECT  
18 TO THE FSAR?

19 MS. WILLIAMS: YES, THERE IS.

20 MR. NORKIN: YOU INDICATED THAT YOU ARE GOING TO BE  
21 LOOKING AT THE FLOW CHARTS DOWNSTREAM NOW AFTER THE REVIEWS  
22 ARE COMPLETED. DID I HEAR YOU CORRECTLY?

23 MS. WILLIAMS: WE'RE CURRENTLY DOING THAT RIGHT NOW.

24 MR. NORKIN: THAT SEEMS A LITTLE BACKWARDS. IT  
25 SEEMS YOU WANT TO LOOK AT THE FLOW CHARTS BEFORE THE REVIEW IS  
26 CONDUCTED SO YOU CAN UNDERSTAND WHERE THE QUESTIONS ARE.

27 MS. WILLIAMS: WE HAD FLOW CHARTS AVAILABLE BEFORE  
28 WE STARTED. THEY WERE NOT AS DETAILED AS THESE FLOW CHARTS.

1 THESE EVOLVED THROUGH THE COURSE OF THE REVIEW AS WE LEARNED  
2 MORE ABOUT THE DECISION-MAKING PROCESS AND INTERFACES AND THAT  
3 SORT OF THING. WE DID HAVE OVERVIEW TYPE FLOW CHARTS TELLING  
4 US WHO THE MAIN PLAYERS WERE FOR WHAT PORTIONS OF THE DESIGN  
5 AND WHAT THEY ARE RESPONSIBLE FOR, SO THAT WE KNEW WHO TO GO  
6 TO FOR WHAT INFORMATION.

7 MR. NORKIN: WERE THOSE OVERVIEW FLOW CHARTS USED AS  
8 A BASIS FOR YOUR CHECKLIST AND FOR YOUR PLAN OF ATTACK AND IT  
9 WAS RESPONSIBLE FOR THE DEVELOPING THE CHECKLIST SCOPE THAT WE  
10 HAVE REVIEWED OR IS THIS SOMETHING YOU'RE JUST DOING AFTER THE  
11 FACT NOW?

12 MS. WILLIAMS: NO, NO, THEY WERE SOMETHING THAT WE  
13 HAD SKETCHED UP REALLY AS PART OF THE SCOPING SO THAT WE COULD  
14 DECIDE, ALL RIGHT, WHO IS RESPONSIBLE FOR THE ANALYSIS AND WHO  
15 IS RESPONSIBLE FOR THE INPUT DOCUMENTS AND THIS SORT OF THING  
16 SO THAT WE KNEW WE HAD TO GO TO WESTINGHOUSE TO GET BOP FR-1.

17 WE KNEW THAT WE HAD TO GO TO GIBBS & HILL TO DO THE  
18 ANALYSIS REVIEW, BUT THEY WERE MAJOR STEPS IN THE DESIGN  
19 PROCESS AND NOTHING ANYWHERE NEAR AS DETAILED AS WHAT WE'RE  
20 WORKING WITH NOW TO REALLY SEE WHAT THE INTERFACES ARE IN THE  
21 PROCESS WHICH WE'VE LEARNED AS WE'VE GONE THROUGH.

22 SOME OF THESE ARE AVAILABLE IN SOME OF OUR PREVIOUS  
23 FINAL REPORTS. IN PHASE 1 AND 2 WE HAD SOME VERY GENERAL FLOW  
24 CHARTS BUT, AS I SAY, THESE ARE MUCH MORE DETAILED.

25 MR. CALVO: LET ME ASK A QUESTION, GARY. YOU HAVE  
26 ENOUGH INFORMATION FOR YOU TO UNDERSTAND NOW HOW THEY DID THIS?  
27 THE JUDGMENT ON THAT BASIS, WHAT YOU ARE GOING TO DO WITH THE  
28 INFORMATION, THAT WILL COME LATER. DO YOU UNDERSTAND NOW WHAT

1 THEY USED, THE DOCUMENTS TO DO THIS?

2 MR. OVERBECK: THEY USED THE BOP FOR A LOT OF  
3 CRITERIA AND I GUESS THE FSAR TO REFERENCE IT BACK HERE TO --

4 MR. CALVO: WE CAN GO BACK TO THE NEXT QUESTION.

5 MR. NORKIN: BEFORE YOU GO TO THE NEXT QUESTION, I  
6 WANT TO ASK ONE QUESTION. I WANT TO ASK THE QUESTION BEFORE  
7 GARY'S INITIAL QUESTION THAT WE HAVEN'T ASKED YET. AND THAT  
8 IS, IN THE PROCESS OF DOING THIS REVIEW OF THE COMPONENT  
9 COOLING WATER SYSTEM, WAS THERE SOME KIND OF A CUT-OFF DATE  
10 THAT WE FOUND FROM EXPERIENCE THAT WHEN YOU ANNOUNCE YOU ARE  
11 GOING TO DO A SYSTEM, THERE IS A PERIOD OF TIME FROM THE TIME  
12 YOU SAY YOU ARE GOING TO DO IT TO THE TIME THAT YOU ACTUALLY  
13 START DOING IT.

14 AND THERE IS A CONCERN THAT IF YOU DON'T HAVE A  
15 CUT-OFF DATE THAT BY THE TIME YOU ACTUALLY PHYSICALLY START  
16 THE REVIEW, YOU WIND UP WITH A POLISHED SYSTEM. I'M CURIOUS  
17 HOW YOU CONTENDED WITH THAT TO MAKE SURE THAT YOU WEREN'T  
18 REVIEWING A SYSTEM THAT GOT, YOU KNOW, I CAN'T THINK OF A  
19 BETTER WORD THAN POLISHED.

20 MR. ANKRUM: I THINK THE WORD YOU WANT IS IN A  
21 VERTICAL SLICE, YOU WANT TO TAKE A VERTICAL SLICE OF SOMETHING  
22 THAT IS REPRESENTATIVE OF THE REMAINDER OF THE DESIGN, AND  
23 THERE IS SOME CONCERN THAT THIS MIGHT NO LONGER REPRESENT WHAT  
24 THE REST OF THE DESIGN IS LIKE.

25 MR. NORKIN: WELL, I CAN GIVE YOU AN EXPERIENCE THAT  
26 I HAD IN THE VERY FIRST EFFORT I EVER PARTICIPATED IN. THE  
27 SYSTEM DESCRIPTION, THE PNID AND A FEW OTHER IMPORTANT  
28 DOCUMENTS WERE ALL DATED THE DAY WE BEGAN THE REVIEW AND WE HA



1 ANNOUNCED IT TWO MONTHS BEFORE. SO I'M CURIOUS SINCE THIS  
2 SYSTEM IS A REPRESENTATIVE SLICE, HOW DO YOU CONTEND WITH THAT  
3 PROBLEM?

4 WAS THERE A CUT-OFF DATE, FOR EXAMPLE?

5 MS. WILLIAMS: THE ANSWER IS NO, THERE WASN'T A  
6 CUT-OFF DATE AND THAT WE WENT IN AND ASKED FOR THE MOST RECENT  
7 CALCULATIONS. HOWEVER, THERE WERE CALCULATIONS IN PROCESS AT  
8 THE TIME WE DID OUR REVIEW. THE PRESSURE CALCULATION, I THINK  
9 IS ONE, AND BOB YOU CAN GIVE SOME DETAILS.

10 WE AS OF GETTING READY FOR THIS MEETING AND UPDATING  
11 OUR FILES HAVE OBTAINED THE FINAL COPY OF THOSE CALCULATIONS  
12 WHICH WERE BEING UPDATED TO REFLECT THE AS-BUILT CONDITION.  
13 BUT I WANT TO ASK BOB HOW MUCH WE GOT INTO THE CALCULATIONS  
14 THAT EXISTED PREVIOUS TO THIS ONE THAT WAS IN THE STATE OF  
15 REVISION WHEN WE WERE DOING OUR REVIEW.

16 MR. HESS: WE REVIEWED ALL OF THE PRESSURE DROP AND  
17 FLOW CALCS AND THE SEISMIC CALCS, NPSH TYPE CALCS THAT EXISTED  
18 ON THE SYSTEM. WE GOT A HAND DRAWN INTERRELATIONSHIP THAT WE  
19 PUT TOGETHER OF HOW ALL THE CALCS FIT TOGETHER AND WHICH DATES  
20 WERE WHICH. THERE WAS -- THOSE WERE THE INITIAL CALCS.

21 AND ONE OF THE CALCULATIONAL METHODS THAT GIBBS &  
22 HILL USED WAS A PROGRAM CALLED P DROP FOR PRESSURE DROP CALCS.  
23 THAT'S BASICALLY A PROGRAM WHERE YOU GIVE IN A CERTAIN FLOW  
24 PATH AND IT TELLS YOU WHAT THE OVERALL DROP IS FOR A GIVEN  
25 FLOW THROUGH THAT FLOW PATH.

26 THE CALCULATION THAT WAS IN THE PROCESS OF BEING  
27 REVISED OR PERFORMED AT THE TIME OF OUR REVIEW WAS A PIP' FLOW  
28 ANALYSIS CALCULATION, AND THIS IS A FLOW BALANCING TYPE

1 PROGRAM WHERE YOU PUT IN THE WHOLE SYSTEM AND THEN YOU CAN  
2 RESTRICT FLOW PATHS, OPEN UP FLOW PATHS, IT DOES LOOP FLOW.

3 SO, THAT CALCULATION WAS IN THE PROCESS OF BEING  
4 UPDATED AT THE TIME OF OUR REVIEW. WE ALSO REVIEWED THE INPUT  
5 AND OUTPUT OF THAT CALCULATION AS IT EXISTED AT THE TIME OF  
6 THE REVIEW.

7 MR. NEVSHEMAL: LET ME ASK A PROCEDURAL THING ALONG  
8 THE LINES OF WHAT DON WAS ASKING.

9 SOME OF THESE CALCULATIONS THAT YOU REVIEWED THAT  
10 YOU FELT WERE FINISHED CALCULATIONS OR THEY SAID THEY WERE  
11 FINISHED, DID YOU FIND ANY -- DID YOU FIND ERRORS IN THEM  
12 WHICH WERE SUBSEQUENTLY, THEN, CORRECTED AND DO NOT SHOW AS A  
13 FINDING OR INCIDENT OR WHATEVER YOU CALL IT IN THE CURRENT  
14 CHECKLIST?

15 MR. HESS: I BELIEVE THAT ALL THE DISCREPANCIES WE  
16 FOUND, WHETHER THEY WERE WITHIN THE OLD CALCULATIONS OR THE  
17 NEW, ARE AT LEAST DOCUMENTED IN THE COMMENTS COLUMN IN THE  
18 CHECKLIST. IF THERE WERE ERRORS LIKE USING THE WRONG CV FOR A  
19 VALVE, THAT WAS ASSESSED, NO MATTER WHICH CALCULATION IT WAS  
20 IN. FRICTION FACTORS, L OVER D'S, THOSE ITEMS WERE ALL  
21 CHECKED BASICALLY ON A LINE-BY-LINE TYPE CHECK IN THE CALCS.

22 MR. NEVSHEMAL: SO, ESSENTIALLY, YOU DID HAVE A  
23 CUT-OFF DATE WHICH WAS WHEN YOU LOOKED AT IT.

24 MR. HESS: THAT'S RIGHT. IT WAS -- THE CUTOFF DATE,  
25 IF YOU WANTED A CUT-OFF DATE, WAS JUNE OF '84.

26 MR. OVERBECK: THESE CALCULATIONS MARKED FINAL OR  
27 PRELIMINARY OR WHAT?

28 MR. HESS: THEY WERE -- I DON'T KNOW OF ANY THAT

1 WERE MARKED FINAL, ALL RIGHT AS SUCH. THEY WERE THE LATEST  
2 REVISION.

3 MR. OVERBECK: IS THERE SUCH A THING AT GIBBS & HILL,  
4 PRELIMINARY CALC? SOMETIMES A/E'S GENERATE PRELIMINARY CALCS  
5 PRIOR TO PROCURING EQUIPMENT AND AFTER THE EQUIPMENT IS  
6 PROCURED, THEN THEY GENERATE SOME FINAL CALCS WHICH GET IN  
7 VARIOUS REVISIONS.

8 MR. HESS: OKAY, MY RECOLLECTION OF THEIR  
9 CALCULATIONAL SYSTEM WAS THAT THEY JUST HAD VARIOUS REVISION  
10 NUMBERS. THEY WEREN'T MARKED PRELIMINARY OR FINAL.

11 MS. WILLIAMS: IN THEIR SYSTEM THAT'S A FINAL  
12 CALCULATION. I THINK THAT WHAT WAS HAPPENING AT THE TIME OF  
13 OUR REVIEW WAS THEY WERE STILL VERIFYING THE INDEPENDENT  
14 VERIFICATION OF THE CALCULATION, BUT IT'S AN OFFICIAL, NOT A  
15 PRELIMINARY CALCULATION.

16 MR. OVERBECK: LET ME PURSUE THAT A LITTLE BIT.  
17 THESE CALCULATIONS WERE NOT VERIFIED PRIOR TO PROCUREMENT OF  
18 EQUIPMENT?

19 MS. WILLIAMS: NO, NO, NO. THE MOST RECENT  
20 CALCULATION INVOLVED --

21 MR. HESS: THE PIPE FLOW ANALYSIS WAS NOT COMPLETE  
22 THROUGH ITS CHECK AND VERIFICATION AT THE TIME OF OUR REVIEW.  
23 THE OTHER CALCS WERE ALL SIGNED.

24 MR. OVERBECK: YOU WERE LOOKING AT A -- NOT A REV  
25 ZERO. IT WAS NEVER VERIFIED.

26 MR. HESS: IT WASN'T COMPLETE. IT WAS IN PROCESS AT  
27 THE TIME.

28 MR. STUART: IF YOU MISINTERPRET VERIFICATION. I



1 THINK YOU'RE TALKING ABOUT AS-BUILT VERIFICATION.

2 MS. WILLIAMS: NO. QA PAPERWORK.

3 MR. STUART: WASN'T THAT DONE ON A PER-REVISION  
4 BASIS?

5 MS. WILLIAMS: YES. THEY HAVE -- YES, THE  
6 APPROPRIATE PROCEDURES IN PLACE. THEY CONTROL THEIR  
7 CALCULATIONS. WE DID CHECK ALL THAT, BUT THE CALCULATION THAT  
8 WAS IN PROCESS, I THINK, WAS AN AMALGAMATION OF MANY DIFFERENT  
9 HAND CALCULATIONS PRIOR TO THAT.

10 MR. HESS: WHAT ENCOMPASSED ALL OF THOSE, WHAT IT  
11 BASICALLY DID WAS THE AS-BUILT SYSTEM WAS -- YOU KNOW, TAKING  
12 THE AS-BUILT SYSTEM AND THEN RUNNING A FLOW BALANCE  
13 CALCULATION ON THAT SYSTEM.

14 MR. OVERBECK: LET ME START OVER. WHAT REVISION WAS  
15 THAT CALCULATION?

16 MR. HESS: I WOULD HAVE TO CHECK THE FILES AS TO --

17 MS. WILLIAMS: IT'S THE FIRST ONE OF ITS TYPE.

18 MR. HESS: IT'S PROBABLY THE FIRST ONE. IT'S  
19 PROBABLY A REV ZERO.

20 MS. WILLIAMS: IT'S THE FIRST TIME THEY RAN THAT  
21 PROGRAM ON THAT SYSTEM, IS THAT CORRECT?

22 MR. HESS: AS FAR AS I KNOW.

23 MS. WILLIAMS: AND BEFORE THEY HAD INDIVIDUAL  
24 CALCULATIONS WHICH COVERED THE VARIOUS ASPECTS OF THE SYSTEM  
25 DESIGN. AND THIS IS THE FIRST TIME THAT THEY WENT IN HAVING  
26 AS-BUILT DATA AND RAN IT ON A COMPUTER PROGRAM, SO IT WOULD  
27 PROBABLY BE REV ZERO.

28 MR. OVERBECK: SO THE CALCULATION WAS NOT PERFORMED

1 AND VERIFIED PRIOR TO YOUR COMMENCING YOUR INSPECTION?

2 MS. WILLIAMS: THE AS-BUILT CALCULATION WAS NOT.

3 MR. HESS: THAT'S RIGHT.

4 MR. STANLEY: CAN WE GET THE ANSWER TO YOUR QUESTION?

5 MR. NORKIN: WAIT A MINUTE. WE'RE STILL WORKING ON  
6 IT.

7 MR. CALVO: YOU'RE SUPPOSED TO HAVE THE FSAR. WE  
8 WOULD LIKE TO FINISH ONE FIRST. BEFORE WE SAY THAT, DO YOU  
9 GUYS, GARY, GEORGE, DO YOU ALL HAVE ANYTHING ELSE IN THE FRONT  
10 END OF IT, ANYTHING ELSE BEFORE WE CAN GO TO THE NEXT QUESTION?  
11 YOU KNOW, SOME OF THE QUESTIONS THAT YOU ARE ASKING NOW, YOU  
12 ARE GOING TO ATTACH THEM LATER ON WITH THE OTHERS, YOU KNOW,  
13 BUT DO YOU HAVE ANYTHING ELSE? OKAY.

14 MR. NORKIN: I STILL DIDN'T GET AN ANSWER TO THIS  
15 QUESTION ON THE CUT-OFF DATE. CAN YOU TELL ME APPROXIMATELY  
16 OR EXACTLY, IF POSSIBLE, WHEN IT WAS KNOWN BY ALL PARTIES THAT  
17 THE COMPONENT COOLING WATER SYSTEM WAS BEING REVIEWED? IS  
18 THERE ANY DATE OR LETTER OR SOMETHING WHEN IT WAS KNOWN BY  
19 GIBBS & HILL, FOR EXAMPLE?

20 MS. WILLIAMS: THERE WAS A PROGRAM PLAN, IF I CAN  
21 GET MY HANDS ON IT HERE.

22 MR. FOLEY: IS THIS THE ONE YOU WANT?

23 MS. WILLIAMS: I NEED THE COVER LETTER.

24 MR. FOLEY: I DON'T HAVE THE COVER LETTER.

25 MS. WILLIAMS: I CAN GO GET THE DATE FOR YOU.  
26 APPROXIMATELY, THOUGH, I BELIEVE WE SENT THE PROGRAM PLAN OUT  
27 APRIL OF 1984, SOMETHING ALONG THAT LINE. WE COMMENCED  
28 COLLECTING DOCUMENTS AROUND EARLY MAY, AND WE FOUND OUT DURING

1 THAT PROCESS OF COLLECTING DOCUMENTS THAT THEY WERE IN THE  
2 PROCESS OF REVISING THE CALCULATIONS THAT BOB HAS SPOKE OF  
3 HERE.

4 AND WE HAD A TELEPHONE CONVERSATION WITH TEXAS  
5 UTILITIES REGARDING THIS CONCERN BECAUSE WE THOUGHT THAT  
6 PERHAPS THEY WOULD WANT TO SELECT ANOTHER SYSTEM, SINCE WHERE  
7 THEY WERE IN TIME OR FOR WHATEVER REASON THAT IT WAS DECIDED  
8 THAT THEY WOULD UPDATE THESE CALCULATIONS, THAT MAYBE IT  
9 WASN'T APPROPRIATE FOR US TO DO THE REVIEW. THE DECISION WAS  
10 MADE BY TEXAS TO CONTINUE OUR REVIEW ON THE CCW SYSTEM, SO WE  
11 REALLY LOOKED AT BOTH SETS OF CALCULATIONS EVENTUALLY, THE  
12 EARLIER AND --

13 MR. NORKIN: WELL, WAS THERE ANY -- BY LOOKING AT  
14 BOTH SETS, DID YOU ATTEMPT TO DISCRIMINATE ANY DIFFERENCE  
15 BETWEEN THE SETS IN ANY WAY? HOW DO WE KNOW, FOR EXAMPLE,  
16 THAT IF YOU LOOKED AT THE LATEST SET THAT THAT WAS  
17 REPRESENTATIVE, THAT A SET WAS BEING DEVELOPED AFTER THE  
18 SYSTEM WAS ANNOUNCED. HOW DO YOU KNOW FROM YOUR REPORT THAT  
19 THAT -- THE SIGNIFICANCE OF THAT?

20 MR. ANKRUM: LET ME EXPAND ON THAT QUESTION. WHAT  
21 WE ARE LOOKING FOR IS THE BASIS UPON WHICH CYGNA HAS COME TO  
22 THE CONCLUSION THAT THE VERTICAL SLICE LOOKED AT IS  
23 REPRESENTATIVE OF THE REMAINDER OF THE DESIGN OR A CONCLUSION  
24 ON YOUR PART THAT THE VERTICAL SLICE YOU LOOKED AT, THERE IS  
25 NO WAY FOR YOU TO CONCLUDE THAT IT IS REPRESENTATIVE OF THE  
26 REMAINDER OF THE DESIGN.

27 I THINK THIS REMAINS TO BE YOUR FINAL CONCLUSION.  
28 AND WHEN YOU COME TO THAT CONCLUSION, ONE OF THE QUESTIONS WE



1 WILL ASK IN ASSESSING THE VALIDITY OF YOUR CONCLUSION IS WAS  
2 THERE A REASONABLE BASIS FOR YOU TO COME TO THAT CONCLUSION.

3 AND ONE OF THE QUESTIONS WE'LL ASK IN DOING THAT IS  
4 DO WE AGREE THAT THE VERTICAL SLICE WAS, IN FACT,  
5 REPRESENTATIVE OF THE REMAINDER OF THE DESIGN. I THINK WE  
6 PROBABLY DON'T NEED TO BORE INTO THIS IN ANY GREATER DETAIL,  
7 BUT --

8 MR. STUART: I THINK THAT THE ORIGINAL QUESTION WAS  
9 A GOOD ONE. YOUR CLARIFICATION HAS ME CONFUSED BECAUSE THE  
10 SCOPE AS WE'VE HAD HANDED TO US FROM TEXAS UTILITIES WAS NOT  
11 FOR US TO BE ABLE TO MAKE SUCH A GENERAL SWEEPING STATEMENT  
12 AFTER OUR REVIEW IS DONE IN EACH OF THE TECHNICAL AREAS.

13 RATHER, GIVEN THE GROUND RULES OF OUR REVIEW WHICH  
14 ASSUMES CERTAIN INPUTS AND CERTAIN OUTPUTS OF THE REVIEW, WE  
15 CAN THEN ATTEST TO WHETHER BOTH THE DEPARTMENTS THAT WE'VE  
16 LOOKED AT AS WELL AS THE INDIVIDUAL DESIGNS ARE REPRESENTATIVE,  
17 IT GIVEN THAT THE SYSTEMS THAT WE HAVE SELECTED ARE A  
18 RELATIVELY LIMITED SAMPLE.

19 AND I THINK IF YOU REALLY WENT OUT -- THROUGHOUT THE  
20 ENTIRE PLANT, ONE COULD ALWAYS GO ONE STEP FURTHER AND FIND A  
21 SYSTEM THAT'S GOT SOMETHING DIFFERENT THAN ANY INDIVIDUAL  
22 SYSTEM THAT YOU HAPPEN TO LOOK AT.

23 AND GIVEN THAT THIS PARTICULAR SYSTEM WAS SELECTED  
24 PRIMARILY FOR MECHANICAL REASONING, I THINK YOU'RE GOING TO  
25 FIND IT HARD-PRESSED FOR A CYGNA PERSON TO BE ABLE TO GO  
26 UP -- TO STAND UP AND MAKE AS SWEEPING A STATEMENT AS YOU JUST  
27 INDICATED.

28 MR. ANKRUM: IF YOU MADE THAT STATEMENT, THEN WE

1 WOULD QUESTION IT.

2 MR. STUART. I'M GLAD WE'RE ON THE SAME WAVELENGTH.

3 MR. ANKRUM: YES. IF YOU MADE THAT STATEMENT, THEN  
4 THERE WOULD BE SOME QUESTION IN OUR MIND AS TO HOW YOU ARRIVED  
5 AT IT.

6 MR. STUART: JUSTIFIABLY, THIS SYSTEM AND IN THE  
7 I&C AND ELECTRICAL AREA IS RELATIVELY LIMITED. AND I THINK AS  
8 PART OF THE -- AS I VIEW IT, PART OF THIS PROCESS, AS I  
9 INDICATED EARLIER, I WOULD GUESS AT LEAST, WOULD BE FOR CYGNA,  
10 TEXAS, AND NRC REALLY TO GIVE SOME COMMENT AS TO WHETHER THE  
11 ORIGINAL BASIS FOR SELECTING CCW SYSTEM FOR MECHANICAL  
12 PURPOSES NEEDS TO BE EXPANDED SOMEWHAT TO INCLUDE WHATEVER THE  
13 CONCERNS ARE IN THE ELECTRICAL AND I&C AREA TO ENSURE THAT AT  
14 LEAST IN THE EXTRAPOLATION OF THE IMPLICATIONS IN ELECTRICAL  
15 AND I&C FOR THIS PARTICULAR SYSTEM THAT WE'VE BEEN RELATIVELY  
16 COMPLETE.

17 AND THEN THE NEXT QUESTION, I GUESS, WOULD BE IS  
18 THIS SYSTEM RIGOROUS ENOUGH TO REALLY BE ABLE TO -- TO, AT  
19 LEAST, MAKE SOME STEPS TOWARDS THE KINDS OF STATEMENTS YOU  
20 WERE MAKING.

21 MR. ANKRUM: SIR, WE WANT TO KNOW TO WHAT DEGREE WE  
22 CAN PLACE RELIANCE ON YOUR PHASE 4 REPORT WITH RESPECT TO THE  
23 OVERALL DESIGN OF THE PLANT. AS I SAY, YOURS IS A PIECE IN  
24 THE OVERALL AND WE'RE TRYING TO ASSESS HOW MUCH OF A PIECE IT  
25 IS IN THAT OVERALL --

26 MR. STUART: OKAY, BUT WHAT I WANT YOU TO UNDERSTAND,  
27 THOUGH, IS THAT WE'RE LIMITED BY THE SCOPE THAT WAS AGREED  
28 UPON BETWEEN TEXAS AND THE NRC.

1 MR. ANKRUM: NO QUESTION.

2 MR. STUART: OKAY. SO THE ONLY WAY WE CAN GET  
3 UNLIMITED BY THAT IS TO AGREE UPON SOME VARIATION OF THAT  
4 SCOPE.

5 MR. CALVO: BUT THAT'S NOT RELEVANT AT THIS TIME.  
6 RELEVANT AT THIS TIME IS TO UNDERSTAND WHAT YOU DID. YOU ARE  
7 ONE POINT AMONG 20 POINTS OR DATA OR BENCH MARKS AND WE'RE  
8 TRYING TO UNDERSTAND WHAT YOU DID SO WE KNOW WHAT WE'RE GOING  
9 TO DO NEXT.

10 MR. STUART: UNDERSTAND.

11 MR. CALVO: WE HAVE TO KNOW WHAT YOU DID. IT'S OUR  
12 JUDGMENT BASED ON WHAT WE FIND OUT HERE AND OUR EVALUATION IN  
13 TALKING TO YOU, THAT THIS IS A A BENCHMARK OR SOMEWHERE  
14 BETWEEN A BENCHMARK AND A DATA POINT IN COMBINATION WITH OTHER  
15 THINGS THAT HAVE BEEN GOING ON FOR THE LAST 10 YEARS, AND THEN  
16 DETERMINE WHETHER IT'S ENOUGH TO REACH THE ORIGINAL ASSURANCE.

17 IT WAS NEVER THE INTENT TO FIND OUT WITH YOU ALONG  
18 WITH PHASE 4 GIVE YOU THE OVERALL ASSURANCE, BUT IT WILL HELP  
19 US OUT TO REACH THAT FINAL ORIGINAL ASSURANCE.

20 MR. ANKRUM: WE ARE NOT INTERESTED IN DUPLICATING  
21 THE WORK THAT YOU HAVE DONE.

22 MR. CALVO: THAT'S WHY WE WANT TO KNOW THIS QUESTION,  
23 BECAUSE WE GOT THE SLIDING SCALE, EVERYTHING DONE, SEE HOW YOU  
24 FIT IN THERE AND WHAT IS OUR JUDGMENT OF HOW YOU CONTRIBUTE TO  
25 THIS OVERALL PRINCIPLE ASSURANCE. WHAT ELSE NEEDS TO BE DONE  
26 THAT WE ALREADY ACCEPTED BECAUSE YOU HAD DONE IT AND IT  
27 DOESN'T NEED TO BE DONE INTO THE FUTURE.

28 MR. NORKIN: HOWEVER, YOU KNOW, JUST -- WHAT I HEARD



1 WAS THAT YOU WERE AWARE OF THE FACT THAT CALCULATIONS WERE  
2 BEING PERFORMED EVEN AFTER A PROGRAM PLAN WAS ISSUED AND YOU  
3 WERE -- YOU MADE NO ATTEMPT TO DISTINGUISH THOSE CALCULATIONS  
4 BEFORE AND AFTER.

5 MS. WILLIAMS: BOB, CAN YOU ANSWER THAT?

6 MR. HESS: I DON'T THINK THAT'S EXACTLY A CORRECT  
7 ASSUMPTION. FIRST OF ALL, THE CALCULATIONS THAT WE REVIEWED  
8 RANGED ALL THE WAY BACK TO THE '74-75 TIME PERIOD. ALL RIGHT.

9 NOW, WHEN YOU GO THROUGH RUNNING INDIVIDUAL CALCS ON  
10 SEGMENTS OF A SYSTEM AND THEN YOU PUT THE WHOLE THING TOGETHER,  
11 I GUESS WE DIDN'T INTERPRET THAT AS POLISHING THE SYSTEM FOR  
12 OUR REVIEW. THAT WOULD BE PART OF THE NORMAL DESIGN PROCESS  
13 OF PUTTING THE WHOLE THING TOGETHER.

14 SO, YES, SOME OF THE CALCS, THE LATEST REVISION OF  
15 THOSE CALCS MAY HAVE BEEN JUNE OR EVEN THE FINAL SIGNOFF ON  
16 THIS PIPE FLOW CALC MAY BE JULY, BUT THAT WAS NOT WHAT WE  
17 WOULD CONSIDER TO BE POLISHING OF THE SYSTEM OTHER THAN  
18 REFINEMENT OF THE SYSTEM DURING THE NORMAL DESIGN PROCESS.

19 CERTAIN OF THE CALCS ARE DATED '82, SOME OF THEM ARE  
20 DATED MARCH OF '84 OR JANUARY OF '84. YOU KNOW, THOSE WERE  
21 WHEN THE LATEST REVISION WAS COMPLETED AND SIGNED OFF. THAT  
22 WAS NOT WHAT WE VIEWED AS BEING POLISHING, AS FAR AS YOU  
23 TALKING ABOUT CUT-OFF DATE.

24 SO I GUESS OUR -- FROM WHAT I SEE YOU GETTING AT IS,  
25 NO, WE DIDN'T SEE ANY EVIDENCE OF AFTER WE NOTIFIED EVERYBODY  
26 OF WHAT SYSTEM WE WERE LOOKING AT OF EVERYBODY GOING BACK IN  
27 AND POLISHING WHAT THEY HAD DONE TO MAKE SURE THERE WEREN'T  
28 ANY ERRORS.

1 MR. NORKIN: I THOUGHT I HEARD A COMMENT BEFORE THAT  
2 YOU SAW THAT EVIDENCE AND YOU WONDERED WHETHER YOU SHOULD BACK  
3 OFF THAT SYSTEM.

4 MR. HESS: WE SAW THAT THERE WERE CALCS UNDER  
5 REVISION AND WE QUESTIONED WHY THEY WERE UNDER REVISION.

6 MR. NORKIN: ALL RIGHT.

7 MR. HESS: AND WE FOUND THAT IT WAS THIS PIPE FLOW  
8 CALCULATION WHICH PUT THE WHOLE SYSTEM TOGETHER IN THE  
9 AS-BUILT CONFIGURATION, AND THAT RESOLVED THAT QUESTION ON WHY  
10 THAT CALC WAS BEING REVISED OR PERFORMED.

11 MR. NORKIN: NANCY WANTED TO SAY SOMETHING.

12 MS. WILLIAMS: WELL, I GUESS I WOULDN'T HAVE STATED  
13 IT THAT WAY. IT'S TOTALLY TEXAS'S CALL, YOU KNOW, AS FAR AS  
14 AS TO WHAT THEY WANT US TO REVIEW OR WHAT YOU GUYS AGREE TO.  
15 I THINK IT'S SPECULATION AS TO WHY IT WAS BEING REVISED.

16 AND I GUESS I WOULDN'T GO SO FAR AS TO MAKE A  
17 STATEMENT AS TO WHY IT WAS BEING REVISED ALTHOUGH IT SOUNDS  
18 LOGICAL THAT THEY WERE INTEGRATING THE ENTIRE AS-BUILT SYSTEM  
19 AND IT'S A REASONABLE STEP IN THE DESIGN PROCESS. BUT WE  
20 CAN'T PROVE THAT TO YOU, ANYWAY

21 MR. CALVO: CAN YOU PROVIDE US WITH THE INFORMATION  
22 NEEDED IN ORDER TO MAKE A JUDGEMENT.

23 ANY MORE QUESTIONS OF NUMBER 1?

24 MR. NEVSHMAL: I HAVE A QUESTION.

25 MR. CALVO: THE QUESTION IS STRICTLY FOCUSING TO  
26 THIS FRONT END OF IT.

27 MR. NEVSHMAL: YES. AT THE RISK OF GETTING BOOED  
28 OUT OF THE ROOM, I WOULD LIKE TO ASK A QUESTION ABOUT THE

1 SCOPE AND HOW YOU GOT TO THE SCOPE.

2 DURING THE PRESENTATION IT WAS INDICATED THAT YOU  
3 WENT TO ONE THERMAL BARRIER WHICH WAS RC1, AND THAT WAS NOT  
4 THE FURTHEST LOAD AWAY FROM THE STANDPOINT OF HYDRAULICS.  
5 THAT TELLS ME THAT THERE WAS SOME PHYSICAL LIMITATION ON THE  
6 SCOPE. COULD YOU THEN -- AND THERE IS ALSO I THINK IN ONE OF  
7 YOUR CHECKLISTS THAT A SIMILAR SITUATION IS IDENTIFIED.

8 COULD YOU GIVE ME SOME IDEA AS TO HOW THE SCOPE WAS  
9 DEVELOPED TO ALLOW THAT VERY IMPORTANT FEATURE OF A HYDRAULICS  
10 SYSTEM TO FALL THROUGH THE CRACK?

11 MR. FOLEY: WELL, IT DIDN'T.

12 MR. NEVSHEMAL: YOU FOUND IT, BUT HOW DID YOU GET  
13 THE SCOPE THAT YOU ENDED UP WITH -- THAT YOU STARTED OUT WITH?

14 MR. FOLEY: YOU SAY WE FOUND IT. WHAT YOU'RE SAYING  
15 IS YOU RECOGNIZE THAT WE DID GO AND REVIEW THE THERMAL BARRIER  
16 PUMP, ACTUALLY PUMP 3, ONCE WE DETERMINED WHICH WAS THE SYSTEM  
17 COMPONENT. YOU RECOGNIZE THAT.

18 MR. NEVSHEMAL: I DO RECOGNIZE THAT, BUT WHAT I AM  
19 ASKING IS HOW DID YOU DEVELOP THE SCOPE IN THE BEGINNING TO  
20 ALLOW A VERY IMPORTANT ASPECT OF HYDRAULIC DESIGN TO NOT BE  
21 INCLUDED IN THE SCOPE.

22 MR. HESS: THE -- DO YOU WANT ME --

23 MR. STUART: IT'S A PROGRAMMATIC QUESTION.

24 MS. WILLIAMS: WE CHOSE THE SCOPE ON A MUCH MORE  
25 GENERAL BASIS. AND THAT WAS, OKAY, WE'RE GOING TO LOOK AT THE  
26 CCW SYSTEM, TRAIN "A". HERE'S WHAT WE THINK THE MAJOR  
27 COMPONENTS ARE. BUT AT THAT STAGE, WE HAVE NOT LOOKED AT THE  
28 CALCULATIONS, WE DON'T KNOW ALL THE PARTICULARS SUCH AS, IN



1 THIS CASE, THAT IT WAS THE MOST DISTANT COMPONENT.

2 THEN WHEN WE SENT THE REVIEWERS TO GIBBS & HILL AND  
3 THEY STARTED REVIEWING THE CALCULATIONS AND THEY FOUND OUT, IN  
4 FACT, THAT THEY NEEDED TO CONSIDER THAT, THEN WE SO DID IN  
5 LOOKING AT THE CALCULATIONS. BUT THAT'S KIND OF A LEVEL OF  
6 DETAIL THAT WE WOULDN'T HAVE BEEN KNOWLEDGEABLE OF AT THE TIME  
7 THE DISCUSSIONS ON THE HARDWARE SCOPE WERE BEING SELECTED.

8 BUT IF WE SAW SOMETHING THAT WE REALLY COULDN'T  
9 COMPLETE OUR ASSESSMENT OF THE CALCULATIONS, GIVEN THE  
10 SPECIFIC HARDWARE SCOPE, THEN WE WOULD TALK TO TEXAS OR WE  
11 WOULD JUST GO AHEAD AND LOOK AT THAT ASPECT OF THE CALCULATION  
12 WHICH GAVE US THE ANSWERS THAT WE NEEDED.

13 MR. NEVSEHAL: BASICALLY, WHAT YOU'RE SAYING --  
14 WHAT I UNDERSTAND YOU JUST INDICATED IS THAT THE SCOPE WAS  
15 DEVELOPED FROM LOOKING AT THE HYDRAULICS OF INDIVIDUAL MAJOR  
16 COMPONENTS OF SYSTEM.

17 MR. HESS: NO.

18 MR. FOLEY: I THINK IT WAS THE OTHER WAY AROUND.

19 MR. HESS: BASICALLY, WE DEVELOPED THE SCOPE BY  
20 LOOKING ORIGINALLY AT THE FLOW DIAGRAM.

21 MS. WILLIAMS: THAT'S ALL WE HAD.

22 MR. HESS: THAT'S ALL WE HAD AT THAT INITIAL SCOPING  
23 SESSION WHEN WE INITIALLY SET DOWN THE SCOPE, WHAT FLOW PATHS  
24 WE WANTED TO LOOK AT. AFTER WE GOT INTO THE REVIEW, EVEN  
25 THOUGH WE HAD WRITTEN THE CHECKLIST AND PICKED THE FIRST  
26 REACTOR COOLING PUMP 01, WE REALIZED THAT FROM THE GENERAL  
27 ARRANGEMENT DRAWINGS AND THE PIPING DRAWINGS THAT 01 WAS NOT  
28 THE MOST DISTANT COMPONENT, SO THEN WE LOOKED AT 03, WHICH WAS

1 THE MOST DISTANT.

2 MR. OVERBECK: SO YOU WEREN'T LIMITING THE SCOPE IN  
3 THAT REGARD, THEN?

4 MR. FOLEY: I THINK IT'S A LITTLE DIFFERENT THAN  
5 THAT. I THINK THAT AFTER WE SAID, ALL RIGHT, WE WANT TO LOOK  
6 AT THE HYDRAULIC PERFORMANCE CHARACTERISTICS OF THE SYSTEM,  
7 ALL RIGHT, THAT WAS KIND OF THE INITIAL SCOPE DEFINITION. AND  
8 WE SAID, ALL RIGHT, NOW, WHAT DO YOU NEED FOR CRITERIA TO  
9 DETERMINE WHETHER OR NOT, YOU KNOW, THAT'S PROPERLY SPECIFIED  
10 OR NOT.

11 AND I BELIEVE THAT THE MOST DISTANT COMPONENT WAS  
12 ONE OF THE CRITERIA THAT WAS DEVELOPED AS PART OF THE  
13 CHECKLIST, YOU KNOW, BEFORE WE WENT AND STARTED THE REVIEW,  
14 BUT AFTER THE MORE GENERAL SCOPE WAS DESIGNED, I MEAN, WAS  
15 DEFINED.

16 SO WHEN WE WERE COMING UP WITH THESE CHECKLISTS, WE  
17 SAID ONE OF THE IMPORTANT FEATURES TO LOOK AT THAT, IN FACT,  
18 WAS ONE OF THEM. I MEAN, YOU KNOW, THE FACT THAT 01 WAS  
19 SPECIFIED IN THE -- EVEN IF IT WAS, I'M NOT SURE IF IT WAS IN  
20 THE INITIAL SCOPE, AND IT TURNED OUT TO BE 03 IS VERY  
21 INCIDENTAL TO THE REVIEW, BUT THE --

22 MS. WILLIAMS: WE JUST DEFINED, IF YOU LOOK IN THE  
23 PROGRAM PLAN, THE MAJOR ASPECTS OF THE DESIGN THAT WE WOULD BE  
24 LOOKING AT, THE MAJOR TYPE OF CALCULATION THAT WE WOULD BE  
25 LOOKING AT. AND AS JIM SAYS, THAT'S A DETAIL IN REVIEWING  
26 THAT CALC.

27 MR. CALVO: I GUESS WE FINISHED QUESTION 1. WE'RE  
28 GETTING INTO QUESTION 2 FOR THE MECHANICAL SYSTEMS. WOULD YOU

1 PLEASE READ THE QUESTION IN?

2 MR. MARINOS: IN YOUR INSPECTION, WHAT IS THE STATUS  
3 OF THE FSAR? THIS WAS COVERED A LITTLE BIT, BUT WOULD YOU  
4 TELL US IN MORE DETAIL. THE FOLLOWING QUESTION, WAS IT  
5 CONSIDERED A DESIGN DOCUMENT BY GIBBS & HILL, THE FSAR?

6 MR. CALVO: DO YOU WANT TO --

7 MR. MARINOS: YOU GUYS HAVE AN ELABORATION TO MAKE  
8 ON THIS?

9 MR. OVERBECK: I THINK THAT QUESTION IS CLEAR ENOUGH.  
10 (PAUSE.)

11 MR. MARINOS: BACK ON THE RECORD.

12 I HAVE STATED THE SECOND QUESTION. WE'RE EXPECTING  
13 THE ANSWER.

14 MR. NORKIN: NANCY WANTED TO GIVE US SOMETHING.

15 MS. WILLIAMS: I HAVE THE DATES ASKING ON THE  
16 PROGRAM PLAN, THE FIRST PRELIMINARY SCOPING DISCUSSION TOOK  
17 PLACE ON MARCH 6, 1984. AND CYGNA SUBSEQUENTLY ISSUED A  
18 PROGRAM PLAN DOCUMENT ON MAY 15TH, '84 AND STARTED DATA  
19 COLLECTION JUST ABOUT IN THAT SAME TIME FRAME.

20 THE QUESTION THAT WE WERE DISCUSSING BEFORE WE WENT  
21 OFF THE RECORD, I GUESS, WAS ON THE STATUS OF THE SAR AND THE  
22 RESPONSE THAT WE HAVE FROM GIBBS & HILL IS THE FOLLOWING,  
23 QUOTE,

24 "THE SAR IS A DESIGN BASES DOCUMENT. DESIGN  
25 VERIFICATION IS TO CONFIRM THAT THE DESIGN IS IN COMPLIANCE  
26 WITH THE SAR."

27 THIS COMMENT WAS GIVEN TO US WHEN WE SHOWED THEM OUR  
28 PRELIMINARY FLOW CHARTS AND ASKED THEM TO COMMENT ON IT AND WE



1 HAVEN'T ASSIMILATED THIS INFORMATION ANY FURTHER AT THIS POINT  
2 IN TIME.

3 MR. OVERBECK: RESTATE THAT AGAIN?

4 MS. WILLIAMS: YES. THE SAR IS A DESIGN BASES  
5 DOCUMENT. DESIGN VERIFICATION IS TO CONFIRM THAT THE DESIGN  
6 IS IN COMPLIANCE WITH THE SAR."

7 THIS IS GIBBS & HILL'S RESPONSE TO OUR SAME QUESTION  
8 THAT YOU ARE ASKING.

9 MR. OVERBECK: THAT MEANS IT'S ALLOWED TO BE USED  
10 AS DESIGN INPUT IN THE CALCULATIONS? WHAT DOES THAT MEAN?

11 MS. WILLIAMS: DESIGN BASES DOCUMENT TO ME MEANS  
12 THAT IT SERVES AS AN INPUT TO THE CALCULATIONS OR, CONVERSELY,  
13 THAT THE CALCULATIONS MUST CONFORM WITH THE FSAR.

14 MR. OVERBECK: THE TWO AREN'T THE SAME --  
15 NECESSARILY THE SAME.

16 MS. WILLIAMS: OKAY, I SEE WHAT YOU ARE SAYING.  
17 YEAH, YOU'RE RIGHT.

18 MR. NEVSEHAL: LET ME ASK THIS. WHEN YOU REVIEWED  
19 YOUR CALCULATIONS AND WE'LL GET INTO WHICH ONES YOU DID IN  
20 YOUR NEXT QUESTION, BUT DID YOU SEE INPUT AND/OR ASSUMPTIONS --  
21 I DON'T KNOW HOW THEY LAID THEM OUT -- THAT SAID FSAR NUMBER  
22 SO AND SO, FSAR TABLE SO AND SO AS AN INPUT.

23 MR. HESS: I BELIEVE WE DID, BUT I REALLY HAVE TO GO  
24 BACK AND CHECK THE SPECIFIC CALCS.

25 MS. WILLIAMS: CAN WE PULL ONE OF THE CALCULATIONS  
26 TO ANSWER THEIR QUESTION? CAN SOMEONE GO AND PULL OUT --

27 MR. OVERBECK: ONE OF THE QUESTIONS WE HAVE IS LIST  
28 THE CALCULATIONS. WE PROBABLY WILL ASK FOR SOME OF THOSE

1 CALCULATIONS TO BE PULLED SO WE CAN TAKE A LOOK AT THEM. SO  
2 WE'LL PULL A COUPLE AND SEE FOR OURSELVES.

3 MS. WILLIAMS: OKAY.

4 MR. NORKIN: SINCE YOU REFER TO THE FSAR AS THE  
5 DESIGN INPUT, HOW DOES THAT RELATE TO THE FIRST QUESTION WHEN  
6 YOU REFER TO DOCUMENTS THAT DEVELOPED THE CHECKLIST. YOU  
7 DIDN'T REFER TO IT AS ONE OF THOSE DOCUMENTS, I DON'T THINK.

8 MS. WILLIAMS: YES, WE DID. WE USED BOTH, THE BOP  
9 AND FSAR.

10 MR. CALVO: OKAY, THAT TAKES CARE OF NUMBER 2.

11 MR. OVERBECK: WELL, NOT QUITE. THE FSAR IS  
12 CONSIDERED THE DESIGN BASES DOCUMENT -- AND I'M NOT SURE I  
13 KNOW EXACTLY WHAT GIBBS & HILL MEANS BY THAT STATEMENT.

14 BUT THE QUESTION WE'RE ASKING HERE IS, IS THE FSAR  
15 USED FOR DESIGN INPUT AND IS THAT INPUT CONTROL -- THERE IS A  
16 LOT OF DIFFERENT WAYS THE INPUT IS CONTROLLED, SOMETIMES  
17 THERE'S DESIGN INPUT DOCUMENTS IN THE FORM OF DESIGN CRITERIA  
18 DOCUMENTS OR SYSTEM DESCRIPTIONS.

19 TYPICALLY, A/E'S DO NOT REVIEW THE FSAR AS A SOURCE  
20 OF DESIGN INPUT BECAUSE THE FSAR IS BEHIND DESIGN AND THERE'S  
21 BEEN MANY NUMEROUS MISTAKES IN IT. AND I GUESS WE'LL BE  
22 INTERESTED IN SEEING WHAT YOUR RESPONSES WHEN YOU DO YOUR  
23 PROGRAMMATIC REVIEW, YOUR TREATMENT.

24 MS. WILLIAMS: I CAN TELL YOU HOW I THINK IT  
25 PROBABLY CAME TO PASS, BUT YOU'RE RIGHT. I'M NOT QUITE READY  
26 TO ANSWER IT, BUT I THINK THEY PROBABLY USED THE WESTINGHOUSE  
27 INPUT DOCUMENT TO DEVELOP THEIR CRITERIA WHICH THEY CONTROLLED  
28 INTERNALLY AND, YES, THE FSAR WAS IN DEVELOPMENT THROUGHOUT

1 THE COURSE OF DESIGN.

2 AND IT EVOLVED AND, IN FACT, WE FOUND CERTAIN FACETS  
3 WHERE THE FSAR WAS OUT OF DATE. SO IT REALLY COULD NOT SERVE  
4 AS A DESIGN INPUT DOCUMENT, IF YOU WILL, IF THAT'S THE CASE.  
5 SO THAT'S WHAT WE STILL NEED TO PUT TOGETHER. I THINK THAT'S  
6 WHAT YOU ARE DRIVING AT.

7 MR. MARINOS: AND THE ANSWER TO THE FIRST PART OF  
8 THE QUESTION IS THAT YOU HAVE USED THE FSAR AS THE DESIGN  
9 DOCUMENT, TOO, OR YOU REVIEWED THAT IN YOUR INSPECTION.

10 MS. WILLIAMS: YES, WE LOOKED AT WHAT THE FSAR SAID  
11 VERSUS WHAT WE SAW IN THE CALCULATION VERSUS WHAT WESTINGHOUSE  
12 REQUIRED. WE WERE REALLY COMPARING ALL OF THOSE INPUTS TO SEE  
13 WHAT THE STATE OF THE SYSTEM DESIGN WAS RELATIVE TO ALL OF THE  
14 REQUIREMENTS. AND WE DID CITE AN INCONSISTENCY BETWEEN THOSE  
15 DOCUMENTS.

16 MR. MARINOS; OKAY. YOU RECONCILED THE DIFFERENCE  
17 BECAUSE THE FSAR DOES HAVE, IN PARTICULAR, THE TABLES OF THE  
18 COMPONENT COOLING WATER SYSTEM THAT'S PICTURED, INFORMATION  
19 THAT IS NOT CONSISTENT WITH WHAT THE WESTINGHOUSE BOP FR-1  
20 APPEARS TO REQUIRE. AND I THINK YOU HAVE MADE SOME  
21 IDENTIFICATION IN THAT CHECKLIST THAT YOU HAVE.

22 MS. WILLIAMS: YES.

23 MR. CALVO: NEXT QUESTION, NUMBER 3, IS THAT WE NEED  
24 A LIST

25 MR. MARINOS: QUESTION NUMBER 3 IS WE NEED A LIST OF  
26 THE CALCULATIONS REVIEWED DURING THE INSPECTION ON THE GIBBS &  
27 HILL EFFORT. NOW, IN WHAT FORM COULD YOU RESPOND TO THIS  
28 QUESTION?



1 MS. WILLIAMS: WE HAVE A TYPED LIST OF THEM OR A CUT  
2 AND PASTED LIST WHICH WE COULD GIVE YOU A XEROX OF. IT'S  
3 THREE PAGES LONG. I CAN GET A COPY.

4 MR. MARINOS: DOES THAT GIVE US A LIST OF VARIOUS  
5 COMPONENTS, VARIOUS PARTS OF THE SYSTEM?

6 MS. WILLIAMS: WELL, LET ME SHOW IT TO YOU AND YOU  
7 CAN SEE WHAT THE LEVEL OF DETAIL --

8 MR. MARINOS: EVERYBODY CAN SEE IT.

9 MS. WILLIAMS: IT'S NOT SELF-EXPLANATORY  
10 UNFORTUNATELY IN THE SENSE THAT THE DESCRIPTION IS VERY BRIEF.

11 MR. CALVO: GARY, WHAT'S THE PURPOSE FOR THE LIST?  
12 HOW ARE YOU GOING TO USE IT?

13 MR. OVERBECK: I WILL KNOW BY LOOKING AT THE LIST  
14 THE TYPE OF CALCULATIONS THAT WERE AVAILABLE. I WOULD HOPE I  
15 WOULD LIKE TO KNOW WHAT CALCULATIONS WERE AVAILABLE AT GIBBS &  
16 HILL ORIGINALLY AND WHICH ONES YOU DECIDED TO REVIEW.

17 MR. MARINOS: THEY ARE LISTED HERE SO WE CAN LOOK AT  
18 THEM AND LOOK AT THE LIST AND COME BACK WITH OTHER QUESTIONS  
19 LATER, NOT TODAY, THE ELECTRICAL ENGINEER, MECHANICAL, AND  
20 INSTRUMENTATION.

21 MR. CALVO: LET THE RECORD NOTE THAT A LIST HAS BEEN  
22 GIVEN TO US AND WE'RE GOING TO HAVE TO LOOK AT IT AND...

23 MR. NORKIN: CAN THIS LIST BE CROSS-REFERENCED, ALL  
24 THE CHECKLIST QUESTIONS? ISN'T THAT WHAT WE'RE LOOKING FOR  
25 WHEN WE COME TO THE CHECKLIST QUESTIONS, WE WANT TO KNOW WHAT  
26 KIND OF DETAIL WAS GOTTEN INTO FOR THAT PARTICULAR QUESTION.

27 MS. WILLIAMS: NOT WITH THE INFORMATION THAT YOU  
28 HAVE. IT COULD CERTAINLY BE DONE. I THINK THAT IT WOULD BE A

1 FAIRLY LABOR-INTENSIVE PROCESS.

2 MR. NORKIN: I'M NOT TRYING TO MAKE WORK. I'M JUST  
3 SORT OF THINKING THAT EVENTUALLY WE'RE GOING TO WANT TO ASK  
4 QUESTIONS FOR SPECIFIC CHECKLIST ITEMS, WHAT CALCULATIONS WERE  
5 GOTTEN INTO.

6 MS. WILLIAMS: WELL, YES, BUT YOU ASKED --

7 MR. NORKIN: THOSE CALCULATIONS IN ALL CASES WILL BE  
8 ON THAT LIST, RIGHT?

9 MS. WILLIAMS: THAT'S CORRECT. AND IF YOU ASK US A  
10 QUESTION, WE'LL GO GET THE APPROPRIATE CALCULATION TO DISCUSS  
11 IT WITH YOU.

12 MR. MARINOS: BUT THIS LIST IS COMPLETE OF ALL  
13 CALCULATIONS IN ALL AREAS, MEANING MECHANICAL AND ELECTRICAL  
14 SYSTEMS, INSTRUMENTATION?

15 MS. WILLIAMS: HOPEFULLY, 95 PERCENT. WE LISTED  
16 EVERY ONE THAT WE COULD THINK OF IN PREPARATION FOR THIS  
17 MEETING.

18 MR. CALVO: THE PURPOSE OF THE QUESTION WAS TO LOOK  
19 AT THE LIST AND THEN PICK OUT THOSE CALCULATIONS THAT WE WANT  
20 TO ASK THEM ABOUT. IS THAT RIGHT, GARY?

21 MR. OVERBECK: M-HM.

22 MR. CALVO: OKAY. SO HE ANSWERED THE QUESTION.  
23 WHAT'S THE NEXT QUESTION.

24 MR. NORKIN: THE CALCULATIONS ARE ALL AVAILABLE HERE?

25 MS. WILLIAMS: ALL THE ONES THAT I HAVE BLUED OUT ON  
26 THIS LIST ARE AVAILABLE HERE. IF YOU ASK US A QUESTION, WE'LL  
27 GO GET THE ONE THAT'S APPROPRIATE.

28 MR. CALVO: QUESTION NUMBER 4, LIST THE DRAWINGS

1 REVIEWED DURING THE INSPECTION.

2 MR. MARINOS: WE'RE GOING TO TAKE A COPY OF THAT  
3 LIST. WE NEED MORE THAN ONE COPY ACTUALLY, SO WE NEED ABOUT 5  
4 COPIES.

5 MS. WILLIAMS: 5?

6 MR. MARINOS: OKAY. QUESTION NUMBER 4 IS THE LIST  
7 OF DRAWINGS --

8 MS. WILLIAMS: I NEED TO CLARIFY ONE THING. JUST  
9 FROM A LOGISTIC STANDPOINT, FROM HOW OUR INFORMATION IS LAID  
10 OUT, IT'S PROBABLY EASIER FOR US TO ANSWER A QUESTION AND GET  
11 THE CALC AS OPPOSED TO SITTING HERE TELLING YOU WHAT CALC  
12 NUMBERS YOU ARE GOING TO WANT TO PULL OUT FROM THIS LIST  
13 BECAUSE THEY ARE NOT VERY DESCRIPTIVE ON THIS LIST OF  
14 DOCUMENTS. BUT IF YOU GET INTO THE PRESSURE DROP CALC, WE  
15 WILL BRING IN ALL THE PERTINENT DOCUMENTS.

16 MR. MARINOS: I'M NOT EVEN CERTAIN WE HAVE THIS  
17 DETAIL RIGHT NOW.

18 MR. OVERBECK: HOW DO YOU KNOW WHAT DOCUMENTS YOU  
19 HAVE FROM GIBBS & HILL? HAVEN'T YOU KEPT A CONTROLLED LIST OF  
20 DOCUMENTS YOU HAVE RECEIVED FROM GIBBS & HILL?

21 MS. WILLIAMS: YES, WE HAVE.

22 MR. OVERBECK: CAN'T YOU JUST REPRODUCE THAT  
23 CONTROLLED LIST OF DOCUMENTS AND THAT WILL COVER EVERY  
24 DOCUMENT YOU'VE EVER GOTTEN?

25 MS. WILLIAMS: WE DID NOT TAKE XEROX COPIES OF EVERY  
26 DOCUMENT BECAUSE WE DID THE REVIEWS ON-SITE. WHAT WE DID FOR  
27 THIS MEETING WAS TO OBTAIN SOME OF THE COPIES TO BALANCE OUT  
28 OUR FILES, BUT, YEAH, THIS LIST HERE IS ESSENTIALLY AN ECHO OF



1 OUR DOCUMENTS REVIEW LIST, OF WHICH PROBABLY 80 PERCENT OF  
2 THEM ARE IN OUR CONTROLLED CALCULATION FILE FOR THIS PROJECT.

3 MR. CALVO: OKAY. NEXT QUESTION, PLEASE.

4 MR. MARINOS: NUMBER 4 IS LIST OF DRAWINGS REVIEWED  
5 DURING THE INSPECTION. DO YOU HAVE A WRITTEN LIST OF THE  
6 DRAWINGS THAT YOU REVIEWED?

7 MS. WILLIAMS: YES, WE DO, AND I CAN GET THAT PULLED  
8 TOGETHER FOR YOU AS WELL. IT'S ABOUT EQUAL IN LENGTH, SO I  
9 HAVE TO GET A COPY OF THAT.

10 MR. CALVO: THE PURPOSE OF THAT QUESTION IS?

11 MR. OVERBECK: I WANT TO SEE THE DEPTH OF REVIEW.  
12 BY LOOKING AT THOSE DRAWINGS I MIGHT HAVE SOME IDEA WHAT I  
13 WANT TO LOOK AT IN TERMS OF THAT REVIEW.

14 MR. MARINOS: SO WE NEED THE DRAWINGS.

15 MR. OVERBECK: NO, WHAT I WANT IS A LIST OF DRAWINGS  
16 SO I CAN ASCERTAIN WHAT, IF ANY, CALCULATIONS ARE DRAWINGS  
17 THAT I WANT TO LOOK AT TO VERIFY.

18 MR. NORKIN: WHAT ARE THE LOGISTICS OF YOU GETTING  
19 THEM IF CYGNA DOESN'T HAVE THEM?

20 MS. WILLIAMS: WE CAN GET THEM. WHAT HAPPENED WAS  
21 GIBBS & HILL JUST -- WE MADE A REQUEST A WEEK AND A HALF AGO  
22 TO GET THE BALANCE OF THE FILES AND THEY DIDN'T ALL GET HERE.

23 MR. NORKIN: THESE GENERAL QUESTIONS ABOUT CALCS AND  
24 DRAWINGS THAT ARE ON A MECHANICAL LIST, BUT HAVE YOU GOT A  
25 LIST -- DOES YOUR LIST JUST ADDRESS MECHANICAL OR DOES IT  
26 INCLUDE ELECTRICAL AND I&C AS WELL?

27 MS. WILLIAMS: THAT'S BOTH FOR THE CALCULATIONS.  
28 AND WE'LL GET A SIMILAR LIST FOR THE DRAWINGS. WE DO ISSUE

1 ALL THE DOCUMENTS REVIEWED AS PART OF OUR FINAL REPORT, AND  
2 THERE ARE THINGS IN -- YOU'LL FIND THERE'S THINGS IN THE  
3 DOCUMENTS REVIEWED LIST THAT ARE NOT CALCS AND NOT DRAWINGS.  
4 WE LIST LETTERS AND EVERYTHING ELSE AND THE DOCUMENTS REVIEWED  
5 LIST IS QUITE EXTENSIVE.

6 MR. MARINOS: THE NEXT QUESTION, NUMBER 5, DESCRIBE  
7 THE METHOD USED TO REVIEW CALCULATIONS. THIS WILL PROBABLY  
8 NEED A CLARIFICATION ON THAT, GARY.

9 MR. OVERBECK: WELL, I GUESS NUMBER 5 AND NUMBER 11  
10 GO TOGETHER. WHAT DETAIL TECHNICAL CHECKS WERE CONDUCTED OF  
11 THE CALCULATIONS REVIEWED. AND, IN ESSENCE, WHAT WE'RE ASKING  
12 HERE IS, I DIDN'T -- I SAW CHECKLIST ITEMS.

13 I DIDN'T SEE MAYBE EVERYTHING ON THE CHECKLIST THAT  
14 I WOULD HAVE PUT ON THERE, BUT MAYBE NOW I UNDERSTAND THAT YOU  
15 HAVE GOT SOME DESIGN CONTROL REVIEW GOING ON THAT'S GOING TO  
16 PICK SOME OF THOSE THINGS UP. BUT WHAT PROCESS WAS USED TO  
17 IDENTIFY INCORRECT ITEMS ON THE CALCULATION, WHETHER IT'S  
18 TECHNICAL OR DESIGN CONTROL?

19 MS. WILLIAMS: WE BASICALLY, IF YOU LOOK AT ANSI  
20 N45.2.11, IF YOU LOOK AT VERIFICATION, YOU'VE GOT THREE  
21 METHODS. ONE IS ALTERNATE CALCS, ONE IS REVIEW OF THE  
22 EXISTING CALCULATIONS. THE OTHER IS TESTING. WE BASICALLY  
23 FOLLOWED A SIMILAR PROCEDURE FOR CONDUCTING A REVIEW. WE  
24 WOULD CHECK THE ASSUMPTIONS, THE METHODOLOGY, SPOT CHECKS,  
25 SPECIFIC MATHEMATICAL FACETS OF THE CALCULATIONS TO MAKE SURE  
26 THAT THOSE WERE CORRECT.

27 I WOULDN'T SAY THAT WE DID A 100 PERCENT LINE BY  
28 LINE CHECK, BUT WE DID SPEND CONSIDERABLE TIME LOOKING AT THE

1 CALCULATIONS FROM BOTH ITS PURPOSE AND ITS REFERENCES AND THE  
2 WHOLE PICTURE TOGETHER AND THEN DID MATH CHECKS TO BOOT.

3 MR. STANLEY: SO WHAT YOU ARE INDICATING IS THAT YOU  
4 DID INDEED GO THROUGH A CALCULATION AND DO A NUMBER BY NUMBER  
5 ARITHMETIC CHECK OF THE CALCULATIONS.

6 MS. WILLIAMS: WE DID IN SPECIFIC INSTANCES. WE  
7 WOULD -- MAYBE YOU COULD GIVE SOME EXAMPLES WHERE, IN FACT, WE  
8 WENT THROUGH AND DID SOME SIDE CALCULATIONS OF OUR OWN IN A  
9 COUPLE CASES WHERE THEY WERE VOID IN THEIR CALCULATIONS. AND  
10 YOU CAN PROBABLY PULL OUT A COUPLE OF EXAMPLES.

11 MR. HESS: ONE EXAMPLE WOULD BE THE NPSH CALC WHERE  
12 THINGS SUCH AS THE PRESSURE DROP THROUGH THE 6-INCH FEEDER  
13 LINE FROM THE -- THE BALANCE LINE FROM THE SURGE TANK WAS NOT  
14 INCLUDED IN THE NPSH CALC.

15 WE RAN AN INDEPENDENT CHECK CALC TO SEE THE EFFECT  
16 OF THAT, THE EFFECT FOR ADJUSTING FOR ALTITUDE THAT WAS NOT  
17 DOCUMENTED IN THE CALC, AND VERIFIED THAT IT WAS STILL  
18 CONSERVATIVE IN THE FACT THAT THERE WAS MUCH GREATER NPSH  
19 AVAILABLE THAN REQUIRED, SPECIFIC NUMBERS BEING SOMETHING LIKE  
20 34 FEET A HEAD REQUIRED AND AVAILABLE BEING GREATER THAN 80  
21 FEET A HEAD.

22 WE DID GO BACK AND SPECIFICALLY CHECK IN  
23 CALCULATIONS THE L OVER D'S AND CV'S FOR VALVES. WE DID  
24 CHECKS OF PIPE LENGTHS AS -- FROM THE PIPING DRAWINGS TO WHAT  
25 WAS USED IN THE CALCULATIONS, NUMBERS OF ELBOWS, TEE'S,  
26 WHETHER THEY BRANCH FLOW OR FLOW THROUGH THE LINE IN A GIVEN  
27 CALC.

28 AS NANCY SAID, IT WAS NOT A HUNDRED PERCENT LINE BY



1 LINE CHECK IN ALL CASES, BUT WE CHECKED ENOUGH TO ASSURE  
2 OURSELVES THAT THE CALCULATION WAS ACCURATE.

3 MR. NEVSHEMAL: HOW DID YOU VERIFY THAT THE CORRECT  
4 METHODOLOGY WAS USED IN THE CALCULATION? SPECIFICALLY, LET'S  
5 CHOOSE NPSH. HOW DID YOU DO THAT?

6 MR. HESS: I'M NOT SURE WHAT YOU ARE REALLY GETTING  
7 AT THERE. I MEAN, AN NPSH CALC IS A PRETTY STRAIGHTFORWARD  
8 CALC FROM A HYDRAULIC STANDPOINT. AND WE USED THE EQUATIONS  
9 EITHER FROM THE HYDRAULIC INSTITUTE AND/OR EQUATIONS FROM  
10 CRANE 410.

11 MR. STANLEY: IF THERE WAS AN INPUT ON A CALCULATION  
12 THAT SAID REFERENCE THIS AND SO ON AND SO ON, AND THERE WAS A  
13 NUMBER EXTRACTED FROM THAT, DID YOU GO BACK TO THAT REFERENCE  
14 TO SEE IF, INDEED, THE NUMBER WAS CORRECTLY --

15 MR. HESS: TRANSPOSED?

16 MR. STANLEY: YES.

17 MR. HESS: YES.

18 MR. NORKIN: AREN'T YOU REALLY ASKING ABOUT THE  
19 INPUT IN -- YOU ASSUMED IT WAS CORRECTLY TRANSPOSED, BUT YOU  
20 ARE LOOKING AT THE INPUT, THE SOURCE OF THAT INPUT, AREN'T YOU?  
21 IT'S NOT A MATTER OF --

22 MS. WILLIAMS: WE WOULD CHECK -- WE WOULD GO TO THE  
23 INPUT SOURCE AND MAKE SURE THAT THEY TOOK THE RIGHT  
24 INFORMATION FROM THAT INPUT DOCUMENT AND USED IT CORRECTLY IN  
25 THE CALCULATION. IS THAT THE QUESTION?

26 MR. NORKIN: YES.

27 MR. NEVSHEMAL: YES.

28 MR. OVERBECK: YOU MADE A STATEMENT -- CORRECT ME IF

1 I'M WRONG -- YOU HAVE USED THE CRITERIA OF ANSI N45.2.11 AS  
2 THE BASIS OF THE DESIGN CONTROL GOING THROUGH IT, WHAT NEEDS  
3 TO BE CHECKED, WHAT NEEDS TO BE VERIFIED, WHAT INTERFACE  
4 REQUIREMENTS ARE -- EXIST AND WHERE THAT INFORMATION CAME FROM.  
5 WHAT'S -- I'M SORRY FOR NOT DOING MY HOMEWORK FAR ENOUGH, BUT  
6 WHAT'S THE UTILITIES' COMMITMENT TO ANSI N45.2.11?

7 MS. WILLIAMS: THEY HAVE COMMITTED TO DRAFT 2, REV 2  
8 OF THAT DOCUMENT IN THEIR LICENSING BASIS.

9 MR. OVERBECK: DRAFT --

10 MS. WILLIAMS: DRAFT 2, REV 2 IS THE SPECIFIC  
11 VERSION OF N45.2.11 THAT THEY HAVE COMMITTED TO AS A LICENSING  
12 BASIS AND BECAUSE THAT'S THE IMPLEMENTING DOCUMENT FOR DESIGN  
13 CONTROL 10 CFR, APPENDIX B, CRITERION 3, THAT'S WHAT WE USED.

14 MR. OVERBECK: WHAT'S GIBBS & HILL'S COMMITMENT IN  
15 THEIR PROCEDURES FOR ANSI N45.2.11?

16 MS. WILLIAMS: THEY ARE ALSO COMMITTED TO N45.2.11.  
17 WE CHECKED THEIR PROGRAM AGAINST DRAFT 2, REV 2 OF ANSI  
18 N45.2.11.

19 MR. OVERBECK: ARE THEY DOING MORE OR LESS?

20 MS. WILLIAMS: IN SOME CASES THEY ARE DOING MORE.  
21 WE DIDN'T FIND ANY PROGRAMMATIC TYPE OMISSIONS. AND WHEN WE  
22 WENT AND LOOKED AT THE IMPLEMENTATION SIDE AS TO HOW WELL ARE  
23 THEY FOLLOWING THE PROCEDURES THAT THEY COMMITTED TO, WE FOUND  
24 THAT IN A COUPLE CASES THEY WERE DOING MORE THAN REQUIRED. I  
25 BELIEVE IN DESIGN VERIFICATION THEY WERE DOING A LITTLE MORE.  
26 AND IN SOME CASES, THEY WERE DOING WHAT WAS REQUIRED.

27 MR. NORKIN: FINISHED WITH YOUR QUESTION, GARY?

28 YOU WERE REFERRING TO THAT NET POSITIVE SUCTION HEAD

1 CALCULATION A MINUTE AGO ABOUT AVAILABLE VERSUS REQUIRED, 80  
2 VERSUS 34, OR SOMETHING LIKE THAT, AND YOU MENTIONED THAT YOU  
3 DID AN INDEPENDENT CALCULATION IN SOME AREAS WHERE GIBBS &  
4 HILL HAD NOT ACCOUNTED FOR CERTAIN FACTORS.

5 AS I RECALL, IN LOOKING AT THE ACTUAL CHECKLIST ITEM,  
6 THAT NET POSITIVE SUCTION HEAD CALCULATION, YOU HAD A LOT OF  
7 INFORMATION THERE AND YOU POINTED OUT A LOT OF THINGS THAT --  
8 A LOT OF ERRORS -- I'LL STATE IT, A LOT OF IRREGULARITIES,  
9 THINGS THAT YOU WOULD HAVE CALLED INTO QUESTION.

10 BUT THE FINAL AND BOTTOM LINE WAS THAT IT WAS --  
11 THERE WAS -- IT WAS CONSERVATIVE. I'M WONDERING IF THAT --  
12 GIVEN THERE WERE A LOT OF ERRORS IN THAT CALCULATION AND MAY  
13 HAVE BEEN CONSERVATIVE BECAUSE OF THE LOCATION OF THE  
14 COMPONENT, BUT WHAT DID THAT TELL YOU ABOUT THE CALCULATION IF,  
15 IN FACT, THINGS WORKED OUT RIGHT BECAUSE OF, YOU KNOW, THE  
16 PUMP BEING LOCATED AT THE RIGHT ELEVATION, NOT HAVING A REAL  
17 FRANTIC MARGIN PROBLEM, BUT STILL THE CALCULATION HAD A LOT OF  
18 PROBLEMS.

19 IF YOU HAD LOOKED -- IF SOMEBODY HAD LOOKED AT A NET  
20 POSITIVE SUCTION CALCULATION FOR ANOTHER PUMP, ANOTHER SYSTEM,  
21 IT WOULDN'T HAVE TURNED OUT THAT WAY. I'M CONCERNED ABOUT THE  
22 GENERIC, THE HORIZONTAL ASPECT OF THAT PARTICULAR PORTION OF  
23 THE DESIGN PROCESS.

24 MS. WILLIAMS: YES.

25 MR. MARINOS: MAY I ADD A SPECIFIC TO THAT. WHEN  
26 YOU DETERMINE THE FRICTION LOSSES, WHAT WAS USED? WAS CRANE  
27 410 THE STANDARD AT THAT COMPANY, AT GIBBS & HILL?

28 MR. HESS: YES.



1 MS. WILLIAMS: TO ANSWER THE PREVIOUS QUESTION, YOU  
2 ARE RIGHT ON TARGET, AND THAT IS A QUESTION THAT WE'RE  
3 WRESTLING WITH RIGHT NOW.

4 REALLY, THE ONLY WAY YOU CAN DO THAT IS TO SAY WHAT  
5 ARE THE PERCENTAGE OF THOSE TYPES OF ERRORS THAT WE'VE SEEN IN  
6 THEIR CALCULATIONS SUCH THAT, YOU KNOW, HOW DO WE, CYGNA, FEEL  
7 ABOUT THE QUALITY LEVEL AND THE COMPLETENESS OF THE  
8 CALCULATIONS BECAUSE ALTHOUGH THE ISOLATED INSTANCE MAY BE  
9 TECHNICALLY ACCEPTABLE FOR, AS YOU'VE POINTED OUT, MANY  
10 REASONS, WHAT DOES THAT SAY ABOUT THEIR ABILITY TO EXECUTE AND  
11 CONTROL THE CALCULATIONS AND, THEREFORE, HOW DO WE FEEL ABOUT  
12 THEIR PROGRAM AS A WHOLE.

13 WE HAD THE QA PEOPLE FROM CYGNA GO IN AND LOOK AT  
14 THE INPUT CONTROL, CALCULATION CONTROL, AND THIS SORT OF THING.  
15 BUT NOW WE STILL ARE -- HAVE TO TAKE THE ERRORS THAT CAME OUT  
16 OF THE TECHNICAL REVIEW AND COMPARE THE TWO AND SAY, WELL, IS  
17 THEIR PROCEDURE LACKING, ARE THEY FALLING DOWN IN THE  
18 EXECUTION OF THE CALCULATIONS, OR ARE THE ERRORS INDICATIVE OF  
19 THE FACT THAT THE VERIFICATION PROGRAM IS NOT PICKING UP THESE  
20 KINDS OF ERRORS AND IT SHOULD BE.

21 AND THERE IS A LITTLE BIT OF JUDGMENT IN THERE  
22 BECAUSE YOU ARE DEALING WITH STATISTICS AND NUMBERS AND YOU  
23 ARE NEVER GOING TO SEE A SET OF CALCULATIONS THAT'S IDEAL. IT  
24 WOULD BE NICE, BUT PROBABLY IT'S NOT REALITY.

25 SO WE'RE TRYING TO PUT TOGETHER A BASIS SO THAT WHEN  
26 YOU PEOPLE READ THE REPORT YOU CAN SAY, OKAY, I UNDERSTAND  
27 CYGNA'S CRITERIA FOR JUDGING THE CALCULATIONS.

28 AND I ALSO SEE THE INFORMATION THEY WERE DEALING

1 WITH WHICH WAS HOW MANY ERRORS, WHAT TYPE OF ERRORS, AND IT  
2 WOULD BE LAID OUT AND TRENDED FOR YOU THAT WAY WITHIN A GIVEN  
3 DESIGN ORGANIZATION SUCH AS GIBBS & HILL SO YOU CAN ISOLATE IT  
4 TO THE ORGANIZATION.

5 THEN YOU CAN LOOK AT OUR CRITERIA, YOU CAN DEBATE  
6 WHETHER YOU AGREE WITH OUR CRITERIA OR NOT, BUT YOU WOULD  
7 STILL SEE WHAT THE INFORMATION WAS WE WERE DEALING WITH AND  
8 HOW WE TRIED TO MAKE A JUDGMENT AS TO WHETHER THERE WAS ANY  
9 FURTHER PROBLEMS IN OTHER GROUPS BECAUSE OF THE QUALITY OF THE  
10 WORK THAT WE SAW COMING OUT OF A GIVEN GROUP.

11 AND I CAN'T SPECIFICALLY ANSWER YOUR QUESTION OTHER  
12 THAN TO SAY THAT'S HOW WE'RE APPROACHING IT RIGHT NOW. AND  
13 THAT'S A GOOD QUESTION.

14 MR. MARINOS: WAS THAT THE ONLY SAMPLE OF NPSH  
15 CALCULATIONS THAT YOU DID WITHIN THAT SYSTEM THAT GIVES  
16 YOU -- YOU DON'T HAVE ENOUGH INPUT TO TELL WHETHER THEY ARE  
17 USING THE RIGHT METHODOLOGY OR THEY ARE ACTUALLY DOING THINGS  
18 CORRECTLY BECAUSE YOU HAVE CHECKED OTHER SYSTEMS? YOU HAVE  
19 NOT CHECKED ANY OTHER NPSH ANYWHERE ELSE?

20 MS. WILLIAMS: NO, WE DIDN'T FIND ANY PROBLEMS WITH  
21 IT. IF WE'D FOUND -- AND WE DIDN'T FIND TECHNICALLY THAT  
22 THERE WAS SOMETHING THAT CAUSES CONCERN, SO FROM A TECHNICAL  
23 SIDE IF THE HOUSE, NO, WE DIDN'T PURSUE IT AND ASK TO LOOK AT  
24 OTHER CALCULATIONS AND OTHER SYSTEMS.

25 HAD WE FOUND SIGNIFICANT ERRORS, WE WOULD HAVE DONE  
26 THAT, BUT IT COULD BE THAT WHEN WE FINISH THIS TRENDING  
27 PROCESS I'M TALKING ABOUT, THAT THE VERDICT IS, WELL, THERE'S  
28 A COUPLE OF AREAS WE REALLY DON'T HAVE ENOUGH DATA AND THEN

1 WE'LL HAVE TO TALK TO TEXAS ABOUT THAT.

2 MR. STANLEY: MAYBE I CAN JUST ADD OR ASK ONE  
3 SPECIFIC AND THAT IS WITH RESPECT TO THE RUNOFF FLOW, WAS  
4 THERE A SPECIFIC CALCULATION TO DETERMINE THE RUNOFF FLOW ON  
5 THESE PUMPS?

6 MR. HESS: THE RUNOUT FLOW THAT YOU SEE QUOTED IN  
7 THE CHECKLIST IS BASED ON VENDOR DATA, THE VENDOR PUMP CURVE  
8 AND ATTACHED TEST DATA SHEET WHICH SHOWED A MAX FLOW OF 18- --  
9 APPROXIMATELY 18,000 GPM.

10 MR. OVERBECK: WE GOT A QUESTION ON THAT RIGHT HERE.

11 MR. MARINOS: NEXT QUESTION, QUESTION NUMBER 6 WE  
12 ASK FOR THE BREAKDOWN IN PERCENTAGE OF TIME SPENT AT GIBBS &  
13 HILL AND AT THE TEXAS UTILITIES' OFFICES AND WESTINGHOUSE AND  
14 AT HOME OFFICE.

15 MS. WILLIAMS: OKAY. WE DID NO WORK IN THE  
16 WESTINGHOUSE OFFICES FOR PHASE 4. THE ONLY TIME WE SENT  
17 ANYONE TO WESTINGHOUSE OFFICE WAS FOR EQUIPMENT QUALIFICATION  
18 ON PHASE 2. TUGCO'S OFFICES WE DEFINE AS DALLAS OFFICES AND  
19 IN THE TECHNICAL AREA THEY DIDN'T PERFORM ANY OF THE  
20 CALCULATIONS THERE, SO WE DID NOT SEND TECHNICAL PEOPLE THERE  
21 ALTHOUGH QA PEOPLE WENT THERE.

22 AT GIBBS & HILL PROBABLY ABOUT 35 PERCENT, I'M  
23 SPEAKING BOTH FOR MECHANICAL AND ELECTRICAL. AT COMANCHE PEAK  
24 WHICH WAS FOR DATA COLLECTION AND SUBSEQUENT WALKDOWNS, ABOUT  
25 7 PERCENT.

26 AND HOME OFFICE, MEANING CYGNA, WHICH IS WHEN WE  
27 CAME BACK AND WERE ASSIMILATING THE DATA, DOCUMENTING IT,  
28 REVIEWING THE OBSERVATIONS, FOLLOWING UP WITH TELEPHONE



1 CONVERSATIONS OR SUBSEQUENT MEETINGS WITH GIBBS & HILL  
2 PERSONNEL, ABOUT 58 PERCENT.

3 MR. NORKIN: REALLY THE 58 AND THE 35 ESSENTIALLY  
4 REPRESENT INTERACTION BETWEEN GIBBS & HILL AND CYGNA, WHETHER  
5 IT BE HERE OR AT THE GIBBS & HILL OFFICES?

6 MS. WILLIAMS: THAT'S TRUE.

7 MR. MARINOS: SO THE 7 PERCENT INCLUDES TEXAS  
8 UTILITIES' OFFICES AND SITE OR YOU HAVE NO SITE --

9 MS. WILLIAMS: NO, THAT'S ALL SITE. ALL TUGCO IS  
10 SITE AT COMANCHE PEAK, YES. WE DID NOT GO TO THE DALLAS  
11 OFFICES FOR TECHNICAL. SO THERE'S THREE PLACES, GIBBS & HILL,  
12 COMANCHE PEAK, AND CYGNA HOME OFFICES.

13 MR. MARINOS: QUESTION NUMBER 7, I GUESS WE HAVE  
14 TOUCHED ON ALREADY, BUT WE WANT TO RESTATE IT? YOU'VE HAD  
15 ENOUGH --

16 MR. OVERBECK: I GUESS WE KNOW THE ANSWER. WE KNOW  
17 WHAT ANSI N45.2.11 DOCUMENT THEY USED. DO YOU HAVE ANYTHING  
18 ELSE TO ADD TO THAT?

19 MS. WILLIAMS: YES, I THINK JUST ONE THING. WE  
20 CHECKED FOR -- SPECIFICALLY FROM A QA PAPER WORK PROCEDURAL  
21 STANDPOINT, WE SPECIFICALLY LOOKED AT DESIGN CHANGE CONTROL,  
22 DESIGN ANALYSIS CONTROL, DESIGN VERIFICATION, DESIGN INPUT,  
23 AND INTERFACE CONTROL.

24 NOW, IF YOU PICK UP ANSI N45.2.11, YOU WILL SEE 5  
25 OTHER ATTRIBUTES DEPENDING HOW YOU SLICE THAT DOCUMENT UP.

26 SO IF YOU WERE TO DO A FULL IMPLEMENTATION  
27 EVALUATION OF ANSI N45.2.11, YOU WOULD HAVE THINGS LIKE  
28 DOCUMENT CONTROL. ALTHOUGH WE DID GET INTO DOCUMENT CONTROL,

1 BUT WE DIDN'T SPECIFICALLY LOOK AT IT FOR THESE CALCULATIONS.  
2 SO THE QA SIDE OF OUR REVIEW WAS FROM AN IMPLEMENTATION  
3 STANDPOINT, THOSE 5 ASPECTS OF 2.11. OKAY.

4 FROM A PROGRAMMATIC STANDPOINT, WHICH IS DO THEY  
5 HAVE A PROGRAM IN PLACE TO COMPLY WITH 2.11, WE DID IT ACROSS  
6 THE BOARD.

7 SO, IN ONE CASE WE'RE ASKING WHETHER THEY HAVE THE  
8 PROCEDURES IN PLACE TO COMPLY WITH ALL ASPECTS OF 2.11 AND  
9 THAT WE DID FOR TUGCO, FOR GIBBS & HILL, AND FOR THE TWO PIPE  
10 SUPPORT DESIGN ORGANIZATIONS. WHEN IT COMES TO, ARE THEY  
11 FOLLOWING THE PROCEDURES, THEN WE FOCUSED ON 5 AREAS IN 2.11.

12 AND THAT WAS, AGAIN, NOT A SELECTION FROM A  
13 TECHNICAL STANDPOINT. THAT WAS A SPECIFIC SCOPE LAID DOWN  
14 BEFORE WE STARTED THE REVIEWS FROM A QA STANDPOINT.

15 MR. NEVSEHAL: WITH RESPECT TO THESE CALCULATIONS,  
16 MAY I JUST ASK A SPECIFIC. WHAT DID YOU SEE AS FAR AS A  
17 SIGN-OFF SHEET IS CONCERNED OR INDIVIDUAL SHEETS, WHAT  
18 METHODOLOGY ARE THEY USING OR WHAT PROCEDURES ARE THEY USING,  
19 ARE ALL THE SHEETS SIGNED OFF BY THE PREPARER, CHECKER,  
20 VERIFIER, WHAT IS THEIR APPROACH?

21 MS. WILLIAMS: THEY USE THE REVIEW OPTION FOR DOING  
22 THEIR DESIGN VERIFICATION AS OPPOSED TO ALTERNATE CALCULATIONS.  
23 THEY ARE DOING A HUNDRED PERCENT INDEPENDENT REVIEW IN THE  
24 FORM OF DESIGN VERIFICATION CHECKLIST WHICH IS ATTACHED TO OR  
25 FILED WITH SOMEHOW THE CALCULATIONS, AND THEN THE CALCULATIONS  
26 ARE EACH SIGNED BY A PREPARER AND CHECKER.

27 MR. NEVSEHAL: EVERY SHEET?

28 MS. WILLIAMS: IN ALL THE ONES THAT I SAW.

1 MR. OVERBECK: IS THE DESIGN VERIFICATION CHECKLIST  
2 REFLECT THE ANSI N45.2.11, IS THAT THE BASIS?

3 MS. WILLIAMS: YES, IT DID. YES.

4 MR. CALVO: IS THERE ANYTHING ELSE IN THERE THAT YOU  
5 MAY WANT TO PUT ON THE TABLE THAT BOTHERS YOU ABOUT ANSI  
6 N45.2.11 IN ADDITION TO THIS?

7 MR. OVERBECK: I GUESS WE WOULD BE CONCERNED IF THEY  
8 WEREN'T USING THE ANSI N45.2.11.

9 MS. WILLIAMS: I THINK FROM YOUR STANDPOINT TODAY AS  
10 FAR AS WANTING TO KNOW HOW THE TECHNICAL WORK WAS CONTROLLED,  
11 WE LOOKED AT THE PARTS OF 2.11 THAT ARE NECESSARY TO CONTROL  
12 CALCULATIONS, SO I HOPE I DIDN'T CONFUSE THAT WHEN I ADDED THE  
13 OTHER ELEMENTS IN.

14 MR. OVERBECK: A LITTLE BIT. I MEAN, I DON'T KNOW  
15 HOW CAN SEPARATE ASPECTS OF ANSI -- ATTRIBUTES OF ANSI  
16 N45.2.11. I WOULD HAVE HOPED OR AT LEAST MAYBE HAVE, WE'LL  
17 SEE IT, IS THAT WHEN YOU CAME ACROSS A DESIGN CONTROL PROBLEM,  
18 FOR EXAMPLE, WHEN YOU WERE AT GIBBS & HILL AND YOU WERE  
19 LOOKING AT A STICK FILE, IF YOU DIDN'T EXAMINE WHETHER THOSE  
20 DOCUMENTS WERE THE LATEST DOCUMENTS, THEN HOW DO YOU KNOW WHAT  
21 YOU WERE LOOKING AT?

22 MS. WILLIAMS: OKAY, WE DID THOSE KINDS OF OBVIOUS  
23 THINGS, BUT WHAT WE WOULD DO IS GO DOWN TO THE SOURCE WHICH IS  
24 DCC TO GET ALL OF THE CONTROL DOCUMENTS AND WE ACTED AS A USER  
25 TO THE SYSTEM TO EXTRACT THE CONTROL DOCUMENTS AND, IN FACT,  
26 WE DID DO A REVIEW USING OUR QA PERSONNEL TO ASSESS HOW GOOD  
27 THAT DOCUMENT CONTROL SYSTEM WAS, SO...

28 MR. OVERBECK: TYPICALLY, ENGINEERS HAVE NICE LITTLE



1 FILE DRAWERS WHERE THEY HAVE GOT THEIR OWN LITTLE DRAWINGS.  
2 AND IF YOU DON'T GET DOWN TO THE WORKING LEVEL, SOMETIMES YOU  
3 HAVE A HARD TIME UNDERSTANDING HOW THE PROCESS WORKS, REALLY.

4 MS. WILLIAMS: RIGHT, I AGREE. WELL, THAT'S WHY WE  
5 WENT TO TEST HOW GOOD THE GIBBS & HILL WORK WAS, USING WHAT WE  
6 WERE GIVEN AS THE LATEST DOCUMENTS. IF THEIR WORK DIDN'T  
7 ACCOUNT FOR ALL OF THE CONTROL DOCUMENTS THAT WE KNEW HAVING  
8 GONE TO THE SOURCE THAT CONTROLS DOCUMENTS WERE THE RIGHT SET  
9 OF DOCUMENTS, THEN WE WOULD HAVE SAID, WELL, YOU GUYS HAVE  
10 SOME SORT OF PROBLEM HERE AND WE WOULD HAVE HAD TO INVESTIGATE  
11 IT FURTHER.

12 MR. CALVO: ALSO ON YOUR CHECKLIST OBSERVATION YOU  
13 INDICATE SOME OF THE PROBLEMS THAT GARY IS BRINGING UP, THE  
14 FACT THAT SOME OF THE INPUT, THAT INPUT WAS NOT QUITE READILY  
15 AVAILABLE, SOMEBODY ELSE NOT CONTROLLING THE DOCUMENTS. I  
16 THINK YOU HIGHLIGHTED THAT ONE ONE OF THE THINGS YOU REQUIRED  
17 FULL EVALUATION ON YOUR PART.

18 MS. WILLIAMS: YES, WE DID CITE ALL THE THINGS THAT  
19 ARE CRITICAL TO CONTROLLING AN ANALYSIS WHICH I THINK IS WHAT  
20 WE'RE TALKING ABOUT HERE. AND, SEE, WHEN I TALK IN ANSI  
21 N45.2.11 TERMS, IF I PUT ON MY QA HAT, DESIGN ANALYSIS CONTROL  
22 IS ONLY ONE ASPECT OF 211. THAT'S ALL I'M SAYING.

23 MR. STUART. I THINK, HEARING YOUR QUESTIONS, I  
24 THINK THERE'S SOMETHING ON THE TABLE HERE I WANTED TO CLARIFY.

25 NANCY, IT'S MY UNDERSTANDING THAT YOU WENT THROUGH  
26 AND THOSE DEPARTMENTS THAT WE DID THE REVIEW OR ANALYSIS YOU  
27 BASICALLY REVIEWED THOSE ASPECTS OF N45.2.11 THAT WERE  
28 APPLICABLE WITHIN THAT DEPARTMENT AS WELL AS DOING AN OVERALL

1 PROGRAMMATIC REVIEW TO ENSURE THAT INTERFACES WITH OTHER  
2 DEPARTMENTS WERE SATISFIED.

3 SO, FOR INSTANCE, THE EXAMPLE THAT YOU CITED WHICH  
4 IS AN ENGINEER WITH DESIGN DOCUMENTS SITTING IN HIS FILE  
5 DRAWER, WOULD HAVE BEEN COVERED IF, IN FACT -- IF THAT WAS THE  
6 APPROVED STORAGE LOCATION WHICH I KIND OF DOUBT THAT IT WAS,  
7 IN AN A/E'S OFFICE. AM I CORRECT?

8 MS. WILLIAMS: YES, ONLY IT WASN'T A PROBLEM, SO WE  
9 DIDN'T END UP INVESTIGATING.

10 MR. STUART: MY POINT IS, THE WAY THE QUESTION WAS  
11 ASKED, IT WAS ASKED AS THOUGH THERE WAS A PROBLEM THAT WE  
12 DIDN'T -- THAT WE WOULDN'T FIND GOING INTO THE DEPARTMENT  
13 LOOKING AT DOCUMENT CONTROL AND I DON'T THINK THAT'S THE CASE.

14 WHAT WE WOULDN'T LOOK AT IN THIS REVIEW IS TO GO  
15 OVER TO THE DOCUMENT CONTROL CENTER AND REVIEW WHETHER, IN  
16 FACT, THEY'RE IN CONFORMANCE WITH ALL OF THE VARIOUS ASPECTS  
17 OF N45.2.11 IN THE DOCUMENT CONTROL CENTER AWAY FROM THE  
18 MECHANICAL ENGINEERING OR ELECTRICAL DEPARTMENT.

19 MS. WILLIAMS: WELL, WE REALLY DID DO THAT.

20 MR. STUART: OKAY. WELL, I THINK YOU OUGHT TO  
21 CLARIFY THAT POINT BECAUSE I THINK THAT WHERE THOSE INTERFACES  
22 DID OCCUR, I BELIEVE YOU CHASED THEM DOWN TO THE EXTENT  
23 NECESSARY TO --

24 MS. WILLIAMS: TO ASSURE THAT ALL THE RIGHTS  
25 DOCUMENTS WERE BEING USED, YES.

26 MR. STUART: LET ME SAY ONE MORE THING ABOUT WHAT WE  
27 DIDN'T DO, OKAY. BUT WE DIDN'T THEN -- IF YOU DIDN'T REVIEW  
28 THEM, ALL SECTIONS OF 45.2.11, YOU DIDN'T THEN DO A DETAILED

1 REVIEW OF DESIGN CONTROL -- OR EXCUSE ME -- DOCUMENT CONTROL  
2 AND VARIOUS OTHER ASPECTS OF 45.2.11 THAT DIDN'T FALL WITHIN  
3 THAT AREA, ELECTRICAL, MECHANICAL. OTHERWISE, IT WOULD HAVE  
4 BEEN IN YOUR PROGRAMMATIC REVIEW.

5 MS. WILLIAMS: WE'RE CONFUSING TERMS HERE. SHOULD I  
6 TAKE 5 MINUTES TO CLARIFY SOME OF THE TERMS OF THIS? IT'S NOT  
7 QUITE ON TARGET YET OR NOT.

8 MR. CALVO: PLEASE.

9 MS. WILLIAMS: OKAY. WHEN WE START OUT TO DEFINE  
10 THE SCOPE, WE HAVE TECHNICAL REVIEWS WHICH WE DEFINE HARDWARE  
11 REVIEW SCOPE FOR, AND THEN AT THE SAME TIME WE'RE CONDUCTING  
12 DESIGN CONTROL, WE'LL CALL THEM QA TYPE REVIEWS.

13 NOW, WHEN WE WERE SELECTING THE SCOPE FOR THE  
14 TECHNICAL, WE WOULD CONSIDER WHAT ASPECTS OF THE SYSTEM WERE  
15 NECESSARY, HOW MANY PIPE SUPPORTS THEY WANT US TO REVIEW OR  
16 WHATEVER THE CRITERIA WAS AND SO A HARDWARE SCOPE WAS SET.

17 THEN, IN PARALLEL TO THAT, WE WERE ALSO FORMULATING  
18 A TEAM OF QUALITY ASSURANCE PERSONNEL WHO WERE GOING IN AND,  
19 NUMBER ONE, ASKING WHETHER THEIR PROGRAMS COMPLIED WITH THEIR  
20 LICENSING COMMITMENTS, WHICH IN THIS CASE IS ANSI N45.2.11.  
21 NOW, THAT'S GOING ON IN PARALLEL TO THIS TECHNICAL EFFORT THAT  
22 WE HAVE BEEN TALKING ABOUT.

23 THEN WE TAKE CERTAIN ASPECTS OF THE GIBBS & HILL  
24 PROGRAM AND OF THE TEXAS UTILITIES PROGRAM AND THE PIPE  
25 SUPPORT DESIGN ORGANIZATION PROGRAMS AND WE ASSESS HOW WELL  
26 THEY ARE FOLLOWING THE PROCEDURES THAT WE HAVE ALREADY  
27 DETERMINED TO BE ADEQUATE IN THE SENSE THAT THEY COVER ALL  
28 ASPECTS OF A DESIGN CONTROL PROGRAM THAT'S REQUIRED.



1 WE GO THROUGH AND CHECK WHETHER THEY ARE DOING THE  
2 VERIFICATIONS, WHAT KIND OF METHODS DO THEY USE. WE TAKE  
3 EVERY CALCULATION THAT OUR TECHNICAL PEOPLE ARE USING FOR  
4 THEIR REVIEW SCOPE, THEIR HARDWARE REVIEW SCOPE, AND WE SEND  
5 OUR QA PEOPLE IN TO ASSESS HOW WELL ALL THE CONTROL ASSOCIATED  
6 WITH THOSE CALCULATIONS IS BEING PERFORMED. SO WE DO GO IN  
7 AND CHECK WHETHER THEY'RE LITERALLY DOTTING THE I'S AND  
8 CROSSING THE T'S AND SIGNING THEM OFF.

9 BUT NOW WHAT WE NEED TO DO IS TO TAKE THE QA REVIEW  
10 TRENDS THAT WE SAW AND THEN TAKE ALL THE TECHNICAL DATA THAT  
11 WE HAVE COMING OUT OF THE TECHNICAL REVIEWS AND SAY, OKAY, WE  
12 KEEP SEEING THIS PROBLEM WITH THE FACT THAT THEY ARE MISSING  
13 SOME SYSTEMATIC TYPE ERROR THROUGH ALL THE CALCULATIONS IN  
14 THIS ONE GROUP.

15 AND I GO OVER TO MY QA REVIEW RESULTS. AND I SAY,  
16 WELL, THEY GOT A PROCEDURE IN PLACE. SO YOU MIGHT NOT CATCH  
17 THAT UNTIL YOU PUT THE TWO TOGETHER AND YOU PUT THE TWO  
18 TOGETHER. AND YOU SAY, THE PROCEDURE IS PRETTY WEAK OR MAYBE  
19 THEY'RE JUST NOT FOLLOWING THE PROCEDURES.

20 BUT WE DIDN'T SEND THE TECHNICAL PEOPLE IN TO ASK  
21 THE DESIGN CONTROL QUESTIONS. I WANTED A QA PERSON WHO  
22 UNDERSTOOD 2.11 TO GO IN AND CHECK THE SAME DOCUMENTS THAT THE  
23 TECHNICAL PEOPLE WERE USING AS THEIR HARDWARE SCOPE TO ASSESS  
24 HOW WELL THEY'RE BEING CONTROLLED.

25 AND WE TOOK THAT ALL THE WAY FROM THE DOCUMENT  
26 CONTROL CENTER WHERE THE DOCUMENTS SHOULD BE OBTAINED BECAUSE  
27 THEY ARE THE CONTROLLED SET AND THAT IS WHAT'S BEING ISSUED TO  
28 THE FIELD AND THAT IS WHAT THE CONSTRUCTORS ARE USING.

1                   AND WE MADE SURE, THEN, THAT IT FLOWED ALL THE WAY  
2 THROUGH THE CALCULATIONS INCLUDING THE CONTROL OF THE  
3 CALCULATIONS.

4                   AND TO DO THAT, YOU'RE NOT LOOKING AT EVERY ASPECT  
5 OF ANSI N45.2.11 AND PERHAPS I'M GETTING A LITTLE TOO DETAILED  
6 BY TRYING TO SPLIT HAIRS AND SAY WE REALLY DIDN'T DO ALL  
7 ASPECTS OF IT. WE DID FROM A PROGRAMMATIC STANDPOINT, BUT AS  
8 IT PERTAINS TO CONTROLLING THE HARDWARE WORK THAT WE'RE  
9 LOOKING AT, THERE'S CERTAIN KEY ELEMENTS IN 2.11 WE LOOK AT  
10 AND, YES, WE DID LOOK AT THEM.

11                   MR. MARINOS: YOU USED THIS PROCESS FOR PHASE 4 ALSO?

12                   MS. WILLIAMS: YES, WE DID.

13                   MR. CALVO: ONE THING THAT YOU GUYS FOUND THAT QA  
14 COULD DO WITH THE DESIGN INPUTS, SOMETIMES YOU FOUND IT WAS  
15 NOT PROPERLY JUSTIFIED. YOU COMMENT THAT IT WAS IN THE  
16 ENGINEER'S DESK, YOU KNOW, LEFT DRAWER AND IT WAS A PROBLEM  
17 FINDING THAT.

18                   MR. OVERBECK: ENGINEERING JUDGMENTS THAT ARE NOT  
19 DOCUMENTED ARE ALWAYS A PROBLEM.

20                   MR. CALVO: SO HAVE YOU FOUND THAT IN YOUR REVIEW IN  
21 THE COMPONENT COOLING WATER SYSTEM?

22                   MS. WILLIAMS: YES. WHAT WE ASKED THE TECHNICAL  
23 REVIEWERS TO DO IN PARALLEL TO DOING THE DESIGN INPUT CONTROL  
24 REVIEW, FROM A QA STANDPOINT REALLY ALL YOU CAN GET OUT OF  
25 THAT IS ARE THEY SHOWING INPUTS, BUT THE QA PEOPLE CAN'T TELL  
26 IF THEY ARE THE RIGHT INPUTS.

27                   SO WHAT YOU DO IS YOU ASK YOUR TECHNICAL PEOPLE TO  
28 NOTE WHETHER THEY AGREE WITH ALL THE INPUTS AND ALSO NOTE

1 WHETHER THERE'S ANY MISSING INPUTS. AND THAT INFORMATION IS  
2 IN THE DATA BASIS, QA INFORMATION IS IN THE DATA BASIS AND  
3 THEN YOU CAN JUDGE WHETHER THE PROCESS --

4 MR. CALVO: SO YOU FOUND SOME OF THOSE THINGS.

5 MS. WILLIAMS: YES, WE DID, ABSOLUTELY, AND SO NOW  
6 WE'RE PUTTING IT TOGETHER.

7 MR. MARINOS: YOUR CHECKLIST IS NOT REFLECTING MUCH  
8 OF THAT.

9 MS. WILLIAMS: THAT'S CORRECT.

10 MR. MARINOS: YOU HAVE THAT SOMEPLACE ELSE, THAT  
11 INFORMATION ABOUT THE INCONSISTENCY BETWEEN THE QA AND THE  
12 TECHNICAL STAFF?

13 MS. WILLIAMS: YES, THIS IS THE DATA BASE WHICH IS  
14 OUR TOOL TO SORT ALL THIS INFORMATION OUT. AND WE'RE DOING IT  
15 ACROSS ALL FOUR PHASES. WE'RE NOT JUST DOING IT WITHIN PHASE  
16 4, WHICH IS WHY IT'S BEING DONE NOW AND NOT AS PART OF THE  
17 INDIVIDUAL PHASES.

18 MR. MARINOS: YOU IDENTIFIED THAT, IF I REMEMBER  
19 CORRECTLY, ON ONE OF THOSE GENERIC DEFICIENCY LISTS SUBMITTED  
20 TO THE NRC.

21 MS. WILLIAMS: THAT'S CORRECT, IN THE DESIGN CONTROL  
22 AREA.

23 MR. MARINOS: WE CAN BREAK HERE FOR LUNCH, I THINK.  
24 COME BACK AT 1:00 O'CLOCK?



AFTERNOON SESSION - 1:15 P.M.

MR. MARINOS: CAN WE START, NANCY?

MS. WILLIAMS: SURE.

MR. MARINOS: OKAY. WE'RE GOING TO GO TO QUESTION  
NUMBER 8, I GUESS. WHERE IS JOHN?

MR. OVERBECK: HE IS NOT HERE. HE IS NOT HERE.

MR. MARINOS: WELL, I GUESS YOU CAN AMPLIFY THIS  
QUESTION. NUMBER 8, WE ASK FOR YOU TO DESCRIBE THE  
CORRECTNESS OF THE CALCULATIONAL METHODOLOGY ASCERTAINED,  
PARENTHESES, YOU SAY RUNOUT FLOW AND NPSH, SUB R, WHATEVER THE  
AREA YOU WANT TO CLARIFY OR AMPLIFY.

MR. OVERBECK: I THINK WE DISCUSSED THIS IN THE  
PREVIOUS QUESTION THAT YOU'VE USED, THAT IN YOUR REVIEW OF  
CALCULATIONS, YOU DID LOOK AT METHODOLOGY AND YOU USED  
INDUSTRIAL DOCUMENTS, HANDBOOKS, I SHOULD SAY, HYDRAULIC  
INSTITUTE DOCUMENTS, TO CHECK THE EQUATIONS. I GUESS, DOES  
GIBBS & HILL HAVE ENGINEERING DESIGN GUIDELINES PUBLISHED FOR  
THEIR USE BY THEIR ENGINEERS?

MR. FOLEY: WE DIDN'T REVIEW THEM.

MS. WILLIAMS: WELL, WE DID REVIEW THEM IN THE SENSE  
THAT THEY GO WITH THE DESIGN PROCESS FLOW CHARTS. I KNOW THAT  
THEY HAD THEM IN PIPE STRESS AND I'VE LOOKED AT THOSE. I  
HAVEN'T LOOKED AT MECHANICAL, THE INDICES ON THEM, SO I DON'T  
KNOW IF YOU WANT TO COMMENT ON THAT YET OR NOT.

MR. HESS: I THINK THAT'S PART OF THE --

MS. WILLIAMS: THAT'S THE HORIZONTAL CUT AT  
EXTRAPOLATING INFORMATION, HOW DETAILED THEY ARE IN TERMS OF  
EACH OF THE SPECIFIC SUBJECT AREAS. WE'RE PROBABLY TWO WEEKS

1 AWAY FROM GETTING THOSE FROM GIBBS & HILL.

2 MR. FOLEY: AS PART OF THE SPECIFIC MECHANICAL AND  
3 TECHNICAL REVIEW, WE DID NOT REVIEW ENGINEERING PROCEDURES  
4 PROVIDED INSTRUCTION ON HOW TO PROVIDE -- HOW TO FORM  
5 CALCULATIONS OR ANYTHING.

6 MS. WILLIAMS: BUT IT'S BEING DONE AS PART OF THE  
7 REVIEW SCOPE, ULTIMATELY SPEAKING.

8 MR. OVERBECK: WELL, IN THE REVIEW OF THE CHECKLIST,  
9 I SAW NO AREAS WHERE YOU FELT THE METHODOLOGY WAS AN INCORRECT  
10 METHODOLOGY.

11 MR. HESS: THAT'S CORRECT.

12 MR. MARINOS: WE CAN JUMP TO THE ELECTRICAL  
13 QUESTIONS.

14 MR. OVERBECK: THAT MIGHT BE THE SMARTEST THING TO  
15 DO. WE'LL GO TO THE ELECTRICAL QUESTIONS AND THEN COME BACK.

16 MR. MARINOS: WE'LL GO TO THE ELECTRICAL QUESTIONS.  
17 AND THE QUESTIONS ARE FORMULATED, THEY'RE NUMBERED HERE  
18 ACCORDING TO THE CHECKLIST.

19 AND THEY HAVE THE SAME NUMBER AND SUB NUMBER, I  
20 GUESS NUMBER AND LETTER, SO THE NUMBER 1 QUESTION -- CORRECT  
21 ME IF I'M WRONG, GEORGE -- IT REFERS TO THE FIRST CHECKLIST  
22 ITEM.

23 MR. MORRIS: YES, THAT'S CORRECT.

24 MR. MARINOS: AND ITEM "A" OF THE FIRST CHECKLIST  
25 ITEM IN VOLTAGE, THERE WAS VOLTAGE AT MOTOR REVIEWED OR AT THE  
26 BUS.

27 MR. MARTIN: WHAT WE DID FOR THE VOLTAGE REVIEW, I  
28 GUESS THE ANSWER IS, IT WAS REVIEWED AT THE SWITCHGEAR BUS.

1 WE REVIEWED THOSE SYSTEM TO ASSURE THAT OFF-SITE -- BASICALLY  
2 OUR SYSTEM VOLTAGE CALC WERE ADEQUATE VOLTAGE, LOW GRID  
3 VOLTAGE AND HIGH GRID VOLTAGE ON-SITE POWER AND THEN THAT  
4 CALCULATION GAVE US THE VOLTAGE LEVEL OF THE BUS 69KV  
5 SWITCHGEAR.

6 THE REPORTER: SORRY, I CAN'T HEAR YOU.

7 MR. MARTIN: THAT CALCULATION GAVE US THE VOLTAGE  
8 THE 69 KV SWITCHGEAR.

9 MR. MORRIS: YOU SAID YOU DID IT FOR BOTH THE  
10 OFF-SITE AS WELL AS THE ON-SITE?

11 MR. KNOX: THEY BOTH WERE INCLUDED IN THE SAME --

12 MR. MORRIS: THERE IS TWO OFF-SITE CIRCUITS.

13 MR. KNOX: I MEAN BOTH OFF-SITE, THE PREFERRED AND  
14 ALTERNATE.

15 MR. MARINOS: WHAT DID YOU LOOK AT, HISTORICAL DATA  
16 PROFILES COLLECTED OVER THE YEARS FOR THE OFF-SITE POWER OR  
17 JUST ONE INSTANCE --

18 MR. MARTIN: FOR THAT VOLTAGE LEVEL?

19 MR. MARINOS: YES.

20 MR. MARTIN: THEY, AS AN INPUT THEIR SYSTEM HIGH AND  
21 LOW VOLTAGES AS A REFERENCE AND INPUT TO THE CALCULATION BOTH  
22 345 KV AND 138 KV CIRCUITS.

23 MR. MORRIS: HOW DID THAT INFORMATION GET TO GIBBS  
24 HILL?

25 MR. MARTIN: WE REVIEWED THAT AS BASICALLY BEING AN  
26 INPUT CALCULATION. WE DIDN'T LOOK IN IT FARTHER THAN THAT.

27 MR. MORRIS: DID IT COME FROM THE UTILITY?

28 MR. MARTIN: I'D HAVE TO LOOK AT THE CALC TO SEE



1 EXACTLY WHAT --

2 MS. WILLIAMS: DO WE HAVE THAT DOCUMENT? IS THAT  
3 ONE OF THE ONES THAT WE'VE RECEIVED THAT WE CAN CHECK?

4 MR. MARTIN: I BELIEVE IT IS. WE'RE GETTING INTO  
5 THE SECOND QUESTION HERE ALREADY.

6 MR. MORRIS: YOU TOOK THOSE INPUTS, OR YOU LOOKED  
7 THOSE AS INPUTS TO YOUR CALCULATION. YOU DIDN'T TRY TO VERI  
8 IT?

9 MR. MARTIN: NO, WE DIDN'T TRY TO VERIFY THEM. WE  
10 JUST VERIFIED THE -- TOOK THE 45 KV, STARTED FROM A LOW  
11 VOLTAGE LEVEL AND THEY ANALYZED FOR A HIGH VOLTAGE LEVEL CAS  
12 AND SAME FOR 138.

13 MR. MARINOS: SO YOU CHECKED WHETHER THEY CALCULAT  
14 THE MINIMUM AND MAXIMUM CONDITIONS?

15 MR. FOLEY: DID YOUR CALCULATIONS GO THROUGH A  
16 NORMAL CONFIGURATION OR SOME TYPE?

17 MR. MARTIN: THIS CALCULATION GOES THROUGH NUMEROU  
18 CASES. I FORGET JUST HOW MANY WE REVIEWED FOR THE WORST CAS  
19 LOW VOLTAGE THAT THEY IDENTIFIED AS BEING ON A NON KV BUS AN  
20 WORST CASE HIGH VOLTAGE.

21 MR. KNOX: TO GET THE WORST CASE, WAS THAT THE WOR  
22 CASE CONFIGURATION?

23 MR. MAGGIO: WHAT DO YOU MEAN BY WORST CASE  
24 CONFIGURATION?

25 MR. KNOX: IT WAS A NUMBER OF ALL DIFFERENT  
26 SITUATIONS. WE LOSE ONE OFF-SITE SOURCE, LOADS TRANSFERRED  
27 ANOTHER SOURCE.

28 MR. MARTIN: THE CALC WENT THROUGH A NUMBER OF

1 SITUATIONS WHERE ONE OFF-SITE SOURCE IS LOST WITH THE DESIGN  
2 BASE ACCIDENT. THEY HAD A CASE WHERE IT WAS STARTING UP  
3 ASSUMING LOSS OF POWER AND LOADING SEQUENTIAL, A BLACKOUT.

4 MS. WILLIAMS: AND WE CHECKED ALL OF THESE SCENAR:  
5 IS THAT WHAT YOU ARE SAYING, TOM, OR DID WE PICK THE WORST  
6 CASE?

7 MR. MARTIN: WE WENT THROUGH THERE AND VERIFIED TH  
8 A NUMBER OF CASES --

9 MR. MARINOS: LET'S SEPARATE. WE WANT TO TALK ABC  
10 THE OFF-SITE AND THE ON-SITE. YOU SAID THAT WE HAD A  
11 SITUATION WHERE IT HAPPENED THERE WAS A LOSS OF POWER. WE  
12 WANT TO ESTABLISH MINIMUMS AND MAXIMUMS THAT THEY USED FOR  
13 CALCULATING VARIOUS COMPONENT NEEDS AND WANT MINIMUM AND  
14 MAXIMUM CONDITIONS OF THE OFF-SITE POWER AND THEN WE CAN TAL  
15 ABOUT THE ON-SITE POWER.

16 MR. KNOX: WE'RE TALKING ABOUT OFF-SITE RIGHT NOW,  
17 STRICTLY OFF-SITE.

18 MS. WILLIAMS: IT WAS IN THE SAME CALCULATION,  
19 THOUGH.

20 MR. MARTIN: NO.

21 MS. WILLIAMS: OKAY, I'M SORRY.

22 MR. KNOX: SO WAS THE CONFIGURATION CONSIDERED WHE  
23 YOU HAVE DBA, DESIGN BASIS ACCIDENT, ONE UNIT, SAY, SHUTDOWN  
24 AND THE OTHER UNIT ONE OFF-SITE, SUPPLYING ALL THE LOADS FRO  
25 138 KV TRANSMISSION SYSTEM AND THE FSAR THEY TALKED ABOUT A  
26 PERCENT OR THE 42 PERCENT, ON THAT ORDER, OVERLOAD OF THE  
27 TRANSFORMER. WAS THAT CONDITION -- THAT, TO ME, SOUNDS LIKE  
28 THE WORST CASE CONDITION. WAS THAT THE CONDITION YOU LOOKED

1 AT OR WAS THAT CONSIDERED?

2 MR. MARTIN: WELL, I GUESS WHAT WE'RE SAYING IS  
3 REVIEWED THE CALC TO ENSURE OURSELVES THAT A NUMBER OF  
4 DIFFERENT CASES -- RIGHT NOW, I CAN'T SAY ALL THE SPECIFIC  
5 THE TABLE ARE EXACTLY WHICH CALCS WE LOOKED AT. IT'S BEEN  
6 LENGTH OF TIME.

7 BUT WE DID TRY TO -- IS GAIN CONFIDENCE THAT THE  
8 HAD LOOKED AT A NUMBER OF DIFFERENT CASES AND IT WOULD  
9 PROBABLY BE A REASONABLE VOLTAGE TO EXPECT AT THAT BUS.

10 MR. MORRIS: DID YOU PERSONALLY LOOK AT THE  
11 CALCULATION OR DID SOMEBODY ELSE IN THE GROUP?

12 MR. MARTIN: I BELIEVE I DID.

13 MS. WILLIAMS: IT WAS 9 MONTHS TO A YEAR AGO THAT  
14 DID DO THE REVIEW. WHAT WE CAN DO IS PULL THE CALC OUT AND  
15 SHOW YOU, TONIGHT -- PULL IT OUT TONIGHT AND HAVE THAT  
16 TOMORROW, HOWEVER YOU WANT TO HANDLE THE LOGISTICS OF THIS.  
17 BUT TO GET THE SPECIFIC ANSWERS, WE'LL DO IT TONIGHT.

18 MR. CALVO: LET ME SUMMARIZE WHAT YOU WANT FOR HI  
19 I GUESS WHAT WAS THE DESIGN BASIS, THE USE OF THE CALCULATI  
20 WHAT WAS THE WORST CASE CONDITIONS YOU ASSUMED, RIGHT, MINI  
21 AND MAXIMUM, WHERE THAT INFORMATION -- WHAT DOCUMENT STATES  
22 THAT INFORMATION. AND YOU WANT TO DO IT FOR THE OFF-SITE  
23 POWER.

24 MR. MORRIS: WELL, CONTINUING WITH THAT AND JOHN'S  
25 STATEMENT ABOUT THE FSAR, DID THE CALCULATION ASSUME DIFFERE  
26 CONDITIONS IN THE PLANT SUCH AS THE TRANSFORMER BEING  
27 OVERLOADED AND RESULTANT VOLTAGE DROP THAT YOU WOULD SEE IN  
28 THAT TRANSFORMER.



1 MR. MARTIN: YES, LIKE THE 345, 138 KV TRANSFOR  
2 RIGHT NOW I CAN SAY I REMEMBER SEEING THOSE IN THERE.

3 MR. CALVO: BUT I DON'T UNDERSTAND, JOHN, WHAT  
4 ARE WORRYING ABOUT THE OVERLOAD, OVERLOADING, WHEN YOU AR  
5 POSTULATING OFF-SITE POWER AT THE DESIGN BASIS ACTUALLY  
6 COMPOUND THE FACT YOU ALSO GOT TO SHUTDOWN THE OTHER UNIT  
7 THAT'S WHAT YOU ARE TALKING ABOUT?

8 MR. KNOX: THEY HAVE ANOTHER OPERATION WHERE TH  
9 HAVE AUTOMATIC TRANSFERS BETWEEN ONE OFF-SITE SOURCE AND  
10 ANOTHER OFF-SITE SOURCE, SO WITHIN THESE AUTOMATIC TRANSF  
11 YOU GET DIFFERENT CONFIGURATION IN THE PLANT BASED ON THE  
12 CONDITIONS IN THE PLANT.

13 THAT MAY CREATE A SITUATION WHERE ONE OF THE  
14 TRANSFORMERS IS OVERLOADED. THEY TAKE CREDIT FOR THE OPE  
15 ACTION TO REMOVE LOADS OR TO REDUCE THE -- I GUESS THE LOA  
16 ON THE TRANSFORMER.

17 I JUST WONDERED IF THEY LOOKED AT THE CALCULATIO  
18 FOR A VOLTAGE DROP FOR THOSE OVERLOADED CONDITIONS, IF THO  
19 PARTICULAR CONFIGURATIONS WERE CONSIDERED IN THIS VOLTAGE  
20 ANALYSIS THAT GIBBS & HILL DID.

21 MR. MARTIN: MAYBE I SHOULD MAKE A CLARIFYING  
22 STATEMENT. AS FAR AS OUR ELECTRICAL REVIEW SCOPE WENT, WE  
23 CUT OFF AT 6.9 KV SWITCH AT YOUR SWITCHGEAR. THE INTENTION  
24 ELECTRICAL SCOPE HERE WASN'T SO MUCH A COMPLETE ELECTRICAL  
25 SYSTEM BUT WE'RE GOING TO BE GETTING INTO BOX POWER, DIESEL  
26 GENERATOR DISTRIBUTION.

27 OUR ELECTRICAL REVIEW CONCENTRATED ON REVIEWING T  
28 THE MECHANICALS COMPONENT COOLING WATER SYSTEM FROM THOSE

1 POINTS DOWN WAS DESIGNED ADEQUATELY. AND MAYBE FROM THAT  
2 WERE REVIEWING THEIR METHODOLOGY FROM THAT POINT DOWN.

3 MR. MARINOS: THAT'S THE SCOPE.

4 MR. CALVO: IT GOES BACK AGAIN, THE SAME POINT.  
5 ARE NOT TRYING -- WE'RE TRYING TO FIND OUT WHAT YOU HAVE  
6 WE'RE NOT TRYING TO INFLUENCE FOR YOU TO DO ANYTHING ELSE  
7 LATER. WE'RE TRYING TO DETERMINE WHAT IT IS. THAT'S OUR  
8 PURPOSE, OUR ONLY PURPOSE. WHAT ARE YOU GOING TO DO WHEN  
9 ESTABLISH THIS PHASE 4, YOU HAD A PURPOSE IN MIND. AT THE  
10 YOU ARE GOING TO PROVE WHAT THAT PURPOSE IN MIND IS. IT'S  
11 OUR PURPOSE HERE TO INFLUENCE YOU WHAT IS GOING TO COME UP  
12 THE END.

13 YOU ARE GOING TO ESTABLISH WHAT THE RESULT IS BASED  
14 ON YOUR FINDINGS. ONLY OUR PURPOSE, I REPEAT THAT AGAIN,  
15 TRYING TO UNDERSTAND WHAT YOU HAD DONE. SOMETIMES WE ASK  
16 THAT WE SAY THINGS, WHY YOU DIDN'T DO IT THIS WAY OR THE OTHER  
17 WAY, WHY YOU DIDN'T CONSIDER THAT, ONLY FOR THE PURPOSE TO  
18 UNDERSTAND WHAT YOU DID.

19 BECAUSE, LIKE I SAID BEFORE, THAT IS THE DATA  
20 THAT'S GOING TO BE USED IN THE OVERALL OVERVIEW TO ASSESS  
21 FINAL OVERALL REASONABLE ASSURANCE FOR THE SAME QUALITY.  
22 THAT IN MIND AS WE ASK THOSE QUESTIONS.

23 MR. NORKIN: ON YOUR STATEMENT JUST NOW, I THINK  
24 IMPLIED YOU ARE GOING TO BE DOING MORE ELECTRICAL POWER.  
25 I HEAR THAT? DID YOU INDICATE YOU WERE GOING TO BE USING  
26 AUXILIARY POWER OR SOMETHING?

27 MR. MARTIN: NO.

28 MS. WILLIAMS: I THINK THAT HE WAS REFERRING TO

1 OTHER QUESTIONS THAT YOU HAVE HERE WHICH GETS BACK TO OI  
2 ORIGINAL SCOPE OF DISCUSSION AT THE BEGINNING OF THIS MI  
3 WAS THAT, YES, WE'RE GOING TO GET INTO THOSE DISCUSSIONS  
4 YOU'RE GOING TO FIND THAT OUR ANSWER IS, NO, IT WAS OUT  
5 SCOPE, AND THAT'S WHY WE HAD THAT INTRODUCTORY --

6 MR. MARINOS: WE'RE NOT GIVING YOU ANY INSTRU  
7 OR GUIDANCE TO CHANGE YOUR SCOPE. THAT WOULD BE BETWEEN  
8 AND THE UTILITY WHAT YOU DECIDE TO DO.

9 MS. WILLIAMS: NO, WE HAVE NO INTENTIONS OF  
10 EXPANDING THAT RIGHT NOW.

11 MR. OVERBECK: IF YOU FEEL THAT IT IS AN OUT O  
12 SCOPE, MAYBE IF YOU TELL US UP FRONT IT'S OUT OF SCOPE,  
13 THAT WE WON'T KEEP ASKING QUESTIONS, BECAUSE YOU MIGHT H  
14 COME ACROSS IT IN REVIEWING SOME OF THE STUFF. I WOULD L  
15 KNOW UP FRONT IF IT'S OUT OF YOUR SCOPE. WE NEED TO PUT  
16 ARMS AROUND WHAT THE SCOPE IS.

17 MR. MARINOS: GEORGE, YOU NEED ANY MORE  
18 CLARIFICATION?

19 MR. MORRIS: WELL, WE JUST STARTED GETTING INTO  
20 WHAT -- WHAT THE BASIS FOR THE VOLTAGE WAS AT THE SWITCH  
21 AND I HAVE ADDITIONAL QUESTIONS ON THAT. SHALL I CONTIN

22 MR. MARINOS: SURE.

23 MR. MORRIS: WAS THE LOAD FLOW STUDY THAT YOU L  
24 AT, WAS THAT A GIBBS & HILL COMPUTERIZED CALCULATION?

25 MR. MARTIN: ARE YOU REFERRING TO THE OFF-SITE  
26 VOLTAGE LEVELS?

27 MR. MORRIS: NO, THE OFF-SITE VOLTAGE LEVELS WE  
28 USED IN SOME TYPE OF A LOAD FLOW STUDY ON THE SITE OR WAS



1 THERE A -- MAYBE IT WAS A LOAD FLOW STUDY THAT WAS DO  
2 UTILITY THAT CAME DOWN AND TOUCHED THE 6.9 KV SWITCHG  
3 DON'T KNOW WHAT THE BASIS IS. THAT'S WHAT I'M TRYING  
4 OUT, WHAT THE BASIS IS, WHAT TYPE OF CALCULATION IT I

5 MR. MARTIN: THERE IS --

6 MR. MORRIS: IT APPEARED FROM THE NUMBER OF  
7 CALCULATION THAT IT WAS A GIBBS & HILL CALCULATION.

8 MR. MARTIN: RIGHT. WE REVIEWED 6.9 KV AND  
9 BUS VOLTAGE CALC WHICH USED INPUT FROM THEIR OFF-SITE  
10 SOURCES.

11 MR. MORRIS: WAS THIS A COMPUTERIZED CALCUL

12 MR. MARTIN: I BELIEVE THIS ONE WAS JUST A  
13 HILL HAND CALC OF THEIR SYSTEMS CONFIGURATION. IT WA  
14 DIAGRAMS OF A NUMBER OF DIFFERENT CASES. LET ME CHEC  
15 COULD YOU RESTATE YOUR QUESTION?

16 MR. MORRIS: THE GIBBS & HILL CALC, 2323 RO  
17 NUMERAL III-7, WAS THAT A COMPUTERIZED CALCULATION?

18 MR. MARTIN: NO, IT WAS A GIBBS & HILL HAND  
19 CALCULATION.

20 MR. MARINOS: TO YOUR UNDERSTANDING THEY G  
21 87.5 PERCENT AFTER THEY WERE GIVEN FROM THE UTILITY T  
22 MINIMUM AND MAXIMUM VOLTAGE CONDITION AT THE GRID AND  
23 THEY BACK CALCULATED WHAT THEY WILL HAVE AT THE 6.9 KV  
24 THOSE CONDITIONS WITHOUT YOU CONCERNING YOURSELF WITH  
25 FLOW CALCULATIONS, CONFIGURATIONS OF SWITCHYARD, TRAN  
26 REALIGNMENTS, IS THAT CORRECT?

27 MR. MARTIN: RIGHT.

28 MR. MARINOS: THAT WAS YOUR POINT -- INITIA'

1 POINT FOR YOUR CALCULATIONS. THAT'S FINE.

2 MR. MORRIS: IS THIS ALSO THE BASIS FOR THE  
3 UNDERVOLTAGE RELAY, THIS SAME CALCULATION?

4 MR. KNOX: DID YOU LOOK AT THE UNDERVOLTAGE RELAY TO  
5 START WITH?

6 MR. MARTIN: I'M NOT SURE RIGHT NOW. I WOULD HAVE  
7 TO LOOK.

8 MS. WILLIAMS: IS THAT SOMETHING WE CAN LOOK AT AT A  
9 BREAK?

10 MR. MARTIN: YES.

11 MR. CALVO: MAKE A NOTE.

12 MR. MARTIN: WAIT, NO, IT WASN'T. LET ME CLARIFY  
13 THAT. THE UNDERVOLTAGE FOR THE 6.9 KV SWITCHGEAR IS FOR THE  
14 ENTIRE BUS, AND WE VERIFIED THAT UNDERVOLTAGE CONTACTS EXISTED  
15 IN CIRCUITRY, BUT WE DIDN'T LOOK AT THE DEVELOPMENT OF THE  
16 UNDERVOLTAGE SWITCHING OFF SEQUENCE.

17 MR. MORRIS: SO YOU DON'T KNOW IF THE --

18 MR. MARTIN: MAYBE TO HELP CLARIFY A LITTLE BIT, IF  
19 YOU TAKE IT FROM THE 6.9 KV CUBICLE DOWN WHERE WE START.

20 MR. MORRIS: BUT NOT THE BUS VOLTAGE.

21 MR. MARTIN: NOT THE BUS PROTECTION FEATURES.

22 MS. WILLIAMS: JOHN, YOU HAVE TO SPEAK UP.

23 MR. MARTIN: SORRY.

24 MR. MARINOS: JOHN, THIS 87.5 THAT YOU USED IN ORDER  
25 TO CALCULATE VOLTAGE REQUIREMENTS, ARE YOU CONSIDERING THE  
26 LOADING ALREADY OF THE BUSES OF OTHER COMPONENTS OR YOU LOOKED  
27 AT IN ISOLATION? DO YOU LOOK AT CONTRIBUTIONS FROM OTHER  
28 COMPONENTS THAT ARE ALREADY ON THE BUS OR YOU CONSIDER THAT

1 86.8.

2 MR. MARTIN: THAT'S 87.5. THIS IS A MOTOR STARTING  
3 CASE.

4 MR. MARINOS: OKAY.

5 MR. MARTIN: IN OTHER WORDS, THESE ARE ADEQUATE  
6 VOLTAGE WHEN THIS PUMP TURNS ON TO START.

7 MR. MARINOS: YOU ASSUME THAT VOLTAGE TO BE THERE,  
8 ALL THE OTHER LOADS ALREADY CONNECTED, WHATEVER THE OTHER  
9 LOADS ARE ON THE BUS.

10 MR. KNOX: IS THAT 87.5 A STARTING VOLTAGE OR  
11 CONTINUOUS RUNNING VOLTAGE?

12 MR. MARTIN: THIS WAS -- THIS VOLTAGE HERE WAS THE  
13 BUS VOLTAGE, STARTING HAND CALC TO VERIFY THAT ADEQUATE  
14 VOLTAGE WOULD BE AT THE TERMINALS.

15 MR. KNOX: SO THE 87.5 IS RUNNING.

16 MR. MARTIN: IT'S THE BUS RUNNING, YEAH.

17 MR. KNOX: IT'S A CONTINUOUS -- DID YOU VERIFY THAT  
18 THE MOTOR WAS DESIGNED AND QUALIFIED TO OPERATE IN 87.5?

19 MR. MARTIN: IT WAS SPECIFIED AT 460 AND THE  
20 FSAR -- I BELIEVE THE PROCUREMENTS -- I WOULD HAVE TO CHECK, 80  
21 PERCENT -- 80 PERCENT IS THE NORMAL INDUSTRY STANDARD FOR  
22 MOTORS.

23 MR. KNOX: FOR MOTOR STARTING, YEAH, I UNDERSTAND  
24 THAT, BUT NORMALLY THEY GO UP TO 90 PERCENT AND THEN THEY  
25 EXPECT THE MOTOR TO BE RUNNING AT 90 PERCENT AS AN INDUSTRY  
26 STANDARD.

27 MR. MARTIN: WELL, THIS 87.5 IS ALSO 69 KV AND THE  
28 MOTORS ARE -- THE MOTORS ARE LESS THAN 69KV.



1 MR. KNOX: THE QUESTION I HAD --

2 MR. MAGGIO: I THINK MAYBE WE COULD LOOK AT THE  
3 MOTOR SPEC, AND FROM MY RECOLLECTION, THE MECHANICAL  
4 APPEARANCE, THE MOTOR WAS SPECIFIED TO START AT 80 PERCENT OF  
5 THE VOLTAGE.

6 MS. WILLIAMS: AND WE DID LOOK AT THE PURCHASE SPECS  
7 AS PART OF OUR REVIEW SCOPE.

8 MR. MAGGIO: I THINK THE MOTOR WILL START ON 80  
9 PERCENT VOLTAGE.

10 MR. KNOX: I HAVE NO PROBLEM WITH THAT. IT'S THE  
11 RUNNING VOLTAGE THAT I'M CONCERNED ABOUT. I WOULD ASSUME THE  
12 NORMAL SPEC WOULD CALL FOR 90 PERCENT RUNNING VOLTAGE. THIS  
13 IS 87.5. I JUST WONDERED ABOUT THE DESIGN AND QUALIFICATION  
14 OF THE MOTOR RUNNING AT 87.5. MAYBE IT IS DESIGNED AND  
15 QUALIFIED TO RUN AT THAT. I JUST WANT TO KNOW IF YOU DID  
16 CHECK THAT, DID YOU LOOK INTO THAT.

17 MR. CALVO: IF YOU DON'T KNOW, WRITE IT DOWN AND  
18 THEN YOU CAN COME BACK TO US LATER.

19 MR. MARTIN: I'M NOT SURE HOW YOU'RE --

20 MR. MARINOS: WELL, IF YOUR MINIMUM VOLTAGE START  
21 CONDITIONS WHERE THE MOTOR WAS 80 PERCENT --

22 MR. MAGGIO: I BELIEVE THAT'S THE CASE.

23 MR. MARINOS: -- 87.5 PERCENT START AND RUN  
24 OBVIOUSLY IS ADEQUATE. I WOULD IMAGINE YOU WOULD HAVE TO HAVE  
25 CONFIRMED IN YOUR CALCULATION.

26 MR. CALVO: IF YOU LOOK AT THE PROCUREMENT DOCUMENT,  
27 YOU LOOK AT THE SPECIFICATIONS, IF YOU DID LOOK AT IT, I'M  
28 SURE THAT THAT NUMBERS WILL HAVE COME UP AGAIN THAT -- THE

1 ANSWER TO THAT QUESTION HAD TO COME FROM YOU.

2 MS. WILLIAMS: I THINK THAT THE ANSWER IS -- CORRECT  
3 ME IF I'M WRONG, GUYS -- YES, WE LOOKED AT THE SPEC. NO, WE  
4 DIDN'T FIND A PROBLEM, AND IF YOU WANT THE NUMBERS, WE'LL  
5 CHECK IT AT BREAK.

6 MR. MORRIS: I'D BE SURPRISED IF THE RUNNING VOLTAGE  
7 IS 87 PERCENT.

8 MR. MARTIN: WELL, THIS IS ALSO A WORST CASE.

9 MR. MARINOS: THEY CALCULATED THIS IS THE MINIMUM  
10 THAT THEY EXPECT ON THAT 6.9 KV SOMETIME AT AN UPSET CONDITION.  
11 THAT'S THE WAY I UNDERSTOOD IT. SO, ON THAT BASIS OF THAT  
12 MINIMUM, THESE GUYS CHECKED THE CALCULATION TO SEE THAT THOSE  
13 MOTORS WILL ACCELERATE, BUT YOU WOULDN'T EXPECT TO BE A  
14 ROUTINE LEVEL, BUT IT CAN APPROACH THAT LEVEL.

15 MR. CALVO: YOU ARE RIGHT. THE PROCUREMENT  
16 DOCUMENTS AND SPEC WILL NOT HAVE A 87.5, 80 PERCENT OR 90  
17 PERCENT BY MULTIPLES OF 5.

18 MS. WILLIAMS: THIS 86.7 PERCENT, THAT'S CYGNA'S  
19 NUMBER. WE -- I DON'T KNOW IF THIS IS 87.5 OR --

20 MR. MARINOS: 87.5.

21 MR. MARTIN: THEY DON'T HAVE THIS.

22 MR. MARINOS: IT'S NOT CYGNA'S NUMBER. IT'S A  
23 NUMBER THAT YOU GOT FROM -- ALL RIGHT, ANY MORE QUESTIONS ON  
24 THAT?

25 MR. STANLEY: VERIFY THE CALC INCLUDED THAT CASE, IS  
26 THAT LEFT OPEN OR IS --

27 MR. CALVO: THEY ARE GOING TO GIVE US THAT  
28 INFORMATION THAT WAS THE WORST CASE FOR THOSE MINIMUM AND

1 MAXIMUM VOLTAGE LEVELS.

2 MR. KNOX: I HAVE ANOTHER QUESTION. DID YOU LOOK  
3 INTO WHERE ALL LOADS, BLOCK LOADED ONTO THE OFFSET POWER  
4 SYSTEM, WAS THAT A CONFIGURATION THAT WAS CONSIDERED AS FAR AS  
5 THE 87.5 PERCENT WORST CASE?

6 MR. MARTIN: THIS 87.5 CASE, I BELIEVE, IS -- IS  
7 IDENTIFYING A LOSS OF OFF-SITE POWER AND THE DESIGN OF DBA ON  
8 ONE UNIT DURING STARTUP OF THE OTHER.

9 MR. MAGGIO: DID YOU WANT TO RESTATE YOUR QUESTION?  
10 MAYBE WE DON'T UNDERSTAND WHAT YOU'RE ASKING. IS IT SPECIFIC  
11 CRITERIA THAT YOU EXPECTED TO FIND AS AN ASSUMPTION?

12 MR. KNOX: THE FSAR SAYS THAT THE OFFSET POWER HAS  
13 THE CAPABILITY TO BLOCK LOAD ALL THE SAFETY LOADS ONTO THE BUS  
14 SIMULTANEOUSLY. I WAS JUST CURIOUS IF THIS WAS ONE OF THE  
15 CONFIGURATIONS WHERE YOU GOT THE 87.5 PERCENT.

16 MR. MAGGIO: OKAY.

17 MR. CALVO: MAYBE IT GOES BACK AGAIN TO THE ORIGINAL  
18 QUESTION.

19 MR. KNOX: IT DOES GO BACK TO THE ORIGINAL QUESTION.

20 MR. CALVO: SO WHY DON'T YOU FACTOR THAT -- AS PART  
21 OF THE ORIGINAL QUESTION, WHAT WAS THE WORST CASE CONDITION  
22 YOU ASSUMED AND WHAT WAS THE ELEMENTS OF THE WORST CONDITION  
23 THAT YOU CONSIDERED?

24 MR. KNOX: RIGHT, THAT WOULD GIVE ME THE 87.5.

25 MR. CALVO: WHETHER IT WAS CONSIDERED OR NOT, IT  
26 WILL TELL US THEN.

27 MR. MARINOS: ARE YOU FINISHED, JOHN, GEORGE?

28 MR. MORRIS: WE HAD A NUMBER OF SUBSET QUESTIONS.



1 MR. MARINOS: I'M GOING TO ASK THE OTHER SUBSET (B).  
2 I HAVE (B). (B) IS, DID THE GIBBS & HILL CALCULATION INCLUDE  
3 THE UTILITY DATA FOR SYSTEM SWINGS, MINIMUM OR MAXIMUM  
4 VOLTAGE -- WE JUST COVERED THAT -- THROUGH BOTH THE PREFERRED  
5 AND ALTERNATE SOURCES OF OFF-SITE POWER?

6 I THINK WE COVERED THAT, BUT WE HAVE A LIST OF  
7 THINGS HERE. DID THE CALCULATION INCLUDE VOLTAGE DIPS CAUSED  
8 BY LOADING THE DIESEL GENERATOR WHEN ONLY THE STANDBY SOURCE  
9 IS AVAILABLE.

10 THIS IS A SEPARATE QUESTION HERE.

11 MR. MORRIS: BUT WE'RE ADDRESSING THE OFF-SITE  
12 SOURCE. WE DIDN'T ADDRESS THE ON-SITE SOURCE.

13 MR. MARINOS; I'M CONFUSED. THIS SAYS SUBLISTING IS  
14 UNDER THE OFF-SITE POWER, BUT I'M ASKING QUESTIONS ON THE  
15 DIESEL UNIT.

16 MR. KNOX: WE'RE ASKING QUESTIONS ABOUT THE VOLTAGE  
17 DROP CALCULATION. WE HAVE TWO SOURCES OF POWER, ONE IS A  
18 DIESEL GENERATOR. WHAT WAS THE VOLTAGE AT THE BUS WHEN YOU  
19 USED THE DIESEL GENERATOR.

20 MR. MARINOS: YOU HAVE A COPY OF THIS QUESTION. CAN  
21 YOU ANSWER IT.

22 MR. MARTIN: THE ANSWER IS NO, WE DIDN'T REVIEW THE  
23 DIESEL GENERATOR DESIGN AT ALL.

24 MR. KNOX: WE'RE NOT ASKING THAT. THE DIESEL  
25 GENERATOR WILL COME DOWN BY DESIGN AND GIVE YOU A CERTAIN  
26 VOLTAGE DROP. I'M NOT SURE WHAT IT IS AT COMANCHE PEAK, BUT  
27 GIVEN THAT VOLTAGE DROP, DID YOU LOOK AT THE CALCULATION  
28 DOWN TO THE -- I GUESS DOWN TO THE LOAD IS WHAT WE'RE ASKING.

1 MR. MARTIN: WHAT QUESTION ARE YOU ASKING?

2 MR. MARINOS: WE ARE ON THE DIESELS NOW, RIGHT?

3 MR. KNOX: THE DIESEL GENERATOR SUPPLYING THE POWER  
4 TO THE BUS WILL HAVE CERTAIN VOLTAGE DROPS DUE TO LOADING. IN  
5 OTHER WORDS, THE DIESEL GENERATOR VOLTAGE WILL DROP DOWN TO A  
6 CERTAIN LEVEL, 80 OR 75 PERCENT, DID YOU LOOK AT THE  
7 CALCULATION DOWN FOR THAT SITUATION ON THE DIESEL GENERATOR.

8 MR. CALVO: ARE THE COMPONENT COOLING WATER SYSTEM  
9 ELECTRICAL COMPONENTS, PUMPS AND MOTORS, CAPABLE OF PERFORMING  
10 THE INTENDED FUNCTIONS WHEN THE VOLTAGE IN THE BUS WHERE THEY  
11 ARE COLLECTED DIPS?

12 MR. MAGGIO: YES, BUT THIS IS BASED ON THE DIESEL  
13 GENERATOR --

14 MR. CALVO: I DON'T CARE HOW IT DIPS. HOW THAT DIP  
15 GOT IN THERE, I DON'T KNOW, OKAY, BUT...

16 MR. MARTIN: THE DIPS IDENTIFIED IN THE SYSTEM  
17 VOLTAGE CALCS WERE REVIEWED. DIPS WOULD SEQUENCE LOADING OF  
18 THE DIESEL GENERATOR WERE NOT.

19 MR. MARINOS: WHAT DID YOU CONSIDER AS AN INITIAL  
20 CONDITION FOR VOLTAGE DIESEL AT THE BUS FROM SOURCE B IN THE  
21 DIESEL GENERATOR IN ORDER TO CONFIRM THAT THE COMPONENT  
22 COOLING WATER PUMP MOTOR WILL START? WHAT DID YOU USE AS AN  
23 INITIAL VOLTAGE?

24 MS. WILLIAMS: EXCUSE ME JUST A MINUTE.

25 MR. CALVO: NANCY, WE CAN GO OFF THE RECORD FOR A  
26 MINUTE.

27 MS. WILLIAMS: YES, THANK YOU. I JUST WANT TO MAKE  
28 SURE THAT YOU ARE ANSWERING THE QUESTION.

1 (PAUSE.)

2 MS. WILLIAMS: WE'RE BACK ON THE RECORD.

3 MR. MARINOS: OKAY, WE'RE BACK.

4 MS. WILLIAMS: I WANT TO TRY AND RECAP THE QUESTION  
5 THAT I HAVE JUST EXPLAINED TO OUR PEOPLE.

6 MR. MARINOS: DO YOU WANT US TO RESTATE THE QUESTION  
7 OR WHAT ARE YOU GOING TO DO?

8 MS. WILLIAMS: LET ME TAKE SHOT AT IT AND IF I AM  
9 OFF BASE -- WHAT I THINK YOU SUMMARIZED, IT WAS, YES, WE  
10 UNDERSTAND, CYGNA, YOU DID NOT LOOK AT THE LOADING SEQUENCES  
11 FOR THE DIESELS, OR YOU DID NOT LOOK AT WHAT DEFINED THE WORST  
12 CASE VOLTAGE DIP, BUT DID YOU CHECK THE COMPONENTS TO MAKE  
13 SURE THAT WHATEVER THAT WORST CASE WAS, THAT THEY REMAIN  
14 FUNCTIONAL.

15 WAS THAT WHAT YOU WERE -- WHEN YOU WERE SUMMARIZING  
16 RIGHT AT THE END -

17 MR. MARINOS: NO, LET ME RESUMMARIZE. IF THE OTHER  
18 FELLOWS DON'T AGREE, THEY CAN JUMP IN. I'M TRYING TO  
19 UNDERSTAND WHEN YOU ASSUMED THE OFF-SITE POWER IS NOT  
20 AVAILABLE AND NOW YOU HAVE THE SOURCE OF POWER IS A DIESEL  
21 GENERATOR AND DO YOU THE CALCULATIONS AGAIN TO CONFIRM THAT  
22 THE MOTOR WILL START AND ACCELERATE AND DELIVER UNDER THE  
23 VOLTAGE CONDITIONS THAT THE DIESEL WILL PROVIDE FOR YOU.

24 WHAT ARE THOSE CONDITIONS THAT YOU ASSUME THAT THE  
25 DIESEL WILL PROVIDE FOR YOU FOR DOING THIS CALCULATION?

26 MS. WILLIAMS: WE DIDN'T LOOK AT THE DIESEL, BUT YOU  
27 DID LOOK AT THE SITUATION WHERE THE DIESEL WAS SUPPLYING THE  
28 POWER AND WHATEVER THE ASSOCIATED VOLTAGE DIP WAS, IS THAT



1 TRUE?

2 MR. MARINOS: YOU DIDN'T DO ANY CALCULATIONS WITH  
3 THE DIESEL?

4 MR. MARTIN: WE DID REVIEW OUR DIESEL CALCS. LET ME  
5 VERIFY WHETHER IT WAS INCLUDED IN THE SYSTEM CALCULATION WE  
6 LOOKED AT.

7 MS. WILLIAMS: IT'S NOT THE DIESEL CALC.

8 MR. MARTIN: WELL, THE DIESEL VOLTAGE LEVEL --

9 MR. MARINOS: OKAY, WE'RE GOING TO WAIT FOR THIS FOR  
10 ANOTHER TIME.

11 MR. MARTIN: YES.

12 MR. ANGELO: OKAY. WE CAN GO ON TO THE NEXT  
13 QUESTION AND WE'LL GET BACK TO IT AT ANOTHER TIME.

14 MS. WILLIAMS: I GUESS I'M A LITTLE PUZZLED MYSELF  
15 HERE BECAUSE I THINK, AS TOM EXPLAINED, WE LOOKED AT ALL THE  
16 COMPONENTS TO MAKE SURE THEY FUNCTIONED AND WE HAD CERTAIN  
17 GIVENS. AND I DON'T THINK ANY OF YOU GUYS HERE ARE TELLING ME  
18 THAT WE DIDN'T DO THAT. YOU ALWAYS LOOKED AT THE COMPONENTS  
19 TO MAKE SURE THAT THEY FUNCTIONED FOR WHATEVER THE GIVEN  
20 SCENARIO WAS, IS THAT TRUE? WE'RE NOT TALKING ABOUT DEFINING  
21 SCENARIO.

22 MR. MARTIN: WELL, THE PROBLEM I'M HAVING RIGHT NOW  
23 IS I DON'T REMEMBER ALL THE CASES THAT WELL.

24 MS. WILLIAMS: OKAY. THAT'S WHAT I WANT TO BOIL IT  
25 DOWN TO, SO THE QUESTION IS WHETHER WE NEED TO MAP OUT THE  
26 SCENARIOS, FINE, BUT WE CAN'T ATTEST TO THE VALIDITY OF THE  
27 SCENARIOS, BUT WE DID REVIEW THE COMPONENTS FOR SCENARIOS.  
28 WHETHER YOU CAN REMEMBER EXACTLY WHAT THE SCENARIOS WERE OR

1 NOT, WE'LL GO GET THAT DETAIL. BUT I DON'T WANT TO LEAVE WITH  
2 THE IMPRESSION THAT WE DIDN'T LOOK AT THE COMPONENTS FOR WHAT  
3 WAS GIVEN IN THE DOCUMENTS AS THE WORST CASE SCENARIO AND I  
4 WAS AFRAID THAT WAS THE IMPRESSION THAT'S BEING LEFT HERE AND  
5 THAT'S WHAT I WANTED TO CLARIFY.

6 MR. MARINOS: I DON'T KNOW. I DON'T HAVE AN  
7 IMPRESSION. I'M JUST TRYING TO FIND OUT WHAT YOU DID.

8 MS. WILLIAMS: SO WHAT WE'RE GOING TO GO BACK AND DO  
9 IS PULL THE CALCULATION AND MAKE SURE THAT WE'RE ALL CLEAR ON  
10 THIS AND FIND OUT WHAT THOSE SCENARIOS WERE.

11 DO WE HAVE THAT INFORMATION TO DO THAT, DO WE?

12 MR. MARTIN: I BELIEVE WE DO, YES.

13 MS. WILLIAMS: OKAY.

14 MR. NORKIN: DO YOU HAVE SOMETHING THAT TELLS YOU  
15 WHAT YOU LOOKED AT IN THE CALCULATION? I MEAN YOU CAN LOOK AT  
16 THE CALCULATION, BUT DO YOU KNOW WHAT YOU LOOKED AT IN THE  
17 CALC?

18 MS. WILLIAMS: YES.

19 MR. MARTIN: WE HAVE SOME NOTES THAT WE COMPILED  
20 DURING OUR REVIEW.

21 MR. MARINOS: LET'S GO TO THE NEXT QUESTION. WE CAN  
22 GO TO THE NEXT QUESTION WITHIN THE SAME SUBGROUP.

23 DID THE CALCULATION INCLUDE DISTRIBUTION EQUIPMENT  
24 AS-BUILT DATA. DO YOU WANT TO CLARIFY THAT, GEORGE?

25 MR. MORRIS: THERE IS A STATEMENT IN THE CHECKLIST  
26 THAT SAYS THAT YOU REVIEWED THE CALCULATION AND I WAS TRYING  
27 TO FIND OUT TO WHAT DEPTH YOU REVIEWED THAT CALCULATION.  
28 APPARENTLY FROM WHAT I AM HEARING, WHAT YOU LOOKED AT WAS THE

1 RESULTS OF THAT CALCULATION AND NOT THE BASIS OR THE DETAILS  
2 OF THAT CALCULATION AT ALL.

3 SO THE BUS HAS THREE SOURCES OF POWER, WHERE OR HOW  
4 THAT POWER GETS THERE OR WHETHER THOSE ASSUMPTIONS WERE VALID  
5 OR NOT, YOU DID NOT LOOK AT THAT. AND YOUR STATEMENT THAT YOU  
6 REVIEWED THE CALCULATION REALLY MEANS YOU LOOKED AT THE  
7 RESULTS OF THAT CALCULATION FOR INPUTS INTO THE SPECIFICATION.

8 MR. MARTIN: ARE WE TALKING 1-E RATHER THAN 1-A?

9 MR. NORKIN: ALL THEY ARE SAYING IS THEY CHECKED FOR  
10 THE NUCLEAR IDENTIFICATION. THEY DON'T SEEM TO HAVE NOTHING  
11 MORE. THEY JUST SAY THAT THEY CONFIRM THAT THE THING HAD AN  
12 IDENTIFICATION, PERIOD. THEY DON'T SAY ANYTHING ELSE.

13 MR. MARTIN: QUESTION 1-A IS WHERE WE SAY WE  
14 REVIEWED THE CALC FOR MINIMUM ACCEPTABLE VOLTAGE.

15 MS. WILLIAMS: CAN YOU TELL THEM HOW WE DID THAT?

16 MR. MARTIN: THERE WAS A CURSORY REVIEW OF LINE-UPS  
17 IN THIS CALC. BASICALLY, WE WERE LOOKING FOR A VOLTAGE LEVEL  
18 TO VERIFY THE COMPONENT COOLING PUMP WOULD WORK. AND THAT'S  
19 MAINLY WHAT -- THE EXTENT THAT THIS CALC WAS REVIEWED.

20 MR. NORKIN: THE RESULTS, WOULD THE RESULTS HAVE  
21 SUPPORTED THE NECESSARY VOLTAGES, NOT NECESSARILY HOW YOU GOT  
22 THE RESULTS.

23 MR. MARTIN: RIGHT. YES, I BELIEVE THAT'S A TRUE  
24 STATEMENT.

25 MR. MARINOS: ARE YOU FINISHED, GEORGE, JOHN?

26 MR. KNOX: I'M FINISHED.

27 MR. MARINOS: ONE MORE ITEM IN THIS QUESTION IS WAS  
28 DEGRADED GRID VOLTAGE PROTECTION REVIEWED BY CYGNA. I THINK



1 WE COVERED THIS UNDER ITEM 1-A, DIDN'T WE, GEORGE?

2 MR. MORRIS: I THINK THAT HAS BEEN ANSWERED.

3 MR. MARINOS: UNDER 87.5 IS WHAT YOU GUYS USED AS A  
4 MINIMUM VOLTAGE.

5 MR. MORRIS: THEY DID NOT LOOK AT DEGRADED GRID- --

6 MR. MARINOS: NO. WE ESTABLISHED THAT THEY DID AND  
7 JUST TOOK A GIVEN MINIMUM AND THEY --

8 MR. MORRIS: THEY DIDN'T LOOK AT THE DEGRADED GRID  
9 VOLTAGE PROTECTION.

10 MR. MARINOS: OH, PARDON ME, YES.

11 MR. CALVO: THE PROTECTION THAT REFLECTED WHICH  
12 BUSES --

13 THE REPORTER: WAIT, I'M NOT HEARING ANYTHING RIGHT  
14 NOW EXCEPT A LOT OF NOISE. ONE AT A TIME, PLEASE?

15 MR. MARINOS: WE STATED THE QUESTION. DO YOU WANT  
16 TO ANSWER IT?

17 MS. WILLIAMS: MAYBE YOU BETTER RESTATE IT, PLEASE.

18 MR. CALVO: THE QUESTION WAS, WAS THE DEGRADED GRID  
19 VOLTAGE PROTECTION REVIEWED BY CYGNA.

20 MR. MARTIN: AND WE ANSWERED NO BEFORE, BECAUSE THAT  
21 WAS IN THE SWITCHGEAR, THE SWITCHGEAR, MAIN GATE SWITCHGEAR  
22 CUBICLE.

23 MR. MORRIS: TO THE EXTENT --

24 MR. MARTIN: WE VERIFIED PRIME VOLTAGE CONTACTS WERE  
25 IN THE MOTOR CONTROL CIRCUIT.

26 MR. MARINOS: WE'RE GOING TO GO BACK TO MECHANICAL  
27 NOW.

28 MR. CALVO: YES.

1 MR. KNOX: SO, NANCY, I WILL GO BACK TO MECHANICAL,  
2 JUMP BACK TO MECHANICAL.

3 THE REPORTER: CAN WE TAKE A MINUTE?

4 (PAUSE.)

5 MR. MARINOS: BACK ON THE RECORD.

6 WE HAVE GONE TO MECHANICAL QUESTIONS UNLESS YOU WANT  
7 TO REOPEN ELECTRICAL FOR ANYTHING RIGHT NOW, NANCY, OR CLARIFY  
8 ANYTHING OR GET BACK TO IT AT ANOTHER TIME.

9 MS. WILLIAMS: NO, I THINK WE DO WANT TO CLARIFY  
10 SOME THINGS, BUT WHY DON'T WE PICK IT UP WHEN WE DO ELECTRICAL  
11 ALL AT ONCE --

12 MR. MARINOS: OKAY. IT MAY NOT BE TODAY --

13 MS. WILLIAMS: START FRESH AGAIN.

14 MR. MARINOS: -- MAYBE TOMORROW --

15 MS. WILLIAMS: OKAY.

16 MR. MARINOS: -- MORE LIKELY, WELL, UNLESS WE GET  
17 THROUGH WITH THESE MECHANICAL QUESTIONS TODAY, AND I DON'T  
18 KNOW IF WE CAN.

19 MS. WILLIAMS: OKAY, THAT'S FINE.

20 MR. MARINOS: SO WE'RE GOING TO BE ON QUESTION  
21 NUMBER 9 OF THE MECHANICAL SYSTEM QUESTIONS. AND WE ARE  
22 ASKING YOU TO DESCRIBE HOW THE WALKDOWN PLAYED A ROLE IN THE  
23 OVERALL SCHEME OF THE INSPECTION. PHILOSOPHICAL ENOUGH.

24 MR. OVERBECK: I GUESS I WOULD LIKE TO CLARIFY THAT  
25 WHEN WE ASKED THE QUESTION, WE WERE NOT IN RECEIPT OF THE  
26 PRELIMINARY --

27 MS. WILLIAMS: IS THERE A PARTICULAR THRUST TO THE  
28 QUESTION NOW THAT YOU HAVE SEEN THAT THAT YOU WOULD LIKE US TO

1 ADDRESS OR HAVE YOU NOT HAD A CHANCE TO LOOK AT THOSE.

2 MR. OVERBECK: NO, WE HAVE. WHAT WE WOULD LIKE TO  
3 KNOW IS HOW YOU USED THE WALKDOWN TO DETERMINE THAT THE  
4 SYSTEMS -- THE CALCULATIONS YOU PERFORMED ON THE SYSTEMS WERE  
5 CORRECT. DID YOU USE THE WALKDOWN TO HELP YOU WITH THE  
6 CALCULATIONS OR IS THE WALKDOWN A SEPARATE ITEM?

7 MR. HESS: THE WALKDOWN WAS USED BASICALLY TO VERIFY  
8 WHAT WE HAD SEEN IN THE ANALYTICAL REVIEW. WE WALKED DOWN THE  
9 PIPING SYSTEM THAT WE HAD REVIEWED AND VERIFIED THE GEOMETRY  
10 OF THE PIPING SYSTEM MATCHED THE DRAWINGS THAT WE HAD USED IN  
11 THE ANALYTICAL REVIEW. WE VERIFIED NAMEPLATE DATA FROM WHAT  
12 WAS IN THE SPECIFICATIONS, IN THE DESIGN DOCUMENTS. WE  
13 VERIFIED APPROXIMATE PIPE LENS FITTINGS, VALVE ORIENTATIONS  
14 AND LOCATIONS. WE ALSO LOOKED AT THE HAZARDS ANALYSIS IN THE  
15 WALKDOWN AS FAR AS SEPARATION AND FIRE PROTECTION SUPPRESSION  
16 SYSTEMS AND SEPARATIONS OF REDUNDANT COMPONENTS.

17 MR. OVERBECK: WHO DID THE WALKDOWN? YOU TWO  
18 GENTLEMEN?

19 MR. HESS: MR. FOLEY AND MYSELF.

20 MR. OVERBECK: AND DID YOU DO THEM ALL AT ONE TIME,  
21 ONE WALKDOWN, NUMBER OF WALKDOWNS ON DIFFERENT SUBJECTS?

22 MR. HESS: IT WAS ONE COMPLETE WEEK.

23 MR. OVERBECK: ONE WEEK AT THE PLANT SITE.

24 MR. HESS: ONE WEEK AT THE PLANT SITE.

25 MR. OVERBECK: DID YOU WALK DOWN ALL THOSE BLUED-IN  
26 ITEMS ON THIS DRAWING?

27 MR. HESS: YES.

28 MR. OVERBECK: EVERYTHING THAT WAS WITHIN THE SCOPE



1 OF CYGNA, YOU WALKED DOWN AND VERIFIED.

2 MR. HESS: THAT'S CORRECT.

3 MR. STANLEY: THE MECHANICAL SEPARATION ASPECTS THAT  
4 YOU SAID HAD BEEN TAKEN OUT IN THE WALKDOWN, WHAT KIND OF  
5 CRITERIA DID YOU USE FOR MECHANICAL SEPARATION?

6 MR. FOLEY: WE ASSURED CERTAINLY THAT REDUNDANT  
7 COMPONENTS SUCH AS PUMPS AND WHATEVER ELSE WAS REDUNDANT WERE  
8 SEPARATED BY A SOLID BARRIER, CONCRETE WALL AS OPPOSED TO -  
9 AGAIN, WE WOULD NOT HAVE CHECKED TO SEE THAT THAT PARTICULAR  
10 BARRIER WAS A SEISMIC MISSILE PROOF BARRIER BECAUSE THAT WOULD  
11 HAVE BEEN DONE BY OTHER DISCIPLINES IN OTHER PARTS OF THE  
12 REVIEWS.

13 BUT WE LOOKED AT THE SEPARATION TO MAKE SURE THAT,  
14 FOR EXAMPLE, FOR THE FLOODING, THAT THERE WERE WATERTIGHT  
15 DOORS BETWEEN CUBICLES, THAT THERE WERE WHAT APPEARED TO BE  
16 STANDARD MISSILE TYPE BARRIERS BETWEEN REDUNDANT PARTS OF THE  
17 SYSTEM, THAT THEY WERE SEPARATED BY FIRE DOORS.

18 MR. STANLEY: WHAT WAS THE DISTANCE USED IF YOU  
19 DIDN'T HAVE A BARRIER, IF YOU QUANTIFIED IT?

20 MR. FOLEY: I DON'T REMEMBER THAT WE QUANTIFIED IT.  
21 I ALSO DON'T REMEMBER THAT THERE WAS ANYPLACE THAT COMPONENTS  
22 WERE NOT --

23 MR. HESS: THE CCW HEAT EXCHANGERS ARE ALL IN A  
24 COMMON ROOM, BUT THEY ARE SEPARATED BY QUITE A DISTANCE. IN  
25 OTHER WORDS, TRAIN "A" AND B HEAT EXCHANGERS ARE SEPARATED BY  
26 UNIT 2, TRAIN "A" AND B HEAT EXCHANGERS -- SORRY, STRIKE THAT.  
27 THE -- THERE ARE FOUR HEAT EXCHANGERS IN THAT ROOM.

28 MR. FOLEY: RIGHT, IT GOES UNIT 2-B, UNIT 1-B, UNIT

1 2-A, UNIT 1-A. YOU KNOW, UNIT 2-A IS BETWEEN 1-A AND B.

2 MR. HESS: SO THOSE WERE SEPARATED BY DISTANCE.  
3 THERE WERE COLUMNS IN THERE, BUT THERE IS NOT AN INTERVENING  
4 WALL. THE PUMPS ARE IN SEPARATE ROOMS.

5 MR. STANLEY: IT'S CORRECT TO SAY YOU DIDN'T HAVE  
6 ANY CRITERIA TO JUDGE --

7 MR. HESS: THAT WAS A QUALITATIVE ASSESSMENT.

8 MR. STANLEY: DID GIBBS & HILL HAVE ANY CRITERIA ON  
9 IT THAT YOU USED?

10 MR. FOLEY: I DON'T REMEMBER. THE FSAR HAD -- WE  
11 REVIEWED THE FSAR, AND THE FSAR, THEY HAD A GOOD DEAL OF WHAT  
12 WE USE FOR CRITERIA FOR THESE HAZARD REVIEWS, THE ONES  
13 INVOLVING THE PHYSICAL LAYOUT. I DON'T SPECIFICALLY REMEMBER  
14 WHETHER THERE WAS A DISTANCE SEPARATION CRITERIA OR NOT.

15 MR. OVERBECK: LET'S GO -- I'M LOOKING AT CHECKLIST  
16 NUMBER WD MS-01, THE WALKDOWN ON THE CCW SURGE TANK.

17 MR. FOLEY: YES.

18 MR. OVERBECK: AND IT SAYS THE CHECKLIST SHOULD BE  
19 PROTECTED FROM ROTATING EQUIPMENT IN VICINITY OF SURGE TANK  
20 WHICH COULD GENERATE A MISSILE WHICH COULD DAMAGE THE TRAINS.  
21 SATISFACTORILY. WHAT ROTATING MACHINERY WAS IN THAT VICINITY  
22 OF THE SURGE TANK THAT YOU VERIFIED IT AGAINST?

23 MR. FOLEY: I DON'T REMEMBER THAT THERE WAS -- THE  
24 NEAREST ONES I REMEMBER ARE THE NON-NUCLEAR CHILLERS, OKAY,  
25 WHICH WERE LOCATED, I WOULD GUESS FROM MEMORY, PROBABLY 30  
26 FEET TOWARD THE BACK WALL AND THEN ANOTHER 20 TO 30 FEET ALONG  
27 THE WALL THAT WAY.

28 THE ORIENTATION OF THOSE CHILLERS WAS SUCH THAT ANY

1 ROTATION WAS NOT IN THE PLANE WHICH WOULD HAVE DIRECTED ANY  
2 MISSILES TOWARD THE SURGE TANK.

3 WE DID VERIFY FOR THESE COMPONENTS, WE LOOKED FOR  
4 FANS, WE LOOKED FOR PUMPS, AND WE LOOKED AT THE ORIENTATION IF  
5 THEY WERE THERE AND THAT KIND OF THING. WE ALSO --

6 MR. OVERBECK: DID YOU LOOK AT DESIGN ANALYSES DONE  
7 BY GIBBS & HILL?

8 MR. FOLEY: NO.

9 MR. OVERBECK: WAS THERE DESIGN ANALYSIS DONE BY  
10 GIBBS & HILL FOR THE SYSTEM?

11 MS. WILLIAMS: THAT'S OUT OF SCOPE.

12 MR. OVERBECK: OUT OF SCOPE IN THAT YOU DIDN'T  
13 REVIEW ANY MISSILE ANALYSIS DONE BY GIBBS & HILL?

14 MS. WILLIAMS: THAT'S CORRECT.

15 MR. OVERBECK: INTERNAL OR EXTERNAL?

16 MS. WILLIAMS: THAT'S CORRECT.

17 MR. OVERBECK: SO TURBINE MISSILES IS NOT ONE OF THE  
18 THINGS THAT --

19 MR. FOLEY: THAT'S CORRECT.

20 MR. OVERBECK: HIGH ENERGY LINE BREAKS, HOW DID YOU  
21 PROTECT FROM HIGH ENERGY LINE BREAK LINES IN THE VICINITY  
22 WHICH COULD RUPTURE AND DAMAGE BOTH SIDES OF THE SURGE TANK.

23 MR. HESS: THERE WERE NONE THAT WE NOTED IN THE  
24 VICINITY OF THAT SURGE TANK.

25 MR. OVERBECK: IT WAS MARKED YES. WOULDN'T NA BE  
26 MORE APPLICABLE THERE? I'M LOOKING AT PRELIMINARY CHECKLIST.  
27 IF THERE ARE NO HIGH ENERGY LINES THAT WOULD PROBABLY BE A  
28 CLARIFYING STATEMENT. IMPLIED HERE IS SOMETHING THAT HIGH



1 ENERGY LINES TO BE IN THAT VICINITY AND THERE WAS NONE.

2 MS. WILLIAMS: YOU'RE ABSOLUTELY CORRET.

3 MR. FOLEY: WELL, THE HEADING ON THE COLUMN IS  
4 SATISFACTORY.

5 MS. WILLIAMS: BUT, GENERALLY, WE DIDN'T FIND ANY  
6 EXAMPLES OF SOMETHING, YOU ARE RIGHT, IT'S NA. AND AS FAR AS  
7 GOING THROUGH AND PROOFING THIS KIND OF STUFF IS YET TO BE  
8 DONE.

9 MR. OVERBECK: WELL, HOW DID YOU GO ABOUT  
10 ESTABLISHING WHETHER THE LINE WAS HIGH ENERGY OR NOT?

11 MR. FOLEY: WE HAD THE LAYOUTS.

12 MR. HESS: BASICALLY LOOKING AT THE PIPING THAT WAS  
13 IN THE AREA AND IF THERE WAS SOMETHING THAT WAS CLOSE TO THAT  
14 TANK THAT WAS NOT CCW PIPING, WE LOOKED AT IT TO SEE WHAT IT  
15 WAS, AND THE ONLY PIPING THAT I RECOLLECT IN THAT AREA WERE  
16 SOME FIRE WATER PIPES.

17 MR. OVERBECK: LET'S TALK MORE GLOBAL CCW SYSTEM IN  
18 THE VEIN WHICH YOU GOT MARKED UP HERE, ARE THERE ANY HIGH  
19 ENERGY LINES ASSOCIATED WITH THIS SYSTEM, IN THE VICINITY OF  
20 THIS SYSTEM COMPONENTS.

21 MS. WILLIAMS: YOU ASKED TWO QUESTIONS, IN THE  
22 SYSTEM OR IN THE VICINITY OF THE SYSTEM COMPONENTS.

23 MR. OVERBECK: THIS SYSTEM IS A LOW ENERGY  
24 SYSTEM --

25 MS. WILLIAMS: YES.

26 MR. OVERBECK: -- SO HIGH ENERGY LINES IN THE  
27 VICINITY OF THIS SYSTEM, WERE THERE ANY?

28 MR. HESS: IN THE VICINITY OF THE SPECIFIC EQUIPMENT

1        WITHIN OUR SCOPE, I DON'T RECALL ANY.

2                MR. OVERBECK:    SO THERE WAS NO HIGH ENERGY LINE  
3        BREAK ANALYSIS PER SE.

4                MR. FOLEY:    I CAN'T RECALL ANY, BUT I ALSO RECALL,  
5        THOUGH, THAT THE MAJOR COMPONENTS WITH THE EXCEPTION OF HEAT  
6        EXCHANGERS WERE IN SEPARATE CUBICLES SEPARATED BY WALLS --  
7        HEAVY WALLS AND THAT KIND OF THING.

8                MR. HESS:    THAT'S CORRECT.

9                MS. WILLIAMS:    THE REASON THAT'S IN THE WALKDOWN  
10       CHECKLIST IS BECAUSE WE DIDN'T GET INTO -- TUGCO HAS A DAMAGE  
11       STUDY GROUP WHICH IS RESPONSIBLE FOR PERFORMING THE LINE BREAK  
12       ANALYSIS AND THE BREAK LOCATIONS AND CHECKING HOW THAT ALL  
13       INTERACTS IN THE PLANT AS A WHOLE.

14                SO FROM THE ANALYTICAL STANDPOINT, IT WAS NOT PART  
15       OF OUR REVIEW SCOPE. BOB AND JIM HAVE PUT THIS HAZARDS REVIEW  
16       ON THE WALKDOWN CHECKLIST BECAUSE IT'S A REASONABLE AND WHAT  
17       WE THOUGHT PRUDENT THING TO DO, BUT IT WAS A QUALITATIVE, NOT  
18       QUANTITATIVE, ASSESSMENT OF THE SURROUNDINGS OF THE COMPONENTS  
19       AS WE WALKED THROUGH THE PLANT. BUT WE DIDN'T GET INTO DEPTH  
20       INTO DAMAGE STUDY ANALYSIS OR IF ANY OF YOUR QUESTIONS ARE  
21       GOING TO BE LEADING DOWN THAT PATH.

22                MR. OVERBECK:    THEY ARE. THE NEXT ONE LEADS DOWN  
23       THAT PATH. SEISMIC PROTECTION. NONSEISMIC. SAME QUESTION  
24       YOU GOT CHECKED YES, BUT CAN YOU IDENTIFY THE NONSEISMIC  
25       EQUIPMENT IN THE VICINITY?

26                MR. FOLEY:    THAT REVIEW CENTERED MAINLY AROUND  
27       LOOKING ABOVE OR NEAR SAFETY RELATED PARTS OF THE COMPONENT  
28       COOLING WATER SYSTEM TO SEE IF THERE WERE, FIRST OF ALL, IF

1 THERE WAS EQUIPMENT THERE WHICH COULD FALL AND POTENTIALLY  
2 DAMAGE THE SYSTEM. IF WE IDENTIFIED SUCH EQUIPMENT, THEN WE  
3 WENT BACK AND TRIED TO ASCERTAIN WHETHER OR NOT IT WAS, IN  
4 FACT, SEISMIC OR AT LEAST SEISMICALLY SUPPORTED.

5 ONE INSTANCE COMES TO MIND, I BELIEVE IT WAS THE  
6 CHILLERS FOR THE CRAWL ROOM VENTILATION SYSTEM, HAD SOME  
7 FAIRLY BIG LIGHTS OVER THEM. BUT THEY WERE TETHERED AND WE  
8 CONFIRMED THROUGH DISCUSSIONS WITH SITE PERSONNEL THAT THEY  
9 WERE TETHERED TO PREVENT THEIR FALLING ON THIS EQUIPMENT IN  
10 THE EVENT OF A SEISMIC EVENT.

11 BUT, AGAIN, IT WAS A RATHER GROSS KIND OF A REVIEW  
12 AND NOT SOMETHING -- IT WASN'T A SEISMIC TOOL OF ONE STARTING,  
13 FOR EXAMPLE, IN POINT 3 ON THE SYSTEMS AND DIRECTIONS STUDY,  
14 BUT MORE GROSS THAN THAT. WE DID LOOK ALSO AT MONORAILS AND  
15 DETERMINED THAT THEY WERE SEISMICALLY SUPPORTED, REVIEW.

16 MR. OVERBECK: SEISMIC IS OUTSIDE YOUR SCOPE, THAT  
17 ANALYSIS.

18 MS. WILLIAMS: THAT'S CORRECT. BUT WE KIND OF  
19 PICKED UP A LITTLE ADD-ON. SINCE WE WERE IN THE AREA LOOKING  
20 AT IT, WE CHECKED FOR SOME OF THESE THINGS.

21 MR. OVERBECK: NOW, THERE WERE -- THERE'S NO  
22 NON-SAFETY STUFF OVER SAFETY STUFF. I SHOULDN'T SAY  
23 SAFETY -- NONSEISMIC OR SEISMIC STUFF WITH RESPECT TO YOUR  
24 SCOPE. YOU DIDN'T FIND ANY EXCEPT THIS ONE INSTANCE WHERE YOU  
25 HAD THE LIGHTING.

26 MR. FOLEY: THAT'S CORRECT.

27 MR. HESS: WE HAD THE LIGHTING AND WE ALSO  
28 QUESTIONED ONE OF THE MONORAILS OVER THE CCW PUMP, AND THE



1 RAIL IS SUPPORTED AND THE HOIST MECHANISM IS NOT ON EXCEPT FOR  
2 MAINTENANCE.

3 MR. OVERBECK: YOU DIDN'T LOOK AT NUREG 612 ISSUES.  
4 THAT WAS OUTSIDE THE SCOPE?

5 MR. HESS: THAT WAS OUTSIDE THE SCOPE.

6 MR. FOLEY: THAT'S RIGHT.

7 MR. MARINOS: NEXT QUESTION, NUMBER 10, DESCRIBE HOW  
8 THE VENTING SCHEME FOR THE COMPONENT WATER COOLING SURGE TANK  
9 WAS CONSIDERED TO SATISFY SINGLE FAILURE.

10 MR. HESS: OKAY. THE TANK VENT VALVE IN CONJUNCTION  
11 WITH THE RELIEF VALVE AND THE VACUUM BREAKER PROVIDES  
12 REDUNDANCY FOR OVERPRESSURIZATION AND PREVENTING VACUUM IN THE  
13 TANK. THAT COMBINATION IS WHAT WE VERIFIED.

14 MR. OVERBECK: SO WITH FAILURE, ONE HAD THE OTHER --

15 MR. HESS: YOU HAVE THE OTHER. IF THE VENT VALVE IS  
16 HELD CLOSED, THE RELIEF VALVE WILL PROVIDE THERMAL RELIEF  
17 CAPABILITY. IF THE RELIEF VALVE FAILS, THEN THE VENT VALVE  
18 CAN BE OPENED TO RELIEVE PRESSURE IN THE TANK.

19 MR. OVERBECK: DID YOU FIND ANYWHERE THAT WAS AN  
20 ACCEPTABLE METHOD THAT THEY DESCRIBE THIS IS THE REDUNDANCY  
21 REQUIRED FOR PROTECTING THE TANK OR YOU DETERMINED THAT  
22 YOURSELVES?

23 MR. HESS: THAT WAS BASED ON OUR ASSESSMENT. I DO  
24 NOT REMEMBER A SPECIFIC CRITERIA IN THEIR DOCUMENTATION THAT  
25 REQUIRED THAT. THE BOP FR-1 SPECIFIED -- I BELIEVE, SPECIFIED  
26 SOME -- THAT THE TANK HAD TO BE PROTECTED FROM  
27 OVERPRESSURIZATION AND FROM VACUUM. WE ASSESSED THIS VENTING  
28 AND VACUUM SCHEME TO BE ACCEPTABLE.

1 MR. KNOX: DOES GIBBS & HILL AND FMEA THAT SPECIFIES  
2 THIS ACTION.

3 MR. HESS: THERE IS AN FMEA IN THE FSAR. I WOULD  
4 HAVE TO GO BACK AND CHECK THAT -- WHETHER THAT LEVEL OF DETAIL  
5 WAS IN THAT FMEA. MY RECOLLECTION OF IT IS IT CONSIDERED  
6 THINGS LIKE LOSS OF THE HEAT EXCHANGER, LOSS OF A PUMP, THE  
7 LARGE COMPONENTS.

8 MR. OVERBECK: THIS COMMON COMPONENT HERE, AND I  
9 CAN'T READ FROM MY LITTLE DRAWING, LOOKS LIKE 1-RV-4508.

10 MR. HESS: YES, THAT'S 4506. THAT'S THE VENT VALVE,  
11 THAT'S THE SOLENOID.

12 MR. OVERBECK: THAT VENT VALVE IS BOTH A RELIEVING  
13 PATH AS WELL AS THE --

14 MR. HESS: IT IS A NORMALLY OPEN VALVE.

15 MR. OVERBECK: IS THERE A POSITION INDICATION  
16 PROVIDED WITH THAT VALVE?

17 MR. HESS: IN THE CONTROL ROOM, YES.

18 MR. OVERBECK: DID YOU RELATE POSITION INDICATION?

19 MR. FOLEY: I DON'T BELIEVE IT IS.

20 MR. OVERBECK: THEN THE VALVE IS CLOSED. HOW DO YOU  
21 KNOW IT'S OPEN?

22 MS. WILLIAMS: I TRIED TO DO THAT QUIETLY.

23 MR. HESS: I'M AFRAID I'M NOT GETTING THE DRIFT OF  
24 YOUR QUESTION.

25 MR. OVERBECK: MY POINT IS THAT THE VALVE -- I WANT  
26 TO KNOW IF THE SAFETY RELATED POSITION INDICATION SUCH THAT  
27 THE OPERATOR KNOWS THAT THAT VALVE IS IN THE WRONG POSITION  
28 PRIOR TO COMMENCEMENT OF AN ACCIDENT. IN OTHER WORDS, THE

1 VALVE IS NOT IN A CLOSED POSITION, THEREFORE, UNDETECTED  
2 SINGLE FAILURE.

3 MR. STANLEY: THE OTHER ONE IS THAT THE RELIEF VALVE  
4 IS NOT NORMALLY TESTED. IT'S ASSUMED TO BE FAILED, ALSO.

5 MR. OVERBECK: NOT FROM A MECHANICAL STANDPOINT.  
6 SINGLE FAILURE COULD BE THE RELIEF VALVE.

7 MR. STANLEY: TEST IT.

8 MR. HESS: THAT VALVE IS A SAFETY CLASS VALVE ON THE  
9 TANK TO MAINTAIN PRESSURE INTEGRITY, THE PRESSURE BOUNDARY OF  
10 THE TANK. IT DOES NOT SERVE A SAFETY FUNCTION AS FAR AS THE  
11 POWER SUPPLY TO THAT VALVE IS CONCERNED. IN OTHER WORDS, IT  
12 FAILS IN ITS SAFE POSITION WHICH IS CLOSED. IT FAILS CLOSED  
13 TO MAINTAIN THE PRESSURE INTEGRITY OF THE TANK.

14 MR. STANLEY: TWO SAFETY FUNCTIONS.

15 MR. OVERBECK: TWO SAFETY FUNCTIONS. ONE PURPOSE  
16 WAS TO LET AIR IN AND ONE IS TO LET AIR OUT.

17 MR. HESS: THAT'S CORRECT, BUT WHAT -- YOU KNOW, GET  
18 INTO YOUR SINGLE FAILURE AS TO WHAT ARE YOUR SINGLE FAILURES.  
19 I MEAN, HOW MANY SINGLE FAILURES ARE YOU GOING TO DESIGN FOR,  
20 WHICH ONE. YOU HAVE TOLD ME YOU GOT A DESIGN BASIS ACCIDENT  
21 AND I FAILED THAT VALVE CLOSED, I DON'T HAVE TO TAKE A FAILURE  
22 ON A RELIEF VALVE.

23 MR. STANLEY: NO, YOU DON'T.

24 MR. HESS: IF I TAKE A SINGLE FAILURE ON A RELIEF  
25 VALVE, I DON'T HAVE TO ASSUME A SINGLE FAILURE ON THE VALVE.

26 MR. OVERBECK: THE VALVE IS IN A CLOSED POSITION.  
27 THE OPERATOR DOESN'T KNOW THAT BECAUSE HE DOESN'T HAVE A  
28 SAFETY RELATED POSITION. RIGHT NOW THAT'S THE OPEN ISSUE. IS



1 THERE A SAFETY RELATED POSITION. IF THERE IS, THEN MY  
2 QUESTION'S MOOT.

3 MR. FOLEY: THE ANSWER IS, THERE IS NOT A SAFETY  
4 RELATED POSITION.

5 MR. OVERBECK: SO THE VALVE IS CLOSED. NOW THE  
6 ACCIDENT OCCURS. NOW I NEED EITHER A VENT PATH OR A RELIEF  
7 PATH. NOW I ASSUME MY SINGLE FAILURE IS THE OTHER VENT PATH  
8 OR THE OTHER RELIEF PATH.

9 MR. HESS: OKAY. THE OTHER MITIGATING DEAL THERE IS  
10 THERE A PRESSURE SWITCH ON THE TANK WHICH HAS AN ALARM  
11 FUNCTION, I BELIEVE.

12 MR. FOLEY: SAFETY RELATED?

13 MR. HESS: WE WILL HAVE TO DOUBLE CHECK THAT.

14 MR. OVERBECK: WELL, THE CONTROL SYSTEM FOR THE  
15 VALVE VENTS VALVE AND RELIEF VALVE, THE COMBINATION VENT VALVE  
16 AND RELIEF VALVE IS NOT SAFETY RELATED.

17 MR. STANLEY: HE IS TRYING TO TAKE CREDIT FOR  
18 OPERATOR ACCIDENT.

19 MR. CALVO: YOU HAVE BEEN TALKING ABOUT SINGLE  
20 FAILURES, SAFETY RELATED INDICATIONS AND NOBODY HAS SAID YET  
21 WHAT IS THE CONSEQUENCES IF SOMETHING HAPPENS TO THAT TANK.  
22 WE'RE STILL GOING TO HAVE THE CAPABILITY OF COMPONENT COOLING  
23 SYSTEM TO PERFORM THE ATTEMPTED FUNCTION OR NOT. CAN YOU  
24 ARGUE FROM THAT POINT?

25 YOU GOT ONE SOURCE TANK THAT IS COMING TO A  
26 REDUNDANT SYSTEM. THAT'S WHY THE SINGLE FAILURE GETS INTO THE  
27 PICTURE. THE NEXT QUESTION WAS, I ALSO GOT ONE REACTOR VESSEL.  
28 THE QUESTION IS, HOW DO YOU PROVE YOUR CASE OR HOW DO YOU

1 RATIONALIZE THAT SOMETHING HAPPENED TO THAT TANK, WHAT HAS  
2 HAPPENED TO THE COMPONENT COOLING WATER SYSTEM.

3 IF SOMETHING HAPPENED, THEN YOU MUST BE SURE THAT  
4 YOU MITIGATE THE CONSEQUENCES OF THAT WITH WHATEVER OTHER  
5 EQUIPMENT OR INDICATIONS OR WHATEVER. SO FAR YOU HAVE TAKEN  
6 IT FOR GRANTED THAT EVERYTHING NOW HAS TO BE SAFETY RELATED  
7 AND YOU GOT TO DO THIS AND THAT. GO BACK TO THE PREMISE FIRST  
8 AND SEE WHAT GIBBS & HILL DECIDED AND WHAT WAS THE BASIS FOR  
9 THE DESIGN.

10 MR. HESS: IF YOU OVERPRESSURIZE AND RUPTURED THE  
11 TANK, THEN YOU COULD LOSE CCW.

12 MR. CALVO: HOW YOU GOING TO OVERPRESSURIZE IT?

13 MR. HESS: WITH THE SCENARIO THAT'S BEING POSTULATED  
14 NOW, THAT THE RELIEF VALVE FAILS AND THE OPERATOR DOESN'T KNOW  
15 THAT THE VENT VALVE IS CLOSED, THE TANK IS DESIGNED FOR 15 PSI  
16 AND YOU WOULD HAVE TO HAVE, THEN, SOME OTHER INFLOW INTO THE  
17 SYSTEM FROM A -- ANOTHER SYSTEM IN ORDER TO GET  
18 OVERPRESSURIZATION.

19 MR. OVERBECK: YOUR SYSTEM IS HEATING UP. IT'S A  
20 HEAT REMOVAL SYSTEM. IT'S QUITE COMMON FOR THOSE THINGS TO  
21 EXPAND. THAT'S WHY YOU HAVE EXPANSION SYSTEMS.

22 MR. HESS: THAT'S TRUE. BUT THE SYSTEM IS DESIGNED  
23 SUCH THAT IT CAN -- THE SURGE TANK IS SIZED BASED ON THAT  
24 HEAT-UP, THAT THERMAL LOAD FROM A NORMAL WATER LEVEL AND THERE  
25 IS A FREE VOLUME ABOVE THE NORMAL WATER LEVEL FOR THAT  
26 EXPANSION. AND THAT'S PART OF THE SIZING CALCULATION ON THE  
27 SURGE TANK.

28 SO NOW IF YOU WANT TO ASSUME THAT THE THING WAS

1 ALREADY SOLID OR ALMOST SOLID AT THAT POINT AND THEN YOU GOT A  
2 HEAT UP DUE TO KICKING IN RHR OR CONTAINMENTS SPRAY, I THINK  
3 YOU'RE GETTING INTO THE RANGE OF ASSUMING AGAIN MULTIPLE  
4 FAILURES TO GET TO THAT POINT.

5 MR. CALVO: YOU STILL DON'T GO BACK TO THE  
6 FUNDAMENTAL QUESTION IT IS SUPPOSEDLY REDUNDANT AND  
7 INDEPENDENT SYSTEM TWO TRAINS ALL THE WAY. THE COMMON POINT  
8 IS THAT TANK.

9 MR. HESS: THE COMMON POINT IS THE TANK AND IT HAS A  
10 BARRIER THAT CAN HANDLE NO WATER ON ONE SIDE AND FULL ON THE  
11 OTHER.

12 MR. CALVO: WHAT I AM SAYING, SOMEBODY MUST HAVE  
13 JUSTIFIED THE DESIGN ON THOSE BASES. SOMEWHERE AT GIBBS &  
14 HILL, SOMEBODY IS GOING TO BE THE DOCUMENTATION ON A DESIGN  
15 BASIS, NOT REDUNDANCY REQUIRED IN THIS CASE. BECAUSE ONE WAY  
16 TO GET AROUND IT IS TO PUT ANOTHER TANK. YOU ALSO IDENTIFIED  
17 A PROBLEM RIGHT AT THE REACTOR COOLING PUMP AREAS, RIGHT?  
18 THAT WAS JUST A COMMON PROBLEM THAT IT CAN CAUSE BOTH SYSTEMS  
19 TO FAIL. WHEN YOU -- YOU KNOW, YOU HAD ACCEPTED THAT DESIGN  
20 FEATURE OR YOU NOT ACCEPTED IT. THAT'S WHAT I'M ASKING.

21 BECAUSE WHAT YOU TRYING TO DO NOW IS BAND-AIDS,  
22 WHETHER YOU ARE GOING TO KEEP YOUR VALVE OPEN, WHETHER YOU'RE  
23 GOING TO PUT ANOTHER IN THE CONTROL ROOM. ARE YOU GOING TO GO  
24 TO THE MOST FUNDAMENTAL ONE, IS THAT ONE THING AND HOW DID  
25 GIBBS & HILL DEFEND THAT KIND OF DESIGN. SO IT'S NOT TO  
26 SINGLE FAILURES -- I CAN BE DREAMING OF A THOUSAND SINGLE  
27 FAILURES RIGHT NOW, YOU KNOW, ABOUT THAT TANK.

28 MR. OVERBECK: I GUESS THE BOTTOM -- WHAT I AM



1 TRYING TO SAY HERE IS, IF YOU -- HAVE YOU LOOKED AT THE DESIGN  
2 CALCULATION AND CONFIRMED TO YOURSELF, EITHER THROUGH GIBBS &  
3 HILL'S CALCULATION OR YOUR OWN INDEPENDENT CALCULATION, THAT  
4 THE TANK CAN TAKE THE SITUATION I DESCRIBED AND STILL BE  
5 FUNCTIONAL. I DON'T THINK YOU CAN LOSE THE TANK.

6 MR. HESS: WE VERIFIED THE TANK SIZING CALCULATION  
7 AS FAR AS THE THERMAL HEAT-UP AND VOLUMES REQUIRED IN THE TANK  
8 BOTH FROM HIGH LEVEL AND LOW LEVEL. WE VERIFIED THAT THE TANK  
9 BASICALLY ACTED AS TWO SEPARATE TANKS, EXCEPT FOR THE VENT  
10 SPACE ABOVE IT.

11 WE DID IDENTIFY A SCENARIO WHERE THE TANK -- THIS  
12 ARRANGEMENT COULD BE A PROBLEM COMBINED WITH ANOTHER FAILURE  
13 IN THE SYSTEM WHICH YOU JUST REFERRED TO WITH THE REACTOR  
14 COOLANT PUMP THERMAL BARRIER. THAT SCENARIO CAN BE FIXED AND  
15 HAVE THIS TANK BE ADEQUATE IN THE WAY IT IS TO MEET ITS NORMAL  
16 DESIGN REQUIREMENTS. ALL RIGHT? OR YOU CAN DO THINGS SUCH AS  
17 YOU SAID, HAVING TWO SEPARATE TANKS. THAT'S NOT OUR DECISION.

18 MS. WILLIAMS: WE HAVEN'T GOTTEN A RESPONSE BACK ON  
19 THAT SCENARIO YET AND I DON'T THINK THAT WE FIRMED UP OUR  
20 FEELINGS ON THE SYSTEM UNTIL WE FIND OUT HOW TEXAS UTILITIES  
21 EVALUATED THAT SCENARIO AND WHETHER THERE IS A HUNDRED OTHER  
22 DIFFERENT COMBINATIONS THAT COULD RESULT IN THE SAME THING  
23 WHICH I BELIEVE IS WHAT YOU ARE DRIVING AT. AND TO US RIGHT  
24 NOW, IT'S STILL OPEN. IT'S ON OUR REVIEW ISSUES LIST AND  
25 WE'RE WAITING TO FIND OUT WHAT KIND OF EVALUATION HAS BEEN  
26 DONE, SO...

27 MR. FOLEY: ARE YOU CONSIDERING THE RELIEF VALVE TO  
28 BE AN ACTIVE OR A PASSIVE PERFORMER.

1 MR. HESS: I BELIEVE IN THE EVALUATION WE LOOKED AT  
2 IT AS A PASSIVE COMPONENT, MECHANICAL.

3 MR. OVERBECK: IT HAS TO OPEN TO OPERATE LIKE A  
4 CHECK VALVE.

5 MR. FOLEY: TRUE.

6 MR. MARINOS: YOU MEAN BY THAT UNIT FROM FAILURES,  
7 IS THAT WHY YOU ARE ASKING THE QUESTION IF IT WAS TO BE  
8 ASSUMED A PASSIVE COMPONENT IT WOULD NOT CONSIDERED FAIL.

9 MR. FOLEY: THAT WAS THE THRUST OF MY QUESTION, YES.

10 MR. MARINOS: SO THAT WE DO NOT GIVE CREDIT FOR  
11 PASSIVE COMPONENT, THEY HAVE TO FAIL AS ACTIVE COMPONENTS.

12 MR. STANLEY: IN SUMMARY, THEN, AS I READ IT, WHAT  
13 YOU'RE SAYING IS YOU FIND THE PRESENT DESIGN -- YOU FOUND THE  
14 PRESENT DESIGN TO BE OKAY FOR BOTH OVERPRESSURIZATION AND  
15 DRAWING A VACUUM, IS THAT CORRECT? NO?

16 MR. HESS: WITH THE EXCEPTION OF THE OTHER SCENARIO  
17 WITH THE REACTOR COOLANT PUMP THERMAL BARRIER, YES.

18 MR. OVERBECK: WAS THERE A GIBBS & HILL CALCULATION  
19 THAT ASSUMED THAT THE NORMAL VENT PATH WAS CLOSED AND THE  
20 VACUUM BREAKER THAT -- WE'RE GETTING TO LATER QUESTIONS. WE  
21 MADE THESE QUESTIONS UP JUST WHAT CAME OFF THE TOP OF OUR  
22 HEADS AS WE'RE GOING THROUGH. THERE IS NO RHYME OR REASON  
23 HERE. WE'RE NOT TRYING TO SANDBAG ANYBODY.

24 HOW DID YOU VERIFY THE SIZE OF THE RELIEF VALVE AND  
25 HOW DID YOU VERIFY THE SIZE OF THE VACUUM BREAKER, AND KNOWING  
26 WHETHER THIS PARTICULAR VENT VALVE -- VENT, SLASH, RELIEF  
27 VALVE WAS CLOSED AND THESE OTHER POTENTIAL SYSTEM INTERACTIONS  
28 GOING TO HEAT-UPS, CONTRACTIONS, COOLDOWNS, HOW'D YOU VERIFY --

1 IS THAT -- WAS THERE A CALCULATION THAT YOU LOOKED AT TO  
2 VERIFY THAT?

3 MR. HESS: THERE WAS NO CALCULATION OF, YOU KNOW,  
4 WHAT THE OVERPRESSURE IN THE TANK WOULD BE IF THE RELIEF VALVE  
5 FAILED TO OPEN AND THE VENT VALVE WAS CLOSED THAT I AM AWARE  
6 OF.

7 MR. OVERBECK: CYGNA DIDN'T PERFORM AN INDEPENDENT  
8 CALCULATION?

9 MR. HESS: WHAT WE DID WAS LOOK AT THE VACUUM  
10 BREAKER SIZE AND CV AND LOOK AT THE 583 GPM MODERATE ENERGY  
11 LINE BREAK, WHICH IS THE OUTFLOW FROM THE MAX OUTFLOW FROM THE  
12 TANK.

13 MR. OVERBECK: I'M NOT TALKING PASSIVE FAILURE.  
14 THAT'S ANOTHER FAILURE I DON'T WANT TO TALK ABOUT. ALL I WANT  
15 TO TALK ABOUT RIGHT NOW IS THE PARTICULAR VENT -- VENT, SLASH,  
16 RELIEF VALVE IS CLOSED --

17 MR. HESS: THAT'S WHAT I'M GETTING TO IF YOU JUST  
18 HOLD A SECOND.

19 MR. OVERBECK: SURE.

20 MR. HESS: WE LOOKED AT THE WORST CASE CONDITION  
21 THAT WE ASSUMED, WHICH WAS THE MODERATE ENERGY LINE BREAK  
22 DISCHARGING FROM THE SYSTEM 583 GPM. AND THEN WE LOOKED AT  
23 THE EQUIVALENT AIR FLOW RATE THAT WOULD BE REQUIRED TO REPLACE  
24 THAT VOLUME OF WATER, ALL RIGHT, AND IT COMES OUT TO ABOUT 80  
25 CUBIC FEET PER MINUTE.

26 AND WE LOOKED AT THE PRESSURE DROP, THE LOSSES  
27 THROUGH THAT FLOW PATH THAT WOULD BE INCURRED AND IT'S LESS  
28 THAN 2 PSI DELTA P THROUGH THAT SYSTEM. AND WE BASED ON THE



1 FACT THAT THAT'S A, I BELIEVE, A TWO-INCH CONNECTION WITH THE  
2 VACUUM BREAKER AND ONE-INCH AND TWO-INCH CONNECTION ON THE  
3 VENT VALVE, WE DETERMINED THOSE TO BE ADEQUATE TO MEET THOSE  
4 FLOW RATES. AND THAT'S THE WORST CASE FLOW RATE. THE NORMAL  
5 DESIGN FLOW RATE FOR LEAKAGE IS 50 GPM AND THAT COMES OUT TO  
6 ABOUT 7 OR 8 CUBIC FEET PER MINUTE.

7 MR. OVERBECK: WHAT'S THE DESIGN VACUUM CAPABILITY  
8 OF THE TANK?

9 MR. HESS: I CAN'T ANSWER THAT OFF THE TOP OF MY  
10 HEAD.

11 MR. OVERBECK: IS THAT SOMETHING THAT YOU WOULD HAVE  
12 LOOKED AT?

13 MR. HESS: I BELIEVE WE LOOKED -- WE LOOKED AT THE  
14 TANK SPEC AND IF IT WAS IN THERE, WE VERIFIED IT IN THERE.

15 MR. FOLEY: YES.

16 MR. HESS: I DON'T REMEMBER ANY SPECIFIC NUMBER.

17 MR. OVERBECK: THE SIZING OF THE VENT I CAN  
18 UNDERSTAND MAY BE BASED ON WHAT WOULD OCCUR BECAUSE OF THE  
19 MODERATE ENERGY BREAK. THERE IS ALSO ANOTHER ONE WHERE YOU  
20 DON'T HAVE THE MODERATE ENERGY BREAK, NOW YOU JUST HAVE THE  
21 HEAT-UP AND COOLING THAT SYSTEM DOWN AND YOU'RE STILL TAKING  
22 IT FROM DELTA P, WHATEVER, COLD WATER INSTEAD OF HOT WATER,  
23 AND NOW THE SYSTEM IS CONTRACTING. AND DID YOU LOOK AT THAT  
24 SCENARIO WITH --

25 MR. HESS: CONTRACTION WOULD BE, I'M SURE IT  
26 DOESN'T -- ALTHOUGH I DIDN'T RUN CHECK CALCS ON THAT, I DON'T  
27 THINK THE CONTRACTION IS ANYWHERE NEAR 583 GPM.

28 MR. OVERBECK: OKAY.

1 MR. HESS: AM I MISSING YOUR QUESTION?

2 MR. OVERBECK: I THINK YOU ARE.

3 MR. HESS: RESTATE IT, PLEASE.

4 MR. OVERBECK: I'M TRYING TO -- I'M STILL BACK ON  
5 THE SINGLE FAILURE OF THIS VENT VALVE -- NOT THE VENT VALVE.  
6 THE VENT VALVE -- MY UNDERSTANDING IS THE POSITION INDICATION  
7 IS NOT SAFETY RELATED, THE CONTROL SYSTEM FOR THE OPENING OF  
8 THE VALVE IS NOT SAFETY RELATED, AND THE VALVE IS CLOSED,  
9 GIVEN, BEFORE THE ACCIDENT OCCURS.

10 NOW I NEED A VENT AND RELIEF PATH FOR THE TANK AND I  
11 ASSUME THE FAILURE OF ONE OF THOSE VENT OR RELIEF VALVES, THE  
12 FUNCTION ON DEMAND, IS THAT A TANK PROTECT IT. I THINK THAT'S  
13 THE QUESTION WE HAVE ASKED BACK HERE.

14 MR. STANLEY: LET ME JUST ADD ONE MORE THING. I  
15 THOUGHT YOU HAD INDICATED WHEN YOU TRIED TO TELL US ABOUT THE  
16 VACUUM PROTECTION ON THAT THAT YOU TOOK INTO ACCOUNT BOTH FULL  
17 PATHS.

18 MR. HESS: NO, NEITHER ONE.

19 MR. STANLEY: NEITHER ONE.

20 MR. CALVO: I'M SURE THAT A COMPONENT COOLING WATER  
21 SYSTEM -- THE RELIEF VALVES, THE INDICATION ARE MOST PROBABLY  
22 NOT SAFETY RELATED. TYPICAL I TRIPLE E STUFF, OKAY.

23 SO EITHER YOU GOT TO PROVE YOUR CASE ON THE FACT  
24 THAT YOU GOT A GOOD TANK AND THAT TANK IS NOT GOING TO RUPTURE.  
25 BECAUSE THE SAME BASIS THAT IT'S GOING RUPTURE, THEN THE  
26 SYSTEM THAT YOU PROVIDED TO PRECLUDE THAT FROM RUPTURE, GOT TO  
27 BE BAPTIZED WITH ALL THESE GOOD STANDARDS, OKAY.

28 AND I DON'T THINK SO ON THE COMPONENT COOLING WATER

1 SYSTEM. ALL THESE GOOD FEATURES IN HERE ARE SAFETY RELATED  
2 AND MEET ALL THESE CODES AND STANDARDS, OKAY.

3 SO IT GOES BACK AGAIN TO WHAT I SAID BEFORE. YOU  
4 GOT TO PROVE YOUR CASE THAT ONE TANK IS GOOD ENOUGH. THE  
5 SYSTEM IS SUPPOSED TO BE REDUNDANT AND INDEPENDENT.

6 YOU LOST THE FACT -- YOU CANNOT PROVE THAT CASE.  
7 THEN YOU SAY THE ONLY WAY I CAN MAINTAIN INTEGRITY IN THE TANK  
8 IS THAT I WANT TO BE SURE THAT THE VALVES AND THE  
9 INSTRUMENTATION IS REDUNDANT AND CAPABLE OF BEING TESTED TO  
10 ASSURE THAT IF THIS HAPPENS, I HAVE THE CAPABILITY TO PRECLUDE  
11 IT FROM HAPPENING.

12 IF YOU CAN DO THAT, ALL RIGHT. I WOULD NOT GO ON  
13 THIS IF THAT'S THE CASE, I'M SURE THE INSTRUMENTATION PROVIDED  
14 TODAY IN THE COMPONENT COOLING WATER SYSTEM FOR THE SURGE TANK  
15 DOESN'T MEET ALL THOSE PROTECTION SYSTEM REQUIREMENTS.

16 THAT'S WHY I AM SAYING -- I GOT TO GO BACK TO -- ASK  
17 GIBBS & HILL OR SOMEWHERE WHY THAT'S GOOD ENOUGH.

18 MR. STUART: LET ME TRY TO HELP BEFORE GARY'S  
19 FRUSTRATION LEVEL REACHES A PEAK. THERE ARE THREE POSSIBLE  
20 ANSWERS TO THIS QUESTION. I WOULD LIKE YOU TO SELECT ONE OF  
21 THE THREE. ANSWER ONE, WE DIDN'T LOOK AT IT AND WE WILL;  
22 ANSWER TWO, WE LOOKED AT IT AND IT WAS OKAY; OR NUMBER THREE,  
23 WE LOOKED AT IT AND IT WASN'T OKAY.

24 NOW SELECT ONE OF THOSE THREE ANSWERS AND LET'S MOVE  
25 ON.

26 MR. HESS: WE DIDN'T LOOK AT THAT SCENARIO.

27 MR. STUART: AND WE WILL.

28 MR. HESS: AND WE WILL.



1 MR. STUART: THANK YOU.

2 MR. MARINOS: GO TO THE NEXT QUESTION. NUMBER 12,  
3 WAS THE DESIGN ADEQUACY OF THE HVAC SYSTEM FOR THE CCW PUMP  
4 ROOMS REVIEWED.

5 MR. HESS: NO, THIS WASN'T PART OF OUR SCOPE.

6 MR. ANGELO: NEXT QUESTION, DID GIBBS & HILL HAVE A  
7 SCHEME --

8 MR. CALVO: EVERYBODY IS HAPPY WITH THE ANSWER?

9 MR. MARINOS: NOT IN HIS SCOPE.

10 MR. CALVO: ALL RIGHT.

11 MR. MARINOS: WE ESTABLISHED THIS, RIGHT.

12 MR. OVERBECK: THE REASON FOR ONE OF THE QUESTIONS  
13 IS THERE IS ENVIRONMENTAL STATEMENTS BACK HERE, IS THE  
14 ENVIRONMENT ADEQUATE FOR THE EQUIPMENT TO OPERATE. I CAN'T  
15 LAY MY HANDS RIGHT ON THE CHECKSHEET RIGHT NOW, CHECKED, YES,  
16 SATISFACTORY.

17 AND I WAS WONDERING HOW YOU MADE THAT DETERMINATION  
18 IF YOU DID NOT HAVE THE HVAC SYSTEM TO LOOK AND SEE WHAT  
19 TEMPERATURE THEY GO UP TO, HOW YOU VERIFIED THAT HEAT LOAD IN  
20 THAT ROOM AND ITS ABILITY TO OPERATE CONTINUOUSLY.

21 MR. FOLEY: DO YOU KNOW WHICH CHECKLIST THAT IS?.

22 MR. OVERBECK: WELL, THAT'S WHAT I AM SAYING, I  
23 COULDN'T GET MY HANDS ON IT RIGHT AWAY.

24 MR. HESS: WE HAD A STATEMENT IN ONE OF THE  
25 ANALYTICAL CHECKLISTS ABOUT WHERE THE ENVIRONMENTAL PROVISION  
26 SPECIFIED, IDENTIFIED CHECK SPECIFICATIONS, WE VERIFIED THAT  
27 THEY SPECIFIED THEM, BUT WE DIDN'T VERIFY THE ADEQUACY OF THEM.

28 MR. OVERBECK: OKAY. SO IT'S NOT A WRONG STATEMENT

1 FOR ME TO SAY THAT YOU DIDN'T LOOK AT THE CONTINUOUS  
2 ENVIRONMENT NECESSARILY FOR THE SAFETY RELATED PUMP IN THAT  
3 SYSTEM.

4 MR. HESS: THAT'S CORRECT.

5 MR. CALVO: YOU DIDN'T LOOK AT IT, BUT YOU  
6 CONSIDERED ITS IMPACT.

7 MR. HESS: WE CHECKED ON THE SPECIFICATIONS  
8 GENERALLY THAT THEY HAD SPECIFIED SEISMIC OR ENVIRONMENTAL  
9 REQUIREMENTS FOR THE EQUIPMENT. WE DID NOT VERIFY THAT THOSE  
10 WERE THE SPECIFICS FOR THAT ROOM, THAT LEVEL OR THAT FLOOR.

11 MR. CALVO: OKAY.

12 MR. HESS: AND I GUESS AN ADD-ON IS LIKE THE CCW  
13 PUMP ROOM, DURING THE WALKDOWN WE DID VERIFY THAT THERE WERE  
14 CHILLERS IN THE ROOM, BUT WE DID NOT LOOK AT THE ADEQUACY OF  
15 DESIGN OF THOSE CHILLERS.

16 MR. MARINOS: OKAY. GO TO THE NEXT QUESTION, 13.  
17 DID GIBBS & HILL HAVE A SCHEME TO IDENTIFY SAFETY-RELATED  
18 CALCULATIONS AND WAS THERE A REQUIREMENT TO PERIODICALLY  
19 REVIEW, SLASH, UPDATE THEM.

20 DO YOU UNDERSTAND THAT?

21 MS. WILLIAMS: YES. YES, THEY DID. YES, OUR QA  
22 PEOPLE LOOKED TO MAKE SURE THAT THEIR CONTROL WAS EFFECTIVE  
23 AND, YES, THE TECHNICAL PEOPLE CHECKED TO SEE THAT THE STAMP  
24 WAS THERE.

25 MR. OVERBECK: ARE THEY REQUIRED TO PERIODICALLY  
26 REVIEW THEM, LIKE EVERY SIX MONTHS OR EVERY YEAR, TO SEE IF  
27 THERE'S -- THE CALCULATION NEEDS REVISION BECAUSE NOW WE HAVE  
28 VENDOR DATA AVAILABLE, NOW WE HAVE AN AS-BUILT CONDITION

1 AVAILABLE, NOW, THE CALCULATION AT THIS POINT --

2 MS. WILLIAMS: WELL, WE DID FIND CIRCUMSTANCES WHERE,  
3 IN FACT, THINGS HAD CHANGED THROUGH TIME, AND ALL THE  
4 APPROPRIATE DOCUMENTS WERE NOT UPDATED, SAY, FOR CHANGES IN  
5 TEMPERATURE, SYSTEM PRESSURES OR SOMETHING LIKE THAT. AS TO  
6 WHETHER THAT'S BECAUSE THEY DIDN'T HAVE A PROCEDURE IN PLACE,  
7 WE DON'T KNOW YET BECAUSE WE'RE STILL EXTRACTING THE  
8 PROCEDURES. BUT WE DID FIND EVIDENCE THAT THINGS WEREN'T  
9 BEING REVISED.

10 MR. OVERBECK: ALL RIGHT. DOES THEIR CALCULATION  
11 PROCEDURES REQUIRE THAT ASSUMPTIONS IN DESIGN INPUT THAT NEEDS  
12 VERIFICATION AT A LATER DATE BE CLEARLY IDENTIFIED?

13 MS. WILLIAMS: HAVE TO CHECK THAT FOR YOU. I KNOW  
14 IT REQUIRES THAT THEY SPECIFY DESIGN INPUTS, BUT THE PROCESS  
15 OF REVISING AND CHECKING AT A LATER DATE IS WHAT WE'RE STILL  
16 INVESTIGATING BECAUSE OF OUR TECHNICAL FINDINGS.

17 MR. MARINOS: WE'LL GO TO QUESTION 14. DESCRIBE HOW  
18 THE INSPECTION VERIFIED THE INCLUSION OF CERTIFIED VENDOR  
19 INFORMATION IN THE DESIGN.

20 MR. HESS: OKAY. WE COMPARED THE DATA THAT WAS USED  
21 IN THE CALCULATIONS TO EITHER N TRIPLE S SUPPLIED DATA, VENDOR  
22 DATA, VENDOR DATA SHEETS, PUMP CURVES FOR CONSISTENCY.

23 MR. OVERBECK: DOES THAT MEAN YOU WENT BACK TO THE  
24 DOCUMENT CONTROL CENTER TO GET THAT INFORMATION AND THEN  
25 BROUGHT THAT TO THE CALCULATION?

26 MR. HESS: YES.

27 MR. OVERBECK: WAS THERE -- WERE THERE ANY INSTANCES  
28 THAT YOU IDENTIFIED -- AND I DON'T RECALL HAVING SEEN ANY --



1 WHERE THEY COULD HAVE USED VENDOR DATA THAT WAS AVAILABLE AND  
2 THEY USED AN ASSUMPTION INSTEAD?

3 MR. FOLEY: NO.

4 MR. OVERBECK: WOULD YOU HAVE IDENTIFIED THAT AS A  
5 PROBLEM?

6 MR. FOLEY: YES, IN GENERAL WE WOULD HAVE, I THINK,  
7 IF -- IF THEY WERE CLOSE AND THE CALCULATION WAS CONSERVATIVE,  
8 WE MAY NOT HAVE IDENTIFIED IT AS A PROBLEM BUT, IN GENERAL,  
9 YES, WE WOULD HAVE IDENTIFIED THAT AS A PROBLEM.

10 MR. NEVSCHEMAL: IN OTHER WORDS, WHAT YOU'RE SAYING  
11 HERE IS THAT WHEN YOU NEEDED TO LOOK AT A VENDOR HEAD CURVE,  
12 YOU LOOKED FOR THAT IN THE ASSUMPTIONS WHEN YOU NEEDED THAT  
13 INFORMATION?

14 MR. FOLEY: WELL, WE VERIFIED WHAT THE PUMP VENDOR  
15 CERTIFIED TO BE PUMP RUNOUT ON CURVES AND VERIFIED THAT THOSE  
16 NUMBERS, IN FACT, THE NUMBERS USED IN CALCULATIONS AGREED WITH  
17 THOSE NUMBERS.

18 AND THE SAME FOR HEAT LOADS ON VARIOUS CHILLERS AND  
19 COOLERS, THEY WERE ALL CALCULATED IN THE HEAT LOAD CALCULATION  
20 WE VERIFIED THAT, IN FACT, WHAT THEY SPECIFIED AND PURCHASED  
21 WERE CONSISTENT WITH THOSE NUMBERS USED IN THE CALCULATION.

22 MR. NEVSCHEMAL: WHILE THIS MIGHT BE REDUNDANT  
23 LITTLE BIT, BUT WHEN YOU LOOKED AT A VENDOR CURVE AND HE SAYS  
24 THAT THE RUNOFF FLOW WAS 18,000 GPM, DID YOU VERIFY THAT,  
25 INDEED, THE SYSTEM WAS LIMITED TO 18,000 GPM?

26 MR. HESS: NO.

27 MR. OVERBECK: THAT'S NOT AN ATTRIBUTE YOU WOULD  
28 HAVE CONSIDERED IN THE TECHNICAL REVIEW RIGHT NOW.

1 MR. HESS: NO, BECAUSE THE WAY THE CCW PUMP WOULD  
2 HAVE BEEN OPERATED, YOU BRING YOUR LOADS ON. IF YOU GO TO  
3 RUNOUT, YOU WOULD GO TO LOW PRESSURE ON THE THING AND SWITCH  
4 OVER TO THE OTHER LEG, THE OTHER PUMP.

5 MR. FOLEY: THE PRESSURE WOULD GET THAT LOW?

6 MR. HESS: I BELIEVE SO. I'D WOULD HAVE TO GO BACK  
7 AND CHECK THE --

8 MR. NEVSCHEMAL: SO WHAT YOU ARE SAYING HERE IS THAT  
9 YOU DID NOT SEE THE CALCULATION THAT HAD A CONSERVATIVE FOR  
10 RUNOFF PURPOSES, PRESSURE DROP, OR SYSTEM LOSS THAT WOULD  
11 INDICATE THAT YOU ARE ABOVE THE MAXIMUM RUNOFF. DID I STATE  
12 THAT PROPERLY?

13 MR. HESS: IF I UNDERSTAND YOUR QUESTION, YOU'RE  
14 SAYING THAT WE DIDN'T -- NO CALCULATION WE LOOKED AT SHOWED A  
15 FLOW OUT OF THE PUMP GREATER THAN THE RUNOUT FLOW STATED BY  
16 THE VENDOR.

17 MR. NEVSCHEMAL: NO. WHAT I'M ASKING IS THAT, YOU  
18 DID NOT SEE A CALCULATION THAT DETERMINED WHAT THE -- I'M  
19 SORRY -- THAT DETERMINED THAT THE SYSTEM RESISTANT WAS  
20 SUFFICIENT TO KEEP THE PUMP FROM NOT GOING INTO RUNOFF.

21 MR. HESS: I THINK THE ANSWER TO THAT QUESTION IS WE  
22 SAW A CALCULATION THAT SHOWED THAT IT WOULD NOT GO INTO RUNOUT  
23 BY THE PIPE FLOW CALC WHICH IS A BALANCING FLOW CALC WHICH IS  
24 USED FOR ORIFICE SIZING AND THROTTLE VALVE POSITION.

25 THE TYPE OF CALCULATION YOU ARE REFERRING TO, I'M  
26 NOT FAMILIAR WITH NORMALLY RUNNING ON A GIVEN SYSTEM. I MEAN,  
27 YOU CAN -- A LOT OF TIMES YOUR PUMP IS OVER -- SOMEWHAT OVERSIZE  
28 FOR THE TOTAL SYSTEM DEMAND THAT IT COULD GO INTO RUNOUT IF

1 YOU DIDN'T HAVE THROTTLE VALVES AND ORIFICE PLATES TO LIMIT  
2 FLOW THROUGH THE SYSTEM.

3 THE SYSTEM IS SET UP WITH VARIOUS POINTS FOR ORIFICE  
4 PLATES AND VARIOUS THROTTLE VALVES THROUGHOUT IT THAT WOULD BE  
5 USED TO BALANCE THE SYSTEM OR SUPPOSED TO BE USED TO BALANCE  
6 THE SYSTEM DURING PRE-OP TESTING. WE WERE MORE VERIFYING THAT  
7 THE PUMP HAD ADEQUATE CAPACITY TO MEET ALL ITS FLOW DEMANDS.

8 MR. OVERBECK: ISN'T IT NECESSARY TO GO AHEAD AND  
9 DETERMINE THE RUNOFF FLOW IN ORDER TO GET YOUR NPSH R, AND  
10 SHOULDN'T -- I'M SORRY.

11 MR. HESS: THAT'S A PUMP VENDOR CALC, NPSH R  
12 REQUIRED.

13 MR. NEVSEHAL: IT GETS WHERE YOU ARE ON THE CURVE  
14 WHICH IS A FUNCTION OF THE FLOW RATE THAT THE SYSTEM IS GOING  
15 TO BE GIVING UP.

16 MR. HESS: NPSH REQUIRED IS REQUIRED BY THE PUMP  
17 VENDOR. NPSH AVAILABLE IS BY THE SYSTEM.

18 MR. OVERBECK: WELL, DID THE NPSH AVAILABLE ALWAYS  
19 EXCEED WHAT THE PUMP MANUFACTURER REQUIRED?

20 MR. HESS: YES.

21 MR. OVERBECK: DID IT GO PAST 18,000 GPM AND NPSH R  
22 NUMBER?

23 MR. HESS: I CAN PULL OUT THE FIGURES.

24 OKAY, THE PUMP CURVE SHOWS THE NPSH REQUIRED AT  
25 18,000 GPM AS APPROXIMATELY 41 FEET A HEAD, ALL RIGHT. THE  
26 WORST CASE NPSH AVAILABLE THAT WE CALCULATED, I BELIEVE, THAT  
27 WE GOT ON THE CHECKLIST, WAS 80 FEET A HEAD OR 84 FEET A HEAD,  
28 SO THERE WAS SIGNIFICANT MARGIN BETWEEN THE TWO.



1 MR. NORKIN: AGAIN, FOR THIS SYSTEM THEN IT'S NOT A  
2 FACTOR, IT'S NOT A REPRESENTATIVE SYSTEM.

3 MR. NEVSEHAL: I GUESS ONE OF THE POINTS THAT WE'RE  
4 TRYING TO MAKE HERE OR GET A HANDLE ON IS ARE THEY AWARE OF  
5 THE PROBLEMS WITH RESPECT TO RUNOFF AND ITS RELATIONSHIP TO  
6 NPSH R AND DID -- DO THEY HAVE A METHODOLOGY FOR CALCULATING  
7 THE RUNOFF FLOW THAT IS CONSERVATIVE FOR RUNOFF, .I.E., NOT  
8 USING CRANE 410 BECAUSE THAT'S A VERY CONSERVATIVE PRESSURE  
9 DROP CALCULATION. WHEREAS WHEN YOU CALCULATE FOR SYSTEM  
10 RESISTANCE FOR RUNOFF, YOU WANT TO HAVE THE MINIMUM PRESSURE  
11 DROP SO YOU CAN DETERMINE IF YOU ARE INTO RUNOFF OR NOT.

12 WHAT WE'RE TRYING TO EVALUATE HERE IS WHETHER OR NOT  
13 GIBBS & HILL, AS A GENERAL POLICY, UNDERSTANDS THE PROBLEM  
14 WITH RUNOUT AND NPSH R WHICH COULD APPLY HORIZONTALLY ACROSS  
15 TO OTHER SYSTEMS WHERE NPSH MAY BE A PROBLEM.

16 MR. HESS: OKAY.

17 MR. OVERBECK: AND WHAT YOU ARE SAYING TO ME IS THAT  
18 YOU DON'T SEE A CALCULATION WHERE -- WHICH IS CONSERVATIVE FOR  
19 RUNOFF WHICH IS LOW PRESSURE DROPS, NOT CRANE 410.

20 MR. HESS: CORRECT.

21 MR. OVERBECK: -- TO COME UP WITH A SYSTEM  
22 RESISTANCE CURVE WHICH WILL DETERMINE WHAT YOUR RUNOUT IS FROM  
23 WHICH YOU THEN GET AN IDEA AS TO THE NEED OF ORIFICES OR WHAT  
24 THE NPSH R IS GOING TO BE.

25 MR. HESS: I THINK THE OTHER FACET OF THIS THAT I  
26 WOULD LIKE TO BRING OUT IS THAT GIBBS & HILL DID NOT HAVE  
27 RESPONSIBILITY FOR SIZING ORIFICES. WHAT THEY DID WAS SUPPLY  
28 THE EXCESS HEAD AVAILABLE AS AN INPUT BACK TO THE SITE FOR

1 ON-SITE ORIFICE SIZING.

2 MR. FOLEY: RIGHT, THAT'S CORRECT. BUT WE DID NOT  
3 REVIEW ANY CALCULATIONS THAT TOOK INTO CONSIDERATION THE  
4 CONDITION YOU ARE TALKING ABOUT. WE'RE NOT AWARE OF ANY.

5 MR. OVERBECK: THAT THEY DID. BUT YOU ARE ALSO IN  
6 THE POSITION THAT THEY DON'T NEED TO DO ANYTHING IN THAT AREA.

7 MR. HESS: ON THIS PARTICULAR SYSTEM, WE DID NOT SEE  
8 IT AS A PROBLEM.

9 MR. OVERBECK: BECAUSE THEY ARE ~~GOING~~ TO USE  
10 ORIFICES AND THROTTLE VALVES --

11 MR. HESS: CORRECT.

12 MR. OVERBECK: -- AND NEVER GOING TO APPROACH RUNOUT  
13 WHATEVER RUNOUT MIGHT BE FOR THIS SYSTEM.

14 MR. HESS: WELL, NORMAL SYSTEM DEMAND ON THIS SYSTEM  
15 IS SOMEWHERE AROUND 14,000 GPM.

16 MR. FOLEY: I'M NOT SURE WE -- HAVEN'T TAKEN A  
17 POSITION THAT WE DON'T SEE THE NEED FOR THAT. I MEAN WE  
18 HAVEN'T SAID -- WE DIDN'T PASS JUDGMENT.

19 MR. HESS: I'M SAYING WE DIDN'T ASSESS IT, THAT'S  
20 ALL.

21 MR. OVERBECK: THE SIZE OF THESE ORIFICES IS BASED  
22 ON FIELD TESTING, WHAT THEY ARE GOING TO DO?

23 MR. HESS: THE PROCESS FROM GIBBS & HILL IS TO  
24 PROVIDE THE FLOW CALCULATIONS SHOWING WHAT THE EXCESS HEAD  
25 AVAILABLE IS IN THE SYSTEM. THEY THEN RAN A FLOW BALANCING  
26 CALC WHICH ARTIFICALLY PUT INTO THE COMPUTER PROGRAM THROTTLE  
27 POSITIONS OF VALVES OR ORIFICES TO MAKE SURE THAT THEY COULD  
28 GET FLOW TO ALL THE DIFFERENT COMPONENTS WITH THESE

1 RESTRICTIONS IN IT. BUT THE ACTUAL ORIFICE SIZING WAS TO BE  
2 DONE BY OTHERS. THEY DID NOT HAVE DESIGN RESPONSIBILITY FOR  
3 SAYING IT'S GOT TO BE A .25 ORIFICE.

4 MS. WILLIAMS: IS IT ONE OF THE START-UP PROCEDURES?  
5 IS IT ONE OF THE TESTING PROCEDURES? I THINK THAT'S WHAT HE  
6 IS ASKING. IS THERE A TESTING PROCEDURE IN PLACE OR DID WE  
7 CHECK --

8 MR. HESS: WE DID NOT CHECK THE TESTING PROCEDURE.  
9 WE WERE TOLD IT WAS PART OF THE START-UP TESTING AND FLOW  
10 SYSTEM BALANCING.

11 MS. WILLIAMS: OKAY. THEN THAT'S WHAT WE WERE TOLD  
12 BY GIBBS & HILL. WE DID NOT GO TO TEXAS TEST GROUP TO LOOK AT  
13 THAT PROCEDURE.

14 MR. NEVSCHEMAL: DID YOU REVIEW THE FLOW DIAGRAMS  
15 AND/OR ENID'S TO DETERMINE THAT THERE WERE ENOUGH FLOW  
16 ORIFICES TO BE ABLE TO BALANCE THE SYSTEM?

17 MR. HESS: WE LOOKED AT THROTTLE VALVES AND ORIFICES  
18 IN THE SCOPE OF WHAT WE REVIEWED WITHIN THAT SAFEGUARDS  
19 TURNING IT OUT TO THE THERMAL BARRIER. WE DID NOT LOOK AT THE  
20 FLOW PATHS TO THE CDCS OR OTHER LOADS THAT WERE OUT OF OUR  
21 SCOPE.

22 MS. WILLIAMS: YES, WITHIN OUR SCOPE OR, NO, WE  
23 COULDN'T --

24 MR. HESS: YES, WITHIN OUR SCOPE; NO, WITH THE  
25 OUTSIDE.

26 MR. MARINOS: WANT TO GO TO THE NEXT QUESTION?  
27 SEEMS LIKE A WHOLE LIST OF QUESTIONS BELOW HAVE ALREADY BEEN  
28 ANSWERED, BUT I'LL ASK THEM, ANYWAY.



1 15 IS EXPLAIN HOW THE INSPECTION VERIFIED THE  
2 ADEQUACY OF THE SURGE TANK SIZE TO ACCOMMODATE CHANGES IN A  
3 SYSTEM WATER INVENTORY DUE TO TEMPERATURE CHANGE AND SYSTEM  
4 LEAKAGE.

5 MR. FOLEY: ON TOP OF THE PAGE NOW?

6 MR. HESS: OKAY, THAT WAS DONE BASED ON THE SURGE  
7 TANK SIZING CALCULATION.

8 MR. OVERBECK: IS THAT IT?

9 MR. HESS: THAT'S IT.

10 MR. OVERBECK: DID IT START WITH THE TEMPERATURE  
11 ASSUMED TO BE -- WHAT WAS THE MINIMUM TEMPERATURE ASSUMED IN  
12 THE SYSTEM?

13 MR. HESS: WE CAN PULL THE CALC. I DON'T REMEMBER.

14 MR. OVERBECK: IS THAT HOW DID THEY DID IT?

15 MR. HESS: THEY HAD A NOMINAL TEMPERATURE AND THEN  
16 ASSUMED A HEAT-UP.

17 MR. OVERBECK: NOMINAL TEMPERATURE BUT NOT A  
18 DESIGNED LOW TEMPERATURE?

19 MR. HESS: I DON'T KNOW WHETHER IT WAS LOW  
20 TEMPERATURE OR NOT. I SAID A NOMINAL, MEANING SOME  
21 TEMPERATURE. I DON'T KNOW WHETHER IT WAS THE LOW 60 DEGREES  
22 OR 40 DEGREES OR WHETHER IT WAS 70 DEGREES. WE CAN GO BACK IN  
23 AND PULL THAT CALC FOR YOU.

24 MS. WILLIAMS: WHEN WE LOOKED AT THE CALCULATION,  
25 DID WE LOOK TO SEE WHETHER THE TEMPERATURES WERE REASONABLE AS  
26 FAR AS THE RANGE OF OPERATION FOR THE SYSTEM?

27 MR. FOLEY: WHAT THE BASIS OF THE TEMPERATURES WERE.

28 MR. STUART: ISN'T THE ANSWER TO HIS QUESTION YES?

1 I DIDN'T HEAR YOU, BOB.

2 MR. HESS: IT'S YES.

3 MR. STUART: THANK YOU.

4 MR. OVERBECK: WHICH CALCULATION IS THIS? I HAVE A  
5 LIST OF CALCULATIONS IN FRONT OF ME. I'M LOOKING AT THE ONE  
6 THAT SAYS SURGE TANK SIZING?

7 MR. HESS: YES.

8 MR. OVERBECK: WHERE IS THAT?

9 MS. WILLIAMS: WHICH NUMBER IS THAT?

10 MR. HESS: 229-12 WHICH SAYS CCW STORAGE TANK. IT  
11 SHOULD BE SURGE TANK.

12 MR. ANGELO: NUMBER 12.

13 MR. HESS: SHE HAS GOT A LIST.

14 MS. WILLIAMS: YES, AND WE DO HAVE THAT IN-HOUSE.

15 MR. OVERBECK: ARE THERE CALCULATIONS -- DESIGN  
16 TEMPERATURES WITHIN THE SYSTEM AT VARIOUS POINTS THROUGHOUT  
17 THE SYSTEM, WAS THERE A DESIGN ANALYSIS FOR THAT, MAXIMUM  
18 MINIMUM TEMPERATURES, NORMAL OPERATING, FOR ALL OPERATING  
19 MODES?

20 MR. HESS: YES.

21 MR. OVERBECK: AND THAT INFORMATION, WAS THAT  
22 TRANSFERRED TO THE PIPING?

23 MR. HESS: YES.

24 MR. OVERBECK: DID ONE OF THESE CALCULATIONS COME UP  
25 WITH THOSE DESIGN TEMPERATURES AT VARIOUS POINTS IN THE SYSTEM?

26 MR. HESS: YES, AND I CAN'T TELL YOU SPECIFICALLY  
27 RIGHT NOW WHICH ONE IT IS.

28 MR. OVERBECK: WILL YOU TELL ME BEFORE I LEAVE? I'D

1 LIKE TO KNOW WHICH ONE.

2 MR. HESS: OKAY.

3 MR. MARINOS: 16 OR 17, HAVE THEY BEEN ADDRESSED  
4 ALREADY? YOU GUYS KICKED THAT ONE AROUND.

5 MR. OVERBECK: LET'S ASK IT. EXPLAIN HOW THE  
6 INSPECTION VERIFIED THE ADEQUACY OF THREE-FOURTHS INCH RELIEF  
7 VALVE ON THE SURGE TANK.

8 MR. HESS: THE RELIEF VALVE IS DESIGNED AS A THERMAL  
9 RELIEF VALVE AND IT'S SIZED AT 10 GPM. WE DETERMINED THAT  
10 THAT WAS ADEQUATE FOR THE PURPOSE.

11 MR. OVERBECK: BASED ON THE SURGE TANK SIZING  
12 CALCULATION OR WHAT CALCULATION?

13 MR. FOLEY: IT WAS THE THERMAL EXPANSION.

14 MR. OVERBECK: SEE, I DON'T SEE A RELIEF VALVE  
15 SIZING CALCULATION. THAT'S WHY I ASKED THE QUESTION.

16 MR. HESS: I GUESS I'LL HAVE TO GET BACK TO YOU ON  
17 THAT ONE AS TO WHICH EXACT CALC IT WAS.

18 MS. WILLIAMS: MY UNDERSTANDING OF IT IS --

19 MR. FOLEY: I BELIEVE THERE WAS ANOTHER REVIEWER  
20 INVOLVED, AND I BELIEVE WHAT HE DID WAS LOOKED AT THE  
21 EXPANSION INTO THE TANK BASED ON THERMAL CONSIDERATIONS AND  
22 INDEPENDENTLY DID A CHECK TO SEE THAT THE THREE-QUARTER INCH  
23 VALVE WAS ADEQUATE TO HANDLE THAT EXPANSION INTO THE TANK. I  
24 DON'T BELIEVE THAT WE HAD ACCESS TO AN ACTUAL SIZING  
25 CALCULATION FROM GIBBS & HILL THEMSELVES ON THE VALVES.

26 MR. OVERBECK: WOULD YOU HAVE EXPECTED THEM TO DO  
27 THAT TYPE OF CALCULATION?

28 MR. FOLEY: I GUESS WE WOULD HAVE EXPECTED THEM, YES



1 AS PART OF THE -- WE WOULD HAVE EXPECTED THEM TO DO THAT, YES.

2 MR. OVERBECK: THAT WASN'T AN OBSERVATION OF YOUR  
3 INSPECTION?

4 MR. HESS: NO, NOT AS AN OBSERVATION.

5 MS. WILLIAMS: WELL, WAIT A MINUTE. MISSING  
6 CALCULATIONS ARE A PART OF THE INSPECTION AND WE HAVE  
7 RE-REQUESTED SOME CALCULATIONS FROM GIBBS & HILL TO GIVE THEM  
8 A SECOND GO-ROUND AS TO WHETHER THEY CAN PRODUCE THEM OR NOT.  
9 SOME OF THAT IS THIS LIST THAT YOU'RE LOOKING AT.

10 IN THOSE CASES WHERE WE DID OUR OWN CALCULATIONS TO  
11 VERIFY THE ADEQUACY OF IT, ALL OF THAT IS IN THIS DATA BASE AS  
12 FAR AS OMISSIONS AND AS FAR AS HOW REASONABLE THE NUMBER OF  
13 OMISSIONS IS, THESE GUYS HAVEN'T BEEN INVOLVED IN THAT  
14 DISCUSSION YET.

15 MR. OVERBECK: WELL, IS THIS -- THE FACT -- I DON'T  
16 WANT TO PUT WORDS IN YOUR MOUTH. I WANT TO BE CAREFUL HERE  
17 BECAUSE I WANT YOU TO TELL ME HOW YOU VERIFIED IT. AND IF  
18 THERE'S NOT A CALCULATION BY GIBBS & HILL, I WOULD LIKE TO  
19 KNOW THAT. IF THAT'S THE CASE, DID THAT MAKE YOUR DATA BASE  
20 FOR OMISSIONS.

21 MS. WILLIAMS: THE ANSWER IS IF THEY DON'T PRODUCE  
22 ONE, YES. IT'S TENTATIVELY IN THERE NOW AND JIM'S TOLD YOU  
23 WHAT HE THINKS THE OTHER REVIEWER DID AS FAR AS THE CYGNA.

24 MR. OVERBECK: YOU ARE CONFIRMING THAT IT IS IN YOUR  
25 DATA BASE AS AN OMIT -- CALCULATIONS.

26 MS. WILLIAMS: WELL, WHEREVER THERE'S CALCULATIONS  
27 THAT ARE OMITTED, THEY'RE IN THERE. NOW, I'LL HAVE TO GO  
28 CHECK THE SPECIFIC ONE AND HOPEFULLY WE DIDN'T MISS IT. BUT,

1 YES, OMITTED CALCULATIONS ARE CLEARLY IN THE DATA BASE.

2 MR. OVERBECK: I'D LIKE TO KNOW THAT.

3 MS. WILLIAMS: OKAY.

4 MR. NORKIN: I'M A LITTLE CURIOUS AS TO ONE THING.  
5 SOME OF THESE QUESTIONS THAT WE'VE BEEN ASKING SO FAR ARE  
6 PRETTY SPECIFIC, LIKE THIS ONE, FOR EXAMPLE, AND I THINK THE  
7 RESPONSE ON THAT WAS THAT, YOU KNOW, BASICALLY THE RESPONSE  
8 WAS YOU THINK. AND I GUESS I'M NOT REALLY SURE WHAT THE  
9 ANSWER REALLY IS, YOU KNOW, SOME OF THE QUESTIONS -- WELL, THE  
10 QUESTIONS WERE ALL POSED TO ELICIT A RESPONSE, AND WHERE IT'S  
11 VERY CLEAR LIKE THAT, IT SEEMS LIKE I'M NOT REALLY CERTAIN  
12 WHAT THE ANSWER IS.

13 THERE ARE OTHER QUESTIONS WE'VE ASKED THAT ARE KIND  
14 OF BROAD AND YOU COULDN'T NECESSARILY IMAGINE WHAT WE HAD IN  
15 MIND UNTIL YOU SAT ACROSS THE TABLE FROM US, AND I CAN  
16 UNDERSTAND THAT. BUT WHERE SOME OF THE QUESTIONS ARE CONCISE,  
17 I GUESS I'M CONCERNED ABOUT WHAT WE'RE GOING TO LEAVE HERE  
18 WITH.

19 I THINK WE WERE LOOKING FOR THIS RECORD TO BE A  
20 PRECISE ANSWER OF WHAT YOU DID, AND IT DOESN'T LOOK LIKE IN  
21 SOME CASES THAT YOU KNOW FOR SURE. THAT'S JUST MY PERSPECTIVE  
22 THAT I HAVE ON THIS THING. FOR EXAMPLE, IF WE HAD WRITTEN A  
23 LETTER AND YOU HAD GIVEN US A RESPONSE, I THINK YOU WOULD HAVE  
24 GIVEN US A LITTLE DIFFERENT RESPONSE. YOU ARE PROBABLY NOT  
25 EVEN READY TO GIVE US A RESPONSE ON SOME OF THESE ITEMS BASED  
26 ON WHAT IT LOOKS LIKE TODAY.

27 MR. STUART: LET ME TRY -- I WANT TO TRY A PARTIAL  
28 ANSWER TO YOUR QUESTION. I DON'T BELIEVE THAT ALL THE

1 REVIEWERS THAT CONDUCTED REVIEW ARE SITTING HERE IN THIS ROOM.  
2 SO WE HAVE SOME PEOPLE WHO ARE REPRESENTING SEVERAL REVIEWERS  
3 ATTEMPTING AS BEST THEY CAN TO SET FORTH THE ANSWER TO A  
4 QUESTION WHERE THEY MIGHT NOT HAVE BEEN PERSONALLY INVOLVED IN  
5 THAT REVIEW.

6 IN THOSE AREAS THAT -- WHERE THINGS ARE LEFT ON OPEN  
7 ITEMS, I WOULD LIKE TO MAKE A PROCESS SUGGESTION THAT TOMORROW  
8 MORNING'S MEETING OPEN UP WITH RESPONDING SPECIFICALLY TO  
9 THOSE QUESTIONS TO CLOSE OUT EACH OF THOSE THAT I THINK NANCY  
10 IS MAINTAINING A CHECKLIST ON FOR THAT AND, WHERE POSSIBLE,  
11 FOR US TO GET THE SPECIFIC REVIEWER INVOLVED IN THAT CONCERN  
12 INTO THIS ROOM.

13 AND IN SOME CASES, I BELIEVE THERE MIGHT BE A FEW OF  
14 THOSE PEOPLE IN BOSTON SO THAT MIGHT NOT BE POSSIBLE, BUT  
15 WHERE POSSIBLE, GET THEM HERE IN THIS ROOM TO ANSWER THOSE  
16 SPECIFIC QUESTIONS. AND THE ONLY DAY THAT THAT MIGHT BE A  
17 PROBLEM IS THE LAST DAY OF THE MEETING, BUT THAT WOULD ALLOW  
18 US TO GET THE PEOPLE IN HERE AND TRY TO ADDRESS MOST OF THOSE  
19 CONCERNS.

20 MR. NORKIN: YES, I UNDERSTAND.

21 MR. OVERBECK: WHO SAYS WE CAN'T COME BACK.

22 MR. NORKIN: BUT I GUESS WE'RE GOING TO HAVE TO KNOW  
23 ANYTHING THAT GOES ON THE RECORD THAT'S INACCURATE YOU ARE  
24 GOING TO HAVE TO MAKE A NOTE OF THAT BECAUSE I DON'T KNOW  
25 WHETHER THIS PROCESS IS GOING TO RESULT THINGS FROM GOING ON  
26 THE RECORD THAT LATER COULD CONTRADICT IT. THAT'S WHAT I AM  
27 CONCERNED ABOUT.

28 MS. WILLIAMS: WE NORMALLY DO REVIEW THEM WHEN THEY



1 COME IN AND WE'LL MAKE IT A PARTICULAR POINT TO TAKE THIS ONE  
2 SINCE THERE ARE SO MANY I THINKS RUNNING THROUGHOUT IT TO TELL  
3 YOU AND CONFIRM WHETHER THAT'S THE CASE OR NOT.

4 MR. STUART: NANCY, I THINK, JUST POINTED OUT TO ME  
5 A VARIATION ON THIS AND THAT IS THAT THERE IS ONE REVIEWER  
6 THAT WAS INVOLVED IN THIS PARTICULAR REVIEW THAT'S NO LONGER  
7 WITH THE COMPANY.

8 SO THAT MIGHT BE PART OF WHY YOU ARE GETTING SOME I  
9 THINKS AS OPPOSED TO CONCLUSIVE ANSWERS. BUT NONETHELESS, TON  
10 WHAT WE'LL TRY TO DO IS TAKE A LOOK AT THAT -- OUR REVIEW  
11 PROCESS AGAIN AND GET BACK TO YOU TOMORROW MORNING WITH THOSE  
12 ANSWERS.

13 MR. MARINOS: WELL, LET'S HOPE THE DOCUMENTATION IS  
14 ADEQUATE TO SUPPORT ITSELF RATHER THAN DEPENDING ON  
15 INDIVIDUALS. INDIVIDUALS DISAPPEAR ON A DAILY BASIS. SO  
16 LET'S HOPE THAT YOU HAVE THE DOCUMENTATION.

17 MR. STUART: I'M SURE THAT OUR PROCESS IS AIRTIGHT  
18 IN THAT REGARD.

19 MS. WILLIAMS: WE CAN RECREATE IT. THE PROBLEM IS  
20 IT TAKES TIME TO RECREATE IT. AND IF YOU'RE NOT THE ORIGINAL  
21 INDIVIDUAL, PLUS IT'S A YEAR LATER, IT TAKES TIME.

22 MR. MARINOS: WELL, WE WERE HOPING THAT WITH THE  
23 OPPORTUNITY YOU HAVE TO HAVE THE QUESTIONS IN ADVANCE THAT YOU  
24 MIGHT HAVE DONE THE JOB THAT WAS NECESSARY --

25 MS. WILLIAMS: WELL, SOMETIMES --

26 MR. MARINOS: -- AND HAVE THE SPECIFICS TODAY.

27 MS. WILLIAMS: IT'S TRUE AND, BELIEVE IT OR NOT, WE  
28 DID A LOT OF HOMEWORK FOR THE MEETING, BUT IN A COUPLE OF

1 THESE CASES WE ANSWERED WHAT WE THOUGHT WHAT THE QUESTION WAS  
2 AND PERHAPS DIDN'T GO THE NEXT ONE OR TWO LAYERS DOWN WHERE  
3 WE'RE STARTING TO NOT BE ABLE TO ANSWER YOUR QUESTIONS.

4 FOR EXAMPLE, ON THE ONE WITH THE RELIEF VALVE, WE  
5 HAD A WRITE-UP WHICH EXPLAINED HOW WE PHYSICALLY WENT ABOUT  
6 CHECKING IT, BUT DID GIBBS & HILL GIVE US THE CALCULATION,  
7 WHERE IS THE CALCULATION, IS IT IN THE DATA BASE, THOSE  
8 FOLLOW-ON TYPE QUESTIONS, WE HAVE TO GO GET THE ANSWERS FOR  
9 YOU AGAIN. THAT'S ALL.

10 MR. MARINOS: BUT YOU KNOW WHETHER YOU ACTUALLY DID  
11 A CALCULATION OR YOU DID NOT DO A CALCULATION. YOU CAN GIVE  
12 US A YES OR NO ANSWER TO THIS, NOT ABOUT TRACING DOCUMENTS  
13 THAT YOU USED FROM SOMEONE ELSE, THEN MAYBE, YES, I CAN  
14 APPRECIATE IT MAY BE DIFFICULT FOR YOU TO DETERMINE YOURSELF  
15 IF THE REVIEWER IS NOT HERE. BUT WHETHER YOU HAVE DONE A  
16 CERTAIN TYPE OF REVIEW OR CALCULATION, WE SHOULD HAVE THAT  
17 ANSWER PRETTY CLEAR, YES OR NO.

18 MR. CALVO: EXCUSE ME. ALL THE THING IS BEING  
19 RECORDED AND I'M SURE WHEN THE TRANSCRIPT BECOMES AVAILABLE TO  
20 EVERYBODY, I THINK WE CAN ALSO LOOK AT IT AND IT WOULD APPEAR  
21 THAT A DEGREE OF UNCERTAINTY, I'M SURE WE CAN CLEAR THOSE UP  
22 LATER. AND I THINK WE CAN DO THAT.

23 A LOT OF THINGS BACK AND FORTH, A LOT OF PEOPLE HAVE  
24 BEEN ASKING A LOT OF QUESTIONS, AND I GUESS -- THE END RESULT,  
25 TO BE ASKING A QUESTION STILL I GUESS EVERYBODY'S MIND, WHAT  
26 ARE YOU GOING TO DO WITH THE ANSWER TO THAT QUESTION AND HOW  
27 THAT QUESTION IS -- WHAT KIND OF ROLE THE ANSWER TO THE  
28 QUESTION IS GOING TO PLAY WITH THE OVERALL ASSESSMENT OF THE

1 QUALITY IS.

2 YOU'RE RIGHT, BUT I GUESS WITH THE CONTEXT OF THIS  
3 WORKING MEETING, A LOT OF GIVE AND TAKE IN HERE, AND I HOPE -  
4 I GUESS THAT SOMEBODY READING THAT TRANSCRIPT IS GOING TO  
5 UNDERSTAND WHAT WENT ON IN HERE.

6 AND WHAT YOU SAY IS GOOD TOMORROW, IF YOU CAN HAVE  
7 THE ANSWER IF YOU CANNOT HAVE THE ANSWER THIS WEEK, WHEN YOU  
8 READ THE TRANSCRIPT, ANY CLARIFICATION THAT IS NEEDED WE WILL  
9 APPRECIATE IF YOU MAKE US AWARE OF IT. ALSO WE DO ALSO MAKE  
10 AWARE OF IT. MR. STUART: I WANT TO SAY THERE IS A  
11 LOT OF MORE QUESTIONS COMING UP IN THIS MEETING THAN WERE EVER  
12 TRANSMITTED. AND YOU'RE GOING INTO THIRD AND FOURTH LEVEL OF  
13 DEPTH, AND THAT'S FINE. AND THAT'S WHAT A WORKING MEETING IS  
14 ALL ABOUT. BUT, YOU KNOW, THESE GUYS HAVE GOT TO HAVE SOME  
15 WARNING, IF YOU WILL, TO PREPARE TO GET THE ANSWERS.

16 MR. CALVO: AND I THINK YOU HAVE DONE AN EXCELLENT  
17 JOB, YOU KNOW, ANSWER TO OUR QUESTIONS. AND I'M SURE YOU ARE  
18 RIGHT, WE'VE BEEN GOING DEEPER INTO THIS QUESTION THAN THE  
19 QUESTION ACTUALLY INDICATED IN HERE.

20 AND I GUESS ANYTHING THAT IS MISSING WAS OBVIOUS TO  
21 ME FROM THE BEGINNING. THERE WAS SOMETHING -- YOU DON'T HAVE  
22 ALL THE ANSWERS. IF YOU DO, YOU WOULD BE A SUPERMAN OR SUPERW  
23 TO ANSWER ALL THE THINGS.

24 THE TIME WILL COME WHEN YOU HAVE TIME TO RECONSIDER  
25 WHAT IS IN THE RECORD AND ANYTHING ELSE THAT APPEARS THAT YOU  
26 DISAGREE WITH IT, THEN YOU LET US KNOW.

27 MR. NORKIN: I DID ACKNOWLEDGE AT THE START OF MY  
28 QUESTION THAT THE FOLLOW-ON QUESTIONS, I WOULDN'T HAVE



1 EXPECTED YOU TO ANTICIPATE.

2 MR. CALVO: OKAY. LET'S GO WITH THE NEXT QUESTION.

3 MR. MARINOS: CLOSE 16, GARY?

4 QUESTION NUMBER 17 IS EXPLAIN HOW THE CORRECT SIZING  
5 OF THE SURGE TANK -- EXCUSE ME -- VENT VALVE AND VACUUM  
6 BREAKER WAS VERIFIED BY THE INSPECTION.

7 WHICH -- ARE YOU SATISFIED WITH WHAT HAS BEEN SAID  
8 ABOUT THIS ALREADY?

9 MR. OVERBECK: AGAIN, I'D LIKE TO HAVE CLARIFICATION  
10 WHICH CALCULATION WAS USED TO VERIFY THE VACUUM BREAKER WAS  
11 PROPERLY SIZED. IT'S LIKE THE RELIEF VALVE, JUST GOING IN THE  
12 OTHER DIRECTION.

13 MR. HESS: WE DON'T HAVE THAT CALC.

14 MS. WILLIAMS: AND DID WE HAVE IT DURING THE REVIEW?

15 MR. HESS: I DON'T BELIEVE WE DID. THE ONLY THING  
16 THAT I REMEMBER US DOING IS RUNNING AN INDEPENDENT CHECK ON  
17 THE AIR FLOW RATE.

18 MR. NORKIN: I THOUGHT YOU SAID THERE WAS A CALC FOR  
19 THAT.

20 MS. WILLIAMS: IF YOU GO TO ITEM 41 ON THIS LIST,  
21 YOU'LL NOTICE THERE'S CALCULATION, DASH, DASH. WE DID NOT  
22 HAVE THE CALCULATION TO REFER GIBBS & HILL TO AND WE THOUGHT  
23 IN PREPARATION FOR THIS MEETING THAT MAYBE THEY HAVE ONE  
24 SOMEWHERE FOR WHATEVER REASON THEY COULDN'T FIND IT AT THE  
25 TIME OF OUR REVIEW, BUT APPARENTLY IT WAS NOT PRODUCED.

26 WE VERIFIED THE HARDWARE OURSELVES, BUT WE'RE STILL  
27 WAITING AND I HAVEN'T RECEIVED ANYTHING ON THAT ONE FROM GIBBS  
28 & HILL YET.

1 MR. OVERBECK: SO CYGNA TOOK IT UPON THEMSELVES TO  
2 VERIFY AND VERIFY THAT THIS VENT VALVE WAS THE PROPER SIZE.

3 MR. HESS: WE DID AN INDEPENDENT BACK OF PAPER CHECK.  
4 YES.

5 MR. CALVO: NANCY, WHEN WE KEEP TALKING ABOUT THE  
6 LIST OF CALCULATIONS THAT YOU PROVIDED TO US THIS MORNING, CAN  
7 YOU IDENTIFY THAT ONE FOR THE RECORD, YOU KNOW, THE PURPOSE OF  
8 THE CALCULATION, THE DATE, WHAT IS THE TITLE? I THINK --

9 MR. OVERBECK: WE HAVE NO DATE AND NO TITLE. WE  
10 JUST HAVE TWO SHEETS, THREE SHEETS OF LIST AND CALCULATIONS SO  
11 MAYBE WE OUGHT TO DATE IT TODAY OR WHAT DO YOU WANT TO DO?

12 MS. WILLIAMS: THE DATE ON IT IS MAY 9TH, '85 IN  
13 THAT THIS WAS THE LIST THAT WAS TELECOPIED TO GIBBS & HILL ON  
14 THAT DATE TO COMPLETE OUR FILES HERE IN PREPARATION FOR THE  
15 DISCUSSIONS WITH YOU PEOPLE TODAY.

16 MR. NORKIN: NANCY, WHY DON'T YOU JUST MARK THAT AS  
17 ATTACHMENT 1 TO THE TRANSCRIPT OF TODAY'S MEETING AND PROVIDE  
18 THE RECORDER WITH A COPY OF IT TO INCLUDE WITH THE TRANSCRIPT.

19 MS. WILLIAMS: IS THERE AN EXTRA COPY OF THAT OR ARE  
20 THEY ALL GONE?

21 MR. MARINOS: I HAVE AN EXTRA COPY.

22 MR. CALVO: WHY DON'T WE TAKE A BREAK.

23 MR. MARINOS: YES, WE'LL TAKE A BREAK NOW.

24 (RECESS.)

25 MR. MARINOS: BACK ON THE RECORD, ARE WE?

26 DID WE GET THE ANSWER WE WANTED FOR 17 OR ARE WE  
27 SATISFIED, GARY AND JOHN?

28 MR. OVERBECK: 17, IT IS OUR UNDERSTANDING THAT

1 THEY DO NOT HAVE A CALCULATION CURRENTLY IN HAND FROM GIBBS &  
2 HILL TO VERIFY THE SIZE OF THE VACUUM BREAK OR THE VENT VALVE,  
3 AND THAT A CALCULATION -- FORM OF A CALCULATION OR EVALUATION  
4 WAS DONE BY CYGNA ON THEIR OWN.

5 MS. WILLIAMS: THAT'S CORRECT. AND THE PART THAT'S  
6 STILL OPEN IS TO THE IMPLICATIONS OF NOT HAVING A CALCULATION.

7 MR. OVERBECK: I WOULD LIKE TO HEAR GIBBS & HILL  
8 TELL US THAT THAT'S THE PROPER SIZE.

9 MR. MARINOS: I'M GOING TO GO TO QUESTION 18. HOW  
10 WAS THE BASIS FOR THE 50 GPM SYSTEM LEAKAGE RATE VERIFIED.

11 MR. FOLEY: WE DIDN'T VERIFY THE 50 GPM IN ANY  
12 DETERMINISTIC KIND OF ANALYSIS FOR THIS SYSTEM. HOWEVER, BOTH  
13 NUREG 0800 -- USE THAT AS A STANDARD BASIS FOR COOLING WATER  
14 SYSTEMS AS DOES WESTINGHOUSE INPUT WHICH WAS USED FOR THIS  
15 PLANT FROM THEIR RESAR DOCUMENT. I'M NOT SURE THE EXACT CALC,  
16 BUT THE 50 GPM WAS TAKEN AS A GIVEN KIND OF STANDARD NUMBER  
17 FOR THIS TYPE OF SYSTEM.

18 MR. OVERBECK: THAT 50 GPM WAS NOT IN THE SYSTEM  
19 DESIGN DESCRIPTION OF GIBBS & HILL?

20 MR. FOLEY: I DON'T BELIEVE IT WAS.

21 MR. OVERBECK: WHAT WAS IN THERE?

22 MR. FOLEY: I DON'T THINK THERE WAS ANY SPECIFIC  
23 NUMBER IN THAT DOCUMENT. THEY TALKED ABOUT HANDLING THE  
24 LEAKAGE FROM THE SYSTEM, BUT WITHOUT MENTIONING A SPECIFIC  
25 NUMBER.

26 MR. OVERBECK: IN THE CALCULATION THAT WAS USED AS  
27 THE NUMBER, HOW WAS IT REFERENCED?

28 MR. FOLEY: CALCULATION REFERENCED RESAR CHAPTER 6.2



1 POINT SOMETHING AS A BASIS FOR THE 50 GPM.

2 MR. OVERBECK: IS RESAR A DOCUMENT -- DESIGN  
3 DOCUMENT FOR THIS PLANT?

4 MR. FOLEY: I DON'T BELIEVE IT IS, BUT I'M NOT SURE.

5 MR. OVERBECK: CAN WE VERIFY THAT? IS THAT  
6 SOMETHING THAT YOU WOULD IDENTIFY AS A IMPROPER REFERENCE,  
7 BECAUSE CERTAINLY QA GUYS WOULDN'T KNOW THAT.

8 MR. FOLEY: WE WOULD NOT HAVE -- WE WOULD -- WE  
9 WOULD HAVE HAD -- WE WOULD HAVE MADE A JUDGMENT ON WHETHER WE  
10 FELT IT WAS A REASONABLE NUMBER TO USE BASED ON THE REFERENCES  
11 THAT ARE RECITED WHICH INCLUDED THE SRP. WE WOULD NOT HAVE  
12 NECESSARILY CITED IT AS AN IMPROPER REFERENCE. WE WOULD -- WE  
13 WERE JUDGING MORE WHAT WE FELT WAS THE DESIGN ADEQUACY, NOT  
14 THE CONTROL OF INPUTS AND THAT KIND OF THING AS IS PROBABLY  
15 COVERED.

16 MS. WILLIAMS: WELL, YES, BUT FROM A TECHNICAL  
17 STANDPOINT YOU WOULD LOOK TO SAY, WELL, THAT DOCUMENT IS THE  
18 REASON -- THE SRP IS A REASONABLE REFERENCE. IN THAT CASE IT  
19 WOULD NOT HAVE BEEN CITED BECAUSE WE DID NOT FEEL THAT THERE  
20 WAS ANYTHING INAPPROPRIATE WITH THE 50 GPM.

21 MR. CALVO: IS NOT THE RESAR REFERENCED BY THE FSAR?  
22 IT IS NOT PART OF FSAR IN THIS CASE?

23 MR. FOLEY: I DON'T KNOW THE RELATIONSHIP BETWEEN  
24 THEM AT COMANCHE PEAK.

25 MR. CALVO: WHAT I AM SAYING, I THINK THE SUBJECT  
26 WITHIN THE FSAR CAME UP EARLIER AND YOU INDICATED THE FSAR WAS  
27 USED TO THE DESIGN INPUT DOCUMENT. I WAS WONDERING WHEN YOU  
28 REVIEWED THIS DID YOU FIND OUT THE RESAR WAS PART OF THE FSAR.

1 NORMALLY, THAT'S WHAT YOU DO, YOU REVIEW THE RESAR, RESSAR 3  
2 FOR THIS TYPE. ALSO MADE USED AS PART OF THE FSAR, SO THE  
3 RESAR IS KEPT UP TO DATE AS GOOD AS FSAR. DID YOU FIND THIS  
4 WHEN YOU DID THE -

5 MS. WILLIAMS: THAT'S WHAT WE'RE GOING TO GO CHECK.

6 MR. KUMAR: PERHAPS I CAN CLARIFY THAT. RESAR IS A  
7 PSAR DOCUMENT, SO IT'S NOT REFERENCED IN THE FSAR. IT WAS  
8 REFERENCED IN THE PSAR. COMANCHE PEAK PSAR AND RESAR TOGETHER  
9 FORMED THE SAFETY ANALYSIS FOR THE CONSTRUCTION. FSAR IS A  
10 DOCUMENT THAT STANDS BY ITSELF.

11 MR. OVERBECK: RESAR NEVER DEVELOPED BEYOND THAT  
12 PSAR STAGE. THAT'S WHAT IT WAS. I UNDERSTAND WE WOULD HAVE  
13 DRAWN THE CONCLUSION THAT THE 50 GPM IS A PROPER NUMBER TO USE  
14 I WOULD HAVE PREFERRED TO SEEN IT COME FROM A SYSTEM DESIGN  
15 DESCRIPTION REFERENCE, AND I WOULDN'T EXPECT THE FSAR TO BE  
16 REFERENCED IN THE DESIGN CALCULATION INPUT.

17 MR. NORKIN: I WANTED TO BACK UP ONE QUESTION  
18 WITHOUT SPENDING A LOT OF TIME ON IT. NUMBER 17 ON THE SIZING  
19 OF THE VENT VALVE AND VACUUM BREAKER. I THINK GARY LEFT WITH  
20 THE THOUGHT THAT HE WAS INTERESTED IN GIBBS & HILL'S  
21 CALCULATION OR OTHER TYPE OF ASSURANCE OF THE CORRECT SIZE,  
22 RIGHT, GARY? YOU LEFT WITH THAT THOUGHT. BECAUSE I THINK YOU  
23 GOT THE IMPRESSION CYGNA DID AN INDEPENDENT CALCULATION ON  
24 THAT, RIGHT?

25 MR. OVERBECK: CYGNA, MY UNDERSTANDING, DID AN  
26 INDEPENDENT EVALUATION AND THEY ARE NOT ATTEMPTING TO ASSUME  
27 THE DESIGN RESPONSIBILITY.

28 MR. FOLEY: WE DID A CALCULATION TO SATISFY

1 OURSELVES THAT THE NUMBER WAS REASONABLE.

2 MR. NORKIN: OKAY. ASSUMING YOU DON'T FIND A  
3 CALCULATION AT GIBBS & HILL, THE ANSWER IS PROBABLY THAT THE  
4 THING IS OKAY FOR THIS PARTICULAR SYSTEM.

5 IF YOU FIND A CALCULATION THEN, EVERYTHING IS  
6 HUNKY-DORY, YOUR PROBLEM GOES AWAY. IF YOU DON'T FIND A  
7 CALCULATION, THEN YOU HAVE ONE OF TWO CHOICES, ONE, ADDITIONAL  
8 ASSURANCE FROM GIBBS & HILL, YOU PERHAPS DON'T NEED THAT  
9 BECAUSE YOU HAVE ALREADY ESTABLISHED YOUR OWN ASSURANCE.

10 GETTING GIBBS & HILL TO DO A CALCULATION IS NOT  
11 GOING TO ACCOMPLISH VERY MUCH PERHAPS. CHANCES ARE IT'S A  
12 CORRECT DESIGN, BUT THE MORE IMPORTANT THING IN MY MIND IS  
13 WHETHER THAT'S INDICATIVE OF A GENERIC PRACTICE THAT THEY  
14 DON'T DO CALCULATIONS FOR THIS AND OTHER SYSTEMS AND I THINK  
15 THAT OUGHT TO BE EXPLORED.

16 MS. WILLIAMS: YES, WE AGREE.

17 MR. CALVO: AGAIN, WE'RE USING THE WORD EXPLORE,  
18 WE'RE USING THE WORD PREFER. AGAIN, TAKING IT WITHIN THE  
19 CONTEXT THAT WE'RE TRYING TO FIND OUT WHAT YOU DID. WE ARE  
20 NOT ASKING YOU TO DO ANYTHING ELSE THAT YOU DON'T WANT TO DO.  
21 WE'RE TRYING TO UNDERSTAND WHAT YOU DID, THAT'S ALL. OUR --  
22 AGAIN, THIS IS OUR CONCERNS, OUR QUESTIONS WILL BE --  
23 EVENTUALLY OUR ASSESSMENT WHAT OUR SAFETY EVALUATION REPORT  
24 WILL END UP SAYING WHEN WE EVALUATE YOUR FINAL CONCLUSION.

25 MS. WILLIAMS: OKAY. WELL, IN THIS PARTICULAR CASE  
26 WHENEVER YOU GET INTO THE DESIGN CONTROL IMPLICATIONS OF OUR  
27 TECHNICAL REVIEW RESULTS OF WHICH I CONSIDER A MISSING  
28 CALCULATION, AN EXAMPLE OF A TECHNICAL FINDING THAT COMES OUT



1 OF OUR TECHNICAL PEOPLE, THAT'S NOT CLOSED.

2 SO I WANT TO MAKE CLEAR THAT YOU DON'T THINK THAT  
3 WE'VE STATED THAT AND WE'RE MOVING ON. THAT IS PART OF OUR  
4 ASSESSMENT OF THE -- MOREOVER ALL IMPLICATIONS OF THE FACT  
5 THAT THE CALCULATION WAS MISSING AND I THINK THAT'S WHAT YOU  
6 WERE JUST EXPLAINING, AND IT'S STILL OPEN.

7 MR. CALVO: I JUST DON'T WANT TO CONVEY THAT WE ARE  
8 DIRECTING YOU TO DO SOMETHING. AGAIN, WE'RE TRYING TO  
9 UNDERSTAND WHAT YOU ARE DOING.

10 MS. WILLIAMS: RIGHT.

11 MR. CALVO: THIS IS OUR FEELING. WE HAVE BROUGHT  
12 THE QUESTION TO YOU, WE HAVE AN ANSWER, AND IT APPEARS WE  
13 DON'T REACH AN AGREEMENT WITH IT. AND THIS IS OUR CONCERN.

14 MS. WILLIAMS: YES.

15 MR. CALVO: IT'S UP TO YOU WHAT YOU ARE GOING TO DO  
16 FROM THAT POINT ON.

17 MS. WILLIAMS: IT WILL BE IN THE FINAL REPORT  
18 STATING WHAT OUR ASSESSMENT OF THE LEVEL OF DETAIL  
19 CALCULATIONS AND WHAT WAS MISSING AND WHETHER WE THINK THAT'S  
20 SIGNIFICANT OR NOT. AND YOU CAN LOOK AT THAT AND DECIDE HOW  
21 YOU FEEL ABOUT THAT.

22 MR. CALVO: TAKE THAT COMMENT IN THAT KIND OF LIGHT,  
23 THAT I THINK WILL HELP.

24 MR. NEVSEHAL: MAY I ASK A QUESTION WITH RESPECT TO  
25 THE MISSING CALCULATION. YOU BRING IT UP. I DID NOT, AT  
26 LEAST MYSELF, DID NOT SEE ANY MECHANISM IN THE REVIEW PROCESS  
27 THAT SPOKE ABOUT IDENTIFYING MISSING CALCULATIONS. BUT YOU  
28 BROUGHT IT UP, SO THERE IS -- SOMEWHERE THERE IS A LIST OF

1 THESE MISSING CALCULATIONS THAT HAVE BEEN UNCOVERED, THAT'S  
2 THE FEELING I HAVE RIGHT NOW.

3 CAN WE GET AN OPPORTUNITY TO LOOK AT THAT LIST OF  
4 MISSING CALCULATIONS THAT YOU HAVE IDENTIFIED SO FAR? NOW I'M  
5 ASSUMING -- EXCUSE ME. I'M ASSUMING THAT THIS LIST OR THE  
6 ITEMS ON IT COME FROM THE TECHNICAL REVIEW, SO THAT HAS BEEN  
7 ACCOMPLISHED AND SO, THEREFORE, THERE OUGHT TO BE A LIST OF  
8 THESE SOMEPLACE.

9 MS. WILLIAMS: YOU SAY LIST. IT IMPLIES LENGTH. WE  
10 REALLY ONLY HIT ON ONE OR TWO.

11 MR. NEVSCHEMAL: IF THERE IS ONLY ONE OR TWO, I WOULD  
12 LIKE TO SEE THAT.

13 MS. WILLIAMS: WELL, WE'VE TALKED ABOUT THOSE ONE OR  
14 TWO SO FAR, AND AS FAR AS WHETHER THERE ARE ANY OTHER ONES, I  
15 HAVE TO GO --

16 MR. NEVSCHEMAL: NO, THOSE ARE THE ONES THAT WE HAVE  
17 IDENTIFIED HERE IN THE MEETING. DO YOU HAVE THAT LIST THAT I  
18 CAN SAY THAT HAS BEEN IDENTIFIED? MAY I LOOK AT IT?

19 MS. WILLIAMS: WHAT I WAS TRYING TO EXPLAIN WAS  
20 WE'RE NOT DONE WITH THE DATA BASE, AND WE ARE STILL HAVING OUR  
21 QA REVIEWERS GO THROUGH AND TAKE THE RESULTS OF THE INPUT  
22 VERIFICATION AND ANALYSIS CONTROL RESULTS, AND SIT DOWN AND  
23 INPUT TO THE DATA BASE WHAT WAS MISSING AND, NO, THAT'S NOT  
24 COMPLETE YET.

25 MR. NEVSCHEMAL: SOMEPLACE IT OUGHT TO BE RECORDED  
26 AS TO WHAT IS MISSING.

27 MS. WILLIAMS: YES.

28 MR. NEVSCHEMAL: SOMEPLACE SOMEBODY MUST HAVE

1 WRITTEN DOWN MISSING CALCULATION SHOULD BE INCLUDED ON THIS  
2 LIST.

3 MR. STUART: NANCY, CAN'T WE PROVIDE, FOR INSTANCE,  
4 OBVIOUSLY, IF WE DID OUR OWN DESIGN CALCULATION FOR THIS  
5 PARTICULAR COMPONENT, WE MUST HAVE DETERMINED PRIOR TO DOING  
6 THAT THAT IT WAS MISSING. THEREFORE, HOW CAN WE DEMONSTRATE  
7 THIS TO THE NRC AND THEIR CONSULTANTS THAT, IN FACT, WE HAVE  
8 FOUND SOME MISSING CALCULATIONS PRIOR TO THIS MEETING.

9 MS. WILLIAMS: MOST OF THE -- THE WAY IT'S  
10 IDENTIFIED ON MOST CHECKLISTS, AND I HAVEN'T GONE BACK THROUGH  
11 THESE PARTICULAR CHECKLISTS FOR A LONG TIME, IT SHOULD BE OKAY  
12 PER CYGNA INSPECTION OR OKAY PER CYGNA CALCULATION OR  
13 SOMETHING LIKE THAT INDICATES THAT WE HAD TO DO SOMETHING IN  
14 ADDITION TO THE INFORMATION THAT WAS AVAILABLE AT THE TIME.

15 NOW WHETHER THESE ARE CLEARLY ANNOTATED THAT WAY,  
16 WE CAN GO THROUGH AND CONFIRM THAT FOR YOU TONIGHT. BUT IN  
17 THE -- I'M MORE FAMILIAR AT THIS POINT IN TIME HAVING SPENT  
18 MORE TIME WITH THEM, WITH THE PIPE SUPPORT CALCULATIONS AND  
19 THERE YOU WILL SEE NUMEROUS INSTANCES WHERE IT'S OKAY PER  
20 CYGNA CALCULATIONS. BUT THAT'S GENERALLY HOW IT'S EARMARKED.

21 MR. NORKIN: YOU SAY IN THE CASES WHERE YOU DID A  
22 CALCULATION WAS ONLY BECAUSE THERE WASN'T A CALCULATION  
23 AVAILABLE? YOU DIDN'T DO A CALCULATION TO INDEPENDENTLY CHECK  
24 A GIBBS & HILL CALCULATION?

25 MS. WILLIAMS: NOT ON A NORMAL BASIS. WE WOULD  
26 NORMALLY REVIEW WHAT EXISTED THERE.

27 MR. FOLEY: WELL, WE DID DO -- WE DID DO A FEW  
28 INDEPENDENT, FOR EXAMPLE, IN THE NPSH WE WENT THROUGH FROM



1 SOUP TO NUTS ON THAT AND DID THE WHOLE CALCULATION FOR  
2 OURSELVES. AND WE DID SUBSTANTIALLY THE SAME THING ON A  
3 COUPLE OF OTHER CALCULATIONS INVOLVING PRESSURE DROPS  
4 THROUGHOUT THE SYSTEM.

5 MR. NORKIN: SEEMS LIKE THE NPSH ONE YOU MIGHT HAVE  
6 HAD A MOTIVE -- WHEN YOU WROTE IT UP THERE WERE A LOT  
7 OVERSIGHTS IN THE GIBBS & HILL CALCULATION.

8 MR. FOLEY: POSSIBLY.

9 MS. WILLIAMS: THAT'S ONE REASON WHY WE MIGHT DO IT.  
10 BUT AS A RULE, YOU KNOW, WE NORMALLY LOOKED AT WHAT WAS  
11 AVAILABLE, BUT THAT DOESN'T MEAN WE DID A HUNDRED PERCENT OF  
12 THE TIME.

13 MR. MARINOS: LET'S GO TO THE NEXT QUESTION. 19.

14 HOW WAS THE BASIS FOR THE 30 MINUTE LEAKAGE PERIOD  
15 VERIFIED.

16 MR. FOLEY: THIS ALSO WAS NOT VERIFIED THROUGH ANY  
17 DETERMINISTIC TYPE OF ANALYSIS. 30 MINUTES IS AN INDUSTRYWIDE  
18 ACCEPTED TIME FOR OPERATOR ACTION TO TAKE PLACE, AND THAT WAS  
19 THE BASIS OF OUR ACCEPTING THAT.

20 MR. NORKIN: WHEN YOU SAY INDUSTRYWIDE, IS THERE A  
21 DOCUMENT THAT YOU REFER TO?

22 MR. CALVO: THE NRC -- IF YOU LOOK IN THE STANDARD  
23 REVIEW PLAN, I THINK WE HAVE GIVEN CREDIT -- OPERATOR CREDIT  
24 UP TO 30 MINUTES AND THAT HAS BEEN USED AS THE BASIS FOR  
25 OPERATOR ACTIONS.

26 MR. OVERBECK: HAS THE OWNER COMMITTED TO, I THINK  
27 IT'S ANSI STANDARD N660? I MIGHT HAVE THE WRONG NUMBERS, BUT  
28 IT'S ANSI STANDARD ON OPERATOR ACTION RESPONSE TIME?

1 MR. FOLEY: I DON'T KNOW THE ANSWER TO THAT QUESTION.

2 MR. OVERBECK: IT'S CURRENTLY AN EXISTING STANDARD,  
3 ANSI STANDARD.

4 MR. CALVO: MOST PROBABLY THEY HAVE NOT BECAUSE THAT  
5 THING, I DON'T THINK SO WAS ENDORSED BY THE REGULATORY GUIDE.  
6 BECAUSE NORMALLY THEY ARE GOING TO THE REGULATORY GUIDE, I  
7 DON'T THINK SO THEY HAVE TO COMPLY WITH IT AND STILL IN THE  
8 REGULATORY GUIDE -- THAT ONE THERE BRINGS UP A KIND OF  
9 COMBINATIONS -- ANSWER THE QUESTION.

10 MR. STUART: HE ALREADY ANSWERED IT.

11 MR. CALVO: I GUESS WHAT I WAS TRYING TO SAY -- WHAT  
12 I WAS TALKING, I WAS THINKING OF THIS ANSI STANDARD IS NOT  
13 COINCIDENT WITH THE VINTAGE OF THIS PLAN WHEN IT WAS FIRST  
14 DOCUMENTED, SO MY FEELING IS THAT MAYBE IT DOESN'T APPLY IS  
15 WHAT I WAS SAYING.

16 MR. OVERBECK: IN THE CALCULATION WHAT WAS THE  
17 REFERENCE GIVEN FOR THE 30 MINUTES, NONE?

18 MR. FOLEY: I DON'T REMEMBER IF THERE WAS A SPECIFIC  
19 REFERENCE. IF THERE WAS NONE, THAT. AS I SAY, IT'S A -- YOU  
20 KNOW, EVERY LICENSING PROCEEDING THAT TAKES PLACE, YOU KNOW, I  
21 BELIEVE THAT 30 MINUTES IS ACCEPTED AND IS A UNIVERSAL  
22 CONSTANT ALMOST IN THIS PARTICULAR INDUSTRY.

23 MR. MARINOS: WE'LL GO TO 20. DESCRIBE HOW THE  
24 VENDOR CURVE WAS USED TO DETERMINE A RUNOUT FLOW OF 18,000 GPM.

25 MR. OVERBECK: WE ADDRESSED THAT.

26 MR. MARINOS: WE ADDRESSED THAT.

27 21. DID YOUR REVIEW OF THE CCW HEAT EXCHANGER  
28 INCLUDE ALL OF THE REQUIREMENTS OF THE FSAR COMMITMENT TO TEMA

1 NOT JUST THE FOULING FACTOR. EXPLAIN WHAT YOU REVIEWED.

2 MR. HESS: NO, WE JUST REVIEWED THE FOULING FACTOR

3 MS. WILLIAMS: JIM, WERE YOU INVOLVED IN TRACKING  
4 THAT DOWN?

5 MR. FOLEY: YES, I WAS AND, WELL, THE FOULING FACT  
6 WAS WITHIN THE RECOMMENDED GUIDELINES OF THE TEMA STANDARDS.

7 MR. OVERBECK: ARE THE HEAT EXCHANGERS DESIGN IN  
8 ACCORDANCE WITH TEMA?

9 MR. FOLEY: TEMA IS GIVEN IN THE FSAR WITH  
10 APPLICABLE STANDARDS, AND I BELIEVE IT'S --

11 MR. HESS: WE WILL HAVE TO GO BACK AND CHECK THE  
12 SPECIFICATION. I DON'T REMEMBER ANY DISCREPANCY WE FOUND  
13 BETWEEN THE SPECIFICATION AND THE TEMA REQUIREMENT. IN OTHER  
14 WORDS, I BELIEVE THAT THE TEMA REQUIREMENTS WERE SPECIFIED IN  
15 THE SPECIFICATION, BUT IT WAS NOT PART OF OUR REVIEW.

16 MR. NORKIN: FOULING FACTOR WAS APPLIED, JUST THAT,  
17 NOT THE OTHER REQUIREMENTS.

18 MR. HESS: WE REVIEWED THE FACT THAT THEY HAD  
19 INCLUDED A FOULING FACTOR, YES, IN THEIR SPECIFICATIONS.

20 MR. NORKIN: WHAT OTHER REQUIREMENTS WERE THEY IN  
21 TEMA? I'M NOT FAMILIAR WITH IT.

22 MS. WILLIAMS: WAIT A MINUTE. THAT'S NOT YOUR  
23 RESPONSIBILITY.

24 MR. HESS: THAT'S TRUE. THAT WAS -- WELL, WE DIDN'T  
25 LOOK AT THE HEAT EXCHANGER DESIGN FABRICATION INSTALLATION OR  
26 OPERATION OR MAINTENANCE WHICH WERE SPECIFIED BY TEMA. TEMA  
27 IS SIMILAR TO AN ASME CODE TYPE DOCUMENT, AND THAT WAS NOT IN  
28 GIBBS & HILL'S DESIGN SCOPE. THEY SPECIFIED THAT IT SHOULD



1 MEET TEMA REQUIREMENTS AS SUCH, BUT THAT'S THE -- THEIR  
2 MANUFACTURING REQUIREMENT AS SUCH.

3 MS. WILLIAMS: AND WE DIDN'T LOOK AT VENDOR OR  
4 MANUFACTURER CALCULATIONS.

5 MR. FOLEY: TEMA HAS A LOT TO DO WITH WHAT GOES ON  
6 INSIDE THE MANUFACTURER'S SHOP AND WE DIDN'T DELVE INTO THAT  
7 IN ANY DEPTH.

8 MR. OVERBECK: SO IT'S AN INTERFACE LIKE  
9 WESTINGHOUSE. I MEAN, I UNDERSTAND WHAT TEMA IS. BUT YOU  
10 DIDN'T LOOK AT IT BECAUSE IT'S A INTERFACE SIMILAR TO THE  
11 WESTINGHOUSE INTERFACE. YOU DIDN'T ASK -- YOU DIDN'T LOOK A  
12 THEIR RHR HEAT EXCHANGER, EITHER.

13 MR. FOLEY: RIGHT.

14 MR. NORKIN: YOU'RE SAYING YOU LOOKED AT FOULING  
15 FACTOR BECAUSE THAT WAS THE ONLY TEMA REQUIREMENT THAT WAS  
16 GIBBS & HILL'S RESPONSIBILITY.

17 MR. FOLEY: NOT EXACTLY. WE FELT THAT THE FOULING  
18 FACTOR WAS THE ONE THAT BORE MOST ON THE CRUX OF OUR REVIEW  
19 WHICH WAS THE THERMAL ADEQUACY OF THE OVERALL SYSTEM, THE  
20 THERMAL PERFORMANCE OF THE SYSTEM.

21 MR. OVERBECK: IN OTHER WORDS, YOU WENT TO THE HEAT  
22 LOAD CALCULATION AND YOU SAW THE FOULING FACTOR OR WHATEVER  
23 THE FOULING FACTOR WAS.

24 MR. FOLEY: YES.

25 MR. NORKIN: THERE'S NO OTHER TEMA REQUIREMENTS IN  
26 THAT CALCULATION OF THE FOULING FACTOR?

27 MR. OVERBECK: ON THE CALCULATION, NO. RIGHT HERE,  
28 I'M LOOKING AT CHECKLIST FS DASH 01, SHEET 2 OF 10. THAT'S

1 WHERE THE FOULING FACTOR FOR TEMA ON GUIDELINES CAME UP.  
2 RIGHT BELOW IT IS WHERE YOU TALK ABOUT SOME CCW PUMP FLOW  
3 SUFFICIENT TO MEET CERTAIN FLOW RATES IN THE BOP DOCUMENT.  
4 RIGHT THERE YOU IDENTIFY THREE DIFFERENT FLOW RATES, ONE FOR  
5 RUNOUT IN THE PUMP SPECIFICATION, ITEM NUMBER 5.

6 MR. HESS: YES, RIGHT.

7 MR. OVERBECK: WAS THERE ANY TRACEABLE PATH HOW  
8 GIBBS & HILL ARRIVED AT THE Q EQUAL TO 16,400 GPM FOR THE  
9 PROCUREMENT SPEC?

10 MR. FOLEY: I DON'T REMEMBER.

11 MR. HESS: NO, NOT THAT I REMEMBER, OTHER THAN THE  
12 POSSIBILITY OF GOING BACK TO THE ORIGINAL PRESSURE DROP CALC.  
13 THERE WAS A PUMP TDH CALC THAT WE DID LOOK AT AS ONE OF THE  
14 PRELIMINARY EARLY CALCS, AND WE MAY HAVE -- WE WOULD HAVE  
15 CHECKED IT AGAINST THERE. ALL RIGHT. I DON'T REMEMBER THE  
16 EXACT BASIS OF THAT NUMBER. WE CAN CHECK THAT OUT.

17 MR. NEVSHMAL: I GUESS THE THING THAT I DON'T  
18 UNDERSTAND SPECIFICALLY IN THAT ITEM NUMBER 5 THERE IS HOW  
19 LOOKING AT THE PUMP SPECIFICATION WHICH GIVES YOU TWO NUMBERS  
20 I ASSUME FROM IT, AND THE HEAD CURVE ANSWERS THE QUESTIONS.  
21 THAT JUST SAYS THAT THE PUMP IS DESIGNED TO DO THAT, BUT IS  
22 THE SYSTEM THAT IT'S INSTALLED IN, IS IT GOING TO BE ABLE TO  
23 ALLOW THE PUMP TO DO THAT.

24 MS. WILLIAMS: THE COMMENTS DON'T CONSTITUTE THE  
25 ENTIRETY OF THE ANSWER AND JIM CAN ELABORATE ON SPECIFICALLY  
26 WHAT WE LOOKED AT. BUT IN GENERAL, WHEN YOU SEE COMMENTS,  
27 THEY ARE NOT INTENDED TO REFLECT NECESSARILY THE SOLE BASIS  
28 FOR ANSWERING SAT OR UNSAT.

1 MR. FOLEY: WHAT YOU'RE SAYING IS TRUE. THE PUMP  
2 HAS TO BE ABLE TO MEET THE REQUIREMENTS AS WELL AS THE  
3 REMAINDER OF THE SYSTEM HAS TO BE ABLE TO ALLOW THE PUMP TO  
4 MEET THOSE REQUIREMENTS. AND WE DID REVIEW BOTH ASPECTS OF  
5 THAT QUESTION.

6 MR. NORKIN: BUT YOU IMPLY IN THIS RESPONSE THAT YOU  
7 DIDN'T REVIEW THE CALCULATION TO DETERMINE THAT, YOU JUST  
8 REVIEWED THE FACT THAT THE SPECIFICATION SAYS THAT IT WOULD  
9 PRODUCE THAT. THAT'S WHAT I SEE HERE. I THINK WHEN YOU ASK A  
10 QUESTION CAN YOU MEET CERTAIN FLOW RATES, IT IMPLIES THAT YOU  
11 WOULD LOOK AT A CALCULATION AND SUBSTANTIATE THAT RATHER THAN  
12 JUST A SPECIFICATION.

13 MR. HESS: YES, WE DID LOOK AT THE CALCS.

14 MS. WILLIAMS: AND AGAIN, THESE COMMENTS ARE UP TO  
15 THE REVIEWER. AND IF HE FEELS LIKE NOTING THAT INFORMATION  
16 BECAUSE IT'S GOING TO BE HELPFUL LATER ON TO RECALL WHAT THE  
17 INFORMATION WAS THAT WE SAW, IT'S UP TO HIM TO WRITE WHATEVER  
18 HE WANTS IN THE COMMENTS SECTION. BUT IT DOESN'T MEAN THAT  
19 THAT'S THE BASIS FOR CHECKING SATISFACTORY OR UNSATISFACTORY.  
20 IN THIS CASE WE DID LOOK AT THE CALCULATIONS.

21 MR. FOLEY: THERE IS BASICALLY A THREAT OF, I GUESS,  
22 OF FOUR DIFFERENT STAGES WHERE WE TRIED -- WHICH WE TRIED TO  
23 USE TO DETERMINE THE DESIGN ADEQUACY OF THE SYSTEM, STARTING  
24 WITH THE INPUTS WHICH AS WE INDICATED EARLIER.

25 GOING BACK TO, SAY, THE WESTINGHOUSE INPUTS, FOR EXAMPLE,  
26 WHICH WE TOOK AS GIVENS, ESPECIALLY IN THE CASE OF  
27 WESTINGHOUSE EQUIPMENT. WE LOOKED TO SEE IF THOSE INPUTS WERE  
28 IN FACT, USED IN THE CALCULATIONS AND ALSO THAT THE



1 CALCULATIONS WERE PROPERLY DONE, IN OUR OPINION.

2 AFTER HAVING REVIEWED THE CALCULATIONS, WE LOOKED  
3 PROCUREMENT DOCUMENTATION TO SEE THAT THE NUMBERS THAT WERE  
4 USED AS INPUTS IN THE CALCULATIONS WERE THE SAME AS THE  
5 NUMBERS USED IN PROCUREMENT DOCUMENTATION. AND, FINALLY, WE  
6 USED FIELD REVIEW SUCH AS LOOKING AT NAMEPLATE RATINGS ON  
7 PUMPS, HEAT EXCHANGERS, WHATEVER, TO CONFIRM THAT WHAT WAS  
8 ACTUALLY INSTALLED IN THE FIELD AGREED WITH THE THREE PRIOR  
9 DOCUMENTS.

10 SO THE FACT THAT WE SAY WE LOOKED AT THE SPEC HERE  
11 TO DETERMINE THAT THE NUMBERS WERE AS WE THOUGHT THEY SHOULD  
12 HAVE BEEN DOESN'T IMPLY THAT WE DIDN'T LOOK AT THE OTHER PART  
13 OF THAT SCENARIO FROM INPUT CREW IMPLEMENTATION.

14 MR. NORKIN: DO YOU HAVE A SPECIFIC CHECKLIST THAT  
15 ADDRESSES THOSE ITEMS? I ACKNOWLEDGE THAT IT'S JUST TALKING  
16 ABOUT THE SPECIFICATION. DO YOU HAVE OTHER CHECKLISTS THAT  
17 YOU COULD POINT TO THAT ADDRESS THOSE AREAS AS FAR AS LOOKING  
18 AT THE CALCULATIONS?

19 MR. FOLEY: I BELIEVE THEY'RE IN THESE CHECKLISTS  
20 HERE.

21 MS. WILLIAMS: THE FLOW CALCS THAT FOLLOWED.

22 MR. HESS: IF YOU LOOK AT THE NEXT LINE ITEM, IT  
23 SAYS FLOW CALCULATION THROUGH RHR HEAT EXCHANGER AND IT GIVES  
24 A LIST OF THE THINGS THAT WE CHECKED. AND ONE OF THOSE THING  
25 THAT WE CHECKED WAS PUMP CURVE OPERATING POINT. SO FOR EACH  
26 ONE OF THESE FLOW PATHS, WE DID CHECK THAT THE PUMP FLOW WAS  
27 ON THE CURVE AND WITHIN THE CAPABILITIES OF THE PUMP AND THE  
28 SYSTEM.

1 MR. MARINOS: NEXT QUESTION -- HAVE WE FINISHED WITH  
2 THIS? 22. I CAN READ IT, BUT YOU GUYS HAVE COVERED IT, I  
3 THINK, HAVEN'T YOU? OR YOU WANT ME TO READ IT FOR THE RECORD?

4 HOW WAS THE COMBINATION OF FLOW ORIFICES AND/OR  
5 BALANCE VALVES FOR THE VARIOUS LOADS, PARENTHESES, RHR, CS, I  
6 CETERA, CLOSE PARENTHESES, SHOWN TO BE ADEQUATE TO PREVENT  
7 FLOW STARVATION AT ANY SINGLE LOAD.

8 MR. HESS: WE VERIFIED THIS BY REVIEWING THE PUMP  
9 FLOW OR PIPE FLOW COMPUTER OUTPUT CALCULATION, ALL RIGHT, THAT  
10 THERE WAS SUFFICIENT CAPACITY TO PROVIDE THE REQUIRED FLOW TO  
11 ALL COMPONENTS. AND THE THING THAT WE HAVE NOT VERIFIED IS  
12 THE FINAL BALANCING OF THE SYSTEM BECAUSE THAT WAS OUTSIDE OF  
13 OUR SCOPE AS FAR AS START-UP TESTING AND ACTUALLY PRE-OP  
14 TESTING FOR FLOW BALANCING.

15 MR. FOLEY: WELL, AND IT HADN'T BEEN DONE AS OF THE  
16 TIME.

17 MR. HESS: AT THAT POINT.

18 MR. OVERBECK: DID YOU VERIFY THAT THERE'S ENOUGH C  
19 OR FLOW ORIFICE RESTRICTING CAPABILITY TO SATISFY THE  
20 BALANCING SYSTEM?

21 MR. FOLEY: WHERE IT ENDED UP IS, I BELIEVE, WAS FOR  
22 VARIOUS BRANCHES WITHIN THE SYSTEM, THIS COMPUTER PROGRAM WAS  
23 USED TO DETERMINE ADDITIONAL PRESSURE DROP WHICH WOULD BE  
24 REQUIRED TO BALANCE THE SYSTEM, ALL RIGHT. THIS PRESSURE DROP  
25 WAS AT THAT TIME IN THE PROCESS OF BEING USED IN  
26 SPECIFICATIONS TO GO OUT TO ORIFICE MANUFACTURERS TO PROVIDE  
27 ORIFICES TO GET THAT DELTA P IN THOSE PARTICULAR BRANCHES.  
28 AND THAT'S WHERE THE DESIGN WAS AT THE STAGE EITHER THROUGH

1 THE ORIFICES OR THROUGH THROTTLING VALVES.

2 MR. MARINOS: YOU DONE WITH THAT? WE'LL GO TO 23.

3 WERE THE INPUTS AND ASSUMPTIONS USED IN CALCULATIONS  
4 REVIEWED TO DETERMINE THE NEED FOR SUBSEQUENT VERIFICATION?  
5 DESCRIBE YOUR THRESHOLD ON USE OF UNDOCUMENTED ENGINEERING  
6 JUDGMENTS.

7 MR. CALVO: I THINK WE TOUCHED THIS A LITTLE BIT  
8 BEFORE.

9 MS. WILLIAMS: YES, I WAS GOING TO ANSWER THE SECOND  
10 PART FIRST AND WAS GOING TO ASK YOU A QUESTION ON THE FIRST  
11 PART. THE SECOND PART IS WE HAVE A LOT OF UNDOCUMENTED  
12 ENGINEERING JUDGMENTS THAT WE FOUND THROUGHOUT ALL THE  
13 DISCIPLINES ON THE PROJECT.

14 THE THRESHOLD, THAT'S A VERY DIFFICULT QUESTION.  
15 IT'S A JUDGMENT, AND WE HAVEN'T DEVELOPED A CRITERIA YET FOR  
16 WHAT'S ACCEPTABLE OR NOT, BUT WHAT WE HAVE DONE IS COUNTED THE  
17 INSTANCES WHERE IT'S HAPPENED. AND WE'RE STILL WORKING ON  
18 WHAT'S REASONABLE AND WHAT WE'LL DO IS OFFER AN OPINION IN  
19 THAT CASE. AND YOU WILL BE ABLE TO SEE FOR YOURSELF WHAT ALL  
20 THE INSTANCES WERE AND DECIDE IF YOU CONCUR WITH THAT OR NOT.

21 MR. OVERBECK: I THINK NANCY MISSED THE POINT OF  
22 WHAT I WAS TRYING TO DRIVE AT. THE TECHNICAL PEOPLE WHEN THE  
23 ARE GOING THROUGH A CALCULATION HAVE IN THEIR OWN MIND WHAT  
24 SHOULD BE -- WHAT'S AN ASSUMPTION AND WHAT'S A DESIGN INPUT  
25 AND WHAT THE REFERENCE IS AND WHETHER IT NEEDS TO BE VERIFIED  
26 AT A LATER DATE. AND I WAS WONDERING IF THERE IS SOME  
27 INSTRUCTIONS YOU GAVE YOUR TECHNICAL REVIEWERS PRIOR TO  
28 COMMENCEMENT OF INSTRUCTION ON NONENGINEERING JUDGMENTS AND



1 THEIR USE.

2 MS. WILLIAMS: ON US USING ENGINEERING JUDGMENT?

3 MR. OVERBECK: ON WHAT THEY ARE WILLING TO ACCEPT.  
4 I HAVE ONE OPINION OF ENGINEERING JUDGMENTS, YOU HAVE ANOTHER  
5 AND HE HAS ANOTHER. AND IN ORDER TO GET SOME UNIFORMITY IN  
6 THE REVIEW PROCESS ABOUT THE USE OF ENGINEERING JUDGMENTS, IT  
7 MIGHT HAVE BEEN HELPFUL TO HAVE SOME CRITERIA UP FRONT  
8 IDENTIFYING WHEN AN ENGINEERING JUDGMENT WAS USED AND WHERE  
9 THAT REFERENCE CAME FROM.

10 MS. WILLIAMS: WELL --

11 MR. OVERBECK: OR DID YOU JUST WAIT UNTIL YOU FOUND  
12 A PROBLEM IN THE DESIGN AND THEN YOU TRACED IT BACK TO  
13 NON-REFERENCED ENGINEERING JUDGMENT THAT WAS WRONG.

14 MS. WILLIAMS: WELL, THAT SITUATION HAS HAPPENED.  
15 AND I'M TRYING TO THINK HOW WOULD YOU -- HOW WOULD YOU SET ON  
16 A SET OF INSTRUCTIONS LIKE THAT? WOULD YOU TAKE EACH OF THE  
17 DISCIPLINES AND SAY EVERY TIME THEY DON'T SPECIFY AN INPUT,  
18 LET US KNOW? WE PRETTY MUCH DID DO THAT. WOULD YOU SAY EVER  
19 TIME YOU ARE LOOKING AT A PUMP CALCULATION, HERE'S AS FAR AS  
20 YOU CAN TAKE YOUR JUDGMENT?

21 YOU'RE DEALING WITH, HOPEFULLY, PEOPLE WITH YEARS OF  
22 EXPERIENCE AND THEY KNOW WHAT'S REASONABLE WITHIN THE INDUSTRY  
23 AND THERE'S CLEARLY SOME JUDGMENT THAT GOES INTO EVERYONE'S  
24 BACKGROUND IN WHAT THEY DEEM TO BE REASONABLE.

25 BUT AS FAR AS THE PURE QA SENSE OF THE WORD, WE  
26 TRIED WHAT WE THOUGHT WAS A REASONABLE EFFORT TO ASSESS  
27 WHETHER THE CALCULATIONS WERE COMPLETE IN THE SENSE OF THE  
28 DOCUMENTATION AND, OF COURSE, THEY'RE NOT IDEAL. NONE OF THE

1 WERE.

2 MR. OVERBECK: I GUESS THE REASON THE QUESTION WAS  
3 RAISED IN MY REVIEW OF THESE IN THE CHECKLIST, I SAW VERY FE  
4 INSTANCES WHERE IT WAS IDENTIFIED THAT AN INPUT OR ASSUMPTIO  
5 WAS NOT PROPERLY REFERENCED.

6 MS. WILLIAMS: UH-HUH.

7 MR. OVERBECK: AND SO I SAW -- IN FACT, I THINK I  
8 SAW NONE. MAYBE THERE ARE SOME HERE, BUT THERE ARE FEW, SO  
9 NATURALLY I RAISED THE QUESTION BECAUSE IN OUR REVIEWS WE  
10 TYPICALLY FIND THAT TO BE PREVALENT.

11 MS. WILLIAMS: OKAY --

12 MR. OVERBECK: THEREFORE, I WANTED TO KNOW IF ANY  
13 INSTRUCTION HAD BEEN GIVEN TO THE TECHNICAL REVIEWERS AND --

14 MS. WILLIAMS: YES, THERE WAS INTERPLAY BETWEEN OUR  
15 QA PEOPLE TELLING THEM, YOU KNOW, WE NEED TO CHECK FOR THE  
16 INPUT. I HAVE NOT PERSONALLY SAT DOWN WITH THIS GROUP OF  
17 PEOPLE HERE TO GO THROUGH WHAT THEIR ASSESSMENT WAS IN THESE  
18 CALCULATIONS. IF YOU TAKE ANY OF OUR OTHER CHECKLISTS FROM  
19 THE OTHER DISCIPLINES, YOU WILL CLEARLY SEE THAT.

20 BUT THOSE HAPPEN TO BE THE DISCIPLINES THAT I HAVE  
21 SPENT THE TIME WITH GOING THROUGH AND HAVE NOT SPENT THE TIME  
22 WITH THESE YET. NONE OF THE CHECKLISTS ARE FINAL. WE SENT  
23 THESE TO YOU SO WE COULD HAVE SOME DISCUSSION AND, HOPEFULLY,  
24 GET YOUR FEEDBACK, BUT I HAVEN'T COMPLETED EVERYTHING ON THIS  
25 YET AND PARTICULARLY HAVEN'T COMPLETED ANY OF THE QA TYPE  
26 ASPECTS OF THESE CHECKLISTS.

27 MR. MARINOS: WE WILL GO TO THE NEXT QUESTION.

28 QUESTION NUMBER 24. HOW WAS IT ASCERTAINED THAT THI

1 BREAK LEAKAGE VALUES WERE CONSERVATIVE?

2 MR. OVERBECK: THIS IS IN REFERENCE TO CHECKLIST  
3 MS-06, SHEET 2  
4 OF 4.

5 MR. HESS: OKAY. 2 OF 4, THE CRITERIA THAT WAS --  
6 IS STATED THERE IN THE COMMENTS COLUMN FOR MODERATE ENERGY  
7 LINE BREAK.

8 MR. FOLEY: THOSE WERE THE CRITERIA USED FOR THE 58  
9 GPM.

10 MR. OVERBECK: THE ANSWER IS YES AND THE QUESTION  
11 WAS, HOW DID YOU MAKE A DETERMINATION, WHAT EFFECT DID THE  
12 PRESSURE -- WELL --

13 MR. NEVSHEMAL: COULD YOU REPEAT YOUR ANSWER, PLEASE

14 MR. HESS: WELL, THE -- OKAY, IT SAYS THE MODERATE  
15 ENERGY LINE BREAK -- IF YOUR MS-06, SHEET 2 OF 4, ITEM 7, AND  
16 IT GIVES THE THINGS THAT WERE USED FOR A 24-INCH PIPE WHICH I  
17 THE LARGEST PIPE IN THE SYSTEM, AND THE BREAK SIZE THAT WAS  
18 USED IN THEIR CALCULATION FOR A MODERATE ENERGY LINE BREAK.

19 MR. NEVSHEMAL: ESSENTIALLY, WHAT YOU ARE SAYING  
20 HERE IS THAT BECAUSE THEY USED EQUATION 3-21 FROM CRANE, THAT  
21 IT IS CONSERVATIVE.

22 MR. HESS: I THINK THAT'S REFERRING TO YOUR NEXT  
23 QUESTION WHICH QUESTIONS CRANE 3-21.

24 MR. NEVSHEMAL: NO, BUT IT'S WRITTEN DOWN HERE IN  
25 THE COMMENT COLUMN.

26 MR. HESS: I REALIZE THAT, BUT YOUR NEXT QUESTION  
27 REFERS TO MS-02, SHEET 3 OF 7, AND IT'S REFERRING TO EQUATION  
28 3-21.



1 MR. OVERBECK: THAT'S OUR NEXT QUESTION.

2 MR. NORKIN: STICK TO ONE QUESTION AT A TIME.

3 MR. NEVSEHAL: WAIT A MINUTE. IF YOU LOOK AT MS-(

4 SHEET 2 OF 4 -

5 MR. HESS: YES.

6 MR. NEVSEHAL: -- 7-C, YOU COME ACROSS TO THE  
7 COMMENT COLUMN --

8 MR. HESS: RIGHT. AND IT REFERENCES EQUATION 3-21  
9 OF CRANE.

10 MR. NEVSEHAL: AND SO WHAT YOU'RE SAYING TO ME,  
11 THEN, IS THAT BECAUSE THEY USED THAT FORMULA, THEN THE FLOW  
12 THE LEAK RATES ARE CONSERVATIVE.

13 MR. HESS: NO, THAT'S NOT TOTALLY WHAT I'M SAYING.  
14 I'M SAYING THAT THEY USE THE PROPER METHOD FOR A MODERATE  
15 ENERGY LINE BREAK, BREAK SIZE AND THEN THEY USED THAT BREAK  
16 SIZE AS AN ORIFICE SIZE IN CRANE 3-21. CRANE 3-21 IS FOR  
17 FLOW-THROUGH NOZZLES AND ORIFICES, AND IT ASSUMES A FOR SHAR  
18 EDGE OR SMOOTH EXIT. A BREAK CRACK IS NOT A SMOOTH OR SHARP  
19 EDGED THING. THAT EQUATION DOES NOT ACCOUNT FOR TURNING OF  
20 THE FLOW IN THAT TYPE OF ANALYSIS. EMPIRICAL EQUATIONS FOR  
21 THAT TYPE OF BREAK TEND TO PREDICT LOWER RESULTS THAN WHAT  
22 3-21 PREDICTS.

23 MR. NEVSEHAL: LOWER FLOW RATES?

24 MR. HESS: YES, SIR.

25 MR. NEVSEHAL: SAME PRESSURE.

26 MR. HESS: SAME PRESSURES.

27 MR. MARINOS: OKAY. 25 IS ALREADY ANSWERED, TOO.

28 WE HAVE ADDRESSED 25, RIGHT. GO TO 26. DESCRIBE THE EXTENT

1 THE CCWS HEAT REMOVAL CAPABILITY WAS EXAMINED. IN PARTICULAR  
2 DESCRIBE THE EXTENT INPUT VALUES TO CCWS CALCULATIONS WERE  
3 VERIFIED, THAT IS, THE CONTAINMENT SPRAY HEAT EXCHANGER HEAT  
4 LOAD, THE HEAT REMOVAL CAPABILITY OF THE ULTIMATE HEAT SINK  
5 THROUGH THE SERVICE WATER SYSTEM, ET CETERA.

6 MR. HESS: OKAY. ALL HEAT LOADS ON THE CCW SYSTEM  
7 WERE IDENTIFIED THROUGH REVIEW OF THE WESTINGHOUSE BOP FR-1.  
8 USE OF THESE HEAT LOADS IN THE GIBBS & HILL CALCULATIONS WERE  
9 VERIFIED, THE SPECIFICATIONS FOR THE MANUFACTURED EQUIPMENT  
10 SHOW AS HEAT EXCHANGERS, ET CETERA, WERE REVIEWED TO ASSURE  
11 THAT THOSE LOADS IMPOSED BY THESE SYSTEMS AGREE WITH THE  
12 VALUES USED IN THE CALCS, AND THE SAFE SHUTDOWN CALCULATION  
13 WAS REVIEWED TO ASSURE THAT THE INPUT LOAD TO THE CALCULATION  
14 AGREED WITH THE CCW HEAT EXCHANGER LOAD AND WHAT IT WAS  
15 DISSIPATING TO THE SSI.

16 MR. NORKIN: DO YOU HAVE A CHECKLIST THAT ADDRESSES  
17 THAT?

18 MR. FOLEY: I BELIEVE THERE IS.

19 MR. HESS: I BELIEVE THERE'S A CHECKLIST ITEM ON  
20 THAT, YES, SIR.

21 MR. NORKIN: I KNOW WE DIDN'T -- WE DIDN'T REFERENC  
22 A CHECKLIST. IT'S ALMOST LIKE WE DIDN'T SEE IT.

23 MR. OVERBECK: WHILE SOMEBODY IS LOOKING FOR THE  
24 CHECKLIST, LET ME QUESTION YOUR ANSWER -- YOUR RESPONSE.

25 THE WESTINGHOUSE BOP DOCUMENT HAS A VALUE FOR A HEA  
26 EXCHANGE -- CONTAINMENT SPRAY HEAT EXCHANGER HEAT REMOVAL  
27 REQUIREMENTS WITH TIME? AND IF IT DOES, HOW IS THAT PLAN  
28 SPECIFIC TO COMANCHE PEAK?

1 MR. HESS: THAT DOCUMENT PROVIDES DATA, GENERIC DA  
2 FOR PLANTS VERSUS NUMBER OF LOOPS, NUMBER OF LOOPS IN SERVICE  
3 AND HEAT LOAD PER UNIT AND MILLIONS OF BTU PER HOUR.

4 MR. OVERBECK: FOR THE CONTAINMENT SPRAY SYSTEM?

5 MR. HESS: RESIDUAL HEAT REMOVAL.

6 MR. FOLEY: YES, I THINK SO.

7 MR. HESS: YES, I'M LOOKING FOR IT RIGHT NOW.

8 MR. OVERBECK: THE DESIGN OF THE CONTAINMENT SPRAY  
9 SYSTEM, WHOSE SCOPE AND DESIGN ON COMANCHE PEAK?

10 MR. MARINOS: ARE YOU ASKING WHETHER IT'S  
11 WESTINGHOUSE OR GIBBS & HILL.

12 MR. NORKIN: MOST PLANTS IT'S THE A/E'S. I HAVEN'T  
13 SEEN ANY PLANTS WHERE IT'S NOT THE A/E'S RESPONSIBILITY.  
14 ARCHITECT ENGINEER. GIBBS & HILL WOULD TYPICALLY HAVE THE  
15 CONTAINMENT SPRAY SYSTEM FOR DESIGN.

16 MR. HESS: IT'S NOT ADDRESSED.

17 MS. WILLIAMS: WE DON'T KNOW.

18 MR. HESS: WE DON'T KNOW.

19 MR. OVERBECK: OKAY. THE CONCERN I HAVE IS THAT YO  
20 CANNOT USE THE WESTINGHOUSE FUNCTIONAL REQUIREMENTS AS DESIGN  
21 CRITERIA FOR THIS SYSTEM THAT THEY MUST REFERENCE THE  
22 APPROPRIATE DESIGN CALCULATION. THE DESIGN INPUT IS REQUIRED  
23 FOR THE CONTAINMENT SPRAY SYSTEM HEAT LOAD, THAT IT MUST COME  
24 FROM DESIGN CALCULATIONS ASSOCIATE. THAT'S WHY THE QUESTION  
25 WHERE DO THEY COME FROM? YOU TOLD ME YOU HAVE TAKEN IT FROM  
26 WESTINGHOUSE FUNCTIONAL REQUIREMENTS.

27 MR. HESS: LET ME CORRECT ONE THING. IN THE BOP  
28 FR-1 IT GIVES THE RESIDUAL HEAT REMOVAL SYSTEM LOADS. IT DOES



1 NOT GIVE, AS I'M LOOKING THROUGH IT, THE CONTAINMENT SPRAY.  
2 WE WOULD HAVE TAKEN THE CONTAINMENT SPRAY HEAT EXCHANGER LOAD  
3 FROM THE SPECIFICATION FOR THE CONTAINMENT SPRAY HEAT  
4 EXCHANGER. THE OTHER SIDE OF THAT -- CONTAINMENT SPRAY SIDE  
5 OF THE HEAT EXCHANGER WOULD NOT HAVE BEEN IN OUR SCOPE.

6 MR. OVERBECK: SO YOU DID NOT, FOR THE HEAT LOAD  
7 CALCULATIONS, YOU DID NOT VERIFY, YOU DID NOT GO BACK AND  
8 VERIFY THE DESIGN INPUT AND HOW THEY WERE ARRIVED AT?

9 MR. FOLEY: THAT'S CORRECT.

10 MR. OVERBECK: YOU ACCEPTED WHATEVER DESIGN WAS IN  
11 THE CALCULATION AS BEING THE CORRECT ONE.

12 MR. HESS: IN ORDER TO LIMIT OUR SCOPE, THAT'S  
13 CORRECT, OR ELSE WE WOULD HAVE HAD TO DO THAT ON EVERY  
14 CALCULATION ON EVERY HEAT EXCHANGER THAT THE CCW SERVED.

15 MR. FOLEY: CONTROL ROOM AIR CONDITIONER AND  
16 CHILLERS, FOR EXAMPLE, YOU KNOW, WE DID NOT VERIFY SOMEBODY  
17 WENT THROUGH AND SAID THERE WERE SO MANY --

18 MR. OVERBECK: THERE ARE SOME LOADS ON THE CCW  
19 SYSTEM THAT ARE A LITTLE MORE IMPORTANT THAN CHILLER LOADS AND  
20 SMALL PUMP LOADS, AND CONTAINMENT SPRAY IS AN A/E FUNCTION  
21 WHICH, IF CHECKED, IS SIGNIFICANT.

22 MR. FOLEY: NEVERTHELESS, WAS NOT PART OF OUR SCOPE.

23 MR. OVERBECK: OKAY. LET ME TAKE IT DOWN THE NEXT  
24 STEP. HEAT COMES INTO THE CCW SYSTEM, I GET SOME HEAT BACK --  
25 SOME TEMPERATURE CHANGE AND I HAVE TO TRANSFER THAT TO THE  
26 ULTIMATE HEAT SINK. YOU DID NOT GO PAST THE CCW INTERFACE TO  
27 THE ULTIMATE HEAT SINK.

28 MR. HESS: WE ONLY LOOKED AT THAT INTERFACE AS FAR

1 AS THAT THE HEAT BEING REJECTED BY THE CCW HEAT EXCHANGER WAS  
2 INCLUDED IN THE SSI CALCULATION -- SAFE SHUTDOWN AND  
3 IMPOUNDMENT CALCULATION AS FAR AS THE HEAT LOAD AND THE  
4 TEMPERATUARES MATCHED AS FAR AS THE TEMPERATURE OF THE POND,  
5 MAX SUMMERTIME TEMPERATURE.

6 MR. NORKIN: YOU WERE GOING TO TELL ME WHAT  
7 CHECKLIST ADDRESSED THIS PARTICULAR ITEM.

8 MR. FOLEY: I STOPPED WORKING ON IT. WE GOT ON TO  
9 ANOTHER SUBJECT HERE.

10 MR. OVERBECK: CYGNA WOULD NOT HAVE -- CYGNA WOULD  
11 NOT HAVE DELTA HEAT SINK CALCULATION HERE IN YOUR FILES.

12 MR. HESS: THE SSI CALC, I BELIEVE, IS ONE THAT WE  
13 REQUESTED.

14 MS. WILLIAMS: LET ME SEE IF WE HAVE IT.  
15 SSI HEAT LOADS?

16 MR. HESS: YES.

17 MS. WILLIAMS: NO, WE HAVE NOT RECEIVED THAT YET,  
18 BUT WE DID REQUEST IT.

19 MR. OVERBECK: AND THE CONTAINMENT SPRAY SYSTEM HEA  
20 REJECTION RATES, THE CALCULATION TO DEVELOP THAT CONTAINMENT  
21 PRESSURE AND TEMPERATURE ANALYSIS, YOU DON'T HAVE THAT, EITHE

22 MR. HESS: WE DID NOT HAVE IT AND DID NOT REQUEST I

23 MS. WILLIAMS: WAIT A MINUTE. THE SSI HEAT LOADS,  
24 THERE'S TWO DIFFERENT REVISIONS TO IT THAT LOOKS LIKE WE DON'  
25 HAVE THE ONE ON JANUARY 1980, BUT HERE IT IS AGAIN, 4-4-84.  
26 IS THIS ONE OF THE ONES THAT WAS REVISED? SO WE DO HAVE THE  
27 SSI 1984 VERSION. WE JUST DON'T HAVE THE 1980.

28 WOULD YOU LIKE US TO GET BACK TO YOU ON THIS

1 CHECKLIST QUESTION? OKAY.

2 MR. NORKIN: THIS CALCULATION NUMBER 10 ON YOUR LIST  
3 OF CALCULATIONS, IS THAT THE ONE YOU SAID YOU REQUESTED YOU  
4 HAVEN'T RECEIVED, THE SSI HEAT LOADS?

5 MS. WILLIAMS: WAIT A MINUTE. I SAW THAT LISTED IN  
6 MORE THAN ONE PLACE HERE. LET ME FIND THAT AGAIN.

7 MR. NORKIN: THAT'S THE ONE DATED APRIL 14TH, '84.

8 MS. WILLIAMS: YES, HOLD ON A MINUTE. GO TO NUMBER  
9 23.

10 MR. NORKIN: IT'S NUMBER 10 ON MY LIST.

11 MS. WILLIAMS: YES, IT'S THE SAME THING. LET ME SEE  
12 IF IT'S THE SAME DATE. SAME THING ON ITEM 23 AND I JUST  
13 HAPPEN TO HAVE CHECKED IT OFF ON MY SHEET AS HAVING RECEIVED  
14 ITEM 23 AND THE TWO ITEMS ARE THE SAME.

15 SO WE DO HAVE ITEM 23 WHICH IS THE CALCULATION I  
16 THINK YOU ARE INTERESTED IN. THIS LIST WAS PUT TOGETHER VERY  
17 HURRIEDLY, SO THERE IS A COUPLE OF REPEATS IN THERE.

18 MR. NEVSHMAL: LET ME ASK A CLARIFICATION QUESTION  
19 ON THIS APPENDIX A TO THE RECORD, I GUESS THAT'S WHAT WE'RE  
20 CALLING THIS LIST --

21 MS. WILLIAMS: ATTACHMENT 1.

22 MR. NEVSHMAL: SORRY, ATTACHMENT 1.

23 IS THIS THE LIST OF CALCULATIONS THAT YOU HAVE  
24 REVIEWED IN DEPTH OR WHAT IS THIS LIST? IS THIS ONE THAT YOU  
25 WOULD LIKE TO REVIEW OR SOME THAT YOU HAVE REVIEWED OR SOME  
26 THAT YOU HAVE REQUESTED OR WHAT IS THIS LIST?

27 MS. WILLIAMS: THEY ARE VARYING DEGREES OF WHETHER  
28 THEY WERE AN INPUT OR WHETHER IT'S SOMETHING WE EXTRACTED SOME



1 INFORMATION FROM OR WHETHER WE DID A LINE FOR LINE VERY  
2 DETAILED REVIEW.

3 THIS PARTICULAR LIST WAS PUT TOGETHER BY BOB AND  
4 MYSELF FROM CHICAGO IN ORDER TO GET COPIES OF THE CALCULATION  
5 HERE TO DISCUSS THEM WITH YOU PEOPLE. AND THE REASON WE  
6 DIDN'T HAVE THEM IN THE FIRST PLACE WAS BECAUSE WE CONDUCTED  
7 THE REVIEW IN GIBBS & HILL'S OFFICES AND AT THAT TIME WE WERE  
8 NOT PERMITTED TO TAKE THE CALCULATIONS WITH US.

9 MR. NEVSHMAL: SO YOU HAVE LOOKED AT EVERY ONE OF  
10 THESE CALCULATIONS.

11 MS. WILLIAMS: IN ONE FORM OR ANOTHER.

12 MR. OVERBECK: SOME OF THEM WERE VERY IN-DEPTH.

13 MS. WILLIAMS: RIGHT, EXACTLY. BUT THIS IS NOT A  
14 NEW LIST OF CALCULATIONS WE WANT TO LOOK AT. IT'S JUST THAT  
15 WE DIDN'T HAVE HARD COPIES OF THEM.

16 MR. MARINOS: SHALL WE FINISH UP WITH THIS AND DO  
17 THE ELECTRICAL TOMORROW? FINISH TODAY.

18 MR. MORRIS: BEFORE WE FINISH, MAY I MAKE A QUESTION  
19 ON THIS LIST? ATTACHMENT 1, I NOTICE THAT THERE ARE A FEW  
20 ELECTRICAL CALCULATIONS THAT ARE NOT REFERENCED IN THE  
21 CHECKLIST AND, CONVERSELY, THERE ARE A FEW CALCULATIONS THAT  
22 ARE REFERENCED IN THE CHECKLIST AND NOT ON THE LIST.

23 MS. WILLIAMS: IT'S POSSIBLE.

24 MR. MORRIS: IS THERE ANOTHER LIST SOMEWHERE?

25 MS. WILLIAMS: NO. NO, SOMETIMES THE CHECKLIST --  
26 YOU HAVE TO REMEMBER, THESE CHECKLISTS ARE REALLY WORK SHEETS  
27 AND WE TRIED TO GET THEM AS TYPED UP AND NICE AND UP TO DATE  
28 AS WE CAN SO THAT YOU CAN GET A FEEL FOR OUR REVIEW, BUT THEY

1 ARE NOT 100 PERCENT EVERY LITTLE NIT AND PIECE OF INFORMATION  
2 WE LOOKED AT.

3 THIS LIST OF DOCUMENTS REVIEWED WAS DEVELOPED FROM  
4 THE REVIEWERS WHO MAINTAIN A LIST OF DOCUMENTS REVIEWED DURING  
5 THE COURSE OF THEIR REVIEW, BUT EVERY DOCUMENT HERE DOESN'T  
6 NECESSARILY GET ANNOTATED IN THE CHECKLIST.

7 MR. MORRIS: AND ALSO SOME OF THE CALCULATIONS  
8 LISTED HERE HAVE REVISION NUMBERS AND SOME OF THEM HAVE DATES  
9 AND SOME OF THEM HAVE BOTH.

10 WILL THE FINAL LIST OF DOCUMENTS REVIEWED HAVE THE  
11 REVISION DATES ON THERE?

12 MS. WILLIAMS: I HADN'T THOUGHT ABOUT IT. WE CAN DO  
13 THAT.

14 MR. NORKIN: REVISION ENDING.

15 MS. WILLIAMS: OKAY.

16 MR. OVERBECK: REALLY WE NEED THAT.

17 MR. HESS: THE -- WHERE THE HEAT LOADS WERE ASSESSED  
18 ARE IN MS-01, ITEM 3, AND IN THE COMMENTS COLUMN THAT  
19 SPECIFICALLY REFERENCES CALCULATION 233-16 WHICH IS THE  
20 SHUTDOWN IMPOUNDMENT.

21 MR. NORKIN: MS-01.

22 MR. HESS: MS-01, PAGE 1, ITEM 3.

23 MR. MORRIS: AND ONE FINAL QUESTION.

24 IS THERE A SIMILAR LIST FOR THE SPECIFICATIONS AND  
25 DRAWINGS AND OTHER DOCUMENTS? IS THAT AVAILABLE?

26 MS. WILLIAMS: YES. I HAVE GOT SOMEONE PULLING THAT  
27 TOGETHER FOR YOU RIGHT NOW.

28 MR. CALVO: WE DON'T HAVE NO MORE QUESTIONS. I

1 THINK WE CAN ADJOURN THIS MEETING, BUT BEFORE WE DO, I WANT T  
2 THANK CYGNA FOR -- FOR BEING SO RESPONSIVE TO ALL OUR  
3 QUESTIONS, ACKNOWLEDGE THE FACT THAT YOU HAVE NOT QUITE  
4 FINISHED YET, AND THAT YOU HAVE A LOT OF WORK THAT NEEDS TO B  
5 DONE. AND I HOPE THE INFORMATION THAT WE'RE ASKING YOU GIVE  
6 YOU SOME KIND OF INSIGHTS OF WHAT WE FEEL THAT WE NEED SO WE  
7 CAN AT LEAST UNDERSTAND WHAT YOU ARE DOING.

8 MS. WILLIAMS: ABSOLUTELY. IT'S VERY HELPFUL TO ME  
9 AS A MATTER OF FACT.

10 MR. CALVO: AND, AGAIN, SO YOU KNOW -- THE OTHER  
11 THING -- AGAIN, ALSO GIVE US AN INSIGHT OF HOW THIS OVERALL  
12 PHASE 4 IS GOING TO FIT IN IN THIS OVERALL MATRIX THAT WE HAD  
13 TO COME UP TO THE ORIGINAL ASSURANCE. IT'S NOT ONLY WHAT YOU  
14 ARE DOING, WHAT OTHER PEOPLE HAVE DONE, LINKED TOGETHER SO WE  
15 CAN COME UP WITH A CONCLUSION WHETHER THIS IS ACCEPTABLE OR  
16 NOT ACCEPTABLE.

17 WITH THAT, FINISH THIS MEETING AND WE SEE YOU ALL  
18 TOMORROW. WHAT TIME WOULD YOU LIKE TO GO TOMORROW. OFF THE  
19 RECORD.

20 (MEETING ADJOURNED TO WEDNESDAY, MAY 22, 1985.)  
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ORIGINAL

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TEXAS UTILITIES CPRT MEETING

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CYGNA ENERGY SERVICES

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WEDNESDAY, MAY 22, 1985 - 9:30 A.M.

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101 CALIFORNIA STREET, SUITE 1000

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SAN FRANCISCO, CALIFORNIA

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1 MS. WILLIAMS: ARE YOU READY, JOSE?

2 MR. CALVO: TODAY IS MAY THE 22ND, 1985. IT IS THE  
3 SECOND DAY OF THE MEETINGS BETWEEN CYGNA AND THE NRC STAFF AND  
4 THEIR CONSULTANTS.

5 I GUESS THE OTHER PEOPLE PARTICIPATING IN THE  
6 MEETING ARE REPRESENTATIVES FROM THE TEXAS UTILITIES COMPANY,  
7 REPRESENTATIVES FROM GIBBS & HILL, AND TERRA CORPORATION AND  
8 IS ANY OTHER ORGANIZATION BEING REPRESENTED AT THIS MEETING  
9 THAT IS PRESENT HERE?

10 LET THE RECORD INDICATE THERE IS NO OTHER  
11 ORGANIZATION BEING REPRESENTED AT THIS MEETING.

12 I GUESS THE PURPOSE OF THE MEETING IS TO CONTINUE  
13 WITH THE DISCUSSION OF THE QUESTIONS SUBMITTED TO CYGNA BY THE  
14 NRC ON MAY 3RD, 1985 AND THE RESPONSES TO THE QUESTIONS WILL  
15 BE DOCUMENTED AS PART OF THE RECORD OF THIS MEETING AND,  
16 THEREFORE, THERE WILL ABOUT NO FURTHER MEETING TO RESPOND IN  
17 WRITING TO THE NRC TO THESE QUESTIONS.

18 AS WAS INDICATED THE FIRST DAY, AT THE END OF THE  
19 MEETING WE WILL PROVIDE THE OPPORTUNITY TO ALL THE PEOPLE  
20 BESIDES CYGNA AND THE NRC TO ENTER ANY COMMENTS THEY WANT INTO  
21 THE PUBLIC RECORD. ALSO, I MAKE THE SAME REQUEST THAT I MAKE  
22 THE FIRST DAY, THAT I WOULD LIKE TO HAVE A COPY OF THE  
23 TRANSCRIPT OF THE MEETING TO BE FORWARDED TO MR. VINCE NOONAN,  
24 DIRECTOR OF THE COMANCHE PEAK PROJECT.

25 AND THAT'S ALL I HAVE TO SAY AT THE PRESENT MEETING.  
26 I'M PASSING TO NANCY WILLIAMS, OF CYGNA, TO SEE WHAT YOU WANT  
27 TO DO THIS MORNING.

28 MS. WILLIAMS: OKAY, WE HAVE TWO NEW PEOPLE HERE

1 THAT I'LL INTRODUCE FIRST. THERE IS AL MOERSFELDER BACK HERE  
2 AND BOB PORTER NEXT TO HIM FROM OUR CHICAGO OFFICE.

3 WE HAVE PREPARED A LIST OF WHAT WE THINK WAS  
4 INFORMATION WE OWED YOU FROM YESTERDAY AND I WOULD LIKE TO  
5 START BY GOING THROUGH THAT AND PREPARING WHAT RESPONSES WE  
6 HAVE AVAILABLE AT THIS POINT IN TIME.

7 THE FIRST QUESTION I HAD DOWN WAS, DOES GIBBS & HILL  
8 HAVE ANY MECHANICAL SEPARATION CRITERIA. AND WITH THE  
9 DOCUMENTS THAT WE HAD IN-HOUSE, WE WERE UNABLE TO FIND ANY  
10 SUCH CRITERIA LISTED ANYWHERE LAST NIGHT. AS WE NOTED  
11 YESTERDAY, WE DID CHECK THE ORIENTATION AND THE SEPARATION OF  
12 THE MECHANICAL COMPONENTS FOR ANY PROBLEMS WITH MISSILES.

13 THE SECOND QUESTION I HAVE IS IN TWO PARTS, DEALING  
14 WITH THE SYSTEM TEMPERATURES, AND ONE OF THEM REGARDED THE  
15 HEAT-UP TEMPERATURES FOR THE SURGE TANK SIZING AND BOB HESS  
16 HAS SOME DETAILS ON THAT FOR YOU RIGHT NOW.

17 MR. HESS: OKAY. WE WENT BACK AND RECHECKED THE  
18 CALCULATION AND THE TEMPERATUAES USED FOR SIZING OF THE SURGE  
19 TANK WAS A HEAT-UP FROM 40 DEGREES TO A MAXIMUM CCW OUTLET  
20 TEMPERATURE, HEAT EXCHANGER INLET TEMPERATURE, I'M SORRY, OF  
21 170 DEGREES.

22 MS. WILLIAMS: ANY QUESTIONS? OKAY.

23 THE SECOND PART DEALT WITH, I BELIEVE, THE  
24 TRANSMITTAL OF THE SYSTEM TEMPERATURE INFORMATION TO THE PIPE  
25 STRESS ANALYSIS GROUP IN GIBBS & HILL. WHAT I DID WAS TO --  
26 WELL, TALK WITH THE MECHANICAL PEOPLE TO UNDERSTAND WHAT WE  
27 REVIEWED AND, SECONDLY, TO TALK TO OUR PIPE STRESS PEOPLE TO  
28 SEE WHAT DOCUMENTS THEY HAD REVIEWED.



1           AND WHAT I FOUND WAS THAT OUR MECHANICAL PEOPLE  
2 REVIEWED THE CCW TEMPERATURE PROFILE CALCULATION WHICH  
3 PRODUCES THE TEMPERATURES AND SPOT CHECKED A MEMORANDUM WHICH  
4 IS PRODUCED BY THE GIBBS & HILL MECHANICAL GROUP, A CONTROLLED  
5 MEMORANDUM WITH A NUMBER, WHICH IS SUBSEQUENTLY TRANSMITTED TO  
6 THE GIBBS & HILL PIPE STRESS ANALYSTS FOR USE IN THE PIPE  
7 STRESS ANALYSIS.

8           OUR PIPE STRESS REVIEWERS CHECKED THAT MEMO AND ITS  
9 IMPLEMENTATION INTO THE PIPE STRESS ANALYSIS, SO THAT WAS THE  
10 MEANS OF TRANSMITTING THE TEMPERATURE DATA BETWEEN THE TWO  
11 GIBBS & HILL GROUPS. AND THAT'S IT ON SYSTEM TEMPERATURES  
12 THAT I HAD, UNLESS THERE IS ANY OTHER QUESTIONS.

13           THE THIRD ITEM I HAD DEALT WITH SOME QUESTIONS ON A  
14 COMMENT WHICH WE HAD REGARDING PUMP RUNOUT FLOW ON MECHANICAL  
15 CHECKLIST MS-01, ITEM 5, SHEET 2. I BELIEVE BOB HAS SOME  
16 CLARIFICATION ON THAT AT THIS TIME.

17           MR. HESS: OKAY. THE PUMP SPECS STATED THAT THE  
18 PUMP FLOW REQUIREMENTS WERE 14,700 GPM AT 226 FEET A HEAD FOR  
19 DESIGN AND 16,400 GPM AT 210 FEET FOR RUNOUT. THE ACTUAL PUMP  
20 RUNOUT PER THE VENDOR CURVE WAS APPROXIMATELY 18,000 GPM AT  
21 196 FEET A HEAD WHICH EXCEEDS THE SPECIFIED REQUIREMENT. HEAD  
22 AT 16,400 GPM IS APPROXIMATELY 212 GPM WHICH MEETS THE  
23 SPECIFIED REQUIREMENT OF HAVING 210 AT SIXTEEN-FOUR.

24           MR. NEVSHMAL: I THINK YOU STATED YESTERDAY THAT  
25 YOU HAD LOOKED AT THE CALCULATIONS TO DETERMINE THAT THE  
26 SYSTEM WOULD BE ABLE TO SUPPORT THAT FLOW RATE.

27           ARE YOU SAYING NOW YOU HAD NOT LOOKED AT THE  
28 CALCULATIONS IN ANSWER TO ITEM 5? YOU JUST LOOKED AT THE

1 PURCHASE SPEC?

2 MR. HESS: NO, WE'RE NOT SAYING THAT. THE QUESTION  
3 THAT YOU HAD YESTERDAY, AS I RECALL, WAS WHY THAT COMMENT WAS  
4 IN THERE BASED ON THE TD-029 AND BOP FR-1. AND I WAS JUST  
5 TRYING TO GIVE YOU AN EXPLANATION OF WHY THOSE NUMBERS WERE  
6 RECORDED IN THE COMMENTS COLUMN AND THE MEANINGS OF THEM.

7 MR. NEVSHEMAL: OKAY.

8 MS. WILLIAMS: SHOULD WE RETURN TO THE CHECKLIST AND  
9 GO THROUGH THAT OR DOES THAT NOT ANSWER YOUR QUESTION PERHAPS?

10 MR. OVERBECK: NO, WE FEEL THAT TO VERIFY THAT --  
11 CHECK THAT COMMENT, NEEDED TO LOOK AT THE CALCULATIONS AND THE  
12 PROCUREMENT SPEC WAS NOT THE PRIMARY DOCUMENT YOU WOULD LOOK  
13 AT TO CHECK THE CALCULATIONS. AND THEN GO TO THE PROCUREMENT  
14 SPEC AND MAKE SURE YOU BOUGHT THAT KIND OF PUMP. THAT'S WHAT  
15 WE WOULD HAVE EXPECTED. WE WOULDN'T EXPECT THAT THAT  
16 COMMENT -- WE WERE CONCERNED THAT COMMENT WAS THE BASIS FOR  
17 PUTTING A YES IN THE CHECKLIST, AND YOU INDICATED YESTERDAY  
18 THAT THAT WAS NOT THE BASIS.

19 MR. FOLEY: THAT'S CORRECT.

20 MR. HESS: THAT'S CORRECT, THAT WAS NOT THE BASIS.  
21 WE DID REVIEW THE CALCS.

22 MR. FOLEY: AND THAT PROCEDURE YOU IDENTIFIED OF  
23 REVIEWING THE CALCS FIRST AND THEN THE SPEC WAS, IN FACT, THE  
24 ORDER OF SEQUENCE THAT THE JOB WAS DONE.

25 MS. WILLIAMS: OKAY. SO WE'RE SAYING THAT WE DID  
26 WHAT I THINK YOU ARE SAYING WOULD BE EXPECTED TO DO TO CHECK  
27 THAT ATTRIBUTE ON THE CHECKLIST.

28 MR. NEVSHEMAL: I GUESS THE ONE THING THAT I AM

1 INTERESTED IN, IS THERE ANYTHING THAT YOU HAVE THAT CAN SHOW  
2 ME THAT YOU INDEED LOOKED AT THE CALCULATION TO ANSWER THAT  
3 ITEM NUMBER 5? BECAUSE IF I WAS TO TRY TO ANSWER THAT NUMBER  
4 5, WHAT I WOULD WRITE IN THE COMMENTS WAS THAT I LOOKED AT  
5 CALCULATION SO AND SO, REVISION THIS DATE, TO THIS DATE, AND I  
6 FOUND THIS, AND THEN I WENT TO THE SPEC.

7 I CAN THINK OF A SCENARIO WHERE I WOULD JUST WANT TO  
8 LOOK AT THE PURCHASE SPEC TO FIND OUT IF THE FLOW RATES WERE  
9 LARGER THAN WHAT WAS ASKED FOR IN THOSE TWO DOCUMENTS, THE  
10 WESTINGHOUSE DOCUMENT AND THE GIBBS & HILL DOCUMENT, AND STILL  
11 PUT A YES IN THERE.

12 SO WHAT I AM ASKING FOR AND WHAT I WOULD LIKE TO  
13 HAVE A FEEL IS THAT YOU INDEED DID FOLLOW THE PROCEDURE THAT  
14 WE DISCUSSED IN SOME WAY THAT I CAN PUT MY HANDS ON IT.

15 MS. WILLIAMS: OKAY. UNFORTUNATELY, THE COMMENTS IN  
16 THE COMMENTS COLUMN CHECKLIST AREN'T THAT DETAILED AND ALL  
17 REVIEWERS DON'T WRITE DOWN EVERY CALC AND EVERYTHING THEY  
18 LOOKED AT. WHAT THEY USE IS THE DOCUMENT REVIEW LIST TO  
19 DOCUMENT WHAT IT IS THEY LOOKED AT TO ANSWER THE QUESTIONS,  
20 AND THE TWO AREN'T MATCHED NECESSARILY VIA THE COMMENTS COLUMN.  
21 I DON'T KNOW IF YOU GUYS MAYBE HAVE SOME COMMENTS ON THAT.

22 MR. HESS: WELL, I THINK THE BASIC ANSWER TO YOUR  
23 QUESTION IS YES, WE CAN SHOW YOU THAT. FIRST OF ALL, THE  
24 CHECKLIST ITEM, IF YOU READ IT, IT SAYS IS SPECIFIED CCW PUMP  
25 FLOW SUFFICIENT TO MEET THE FLOW RATE SPECIFIED IN THE BOP  
26 FR-1 AND THE TD-029. AND THE ANSWER TO THAT COMMENT IS YES.

27 THE FOLLOW-ON TO THAT AS FAR AS WHERE WE LOOKED AT  
28 THE DETAIL CALCS STARTS RIGHT IN ITEM 6 WHERE WE'RE GOING



1 THROUGH THE CALCULATION OF FLOW THROUGH THE RHR HEAT EXCHANGER  
2 AND CONTINUES THROUGH THE REST OF THE CHECKLIST WITH THE FLOW  
3 THROUGH EACH OF THE LOOPS THAT WE ANALYZED. AND I THINK THEY  
4 ARE FAIRLY DETAILED ON THE FACT THAT THEY GIVE YOU THE THING  
5 THAT WE CHECKED AS FAR AS MERCHANT FACTOR, FLOW COEFFICIENTS,  
6 PIPE GEOMETRY, PUMP CURVE OPERATING POINT, PIPE SIZE, ET  
7 CETERA.

8 MR. NEVSCHEMAL: SO WHAT I HEAR YOU SAY NOW IS THAT  
9 IN TRYING TO ANSWER ITEM NUMBER 5 YOU LOOKED AT THE PURCHASE  
10 SPEC AND FOUND OUT THAT THE FLOW RATES ASKED FOR ON HEAD  
11 CURVES -- I MEAN THE FLOW RATES ON HEAD CURVES WERE LARGER  
12 THAN WHAT WAS ASKED FOR IN THOSE TWO DOCUMENTS, AND THAT TO  
13 ANSWER NUMBER 5, YOU REALLY DID NOT LOOK AT THE CALCULATION,  
14 BUT TO ANSWER OTHER QUESTIONS ON THE LIST, YOU DID LOOK AT THE  
15 CALCULATION, IS THAT CORRECT?

16 MR. FOLEY: YES.

17 ?? MR. NEVSCHEMAL: ANSWER, OKAY.

18 MS. WILLIAMS: NO MORE COMMENTS ON THAT ONE?

19 THE FOURTH ITEM I HAD WAS THE REQUEST FOR THE NUMBER  
20 OF MISSING CALCULATIONS FOUND DURING THE MECHANICAL REVIEW.  
21 WHAT WE HAVE DONE IS BROKEN THAT INTO TWO CATEGORIES. THE  
22 FIRST IS THOSE WHICH WE HAVE REQUESTED FROM GIBBS & HILL, BUT  
23 NOT YET RECEIVED. I'M REFERRING TO THE ONE WE DISCUSSED  
24 YESTERDAY WHERE IT WAS NOTED WITH NO CALCULATION NUMBER, WE'RE  
25 RE-REQUESTING IT TO SEE IF IT IS SOMEWHERE IN THEIR FILES, BUT  
26 TO DATE WE HAVE NOT RECEIVED CALCULATIONS.

27 AND THE SECOND CATEGORY IS THOSE WHERE VIA A  
28 QUESTION THAT WE HAVE ASKED GIBBS & HILL HAS RESPONDED BY

1 PERFORMING ADDITIONAL CALCULATIONS THAT WERE APPARENTLY  
2 NECESSARY IN ORDER TO RESPOND TO OUR QUESTIONS AND UPDATING  
3 CALCULATIONS ACCORDINGLY.

4 IN THE FIRST CATEGORY FOR THOSE REQUESTED, BUT NOT  
5 RECEIVED, WE INCLUDE THE SIZING CALCULATIONS FOR THE VENT  
6 VALVE, RELIEF VALVE, AND VACUUM BREAKERS. IN ADDITION TO THAT,  
7 WE DID ASK FOR A WATER HAMMER CALCULATION, ALTHOUGH THIS WAS  
8 NOT PERHAPS TECHNICALLY REQUIRED IN THE PARTICULAR INSTANCE OF  
9 THIS SYSTEM AT THAT TIME, THEY HAD SOME JUSTIFICATION WHICH  
10 THEY PROVIDED FOR US VERBALLY AS TO WHY THEY DID NOT RUN A  
11 WATER HAMMER ANALYSIS. HOWEVER, THAT JUSTIFICATION WAS NOT  
12 DOCUMENTED ANYWHERE.

13 AND THEY HAVE A POLICY FOR WHEN THEY RUN WATER  
14 HAMMER CALCULATIONS WHICH EXCLUDED APPARENTLY RUNNING THE CCW  
15 SYSTEM AND THEY DID EVENTUALLY PROVIDE TECHNICAL JUSTIFICATION  
16 FOR IT IN THE PARTICULAR INSTANCE THAT WE ASKED ABOUT.

17 NOW I DON'T KNOW IF YOU WANT TO CONSIDER THAT A  
18 TECHNICAL MISSING CALCULATION.

19 MR. FOLEY: WE DO HAVE DOCUMENTATION ON THE  
20 RECORD -- THAT DOCUMENTS THE CONVERSATION AND THE  
21 JUSTIFICATION.

22 MS. WILLIAMS: ORIGINAL EXISTING DOCUMENTATION, THEY  
23 HAD NONE IN THE FILES.

24 MR. FOLEY: RIGHT.

25 MS. WILLIAMS: ALL OF OUR CONVERSATIONS ARE ON  
26 TELECONS. OKAY, TWO INSTANCES WHERE WE REQUESTED SOME  
27 INFORMATION WHICH RESULTED IN ADDITIONAL GIBBS & HILL  
28 CALCULATIONS WERE FOUND DURING THE MECHANICAL REVIEW, WHICH IS

1 THE SECOND CATEGORY.

2 MR. OVERBECK: WHICH ONES WERE THOSE, NANCY?

3 MR. HESS: THE TWO INSTANCES WHERE WE REQUESTED  
4 INFORMATION THAT RESULTED IN ADDITIONAL CALCULATIONS WAS, ONE,  
5 IN THE CONSIDERATION OF A 10-INCH LINE BREAK IN THE SYSTEM IN  
6 THE BOUNDARY BETWEEN SEISMIC AND NONSEISMIC EQUIPMENT. AND  
7 THE OTHER CASE WAS ON THE RADIOLOGICAL EFFECTS OF NOT CLOSING  
8 THE SURGE TANK VENT VALVE ON A HIGH RADIATION SURGE.

9 MR. OVERBECK: HOW DOES THAT VENT VALVE ARRANGEMENT  
10 REMOVED ON A CALCULATION. IS IT AN ECN OR SOME KIND OF DESIGN  
11 CHANGE? HOW DO YOU ACCOMPLISH THAT?

12 MR. HESS: THERE WAS DESIGN CHANGE PAPER WORK THAT  
13 JUSTIFIED THE REMOVAL BASE ON THE SPURIOUS ACTUATION OF THAT  
14 VALVE DUE TO SPURIOUS SIGNAL FROM THE RADIATION MONITOR UNDER  
15 CERTAIN CONDITIONS.

16 MR. OVERBECK: WAS THAT DESIGN CHANGE REVIEWED BY  
17 THE ARCHITECT/ENGINEER, GIBBS & HILL?

18 MR. HESS: YES, IT WAS.

19 MR. OVERBECK: IS THAT BEING IDENTIFIED AS A -- ANY  
20 KIND OF A PROBLEM?

21 MR. HESS: IT WAS IDENTIFIED IN OUR REVIEW, YES, AND  
22 HAS BEEN CLOSED OUT BASED ON THE...

23 MS. WILLIAMS: WELL, IT'S TECHNICALLY CLOSED OUT. I  
24 THINK HE'S ASKING FROM A DESIGN CONTROL STANDPOINT. I WANTED  
25 TO ASK YOU WHETHER THE CVC, THE CHANGE VERIFICATION CHECKLIST  
26 WAS STAMPED NO CALCULATION REQUIRED OR WHETHER THAT'S  
27 SOMETHING WE NEED TO CHECK.

28 MR. HESS: WE'D HAVE TO CHECK THAT.



1 MS. WILLIAMS: OKAY. THEY HAVE A PROCESS WHERE THEY  
2 DETERMINE AT GIBBS & HILL WHETHER CALCULATIONS ARE REQUIRED OR  
3 NOT AND WE MAY NOT AGREE WITH THE JUDGMENT THAT SAYS NO  
4 CALCULATION REQUIRED BUT THEY THEY MAY HAVE CHECKED THAT THEY  
5 DIDN'T BELIEVE AT THE TIME THERE WAS A CALCULATION REQUIRED.

6 MR. OVERBECK: ALL I'M DRIVING AT, IF THERE IS A  
7 CHANGE IN THE SYSTEM DESIGN, CHANGE OF SYSTEM FUNCTION THAT  
8 HAS TO BE REVIEWED BY GIBBS & HILL WHICH APPARENTLY THEY DID,  
9 AND THEY MISSED THE POINT WHY IT WAS THERE. SO THAT SHOULD BE  
10 IDENTIFIED IN THE REPORT AS SOME KIND OF PROBLEM.

11 MS. WILLIAMS: RIGHT.

12 MR. OVERBECK: THIS CCW SURGE TANK VENT VALVE,  
13 RELIEF VALVE, AND VACUUM BREAKER SIZING CALCULATION, WAS THAT  
14 SOMETHING THAT YOU WERE AWARE OF OR DID YOU ASK FOR THAT IN  
15 RESPONSE TO OUR QUESTION?

16 MS. WILLIAMS: NO, WE ASKED FOR THAT ORIGINALLY, AS  
17 I UNDERSTOOD IT.

18 MR. HESS: YES, WE HAD ASKED FOR THAT IN GIBBS &  
19 HILL'S OFFICES, AND IT WAS RETRANSMITTED AS A REQUEST WHICH  
20 WAS MAY 3RD ON THAT LIST AS DOCUMENTS THAT WE WERE STILL  
21 MISSING.

22 MS. WILLIAMS: THIS LIST WAS NOT PREPARED IN  
23 RESPONSE TO YOUR QUESTIONS. THIS LIST WAS SIMPLY AN ECHO OF  
24 OUR DOCUMENTS REVIEWED AND ONES THAT WE HADN'T RECEIVED YET  
25 FROM OUR REVIEW, SO THAT WE HAVE THEM HERE FOR YOU. IT WASN'T  
26 DIRECTLY IN RESPONSE TO YOUR QUESTIONS.

27 MR. OVERBECK: THANK YOU.

28 MS. WILLIAMS: OKAY, THE FIFTH THING I HAVE DEALS

1 WITH THE SURGE TANK OVERPRESSURIZATION IN THE EVENT THAT VENT  
2 VALVE LOSES POWER AND AS A RESULT FAILS SHUT. AND WE HAVE  
3 SOME ADDITIONAL INFORMATION FOR YOU ON THAT.

4 MR. HESS: FIRST OF ALL, I JUST WANT TO REITERATE  
5 WHAT WE STATED YESTERDAY IS IN THE -- IN OUR ANALYSIS, OUR  
6 ASSESSMENT, WE CONSIDERED THE RELIEF VALVE AND THE VACUUM  
7 BREAKER AS PASSIVE COMPONENTS AND DID NOT TAKE FAILURES OF  
8 THOSE ITEMS. WE CONSIDERED THE SINGLE FAILURE BEING THE VENT  
9 VALVE ITSELF.

10 IN REGARD TO THAT AS FAR AS OVERPRESSURIZATION, WE  
11 HAVE REVIEWED THE TANK SIZING CALC AND THE TEMPERATURE PROFILE  
12 CALCS AND HAD GONE BACK AND LOOKED AT THE INCREASE IN VOLUME  
13 FROM NORMAL OPERATING TEMPERATURE UNDER A LOCAL CONDITION AS  
14 TO WHAT THE INCREASE IN VOLUME WOULD BE. AND THE PRESSURE  
15 ACHIEVED IN THE TANK IS LESS THAN THE DESIGN PRESSURE OF THE  
16 TANK UNDER THOSE CONDITIONS WITH ALL VALVES CLOSED.

17 MR. OVERBECK: AND THAT'S STARTING AT 40 DEGREES AND  
18 HEATING UP TO 170?

19 MR. HESS: NO. THAT'S STARTING AT A NORMAL  
20 OPERATING TEMPERATURE OF A HUNDRED DEGREES.

21 MR. OVERBECK: I THINK WE HAVE TO LOOK AT THE DESIGN  
22 CONDITIONS TO ESTABLISH WHAT RELIEF VALVE SIZE YOU NEED,  
23 WHETHER THAT'S GOING TO WORK OR NOT.

24 MR. HESS: THAT IS SOMETHING THAT WE DID NOT  
25 SPECIFICALLY ASSESS AS FAR AS GOING FROM A 40 DEGREE  
26 TEMPERATURE WHICH IS -- FIRST OF ALL, IF YOU ARE AT A LOCAL  
27 CONDITION YOU ARE NOT GOING TO BE AT 40 DEGREES IN THE CCW  
28 SYSTEM. YOU ARE GOING TO HAVE SOME HEAT -- YOU HAVE BEEN

1 OPERATING, YOU HAVE A HEAT LOAD IN THE SYSTEM. 40 DEGREES IS  
2 BASICALLY A COLD START-UP.

3 MR. OVERBECK: I THINK THAT WHAT NUMBER YOU START AT  
4 HAS TO BE DEFENDED BY GIBBS & HILL. I SUGGEST YOU MIGHT GO  
5 BACK TO GIBBS & HILL AND LET THEM DEFEND THEIR DESIGN, BUT I  
6 APPRECIATE YOUR RESPONSE. I THINK YOU BETTER RELOOK AT  
7 WHETHER YOU CONSIDER THAT A PASSIVE COMPONENT OR NOT. THE  
8 VALVE HAS TO TAKE SOME MOVEMENT. SOMETHING HAS TO MOVE IN  
9 ORDER FOR IT TO WORK, SO IT'S JUST LIKE A CHECK VALVE.

10 MS. WILLIAMS: THEN THE LAST THING I OWE YOU IS A  
11 LIST OF DRAWINGS AND SPECIFICATIONS WHICH IS STILL UNDERWAY.  
12 I WAS JUST GOING TO DO THE MECHANICAL TO START WITH, SO THAT'S  
13 IT FOR MECHANICAL.

14 MR. NEVSHEMAL: MAY I ASK JUST ONE THING WITH  
15 RESPECT TO THE MECHANICAL. THIS IS ADD-ON TO THE VENT VALVE  
16 SIDE. WHAT ABOUT THE VACUUM BREAKER SIZING, COULD YOU GO OVER  
17 WHAT YOU INDICATED YESTERDAY AS TO HOW YOU VERIFIED THE SIZE  
18 OF THAT VACUUM BREAKER, OKAY.

19 MR. HESS: BASICALLY, WE RAN OUR OWN INDEPENDENT  
20 CALC AND LOOKED AT THE MAXIMUM OUTFLOW RATE FROM THE TANK AND  
21 TOOK THE 583 GPM MODERATE ENERGY LINE BREAK AS BEING THE  
22 OUTFLOW FROM THE TANK AND RAN A PRESSURE DROP CALC AIR FLOW  
23 CALC THROUGH THAT VALVE, THE VALVE'S OPENING PRESSURE IS DELTA  
24 P OF .2 PSI, THE MAX DELTA P TO FORCE THE AIR THROUGH THAT  
25 WOULD BE LESS THAN 2 PSI IN THAT CASE. AND WE ASSESS THAT THE  
26 TWO-INCH PIPING WAS ADEQUATE WITH THAT VALVE IN IT.

27 MR. NEVSHEMAL: DID YOU VERIFY THAT THE TANK INDEED  
28 COULD HANDLE A VACUUM 2 PSI?



1 MR. FOLEY: WE LOOKED THROUGH THESE -- WE RELOOKED  
2 THROUGH THE SPECIFICATION OF THE TANK AND AS OF THIS MORNING  
3 HAD NOT BEEN ABLE TO REVERIFY THAT.

4 MR. OVERBECK: AND THAT IS A QUESTION WE ASKED, WHAT  
5 WAS THE DESIGN CONDITION FOR THAT TANK IN VACUUM.

6 MR. NEVSHEMAL: SO AS I UNDERSTAND, WHAT YOUR  
7 CALCULATION INDICATES IS THAT THERE WILL BE A 2 PSI  
8 DIFFERENCE --

9 MR. HESS: LESS THAN 2 PSI.

10 MR. NEVSHEMAL: -- THAT CAN GO ALL THE WAY TO ZERO.

11 MR. HESS: THE EXACT NUMBER IS SOMEWHERE -- THAT I  
12 CALCULATED IS SOMEWHERE AROUND 1.4.

13 MR. OVERBECK: AND THE REASON YOU HAD TO DO THESE  
14 CALCULATIONS BECAUSE GIBBS & HILL HADN'T CONSIDERED THAT  
15 10-INCH LINE BREAK?

16 MR. FOLEY: NO. WELL, AS -- IN THE DOCUMENTS  
17 REQUESTED, THE SIZING OF THE VACUUM BREAKER AND THE RELIEF  
18 VALVE ARE, IN FACT, MISSING DOCUMENTATION AND, PRESUMABLY, IF  
19 WE GET THAT DOCUMENTATION, A LOT OF THESE QUESTIONS COULD GO  
20 AWAY, BUT THEY ARE RELATED TO THAT LACK OF INFORMATION.

21 MR. NEVSHEMAL: WHY DID YOU LOOK AT ONLY THE LEAK  
22 RATE AS THE GOVERNING ISSUE FOR DRAWING A VACUUM ON THE TANK?  
23 WHAT ABOUT START-UP OF A PUMP OR SOMETHING LIKE THIS, SECOND  
24 PUMP MAY BE STARTING UP, THE FIRST ONE OPERATING DRAWING ON  
25 THAT, GOING UP TO, NOT 600 GPM, BUT IN THE THOUSANDS, I THINK  
26 THAT'S NORMAL RATE OF SIZE OF VACUUM ON THE TANK.

27 MR. HESS: COULD YOU -- I'M NOT CLEAR ON YOUR  
28 QUESTION AS FAR AS WHAT YOU ARE TALKING ABOUT. THIS IS A

1 FILLED SYSTEM AND YOU ARE NOT DRAWING DOWN ON THE TANK WHEN  
2 YOU START THE PUMP. THE TANK IS A HIT TANK ON THE SYSTEM SO  
3 I'M NOT CLEAR ON WHAT THE EFFECT OF STARTING THE PUMP WOULD BE.

4 MR. NEVSHEMAL: WELL, WITH THE WHOLE SYSTEM AT REST,  
5 I WOULD VENTURE TO SAY THAT YOU ARE GOING TO BE DRAWING DOWN  
6 THE LEVEL IN THERE FAIRLY RAPIDLY ON THE PUMP START-UP EVEN IF  
7 YOU DO HAVE A FILLED SYSTEM.

8 MR. HESS: I DON'T SEE THAT HAPPENING IN THAT  
9 SCENARIO WITH ONE PUMP RUNNING AND STARTING THE SECOND PUMP.  
10 NOW, THE NORMAL LEAK RATE FROM THE TANK THAT WAS -- NORMAL  
11 DESIGN WAS 50 GPM, WE WENT TO THE MORE CONSERVATIVE NUMBER,  
12 583 MODERATE ENERGY LINE BREAK NUMBER. WE CONSIDERED THAT TO  
13 BE A CONSERVATIVE ANALYSIS.

14 MS. WILLIAMS: THAT'S ALL I HAVE.

15 MR. CALVO: ANY OTHER QUESTIONS?

16 MR. OVERBECK: WE HAVE SOME INFORMATION WE WOULD  
17 LIKE TO GATHER.

18 MR. CALVO: GO AHEAD.

19 MR. OVERBECK: WE CALLED IT YESTERDAY ATTACHMENT 1  
20 TO THE RECORD. WE WOULD LIKE TO HAVE SOME COPIES OF  
21 CALCULATIONS TO LOOK AT.

22 MS. WILLIAMS: OKAY.

23 MR. OVERBECK: AND WE ALSO NEED SOME DRAWINGS AND  
24 STUFF WHEN YOU HAVE THAT LIST. I'LL JUST GIVE YOU THE NUMBERS  
25 OFF OF THE ATTACHMENT 1. WHEN YOU GET THEM FROM GIBBS & HILL,  
26 WILL YOU PASS THEM ON TO US THROUGH THE NRC. 7, 9, 12, 15, 16  
27 21, 23, 24, 30, 41. THANK YOU.

28 MR. FOLEY: THOSE ARE OUR IDENTIFYING NUMBERS.

1 MS. WILLIAMS: YES, I HAVE THAT.

2 MR. CALVO: ANYTHING ELSE?

3 MR. OVERBECK: THIS IS THE ONLY THING WE KNOW. IF  
4 YOU HAVE GOT SOME OF THOSE CALCULATIONS THAT MIGHT BE  
5 AVAILABLE, WE CAN START LOOKING AT THEM TODAY.

6 MS. WILLIAMS: OKAY.

7 MR. OVERBECK: IT WOULD BE HELPFUL.

8 MR. CALVO: TOMORROW, AFTER WE FINISH WITH THE  
9 MECHANICAL AND ELECTRICAL INSTRUMENTATION, WE WILL PROVIDE  
10 WITH A SUMMARY OF OUR PERCEPTIONS ON HOW YOU -- AN INDEPENDENT  
11 DESIGN VERIFICATION FROM OUR STANDPOINT SHOULD INCLUDE. YOU  
12 GOT TO RECOGNIZE THE FACT THAT YOU HAD NOT FINISHED WITH YOUR  
13 DESIGN VERIFICATION AND SOME THINGS THAT OUR PERCEPTIONS MAY  
14 YOU HAD NOT INCLUDED, YOU MAY CONSIDER TO BE OUT OF THE SCOPE  
15 BUT, IN ANY EVENT, WE'RE GOING TO BE TELLING YOU THOSE THINGS

16 WITH THE NRC AND OUR CONSULTANTS PERCEIVE WHAT  
17 INDEPENDENT DESIGN VERIFICATION, KEEP IT IN MIND BOTH DEPTH  
18 AND BREADTH. THE REASON YOU TAKE A FLUID SYSTEM, WHAT THINGS  
19 IN FLUID SYSTEM SOMETIME ARE DONE IN DEPTH HELP YOU TO  
20 CORRELATE FLUID SYSTEMS SIMILAR TO THIS. WE WILL GIVE YOU  
21 WHAT KIND OF THINGS WE FEEL MAY BE UNCOMFORTABLE AT THIS TIME  
22 AND WE WILL PRESENT IT TO YOU WITH CONSIDERATION.

23 WE FEEL WITHIN THE SCOPE YOU HAVE COVERED, HOPING  
24 HAVE SOME DIALOGUE ONLY TO THE EXTENT THAT WE -- OUR  
25 PERCEPTIONS ARE CORRECT ON WHAT YOU ARE DOING. IF YOU FEEL  
26 THAT WE MISUNDERSTOOD YOU OR YOU HAD NOT CLARIFIED, I WOULD  
27 LIKE THOSE THINGS TO BE BROUGHT UP IN THE FRONT OF THE TABLE  
28 TOMORROW.



1 MS. WILLIAMS: OKAY, VERY GOOD.

2 MR. CALVO: AT LEAST WHEN WE LEAVE HERE WITH A CLEAR  
3 UNDERSTANDING HOW EVERYBODY STANDS AND, AGAIN, YOU HAD NOT  
4 FINISHED THIS THING UP AND CERTAINLY OTHER INFORMATION WILL  
5 COME INTO THE FUTURE THAT WILL HELP AT LEAST PROGRESS IN THE  
6 RIGHT DIRECTION IN TRYING TO UNDERSTAND WHAT YOU ARE DOING.

7 SO WE KNOW HOW THIS WILL FACTOR INTO THE OVERALL  
8 REASONABLE ASSURANCE FOR DESIGN QUALITY FOR THE COMANCHE PEAK  
9 PROJECT. THAT'S ALL I HAVE TO SAY NOW. I THINK IF YOU ARE  
10 READY, WE CAN GO BACK -- NOW IT'S TIME TO GO WITH THE  
11 ELECTRICAL SYSTEM AND I THINK I HAVE A SUGGESTION.

12 WHAT WE WERE TRYING TO DO WAS TRYING TO LOOK AT THE  
13 QUESTIONS THAT WE HAD FORWARDED TO YOU ON MAY THE 3RD, 1985  
14 AND WE'RE TRYING TO CLARIFY THOSE QUESTIONS INsofar AS RELATE  
15 TO WHAT KIND OF THINGS WE WANTED.

16 IF YOU FEEL THAT YOU NEED MORE TIME TO ANSWER THOSE  
17 QUESTIONS, FOR FURTHER CLARIFICATION, ASK AS MANY QUESTIONS  
18 THAT YOU HAD AND TRYING TO EXPLAIN THROUGH THE ELECTRICAL  
19 SINGLE-LINE DIAGRAM THIS IS EXACTLY WHAT IT MEANS.

20 AND I GUESS IF YOU ARE PREPARED TO SAY, YES, WE  
21 IT AND WE DID IT THIS WAY OR OUTSIDE THE SCOPE, LET'S SO  
22 INDICATE. IF YOU FEEL YOU REQUIRE MORE TIME, LET'S HAVE MORE  
23 TIME TO DO IT.

24 THE IMPORTANT PART IS YOU UNDERSTAND WHAT IS BEHIND  
25 OUR QUESTION AND WE CAN CLARIFY AS MUCH AS NECESSARY SO BE  
26 WE LEAVE HERE YOU GOT AN UNDERSTANDING OF WHERE WE'RE COMING  
27 FROM.

28 MS. WILLIAMS: WE'LL GO THROUGH THE RECORD AND WE

1       FILL IN WHERE WE HAVE TO.

2               MR. CALVO: IF YOU CAN'T GIVE ME THE ANSWER RIGHT  
3       NOW, WE DON'T NEED TO HAVE THAT, AS LONG AS YOU UNDERSTAND T  
4       QUESTION. AGAIN, IT'S OUR PERCEPTION WHAT WE FEEL THE  
5       ELECTRICAL SYSTEM FOR THE FLUID SYSTEM, WHAT KIND OF  
6       CONSIDERATION SHOULD BE GIVEN TO GET THE DEPTH AND THE BREAD  
7       OF THE SYSTEM. GEORGE?

8               MR. MORRIS: OKAY.

9               MR. CALVO: JOHN?

10              MR. KNOX: OKAY. THAT'S FINE WITH ME.

11              MR. CALVO: SO I GUESS IT WILL HELP IF EVERYBODY I  
12       HAVE THE SINGLE-LINE DIAGRAM OR ALL THE SUPPORT IN DIAGRAMS  
13       AND WHEN WE TALK TO THE QUESTION, WE CAN POINT TO YOU THOSE  
14       AREAS IN THERE TO INDICATE THIS IS WHAT WE MEAN, THIS IS WH.  
15       THE QUESTION INDICATES.

16              MS. WILLIAMS: JOSE, COULD WE TAKE A SHORT TIME O  
17       HERE?

18              MR. CALVO: SURE.

19              MS. WILLIAMS: WE'LL BE RIGHT BACK.

20              (RECESS.)

21              MS. WILLIAMS: WE'RE READY.

22              MR. MARINOS: SO I'M GOING TO START FROM THE  
23       BEGINNING OF THE ELECTRICAL QUESTIONS, NANCY, AND I'M GOING  
24       STATE THAT THE ELECTRICAL QUESTIONS ARE NUMBERED TO REFLECT  
25       EXACTLY THE NUMBERING SYSTEM YOU HAVE IN YOUR SUBMITTAL OF,  
26       WHAT IS IT, APRIL 29TH, AND WE START WITH THE CHECKLIST NUM  
27       EE-01, QUESTION 1, AND UNDER VOLTAGE AND SUB NUMBER A, WE I  
28       WAS THE VOLTAGE AT MOTOR REVIEW OR AT THE BUS.

1 MR. MARTIN: OKAY. AND MY REPLY WAS WORST CASE BU  
2 VOLT REVIEW CALCULATIONS 2323-III-7 AND 2323-III-8.

3 MR. MARINOS: DO YOU HAVE ANY QUESTIONS?

4 MR. MORRIS: YOUR REVIEW OF THAT WAS TO LOOK AT TH  
5 RESULTS OF THOSE CALCULATIONS, NOT THE METHOD?

6 MR. MARTIN: THE REVIEW OF THAT CALC WAS TO  
7 ESTABLISH -- BASICALLY WHAT THE FIRST CALC DID WAS TO  
8 ESTABLISH THE 69KV VOLTAGE LEVEL AT THE 69KV SWITCHGEAR AND  
9 WAS USED FOR PROCUREMENT PURPOSES OF THE SWITCHGEAR. SO IT  
10 WAS KIND OF BASIS FOR PROCUREMENT OF THE SWITCHGEAR AND IT  
11 CONSIDERED THE WORST CASE VOLTAGE.

12 MR. KNOX: THAT WAS CALCULATION 2323-III-8 OR 7,  
13 WAS THE WORSE CALC.

14 MR. MARTIN: THERE WAS TWO CALCS THERE, AND I THI  
15 IT'S -- 8 PROBABLY JUST REITERATES WHAT WAS DONE IN 7. THE  
16 WAS AN NRC QUESTION IN WHICH THEY REFINED OR REDUCED THE  
17 VOLUME OF III-7 AND TRANSMIT SOME INFORMATION TO ANSWER THE  
18 QUESTION.

19 MR. KNOX: WHAT WAS THE CONFIGURATION -- THE WORS  
20 CASE CONFIGURATION FOR THAT CALC?

21 MR. MARTIN: WORST CASE CONFIGURATION FOR THE CAL  
22 WAS WITH UNIT 1 FULLY -- THE FULL AUX LOAD OF UNIT 1 ON 138  
23 TRANSFORMER BUS XA1.

24 MR. CALVO: THIS 138 KV, THIS IS ONE OF TWO  
25 OFF-SITE -

26 MR. FOLEY: RIGHT, TWO OFF-SITE POWER SOURCES.  
27 ACTUALLY THE ALTERNATE OFF-SITE POWER SYSTEM, BUS XA1  
28 CONNECTED TO XST-1, XST-2 UNAVAILABLE, UNIT 2 MAX



1 START-UPS ESF LOAD ON EXT-1 EXCLUDING COMMON LOADS AND UNIT 1  
2 MAX AUTOSEQUENCE BLACKOUT LOAD WITH COMMON ON XST-1.

3 SO IN OTHER WORDS, WE'RE ON THE ALTERNATE OFF-SITE  
4 POWER SOURCE. UNIT 2 LOADS ARE ON THE SAME LOADS AS UNIT 1,  
5 AND THEY ARE ALSO IN CONSIDERING AN AUTOSEQUENCE BLACKOUT  
6 START ON THAT TRANSFORMER FOR UNIT 1.

7 MR. KNOX: AUTOSEQUENCE THAT MEANS YOU'RE SEQUENCIN  
8 ON -

9 MR. FOLEY: THE SAFEGUARDS LOAD TIME THE SAME WAY  
10 YOU WOULD ON THE DIESEL.

11 MR. KNOX: SEQUENCING VERSUS BLOCK LOAD.

12 MR. MARTIN: RIGHT.

13 MR. CALVO: CAN I SUMMARIZE THAT BY SAYING THAT --  
14 ASSUMING IF ONE OF THE OFF-SITE POWERS, ALTERNATE 138 KV AND  
15 YOU ARE ASSUMING YOU HAVE AN ACCIDENT ON ONE UNIT AND YOU SH  
16 DOWN -- REQUIRED FOR A SHUTDOWN ON THE OTHER UNIT, WASN'T TH  
17 IMPLY WHAT YOU'RE SAYING?

18 MR. KNOX: HE SAID TAKE THE MAXIMUM UNIT 2 LOADS A  
19 TAKE THOSE AND PUT THEM ON THE TRANSFORMER T-1.

20 MR. MARTIN: RIGHT.

21 MR. CALVO: FOR NORMAL CONDITIONS.

22 MR. KNOX: WELL, NO. MAXIMUM. IN OTHER WORDS, THE  
23 WORST CASE LOAD THAT YOU HAVE ON UNIT 2 IS GOING TO BE ON THE  
24 TRANSFORMER T-1 AND THEN YOU HAVE A DESIGN BASIS ACCIDENT OF  
25 UNIT 1 AND YOU SEQUENCE THE LOADS ON UNIT 1.

26 MR. CALVO: OKAY, ALL RIGHT. BUT -- ALL RIGHT, GO  
27 AHEAD.

28 MR. KNOX: IN THE FSAR THEY SAID THEY HAD THE

1 CAPABILITY OF HANDLING BLOCK LOADING, BUT THEY DIDN'T CHECK  
2 THAT LIST CALC.

3 MR. CALVO: FOR BLOCK LOADING?

4 MR. KNOX: THEY SAID THEY HAD THE CAPABILITY OF  
5 BLOCK LOADING ALL THE DESIGN BASIS ACCIDENT LOADS ON THE --  
6 GUESS ON THE BUS 1 EA 2 AND A-1 SIMULTANEOUSLY AND THE  
7 TRANSFORMER SHOULD BE ABLE TO HANDLE THAT TYPE LOAD.

8 MR. CALVO: WHY THE FSAR WORRIES ABOUT THAT, THE  
9 CAPABILITY OF DESIGN WAS TO SEQUENCE.

10 MR. KNOX: THAT'S FINE, BUT THEY SAID THEY HAD THE  
11 CAPABILITY, BUT THE DESIGN CALLS FOR THE SEQUENCING.

12 MR. CALVO: SO THAT PART WAS NOT CONSIDERED IN THE  
13 CALCULATION.

14 MR. KNOX: THAT'S RIGHT.

15 MR. CALVO: DID THEY CONSIDER IN THE CALCULATION,  
16 THE NORMAL -- THE WORST CASE CONDITION AS DEFINED WOULD BE  
17 THE LOADS CONNECTED TO ONE UNIT, THE ONE WITHOUT THE ACCIDE  
18 AND THE OTHER HAD THE ACCIDENT WAS SEQUENTIALLY CONNECTED.  
19 OKAY.

20 MR. KNOX: WE NOW HAVE A QUESTION ABOUT THIS BUS  
21 IS THAT THE COMMON BUS BETWEEN UNIT 1 AND 2 THAT HAS THE 70  
22 KW BORE LOAD ON IT?

23 MR. MARTIN: I REALLY DON'T KNOW. OUR SCOPE DIDN  
24 GO THAT FAR.

25 MR. KNOX: YOU HAD THE -- I'M TRYING TO UNDERSTAI  
26 WHAT THE BUS XA1 WAS. I DON'T HAVE IT ON MY DRAWING.

27 MR. CALVO: IS NOT THAT THE BUS COMING UP WITH T  
28 SECOND VALVE ON THE TRANSFORMER 6.9 KV? IT'S NOT THAT ONE

1 WHAT IS THE VOLTAGE OF THE SECOND VALUE OF THE TRANSFORMER  
2 COMING FROM THE 138 KV?

3 MR. KNOX: YES. I THINK THIS XA1 IS A NONSAFETY E  
4 I'M JUST TRYING TO UNDERSTAND WHICH BUS IT WAS.

5 MR. CALVO: DO YOU HAVE --

6 MR. KNOX: DO YOU HAVE THE ONE -- DO YOU HAVE THE  
7 IT'S NOT ON MY DIAGRAM. DO YOU HAVE THE FSAR FIGURE 831?

8 MR. MARTIN: I CAN GET IT.

9 MS. WILLIAMS: IS THIS THE SAME?

10 MR. MARTIN: NO, THIS SHOULD SAY --

11 MS. WILLIAMS: OKAY.

12 MR. MARTIN: DO YOU WANT ME TO GET IT NOW OR DO Y  
13 WANT TO --

14 MS. WILLIAMS: WILL IT TAKE VERY LONG?

15 MR. HESS: I'LL GO LOOK.

16 MR. MARTIN: I CAN GET IT. I KNOW WHERE IT'S AT.

17 (OFF THE RECORD.)

18 MS. WILLIAMS: BACK ON THE RECORD. MAKE SURE YOU  
19 IDENTIFY THE FIGURE, TOM.

20 MR. MARTIN: OKAY. WE'RE LOOKING AT DRAWING 2323  
21 E1-0001, REV 8.

22 MR. CALVO: GO BACK TO THE 138 KV INCOMING LINE A  
23 SHOW HOW THE THING GOES BACK TO THE EMERGENCY BUSES. NOW S  
24 HOW YOU COMING ONTO THERE AND WHICH BUSES THEY HIT. THAT'S  
25 WHAT WE NEED, OKAY.

26 MR. MARTIN: OKAY.

27 MR. CALVO: WELL, WE'RE TRYING TO UNDERSTAND WHEN  
28 THE X-1 COMES IN. DO YOU KNOW WHERE THE X-1 COMES IN? GO



1 AHEAD. YOU GO AHEAD. WE'RE ALL COMPETING FOR ATTENTION. GO  
2 AHEAD.

3 MR. MARTIN: OKAY. WE'RE COMING IN ON XST-1 WHICH  
4 IS A 138KV TO 69KV TRANSFORMER.

5 MR. CALVO: COMING TO XA1 THERE. I THOUGHT IT WAS  
6 6.9 KV.

7 MR. MARTIN: YES, COMING THROUGH -- COMING THROUGH  
8 THE 69KV WINDING THROUGH A SERIES OF BREAKERS AND --

9 MS. WILLIAMS: SPEAK UP A LITTLE, TOM.

10 MR. MARTIN: -- FEEDING BUS XA1.

11 MR. CALVO: WHAT IS THE VOLTAGE IN THE BUS?

12 MR. MARTIN: PARDON?

13 MR. CALVO: WHAT'S THE VOLTAGE ON THAT BUS?

14 MR. KNOX: 69.

15 MR. CALVO: 69. 6.9 KV.

16 MR. KNOX: THAT'S RIGHT.

17 MR. MARTIN: THESE ARE ALL 69KV BUSES.

18 MR. CALVO: 6.9, SO THE X-1 IS ON THE NONSAFETY  
19 RELATED BUSES. AND FROM THERE YOU MUST GO TO A

20 TRANSFORMER -- GOES TO A TRANSFORMER -- THIS IS A 41 SYSTEM

21 MR. KNOX: 69. THOSE ARE 69.

22 MR. CALVO: ALL RIGHT. SO BEFORE YOU COME INTO TH  
23 69, YOU ARE COMING THROUGH ANOTHER BUS RIGHT HERE.

24 MR. KNOX: NO, THAT'S A NONSAFETY BUS WITH A NUMBE  
25 OF LOADS SHARED BETWEEN THE TWO UNITS.

26 MR. CALVO: OKAY. AND THAT'S THE ONE THAT YOU  
27 NORMALLY HAVE THE REACTOR COOLING PUMPS CONNECTED TO, RIGHT?

28 MR. KNOX: NO, IT'S A DIFFERENT ONE. ONE A-1 HAS

1 THE REACTOR COOLANT PUMPS.

2 MY QUESTION IS THAT BUS XA1 IS TRIPPED OFF ON A  
3 NUMBER OF SIGNALS AND THE CALC, WAS THAT BUS INCLUDED IN THE  
4 CALCULATION, OTHER VOLTAGE CALCULATIONS.

5 MR. MARTIN: WAS BUS XA1 CONNECTED TO THE --

6 MR. KNOX: WAS IT INCLUDED IN THE CALCULATION?

7 MR. MARTIN: FOR THIS LOW VOLTAGE CASE. YES.

8 MR. KNOX: ALL THE LOADS IN THAT BUS WERE IN THE  
9 CALC, OKAY. THAT'S ALL I WANTED TO KNOW.

10 MR. MARINOS: ANYTHING ELSE, GEORGE? GO ON TO THE  
11 SECOND PART OF THE QUESTION NOW. 1(B). WE ARE ASKING HERE,  
12 DID THE GIBBS & HILL CALCULATION INCLUDE UTILITY DATA FOR  
13 SYSTEM SWINGS, AND WE HAVE IN PARENTHESES, MIN AND MAX VOLT;  
14 THROUGH BOTH THE PREFERRED AND ALTERNATE SOURCES OF OFF-SIT  
15 POWER.

16 MR. MARTIN: YES. 134 KV AND 142 KV WERE IDENTIF  
17 FOR THE 138 KV SYSTEM, AND 336 KV AND 354 KV WERE IDENTIFIE  
18 FOR THE 345 KV SYSTEM.

19 MR. MORRIS: WHERE DO THOSE NUMBERS COME FROM?

20 MR. MARTIN: THOSE WERE INPUT TO THIS CALCULATION

21 MR. MORRIS: FROM WHAT?

22 MR. MARTIN: THEY WERE REFERENCES FROM THE UTILIT  
23 I'M NOT SURE OF THE CORRECT TERMINOLOGY, BUT IT WAS THE SYS  
24 GRID VOLTAGE.

25 MR. MARINOS: AND THIS MINIMUM RESULTS DOWN TO TI  
26 87.5 PERCENT THAT YOU ASSUMED AT THE 6.9 KV BUS, IF I  
27 UNDERSTAND CORRECT.

28 MR. MARTIN: YES. THE 87.5 PERCENT WHICH I

1 IDENTIFIED IN THE COMMENT ON THE CHECKLIST WAS THE VOLTAGE -  
2 WORST CASE VOLTAGE OF THE 6.9 KV SWITCHGEAR.

3 MR. MARINOS: RESULTING FROM THOSE MINIMUMS AND  
4 MAXIMUMS YOU JUST STATED TO ME OF THE UTILITY DATA.

5 MR. MARTIN: CORRECT.

6 MR. KNOX: WAS THERE ANY EFFORT TO DETERMINE WHETHER  
7 THAT CONFIGURATION YOU CAN FIND AS TO WHAT WAS THE WORST CASE  
8 CONFIGURATION, THE WORST VOLTAGE DROP?

9 MR. CALVO: I THINK THEY ASSUMED THAT WAS -- YOU  
10 ACCEPTED THAT.

11 MR. KNOX: YOU ACCEPT THAT AS THE WORST CASE.

12 MR. CALVO: YES.

13 MR. MARTIN: YES.

14 MR. MARINOS: BETWEEN THE 6.9 KV BUS AND THE GRID  
15 SWINGS OF MINIMUM AND MAXIMUM VOLTAGES, YOU DID NOT LOOK AT  
16 THE CONFIGURATION OF THE SWITCHYARD OF THE PLANT BETWEEN TH  
17 TWO POINTS, THE 6.9 KV AND THE GRID.

18 MR. MARTIN: NO, WE DIDN'T.

19 MR. MARINOS: YOUR ONLY DATA 87.5 PERCENT MINIMUM  
20 VOLTAGE OF THE 6.9 KV AND YOU CONSIDERED THAT WITHOUT  
21 CONSIDERING ARRANGEMENTS OF THE SWITCHGEAR.

22 MR. MARTIN: RIGHT.

23 MR. MARINOS: THAT'S GOOD.

24 MR. MORRIS: THAT UTILITY DATA WAS INPUT TO WHICH  
25 CALCULATION?

26 MR. MARTIN: THE 6.9 KV SYSTEM VOLTAGE LEVELS.

27 MR. MORRIS: THAT'S CALCULATION NUMBER --

28 MR. MARTIN: 2327-III-7 AND III-8.



1 MR. MARINOS: WE'RE READY FOR THE FOLLOW-UP ON THE  
2 SAME 1(B). WE'RE ASKING YOU, DID THE CALCULATIONS INCLUDE  
3 VOLTAGE DIPS CAUSED BY LOADING THE DIESEL WHEN ONLY THE  
4 STANDBY SOURCE IS AVAILABLE.

5 AND LET ME CLARIFY THAT. WHAT WE'RE LOOKING FOR,  
6 AGAIN, A MINIMUM AND MAXIMUM VOLTAGE AT THE 6.9 KV BUS THAT  
7 YOU ASSUMED WHEN THE OFF-SITE POWER IS NOT AVAILABLE AND THE  
8 DIESEL GENERATOR IS AVAILABLE. DO YOU FOLLOW ME?

9 MR. CALVO: IT IS --

10 MR. MAGGIO: OKAY. I CAN RESPOND TO THAT. I  
11 BELIEVE WHAT I CAN SAY IS THAT WE DID NOT INCLUDE IN OUR  
12 REVIEW THE DIESEL GENERATOR SYSTEM AS BEING THE SUPPLY SOURCE  
13 THE REASON WE DIDN'T INCLUDE IT WAS WE FELT THAT THE DIESEL  
14 GENERATOR WAS NOT CONSIDERED TO HAVE CONTROLLED LOADING --  
15 SORRY. LET ME RESTATE THAT.

16 IT WAS CONSIDERED TO HAVE A CONTROLLED LOADING  
17 SEQUENCE WHICH WOULD ALLOW THE COMPONENT COOLING WATER PUMP  
18 HAVE ADEQUATE VOLTAGE TO START AND TESTING OF THE SYSTEM WO  
19 SHOW IF THERE WAS ANY SEQUENCING PROBLEM. SO WE FELT IT CO  
20 BE ALLOWED TO START THE MOTOR.

21 MR. MARINOS: THIS IS YOUR ASSESSMENT?

22 MR. MAGGIO: THAT WAS OUR ASSESSMENT.

23 MR. MARINOS: YOU LIMITED YOUR SCOPE ON THE BASIS  
24 THAT JUSTIFICATION?

25 MR. MAGGIO: BASED ON THAT, YEAH. WE FELT THAT T  
26 ANALYSIS WE DID WITH THAT WOULD BE MORE FRUITFUL.

27 MR. MARINOS: OKAY. WE WILL GIVE OUR COMMENTS  
28 REGARDING, YOU KNOW, WHETHER WE AGREE WITH YOUR TECHNICAL

1 ASSESSMENT OF THE DIESEL GENERATOR CAPABILITY.

2 MR. MORRIS: DID GIBBS & HILL HAVE THAT SAME  
3 JUSTIFICATION FOR NOT INCLUDING THAT IN THE YOUR CALCULATION  
4 OR DO YOU --

5 MR. MAGGIO: WELL, THERE IS A DIESEL GENERATOR  
6 SIZING CALCULATION, BUT WE DIDN'T REVIEW IT IN THIS REGARD.  
7 SO WE'RE NOT SAYING IT DIDN'T INCLUDE IT OR WE DIDN'T CONSIDER  
8 IT. WE'RE SAYING IN OUR ASSESSMENT WE CHOSE NOT TO INCLUDE IT.

9 MR. MARINOS: YOU LIMITED YOUR SCOPE --

10 MR. MAGGIO: BASELINE, YOU KNOW, BASELINE --

11 MR. MARINOS: -- SO YOU HAVE NO CALCULATION OR NO  
12 ASSESSMENTS?

13 MR. MAGGIO: OF THE DIESEL GENERATOR CAPABILITY.

14 MR. MARINOS: OKAY.

15 MS. WILLIAMS: BUT THEY MIGHT EXIST.

16 MR. MAGGIO: WE'RE SURE THAT THE CALC DOES EXIST.

17 MR. MORRIS: THE CALCULATION THAT YOU DID LOOK AT  
18 ONLY ADDRESSED THE OFF-SITE POWER SOURCE, IT DID NOT ADDRESS  
19 THE ON-SITE.

20 MR. MAGGIO: CORRECT.

21 MR. MARINOS: BUT YOURS WAS THE KIND OF DECISION --  
22 YOU MADE A TECHNICAL JUDGMENT THAT THE DIESEL GENERATOR IS  
23 SIZED CORRECTLY AND THE TESTS WILL PROVE THAT.  
24 IS THIS --

25 MR. MAGGIO: WE WERE CHECKING VOLTAGE AT THE 69KV  
26 BUS AND WE FELT THAT THIS ANALYSIS WOULD SATISFY A REQUIREMENT  
27 THAT THE MOTOR WOULD START BASED ON THE CASE THAT WE TOOK.  
28 DIDN'T MAKE --

1 MR. MARINOS: WHAT ANALYSIS, YOU DIDN'T LOOK AT ANY  
2 ANALYSIS.

3 MR. MAGGIO: ON THE ANALYSIS OF THE SYSTEM  
4 CONNECTION THAT WE DID LOOK AT.

5 MR. MARINOS: YOU'RE NOT TALKING ABOUT THE DIESEL.

6 MR. MAGGIO: NOT THE DIESEL, NO. THE DIESEL WAS NO  
7 WE DIDN'T CONSIDER THAT.

8 MR. MARINOS: GEORGE, YOU HAVE ANY MORE QUESTIONS (   
9 THAT?

10 MR. MORRIS: IN YOUR REPORT, DID YOU IDENTIFY THAT  
11 THAT WAS A MISSING INPUT TO THE VOLTAGE STUDY AT THE 6.9 KV?

12 MR. MAGGIO: NO, WE DIDN'T CONSIDER IT AS PART OF  
13 OUR CHECKLIST ITEM. IT'S NOT INCLUDED IN OUR LISTING.

14 MS. WILLIAMS: IT WOULD NOT BE MENTIONED BY VIRTUE  
15 OF THE FACT THAT IT WAS NOT IN THE SCOPE. WE DIDN'T LOOK AT  
16 THE CALCULATION.

17 MR. MAGGIO: WE ELIMINATED IT, SO WE DIDN'T FEEL I  
18 WAS A DEFICIENCY.

19 MS. WILLIAMS: YOU ALSO WILL NOT SEE THAT CALC IN  
20 OUR DOCUMENTS REVIEWED LIST, I BELIEVE, IS THAT CORRECT?

21 MR. MARTIN: YES.

22 MR. CALVO: TO SUMMARIZE, REGARDLESS WHERE THE  
23 VOLTAGE DIPS COME FROM, IF I HAVE IN THE COMPONENT COOLING  
24 WATER PUMP MOTORS AND VALVES CONNECTED TO THE DISTRIBUTION  
25 SYSTEM MOTOR CONTROL CENTERS, AND I'M ASSUMING THAT I GOT SC  
26 DIPS IN THERE, THEY CAN COME FROM THE OFF-SITE POWER SYSTEM,  
27 THEY CAN COME FROM THE DIESEL. YOU DON'T CONSIDER THAT ASPE  
28 REGARDLESS OF WHERE THEY COME FROM, YOU DON'T CONSIDER THAT



1 POSSIBILITY, YOU DID NOT CONSIDER IT.

2 MR. MARTIN: WAIT A MINUTE. WE DID REVIEW -- DOES  
3 CONSIDER THE DIPS THAT ARE EXPERIENCED ON A SEQUENCE LOAD-UP.

4 MR. CALVO: OKAY, ALL RIGHT. YOU CONSIDER, BUT ALL  
5 RIGHT, YOU ACCEPT IT.

6 MR. MARTIN: WE ACCEPTED THAT.

7 MR. CALVO: YOU NEVER VERIFIED WHAT KIND OF DIPS  
8 THAT WERE THIS BIG.

9 MR. MARTIN: THE INTENTION OF OUR REVIEW WAS TO  
10 IDENTIFY WHAT WE FELT CONFIDENT AS A 6.9 KV VOLTAGE LEVEL TO  
11 REVIEW THE SYSTEM DESIGN COMPONENT, COOLING WATER COMPONENTS

12 MR. MORRIS: OKAY, LET ME CLARIFY THAT. I THINK I  
13 JUST HEARD SOMETHING THAT I DIDN'T HEAR BEFORE. YOUR ANALYS  
14 OR YOUR REVIEW OF THAT CALCULATION DID, IN FACT, LOOK FOR TH  
15 VOLTAGE EXTREMES THAT YOU WOULD SEE FROM BOTH OFF-SITE AND  
16 ON-SITE.

17 MR. MARTIN: NO, THAT'S NOT WHAT I SAID.

18 MR. CALVO: WHEREVER THEY COME FROM.

19 MR. MORRIS: SEQUENCE.

20 MR. KNOX: SEQUENCE START-UP, JUST ON THE OFF-SITE

21 MR. MORRIS: JUST ON OFF-SITE, NOT ON --

22 MR. CALVO: THE QUESTION IS, IF YOU HAVE THE SAME  
23 THING ON THE ON-SITE YOU WOULD ARGUE IT WOULD KILL TWO BIRD  
24 WITH ONE STONE, BUT YOU HAVE NOT DONE THAT.

25 MR. STUART: A POINT OF CLARIFICATION. I THINK W  
26 I'M HEARING IS THAT YOU GUYS ASSUMED THAT THE GIBBS & HILL  
27 INPUT RELATIVE TO VOLTAGE DIPS AS INPUTS AND DID NOT VERIFY  
28 THOSE INPUTS TO FIND OUT WHETHER THEY ENCOMPASS BOTH ON-SIT

1 AND OFF-SITE POWER, IS THAT CORRECT?

2 MR. MARTIN: WELL, AS I --

3 MS. WILLIAMS: THAT'S CORRECT.

4 MR. STUART: THAT'S CORRECT, ISN'T IT?

5 MR. MARTIN: COULD YOU SAY THAT ONCE AGAIN.

6 MR. STUART: I'M NOT AN ELECTRICAL ENGINEER, SO I  
7 DON'T KNOW WHAT I'M TALKING ABOUT. BUT IT SEEMS TO ME THAT  
8 YOU ASSUMED AT THE BUS THAT WHATEVER WAS COMING INTO THE BUS  
9 WERE INPUTS INTO OUR REVIEW PROCESS AND YOU DIDN'T VERIFY  
10 THOSE INPUTS.

11 MR. MARTIN: CORRECT.

12 MR. PORTER: THAT'S RIGHT.

13 MR. STUART: SO I MEAN THAT MIGHT BE A SIMPLE WAY  
14 STATING, I THINK, WHAT'S GOING ON.

15 MR. MARINOS: THERE'S TWO INPUTS ONLY, A MINIMUM A  
16 A MAXIMUM. CORRECT ME IF I'M WRONG. BUT MY OWN  
17 UNDERSTANDING, YOU HAD A MINIMUM VOLTAGE, YOU'RE TALKING ABC  
18 87.5, AND WHATEVER THE MAXIMUM IS WHICH YOU NEVER TOLD US.  
19 WHAT WAS THAT MAXIMUM? YOU TOLD US SOME NUMBERS, BUT YOU  
20 DIDN'T GIVE US PERCENTAGES AND I CAN'T RETAIN THE NUMBERS.

21 MR. STUART: THAT'S CORRECT.

22 MR. MARTIN: THE MAXIMUM IS SOME -- I DON'T KNOW  
23 EXACT NUMBER. IT'S AROUND 7,040.

24 MR. MARINOS: WHAT PERCENT DOES THAT COME OUT?

25 MR. PORTER: CLICK, CLICK, CLICK, CLICK, 14.3.

26 MR. CALVO: ARE WE TOGETHER ON THIS ONE? I THINK  
27 ARE ALL CONFUSED. ARE WE TOGETHER ON THIS ONE? I THINK YO  
28 CONFUSED ME AGAIN. I HAVE A BUS IN HERE, AND A 6.9 KV

1 SUPPLIED BY THE DIESELS. FROM THAT BUS, I GO TO A COMPONENT  
2 COOLING WATER PUMP. WHAT IS THE VOLTAGE FOR THAT MOTOR?

3 MR. MARTIN: 6.9 KV.

4 MR. CALVO: ALL RIGHT. I'M GOING TO DISCONNECT THE  
5 DIESEL AND I'M GOING TO THROW AWAY THE -- DISCONNECT THE  
6 ON-SITE POWER SYSTEM, AND LOOK AT THE BUS, THAT BUS WITH THAT  
7 PUMP, FOR THE COMPONENT WATER COOLER PUMP, OKAY?

8 MR. MARINOS: IT'S NOT GOING TO WORK.

9 MR. CALVO: I'M GOING TO SHOW YOU BLACK MAGIC. ALL  
10 OF A SUDDEN, I'M GOING TO HAVE SOME SPIKES ON THAT BUS, OKAY,  
11 SOME UPS AND DOWNS, OKAY, AND I'M ASKING -- SO I'M LOOKING AT  
12 THE COMPONENT COOLING WATER PUMP MOTOR.

13 CAN THAT MOTOR BE ABLE TO PERFORM THE INTENDED  
14 FUNCTION OF START UNDER THOSE CONDITIONS, YOU HAPPEN TO GO L  
15 HAPPEN TO GO HIGH. AND YOU DON'T CARE WHERE IT COMES FROM.  
16 YOU GOT ALL THIS OTHER YOU FIND THERE.

17 MR. MARINOS: DID YOU PUT A VOLTAGE ON THAT ONE?

18 MR. CALVO: WHATEVER ARE THE SPIKES GOING TO BE,  
19 WHATEVER.

20 MR. MARINOS: WHERE DID THAT COME FROM?

21 MR. CALVO: SPIKES, WHATEVER.

22 MS. WILLIAMS: WE DIDN'T LOOK FOR THE --

23 MR. CALVO: FORGET ABOUT THE OFF-SITE POWER THAT'S  
24 CONFUSING EVERYBODY AND DIESEL CONFUSING EVERYBODY, ALL OF A  
25 SUDDEN YOU GOT A SPIKE. YOU DON'T KNOW WHERE THEY ARE COMIN  
26 FROM BECAUSE YOU ARE NOT ALLOWED TO KNOW WHERE THEY'RE COMIN  
27 FROM, OKAY? I WANT TO KNOW LOOKING AT THE MOTOR, CAN THAT  
28 MOTOR BE ABLE TO PERFORM THE INTENDED FUNCTION WHEN YOU GOT



1 THESE UPS AND DOWNS. I DON'T CARE. I UNDERSTAND THAT.

2 MR. MARTIN: YES, YES.

3 MR. CALVO: CAN YOU CONSIDER THOSE THINGS.

4 MR. MARINOS: WHAT IS YOUR ANSWER, YES?

5 MR. MARTIN: YES.

6 MS. WILLIAMS: YES. WE CHECKED THE PUMP AND, YES,  
7 IT'S OKAY.

8 MR. CALVO: AND DID YOU ALSO -- YOU SAY THAT YOU  
9 HAVE NOT VERIFIED THE FACT WHETHER THE SPIKES, FIRST OF ALL,  
10 WHATEVER THEY WERE, THE MAXIMUM, DO YOU ACCEPT IT. YOU NEVER  
11 VERIFY WHETHER THEY WERE ONE MILLIMETER LONGER OR ONE  
12 MILLIMETER SHORTER, OKAY? ALL RIGHT? THAT'S WHAT HE IS  
13 SAYING. THAT PART IS OUTSIDE THE SCOPE. NOW I UNDERSTAND IT.

14 MR. MARINOS: YES, BUT I DON'T.

15 MR. CALVO: YOU GOT A PROBLEM.

16 MR. MORRIS: THE VOLTAGE INPUTS THAT YOU ACCEPTED AS  
17 INPUTS TO THE CALCULATION WERE ONLY OFF-SITE POWER INPUTS.  
18 YOU DID NOT QUESTION --

19 MR. MARTIN: RIGHT, FOR THE REASONS WE STATED.

20 MR. MORRIS: AND THAT WAS --

21 MR. MARTIN: THAT WE FELT THE CASE WE LOOKED AT  
22 WHERE THE PUMP WAS A DIESEL GENERATOR CASE.

23 MR. MORRIS: BUT YOU DID NOT LOOK FOR INPUTS TO THE  
24 CALCULATION FROM THE ON-SITE VOLTAGE SWING?

25 MR. MARTIN: RIGHT.

26 MR. KNOX: DID YOU VERIFY ANY COVERAGE FROM THE  
27 DIESEL GENERATOR TANKS? DID YOU VERIFY THE SWINGS YOU SAW  
28 FROM THE OFF-SITE WOULD COVER THE DIESEL GENERATOR SWINGS?

1 MR. MARTIN: WE DIDN'T REVIEW THE DIESEL GENERATOR.

2 MR. NORKIN: ONE ADDITIONAL QUESTION. WERE YOU  
3 TALKING, JOHN? JOSE HAD A SCENARIO WHERE JUST LOOKING AT THE  
4 INPUT TO THE MOTOR, THE PUMP MOTOR AS A GIVEN, DO I IMPLY THAT  
5 YOU DID EVALUATE THE CALCULATION OF THAT INPUT BASED ON THE  
6 OFF-SITE POWER SWINGS?

7 MR. MARTIN: WE REVIEWED THE CALCULATION TO  
8 DETERMINE AN ACCEPTABLE LEVEL TO START OUR REVIEW WITH. WE  
9 REVIEWED THE INPUTS TO THE CALCULATION AND USED THE OUTPUT OF  
10 IT TO START OUR REVIEW.

11 MR. NORKIN: OKAY.

12 MR. KNOX: SO THE CALCULATION YOU USED WAS FOR THE  
13 WORST CASE THAT YOU DESCRIBED, OKAY, SO YOU DIDN'T GO THROUGH  
14 THE NORMAL CONFIGURATION WITH THE SWINGS YOU GET IF YOU DIDN'T  
15 LOSE YOUR OFF-SITE CIRCUIT?

16 MR. CALVO: I DON'T THINK SO. I THINK HE SAY, JOHN  
17 HE ACCEPTED THE WORST CASE FROM GIBBS & HILL. HE ACCEPTED.  
18 HE DIDN'T CHALLENGE IT TO KNOW IT WAS SOMETHING WORSE THAN  
19 THAT OR LESS THAN THAT. HE JUST ACCEPTED THAT ONE AS WELL AS  
20 THE MAXIMUM AND MINIMUM AND JUST AS INPUT TO THE CALCULATIONS

21 NOW WHETHER IT'S A WORST CASE IN THERE OR NOT, IT  
22 WAS OUTSIDE THE SCOPE.

23 MR. STUART: AND --

24 MR. NORKIN: DID GIBBS & HILL, IN FACT, SAY THE  
25 WORST CASE WAS THESE OFF-SITE SWINGS?

26 MR. CALVO: YES, THAT'S WHAT HE SAID.

27 MR. MARTIN: WE CAN'T MAKE THE STATEMENT THAT GIBBS  
28 & HILL SAID THAT.

1 MR. NORKIN: SO YOU CAN'T REALLY SAY THAT IT WAS A  
2 GIBBS & HILL GIVEN THAT THE WORST CASE WAS THE OFF-SITE VERSU  
3 THE DIESEL GENERATOR SWINGS?

4 MS. WILLIAMS: WE DON'T KNOW.

5 MR. MAGGIO: WE DIDN'T LOOK AT THE DIESEL GENERATOR  
6 SO WE DON'T KNOW THAT.

7 MR. NORKIN: I CAN UNDERSTAND IF GIBBS & HILL HAD  
8 MADE THAT STATEMENT, THEN YOU COULD HAVE STARTED, THAT WOULD  
9 BE YOUR START POINT AND JUST EVALUATED HOW THEY EVALUATED THA  
10 YES.

11 MR. MARINOS: LET ME GO NOW WITH THE NEXT PART OF  
12 THE SAME QUESTION. WE ASKED YOU, DID THE CALCULATION INCLUD  
13 DISTRIBUTION EQUIPMENT AS-BUILT DATA. AND MY UNDERSTANDING  
14 IS - I'M GOING TO GO BACK TO THE COMMENT OF THAT QUESTION  
15 NUMBER 1 IN THE ITEM 1(A) WHERE YOU SAY YOU ALSO REVIEWED  
16 GIBBS & HILL CALCULATION 2323-III-7, PERIOD. THE WORST CASE  
17 VOLTAGE CALCULATED AS 6036 VOLTS, PARENTHESES, 87.5 PERCENT.

18 NOW THE UNDERSTANDING I HAVE AS WE TALKED, YOU HAV  
19 TAKEN THIS 87.5 AS A GIVEN. YOU DID NOT VERIFY THAT ONE  
20 THROUGH COMING FROM THE GRID THROUGH YOUR IMPEDANCE  
21 TRANSFORMATIONS AND DOWN TO THE 6.9 KV. YOU DID NOT GO  
22 THROUGH TO CONFIRM THAT YOU WILL HAVE A 87.5. YOU TAKE IT /  
23 A GIVEN.

24 MR. MARTIN: CORRECT.

25 MR. MARINOS: SO THIS REVIEW REALLY DOES NOT REFL  
26 YOUR INDEPENDENT ASSESSMENT OF THE TWO POINTS BETWEEN GRID  
27 BUS.

28 MR. MARTIN: CORRECT.



(PAUSE.)

MR. MARINOS: ARE WE READY?

MR. MARTIN: THERE MAY BE ONE CLARIFICATION. ONE OTHER REASON THAT WE USED THIS CALCULATION AS OUR ASSUMPTION FOR LOW VOLTAGE WAS THAT IT WAS A CALCULATION THAT WAS USED TO PROCURE THE SWITCHGEAR.

MR. MARINOS: BY GIBBS & HILL.

MR. MARTIN: BY GIBBS & HILL. OR AT LEAST IT WAS A CALCULATION THAT PROVIDED THE INPUT FOR THE PROCUREMENT SPECIFICATION.

MR. MAGGIO: AND BASED ON THAT, WE DON'T KNOW WHERE THE DIP CAME FROM. WE PRESUME THAT IT WAS AN OFF-SITE DIP, IS THAT RIGHT?

MR. MARINOS: YES, WE'RE TALKING ABOUT OFF-SITE POWER.

MR. MAGGIO: OKAY. SO THAT WAS OUR ASSUMPTION. WE DON'T KNOW FOR SURE.

MR. MORRIS: HOW DID GIBBS & HILL USE THIS CALCULATION IN PREPARATION OF THE SPECIFICATION?

MS. WILLIAMS: WHAT WAS THIS INPUT TO? WHAT WERE THE RESULTS USED FOR?

MR. MARINOS: THE RESULTS -- SORRY.

MR. MARTIN: THE RESULTS WERE VERIFIED THAT THE 7. KV SWITCHGEAR WAS AN ACCEPTABLE LEVEL SWITCHGEAR.

MR. MORRIS: SO IT WAS JUST NOMINAL VOLTAGE OR MAXIMUM VOLTAGE OR, REALLY, WAS IT AN INPUT, JUST CALCULATED FOR MINIMUM VOLTAGE OR WAS IT AN INPUT TO THE SPECIFICATION FOR MINIMUM VOLTAGE.

1 MR. MARTIN: I'D HAVE TO GET BACK TO YOU ON THAT.

2 MR. MARINOS: YOU SAY THE 87.5 PERCENT WAS USED TO  
3 PROCURE SWITCHGEAR AS A MINIMUM VOLTAGE EXPECTED AT THAT BUS,  
4 SO THEY TOOK THAT NUMBER AND THEY WENT AND PURCHASED A  
5 SWITCHGEAR THAT WOULD BE ABLE TO PERFORM WITH THIS MINIMUM  
6 VOLTAGE. IS THAT --

7 MR. MARTIN: CORRECT. THAT MINIMUM VOLTAGE PLUS THE  
8 MAXIMUM VOLTAGE.

9 MR. MARINOS: PLUS THE MAXIMUM VOLTAGE. OKAY. NOW  
10 YOU DID NOT GO THROUGH THE CALCULATIONS FROM THE GRID THROUGH  
11 THE SWITCHYARD THROUGH THE TRANSFORMERS TO 6.9 KV TO CONFIRM  
12 THAT THE CALCULATION WAS TO YOUR LIKING.

13 MR. MARTIN: CORRECT.

14 MR. MARINOS: YOU DID NOT DO THAT.

15 MR. MARTIN: I DID NOT.

16 MR. CALVO: OUTSIDE THE SCOPE.

17 MR. MORRIS: MAYBE I SHOULD REPHRASE IT. HOW DOES  
18 THE MINIMUM CALCULATED VOLTAGE AFFECT THE SPECIFICATIONS.

19 MR. MARTIN: I DON'T HAVE THOSE DETAILS RIGHT OFF  
20 THE TOP OF MY HEAD.

21 MR. CALVO: MAKE A NOTE ABOUT THAT.

22 MS. WILLIAMS: DO YOU HAVE THE SPEC?

23 MR. MARTIN: WE SHOULD.

24 MAYBE I CAN CLARIFY IT ANOTHER WAY WITHOUT GETTING  
25 INTO THAT SPECIFIC DETAIL. THE REVISION OF THIS CALCULATION  
26 IS -- HAS GOT A COUPLE OF REVISIONS INPUTTING DATA TO IT FROM  
27 AS-BUILT INFORMATION THEY'VE GOT, AND IT IS DATED AFTER THE  
28 PROCUREMENT SPEC, SO IT WOULD BE A CHECK. MAYBE I SHOULD

1 REPHRASE IT, THAT IS A CHECK TO VERIFY THAT THE 7.2 KV  
2 SWITCHGEAR IS ADEQUATE FOR THE SYSTEM VOLTAGE.

3 MR. MARINOS: WHAT DOES THE PROCUREMENT SPEC SAY  
4 WITH REGARD TO THE SWITCHGEAR FUNCTIONABILITY AT MINIMUM AND  
5 MAXIMUM VOLTAGE? WHAT MINIMUM VOLTAGE CAN THE SWITCHGEAR  
6 PERFORM, OKAY?

7 MR. MARTIN: I'LL HAVE TO GET BACK TO YOU.

8 MR. MARINOS: PRESUMABLY 87.5 WAS WELL WITHIN THE  
9 MINIMUM OF THAT SWITCHGEAR, IS THAT WHAT YOU ESSENTIALLY  
10 DETERMINED?

11 MR. STANLEY: HE DOESN'T KNOW.

12 (OFF THE RECORD.)

13 MR. MARINOS: CAN WE GET BACK ON THE RECORD? OKAY.  
14 TOM, WHILE YOU'RE CHECKING THE PROCUREMENT FOR THE SWITCHGEAR  
15 FOR VOLTAGES, OF COURSE, THE IMPORTANT THING IS THE MAXIMUM  
16 VOLTAGE AT WHICH THAT SWITCHGEAR HAS TO PERFORM. SO YOU LOOK  
17 AT YOUR MINIMUM AND MAXIMUM VOLTAGES AND YOU HAVE TO GET BACK  
18 TO US, WHAT WAS THE MAXIMUM VOLTAGE THAT THE SWITCHGEAR WAS  
19 PROCURED FOR AND WHAT WAS THE MAXIMUM VOLTAGES THAT YOU HAVE  
20 EXPECTED AT THE BUS.

21 MR. MARTIN: WAS THAT A QUESTION?

22 MS. WILLIAMS: THEY WANT SOME FURTHER INFORMATION.  
23 I WAS ASKING TOM, THOUGH, WHETHER IT'S SAFE TO MAKE THE  
24 STATEMENT THAT, YEAH, WE WOULD CHECK A VERIFYING CALCULATION  
25 AGAINST A PURCHASE SPEC, BUT WHAT HE DOESN'T HAVE IS THE  
26 SPECIFICS AND I GUESS YOU TOLD ME THAT'S CORRECT.

27 MR. MARINOS: SO FAR WE HAVE BEEN TALKING ABOUT  
28 MINIMUM VOLTAGES, OKAY, AND THOSE ARE IMPORTANT FOR STARTING



1 EQUIPMENT DOWN THE LINE.

2 MR. MARTIN: MAYBE I SHOULD MAKE A CLARIFICATION.  
3 THE MINIMUM VOLTAGES WERE MORE SPECIFICALLY REVIEWED FOR MOTOR  
4 STARTING VOLTAGES. WE HAVE REVIEWED SHORT CIRCUIT CALCS TO  
5 VERIFY --

6 MR. MARINOS: THE ADEQUACY OF THE --

7 MR. MARTIN: -- THE ADEQUACY OF THE SWITCHGEAR THAT  
8 WAS PROBABLY MORE OF AN IMPORTANT FACTOR FOR THE SWITCHGEAR  
9 THAN ACTUAL VOLTAGE LEVELS.

10 MR. MARINOS: WELL, OKAY. WHAT VOLTAGE LEVELS DID  
11 YOU CONSIDER FOR THE SHORT CIRCUIT CALCULATIONS TO DETERMINE  
12 THE ADEQUACY OF THE SWITCHGEAR.

13 MR. MARTIN: CHECKLIST ITEM 3(B) IDENTIFIES WHERE WE  
14 REVIEWED CALCULATION 2323-IV-3 FOR AN AVAILABLE SHORT CIRCUIT  
15 LEVEL AT THE 6.9 KV.

16 MR. MAGGIO: THE ACTUAL VOLTAGE THAT THEY USED IN  
17 THE CALCULATION, WE WILL HAVE TO GET BACK TO YOU ON.

18 MR. MARINOS: GO ON.

19 MR. CALVO: JOHN?

20 MR. KNOX: NOTHING MORE.

21 MR. MARINOS: THE NEXT PART OF THIS QUESTION IS, W.  
22 THE DEGRADED GRID VOLTAGE PROTECTION REVIEWED BY CYGNA.

23 DO YOU WANT ME TO ELABORATE MORE ON THAT OR DO YOU

24 MR. MARTIN: YES, PLEASE.

25 MR. MARINOS: WHEN YOU HAVE SUSTAINED DEGRADED  
26 VOLTAGE OF THE GRID WHICH REFLECTS INTO THE LOWER BUSES AND  
27 VOLTAGES OF THE MOTORS, THEY HAVE A LIMIT TO WHICH THEY MUST  
28 THEY CAN OPERATE EFFECTIVELY, LIKE 90 PERCENT VOLTAGE IN SOME

1 MOTORS, LOWER IN OTHERS, HIGHER IN OTHERS. THERE GENERALLY IS  
2 A PROTECTION AGAINST SUSTAINED VOLTAGE BELOW THAT OPERATED  
3 LEVEL OF THE MOTOR.

4 DID YOU REVIEW THE PROTECTION TO ISOLATE THE MOTOR  
5 FROM THAT SOURCE?

6 MR. MARTIN: OUR EXTENT OF THE UNDERVOLTAGE  
7 PROTECTION REVIEW CONSISTED OF VERIFYING THAT THE PRODUCTIVE  
8 DEVICES EXISTED ON THE 6.9 KV SWITCHGEAR BY LOOKING AT THE  
9 SINGLE-LINE DIAGRAM AND REVIEWING THE REQUIREMENTS OF THE  
10 PROTECTION AND RELAY PROCEDURES.

11 MR. MAGGIO: AND ALSO COMPARING REQUIREMENTS OR  
12 RECOMMENDED PRACTICES OF I TRIPLE E STANDARD -- RECOMMENDED  
13 PRACTICES OF AN I TRIPLE E, I-E-E-E, STANDARD, STANDARD 242.  
14 AND WE CAN ELABORATE MORE ON EXACTLY WHAT WE DID ON THE ITEM  
15 RELAYING IF YOU WISH OR I CAN DO IT NOW.

16 MR. CALVO: GO AHEAD.

17 MR. MAGGIO: DO IT NOW? OKAY.

18 THE ITEM THAT WAS ASKED WAS WHAT THE BASIS FOR GIB  
19 & HILL'S RELAYING ORGANIZATION WAS, AND WE FOUND THAT IN OUR  
20 REVIEW TUGCO PROTECTIVE RELAYING PHILOSOPHY PRACTICES FOR  
21 COMANCHE PEAK UNIT 1. WE REVIEWED THIS DOCUMENT, AND THE  
22 REQUIREMENTS FOR 6900 VOLT SAFEGUARD LOAD WERE FOUND IN  
23 SECTION 6. UNDER MOTOR FEEDER PROTECTION IT WAS STATED EACH  
24 MOTOR WAS PROVIDED WITH PHASE-FALL PROTECTION CONSISTING OF  
25 PRE-LONG TIME INSTANTANEOUS OVERPOWERING RELAYS WHICH WOULD  
26 PROTECTIVE DEVICE NUMBER 50-M DASH 51 AND PREINSTANTANEOUS  
27 RELAYS, TIMER WHICH WOULD BE PROTECTIVE DEVICE NUMBER 50 M-1  
28 WE IDENTIFIED THIS IN THE PROCEDURE. ALSO, EACH

1 MOTOR WAS TO BE PROVIDED WITH ONE GROUND FALL PROTECTION RELAY  
2 CONSISTING OF A GROUND FALL DEVICE NUMBER 50-N.

3 MR. MARTIN: THAT'S THE PUMP PROTECTION.

4 MR. MAGGIO: WELL, THEY'RE ASKING WHAT REVIEW OF  
5 PROTECTION RELAY DID WE DO AND THIS IS THE DEGREE OF REVIEW WE  
6 DID AND IT IS THIS ITEM THAT I AM JUMPING BACK TO.

7 MR. MARTIN: SHOULD WE HAVE SAID OFF THE RECORD?

8 MR. MAGGIO: TO FURTHER CONCLUDE WHAT WE DID, WE  
9 IDENTIFIED THIS REQUIREMENT IN THE PROCEDURE. WE COMPARED THE  
10 SINGLE-LINE DIAGRAM AND FOUND THAT THESE RELAYS WERE INCLUDED  
11 ON SINGLE-LINE DIAGRAM 2323-E-1004. IT WAS ASSOCIATED WITH  
12 THE COMPONENT COOLING WATER PUMP ON BUS 1EA1.

13 BASED AS A SANITY CHECK IN TERMS OF THESE  
14 REQUIREMENTS, WE REVIEWED I TRIPLE E STANDARD 242 AND WE FOUND  
15 NO CONFLICT ON THESE RELAYS IN THE STANDARD WE IDENTIFIED  
16 REQUIREMENTS FOR RELAY 50-N ON PAGE 191 AND RELAYS 50-N DASH  
17 51 ON PAGE 188, AND RELAY 50 M1 PAGE 188. THIS IS I TRIPLE E  
18 STANDARD 242-9275. THAT WAS THE LIMIT OF OUR RELAY PROTECTION  
19 REVIEW.

20 MR. CALVO: IS NOT ALL THE VOLTAGE PROTECTION MOST  
21 OF ARCHITECT/ENGINEERS USES A 27 RELAY. DID THE SAME THING  
22 YOU HAPPEN TO KNOW WHETHER THE GIBBS & HILL USES THE 27? HAVE  
23 YOU REVIEWED THAT RELAY?

24 MR. MAGGIO: OKAY. WE HAD IDENTIFIED THAT ON THE  
25 SINGLE-LINE DIAGRAM THAT I INDICATED, BUT IT IS A BUS RELAY  
26 AND NOT A FEEDER RELAY.

27 MR. CALVO: RIGHT, BUS RELAY. YOU GOT ABOUT THREE  
28 OF THEM PER BUS? ABOUT THREE PER BUS. LOOKS LIKE YOU HAVE



1 THREE OF THEM.

2 MR. MAGGIO: YES, IT INDICATES THAT.

3 MR. CALVO: OKAY. YOU GOT THREE OF THEM. IN A  
4 TYPICAL DESIGN, THOSE ARE THE THREE RELAYS THAT YOU USE TO  
5 ANSWER THAT QUESTION, WAS THE DEGRADED GRID VOLTAGE PROTECTIO  
6 REVIEW. THAT'S THE ONE YOU NORMALLY HAVE A TWO OUT OF THREE  
7 COMBINATION. YOU SEPARATE THE 6.9 KV FROM THE INCOMING  
8 BREAKER THAT IS CONNECTED TO THE OFF-SITE POWER. THAT'S THE  
9 THREE RELAY. DID YOU REVIEW THOSE THREE RELAY --

10 MR. MAGGIO: YES, WE IDENTIFIED THAT THE 27 RELAYS  
11 WERE ON A SINGLE-LINE DIAGRAM.

12 MR. MORRIS: I THINK THE QUESTION WAS, DID YOU LOO  
13 AT THE SETTINGS OF --

14 MR. MAGGIO: NO. NO, WE DID NOT IDENTIFY THE RELA  
15 SETTINGS.

16 MR. MORRIS: SO CAN YOU TELL WHETHER THE RELAYS WE  
17 USED FOR DEGRADED GRID PROTECTION OR LOSS OF VOLTAGE  
18 PROTECTION?

19 MR. MARTIN: WELL, WE CAN -- WE VERIFIED THEIR  
20 EXISTENCE AND IN TERMS OF PLACEMENT, THERE WAS PROTECTION FO  
21 GRID UNDERVOLTAGE BY THE PROTECTIVE AND RELAYING PROCEDURE.

22 MR. MORRIS: WAS THAT -- BY NOT LOOKING AT THE  
23 SENTENCE, YOU COULD NOT TELL WHETHER THAT WAS PROTECTION FOR  
24 DEGRADED GRID OR FOR LOSS OF VOLTAGE?

25 MS. WILLIAMS: THAT'S CORRECT. WE JUST LOOKED AT  
26 THERE WAS SOME PROTECTION THAT EXISTED AND STOPPED THERE.

27 MR. CALVO: TO SUPPLEMENT WHAT HE IS SAYING, IF I  
28 TO LOOK AT THE 6.9 KV CIRCUIT BREAKER OF THESE COMPONENT

1 COOLING WATER PUMPS, THE ONE THAT YOU LOOK AT, IS ANYTHING  
2 THERE IN THE TRIP CIRCUIT WHO HAS A 27 RELAY THERE?

3 MR. MARTIN: LET ME REFRESH MY MEMORY.

4 MR. CALVO: THAT'S OKAY.

5 MR. MARTIN: REFERRING TO DRAWING 2323 31 DASH 0031  
6 SHEET NUMBER 25, REVISION 12, RELAY CONTACTS 27 2XB FOR BUS  
7 ONE EA1 ARE INCLUDED IN THE TRIP CLOSE CIRCUIT, THE BREAKER  
8 CLOSE CIRCUIT, OR THE TRIP COIL CIRCUIT -- I'M SORRY.

9 MR. CALVO: IS THERE ANY WAY YOU CAN FIND OUT EITHE  
10 CONTACTS FROM THOSE RELAYS COMING FROM THE OTHER RELAYS  
11 CONNECTED TO THE BUS?

12 MR. MARTIN: OUR EXTENT OF REVIEW WENT TO VERIFYING  
13 THAT THIS FUNCTION EXISTED.

14 MR. CALVO: THAT'S ALL?

15 MR. MARTIN: THAT'S ALL.

16 MR. CALVO: AGAIN, THAT FUNCTION EXISTED, YOU ONLY  
17 MENTIONED CONTACT IN THE TWO TRIP CIRCUITS. WHERE ARE THOSE  
18 CONTACTS COMING FROM?

19 MR. MARTIN: FROM THE UNDERVOLTAGE RELAYS IN THE --

20 MR. CALVO: AT THE BUS.

21 MR. MARTIN: AT THE BUS.

22 MR. KNOX: YOU HAVE NO WAY OF KNOWING WHETHER THEY  
23 ARE FOR A DEGRADED GRID OR LOSS OF VOLTAGE, IS THAT RIGHT?

24 MR. MARTIN: I DON'T THINK WE CAN ANSWER THAT.

25 MR. CALVO: ALL YOU DID IS TO -- THE FUNCTION IS  
26 THERE THAT YOU HAVE A LOW VOLTAGE CONDITION. IT SAYS YOU GO  
27 THE EQUIPMENT TO DO IT. YOU HAVE NOT VERIFIED THE SETTINGS  
28 ANYTHING. OKAY, WE UNDERSTAND.

1 MR. KNOX: OKAY, BUT --

2 MR. CALVO: WE UNDERSTAND.

3 MR. KNOX: BUT YOU DON'T KNOW WHETHER YOU HAVE A  
4 DEGRADED GRID PROTECTION OR -- VERSUS THE LOSS OF VOLTAGE  
5 PROTECTION. YOU HAVE ONE OR THE OTHER, BUT YOU DO NOT KNOW IF  
6 YOU HAVE BOTH?

7 MR. CALVO: THAT'S CORRECT.

8 MR. KNOX: WHEN YOU SAY THAT YOU VERIFIED THAT YOU  
9 HAD THE PROTECTION, YOU GOT A LOSS OF VOLTAGE PROTECTION, YOU  
10 HAVE DEGRADED GRID VOLTAGE PROTECTION? DO YOU HAVE BOTH OF  
11 THOSE TYPES OF PROTECTION?

12 MR. CALVO: I DON'T THINK SO. YOU COULD NOT BECAUS  
13 YOU COULD NOT ASSESS THE SETTINGS SO, THEREFORE, YOU DON'T  
14 KNOW WHICH ONE IT IS.

15 MR. MARTIN: I CAN'T MAKE THAT STATEMENT.

16 MS. WILLIAMS: OUT OF SCOPE.

17 MR. CALVO: ALL YOU KNOW, THAT YOU HAVE A 27 RELAY  
18 THERE, THAT IT DOES SOMETHING WHEN THE VOLTAGE GOES UP. SO  
19 WHATEVER MADE THAT VOLTAGE GOES DOWN, THE THING WILL OPEN UP.

20 MR. MARINOS: NANCY, YOU JUST STATED IT WAS OUT OF  
21 SCOPE.

22 MS. WILLIAMS: WELL, GOING BEYOND, GOING INTO THE  
23 ASSESSING, THE QUESTION THAT HE WAS JUST ASKED, ALL WE DID W/  
24 SEE WHETHER THE RELAY EXISTED AND WE STOPPED.

25 MR. MARINOS: THAT WAS BEYOND SCOPE, THEN IT WAS A  
26 CONSCIOUS OMISSION, IS THIS WHAT YOU ARE SAYING?

27 MS. WILLIAMS: YES, I BELIEVE THAT'S TRUE. YOU HAD  
28 NO INTENTION OF TAKING IT FURTHER BACK UPSTREAM FROM THERE,



1 DID YOU?

2 MR. MARTIN: NO.

3 MR. MORRIS: EVEN THOUGH THAT'S PART OF THE CONTROL  
4 CIRCUIT ON THE CONTROLLING WATER COOLANT PUMP, YOU CONSIDER  
5 THAT OUT OF SCOPE?

6 MR. MARTIN: WE REVIEWED THE FACT THAT UNDERVOLTAGE  
7 DROP OUT OF THE PUMP CIRCUIT EXISTED.

8 MR. MORRIS: YES, BUT YOU DID NOT LOOK TO SEE WHAT  
9 THAT WAS PROTECTING, WHETHER IT WAS LOSS OF VOLTAGE OR LOW  
10 VOLTAGE.

11 MR. OSZEWSKI: WE DIDN'T CHECK THE SETTING.

12 MR. MARTIN: WE DIDN'T CHECK THE SETTING, BUT AS I  
13 SAY, WE REVIEWED THE PROCEDURES FOR THAT TYPE OF PROTECTION  
14 AND VERIFIED THAT THEY WERE ON.

15 MR. CALVO: LET ME GO ONE FURTHER. IN THAT TRIP  
16 CIRCUIT, YOU HAVE THE 27 RELAY AND YOU GOT SOME -- ALL THE  
17 RELAYS ARE IN PARALLEL WITH THAT RELAY, WITH THAT CONTACT, TH  
18 SO, THE OVERLOADS, WHATEVER IN THE GROUNDS. DID YOU VERIFY  
19 THE SETTINGS OF THOSE RELAYS? DO YOU KNOW WHAT I AM GETTING  
20 AT?

21 MR. MARTIN: YES. WE REVIEWED A SET POINT  
22 CALCULATION FOR THE SETTINGS ON THE OTHER PROTECTED RELAYS.

23 MR. MARINOS: SO THE OVERCURRENT, YOU MEAN,  
24 OVERCURRENT PROTECTION, YOU DID LOOK AT THE COORDINATION OF  
25 RELAYING?

26 MR. CALVO: THE ONLY ONE THAT YOU DID NOT LOOK IN  
27 THAT CIRCUIT IS THE 27 RELAY, RIGHT?

28 MR. MARTIN: PARDON?

1 MR. CALVO: THE ONLY RELAY THAT YOU DID NOT  
2 DETERMINED WHETHER IT FUNCTIONED IN ACCORDANCE WITH THE SYST  
3 REQUIREMENTS IS THAT 27 RELAY, THE ONLY ONE IN THAT CIRCUIT?

4 MR. MARTIN: CORRECT.

5 MR. CALVO: ALL THE OTHERS, THE PROTECTIVE RELAYS,  
6 CIRCUITS AND GROUNDS, THOSE YOU DID VERIFY.

7 (OFF THE RECORD.)

8 MR. CALVO: THE ANSWER TO THE QUESTION IS NOT  
9 READILY AVAILABLE. WHY DON'T YOU MAKE A NOTE OF IT BECAUSE  
10 ALL I'M ASKING IS --

11 MR. MARTIN: YES.

12 MS. WILLIAMS: WHAT'S THE QUESTION NOW?

13 MR. MARTIN: LET ME GET BACK TO YOU ON THAT ONE.

14 MR. CALVO: PERFECTLY ALL RIGHT.

15 MR. MARTIN: THE CHECKLIST --

16 MS. WILLIAMS: WHAT IS THE QUESTION?

17 MR. MARTIN: THE QUESTION WAS --

18 MR. CALVO: THE QUESTION WAS, WERE THE OTHER  
19 PROTECTIVE RELAYS IN THE TRIP CIRCUIT FOR THE COMPONENT  
20 COOLING WATER PUMP, WHETHER YOU VERIFIED THE SETTINGS OF TH  
21 RELAYS.

22 MR. MARTIN: WE DID REVIEW THE CALC.

23 MR. MARINOS: NANCY, WOULD YOU INTRODUCE THE  
24 GENTLEMAN TO YOUR LEFT FOR US?

25 MS. WILLIAMS: YES, THIS IS AL MOERSFELDER AND HE  
26 WAS INVOLVED IN SOME OF THE INSTRUMENT CONTROL REVIEWS.  
27 THAT'S WHY I WAS RUNNING AROUND GETTING HIS INPUT HERE.

28 MR. MARINOS: WE WILL GO TO THE NEXT QUESTION,

1 QUESTION 2(A), AND WE'RE ASKING, WAS THE TRANSFER CIRCUITRY  
2 FOR THE PREFERRED, ALTERNATE, AND STANDBY POWER SUPPLIES  
3 REVIEWED.

4 MR. MARTIN: NO, THIS WAS NOT IN CYGNA'S SCOPE OF  
5 WORK.

6 MR. MARINOS: GEORGE, DO YOU HAVE A QUESTION?

7 MR. MORRIS: NO, THAT WAS JUST A CLARIFICATION  
8 BECAUSE ITEM 2 IN THE CHECKLIST STATED THAT THEY LOOKED AT T  
9 CONNECTIONS TO THE BUS IN COMPLIANCE TO A NUMBER OF DESIGN  
10 CRITERIA IN THE REG GUIDES.

11 MR. MARTIN: WHAT WE HAVE DONE IN THIS CHECKLIST  
12 ITEM WAS TO REVIEW THAT THE OFF-SITE AND ON-SITE POWER SOURC  
13 WERE CONNECTED TO THE 6.9 BUS TO VERIFY THE PREFERRED, THE  
14 ALTERNATE OFF-SITE AND STANDBY POWER SOURCE WERE CONNECTED  
15 THIS BUS.

16 MR. MORRIS: ALL RIGHT.

17 MR. MARINOS: WE HAVE A FOLLOW-UP QUESTION UNDER  
18 SAME NUMBER. WHAT SOURCE DID CYGNA MEAN BY THE, QUOTE,  
19 BACKUP POWER SOURCE, UNQUOTE.

20 MR. MARTIN: THE DIESEL GENERATOR. WELL, MAYBE -  
21 THE CHECKLIST ITEM SHOULD INDICATE STANDBY POWER SOURCE  
22 INSTEAD OF BACKUP POWER SOURCE TO BE CONSISTENT WITH THE FS  
23 DESCRIPTION.

24 MR. CALVO: EXCUSE ME. WHAT IS THE SIGNIFICANCE  
25 THAT QUESTION, GEORGE?

26 MR. MORRIS: THE SIGNIFICANCE IS THAT THE FSAR HA  
27 AN IMPLICATION THAT THE GENERATOR STARTUP TRANSFORMER WAS A  
28 USED AS A BACKUP SUPPLY. AND THE INDUSTRY STANDARD IS NOT



1 USE THE TERM BACKUP POWER SOURCE AS A STANDBY SOURCE.

2 MR. CALVO: OKAY, ALL RIGHT.

3 MR. MARINOS: JOHN, DO YOU HAVE ANY MORE QUESTIONS  
4 ON THIS?

5 MR. KNOX: NO.

6 MR. MARINOS: WE WILL GO TO ITEM 3, WE CALL IT  
7 RELAYING. SO WE MAY HAVE COVERED THINGS THAT WE ALREADY  
8 DISCUSSED, BUT WE'LL GO OVER QUICKLY SOME OF THEM. ITEM (A)  
9 IS WHAT IS THE BASIS FOR THE GIBBS & HILL RELAYING  
10 RECOMMENDATIONS.

11 MR. MAGGIO: I BELIEVE I ADDRESSED THAT EARLIER ON  
12 THE RESPONSE THAT I HAD GIVEN. IT'S BASED ON THE TUGCO  
13 PROTECTIVE RELAYING PHILOSOPHY AND PRACTICES WHICH WE REVIEWED  
14 AND IDENTIFIED THAT RELAYS WERE ON THE SINGLE-LINE DIAGRAM  
15 THAT I INDICATED AND ALSO HAD REVIEWED THE I TRIPLE E STANDARD

16 MR. MARINOS: AS WE HAVE -- AS CLARIFICATION TO THE  
17 QUESTION, WAS THE APPLICABLE MOTOR DATA REVIEWED, AND WE HAVE  
18 IN PARENTHESES, FOR EXAMPLE, THERMAL DAMAGE CURVES,  
19 ACCELERATION DATA AT MINIMUM AND MAXIMUM VOLTAGE.

20 DID YOU LOOK AT THAT TYPE OF INFORMATION?

21 MR. MARTIN: YES, FULL LOAD CURRENT, LEAKY LOAD  
22 CURRENT, SERVICE FACTOR, AND ACCELERATION DATA MINIMUM AND  
23 MAXIMUM VOLTAGE WERE INCLUDED IN CALCULATION 2323-VIII-6.

24 MR. MORRIS: HOW ABOUT MOTOR THERMAL DAMAGE?

25 MR. MARTIN: MOTOR --

26 MR. MORRIS: CAN YOU TELL THAT THE SETTING OF THOSE  
27 OVERCURRENT RELAYS ARE SUFFICIENT TO PROTECT THE MOTOR ON THE  
28 COMPONENT COOLING WATER PUMP FROM THE THERMAL GUIDE?

1 MR. MARTIN: I WOULD LIKE TO CHECK MY NOTES AND GET  
2 BACK TO YOU ON THAT ONE. COULD YOU RESTATE THE QUESTION.

3 MR. MORRIS: THE REVIEW OF THE RELAY SETTINGS FOR  
4 THE COMPONENT COOLING WATER PUMP INCLUDE A REVIEW OF THE MOTOR  
5 THERMAL DAMAGE CURVE, AND AS A FOLLOW-UP, WHETHER THE GIBBS &  
6 HILL SPECIFICATION ON LARGE MOTORS REQUIRES IMPORTANT MOTOR  
7 CHARACTERISTICS SUCH AS THERMAL DAMAGE CURVES AND ACCELERATING  
8 TIME CURVES TO BE INCLUDED IN VENDOR DATA SUBMITTALS. WHAT  
9 WAS THE TUGCO DRAWING REFERENCE THAT YOU MADE FOR RELAYING  
10 PRACTICES? YOU MADE REFERENCE TO --

11 MR. MAGGIO: IN TERMS OF THE SINGLE LINE THAT WAS  
12 REVIEWED OR THE DOCUMENT -- THE NAME -- IT'S PROTECTIVE  
13 RELAYING PHILOSOPHY AND PRACTICES PROCEDURES.

14 MR. MORRIS: IS THAT DOCUMENT AVAILABLE HERE?

15 MS. WILLIAMS: WE'LL HAVE TO CHECK.

16 MR. MARINOS: TOM, AS A FURTHER AMPLIFICATION TO  
17 THIS QUESTION, DID YOU LOOK AT THE OVERLOAD PROTECTION,  
18 OVERCURRENT PROTECTION OF THOSE MOTORS WITH REGARD TO SETTING  
19 OF THE INSTANTANEOUS AND ONE-TIME PROTECTION OF THE RELAYING?

20 MR. MARTIN: THIS ISN'T ON HERE.

21 MR. MAGGIO: OKAY, WE'RE GOING TO HAVE TO GET BACK  
22 TO YOU.

23 MR. MARTIN: NO, I THINK WE CAN --

24 MR. MARINOS: FOR THE SPECIFIC MOTOR I'M ASKING.

25 MR. MARTIN: THE SPECIFIC MOTOR, WE REVIEWED THE  
26 RELAY SETTING CALC WHICH HAD THE CALCULATIONS FOR THOSE TYPES  
27 OF PROTECTION.

28 MR. MAGGIO: YES.

1 MR. MARINOS: OKAY, QUESTION 3(B), WAS SHORT CIRCUIT  
2 CALCULATION REVIEWED FOR CORRECT RESULTS AND WAS THE INPUT  
3 DATA REVIEWED BY CYGNA.

4 MR. MAGGIO: YES, THEY WERE REVIEWED FOR RESULTS AND  
5 WERE VERIFIED TO BE LESS THAN THE SWITCHGEAR RATINGS. ALSO  
6 REVIEWED WERE INPUT DATA SUCH AS MOTORS -- SUCH AS AT THE  
7 MOTORS, TRANSFORMERS, AND IT WAS FOUND THAT THEY WERE  
8 REASONABLE.

9 MR. MORRIS: THEN AS A CARRYOVER FROM THE PREVIOUS  
10 COMMENT, YOU WILL BE CHECKING TO SEE WHAT VOLTAGE YOU USED IN  
11 THE SHORT CIRCUIT CALCULATIONS?

12 MR. MAGGIO: YES, WE WILL.

13 MR. MARINOS: YOU DID A CALCULATION OR YOU CHECKED  
14 THEIRS?

15 MR. MARTIN: WE REVIEWED THEIRS.

16 MR. MARINOS: DID YOU USE -- DID YOU CHECK A DC  
17 OFFSET MULTIPLYING FACTOR THAT THEY USED FOR THE SIZE OF THE  
18 SWITCHGEAR?

19 MR. MAGGIO: WE'LL HAVE TO GET BACK TO YOU ON THAT,  
20 IF IT'S INCLUDED.

21 MR. MARINOS: DID YOU LOOK AT ANY DIAGRAM TO  
22 DETERMINE CONTRIBUTIONS FROM OTHER OPERATING LOADS AND SOURCE  
23 TO DETERMINE THE MAXIMUM FULL CURRENT THROUGH A BREAKER?

24 MR. MAGGIO: OKAY, THAT WAS REVIEWED ON THE 40 VOLT  
25 SHORT CIRCUIT CALCULATION, IN WHICH CASE I SPOT CHECKED  
26 IMPEDANCE DIAGRAMS THAT WERE USED AND IDENTIFIED THAT  
27 REPRESENTED THAT CABLE AND SYSTEM IMPEDANCES.

28 MR. MORRIS: EXCUSE ME.



1 MS. WILLIAMS: CAN WE HOLD ON A MINUTE. I THINK WE  
2 LOST A QUESTION HERE.

3 MR. MARTIN: WE LOST THE PREVIOUS QUESTION.

4 MS. WILLIAMS: THE ONE ON SOMETHING BEING INCLUDED  
5 IN THE CALCULATION. YOU HAD THAT ONE, DIDN'T YOU? IT WAS  
6 RIGHT BEFORE I SAID --

7 MR. MARINOS: THE MULTIPLYING FACTOR FOR A DC OFFSE

8 MR. MAGGIO: YOU WERE ASKING US --

9 MS. WILLIAMS: OKAY, SORRY, GO AHEAD.

10 MR. MORRIS: WHAT WAS YOUR LAST QUESTION?

11 MR. MARINOS: DID YOU GET MY LAST QUESTION? YOU  
12 WANT ME TO REPEAT THAT? I ASKED IF YOU LOOKED AT AN IMPEDANC  
13 DIAGRAM AND CONSIDERED CONTRIBUTIONS TO A FULL CONDITION IN  
14 DETERMINING THE PROPER SIZING OF THE BREAKER, IT'S  
15 CONTRIBUTION FROM OTHER SOURCES.

16 MR. MAGGIO: YES, WE DID. WE IDENTIFIED THE SHORT  
17 CIRCUIT VALUES AND DETERMINED THAT IT WOULD BE -- WITH --  
18 UNDER THE RATINGS OR THE CIRCUIT BREAKERS WITHIN THE BUSES AN  
19 THE BUS RATINGS.

20 MR. MARINOS: YOU LOOKED AT IMPEDANCES DIAGRAM OR  
21 YOU PREPARED YOUR OWN?

22 MR. MAGGIO: I REVIEWED THE IMPEDANCE DIAGRAM  
23 INCLUDED IN THE CALCULATION AND DID SPOT CHECK OF HOW THEY  
24 ARRIVED AT THOSE IMPEDANCE DIAGRAMS IN TERMS OF THE CALCULATE  
25 FALL CURRENT THAT WOULD BE EXPECTED.

26 MR. MORRIS: WHAT WAS THE BASIS OF THOSE IMPEDANCE  
27 DIAGRAMS? WAS IT CALCULATED NUMBERS FOR CABLE IMPEDANCE AND  
28 TRANSFORMER IMPEDANCE OR WAS IT ACTUAL FIELD DATA?

1 MR. MAGGIO: I TOOK THAT INFORMATION AS AN INPUT TO  
2 THE CALCULATION AND JUST REVIEWED IT FOR SANITY IN TERMS OF  
3 WAS IT REASONABLE ON THE BASIS OF MY EXPERIENCE. BUT I'M NOT  
4 SURE IF IT WAS -- WHERE IT CAME FROM.

5 MR. MARINOS: BY NAMEPLATE DATA, YOU MEAN FROM  
6 TRANSFORMERS --

7 MR. MAGGIO: I DON'T KNOW IF IT WAS NAMEPLATE DATA  
8 FROM ACTUAL EQUIPMENT THAT WAS OUT IN THE FILED.

9 MR. MORRIS: BUT IT WAS BALL PARK NUMBERS, AT LEAST

10 MR. MAGGIO: AS FAR AS I WAS CONCERNED, IT WAS  
11 REALISTIC.

12 MR. MORRIS: HOW MUCH EXTRA CAPACITY WAS THERE IN  
13 THE BREAKERS?

14 MR. MAGGIO: I'LL HAVE TO GET BACK TO YOU ON THAT  
15 SPECIFIC QUESTION.

16 MR. MARINOS: CAN YOU MAKE AVAILABLE THE IMPEDANCE  
17 DIAGRAM?

18 MR. MAGGIO: I'LL HAVE TO CHECK AND SEE IF WE HAVE  
19 IT.

20 MS. WILLIAMS: DO YOU KNOW WHAT CALC THEY WERE IN?

21 MR. CALVO: DO YOU HAVE A RECORD CAPABILITY IF  
22 SOMEBODY ASKS TO REPEAT THE QUESTION?

23 MS. WILLIAMS: I THINK YOU WANT THIS OFF THE RECORD  
24 (OFF THE RECORD.)

25 MR. MARINOS: SHALL WE CONTINUE?

26 MS. WILLIAMS: YES.

27 MR. MARINOS: QUESTION NUMBER 3(C), WAS THE  
28 COORDINATION OF THE COMPONENT COOLING WATER PUMP MOTOR BREAKER

1 CHECKED WITH THE THREE INCOMING BREAKERS.

2 MR. MARTIN: NO, CYGNA REVIEWED THE BREAKERS  
3 PROTECTIVE FUNCTION FOR THE COMPONENT COOLING WATER PUMP, BUT  
4 DID NOT EXTEND ITS SCOPE IN THE COORDINATION OF UPSTREAM  
5 BREAKERS.

6 MR. MORRIS: SO YOU CANNOT SAY WHETHER A FAULT AT  
7 THE COMPONENT COOLING WATER PUMP WILL CAUSE THE LOSS OF THE  
8 ENTIRE BUS.

9 MR. MARTIN: BASICALLY, OUR REVIEW STOPPED AT THE  
10 6.9 KV SWITCHGEAR IN THE REVIEW OF ITS PROTECTIVE FUNCTIONS  
11 FOR THE COMPONENT COOLING WATER PUMP. AND WE DIDN'T EXTEND I  
12 INTO REVIEWING THE COORDINATION OF THE UPSTREAM BREAKERS.

13 MR. MARINOS: ITEM 3(F), WAS THE BASIS FOR THE  
14 ENVIRONMENTAL AND SEISMIC DATA IN THE SWITCHGEAR SPEC  
15 CONFIRMED BY CYGNA AND REVIEWED IN A QUALIFICATION REPORT.

16 MR. MARTIN: NO. CYGNA'S REVIEW ONLY VERIFIED THE  
17 INCLUSION OF SEISMIC AND ENVIRONMENTAL REQUIREMENTS AND  
18 PROCUREMENT SPECIFICATIONS. ENVIRONMENTAL AND SEISMIC REVIEW  
19 WAS NOT PART OF THE ELECTRICAL REVIEW SCOPE.

20 MR. MARINOS: DO YOU HAVE QUESTIONS, GEORGE?

21 MR. MORRIS: YOU ARE SAYING, IF I UNDERSTAND YOU  
22 RIGHT, THAT YOUR CHECK THEN WAS JUST TO SEE THAT THERE WAS A  
23 SECTION IN THE CALCULATIONS FOR ENVIRONMENTAL AND SEISMIC.

24 MR. MARTIN: THE SPECIFICATION, YES.

25 MR. MORRIS: THE SPECIFICATION, BUT NOT WHERE THOSE  
26 INPUTS CAME FROM.

27 MR. MARTIN: CORRECT.

28 MR. MORRIS: AND NOT THE INTERDISCIPLINE INTERFACE



1 THAT WOULD BE REQUIRED IN THE PREPARATION OF THAT  
2 SPECIFICATION.

3 MS. WILLIAMS: THAT'S CORRECT. WE DID NOTHING ON  
4 ENVIRONMENTAL AND SEISMIC, ONLY THAT THERE WAS A NOTATION THA  
5 MENTIONED THAT THE EQUIPMENT NEEDED TO BE DESIGNED TO CONSIDE  
6 THAT. BEYOND THAT, WE DID NOTHING WITH THE NUMBERS.

7 MR. MORRIS: NOR DID YOU INCLUDE INTERDISCIPLINE  
8 REVIEW OR INTERACTION.

9 MS. WILLIAMS: THAT'S RIGHT. WE WOULD DO NOTHING  
10 ASSOCIATED WITH CARRYING OUT THE 323, ANY OF THAT 1(B) SEISM!  
11 QUALIFICATION, ALL THAT WAS OUT OF THE SCOPE.

12 MR. MORRIS: THAT'S NOT WHAT I'M ASKING.

13 MS. WILLIAMS: YES, BUT I MEAN, WE WOULDN'T HAVE  
14 LOOKED AT ANY INTERFACES OR ANYTHING. ANYTHING THAT YOU SAY  
15 TO US THAT DEALS WITH HANDLING THAT INFORMATION OR RECORDING  
16 IT OR TRANSFERRING IT OR DESIGNING FOR IT, WE DIDN'T LOOK AT.

17 MR. MORRIS: OKAY.

18 MR. MARINOS: WE GO TO QUESTION 4 UNDER CABLE, SO  
19 QUESTION 4(D), DID MOTOR SPEC INCLUDE ELECTRICAL DATA SUCH AS  
20 MINIMUM STARTING VOLTAGE AND MINIMUM ACCELERATING TIME AT  
21 MINIMUM AND MAXIMUM VOLTAGE.

22 MR. MARTIN: YES, MECHANICALS ARE -- SPECIFICATION  
23 2323 ES 1B INDICATED THAT MOTOR SHALL START AT 80 PERCENT OF  
24 MOTOR RATED VOLTAGE TO FULL SPEED IN 5 SECONDS.

25 MS. WILLIAMS: THE ANSWER IS NO.

26 MR. MARINOS: DID IT HAVE MAXIMUM VOLTAGE?

27 MR. MARTIN: I'D HAVE TO DOUBLE CHECK THAT, SO CAN  
28 GET THE SPECIFICS ON THAT BACK TO YOU?

1 MR. MARINOS: SURE.

2 GEORGE, DO YOU HAVE ANY MORE QUESTIONS ON THAT?

3 MR. MORRIS: (SHAKES HEAD.)

4 MR. MARINOS: DID YOU CHECK UNDER THE SAME QUESTION  
5 TO CONFIRM THE ACCELERATION TIMES?

6 MR. MARTIN: MAYBE -- COULD YOU EXPAND ON THAT A  
7 LITTLE BIT?

8 MR. MARINOS: YES. THE SPECIFICATION SPECIFIED  
9 MINIMUM STARTING VOLTAGE AT 80 PERCENT AND MINIMUM  
10 ACCELERATION TIME 5 SECONDS. DID YOU CONFIRM THAT YOU WOULD  
11 BE ABLE TO ACCELERATE THE MOTOR IN 5 SECONDS WITH MINIMUM  
12 VOLTAGE OF 80 PERCENT, AND HOW DID YOU DO IT?

13 MR. CALVO: IF YOU DON'T HAVE THE ANSWER, DON'T  
14 WORRY ABOUT IT.

15 MR. MARTIN: THERE IS SOMETHING FLOATING AROUND UP  
16 HERE, BUT I CAN'T PUT IT IN THE RIGHT WORDS RIGHT NOW. THERE  
17 ARE REQUIREMENTS PLACED ON THE PUMP MANUFACTURER TO SUPPLY  
18 MOTOR REQUIREMENTS AND SOME OF THE SPECS, ALSO.

19 MR. MARINOS: BUT YOU DON'T RECALL WHETHER YOU WENT  
20 THROUGH THE MECHANICS OF CONFIRMING THE CALCULATION.

21 MR. MARTIN: NO, WE DIDN'T GO THROUGH AN  
22 ACCELERATION CALCULATION.

23 MR. MARINOS: YOU DID NOT GO THROUGH AN ACCELERATION  
24 CALCULATION.

25 MR. MARTIN: NO. I BELIEVE -- I SAY I BELIEVE, I'  
26 VERIFY THAT WE REVIEWED THE FACT THAT THE PUMP VENDOR WAS  
27 REQUIRED TO SUPPLY MOTOR DATA FOR PURCHASING THE MOTOR.

28 MR. MARINOS: DID YOU LOOK AT THE PUMP AND MOTOR

1 TORQUE CURVES?

2 MR. MARTIN: THEY WERE INCLUDED IN THE MOTOR  
3 PROCUREMENT SPECIFICATION.

4 MS. WILLIAMS: ANSWER HIS QUESTION YES OR NO, DID  
5 YOU LOOK AT IT.

6 MR. MARTIN: YES.

7 MR. CALVO: ALL RIGHT.

8 MR. MARINOS: GEORGE.

9 MR. MORRIS: YES. TOM, DO YOU KNOW, WAS THE MOTOR  
10 PURCHASED SEPARATELY OR INCLUDED WITH THE DRIVEN EQUIPMENT  
11 SPECIFICATION?

12 MR. MARTIN: THE MOTOR WAS PURCHASED ON A SEPARATE  
13 MOTOR SPECIFICATION.

14 MR. MORRIS: DID YOU LOOK INTO THE INTERFACE, THEN,  
15 THAT WAS REQUIRED BETWEEN THE PUMP VENDOR AND MOTOR VENDOR?

16 MR. MAGGIO: ARE YOU REFERRING TO MECHANICAL SPECS?

17 MR. KILLOUGH: CRAIG KILLOUGH. DIDN'T THE  
18 SPECIFICATION STATE THAT THE PUMP MANUFACTURER WILL ESTABLISH  
19 MOTOR HORSEPOWER TORQUE AND SPEED REQUIREMENTS FOR PROPER  
20 APPLICATION OF THE MOTOR?

21 MR. MARTIN: YES, THEY DID.

22 MR. KILLOUGH: AND THAT WAS WHAT WE IMPLIED AS THE  
23 INTERFACE. THE SPECIFICATION STATED THAT THE PUMP  
24 MANUFACTURER WILL PROVIDE THE PROPER SPECIFICATIONS FOR THE  
25 APPLICATION OF THE MOTOR.

26 MR. MORRIS: WAS THAT THE PUMP SPECIFICATION OR  
27 MOTOR SPECIFICATION?

28 MR. KILLOUGH: NO, THE MOTOR SPEC, 2323 ES 1B, WHI



1 IS THE MOTOR SPECIFICATION, RIGHT, WHICH WE REFERENCE THERE.

2 MR. MARTIN: YES, YES.

3 MR. KILLOUGH: THE MOTOR SPECIFICATION IDENTIFIES  
4 THAT THE PUMP MANUFACTURER WILL ESTABLISH THE PROPER  
5 APPLICATION OF THE MOTOR THROUGH HIS HORSEPOWER, TORQUE, AND  
6 SPEED REQUIREMENTS.

7 MR. MORRIS: WAS IT VERIFIED THAT THAT DID, IN FAC-  
8 TAKE PLACE?

9 MR. MARTIN: YES, IT WAS INCLUDED IN THE PURCHASE  
10 SPECIFICATION.

11 MS. WILLIAMS: NO, THAT THE COORDINATION TOOK PLAC  
12 THAT CRAIG JUST SPOKE OF.

13 MR. KILLOUGH: WHAT DO YOU MEAN BY COORDINATION?

14 MR. MORRIS: HOW DID THE MOTOR VENDOR GET THE LOAD  
15 THAT HE WAS REQUIRED TO? HOW DID HE GET THAT LOAD DATA?

16 MR. KILLOUGH: WASN'T THE PUMP MANUFACTURER --  
17 DIDN'T HE ESTABLISH THAT IN THE PROCUREMENT SPECIFICATION TH  
18 WE CHECKED? WASN'T THAT PROVIDED BY HIM?

19 MR. MARTIN: THERE ARE A LOT OF DETAILS FLOATING  
20 AROUND IN MY HEAD ON WHAT WE TALKED ABOUT A YEAR AGO ON THI  
21 I WOULD LIKE TO BE ABLE TO IRON THEM OUT.

22 MR. CALVO: PUT THEM DOWN THE PURPOSE FOR BEING HE  
23 IS TRYING TO CLARIFY THESE QUESTIONS, SO...

24 MR. MARTIN: COULD YOU PLEASE RESTATE THE QUESTION  
25 SO I'M SURE TO ANSWER WHAT YOU WANT TO KNOW.

26 MR. MORRIS: YOU STATED THAT THE MOTOR SPECIFICAT  
27 HAD A STATEMENT IN THERE THAT THE PUMP LOADS WOULD BE PROVI  
28 BY THE PUMP VENDOR. AND THE QUESTION WAS, HOW WAS THAT

1 INFORMATION ACTUALLY SUPPLIED TO THE MOTOR VENDOR.

2 MR. MARTIN: LET ME CLARIFY THAT THE PUMP, THE  
3 MOTOR -- THE DRIVEN EQUIPMENT VENDOR SUPPLIED THE MOTOR DATA,  
4 THE MOTOR REQUIREMENTS FOR THE PUMP WHICH WERE INCLUDED IN THE  
5 MOTOR DATA.

6 DO YOU STILL HAVE A QUESTION?

7 MR. MORRIS: IF I UNDERSTAND, WHAT YOU ARE SAYING IS  
8 THE PUMP WAS SPECIFIED AND PURCHASED FIRST AND THEN WHEN THAT  
9 WAS FINALIZED AND THE PUMP DATA WAS AVAILABLE, THEN THE MOTOR  
10 SPECIFICATION WAS LEFT.

11 MR. MARTIN: CORRECT, AND --

12 MR. CALVO: YOU SAY THAT'S CORRECT?

13 MR. MARTIN: RIGHT.

14 MR. MARINOS: NOW, LET ME FURTHER -- THERE'S ONE  
15 MORE POINT, AND WE'LL GO OFF TO THE NEXT QUESTION.

16 DID YOU LOOK AT THE INTEGRATED CURVE, THE TORQUE  
17 CURVE, THE MOTOR TORQUE CURVE WITH THE PUMP REQUIREMENT TO  
18 DETERMINE OR TO VERIFY THE ACCELERATION TIME AVAILABLE TO YOU  
19 ON THE ACCELERATION TORQUE?

20 MR. MORRIS: OR DID YOU LOOK TO SEE IF GIBBS & HILL  
21 DID THAT VERIFICATION.

22 MR. MARTIN: I KNOW WE REVIEWED -- WE LOOKED AT  
23 THOSE CURVES, AND LET ME VERIFY THE EXTENT.

24 MR. MARINOS: WOULD YOU, PLEASE.

25 WE'LL GO TO QUESTION 4(E), WAS THE ROUTING OF THE  
26 POWER AND CONTROL CABLES REVIEWED FOR VOLTAGE LEVEL SEPARATIO

27 MR. MARTIN: YES, CYGNA REVIEWED VOLTAGE RACEWAY  
28 DESIGNATIONS ON THE CABLE RACEWAY SCHEDULES TO VERIFY VOLTAGE

1 LEVELS, VOLTAGE LEVEL SEPARATION.

2 MR. MORRIS: WAS THERE A DEDICATED 6.9 KV RACEWAY  
3 SYSTEM?

4 MR. MARTIN: YES, YES.

5 MR. MARINOS: GO TO QUESTION 4(G), 6.9 KV POWER IS  
6 NOT LIMITED BY PERCENT FILL BUT BY SPACING. HOW WAS THIS  
7 REVIEWED?

8 MR. MARTIN: THE CABLE AND RACEWAY SCHEDULES  
9 IDENTIFY THAT REQUIREMENT THAT 6.9 KV POWER FEEDERS ARE  
10 REQUIRED TO MAINTAIN PHYSICAL SPACING IN THEIR FUNCTION  
11 REMARKS COLUMN.

12 MR. MORRIS: AND THE REASON FOR THAT QUESTION WAS OF  
13 SHEET 8 OF YOUR CHECKLIST EE-01. YOU SAID THAT THE RACEWAY  
14 ROUTING POINTS WERE REVIEWED AND WERE LESS THAN THE 30 TO 40  
15 PERCENT MAXIMUM FILL REQUIREMENTS.

16 MR. NORKIN: YOU'RE SAYING THEY'RE NOT LIMITED BY  
17 THE FILL, RIGHT. WHERE DOES IT SAY THEY'RE LIMITED BY SPACING  
18 IN THIS STATEMENT?

19 MR. KNOX: INDUSTRY PRACTICE RECOMMENDED SEPARATION

20 MR. MARTIN: WE HAVE REVIEWED CALCULATIONS ALSO THAT  
21 ARE CABLE SIZING CALCS, 6.9 KV CABLE SIZING CALCS IDENTIFIES  
22 THE REQUIREMENT, SO WE WERE AWARE OF IT, AND I NEED TO VERIFY  
23 THE DETAILS OF IT.

24 MS. WILLIAMS: I GUESS WHAT WE'RE SAYING IS IT'S NO  
25 TO BE CONSTRUED BECAUSE THIS ATTRIBUTE IS CALCD IN TERMS OF  
26 PERCENT FILL THAT WE WERE UNAWARE OF THE SEPARATION CRITERIA  
27 BECAUSE WE DID FIND THAT EVIDENCE. THIS WAS TAKEN FROM ES 10  
28 WHICH I WAS CHECKING THROUGH THIS MORNING, BUT DIDN'T FINISH



1 BEFORE COMING INTO THIS MEETING, WHERE GIBBS & HILL DID  
2 SPECIFY PERCENT FILL. NOW WHETHER THERE WAS A CALCULATION OR  
3 SOMETHING IN GIBBS & HILL'S HOUSE WHICH JUSTIFIED WORDING IT  
4 IN THAT WAY BECAUSE THERE WAS SOME CORRELATION BETWEEN THE TW  
5 THAT WE NEED TO CHECK.

6 MR. MORRIS: TOM, DID YOU SAY THAT THE SIZING  
7 CALCULATION FOR 6.9 KV CABLE REFERRED TO PERCENT FILL?

8 MR. MARTIN: NO, IT REFERRED TO CABLE SPACING.

9 MS. WILLIAMS: AND THE CABLE RACEWAY SCHEDULE ALSO  
10 HAD A WARNING FLAG ON IT INDICATING THAT TUGCO, SLASH, GIBBS  
11 HILL WERE ALSO AWARE OF THAT REQUIREMENT. BUT I THINK THAT  
12 THE THING THAT'S NOT CLOSED IS WHY WOULD THEY WRITE THE SPEC  
13 IN TERMS OF PERCENT FILL OR DID THEY HAVE SOME JUSTIFICATION  
14 FOR WORDING IT THAT WAY AS OPPOSED TO SPACING REQUIREMENT.

15 MR. MORRIS: THIS SPECIFICATION THAT YOU REFERRED  
16 ES 100 IS THE ELECTRICAL INSTALLATION.

17 MS. WILLIAMS: ELECTRICAL ERECTION SPECIFICATION,  
18 YES. AS I SAY, WE WERE JUST CHECKING THAT, BUT I DIDN'T GET  
19 THE ANSWER BEFORE I CAME IN HERE.

20 MR. MARINOS: WE'LL GO TO THE NEXT QUESTION.

21 4(J) -- EXCUSE ME, GEORGE, YOU HAD --

22 MR. MORRIS: LET'S GO BACK. TOM WAS TALKING ABOUT  
23 THE CAPACITY CALCULATIONS FOR THE CABLE SIZING CALCULATIONS  
24 FOR 6.9 KV. IS THAT 6.9 KV CABLE SIZE ON A CAPACITY OR IS  
25 THAT SHORT CIRCUIT?

26 MR. MAGGIO: IT IS SIZED BOTH WAYS, ON BOTH CAPACI  
27 AND MINIMUM SIZE BASED ON THE AVAILABLE SHORT CIRCUIT THEY I  
28 THAT'S CLEARLY IN THE CALCULATIONS.

1 MR. MORRIS: WHICH CALCULATION WAS THAT?

2 MR. MAGGIO: BOTH THE 6.9 KV CABLE CALCULATION AND  
3 SIZING CALCULATION FOR LOADS ON FOUR EQUAL BUSES. IT WAS  
4 INCLUDED IN BOTH CASES.

5 MR. MORRIS: THANK YOU.

6 MR. MARINOS: WE'LL GO TO QUESTION 4(J), WAS THE  
7 BASIS FOR THE ENVIRONMENTAL AND SEISMIC INPUT TO THE MOTOR  
8 SPEC CONFIRMED BY CYGNA AND REVIEWED IN A QUALIFICATION REPORT

9 MR. MARTIN: NO. CYGNA VERIFIED THE EXISTENCE OF  
10 SEISMIC AND ENVIRONMENTAL REQUIREMENTS ONLY.

11 MS. WILLIAMS: OUT OF SCOPE.

12 MR. MARINOS: RIGHT. WE'LL GO TO QUESTION 5(A),  
13 WERE THE ISOLATION RELAYS CONFINED TO COIL TO CONTACT  
14 ISOLATION OR WERE THEY QUALIFIED ALSO FOR CONTACT TO CONTACT  
15 ISOLATION.

16 MR. MARTIN: I'M GOING TO TRY TO  
ANSWER THE TWO QUESTIONS AT THE SAME TIME.

17 MS. WILLIAMS: I THINK WE WANTED A CLARIFICATION OF  
18 THIS QUESTION. MAYBE YOU COULD GIVE US A LITTLE MORE DETAIL

19 MR. MORRIS: ALL RIGHT. THE STATEMENT IN THE  
20 CHECKLIST SAYS THE CLASS 1 ISOLATION WAS ACTUALLY USED FOR  
21 ISOLATION, AND THE QUESTION IS TO FIND OUT HOW THOSE ISOLATION  
22 RELAYS WERE USED. WERE THE ISOLATION RELAYS QUALIFIED FOR  
23 COIL TO CONTACT ISOLATION OR CONTACT TO CONTACT ISOLATION, A  
24 HOW WERE THEY USED IN THE CIRCUIT.

25 MR. STANLEY: THIS IS ON SHEET 10.

26 MR. MARTIN: I'LL TRY INITIALLY TO ANSWER THAT. I  
27 NOT SURE IF I AM ADDRESSING EXACTLY WHAT YOU ARE LOOKING FOR  
28 BUT I REVIEWED A QUALIFICATION FOR THESE RELAYS WA

1 TO THE EXTENT THAT THEY WERE INCLUDED IN THE SWITCHGEAR AND  
2 THAT THE SWITCHGEAR WAS A PROCURED SAFETY RELAY.

3 MR. STANLEY: LET'S TRY IT A DIFFERENT WAY. YOU ARE  
4 TALKING HERE IN YOUR REVIEW STATEMENT THAT YOU LOOKED AT THE  
5 CONTROL SCHEMATIC FOR THE PUMP, FOR ELECTRICAL ISOLATION OF  
6 ALL NONSAFETY RELATED BETWEEN THE CONTROL CIRCUITS. THEN YOU  
7 MAKE THE STATEMENT CLASS 1 UTILIZED FOR ISOLATION, BUT THAT  
8 RAISES A QUESTION AS TO WHAT FORM DID THAT ISOLATION TAKE, HOW  
9 WAS THAT CIRCUIT DESIGNED TO ACHIEVE THAT ISOLATION.

10 MR. OSZEWSKI: EXCUSE ME. THIS IS JIM OSZEWSKI.  
11 ISN'T THIS THE SAME QUESTION THAT COMES UP IN THE  
12 I&C?

13 MR. KILLOUGH: WHY DON'T YOU READ YOUR ANSWER THAT  
14 WE HAVE FOR THAT.

15 MR. MARTIN: LET ME TRY THIS ONE ANSWER, AND I  
16 WROTE -- THIS WAS AN ATTEMPT TO ANSWER YOUR QUESTION BEFORE  
17 GOT THIS CLARIFICATION. SEE IF IT ANSWERS WHAT YOU ARE  
18 LOOKING FOR.

19 RELAY 52-B AS A COIL TO CONTACT AND CONTACT TO  
20 CONTACT ISOLATION FOR INPUTS TO THE SOLID STATE ISOLATION  
21 CABINET SSIC FOR COMPUTER INPUTS.

22 MR. STANLEY: SO IT USES BOTH COIL TO CONTACT AND  
23 CONTACT TO CONTACT.

24 MR. MARTIN: IT USES COIL TO CONTACT ISOLATION TO  
25 THE EFFECT THAT THE INPUTS TO THIS -- TO THE COMPUTER ARE  
26 ISOLATED FROM THE PUMP CIRCUIT BY COIL TO CONTACT ISOLATION.

27 MR. STANLEY: SO COMPUTER TO PUMP IS COIL TO CONTACT  
28 ISOLATION BETWEEN THE PUMP CIRCUIT AND THE COMPUTER.



1 MR. MARTIN: CORRECT, CORRECT. BETWEEN THE  
2 INTERLOCK FUNCTIONS THE COILS ON THAT RELAY FOR THE CONTROL  
3 CIRCUIT OF THE PUMP AND THE COMPUTER PHASE CONTACT TO CONTACT  
4 ISOLATION.

5 MR. STANLEY: OKAY, THANKS.

6 MR. CALVO: I GUESS IT'S GETTING CLOSE TO 11:45.  
7 THAT'S WHERE WE TAKE A BREAK YESTERDAY.

8 MS. WILLIAMS: YES.

9 MR. CALVO: WHY DON'T WE TAKE A BREAK RIGHT NOW,  
10 RECONVENE ABOUT WHAT TIME, 1:00 O'CLOCK? EVERYBODY IN FAVOR.  
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AFTERNOON SESSION - 1:25 P.M.

1  
2 MR. MARINOS: READY? WE'RE GOING TO FOLLOW UP ON  
3 THAT PREVIOUS QUESTION THAT WE HAD ON 5(A), RIGHT?

4 MR. MORRIS: YES.

5 YOUR STATEMENT IN THE REPORT WAS MADE THAT CLASS  
6 RELAYS WERE USED FOR ISOLATION. AND BEFORE WE BROKE FOR LUNC  
7 YOU STATED THAT THE RELAYS IN QUESTION ARE USED BOTH IN A COI  
8 AND CONTACT MODE AND IN A CONTACT TO CONTACT MODE FOR  
9 ISOLATION. THE QUESTION I HAVE IS, DID YOU LOOK  
10 TO SEE IF THOSE RELAYS WERE DESIGNED FOR THE PURPOSE THAT THE  
11 ARE BEING USED, THAT IS CONTACT TO CONTACT ISOLATION.

12 MR. MARTIN: SPECIFICALLY FOR THAT -- NO, NOT  
13 SPECIFICALLY FOR THAT APPLICATION. THE CABLES THAT THESE ARE  
14 ISOLATING GO INTO THE SOLID STATE ISOLATION CABINET AND AN  
15 ENUNCIATOR LOGIC CABINET WHICH BOTH HAVE QUALIFIED OPTICAL  
16 ISOLATORS.

17 MR. MORRIS: DID GIBBS & HILL GET THAT JUSTIFICATIO

18 MR. MARTIN: YES, IN THE FSAR.

19 MR. MORRIS: WHAT'S IN THE FSAR?

20 MR. MARTIN: THE FACT THEY HAVE QUALIFIED OPTICAL  
21 ISOLATION AT THE SOLID STATE ISOLATION CABINET AND ENUNCIATIO  
22 LOGIC CABINET.

23 MR. MORRIS: THERE WAS NOTHING SPECIFICALLY STATED  
24 ABOUT THESE ISOLATION RELAYS IN THE CONTROL CIRCUIT.

25 MR. MARTIN: WELL, THE FSAR ALSO ADDRESSES THESE  
26 CLASS 1-E RELAYS. OKAY, BASICALLY WHAT THE FSAR STATES FOR  
27 CLASS 1-E RELAYS IS THAT CLASS 1-E CONTACT PERFORMS A --  
28 EXCUSE ME, LET ME START OVER.

1 ON A CLASS 1-E CONTACT PERFORMS A NONCLASS 1-E  
2 MONITORING FUNCTION, AN ISOLATION IS NORMALLY PROVIDED BY A  
3 PHOTOTRANSISTOR COUPLED PAIR, PAREN, LIGHT EMITTING DIODE AND  
4 A TRANSISTOR, END PAREN.

5 MR. STANLEY: IT USES THE WORD NORMAL THERE?

6 MR. MARTIN: USES THE WORD NORMALLY. AND ANOTHER  
7 SECTION THAT IDENTIFIES THAT THE SOLID STATE ISOLATION CABINE  
8 AND ENUNCIATOR LOGIC CABINET FOR ISOLATION.

9 MR. MORRIS: WHAT SECTION OF THE FSAR IS THIS. DO  
10 YOU HAVE A PAGE?

11 MR. MARTIN: THIS IS PAGE 8.3-40B DATED NOVEMBER  
12 30TH, 1979.

13 MR. STANLEY: TO BE A LITTLE MORE SPECIFIC ON THAT  
14 QUESTION, YOU DIDN'T SEE OR REVIEW IN ANY KIND OF A TEST  
15 REPORT TO QUALIFY THOSE RELAYS?

16 MR. MARTIN: NO.

17 MR. STANLEY: THAT'S ALL I HAVE.

18 MR. MORRIS: YOU DIDN'T QUESTION THE DIFFERENCE  
19 BETWEEN THE STATEMENT IN THE FSAR TALKING ABOUT ELECTRICAL  
20 OPTICAL ISOLATORS OPPOSED TO RELAY ISOLATION?

21 MR. MARTIN: MY COMMENT IS PROBABLY MISLEADING.

22 MR. STANLEY: I THINK THAT'S WHAT THIS ALL IS  
23 IDENTIFYING.

24 MR. KNOX: I GUESS I'M CONFUSED ABOUT THE TYPES OF  
25 ISOLATION DEVICES THAT YOU USED. YOU ARE SAYING YOU ONLY  
26 REVIEWED THE OPTICAL ISOLATORS OR WAS IT ALSO ISOLATION DEVI  
27 BY CONTACT TO CONTACT AS WELL AS COIL TO CONTACT ISOLATION?

28 MR. MARTIN: BOTH TYPES OF ISOLATION EXIST, AND I



1 WAS JUST IDENTIFYING THAT.

2 MR. KNOX: YOU HAVEN'T LOOKED AT ANY QUALIFICATION  
3 REPORTS TO QUALIFY ANY TYPE OF ISOLATION DEVICE. IT JUST  
4 EXISTS.

5 MR. MARTIN: AS FAR AS QUALIFICATION, OUR SCOPE OF  
6 QUALIFICATION REVIEW WENT.

7 MR. CALVO: I GUESS I'M HAVING A PROBLEM TRYING TO  
8 UNDERSTAND WHAT IS THE PROBLEM.

9 MR. STANLEY: WELL, THE PROBLEM IS THAT THIS CLASS  
10 1A RELAY USED FOR ISOLATION IS EXACTLY RIGHT, BUT THAT  
11 STATEMENT WAS INSUFFICIENT TO ANSWER THE QUESTION. THAT'S  
12 WHAT'S TRIGGERED ALL OF OUR QUESTIONS.

13 MR. CALVO: I'M TRYING TO VISUALIZE IN THE COMPONEN  
14 COOLING WATER PUMP CIRCUIT ONE TRAIN, WHAT IS IN THERE COMING  
15 FROM A 52-B CONTACT GOING TO THE ENUNCIATOR ALSO PROBABLY  
16 COMPROMISE THE INDEPENDENCE IN THE OTHER TRAIN B. THAT'S MY  
17 PROBLEM

18 MR. MARTIN: THERE WERE NO CASES OF THAT.

19 MR. CALVO: THERE WAS NO CASES, THEN WE DON'T HAVE  
20 TO BE WORRYING ABOUT IT.

21 MR. STANLEY: WE GOT A SENSOR COMING INTO THAT EXAC  
22 SAME CIRCUIT, LOW PRESSURE SENSOR THAT WE TALKED ABOUT  
23 YESTERDAY.

24 MR. CALVO: OKAY. LOW PRESSURE.

25 MR. STANLEY: COMING INTO THE OTHER SIDE OF THE  
26 BUILDING.

27 MR. CALVO: FROM THE PROCESS PIPE.

28 MR. STANLEY: YES, YES, YES. SO WE HAVEN'T FINISHE

1 ANSWERING THAT QUESTION.

2 MR. CALVO: OKAY. SO THE PROBLEM IS NOW IF YOU GO  
3 TO THE PROCESS PIPING, YOU ARE GOING TO SEE TWO INTERLOCKS,  
4 ONE GOING TO TRAIN "A" PUMP CIRCUIT AND ONE GOING TO TRAIN B  
5 PUMP CIRCUIT.

6 MR. STANLEY: NO.

7 MR. CALVO: I ONLY GOT ONE GOING TO BOTH SIDES?

8 MR. STANLEY: ONLY THE B PRESSURE TRAIN GOES TO  
9 TRAIN A.

10 MR. CALVO: OKAY, SO THE B -- OKAY. SO THE B  
11 PRESSURE SENSOR --

12 MR. OVERBECK: PRESSURE SENSOR GOES TO TRAIN "A".

13 MR. CALVO: OKAY. IF THAT'S THE CASE -- IF THAT'S  
14 THE CASE, THE ONLY REACTION WOULD BE ONE OF ROUTING THAT  
15 SIGNAL FROM THAT SECTION BACK TO THERE.

16 MR. STANLEY: YES.

17 MR. CALVO: SO IF YOU ROUTE IT PROPERLY, THEN WHO  
18 CARES ABOUT ISOLATION. IF YOU ROUTE IT IMPROPERLY - YOU SEE  
19 I DON'T CARE WHAT ISOLATION YOU PUT THERE BECAUSE I'M GOING  
20 FIND OUT WHERE YOU PUT IT, AND I'M GOING TO FIND OUT IT'S IN  
21 THE WRONG PLACE AND THEN I'M GOING TO POSTULATE SOMEWHERE AN  
22 COMPROMISE THE INDEPENDENCE, TOO. WHAT I AM GETTING, MAYBE  
23 ARE ASKING A -- SOMETHING --

24 MR. MARTIN: I THINK MAYBE TO CLARIFY THAT ISSUE A  
25 LITTLE BIT FURTHER, THE SENSOR IN THE B TRAIN THAT INITIATES  
26 THE COMPONENT COOLING WATER PUMP IS A CLASS -- TRAIN "A"  
27 CABLING, TRAIN "A" CONTACT INSIDE THE TRAIN, A CONTROL SYSTE

28 MR. CALVO: IN NO WAY WHATSOEVER IT GETS MIXED WIT

1 THE B.

2 MR. MARTIN: CORRECT.

3 MR. CALVO: IF THAT'S THE CASE, THEN WHAT WE  
4 WORRYING ABOUT ISOLATION, IF THAT HAS BEEN VERIFIED.

5 MR. MORRIS: WE'RE QUESTIONING --

6 MR. CALVO: I AGREE. I AGREE. MAYBE I'M TAKING --  
7 I'M TRYING TO CLARIFY THAT MAYBE THE CHECKLIST IS NOT  
8 REPRESENTATIVE OF --

9 MR. KNOX: DID YOU LOOK AT THE CIRCUITS FROM THE  
10 ISOLATION DEVICE ONCE THE CIRCUITS BECAME NONCLASS 1-A? DID  
11 YOU LOOK AT THOSE CIRCUITS IN YOUR REVIEW?

12 MR. MARTIN: YES. WE VERIFIED THE CABLE ROUTING TO  
13 THE SOLID STATE ISOLATION CABINET AND ENUNCIATION CABINET.

14 MR. KNOX: AS IN MEETING WHAT CRITERIA?

15 MR. MARTIN: THEY WERE ASSOCIATED CABLES.

16 MR. KNOX: WHAT WAS THE CRITERIA YOU REVIEWED THOSE  
17 CABLES AGAINST?

18 MR. MARTIN: THAT'S PART OF THE CRITERIA OF THE  
19 SEPARATION OF THE FSAR.

20 MR. CALVO: IF I MAY SUGGEST, MAYBE WE SHOULD REMOVE  
21 THIS ITEM FROM YOUR CHECKLIST ON THE -- IF THAT'S THE CASE,  
22 THEN WE CAN RESOLVE THE QUESTION.

23 MR. MORRIS: I DON'T AGREE.

24 MR. CALVO: REPHRASE IT. GO AHEAD, GEORGE.

25 MR. MORRIS: THERE IS A STATEMENT IN THE CHECKLIST  
26 THAT SAYS THAT ELECTRICAL ISOLATION BETWEEN SAFETY RELATED AND  
27 NONSAFETY RELATED CIRCUITS WAS CHECKED. THERE IS A STATEMENT  
28 FROM TOM THAT SAYS THERE IS OR THERE ARE IN EACH CIRCUIT OR A



1 LEAST IN THE CIRCUIT THAT HE LOOKED AT, A RELAY THAT'S USED  
2 WITH COIL CONTACT AND CONTACT TO CONTACT ISOLATION, THE  
3 NONSAFETY CIRCUIT ON THAT RELAY IS GOING TO AN ENUNCIATOR  
4 CIRCUIT. WE HAVE -- I DON'T BELIEVE -- LET ME ASK HIM. DID  
5 YOU LOOK AT THE TRAIN B CIRCUIT TO SEE IF THAT WAS ALSO GOING  
6 TO THE SAME ENUNCIATOR CIRCUIT?

7 MR. CALVO: THIS IS THE SECOND QUESTION. I'M SORRY,  
8 GEORGE. THAT'S OKAY. THAT'S ALL RIGHT.

9 MR. MORRIS: WE KNOW WE HAVE A NONSAFETY CIRCUIT  
10 COMING OFF OF THAT RELAY GOING SOMEWHERE. WE DON'T KNOW WHERE  
11 THE REDUNDANT CIRCUIT IS GOING.

12 MR. CALVO: THAT'S CORRECT, I GUESS, OF -- GO AHEAD.

13 MR. MARTIN: WE VERIFIED SEPARATION OF THE CABLING  
14 TO THE ENUNCIATOR OR THE ENUNCIATOR LOGIC CABINET OR SOLID  
15 STATE ISOLATION CABINET SEPARATION FROM TRAIN B ONCE AND  
16 THAT'S AS FAR AS OUR REVIEW WENT.

17 MR. MORRIS: IS THERE A SEPARATE ENUNCIATOR CABINET  
18 FOR EACH TRAIN?

19 MR. MARTIN: I'M NOT SURE RIGHT AT THIS POINT.

20 MR. PORTER: THE QUESTION IS, IS THERE A WINDOW IN  
21 THE ENUNCIATOR FOR TRAIN "A" AND ANOTHER WINDOW FOR TRAIN B  
22 AND ARE THEY IN TWO SEPARATE CABINETS WHERE YOU PUT THE INPUTS  
23 INTO THEM SEPARATED PROPERLY. THAT'S THE QUESTION.

24 MR. KNOX: IN OTHER WORDS, THEY GOT TO BE SEPARATED  
25 BY SIX INCHES.

26 MR. PORTER: WHATEVER THE SEPARATION CRITERIA IS, IS  
27 THAT SEPARATION CRITERIA TRUE FOR THE TRAIN "A" INPUT TO THE  
28 ENUNCIATOR AND THE TRAIN B TO THE ENUNCIATOR?

1 MR. CALVO: IN ALL PROBABILITY, THE ENUNCIATORS ARE  
2 CONSIDERED AS A COMMON POINT, SO THAT WAY YOU KNOW IT'S  
3 IMPORTANT AND YOU WON'T GO BACK TO THE SOURCE AND FIND OUT  
4 WHAT THE COIL TO CONTACT ISOLATION WAS CONFIRMED TO BE  
5 ADEQUATE TO SOME KIND OF TEST.

6 IF YOU HAVE THAT IN TRAIN "A" AND IN TRAIN B, YOU  
7 DON'T CARE WHETHER THEY GO TO THE COMMON ENUNCIATOR BECAUSE  
8 YOU ALREADY ISOLATED THEM COMING OUT OF THE SAFETY BUSES. SO  
9 I GUESS YOU MUST GO BACK AGAIN TO THE SOURCE AND FIND OUT WHAT  
10 GEORGE WAS ASKING YOU, IF THE COIL TO CONTACT ISOLATION WAS  
11 VERIFIED TO BE ADEQUATE BY SOME TEST -- SOME TEST REPORT THAT  
12 GIBBS & HILL HAS DONE OR SOMEBODY HAS DONE.

13 I GUESS THE QUESTION IS, HAD YOU VERIFIED THAT FACT,  
14 RIGHT, GEORGE?

15 MR. PORTER: HE'S ALREADY ANSWERED THE QUESTION. HE  
16 SAID NO, HE DIDN'T CHECK IT, BUT HE DID GET A QUALIFICATION ON  
17 CLASS 1-E LEVEL. THAT'S WHAT THE ANSWER WAS.

18 MR. CALVO: BUT THEN THE PART -- THE PART THAT  
19 DOESN'T -- THAT YOU GO TO AN ENUNCIATOR, THAT PRESUMABLY ONLY  
20 YOU HAVE VERIFIED THE FACT THAT YOU HAVE SEPARATE AND  
21 INDEPENDENT ENUNCIATORS, I GUESS THE QUESTION IS, IF THAT'S  
22 THE CASE THAT YOU HAVE THAT, ALSO THE FACT -- ALSO, HOW DO YOU  
23 ROUTE THAT CABLE TO THE ENUNCIATOR ANY WAY GET MIXED FROM THE  
24 CABLE TO THE OTHER TRAIN. YOU GOT TO ANSWER THAT QUESTION  
25 WHEN YOU CANNOT ANSWER THE --

26 MR. PORTER: I THINK THE ANSWER TO THE QUESTION IS  
27 THAT THEY --

28 MR. MARTIN: THE CABLE -- WE REVIEWED THE CABLE

1 ROUTINGS, THE ASSOCIATED -- IT WAS AN ASSOCIATED "A" CABLE  
2 THAT WAS ROUTED WITH TRAIN "A" CABLES.

3 MR. CALVO: OKAY.

4 MR. MARTIN: WE HAVE DONE A REVIEW THAT VERIFIES THE  
5 SEPARATION OF THOSE TRAINS.

6 MR. CALVO: OKAY.

7 MR. MARTIN: I DID NOT -- I'M PRETTY SURE THAT THAT  
8 HAS BEEN -- THE SEPARATION OF A AND B TO THOSE PANELS WAS  
9 COMPLETED. I NEED TO CHECK OUR REVIEWER THAT'S NOT HERE.

10 MR. CALVO: ALL RIGHT. GO TO THE NEXT QUESTION.

11 MR. MARINOS: QUESTION 5(B), WAS THE PUMP CONTROL  
12 INOPERABLE CIRCUIT REVIEWED BY CYGNA FOR COMPLETENESS FOR SUCH  
13 THINGS AS CONTROL SWITCH POSITION, CONTROL VOLTAGE  
14 AVAILABILITY, BREAKER IN CORRECT POSITION, SERVICE WATER  
15 SYSTEM AVAILABLE, ET CETERA.

16 MR. MARTIN: YES. THE FOLLOWING INPUTS HAVE  
17 PROVIDED FOR THE COMPONENT COOLING WATER SYSTEM INOPERABLE  
18 CIRCUIT, LOSS OF SERVICE WATER, LOSS OF 125 VOLT DC, LOSS OF  
19 118 VOLT AC, CCW PUMP CONTROL SWITCH, LOCKOUT POSITION, BUS  
20 TIE BREAKER BT 1E A1, OPEN, UNDERVOLTAGE 6.9 KV, UNDERVOLTAGE  
21 FOR 80 VOLTS, FOR 80 VOLT SWITCHGEAR UNAVAILABLE AND COMPONENT  
22 COOLING WATER SWITCH, PUMP ROOM COOLER SWITCH AND LOCKOFF  
23 POSITION FOR OPERATOR MANUAL ACTION ON THE SSII PANEL.

24 MR. MARINOS: ANY MORE QUESTIONS, GEORGE?

25 MR. MORRIS: YOU MENTIONED BUS TIE BREAKER, BUT I  
26 DIDN'T NOTICE ANYTHING THERE ABOUT THE POSITION OF THE  
27 COMPONENT COOLING WATER BREAKER.

28 MR. MARTIN: THAT'S OBTAINED THROUGH THE COMPONENT



1 COOLING WATER SYSTEM PUMP CONTROL SWITCH LOCKOUT POSITION.

2 MR. MARINOS: ARE WE FINISHED? WE'LL GO TO 5(C),  
3 WHERE IS THE SINGLE FAILURE OF THE LOOP A/LOOP ISOLATION  
4 VALVES DISCUSSED.

5 MR. MARTIN: REVIEW OF THE LOOP A/LOOP ISOLATION  
6 VALVES IS DOCUMENTED ON CHECKLIST EE-02, ITEM 5, POINT C.

7 MR. MARINOS: DO YOU WANT TO REVIEW THAT NOW, GEORGE  
8 OR GO ON TO THE NEXT QUESTION? GO TO THE NEXT QUESTION. ALL  
9 RIGHT, WE'RE GOING TO GO TO THE NEXT QUESTION.

10 MS. WILLIAMS: HOLD JUST A SECOND.

11 WE'RE CHECKING ONE THING BECAUSE THIS IS AN EXAMPLE  
12 OF SOMETHING THAT WAS REVIEWED IN DIFFERENT ANGLES BY  
13 MECHANICAL AND THEN THE ELECTRICAL PEOPLE. TOM HAS GIVEN THE  
14 REFERENCE FROM HIS CHECKLIST AND I'D ASK BOB TO GIVE THE  
15 REFERENCE FOR THE MECHANICAL CHECKLIST SINCE THERE'S TWO  
16 ASPECTS TO THE QUESTION. IF WE CAN'T GET THAT TO YOU NOW, WE  
17 CAN GET BACK AND SUFFICE TO SAY, IT'S ON MECHANICAL OR DID YOU  
18 FIND IT, BOB?

19 MR. HESS: IT'S ALSO ADDRESSED IN CHECKLIST MS-02,  
20 SHEET 5 OF 7 AND THE FACT THAT NONESSENTIAL LOADS MUST BE  
21 ISOLATED BY ESSENTIAL LOADS BY REDUNDANT VALVES FOLLOWING AN  
22 ACCIDENT.

23 MR. MARINOS: CAN WE GO TO THE NEXT QUESTION,  
24 QUESTION NUMBER 6(A). WAS THE ALTERNATE SHUTDOWN CIRCUIT  
25 PROVIDED WITH AN ALTERNATE POWER SUPPLY.

26 MR. MARTIN: NO. THE ALTERNATE SHUTDOWN CAPABILITY  
27 FOR THE CCWS PUMP CONSISTS OF TRANSFERRING CONTROL FROM THE  
28 CONTROL ROOM TO THE HOT SHUTDOWN PANEL. THIS IS ACCOMPLISHED

1 AT THE SHUTDOWN TRANSFER PANEL SINCE IT ISOLATES THE CABLE AND  
2 CONTROL SWITCH IN THE CONTROL ROOM FROM THE CCWS PUMP CONTROL  
3 CIRCUIT AND CONTROL SWITCH AND THE CABLING AT THE HOT SHUTDOWN  
4 PANEL AND CCWS PUMP CONTROL CIRCUITRY. 6.9 KV POWER AND 1.5  
5 VOLT PC CONTROL POWER CIRCUITS ARE THE SAME FOR -- ARE FROM  
6 THE SAME SWITCHGEAR CUBICLE REGARDLESS OF WHERE THE CONTROL  
7 FUNCTION IS INITIATED FROM.

8 MR. KNOX: THE CONTROL PANEL FOR THAT, DOES IT COME  
9 FROM THE SAME -- COME THROUGH THE SAME CIRCUIT BREAKER OR FUSE,  
10 THE CONTROL PANEL? DOES IT COME FROM THE SAME FUSE?

11 MR. MARTIN: ALL IT DOES IS TRANSFER CONTROL FROM  
12 THE CONTROL ROOM DOWN TO THE HOT SHUTDOWN PANEL.

13 MR. KNOX: NOW, DOES THE POWER FROM THE CONTROL ROOM  
14 GO THROUGH A CERTAIN FUSE TO SUPPLY POWER TO THE CONTROL ROOM  
15 USE THE SAME FUSES TO SUPPLY POWER FOR THE CONTROL OF THE SHUT  
16 PANEL, TRANSFER SWITCH, SWITCH FROM -- TO A DIFFERENT FUSE?

17 MR. MARTIN: I CAN CHECK THE FUSE.

18 MR. CALVO: LET ME TELL YOU THE PURPOSE OF THE  
19 QUESTION, CORRECT ME, JOHN. YOU WANT TO TELL THE PURPOSE OF  
20 THE QUESTION, WHAT YOU ARE WORRYING ABOUT THE FUSES.  
21 POSTULATE.

22 MR. KNOX: THE EVENT IS A FIRE IN THE CONTROL ROOM  
23 SHORTS OUT THE CIRCUITS, BLOWS THE FUSE THAT GO TO THE REMOTE  
24 SHUTDOWN PANEL THROUGH YOUR TRANSFER SWITCH FUSE IS BLOWN, SO  
25 YOU DON'T YOU HAVE ANY POWER AT THE TRANSFER SWITCH, THE  
26 REMOTE SHUTDOWN PANEL. IN ORDER TO SHUT DOWN THE PLANT AND  
27 YOU HAVE TO GO BY PROCEDURE AND REPLACE THE FUSE. I WANT TO  
28 KNOW WHETHER OR NOT THE FUSE -- YOUR TRANSFER SWITCH WILL

1 TRANSFER YOU TO ANOTHER FUSE TO ELIMINATE THAT PROBLEM.

2 MR. CALVO: IF YOU LOOK INTO THE CONTROL CIRCUIT,  
3 MOST PROBABLY IT WILL BE SHOWN IN THERE, IF IT IS THERE. IF  
4 YOU DON'T HAVE THE ANSWER, MAYBE YOU CAN NOTE IT AND WE CAN  
5 COME BACK TO IT.

6 MR. MARTIN: I DON'T HAVE THAT.

7 MR. MARINOS: ARE WE GOING TO GO TO THE NEXT  
8 QUESTION, THEN?

9 MR. MARTIN: YES.

10 MR. MARINOS: QUESTION 7(B).

11 MR. KNOX: WAIT A MINUTE. I HAVE ANOTHER QUESTION  
12 ON THIS SHUTDOWN. YOU TALK ABOUT THE "A" TRAIN CABLES GETTING  
13 VERIFIED IN YOUR ANALYSIS THAT YOUR "A" TRAIN CABLES WERE  
14 SEPARATED BY 20 FEET FROM YOUR B TRAIN CABLES.

15 DID YOU ALSO VERIFY THAT THE "A" TRAIN CABLES WERE  
16 SEPARATED FROM OTHER ASSOCIATED "A" TRAIN CABLES BY 20 FEET OR  
17 NONSAFETY CABLES THAT WOULD BE IN THE SAME FIRE ZONE COMING  
18 BACK AND CONNECTING THE BUS OR WAS THAT OUTSIDE OF YOUR SCOPE?

19 MR. MARTIN: YES, THE EXTENT OF OUR SCOPE ORIGINALLY  
20 DID NOT INCLUDE ANY FIRE PROTECTION REVIEW. AS WE REVIEWED  
21 SOME OF THESE CIRCUITS AND SAW THEY WERE INCLUDED IN IT, WE  
22 EXTENDED IT AT LEAST GET A CERTAIN CONFIDENCE LEVEL THAT IT  
23 HAD BEEN ADDRESSED.

24 MR. KNOX: SO YOU REVIEWED THE SEPARATION BETWEEN  
25 THE "A" AND B TRAIN FOR AT LEAST FOR THE 20 FOOT, BUT AS FAR  
26 AS ANY ASSOCIATED CIRCUITS WHICH MAY CAUSE LOSS OF A CERTAIN  
27 BUS, YOU DIDN'T VERIFY THAT THOSE WERE ALSO PROTECTED FOR FIRE.

28 MR. MARTIN: WE -- LET ME REFRESH MY MEMORY. TRAIN



1 "A" ASSOCIATED CABLE AT GIBBS & HILL ARE ROUTED IN THE TRAIN  
2 "A" TRAY. I GUESS THAT'S WHERE MY CONFUSION IS GOING, UNLESS  
3 YOU ARE TALKING ASSOCIATED --

4 MR. KNOX: I'M TALKING ABOUT ASSOCIATED CIRCUITS AND  
5 IN CONNECTION WITH THE FIRE PROTECTION.

6 MR. MARTIN: WE DIDN'T GET INTO THAT.

7 MR. CALVO: WAIT A MINUTE. YOU ANSWERED THE  
8 QUESTION. YOU SAY THAT THE CLASS 1 CABLES AND THE ASSOCIATED  
9 CABLES HAVE BEEN ROUTED IN THE SAME CABLE TRAYS, AND YOU HAVE  
10 COMPARED THE CABLE TRAYS FOR CLASS 1-E WITH RESPECT TO THE  
11 CABLE TRAYS FOR CLASS 1-E IN THE OTHER TRAY FOR 20 FEET. DID  
12 YOU CHECK IT OUT?

13 MR. MARTIN: YES.

14 MR. CALVO: IF YOU HAD DONE THAT AND YOU ALREADY  
15 CHECKED THE FACT THAT THE ASSOCIATED CABLES ARE THE SAME, YOU  
16 ESSENTIALLY HAVE CHECKED THAT ONE OUT. RIGHT, JOHN?

17 MR. KNOX: THAT'S CORRECT, IF IT'S IN THE SAME TRAY,  
18 THERE IS NO PROBLEM, THE "A" TRAIN CABLES BE PROTECTED.  
19 HOWEVER, IF THEY ARE IN A DIFFERENT TRAY NOT SEPARATED BY 20  
20 FEET, THEN YOU WOULD HAVE A PROBLEM. THE ASSOCIATED CABLES  
21 ARE NOT PROTECTED.

22 MR. CALVO: THE QUESTION IS WHETHER THE ASSOCIATED  
23 CABLES IN THE COMPONENT COOLING WATER SYSTEM, WERE ALL THOSE  
24 ASSOCIATED CABLES ROUTED IN THE SAME CABLE TRAY TO CLASS 1-E  
25 CABLES. CAN YOU VERIFY THAT?

26 MR. MARTIN: YES.

27 MR. KNOX: BUT IT WAS BEYOND YOUR SCOPE TO LOOK AT  
28 THE ASSOCIATED CABLES, OTHER THAN THE SAFE SHUTDOWN, OTHER

1 CABLES THAT ARE NOT ASSOCIATED WITH SAFE SHUTDOWN FOR FIRE  
2 PROTECTION FOR OTHER SYSTEMS, YOU DIDN'T LOOK TO SEE --

3 MR. MARTIN: NO.

4 MR. KNOX: -- SEE WHETHER THOSE WERE PROTECTED. IN  
5 OTHER WORDS, IT WAS OUTSIDE YOUR SCOPE.

6 MR. MAGGIO: WE DIDN'T DO AN INVESTIGATION.

7 MR. KNOX: I UNDERSTAND THAT. WHEN YOU SAY 20 FEET  
8 SEPARATION, YOU'RE GETTING INTO APPENDIX R SEPARATION CRITERIA.  
9 I'M JUST TRYING TO DETERMINE HOW FAR YOU WENT INTO THIS.

10 MR. PORTER: TO GIVE YOURSELF A LEVEL OF CONFIDENCE  
11 THAT THEY FOLLOWED IT.

12 MR. KNOX: WE WENT INTO A CERTAIN LEVEL AND AT THE  
13 POINT WE WENT INTO IT, I ASSUME IT WAS SATISFACTORY, WITHOUT  
14 ANY PROBLEMS.

15 MR. MARINOS: WE'LL GO TO THE NEXT QUESTION, 7(B),  
16 CCW/SWP PUMP INTERFACE. WILL (A) THE CCW PUMP START WITH SSW  
17 PUMP OR -- WHAT DID I SAY? -- LET ME REPHRASE THAT STATEMENT.

18 WILL (A) THE CCW PUMP START THE SSW PUMP OR (B) THE  
19 SSW PUMP START THE CCW PUMP.

20 MR. MARTIN: THE ANSWER TO (A) IS YES. THE  
21 COMPONENT COOLING WATER PUMP WILL START THE STATION SERVICE  
22 WATER PUMP, AND THE STATION SERVICE WATER PUMP ALSO HAS AN  
23 INTERLOCK TO START THE COMPONENT COOLING WATER PUMP.

24 MR. MARINOS: SO (A) IS TRUE.

25 MR. MARTIN: (A) IS TRUE.

26 MR. STANLEY: (B) IS TRUE.

27 MR. MARINOS: (B) IS TRUE. SO HAS THIS BEEN  
28 REVIEWED WITH A DIESEL GENERATOR LOADING?

1 MR. MARTIN: NO, IT HASN'T. DIESEL GENERATOR  
2 LOADING IS NOT WITHIN OUR SCOPE.

3 MR. MORRIS: THE CONCERN HERE IS THAT THE DIESEL  
4 GENERATOR LOADING SEQUENCE SHOWN IN THE FSAR HAS DIFFERENT  
5 LOADING TIMES FOR THE COMPONENT COOLING WATER AND THE SERVICE  
6 WATER PUMP. AND THE CONCERN IS IF THEY ARE INTERLOCKED LIKE  
7 THIS, WHAT HAPPENS WITH THE SEQUENCE LOADING NOW, BOTH PUMPS  
8 ARE GOING TO BE STARTING AT THE FIRST STEP.

9 MR. PORTER: AS RELATED TO THE DIESEL GENERATOR?

10 MR. MORRIS: DIESEL GENERATOR, OR THERE WAS A  
11 STATEMENT EARLIER THIS MORNING THAT FOR THOSE ON SEQUENCE  
12 AREN'T EVEN ON NORMAL POWER AND DIDN'T CONSIDER --

13 MR. PORTER: DID NOT CONSIDER THE DIESEL GENERATOR.  
14 SAME ANSWER.

15 MR. MARINOS: BUT YOU HAVE CONFIDENCE THAT THE  
16 UNLIMITED SUPPLY OF THE OFF-SITE POWER WILL NOT BE AFFECTED IF  
17 YOU BLOCK LOAD THOSE TWO PUMPS OUT OF SEQUENCE.

18 MR. PORTER: THE ANSWER WAS THAT WE DID NOT LOOK AT  
19 THE BLOCK LOADING.

20 MR. MARINOS: BUT IF ONE PUMP STARTS THE OTHER, YOU  
21 DON'T HAVE A SEQUENCE, YOU JUST PUT THEM BOTH ON SO YOU ARE  
22 NOT SEQUENCING LOADS.

23 MR. PORTER: WE DID NOT LOOK AT IT.

24 MR. CALVO: I GUESS THE CONCERN -- I KNOW YOU DON'T  
25 LOOK AT IT -- BUT THE CONCERN IS THAT BECAUSE YOU START THE  
26 COMPONENT COOLING WATER PUMP AND, AS A RESULT, THEY START THE  
27 SERVICE WATER PUMP OUTSIDE OF SEQUENCE, YOU MAY END UP  
28 OVERLOADING THE DIESEL GENERATOR. THAT'S A FEATURE OF THE



1 DESIGN. THERE WILL BE A FAILURE PLUS ANOTHER FAILURE OF THE  
2 OTHER DIESEL, YOU END UP WITH NOTHING. SO TO TELL YOU THE  
3 EFFECTS OTHER COMPONENT WILL HAVE ON THE SYSTEM IN THE OVERALL  
4 ELECTRICAL DESIGN.

5 MR. MARTIN: NO, I UNDERSTAND YOUR CONCERN.

6 MR. CALVO: GOOD, GOOD.

7 MR. MARINOS: BUT THAT WAS NOT MY QUESTION, JOSE.  
8 MY QUESTION WAS, IF THEY CONSIDER SEQUENCE LOADING EVEN WITH  
9 THE OFF-SITE POWER, RIGHT, IF THE OFF-SITE POWER YOU DIDN'T  
10 CONSIDER ANY OF THE COMPONENTS BLOCK LOADING TOGETHER. IN  
11 THIS ARRANGEMENT YOU COULD HAVE CONCEIVABLY TWO PUMPS  
12 SIMULTANEOUSLY STARTING, SO YOU DID NOT CONSIDER THAT  
13 DIVERSION FROM THE SEQUENCE EVEN WITH THE OFF-SITE POWER  
14 AVAILABLE. CHANCES ARE THERE IS NO PROBLEM BECAUSE IT'S AN  
15 UNLIMITED SUPPLY, BUT --

16 MR. KNOX: THEY DIDN'T LOOK AT THE SEQUENCING LOGIC.  
17 YOU STILL FOLLOW YOUR SEQUENCE, IT PROBABLY WOULDN'T HAPPEN.

18 MR. PORTER: THE TWO PUMPS WON'T START TOGETHER.

19 MR. KNOX: IN ASSOCIATION WITH THE SEQUENCING.

20 MR. MARINOS: SO YOU SAY THAT PERMISSION MAY BE  
21 GIVEN, BUT THE SEQUENCER WOULD TAKE OVER AND NOT PERMIT THE  
22 SIMULTANEOUS LOADING OF THOSE PUMPS TOGETHER.

23 MR. PORTER: THAT'S WHAT IT SHOULD DO.

24 MR. MARINOS: DID YOU CONFIRM THAT?

25 MR. KNOX: THEY DIDN'T CONFIRM THAT.

26 MR. HESS: IF I MAY POP IN, THE ONLY THING THAT WE  
27 WERE CONCERNED WITH IN THAT SECTION OF THE REVIEW WAS ENSURING  
28 THAT WHEN YOU HAD A CCW PUMP OPERATIONAL, THAT THE ASSOCIATED

1 SERVICE WATER PUMP WAS SUPPLYING COOLING WATER TO THE HEAT  
2 EXCHANGER. THAT WAS THE PURPOSE OF OUR REVIEW OF THAT  
3 INTERLOCK.

4 MR. MARINOS: WELL, FROM THE ELECTRICAL ASPECTS,  
5 THOUGH, IT IS NOT. THIS IS FROM THE HYDRAULICS THAT YOU ARE  
6 REFERRING TO, NOT FROM THE --

7 MR. HESS: I THINK WE HAVE TO KEEP IN MIND THAT MOST  
8 OF THE ELECTRICAL REVIEW WAS DONE IN RELATION TO THE  
9 MECHANICAL SCOPE.

10 MR. MARINOS: OF COURSE, IF THE ELECTRICAL SYSTEM  
11 CANNOT DELIVER WHAT YOU WANT MECHANICALLY, THEN YOU HAVE  
12 FAILED IN YOUR ASSESSMENT. SO THAT'S WHAT --

13 MR. MAGGIO: BUT OUR DEPTH ELECTRICALLY WAS LIMITED  
14 TO THE MECHANICAL OPERATION AND IT WASN'T MAYBE EXPANDED  
15 DESIGN OR ANALYSIS THAN IT MAY HAVE BEEN DESIRABLE, PER SE.  
16 BUT BASED ON SUPPORTING THE MECHANICAL ASPECTS THAT DESCRIBES  
17 IN ONE.

18 MR. MARINOS: GEORGE, DO YOU HAVE ANY MORE QUESTIONS  
19 ON THAT?

20 QUESTION 7(C), IF ONE CCW LOOP IS NORMALLY SHUT DOWN,  
21 ARE THE UPS A/C UNIT AND THE NUCLEAR CHILLED WATER SYSTEM 100  
22 PERCENT REDUNDANT AND SHARE A COMMON DISTRIBUTION SYSTEM TO  
23 PROVIDE COOLING FOR CLASS 1 SWITCHGEAR AND CLASS 1 MOTORS.

24 MR. HESS: OKAY. I'LL FIELD THAT QUESTION. LOOKING  
25 AT THE NUCLEAR CHILLED WATER SYSTEM AND UPS AIR CONDITIONING  
26 SYSTEMS WERE OUT OF OUR SCOPE. WE DID VERIFY THAT THERE ARE  
27 REDUNDANT NUCLEAR CHILLED WATER SYSTEM CHILLERS SUPPLIED BY  
28 THE CCW SYSTEM. WE DID NOT VERIFY THE DISTRIBUTION SYSTEMS ON

1 THOSE ASSOCIATED SYSTEMS.

2 MR. MARINOS: OFF THE RECORD A MINUTE.

3 (OFF THE RECORD.)

4 MR. MARINOS: LET'S GO BACK ON THE RECORD.

5 NOW, WE ARE ON CHECKLIST NUMBER EE-02. WE HAVE A  
6 GENERAL STATEMENT OF OBSERVATIONS THAT THE ENTIRE DISCUSSION  
7 DOES NOT ADDRESS THE CONTAINMENT ISOLATION VALVES OR THE  
8 REACTOR COOLANT PUMP THERMAL BARRIER COOLER ISOLATION VALVES.  
9 TELL US WHETHER THIS WAS OUT OF SCOPE.

10 MR. MORRIS: IT APPEARED FROM THE FLOW DIAGRAM THAT  
11 WE WERE LOOKING AT YESTERDAY THAT PART OF THIS WAS AT LEAST IN  
12 THE MECHANICAL SCOPE.

13 MR. MARTIN: THE VALVES WERE NOT INCLUDED IN OUR  
14 ELECTRICAL SCOPE AND THE MECHANICAL -- THE VALVES WERE NOT  
15 INCLUDED IN THE ELECTRICAL SCOPE THE ELECTRICAL SCOPE REVIEW  
16 CONSISTED OF A TRAIN "A" SAFEGUARDS PORTION OF THE COMPONENT  
17 COOLING WATER SYSTEM WHICH STOPPED AT THE TRAIN SEPARATION  
18 PUMP.

19 MR. HESS: YOU ARE CORRECT. WE LOOKED AT IT FROM A  
20 FLOW PATH STANDPOINT INTO THE REACTOR COOLANT PUMP SUPPLIED TO  
21 THE REACTOR COOLING PUMP FOR THE COOLERS. THOSE VALVES WERE  
22 NOT INCLUDED IN THE ELECTRICAL SCOPE. THERE WERE QUESTIONS  
23 FROM MECHANICAL TO ELECTRICAL WHICH THEY ANSWERED AS TO THE  
24 CONTROL FUNCTION OF THOSE VALVES, WHEN THEY SHUT WHAT SIGNALS  
25 ISOLATED THEM AND THEY GOT INVOLVED IN THAT SECTION OF THE  
26 REVIEW, BUT IT WAS NOT PART OF THEIR REVIEW SCOPE.

27 MR. MORRIS: I RAISED THIS QUESTION BECAUSE THESE  
28 ARE THE ONLY CONTAINMENT ISOLATION VALVES ON THIS SYSTEM WITH



1 THE CORRESPONDING QUESTIONS ABOUT ELECTRICAL PENETRATIONS  
2 ASSOCIATED WITH THOSE ISOLATION VALVES.

3 MR. HESS: AND THOSE ELECTRICAL PENETRATIONS WERE  
4 NOT INCLUDED IN THE ELECTRICAL SCOPE.

5 MR. NORKIN: YOU REFER TO THE ELECTRICAL SCOPE, IS  
6 THERE SOMETHING IN WRITING WHICH DEFINES ELECTRICAL SCOPE?

7 MR. HESS: AS WE DISCUSSED YESTERDAY, THE DESIGN  
8 CRITERIA LAYS OUT THE ELECTRICAL SCOPE.

9 MR. MARINOS: LET ME UNDERSTAND. YOU DID NOT LOOK  
10 AT PENETRATIONS, ELECTRICAL PENETRATIONS AT ALL.

11 MR. MAGGIO: WHAT WOULD WE LOOK AT ELECTRICALLY IN  
12 TERMS OF PENETRATION?

13 MR. MARINOS: YOU TELL ME.

14 MR. MAGGIO: WE DIDN'T LOOK AT IT SO WHAT WOULD YOU  
15 EXPECT US TO LOOK AT.

16 MR. MARINOS: LOTS OF THINGS I WOULD LOOK AT.

17 MR. MAGGIO: I MIGHT ADD WE DID IDENTIFY CABLE SIZE  
18 CALCULATIONS AS FAR AS PROPER DERATION FOR CABLE TRAYS -- I  
19 MIGHT JUST SAY THAT WE DID IDENTIFY PENETRATIONS IN CABLE  
20 SIZING CALCULATIONS AND AN APPROPRIATE DERATION FACTOR WAS  
21 INCLUDED. AND THAT'S AS FAR AS WE TOOK IT. IN TERMS OF US  
22 LOOKING AT WHERE THEY WERE OR THE MATERIALS THAT WERE INVOLVED  
23 WE DIDN'T DO THAT.

24 MR. MARINOS: YOU DID NOT LOOK, THEN, AT THE  
25 CAPABILITY OF PENETRATION TO WITHSTAND FAULT INSIDE  
26 CONTAINMENT WITH FAULT CURRENTS THROUGH THEM AND ITS INTEGRITY

27 MR. MAGGIO: THAT'S CORRECT WE DID NOT LOOK AT THAT.

28 MR. KNOX: ALONG THE SAME LINE, YOU DID NOT LOOK AT

1 BACK UP PROTECTION TO PROTECT THE ELECTRICAL PENETRATION.

2 MR. MAGGIO: THAT'S CORRECT.

3 MR. MARINOS: YOU SAY YOU LOOK AT THE RATING OF THE  
4 CABLE.

5 MR. KNOX: WE IDENTIFIED THAT.

6 MR. MAGGIO: WE IDENTIFIED THAT PENETRATIONS WERE  
7 COVERED IN THAT AREA SO IT WAS RECOGNIZED BY GIBBS & HILL. I  
8 DIDN'T UNDERSTAND WHAT WE WERE DRIVING AT. WE JUST IDENTIFIED  
9 THAT ITEM.

10 MR. MARINOS: ANY MORE QUESTIONS ON THAT? WELL,  
11 QUALIFICATION REQUIREMENTS FOR PENETRATIONS ELECTRICAL AND  
12 ENVIRONMENTAL AND WHAT I GET FROM YOU, YOU DID NOT BOTHER --  
13 IT WAS NOT IN YOUR SCOPE. YOU DECIDED THAT WOULD NOT BE IN  
14 YOUR SCOPE.

15 MR. MAGGIO: THAT IS CORRECT TO IDENTIFY  
16 QUALIFICATION PERFORMANCE FOR A SPECIFIC PIECE OF EQUIPMENT  
17 INCLUDING PENETRATION.

18 MR. MARINOS: SAYING QUALIFICATION YOU HAVE STATED  
19 BEFORE ENVIRONMENTAL QUALIFICATION YOU EXCLUDED ELECTRICAL  
20 SPECIFICATIONS, ELECTRICAL QUALIFICATION REQUIREMENTS ON  
21 PENETRATIONS, FOR EXAMPLE, FAULT CAPABILITY.

22 MR. HESS: I DON'T THINK, BUT NONE OF -- CORRECT ME  
23 IF I'M WRONG. NONE OF THE CABLES THAT ARE IN THE TRAIN "A"  
24 SAFEGUARDS LOOP GO THROUGH A CONTAINMENT.

25 MR. MAGGIO: YES.

26 MR. HESS: YOUR REVIEW WHERE YOU PICKED UP THIS  
27 DERATING DUE TO PENETRATIONS WAS SOMETHING THAT YOU NOTED IN  
28 CALCULATIONS ASSOCIATED WITH THE SCOPE IN THE SAME CALC, BUT

1 NOT ON THE CABLES THAT WE WERE ACTUALLY REVIEWING.

2 MR. MARINOS: YOU SAID IT WAS NOT IN SAFEGUARDS, THE  
3 ACTUAL WERE NOT IN SAFEGUARDS.

4 MR. MORRIS: SAFEGUARDS LOOP.

5 MR. HESS: SAFEGUARDS LOOP IS ENTIRELY OUTSIDE OF  
6 CONTAINMENT.

7 MR. MORRIS: THEY ARE SAFETY RELATED VALVES IN TRAIN  
8 "A" AND COMPONENT COOLING WATER SYSTEM LOCATED INSIDE.

9 MR. PORTER: WHAT'S IMPORTANT, IT'S NOT THAT WE DID  
10 NOT BOTHER TO DO IT, IT WAS OUTSIDE OUR SCOPE AND WE PLANNED  
11 NOT TO DO IT VERY SPECIFICALLY.

12 MR. CALVO: I THINK WE'RE COMING TO A BREAKING POINT.  
13 I THINK WE WOULD LIKE TO TALK AMONG OURSELVES, IF YOU WILL  
14 ALLOW US FOR A MINUTE.

15 (RECESS.)

16 MR. STUART: I WOULD -- DURING THE BREAK WE CAUCUSED,  
17 AND I WOULD LIKE TO MAKE A SUGGESTION TO THE NRC. IT'S CLEAR  
18 TO US AFTER HAVING GONE THROUGH THIS FOR A DAY AND A HALF,  
19 THAT THE LEVEL OF DETAIL OF THE QUESTIONS AND OUR PREPARATION  
20 FOR THAT LEVEL OF DETAIL OF QUESTIONS REALLY HAVE NOT  
21 COINCIDED. AND WE HAVE BEEN AT A RELATIVELY SLOW SPACE  
22 THROUGH THOSE QUESTIONS.

23 AND I WOULD LIKE TO REQUEST THAT THE CYGNA PEOPLE GO  
24 OFF AND REALLY ATTEMPT TO PREPARE IN MUCH GREATER DEPTH NOW  
25 THAT WE UNDERSTAND THE LEVEL OF DETAIL THAT'S REQUIRED ON OUR  
26 REVIEW AND THAT WE RECONVENE THIS MEETING IN SEVERAL WEEKS AT  
27 A TIME THAT'S CONVENIENT TO THE KEY PLAYERS REPRESENTED HERE  
28 IN THIS MEETING.



1                   IN ADDITION, I THINK IT WOULD BE USEFUL IN  
2 PREPARATION FOR THAT FOR US TO REALLY GET A FEEL FOR THE  
3 REMAINDER OF THE QUESTIONS THAT WERE NOT DISCUSSED HERE TODAY,  
4 WHAT REALLY IS THE BASIS OR PURPOSE BEHIND THOSE QUESTIONS  
5 WHICH HAVE LED TO SOME OF THE GREATER DETAIL THAT I THINK OUR  
6 PEOPLE WERE UNPREPARED AND UNAWARE OF.

7                   IF THAT WERE TO BE ACCEPTABLE TO YOU, IN THAT NEXT  
8 MEETING, I THINK OUR REVIEWERS WOULD BE PREPARED TO HAVE ALL  
9 OF THE CALCULATIONS THAT THEY REVIEWED IN THE MEETING WITH  
10 THEM SO THAT SPECIFIC NUMBERS WERE CALLED FOR, THEY COULD GO  
11 TO THOSE CALCULATIONS AND PICK OUT THOSE SPECIFIC NUMBERS IN  
12 THE MEETING, AND THAT WE WOULD BE PREPARED, REALLY, I THINK TO  
13 LOOK AT THE BOUNDS OF OUR REVIEW WHICH I KNOW THERE HAVE BEEN  
14 MANY, MANY QUESTIONS RELATIVE TO OUR BASIS FOR THE BOUNDS ON  
15 DEFENDING THAT BOUNDARY AND SCOPE, AS WELL AS TO I THINK  
16 ATTEMPT TO, TO THE MAXIMUM EXTENT POSSIBLE, RESOLVE RIGHT IN  
17 THAT MEETING ALL OF YOUR QUESTIONS WITHOUT HAVING REALLY TO GO  
18 TO FURTHER ROUNDS OF QUESTIONING OR FURTHER MEETINGS.

19                  NOW, THAT'S MY SUGGESTION, JOSE.

20                  MR. CALVO: I THINK THERE WILL BE SOME KIND OF WAY.  
21 WE ARE HAVING TROUBLE AT THIS TIME TRYING TO ASCERTAIN THE  
22 SCOPE OF WHAT YOU HAVE DONE. GOING THROUGH THE QUESTIONS AND  
23 TRYING TO CLARIFY THOSE QUESTIONS, ESTABLISHING THE PURPOSE,  
24 THAT WILL HELP YOU TO -- SOME KIND OF WAY TO BETTER UNDERSTAND  
25 WHERE WE ARE COMING FROM, THAT WOULD BE PERFECTLY ALL RIGHT.  
26 I PROPOSE WHAT TO DO IS TO GO THROUGH THE REMAINING QUESTIONS.  
27                  AND WE CAN READ THE QUESTIONS, WE CLARIFY THE  
28 QUESTION THE BEST WE CAN, WE ASK YOU WHETHER FURTHER

1 CLARIFICATION IS NEEDED. IF YOU SAY THAT YOU UNDERSTOOD THE  
2 QUESTION AND THE PURPOSE, THEN WE SAY, WELL, LET'S GO TO THE  
3 NEXT QUESTION. IF YOU HAVE FURTHER CLARIFICATION, WE TRY TO  
4 GIVE FURTHER CLARIFICATION.

5 MR. MARINOS: CAN I SAY SOMETHING. WE MIGHT, JUST  
6 TO EXPEDITE THIS, WE MIGHT WAIT AND TELL US WHICH QUESTIONS  
7 YOU WANTED US TO REITERATE. AND MAYBE SOME OF THEM YOU MAY  
8 NOT WANT US TO RECITE AGAIN. THEY ARE IN WRITING, IF THEY ARE  
9 CLEAR ENOUGH FOR YOU, WE CAN SKIP OVER THEM AND NOT RECITE  
10 THEM INTO THE RECORD. WE CAN PUT IN THE RECORD THE QUESTIONS  
11 THAT YOU HAVE OR NEED CLARIFICATION FOR. WOULD THAT BE  
12 ACCEPTABLE.

13 MR. STUART: LET ME TRY TO GIVE MY RESPONSE. WE  
14 THOUGHT WE WERE PREPARED FOR ALL 14 PAGES OF QUESTIONS PRIOR  
15 TO THE MEETING. AND, OBVIOUSLY, GIVEN THE WAY THE MEETING,  
16 THE COURSE OF THE MEETING, I THINK WE WEREN'T AND IN THE LEVEL  
17 OF DEPTH. I THINK WHAT'S IMPORTANT FOR US IS TO, NUMBER ONE,  
18 UNDERSTAND THE PURPOSE BEHIND THE QUESTION, BUT ALSO  
19 ESPECIALLY YOUR CONSULTANTS COULD TELL US WHAT REALLY THEY ARE  
20 AFTER IN TERMS OF WHAT ARE THEY GOING AFTER IN TERMS OF THE  
21 LEVEL OF DEPTH. I THINK THAT WOULD BE HELPFUL FOR US TO MAKE  
22 SURE --

23 MR. MARINOS: YOU SUGGEST TO GO THROUGH EACH  
24 QUESTION.

25 MR. STUART: I SUGGEST TO GO THROUGH EACH QUESTION  
26 FROM YOUR POINT OF VIEW TO TELL US THE PURPOSE AND WHAT'S  
27 REALLY HIDDEN BEHIND THE QUESTION IN TERMS OF WHAT YOU ARE  
28 AFTER. I'M PROPOSING THAT WE WOULD JUST TAKE NOTES ON THAT

1 PROCESS. IF THERE ARE NO QUESTIONS ON OUR SIDE, YOU CAN MOVE  
2 TO THE NEXT QUESTION.

3 IT WOULD BE VERY USEFUL FOR US TO MAKE SURE THAT THE  
4 LEVEL OF DEPTH OF PREPARATION FOR THAT IS GOING TO AGREE WITH  
5 WHAT YOU'RE LOOKING FOR.

6 NOW, I MIGHT ADD, I HAVE JUST TALKED TO OUR PEOPLE  
7 THAT FROM OUR POINT OF PREPARING FOR THIS IS NOT TO GO BACK  
8 AND REDO THE INDEPENDENT DESIGN VERIFICATION. THAT'S NOT OUR  
9 INTENT AT ALL, BUT RATHER TO MAKE SURE THAT OUR PEOPLE ARE  
10 PREPARED WITH ALL THE DATA AND DETAIL RELATIVE TO THE  
11 CALCULATIONS THAT ON THE REVIEW THAT WE DID DO. BECAUSE,  
12 OBVIOUSLY, WHEN QUESTIONS ARE ASKED RELATIVE TO A SPECIFIC  
13 PRESSURE OR A SPECIFIC PIECE OF DATA IN A 20 OR 30 PAGE  
14 CALCULATION, WHAT YOU REALLY ARE LOOKING FOR IS EITHER FOR US  
15 TO HAVE THAT SITTING HERE IN THE MEETING AND TO BE ABLE TO  
16 SPECIFY THAT TO YOU OR TO HAVE IT MEMORIZED OR ONE OR THE  
17 OTHER. AND I THINK OUR REVIEWERS WERE JUST NOT PREPARED FOR  
18 THAT LEVEL OF DEPTH.

19 MR. CALVO: WHY DON'T WE START.

20 MR. STUART: WE CAN GO WITH THE REMAINING QUESTIONS  
21 AS WE GO ON.

22 MR. MARINOS: WE COVERED THE GENERAL STATEMENT  
23 SUFFICIENTLY, GEORGE, ON THE EE-02?

24 MR. MORRIS: YES.

25 MR. MARINOS: SO WE WILL GO TO QUESTION 1(A) AND  
26 WE'RE ASKING WAS THE MOV VOLTAGE CONFIRMED AT THE MOTOR FOR  
27 STARTING AND RUNNING CONDITION DO YOU NEED CLARIFICATION FOR  
28 THIS QUESTION?



1 MR. CALVO: WE ARE GOING TO GIVE THEM THE  
2 CLARIFICATION. WE'RE GOING TO TELL THEM THE PURPOSE BEHIND  
3 THE QUESTION, WHAT WE EXPECT THEM TO SEE.

4 MR. MORRIS: THE STATEMENT IN THE CHECKLIST  
5 INDICATED THAT YOU LOOKED AT A CALCULATION FOR A STARTING AND  
6 RUNNING VOLTAGES FOR THE 480 VOLT BUS. THE QUESTION IS  
7 LOOKING TO SEE IF YOU WENT FURTHER THAN THE BUS AND ACTUALLY  
8 WENT DOWN TO THE EQUIPMENT TO SEE WHAT THE VOLTAGE WOULD BE AT  
9 THE EQUIPMENT.

10 WE HAVE NOTICED IN OTHER OCCASIONS PROBLEMS IN THE  
11 DESIGN WHERE VOLTAGE DROP CALCULATIONS, ESPECIALLY THE 480  
12 VOLT LEVEL, WERE INADEQUATE AT OTHER PLANTS THAT WE HAVE  
13 LOOKED AT. AND IT IS UNFORTUNATE THAT THE VALVES INSIDE  
14 CONTAINMENT ARE OUT OF THE SCOPE OF YOUR REVIEW BECAUSE THIS  
15 WAS AN AREA OF PARTICULAR CONCERN.

16 MR. CALVO: FINISHED CLARIFYING. JOHN, YOU GOT  
17 SOMETHING ELSE YOU WANT TO ADD TO CLARIFY THAT QUESTION?

18 MR. KNOX: NO, NOTHING.

19 MR. CALVO: YOU DON'T HAVE ANY QUESTIONS.

20 MR. MARTIN: NO THAT'S PRETTY STRAIGHTFORWARD.

21 MR. KILLOUGH: ALONG THE SAME LINE, IS IT ALSO IN  
22 YOUR CONCERN THAT WE LOOKED AT THESE VOLTAGES UNDER DIFFERENT  
23 CONDITIONS OR JUST THE WORST CASE VOLTAGE CONDITION ON THE BUS  
24 AT THE TIME TO MAKE SURE THAT THOSE OPERATING VOLTAGES ARE  
25 SATISFACTORY FOR THOSE MOTOR OPERATED VALVES.

26 MR. MORRIS: THE CONCERN IS TO INSURE THAT THE  
27 VOLTAGES AVAILABLE ARE SUFFICIENT SO THAT THE VALVE WILL  
28 PERFORM ITS SAFETY FUNCTION, WHETHER YOU WILL HAVE SUFFICIENT

1 FOR ANY CONDITION.

2 MR. KNOX: FOR ALL MODES OF PLANNED OPERATION.

3 MR. MARINOS: MINIMUM VOLTAGE CONDITION AT THE VALVE  
4 OPERATOR, OF COURSE, WILL GIVE YOU LOWER TORQUE AVAILABLE FOR  
5 THE VALVE TO OPEN OR CLOSE, SO YOU WANT TO -- WE WANT TO  
6 DETERMINE THAT -- THAT THIS IS ADEQUATELY ADDRESSED.

7 MR. CALVO: ANY MORE FURTHER CLARIFICATION FROM  
8 CYGNA?

9 MS. WILLIAMS: NO.

10 MR. CALVO: NEXT QUESTION.

11 MR. MARINOS: 1(B), DID CYGNA CONFIRM THAT ALL DC  
12 LOADS WOULD OPEN AT 90 VOLTS.

13 MR. MORRIS: THE REASON FOR THAT QUESTION WAS THERE  
14 IS A STATEMENT IN THE COMMENT SECTION ON THE CHECKLIST THAT DC  
15 LOADS REQUIRE A MINIMUM OF 90 VOLTS. I DON'T KNOW WHAT THE  
16 BASIS OF THAT STATEMENT IS, WHETHER THAT STATEMENT WAS  
17 SPECIFIC TO A CERTAIN COMPONENT.

18 MS. WILLIAMS: WE'RE NOT ANSWERING THE QUESTION,  
19 JUST MAKE SURE YOU UNDERSTAND IT.

20 MR. CALVO: OKAY, CLARIFICATION OF WHAT YOU HAD ON  
21 YOUR CHECKLIST.

22 MR. NORKIN: ARE WE INTERESTED IN WHETHER 90 VOLTS  
23 ARE AVAILABLE?

24 MR. MORRIS: WE'LL GET TO THAT.

25 MR. KNOX: I GUESS I HAD A QUESTION ABOUT ADEQUACY  
26 OF THE 90 VOLTS VERSUS I EXPECT THE NORMAL DC VOLTAGE TO BE  
27 105 VOLTS AS THE MINIMUM VERSUS 90. I WAS CONCERNED ABOUT WHY  
28 90 VERSUS 105.

1 MR. PORTER: 87 AND A HALF PERCENT IS 105 VOLTS, NOT  
2 90.

3 MR. KNOX: WE'RE LOOKING AT THE DC.

4 MR. MARINOS: NOT AC.

5 MR. KNOX: NORMAL 60 CELL BATTERY SYSTEM, THE  
6 MINIMUM VOLTAGE TOTAL DISCHARGE IS 105 VOLTS VERSUS 90. I'M  
7 NOT SURE WHERE THE 90 COMES FROM.

8 MR. MARINOS: DOES THIS MEAN, GEORGE, THAT 90 STATED  
9 BY GIBBS & HILL, THAT THEIR EQUIPMENT WILL BE CAPABLE OF  
10 OPERATING AT THAT LOW A VOLTAGE AS A CONSERVATIVE ASSUMPTION,  
11 IS THAT --

12 MR. MORRIS: THE STATEMENT APPEARS TO BE ADDRESSING  
13 ONE PARTICULAR COMPONENT, IT DOESN'T -- PROBABLY DOES NOT  
14 ADDRESS A GENERAL STATEMENT OF THE DC SYSTEM.

15 MR. MARINOS: WHICH COMPONENT ARE YOU TALKING ABOUT?

16 MR. MORRIS: I DON'T KNOW WHAT COMPONENT WAS STATED  
17 IN HERE, IT JUST SAYS, DC LOADS REQUIRE A MINIMUM OF 90 VOLTS.

18 MR. MARTIN: WE UNDERSTAND THE QUESTION.

19 MR. MARINOS: OKAY. NOW, AS SUBSET TO THIS QUESTION  
20 WE HAVE NOW WHY WAS THE NON 1-E PANEL XD 2-3 INCLUDED IN THE  
21 REVIEW. DO YOU HAVE A COPY OF THE QUESTION THERE?

22 MR. CALVO: THAT'S THE QUESTION.

23 MR. MARTIN: WE UNDERSTAND THAT.

24 MR. MAGGIO: IS THERE ANYTHING IN GREATER DETAIL  
25 OTHER THAN EXPLANATION WHY TO BE CONCERNED ABOUT THAT DEVICE?

26 MR. MORRIS: THERE IS NO PARTICULAR CONCERN ABOUT  
27 THAT PANEL OTHER THAN I DID NOT SEE OFFHAND THAT THERE WAS A  
28 NONSAFETY RELATED DC LOAD IN THE LOOP "A".



1 MR. MARTIN: I UNDERSTAND THE QUESTION.

2 MR. MARINOS: THE OTHER QUESTION UNDER THE SAME  
3 QUESTION 1(B) WAS THE VOLTAGE DROP IN THE DC SYSTEM REVIEWED  
4 TO OTHER EQUIPMENT SUCH AS INVERTERS AND SWITCHGEAR.

5 MR. MARTIN: OKAY, MAYBE IT WOULD HELP IF YOU  
6 EXPANDED ON THAT ONE A LITTLE.

7 MR. MORRIS: THAT -- THAT'S AN EXTENSION OF THE  
8 ORIGINAL QUESTION ON WHETHER ALL EQUIPMENT WAS SPECIFIED AT 90  
9 VOLTS AND WHETHER THE CABLE SIZE AND CALCULATION THAT YOU  
10 REVIEWED INCLUDED OTHER LOADS ON THE DC SYSTEM THAT WOULD  
11 INFLUENCE THE COMPONENT COOLING WATER SUCH AS THE FEEDS TO THE  
12 6.9 KV SWITCHGEAR OR THE FEEDS TO THE INVERTER SUPPLYING THE  
13 INSTRUMENT POWER.

14 MR. OSZEWSKI: IS THIS A QUESTION WHICH YOU ALLUDED  
15 TO EARLIER AS BEING 90 VOLTS AVAILABLE.

16 MR. MORRIS: YES.

17 MR. NORKIN: AS FAR AS THE SWITCHGEAR, WOULD A  
18 VOLTAGE DROP CAUSE A DYNAMIC EFFECT BY THE 90 VOLTS AVAILABLE,  
19 RIGHT?

20 MR. MORRIS: TYPICALLY, INVERTERS ARE NOT RATED AT  
21 90 VOLTS. AND WE HAVE SEEN IN OTHER PLANTS PROBLEMS IN  
22 VOLTAGE DROPS IN DC CONTROL CIRCUITS TO SWITCHGEAR.

23 MR. KNOX: I ALSO HAVE A CONCERN ABOUT THE BASIS --  
24 DESIGN BASIS FOR SIZING THE DC SYSTEM. READING THE FSAR, I  
25 WAS UNABLE TO DETERMINE WHAT THE BASIS WAS FROM READING  
26 SECTION 8.32 HOW THE -- WHAT THE DESIGN DOCUMENTS USED TO SIZE  
27 THE BATTERY IN THE DC SYSTEM SUPPLY LOADS.

28 MR. MARTIN: YOUR CONCERN IS A DESIGN BASIS FOR

1 SIZING THE DC SYSTEM.

2 MR. KNOX: THE BATTERIES, THE CHARGER, THE  
3 DISTRIBUTION SYSTEM SO WE WOULD HAVE SUFFICIENT CAPACITY AND  
4 CAPABILITY OVER THE LIFE OF THE PLANT.

5 MR. CALVO: ASK THE QUESTION WHETHER YOU CONSIDER IT  
6 TO BE IN YOUR SCOPE OR NOT. YOU KNOW, ALSO ON THIS ONE, EVERY  
7 TIME YOU GO BACK TO WHY WAS THE NON E PANEL. NORMALLY, WE  
8 DON'T LIKE NON-CLASS 1-E TO BE MIXED WITH CLASS 1-E. BE  
9 PREPARED TO GO ALL THE WAY QUESTIONS ABOUT SEPARATION, ABOUT  
10 INDEPENDENCE, ABOUT CLASSIFICATION OF THE CLASS 1-E BREAKERS  
11 HAS BEEN TESTED WHAT IS THE CONSEQUENCES OF THE FAILURE. BE  
12 PREPARED TO ANSWER ALL THOSE QUESTIONS TO JUSTIFY THAT A  
13 FAILURE OF NON-CLASS 1-E CANNOT RESULT TO COMPROMISE THE  
14 INDEPENDENCE OF THE OTHER TRAIN.

15 MR. MARINOS: NEED ANY FURTHER CLARIFICATION ON THIS

16 MR. MAGGIO: I THINK WE UNDERSTAND.

17 MR. MARINOS: OKAY, QUESTION 2(A). THIS ITEM  
18 ADDRESSED AND THIS REFERS TO YOUR ITEM 2(A) --

19 MR. MORRIS: REFERS TO ITEM 2(B) ACTUALLY IN THE  
20 CHECKLIST.

21 MR. MARINOS: ITEM 2(A) IN OUR QUESTION IS ACTUALLY  
22 2(B) IN YOUR CHECKLIST.

23 MR. MORRIS: CHECKLIST EE-02.

24 MR. MARINOS: THIS ITEM ADDRESSED THE CONNECTION OF  
25 THE BATTERY AND BATTERY CHARGER TO THE DC BUS, BUT DID NOT  
26 ADDRESS THE CAPABILITY OF THIS EQUIPMENT TO SUPPLY THE DESIGN  
27 LOAD OR SURVEILLANCE REQUIRED TO PROVE THE ABILITY TO PERFORM  
28 ITS SAFETY FUNCTION.

1 MR. MORRIS: WE'RE QUESTIONING WHETHER YOU LOOKED  
2 INTO THE CAPABILITY OF THE DC SYSTEM TO SUPPORT THE COMPONENT  
3 COOLING WATER SYSTEM.

4 MR. MAGGIO: IN TERMS OF SURVEILLANCE DO YOU MEAN,  
5 FOR EXAMPLE, AN EQUIPMENT SURVEILLANCE OF, SAY, THE BATTERY  
6 AND PROCEDURES FOR THAT?

7 MR. MORRIS: NO.

8 MR. MAGGIO: WHAT DO YOU MEAN BY SURVEILLANCE?

9 MR. MORRIS: SURVEILLANCE IN THE CONTROL ROOM SO THE  
10 OPERATOR KNOWS HE HAS A DC SYSTEM AVAILABLE, SO THAT HE CAN  
11 TELL DURING DISCHARGE HOW MUCH CAPACITY HE STILL HAS LEFT IN  
12 THE BATTERY. ITEMS SUCH AS THAT, REQUIREMENTS OF I TRIPLE E  
13 MATERIAL.

14 MR. CALVO: YOU MAY ALSO WANT TO CHECK WHAT THE TECH  
15 SPECS -- TECHNICAL SPECIFICATION FOR COMANCHE PEAK ALSO SAY  
16 SURVEILLANCE REQUIREMENTS, THEY ARE ESSENTIAL TO BE MET TO  
17 ASSURE THE AVAILABILITY OF THE DC SYSTEM.

18 MR. FOLEY: IS THAT IN ADDITION TO THE SURVEILLANCE  
19 YOU ARE TALKING ABOUT? YOU SAID SURVEILLANCE IN THE SENSE OF  
20 MONITORING IN THE CONTROL ROOM. NOW WE'RE TALKING ABOUT  
21 SURVEILLANCE, TECH SPEC SURVEILLANCE.

22 MR. MORRIS: MY CONCERN IS SURVEILLANCE IN THE  
23 CONTROL ROOM VOLTAGE AND CURRENT OF THE DC SYSTEM.

24 MR. CALVO: I THINK YOU MUST HAVE SIMILAR  
25 SURVEILLANCE AND ALSO BRANCH TECHNICAL POSITION I BELIEVE,  
26 POWER SYSTEMS BRANCH, JOHN KNOX WHO TALKS ABOUT COUNTER  
27 SURVEILLANCE YOU WANT IN THE POWER SYSTEMS EACH PLANT IN THE  
28 NEXT 5 OR 6 YEARS YOU HAVE ALL THE SURVEILLANCE. ALL WE'RE



1 ASKING, I GUESS, YOU VERIFY THE FACT THAT THOSE THINGS ARE  
2 THERE, SO...

3 MR. MORRIS: TYPICALLY, THOSE TECH SPECS  
4 SURVEILLANCE ARE MORE AIMED AT MAINTENANCE, BUT THERE ARE SOME  
5 LIMITS IN THERE THAT MAY AFFECT THE DESIGN OF THE EQUIPMENT  
6 SUCH AS MINIMUM ACCEPTABLE BATTERY TEMPERATURE, FOR INSTANCE,  
7 THAT WOULD AFFECT THE CAPABILITY OF THE BATTERY TO SUPPLY THE  
8 LOAD.

9 MR. KILLOUGH: YOU EXPECT THE INDICATIONS IN THE  
10 CONTROL ROOM TO BE REVIEWED TO ASSESS THEIR ADEQUACY, BATTERY  
11 VOLTAGE, DISCHARGE RATE, THINGS LIKE THAT, AVAILABLE VOLTAGE  
12 FROM THE NORMAL DC POWER SUPPLY? IS THAT WHAT YOU'RE TRYING  
13 TO GET AT, WHAT THE OPERATOR HAS AVAILABLE TO HIM TO FIND OUT  
14 IF THE SYSTEM MINIMUM VOLTAGES ARE THERE IN ACCORDANCE WITH  
15 PROCEDURE THAT HE HAS?

16 MR. MORRIS: YES, TO SHOW THE OPERATOR THAT HE DOES,  
17 IN FACT, HAVE A DC SYSTEM AVAILABLE TO SUPPORT IT.

18 MR. CALVO: RIGHT. KEEP IN MIND THAT YOU ARE  
19 REVIEWING THE COMPONENT COOLING WATER SYSTEM. WHAT WE'RE  
20 TRYING TO KNOW IS THE CAPABILITY OF ALL THE SUPPLIES TO THAT  
21 SYSTEM OPERATED BY DC SYSTEM THAT WILL PRECLUDE THAT SYSTEM  
22 FOR PERFORMING THE INTENDED FUNCTION. VOLTAGES ARE TOO LOW  
23 AND THE EQUIPMENT IS NOT DESIGNED TO TAKE THE VOLTAGE, THERE  
24 IS SOMETHING WRONG WITH THE SOURCE EITHER FIX THE EQUIPMENT OR  
25 FIX THE SOURCE WITHIN THE BOUNDS OF THAT EQUIPMENT.

26 MR. KILLOUGH: IN OUR INTERPRETATION OF SOME OF  
27 THESE QUESTIONS, IT WAS CLEAR TO US BY READING THE QUESTION  
28 THAT WHAT WE THOUGHT YOU WERE GETTING AT WAS OUT OF OUR SCOPE

1 OF REVIEW. BUT IN SOME OF THE CLARIFICATIONS THAT WE HAVE  
2 COME -- HAVE COME TO LIGHT IN HERE, THE INTENT OF ASKING THE  
3 QUESTION SOMETIMES RESULTED IN BEING INSIDE THE SCOPE OF  
4 REVIEW. THAT'S WHY WE'RE TRYING -- EVEN THE THINGS WE MIGHT  
5 BELIEVE RIGHT NOW ARE OUT OF SCOPE, WE MIGHT WANT TO DELVE A  
6 LITTLE DEEPER TO FIND OUT WHAT WAS YOUR INTENT IN ASKING THE  
7 QUESTION SO THAT IF SOME OF THE THINGS WE THOUGHT WERE PLAIN  
8 TO US OUT WERE OF SCOPE, THE INTENTIONS OF YOU ASKING THE  
9 QUESTIONS RESULTED SOMETHING WE DID LOOK AT THAT WAS INSIDE  
10 SCOPE. THAT'S WHY WE'RE TRYING TO GET THIS IN THE FOREFRONT.

11 MR. CALVO: IF YOU SELECTED THE COMPONENT COOLING  
12 WATER SYSTEM, I WANT TO KNOW WHETHER THAT THE SYSTEM IS GOING  
13 TO PERFORM THE INTENDED FUNCTION. THAT SYSTEM HAS A LOT OF  
14 OTHER SUPPORTING SYSTEMS, HELPING THE SYSTEM PART OF THE DC  
15 POWER, ONCE DC POWER DUPLICATION SYSTEMS. SO THAT'S ONE THING.

16 NOW THE OTHER THING ALSO WE'RE LOOKING AT, WHATEVER  
17 YOU DO IN THAT SYSTEM THAT IS GOING TO HELP TO MAKE IT A  
18 LATERAL DETERMINATION AND CORRELATE IT WITH ALL THE FLUID  
19 SYSTEMS SO YOU CAN SAY, IF IT WAS DONE GOOD IN THIS SYSTEM IN  
20 THIS WAY IN THIS MANNER, ALSO WOULD BE DONE GOOD IN THIS  
21 SYSTEM. IF IT WAS DONE BAD ON THIS SYSTEM, YOU CAN COME TO  
22 THE CONCLUSION ONLY IT WAS SPECIFIC TO THE SYSTEM, BUT IT CAN  
23 ALSO BE. IT ALSO WENT DOWN BAD IN ALL THE OTHER SYSTEM.

24 MOST OF OUR QUESTIONS WERE GEARED TO GET THE KIND OF  
25 INSIGHT FROM WHAT YOU DID. OKAY?

26 MR. STUART: KEEP DRILLING, JOSE, WE'LL GET IT  
27 EVENTUALLY.

28 MR. MARINOS: WE'LL GO TO THE NEXT QUESTION.

1 QUESTION 3(A) WAS THE SHORT CIRCUIT CHECKED BY CYGNA OR JUST  
2 THE RESULTS OF THE CALCULATION PREPARED WITH THE MCC SPEC.

3 MR. NORKIN: YOU MEAN THE SHORT CIRCUIT CALCULATION.

4 MR. MORRIS: THE 480 VOLT SHORT CIRCUIT CALCULATION.

5 MR. MAGGIO: ARE YOU ASKING WERE THE RESULTS OF THE  
6 CALCULATION COMPARED AGAINST THE EQUIPMENT RATINGS?

7 MR. MORRIS: WAS YOUR INTENT TO LOOK AT THAT SHORT  
8 CIRCUIT CALCULATION, TO REVIEW THE SHORT CIRCUIT CALCULATION  
9 OR JUST TO OBTAIN THE NUMBERS FROM THE RESULTS OF THAT  
10 CALCULATION AND COMPARE THAT TO THE NUMBERS GOING INTO THE  
11 SPECIFICATION FOR THE 480 VOLT SWITCHGEAR

12 MR. OSZEWSKI: YOU ARE ASKING IF WE REVIEWED THE  
13 METHODOLOGY FOR THE SANITY CHECK ON THE RESULTS.

14 MR. MAGGIO: THEN YOU ARE ASKING DID WE ALSO UTILIZE  
15 THE INFORMATION TO COMPARE THE EQUIPMENT THAT WAS PURCHASES BY  
16 LOOKING AT THE SPECIFICATION TO PURCHASE THE EQUIPMENT?

17 MR. MORRIS: YES.

18 MR. MAGGIO: WILL YOU BE INTERESTED IN OTHER AREAS  
19 OF DETAIL OUT OF THE CALCULATION TO ASSURE YOURSELF THAT IT'S  
20 ADEQUATE?

21 MR. MORRIS: SIMILAR TO THE 6.9 KV SWITCHGEAR, WE  
22 WOULD BE INTERESTED AS TO WHAT VOLTAGES WERE USED ON SHORT  
23 CIRCUIT.

24 MR. MARINOS: ADDITIONALLY, TO GIVE MORE  
25 AMPLIFICATION WHAT I WOULD BE INTERESTED TO LOOK AT IS THE  
26 WITHSTAND CAPABILITY OF THE BREAKER, WHICH IS A TRANSIENT  
27 LEVEL IN A HALF A CYCLE AND ALSO THE SHORT CIRCUIT  
28 INTERRUPTING OF THE MCC'S AND BREAKERS, IF THIS IS THE AREA



1 THAT YOU ALSO CHECKED.

2 MR. NORKIN: AREN'T YOU REALLY SAYING IF THEY DID  
3 REVIEW THE CALCULATION, YOU WOULD WANT THEM TO BE PREPARED TO  
4 DISCUSS THE DEPTH THEY GOT INTO IN THE CALCULATION?

5 MR. MARINOS: THIS GOES BACK LIKE JOE SAYS WHETHER  
6 YOU USE DC OFFSETS IN YOUR EVALUATION OF THE WITHSTAND  
7 CAPABILITY OF THE EQUIPMENT.

8 MR. NORKIN: I JUST DON'T WANT US TO BE TOO SPECIFIC  
9 AS TO WHAT WE'RE LOOKING FOR. BECAUSE ANY CALCULATION YOU  
10 HAVE REVIEWED WE WOULD POTENTIALLY BE ACTUALLY LOOKING OVER  
11 YOUR SHOULDER TO SEE WHAT YOU DID ON IT RATHER THAN SAY DID  
12 YOU DO THIS OR DO THAT. ONCE WE SEE THE CALCULATION, WE MIGHT  
13 HAVE OTHER QUESTIONS ABOUT IT.

14 MR. MAGGIO: SURE. THE FEEL IS FOR THE DEPTH OF  
15 YOUR QUESTION, HOW FAR TO LOOK IN OUR REVIEW.

16 MS. WILLIAMS: I THINK WE UNDERSTAND, I THINK WE  
17 UNDERSTAND.

18 MR. CALVO: WE CAN GIVE YOU, TOO, SOME OF THE  
19 BENEFITS OF THE PREVIOUS PROBLEMS THAT WE HAVE FOUND IN TRYING  
20 TO HELP YOU OUT TO MAYBE AT LEAST TAKE CARE OF THOSE I'M SURE  
21 OTHERS WILL COME UP.

22 MR. MARINOS: WE'RE GIVING YOU THIS IN ORDER TO HELP  
23 YOU GIVE US THE DOCUMENTATION THAT PROBABLY WILL GIVE US THESE  
24 ANSWERS OF THE WORK THAT YOU HAVE DONE.

25 MR. MORRIS: LET ME ADD ANOTHER CLARIFICATION TO  
26 THAT. TYPICALLY IN A SHORT CIRCUIT CALCULATION ON A 480 VOLT  
27 LEVEL, THIS WOULD BE A HAND CALCULATION. AND THE IMPEDANCE  
28 DIAGRAM WOULD NORMALLY BE DONE USING ASSUMED VALUES IN THE

1 BEGINNING OF THE PROJECT AND COME BACK TO VERIFY TOWARDS THE  
2 END OF THE PROJECT WITH ACTUAL AS-BUILT DATA, ESPECIALLY  
3 IMPEDANCES ON THE SUBSTATION UNIT, SUBSTATION TRANSFORMERS,  
4 THE ACTUAL CABLE LENGTHS THAT WERE USED GOING OUT. I WOULD BE  
5 LOOKING TO SEE WHAT TYPE OF INPUT DATA WAS INCLUDED IN THOSE  
6 CALCULATIONS AND THE BASIS OF THAT INPUT DATA.

7 MR. MARINOS: OR VARIOUS SOURCES OF INPUT FOR  
8 SOURCES MEANING THE CONTRIBUTIONS FOR INDUCTION MOTORS THAT  
9 ARE OPERATING SOMEWHERE AND BUS NAMES ARE SUPPLIED AND THINGS  
10 OF THAT NATURE.

11 MR. OVERBECK: WE'RE CONTINUING TO TRY TO TRACE, TO  
12 DEMONSTRATE THE TRACEABILITY TO THE DESIGN INPUT TO THE DESIGN  
13 OUTPUT.

14 MR. MARINOS: QUESTION 3(B), DOES THE REFERENCED  
15 SPEC COVER BOTH THE DC BUS AND THE DC POWER PANEL BOARD.

16 MR. MORRIS: THE REFERENCE SPEC IN THE CHECKLIST WAS  
17 2323-ES-11 AND I COULD NOT TELL FROM THE CHECKLIST ACTUALLY  
18 WHAT THAT -- WHAT DC EQUIPMENT WAS COVERED UNDER THAT  
19 SPECIFICATION AND, THEREFORE, WHAT THE SHORT CIRCUIT AT THE DC  
20 SYSTEM -- WAS THAT THE SWITCHGEAR LEVEL OR POWER PANEL LEVEL.

21 MR. MARTIN: THIS IS A CLARIFICATION ON EQUIPMENT  
22 COVERED BY E S 11.

23 MR. MORRIS: COVERED BY YOUR REVIEW OF ES-11, YES.

24 MR. MAGGIO: I WOULD THINK YOU WOULD WANT US TO  
25 INDICATE THE RATINGS OF THE SPECIFIC EQUIPMENT THAT WE LOOKED  
26 AT IN THE SPEC --

27 MR. MORRIS: YES.

28 MR. MAGGIO: -- IN COMPARISON TO THE SHORT CIRCUIT

1 CALCULATIONS THAT WERE CORRESPONDING TO IT THAT WE REVIEWED.

2 MR. MORRIS: YES. FOR INSTANCE, THE COMMENT IN THE  
3 CHECKLIST INDICATE PANEL BOARD HEADER RATING OF 10,000 AMPS  
4 AND DID NOT SPECIFY WHETHER THAT 10,000 AMP RATING WAS AN AC  
5 OR DC RATING.

6 MR. MARINOS: ANY MORE CLARIFICATION ON THIS?

7 MS. WILLIAMS: NO.

8 MR. MARINOS: I HAVE A SUBSET OF THIS QUESTION 3(B).  
9 DID CYGNA REVIEW THE SHORT CIRCUIT CALCULATION FOR THE PANEL  
10 BOARD AND CONFIRM THAT THE SHORT CIRCUIT RATING WAS A DC  
11 RATING DO YOU WANT FURTHER CLARIFICATION ON THIS? QUESTION  
12 3(C) ARE THE OVERALL CONTACTS USED TO PROTECT THE MOTOR DURING  
13 PERIODIC TESTING AS REQUIRED BY REGULATORY GUIDE 1.106.

14 WE'LL GO TO THE NEXT QUESTION.

15 MR. MORRIS: THE STATEMENT IN THE CHECKLIST SAYS  
16 THAT OVERLOAD CONTACTS ARE USED TO ANNUNCIATE THERMAL OVERLOAD  
17 CONDITION. IT DOES NOT ADDRESS WHETHER THERMAL OVERLOAD  
18 CONTACTS ARE USED TO PROTECT THE MOTOR

19 MR. KILLOUGH: SO YOU WANT US TO FIND OUT IF WE  
20 CLARIFY THE DIFFERENCE BETWEEN THE OVERLOAD CONTACTS USED FOR  
21 ANNUNCIATION FOR PERIODIC TESTING PURPOSES AND ALSO IF THERE  
22 WERE THERMAL OVERLOADS THAT WERE USED TO PROTECT THE MOTOR  
23 ITSELF.

24 MR. MORRIS: MY CONCERN IS THAT EITHER THE OVERLOADS  
25 ARE BYPASSED ALL THE TIME OR NOT IN THE PROTECTION CIRCUIT AT  
26 ALL.

27 MR. MARINOS: GO TO THE NEXT QUESTION.

28 MR. MARTIN: YES.



1 MR. MARINOS: 3(D), WAS THE SETTING CRITERIA AND  
2 ACTUAL SELECTION OF OVERLOAD HEATERS, PARENTHESES, USED FOR  
3 THE ALARM AND, SLASH, OR PROTECTION, END OF PARENTHESES,  
4 REVIEWED BY CYGNA FOR ACCURACY AND BASIS, PERIOD. WERE THESE  
5 IN AGREEMENT WITH THE MOV VENDORS RECOMMENDATION FOR THERMAL  
6 PROTECTION?

7 MR. MAGGIO: MAYBE A LITTLE CLARIFICATION ON THAT.  
8 ARE YOU LOOKING FOR THE METHOD IN WHICH THE OVERLOADS WERE  
9 SIZED AND, OF COURSE, THE OTHER QUESTION IS WHAT WERE THESE  
10 OVERLOADS BY IS WHAT YOU ARE ASKING.

11 MR. MORRIS: MY CONCERN HERE IS TO FIND OUT IF THE  
12 MOTOR OPERATED VALVES OR ANY OTHER MOTOR CONTROL CENTER LOAD  
13 IS PROTECTED ADEQUATELY.

14 MR. MAGGIO: OKAY.

15 MR. MORRIS: MY CONCERN IS EMPHASIZED, TOO, IN THE  
16 WALKDOWN CHECKLIST WHERE YOU NOTE THAT THE MOTOR OPERATED  
17 VALVES THAT YOU LOOKED AT DURING THE WALKDOWN ARE A DIFFERENT  
18 SIZE HORSEPOWER THAN WHAT WAS USED IN THE CALCULATION.

19 MR. MAGGIO: SO THEN YOUR CONCERN IS WERE THE  
20 OVERLOADS THEN SIZED FOR THE ACTUAL OVERLOAD.

21 MR. MARINOS: YOU ARE CLEAR WITH THAT?

22 MR. MAGGIO: YES.

23 MR. MARINOS: WE'LL GO TO THE NEXT ONE, 3(E).

24 MR. OVERBECK: THROW OUT A MECHANICAL QUESTION, TOO,  
25 BECAUSE NOW THE MOTOR IS A DIFFERENT SIZE THAN WHAT WAS USED  
26 IN THE HORSEPOWER CALCULATION. THERE IS CONCERN WHETHER  
27 TORQUE WAS SUFFICIENT TO OPEN THE VALVES, SO THERE IS A  
28 MECHANICAL ASPECT TO THIS CONCERN ALSO.

1 MR. MARINOS: OKAY. QUESTION 3(E), WAS THE BASIS  
2 FOR THE ENVIRONMENTAL AND SEISMIC REQUIREMENTS FOR THE MCC AND  
3 DC EQUIPMENT SPECS REVIEWED BY CYGNA AND INCLUDED IN THE  
4 QUALIFICATION REPORT.

5 MR. MARTIN: WE HAVE COVERED THIS QUESTION A COUPLE  
6 OF TIMES I THINK.

7 MR. MARINOS: YOU ARE RIGHT. THIS IS OUT OF YOUR  
8 SCOPE.

9 MR. MORRIS: LET ME -- EVEN THOUGH WE HAVE SAID THIS  
10 A NUMBER OF TIMES, MY CONCERN IS NOT JUST THE QUALIFICATION OF  
11 THE EQUIPMENT, BUT THE INTERFACE THAT'S REQUIRED BETWEEN  
12 DIFFERENT DISCIPLINES IN THE DESIGN. THIS IS ELECTRICAL  
13 EQUIPMENT. INTERFACE IS REQUIRED WITH MECHANICAL SERVICES,  
14 PEOPLE FOR VENTILATION, STRUCTURAL PEOPLE FOR SEISMIC. AND  
15 DURING A DESIGN REVIEW, I WOULD EXPECT TO BE LOOKING TO SEE  
16 THAT THAT INTERDISCIPLINE INTERFACE EXISTED.

17 MR. MARINOS: OKAY, NO MORE CLARIFICATION. WE GO TO  
18 QUESTION NUMBER 4(A). AND THIS IS MELT POWER AND CONTROL  
19 CABLE. WAS THE BASIS FOR THE GIBBS & HILL ALLOWABLE CABLE  
20 LENGTH CONFIRMED BY CYGNA.

21 MR. MARTIN: FIRST OF ALL, I CAN USE A CLARIFICATION  
22 WHAT YOU MEAN BY BASIS.

23 MR. MORRIS: VALVE POWER. THE QUESTION CONCERNS THE  
24 ALLOWABLE FEEDER CABLE SIZES FOR MOTOR OPERATED VALVES AND THE  
25 CONCERN IS THE VOLTAGE DROP THAT YOU SEE IN THAT TYPE CABLE.  
26 THERE IS A STATEMENT IN THE COMMENTS THAT SAID THAT YOU  
27 VERIFIED THE CABLE LENGTHS ARE LESS THAN ONE-EIGHTH THE  
28 ALLOWABLE LENGTH TO MAINTAIN ACCEPTABLE VOLTAGE DROP. AND MY

1 QUESTION IS WHAT IS THE BASIS FOR THAT ALLOWABLE LENGTH.

2 MR. MARTIN: LOOKING FOR REVIEW OF THE BASIS OF THE  
3 FEEDER CABLE LENGTH.

4 MR. MORRIS: I WOULD EXPECT TO SEE IN THE GIBBS &  
5 HILL CALCULATION VOLTAGE DROP CALCULATION SHOWING THE  
6 DIFFERENT LOADS VERSUS ALLOWABLE LENGTHS, BUT DIFFERENT SIZE  
7 LOADS, CABLE LOADS.

8 MR. MAGGIO: OKAY, WE UNDERSTAND.

9 MR. MARINOS: AS SUBSET TO THIS 4(A), DID GIBBS &  
10 HILL INCLUDE MOV STARTING CURRENT IN THE VOLTAGE ANALYSIS.

11 MR. MARTIN: THE FIRST CLARIFICATION WOULD BE WHICH  
12 VOLTAGE ANALYSIS ARE YOU REFERRING TO.

13 MR. MORRIS: THE 480 VOLTAGE DROP ANALYSIS  
14 ESTABLISHING THE VOLTAGE AT THE OPERATING EQUIPMENT.  
15 TYPICALLY, CABLES ARE SIZED FOR NORMAL RUNNING CURRENT, BUT IN  
16 SHORT DUTY MOTORS SUCH AS MOTOR OPERATED VALVES, THE STARTING  
17 CURRENT MAY AFFECT THE SIZE OF THAT CABLE SUBSTANTIALLY.

18 MR. MARINOS: THE LACK OR CAPABILITY FOR IT.

19 MR. NORKIN: ALL THIS FEEDS INTO THE ALLOWABLE  
20 CABLING CALCULATION, RIGHT.

21 MR. MORRIS: THAT'S CORRECT.

22 MR. MARINOS: AND/OR SIZE OF THE CABLING, CORRECT.

23 MR. MARTIN: OKAY.

24 MR. MORRIS: THAT'S FINE.

25 MR. MARINOS: ANOTHER QUESTION AS A SUBSET TO 4(A)  
26 IS HOW DOES GIBBS & HILL CALCULATION, SLASH, ANALYSIS HANDLE  
27 THE LOADS INSIDE CONTAINMENT WHERE MORE THAN ONE CABLE IS  
28 INVOLVED SUCH AS CCW VALVE HV 4696.



1 MR. MORRIS: WE HAVE SEEN OCCASION WHERE SOME PLANTS  
2 HAVE -- YOU LOOKED AT LOADS, ESTABLISHED THE CALCULATION AND  
3 SET A LIMIT ON THE ALLOWABLE LENGTH OF CABLE THAT YOU COULD  
4 RUN TO A PARTICULAR LOAD, NOT REALIZING THAT LOADS INSIDE  
5 CONTAINMENT HAVE TWO CABLES ASSOCIATED WITH IT, CABLE INSIDE  
6 CONTAINMENT AND CABLE OUTSIDE CONTAINMENT.

7 MR. MORKIN: ARE YOU SAYING IT'S A SEPARATE  
8 ALLOWABLE LENGTH FOR THE ONE INSIDE AND ONE OUTSIDE, BUT THEY  
9 DON'T REALLY LOOK AT THE LENGTH OF BOTH INSIDE AND OUTSIDE  
10 CONTAINMENT?

11 MR. MAGGIO: I'M NOT SURE I UNDERSTAND THAT  
12 COMPLETELY. MAYBE YOU COULD REPHRASE THAT AGAIN, PLEASE.

13 MR. MORRIS: IF THE GIBBS & HILL CALCULATION, FOR  
14 INSTANCE, SAYS THAT ON A MOTOR OPERATED VALVE YOU ARE ALLOWED  
15 TO RUN A ONE HORSEPOWER MOTOR FOR 200 FEET, AND THE DISTANCE  
16 OUTSIDE CONTAINMENT IS 187 FEET, THEY MAY ACCEPT THAT.

17 MR. MAGGIO: FROM THE SOURCE TO THE MOTOR OUTSIDE  
18 CONTAINMENT.

19 MR. MORRIS: BUT THE LOAD, IN FACT, MAY BE INSIDE  
20 CONTAINMENT. AND YOU MAY HAVE 187 FEET OUTSIDE CONTAINMENT  
21 AND ANOTHER 150 FEET INSIDE CONTAINMENT. THE TOTAL MAY EXCEED  
22 THE ALLOWABLE, BECAUSE THEY ARE TWO DIFFERENT CABLES, THEY MAY  
23 NOT CATCH THAT.

24 MR. MARTIN: BASED ON THE FACT THEY ARE DIFFERENT  
25 CABLE.

26 MR. MAGGIO: OKAY.

27 MR. MORRIS: THAT'S REALLY A QUESTION OF THE  
28 METHODOLOGY THAT GIBBS & HILL USED IN A VOLTAGE DROP ANALYSIS.

1 MR. MARINOS: GO TO THE NEXT QUESTION.

2 MR. MAGGIO: YES, PLEASE.

3 MR. MARINOS: QUESTION 4(C), DOES GIBBS & HILL  
4 CAPACITY CALCULATION INCLUDE THE RATING FOR HIGH AMBIENCE,  
5 PARENTHESES, SUCH AS INSIDE CONTAINMENT, CLOSE PARENTHESES,  
6 FLAME RETARDENTS AND FIRE BARRIERS, TRAY COVERS ON CABLE TRAY.

7 MR. MAGGIO: IN ADDITION TO AN ANSWER INDICATING IF  
8 THERE ARE ANY OR NOT, WOULD YOU WANT SPECIFICS IN TERMS OF  
9 THEIR CAPACITIES OF VALUES FOR CERTAIN VOLTAGE -- AMBIENT  
10 LEVELS.

11 MR. MORRIS: I WOULD EXPECT THAT YOUR REVIEW OF THAT  
12 WOULD LOOK AT THE AMBIENCE, FOR INSTANCE, THAT DIFFERENT  
13 CABLES HAVE TO RUN THROUGH AND COMPARE THAT TO THE ALLOWABLES  
14 THAT GIBBS & HILL CAME UP WITH IN THEIR CAPACITY CALCULATION.

15 MR. MAGGIO: OKAY.

16 MR. MORRIS: THE STATEMENTS ON FLAME RETARDANTS AND  
17 FLAME COVERS COMES ABOUT BECAUSE SOME PLANTS DO NOT PROVIDE  
18 ADEQUATE SEPARATION THROUGHOUT THE PLANT AND, THEREFORE, WINDS  
19 UP PUTTING IN SOME TYPE OF FLAME RETARDANT OR COVERING THE  
20 TRAYS IN SOME MANNER TO PROTECT ONE TRAIN FROM ANOTHER TRAIN  
21 AND FAIL TO TAKE ANY ACCOUNT OF THE EFFECT THAT HAS ON THE  
22 ALLOWABLE CAPACITY OF THE CABLE.

23 MR. MARINOS: IN SOME SITUATIONS YOU MAY HAVE BOTH,  
24 YOU MAY HAVE THE FLAME RETARDANTS AND COVER IN SOME PLACES  
25 WHERE YOU GO THROUGH A WALL AND YOU HAVE A TRAY COVER AND  
26 RETARDANTS THAT WOULD COMPOUND THE THERMAL EFFECTS ON THE  
27 CABLE.

28 MR. STUART: I THINK YOU ARE SAYING NOT ONLY

1 VERIFYING, HOWEVER, THAT THOSE CALCULATIONS WERE DONE, BUT  
2 VERIFYING -- TAKE THE FACT THAT ALMOST A FIRE ANALYSIS, IF YOU  
3 WILL, IN TERMS OF FLAME RETARDANTS, THAT THEY WERE THE  
4 APPROPRIATE ONES FOR THE ZONES THAT IT PASSES THROUGH. AM I  
5 READING THAT, YES?

6 MR. MORRIS: NO, I WOULD EXPECT THE CAPACITY  
7 CALCULATION WOULD HAVE A DIRECT FLAME RETARDANCE IF, IN FACT,  
8 FLAME RETARDANTS ARE USED IN THE PLANT. AND IF THEY ARE NOT  
9 ADDRESSED IN THE CALCULATION, THEN A WALKDOWN MAY OR MAY NOT  
10 SPOT THAT ACCORDING TO THE EXTENT OF THE CONSTRUCTION AT THE  
11 SITE.

12 MR. MARINOS: BECAUSE HEAT DISSIPATION FROM THE  
13 CABLE INSULATION WOULD BE RESTRICTED WHEN YOU GO THROUGH THIS  
14 TYPE OF ENVIRONMENT SO THE CABLE MAY HAVE TO INCREASE IN SIZE  
15 COMPENSATE THE RESTRICTION AND REJECTION.

16 MR. KILLOUGH: CORRECT ME IF I'M WRONG. I THINK IN  
17 SOME CASES YOU REALLY DO NOT KNOW UNTIL THE CABLE IS INSTALLED  
18 WHETHER YOU ARE GOING TO NEED -- WHETHER YOU CAN ACCOMMODATE  
19 THAT SEPARATION CRITERIA. SO IN SOME CASES THERE MAY BE AN  
20 ORIGINAL CALCULATION WHERE YOU DON'T TAKE ACCOUNT FOR  
21 THERMACIL OR SOMETHING LIKE THAT OR THE TRADE BEING COVERED  
22 AND THEN YOU WOULD EXPECT IF WE NOTICE THAT ON OUR WALKDOWN,  
23 THAT THERE WOULD BE A CHECK OF INSTALLATION PROCEDURE OR  
24 SOMETHING LIKE THAT TO GO AND VERIFY IF, IN FACT, THAT HAD  
25 BEEN DONE AFTER THE CABLE WAS INSTALLED.

26 MR. MARINOS: I GUESS YOU WOULD LOOK FOR A MECHANISM  
27 BY WHICH THEY WOULD MAKE THAT ASSESSMENT OR NOTE IT.

28 MR. KILLOUGH: A LOT OF CASES THAT'S NOT ORIGINALLY



1 DONE IN AN INITIAL DESIGN CALC BECAUSE IN SOME CASES YOU  
2 REALLY DON'T KNOW IF YOU ARE GOING TO GET A SEPARATION DUE TO  
3 CONSTRUCTION PROBLEMS, AS-BUILT.

4 MR. NEVSEHAL: I BELIEVE SO, ALSO FEEDBACK BACK TO  
5 THE REQUIREMENT TO DO A VERIFICATION

6 MR. OSZEWSKI: ALSO, LOOKING FOR EVIDENCE OF  
7 INTERDISCIPLINARY COORDINATION, PEOPLE DOING HAZARD ANALYSIS  
8 BE THE SAME PEOPLE RUNNING CABLE.

9 MR. OVERBECK: TYPICALLY THE PROBLEMS ARISE WHERE  
10 THE INTERFACES ARE, IS WHERE IT BELONGS.

11 MR. MARINOS: THE NEXT QUESTION. ARE WE READY?

12 MR. MAGGIO: YES, PLEASE.

13 MR. MARINOS: QUESTION 4(D), WAS THE LIMITORQUE DATA  
14 REVIEWED FOR OTHER ELECTRICAL DATA SUCH AS THE LOCKED ROTOR  
15 CURRENT AND STROKE TIME.

16 MR. MORRIS: BASED UPON THE STATEMENT IN THE  
17 CHECKLIST EE-02, SHEET 10, THAT SAID REVIEW LIMITORQUE MOTOR  
18 DATA LETTER CDN 027, I DON'T KNOW WHAT THE CONTENTS OF THAT  
19 LETTER IS.

20 MR. HESS: ARE THERE OTHER THINGS OTHER THAN LOCKED  
21 ROTOR CURRENT AND STROKE TIME THAT YOU WOULD BE INTERESTED IN  
22 IN THAT REGARD?

23 MR. MORRIS: FROM THE STATEMENT IN THE CHECKLIST I  
24 ASSUMED THAT THE CABLE SIZING CALCULATION AT LEAST LOOKED AT  
25 THE RUNNING CURRENT.

26 MR. MARINOS: BY THE WAY, THERE WAS AN ERROR IN  
27 THERE, A TYPOGRAPHICAL ERROR IN THE QUESTION. WE CALL IT A  
28 REACTOR, OF COURSE, IT'S ROTOR. DO YOU NEED ANY FURTHER

1 CLARIFICATION ON THE LOCKED ROTOR CURRENT AND STROKE TIME?

2 MR. MARTIN: NO.

3 MR. MARINOS: THE NEXT QUESTION, 4(E), WAS THE VALVE  
4 SPECS ALSO REVIEWED FOR ELECTRICAL INPUTS, SUCH AS AC VOLTAGE  
5 RANGE, MINIMUM STARTING VOLTAGE, MINIMUM AND MAXIMUM DC  
6 VOLTAGE, TERMINATION REQUIREMENTS INCLUDING LIMIT SWITCH AND  
7 OPERATOR ENVIRONMENTAL CONDUIT SEALS AND CONTACT RATINGS.

8 MR. MORRIS: THAT'S OPERATOR ENVIRONMENTAL CONDUIT.

9 MR. NORKIN: CONDUIT. IT SAYS CONDUIT. IT'S  
10 CONDUIT.

11 MR. MARTIN: SO YOU ARE LOOKING FOR A CLARIFICATION  
12 OF OUR CHECKLIST ITEMS.

13 MR. NORKIN: THE CHECKLIST ITEMS ARE ONLY FOR  
14 MECHANICAL DESIGN

15 MR. KILLOUGH: ANYTHING MORE ON THAT?

16 MR. MARTIN: NO.

17 MR. KILLOUGH: WE'RE READY.

18 MR. MARTIN: MAYBE ONE CLARIFICATION, CABLE TRAY.

19 MR. CALVO: OKAY.

20 MR. MARTIN: MAYBE ONE CLARIFICATION MIGHT BE YOUR  
21 QUESTION ON OPERATOR ENVIRONMENTAL CONDUIT. SEALS, I BELIEVE  
22 I UNDERSTAND WHAT YOU ARE SAYING, BUT I WANT TO MAKE SURE  
23 THERE ARE NO OTHER LEVELS. ARE YOU REFERRING TO ENVIRONMENTAL  
24 SEALS?

25 MR. MORRIS: ENVIRONMENTAL SEALS REQUIRED ON THE  
26 VALVE OPERATOR LIMIT SWITCHES ON THE SOLENOIDS OR OTHER  
27 EQUIPMENT INSIDE CONTAINMENT OR IN HARSH ENVIRONMENTS, AS I  
28 SAY, WITH THE COMPONENT COOLING WATER SYSTEM.

1 MR. MARINOS: NEXT QUESTION IS 4(F), WAS TRAY  
2 VOLTAGE LEVEL CONFIRMED FOR CABLE ROUTING IN ACCORDANCE WITH  
3 FSAR 8.3.1.4.3.

4 MR. MORRIS: FROM THE CHECKLIST I COULD NOT  
5 DETERMINE WHAT YOU REALLY DID IN YOUR REVIEW OF THE ROUTING OF  
6 THE CABLE FOR THE COMPONENT COOLING WATER EQUIPMENT. I  
7 COULDN'T TELL WHETHER YOU WERE JUST LOOKING TO SEE WHETHER THE  
8 CABLES WERE ALL IN TRAIN "A" TRAYS OR WHETHER THEY WERE IN  
9 TRAIN A 4(A) VOLT TRAYS.

10 MR. MARTIN: I UNDERSTAND.

11 MR. KNOX: DO WE KNOW WHAT THE GIBBS & HILL CRITERIA  
12 FOR SEPARATION OF CLASS 1-E EQUIPMENT AND CIRCUITS FOR THIS  
13 ITEM IS? WE DON'T KNOW WHAT THAT IS. I GUESS MY CONCERN IS  
14 THAT THE SAME AS THE FSAR COMMITMENT TO REG GUIDE 1.75 AND I  
15 TRIPLE E 84 WOULD THAT ENTAIL.

16 MR. MARINOS: GO ON TO THE NEXT QUESTION. QUESTION  
17 4(H), WAS THE TRAY FILL BASIS CHECKED BY SAMPLING THE ACTUAL  
18 CABLES IN A GIVEN TRAY SECTION AND THEN CALCULATING THE  
19 PERCENT FILL.

20 WAS THIS DONE FOR POWER CONTROL AND INSTRUMENT TRAYS  
21 WHICH HAVE DIFFERENT FILL RESTRICTIONS, WAS THE BASIS FOR  
22 INSTRUMENT CABLE TRAY FILL LIMIT REVIEWED.

23 MR. MARTIN: THAT'S PRETTY STRAIGHTFORWARD.

24 MR. MORRIS: THE INTENT THERE IS THAT IT APPEARS  
25 THAT GIBBS & HILL HAS A COMPUTERIZED TRAY SYSTEM, AND I COULD  
26 NOT DETERMINE FROM YOUR STATEMENT IN THERE WHETHER YOUR CHECK  
27 OF FILL WAS -- CONSISTED OF GOING DOWN THEIR COMPUTER LIST AND  
28 LOOKING FOR AN OVERFILLED CABLE INDICATING A COMPUTER ERROR OR



1 WHETHER YOU ACTUALLY TOOK A CROSS-SECTION OF A SAMPLE OF TRAY  
2 SECTIONS AND DETERMINED WHAT CABLES WERE IN THERE, WHETHER  
3 THAT AGREED WITH THEIR COMPUTER SYSTEM OR NOT.

4 MR. OVERBECK: WE HAVE FOUND INSTANCES WHERE CABLES  
5 WERE JUST DEAD ENDED, JUST LAYING IN THERE, NOT TERMINATED  
6 ANYWHERE, TOO HARD TO TAKE OUT. FIRE PROTECTION PEOPLE DIDN'T  
7 KNOW THEY WERE IN THERE, CONTINUED TO GO ON.

8 MR. MAGGIO: FOR EXAMPLE, IF THESE CABLES WOULD GIVE  
9 AN EXCESSIVE TRAY FILL.

10 MR. MORRIS: BOTH FROM A CAPACITY POINT OF VIEW IF  
11 THE CIRCUITS ARE LIVE CIRCUITS AND ALSO FOR FIRE PROTECTION,  
12 COMBUSTIBLE.

13 MR. OVERBECK: THE COMPUTER PROGRAM MIGHT EVEN  
14 INDICATE IT IS NOT OVERLOADED, IN FACT, IT MIGHT BE.

15 MR. CALVO: AS A MATTER OF FACT, YOU DO HAVE  
16 OVERFILL IN COMANCHE PEAK. HOWEVER, ON THIS THING IN THOSE  
17 CASES WHERE THE OVERFILL CRITERIA WAS EXCEEDED, SOME  
18 ADDITIONAL CALCULATIONS ABOUT THE IMPACT OF THE THERMAL LAG  
19 AND SUPPORT WAS DONE. SO YOU MAY FIND OUT THAT YOU HAVE THE  
20 OVERFILL, YOU WANT TO KNOW IF IT'S OKAY TO HAVE THE OVERFILL.  
21 IT IS A PROCEDURAL OR REQUIREMENT IN CASE YOU COME UP WITH AN  
22 OVERFILL, YOU MUST DO CERTAIN THINGS TO ASSURE THAT THE  
23 STRESSES, THERMAL OR STRUCTURAL STRESSES ARE OKAY. SO IT IS A  
24 VERY REAL SITUATION. YOU HAVE IT IN COMANCHE PEAK.

25 MR. MARINOS: GO TO THE NEXT ONE, TOM.

26 MR. MARTIN: YES, PLEASE.

27 MR. MARINOS: QUESTION 4(1), WAS A 600 VOLT POWER  
28 CABLE SPECIFICATION REVIEWED. AND I AM GOING TO READ THE REST

1 OF THE QUESTION. DID THE REVIEW INCLUDE A DETERMINATION OF  
2 THE REQUIRED INSULATION LEVEL BECAUSE OF -- BECAUSE THE 480  
3 VOLT SYSTEM IS UNGROUNDED AND NOT TRIPPED ON GROUNDS. WAS THE  
4 CABLE MANUFACTURER'S CABLE DATA REVIEWED AND COMPARED TO  
5 DESIGN DOCUMENTS, A, CABLE OUTSIDE DIAMETER VERSUS TRAY FILL  
6 AND AMPACITY CALCULATIONS. B, MAXIMUM PULLING TENSION AND SIDE  
7 WALL PRESSURE VERSUS INSTALLATION SPEC, C, CABLE REPAIR AND  
8 SLICE CRITERIA.

9 MR. MORRIS: THE REASON FOR THIS QUESTION IS YOUR  
10 CHECKLIST INDICATE THAT YOU LOOKED AT THE 6.9 KV CABLE AND IT  
11 LOOKED -- YOU HAVE AN ENTRY ON CONTROL CABLE AND ANOTHER ENTRY  
12 I BELIEVE ON INSTRUMENT CABLE LATER ON IN THE NEXT CHECKLIST.  
13 BUT I DID NOT SEE ANYTHING ANYWHERE ON THE SIX HUNDRED VOLT  
14 CABLE.

15 MR. MAGGIO: I HAVE ONE QUESTION THAT IS DIRECTED AT  
16 A DETERMINATION OF INSULATION LEVEL, AND I'M NOT SURE ABOUT  
17 THE CRITERIA OF USING SAY UNDERGROUND SYSTEM AT 40 VOLTS FOR,  
18 SAY, 600 VOLT CABLE. I'M NOT SURE I UNDERSTAND THE  
19 ASSOCIATION BETWEEN THOSE TWO THINGS IN LIGHT OF THE FACT THAT  
20 THE INSULATION LEVEL CAN BE SPECIFIED AS A NOMINAL CUT  
21 TEMPERATURE OF 90 DEGREE C, 150 DEGREE C FOR OVERLOAD IN AN  
22 EMERGENCY SHORT CIRCUIT 250 DEGREES C.

23 MR. MORRIS: THERE IS TWO DIFFERENT PROBLEMS WITH  
24 CABLE. THE QUESTION THAT I AM RAISING HERE HAS TO DO WITH THE  
25 VOLTAGE BREAK DOWN AT THE CABLE BECAUSE THIS CABLE -- BECAUSE  
26 THE 480 VOLT SYSTEM IS AN UNGROUNDED SYSTEM, A POTENTIAL  
27 GROUND COULD EXIST WITHOUT TRIPPING THE SYSTEM WHICH IS THE  
28 INTENT OF AN UNGROUNDED SYSTEM, TO ALLOW THE PLANT TO CONTINUE

1 OPERATION UNTIL THE GROUND CAN BE REPAIRED. BECAUSE THIS  
2 SYSTEM IS UNGROUNDED AND COULD RUN WITH A GROUND FAULT ON  
3 THERE, THE FAULT DOES NOT TRIP, THE ICEA STANDARDS FOR CABLE  
4 CALLS FOR A HIGHER VOLTAGE LEVEL INSULATION.

5 AND THE OTHER AREA THAT YOU WERE TALKING ABOUT, WAS  
6 THE THERMAL CAPABILITY OF THE INSULATION SYSTEM AND THE  
7 CURRENT CARRYING CAPABILITY.

8 MR. MARTIN: OKAY.

9 MR. MAGGIO: THANK YOU.

10 MR. MARINOS: NEXT QUESTION, 4(K), IS THE POWER  
11 OPERATED VALVE SPECIFICATION ALSO COVER THE VALVES INSIDE  
12 CONTAINMENT WITH ITS HARSH ENVIRONMENT. DID THE VALVE SPEC  
13 PROVIDE RADIATION VALUES -- IS THAT RIGHT -- FOR DIFFERENT  
14 PLANT AREAS.

15 MR. MARTIN: MY IMPRESSION OF THIS QUESTION IS THAT  
16 IT'S NO, SOME OF THESE VALVES AREN'T INCLUDED IN OUR CHECKLIST  
17 AND THAT'S WHY YOU ARE ASKING ABOUT THE INCLUSION.

18 MR. MORRIS: YOU MADE A STATEMENT THAT YOU LOOKED AT  
19 THE SPECIFICATION OF THE POWER OPERATED VALVES, BUT I DON'T  
20 KNOW WHAT THE -- WHAT VALVES WERE INCLUDED IN THAT  
21 SPECIFICATION.

22 MR. MARTIN: OKAY.

23 MR. MORRIS: I DON'T KNOW IF ALL THE VALVES IN THE  
24 PLANT WERE PURCHASED UNDER THAT ONE SPECIFICATION.

25 MR. MARTIN: OKAY.

26 MR. MORRIS: AND IF THEY ARE PURCHASED UNDER THIS  
27 ONE SPECIFICATION, THEN I WOULD EXPECT TO SEE DIFFERENT  
28 ENVIRONMENTS SPECIFIED FOR DIFFERENT PLANTS, DIFFERENT PARTS



1 OF THE PLANT.

2 MR. MARTIN: OKAY.

3 MR. NORKIN: DID THAT K, THAT INCLUDED EQUIPMENT  
4 SPEC POWER OPERATED VALVES FOR IDENTIFICATION I TRIPLE E?

5 MR. MORRIS: K ALSO ADDRESSES SPECIFICATION MS 600  
6 AND ENVIRONMENTAL REQUIREMENTS.

7 MR. NORKIN: OKAY.

8 MR. MARINOS: QUESTION 5(A), WAS A QUALIFICATION OF  
9 THE, QUOTE, QUALIFIED ISOLATOR, UNQUOTE, REVIEWED BY CYGNA.

10 MR. MARTIN: I BELIEVE WE WENT OVER THIS QUESTION  
11 EARLIER IN OUR OTHER CHECKLIST.

12 MR. MARINOS: QUESTION 5(B), DID CYGNA QUESTION WHY  
13 VALVES HV 4512 AND HV 4514 WERE NOT MONITORED THE SAME AS IF  
14 THEY PERFORMED THE SAME FUNCTION TO ISOLATION, TO ISOLATE THE  
15 COMPONENT COOLING WATER A LOOP FROM THE B LOOP.

16 MR. MORRIS: AND THE REASON FOR THIS QUESTION IS  
17 YOUR CHECKLIST INDICATES CHECK OFF IN THE YES COLUMN FOR ONE  
18 OF THE VALVES AND CHECK OFF IN THE N/A COLUMN FOR THE OTHER  
19 VALVE.

20 MR. MARTIN: OKAY.

21 MR. MARINOS: NOW, SUBSET HERE TO THIS QUESTION IS  
22 WHY ARE VALVES HV 4572 AND 4574 NOT INCLUDED IN REGULATORY  
23 GUIDE 147 MONITORING TO ALLOW LOSS OF THE RHR AND CONTAINMENT  
24 SPRAY AND COOLING CAPABILITY.

25 MR. MORRIS: YOUR CHECKLIST INDICATES THAT THOSE  
26 VALVES ARE CHECKED OFF UNDER N/A AND WE WOULD THINK THAT THOSE  
27 ARE IMPORTANT VALVES.

28 MR. MARTIN: OKAY. I BELIEVE I UNDERSTAND.

1 MR. OSZEWSKI: MAY I ASK A CLARIFICATION, WE'LL GET  
2 TO IT LATER, SOME OF THE INSTRUMENT AND CONTROL QUESTIONS THAT  
3 WE HAVEN'T GOT TO YET, ONE OF THE QUESTIONS TALKS ABOUT  
4 WHETHER THAT SIGNALS MAKES AN OPERATIVE SYSTEM BYPASS  
5 INDICATION SSII. ARE YOU ASKING SORT OF THE SAME QUESTION FOR  
6 THOSE TWO QUESTIONS? I DON'T KNOW IF THEY ARE ASKED BY THE  
7 SAME PERSON.

8 MR. MORRIS: THEY ARE ASKED BY TWO.

9 MR. OSZEWSKI: DIFFERENT PEOPLE, BUT THE SAME  
10 QUESTION.

11 MR. STANLEY: WORKING IN DIFFERENT OFFICES. THIS  
12 ONE IS A LITTLE MORE SPECIFIC, ASKING ABOUT A CERTAIN VALVE.  
13 I WAS ASKING ALL OF THEM.

14 MR. MARINOS: ITEM 5(C), VALVE RV-4508 DOES NOT HAVE  
15 A TRAIN B COUNTERPART AS IMPLIED BY AN X IN THE YES COLUMN.

16 MR. MARTIN: NO FURTHER CLARIFICATION.

17 MR. MARINOS: QUESTION 6(A), WAS THE BASIS FOR THE  
18 CCW ALTERNATE SHUTDOWN REPORT INPUT REVIEWED.

19 MR. KILLOUGH: FROM FIRE PROTECTION STANDPOINT.

20 MR. OSZEWSKI: WE NEED SOME MORE ON THAT ONE.

21 MR. KILLOUGH: 6(A).

22 MR. MORRIS: YOUR CHECKLIST INDICATES THAT THE  
23 ALTERNATE SHUTDOWN REPORT AND FIRE ANALYSIS REPORT IDENTIFIED  
24 WERE REVIEWED FOR IDENTIFICATION OF THE COMPONENT COOLING  
25 WATER SYSTEM ELECTRICAL VALVES. THE QUESTION WAS WHAT WAS THE  
26 INPUT, WHAT TYPE OF INPUT WENT INTO THE FORMATION OF THAT  
27 ALTERNATE SHUTDOWN REPORT THAT INCLUDED THE -- THOSE COMPONENT  
28 COOLING WATER VALVES. WAS THERE AN INTERDISCIPLINE REVIEW

1 ESTABLISHED FOR THAT?

2 MR. MAGGIO: I'M NOT SURE WE ASKED THE QUESTION,  
3 WE'RE ALSO CONCERNED ABOUT DESIGN.

4 MR. MORRIS: I'M LOOKING FOR THE INTERDISCIPLINE  
5 INTERACTION HERE ESTABLISHING THESE REQUIREMENTS -- THE  
6 REQUIREMENTS FOR THESE VALVES IN BOTH CONDITIONS.

7 MR. MARINOS: DID YOU FINISH, GEORGE? WE'LL GO TO  
8 THE NEXT QUESTION. OKAY, WE'LL GO TO QUESTION 7, FUNCTIONAL  
9 REQUIREMENTS. WE'RE ASKING WAS THERE AN FMEA PERFORMED ON THE  
10 CONTROL CIRCUITS.

11 MR. FOLEY: BY CYGNA OR GIBBS & HILL.

12 MR. MORRIS: BY GIBBS & HILL.

13 MR. MARINOS: QUESTION 7(B).

14 MR. HESS: CAN I ASK ONE OTHER? ARE YOU TALKING  
15 SOMETHING IN ADDITION TO THE FMEA OR FAILURE MODES TABLE  
16 INCLUDED IN THE FSAR OR LOOKING FOR THE BACKUP TO THAT, THE  
17 INPUT TO THAT TABLE?

18 MR. MORRIS: I'M LOOKING FOR THE INPUT TO THE TABLE.

19 MR. MARINOS: QUESTION 7(B).

20 MR. MAGGIO: I MIGHT ASK QUICKLY, FOR MY OWN  
21 CLARIFICATION, WE'RE TALKING FMEA IN TERMS OF AN ELECTRICAL  
22 SENSE, ELECTRICAL EQUIPMENT FAILURE. IS THAT WHAT WE'RE  
23 LOOKING FOR?

24 MR. MORRIS: I'M PARTICULARLY CONCERNED ABOUT THE  
25 ELECTRICAL FAILURE AFFECTING THE COMPONENT COOLING WATER  
26 SYSTEM.

27 MR. MAGGIO: THANK YOU.

28 MR. ANGELO: QUESTION 7(B), DOES A SUFFICIENT



1 DEADBAND EXIST ON THE CCW PUMP RECIRC. VALVE FLOW CONTROL.

2 MR. MORRIS: CONCERN IS WHETHER THE RECIRCULATION  
3 VALVE IS GOING TO BE CYCLING ON AND OFF OR OPENING AND CLOSING

4 MR. OSZEWSKI: SORT OF COMBINATION OF MECHANICAL AND  
5 CONTROLS QUESTION.

6 MR. MORRIS: YES.

7 MR. MARINOS: NEXT QUESTION, 7(C), WAS THE BASIS FOR  
8 THE PARTIALLY OPEN SET POINT OF VALVE HV-4572 REVIEWED FOR  
9 INTERDISCIPLINE INTERFACE? DOES THIS AGREE WITH THE ACTUAL  
10 SETTING?

11 MR. MORRIS: CONCERN THERE IS THAT VALVE IS GOING TO  
12 SOME INTERMEDIATE POSITION, WHAT DETERMINED THAT INTERMEDIATE  
13 POSITION, AND DOES THAT CONTROL AGREE WITH THE -- DOES THAT  
14 INTERMEDIATE POSITION AGREE WITH THE CONTROL CIRCUIT.

15 MR. MARTIN: OKAY.

16 MR. MARINOS: WE'LL GO TO 7(E), DOES AN INTERLOCK  
17 EXIST TO ISOLATE THE SAFEGUARDS LOOP ON SURGE TANK LO LO LEVEL  
18 WHICH COULD BE CAUSED BY A BREAK IN THE NON-SAFEGUARDS SECTION  
19 OF CCW.

20 MR. PORTER: IS THERE ANYTHING BEHIND THAT QUESTION?

21 MR. MORRIS: THE CHECKOFF LIST INDICATED THAT THE  
22 COMPONENT -- THAT THE NONSAFETY RELATED SYSTEM WAS ISOLATED ON  
23 A P SIGNAL, BUT I WOULD EXPECT THAT A NONSAFETY RELATED SYSTEM  
24 WOULD BE ISOLATED ON LO LO SURGE TANK LEVEL IN ORDER TO  
25 CONSERVE THE WATER FOR THE SAFETY SYSTEM.

26 MR. PORTER: OKAY.

27 MR. MARINOS: QUESTION 7(F) -- ARE WE DONE?

28 DOCUMENT WHOSE ANALYSIS FORMS THE BASIS FOR REMOVING THE HIGH

1 RADIATION INTERLOCK ON VALVE RV-4508.

2 MR. FOLEY: IT'S CLEAR.

3 MR. KILLOUGH: SAME QUESTION WAS ASKED THREE TIMES.

4 MR. HESS: SAME ONE WE ANSWERED EARLIER THIS MORNING  
5 BEFORE WE GET OFF THAT, LET ME ASK FOR MECHANICAL  
6 BACKGROUND WAS THERE ANYTHING ELSE THAT YOU NEEDED OTHER THAN  
7 THE ANSWER THAT WAS PRESENTED THIS MORNING ON THE INTERLOCK?  
8 IS THERE ADDITIONAL INFORMATION?

9 MR. OVERBECK: I GUESS YOU ARE TRACKING IT -- YOU  
10 GAVE US A LOT OF ANSWERS SAYING WE'RE GOING TO GET THAT WHEN  
11 WE DO OUR DESIGN CONTROL PROCEDURE OR WHATEVER. I DON'T WANT  
12 TO STEAL YOUR WORDS, I'M NOT SURE HOW YOU PHRASED IT. WHEN WE  
13 DO OUR REVIEWS, THE FELLOWS WHO ARE DOING THE TECHNICAL  
14 REVIEWS ARE ALSO DOING THE PROGRAMMATIC. WE DON'T REALLY DO A  
15 PROGRAMMATIC PER SE. WE LOOK AT THE CALCULATION, FIND THE  
16 PROBLEM, AND LOOK AT THE PROCEDURES TO SEE WHAT WAS VIOLATED.

17 IT ALSO GETS TO BE WRITTEN UP AT ONCE. THERE SEEMS  
18 TO BE A SEGREGATION IN THE MECHANICAL AREA. WE DID OUR OWN  
19 CHECK AND FIND IT ALL RIGHT. OUR QUESTION IS, IS IT STILL A  
20 DESIGN CONTROL PROCESS PROBLEM. SO I STILL HAVE THAT OPEN  
21 QUESTION. TO ME, IT'S NOT RESOLVED. IT MAY BE ALL RIGHT  
22 TECHNICALLY, BUT NOT FROM A DESIGN PROCESS STANDPOINT.

23 MR. HESS: YOU ARE WORRIED ABOUT THE DESIGN CONTROL,  
24 DESIGN PROCESS.

25 MS. WILLIAMS: I UNDERSTAND.

26 MR. OVERBECK: I'M WORRIED. THAT'S WHAT WE'RE  
27 TRYING TO ASCERTAIN, WHETHER THERE WAS A CONTROL DESIGN  
28 PROCESS INVOLVED IN THE SYSTEM. IN ADDITION, IS THIS SYSTEM

1 PROPERLY DESIGNED. I THINK THERE IS TWO QUESTIONS THAT HAS TO  
2 BE ANSWERED.

3 MR. CALVO: TOMORROW I INDICATED WE WOULD GIVE YOU A  
4 SUMMARY, AT LEAST OUR PERCEPTION THAT TOOK PLACE IN THESE TWO  
5 OR THREE DAYS OF HOW WE STAND FROM OUR STANDPOINT, HOW WE SEE  
6 AS AREAS THAT ARE REQUIRED FURTHER CONSIDERATION FOR THE  
7 ASSESSMENT TO SATISFY OUR CONCERNS.

8 SO TOMORROW WE WILL DO -- WE WILL TRY TO SUMMARIZE  
9 AND GIVE YOU THAT KIND OF OVERVIEW.

10 MS. WILLIAMS: OKAY.

11 MR. CALVO: I GUESS WE CAN TAKE A 5-MINUTE BREAK.  
12 (RECESS.)

13 MR. MARINOS: WE'RE GOING TO GO TO CHECKLIST EE-03,  
14 ELECTRICAL CCW INSTRUMENTATION. AND QUESTION NUMBER 1, WAS  
15 THE POST-ACCIDENT MONITORING EQUIPMENT INCLUDED IN THE EQ LIST

16 MR. MORRIS: WHAT I AM REALLY LOOKING FOR HERE IS  
17 WHAT WAS THE BASIS OF ESTABLISHING THE POST-ACCIDENT  
18 MONITORING SYSTEM, WHAT INPUT WAS THERE FROM THE DIFFERENT  
19 DISCIPLINES AND WHAT DEFINED WHETHER THAT EQUIPMENT WAS  
20 REQUIRED TO BE SAFETY RELATED OR NOT.

21 MR. MARINOS: QUESTION 1(B), DOES SPECIFICATION  
22 2323-MS-622 COVER ALL TEMPERATURE ELEMENTS INSIDE AND OUTSIDE  
23 CONTAINMENT. ARE THE TEMPERATURE ELEMENTS RTD'S OR  
24 THERMOCOUPLES, IF THE TE'S INSIDE CONTAINMENT ARE  
25 THERMOCOUPLES, HOW ARE THEY BROUGHT OUT THROUGH THE ELECTRICAL  
26 PENETRATIONS.

27 MR. MORRIS: THIS QUESTION HERE ON THE CHECKLIST  
28 WHETHER THAT SPECIFICATION IS 622 OR 620, TWO REFERENCES TO



1 SPECIFICATION.

2 MR. PORTER: SO YOU ARE LOOKING THERE FOR  
3 THERMOCOUPLE WIRE USED IN THE PENETRATION. THAT'S THE TYPE OF  
4 QUESTION YOU ARE LOOKING FOR.

5 MR. CALVO: YOU ALSO GOT THERMOCOUPLE, JUNCTIONS,  
6 ALL THAT STUFF.

7 MR. PORTER: YES, YES.

8 MR. CALVO: OKAY.

9 MR. MARINOS: GO TO THE NEXT QUESTION. QUESTION  
10 NUMBER 4, INSTRUMENT POWER SOURCES REVIEW WAS NOT COMPLETED IN  
11 THE CHECKLIST. WAS THE CORRECT TRAIN ASSOCIATED POWER USED.  
12 WERE VOLTAGE AND CURRENT REQUIREMENTS OF BOTH THE INSTRUMENT  
13 LOOP AND ELECTRONICS RACK REVIEWED. WAS CLASS 1-E SLASH NON  
14 1-E ISOLATION IN THE RACK ELECTRONICS REVIEWED. WAS THE RACK  
15 SUPPLIED BY A UPS AND WAS THE CAPABILITY OF THE INVERTER  
16 REVIEWED.

17 MR. MORRIS: THE REASONING BEHIND THIS QUESTION,  
18 THERE IS AN ENTRY IN THE CHECKLIST EE-03 SHEET 8 OF 8 FOR  
19 REVIEW OF THE INSTRUMENT POWER SOURCE. AND THERE IS NO  
20 INDICATION WHETHER THAT REVIEW WAS PERFORMED. THERE IS NO  
21 CHECKOFFS IN THE BOX AND NO ENTRANCE IN THE COMMENT SECTION.

22 MR. NORKIN: IS THAT ITEM 4?

23 MR. MORRIS: THAT'S 4.

24 MR. NORKIN: REQUIREMENT OF POWER SOURCE, AND  
25 REQUIREMENTS OF DDC 13.

26 MR. MARINOS: ARE WE FINISHED? AN ADDITIONAL SUBSET  
27 OF QUESTIONS UNDER 4 WHICH I DID NOT STATE I WILL STATE NOW.  
28 CHECKLIST STATES THAT NUMBER 12 CONDUCTORS ARE USED FOR

1 INSTRUMENT CABLE, BUT LIST EE-02 ITEM 41 LISTS SHIELDED  
2 TWISTED PAIR NUMBER 16 CABLES. AN ADDITIONAL QUESTION, IF  
3 NUMBER 12 IS, IN FACT, USED ARE THE CABLES IN A SHIELDED  
4 TWISTED PAIR FORMED.

5 MR. MORRIS: THE QUESTION THERE IS IN THE CONTROL  
6 SECTION YOU INDICATED THAT THE REVIEW OF THE CONTROL  
7 SPECIFICATION FOR CONTROL CABLE INCLUDED CHILLER TWISTED CABLE  
8 HERE IN THE INSTRUMENTATION SECTION YOU ARE SAYING OR IMPLYING  
9 THAT CONTROL CABLE IS USED TO INSTRUMENT.

10 MR. MARTIN: I THINK I KNOW WHAT THE  
11 MISUNDERSTANDING IS THERE. I UNDERSTAND YOUR CONCERN.

12 MR. MARINOS: I HAVE AN ADDITIONAL LIST OF QUESTIONS  
13 WHICH DO NOT APPEAR IN THE CHECKLIST. WE CALL THEM OTHER  
14 AREAS NOT REVIEWED BUT SHOULD HAVE BEEN INCLUDED. AND I HAVE  
15 QUESTION NUMBER 1, ELECTRICAL CONTAINMENT PENETRATION REQUIRED  
16 FOR THE CCW SYSTEM MOV, SOLENOID POWER AND CONTROL AND CCW  
17 INSTRUMENTATION CONTAINMENT. SUBSET, PENETRATION  
18 SPECIFICATION INPUTS FOR REQUIRED CAPACITY, SHORT CIRCUIT  
19 CAPABILITY, ENVIRONMENTAL, PARENTHESES, INCLUDING RADIATION,  
20 CLOSE PARENTHESES, SEISMIC REQUIREMENTS FOR NORMAL AND DBE  
21 CONDITIONS, TERMINATION REQUIREMENTS, ET CETERA.

22 MR. MORRIS: THIS AREA WAS ADDED EVEN THOUGH IT WAS  
23 NOT INCLUDED IN YOUR REVIEW. CONTAINMENT PENETRATIONS TEND TO  
24 BE A PROBLEM AREA BECAUSE OF THE LARGE INTERFACE REQUIRED, NOT  
25 ONLY BETWEEN DISCIPLINES, BUT ALSO INTERNAL IN THE ELECTRICAL  
26 DISCIPLINE. AND I ACKNOWLEDGE THAT PENETRATIONS ARE OUTSIDE  
27 THE DEFINED SCOPE.

28 MR. MARTIN: OKAY. I UNDERSTAND THESE ITEMS.

1 MR. MARINOS: GO TO QUESTION NUMBER 2, DIESEL  
2 GENERATOR CAPABILITY TO ACCEPT THE CCW PUMP. AND SUBSET OF  
3 QUESTIONS UNDERNEATH, WHAT'S THE BASIS FOR LOADING TABULATION,  
4 HAS THE INPUT DATA BEEN REVIEWED, HAS DIESEL GENERATOR TESTS  
5 PROVEN THE CAPABILITY OF THE UNIT TO ACCEPT THE DESIGN BASIS  
6 LOAD, HAS THE ACTUAL MOTOR DATA FOR LARGE MOTOR, PARENTHESES,  
7 480 VOLT LOAD AND 6.9 KV SWITCHGEAR LOADS, CLOSE PARENTHESES,  
8 BEEN REVIEWED FOR STARTING KV'S --

9 MR. MORRIS: THAT'S KVA'S.

10 MR. MARINOS: KVA'S AND ACCELERATING TIMES AND  
11 COMPARED TO THE DIESEL GENERATOR LOADING CALCULATION. WERE  
12 DIFFERENCES JUSTIFIED.

13 MR. MAGGIO: I THINK WE UNDERSTAND THESE VERY WELL.  
14 AT THIS TIME IS THERE ANYTHING THAT YOU WOULD ALSO LIKE TO ADD  
15 AS FAR AS THE QUESTION THAT MAYBE BROACHED INTO DIFFERENT  
16 AREAS THAT WE MAY HAVE COVERED ANYWAY.

17 MR. MORRIS: NOT AT THIS TIME.

18 MR. MARINOS: QUESTION NUMBER 3 IS FIELD DESIGN  
19 CHANGES IN CCW, PARENTHESES, AND OTHER SYSTEMS, CLOSE  
20 PARENTHESES. DO DESIGN CHANGES INITIATED IN THE FIELD CONFORM  
21 TO THE PROJECT SPECIFICATION GUIDELINES, SPECIFICATIONS,  
22 GUIDELINES, AND CALCULATIONS.

23 MR. MORRIS: I DIDN'T SEE ANYTHING IN THE CHECKLISTS,  
24 I DIDN'T SEE ANYTHING IN THE CHECKLISTS WHERE YOU REVIEWED  
25 FIELD CHANGES ASSOCIATED WITH THE COMPONENT COOLING WATER  
26 SYSTEM.

27 MS. WILLIAMS: FOR THE RECORD, WE DID. WE'LL  
28 ADDRESS THAT. BOXES OF THEM.



1 MR. MARINOS: QUESTION NUMBER 4, 480 VOLT MOTOR  
2 PROTECTION AND COORDINATION, PARENTHESES, SWITCHGEAR AND MCC,  
3 CLOSE PARENTHESES, WITH UPSTREAM BREAKERS, PARENTHESES, NOT  
4 COVERED BY CCW SYSTEM, CLOSE PARENTHESES, PERIOD.

5 MR. MORRIS: EXCUSE ME THE REASON WHY I ADDED THAT,  
6 THE SCOPE OF THE COMPONENT COOLING WATER SYSTEM HAS LARGE  
7 MOTORS ON THE 6.9 KV BUS AND RELATIVELY SMALL MOTOR OPERATED  
8 VALVES, BUT IT DOES NOT COVER THE MOTORS IN THE -- ON THE 480  
9 VOLT SWITCHGEAR OR LARGER 480 VOLT LOADS. SO BY USING THE  
10 COMPONENT COOLING WATER SYSTEM AS A GUIDE SYSTEM, YOU ARE  
11 MISSING THAT SECTION OF THE ELECTRICAL REVIEW.

12 MR. MARTIN: OKAY, I UNDERSTAND.

13 MR. OVERBECK: YOU MADE A COMMENT ABOUT FIELD DESIGN  
14 CHANGE WE HAVE LOOKED AT A LOT OF THEM. FROM A DESIGN  
15 STANDPOINT, WE'RE INTERESTED IN LOOKING AT HOW FIELD DESIGN  
16 CHANGE WAS INITIATED AND HOW THAT GOT BACK TO THE ORIGINAL  
17 DESIGNER TO VERIFY. AND NOT JUST A QA CHECK, AN ACTUAL  
18 TECHNICAL REVIEW AND HOW THAT WAS ACCOMPLISHED.

19 MR. MARINOS: WE'RE FINISHED WITH THE ELECTRICAL  
20 QUESTIONS. WE CAN START ON THE INSTRUMENTATION AND CONTROL  
21 QUESTIONS IF YOU ARE READY.

22 QUESTION NUMBER 1, FSAR TABLE 7.1-2, SHEETS 1 AND 2,  
23 LIST 10 CFR 50, APPENDIX A, GDC NRC REGULATORY GUIDES, AND I  
24 TRIPLE E STANDARDS APPLICABLE TO CCW. FOR EACH SAFETY RELATED  
25 CCW'S COMPONENT, HAVE THE FOLLOWING ITEMS BEEN ADDRESSED. A,  
26 GDC 24 AND WHERE, B, GDC 44, WHERE, C, GDC 46 AND WHERE, D,  
27 REGULATORY GUIDE 1.22 AND WHERE, 1-E, REGULATORY GUIDE 1.62  
28 AND WHERE, 1-F, REGULATORY GUIDE 1.89 AND WHERE.

1 QUESTION 1(G), REGULATORY GUIDE 1.100 AND WHERE,  
2 1(H), REGULATORY GUIDE 1.118 AND WHERE, AND QUESTION 1(I), I  
3 TRIPLE E 279 AND WHERE, 1(J) I TRIPLE E 338 AND WHERE.

4 MR. STANLEY: BY WAY OF BACKGROUND TO CLARIFY THAT,  
5 THIS LIST CAME OUT OF THE READING OF YOUR DC-5 ELECTRICAL  
6 CRITERIA, AND DC-4 MECHANICAL CRITERIA RELATIVE TO CHAPTER 7  
7 OF THE SAR. THESE ONES I HAVE LISTED, EXCEPT FOR 279, WERE  
8 NOT IN YOUR CRITERIA DOCUMENTS. AND IN REVIEWING THE CHECK  
9 SHEETS THAT DEALT WITH INSTRUMENTATION OR CONTROL CIRCUITS, I  
10 DIDN'T SEE ANY INDICATION THAT ANY OF THESE WERE ADDRESSED IN  
11 ANY ENTRY. IN ADDITION TO THAT, THE ISSUE OF SET POINTS IS  
12 COMPLETELY ABSENT. AND DC-5, SECTION 4.5, IS WHERE YOU HAVE  
13 IT LISTED. AND I EXPECTED TO SEE SOME ADDRESSING OF THAT.  
14 THIS CAME OUT IN YOUR DESIGN CRITERIA.

15 MS. WILLIAMS: OKAY.

16 MR. MARINOS: QUESTION NUMBER 2, IN SIGNAL ANALYSIS  
17 EE -- WE SKIP NUMBER 2.

18 MR. MARTIN: SKIP 2 AND 3.

19 MR. MARINOS: SKIP 3.

20 MS. WILLIAMS: IF YOU HAVE OTHER QUESTIONS, LET'S GO  
21 THROUGH THEM.

22 MR. MARINOS: QUESTION NUMBER 3, THEN, I WILL STATE  
23 IT AND YOU CLARIFY IT. NUMBER 3, WHAT EXACT SIGNALS MAKE UP  
24 THE, QUOTE, TRIP INOPERABLE, END QUOTE, SYSTEM BYPASS, SLASH,  
25 INOPERATIVE INDICATION FOR SSII FOR CCW PUMP TRAIN "A" AS  
26 MENTIONED IN EE-01, PARENTHESES, 5(B), CLOSE PARENTHESES, IN  
27 EE-02, PARENTHESES, 5(B), CLOSE PARENTHESES.

28 MR. CALVO: QUESTION MARK.

1 MR. MARINOS: QUESTION MARK.

2 MR. STANLEY: THAT'S A TOUGH ACT TO FOLLOW.

3 MR. PORTER: THAT WAS WELL DONE.

4 MR. STANLEY: MY INTEREST IN THERE IS GETTING  
5 INFORMATION ON EACH VARIABLE FROM THIS SYSTEM THAT'S PUT INTO  
6 THE SSII AND, IN PARTICULAR, HAVING INFORMATION ON THOSE THAT  
7 WERE LEFT OUT AS BEING USED LESS FREQUENTLY THAN ONCE PER YEAR  
8 THE ONCE PER YEAR DECISION IN REG GUIDE 1.47. I PARTICULARLY  
9 WANTED TO SEE WHAT THE DESIGN CONTAINED AND WHAT YOUR REVIEW  
10 OF WHAT THAT ADDRESSED, HOW YOU REVIEWED NOT ONLY WHAT WAS IN  
11 THE LIST, BUT WHAT WAS LEFT OFF THE LIST.

12 MR. MARINOS: NUMBER 4.

13 MR. MARTIN: WE'RE READY.

14 MR. MARINOS: WHAT MEANS HAVE YOU PROVIDED IN A  
15 DETAILED CCW'S PUMP CONTROL CIRCUIT TO ASSURE THAT THE LOW  
16 PRESSURE PUMP START INTERLOCK CROSS CONNECTIONS BETWEEN  
17 REDUNDANT TRAINS MEET THE REQUIREMENTS OF I TRIPLE E 279, I  
18 TRIPLE E 379, AND I TRIPLE E 384. IDENTIFY SPECIFIC SENSORS,  
19 POWER SOURCES, CHANNEL COMPONENTS, AND ISOLATION DEVICES IF  
20 USED. REFERENCES EE-01, PARENTHESES, 5C CLOSE PARENTHESES,  
21 AND 7B AND EE-03, PARENTHESES, 2C, CLOSE PARENTHESES.

22 MR. STANLEY: MY CONCERN WITH THIS ONE WAS THAT YOU  
23 WERE DOING A REVIEW OF TRAIN "A" AND TRAIN "A" ONLY. AND THIS  
24 IS A CASE WHERE TRAIN B, THE PHYSICAL PROCESS OF TRAIN B IS  
25 CONNECTED INTO THE ELECTRICAL CONTROL CIRCUIT FOR THE PUMP FOR  
26 TRAIN "A". IT RAISES THE SPECTRUM OF COMMON MODE OF FAILURE,  
27 POTENTIAL FOR COMMON MODE OF FAILURE.

28 I DIDN'T SEE FROM THE SCOPE THAT YOU HAD THERE WAS



1 ANY WAY THAT YOU COULD OR DID ADDRESS THE LARGER ISSUE OF  
2 COMMON MODE OF FAILURE. YOUR WRITEUP ON THAT WAS -- INDICATED  
3 THAT THE INTERLOCK EXISTED, BUT YOU DIDN'T QUESTION WHETHER IT  
4 WAS EVEN WISE TO HAVE IT OR IF IT COULD BE DONE DIFFERENTLY.

5 NOW, SPECIFICALLY WHAT I WOULD LIKE TO GET ON THAT  
6 IS THE MTBF OF THE PRESSURE SWITCH IN THE PURCHASE SPEC.  
7 THAT'S GOING TO BE AN EXTREMELY HIGH RELIABILITY PRESSURE  
8 SWITCH. OTHERWISE, IT CAN BE A WEAK COMMON LINK IN THE SYSTEM.  
9 I WANTED TO DIG INTO THAT PRESSURE SWITCH IN DETAIL, KNOW  
10 EVERYTHING I CAN ABOUT IT.

11 MR. MARTIN: OKAY.

12 MR. MARINOS: NEXT ONE, 5, DESCRIBE HOW THE MODIFIED  
13 NORMALLY OPEN SURGE TANK VENT VALVE CIRCUIT SATISFIES I TRIPLE  
14 E 279 AND I TRIPLE E 379 IF A SINGLE POWER SOURCE IS PROVIDED  
15 FOR THIS VALVE DESCRIBE THE VALVE POSITION INDICATION.

16 MR. STANLEY: WE COVERED THE VALVE INDICATION  
17 YESTERDAY WE SAID IT WAS NONSAFETY RELATED, BUT THE VALVE  
18 CONTROL SWITCH IS ON BUS "A". SO IF YOU DON'T HAVE BUS "A"  
19 POWER, HOW DO YOU GET THE VALVE OPEN IF IT CLOSES. YOU DIDN'T  
20 SEEM TO ADDRESS THAT ISSUE AT ALL. AM I MAKING MYSELF CLEAR  
21 ON THAT?

22 MR. MARTIN: LET ME BREEZE THROUGH HERE ONCE.

23 MR. FOLEY: ON THE VENT VALVE.

24 MR. STANLEY: ON THE VENT VALVE, IF YOU HAVE "A"  
25 POWER AND YOU LOSE "A" POWER, YOU WILL NEVER BE ABLE TO GET IT  
26 BACK ON.

27 MR. MARTIN: I UNDERSTAND.

28 MR. MARINOS: QUESTION NUMBER 6, FOR PAM INSTRUMENTS

1 COMPARE REQUIRED VERSUS ACTUAL RANGES AND PROVIDE POWER  
2 SOURCES FROM THE TEMPERATURE AND FLOW MEASUREMENTS. REFERENCE  
3 IS EE-03, PARENTHESES, 1A, CLOSE PARENTHESES.

4 MR. STANLEY: THERE IS ONLY TWO MEASUREMENTS IN THIS  
5 SYSTEM AMONG THE REG GUIDE 1.97 FLOW TEMPERATURE. GOING  
6 THROUGH YOUR MARKUPS, THOUGH, I DIDN'T SEE ANY INDICATION THAT  
7 THE RANGE WAS WITHIN THE 32 TO 200 DEGREE RANGE TEMPERATURE  
8 NOR THE FLOW WAS WITHIN THE RANGE OF ZERO TO 100 AND 10  
9 PERCENT DESIGN RATED FLOW. THE FSAR DID STATE THAT THERE WAS  
10 A 20,000 GPM RANGE ON THE INSTRUMENT. SO I SUSPECT THERE IS  
11 NO TECHNICAL PROBLEM, BUT YOUR WRITEUP I COULDN'T TELL HOW  
12 THOROUGHLY YOU HAD EXAMINED THAT.

13 MR. MARTIN: I CAN UNDERSTAND THE QUESTION.

14 MR. PORTER: WE HAVE IT.

15 MR. STANLEY: BUT IT DIDN'T COME OUT IN THE TEXT OR  
16 IN THE COMMENTS.

17 MR. MARINOS: QUESTION NUMBER 7, ELABORATE ON  
18 WHETHER ALL LISTED INSTRUMENTS IN EE-03, PARENTHESES, 3A,  
19 CLOSE PARENTHESES, ARE CLASS 1-E, THEIR SET POINT VALUES, AND  
20 ADEQUACY OF THE SET POINTS FOR ITEMS IN EE-03, PARENTHESES, 3B,  
21 CLOSE PARENTHESES, ELABORATE ON SET POINT VALUES, ACTUAL  
22 RANGES, AND REQUIRED RANGES.

23 MR. PORTER: AS ASSOCIATED WITH THE PROCESS? TIME  
24 TO EMPTY THE TANK, THOSE KINDS OF ISSUES BASED ON THE LEVEL  
25 SET POINT, RECIRCULATION FLOW SET POINT BASED ON BTU DRAW OFF.

26 MR. STANLEY: NO, I WASN'T BEING THAT SOPHISTICATED.

27 MR. PORTER: OKAY, WHAT LEVEL?

28 MR. STANLEY: I WANTED TO HAVE YOU IDENTIFY WHAT THE

1 VALUES WERE, WHAT THE RANGES WERE, WHAT THE REQUIRED RANGES  
2 WERE. THAT WOULD COME OUT OF THE CALCULATION.

3 MR. PORTER: WE HAVE A LIST, A TABLE LIST. YOU ARE  
4 SAYING LIST THE TABLE. SHOULD WE DISCUSS THEM BEYOND THAT?

5 MR. STANLEY: LET'S START WITH THAT.

6 MR. OVERBECK: YES, I THINK THEY HAVE TO BE  
7 DISCUSSED THAT'S SOMETHING THAT MECHANICAL SYSTEMS HAS TO  
8 PROVIDE INPUT TO I&C. I WOULD EXPECT THAT TO HAVE BEEN LOOKED  
9 AT.

10 MR. PORTER: IT'S BEEN LOOKED AT. WHAT I WANT TO DO  
11 WHEN I GIVE YOU AN ANSWER, WHEN WE GIVE YOU AN ANSWER, I WANT  
12 TO HAVE A WHOLE ANSWER FOR YOU. THAT'S THE POINT.

13 MR. STANLEY: LET'S HAVE THE VALUES. LET'S LOOK AT  
14 THOSE AND SET POINT EVALUATION.

15 MR. PORTER: FINE, WE'LL DO THAT UP FRONT.

16 MR. STANLEY: IN YOUR TABLE ON THIS ONE THERE WERE  
17 AT LEAST THREE TRANSMITTERS THAT APPEARED TO BE MISSING FROM  
18 THE LIST. WE HAD THE DOWNSTREAM ELECTRONIC BISTABLE OR OUTPUT  
19 SWITCH, BUT YOU DIDN'T HAVE THE TRANSMITTER. YET YOU HAD SOME  
20 OF THEM IN THERE. SOME HAD TRANSMITTERS AND SOME DID NOT. SO  
21 IT LOOKED TO ME LIKE YOUR TABLE WAS PERHAPS INCOMPLETE. THE  
22 ONES IN PARTICULAR WERE THE TRANSMITTER 4536 BAKER, 4556 AND  
23 4560.

24 MR. PORTER: WHOLE FLOW SWITCHES.

25 MR. STANLEY: YES, POSSIBLY THEY WERE COVERED  
26 ELSEWHERE.

27 MR. PORTER: OKAY.

28 MR. STANLEY: POSSIBLE, BUT I WAS LOOKING FOR THEM



1 IN HERE. NOW THE SET POINT CALCULATIONS ON ALL THE  
2 INSTRUMENTS IN THIS ONE, WE WILL WANT TO LOOK AT.

3 MR. PORTER: WELL, LET'S DELVE INTO THIS JUST A TINY  
4 BIT IN THE RECIRCULATION FLOW AREA. MINIMUM SAYS 6,000. SET  
5 POINT IS ELEVEN FIVE. WHEN I HIT ELEVEN FIVE, I CLOSE THE  
6 RECIRC VALVE AND CONTINUE ON UP. WHEN I AM COMING DOWN, I HIT  
7 ELEVEN FIVE, I OPEN IT. IMMEDIATELY JUMP TO SEVENTEEN FIVE  
8 AND CONTINUE ON DOWN. THOSE KIND OF DISCUSSIONS.

9 MR. STANLEY: HISTORIES, THE RANGE.

10 MR. PORTER: FINE.

11 MR. STANLEY: AND WHERE THE SET POINT IS IN THE  
12 RANGE, RESPONSE TIME.

13 MR. PORTER: OKAY.

14 MR. OVERBECK: AND WHETHER THAT INPUT CAME FROM  
15 MECHANICAL SYSTEMS AND TRACEABILITY AND INPUT TO I&C.

16 MR. STANLEY: EXACTLY.

17 MR. MARINOS: AND LAST, BUT NOT LEAST, NUMBER 8, IT  
18 APPEARS THAT THE FOLLOWING ITEMS ARE MISSING FROM THE CYGNA  
19 PHASE 4 ANALYSIS. PLEASE DISCUSS THEIR INCLUSION OR EXCLUSION,  
20 (A) BSFAS CIRCUITRY FOR SI AND LOSS OF OFF-SITE POWER USED TO  
21 ACTUATE CCW COMPONENTS, B, SUPPORTING SYSTEMS NEEDED FOR CCW'S  
22 OPERATION IN ACCIDENT SITUATION, C, INSTRUMENT RACK AND  
23 CABINET PROCUREMENT SPECIFICATIONS FOR IMPLEMENTATION OF  
24 DESIGN REQUIREMENTS, D, INSTRUMENT SENSING LINE PHYSICAL  
25 SEPARATION REQUIREMENTS, E, CAPABILITIES FOR PERIODIC TEST IN  
26 A DESIGN, AND, F, ADEQUACY OF PROTECTIVE ACTION INTERLOCK SET  
27 POINTS.

28 MR. STANLEY: A LITTLE BACKGROUND ON THAT THE ESFAS

1 CIRCUITRY WE HAVE DONE 5 IDI'S AS A TEAM. ON TWO OF THOSE  
2 PLANTS WE FOUND TECHNICAL ERRORS IN THE DESIGN PERFORMED BY  
3 THE ARCHITECT ENGINEER WHERE HE MEASURES UNDERVOLTAGE ON THE  
4 BUSES AND CREATES A PLANTWIDE LOSS OF OFF-SITE POWER.

5 MR. PORTER: WHAT WAS THE CALCULATION ERROR,  
6 CALCULATION ERROR?

7 MR. STANLEY: NO, HARDWARE DESIGN ERROR.

8 MR. PORTER: OKAY.

9 MR. STANLEY: IT APPEARS THAT WAS OUTSIDE YOUR SCOPE  
10 ALSO APPEARS ON THIS PLANT IT'S ALL WESTINGHOUSE SUPPLY.  
11 THAT'S MY PERCEPTION, IT'S WESTINGHOUSE SUPPLY.

12 MR. PORTER: THAT'S RIGHT.

13 MR. STANLEY: NEVERTHELESS, BECAUSE OF THE NUMBER  
14 THAT WE FOUND, I THINK IT'S A CRUCIAL AREA TO LOOK AT. WE  
15 WANTED TO EXAMINE THE DETAIL CIRCUITS SIMILAR TO WHAT GEORGE  
16 WILL BE TAKING IT INTO. ON THE THE INSTRUMENT RACK AND  
17 PROCUREMENT SPECS, THAT IS SIMILAR WHAT GARY WAS ALLUDING TO,  
18 FOLLOW DESIGN PROCESS, REQUIREMENTS FROM HVAC, REQUIREMENTS  
19 FROM OTHER DISCIPLINES, ALL THE WAY THROUGH TO PROCURED  
20 EQUIPMENT, AND LOOKING AT THE VENDOR DOCUMENTS COMING BACK AS  
21 TO WHAT WAS PROVIDED, INSTRUMENT SENSING LINES.

22 WE SEEN A WIDE VARIATION IN CRITERIA FOR THE  
23 SEPARATION DISTANCES OF REDUNDANT INSTRUMENT LINES. THE  
24 INDICATIONS THAT WE HAVE GOTTEN ARE THAT THERE ARE NO SUCH  
25 CRITERIA, BUT THERE ARE WITHIN THE WESTINGHOUSE DOCUMENTATION,  
26 THERE ARE CRITERIA.

27 THE WHOLE ISSUE OF PERIODIC TESTS, REG GUIDE 1.105,  
28 REG GUIDE 1.108, I TRIPLE E 338. A WHOLE THING IS ABSENT FROM

1 YOUR DOCUMENT AS IF IT WASN'T THOUGHT ABOUT. THAT WHOLE AREA  
2 NEEDS TO BE LOOKED AT. IS EVERYTHING CAPABLE OF PERIODIC  
3 TESTS.

4 MR. PORTER: O-S --

5 MR. STANLEY: O-O-S AND B-I-S.

6 ARE THERE ANY OTHER CLARIFICATIONS?

7 MR. MARINOS: THE LAST ONE, F.

8 MR. PORTER: THAT'S FINE.

9 MR. MARINOS: ITEM F.

10 MR. STANLEY: THAT'S DEALING WITH CROSS CONNECTION  
11 FROM TRAIN B TO TRAIN A, THE PROTECTIVE ACTION AIR LINE.

12 MR. MARINOS: WHAT SET POINTS ARE YOU ASKING THERE?

13 MR. STANLEY: I HAVE NEVER FOUND THE VALUE OF  
14 PRESSURE.

15 MR. PORTER: AT WHICH YOU SWITCH.

16 MR. STANLEY: I DON'T KNOW WHAT THE VALUE IS.

17 MR. PORTER: IT EXISTS. I DON'T KNOW WHAT IT IS,  
18 BUT IT EXISTS.

19 MR. OVERBECK: I'LL BE INTERESTED TO KNOW HOW IT WAS  
20 SELECTED IF IT EXISTS.

21 MR. CALVO: FINISHED. I GUESS WE WILL HAVE SOME  
22 QUESTIONS, SOME SPECIFIC QUESTIONS ON THE MECHANICAL SYSTEMS.  
23 WE ARE GOING TO SAVE FOR TOMORROW, OUR IMPRESSION AND SUMMARY  
24 OF THESE MEETINGS. GARY AND JOHN CAN ASK THOSE QUESTIONS,  
25 SPECIFIC QUESTIONS. WE CAN ASK THEM RIGHT NOW.

26 MS. WILLIAMS: WE WOULD LIKE TO GO BACK TO THE  
27 MECHANICAL QUESTIONS IF WE COULD AND SCAN DOWN THEM PERHAPS  
28 AND MAYBE YOU COULD TELL US IF THERE IS ANY ADDITIONAL SECOND



1 OR THIRD TIER TYPE QUESTIONS WHICH WE HAVE EITHER NOT  
2 ADEQUATELY ADDRESSED AND WOULD LIKE TO EMPHASIZE OR YOU WOULD  
3 LIKE TO ADD AT THIS POINT IN TIME GIVEN OUR ANSWERS.

4 MR. CALVO: I THINK WE CAN DO THAT TOMORROW, THE  
5 OVERALL.

6 MR. OVERBECK: GO AHEAD.

7 MR. CALVO: WE ARE GOING TO SUMMARIZE, I THINK WE  
8 HAVE TALKED ENOUGH ABOUT THE MECHANICAL BETWEEN -- BACK AND  
9 FORTH. I THINK THERE IS SOME PROCEDURAL QUESTIONS WE HAD. I  
10 WOULD LIKE TO SEE THOSE GET OVER WITH. THE ONLY THING LEFT  
11 TOMORROW IS THE SUMMARY OF THE THREE MEETINGS WE HAVE, TWO AND  
12 A HALF DAYS. OKAY? AND THEN TOMORROW WE CAN GIVE YOU OUR  
13 SUMMARY, AND WE WANT TO BE SURE YOU UNDERSTAND OUR PERCEPTION  
14 OF HOW THE MECHANICAL SYSTEM, THE ELECTRICAL, INSTRUMENTATION  
15 GOES.

16 MR. NEVSHEMAL: AS FAR AS THE MECHANICAL, I JUST  
17 HAVE ONE ADDITIONAL OBSERVATION. ON MS-04, SHEET 7 OF 7, ITEM  
18 13, MS-04, SHEET 7 OF 7, ITEM 13. IF YOU READ THAT, I HAVE TO  
19 BELIEVE THAT THAT REQUIREMENT ... ERROR WHERE THE CHECKLIST  
20 IS CONCERNED BECAUSE THAT REQUIREMENT SAYS THAT THE SYSTEM  
21 DESIGN PRESSURE MUST BE LESS THAN THE PUMP HEAD.

22 MR. NORKIN: GREATER THAN.

23 MR. NEVSHEMAL: THAT'S WHAT I AM ASSUMING AND I'M  
24 GIVING IT THE BENEFIT OF A DOUBT.

25 MR. HESS: THAT'S A MISTAKE.

26 MR. NEVSHEMAL: ANOTHER ONE I WOULD LIKE TO HAVE  
27 CLARIFICATION ON FOR THE MATTER OF UNDERSTANDING IS THAT FOR --  
28 AS AN EXAMPLE, YOU HAVE MS ON MS-01, SHEET 3 OF 10, ITEM 6-I,

1 YOU MAKE A STATEMENT THERE THAT THE TOTAL HEAD LOSS TO THE  
2 HEAT EXCHANGER IS MUCH LESS THAN THE TOTAL DISCHARGE HEAD OF  
3 THE PUMP.

4 AM I TO ASSUME THAT YOU ONLY LOOKED AT THE FRICTION  
5 LOSS FROM THE OUTLET OF THE PUMP TO THE INLET OF THE HEAT  
6 EXCHANGER AND NOT THE FRICTION LOSS TO THE LOOP? AND THAT'S A  
7 COMMENT THAT YOU HAVE THERE THAT APPEARS IN MORE THAN ONE  
8 LOCATION.

9 MR. FOLEY: OKAY, I THINK WE UNDERSTAND YOUR CONCERN

10 MR. NEVSHEMAL: THEN I HAVE JUST A QUESTION. YOU  
11 USE THE TERM SUCTION LOOPS. I WOULD LIKE TO HAVE WHAT YOU  
12 MEAN BY THAT. I DON'T KNOW WHAT PAGE, SORRY.

13 MR. HESS: WHAT WAS THE TERM?

14 MR. OVERBECK: SUCTION LOOPS. WE'RE NOT FAMILIAR  
15 WITH WITH THAT TERMINOLOGY. IT'S ON CHECKLIST MS-01, SHEET 8  
16 OF 10, NO SUCTION LOOPS.

17 MR. HESS: SHEET 8 OF 10.

18 MR. OVERBECK: 8 OF 10, MS-01.

19 MR. HESS: WHAT WE'RE LOOKING AT THERE IS THE  
20 ENTRAPMENT OF AIR HIGH POINTS ON THE SUCTION SIDE OF THE PUMP  
21 VERIFYING THE PIPING GEOMETRY AS FAR AS NPSH AND CAVITATION.  
22 THAT WAS JUST THE WAY WE NOTED IT IN THE CHECKLIST.

23 MR. NEVSHEMAL: ALSO IN ONE OF THE ITEMS, TOO,  
24 THAT'S ALL THE QUESTIONS I HAVE ADDITIONAL.

25 MR. CALVO: JOHN, GARY.

26 MR. OVERBECK: YES, I HAVE SOME. THESE ARE RELATED  
27 TO THE WALKDOWN CHECKLIST AND ALSO RELATED TO QUESTION NUMBER  
28 8 ORIGINALLY -- NUMBER 9. DESCRIBE HOW THE WALKDOWN PLAYED A

1       ROLE IN THE OVERALL SCHEME IN THE INSPECTION. AND WITH THAT  
2       ONE QUESTION IN MIND, TRYING TO LOOK AT WHAT YOU DID ON THE  
3       WALKDOWN AND HOW YOU ARRIVED AT SOME OF YOUR CONCLUSIONS, I  
4       THINK IF WE GO TO THE FIRST ONE. WD MS-01, SHEET 2 OF 3.

5               I THINK I BROUGHT UP BEFORE WHEN WE TALKED ABOUT HOW  
6       DID YOUR LINE BREAK AND ASK YOU HOW WERE YOUR LINES LOCATED IN  
7       THE AREA, THERE WERE NONE, THEREFORE, MARKING YES YOU ARE  
8       PROJECTING A FALSE IMPRESSION THAT THERE WAS SOMETHING  
9       REVIEWED AND LOOKED AT. IT GIVES AN IMPRESSION THAT HIGH  
10      ENERGY LINE BREAK WAS CONSIDERED IN THIS DESIGN REVIEW. ALONG  
11      THOSE LINES --

12             MR. FOLEY: SPECIFICALLY YOU ARE CONCERNED -- WHEN  
13      YOU SAY THE DESIGN REVIEW, YOU MEAN THE WALKDOWN REVIEW --

14             MR. OVERBECK: ANY PART OF YOUR SYSTEM REVIEW.  
15      THERE ARE NO HIGH ENERGY LINES FROM CCW, AND SO FAR I HAVEN'T  
16      SEEN IDENTIFIED ANY LINES THAT IMPACT CCW.

17             MR. FOLEY: RIGHT.

18             MR. NORKIN: DOESN'T THAT IMPLY HIGH ENERGY LINES IN  
19      THAT AREA THAT COULD BE IN ANOTHER SYSTEM?

20             MR. OVERBECK: YES.

21             MR. NORKIN: IN THE VICINITY.

22             MR. OVERBECK: SAME THING FOR FIRE. AND THAT'S I  
23      GUESS REALLY -- THIS FIRST QUESTION. THE CHECKLIST THAT I  
24      JUST CALLED OUT WD MS-01, SHEET 2 OF 3, INDICATES THAT THE  
25      SIZE IN THE VACUUM BREAKER WAS VERIFIED DURING SYSTEM WALKDOWN  
26      I'M A LITTLE CONFUSED. IT'S A MISSTATEMENT ON THE CHECKLIST.  
27      YOU DIDN'T VERIFY THE SIZING OF THE BACKING, YOU VERIFIED THE  
28      SIZE OF THE VACUUM BREAKER?



1 MR. FOLEY: WE VERIFIED NAMEPLATE DATA AGREED WITH  
2 THE SPECIFICATION.

3 MR. OVERBECK: VACUUM BREAKER CORRECTLY SIZED.

4 MR. HESS: IT'S POOR WORDING.

5 MR. FOLEY: ACCORDING TO THE SPECIFICATION, THE  
6 CALCULATION THAT MIGHT HAVE SIZED THAT REMAINS MISSING.

7 MR. OVERBECK: THE SAME CHECKLIST YOU STATE THAT THE  
8 CCW SURGE TANK UNDER THE CATEGORY OF FIRE, ARE REDUNDANT  
9 TRAINS PROTECTED FROM DAMAGE BY A SINGLE FIRE, THE ANSWER IS  
10 NO. HOWEVER, IN THE COMMENT SECTION YOU STATE THE COMMON TANK  
11 FOR BOTH CCW TRAINS THAT'S ACCEPTABLE DUE TO LACK OF  
12 COMBUSTIBLES, PASSIVE NATURE OF THE TANK, AND DETECTION AND  
13 SUPPRESSION EQUIPMENT. TRY TO PROVIDE THE BASIS FOR THAT  
14 STATEMENT. WHAT BASIS DID YOU USE TO ARRIVE AT THAT  
15 CONCLUSION. THAT'S THE QUESTION.

16 AND THE THRUST IS, IF IT WAS BASED ON A WALKDOWN AND  
17 SCANNING THE AREA YOU WERE LOOKING AT, DID YOU KNOW ALL THE  
18 CABLES WERE IN THE CABLE TRAYS? DO YOU KNOW THAT THE  
19 COMBUSTIBLE LOAD IS SATISFACTORY SO THAT THAT AREA CAN TAKE IT  
20 DO YOU KNOW WHAT THE SAFE SHUTDOWN ANALYSIS SAYS. IF YOU  
21 HAVEN'T LOOKED AT THOSE THINGS AND TOLD ME BEFORE YOU HAVEN'T,  
22 THEN I DON'T KNOW HOW YOU CAN ARRIVE AT THIS CONCLUSION.

23 MR. FOLEY: OKAY. I UNDERSTAND YOUR CONCERN.

24 MR. OVERBECK: ONE AREA THAT IS COVERED, I SEE  
25 CALCULATIONS FOR, IS FLOOD. AGAIN, IN A NUMBER OF AREAS YOU  
26 INDICATE A PIECE OF EQUIPMENT AND THE LOWEST PIECE OF  
27 EQUIPMENT IN THIS AREA IS SO AND SO AND IT MEETS THE FLOOD  
28 LEVEL. AND ONE QUESTION MIGHT BE EASY TO BE ADDRESSED IS HOW

1 YOU IDENTIFY WHAT THAT FLOOD LEVEL WAS, AND HOW YOU IDENTIFY  
2 THAT WAS THE LOWEST PIECE OF EQUIPMENT DID YOU DO IT DURING  
3 YOUR WALKDOWN OR DO IT BY REVIEWING ARRANGEMENT DRAWINGS OF  
4 THE SYSTEM AND FLOOD CALCULATIONS. I SEE FLOOD CALCULATIONS  
5 IN YOUR REVIEW LIST. I NEED THAT CLARIFIED.

6 MR. FOLEY: OKAY.

7 MR. CALVO: DO WE HAVE ANY OTHER QUESTIONS IN THE  
8 WALKDOWN?

9 MR. STANLEY: I WOULD JUST LIKE TO COMMENT IN THE  
10 ELECTRICAL WALKDOWN THAT WAS PERFORMED I FOUND NO  
11 INSTRUMENTATION COMPONENTS WHATSOEVER. IT WOULD SEEM TO ME  
12 THAT THAT PRESSURE SWITCH FOR ONE WOULD HAVE BEEN AN OBJECT,  
13 IT'S MISSING.

14 MR. CALVO: GEORGE, HOW ABOUT THE ELECTRICAL  
15 WALKDOWN, ARE YOU PREPARED TO DISCUSS THEM NOW OR WANT TO WAIT.

16 MR. MORRIS: WE RAISED TWO QUESTIONS DURING THE  
17 DISCUSSION THAT AFFECTED WALKDOWN. ONE WAS THE HORSEPOWER OF  
18 THE MOTOR OPERATED VALVES, AND THE OTHER ONE WAS ON THE CABLE  
19 TRAY FILL CABLE TRAY FILL WAS -- I DID NOT SEE IN THE WALKDOWN  
20 CHECKLIST.

21 MR. CALVO: THAT'S ALL. I GOT SOME QUESTIONS  
22 REGARDING THE ELECTRICAL DESIGN. I GUESS AS WE WENT THROUGH  
23 THE REVIEW OF THE CHECKLIST, WE IDENTIFIED SIX PERSONS WERE  
24 IDENTIFIED IN THE CHECKLIST FOR THE ELECTRICAL INSTRUMENTATION  
25 REVIEW. I GUESS THE QUESTIONS THAT WE WANTED TO KNOW THE  
26 QUESTION THAT WE ASK, WHETHER YOU WANT TO GIVE THE ANSWER NOW  
27 OR WAIT UNTIL LATER, DID EACH PERSON HAVE A SPECIFIC TASK TO  
28 REVIEW AND WHAT WAS THE RESPONSIBILITY OF THE CREW?

1 MR. KILLOUGH: JOSE, TALKING ABOUT THE ELECTRICAL  
2 DESIGN REVIEW OR WALKDOWN?

3 MR. CALVO: BOTH. I GUESS -- LET ME ASK THE ARC  
4 STAFF AND CONSULTANTS, DO WE HAVE ANY MORE QUESTIONS OF THE  
5 NATURE AT THIS TIME OR JUST ABOUT HAVE ENOUGH FOR TODAY, GO  
6 BACK AND ASK CYGNA DO YOU HAVE ANY OTHER QUESTIONS OF  
7 CLARIFICATION THAT YOU MAY NEED TO ASK US. QUESTION, I'M  
8 SORRY.

9 MR. MORRIS: I WOULD JUST LIKE TO KNOW THE STATUS OF  
10 THE DOCUMENT LIST THAT YOU WERE PREPARING YESTERDAY.

11 MR. HESS: IT'S IN WORK. I HAVE NOT GOTTEN IT ALL  
12 COMPLETED WITH BEING IN HERE ALL DAY.

13 MR. CALVO: GARY, YOU ALSO REQUESTED CALCULATIONS.

14 MR. OVERBECK: ONE OF THE GOALS THAT WE HAVE IS TO  
15 GET THE OTHER DOCUMENT LIST AND CALCULATIONS SO I CAN TELL YOU  
16 WHAT DRAWINGS I'M GOING TO NEED COPIED. IN ORDER TO REVIEW  
17 THE CALCULATIONS, WE'RE GOING TO NEED ID'S AND CALCULATIONS SO  
18 TO GIVE YOU LEAD TIME TO GET STARTED.

19 MS. WILLIAMS: NO COMMENTS OR QUESTIONS.

20 MR. CALVO: NO MORE QUESTIONS AND THE MEETING IS  
21 ADJOURNED. SEE YOU ALL TOMORROW. 9:00 O'CLOCK?

22 MS. WILLIAMS: THAT'S FINE.

23 (MEETING ADJOURNED TO THURSDAY, MAY 23, 1985.)  
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ORIGINAL

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TEXAS UTILITIES CPRT MEETING  
CYGNA ENERGY SERVICES

- - -

THURSDAY <sup>23</sup>  
~~TUESDAY~~, MAY ~~21~~, 1985 - 9:15 A.M.

SBS

101 CALIFORNIA STREET, SUITE 1000  
SAN FRANCISCO, CALIFORNIA

- - -

1 MR. CALVO: TODAY IS THE THIRD DAY, MAY THE 23RD,  
2 THESE MEETINGS BETWEEN THE NRC AND CYGNA. MY NAME IS JOSE  
3 CALVO, I'M THE ELECTRICAL OPERATIONS GROUP MANAGER OF THE  
4 COMANCHE PEAK PROJECT. ALSO HAVE MEMBERS OF THE NRC STAFF &  
5 ALSO OUR CONSULTANTS, ALSO SEE MEMBERS REPRESENTATIVES FROM  
6 GIBBS & HILL, TERRA CORPORATION. AND I GUESS ANY OTHER  
7 ORGANIZATIONS BEING REPRESENTED IN THIS MEETING? AND JACK  
8 REDDING FROM THE TEXAS UTILITY COMPANY. I WOULD LIKE TO  
9 INDICATE THERE IS NO OTHER ORGANIZATION BEING REPRESENTED AT  
10 THIS MEETING.

11 WHAT I WOULD LIKE TO DO, MAYBE WE SHOULD GET INTO  
12 THE SUMMARY OF WHAT HAPPENED IN THE LAST TWO DAYS. AND WHAT  
13 WOULD LIKE TO DO, I WOULD LIKE TO SUGGEST THE FOLLOWING FORM  
14 LET ME GIVE AN INTRODUCTION WHY WE'RE HERE, WHAT WE DID, WHA  
15 WAS OUR PURPOSE AND THEN I WOULD LIKE TO GO TO THE THREE  
16 DISCIPLINES THAT WE CONSULTED MECHANICAL, ELECTRICAL,  
17 INSTRUMENTATION AND GIVE YOU OUR PERCEPTION OF WHAT WE HAVE  
18 LEARNED LOOKING AT YOUR PRELIMINARY INFORMATION AND DISCUSS  
19 WHAT WE HAD WITH YOU.

20 AT THE END, AFTER I FINISHED, IF WE HAVE QUESTIONS,  
21 WE CAN OPEN THE MEETING SO EVERYBODY CAN ASK QUESTIONS OR  
22 CLARIFICATIONS OR WHATEVER NEEDS TO BE DONE. IS THAT  
23 AGREEMENT WITH YOU?

24 MS. WILLIAMS: THAT'S GOOD.

25 MR. CALVO: WELL, AS YOU KNOW WE HAVE BEEN MEETING  
26 FOR THE LAST TWO DAYS. WE HAVE DISCUSSED THE QUESTIONS THAT  
27 WE HAD CONCERNING THE DEPTH AND BREADTH OF PHASE 4 OF YOUR  
28 INDEPENDENT DESIGN VERIFICATION FOR THE MECHANICAL SYSTEMS

1 ELECTRICAL INSTRUMENTATION.

2 WE RECOGNIZE THAT THE INFORMATION FROM WHERE WE  
3 DERIVE OUR QUESTIONS WERE CONSIDERED PRELIMINARY AND YOU HAD  
4 NOT REACHED YOUR FINAL CONCLUSIONS REGARDING THE INDEPENDENT  
5 DESIGN VERIFICATION FOR PHASE 4. HOWEVER, THE DISCUSSIONS  
6 THAT WE HAD IN THESE TWO DAYS HAVE GIVEN US A BETTER  
7 APPRECIATION WHICH WILL HELP US TO DETERMINE HOW THE RESULTS  
8 OF PHASE 4 WILL CONTRIBUTE INTO THE OVERALL ASSESSMENT OF THE  
9 DESIGN QUALITY FOR THE COMANCHE PEAK PROJECT.

10 AS INDICATED IN THE MEETING, WE HAVE MANY QUESTIONS  
11 AND WE GOT SOME ANSWERS. WE ALSO HAVE CLARIFIED QUESTIONS TO  
12 PROVIDE YOU WITH A BETTER INSIGHT WHAT WAS THE PURPOSE OF OUR  
13 QUESTIONS. THE RESPONSES TO THE REMAINING QUESTIONS WILL  
14 PROVIDE US WITH A BETTER APPRECIATION OF THE DEPTH AND BREADTH  
15 OF YOUR PHASE 4 REVIEW.

16 WE CONSIDERED OUR PHASE 4 INCOMPLETE FOR MECHANICAL  
17 ELECTRICAL, AND INSTRUMENTATION. HOWEVER, WE WOULD LIKE TO  
18 HIGHLIGHT SOME OF THE TECHNICAL AREAS THAT WE FEEL THAT YOU  
19 SHOULD CONSIDER SO AN INDEPENDENT ASSESSMENT OF THE DEPTH AND  
20 BREADTH OF YOUR PHASE 4 OF YOUR REVIEW CAN BE ASCERTAINED. WE  
21 RECOGNIZE THAT OUR PERCEPTIONS OF YOUR EVALUATION COULD CHANGE  
22 AS MORE INFORMATION BECOMES AVAILABLE TO US.

23 THE TECHNICAL AREAS THAT I WOULD LIKE TO HIGHLIGHT,  
24 ELECTRICAL, MECHANICAL, AND INSTRUMENTATION CONCERNING THE  
25 COMPONENT COOLING WATER SYSTEM AND HOW IT WAS USED TO SOME  
26 KIND OF WAY WHEN CONCLUSIONS ARE FIRM HOW THE BREADTH TO WHAT  
27 OTHER SYSTEMS THE THING CAN BE CARRIED TO. AND SO, ALSO, I  
28 MUST INDICATE, THAT IS, OTHER DISCIPLINES IN YOUR PHASE 4 THAT



1 WE HAVE NOT TOUCHED AT THIS TIME, THOSE ARE THE MECHANICAL  
2 COMPONENTS AND CIVIL AND STRUCTURE. I THINK THOSE WILL  
3 REQUIRE FUTURE MEETINGS BETWEEN THE NRC AND CYGNA SO WE CAN  
4 UNDERSTAND AND APPRECIATE WHAT YOU'RE DOING SO IT CAN ALSO BE  
5 USED AS AN OVERALL ASSESSMENT TO DETERMINE DESIGN QUALITY FOR  
6 THOSE TWO OTHER SYSTEMS.

7 I WOULD LIKE TO START WITH THE MECHANICAL SYSTEMS  
8 AND I WOULD LIKE TO ADDRESS YOUR ATTENTION TO OUR PERCEPTIONS  
9 AT THIS TIME BASED ON THE PRELIMINARY INFORMATION THAT YOU  
10 GIVE US IN OUR DISCUSSIONS THAT WE HAD. THE MECHANICAL  
11 SYSTEMS, ONE OF THE FIRST PERCEPTIONS IS THAT THE SYSTEM  
12 CHECKLIST DID NOT QUITE INCLUDE A DESCRIPTION OF WHAT WAS  
13 REVIEWED AND HOW THE REVIEW WAS USED TO ARRIVE AT A YES, NO  
14 CONCLUSION WITH RESPECT TO SATISFYING THE CHECKLIST ATTRIBUTE

15 AS A RESULT OF THIS, IT BECOMES KIND OF DIFFICULT  
16 FOR AN INDEPENDENT EVALUATOR SUCH AS THE NRC TO ASCERTAIN  
17 WHETHER THE DESIGN DOCUMENTS WERE REVIEWED TO CONFIRM THAT THE  
18 CHECKLIST ATTRIBUTES AND THE DEPTH OF THAT REVIEW. I THINK  
19 YOU SHOULD CONSIDER THAT IN YOUR -- WHEN YOU REVIEW IN  
20 PROGRESS AND DETERMINE IF THAT CAN BE CLARIFIED.

21 THE NEXT ONE WE TEND TO -- WE DON'T AGREE WITH YOUR  
22 BASIS TO CONSIDER RELIEF VALVE AND VACUUM BREAKER TO BE  
23 PASSIVE DEVICES TO DEFENDING YOUR DESIGN AGAINST THE SINGLE  
24 FAILURE CRITERIA. WE FEEL THAT THESE VALVES MUST OPERATE TO  
25 PERFORM THE SAFETY FUNCTION, THEY SHOULD BE CONSIDERED ACTIVE  
26 COMPONENTS AND SUSCEPTIBLE TO SINGLE FAILURES.

27 THE THIRD ONE, WITH REGARD TO THE MECHANICAL DESIGN  
28 REVIEW CRITERIA USED TO ESTABLISH THE CHECKLIST, IT APPEARS

1 THAT YOU DIDN'T USE THE GIBBS & HILL DESIGN DOCUMENTS. AND  
2 YOU MOSTLY RELIED UPON THE WESTINGHOUSE INTERFACE DOCUMENT TO  
3 IDENTIFY CHECKLIST DESIGN ATTRIBUTES. I'M GOING TOO FAST?  
4 ALL RIGHT.

5 SYSTEM DESIGN CRITERIA, IT'S OUR FEELING IS NO MORE  
6 REFLECTED IN THE SYSTEM DESCRIPTIONS ON PIPING AND  
7 INSTRUMENTATION DIAGRAMS. THE CHECKLIST MAY NOT BE SUFFICIENT  
8 COMPLETE, THAT THE DESIGN ATTRIBUTES SHOULD HAVE BEEN TAKEN  
9 FROM THE OWNER'S FSAR COMMITMENTS AND GIBBS & HILL DESIGN  
10 DOCUMENTS.

11 THE FOURTH ONE, THE NRC HAS A PERCEPTION THAT THE  
12 WALKDOWN WAS NOT INTEGRATED INTO THE VERIFICATION DESIGN  
13 ADEQUATE FOR THE CCW SYSTEM. IT WAS NOT CLEAR THAT THE  
14 WALKDOWN WAS USED TO CONFIRM DESIGN INPUTS OR OUTPUTS OF  
15 DESIGN ANALYSIS, FOR EXAMPLE, APPEARS THE HIGH ENERGY LINE  
16 BREAK ANALYSIS WAS NOT A DESIGN VERIFICATION APPLICABLE  
17 KNOWLEDGEABLE TO THE CCW SYSTEM. WE ACKNOWLEDGE YOU INDICATED  
18 THAT IT WAS OUTSIDE YOUR SCOPE. HOWEVER, THE WALKDOWN  
19 CHECKLIST IMPLY THAT PROTECTION PROVIDED FOR THE COMPONENT  
20 COOLING WATER COMPONENT FOR UNRESTRAINED HIGH ENERGY LINES.

21 WITH REGARD TO THE EFFECTS OF SEISMIC TWO OVER ONE,  
22 WE APPEAR THAT IT WAS NOT ASSIGNMENT IN THE COMPONENT COOLING  
23 WATER COMPONENT WALKDOWN MAY NOT HAVE BEEN EXPOSED TO  
24 NONSEISMIC SUPPORTED EQUIPMENT. AS REFLECTED IN THE WALKDOWN  
25 CHECKLIST, THE SYSTEMS WALKDOWN DID NOT ADDRESS THAT THE CCW  
26 EQUIPMENT SUCH AS THE HEAT EXCHANGERS OR THE SURGE TANK WAS  
27 SEISMICALLY SUPPORTED IN ACCORDANCE WITH DESIGN ANALYSIS  
28 PERFORMED BY GIBBS & HILL OR THE EQUIPMENT SUPPLIER.

1 ANOTHER ASPECT THAT WE FEEL OUR PERCEPTION YOU  
2 SHOULD CONSIDER IS THE FACT THAT THE SYSTEM WALKDOWN DID NOT  
3 ADDRESS THE ELEVATION HEAD AVAILABLE BETWEEN THE COMPONENT  
4 COOLING WATER SURGE TANK IN THE SUCTION TO THE PUMPS ON THE  
5 SYSTEM.

6 THE FIFTH ONE, WE HAVE OUR PERCEPTION OF THE  
7 ENGINEERING INTERFACES. WE FEEL THEY HAD NOT BEEN  
8 SUFFICIENTLY EXPLORED SO AN INDEPENDENT ASSESSMENT CAN BE  
9 PERFORMED SO WE CAN DETERMINE TO WHAT EXTENT, HOW DEPTH YOU  
10 HAD BEEN GOING WITH THOSE INTERFACES. FOR EXAMPLE, THE GIBBS  
11 & HILL'S MECHANICAL DISCIPLINES INTERFACE WITH INSTRUMENTATION  
12 AND CONTROL DISCIPLINES, IT APPEARS THAT MAYBE SOME -- YOU HAD  
13 NOT ADDRESSED TO WHAT EXTENT THAT THING WAS REVIEWED WITH  
14 RESPECT TO THE SET POINTS. THERE WAS NO EVIDENCE TO THE FACT  
15 THAT YOU HAD INCLUDED THAT IN THE SCOPE.

16 THE NEXT ONE IS THE MECHANICAL SYSTEMS CHECKLIST.  
17 IT APPEARS THAT IT DID NOT QUITE REFLECT THE EXTENT TO WHICH  
18 THE REQUIREMENTS LISTED IN THE DESIGN CRITERIA WERE  
19 INCORPORATED INTO THE REVIEW. I GUESS EXAMPLES OF THAT IS THE  
20 FSAR SECTION 3.11 ENVIRONMENTAL QUALIFICATION MECHANICAL AND  
21 ELECTRICAL EQUIPMENT WAS LISTED. HOWEVER, WE COULDN'T FIND  
22 EVIDENCE THAT THE CRITERIA WAS BEING VERIFIED. WE'RE NOT  
23 QUITE SURE THAT WAS PART OF YOUR SCOPE OR WAS NOT PART OF YOUR  
24 SCOPE. ALSO, THERE IS A COUPLE OF REGULATORY GUIDES THAT YOU  
25 HAD NOT ADDRESSED, REGULATORY GUIDE 1.29, REGULATORY GUIDE  
26 1.41.

27 I'M GOING TO TAKE A PAUSE IN HERE. AGAIN, I JUST  
28 WANT TO REITERATE THE FACT THIS WHOLE PERCEPTION, TRYING TO



1 UNDERSTAND WHAT THE DEPTH AND BREADTH ARE OF YOUR REVIEW.  
2 SOME OF THOSE QUESTIONS, IN OUR OPINION, I THINK THEY ARE  
3 IMPORTANT ENOUGH TO KNOW, TO ASCERTAIN THE TWO ELEMENTS IN  
4 REVIEW YOU MAY CONSIDER THOSE THINGS BEING OUTSIDE YOUR SCOPE.  
5 WE'RE NOT GOING ON THAT BASIS WE'RE GOING ON THE BASIS WE'RE  
6 TRYING TO ASCERTAIN THAT KIND OF THING. WE'RE GOING TO USE  
7 WHATEVER COMES OUT OF OUR EVALUATION OF THIS PHASE 4 WILL BE  
8 USED TO ASSESS THE OVERALL CONTRIBUTION, THE OVERALL  
9 ASSESSMENT OF THE SAME QUALITY.

10 LET ME CONTINUE. THERE ARE DESIGN CONSIDERATIONS  
11 SUCH AS NET POSITIVE SUCTION HEAD, VORTEXING, WATER HAMMER,  
12 PIPE SCHEDULE SELECTION, ET CETERA, WHICH ARE ENCOUNTERED BY  
13 THE ARCHITECT/ENGINEER DURING THE MECHANICAL DESIGN OF A  
14 SYSTEM. WE FEEL THAT DEPENDING UPON THE SYSTEM FUNCTIONAL  
15 REQUIREMENTS AND SYSTEM PHYSICAL RESTRICTIONS, THIS DESIGN  
16 CONSIDERATION WILL VARY IN IMPORTANCE AND THE NRC FEELS THAT  
17 THE SYSTEM SELECTED MAY NOT PROVIDE SUFFICIENT BASIS FOR  
18 CONCLUDING THAT ARCHITECT/ENGINEER HAS SUCCESSFULLY PRODUCED  
19 DESIGN WHERE THESE ATTRIBUTES ARE CRITICAL.

20 NEXT ONE, BECAUSE THE FSAR REPORT, IS OUR OPINION  
21 THE FSAR REPORTS SHOULD NOT BE USED AS A SOURCE OF INPUT TO  
22 DESIGN ANALYSIS, WE NOTE THAT FURTHER WORK IS NEEDED TO  
23 IDENTIFY TRACEABILITY OF DESIGN INPUT DESIGN OUTPUT WITH THE  
24 DESIGN DOCUMENTS. THE CHECKLIST REFLECTED EVIDENCE THAT THE  
25 FSAR WAS USED AS A SOURCE TO VERIFY ACCEPTANCE OF AN ATTRIBUTE  
26 AND THAT WE DO NOT DEGREE.

27 THE HEAT REMOVAL CAPABILITY OF THE SYSTEM FROM HEAT  
28 SOURCE TO ULTIMATE HEAT SINK WAS NOT PROPERLY CONSIDERED. THE

1 SUPPORTING SYSTEM REQUIRED TO ASSURE THAT THE COMPONENT  
2 COOLING WATER COMPONENTS IN THE SYSTEMS PERFORMED THE INTER  
3 FUNCTION WERE NOT ALSO CONSIDERED IN THE REVIEW, SUCH AS THE  
4 HEATING AND VENTILATION SYSTEM. THAT FINISHED THE MECHANICAL  
5 SYSTEMS. LET ME GO TO THE ELECTRICAL SYSTEMS.

6 TO THE ELECTRICAL INSTRUMENTATION QUESTIONS I ALSO  
7 HAVE SOMETHING FOR THE INSTRUMENTATION. ELECTRICAL QUESTIONS  
8 ON THE PHASE 4 REVIEW THAT WE HAVE BROUGHT TO YOUR ATTENTION  
9 WOULD REVIEW AND CLARIFY AS YOU REQUESTED TO PROVIDE YOU SO  
10 YOU CAN BETTER UNDERSTAND WHAT THE PURPOSE OF THE QUESTIONS  
11 WERE.

12 WE FELT THAT WE HAVE ENOUGH OF THE INTERCHANGE AND  
13 COMMUNICATION BETWEEN THE TWO OF US AT THIS TIME TO PASS  
14 JUDGMENT ON HOW THE ELECTRICAL -- THE SCOPE OF THE YOUR  
15 ELECTRICAL DESIGN. OUR INITIAL IMPRESSION, WE FEEL THAT THE  
16 ELECTRICAL DESIGN HAS -- MAY BE SEVERELY LIMITED BY THE  
17 MECHANICAL SYSTEM COMPLAINTS. WE ARE CONCERNED THAT THE CYG  
18 REVIEW MAY HAVE NOT ADDRESSED SIGNIFICANT CONCERNS IN THE  
19 ELECTRICAL SYSTEM SUPPORTING THE COMPONENT COOLING WATER  
20 SYSTEM.

21 SOME OTHER THINGS THAT WE WOULD LIKE TO BRING TO  
22 YOUR ATTENTION AT THIS TIME FOR YOUR CONSIDERATION AND OUR  
23 PERCEPTION WHAT WE FEEL THAT IT SHOULD BE CONSIDERED OR SHOULD  
24 BE OUTSIDE YOUR SCOPE BASED ON WHAT WE DISCUSS IT. THE BASIS  
25 FOR THE INPUT TO CALCULATIONS SPECIFICATIONS WERE NOT  
26 QUESTIONED AND VERIFIED BY CYGNA BECAUSE I UNDERSTAND THEY  
27 WERE OUTSIDE THE SCOPE OF YOUR REVIEW. THE INTERDISCIPLINE  
28 AND INTERCOMPANY INTERFACERS APPEAR THAT THEY WERE NOT

1 CONSIDERED IN YOUR SCOPE.

2 THE -- YOU ALSO WE DISCUSSED SOME OF THE SYSTEMS  
3 THAT WE FELT THAT IN OUR OPINION ESTABLISHED THE DEPTH AND  
4 BREADTH IN ARRIVING AT THE SAME QUALITY ARE IMPORTANT TO BE  
5 CONSIDERED ARE THE DIESEL GENERATOR AND DC SYSTEMS, IN  
6 PARTICULAR, VOLTAGE RESPONSES AND LOADING SEQUENCE FOR THE  
7 DIESELS AND CAPABILITY OF THE DC SYSTEM. ALSO, WE FELT IT WA  
8 IMPORTANT TO CONSIDER THINGS LIKE LOSS OF OUTSIDE POWER,  
9 TRANSFER CIRCUITRY.

10 INSOFAR AS DEPTH OF THE REVIEW, WE FEEL THAT  
11 ADDITIONAL INFORMATION WILL BE -- I THINK WILL BE NEEDED FOR  
12 AN INDEPENDENT ASSESSMENT OF YOUR DEPTH OF YOUR REVIEW IN THE  
13 AREAS OF THE 6.9 KV MOTOR PROTECTION, ISOLATION RELAY  
14 APPLICATION, ALTERNATE SHUTDOWN CONTROL CIRCUIT FUSE, MOTOR  
15 OPERATOR VALVE, THERMAL OVERLOAD PROTECTION, AND CAPABILITY O  
16 EQUIPMENT TO OPERATE AT REDUNDANT VOLTAGE.

17 THE OTHER AREAS THAT HAD WE BEEN OBSERVED BY US, TH  
18 NRC, TO BE POTENTIAL PROBLEMS IN OTHER PLANTS, AT LEAST WE  
19 THROW THEM, PUT THEM ON THE TABLE FOR YOUR INFORMATION,  
20 CONTAINMENT ELECTRICAL PROTECTION, IN PARTICULAR THOSE  
21 CONCENTRATED WITH THE LARGEST CONCENTRATION THAN YOU NORMALLY  
22 HAD, THE PRESSURE WATER REACTOR, NAMELY, THE REACTOR COOLING  
23 PUMP.

24 AND THE OTHER ONE IS BECAUSE WE'RE TALKING ABOUT A  
25 LOT OF VALVES, AND NORMALLY THOSE ARE POWERFUL, 480 MOTORS.  
26 CONTROL CENTERS, PENETRATION ASSOCIATED WITH THOSE MOTORS I  
27 THINK, SO IT'S ALSO IMPORTANT TO BE CONSIDERED IN THE DEPTH OF  
28 ANY FLUID SYSTEM SELECTED FOR REVIEW.



1           THAT FINISHES THE ELECTRICAL, AND WE'RE GETTING NOW  
2           TO THE INSTRUMENTATION.

3           AND AN OVERALL IMPRESSION IN THE INSTRUMENTATION, W  
4           FEEL THAT THE COMPONENT COOLING WATER SYSTEM HAS NOT TOO MUCH  
5           SIGNIFICANT INSTRUMENTATION. SO A LOGICAL EXTRAPOLATION CAN  
6           BE MADE OR CONCLUSION CAN BE DRAWN ABOUT THE OVERALL ADEQUACY  
7           OF THE DESIGN QUALITY FOR INSTRUMENTATION AND CONTROL FOR  
8           COMANCHE PEAK.

9           WE FEEL THAT THE SCOPE OF THE I&C REVIEW SELECTED  
10          FOR THE COMPONENT COOLING WATER SYSTEM DOESN'T -- DOES NOT  
11          CONSIDER OR CONSIDERS OUTSIDE THE SCOPE THOSE ASPECTS  
12          CONCERNING THE LOSS OF THE OUTSIDE POWER, SAFETY INJECTION,  
13          AND CONTAINMENT ISOLATION SENSOR CHANNELS, THEIR POWER SOURCE  
14          AND OTHER INSTRUMENTATION AND CONTROL IN SUPPORTING SYSTEMS.

15          IT APPEARS THAT THE DESIGN REVIEW CRITERIA AS  
16          EXPRESSED IN CYGNA DC 4 AND DC 5 DOCUMENTS FOR MECHANICAL AND  
17          ELECTRICAL SYSTEMS DO NOT QUITE REFLECT ALL THE FSAR  
18          COMMITMENTS AND OTHER AREA IN COMMITMENTS.

19          OTHER AREAS THAT WE FEEL THAT WE NEED FURTHER  
20          EMPHASIS ARE THE PERIODIC TEST CAPABILITY OF THE DESIGN OF  
21          BOTH COMPONENT AND SYSTEM LEVELS, THE REVIEW OF FORMAL DESIGN  
22          CALCULATIONS FOR INSTRUMENTS SET POINT VALUES AND AN  
23          ASSESSMENT OF THE ADEQUACY. AND ASSESSMENT OF THE  
24          DESIRABILITY FOR LOW PRESSURE CROSS-CONNECTION BETWEEN THE  
25          REDUNDANT TRAINS AND THE IMPACT OF SENSOR UNRELIABILITY ON  
26          SYSTEM AVAILABILITY.

27          I THINK BECAUSE THAT'S AN IMPORTANT ONE BECAUSE A  
28          POTENTIAL FOR A COMMON CAUSE HERE DISABLING TWO SUPPOSEDLY

1 REDUNDANT TRAINS, QUESTIONING OF DESIGN INPUTS TO ASSESS THE  
2 VALIDITY AND COMPLETENESS OF DESIGN BASIS.

3 WE FEEL THAT NEW EMPHASIS WILL BE PUT IN THOSE ARE/  
4 AND ASSESSMENT OF INSTRUMENT SENSING LINE OPERATION AS WELL /  
5 OTHER DETAILS IN MECHANICAL SEPARATION AND ELECTRICAL  
6 ISOLATION.

7 AS A MANNER OF COMMENT, THE WORDING OF SOME OF THE  
8 COMMENTS AS STATED IN INSTRUMENTATION DESIGN REVIEW OF THE CC  
9 SYSTEM NEED TO BE AUGMENTED TO REFLECT WHAT YOU ACTUALLY DID,  
10 BECAUSE IT DOES NOT COME QUITE CLEAR.

11 THAT COMPLETES THE SUMMARY AND, AGAIN, LIKE I SAID  
12 BEFORE, I HOPE THAT THIS CAN PUT US IN A BETTER POSITION THAT  
13 YOU CAN UNDERSTAND SOME OF THE QUESTIONS AND THE PURPOSE. AN  
14 I HOPE AS A RESULT OF THOSE, MAYBE THE END PRODUCT WILL BE A  
15 BETTER PRODUCT.

16 I HAVE NOTHING ELSE TO ADD OTHER THAN THANK YOU FOR  
17 ALL THE HELP THAT YOU HAVE GIVEN US AND I THINK WE TRULY  
18 APPRECIATE THE COMMUNICATION THAT WE HAD.

19 SO I LEAVE IT UP TO YOU, ANY COMMENTS THAT YOU WANT,  
20 ANYTHING YOU WANT TO SAY.

21 MS. WILLIAMS: I DON'T BELIEVE WE HAVE ANY QUESTIONS  
22 AND NO COMMENTS.

23 MR. STUART: I HAVE AN OVERVIEW COMMENT. DO YOU  
24 WANT TO GO FIRST?

25 MS. WILLIAMS: I WAS GOING TO SAY, GO AHEAD.

26 MR. STUART: JUST AN OVERVIEW COMMENT. WE  
27 APPRECIATE THE SPECIFIC COMMENTS THAT YOU HAVE GIVEN US BOTH  
28 YESTERDAY AFTERNOON AND TODAY. I THINK THESE SHOULD BE

1 HELPFUL FOR US TO PREPARE FOR OUR NEXT MEETING ON THIS  
2 PARTICULAR AREA. I THINK FROM OUR POINT OF VIEW, I THINK WE  
3 WOULD LIKE TO HELP TO FACILITATE THOSE NEXT MEETINGS.

4 I THINK IT WOULD BE USEFUL FOR US TO ATTEMPT WITH  
5 ONE OF THE COMMENTS IN THE MECHANICAL SECTION TO ATTEMPT TO  
6 HAVE THAT PORTION OF PROCESS OVERVIEW COMPLETED BY THE TIME  
7 OUR NEXT MEETING SO WE CAN ADDRESS THOSE CONCERNS IN THIS  
8 MEETING.

9 AND I THINK THAT THERE WERE MANY QUESTIONS THAT  
10 RELATED TO THAT WHICH I THINK WOULD BE USEFUL TO AT LEAST BE  
11 AT THAT POINT RELATIVE TO CCW COMPLETE IN OUR OVERALL REVIEW  
12 SO THAT WE CAN ADDRESS MOST OF THOSE QUESTIONS IN THE MEETING  
13 IN ADDITION TO THAT, I THINK JUST ON A PROCESS ISSUE, I THINK  
14 WE'RE INTENDING TO HAVE ALL OF THE CALCULATIONS THAT WE  
15 REVIEWED IN THE MEETING ROOM NEXT TIME SO THAT I THINK DETAIL  
16 QUESTIONS WHERE SOMEONE IS LOOKING FOR A PARTICULAR NUMBER  
17 FROM A CALCULATION, AND THAT'S HELD US UP, I THINK, IN THIS  
18 MEETING.

19 WE'RE INTENDING TO HAVE THAT TYPE OF INFORMATION  
20 AVAILABLE IN THE MEETING ROOM NEXT TIME. AND I THINK THAT  
21 THAT SHOULD MAKE THIS MORE OF A WORKING SESSION AND LESS OF A  
22 QUESTION AND ANSWER SESSION.

23 MR. CALVO: OKAY.

24 MR. STUART: THE PARTICULAR COMMENTS THAT OCCUR THAT  
25 I OBSERVE DID GET INTO A GREAT DEAL OF DETAIL, PROBABLY MORE  
26 THAN WE HAVE SEEN IN THE PAST FOR AN INDEPENDENT VERIFIER OR  
27 INDEPENDENT DESIGN REVIEWER, BUT WE NOW UNDERSTAND THAT THAT'S  
28 THE LEVEL OF DETAIL THAT WE'LL BE PREPARED FOR NEXT TIME.



1 MR. NORKIN: I HAVE ONE QUESTION TO ASK.  
2 YOU MENTION THAT THE CALCULATIONS WILL BE IN THE  
3 ROOM NEXT TIME?

4 MR. STUART: M-HM.

5 MR. NORKIN: REALIZING THIS PERIOD OF TIME BETWEEN  
6 NOW AND THE TIME WE WILL BE MEETING AGAIN, AND GIVEN THE SAME  
7 FORMAT WHERE IF WE DO WANT TO LOOK AT A CALCULATION, YOU KNOW  
8 IF YOU REALLY LOOK AT THE CALCULATION THE RIGHT WAY, YOU CAN  
9 SPEND HALF THE MORNING DOING IT.

10 IT WOULD BE USEFUL IF IN ADVANCE OF THAT MEETING,  
11 THE TEAM MEMBERS, AND YOU KNOW WHO THE PRINCIPALS ARE, HAD TH  
12 OPPORTUNITY TO LOOK AT THOSE CALCULATIONS IN THEIR HOME  
13 OFFICES SO THEY CAN FORMULATE SOME IMPRESSIONS AND QUESTIONS.

14 I THINK IT WOULD MAKE THINGS GO A LOT FASTER AT THE  
15 MEETING IF WE HAD THE SAME CALCULATIONS INDEPENDENTLY BEFORE  
16 THE MEETING. YOU KNOW, IT WOULD GO A LOT FASTER. I THINK IT  
17 WOULDN'T TAKE MORE THAN A HALF-HOUR TO DISCUSS A GIVEN  
18 CALCULATION IF WE HAD A CHANCE TO LOOK AT IT AHEAD OF TIME.

19 MR. CALVO: A REQUEST WAS MADE FOR SOME SIMPLE  
20 CALCULATIONS. IF YOU STILL FEEL YOU WANT TO PROVIDE THOSE  
21 CALCULATIONS TO US, WE WILL APPRECIATE IT. BECAUSE IT'S  
22 CONSISTENT WITH TRYING TO DETERMINE AN OVERLL ASSESSMENT.

23 KEEP IN MIND, ALL WE'RE TRYING TO DETERMINE, NOT  
24 TELLING YOU WHAT TO DO, TRYING TO DETERMINE SO WE CAN  
25 UNDERSTAND YOUR DEPTH SO WE CAN BETTER UNDERSTAND WHEN YOU  
26 COME TO YOUR CONCLUSIONS.

27 AND THE END RESULT IS TRYING TO DETERMINE HOW THIS  
28 WILL CONTRIBUTE TO THE OVERALL DESIGN QUALITY REVIEW FOR

1 COMANCHE PEAK. YOU ARE NOT THE ONLY INPUT TO THAT DESIGN  
2 QUALITY, THEY GOT MANY INPUTS.

3 WE LIKE TO PUT IT IN PERSPECTIVE, TO KNOW HOW WE CAN  
4 DO SOMETHING ELSE, WHAT'S NEEDED TO BE DONE IN THE FUTURE.  
5 THIS IS THE WHOLE PURPOSE OF THIS. OKAY.

6 WHAT WE REQUESTED -- WE HAD REQUESTED SOME  
7 CALCULATIONS. AND YOU FEEL -- YOU PREPARED TO GIVE US THE  
8 CALCULATIONS, WE WILL TAKE THEM AND REVIEW THE CONTEXT TRYING  
9 TO UNDERSTAND WHAT YOU'RE DOING WE WILL NOT REPEAT YOUR REVIEW

10 MS. WILLIAMS: WE'RE GETTING THOSE CALCULATIONS  
11 TOGETHER. WE'RE GOING THROUGH AND MAKING SURE THEY ARE THE  
12 ONES WE REVIEWED AND HAVING TO PIECE THEM TOGETHER BECAUSE  
13 THEY HAVE BEEN ARRIVING AS RECENTLY AS YESTERDAY.

14 MR. CALVO: WHEN YOU ARE READY, LET US KNOW.

15 IF YOU HAVE NOTHING ELSE TO SAY, I WOULD LIKE TO ASK  
16 OTHER MEMBERS INVOLVED IN THIS MEETING, STARTING WITH TEXAS  
17 UTILITIES, DO YOU HAVE ANYTHING TO SAY?

18 MR. REDDING: NO. I'M LOOKING FORWARD TO THE NEXT  
19 MEETING WHERE YOU WILL HAVE A BETTER FEEL FOR WHAT CYGNA HAS  
20 DONE IN THEIR REVIEW. I ALSO KNOW PROBABLY BETWEEN THEN YOU  
21 WILL ALSO HAVE A CHANCE TO GET A BETTER FEEL FOR WHAT WE AT  
22 TUGCO AND THE CPRT ARE DOING IN THEIR REVIEW OF THE COMANCHE  
23 PEAK PLANT.

24 AND I ACTUALLY FEEL THAT THROUGH THOSE REVIEWS AND  
25 THE WORK THAT WE'RE DOING THAT WE WILL BE ABLE TO ADDRESS THE  
26 CONCERNS THAT YOU HAVE WITH REGARD TO THE DESIGN OF THE PLANT

27 MR. CALVO: ANYBODY ELSE BEFORE I ADJOURN? HOW  
28 ABOUT ANYBODY ELSE IN THE NRC STAFF, CONSULTANT? NOBODY HAVE

1 ANYTHING TO ADD?

2 MR. MORRIS: I WOULD JUST LIKE TO STATE THAT THE  
3 SPECIFICS THAT WE ADDRESSED IN TODAY'S MEETING ARE NOT OR MAY  
4 NOT BE OUR TOTAL CONCERNS, JUST EXAMPLES OF THE DEPTH THAT  
5 WE'RE LOOKING FOR AND THE TYPES OF THINGS THAT WE'RE LOOKING  
6 FOR.

7 MR. CALVO: NO OTHER QUESTIONS, THE MEETING IS  
8 ADJOURNED, THANKS.

9 (MEETING ADJOURNED.)  
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1. Calculation 2323-IV-4, Revision 5: Short Circuit Level at 480 Volt Switchgear and MCC's
2. Calculation 2323-XIII-1, Revision 0: Static Uninterruptable Power Supply (SUPS) System - TMI
3. Calculation 2323-VII-1, Revision 3: Cable Size - 6.9 KV Loads
4. Calculation 2323-IV-3, Revision 2: 6.9kv Bus Short Circuit Calculation
5. Calculation 2323-IV-4, Revision 5: Short Circuit Level at 480v Swgr and MCC's
6. Calculation 2323-MI-2200-25, Revision 2: STP Local Override Common Alarm - ICD
7. Calculation 229-9, dated 1/75: Component Cooling Water Pump TDH & NPSH Calculation
8. Calculation 229-13, dated 1/25/79: Component Cooling Water Recirculation Orifice  $\Delta P$  Calculation
9. Calculation 229-15, dated 3/29/84: Component Cooling Water Pressure Drop
10. Calculation 233-16, Addition 1, dated 4/14/84: SSI (Safe Shutdown Independent) Heat Loads
11. Calculation 544, dated 11/15/83: Flooding Analysis - Flood Levels
12. Calculation 229-12, dated 5/29/84: Component Cooling Water Storage Tank
13. Calculation 542, dated 3/14/84: Flooding Analysis (Sub-Cooled Piping)
14. Calculation 233-16, dated 1/30/80: SSI Heat Loads
15. Calculation 229-8, dated 4/12/84: Component Cooling Water - Pressure Drop
16. Calculation 229-8, dated 1/12/82: Component Cooling Water System- Pressure Drop

- 
17. Calculation 2323-XIII-4, Revision 1: 125 VDC Switchboard and Distribution Panel Electrical Requirements and Coordination
  18. Calculation 2323-XIII-6, Revision 0: Electrical Requirements for Class 1E AC Panel Boards-TMI
  19. Calculation 229-4, dated 7/12/74: Component Cooling Water Drain Pump
  20. Calculation 229-3, dated 7/11/74: Component Cooling Water Drain Tank
  21. Calculation 229-10, dated 1/12/82: Component Cooling Water - Pressure Drop
  22. Calculation 229-15, Application 3, dated 4/1/84: Component Cooling Water Pressure Drop Computer Outputs
  23. Calculation 233-16, dated 4/14/84: SSI Heat Loads
  24. Calculation 229-14, dated 3/6/84 Component Cooling Water Temperature Profile
  25. Calculation 229-1: Component Cooling Water Heat Exchanger (Superseded)
  26. Calculation 543, dated 6/21/83: Flooding Analysis (Moderate Energy)
  27. Calculation No 543, Sheet No. 3-5a, and 67A, 70, 100, 101, 105, 106, 107, Revision 2: Flooding Analysis (Moderate Energy)
  28. Calculation No. 543, Sheets No. 3 through 5a and 67A, 70, 100, 101, 105, 106, 107, Revision 2, dated 6/21/83: Flooding Analysis (Moderate Energy)
  29. Westinghouse, Document NYDA 84174-L7: Motor Data Sheet for CPI-CCAPCC-01M
  30. Vendor Document NC-CT-6, dated 11/9/79: Analysis of Heat Rejection Rates to Component Cooling Water System

- 
31. CP-EI-4.0-24, Revision 0, dated 7/1/81: Tugco Cable Pulling Tension Evaluations and Calculations
32. GTN-40107, dated 9/21/79: Instantaneous Breaker Trip Setting Positions
33. - - , dated 4/81: Alternate Shutdown Study
34. Calculation 2323-III-7, Revision 2, dated 4/19/82: Start up and Unit Auxillary Transformer Load Study
35. Calculation-2323-III-8, Revision 0, dated 11/30/83: 6.9KV and 480V Safety Hazard Bus Voltages
36. - - , 2323-ES-8A, Revision 2, dated 11/15/76: Batteries & Accessories
37. Calculation 2323-VII-8, Revision 4, Cable Sizing Calculation - DC System
38. Calculation 2323-IX, Revision 1, dated 9/6/79: DC Switchboards and Distribution Panels
39. Calculation 2323-IX-4, Revision 2, dated 4/2/80: 125V & 250 VDC Coordination Study
40. Calculation 2323-VII-5, Revision 13, dated 10/14/83: Cable Sizing 480V.MCC Branch Feeder Loads (VII-5 #)
41. Calculation - - : CCW Surge Tank Vent Valve Relief Valve and Vacuum Breaker Sizing Calculations

42. *Hydro Thermal Simulation of Comanche Peak  
Safe Shutdown dated May 1980 (Requested  
5/10/85)*

43. TNE-CA-063
44. TNE-CA-66
45. TNE-CA-068
46. TNE-CA-74





JUN 28 1985

MEETING SUMMARY DISTRIBUTION

Pocket File

NRC PDR

L PDR

NSIC

PRC System

LB#1 Reading File

Project Manager S. B. Burwell

M. Rushbrook

Attorney, OELD

R. Hartfield\*

OPA\*

VNoonan, Project Director

NRC Participants

J. A. Calvo

E. C. Marinos

J. Knox

E. Tomlinson

D. Norkin

T. Ankrum

L. Stanley

G. Overbeck

G. Morris

J. Neushamal

V. Ferrarini

OTHERS

bcc: Applicant & Service List

(By Board Notification)

85-066

\*Caseload Forecast Panel Visits



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

MAY 3 1985

CYGNA Energy Services  
101 California Street  
Suite 1000  
San Francisco, CA 94111-5894

ATTN: Nancy H. Williams, Project Manager

Subject: Request for Information on Phase 4  
Independent Assessment

Dear Ms. Williams:

We have received your submittal of April 29, 1985 with preliminary results of your independent assessment of the CCWS, in the areas of Mechanical and Electrical systems and have performed a limited review of that information. In order, however, to better understand your technical effort we request response to the enclosed questions.

To best utilize the information requested we would like receipt of your responses on or before May 7, 1985. For any clarification regarding this request, please contact me at (301)492-9439.

Sincerely,

A handwritten signature in cursive script, reading "Evangelos C. Marinos".

Evangelos C. Marinos, Deputy  
Electrical/Operational Group  
Comanche Peak Project

cc: w/enclosure  
J. Redding, TUGCO  
J. Ellis, CASE  
J. Beck, TUGCO  
W. Horin (Bishop, Liberman et al.)

85-0523-668 13pp

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Questions for CYGNA on Mechanical Systems

- 1) List the documents used to develop the checklist.
- 2) In your inspection what is the status of the FSAR? Was it considered a design document by Gibbs & Hill?
- 3) List the calculations reviewed during the inspection.
- 4) List the drawings reviewed during the inspection.
- 5) Describe the method used to review calculations.
- 6) Breakdown (in percentage) the time spent at Gibbs & Hill, N.Y., site, TUGCO offices, Westinghouse and home office.
- 7) Describe how the Mechanical Systems aspect of the design was inspected for compliance with the design control attributes described in ANSI-N45.2.11.
- 8) Describe how the correctness of calculational methodology was ascertained, (e.g. runout flow and  $NPSH_R$ ).
- 9) Describe how the walkdown played a roll in the overall scheme of the inspection.
- 10) Describe how the venting scheme for the CCW Surge Tank was considered to satisfy single failure.
- 11) What detailed technical checks were conducted on the calculations reviewed?



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- 12) Was the design adequacy of the HVAC system for the CCW pump rooms reviewed?
- 13) Did Gibbs & Hill have a scheme to identify safety-related calculations and was there a requirement to periodically review/update them?
- 14) Describe how the inspection verified the inclusion of certified vendor information in the design?
- 15) Explain how the inspection verified the adequacy of the surge tank size to accommodate changes in the system water inventory due to temperature change and system leakage.
- 16) Explain how the inspection verified the adequacy of the 3/4 in. relief valve on the surge tank.
- 17) Explain how the correct sizing of the surge tank vent valve and vacuum breaker was verified by the inspection.
- 18) How was the basis for the 50 gpm system leak rate verified? (MS-01 sht 10/10).
- 19) How was the basis for the 30 minute leakage period verified? (MS-01 sht 10/10).
- 20) Describe how from the vendor curve was used to determine a runout flow of 18,000 gpm . (MS-01 sht 2/10)
- 21) Did your review of the CCW heat exchanger include all of the requirements of the FSAR commitment to TEMA not just the fouling factor (MS-01 sht 2/10)? Explain what was reviewed.
- 22) How was the combination of flow orifices and/or balance valves for the various loads (RHR, CS, etc.) shown to be adequate to prevent flow starvation at any single load?

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- 23) Were the inputs and assumptions used in calculations reviewed to determine the need for subsequent verification? Describe your threshold on use of undocumented engineering judgements?
- 24) How was it ascertained that the break leakage values were conservative? (MS-06 sht 2/4)
- 25) Describe the conservatism used in arriving at the 583 gpm leak rate (MS-02 sht 3/7). Explain the conservatism of use crane 410 EQN. 3-21.
- 26) Describe the extent the CCWs heat removal capability was examined. In particular describe the extent input values to CCWs calculations were verified (i.e., the containment spray heat exchanger heat load, the heat removal capability of the ultimate heat sink through the service water system, etc.)

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Question for CYGNA on Electrical Systems

EE-01 Electrical CCW Pump Motor

1) Voltage

- (a) Was voltage at motor reviewed or at bus
- (b) Did the G & H calculation include Utility data for system swings (min & max voltage) through both the preferred and alternate sources of offsite power?
  - Did the calculation include voltage dips caused by loading the D.G. when only the standby source is available.
  - Did the calculation include distribution equipment as-built data.
  - Was degraded grid voltage protection reviewed by CYGNA?

- 2) (a) Was the transfer circuitry for the preferred, alternate and standby power supplies reviewed?
- What source did CYGNA mean by the "back-up power source"?

3) Relaying

- (a) What is the basis for the G & H relaying recommendations?
  - Was the applicable motor data reviewed (e.g. thermal damage curves, acceleration data at min and max voltage).
- (b) Was the Short Circuit Calculation reviewed for correct results and was the input data reviewed by CYGNA?
- (c) Was the coordination of the CCW pump motor breaker checked with the three incoming breakers?
- (f) Was the basis for the environmental and seismic data in the switchgear spec confirmed by CYGNA and reviewed in the qualification report?



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4) Cable

- (d) Did motor spec include electrical data such as minimum starting voltage and minimum accelerating time at minimum and maximum voltage?
- (e) Was the routing of the power and control cables reviewed for voltage level separation?
- (g) 6.9kV power cable is not limited by percent fill but by spacing, how was this reviewed.
- (j) Was the basis for the environmental and seismic input to the motor spec confirmed by CYGNA and reviewed in the qualification report?

5) Pump Control

- (a) Were the isolation relays confined to coil to contact isolation or were they qualified also for contact to contact isolation.
- (b) Was the pump control inoperable circuit reviewed by CYGNA for completeness for such things as control switch position, control voltage availability, breaker in correct position, service water system available etc.?
- (c) Where is the single failure of the Loop A/Loop Isolation valves discussed.

6) Alternate Shutdown

- (a) Was the alternate shutdown circuit provided with an alternate power supply?

7) (b) CCW/SWP pump interface

will (a) the CCW pump start the SSW pump or (b) the SSW pump start the CCW pump? If (a) is true, has this been reviewed with the DG Loading.

- (c) If one CCW loop is normally shutdown, are the UPS A/C unit and the nuclear chilled water system 100% redundant and share a common distribution system to provide cooling for the Class 1E Switchgear and Class 1E motors.

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EE-02 CCW Electrical Valves

General - Entire discussion does not address the containment isolation valves or the reactor coolant pump thermal barrier cooler isolation valves.

- 1) (a) Was the MOV voltage confirmed at the motor for starting an running condition.  
  
(b) Did CYGNA confirm that ALL dc loads would operate at 90 volts.
  - Why was the non 1E panel XD2-3 included in the review?
  - Was the voltage drop in the dc system reviewed to other equipment such as Inverters and Switchgear?
- 2) (a) This item addressed the connection of the battery and battery charger to the dc bus but did not address the capability of this equipment to supply the design load or the surveillance required to prove the availability to perform its safety function.
- 3) (a) Was the short circuit checked by CYGNA or just the results of the calculation compared with the MCC spec.  
(b) Does the referenced spec cover both the dc bus and the dc power panelboard.
  - Did CYGNA review the short circuit calc for the panelboard and confirm that the short circuit rating was a DC rating.(c) Are the overload contacts used to protect the motor during periodic testing as required by R.G. 1.106?  
(d) Was the setting criteria and actual selection of the overload heaters (used for alarm and/or protection) reviewed by CYGNA for accuracy and basis. Were these in agreement with the MOV vendor's recommendation for thermal protection.  
(e) Was the basis for the environmental and seismic requirements for the MCC and DC equipment specs reviewed by CYGNA and included in the Qualification Report?

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4) Valve Power and Control Cable

- (a) Was the basis for the G & H allowable cable length confirmed by CYGNA?
  - Did G & H include MOV starting current in the voltage analyses?
  - How does the G & H calculation/analysis handle the loads inside containment where more than one cable is involved such as CCW valve HV4696.
- (c) Does the G & H ampacity calculation include deratings for
  - higher ambients (such as inside containment)
  - flame retardents and fire barriers
  - Tray covers on cable tray
- (d) Was the Limitorque Data reviewed for other electrical data such as locked reactor current and stroke time.
- (e) Was the valve specs also reviewed for electrical inputs such as AC voltage range, minimum starting voltage, minimum and maximum dc voltage, termination requirements including limit switch and operator environmental conduct seals, and contact ratings?
- (f) Was tray voltage level confirmed for cable routing in accordance with FSAR 8.3.1.4.3?
- (h) Was the tray fill basis checked by sampling the actual cables in a given tray section and hand calculating the percent fill.
  - Was this done for power control and instrument trays which have different fill restrictions.
  - Was the basis for the instrument tray fill limit reviewed.
- (i) Was the 600 volt power cable specification reviewed?
  - Did the review include a determination of the required insulation level because the 480 volt system is ungrounded and not tripped on grounds.
  - Was the cable manufacturer's cable data reviewed and compared to design documents: a) Cable outside diameter vs. tray fill and ampacity calcs. b) maximum pulling tension and side wall pressure vs installation spec. c) cable repair and splice criteria.



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- (k) Did the power operated valve specification also cover the valves inside containment with its harsh environment.
  - Did the valve spec provide radiation valves for different plant areas.
- 5) (a) Was the qualification of the "qualified isolator" reviewed by CYGNA?  
(b) Did CYGNA question why valves HV 4512 and HV 4514 were not monitored the same if they perform the same function to isolation the CCW A Loop from the B Loop?
  - Why are valves HV 4572 and 4574 not included in R.G. 1.47 monitoring to alarm loss of the RHR and containment spray cooling capability?  
(c) Valve RV-4508 does not have a Train B counterpart as implied by an x in the "yes" column.
- 6) (a) Was the basis for the CCW alternate shutdown report input reviewed?
- 7) Functional Requirements
  - Was a FMEA performed on the control circuits?
  - (b) Does a sufficient deadband exist on the CCW pump recirc. valve flow control.
  - (c) Was the basis for the partially open setpoint of valve HV-4572 reviewed for interdiscipline interface. Does this agree with the actual setting.
  - (e) Does an interlock exist to isolate the safeguards loop on surge tank 10 10 level which could be caused by a break in the non-safeguards section of CCW.
  - (f) Document whose analysis forms the basis for removing the high radiation interlock on valve RV 4508.

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EE-03 Electrical CCW Instrumentation

- 1) Was the Post Accident Monitoring equipment included on the EQ list.
  - (b) Does specification 2323-MS-622 cover all temperature elements inside and outside containment.
    - are the temperature elements RTD's or thermocomplexes (T/C) If the TE's inside containment (on the CCW system, etc) are T/C how are they brought out through the electrical penetrations?
- 4) Instrument Power Sources review was not completed in the checklist.
  - Was the correct train associated power used?
  - Were voltage and current requirements of both the instrument loop and the electronics rack reviewed?
  - Was Class 1E/non 1E isolation in the rack electronics reviewed?
  - Was the Rack supplied by a UPS and was the capability of the inserter reviewed?
  - Checklist states that #12 conductors are used for instrument cable but list EE-02, Item 4 i lists shielded twisted pair #16 cables.
  - IF #12 is in fact used are the cables in a shielded twisted pair form.

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Other areas not reviewed but that should have been included:

- 1) Electrical Containment Penetration required for the CCW system MOV, solenoid power and control and CCW instrumentation inside containment.
  - Penetration specification inputs for required ampacity, short circuit capability, environmental (incl. radiation) and Seismic requirements for normal and DBE conditions, termination requirements etc.
- 2) Diesel Generator Capability to accept the CCW Pump
  - What is the basis of the loading tabulation
    - has the input data been reviewed
    - has the Diesel Generator tests proven the capability of the unit to accept the design basis load.
    - has the actual motor data for large motor (480V and 6.9kV switchgear loads) been reviewed for starting kvs and accelerating times and compared to the diesel generator loading calculation. Were differences justified?
- 3) Field Design Changes in CCW (and other systems)

Do design changes initiated in the field conform to the project specifications, guidelines and calculations.
- 4) 480 volt motor protection and coordination (switchgear & MCC) with upstream breakers (not covered by CCW system).



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Questions for CYGNA Phase 4 Study - Instrumentation & Control

- 1) FSAR Table 7.1-2 sheets 1 and 2 list 10 CFR 50 App. A, G.D.C.'s, NRC R.G's, and IEEE standards applicable to CCWs. For each safety-related CCWs component, have the following items been addressed:
  - (a) GDC 24, Separation of protection and control systems? Where?
  - (b) GDC 44, Cooling water Where?
  - (c) GDC 46, Testing of cooling water system Where?
  - (d) RG1.22, Periodic testing of protection system actuation functions? Where?
  - (e) RG1.62, Manual initiation of protective actions? Where?
  - (f) RG1.89, Qualification of class IE equipment for NPPs Where?
  - (g) RG1.100, Seismic qualification of elec. equip. for NPPS? Where?
  - (h) RG1.118, Periodic testing of elec. power & protection systems? Where?
  - (i) IEEE279, Criteria for protection systems for NPGS? Where?
  - (j) IEEE338, Periodic testing of NPGS protection systems? Where?
- 2) In CYGNA analysis EE-01(5A), Class IE relays are used as isolation devices. Is this isolation always achieved by coil to contact isolation; conversely, are any instances contact-to-contact isolation? Has every isolation device requirement in CCWS been assessed?
- 3) What exact signals make up the "tripped and inoperable" system bypass/inoperative indication on SSII for CCWs pump train "A" as mentioned in EE-01(5B) and EE-02(5B)?
- 4) What means have been provided in the detailed CCWs pump control circuit to assure that the low pressure pump start interlock cross connections between redundant trains meet the requirements of IEEE 279, IEEE 379, and IEEE 384? Identify specific sensors, power sources, channel components and isolation devices, if used. Ref. EE-01(5C) and (7B) and EE-03(2C).

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- 5) Describe how the modified normally open surge tank vent valve circuit satisfies IEEE 279 and IEEE 379 if a single power source is provided for this valve. Describe the valve position indications.
- 6) For PAM instruments, compare required versus actual ranges and provide power source for the temperature and flow measurements. Ref. EE-03(1A).
- 7) Elaborate on whether all listed instruments in EE-03(3A) are Class 1E, their setpoint values, and adequacy of these setpoints. For items in EE-03(3B), elaborate on setpoint values, actual ranges, and required ranges.
- 8) It appears that the following items are missing from the CYGNA, Phase 4 analysis. Please discuss their inclusion or exclusion:
  - (a) ESFAS circuitry for SI and loss-of-offsite-power used to actuate CCWs components.
  - (b) Supporting systems needed for CCWs operation in an accident situation.
  - (c) Instrument rack and cabinet procurement specifications for implementation of design requirements.
  - (d) Instrument sensing line physical separation requirements.
  - (e) Capabilities for periodic test in the design.
  - (f) Adequacy of protective action interlock setpoints.