TU ELECTRIC

Log # TXX-89850
Corrected Copy
File # 10086

December 21, 1989

William G. Counsil
Vice Chairman

Mr. Christopher I. Grimes, Director
Office of Special Projects
Comanche Peak Project Division
Office of Nuclear Reactor Regulation
United States Nuclear Regulatory Commission
Washington, D.C. 20555

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION
DOCKET NOS. 50-445 and 50-446
RESPONSE TO CASE DOCUMENTED REQUEST FOR ACTION -
SCALING CALCULATIONS

Dear Mr. Grimes:

Texas Utilities Electric Company (TU Electric) hereby responds to CASE's December 6, 1989 Documented Request for Action concerning scaling calculations. For the reasons stated below and in Attachments 1, 2 and 3 and Enclosures 1 through 4 hereto, the subject Request for Action should be denied.

TU Electric's positions concerning those issues that control a decision on the subject Request for Action have been previously documented in Enclosures 1 through 4, and are now summarized in the body of this letter. Attachment 1 provides TU Electric's point-by-point response to the CASE Monitors' Scaling Calculation Report (CASE Report) in the form of a detailed matrix. This matrix presents a reference to the CASE Report for each specific CASE argument, the corresponding reference in Enclosures 1 through 4 for TU Electric's position on the basic thrust of each such argument, and any additional TU Electric response. In many instances it should be noted that CASE has taken paragraphs of TU Electric's response to CASE's stop work request (Enclosure 2) and has criticized such paragraphs in isolation and out of context. Thus, TU Electric's references to the overall portions of its previous documents supporting each such paragraph were considered sufficient to document TU Electric's position, which was not changed by any of CASE's arguments. In general, TU Electric's additional responses are provided only as necessary to respond to matters raised for the first time in the CASE Report, and where applicable, the additional response will consist of a reference to the TU Electric positions summarized in the body of this letter. TU Electric positions concerning the issues that control a decision on CASE's Request for Action are summarized as follows:

1. TU Electric's Action Plan Relating to Scaling Calculations is Adequate -

After two hundred-two pages of text, the CASE Report comes to grips with the issue which ultimately controls the subject dispute. On page 202, the CASE Report concedes that CASE generally agrees with the TU Electric Action Plan (Enclosure 1) to address the issues relating to scaling calculations identified by Mr. Bodiford, CASE, and the TU Electric TAP auditors. Figure 2 of the CASE Report provides a point-by-point-comparison of the TU Electric Action Plan and the corresponding CASE assessment, and shows that there is agreement upon all but a few relatively minor points. Attachment 2 hereto provides a point-by-point-comparison for only those remaining Action Plan elements where there is not complete agreement, and provides the basis for TU Electric's final position on each such element of disagreement. On the basis of Attachment 2, it is apparent that the remaining disagreements are insignificant, that the Action Plan is technically sufficient, and that no further action by either TU Electric or NRC is warranted. Accordingly, to the extent that the CASE Request for Action could be construed to require actions for scaling calculations beyond those already identified by TU Electric in the Action Plan and Attachment 2, the Request for Action should be denied.

2. TU Electric's Safety-Related Scaling Calculations are Technically Adequate -

As TU Electric was proceeding to complete its scaling calculations, numerous audits and reviews, including the most recent TAP audit (Enclosure 3) which is central to the subject dispute, have indicated that the safety-related scaling calculations have been technically adequate and that any deficiencies identified have had no impact on field conditions.[1]

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[1]CASE indicates that the Hot Functional Tests disclosed evidence of deficient conditions in scaling calculations (CASE Report, page 150). CASE has provided no specific evidence in the Report. TU Electric's own review of HFT results revealed no deficiencies attributable to the scaling calculation program. CASE informally provided to one of the TAP auditors two examples which allegedly support this concern. One example is, in fact, the result of an error in one of the scaling calculation input documents for a non-safety related scaling calculation, and not a deficiency in the scaling calculation itself. The other reflects a change in test procedure acceptance value tolerances based on hardware accuracies which are reiterated in one of the appendices to the Scaling Calculations Manual. Neither instance represents a deficiency which is attributable to the scaling calculation program.

CASE attempts to avoid this fact by arguing that the real "end product" is the safety-related calculations, and not the field conditions (see e.g., CASE Report, Page 3, Para. 2; page 174). From this CASE evidently infers that the existence of deficiencies in the documentation underlying the calculations necessarily means that the end product (the calculation) is deficient. CASE even implies that the technically qualified and oriented auditors, such as the TAP auditors, may not be as cognizant of "quality" as other QA auditors (CASE Report, Page 184). These efforts to denigrate the technical results achieved in TU Electric's scaling calculation efforts cannot be credited. The field condition is the ultimate end product and its quality must be measured in terms of its capability to fulfill its intended safety function. 10 CFR Part 50, Appendix B enunciates the ultimate test of a QA program by reference to the field condition; namely, "[a]s used in this appendix, 'quality assurance' comprises all those planned and systematic actions necessary to provide adequate confidence that a structure, system or component will perform satisfactorily in service." In addition, the previous results of TU Electric's audits and reviews, coupled with the results from the Action Plan to date, provide overwhelming evidence as to the technical adequacy of the safety-related calculations. Expressed in other words, none of the deficiencies was safety significant within the meaning of 10 CFR Part 50, Appendix B. That is, the documentation deficiencies were such that even if they were left uncorrected, none would have adversely impacted the capability of the safety-related systems and components to perform their intended safety functions. While TAP verification of implementation of corrective actions identified in the Action Plan and in the TAP audit is not yet complete, prior to closure of the TAP audit findings TAP will confirm these corrective actions have been effectively implemented. TU Electric submits that its safety-related scaling calculations are technically adequate and that no further NRC action is warranted. Accordingly, to the extent that the CASE Request for Action seeks some undefined relief relating to technical adequacy, it should be denied.

3. <u>TU Electric's Actions Addressing Scaling Calculations are Timely</u> -

CASE's Report repeatedly asserts that TU Electric's actions addressing scaling calculations were not timely. CASE's misconception on this point is grounded on a fundamental error in logic. This is most obvious from CASE's statement that "[i]t is unclear why TU Electric would consider 'defining a task that had to be completed prior to fuel load' appropriate, rather than obtaining prompt action to a problem" (CASE Report, Page 176). TU Electric has committed to assure that its safety-related scaling calculations and associated documentation are adequate before fuel load, and that it will do so for non-safety related scaling calculations prior to exceeding 5% power. Indeed, an examination of Figure 2 to CASE's Report indicates that CASE agrees with this schedule for action. Scaling calculations could not be completed until near the end of the Corrective Action Program (CAP) because key input information, such as setpoint calculations, was not finalized and available until the system design validation was

completed. This is typical of the normal design process and corresponds to the normal construction and pre-operational testing completion cycle. There is no viable technical or legal reason why the safety-related scaling calculation actions need to be completed any earlier than fuel load. Indeed, taken at face value, CASE's argument says that all problems must be fixed as soon as possible, irrespective of safety significance, resource constraints, or any other factors that are normal parts of the accepted management process of setting priorities. CASE's argument is reduced to a "first-come, first-served" priority system that is incompatible with sound management and regulation of nuclear power plant design, construction, and operation. TU Electric submits that it has exercised its discretion to set the right priority for completion of its scaling calculations, and no further TU Electric or NRC action is warranted in this regard. Accordingly, to the extent that the CASE Request for Action somehow seeks to require more prompt action, it should be denied.

4. <u>TU Electric Properly Assessed the Programmatic Implications of its Scaling Calculations Findings</u> -

CASE repeatedly asserts that TU Electric has failed to assess adequately the programmatic implications of its scaling calculation findings. TU Electric disagrees. The best and most complete summary of TU Electric's position can be found in the following quoted language from Enclosure 2, which is TU Electric's previous response to CASE's request for a Stop Work Order:

> "We agree that the majority of the items discussed above were known to TU Electric and SWEC in late 1987. We also agree that some of the items are not complete as of this date. However, in general, we are of the view that the project was responsive in addressing the items. In regard to CASE's contention that the recent TAP audit verified that programmatic deficiencies indicated in TU Electric Letter NE-19097, dated May 10, 1988, were . . . 'not even addressed . . . much less corrected,' that statement is simply not correct. While the TAP audit was not structured to address the issues raised in the referenced TU Electric letter, the audit coincidentally confirmed partial or complete implementation of most of the actions directed by CPE, and only resulted in three minor findings that directly correspond to NE-19097. Additionally, the review effort described in Item 1) above indicates that most of these actions were properly tracked and addressed. We acknowledge that

in two instances (i.e., NCB and NCH issues) the thoroughness and effectiveness of the followup to these items has not been entirely satisfactory. Although the impact of these particular items appears to not be significant, a Corrective Action Request was conservatively issued by the Director, Quality Assurance on October 6, 1989, to fully address these instances. Due to the extensive measures undertaken to validate the CPSES design, we do not expect resolution of the CAR to reveal significant programmatic, design or hardware issues that have not been previously addressed.[2] We do not agree with CASE's contention that Audit ATP-89-146S, '. . . . verified the repeated failure of the scaling calculation/documentation review program to perform adequately and fulfill its intended purpose.' While the TAP audit identified a number of generally isolated findings, they do not impact on the acceptability of the CPSES scaling calculation effort. The nature and substance of the audit findings identified are not considered unusual given the scope and depth of the audit effort. The auditors were able in each instance to trace and verify the sources of input data and, further, verified the actual input values used in the calculations were correct. The Scaling Calculations Action Plan which was forwarded to CASE with TU Electric's letter of September 25, 1989, will assure that all inputs used in the scaling calculation effort are identified; reviewed for applicability; updated, as appropriate; and a traceable link established to each calculation. These actions will ensure that documentation-related shortcomings associated with the scaling calculation effort are fully and effectively corrected.

In summary, the results of TAP audits and surveillances, as well as other management reviews undertaken to address the scaling calculation effort, indicate adequate programmatic control and satisfactory technical products. Although the need for improvements is indicated, the collective results of our review of the issues set forth by CASE cannot, in any reasonable fashion, be accurately characterized as a programmatic breakdown necessitating the issuance of a stop work order. We strongly disagree that the evidence meets the provisions of Paragraph 6.1.5 of our stop work procedure (NEO 3.25) or any other provision of that document." (Enclosure 2, pages 15 - 16)

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[2] This expectation has been realized. The results of the CAR resolution are summarized in TU Electric's Comments regarding CASE Item 1.10, Attachment 1.

Three additional points deserve emphasis. First, although improvements were needed in the specific referencing of calculation inputs and guidelines for calculation preparation, as explained in item 2 above, the safety-related calculations are technically adequate. Reviews conducted pursuant to the scaling calculation Action Plan have confirmed this point. Consequently, the programmatic implications associated with those improvements did not cause safety-significant concerns in the calculations. Second, even if the deficiencies had escaped detection, it is highly likely that any effect on plant performance or function would have been disclosed in plant instrument calibration and testing. Third, CASE's attempts at establishing a basis for violations of 13 of the 18 10 CFR Part 50, Appendix B criteria are simply not reasonable. TU Electric's analyses, as documented in Enclosure 2 and Enclosure 3, indicate several violations of Criterion III and Criterion V, but no widespread pattern and no basis for concluding that a programmatic breakdown exists. Accordingly, to the extent that CASE's Request for Action seeks to require further action to address the programmatic implications of the scaling issues, it should be denied.

5. <u>TU Electric Properly Declined CASE's Requests for a Stop Work Order</u> -

Partway through the TAP audit CASE strenuously urged TU Electric's Director of QA to issue a Stop Work Order (SWO) on scaling calculations. TU Electric's Director of QA declined to do so for the reasons summarized in Enclosure 2, page 16. TU Electric maintains that the decision of the Director of QA was correct and constituted a proper exercise of management discretion under the circumstances. Now CASE attacks this decision by labeling it "political" based on two arguments that are little more than name calling. First, CASE argues that because TU Electric had "unofficially stopped" work on scaling calculations, its refusal to issue a SWO was evidence of "political" decision-making. On the contrary, if TU Electric were politically motivated it would have issued a SWO. This would have avoided a controversy with CASE and would have cost nothing since there were limited scaling calculation activities underway at that time. TU Electric's Director of QA, however, eschewed the easy political solution and made the tough decision based upon his firm conviction that a SWO was not warranted under the circumstances. Second, CASE argues that TU Electric declined to issue a SWO because that action would have initiated a CAR, and in turn, the CAR would have triggered a 10 CFR 50.55(e) reportability review. Consequently, CASE claims, TU Electric's real motive was to circumvent 10 CFR 50.55(e). TU Electric submits that CASE's argument is simply incredible. It is difficult to conceive of how or why TU Electric would want to circumvent 50.55(e) reporting, when the issues relating to scaling calculations were so visible at CPSES, and obviously no secret to the NRC. In any event, the scaling calculation audit did not identify any safety significant

deficiencies that would have required a review for reportability. TU Electric made its decision not to issue a SWO on valid technical grounds and has hidden no part of that decision from CASE or the NRC. TU Electric stands by that decision, and submits that no further action by TU Electric or NRC is warranted. Accordingly, to the extent that CASE's Request for Action somehow seeks to compel the issuance of a SWO by TU Electric, it should be denied.

6. TU Electric's Good Faith Efforts to Investigate Possible Management and Intimidation Allegations Have Been Impaired by Mr. Bodiford's Inactions -

CASE alleges that TU Electric did not undertake a thorough investigation of Mr. Bodiford's allegations that an intimidating atmosphere prevailed while he was working at CPSES on scaling calculations. (CASE Report, pages 194 - 198). Moreover, CASE asserts that Mr. Bodiford was never interviewed by TU Electric concerning his perceptions on this point (CASE Report, pages 195, 198).[3] TU Electric submits that the CASE Report does not accurately represent the relevant facts. In response to Mr. Bodiford's May, 1988 SAFETEAM concerns, Mr. Bodiford's employer investigated his allegations of intimidation and determined that those allegations were not substantiated. Subsequently, TU Electric committed to CASE Management that it would exercise good faith efforts to investigate Mr. Bodiford's intimidation concerns and take such action as may be appropriate. TU Electric's Corporate Security Department did interview Mr. Bodiford in Ft. Worth, Texas on June 17, 1989. Efforts to fully complete the investigation have been impaired because Mr. Bodiford has refused to sign a release for his personnel records retained by his former employer, and to sign a corrected copy of the release pursuant to which he has already accepted a settlement payment from his former employer to resolve his previous Section 210 claim. Despite repeated attempts by TU Electric, through CASE's counsel, to obtain Mr. Bodiford's cooperation on meeting these prerequisites, Mr. Bodiford has not signed the releases. In spite of this, TU Electric intends to proceed as best it reasonably can with an investigation without the relevant personnel records. Unless releases for the previous settlement and the personnel records are signed, TU Electric will be unable to provide the investigation results to Mr. Bodiford or CASE. In any event, TU Electric's investigation has thus far disclosed that the individual named by Mr. Bodiford as responsible for intimidation during Mr. Bodiford's tenure at CPSES is no longer at CPSES. Consequently, TU Electric has no basis to believe that, on the basis of Mr. Bodiford's intimidation allegations, there is currently an atmosphere of intimidation at CPSES. CASE's vague references (e.g. CASE Report, page 195) to other instances of intimidation at CPSES are either so non-specific as to make responding impossible or covered by

[3]Lastly, CASE argues that the intimidating atmosphere must exist or it would not have taken two years to respond to and correct Mr. Bodiford's concerns (CASE Report, page 198). As indicated in item 3 above, TU Electric's actions to address scaling calculations were timely.

another dispute (i.e. THERMO-LAG). TU Electric submits that it has taken all of the action that it can take, and that there is no action the NRC can or should take in regard to this matter. Accordingly, in regard to intimidation issues, the Request for Action should be denied.

7. NRC Should Deny the Request for Action -

The subject Request for Action does not present any issues that are genuinely necessary for the NRC to decide in connection with this dispute. To the extent that TU Electric's TAP audit and this dispute identified violations of 10 CFR Part 50, Appendix B, it will be incumbent on the NRC to exercise its enforcement discretion and authority if, and when, it sees fit. The Joint Stipulation does not change the NRC staff's decision-making processes, and places NRC under no obligation whatsoever in regard to enforcement decisions. As for CASE's persistent suggestions of linkage between this dispute and CASE's root cause concerns, the concerns are now only a potential dispute between TU Electric and CASE which will in due course be resolved or elevated to a dispute on their own merits. Certainly the scaling calculations dispute does not necessitate an NRC decision on the potential root cause dispute. As for CASE's implied relationship of this dispute to the Service Water System and Auxiliary Feedwater System enforcement matters, TU Electric submits that those enforcement matters have been fully addressed by TU Electric's previous written submissions and presentations, are matters solely for NRC's enforcement discretion, and are simply unrelated to the scaling calculations dispute. TU Electric submits that the scaling calculation issues and their underlying causes have been thoroughly identified and that the Action Plan has defined the actions necessary to resolve those issues, including programmatic issues. There is simply no decision for NRC to make on the subject dispute. Accordingly, CASE's Request for Action should be denied.

Very truly yours,

W. G. Counsil
Vice Chairman

WGC:lmi

Attachment 1 - Matrix of CASE Concerns and TU Electric Documented Positions
Attachment 2 - Action Plan Disagreement Table
Attachment 3 - Status of Completion of Action Plan
Enclosure 1 - September 25, 1989 letter, from W. G. Counsil to J. Ellis transmitting Scaling Calculations Action Plan
Enclosure 2 - October 12, 1989 letter, LIT-89/571, from W. G. Counsil to J. Ellis transmitting Evaluation of CASE Position Regarding Need for Scaling Calculation Program Stop Work Order
Enclosure 3 - TU Electric QA Technical Audit Report, ATP-89-146S, Scaling Calculations
Enclosure 4 - November 17, 1989 memorandum NE-28,245 from C. B. Hogg to D. E. Ranstrom, Response to TU Electric QA Audit Report ATP-89-146S

MATRIX OF CASE CONCERNS
AND
TU ELECTRIC DOCUMENTED POSITIONS

CASE ITEM	CASE ITEM PAGE REF.	REFERENCE FOR TU ELECTRIC DOCUMENTED POSITION	TU ELECTRIC ADDITIONAL COMMENTS
1.1	006 TO 008	ENCL. 2 (PAGES 2 TO 5, 15 PARAGRAPH 4, 16)	
1.2	008 TO 009	ENCL. 2 (PAGES 2 TO 5, 15 PARAGRAPH 4, 16)	
1.3	009 TO 010	ENCL. 2 (PAGES 2 TO 5, 15 PARAGRAPH 4, 16)	
1.4	010 TO 011	ENCL. 2 (PAGES 2 TO 5, 15 PARAGRAPH 4, 16)	
1.5	011 TO 012	ENCL. 2 (PAGES 2 TO 5, 15 PARAGRAPH 4, 16)	
1.5.1	012 TO 012	ENCL. 2 (PAGES 2 TO 5, 15 PARAGRAPH 4, 16)	COVER LETTER ITEMS 1, 3, & 4
1.5.2	013 TO 015	ENCL. 2 (PAGES 2 TO 5, 15 PARAGRAPH 4, 16)	
1.5.3	015 TO 016	ENCL. 2 (PAGE 2 PARAGRAPH 5 TO PAGE 3 PARAGRAPH 1, PAGE 5 SUMMARY PARAGRAPH) ENCL. 3 (PAGES 3 TO 6, 39 ITEM 7a)	THE ITEM CITED BY CASE IS AN EXAMPLE OF AN ACTIVITY WITHIN THE SCOPE OF THE AUDIT; NOT OF AN ACTIVITY OUTSIDE OF THE AUDIT SCOPE. ATTRIBUTE 7a OF THE AUDIT CHECKLIST ONLY REQUIRES THE REVIEW OF THOSE IMDs AFFECTING THE SCALING CALCULATION BEING AUDITED.
1.5.4	016 TO 018	ENCL. 2 (PAGES 2 TO 5, 15 PARAGRAPH 4, 16)	

MATRIX OF CASE CONCERNS
AND
TU ELECTRIC DOCUMENTED POSITIONS

CASE ITEM	CASE ITEM PAGE REF.	REFERENCE FOR TU ELECTRIC DOCUMENTED POSITION	TU ELECTRIC ADDITIONAL COMMENTS
1.5.5	018 TO 020	ENCL. 2 (PAGES 2 TO 5, 11 ITEM 8, 12 ITEM 10)	COVER LETTER ITEMS 2, 3, & 4
1.5.6	020 TO 022	ENCL. 2 (PAGE 2 TO 5, 15 PARAGRAPH 4, 16)	THE SCOPE OF TAP AUDIT ATP-89-146S, WHICH WAS DEVELOPED WITH CASE INPUT AND CONCURRENCE, IS DELINEATED IN THE APPROVED AUDIT PLAN. THE SCOPE, AS REFLECTED IN THE APPROVED AUDIT PLAN, WAS IMPLEMENTED IN ITS ENTIRETY WITHOUT RESTRICTION OR LIMIT.
1.5.7	022 TO 023	ENCL. 1 (COMPLETE DOCUMENT) ENCL. 3 (COMPLETE DOCUMENT)	THE RESULTS OF TU ELECTRIC'S EVALUATION OF THE "AGGREGATE ISSUES" RELATING TO SCALING CALCULATIONS ARE ADDRESSED BY A COMBINATION OF THE SCALING CALCULATION ACTION PLAN AND TAP AUDIT, ATP-89-146S.
1.6	024 TO 030	ENCL. 2 (PAGES 2 TO 5, 15 PARAGRAPH 4, 16)	COVER LETTER ITEMS 1, 3, & 4
1.6.3a	027 TO 027	ENCL. 1 (PAGE 3, ITEMS 1 & 2)	CONTRARY TO CASE'S CONTENTION, TAP AUDIT ATP-89-146S NEITHER STATED, IMPLIED, NOR OTHERWISE SUGGESTED THAT THE REFERENCED DESIGN DOCUMENTS (I.E., DBD-EE-032, WCAP-9696 AND SUPPLEMENT, AND CPSES SCALING CALCULATIONS MANUAL) WERE EITHER INADEQUATE OR UNCONTROLLED, OR THAT THE IMPACTS OF RELYING ON OR USE OF THESE DOCUMENTS ARE INDETERMINATE. THE CASE STATEMENTS IN THESE REGARDS ARE INCORRECT. IN REGARDS TO DBD-EE-032, SPECIFICALLY, THIS REFERENCE DOCUMENT DID NOT CONTAIN DESIGN BASIS INFORMATION WHICH WAS NOT ALREADY INCLUDED IN OTHER DESIGN BASIS DOCUMENTS. THE BALANCE OF PLANT ANALOG CONTROL LOOPS DESIGN BASIS REQUIREMENTS ARE CONTAINED IN VARIOUS MECHANICAL SYSTEM DESIGN BASIS DOCUMENTS. THE REMAINING INFORMATION CONTAINED IN DBD-EE-032 WAS DESIGN IMPLEMENTATION INFORMATION OR METHODOLOGY UTILIZED IN THE PREPARATION OF INSTRUMENT LOOP SCALING CALCULATIONS. THE APPLICABLE SECTIONS OF DESIGN BASIS DOCUMENT DBD-EE-032 WERE INCORPORATED IN REVISION 2 OF THE SCALING CALCULATIONS MANUAL. THE DBD WAS THEREFORE NOT REQUIRED.

MATRIX OF CASE CONCERNS
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1.6.3b	027 TO 027	ENCL. 1 (PAGE 3, ITEM 1, 3) ENCL. 2 (PAGE 6, PART C) ENCL. 3 (PAGE 6 PARAGRAPH 3, "WESTINGHOUSE DOCUMENTS...")	COVER LETTER ITEMS 1 & 2 REFER TO COMMENT FOR CASE ITEM 1.6.3a.
1.6.3c	027 TO 027	ENCL. 1 (PAGE 3, ITEM 1) ENCL. 2 (PAGE 7, ITEM 4)	COVER LETTER ITEMS 1 & 2 REFER TO COMMENT FOR CASE ITEM 1.6.3a
1.7	030 TO 062		COVER LETTER ITEMS 1, 2, 3, & 4 THE CASE STATEMENT THAT THE TAP AUDIT "...VERIFIED THAT SCALING CALCULATIONS, ONCE DEVELOPED, ARE NOT REVIEWED AGAIN, EVEN WHEN A DCA ACTIVITY TAKES PLACE" IS INCORRECT. THIS SUBJECT WAS NOT ADDRESSED DURING THE REFERENCED AUDIT. THE TAP AUDITS AND TU ENGINEERING SURVEILLANCE AUDITS RELATING TO SCALING CALCULATIONS WERE STRUCTURED AND INTENDED TO ASSESS THE ACCEPTABILITY OF THE SCALING CALCULATIONS ON A PROGRAMMATIC BASIS AND WERE NOT INTENDED TO AUDIT OR TRACK THE STATUS OF THE ACTION ITEMS ADDRESSED IN THE MAY 10, 1988 MEMORANDUM. ALTHOUGH NOT ADDRESSING THESE SPECIFIC ACTION ITEMS, IT IS TU ELECTRIC'S CONCLUSION THAT THE TAP AUDITS AND ENGINEERING SURVEILLANCES DEMONSTRATE THE OVERALL ACCEPTABILITY OF THE SCALING CALCULATION PROGRAM, AS WELL AS THE TECHNICAL ADEQUACY OF THE SCALING CALCULATIONS THEMSELVES.

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1.8	063 TO 068	ENCL. 2 (PAGES 2 TO 5, 15 PARAGRAPH 4, 16)	COVER LETTER ITEMS 1, 2, 3, & 4 TU ELECTRIC ACKNOWLEDGES THAT TWO OF THE CALCULATIONS REVIEWED IN AUDIT ATP-89-146S WERE ADDRESSED IN AN EARLIER TAP AUDIT. THE VERSION (I.E., REVISION LEVEL) OF ONE OF THE CALCULATIONS (NO. 1-SC-55-28) REFLECTED SIGNIFICANT CONFIGURATION CHANGES AGAINST WHICH AUDIT FINDINGS (DEFICIENCIES) WERE REPORTED IN ATP-89-146S. THE SAME SYSTEM CONFIGURATION DID NOT EXIST IN THE EARLIER AUDITED VERSION. THE OTHER COMMON CALCULATION (NO. 1-SC-37-18) WAS FOUND IN THE LATER AUDIT TO CONTAIN DISCREPANCIES IN PROM CONTROL AND TIMER CONFIGURATION. THESE FINDINGS DID NOT IMPACT THE ACCEPTABILITY OF THE INSTALLED HARDWARE. THE CASE STATEMENT THAT WESTINGHOUSE INSTRUCTION BULLETINS WERE..."VERIFIED TO BE DEFICIENT IN ATP-89-146S" IS INCORRECT. THE WESTINGHOUSE DOCUMENTS CITED BY CASE WERE NOT EVALUATED IN THE REFERENCED AUDIT.
1.9 (1 OF 5)	069 TO 92	ENCL. 1 (COMPLETE DOCUMENT) ENCL. 2 (PAGES 2 TO 5) ENCL. 3 (PAGES 2 TO 6)	COVER LETTER ITEMS 1 & 4
1.9 (2 OF 5)	092 TO 098		COVER LETTER ITEMS 1 & 4
1.9 (3 OF 5)	098 TO 100	ENCL. 1 (COMPLETE DOCUMENT)	COVER LETTER ITEMS 1 & 4

MATRIX OF CASE CONCERNS
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TU ELECTRIC DOCUMENTED POSITIONS

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1.9 (4 OF 5)	100 TO 103	ENCL. 1 (PAGE 4, ITEM 7) ENCL. 2 (PAGES 4 TO 5) ENCL. 3 (PAGE 37)	COVER LETTER ITEMS 1, 3, & 4
1.9 (5 OF 5)	103 TO 104		COVER LETTER ITEMS 1 & 4 C2R-89-016 ADDRESSES THESE CONCERNS.
1.10	105 TO 107	ENCL. 2 (PAGES 2 TO 5, 15 PARAGRAPH 4, 16)	COVER LETTER ITEMS 1, 2, 3 & 4 TU ELECTRIC WISHES TO EMPHASIZE THAT IT DOES NOT CONTEND THAT ITS ACTIONS ADDRESSING SCALING CALCULATIONS WERE, IN ALL CASES, EFFECTIVE. ENCLOSURE 2, PAGES 3, 4, & 5, INDICATES THAT THERE WERE ACTIONS THAT WERE NOT PROPERLY TRACKED TO CLOSURE BY SWEC IN RESPONSE TO TU ELECTRIC'S MAY 10, 1988 MEMORANDUM DIRECTING ACTIONS ON SCALING CALCULATIONS. FURTHER, HAD MR. BODIFORD NOT RAISED HIS CONCERNS AND TU ELECTRIC INITIATED THE TAP AUDIT, THE INTERCHANGES OF NCB1 AND NCB11 PRINTED CIRCUIT CARDS AND THE USE OF NCH CIRCUIT CARDS MIGHT NOT HAVE BEEN IDENTIFIED FOR CORRECTION. A CAR WAS INITIATED FOR BOTH INSTANCES. THE CAR INVESTIGATION RESULTS ARE NOW AVAILABLE FOR BOTH SUBJECTS, AND IN NEITHER OF THESE CASES DID THE IDENTIFIED CONDITIONS RESULT IN A FAILURE TO PERFORM AN INTENDED SAFETY FUNCTION. TAP WILL CONFIRM THAT THE RESPONSE TO THE CAR SATISFACTORILY ADDRESSED BOTH THE SPECIFIC AND PROGRAMMATIC ISSUES IDENTIFIED IN THE CAR. WITH RESPECT TO NCH CARDS, CECO ENGINEERING REQUESTED ADDITIONAL SEISMIC ERROR DATA FROM WESTINGHOUSE. UPON RECEIPT OF THIS DATA, CECO ENGINEERING EVALUATED ITS IMPACT ON SETPOINT AND LOOP ACCURACY CALCULATIONS. THIS DATA WAS INCORPORATED INTO THE CALCULATIONS AND FOUND TO BE WITHIN THE ACCEPTABLE MARGIN ALLOWABLE IN THE CALCULATIONS, FOR MOST CASES. THE RESULTS OF FOUR CALCULATIONS WERE FOUND TO BE OUTSIDE THE

MATRIX OF CASE CONCERNS
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CASE ITEM	CASE ITEM PAGE REF.	REFERENCE FOR TU ELECTRIC DOCUMENTED POSITION	TU ELECTRIC ADDITIONAL COMMENTS
			ALLOWABLE MARGIN ASSOCIATED WITH THE ORIGINAL CALCULATIONS. THESE CALCULATIONS WERE REVISED TO BE CONSISTENT WITH THE NEW SEISMIC ERROR DATA, AND NEW SETPOINTS WERE ISSUED. EVALUATION OF THESE MINOR ADJUSTMENTS IN SETPOINTS IDENTIFIED NO SAFETY CONCERNS. THE ENVIRONMENTAL QUALIFICATION GROUP WAS PROVIDED THE NEW SEISMIC ERROR DATA FOR INCORPORATION INTO THE APPLICABLE QUALIFICATION REPORTS. THERE ARE NO REMAINING OPEN ITEMS ASSOCIATED WITH THIS ISSUE. WITH REGARD TO THE NCB1/NCB11 CARDS, CECO ENGINEERING REQUESTED OPERATIONS TO IDENTIFY THE CURRENT AS-BUILT LOCATION OF NCB1/NCB11 CARDS. AFTER REVIEWING THIS DATA, CECO ENGINEERING ISSUED A DCA TO REVISE APPLICABLE DRAWINGS TO REFLECT THE AS-BUILT CONFIGURATION. TO ADDRESS THE ISSUE OF FUTURE DOCUMENTATION CONTROL FOR THESE CARDS, IT WAS DETERMINED THAT APPLICABLE DESIGN DOCUMENTS AND DRAWINGS SHOULD BE REVISED TO ALLOW UTILIZATION OF EITHER CARD AND TO IDENTIFY ANY LIMITATION/RESTRICTIONS ON THE USE OF THESE CARDS. WITH REGARD TO THE ISSUE OF REVIEWING WPT LETTERS FOR DESIGN INPUT THAT HAVE NOT BEEN EVALUATED BY ENGINEERING, THE WESTINGHOUSE TECHNICAL EXPERT WHO REVIEWED PAST WPT LETTERS FOR IMPACT ON SCALING FOUND NO CASES OF PAST CORRESPONDENCE THAT HAD NOT BEEN INCLUDED AS INPUT, IF INCLUSION WAS APPROPRIATE.
2.1 (1 OF 4)	108 TO 113	ENCL. 1 (PAGE 6, PARAGRAPHS 3 & 4) ENCL. 2 (PAGES 5 TO 6, ITEM 2a)	COVER LETTER ITEMS 1 & 3 TU MANAGEMENT IS REEXAMINING THE PROCEDURAL REQUIREMENTS FOR INCORPORATION OF CHANGE DOCUMENTS TO IWDs BASED ON OPERATIONAL NEEDS.
2.1 (2 OF 4)	113 TO 114B	ENCL. 1 (PAGE 3, ITEM 3)	COVER LETTER ITEMS 1, 3, & 4

MATRIX OF CASE CONCERNS
AND
TU ELECTRIC DOCUMENTED POSITIONS

CASE ITEM	CASE ITEM PAGE REF.	REFERENCE FOR TU ELECTRIC DOCUMENTED POSITION	TU ELECTRIC ADDITIONAL COMMENTS
2.1 (3 OF 4)	114B TO 115	ENCL. 1 (PAGE 3, ITEMS 1 & 3) ENCL. 2 (PAGES 6 & 7, PART c) ENCL. 3 (PAGES 6, 41)	COVER LETTER ITEMS 1, 3, & 4
2.1 (4 OF 4)	115 TO 116	ENCL. 1 (PAGE 3, ITEMS 1 & 3) ENCL. 2 (PAGES 6 & 7, PART c)	COVER LETTER ITEMS 1, 2, 3, & 4
2.1 SUMMARY	116 TO 123	ENCL. 1 (COMPLETE DOCUMENT) ENCL. 2 (PAGES 5 TO 10, 12 & 13, 15 & 16; ASSOCIATED ITEMS 2 TO 5, 10 & CONCLUSION, RESPECTIVELY) ENCL. 3 (PAGES 2 TO 6)	COVER LETTER ITEMS 1, 2, 3, & 4 REFER TO CASE ITEM 1.6.3a FOR COMMENTS PERTAINING TO DBD-EE-032.
2.2	123 TO 125	ENCL. 2 (PAGES 7 & 8, ITEMS 3 & 4)	REFER TO CASE ITEM 1.6.3a FOR COMMENTS PERTAINING TO DBD-EE-032.
2.3	125 TO 129	ENCL. 2 (PAGE 7, ITEM 3) ENCL. 3 (PAGE 4, LAST PARAGRAPH) ENCL. 4 (PAGES 4 & 5, DEFICIENCY 89-146S-02)	
2.4	129 TO 132	ENCL. 2 (PAGES 7 & 8, ITEM 4) ENCL. 4 (PAGES 4 & 5, DEFICIENCY 89-146S-02)	REFER TO CASE ITEM 1.6.3a FOR COMMENTS PERTAINING TO DBD-EE-032.

MATRIX OF CASE CONCERNS
AND
TU ELECTRIC DOCUMENTED POSITIONS

CASE ITEM	CASE ITEM PAGE REF.	REFERENCE FOR TU ELECTRIC DOCUMENTED POSITION	TU ELECTRIC ADDITIONAL COMMENTS
2.5 (1 OF 6)	132 TO 133	ENCL. 2 (PAGE 7, ITEM 4a)	COVER LETTER ITEM 4
2.5 (2 OF 6)	133 TO 136	ENCL. 2 (PAGE 8, ITEM 4b)	REFER TO CASE ITEM 1.6.3a FOR COMMENTS PERTAINING TO DBD-EE-032.
2.5 (3 OF 6)	136 TO 137	ENCL. 2 (PAGE 8, ITEM 4c)	
2.5 (4 OF 6)	137 TO 138	ENCL. 1 (PAGE 3, ITEMS 1 & 2) ENCL. 2 (PAGE 8, ITEM 4d)	REFER TO CASE ITEM 1.6.3a FOR COMMENTS PERTAINING TO DBD-EE-032
2.5 (5 OF 6)	138 TO 139		COVER LETTER ITEMS 1, 3, & 4
2.5 (6 OF 6)	139 TO 140		COVER LETTER ITEMS 1, 3, & 4
2.5 SUMMARY	140 TO 147		COVER LETTER ITEMS 1, 2, 3, & 4
2.6 (1 OF 9)	147 TO 148	ENCL. 1 (PAGE 3, ITEM 1 & 3) ENCL. 2 (PAGE 8, ITEM 5)	
2.6 (2 OF 9)	148 TO 149		
2.6 (3 OF 9)	149 TO 150	ENCL. 1 (PAGE 4, ITEM 9) ENCL. 2 (PAGE 9, ITEM 5a)	
2.6 (4 OF 9)	150 TO 151	ENCL. 2 (PAGES 8 & 9, ITEM 5)	COVER LETTER ITEMS 2 & 4
2.6 (5 OF 9)	151 TO 152		

MATRIX OF CASE CONCERNS
AND
TU ELECTRIC DOCUMENTED POSITIONS

CASE ITEM	CASE ITEM PAGE REF.	REFERENCE FOR TU ELECTRIC DOCUMENTED POSITION	TU ELECTRIC ADDITIONAL COMMENTS
2.6 (6 OF 9)	152 TO 153	ENCL. 2 (PAGES 9 PART A, 10 PARAGRAPH 5)	COVER LETTER ITEM 4
2.6 (7 OF 9)	153 TO 154	ENCL. 1 (PAGE 5, PARAGRAPH 4) ENCL. 2 (PAGES 9 PART B, 10 PARAGRAPH 5)	COVER LETTER ITEMS 1, 3, & 4
2.6 (8 OF 9)	154 TO 155	ENCL. 2 (PAGE 10 PART C & PARAGRAPH 5) ENCL. 4 (PAGE 10 DEFICIENCY 89-146S-04)	COVER LETTER ITEM 4
2.6 (9 OF 9)	155 TO 156	ENCL. 1 (PAGE 5, PARAGRAPH 4) ENCL. 2 (PAGE 10 PART D & PARAGRAPH 5) ENCL. 4 (PAGES 15, DEFICIENCY 89-146S-09)	COVER LETTER ITEM 4
2.6 SUMMARY	156 TO 161	ENCL. 1 (PAGE 4, ITEM 4) ENCL. 2 (PAGES 8 TO 10, ITEM 5) ENCL. 4 (PAGES 10 DEFICIENCY 89-146S-04, 15 DEFICIENCY 89-146S-09)	COVER LETTER ITEMS 1, 3, & 4
2.7 (1 OF 2)	161 TO 164	ENCL. 1 (PAGE 3, ITEM 3) ENCL. 2 (PAGES 11 ITEM 6, 16 PARAGRAPH 3)	COVER LETTER ITEMS 1, 2, 3, & 4

MATRIX OF CASE CONCERNS
AND
TU ELECTRIC DOCUMENTED POSITIONS

CASE ITEM	CASE ITEM PAGE REF.	REFERENCE FOR TU ELECTRIC DOCUMENTED POSITION	TU ELECTRIC ADDITIONAL COMMENTS
2.7 (2 OF 2)	164 TO 167	ENCL. 1 (PAGE 4, ITEMS 4, 5, & 6) ENCL. 2 (PAGES 11 ITEM 7, 16 PARAGRAPH 3)	COVER LETTER ITEMS 1, 2, 3, & 4
2.8	167 TO 172	ENCL. 1 (PAGE 4, ITEM 5) ENCL. 2 (PAGES 11 & 12 ITEM 8, 16 PARAGRAPH 3)	COVER LETTER ITEMS 1, 2, 3, & 4
2.9	172 TO 173	ENCL. 2 (PAGE 12, ITEM 9)	COVER LETTER ITEM 4
2.10 (1 OF 3)	173 TO 174	ENCL. 2 (PAGES 12 & 13 ITEM 10, 15 PARAGRAPH 4, & 16)	COVER LETTER ITEM 4
2.10 (2 OF 3)	174 TO 176	ENCL. 2 (PAGES 12 ITEM 10, 15 PARAGRAPH 4, & 16)	COVER LETTER ITEMS 2, 3, & 4
2.10 (3 OF 3)	176 TO 177	ENCL. 2 (PAGES 12 & 13 ITEM 10, 15 PARAGRAPH 4, & 16)	
2.11	177 TO 178	ENCL. 1 (PAGE 3, ITEMS 1 & 3) ENCL. 2 (PAGE 13, PARAGRAPHS 2 & 3)	COVER LETTER ITEMS 1 & 2
2.12 (1 OF 5)	179 TO 183	ENCL. 2 (PAGES 13 & 14 "DIARY REVIEW, PAGES 19 & 20")	COVER LETTER ITEMS 4 & 5
2.12 (2 OF 5)	184 TO 184		COVER LETTER ITEM 2
2.12 (3 OF 5)	185 TO 185	ENCL. 2 (PAGES 13 & 14 "DIARY REVIEW, PAGES 19 & 20")	COVER LETTER ITEM 2

MATRIX OF CASE CONCERNS
AND
TU ELECTRIC DOCUMENTED POSITIONS

CASE ITEM	CASE ITEM PAGE REF.	REFERENCE FOR TU ELECTRIC DOCUMENTED POSITION	TU ELECTRIC ADDITIONAL COMMENTS
2.12 (4 OF 5)	185 TO 188		COVER LETTER ITEM 4
2.12 (5 OF 5)	188 TO 191		COVER LETTER ITEMS 3, 5, & 7
2.13 (1 OF 2)	191 TO 192		COVER LETTER ITEM 4
2.13 (2 OF 2)	192 TO 194	ENCL. 2 (PAGE 14 GENERAL CONCLUDING COMMENT 2)	COVER LETTER ITEMS 1, 2, 3, & 4
2.14 (1 OF 3)	194 TO 195	ENCL. 2 (PAGE 15, PARAGRAPH 1)	COVER LETTER ITEM 6
2.14 (2 OF 3)	195 TO 197	ENCL. 2 (PAGE 15, PARAGRAPHS 2 & 3)	COVER LETTER ITEM 6
2.14 (3 OF 3)	197 TO 198	ENCL. 2 (PAGE 15, PARAGRAPH 3)	COVER LETTER ITEM 6
2.15 (1 OF 3)	199 TO 200	ENCL. 2 (PAGES 15 PARAGRAPH 4, 16)	COVER LETTER ITEMS 3 & 4
2.15 (2 OF 3)	201 TO 201	ENCL. 2 (PAGE 16, PARAGRAPH 2)	COVER LETTER ITEMS 1, 2, 3, & 4
2.15 (3 OF 3)	202 TO 203	ENCL. 2 (PAGE 16, PARAGRAPH 3)	COVER LETTER ITEMS 4 & 7

THE CASE STATEMENT THAT THE TAP AUDIT VERIFIED MR. BODIFORD'S CONCERN THAT SCALING CALCULATION SUPPORTING DOCUMENTATION "WAS NOT DEFINED, CONTROLLED, REFERENCED, UPDATED, AND THEREFORE, WAS NOT AUDITABLE" IS NOT CORRECT. ALTHOUGH FINDINGS WERE MADE REGARDING DESIGN DOCUMENT UPDATING AND REFERENCING, THEY WERE NOT SIGNIFICANT IN THAT THEY DID NOT DETRACT FROM THE ABILITY TO EFFECTIVELY PERFORM THE TAP AUDIT.

ACTION PLAN DISAGREEMENT TABLE[1]

CASE ITEM NUMBER	TU ELECTRIC ACTION PLAN	CASE RESPONSE	TU ELECTRIC CURRENT POSITION
3	Applicable documents (including Westinghouse NSSS Design Specifications and WCAP-9696 to the extent they are used as input documents) are accurate, acceptable for use, and controlled through CPSES Document Control System.	- second item requires clarification. The "applicable documents" should all be identified and should include NSSS specification sheets.	TU Electric agrees. All applicable input documents for scaling calculations are identified, including NSSS specification sheets.
3	1-SC-8800 Appendix I is accurate and acceptable for use by verifying that no changes have occurred in safety-related head sensitive instrument elevations and that the elevation data are controlled.	- the fourth item only appears to limit Appendix "I" to just "safety-related head sensitive instrument elevations". Non-safety related devices should also receive the same verifications and controls. Although non-safety components will not be involved in the potential release of radioactivity to the environment in the event of an accident, they can be a direct cause for personnel injury or death (i.e., a tank rupture).	TU Electric does not agree that this effort is warranted for non-safety related instruments on the basis of "safety". TU Electric knows of no specific instance where there is any evidence of a significant personnel risk which would occur if the elevation data for non-safety related instruments were not reviewed and incorporated into the scaling calculations. Where head corrections data is applied to non-safety related scaling calculations it is to address instrument accuracy concerns only.

[1] The CASE Item Number, TU Electric Action Plan, and CASE Response columns are taken verbatim from the CASE Report, Figure 2.

ACTION PLAN DISAGREEMENT TABLE

CASE ITEM NUMBER	TU ELECTRIC ACTION PLAN	CASE RESPONSE	TU ELECTRIC CURRENT POSITION
3	Instrumentation specification data sheets are acceptable for use and controlled through the CPSES Document Control System.	- the fifth item should also include NSSS specification sheets as well as BOP specification sheets.	TU Electric agrees. NSSS and BOP instrument specification data sheets used in scaling calculations are controlled through CPSES DCC.
8	The WPT letters are being reviewed to assure that any that may affect scaling calculations are identified and addressed. Procedural control of WPT letters will continue to be maintained.	WPT letters were not the only means to transfer information to CPSES (i.e., RDF/RTD "WN" letter [Procurement]). We agree with the stated actions to be taken regarding WPT letters.	No change from Action Plan. Westinghouse does not utilize "WN" letters for CPSES correspondence. Vendor documentation and correspondence are controlled by CPSES procedures.
CASE Suggestion (Item (1) (b) on page 2)	This is a new issue raised by CASE. These DBDs are Westinghouse prepared documents and there is no technical reason why the transforms are needed in the DBDs.	DBD-EE-021 and other relevant DBDs should be revised to correlate math transforms with system explanations. We agree with the TU Electric response if the information is to be included in the TU Electric Scaling Manual (SC-8800).	No change from Action Plan. TU Electric Scaling Calculation Manual (1-SC-8800) references appropriate documents.
CASE Suggestion (Item (7) page 4)	WPTs are the only source of correspondence to be reviewed because SWEC Project Procedure PP-012, "SWEC/Westinghouse Interface," requires "for the exchange of design information/input or output criteria, SWEC and Westinghouse shall utilize their respective correspondence procedure	As has been previously relayed to TU Electric by Mr. Bodiford, an example of where WPT letter did not relay configuration definition to TU Electric was RDF/RTD's. CASE requests that previous transmittal	See Position on CASE Item Number 8 above.

ACTION PLAN DISAGREEMENT TABLE

CASE ITEM NUMBER	TU ELECTRIC ACTION PLAN	CASE RESPONSE	TU ELECTRIC CURRENT POSITION
	unless an alternate approved program (e.g., DCAs, NCRs, etc.) has been established to control this type of activity." For example, PIP and shop order updates are transmitted by WPTs and are processed by the Vendor Document Group in accordance with PP-053 and receive Engineering review and status (e.g., approved, approved with comments, for information only, etc.). Any documents used as references in the scaling calculations which were previously controlled only through the PIP are being placed in the CPSES Document Control System through the Vendor Document Program.	activities be reviewed to assure up to date information is included in controlled project documentation. We agree with the controls in place.	
CASE Suggestion (Item (8) page 4)	The DCA controls are adequate and it has been determined that the number of outstanding DCAs is in compliance with those controls.	CASE disagrees that the system for updating documents to include DCA information does not need to be improved. The incorporation of DCA information may be "in compliance" with procedural controls, however, we feel it is not adequate to control field use (i.e., TAP preliminary Finding 89-146-01 of 9/19/89).	TU Electric management is reexamining the procedural requirements for IWD incorporation of change documents based on operational needs.
CASE Suggestion	It may not be necessary to have all actions related	CASE has a concern that the Corrective	No change in Action Plan.

ACTION PLAN DISAGREEMENT TABLE

CASE ITEM NUMBER	TU ELECTRIC ACTION PLAN	CASE RESPONSE	TU ELECTRIC CURRENT POSITION
(page 5)	to TAP audit findings completed prior to fuel load. However, all of the audit findings concerning the acceptability of safety related calculations will be addressed by the responsible organization and concurred with by the QA Department prior to fuel load.	Action Program being implemented by TU Electric is not always totally effective or timely. The TU Electric response to this item may be adequate if all deficient conditions are resolved prior to fuel load.	

STATUS: SCALING CALCULATIONS ACTION PLAN

ITEM 1: Complete

ITEM 2: Complete

ITEM 3: Complete

ITEM 4: Complete

ITEM 5: The Safety-Related Scaling Calculations have been reviewed and reissued; however, TAP verification of corrective actions is on-going.

ITEM 6: About 50% of the Non-Safety Related Scaling Calculations have been reviewed and reissued; however, TAP verification of corrective actions is on-going.

ITEM 7: Complete

ITEM 8: Complete

ITEM 9: TAP Audit findings are in the process of resolution. TAP verification of corrective actions is on-going.

TUELECTRIC

William G. Counsil
Vice Chairman

September 25, 1989

Mrs. Juanita Ellis
President, CASE
1426 South Polk Street
Dallas, TX 75224

Dear Juanita:

As a result of our earlier discussions concerning actions that TU Electric is taking to address the issues related to scaling calculations raised by CASE, Mr. Bodiford and the TAP audit, we provided to CASE a draft TU Electric Action Plan. Enclosure 2 of your letter of September 21, 1989, provided CASE's comments with respect to the draft Action Plan in the form of a memorandum from Mr. Thero to Ms. Garde dated September 18, 1989.

We have reviewed CASE's comments and have incorporated them, to the extent that we considered appropriate, in the enclosed Scaling Calculations Action Plan dated September 25, 1989. We are also enclosing a brief explanation of our reasons for not incorporating several of CASE's suggestions.

We consider the enclosed Scaling Calculations Action Plan as TU Electric's final position on this matter, subject only to such Action Plan revisions, if any, as may be appropriate when the TAP audit is completed and its results are available. Although Item 9 already specifies that we will resolve specific TAP audit findings, it is possible that such findings may also involve possible revisions in Items 1 to 8. We will inform you of any revisions in the Action Plan.

Your letter of September 21 also formally provided to us a memorandum dated September 12, 1989 (Enclosure 1), that sets forth the basis of CASE's position that a stop work order should be issued. In meetings and telephone conversations with CASE we have previously informed you of the basis for the determination by TU Electric's QA Director that a stop work order was neither required nor appropriate. Now that CASE's position has been formally communicated to us we will provide to CASE a detailed response within one week.

We regret that CASE has determined that "at least at this point, we have reached the stage of a dispute over this issue." We hope that the enclosed response relating to the Action Plan and the information we will provide to you shortly regarding the stop work order will resolve these matters between us pursuant to paragraph B.2 of the Joint Stipulation.

Very truly yours,

W. G. Counsil

WGC:LI
cc: B. P. Garde
G. Bodiford
O. L. Thero
E. F. Ottney

SCALING CALCULATIONS ACTION PLAN

TU Electric will take the following actions to address issues related to scaling calculations raised by CASE, G. Bodiford and the TAP Audit.

1. The TU Electric "Scaling Calculations Manual for CPSES Unit 1 and Common" (1-SC-0800), including supplements, will be reviewed by Engineering for acceptability and accuracy and updated to: define its intended scope, usage, and implementation; define the method of preparing scaling calculations; and clarify the relationship between the Scaling Calculations Manual (1-SC-0800) and Project procedures and documents related to scaling calculations and describe their use. Specific revisions will include but not be limited to:

   - Clarification of the role of applicable Westinghouse NSSS Design Specifications.
   - Clarification of the role of "Westinghouse Process Control System Scaling Manual" (WCAP-9696) and supplements.
   - Definition of source documents (by type/application) which contain input to scaling calculations (e.g., PL&S, drawings, instrumentation specification data sheets, etc.).
   - Inclusion of guidelines for documentation of PROM logic.
   - Inclusion of appropriate information from DBD-EE-032.

2. DBD-EE-032 will be deleted.

3. Scaling calculation input documents will be reviewed by Engineering to assure that:

   - PL&S is acceptable for use and controlled through the CPSES Document Control System.
   - Applicable documents (including Westinghouse NSSS Design Specifications and WCAP-9696 to the extent they are used as input documents) are accurate, acceptable for use, and controlled through the CPSES Document Control System.
   - Approved Westinghouse FCNs have been addressed.
   - 1-SC-0800 Appendix I is accurate and acceptable for use by verifying that no changes have occurred in safety-related head sensitive instrument elevations and that the elevation data are controlled.
   - Instrumentation specification data sheets are acceptable for use and controlled through the CPSES Document Control System.

4. Personnel performing, reviewing and independently checking scaling calculations will be trained to the requirements of the revised Scaling Calculations Manual (1-SC-8800) and the Project procedures which control scaling calculation preparation, review, and approval. The training will include emphasis on the application of the input documents, including the use of applicable drawings.

5. Prior to fuel load, the safety-related scaling calculations will be reviewed by personnel trained per Item 4 above against the revised Scaling Calculations Manual (1-SC-8800) and applicable Project procedures, and the calculations will be revised as necessary to assure they are technically correct, are consistent with the results of Item 3 above, and meet procedural requirements. "Confirmation Required" will be removed from calculations as appropriate per Project procedures.

6. Prior to operation above 5% power, the non-safety related scaling calculations will be reviewed by personnel trained per Item 4 above against the revised Scaling Calculations Manual (1-SC-8800) and applicable Project procedures, and the calculations will be revised as necessary to assure that they are technically correct, are consistent with the results of Item 3 above, and meet procedural requirements. "Confirmation Required" will be removed from calculations as appropriate per Project procedures.

7. Prior to fuel load, the seismic drift for NCH cards will be evaluated and the results of that evaluation will be reflected in the setpoint and loop accuracy calculations. During the reviews described in Items 5 and 6 above, the use and control of NCB 1 and NCB 11 cards will be addressed.

8. The WPT letters are being reviewed to assure that any that may affect scaling calculations are identified and addressed. Procedural control of WPT letters will continue to be maintained.

9. Prior to fuel load, the TAP audit findings concerning the acceptability of safety-related scaling calculations will be resolved in accordance with Project procedures. The remaining TAP audit findings will be resolved prior to operation above 5% power.

Calculations issued prior to completion of the activities described in Items 1, 2, 3, and 4 above will be subjected to the actions described in Items 5 and 6. All action items defined above will be completed prior to fuel load except as noted in Items 6 and 9.

EXPLANATION OF REASONS FOR NOT INCORPORATING SOME CASE SUGGESTIONS ON SCALING CALCULATIONS ACTION PLAN

CASE Suggestion (Item (1)(b) on page 2):

DBD-EE-021 and other relevant DBDs should be revised to correlate math transforms with system explanations.

TU Electric Reason for Not Incorporating:

This is a new issue raised by CASE. These DBDs are Westinghouse prepared documents and there is no technical reason why the transforms are needed in the DBDs.

CASE Suggestion (Item (1)(d) on page 2):

TU Electric should control the PROM logic configuration by appending the 8800 Scaling Manual and modifying field procedures on how to "burn in", identify and control the installation of PROM devices. The "burn in" library and timer module data should also be contained in appendices to the 8800 Scaling Manual.

TU Electric Reason for Not Incorporating:

TU will assure that controls of PROM logic configuration, "burn in", identification, installation, timer module and references to the "burn in" library will be documented. The guidelines for documentation of PROM logic will be included in the Scaling Calculations Manual (1-SC-8800). The specific documents in which the details of the other PROM controls will be contained has not been determined. This will be determined during the resolution of the anticipated TAP audit finding on this matter.

CASE Suggestion (Item (1)(b) on page 2):

DBD-EE-021 should be revised to explain the interface requirements of WCAP-9696 by referencing pertinent sections of WCAP-9696 in DBD-EE-021.

TU Electric Reason for Not Incorporating:

This is a new issue raised by CASE. The Scaling Calculations Manual (1-SC-8800) is the appropriate place to contain the interface requirements with DBD-EE-021 and WCAP-9696. The revision to the Scaling Calculations Manual (1-SC-8800) will incorporate any interface requirements.

CASE Suggestion (Item (7) on page 4):

All miscellaneous correspondence and documents that transfers information should be reviewed to assure that any that may affect scaling calculations are identified and addressed. Shop orders 320, 325, 395, etc., should also be reviewed to verify that all sections are still appropriate. This would require that the entire PIP be reviewed by shop order for drawing applicability and when applicable, these documents be controlled through the DCA/DCC system. When the documents are not applicable, they should at a minimum, be annotated "information only".

TU Electric Reason for Not Incorporating:

WPTs are the only source of correspondence to be revised because SWEC Project Procedure PP-012, "SWEC/Westinghouse Interface," requires "for the exchange of design information/input or output criteria, SWEC and Westinghouse shall utilize their respective correspondence procedure unless an alternate approved program (e.g., DCAs, NCRs, etc.) has been established to control this type of activity." For example, PIP and shop order updates are transmitted by WPTs and are processed by the Vendor Document Group in accordance with PP-053 and receive Engineering review and status (e.g., approved, approved with comments, for info only, etc.). Any documents used as references in the scaling calculations which were previously controlled only through the PIP are being placed in the CPSES Document Control System through the Vendor Document Program.

CASE Suggestion (Item (8) on page 4):

More should be done regarding DCAs than just making sure that the DCA program is "in compliance with Project procedures." The DCA procedure appears to be deficient in that consideration is not given to timeliness (3-6 months) prior to document update. Additionally, DCAs involving multiple documents, issues and pages should be assessed individually for incorporation.

TU Electric Reason for Not Incorporating:

The DCA controls are adequate and it has been determined that the number of outstanding DCAs is in compliance with those controls.

CASE Suggestion (page 5):

It is mandatory that specific TAP audit findings be resolved prior to fuel load.

TU Electric Reason for Not Incorporating:

It may not be necessary to have all actions related to TAP audit findings completed prior to fuel load. However, all of the audit findings concerning the acceptability of safety related calculations will be addressed by the responsible organization and concurred with by the QA Department prior to fuel load.

TUELECTRIC

LIT-89/571
File 10086

William G. Counsil
Vice Chairman

October 12, 1989

Mrs. Juanita Ellis
President, CASE
1426 South Polk Street
Dallas, TX 75224

Dear Mrs. Ellis:

My letter of September 25, 1989, responded to Enclosure 2 to your letter of September 21, 1989, which provided CASE's comments with respect to TU Electric's draft Action Plan for scaling calculations.

Your letter of September 21, also formally provided a memorandum (Enclosure 1) dated September 12, 1989, which set forth the basis of CASE's position that a stop work order should be issued against further scaling calculation activity. In response to that document, enclosed is TU Electric's "Evaluation of CASE Position Regarding Need for Scaling Calculation Program Stop Work Order."

As you will note, TU Electric's evaluation addresses, in sequence, each of the ten basic arguments presented in the CASE memorandum, as well as CASE's observations based on its review of Mr. Bodiford's diary, CASE's "general concluding comments", and CASE's conclusion.

On the basis of this detailed evaluation of CASE's arguments, TU Electric's position remains the same as previously communicated to you by TU Electric's QA Director, namely, that a stop work order is neither required nor appropriate.

We have provided you with both our Scaling Calculations Action Plan and our detailed explanation for not imposing a stop work order. We hope that this information will be considered sufficient to resolve these matters pursuant to paragraph B.2 of the Joint Stipulation.

Very truly yours,

W. G. Counsil

W. G. Counsil

Enclosure

cc: B. P. Garde

Evaluation of CASE Position Regarding Need for Scaling Calculation Program Stop Work Order

Item 1)

On May 10, 1988, as a result of concerns raised by Mr. Gary Bodiford following his termination as a Stone & Webster Engineering Corporation (SWEC) engineer in the scaling calculation organization at CPSES, Comanche Peak Engineering (CPE) directed SWEC by memorandum (NE-19097) to take certain actions and requested that the status of these actions be reported in monthly reports. On August 1, 1988, SWEC responded to the CPE directive by memorandum (SWTU-9733) indicating: that certain actions were complete; that some actions were unnecessary (justification provided); and the status of items remaining to be completed.

In the June and July 1988 monthly reports the status of all action items was reported. There was no report for August due to the pending implementation of the Consolidated Engineering Contractor Organization (CECO). In September, October, and November the monthly report was reformatted as a CECO document with less detail provided than the previous SWEC reports. Consequently, the status of the scaling calculation actions was not included in the CECO monthly reports. In December, the CECO monthly report was discontinued because close daily interfacing between CECO and TU Electric management made these reports unnecessary.

In the fall of 1988, the activities identified in the May 10, 1988, CPE memorandum which represented significant manhour expenditures and which were not complete were incorporated in the project scheduling system (PREMIS) and thereby tracked as part of the normal project completion process. Items which did not represent significant manhour expenditures (i.e., the NCB and NCH printed circuit card issues addressed as Items 12 and 13, respectively, in the CPE memorandum) were not formally tracked.

As a result of CASE inquiries in early 1989 regarding the status of actions TU Electric had taken to address Mr. Bodiford's concerns, CECO QA conducted a special surveillance in May 1989 to verify actions taken associated with all known scaling calculation issues including those identified in NE-19097 and to provide a tracking mechanism for any issue not resolved. The results of that special surveillance were documented in Surveillance Report CAP-89073. Items not complete or fully resolved from that time forward are being tracked by CECO.

The CASE statement that the in-process TAP audit findings have verified Mr. Bodiford's technical concerns as discussed in the May 10, 1988, CPE memorandum is incorrect. Although not structured to address the memorandum, the TAP audit coincidentally confirmed partial or complete implementation of most of the actions directed by CPE. (Some of the action item subject areas were not within the scope of the TAP audit.) For example, the TAP audit verified that 9 sheets of the total set (approximately 450 sheets) of Interconnection Wiring Diagram (IWD's) developed by Westinghouse for the BOP process instrument cabinets remain

in the system as "Approved-Except-as-Noted" (AEN) documents. Seven of these IWDs appropriately have Design Change Authorizations (DCA's) written against them approving incorporation of the AEN annotation. The two drawings not presently covered by a DCA contain annotations to the system grounding wires made by Gibbs and Hill during review and approval of the BOP instrumentation document package and depict wiring changes made by Westinghouse. The annotated drawings are technically correct, represent the installed hardware, were reviewed and approved by both Westinghouse and Gibbs and Hill, and were validated as correct under the Corrective Action Program design validation effort. An audit finding was identified concerning the failure to initiate a DCA against these two drawings as required by Deficiency Report (DR) C-87-05180. This is considered to be an isolated finding that does not call into question the overall adequacy of the Westinghouse IWDs. This finding along with a finding related to an NCB1/NCB11 inconsistency within a calculation and a finding related to the Westinghouse Project Information Package (PIP) Master Index were the only findings identified which directly correspond to items addressed in the May 10, 1988, memorandum. Rather than confirming inaction as CASE implies, the audit results generally indicate that the action items in the memorandum that were within the scope of the audit had been addressed by SWEC.

Regarding CASE's contention that . . . "deficient programmatic and technical conditions recognized in the May 10, 1988, memorandum have been allowed to continue throughout the past year, even though several previous TAP, SWEC, and NRC audits and surveillances have been conducted," a review was undertaken of the following TAP and SWEC audit/surveillances performed subsequent to May 10, 1988:

- TAP Audit ATP-88-105 (Instrumentation and Controls)
- TU Electric Engineering Surveillance EASR-89-06 (Review of Scaling Calculations)
- SWEC QA Surveillance CAP-89073 (Westinghouse 7300 Systems)

Results of the above audit and surveillances with respect to the corrective measures addressed in the May 10, 1988, memorandum are as follows:

- Neither the TAP audit nor the TU Electric Engineering Surveillance were structured to address (directly or indirectly) the conditions and corrective measures described in the CPE memorandum. While some findings were identified, the results of these oversight activities indicate acceptable scaling calculation packages.
- SWEC QA Surveillance CAP-89073, dated May 10, 1989, was a special effort to assess the status of past scaling calculation issues, including the issues identified in the May 10, 1988, CPE memorandum. In most instances, implementation of corrective measures, where appropriate, was verified either to be complete or in process and being properly tracked. However, the surveillance identified two issues (i.e., NCB and NCH card issues) which were

apparently not being tracked in a manner that assured they would be resolved prior to issuance of an operating license.

There is no indication that the conditions revealed in the scaling calculation audit are indicative of deficiencies in the TU Electric or SWEC audit/surveillance programs. These programs have provided an accurate assessment of the technical acceptability of the scaling program products.

In addition to the recent audit, after receiving the September 21, 1989 CASE letter, the QA Department reviewed project actions taken in response to the May 10, 1988, memorandum. That review revealed that SWEC was responsive to completing most of the actions directed in the memorandum. There were four items that were either not intended to be accomplished by SWEC as discussed in the August 1, 1988, SWEC response to the CPE memorandum or were not being formally tracked to completion until the May 1989, CECO surveillance. These items are as follows:

- The CPE memorandum directed that a technical audit be conducted of the scaling calculation effort to determine its technical adequacy. SWEC responded that such an audit was unnecessary because a past audit and past surveillances verified the acceptability of the scaling calculation effort and SWEC provided details of the results of those efforts in its response. The SWEC position was subsequently agreed to by CPE. It appears that the SWEC position was reasonable, and the recent audit results attest to the technical acceptability of the scaling calculation effort.

- The CPE memorandum directed (Item 3) that WPTs (Westinghouse Project Transmittals) be reviewed to assure they were included in the PIP Master Index. The SWEC response implied that this effort was unnecessary because the PIP Master Index was not a plant design document. Apparently, SWEC's position was based on SWEC having reasonable assurance that the WPTs did not contain design information that was not also reflected in design documents. It appears that SWEC's decision was rational; however, the Scaling Calculations Action Plan includes a provision to screen all WPTs received prior to establishment of enhanced CPSES WPT tracking in 1987. The screening will identify any WPTs that could potentially have scaling impact and any WPTs so identified will be reflected in revised scaling calculations.

- The CPE memorandum directed (Item 12) that any interchanges of NCB1 and NCB 11 printed circuit cards be identified and that the potential impact on scaling data be evaluated. SWEC responded that the directive would be accomplished; however, although technical personnel were aware of the issue, it appears that it was not being tracked by SWEC in a manner that would have assured completion of the effort. Following the recent CASE inquiries, efforts were initiated to assure resolution of this matter as indicated by the Scaling Calculations Action Plan. The failure to properly track this item appears to be contrary to SWEC Procedure PP-010, "Preparation, Issuance, and Control of Project

Correspondence", which had provisions in Attachment PP-010-C for the identification and control of actions needed to resolve such matters. This resulted in the QA Director conservatively issuing a Corrective Action Request (CAR) on October 6, 1989, to address the NCB issue and the NCH issue discussed below. This matter is not expected to have technical significance because in 1983 Westinghouse and TU Electric approved the NCB 11 cards as direct replacements for NCB 1 cards.

- The CPE memorandum directed (Item 13) that SWEC validate the Gibbs and Hill calculation concerning the acceptability of utilizing NCH printed circuit cards which were susceptible to seismically induced problems. SWEC responded that the issue would be investigated and resolved by SWEC; however, although technical personnel were aware of the issue, it appears that it was not tracked by SWEC in a manner that would have assured completion of the effort. Following the recent CASE inquiries, efforts were initiated to assure resolution of this matter as indicated by the Scaling Calculations Action Plan. Similar to the NCB issue, the failure to properly track this item appears to be contrary to SWEC Procedure PP-010 and this issue is also a subject of the CAR discussed above. Preliminary engineering impact assessments indicate that this matter will not have technical significance.

In summary, the CASE contention that the actions directed by the May 10, 1988, memorandum have not been implemented is not consistent with the facts. The evidence from the audit and the results of the QA Department review of the status of project actions taken in response to the memorandum indicate that, with a few exceptions, the actions were either complete, properly incorporated and tracked as part of the overall project completion, or justifiably not intended to be accomplished. None of the exceptions is likely to be technically significant and all of them will be resolved during the resolution of associated audit findings or resolution of the CAR discussed above. The exceptions are considered to represent noncompliance with Appendix B Criterion V (Instructions, Procedures, and Drawings). No noncompliances with Criteria II, VII, XVI, XVII, and XVIII as suggested by CASE were identified.

Item 2)

Part a)

The IWDs fall into two categories - Nuclear Steam Supply System (NSSS) and Balance of Plant (BOP). It is true that many of these drawings have outstanding DCAs posted against them. The majority of the BOP IWDs have been incorporated into the CPE drawing control system and have been revised in accordance with SWEC Procedure PP-032. The NSSS drawings are still under Westinghouse control with required changes appropriately documented on DCAs; however, Westinghouse has not been issued a purchase order to update these drawings. The fact that there are NSSS drawings with DCAs outstanding since 1983 is not contrary to administrative controls and does not render the drawing information indeterminate or unreliable; however, the DCAs do make it more time consuming to

understand the design and could therefore possibly result in increased plant down time during operations due to longer times required to troubleshoot and correct instrumentation problems that might arise. On that basis a recommendation was made by the audit team that outstanding DCAs against Westinghouse IWDs be incorporated into revised drawings.

The TAP audit team verified that there are only two "Approved-Except-As-Noted" (annotated) IWDs which have not been formally incorporated into the design documents via DCAs. (This is the same issue discussed in Item 1) above and therefore will not be addressed further.)

Part b)

The audit results indicate that Westinghouse NSSS equipment specifications (e.g., transmitters, indicators, recorders, etc.) are adequately controlled by CPSES. Initially, the specifications were listed in Shop Orders 320, 325, and 395 and referenced in the PIP Master Index. In 1988, an effort was begun to incorporate these specifications into the CPSES Document Control System thus giving the project the ability to write DCAs against these specifications without the need for Westinghouse approval.

Part c)

WCAP 9696 and its supplements have not been revised since 1983. These documents are utilized by calculation preparers to obtain scaling methodology and also provide justification for gain, bias and transfer functions found in many calculations. Values for setpoints are found in the Westinghouse Precautions, Limitations and Setpoint (PL&S) document. An isolated finding was identified in which the Westinghouse Scaling Manual (WCAP 9696) was inappropriately referenced in one calculation as the source of setpoint information. The setpoint values used in the calculation, however, were correct per the PL&S (the appropriate reference document). This finding is considered to be isolated since all of the other calculations reviewed by the auditors correctly reference the PL&S as the source of NSSS setpoints which indicates that the calculation preparers were fully cognizant of the appropriate sources of setpoint data.

The status and control of other Westinghouse documents used by CPSES in the preparation of scaling calculations were reviewed by the audit team. While no instances were found in which incorrect or obsolete Westinghouse input data were used in these calculations, the audit team believes that the Westinghouse Scaling Manual and supplements should either be updated by Westinghouse or placed into the CPSES Document Control System. A recommendation was made by the audit team to update WCAP-9696 and maintain it current.

In summary, the audit team concluded that the drawings and information utilized in the preparation of scaling calculations are functional and reliable. In every calculation reviewed during the audit, the proper input values and methodology were used and the end results were correct. The audit team did recommend that it would be desirable to incorporate outstanding DCAs into revised drawings and to update WCAP-9696 and

maintain it current. Isolated noncompliances with Appendix B Criteria V (Instructions, Procedures, and Drawings) were identified as discussed in Part a) above. No noncompliances with Appendix B Criteria III, VI, VII, XVI, and XVII as suggested by CASE were identified.

Item 3)

Contrary to the CASE contention, the FSAR does not mention DBD-EE-032 in any way and consequently does not indicate that this document is used to control the Analog and Scaling Calculation effort. Section 1.1 of the DBD describes its purpose as follows:

> "The purpose of this Design Basis Document (DBD) is to describe the design basis and the functional requirements of the BOP Analog controls of the Comanche Peak Steam Electric Station (CPSES) Unit 1 and Unit 2. In addition this document is to provide the design basis for analog scaling of the Westinghouse 7300 Series BOP process control instrumentation. Implementing documents and equipment selection are addressed."

No mention is made in the DBD regarding the DBD acting as a controlling document for the scaling calculation technical effort. However, the DBD is one of the documents that provides direction on the format and production of scaling calculations.

The audit team concluded that there is no single CPSES document which provides an overall "road map" for the preparation of scaling calculations, addressing input sources, equipment reference manuals, and calculation content and methodology. Even without an overall program description, the practices, procedures, and controls used in the production of scaling calculations are resulting in accurate and useful end products. The success of the calculation effort is due to the knowledge and experience of the calculation preparers coupled with appropriate training and management supervision. A finding was identified indicating a need for an overall program description (or "road map") covering the CPSES scaling calculation process. This finding is considered to represent noncompliance with Appendix B Criterion V (Instructions, Procedures and Drawings). No noncompliances with Appendix B Criteria III or VI as suggested by CASE were identified.

Item 4)

The audit team confirmed that the TU Electric Scaling Calculation Manual (SC-8800) and its appendices do not completely define the scaling methodology; however, the audit team did not find the manual or its appendices to be deficient nor did the team find an instance where the manual and appendices contained outdated or inaccurate information.

a) Appendices F and G have been adequately prepared, reviewed, and approved by CECO. The audit team verified that these documents were developed based on data generated and approved by Westinghouse. It is not necessary for Westinghouse to concur with these appendices.

b) The equipment elevation measurements made during FVM-069 walkdowns were made to verify compliance with specifications, not to determine precise instrument location as do surveys made for the Field Engineering Sketches. Therefore, the field survey data rather than FVM data were used in Appendix I. The procedure to control the Field Engineering Sketches was reviewed by the audit team and is considered adequate.

c) The audit team verified that Appendix H contains methodology for determining instrument calibration accuracy and the component accuracy data base required for use in the analysis. Loop accuracy calculations are contained in separate documents for selected instrument loops.

d) Although DBD-EE-032 referenced Appendices "J," "K," and "L", these appendices were identified to be "not used" in the TU Electric Scaling Calculation Manual. The DBD has since been voided.

e) Action has been taken to update the TU Electric Scaling Calculation Manual and to void DBD-EE-032. The updated Scaling Calculation Manual provides an overall description (or "road map") for preparation of scaling calculations.

f) As indicated in Item 3) above, the audit team identified a finding relating to the lack of an overall program description (or "road map") relating to the preparation and control of scaling calculations.

In summary, as noted in Item 3) above, neither the TU Electric Scaling Calculation Manual nor DBD-EE-032 provide a complete program description (or "road map") of the overall scaling calculation production process; however, no instances were found in which incorrect or outdated information was used in any scaling calculation. In all instances, the end product calculations were found to be technically accurate and complete. Other than the matter of noncompliance with Criterion V addressed in Item 3) above, no noncompliances with Appendix B Criteria III, VI, X, or XVII as suggested by CASE were identified.

Item 5)

The engineering basis for the scaling calculation effort has its genesis at Westinghouse where the original engineering was completed for the NSSS process instrumentation. The BOP scaling calculation effort was developed on site based on the Westinghouse methodology. Westinghouse developed the Interconnection Wiring Diagrams (IWDs), instrument component configuration, Equipment Reference Manuals, Instrument Data Sheets, and issued methodology documents which specify the scaling and accuracy requirements for the process instrumentation. The CPSES scaling effort serves to compile this information in one document and to maintain it current by incorporating changes as the design evolved.

The audit team verified through document review and interview that:

- Hardware related aspects of the scaling calculations are satisfactory and adequate to meet technical requirements.
- The scaling calculations and their technical content are viewed by the user (i.e., Operations I&C) to be adequate for the intended purposes.
- There have been no significant errors relating to instrument system configuration and scaling detected during Hot Functional and other system tests.

Technical training has been accomplished by the following means: (1) on-the-job training where engineers new to the program were tutored by experienced engineers, (2) selected individuals were trained by Westinghouse in scaling methodology and application, and (3) Operations I&C (the scaling calculation users) was trained by Westinghouse and the TU Electric Training Department in maintenance and installation of the Westinghouse instrumentation. The audit team verified that a high level of competence currently exists among the scaling calculation preparers, particularly with respect to understanding Westinghouse engineering design requirements.

Part a)

The audit team verified that a SWEC engineer involved in the production and review of scaling calculations failed to fully understand the nature of the NPL timer modules and consequently did not adequately detail the logic requirements in a change (i.e., DCA) to the Auxiliary Feedwater System controls. The engineer incorrectly assumed that Westinghouse provided both time-to-pick-up and time-to-dropout timer modules similar in function to those provided by most other timer manufacturers. The engineer had asked for a drop out; however, Westinghouse timers only provide a pick-up function. An audit finding was identified addressing the incomplete DCA circuit description.

This DCA was not implemented and is currently being revised. The audit team requested that Operations I&C conduct a bench test of the timer module as described in the DCA. This test demonstrated that the timer logic described in the DCA could not have been physically implemented and consequently would have been routinely referred back to Engineering for resolution. The audit team found no other examples of an inadequately or incorrectly engineered DCA.

Part b)

An audit finding was identified concerning the lack of adequate scaling calculation reference to the Programmable Read Only Memory (PROM) Library which contains the coding for each uniquely configured PROM. One of the IWDs also failed to reference the PROM Library. This audit finding indicates that in some cases there is no direct traceability between the

PROM Library, the IWDs, and the scaling calculations; however, the audit team confirmed that there is indirect traceability of PROMs but this is a laborious process. While this finding does not call into question the acceptability of the installed PROMs or the ability to trace them, it does reflect the difficulties in tracing PROMs in the absence of direct references in documentation.

PROMs are utilized on a small number of printed circuit cards in CPSES instrument loops. They are utilized on NPL and NTD cards and approximately 30 PROMs are in use in safety-related instrument loops. The audit team verified that PROMs have distinguishing physical features which indicate the required mounting orientation and, further, that a warning is contained in the Westinghouse Equipment Reference Manual regarding the need to ensure proper physical orientation of these devices. The audit team verified that pre-programmed PROMs furnished by Westinghouse for both the NPL cards and the NTD cards contain identifying markings which differentiate between various control system logics.

Part c)

The audit team identified a finding against the scaling calculations for failure to identify the specific model of timer required. Four types of timer modules are produced by Westinghouse, none of which are interchangeable. The audit team found no indication, however, that the wrong type of timer was installed in the field.

Part d)

As mentioned in Part b) above, PROMs are in limited use at CPSES. They are individually programmed and mounted by the same technician and, based on audit results, appear to have been properly controlled. The auditors confirmed through interviews that dropped, damaged, or indeterminate PROMs have been appropriately discarded. General PROM-related instructions are contained in the applicable Operations I&C Work Orders. A more appropriate practice would be to generate PROM-specific procedures delineating requirements for documentation, programming, and physical identification of these devices. An audit finding was identified concerning the lack of a PROM-specific procedure which describes the programming and marking of these devices.

In summary, the Westinghouse design of instrument systems provides an adequate engineering basis for preparation of CPSES scaling calculations. Personnel training was also determined to be adequate and has resulted, with one exception (see Item 5a) above), in satisfactory design products. Findings were identified by the audit team involving (1) calculation references, (2) an incomplete DCA circuit description, and (3) the lack of a PROM-specific procedure which specifies requirements for programming and physical marking of PROMs. These findings are considered to represent isolated noncompliances with Appendix B Criteria III (Design Control) and V (Instructions, Procedures, and Drawings). No noncompliances with Appendix B Criteria II, VI, VII, VIII, XVI, and XVIII as suggested by CASE were identified.

Item 6)

The audit team concluded that setpoint values, setpoint references, and revision levels as stated in the scaling calculations are generally satisfactory. In most calculations reviewed, the setpoints properly referenced either the PL&S, a setpoint calculation, or a mechanical system DBD at the appropriate revision level. A finding was identified involving two calculations in which an inappropriate reference source or revision level had been used; however, the correct setpoints had been utilized in the calculations. This is contrary to SWEC Procedure EAP 5.3, "Preparation and Control of Manual and Computerized Calculations (Nuclear)," and is considered to represent isolated examples of noncompliance with Appendix B Criterion V (Instructions, Procedures, and Drawings). No noncompliances with Appendix B Criteria III, XVI, XVIII, as suggested by CASE were identified.

Item 7)

A finding was identified concerning the adequacy of references for several types of input data (e.g., gains, bias and transfer functions). The audit team, by familiarity with the calculation process, was able to determine appropriate sources of input data and verify that in all cases the actual values used in the calculations were correct. It appears that the calculation preparers have been properly trained in the selection of data and methodology to perform the calculations; however, the lack of specific references for individual pieces of data is an impediment to the review of calculations and is contrary to the requirements of SWEC Procedure EAP 5.3. The lack of specific references is contrary to SWEC Procedure EAP 5.3 and is considered to represent noncompliance with Appendix B Criterion V (Instructions, Procedures, and Drawings). No noncompliances with Appendix B Criteria III, XVI, and XVIII as suggested by CASE were identified.

Item 8)

Except as noted below, the audit team found that the "Confirmation Required" process has been properly and appropriately applied in the scaling calculation effort. There is no evidence that the "Confirmation Required" process has been used to issue incomplete and/or inaccurate calculations or to otherwise circumvent existing project controls. Project Procedure PP-009 has been meticulously followed for the removal of "Confirmation Required" items and for revision of calculations.

It appears that there may have been an unnecessary use of "Confirmation Required" in one calculation. This minor misuse of the process had no effect on calculation results. A review of an additional forty scaling calculations prepared for other redundant instrumentation loops similar to those addressed in this one instance indicates that "Confirmation Required" items are consistent and appropriate.

One other calculation was found designated as "No Confirmation Required"; however, the cover sheet indicated "Confirmation Required" for one item. A finding was identified addressing these conflicting statements. This is contrary to SWEC Procedure EAP 5.3.

In summary, the audit found no evidence that the "Confirmation Required" process has been used for purposes of issuing either incomplete or inaccurate scaling calculations. The minor inconsistency discussed above is considered to be an isolated noncompliance with Appendix B Criterion V (Instructions, Procedures, and Drawings). No compliance with Appendix B Criteria I, II, and III as suggested by CASE were identified.

Item 9)

Design review of draft documents (i.e., drawings, specifications, and calculations) is a practice employed by SWEC to provide early design verification input into the engineering design process. These reviews are accomplished in accordance with SWEC Procedure EAP 5.3 and documented accordingly. The final version of these documents are again reviewed to: 1) ensure that comments and questions identified during the initial draft review have been addressed and resolved to the reviewer's satisfaction, and 2) evaluate any changes made subsequent to the initial draft version. The date of the reviewer's signature merely indicates the date that the total review process has been completed and the final document(s) judged to be correct. The audit team has reviewed a sample of scaling calculation packages and confirmed that the process of reviewing draft documents is satisfactory and meets the intent of SWEC Procedure EAP 5.3. No noncompliances with Appendix B Criteria were identified.

Item 10)

Contrary to the CASE contention, the audit results do not provide evidence "that SWEC concentrated on scaling calculations only." Rather, the audit results indicate that the SWEC calculation effort ensured the validity of input data. The need for additional updating of reference documentation is, however, acknowledged (see Item 7) above).

Mr. Streeter discussed with Messrs. Brian Haynes and Gayle Creamer the purpose of the December 1986 meeting referred to by CASE. They stated that the meeting was to discuss the transition of responsibility for the scaling calculation effort from Gibbs and Hill to SWEC. Mr. Haynes recalled Mr. Bodiford discussing how Gibbs and Hill had approached the task and status of the Gibbs and Hill effort. It appears that the scope of the task, including the updating of supporting documentation, was also discussed. Messrs. Haynes and Creamer indicated that to their knowledge there were no minutes of the December 1986 meeting.

It appears that the direction given to SWEC was not for the purpose of obtaining prompt action to a problem, but rather it was for the purpose of defining a task that had to be completed prior to fuel load. It also appears that TU and SWEC periodically discussed and assessed SWEC progress on completing the assigned work task. However, when Mr. Bodiford left CPSES and registered his concerns to SAFETEAM, TU provided written direction to SWEC as to the actions that were expected of SWEC to complete the scaling calculation effort, including resolution of all known scaling calculation issues. Therefore, Mr. Love issued his May 10, 1988, memorandum to SWEC.

The implication of Item 10) is that corrective action directed by TU Electric in December 1986 had not been taken. This is the same issue discussed in Item 1) above. Therefore, this matter is not discussed further here except to say that the actions were implemented by SWEC as part of the overall completion effort and had not been singled out for special attention. This approach was not in noncompliance with any Appendix B requirements; however, the failure to track the NCB and NCH card issues to assure effective resolution is considered a noncompliance with Appendix B Criterion V (Instructions, Procedures, and Drawings) as discussed in Item 1) above. No noncompliances with Appendix B Criteria I, II, III, VI, VII, XVI, XVII, and XVIII as suggested by CASE were identified.

Diary Review, pages 17 - 18

The audit team has investigated the statement by Mr. Bodiford that wide range RDF/RTD serial numbers are incorrect. These RTDs are unique and must be serialized as well as "linearized" by applying appropriate correction factors contained in a table to obtain an accurate reading. Audit results indicate that the original CPSES RTDs furnished under the NSSS scope of supply and, which are identified by unique serial numbers, were sent back to the vendor for recalibration. The Unit 2 RTDs, with different serial numbers, were then transferred to Unit 1 via Permanent Equipment Transfer (PET).

The audit team reviewed the scaling calculation which contains the serialized RTDs. The numbers from this calculation matched those on the PET. The serial numbers and "linearization" tables in the calculation were then checked against the values in Appendix F to the TU Electric Scaling Calculation Manual (referenced in the calculation) and were found to be in agreement. The only inconsistency noted in this review was that the original RTD serial numbers and linearization values contained in WCAP-9696 have not been updated. However, none of the documents reviewed makes reference to WCAP-9696 as the data source for serial numbers; consequently, no audit finding was issued.

Diary Review, pages 19 - 20

The purpose of the Technical Audit Program is to provide a level of confidence that the Corrective Action Program for assuring the quality of CPSES Unit 1 design and hardware was effectively executed. The TAP was designed to accomplish this purpose using a performance-based approach utilizing 10CFR50 Appendix A as the acceptance criteria for the technical effort and 10CFR50 Appendix B as the criteria for determining programmatic and procedural adequacy. All deficiencies identified in the TAP can be traced back to the Appendices of 10CFR50.

The Technical Specialists associated with the TAP were selected on the basis of the following principal criteria:

- A demonstrated expertise in a specific engineering discipline (or disciplines) involved in the Corrective Action Program including the capability to perform, as well as overview, the specific

technical functions and activities which they were assigned to evaluate.

- Complete independence of the activity which they were to evaluate. Each assigned specialist was confirmed to have had no prior association or responsibility for any portion of the work to be audited.

The Technical Specialists utilized in the TAP audit and surveillance process averaged over twenty years of design engineering experience, more than fourteen years of which involved nuclear power plant engineering design. Approximately fifty percent of these Technical Specialists were involved in one or more aspects of the CPSES Design Adequacy Program thus gaining valuable experience in performing critical design oversight assessments.

To assure that the TAP oversight effort was carried out within an appropriate Appendix B framework, each audit was managed by an Audit Team Leader qualified per ANSI N.45.2.23 and experienced in nuclear power plant quality assurance activities. The integration of Technical Specialists into the audit process was further enhanced by the assignment of two full-time senior advisors, each having extensive management experience and expertise in nuclear quality assurance program activities. The effectiveness of this arrangement is best illustrated by the nature and depth of issues and findings raised since the TAP was established in early 1987, many of which have resulted in fundamental changes and improvements in the overall Corrective Action Program design validation process.

The findings of the TAP audit are considered to represent noncompliances with 10CFR50 Appendix B Criteria III (Design Control) and V (Instructions, Procedures, and Drawings). The nature and substance of the findings are not considered unusual given the scope and depth of the team's effort. The majority of the findings appear to be isolated occurrences having little, if any, impact on the acceptability of CPSES scaling calculations. No breakdown in either the CPSES Appendix B Quality Assurance Program or in the implementation of any of the program criteria was observed. On the basis of this exhaustive review and the absence of any substantive findings, there is no basis for issuance of a Stop Work Order. Existing processes and procedures are more than adequate to assure that appropriate corrective and preventive actions are taken to address each of the audit team's findings and recommendations.

<u>General Concluding Comment 1), pages 21-22</u>

Past audits and surveillances were reviewed to determine whether they adequately addressed the scaling calculation effort. The scope and content of these audits and surveillances, as well as effectiveness of corrective actions resulting from prior audit and surveillance findings, appear reasonable and appropriate.

<u>General Concluding Comment 2), pages 22-23</u>

This matter is addressed in Item 5a) above.

General Concluding Comment 3), page 23

CASE asserts that Mr. Bodiford stated that a general intimidating atmosphere existed in Mr. Bodiford's department during the time of his employment at CPSES and that no action has been taken to remedy that situation. Mr. Streeter recently spoke to an individual who worked with Mr. Bodiford as a scaling engineer at CPSES. The engineer stated that while there was an emphasis on schedule that was at times uncomfortable, SWEC management continually emphasized that schedule was not to take priority over quality. While it may have been an uncomfortable situation, this individual emphasized that, to his knowledge, quality of the design product was never knowingly compromised to achieve schedule objectives.

CASE refers to a recent comment purportedly made by a CPSES employee that he was "directed to sign off a document under duress by [his] supervisor." Mr. Streeter determined the source of this comment and interviewed the individual. This is the same SWEC employee mentioned above. Mr. Streeter has concluded that either the exact statement as reported by CASE or a very similar statement was made in which the word "duress" was used. However, the person stated that he did not intend by the use of that word to convey that he was pressured by his supervisor to sign off or approve work that he believed to be incorrect. Rather, he was trying to explain that management had directed that certain calculations were to be revised to resolve an audit finding, and he did not want management to think that his signature on a revised scaling calculation represented a complete review of the calculation when in fact his review was limited to only the revised portions of the calculation. He indicated that once he had resolved that matter with his management, he had no concern about signing the revised calculations. He further stated that he had never signed or endorsed any design document that he believed to be incorrect.

In summary, there was schedule emphasis which apparently was perceived by Mr. Bodiford as an intimidating atmosphere. However, that perception was not shared by all employees and the technical acceptability of the scaling calculations provides ample evidence that the schedule emphasis did not detract from the technical quality of the work.

Conclusion, page 24

We agree that the majority of the items discussed above were known to TU Electric and SWEC in late 1987. We also agree that some of the items are not complete as of this date. However, in general, we are of the view that the project was responsive in addressing the items. In regard to CASE's contention that the recent TAP audit verified that programmatic deficiencies indicated in TU Electric Letter NE-19097, dated May 10, 1988, were . . . "not even addressed . . . much less corrected," that statement is simply not correct. While the TAP audit was not structured to address the issues raised in the referenced TU Electric letter, the audit coincidentally confirmed partial or complete implementation of most of the actions directed by CPE, and only resulted in three minor findings that directly correspond to NE-19097. Additionally, the review effort described in Item 1) above indicates that most of these actions were properly tracked and addressed. We acknowledge that in two instances

(i.e., NCB and NCH issues) the thoroughness and effectiveness of the followup to these items has not been entirely satisfactory. Although the impact of these particular items appears to not be significant, a Corrective Action Request was conservatively issued by the Director, Quality Assurance on October 6, 1989, to fully address these instances. Due to the extensive measures undertaken to validate the CPSES design, we do not expect resolution of the CAR to reveal significant programmatic, design or hardware issues that have not been previously addressed.

We do not agree with CASE's contention that Audit ATP-89-1465,". . . . verified the repeated failure of the scaling calculation/ documentation review program to perform adequately and fulfill its intended purpose." While the TAP audit identified a number of generally isolated findings, they do not impact on the acceptability of the CPSES scaling calculation effort. The nature and substance of the audit findings identified are not considered unusual given the scope and depth of the audit effort. The auditors were able in each instance to trace and verify the sources of input data and, further, verified the actual input values used in the calculations were correct. The Scaling Calculations Action Plan which was forwarded to CASE with TU Electric's letter of September 25, 1989, will assure that all inputs used in the scaling calculation effort are identified; reviewed for applicability; updated, as appropriate; and a traceable link established to each calculation. These actions will ensure that documentation-related shortcomings associated with the scaling calculation effort are fully and effectively corrected.

In summary, the results of TAP audits and surveillances, as well as other management reviews undertaken to address the scaling calculation effort, indicate adequate programmatic control and satisfactory technical products. Although the need for improvements is indicated, the collective results of our review of the issues set forth by CASE cannot, in any reasonable fashion, be accurately characterized as a programmatic breakdown necessitating the issuance of a stop work order. We strongly disagree that the evidence meets the provisions of Paragraph 6.1.5 of our stop work procedure (NEO 3.25) or any other provision of that document.

TU ELECTRIC

LOG # LIT-90/659
FILE # 10086

January 5, 1990

William G. Counsil
Vice Chairman

Juanita Ellis, President
Citizens Association for Sound Energy
1426 S. Polk Street
Dallas, Texas 75224

Dear Mrs. Ellis:

This is to summarize our understanding of the status of CASE Concerns and reiterate our request that you furnish us with a definition of CASE Concerns, if any, that you believe could impact a licensing decision for CPSES.

As we now understand it, there are a total of fifty-eight (58) broad areas of concerns on CASE's list, some of which may consist of a number of individual concerns. Thus far, we have received a total of five (5) CASE concerns, which represent three (3) broad areas plus two (2) of the four (4) identified individual concerns within a fourth broad area (CASE Item 89-0027). We have answered in writing and in detail all five (5) of the concerns we have received to date. In addition we have answered a CASE dispute on scaling calculations, which, we assume, encompasses a fifth broad area (CASE Item 89-0030). Thus, there remain unanswered on CASE's list fifty-three (53) broad areas of concern plus two (2) individual concerns within CASE Item 89-0027, or a total of fifty-five (55) listed concerns. Our assessment has enabled us to group these fifty-five (55) listed concerns into the following categories: 1) ten (10) concerns are insufficiently defined for development of an answer, but the titles seem to be sufficiently specific to enable us to assemble pertinent background documentation; 2) sixteen (16) concerns seem to have no possible hardware safety impact for CPSES Unit 1 Licensing; and 3) twenty-nine (29) concerns are impossible for us to define. Examples of the second category are "U/2 Enhancements" (Item 89-0019) and "Scaffolding" (Item 89-0035). The third category contains concerns defined only as "Maintenance", "SAFETEAM", etc. We have coded the CASE list with the aforementioned categories for ease of reference (Enclosure A).

As we understand it, except for those matters now under Dispute pursuant to Paragraphs B.3 through B.5 of the Joint Stipulation,

or the item of "potential" dispute (Root Cause), you do not anticipate that any of the concerns would be an impediment to a licensing decision.

While we recognize that CASE has directed its recent priorities toward the existing Disputes and internal matters, we nevertheless remain concerned that there should be no last-minute submission of Concerns now on CASE's list that are now or have been susceptible to definition. As we have made repeatedly clear, our people have been organized and ready to receive, investigate, and answer CASE concerns. These same people are key players in plant completion and readiness, and it would severely impact the orderly completion and readiness for operation of Unit 1 if these people were forced to shoulder an additional last-minute deluge of work. Moreover, it would seem counter to the spirit of the Joint Stipulation and to our mutual hope and expectation that the Joint Stipulation would provide a constructive and efficient vehicle for resolution of CASE's concerns.

As you will no doubt recall, the April 7, 1989 letter from George Edgar to you outlines the mutual understandings which CASE, TU Electric, and NRC reached concerning our respective interactions. On that basis, it is expected that CASE will bring issues to TU Electric's attention in the first instance, and that CASE will only go directly to the NRC when expressly authorized by CASE management. This translates into the proposition that a concern shared between TU Electric and CASE is not a matter that should impact an NRC licensing decision, unless NRC has independent reason to share the concern. Of course, any concern held only by CASE and not shared with TU Electric in the first instance, nor given to the NRC by or with the authorization of CASE management, should similarly not impact a licensing decision. We believe that these agreements have worked reasonably well and we trust that they will be upheld.

We should also be mindful of our mutual agreement with the NRC that nothing in the Joint Stipulation is in any way intended to change the NRC Staff's established decision-making processes. In that regard, if last-minute concerns were ever received directly by the NRC, we would expect the Staff to apply the standards in its established allegations policy; namely, that there is no basis for holding a licensing decision for a late filed allegation, unless it raises a material issue that is new and particular to CPSES Unit 1, and has a sufficient, specific basis to raise legitimate doubt as to plant safety.

All of the foregoing is to more fully explain the basis for our ongoing concern and to reiterate our request for information.

While we take some comfort in your assurance that any potential "show stoppers" are now the subject of known formal or "informal" disputes, we wish to know about any significant concerns and to answer them. When any concerns are released to us we will be prepared to support any meetings that may be advisable. We would appreciate being advised immediately if our assessments of the status of CASE Concerns as summarized in Enclosure A, or the understandings as stated above, are in any way incorrect.

Very truly yours,

W. G. Counsil

Enclosure A - Coded CASE Concerns List

cc: Billie P. Garde, Esq.
Christopher Grimes
Janice Moore, Esq.

CODED CASE CONCERNS LIST

Concern	Title	Category
89-0001	Cold Hydrostatic Test Issues Open (CI 89-0001)	*
89-0002	Welder Certification Renewal Process	3
89-0003	WPS/Revisions not verified by QC	*
89-0004	Weld Rod Control (Caddies)	3
89-0005	Stop Work Order Process	2
89-0006	Open Items	3
89-0007	Documentation Review	3
89-0008	Bolt/Fastener Issue	1
89-0009	10CFR50.55(e) Reportability Process	2
89-0010	Use of PT after use of flapper wheels	1
89-0011	Maintenance	3
89-0012	Emergency Lighting	1
89-0013	Fire Extinguishers	2
89-0014	Manpower vs QA/QC Production	2
89-0015	QA Program (collective issues)	3
89-0016	Audit Scope (to effectively assess project)	2
89-0017	Deficiencies closed in process without paper	3
89-0018	Prerequisite/Preoperational Test Program	3
89-0019	U/2 Enhancements	2
89-0020	NCIG Documents/VWAC	1

* Response provided to CASE concern

Concern	Title	Category
89-0021	Near Term Operating Mode	2
89-0022	Drawings	3
89-0023	Thread Engagement (Specification vs. Safety)	1
89-0024	Corrective Action Program	3
89-0025	Welds in Steam Generators	3
89-0026	Replication/PT Process	1
89-0027	Alleger Concerns:	
	MIG vs. Stick	*
	Falsification of Records	*
	Lighting	3
	Grounding	2
89-0028	10CFR Part 21	2
89-0029	Borg-Warner Valves (back-leakage & swing arms)	1
89-0030	Bodiford Audit Issues	**
89-0031	Teflon Tape Issue	*
89-0032	QA on JTG (review of procedures/processes)	2
89-0033	I & C shop	3
89-0034	Cable pulling/wire stripping	3
89-0035	Scaffolding	2
89-0036	Comparison of EPRI and CB&I Procedure	1
89-0037	Closure of Deficiency Paper	3
89-0038	Reporting of Deficiencies	2
89-0039	Service Water	1

* Response provided to CASE concern
** Bodiford Audit Issues addressed in TU Response to CASE Dispute on Scaling Calculations

Concern	Title	Category
89-0040	ILRT/Audit Results	3
89-0041	Reactor Coolant Pump Casing	3
89-0042	M&TE Equipment Lab	2
89-0043	Temporary Modifications	3
89-0044	Response to PODs (audits)	2
89-0045	Numerous Record Deficiencies (to be addressed as separate CASE concerns)	3
89-0046	Numerous out-of-scope audit CASE findings (known to auditor/TU) and to be addressed as separate CASE Concerns	1
89-0047	HVAC	3
89-0048	NRC Inspection Report 84-32 "Historical Inadequacies of TU Quality Audit Program"	2
89-0049	Coatings	2
89-0050	Intimidation and Harassment (workers)	3
89-0051	Electrical	3
89-0052	Piping/Pipe Supports	3
89-0053	Improper Valve Replacement	3
89-0054	SAFETEAM	3
89-0055	QC Holdpoints	3
89-0056	SDARs	3
89-0057	Corporate Security	3
89-0058	Test Matrices	3

TU ELECTRIC QA TECHNICAL AUDIT REPORT

ATP-89-1465

SCALING CALCULATIONS

CPSES SITE

AUDIT DATES: August 21 through September 28, 1989

AUDIT TEAM:

W.	J.	STURTZ	:	AUDIT TEAM LEADER
B.	E.	SCANGA	:	AUDIT TEAM LEADER
T.	L.	MCLEAN	:	TECHNICAL SPECIALIST
H.	.	CHOUDHRY	:	TECHNICAL SPECIALIST
K.	A.	MARDIROSIAN	:	TECHNICAL SPECIALIST

AUDIT STATUS: OPEN

PREPARED:

W. J. STURTZ
AUDIT TEAM LEADER

APPROVED:

D. L. LANSTROM
SUPERVISOR, TECHNICAL AUDITS

ATP-89-146S

EXECUTIVE SUMMARY

The audit of scaling calculations related to the Westinghouse 7300 Process Instrumentation System was performed from August 21, 1989 through September 28, 1989 at the CECO offices on the CPSES site in Glen Rose, Texas.

PREFACE:

The Westinghouse 7300 Process Instrumentation System is considered to be a mature system since it is installed and operating in a number of nuclear facilities worldwide. The CPSES system was designed, fabricated, assembled, and tested by Westinghouse under their QA program. Documentation including Equipment Reference Manuals; the Scaling Manual, the Precautions, Limitations and Setpoint Document (PL&S); and Interconnection Wiring Diagrams was sent to the site to facilitate the understanding of the system. In the 1982 time frame the project decided that a document was needed which provided necessary instrumentation calibration and setup information in a concise useable format. The scaling calculation evolved as the document to fill that need. Scaling Calculations are not calculations in the classical engineering sense. These documents, which are unique to CPSES, are primarily a compilation of information derived from several sources that is assembled in one document for the convenience of the user. The average scaling calculation contains approximately 100 discrete bits of information necessary for the proper calibration of the loop, less than 20% of which are actually calculated or derived. This is not meant to indicate that scaling calculation preparation is simplistic; on the contrary, a thorough understanding of electronics and the Westinghouse system and components as well as documentation reference sources and drawings is a prerequisite.

Scaling is the process of determining the adjustments to the process instrumentation which will correctly convert plant variables (e.g., temperature, pressure, etc.) from engineering units (°F, psig etc.) to equivalent analog voltages. The Westinghouse 7300 process instrumentation system utilizes these voltages to perform protection and control functions for both the Nuclear Steam Supply System (NSSS) and Balance of Plant (BOP) systems. To achieve these functions instrument loops are configured using a series of printed circuit boards (cards) which modify (condition) an incoming signal to give a desired output. Examples of common card types are: NPL - PROM Logic Card which provides logic gates (i.e., "AND" and "OR" functions); NSA - Summing Amplifier Card which adds or subtracts incoming signals and applies gain (amplification) to the result; NCH - Characterizer Card which provides square root and "curve fit" functions; and NAL - Signal Comparator Card which compares an incoming signal with a predetermined "setpoint" and changes state (on or off) when the setpoint is reached.

In the 7300 systems cabinets the incoming field signal is converted to a 0 - 10VDC range signal which is acted upon by the various instrument loop cards. The signal may ultimately be used for: control room indication and alarm, input to the plant process and emergency response computers, input to other instrument loops, or utilized for protection and control (e.g., trip the reactor, start the auxiliary feedwater pumps, isolate the containment, initiate safety injection, etc.). One of the functions of the scaling calculations is to describe each card in the instrument loop and provided critical parameters such as setpoints, card gain and bias, as well as application unique card configuration changes for plug-in components such as resistors, jumpers, and PROMs. The end user of the calculations is the Operations I&C Calibration group which applies the information in the scaling calculation to configure the installed instrumentation.

EXECUTIVE SUMMARY

AUDIT PURPOSE:

The purpose of this audit was to verify the technical adequacy and programmatic aspects of the CECO scaling calculation effort.

AUDIT SCOPE:

The audit scope consisted of 15 preselected scaling calculations, five of which were safety related and 10 of which were non-safety related. Both Nuclear Steam Supply System (NSSS) and Balance of Plant (BOP) calculations were included in the audit sample. Where a larger sample was required to address a specific issue, additional calculations were reviewed for appropriate attributes. Calculations which provided inputs to or outputs from the audited calculations were partially reviewed. Additionally, the audit team reviewed the engineering documents which provided sources of input data to the scaling calculations. A number of scaling calculation related issues which became subjects of concern during the audit were also investigated.

AUDIT RESULTS:

The review of the sample of scaling calculations was comprehensive and detailed. Specific scaling calculation content and format is contained in Project Procedure PP-009, Attachment B (Preparation and Control of Scaling Calculations). SWEC Engineering Assurance Procedure EAP 5.3 (Preparation and Control of Manual and Computerized Calculations) contains guidelines for preparation and review of calculations. The data utilized in the preparation of scaling calculations is taken from several sources. NSSS setpoints are obtained from the Westinghouse Precautions, Limitations and Setpoint Document. BOP setpoints are obtained from setpoint calculations or system DBDs. Scaling methodology and the derivation of transform equations are contained in the Westinghouse Scaling Manual. Component specific data (i.e., resistors required or removed, jumpers required, gain and bias settings) are found in the Westinghouse Equipment Manual. Data relating to indicators, transmitters, and recorders are contained in Westinghouse Shop Order specification sheets. Instrument hydraulic head corrections, linearization of RTDs, and component accuracies are found in the Appendicies to the CPSES Scaling Calculation Manual. Instrument loop components and configuration are found in the Westinghouse Interconnection Wiring Diagram (IWDs) and Process Control Block Diagrams (PCBDs).

Each of the 15 scaling calculations examined was checked against the referenced drawings and documents for the following attributes:

a. Administrative Control
   - that the calculation safety classification is appropriate.
   - that the signatures and dates of preparers and reviewers are in accordance with procedures.
   - that the "Confirmation Required" removal process is correct and in accordance with procedures.

b. Purpose - that the calculation adequately describes the purpose of the instrument loop.
c. Scope - that devices within the instrument loops are listed and contain appropriate tag numbers, model numbers, and group numbers.
d. Reference Documents - that the engineering premises and input data utilized in the calculations are appropriately referenced.
e. Calculation - that sensors, cards, indicators, signal comparators have appropriate inputs, outputs, accuracy, location, scale, jumpers, and resistors, and are included in the calculation

EXECUTIVE SUMMARY

as required by loop function. Further, that mathematical manipulations and data from references were performed and/or transcribed correctly.

f. Figures - that Functional Block Scaling Diagrams (figures) contain the correct devices numbers, setpoints, location, and function and are consistent with reference documentation.

g. Westinghouse Inputs - that design changes to IWD and Instrument and Control Drawings (ICD) have been referenced in the calculations; further that Field Change Notices (FCN) and changes to Westinghouse input documents have been included or referenced in the calculations.

The above attributes, as applicable to each calculation, were investigated by review of associated IWDs, ICDs, Westinghouse Equipment Reference Manuals, Scaling Manual, the PLAS, specific Westinghouse Project Transmittals (WPTs), Process Control Block Diagrams (PCBDs), and other pertinent documents. In order to verify the appropriateness of inputs to and outputs from a calculation under review, it was occasionally necessary to check other calculations, references, and drawings.

The overall results of the audit indicate that the scaling calculation effort is appropriately managed and controlled; that calculation preparation methodology, although not fully documented, is adequate in that it has produced useful and technically acceptable end products; and that the calculation information is presented in a form which is acceptable to the user organization (i.e., Operations I&C). The audit team verified that a high level of competence currently exists among the scaling calculation preparers, particularly with respect to understanding Westinghouse 7300 Process Instrumentation System design requirements. No significant errors relating to instrument system configuration and scaling were detected during hot functional and subsequent preoperational tests. The calculations are judged to be technically correct, and with the exception of references to input data sources, have generally been prepared in accordance with the applicable procedures.

Notwithstanding the generally satisfactory nature of the scaling calculations, certain programmatic shortcomings were identified during the course of the audit as follows:

- References - The scaling calculations contain data extracted from multiple reference sources as well as values which must be calculated based on equations and data contained in yet other reference sources. Audit results indicate a lack of clear and readily traceable references to data and required equations (i.e., transform functions) contained in many of the scaling calculations examined. SWEC Engineering Procedures require that the source of input values, computations, explanatory text, and diagrams leading to the results be clearly identified in the calculations. The lack of adequate references and explanatory information, in many instances, resulted in the need for recourse to the calculation originator in order to understand the methodology used in the calculation (see Deficiency No. 89-1468-01). In all cases, however, references were verified, and design input values used in the calculations were found to be correct.

- Calculation Preparation Guidelines - There is no single CPSES document which provides an overall description (or "road map") for the preparation of scaling calculations, addressing input sources, assumptions, engineering premises, equipment references, and calculation content and methodology. DBD-EE-052 contains some direction on calculation format, while the Scaling Calculation Manual (1-SC-4800) contains scaling philosophy and specific component data; however, these documents neither individually nor collectively provide overall program definition and procedural direction governing the preparation of scaling calculations (see Deficiency No. 89-146-02). Even without a written overall program description, the actual practices, procedures, and controls used in the production of scaling

calculations were found to be satisfactory and have resulted in technically accurate and acceptable end products.

- Programmable Read Only Memories (PROMs) - Westinghouse 7300 System NPL and NDT cards contain PROMs, which are physically identical electronics components used to implement required control system logic. While these devices look the same and are physically interchangeable, they can (by design) contain different electrical circuits. Also, the PROMs are not permanently affixed to a circuit board (either by soldering or crimping) and can be removed for replacement purposes. Changes in system design require that new PROMs be programmed to reflect the specific change in circuit logic.

  The auditors found that individually programmed PROMs are not consistently identified within the various design documents (i.e., the Scaling Calculation, IWD, and the PROM Library). Additionally, there is no PROM-specific procedure which describes controls for programming, verification, or physical identification of PROMs (see Deficiency No. 89-146S-09).

  The Westinghouse NPL cards can also contain timer modules used to implement time delays where required in the control system. The scaling calculations do not explicitly specify the type of timer module to be used (see Deficiency No. 89-146S-04).

  An additional timer related issue was found involving a DCA used to modify the Auxiliary Feedwater (AFW) system "trip to auto" logic. The DCA in question failed to properly describe the required timer circuit. Although the DCA was incorrect in its description of the timer function, the audit team concluded, based on the results of an Operations I&C bench test, that the design modification could not have been implemented and would have been detected prior to implementation in the field. The DCA also failed to identify an appropriate "PROM Library" drawing on the changes made to the IWD (see Deficiency No. 89-146S-09).

In addition to the issues described above, the following documentation deficiencies were identified, none of which impacted the results of any of the scaling calculations examined:

- The use of the "Confirmation Required" process by the scaling calculation preparers was found to be appropriate and generally in accordance with the applicable procedures; however, investigation into the TU Administrative Services distribution process indicates that the "Confirmation Required" removal cover sheets for approximately 160 calculations were not distributed to the Scaling Document Control Center (DCC) (see Deficiency No. 89-146S-07).

  Also, the Westinghouse Project Information Package Master Index was not being updated by Administrative Services as required by Procedure ECE-3.19, Revision 2 (see Deficiency No. 89-146S-08); however, most Westinghouse documents (e.g., manuals, drawings, etc.) are available directly from the DCCs. Certain Reference documents, such as the PL&S and Instrument Specification Sheets, have not been fully entered into the DCC database; however, Westinghouse project transmittals containing design changes are reviewed by I&C Engineering for impact on scaling calculations.

- Several Westinghouse IWDs were found which contained handwritten annotations dating from 1983. The audit team verified that nine sheets of the total set (approximately 490 sheets) of IWDs developed by Westinghouse remain in the DCC system as "Approved-Except-as-Noted" (AEN) documents. Seven of these IWDs appropriately have DCAs written

EXECUTIVE SUMMARY

against them approving incorporation of the AEN annotation. The two drawings not presently covered by a DCA contain AEN annotations made by Gibbs and Hill during review and approval of the BOP instrumentation document package and depict wiring changes engineered by Westinghouse. The annotated drawings are technically correct and represent the installed hardware. The drawings, including annotations, had been reviewed and approved by both Westinghouse and Gibbs and Hill. The lack of a DCA initiated against these drawings is considered an isolated finding (see Deficiency No. 89-146S-06).

- Most of the Westinghouse NSSS IWDs reviewed during the audit have outstanding DCAs posted against them; some for extended periods of time. While lack of incorporation of the DCAs does not violate any site procedure, it does complicate the use of these drawings (see Observation No. 89-146S-01).

- Westinghouse documents were reviewed to assure that appropriate design data were being utilized in the preparation of sealing calculations. The Auditors observed that the Westinghouse Sealing Manual used in sealing methodology had not been updated since 1983. While no instances were found for which incorrect methodology or input data was utilized in any of the sealing calculations examined in the audit, there is a potential for error since the Sealing Manual is based, in part, on an outdated version of the Westinghouse PLASS document (see Observation No. 89-146S-02).

In addition to the programmatic and documentation-related shortcomings discussed above, the audit team identified 30 text discrepancies or inconsistencies in its review of the 15 preselected and 14 interfacing calculations. These text discrepancies/inconsistencies represent isolated findings involving inconsistencies within the calculations and/or reference documents, minor mathematical or transcription errors, inappropriate references, incorrect or missing notes, and notational errors in "Confirmation Required" statements (see Deficiency No. 89-146S-03). None of the specific discrepancies/inconsistencies identified during the audit impacted either final calculation results or the acceptability of field application.

AUDIT CONCLUSION:

The audit team finds that sealing calculations are being prepared in a generally satisfactory manner. Controls used in the preparation, review, revision, and application of these sealing calculations were also judged to be adequate. Improvements are required in the sealing calculation effort, particularly in the areas of references, treatment of PROMs, and guidelines for calculation preparation. Nevertheless, the deficiencies and observations identified in the audit do not appreciably detract from the adequacy of the overall sealing calculation program which was found to be producing technically correct and consistent calculations.

ATP-89-146S

AUDIT DETAILS

Meeting Attendees:

	Name	Organization-Title	Entrance 8/21/89	Exit 9/23/89	Exit 9/28/89
	D. Bisey	CBCO-Director	X	X	
	T. Baumgartner	CBCO-QA Program Manager	X		
	C. Benson	Westinghouse - Project Engineer	X		
	G. Bickford	CASE	X		X
	L. Bright	SWEC-Chief Engineer I&C		X	
	H. Bruner	TUE-Senior Vice President		X	
	R. Burnham	CBCO-Lead I&C Engineer	X	X	
	H. Carmichael	CBCO-Sr. Project QA Manger		X	
•	H. Choudhry	TU-QA Technical Specialist	X		
	C. Creamer	TUE-I&C Engineering Manager	X	X	
	W. Crisler	CBCO-QA - QA Supervisor	X		
	B. Gaste	CASE			X
	W. Eifert	SWEC-EA Chief Engineer		X	
	B. Haynes	CBCO-I&C Supervisor	X	X	
	C. Hogg	TUE-Chief Engineer		X	
	J. Kreching	TUE-Director, Technical Interface	X		
	J. LaMarca	TUE-Manager, Electrical I&C		X	
	S. McBee	TUE-Licensing Interface	X		
•	T. McLean	TUE-Technical Specialist		X	X
	D. Miller	CBCO-I&C QA Engineer	X	X	
	C. Nardella	CBCO-Asst. Project Engineer I&C		X	
	K. Norman	TUE-Supervisor, DCC		X	
	E. Ossey	CASE		X	X
	S. Palmer	TUE-Stipulation Manger	X	X	
	W. Parker	CBCO-Project Engineer	X	X	
	J. Pickett	TUE-OPS I&C		X	
	R. Polerino	CBCO-I&C Engineer	X	X	
	D. Quamme	SWEC-Vice President and Director, QA		X	
••	D. Ransrom	TUE-QA Supervisor, TAP	X	X	X
	P. Raymer	CBCO-Deputy Director	X	X	
•	B. Scaggs	TUE-QA Lead Auditor	X		
••	J. Severer	TUE-Director, QA	X	X	X
•	W. Sierra	TUE-QA Lead Auditor	X	X	X
	O. Thero	CASE	X	X	X
	S. Wrenn	TUE-TAP Supervisor	X		

Key:

• Audit Team Members
•• Management Support

ATP-89-146S

Deficiency No. 89-146S-01

Deficiency Title: Inadequate Input References in Scaling Calculations

Responsible Organization: CECO

Requirement:

EAP 5.3, "Preparation and Control of Manual and Computerized Calculations (Nuclear Projects)," Rev. 3 states:

1) Section 2.0 - "All manual and computerized engineering and design calculations shall be:

   - Prepared such that the analysis can be understood by an individual competent in the calculation discipline without recourse to the preparer of the calculation."

2) Attachment 1.4 - "The body of the calculation shall consist of all computations, along with explanatory text and diagrams, leading to the results. The following shall be included:

   Inputs (Including Sources)

   Input values (including units) and identification of the sources (see sample source reference below).

   - Technical Document - Document Number and/or Title; Issue Date; Revision Number, and Section, Page, or Table Numbers, if applicable."

Deficiency:

Contrary to the above, most of the scaling calculations reviewed exhibited one or more of the following deficient conditions (in many cases recourse to the preparer was required to understand the calculations):

1. Section 3 of the calculations contains reference to "Standard Reference Documents" in Section 2.0 of the Scaling Calculation Manual (1-SC-8800); however, Section 2.0 contains 29 documents, not all of which are applicable to any one calculation. Additionally, these references do not contain revision levels or dates, yet specific information contained in these documents (e.g., gain, bias values, etc.) was used in the calculations.

2. The body of the calculations does not contain specific input reference sources (e.g., document number, revision number, titles, issue date, section, page, etc.) for: module gain, bias, and input voltage; jumpers required or removed; or resistors required.

3. Input reference sources are not stated for module equations or transfer functions utilized.

4. Explanatory notes are not provided for mathematical manipulations performed nor are the manipulations shown.

5. Section 6 of the calculations contains the statement "For Loop Accuracies, see Scaling Calculation Manual Appendix H (1-SC-8800-1L, Rev. 1)"; however, Appendix H only provides guidelines for determination of loop accuracy values rather than providing actual loop accuracy values themselves. (A similar statement is made in Project Procedure PP-009, Attachment B, page 7, Paragraph E.)

6. Figure 1 of the calculations does not contain a reference for the source (e.g., Westinghouse Process Control Block Diagram, etc.) of the loop configuration.

Discussed with:

B. Haynes	CECO	I&C, Control Systems Supervisor
W. Hinton	CECO	I&C, Senior Engineer

ATP-89-146S

Deficiency No. 89-146S-02

Deficiency Title: Inadequate Scaling Calculation Preparation Guidelines

Responsible Organization: CECO

Requirement:

ANSI N45.2.11-1973, Draft 2, Revision 2, Section 4.1 states:

> "Design activities shall be prescribed and accomplished in accordance with procedures of a type sufficient to assure that applicable design inputs are correctly translated into specifications, drawings, procedures or instructions."

Deficiency:

Contrary to the above, design activities are not prescribed in sufficient written detail to define the relationship of the various source or reference documents utilized in the production of scaling calculations. Specifically, there is no single document which provides an overall "road map" for the preparation of scaling calculations which addresses input data sources, equipment reference manuals and calculation content and methodology. Neither DBD-EE-032, Scaling Calculation Manual (SC-8800) nor any of several other references provide the required overall procedural definition or guidelines for this activity.

Note: On the basis of its review, the audit team finds that practices and controls used in the production of scaling calculations are adequate as evidenced by the technical acceptability of the end products. Design drawings and reference data used as input were also determined to be appropriate. To ensure that future scaling calculation activities are continued on a sound and controlled basis, existing practices and controls need to be incorporated in an overall program description (or "road map") covering the entire scaling calculation process.

Discussed with:

B. Haynes	CECO	I&C, Control Systems Supervisor
W. Hinton	CECO	I&C, Senior Engineer

ATP-89-146S

Deficiency No. 89-146S-03

Deficiency Title: Inadequate Preparation and Review of Scaling Calculations

Responsible Organization: CECO

Requirement:

1) ANSI N45.2.11-1973, Draft 2, Rev. 2, Section 4.2 states in part:

"Design analyses. . . shall be performed in a. . . correct manner."

2) EAP 5.3, Rev. 3, Attachment 3.0, "Review Requirements," states:

"The signature of the reviewer(s) on the calculation page signifies that requirements of this attachment have been met."

Deficiency:

Contrary to the above, the calculation preparation and review process failed to identify the following errors, omissions, and inconsistencies which were identified during the audit of scaling calculations:

1. Calculation 1-SC-55-52, Rev. 4 shows relay card NRC8 as 1-TS/411F, whereas the referenced Westinghouse IWD 8810D31, Sheet 6 shows this device as TS/411E.

2. Calculation 1-SC-55-52 confirmation item 2 states "Westinghouse Instrumentation Sheets for Shop Order 320, 325 and 395. Revise to show current status." This note apparently applies to confirmation item 6 which relates to the revision of Section 2 of the Scaling Calculation Manual.

3. Calculation 1-SC-55-52, Rev. 4, page 20, Sections D-1 and D-2 reference Westinghouse Precautions, Limitations and Setpoints (PL&S), Rev. 2 as the source of the Lo and Lo-Lo TAvg. interlock setpoints. Rev. 3 of the PL & S was issued in January 1985. The calculation (issued 3/2/88) did not reference the latest revision of the PL&S.

4. Calculation 1-SC-55-72, Rev. 6, page 13 states that Vreset = Vsetpoint - 0.40 VDC. The -0.40 VDC value should be -0.04 VDC.

5. Calculation 1-SC-55-52, Rev. 4, pages 21 and 22 reference Westinghouse Scaling Manual Supplement, Rev. 2 as a source of setpoint values. This reference is not appropriate since it is based on Rev. 2 of the PL & S. Rev. 3 of the PL & S has been issued since Rev. 2 of the Scaling Manual (October 1983).

6. Calculation 1-SC-55-28, Rev. 5, Figure 1 shows device JY-410K as an NCH1 card, whereas DCA 88528 indicates that this device is an NCH4 card.

7. Calculation 1-SC-55-28, Rev. 5, page 8 states that Bench Calibration Accuracy for Summining Amplifier 1-JY-410A is ± 0.10% of span or ± 0.10 VDC. The span is 0 - 10 VDC, thus the correct value should be ± 0.01 VDC.

8. Calculation 1-SC-28-19, Rev. 4, page 11 improperly references a previous revision of the same calculation for the setpoint value for loss of feedwater pump speed rather than referencing a controlled, up-to-date source of setpoint data such as the PL&S or Instrument Setpoint List.

9. Calculation 1-SC-55-28, Rev. 5, page 8 calculates gain for NSA1 card 1-JY-410A as "RI = 50K ohms/0.1 = 500 K ohms, use 499 K ohms." No explanatory note was indicated for using a 499 K ohm resistor in place of the calculated value of 500 K ohms.

10. Calculations 1-SC-55-01, Rev. 8 and 1-SC-55-02, Rev. 7 are designated "No Confirmation Required"; however, Note 1 on the cover sheet states "Confirmation Required for values in Table 1 Breakpoints by W."

11. Calculation 1-SC-55-01, Rev. 8, page 5 for component 1-TY-0413M states that the output is 1.417 to 7.833 VDC. The 7.833 VDC value should be 7.783 VDC.

12. Calculations 1-SC-55-01, Rev. 8 (page 8) and 1-SC-55-02 Rev. 7 (page 8) for devices 1-PB-0403D and 1-PB-0405D state that the alarm setpoint is "greater than -20 psi Valve (close, hysteresis)." The notation "Valve (close, hysteresis)" does not apply to the alarm function.

13. Calculation 1-SC-55-02, Rev. 7, page 9 shows the output from device 1-TY-0413P as 1.417-7.783 VDC. The 1.417 VDC value should be 1.667 VDC as shown on page 5 of the calculation.

14. Calculations 1-SC-55-01, Rev. 8, and 1-SC-55-02, Rev. 7 page 7 use a deadband of 0.667% for bistables 1-PB-0403C and 1-PB-0405C. No justification or explanation was provided for the use of this deadband value.

15. Appendix H of the Scaling Calculation Manual (1-SC-8800-H), Rev. 1, page 10, Item 4 identifies an output accuracy +0.35% of span for NAL cards. All scaling calculations using NAL cards state that the output accuracy is + 0.25%. (A note on page 10 of Appendix H points out this discrepancy in Westinghouse reference documents.)

16. The level program "from" devices on page 22 (Figure 1) of Calculation 1-SC-28-23 and on Westinghouse Process Control Block Diagram 8758D39, Sheet 33, Rev. 5 are shown as 1-PY-0505X and 1-PY-505Y. Westinghouse IWD8810D35, Sheet 30, Rev. 7 shows these devices as PY/505X and PY/505Y, respectively.

17. Calculation 1-SC-28-23, Rev. 2 contains the following discrepancies:

    a) Westinghouse drawing 8810D35, Sheet 28 shows that the output of device 1-FY-0512 goes directly to device 1-FY-0509. The Figure 1 representation in the calculation shows the signal to 1-FY-0509 as being processed by device 1-FY-0510D before going to 1-FY-0509.

    b) The output of 1-FY-510E is shown on Figure 1 of the calculation as going to 1-FY-2181. Westinghouse drawing 8810D35, Sh. 29 shows this output as going to 1-FY-2181A.

c) Figure 1 shows output of bistable 1-FB-0510B is shown as "LO 0.7X106 lb/hr." Page 19 of the calculation shows this output as "HI 0.7 x 106 lb/hr."

d) Figure 1 of the calculation shows devices 1-LC-0519, 1-LC-0550, and 1-LC-0510 as NCB1 Cards, whereas Sheets 11, 12, and 14 of the calculation show them as NCB11 cards.

e) Page 12 of the calculation shows the input to 1-LC-550 as coming from 1-QY-0519, whereas the referenced Westinghouse IWD 8810D25, Sheet 27 shows this source as 1-QY-510.

f) Page 15 of the calculation shows bench calibration accuracy of device 1-FCY-0510 as 0.025 mV. This should be 0.025 VDC.

g) Page 15 also shows the NTD (1-LCY-0550) clock to be a T^2 output while the jumpers shown will give a linear clock rate.

18. Calculation 1-SC-49-01, Rev. 3 contains the following discrepancies:

a) The calculation references ICD-2323-M1-2295-12, Rev. 4 which is a voided document.

b) Appendix E of the Scaling Calculation Manual (1-SC-8800-E) is not referenced in the calculation as a source of the application notes for the NTD card.

c) Page 5 of the calculation contains no values for gain or bias setting for the NMD1 card used in the loop.

d) The calculation identifies a device on the Hot Shutdown Panel as 1-FK-0121A, whereas Westinghouse PCBD 8758D39, Sheet 27, Rev. 6 identifies this device as 1-FK-0121F.

19. Calculations 1-SC-37-18 and 1-SC-34-19 did not identify the jumper patterns required to implement the binary timer range code. Also, the characters 1000 and 0000 were not identified as binary codes.

20. Calculation 1-SC-28-19, Rev. 4 had "Confirmation Required" removed, yet the cover sheet was checked "Confirmation Required yes."

21. Calculation 1-SC-49-01, Rev. 3 lists the appropriate shop order number and specification sheets for the indicator, manual auto station, and orifice plate in the loop but fails to include the sheet revisions numbers for these components.

Discussed with:

B. Haynes	CECO I&C	Control Systems Supervisor
W. Hinton	CECO I&C	Senior Engineer
K. Grimm	CECO I&C	Systems Engineer

ATP-89-146S

Deficiency No. 89-146S-04

Deficiency Title: Inadequate Timer Identification

Responsible Organization: CECO

Requirement:

ANSI N45.2.11-1984, Section 3.1 ". . . The design input shall be specified . . . to the level of detail necessary to permit the design activity to be carried out in a correct manner . . ."

Deficiency:

Contrary to the above, Scaling Calculations 1-SC-37-18 and 1-SC-34-19 did not specify the type of timer module required (Westinghouse produces four timer modules, none of which are directly interchangeable).

Discussed with:

B. Haynes	CECO I&C	Control Systems Supervisor
R. Poltrino	SWEC I&C	Principal Controls Engineer

ATP-89-146S

Deficiency No. 89-146S-05

Deficiency Title: Technically Incorrect DCA

Responsible Organization: CECO

Requirement:

PP-023, "Processing of Design Change Authorizations (DCA's) and Component Modification Cards (CMC's)," Rev. 6, Section 5.3 states "The Responsible Engineers are responsible for: Ensuring that the design change is technically satisfactory . . ."

Finding:

Contrary to the above;

1. DCA-88869, Rev. 1 failed on pages 10, 11, and 16 to properly reflect the required timer circuit. The DCA calls for a Time-Delay-Drop-Out logic, whereas the Westinghouse 7300 series process instrumentation only provides Time-Delay-Pick-Up logic. Additional logic elements required to implement the function described in the DCA were not included in the Circuit development.

2. DCA-88869, Rev. 1 failed to identify Drawing 8358A95, Sheets 11 and 12 as the PROM program on the Interconnection Wiring Diagrams.

Discussed With:

B. Haynes CECO I&C Control Systems Supervisor

ATP-89-146S

Deficiency No. 89-146S-06

Deficiency Title: Failure to Update "Approved-Except-as-Noted" Drawings

Responsible Organization: CECO

Requirement:

NEO 3.06, "Reporting and Control of Deficiencies," Section 6.4 states "The organization responsible for resolving the DR has the responsibility for development, implementation, and verification of the actions necessary to correct the deficient conditions. . ."

Deficiency:

Contrary to the above, Westinghouse Interconnection Wiring Diagram 8815D36, Sheets 2 and 3 were not updated to incorporate the "Approved-Except-as-Noted" (AEN) annotations as required by Deficiency Report C-87-05180.

Note: The auditors extended their review to include all remaining "Approved-Except-as-Noted" drawings for the Westinghouse-supplied BOP process instrumentation. This review identified seven additional drawings stamped "Approved-Except-as-Noted," each of which had been properly revised by DCA to incorporate the annotations.

Discussed With:

B. Haynes	CECO I&C	Control Systems Supervisor
K. Grimm	CECO I&C	Systems Engineer

ATP-89-146S

Deficiency No. 89-146S-07

Deficiency Title: Failure to Distribute Confirmation Removal Updates

Responsible Organization: TU Electric Administrative Services

Requirement:

Procedure PC-213-02, Rev. 3, "Distribution Control," states in paragraph 6.9.1 "Design change documentation, except final DCAs/CRs and "No Change Required" DCAs and CHNs shall be distributed to controlled copy holders and maintained at the same location as the affected documents, except for DCC Satellites. Distribution for satellites will be on an as required basis."

Deficiency:

On one occasion, involving approximately 160 scaling calculations, Interoffice Correspondence (IOC) related to removal of confirmations from those scaling calculations were not distributed to DCC satellites for required distribution.

Discussed with:

K. Norman	TUE Administrative Services	EDCC Coordinator
K. Patterson	TUE Administration Services	Procedures Supervisor
N. Sadler	Operations DCC	Librarian

ATP-89-146S

Deficiency No. 89-146S-08

Deficiency Title: Failure to Distribute PIP Master Index Sheets

Responsible Organization: TU Electric Administrative Services

Requirement:

ECE 5.19, Rev. 2, "Review of Vendor Documents," Section 6.3.p. states, in part, "The Master Index Sheets and the Associated PIP documents shall be distributed to the controlled copies of the PIP."

Deficiency:

Contrary to the above, approximately 15 Westinghouse WPT letters with their respective attached Master Index Sheets were not distributed to holders of controlled copies of the PIP Master Index.

Discussed with:

K. Norman TUE Administrative Services EDCC Coordinator

ATP-89-146S

Deficiency No. 89-146S-09

Deficiency Title: Inadequate Programmable Read Only Memory (PROM) Activities

Responsible Organization: CECO

Requirement:

ANSI N45.2.11-Draft 2, Revision 2, Section 4.1 states:

> "Design activities shall be prescribed and accomplished in accordance with procedures of a type sufficient to assure that applicable design inputs are correctly translated into specifications, drawings, procedures or instructions."

Background:

Programmable Read Only Memories (PROMs) are physically identical electronic components used to implement required control system logic. While these devices look the same and are physically interchangeable, they can (by design) contain different electrical circuits. Also, PROMs are not permanently affixed to a circuit board by soldering or crimping and can be removed for replacement purposes. Changes in system design require that new PROMs be programmed to reflect the specific change.

PROMs currently installed in the Westinghouse 7300 Series Instrumentation were originally programmed, identified, installed, and the systems tested by Westinghouse before shipment to CPSES. The original system configuration has been maintained through the use of existing printed circuit board procedures.

Deficiency:

1. Contrary to the above requirement, PROMs are not consistently identified within the design document set. For example:

   - Scaling Calculation 1-SC-30-18, Rev. 4, page 9 identifies the instrument tag number and the respective NPL card locations but does not reference the PROM Library nor identify which PROM is to be used in which PROM location.
   - The PROM Library drawing 8358A95 references the instrument tag number for only 4 of the 10 PROMs in this set of drawings.
   - IWD 8815D31, Sheet 41, Rev. 7 provides the instrument tag number but does not include the PROM Library drawing number. Other IWDs appropriately list both the tag number and library drawing number for other PROM-related NPL cards.

2. Contrary to the above, there is no PROM-specific procedure which describes the controls to be used for programming PROMs, for verification of PROM programs, and for physical identification of programmed PROMs. The procedure should address the application of all types of Westinghouse 7300 series PROMs at CPSES.

Note: The audit team finds that, with the exception of inconsistent identification of PROMs in the document set, existing practices relating to PROMs are adequate as evidenced by the technical acceptability of the installed instrumentation. It is also noted that PROMs are traceable through each individual design document package but with considerable difficulty. Availability of a PROM-specific procedure will ensure consistent PROM identification from design documentation through programming and physical identification and will further ensure that future PROM-related activities continue to be carried out in an orderly and controlled manner.

Discussed With:

B. Haynes	CECO I&C	Control Systems Supervisor
J. Laughlin	TU Electric	Operations I&C Manager

ATP-89-146S

Observation No. 89-146S-01

Responsible Organization: CECO

Relevant Documents: Westinghouse Interconnection Wiring Diagrams (IWDs)

Description of Condition:

A majority of the Westinghouse NSSS IWDs have outstanding Design Change Authorizations (DCAs) posted against them, some of which were dispositioned in the 1983 to 1985 timeframe.

Recommendation:

Incorporate outstanding DCAs to Westinghouse NSSS loops.

Discussed with:

B. Haynes CECO I&C Control Systems Supervisor

ATP-89-146S

Observation No. 89-146S-02

Responsible Organization: CECO

Relevant Documents: Westinghouse Scaling Manual (WCAP-9696)

Description of Condition:

The Westinghouse Scaling Manual and its supplements, which contain scaling methodology and data used in the preparation of scaling calculations, have not been updated since 1983. While no instances were found where incorrect methodology or data were used in a calculation, there is a potential for this to occur.

Recommendation:

Update this document and maintain it current.

Discussed with:

B. Haynes CECO I&C Controls Systems Supervisor

ATP-89-146S

CHECKLIST WORKSHEETS

TOTAL ITEMS: 1

Audit Report No.: ATP-89-146S

CHECKLIST WORKSHEET

ITEM NO.: 1 - Scaling Calculations

Personnel Contacted:			
R.	Adams	TU Operations I&C	Supervisor I&C Engineering
K.	Grimm	CECO I&C	Systems Engineer
B.	Haynes	CECO I&C	Controls System Supervisor
W.	Hinton	CECO I&C	Senior Engineer
J.	Laughlin	TU Operations I&C	I&C Manager
K.	Norman	B&R Administrative Services	EDCC Coordinator
F.	Nunn	TU Operations I&C	Staff Engineer
K.	Patterson	B&R Administrative Services	Procedures Supervisor
R.	Poirino	SWEC I&C	Principal Controls Engineer
N.	Sadler	Operations DCC	Librarian
C.	Fleming	B&R Field Engineer	Surveying Supervisor

Auditor(s): H. Choudhry, T. McLean, W. Sarra, B. Scanga, K. Mardirosian (part time) (See Attachment-A for Specific Calculations Reviewed)

Checklist Objective: 10CFR50 Appendix B Criteria: III

For each scaling calculation selected for review, determine the adequacy of the following attributes:

1) Title Page

1a) Design Document Classification is appropriate.
1b) Signatures and dates of preparer, reviewers, and independent reviewers are correct.
1c) If "Confirmation Required" has been removed in this revision, obtain previous revision and review technical justification for confirmation required items.

2) Purpose - Verify that the calculation purpose statement accurately describes the function and purpose of the instrument loop.

3) Scope - Verify that the information for devices listed in this section of the calculation are accurate:

3a) All devices, cards, power supplies, indicator numbers, etc., agree with Specification Sheets, Interconnection Wiring Diagrams (IWDs), and the Instrumentation and Control Diagrams (ICDs).

3b) Model numbers and card group numbers agree with the instrumentation specifications and the Equipment Reference Manuals, respectively.

4) Reference Documents

4a) Verify accuracy of data transfer from specification sheets, drawings, scaling appendices, setpoint calculations, and the Standard Reference Documents in Section 2.0 of the Scaling Calculation Manual to the scaling calculations.

Auditor(s) Signature/Date: Signatures Given on File

Audit Team Leader Signature/Date: William J. Hinton 10/26/89

Audit Report No.: ATP-89-146S

CHECKLIST WORKSHEET
Continuation Sheet

ITEM NO.: 1 - Scaling Calculations

Checklist Objective: (cont.)

4b) Verify that the latest information (as of the calculation sign off date), including Design Change Authorizations (DCAs) was utilized in the preparation of the scaling calculations.

4c) Verify that all premises utilized in the scaling calculations are supported by appropriate reference documentation.

5) Calculations

5a) Verify sensor inputs, outputs, and head correction, if required.
5b) For cards in the instrument loop, verify type, group number, tag number, inputs, outputs, bench calibration accuracy, jumpers required, resisters required, etc.
5c) For indicators, verify type, tag no., location, input, output, scale, scale factor, etc.
5d) For signal comparators verify type, tag no., inputs, setpoint value and reference source, setpoint voltage, reset voltage, resistors required, jumpers, etc.

6) Figures - Review the Functional Block Scaling Diagram for device type, setpoints, location, function, voltage/current, etc. Verify that this information is consistent throughout the calculation and documentation.

7) Westinghouse Inputs - for the scaling calculations selected perform the following:

7a) Review changes to Westinghouse Interconnection Wiring Diagrams for technical adequacy and verify that changes affecting scaling calculation parameters have been appropriately incorporated.

7b) Review changes to Instrumentation and Control Drawings and verify that changes affecting scaling calculation parameters have been appropriately incorporated.

7c) Review Field Change Notices (FCNs) to design documentation utilized as inputs to scaling calculations and verify that the changes have been appropriately incorporated.

7d) Review changes to instrument specifications (i.e. RdF-RTDs) and verify that change were appropriately incorporated into scaling calculations.

7e) Verify that Westinghouse input documents used in the scaling calculations are the latest per the Project Information Package Master Index.

Evidence:

See Evidence Document sheets 1 through 15.

Audit Report No.: ATP-89-146S

CHECKLIST WORKSHEET
Continuation Sheet

ITEM NO.: 1 - Scaling Calculations

Results:

CHECKLIST MATRIX

Scaling Calculation No.	1a	1b	1c	2	3a	3b	4a	4b	4c	5a	5b	5c	Comments
1-SC-28-19, R.4	S	S	[illegible]	S	S	S	[illegible]	S	[illegible]	S	S	S	Evidence Doc. Sh. 1
1-SC-28-23, R.2	S	S	S	S	S	S	[illegible]	S	[illegible]	S	[illegible]	S	Evidence Doc. Sh. 2
1-SC-34-02, R.1	S	S	S	S	S	S	[illegible]	S	[illegible]	S	S	S	Evidence Doc. Sh. 3
1-SC-37-18, R.4	S	S	S	S	S	S	[illegible]	[illegible]	[illegible]	S	[illegible]	S	Evidence Doc. Sh. 4
1-SC-49-01, R.3	S	S	S	S	S	S	[illegible]	S	[illegible]	S	S	S	Evidence Doc. Sh. 5
1-SC-55-70, R.2	S	S	S	S	S	S	[illegible]	S	[illegible]	S	S	S	Evidence Doc. Sh. 6
1-SC-28-12, R. 3	S	S	S	S	S	S	[illegible]	S	[illegible]	S	S	S	Evidence Doc. Sh. 7
1-SC-55-04, R. 4	S	S	S	S	S	S	[illegible]	S	[illegible]	S	S	S	Evidence Doc. Sh. 8
1-SC-19-11, R. 1	S	S	S	S	S	S	[illegible]	S	[illegible]	S	S	S	Evidence Doc. Sh. 9
1-SC-19-05, R. 3	S	S	S	S	S	S	[illegible]	S	[illegible]	S	S	S	Evidence Doc. Sh. 10
1-SC-19-07, R. 2	S	S	S	S	S	S	[illegible]	S	[illegible]	S	S	S	Evidence Doc. Sh. 11
1-SC-48-01, R. 2	S	S	S	S	S	S	[illegible]	S	[illegible]	S	S	S	Evidence Doc. Sh. 12
1-SC-34-19, R. 4	S	S	S	S	S	S	[illegible]	S	[illegible]	S	[illegible]	S	Evidence Doc. Sh. 13
1-SC-55-52, R. 4	S	S	[illegible]	S	[illegible]	S	[illegible]	S	[illegible]	S	S	S	Evidence Doc. Sh. 14
1-SC-55-28, R. 5	S	S	S	S	S	[illegible]	[illegible]	[illegible]	[illegible]	S	S	[illegible]	Evidence Doc. Sh. 15

Scaling Calculation No.	5d	6	7a	7b	7c	7d	7e		Comments
1-SC-28-19, R. 4	[illegible]	S	S	S	N/A	S	S[2]		Evidence Doc. Sh. 1
1-SC-28-23, R. 2	[illegible]	[illegible]	S	S	N/A	S	S[2]		Evidence Doc. Sh. 2
1-SC-34-02, R. 1	S	S	S	S	N/A	S	S[2]		Evidence Doc. Sh. 3
1-SC-37-18, R. 4	[illegible]	S	S	S	S	S	S[2]		Evidence Doc. Sh. 4
1-SC-49-01, R. 3	[illegible]	[illegible]	S	S	N/A	[illegible]	S[2]		Evidence Doc. Sh. 5
1-SC-55-70, R. 2	S	S[1]	S	S	N/A	S	S[2]		Evidence Doc. Sh. 6
1-SC-28-12, R. 3	S	S	S	S	N/A	S	S[2]		Evidence Doc. Sh. 7
1-SC-55-04, R. 4	S	S	S	S	N/A	S	S[2]		Evidence Doc. Sh. 8
1-SC-19-11, R. 1	S	S	S	S	N/A	S	S[2]		Evidence Doc. Sh. 9
1-SC-19-05, R. 3	S	S	S	S	S	S	S[2]		Evidence Doc. Sh. 10
1-SC-19-07, R. 2	S	S	S	S	S	S	S[2]		Evidence Doc. Sh. 11
1-SC-48-01, R. 2	S	S	S	S	N/A	S	S[2]		Evidence Doc. Sh. 12
1-SC-34-19, R. 4	[illegible]	S	S	S	S	S	S[2]		Evidence Doc. Sh. 13
1-SC-55-52, R. 4	[illegible]	S	S	S	S	S	S[2]		Evidence Doc. Sh. 14
1-SC-55-28, R. 5	[illegible]	S	S	S	S	S	S[2]		Evidence Doc. Sh. 15

KEY:

S = Satisfactory
U = Unsatisfactory
N/A = Not Applicable

Audit Report No.: ATP-89-146S

CHECKLIST WORKSHEET
Continuation Sheet

ITEM NO.: 1 - Scaling Calculations

CHECKLIST MATRIX NOTES

U1: Confirmation Required had been removed; however, the cover sheet was annotated yes (see Deficiency No. 89-146S-03, Item 20).
U2: Generally, data was correctly transferred from the reference documents to the calculations; however, there is a lack of programmatic description (or "road map") for the preparation of scaling calculations and the inter-relationships between reference documents (see Deficiency No. 89-146S-02).
U3: References were not made directly to the source document (see Deficiency No. 89-146S-01).
U4: On Page 15, Item 13 Clock Rate is given as T^2 output when it should be linear (see Deficiency 146S-03, Item 17g).
U5: Timer Module Type and PROMs not identified within document set (see Deficiency Nos. 89-146S-04 and 09.
U6: Reference Drawings contained unincorporated Approved-Except-As-Noted annotations (see Deficiency No. 86-146S-06).
U7: DCA 88 869 incorrectly addressed timer logic (see Deficiency No. 89-146S-05).
U8: Referenced ICD had been voided (see Deficiency No. 86-146S-03, Item 18a). Also, Appendix E was not referenced for NTD card (see Deficiency No. 86-146S-03, Item 18b).
U9: Gain values not given for NMD card (see Deficiency No. 89-146S-03, Item 18c).
U10: Tag Number 1-FK-0121 A conflicts with tag number used in references (see Deficiency No. 89-146-03, Item 18d).
U11: Confirmation note incorrect (see Deficiency No. 89-146S-03, Item 2).
U12: Device numbers inconsistent (see Deficiency No. 146S-03, Item 1).
U13: Direct setpoint reference was to outdated revision of PL&S (see Deficiency No. 89-146S-03, Item 3). Also, incorrect reference made to Westinghouse Scaling Manual as input data source (see Deficiency No. 89-146-03, Item 5).
U14: Calculation 1-SC-29-19, Rev. 4 references the same calculation Rev. 1 for setpoint value (see Deficiency No. 89-146S-03, Item 8).
U15: NCH card group number on Calculation Figure 1 not in agreement with DCA (see Deficiency No. 146S-03, Item 6).
U16: Error in Bench Calibration Accuracy (see Deficiency No. 89-146S-03, Item 7).
U17: No explanatory note stated for resistance value to be used in field (see Deficiency No. 89-146S-03, Item 9).
U18. Several errors in Figure 1 of this calculation (see Deficiency No. 89-146S-03, Items 16, 17a, 17b, 17c, and 17d).
U19. Controller input source inconsistently identified (see Deficiency No. 89-146S-03, Item 17e).
U20. Bench calibration accuracy math error (See Deficiency No. 89-146S-03, Item 17f).
U21. Timer range code not adequately identified (see Deficiency No. 89-146S-03, Item 19).
U22. No revision level given for Shop Order specification sheet (see Deficiency No. 89-146S-03, Item 21).
S1: Configuration not in conformance with flow diagrams, however, this is noted "Confirmation Required."
S2: Westinghouse documents obtained from DCC; however, PIP Master Index had not been updated (see Deficiency No. 89-146S-08) by Administrative Services. The deficiency is not against the scaling calculations.

Audit Report No.: ATP-89-146S

CHECKLIST WORKSHEET
Continuation Sheet

ITEM NO.: 1 - Sealing Calculations

CHECKLIST MATRIX NOTES

Note: 1. Deficiency No. 89-146S-03, Items 4, 10, 11, 12, 13, and 14 were found in calculations which were outside of the scope of the 15 audit sample calculations.

2. Deficiency No. 89-146S-03, Item 15 describes a condition within Appendix H of the Sealing Calculation Manual where a typographical error in the Westinghouse Equipment Reference Manual was incorrectly included in the bench calibration accuracy data for NAL cards.

3. Deficiency 89-146S-07 describes the failure by Administrative Services to distribute "Confirmation Required" removal updates.

Audit Report No.: ATP-89-1465

CHECKLIST WORKSHEET
Continuation Sheet

ITEM NO.: 1 - Scaling Calculations

Checklist Comments:

Each of the 15 preselected scaling calculations was reviewed to satisfy the checklist objectives as specified in the audit checklist worksheet attributes for Item 1. Although not explicitly stated in the checklist attributes, the calculations were reviewed against the requirements of SWEC Engineering Assurance Procedure EAP-5.3 for general calculation preparation and review process and against CECO Project Procedure PP-009, including Attachment B, for specific scaling calculation preparation requirements. Input data and loop configurations in the calculations were reviewed against the Evidence Documents listed for each calculation. Issues which arose during the audit which were outside of the immediate audit checklist scope were also investigated. These issues are discussed herein and are identified by reference to Supplementary Evidence Document Lists.

The following is an analysis and expansion of the audit results by checklist attribute:

1) Title Page

1a) Document Classification is appropriate.

Each of the 15 calculations reviewed had the appropriate safety classification identified on the title page.

1b) Signatures and dates of preparers, reviewers, and independent reviewers, are correct.

The signatures and dates of preparers, reviewers, and independent reviewers on the calculations were found to be appropriate and in accordance with the requirements of procedure EAP 5.3.

The dates corresponding to the reviewers signatures on most of the calculations were the same or within a few days of that of the calculation preparation dates. It appeared that the close proximity of signoff dates would not allow adequate time to review the calculations and resolve comments. In response to questions raised, CECO indicated that the reviewers signoff date was the date of final review, and that an initial review cycle was provided on a draft or preliminary version of the calculation. This response was examined as indicated below:

A sample of two safety related and two nonsafety related calculations was selected (see Supplementary Evidence Document List 01). Auditors determined that the calculations were revised by the preparer whose changes appeared on the draft review copy in red ink. The reviewer then added his comments in green ink. The independent reviewer's comments were made in black ink; thus traceability to the individuals responsible for comments and changes was established. The audit team compared the annotated draft copies to the issued revisions and found that all draft comments were appropriately incorporated on the issued revision, and nothing further was added. Auditors concluded that the draft revision process is consistent with the intent of the procedure, information is not "lost" in the review process, comments and changes are traceable, and the simultaneous signing of the calculations, which takes place at the completion of the draft review process, is not an indication of inadequate or incomplete review.

Audit Report No.: ATP-89-1468

CHECKLIST WORKSHEET
Continuation Sheet

ITEM NO.: 1 - Scaling Calculations

1c) If "Confirmation Required" has been removed in this revision, obtain previous revision and review technical justification for confirmation required items.

In those calculations where "Confirmation Required" had been removed, the audit team verified that the technical justification for such removal was appropriate. This was determined by review of the previous calculation revision; however, during the audit several ancillary issues emerged related to the Confirmation Removal process as follows:

i) The "Confirmation Required" process is utilized when an input value or other data is not available in final form at the time of calculation issuance. Procedure PP-009 states that when the "Confirmation Required" changes from "yes" to "no" status, and the data confirmed does not affect the calculation results, an IOC (Interoffice Correspondence) noting this fact is to be sent to the calculation file. In addition, a revised calculation coversheet is to be generated showing the new confirmation status which is initialed and dated by the Lead Design Engineer. Distribution to satellite Document Control Centers (DCC) is then made by TU Administrative Services. The audit team investigated the fact that some scaling calculations received from the TU Operations DCC had a "Confirmation Required Yes" status dating back to 1987, yet the required confirmation data had been available for some time. The CECO organization stated that Confirmation Required had been removed by an IOC. Review of the Confirmation Required removal process for 10 calculations and four transmittals (see Supplementary Evidence Document List 02) revealed that Operations DCC had not received the revised coversheets even though they had been received at the main DCC on site. Examination of the records in the main DCC indicated that approximately 40 transmittals with "Confirmation Required" removals covering roughly 160 scaling calculation were not distributed to the satellite DCC's. All of these transmittals occurred on May 10, 1989 and were annotated "No distribution required" by the same person. This deficiency appears to be isolated (see Deficiency 89-1468-07).

It was confirmed that current DCC practice is to distribute "Confirmation Required" removal cover sheets to the appropriate distribution.

ii) One instance was found where two scaling calculations prepared for identical redundant instrument loops on the same day by the same preparer had different "Confirmation Required" items listed on the coversheet (i.e., one calculation required confirmation of eight items, the other four); thus, it appeared that the confirmation removal process was being inconsistently applied to identical calculations. Further investigation revealed that in one of the calculations the four additional confirmation required items were inappropriately applied, since they requested that changes be made to other documents. The confirmation required process cannot change other documents. This over use of conformation required was considered isolated and not of sufficient significance in itself to issue an audit finding. The remaining items on both calculations were identical.

As a result of this case, the audit team undertook an investigation of an additional 40 calculations (see Supplementary Evidence Document List 03) for redundant instrument loops, the results of which indicated that the "confirmation required" items

Audit Report No.: ATP-89-146S

CHECKLIST WORKSHEET
Continuation Sheet

ITEM NO.: 1 - Scaling Calculations

were consistently identified. The audit team concluded that the "Confirmation Required" process has been appropriately utilized and is in conformance with Procedure PP-009 requirements.

iii) Calculation 1-SC-55-52, Rev. 4 was found to require confirmation of revision of Westinghouse Shop Orders when, in fact, confirmation of a portion of Section 2.0 of the Scaling Calculation Manual referencing Shop Orders was required (see Deficiency No. 89-146S-03, Item 3).

iv) Calculations 1-SC-55-01, Rev. 7 and 1-SC-55-02, Rev. 8 are designated "no Confirmation Required," yet the cover sheets state that confirmation is required for values in Table 1 (see Deficiency No. 89-146S-03, Item 10.)

v) Calculation 1-SC-28-19, Rev. 4 had "Confirmation Required" removed, yet the cover sheet was checked "Confirmation Required Yes." (see Deficiency No. 89-146S-03, Item 20).

In summary, the audit team determined that, with the exception of three minor errors (items iii, iv, and v above), that the "Confirmation Required" process with regard to scaling calculation preparation is appropriate and in accordance with the applicable procedure.

2) Purpose

Verify that the calculation purpose statement accurately describes the function and purpose of the instrument loop.

The statement of purpose in the 15 calculations reviewed accurately described the function of the instrument loop. Indications and alarms functions were stated, and the loop function descriptions were in accordance with the example in PP-009, Attachment B.

3) Scope

Verify that the information for devices listed in this section of the calculation are accurate:

3a) All devices, cards, power supplies, indicator numbers, etc. agree with Specification Sheets, IWDs, and the ICDs.

3b) Model numbers and card group numbers agree with the instrumentation specifications and the Equipment Reference Manuals, respectively.

In this section of the calculations, all of the devices utilized in the instrument loop are listed sequentially by tag number. A one-to-one comparison was made between the actual components (e.g., transmitters, cards, indicators computer inputs, alarms, etc.) and their tag numbers in the calculations, IWDs, and ICDs. No discrepancies were found.

CHECKLIST WORKSHEET
Continuation Sheet

ITEM NO.: 1 - Scaling Calculations

Additionally, the device vendor model numbers and Westinghouse group numbers were verified against the Equipment Reference Manuals and the IWDs. No discrepancies were found relating to the scope section of the calculations.

4) Reference Documents

Sections 3, 4, 5, and 6 of the checklist constitute the bulk of the review performed on the scaling calculations. Many of the attributes are overlapping since they involve comparisons between sections of the calculations with each other and reference documentation. The description of review activities performed in conjunction with other attributes will only be addressed once.

4a) Verify accuracy of data transfer from specification sheets, drawings, scaling appendices, setpoint calculations, and the Standard Reference Documents in Section 2.0 of the Scaling Calculation Manual to the scaling calculation.

One of the primary functions of scaling calculations is to compile the multitude of separate pieces of data required to set up and calibrate the instrument loops. For example, NSSS setpoints are obtained from the Westinghouse Precautions, Limitations and Setpoint Document; BOP setpoints are obtained from setpoint calculation or system DBDs; scaling methodology and the derivation of transform equations are contained in the Westinghouse Scaling Manual; and component specific data (i.e., resistors required or removed, jumpers required, gain and bias settings) are found in the Westinghouse Equipment Manual. Input data relating to indicators, transmitters, and recorders are contained in Westinghouse Shop Order specification sheets. Instrument Hydraulic head corrections, linearization of RTDs, and component accuracies are found in the Appendicies to the CPSES Scaling Calculation Manual. Instrument loop components and configuration are found in the Westinghouse IWDs and PCBDs.

Procedure EAP 5.3 requires that calculations be prepared so that the analysis can be understood by an individual competent in the calculation discipline and, further requires that input values be identified to a source document (i.e., technical document number or title, issue date, revision number, section, or page, if applicable). Although the input data was found to have been accurately transferred from reference sources, the audit team found (with the exception of setpoint references) a general lack of specific references in the body of the calculations for gains, bias, plug in components, and equations. General references are provided in Section 2.0 of the CPSES Scaling Calculation Manual which contains some 29 documents in which data can be found; however, not all of the 29 documents are utilized in any one calculation. Also, the figures in the calculations contain a graphical representation of the instrument loops but no reference is provided to the source of the loop configuration. Additionally, when computations were required, only the final numerical value was given without explanatory notes or mathematical computations (see Deficiency No. 89-146S-01).

While the task of verification of the input values was laborious due to lack of references and in some cases required consultation with the calculation preparers, auditors determined that in every calculation reviewed, the correct input values were utilized.

4b) Verify that the latest information (as of the calculation signoff date) including Design Change Authorizations was utilized in the preparation of the scaling calculations.

Audit Report No.: ATR-89-1465

CHECKLIST WORKSHEET
Continuation Sheet

ITEM NO.: 1 - Scaling Calculations

Auditors found that the scaling calculations are using the latest information available by DCAs. In instances where information required for the calculation was suspect or not available immediately, a "Confirmation Required" note referencing this fact was appropriately applied to the calculation.

Most DCAs encountered during the audit were written to document changes to the Westinghouse IWDs. Auditors observed that many of the IWDs have outstanding DCAs posted against them, some from the 1983 to 1985 time frame. While this practice is not a violation of any site procedure, it does complicate the understanding of the drawings (see Observation 89-1465-01).

Auditors found several Westinghouse IWDs which contained handwritten annotations dating from 1983 which had not been included in DCAs. The audit team verified that nine sheets of the total set (approximately 450 sheets) of IWDs developed by Westinghouse for the BOP process instrument cabinets remain in the system as "Approved-Except-as-Noted" (AEN) documents. Seven of these IWDs have DCAs written against them approving incorporation of the AEN annotation. The two drawings not presently covered by a DCA contain annotations to the system grounding wires made by Gibbs and Hill during review and approval of the BOP instrumentation document package. The annotated drawings are technically correct, represent the installed hardware, and were reviewed and approved by both Westinghouse and Gibbs and Hill. An audit finding was identified concerning the failure to initiate a DCA against these two drawings as required by Deficiency Report (DR) C-87-05180 (see Deficiency No. 89-1465-06). This is considered to be an isolated finding that does not call into question the overall adequacy of the Westinghouse IWDs (see Supplementary Evidence Document List 05).

4c) Verify that all premises utilized in the scaling calculations are supported by appropriate reference documentation.

The audit team concluded after review of several scaling calculations that it was difficult to verify the premises, assumptions, and postulates used in the preparation of the calculations without recourse to the originators. This coupled with the lack of specific references, as discussed in item 4a, lead the audit team to the conclusion that there needs to be a single CPSES document which provides an overall "road map" for the preparation of scaling calculations. Deficiency No. 89-1465-02 identifies the need for an overall program description (or "road map") covering the CPSES scaling calculation process. Even without an overall program description, the practices, procedures, and controls used in the production of scaling calculations are resulting in accurate and useful products.

5. Calculations

This section of the scaling calculations consists of four parts:

5.a) The sensor data (i.e., interface with the field)
5.b) Configuration and setting values for the cards in the Westinghouse 7300 Series Instrument Racks
5.c) Indicators, recorders, and computer inputs in the control room

Audit Report No.: AJR-89-1468

CHECKLIST WORKSHEET
Continuation Sheet

ITEM NO.: 1 - Scaling Calculations

5.d) Data for bistable setpoints.

Throughout this section are the calculated values derived from the equations given in the Westinghouse Scaling manual. The audit team found that in several calculations only the final values were given (i.e., the computations performed to derive the results were not included). This is considered a violation of Procedure EAP 3.3 and is described in Deficiency No. 89-1468-01, Item 4.

5a) Verify sensor inputs, outputs, and head correction, if required.

Sensor inputs and outputs were verified to be correct for all of the transmitters referenced in the audit sample. The data was verified by review of vendor specification sheets and instrumentation and control diagrams.

The audit team investigated the source of transmitter and instrument TAP elevation data being used to determine hydraulic head corrections. Scaling Calculation Manual Appendix I contains a listing of the instrument transmitter and process tap elevations for all of the Westinghouse 7300 instrument loops. Elevation data was obtained from Brown & Root FE documents. The audit team concerns were 1) that the Brown & Root FE sketches were not controlled documents, 2) the precision used to collect the data was unknown, and 3) there did not appear to be any correlation with the FVM-069 walkdown. The audit team verified that the elevations were treated as surveyors data. Each sketch is logged and revised (when required), reviewed and approved before being issued, and in general appear to meet the requirement of a controlled document. The audit team verified that the measurements were made to an accuracy of ± 1/32 in. The audit team also verified that the FVM-069 walkdown elevation data were taken with a tape measure and were not intended to replace the Brown & Root data (see Supplementary Evidence Document List 11).

The audit team determined that the existing practices and procedures used for obtaining transmitter and instrument TAP elevations are adequate for their application and are being correctly followed.

5b) For cards in the instrument loop verify type, group number, tag number, inputs, outputs, bench calibration accuracy, jumpers required, resistors required, etc.

The data contained in this portion of the calculations are taken from sources as described in Item 4a and represents the bulk of the information in the calculations. Errors were found in this section of the calculations in references, math, and notes (see Deficiency No. 89-1468-03, Items 3, 4, 5, 7, 8, 9, 11, 12, 13, 14, 17a, 17f, 17g, 18b, 18c, and 18d for details of the errors/inconsistencies found in this section of the calculations).

Note: Auditors identified a total of 30 such errors, including the above, in the 15 preselected and 14 partially reviewed calculations. These consisted of:

a) inconsistencies between the body of the calculations, figures, reference drawings, device tag numbers, and group numbers - 11 examples

b) notational error in "Confirmation Required" statements - 3 examples

Audit Report No.: ATP-89-1465

CHECKLIST WORKSHEET
Continuation Sheet

ITEM NO.: 1 - Scaling Calculations

c) minor math or number transcription errors - 6 examples

d) inappropriate references cited - 6 examples

e) incorrect or missing notes - 4 examples

None of the above identified discrepancies, individually nor collectively, impact the results or usefulness of the final calculations. The inconsistencies/discrepancies identified represent the audit teams evaluation of approximately 6000 individual data points (or entries) contained within the calculations examined. Deficiency No. 89-1465-03 provides details of all of these errors/inconsistencies found in the calculation preparation and review process.

Several additional card related issues were identified:

- PROMs - Programmable Read Only Memories (PROMs) are physically identical electronic components used to implement required control system logic. While these devices look the same and are physically interchangeable, they can (by design) contain different electrical circuits. Also, PROMs are not permanently affixed to a circuit board by soldering or crimping and can be removed for replacement purposes. Changes in system design require that new PROMs be programmed to reflect the specific change.

  PROMs currently installed in the Westinghouse 7300 Series Instrumentation were originally programmed, identified, installed, and the systems tested by Westinghouse before shipment to CPSES. The original system configuration has been maintained through the use of existing printed circuit board procedures. Deficiency 89-1465-09 identifies the lack of adequate scaling calculation reference to the PROM Library which contains the coding for each uniquely configured PROM. One of the IWDs also failed to reference the PROM Library. This audit finding indicates that in some cases there is no direct traceability between the PROM Library, the IWDs, and the scaling calculations; however, the audit team confirmed that there is indirect traceability of PROMs. Additionally, there is no PROM-specific procedure which describes the controls to be used for programming PROMs, for verification of PROM programs, and for physical identification of programmed PROMs. This finding does not question the acceptability of the installed PROMs or the ability to trace them but reflects the difficulty in tracing PROMs in the absence of direct referencing.

  The audit team found that PROMs are utilized on a small number of NPL and NTD printed circuit cards in CPSES instrument loops. The audit team verified that PROMs have distinguishing physical features which indicate the required mounting orientation and, further, that a warning is contained in the Westinghouse Equipment Reference Manual regarding the need to ensure proper physical orientation of these devices. The audit team verified that pre-programmed PROMs furnished by Westinghouse for both the NPL cards, used in

Audit Report No.: ATP-89-146S

CHECKLIST WORKSHEET
Continuation Sheet

ITEM NO.: 1 · Scaling Calculations

- the BOP, and the NTD cards contain identifying markings which differentiate between various control system logics.

- Incorrect DCA - While reviewing outstanding DCAs against audit scaling calculation samples, the audit team verified that a SWEC engineer involved in the production and review of scaling calculations failed to fully understand the nature of the NPL timer modules and, consequently, did not adequately detail the logic requirements in a change (i.e., DCA 88869, Rev. 1) to the Auxiliary Feedwater System controls. The engineer incorrectly assumed that Westinghouse provided both time-to-pickup and time-to-dropout timer modules similar in function to those provided by most other timer manufacturers. The engineer had specified for a drop out; however, Westinghouse timers only provide a pick-up function (see Supplementary Evidence Document List 04). Deficiency No. 89-146S-05, Item 1 addresses the incomplete DCA circuit description.

  This DCA was not implemented and is currently being revised. The audit team requested that Operations M&C conduct a bench test of the timer module as described in the DCA. This test demonstrated that the timer logic described in the DCA could not have been physically implemented and, consequently, would have been routinely referred back to Engineering for resolution. In addition, DCA 88869, Rev. 1 failed to identify Drawing E-58A93 as the PROM program on the Interconnection Wiring Diagram (see Deficiency No. 89-146S-05, Item 2). The audit team found no other examples of an inadequately or incorrectly engineered DCA.

- Timer Logic - Scaling calculations 1-SC-37-18 and 1-SC-34-19 require timer modules; however, the type of module to be used in each case was not specified (see Deficiency No. 89-146S-04). Four types of timer modules are produced by Westinghouse, some of which are directly interchangeable. The audit team found no indication that the wrong type of timer was installed in the field.

  Neither calculation identified the jumper patterns required to implement the binary timer range code. In addition, the characters 1000 and 0000 were not identified as binary codes (see Deficiency No. 89-146S-03, Item 19).

- Function Generator Cards (NCH) - Westinghouse manufactures a number of Function Generator Cards (NCH series). Each of these cards contains 17 potentiometers which must be adjusted for the card to correctly transform the input signal into the required output function. For example, square root functions are required to correct flow signals for flow element characteristics. Due to the vulnerability of potentiometers to vibration, Westinghouse introduced a new function generator card (NCH4) with reduced potentiometer seismic sensitivity. This card has been tested to the Westinghouse broad spectrum seismic test and the results were published. The audit team verified that CECO has a program to review the use of function generator cards to assure that the correct card type has been applied in each instrument loop requiring a characterizer function. CECO will compare the Westinghouse test data for all NCH cards with the curve

CHECKLIST WORKSHEET
Continuation Sheet

ITEM NO.: 1 - Scaling Calculations

- characteristics programmed into the card to determine the largest expected error following a seismic event. The error data will be used in setpoint calculations to determine required trippable setpoint values. The audit team found this ongoing activity to be satisfactory and in accordance with good engineering practice (see Supplementary Evidence Document List 06).

- Controller (NCB) Cards - Westinghouse initially manufactured a family of controller cards (NCB1, NCB2, NCB3, NCB4, NCB5, NCB6, NCB7, NCB8, and NCB9), each of which is basically similar but which contain different control options. In the 1983 time frame Westinghouse consolidated these designs into two cards, NCB11 and NCB12. The NCB11 card was designed to be a direct replacement for all NCB odd numbered cards and the NCB12 card replaced the even numbered cards. The audit team interviewed Westinghouse 7300 Process Instrumentation System experts and reviewed application literature for both the NCB1 and NCB11 cards. As a result of this review, the auditors concluded that these boards are directly interchangeable. Control reset rates are slightly different between the NCB1 and NCB11 cards; however, these rates are adjusted in the field to accommodate specific process loop requirements when the control system is tuned. The scaling calculations contain a note stating that board parameters are specified for slow response and should be fine tuned under operating conditions.

  The audit team also verified that NCB11 boards are qualified replacements for NCB1 boards by reviewing the original Westinghouse transmittal and The TUE item replacement evaluation. It was verified that the TUGCO Stock Numbers (TSNs) for the NCB1 and NCB11 are identical. Also, the current TU Electric warehouse stock contains only of the NCB11 cards (see Supplementary Evidence Document List 07).

  The audit team found CECO's application of Westinghouse controller cards to be generally satisfactory.

5c) For indicators, verify type, tag no., location, input, output, scale, scale factor, etc.

Data for indicators and recorders and computer inputs in the Control Room or Hot Shutdown Panel were reviewed against vendor data and the FCRs. Items verified were tag number, location, model number, input and output voltages, scale, scale factor, and bench calibration accuracy where appropriate. Results indicate no discrepancies in this area.

5d) For signal comparators, verify type, tag no., inputs, setpoint value and reference source, setpoint voltage, reset voltage, resistors required, jumpers, etc.

For each of the calculations containing signal comparator cards, the input data sources for setpoint values, reset voltages, and card configuration (jumpers and resistors) was verified. Card configurations were found to be in agreement with the functional requirements derived from the Westinghouse Equipment Reference Manual.

Audit Report No.: ATP-89-146S

CHECKLIST WORKSHEET
Continuation Sheet

ITEM NO.: 1 - Scaling Calculations

As a result of Deficiency No. 89-146S-03, Items 3 and 5 concerning questionable setpoint references, an expanded sample (see Supplementary Evidence Document List 08) was reviewed in order to verify that appropriate reference sources were used for setpoint data. Auditors verified that either a setpoint calculation or the Precautions, Limitations and Setpoint Document was appropriately referenced in each of the supplementary calculations reviewed.

6) Figures - Review the Functional Block Scaling Diagram for device type, setpoints, location, function, voltage/current, etc. Verify that this information is consistent throughout the calculation and documentation.

The figure (Functional Block Diagram) section of the calculation is a graphic representation of the components which make up the instrument loop as defined by the IWD and PCBD. Each of the major loop components is represented by a symbol with input and output direction and value stated. For certain cards (i.e., NRA, NSA, and NLL cards) pertinent information such as gain, setpoint, lead, lag, bias, etc., are shown. The figure contains a wealth of information and gives a simplified, yet accurate picture of the interactions of all the components in a loop.

The figures for each of the 15 audit sample calculations, and for an additional 14 calculations which provided inputs to or received output from the audit sample were reviewed. A total of seven discrepancies between the figures and either the reference documents or the calculation sections were found (see Deficiency No. 89-146S-03, Items 6, 16, 17a, 17b, 17c, and 17d for details). Considering the total amount of discrete data presented on the calculation figures, this number of errors is not considered to be excessive.

The component tag numbers and group numbers were satisfactorily verified against the IWDs and the other sections of each calculation. Values for gain, bias, lead, lag, etc. were verified satisfactorily against the appropriate card calculations.

7) Westinghouse Inputs - for the scaling calculations selected perform the following:

During the audit, particular attention was paid to the Westinghouse documentation which provides the methodology, card configurations, equipment data, setpoints, and drawings utilized in the scaling calculation effort.

The engineering basis for the scaling calculation effort has its genesis at Westinghouse where the original engineering was completed for the NSSS process instrumentation. The BOP scaling calculation effort was developed on site based on the Westinghouse methodology. Westinghouse developed the IWDs, instrument component configuration, Equipment Reference Manuals, and Instrument Data Sheets and issued methodology documents which specify the scaling and accuracy requirements for the process instrumentation. The CPSES scaling effort serves to compile this information in one document and to maintain it current by incorporating changes as the design evolves.

It was the intent of this portion of the audit to verify that changes in the design of the 7300 Process Instrumentation System were appropriately included in the scaling calculations.

Audit Report No.: ATP-89-146S

CHECKLIST WORKSHEET
Continuation Sheet

ITEM NO.: 1 - Scaling Calculations

7a) Review changes to Westinghouse Interconnection Wiring Diagrams for technical adequacy and verify that changes affecting scaling calculation parameters have been appropriately incorporated.

For each of the calculations audited, the corresponding IWDs and Process Control Block Diagrams, when applicable, were obtained and reviewed against the data contained in the scaling calculation. In order to determine outstanding changes to the IWDs, an Affected Document Update Report (ADUR) which identifies outstanding DCAs was obtained for each drawing. The DCAs were reviewed to determine the revised instrument loop configuration which was then compared to the scaling calculation. Only those DCAs issued prior to the scaling calculation preparation date were expected to have been reflected in the calculations. DCAs issued after the calculation preparation date were reviewed for technical adequacy and completeness. DCAs applicable to each calculation audited are listed in their respective Evidence Document Sheets.

In most cases the scaling calculations accurately reflected the design changes; however, as discussed in Item 4b, one DCA was found in which a logic timer requirement was incorrect. Additionally, one instance was found where the figure in Calculation 1-SC-33-28, Rev. 5 shows an NCH1 card, whereas DCA 88528 indicates that an NCH4 card is to be used in the circuit (see Deficiency No. 89-146S-03, Item 6).

7b) Review changes to Instrumentation and Control Drawings and verify that changes affecting scaling calculation parameters have been appropriately incorporated.

In a manner similar to that for the review of IWDs, the changes to the Instrumentation and Control Diagrams were reviewed and compared to the information in the scaling calculations. No discrepancies were noted between the calculations and the outstanding DCAs.

7c) Review Field Change Notices to design documentation utilized as inputs to scaling calculations and verify that the changes have been appropriately incorporated.

Westinghouse Field Change Notices (FCNs) are transmitted to the site via Westinghouse Project Transmittals (WPTs) which receive a technical review by Ebasco Engineering under the Vendor Log (VL) Program. If the FCN is found to impact hardware or design drawings (e.g., IWDs, ICDs), a DCA is prepared and issued against the appropriate drawing. Additionally, hardware changes are made in the field via the DCA since the FCN is not an appropriate implementation document. During the audit a total of seven FCNs were identified as having an affect on the scaling calculations under review. In each case the FCN information was incorporated into a DCA and appropriately reflected in the applicable scaling calculation.

7d) Review changes to instrument specifications (i.e., RdF-RTDs) and verify that change was appropriately incorporated into scaling calculations.

A review was made of the Westinghouse instrument specification sheets to determine that the revision level referenced in the calculations was appropriate, and that design changes were incorporated. The specific Westinghouse Shop Order and specification sheets associated with the calculations are listed on their respective Evidence Document Sheets.

Audit Report No.: ATP-89-146S

CHECKLIST WORKSHEET
Continuation Sheet

ITEM NO.: 1 - Scaling Calculations

Calculation 1-SC-49-01, Rev. 3 listed the appropriate Shop Order number and specification sheets for the indicators, manual auto station, and orifice plate in the loop but failed to include the sheet revision numbers for these components (see Deficiency No. 89-146S-03, item 21).

In addition to checking the audit sample calculations as required, an expanded sample of nine "out of audit scope" calculations was reviewed to verify that Shop Order Specification Sheets were appropriately referenced (see Supplementary Evidence Document List 09). Auditors concluded that in general, the Westinghouse equipment specification sheets were being properly referenced and that the data used in the calculations reflects the latest changes.

The audit team also investigated whether or not the wide range RdF/RTD serial numbers are correct. These RTDs are unique and must be serialized as well as "linearized" by applying appropriate correction factors contained in a table in the scaling calculations to obtain an accurate reading. Audit results indicate that the original CPSES RTDs (which are identified by unique serial numbers) furnished under the NSSS scope of supply were sent back to the vendor for recalibration. The Unit 2 RTDs with different serial numbers were then transferred to Unit 1 via Permanent Equipment Transfer (PET) (see Supplementary Evidence Document List 10).

The audit team reviewed the scaling calculation which contains the serialized RTDs. The number from this calculation matched those on the PET. The serial numbers and "linearization" tables in the calculation were then checked against the values in Appendix F to the TU Electric Scaling Calculation Manual (referenced in the calculation) and were found to be in agreement. The only inconsistency noted in this review was that the original RTD serial number and linearization values contained in the Westinghouse Scaling Manual (WCAP-9696) have not been updated; however, none of the documents reviewed makes reference to WCAP-9696 as the data source for serial numbers; consequently, no audit finding was issued.

7e) Verify that Westinghouse input documents used in the scaling calculations are the latest per the Project Information Package Master Index.

Interviews with the scaling calculation preparers, and Document Control Center personnel revealed that the Westinghouse Project Information Package (PIP) Master Index is no longer used as a primary documentation reference source. At one time (pre 1988) the PIP Master Index was used for this purpose. In 1988 CPSES decided that the PIP Master Index system was cumbersome, and an effort was begun to maintain Westinghouse documentation current in the Site Documentation Control System (ECE 5.19, Rev. 2). The audit team investigated the procedure and existing practices for control of the vendor (Westinghouse) documentation referenced in Section 2.0 of the CPSES Scaling Calculation Manual (1-SC-8900 Rev. 2).

The following Westinghouse documents are vendor drawings and have always been handled by CPSES DCC as controlled design documents. They are subject to the provisions of PP-023 (i.e., site design changes) and are periodically updated or revised by Westinghouse to incorporate design changes and Westinghouse FCNs. With the exception of Westinghouse BOP Analog Control System drawings, Westinghouse maintains design responsibility for these documents.

Audit Report No.: ATP-89-146S

CHECKLIST WORKSHEET
Continuation Sheet

ITEM NO.: 1 - Scaling Calculations

1) Process Control Block Diagrams, Dwg. 9758D39
2) NSSS M/A Station Tabulation, Dwg. 8815D28
3) BOP M/A Station Tabulation, Dwg. 8815D28
4) Upgrade Protection & Surveillance Block Diagrams, Dwg. 9554D85
5) Functional Diagrams, Dwg. 7247D05
6) 7300 Series Analog Process Control System Dwgs. for NSSS shown on Dwg. 8810D30
7) 7300 Series Analog Process Control System Dwgs. for BOP shown on Dwg. 8815D11

The following Westinghouse manuals are controlled and issued through Operations DCC. These documents are purchase order specific and are generally limited to instruction/operation/maintenance documents. These manuals are generally not updated unless subsequent purchase orders or vendor initiated changes affect the manuals. These documents are not subject to site design changes and are identified by their CPSES document number which consists of the purchase order number followed by a dash (-) and a sequential number.

8) Process Control System Scaling Manual (WCAP 9696) with Supplements for Unit 1 & 2, G61-00151-001, -002, and -003

9) Instruction Book for Upgrade Protection and Surveillance System, CPSES Units 1 & 2, Equipment Reference and System Drawing Manual, CP-0001-027

10) Instruction Book for Process Instrumentation & Control for CPSES Units 1 & 2, Volume I, Equipment Reference Manual, CP-0001-89; Volume II, Systems Drawings, CP-0001-90

11) Instruction Book for Balance of Plant Process Instrumentation and Control for CPSES Units 1 & 2, Volume I, Equipment Reference Manual, CP-0611B-001; Volume II, Systems Drawings, CP-0611B-002; Volume III, Misc. Process Instruments, CP-0611B-03

The Westinghouse Scaling Manual (WCAP 9696) has not been revised since 1983, yet there have been several page replacements since then which were transmitted on WPTs. The audit team recommended the update of this document (see Observation No. 89-146S-02).

The following miscellaneous Westinghouse design documents which are not drawings or manuals are supposed to be controlled and updated through the Westinghouse Project Information Package; however, some of these documents are not as yet entered into the CPSES Document Control Data Base. These documents are updated on an "as needed" basis when changes are identified by TU Electric or initiated by Westinghouse. NSSS documents for CPSES are listed and are required by Procedure ECE 5.19 to be statused in the PIP Master Index which identifies the latest revision, any supplements (if applicable) and the Westinghouse letter and date which transmitted the document. Additionally, a copy of the WPT and attachments is routed to the disciplines for review and acknowledgement. The audit team found 15 instances where the PIP Master Index was not being updated as required by ECE 5.19 (see Deficiency No. 89-146S-08). Investigation indicated that since 6/24/88

CHECKLIST WORKSHEET
Continuation Sheet

ITEM NO.: 1 · Scaling Calculations

(the issue date of Revision 2 of ECE 5.19) that Westinghouse documents have been entered directly into the Vendor Document Index and are accessible through the site Document Control System. Although the PIPMI has not been updated since early 1989, the documents are being maintained on a current basis by DCC. The audit team found no instances of where out of date information was utilized in the preparation of scaling calculations.

12) CPSES Precautions, Limitations, and Setpoints (PL&S)
13) Process Instrumentation Calibration Guidelines, W Design Specification 955556
14) Instrument Specification Sheets for CP-00001 (TBX) Shop Orders 320, 325, and 395

The remaining two Westinghouse Documents listed in Section 2.0 of the CPSES Scaling Calculation Manual are "Westinghouse Setpoint Methodology for Protection Systems-Comanche Peak Station (WPT-7282)" and the Setpoint Study for Texas Utilities Services, Inc., Comanche Peak Units 1 & 2 (WCAP-9818) have been superseded by WCAP-12123 "Setpoint Methodology for Protection Systems - Comanche Peak Unit 1" which was issued April, 1989.

The Audit team concluded that even though the processing and control of Westinghouse documentation is undergoing a transition to CPSES control, that the scaling preparers are cognizant of the latest available information. No instances were found where incorrect input values or loop configurations were represented in calculations. At the time of the audit the CECO personnel had a thorough understanding of the Westinghouse documentation set and were aware of changes via WPTs and PCNs routed to them by DCC. The audit team did not, however, attempt to verify past documentation control practices but concentrated on the current situation.

EVIDENCE DOCUMENT SHEET NO. 1
CALCULATION 1-SC-28-19, REV. 4

	DOCUMENT NO.	REV.	TYPE
1.	8810D35, Sht. 42	7	Interconnection Wiring Diagram
2.	8810D35, Sht. 43	2	Interconnection Wiring Diagram
3.	8810D35, Sht. 44	5	Interconnection Wiring Diagram
4.	8810D35, Sht. 45	5	Interconnection Wiring Diagram
5.	8810D35, Sht. 47	5	Interconnection Wiring Diagram
6.	8758D39, Sht. 25	5	Process Control Block Diagram
7.	DCA 073117	0	Design Change Authorization
8.	DCA 065071	1	Design Change Authorization
9.	8810D29	3	M/A Station Tabulation
10.	1-SC-28-02	3	Scaling Calculation
11.	1-SC-28-23	1	Scaling Calculation
12.	1-SC-34-09	2	Scaling Calculation
13.	1-SC-34-16	2	Scaling Calculation
14.	1-SC-8800-H	1	Scaling Appendix
15.	1-SC-28-19	1	Scaling Calculation
16.	CP-0001-089	Vol. 1	Westinghouse Equipment Reference Manual

Audit Report No.: ATP-89-166S

EVIDENCE DOCUMENT SHEET NO. 2
CALCULATION 1-SC-28-23, REV. 2

DOCUMENT NO.	REV.	TYPE
1. 8810D35, Sht. 27	9	Interconnection Wiring Diagram
2. 8810D35, Sht. 28	8	Interconnection Wiring Diagram
3. 8810D35, Sht. 29	8	Interconnection Wiring Diagram
4. 8810D35, Sht. 30	7	Interconnection Wiring Diagram
5. 8798D39, Sht. 23	7	Process Control Block Diagram
6. 8798D89, Sht. 33	9	Process Control Block Diagram
7. DCA 059071	1	Design Change Authorization
8. 8810D29	3	M/A Station Tabulation
9. 1-SC-8800-H	1	Scaling Calculation
10. Spec. 955956	1	Westinghouse Design Specification
11. PLAS	3	Westinghouse Precautions Limitations and Setpoints
12. CP-0001-059	Vol. 1	Westinghouse Equipment Reference Manual
13. 1-SC-28-23	0	Scaling Calculation
14. 1-SC-34-16	2	Scaling Calculation
15. 1-SC-34-19	1	Scaling Calculation
16. 1-SC-34-17	4	Scaling Calculation
17. 1-SC-34-03	3	Scaling Calculation
18. 1-SC-55-70	2	Scaling Calculation

EVIDENCE DOCUMENT SHEET NO. 3
CALCULATION 1-SC-34-02, REV. 1

	DOCUMENT NO.	REV.	TYPE
1.	8810D35, Sht. 49	6	Interconnection Wiring Diagram
2.	8810D35, Sht. 50	7	Interconnection Wiring Diagram
3.	8758D39, Sht. 25	5	Process Control Block Diagram
4.	DCA 020873	0	Design Change Authorization
5.	1-SC-8800-H	1	Scaling Appendix
6.	PL&S	3	Westinghouse Precautions Limitations and Setpoints
7.	Spec. 955556	1	Westinghouse Design Specifications
8.	CP-0001-089	Vol. 1	Westinghouse Equipment Reference Manual

Audit Report No.: ATP-89-1465

EVIDENCE DOCUMENT SHEET NO. 4
CALCULATION 1-SC-37-18, REV. 4

	DOCUMENT NO.	REV.	TYPE
1.	1D65913, Sht. 2	2	Interconnection Wiring Diagram, STP
2.	8815D31, Sht. 5	7	Interconnection Wiring Diagram
3.	8815D31, Sht. 6.	7	Interconnection Wiring Diagram
4.	8815D31, Sht. 22	5	Interconnection Wiring Diagram,
5.	8815D31, Sht. 27	7	Interconnection Wiring Diagram,
6.	8815D31, Sht. 41	7	Interconnection Wiring Diagram,
7.	8815D36, Sht. 2	7	Interconnection Wiring Diagram,
8.	8815D36, Sht. 3	7	Interconnection Wiring Diagram,
9.	8815D36, Sht. 7	CP-1	Interconnection Wiring Diagram,
10.	M1-2206-03	0	Instrument and Control Diagram
11.	DCA 020694	2	Design Change Authorization
12.	DCA 059980	1	Design Change Authorization
13.	DCA 059869	0/1	Design Change Authorization
14.	ECN 000244	0	Engineering Change Notice
15.	DCA 056798	0	Design Change Authorization
16.	DCA 017397	0	Design Change Authorization
17.	DCA 052785	0	Design Change Authorization
18.	DCA 053467	0	Design Change Authorization
19.	DCA 053312	0	Design Change Authorization
20.	DCA 059617	5	Design Change Authorization
21.	DCA 017649	0	Design Change Authorization
22.	DCA 052932	0	Design Change Authorization
23.	DCA 056369	0	Design Change Authorization
24.	DCA 080725	0	Design Change Authorization
25.	DCA 053412	0	Design Change Authorization
26.	DCA 053411	0	Design Change Authorization
27.	DCA 052530	0	Design Change Authorization

EVIDENCE DOCUMENT SHEET NO. 6 (cont.)
CALCULATION 1-SC-37-18, REV. 4

DOCUMENT NO.	REV.	TYPE
28. CP-0611D-001	Vol. 1	Westinghouse Equipment Reference Manual
29. Design Spec. 955556	1	Westinghouse Design Specification
30. 1-SC-8800-H	1	Scaling Appendix
31. 8815D28	3	M/A Station Tabulation
32. 1-SC-8800-I	2	Scaling Appendix
33. IC(B)-004	1	Setpoint Calculation
34. 8338A95 Sheets 1 thru 8	9	PROM Library
35. C-87-05180	12/2/87	Deficiency Report
36. C-87-05035	12/2/87	Deficiency Report
37. WCAP 9806	2	Westinghouse Scaling Manual
38. FCN TBXM 10990	0	Field Change Notice
39. DCA 17,342	1	Design Change Authorization

EVIDENCE DOCUMENT SHEET NO. 5
CALCULATION 1-SC-49-01, REV. 3

DOCUMENT NO.	REV.	TYPE
1. 2910D37, Sht. 7	8	Interconnection Wiring Diagram
2. 2910D37, Sht. 8	8	Interconnection Wiring Diagram
3. 1065902, Sht. 3	CP-1	Interconnection Wiring Diagram
4. 8758D39, Sht. 27	6	Process Control Block Diagram
5. M1-2295-12	CP-4	Instrumentation Control Diagram
6. DCA 021227	1	Design Change Authorization
7. DCA 016957	2	Design Change Authorization
8. DCA 016968	0	Design Change Authorization
9. DCA 077633	0	Design Change Authorization
10. CP-0001-089	Vol. 1	Westinghouse Equipment Ref. Manual
11. Spec. 955556	1	Westinghouse Design Specification
12. 1-SC-[illegible]-N	1	Scaling Appendix
13. 1-SC-[illegible]-B	2	Scaling Appendix
14. WCAP-9695	2	Westinghouse Scaling Manual
15. 1-SC-[illegible]-E	1	Scaling Appendix
16. PL&S	3	Westinghouse Precautions Limitations and Setpoints
17. 2910D29	3	M/A Station Tabulation

EVIDENCE DOCUMENT SHEET NO. 6
CALCULATION 1-SC-33-70, REV. 2

	DOCUMENT NO.	REV.	TYPE
1.	8810D38, Sht. 39	2	Interconnection Wiring Diagram
2.	8810D38, Sht. 41	9	Interconnection Wiring Diagram
3.	8810D38, Sht. 45	9	Interconnection Wiring Diagram
4.	8810D38, Sht. 49	2	Interconnection Wiring Diagram
5.	8810D38, Sht. 50	2	Interconnection Wiring Diagram
6.	8810D38, Sht. 51	7	Interconnection Wiring Diagram
7.	8750D39, Sht. 23	7	Process Control Block Diagram
8.	8750D39, Sht. 24	2	Process Control Block Diagram
9.	8750D39, Sht. 32	4	Process Control Block Diagram
10.	DCA 059071	1	Design Change Authorization
11.	DCA 077928	0	Design Change Authorization
12.	DCA 080993	0	Design Change Authorization
13.	DCA 073062	0	Design Change Authorization
14.	CP-00001-089	Vol. 1	Westinghouse Equipment Reference Manual
15.	Spec. 955956	1	Westinghouse Design Specification
16.	1-SC-4800-N	1	Scaling Appendix
17.	DBD-NE-021	0	Design Basis Document
18.	PLAS	3	Westinghouse Precautions Limitations and Setpoints
19.	WCAP 9806	2	Westinghouse Scaling Manual

EVIDENCE DOCUMENT SHEET NO. 7
CALCULATION 1-SC-28-12, REV. 3

	DOCUMENT NO.	REV.	TYPE
1.	CP-0611B-001	Vol. 1	Westinghouse Equipment Reference Manual
2.	8815D33, Sht. 13	9	Interconnection Wiring Diagram
3.	8815D33, Sht. 44	6	Interconnection Wiring Diagram
4.	8815D34, Sht. 33	CP-1	Interconnection Wiring Diagram
5.	8815D34, Sht. 34	CP-1	Interconnection Wiring Diagram
6.	MS-605	5	Equipment Specification
7.	MS-613	1	Equipment Specification
8.	MS-622	2	Equipment Specification
9.	1-SC-[illegible]-C	2	Scaling Calculation Manual Appendix
10.	1-SC-[illegible]-H	1	Scaling Calculation Manual Appendix
11.	DCA [illegible]	0	Design Change Authorization
12.	DCA 31581	0	Design Change Authorization
13.	DCA 31582	0	Design Change Authorization

EVIDENCE DOCUMENT SHEET NO. 8
CALCULATION 1-SC-55-04, REV. 4

	DOCUMENT NO.	REV.	TYPE
1.	CP-0001-089	Vol. 1	Westinghouse Equipment Reference Manual
2.	8810D31, Sht. 41	5	Interconnection Wiring Diagram
3.	8810D31, Sht. 42	7	Interconnection Wiring Diagram
4.	8758D39	7	Process Control Block Diagram
5.	M1-2250-03	CP-2	Instrumentation and Control Diagram
6.	M1-2250-03A	CP-3	Instrumentation and Control Diagram
7.	DCA-77275	4	Design Change Authorization
8.	S.O. 325, Sheet 04210	9	Westinghouse Shop Order
9.	S.O. 395, Sheet 05410	15	Westinghouse Shop Order

Audit Report No.: ATP-89-1665

EVIDENCE DOCUMENT SHEET NO. 9
CALCULATION 1-SC-19-11, REV. 1

	DOCUMENT NO.	REV.	TYPE
1.	8815D33, Sht. 21	CP-1	Interconnection Wiring Diagram
2.	8815D33, Sht. 22	4	Interconnection Wiring Diagram
3.	8815D28	3	M/A Station Tabulation
4.	M1-2204-03	CP-2	Instrument and Control Drawing
5.	1-SC-8800-B	2	Scaling Calculation Manual Appendix
6.	1-SC-8800-H	1	Scaling Calculation Manual Appendix
7.	MS-603	3	Equipment Specification
8.	MS-611A	2	Equipment Specification
9.	MS-634	4	Equipment Specification
10.	CP-0311D-001	Vol. 1	Westinghouse Equipment Reference Manual
11.	1-SC-8800-E	1	Scaling Calculation Manual Appendix

Austin Report No.: ATP-89-1465

EVIDENCE DOCUMENT SHEET NO. 10
CALCULATION 1-SC-19-03, REV. 3

	DOCUMENT NO.	REV	TYPE
1.	8815D33, Sht. 16	CP-1	Interconnection Wiring Diagram
2.	CP-0611B-001	Vol. 1	Westinghouse Equipment Reference Manual
3.	8815D28	1	MVA Section Tabulation
4.	1-SC-8800-H	1	Scaling Calculation Manual Appendix
5.	1-SC-8800-I	2	Scaling Calculation Manual Appendix
6.	MS-611A	2	Equipment Specification
7.	MS-611B	CP-3	Equipment Specification
8.	M1-2204-02A	CP-8	Interconnection Wiring Diagram
9.	FCN TBJOM 10658	A	Field Change Notice
10.	DCA 58841	0	Design Change Authorization
11.	FCN TBJOM 10930	0	Field Change Notice
12.	DCA 17342	1	Design Change Authorization

Audit Report No.: ATP-89-1665

EVIDENCE DOCUMENT SHEET NO. 11
CALCULATION 1-SC-19-07, REV. 2

	DOCUMENT NO.	REV.	TYPE
1.	8815D33, Sht. 17	CP-1	Interconnection Wiring Diagram
2.	8815D33, Sht. 18	4	Interconnection Wiring Diagram
3.	DCA-60145	3	Design Change Authorization
4.	M1-2204-03	CP-5	Instrumentation and Control Diagram
5.	8815D28	3	M/A Station Tabulation
6.	MS-605	3	Equipment Specification
7.	MS-611A	2	Equipment Specification
8.	MS-624	4	Equipment Specification
9.	CP-0611B-001	Vol. 1	Westinghouse Equipment Reference Manual
10.	FCN TBXM 10590	0	Field Change Notice
11.	DCA 17342	1	Design Change Authorization

EVIDENCE DOCUMENT SHEET NO. 12
CALCULATION 1-SC-48-01, REV. 2

	DOCUMENT NO.	REV.	TYPE
1.	CP-0001-089	Vol. 1	Westinghouse Reference Manual
2.	IWD 8810D36	2	Interconnection Wiring Diagram
3.	PCBD 8758D39, Sht. 51	2	Process Control Block Diagram
4.	Drawing 8810D29	3	M/A Station Tabulation
5.	ICD M1-2256-03	CP-3	Instrumentation and Control Diagram
6.	MS-605	3	Equipment Specification

EVIDENCE DOCUMENT SHEET NO. 13
CALCULATION 1-SC-34-19, REV. 4

	DOCUMENT NO.	REV.	TYPE
1.	CP-0001-089	Vol. 1	Westinghouse Equipment Reference Manual
2.	8810D31, Sht. 14	12	Interconnection Wiring Diagram
3.	8810D31, Sht. 15	8	Interconnection Wiring Diagram
4.	8815D32, Sht. 14	13	Interconnection Wiring Diagram
5.	8815D32, Sht. 15	7	Interconnection Wiring Diagram
6.	S.O. 325, Sheet 01410	48	Westinghouse Shop Order
7.	S.O. 395, Sheet 05020	41	Westinghouse Shop Order
8.	8758D39, Sheet 17	6	Process Control Block Diagram
9.	1-SC-8800-H	1	Scaling Calculation Manual Appendix
10.	1-SC-8800-I	3	Scaling Calculation Manual Appendix
11.	WCAP-9696	2	Westinghouse Scaling Manual
12.	FCN TBXM 10658	A	Field Change Notice
13.	DCA 58841	0	Design Change Authorization
14.	FCN TBXM 10590	0	Field Change Notice
15.	DCA 17342	1	Design Change Authorization

EVIDENCE DOCUMENT SHEET NO. 14
CALCULATION 1-SC-55-52, REV. 4

	DOCUMENT NO.	REV.	TYPE
1.	S.O. 325, Sht. 04215	4	Westinghouse Shop Order
2.	S.O. 395, Sht. 05020	41	Westinghouse Shop Order
3.	S.O. 395, Sht. 09410	15	Westinghouse Shop Order
4.	8810D31, Sht. 5	8	Interconnection Wiring Diagram
5.	8810D31, Sht. 6	9	Interconnection Wiring Diagram
6.	8810D31, Sht. 7	7	Interconnection Wiring Diagram
7.	8810D31, Sht. 8	5	Interconnection Wiring Diagram
8.	8810D38, Sht. 43	2	Interconnection Wiring Diagram
9.	8758D39, Sht. 7	6	Process Control Block Diagram
10.	8758D39, Sht. 35	3	Process Control Block Diagram
11.	2323-M1-2250-02A	CP-2	Instrumentation and Control Drawing
12.	1-SC-8800-G	1	Scaling Calculation Manual Appendix
13.	1-SC-8800-H	1	Scaling Calculation Manual Appendix
14.	WCAP 8695	2	Westinghouse Scaling Manual
15.	DCA 72491	0	Design Change Authorization
16.	DCA 73752	0	Design Change Authorization
17.	DCA 88523	1	Design Change Authorization
18.	DCA 16740	1	Design Change Authorization
19.	DCA 20494	0	Design Change Authorization
20.	DCA 83059	0	Design Change Authorization
21.	FCN TBX04-10696	A	Field Change Notice
22.	FCN TBX04-10613	A	Field Change Notice
23.	FCN TBX04-10594	A	Field Change Notice
24.	CP-0001-89	Vol. 1	Westinghouse Equipment Reference Manual
25.	1-SC-55-28	5	Scaling Calculation
26.	1-SC-55-76	2	Scaling Calculation
27.	1-SC-55-46	1	Scaling Calculation
28.	PLAS	3	Westinghouse Precautions Limitations and Setpoints
29.	CP-0001-027	0	Equipment Reference and System Drawing Manual - M16 Upgrade

EVIDENCE DOCUMENT SHEET NO. 15
CALCULATION 1-SC-55-28, REV. 5

	DOCUMENT NO.	REV.	DOCS
1.	8833D38, Sht. 3	8	Interconnection Wiring Diagram
2.	8833D38, Sht. 4	6	Interconnection Wiring Diagram
3.	8833D38, Sht. 6	8	Interconnection Wiring Diagram
4.	8833D38, Sht. 7	6	Interconnection Wiring Diagram
5.	8833D38, Sht. 14	6	Interconnection Wiring Diagram
6.	8833D38, Sht. 15	6	Interconnection Wiring Diagram
7.	9594D89, Sht. 2	3	Process Control Block Diagram
8.	1-SC-6800-H	1	Scaling Calculation Manual Appendix
9.	WPT-11080	1	Westinghouse Project Transmittal
10.	DCA 072491	0	Design Change Authorization
11.	DCA 73752	0	Design Change Authorization
12.	DCA 88528	1	Design Change Authorization
13.	FCN TBXM-10696	A	Field Change Notice
14.	FCN TBXM-10654	A	Field Change Notice
15.	FCN TBXM-10613	A	Field Change Notice
16.	CP-00001-89	Vol. 1	Westinghouse Equipment Reference Manual
17.	WCAP 9695	2	Westinghouse Scaling Manual
18.	1-SC-55-53	5	Scaling Calculation
19.	PL28	3	Westinghouse Precautions Limitations and Setpoints
20.	FCN TBXM 10570	0	Field Change Notice
21.	DCA 17343	1	Design Change Authorization

Audit Report No.: ATP-89-1465

SUPPLEMENTARY EVIDENCE DOCUMENT LIST 01

REVIEW OF DRAFT SCALING CALCULATION COPIES

	DOCUMENT NO.	REV./DATE	TYPE
1.	1-SC-58-02	Rev. 3 to 4	Scaling Calculation
2.	1-SC-37-18	Rev. 4 to 5	Scaling Calculation
3.	1-SC-37-10	Rev. 3 to 4	Scaling Calculation
4.	1-SC-33-69	Rev. 4 to 5	Scaling Calculation

AuCH Report No.: ATP-89-1468

SUPPLEMENTARY EVIDENCE DOCUMENT LIST 02

CONFIRMATION REQUIRED REMOVAL DISTRIBUTION

	DOCUMENT NO.	REV./DATE	TYPE
1.	IOC for 1-SC-34-02	02/17/89	Inter Office Correspondence
2.	IOC for 1-SC-44-06	03/27/89	Inter Office Correspondence
3.	IOC for 1-SC-34-05	03/27/89	Inter Office Correspondence
4.	IOC for 1-SC-37-06	03/27/89	Inter Office Correspondence
5.	1-SC-28-12	Rev. 3	Sealing Calculation
6.	1-SC-28-23	Rev. 2	Sealing Calculation
7.	1-SC-28-19	Rev. 4	Sealing Calculation
8.	1-SC-28-01	Rev. 3	Sealing Calculation
9.	1-SC-28-04	Rev. 4	Sealing Calculation
10.	1-SC-28-01	Rev. 8	Sealing Calculation
11.	1-SC-28-02	Rev. 7	Sealing Calculation
12.	1-SC-28-28	Rev. 5	Sealing Calculation
13.	1-SC-28-52	Rev. 4	Sealing Calculation
14.	1-SC-28-70	Rev. 2	Sealing Calculation

SUPPLEMENTARY EVIDENCE DOCUMENT LIST 03

CONFIRMATION REQUIRED FOR REDUNDANT LOOPS

	DOCUMENT NO.	REV./DATE	TYPE
1.	X-SC-07-01	Rev. 4	Scaling Calculation
2.	X-SC-07-02	Rev. 4	Scaling Calculation
3.	X-SC-24-01	Rev. 3	Scaling Calculation
4.	X-SC-24-05	Rev. 2	Scaling Calculation
5.	X-SC-49-02	Rev. 3	Scaling Calculation
6.	X-SC-49-03	Rev. 3	Scaling Calculation
7.	1-SC-19-01	Rev. 2	Scaling Calculation
8.	1-SC-19-02	Rev. 3	Scaling Calculation
9.	1-SC-19-03	Rev. 2	Scaling Calculation
10.	1-SC-23-03	Rev. 2	Scaling Calculation
11.	1-SC-28-04	Rev. 3	Scaling Calculation
12.	1-SC-28-05	Rev. 2	Scaling Calculation
13.	1-SC-28-07	Rev. 2	Scaling Calculation
14.	1-SC-28-08	Rev. 2	Scaling Calculation
15.	1-SC-28-09	Rev. 2	Scaling Calculation
16.	1-SC-31-01	Rev. 3	Scaling Calculation
17.	1-SC-31-02	Rev. 2	Scaling Calculation
18.	1-SC-34-11	Rev. 2	Scaling Calculation
19.	1-SC-34-12	Rev. 2	Scaling Calculation
20.	1-SC-35-05	Rev. 3	Scaling Calculation
21.	1-SC-35-06	Rev. 3	Scaling Calculation
22.	1-SC-35-07	Rev. 3	Scaling Calculation
23.	1-SC-35-08	Rev. 3	Scaling Calculation
24.	1-SC-49-02	Rev. 4	Scaling Calculation

SUPPLEMENTARY EVIDENCE DOCUMENT LIST 03 (cont.)

CONFIRMATION REQUIRED FOR REDUNDANT LOOPS

	DOCUMENT NO.	REV./DATE	TYPE
25.	1-SC-43-03	Rev. 4	Scaling Calculation
26.	1-SC-43-04	Rev. 4	Scaling Calculation
27.	1-SC-48-03	Rev. 3	Scaling Calculation
28.	1-SC-48-04	Rev. 3	Scaling Calculation
29.	1-SC-48-05	Rev. 3	Scaling Calculation
30.	1-SC-48-06	Rev. 3	Scaling Calculation
31.	1-SC-48-10	Rev. 5	Scaling Calculation
32.	1-SC-48-11	Rev. 5	Scaling Calculation
33.	1-SC-55-03	Rev. 4	Scaling Calculation
34.	1-SC-55-04	Rev. 4	Scaling Calculation
35.	1-SC-55-05	Rev. 4	Scaling Calculation
36.	1-SC-55-06	Rev. 4	Scaling Calculation
37.	1-SC-55-24	Rev. 3	Scaling Calculation
38.	1-SC-55-25	Rev. 3	Scaling Calculation
39.	1-SC-55-37	Rev. 3	Scaling Calculation
40.	1-SC-55-38	Rev. 2	Scaling Calculation

Audit Report No.: AIP-89-146S

SUPPLEMENTARY EVIDENCE DOCUMENT LIST 04

PROGRAMMABLE READ ONLY MEMORIES (PROMS)

DOCUMENT NO.	REV./DATE	TYPE
1. INC-4400A	Rev. 1	Channel Calibration Procedure
2. DCA-88369	Rev. 1	Design Change Authorization
3. W.R. # 64948	Rev. 0	Work Request
4. ICA-106	Rev. 0	Maintenance Procedure

Audit Report No.: ATP-89-146S

SUPPLEMENTARY EVIDENCE DOCUMENT LIST 05

ANNOTATED IWDs

	DOCUMENT NO.	REV./DATE	TYPE
1.	DCA-14775	Rev. 4	Design Change Authorization
2.	DCA-14775	Rev. 5	Design Change Authorization
3.	DCA-14775	Rev. 6	Design Change Authorization
4.	CAR 035	Rev. 2	Corrective Action Report
5.	DR-C-87-03086	12/15/89	Deficiency Report
6.	DR-C-05180	12/15/89	Deficiency Report
7.	F-1149	11/04/89	Survey Work Request
8.	GTN-63163	01/10/83	Gibbs & Hill Letter
9.	GTN-62983	12/19/82	Gibbs & Hill Letter

SUPPLEMENTARY EVIDENCE DOCUMENT LIST 06

NCH CARDS

	DOCUMENT NO.	REV./DATE	TYPE
1.	WPT-11928	08/23/89	Westinghouse Project Transmittal
2.	WPT-11793	08/08/89	Westinghouse Project Transmittal
3.	ECN-243	Rev. 1	Engineering Change Notice
4.	ECN-244	Rev. 1	Engineering Change Notice
5.	ECN-245	Rev. 1	Engineering Change Notice

SUPPLEMENTARY EVIDENCE DOCUMENT LIST 07

NCR CARDS

	DOCUMENT NO.	REV./DATE	TYPE
1.	PO 661-703695	08/23/83	Purchase Order
2.	TSN 139984-8	09/14/83	TUCCO Stock Number Item Substantiation Initiation and Review Form
3.	DA-66004	08/23/83	Westinghouse Letter
4.	83-01919	08/01/83	Over, Short, Damaged or Non Conforming Goods Report
5.	NCR 87-00316	10/07/87	Non Conformance Report
6.	6C-023787	08/24/88	CPSES Change Order
7.	06-6084 page 2404	08/24/88	Master Stock Number Catalog
8.	6S-403259	12/04/87	TU Stock Action Request
9.	CAR-88-17	3/3/88	Corrective Action Request
10.	MCA-106	0	Maintenance Procedure

Audit Report No.: ATP-89-146S

SUPPLEMENTARY EVIDENCE DOCUMENT LIST 08

SETPOINT REFERENCES

	DOCUMENT NO.	REV./DATE	TYPE
1.	1-SC-11-09	Rev. 3	Scaling Calculation
2.	1-SC-11-11	Rev. 3	Scaling Calculation
3.	1-SC-14-02	Rev. 2	Scaling Calculation
4.	1-SC-34-08	Rev. 3	Scaling Calculation
5.	1-SC-34-09	Rev. 2	Scaling Calculation
6.	1-SC-34-14	Rev. 4	Scaling Calculation
7.	1-SC-34-17	Rev. 3	Scaling Calculation
8.	1-SC-37-10	Rev. 3	Scaling Calculation
9.	1-SC-37-18	Rev. 5	Scaling Calculation

SUPPLEMENTARY EVIDENCE DOCUMENT LIST 09

SHOP ORDER SPECIFICATION SHEET REVIEW

	DOCUMENT NO.	REV./DATE	TYPE
1.	1-SC-49-06	Rev. 4	Sealing Calculation
2.	1-SC-55-03	Rev. 4	Sealing Calculation
3.	1-SC-55-08	Rev. 4	Sealing Calculation
4.	1-SC-57-01	Rev. 5	Sealing Calculation
5.	1-SC-57-07	Rev. 4	Sealing Calculation
6.	1-SC-58-02	Rev. 4	Sealing Calculation
7.	1-SC-58-04	Rev. 3	Sealing Calculation
8.	1-SC-34-03	Rev. 3	Sealing Calculation
9.	1-SC-34-05	Rev. 5	Sealing Calculation

SUPPLEMENTARY EVIDENCE DOCUMENT LIST 10

RDF - RESISTANCE TEMPERATURE DEVICES (RTDs)

	DOCUMENT NO.	REV./DATE	TYPE
1.	PO 29357-D-L-G	07/22/83	Purchase Order
2.	PO 29357-D-L-G	Supl.04/25/86	PO Supplement
3.	QRN-79681	Rev. 0	Westinghouse Quality Release
4.	PET # 1893	08/18/87	Permanent Equipment Transfer
5.	WPT-9067	07/13/87	Westinghouse Letter

SUPPLEMENTARY EVIDENCE DOCUMENT LIST 11

INSTRUMENT ELEVATIONS

	DOCUMENT NO.	REV./DATE	TYPE
1.	1-SC-8800-1	Rev. 3	Scaling Appendix
2.	FE-9490	Rev. 8	Brown & Root Equipment
3.	FE-9187	Rev. 6	Brown & Root Equipment
4.	FE-9183	Rev. 4	Brown & Root Equipment
5.	FE-9182	Rev. 4	Brown & Root Equipment
6.	FE-7099	Rev. 2	Brown & Root Equipment
7.	FE-4187	Rev. 3	Brown & Root Equipment
8.	FE-9112	Rev. 1	Brown & Root Equipment
9.	FE-4182	Rev. 3	Brown & Root Equipment
10.	FE-13505	Rev. 1	Brown & Root Equipment
11.	SWTU-13,379	07/10/89	SWEC Memo
12.	1-LT-0517-IWP-333	Rev. 0	FVM-089 Walkdown Package
13.	1-LT-0537-IWP-350	Rev. 0	FVM-089 Walkdown Package
14.	1-LT-0527-IWP-342	Rev. 0	FVM-089 Walkdown Package
15.	1-LT-0547-IWP-358	Rev. 0	FVM-089 Walkdown Package
16.	1-LT-4752-IWP-192	Rev. 0	FVM-089 Walkdown Package
17.	1-LT-4753-IWP-193	Rev. 0	FVM-089 Walkdown Package
18.	1-PT-614-IWP-249	Rev. 0	FVM-089 Walkdown Package
19.	1-PT-615-IWP-250	Rev. 0	FVM-089 Walkdown Package

Audit Report No.: ATP-89-1465

ATTACHMENT A

	Calculation	Reviewer
1.	1-SC-28-19, Rev. 4	T. McLean
2.	1-SC-28-23, Rev. 2	T. McLean, W. Sturtz
3.	1-SC-34-02, Rev. 1	T. McLean
4.	1-SC-37-18, Rev. 4	T. McLean
5.	1-SC-49-01, Rev. 3	T. McLean
6.	1-SC-55-70, Rev. 2	T. McLean
7.	1-SC-28-12, Rev. 3	H. Choudhry
8.	1-SC-55-04, Rev. 4	H. Choudhry
9.	1-SC-19-11, Rev. 1	H. Choudhry
10.	1-SC-19-05, Rev. 3	H. Choudhry
11.	1-SC-19-07, Rev. 2	H. Choudhry
12.	1-SC-48-01, Rev. 2	H. Choudhry
13.	1-SC-34-19, Rev. 4	H. Choudhry
14.	1-SC-55-52, Rev. 4	W. Sturtz
15.	1-SC-55-28, Rev. 5	W. Sturtz

Note: K. Mardirosian reviewed audit checklist Items 7c and 7e for all calculations.

TU ELECTRIC

OFFICE MEMORANDUM

NE-28.245
November 17, 1989

TO: D.E. Ramstrom A08

COMANCHE PEAK STEAM ELECTRIC STATION
RESPONSE TO TU ELECTRIC QA AUDIT
REPORT ATP-89-1468

Please find attached the responses to the deficiencies and observations identified in Tap Audit Report ATP-1468, "Scaling Calculations". If you have any questions or require any additional information concerning this subject, please contact Brian Haynes at extension 8034.

C.B. Hoss E01

BMH:jb

Attachment

cc:

A0[illegible]		1L,1A	E08
D.P.	Barry	1L,1A	Admv/443
M.R.	Blevins	1L,1A	C09
H.D.	Bruner	1L,1A	E21
R.N.	Burnham	1L,1A	IC/444
D.	Corbitt	1L,1A	C08
C.G.	Crossman	1L,1A	E04
B.M.	Haynes	1L,1A	E08
J.J.	Kelley	1L,1A	C09
J.	Kreuzberg	1L,1A	244987
J.J.	Lefevre	1L,1A	E08
G.J.	Laughlin	1L,1A	C04
O.W.	Lowe	1L,1A	E07
J.W.	Moffett	1L,1A	C09
K.A.	Norman	1L,1A	E04
P.	Rastivar	1L,1A	Admv/443
J.F.	Streeter	1L,1A	A08

ATP-89-1468, DEFICIENCY NO. 89-1468-01

Deficiency Title: Inadequate Input References in Scaling Calculations

Requirement

EAP 5.3, "Preparation and Control of Manual and Computerized Calculations (Nuclear Projects)", Rev. 3, states:

1. Section 2.0 - "All manual and computerized engineering and design calculations shall be:

   - Prepared such that the analysis can be understood by an individual competent in the calculation discipline without recourse to the preparer of the calculation".

2. Attachment 1.4 - "The body of the calculation shall consist of all computations, along with explanatory text and diagrams, leading to the results. The following shall be included:

   Inputs (Including Sources)

   Input values (including units) and identification of the sources (see sample source reference below).

   - Technical Document - Document Number and/or Title; Issue Date; Revision Number, and Section, Page, or Table Numbers, if applicable."

Deficiency

Contrary to the above, most of the scaling calculations reviewed exhibited one or more of the following deficient conditions (in many cases, recourse to the preparer was required to understand the calculations):

1. Section 3 of the calculations contains reference to "Standard Reference Documents" in Section 2.0 of the Scaling Calculation Manual (1-SC-8800); however, Section 2.0 contains 20 documents, not all of which are applicable to any one calculation. Additionally, these references do not contain revision levels or dates, yet specific information contained in these documents (e.g., gain, bias values, etc.) was used in the calculations.

2. The body of the calculations does not contain specific input reference sources (e.g., document number, revision number, titles, issue date, section, page, etc.) for: Module gain, bias, and input voltage; jumpers required or removed; or resistors required.

3. Input reference sources are not stated for module equation or transfer functions utilized.

4. Explanatory notes are not provided for mathematical manipulations performed nor are the manipulations shown.

5. Section 6 of the calculations contains the statement, "For Loop Accuracies, see Scaling Calculation Manual Appendix H (1-SC-8800-H, Rev. 1)"; however, Appendix H only provides guidelines for determination of loop accuracy values rather than providing actual loop accuracy values themselves. (A similar statement is made in Project Procedure PP-008, Attachment B, Page 7, Paragraph E).

6. Figure 1 of the calculations does not contain a reference for the source (e.g., Westinghouse Process Control Block Diagram, etc.) of the loop configuration.

Response

Discussion/Corrective Action

Items 1-4

During the early stages of the audit, a decision was made to revise the scaling calculations to enhance th detail and document specific references contained in the reference section and body of the calculation.

Item 5

Appendix H provides component accuracies and guidelines for determination of loop calibration accuracy. The function of Appendix H is correctly and specifically stated in the appendix itself. As calculations are revised, a clarification will be added to reference Appendix H as guidelines in determining loop calibration accuracies. Project Procedure PP-008 does not require a change.

Item 6

The functional block scaling diagram is a graphic representation of the loop described in the scaling calculation. The scaling calculation is therefore the source document providing the input to the diagram. Since the source documents providing input to the scaling calculation are being referenced in the calculation itself, references are not required on the functional block scaling diagram. A similar explanation has been added to the applicable section of the Scaling Calculations Manual.

Extent of Condition

A recently performed CECO QA Surveillance (CAP 89-080) determined that the cited condition is isolated to Scaling Calculations. Additionally, a special assessment is being performed by SWEC's Engineering Assurance division to substantiate the surveillance results which is scheduled for completed by 11/24/89.

Cause

The scaling calculations in their audited format were originally believed to be in compliance with the intent of the program requirements.

Preventive Action

Project Procedure PP-009 and the Scaling Calculations Manual have been revised to provide and clarify the specific requirement for scaling calculation content. Subsequent to revising these documents, all scaling calculation preparers, reviewers, and independent reviewers have been trained to these documents.

Completion Dates

Prior to fuel load, the safety-related scaling calculations will be reviewed by personnel trained to the revised Scaling Calculations Manual (1-SC-8900) and applicable project procedures. The calculations will be revised as necessary to assure they are technically correct, meet procedural requirements, have "Confirmation Required" annotations removed and are consistent with applicable design documents.

Prior to operation above 5% power, the non-safety related scaling calculations will be reviewed by personnel trained to the revised Scaling Calculations Manual (1-SC-8900) and applicable project procedures. The calculations will be revised as necessary to assure they are technically correct, meet procedural requirements, have "Confirmation Required" annotations removed and are consistent with applicable design documents.

ATP-89-1468, DEFICIENCY NO. 89-1468-02

Deficiency Title: Inadequate Scaling Calculation Preparation Guidelines

Requirement

ANSI N45.2.11 - Draft 2, Revision 2, Section 4.1, states:

"Design activities shall be prescribed and accomplished in accordance with procedures of a type sufficient to assure that applicable design inputs are correctly translated into specifications, drawings, procedures, or instructions."

Deficiency

Contrary to the above, design activities are not prescribed in sufficient written detail to define the relationship of the various source or reference documents utilized in the production of scaling calculations. Specifically, there is no single document which provides an overall "road map" for the preparation of scaling calculations which addressed input data sources, equipment reference manuals, and calculation content and methodology. Neither 2323-ES-032, Scaling Calculation Manual (SC-5800) nor any of several other references provide the required overall procedural definition or guidelines for this activity.

NOTE: On the basis of its review, the audit team finds that practices and controls used in the production of scaling calculations are adequate as evidenced by the technical acceptability of the end products. Design drawings and reference data used as input were also determined to be appropriate. To ensure that future scaling calculation activities are continued on a sound and controlled basis, existing practices and controls need to be incorporated in an overall program description (or "road map") covering the entire scaling calculation process.

Response

Statement of Condition

The concerns identified are pertinent to the scaling calculations activity only.

Cause

It is agreed that one specific document does not exist which provides a "road map" for preparation of scaling calculations. However, collectively more than adequate details were contained in the DED-ES-32, the Scaling Calculations Manual (1-SC-5800) and the project procedure to provide an acceptable product.

Corrective Action

Revision of the Scaling Calculations Manual and subsequent training has been completed.

Corrective Action

As a result of an additional review of the concern, it was decided that the DED would be cancelled when applicable direction and requirements from the DED were placed in the Scaling Calculations Manual. The Scaling Calculations Manual has been revised to incorporate the applicable portions of the DED and the DED has been voided.

Completion Date

All actions are completed.

ATP-89-1468, DEFICIENCY NO. 89-1468-03

Deficiency Title: Inadequate Preparation and Review of Scaling Calculations

Requirement

1. ANSI N45.2.11, Draft 2, Rev. 2, Section 4.2, states in part:

"Design analyses...shall be performed in a...correct manner."

2. EAP 5.3, Rev. 3, Attachment 3.0, "Review Requirements," states:

"The signature of the reviewer(s) on the calculation page signifies that requirements of this attachment have been met".

Deficiency

Contrary to the above, the calculation preparation and review process failed to identify the following errors, omissions, and inconsistencies which were identified during the audit of scaling calculations:

1. Calculation 1-SC-55-52, Rev. 4, shows relay card NSC8 as 1-TS/411F, whereas the referenced Westinghouse P&D 8810D91, Sheet 6, shows this device as TS/411E.

2. Calculations 1-SC-55-52, confirmation Item 2, states, "Westinghouse Instrumentation Sheets for Shop Order 330, 338, and 383. Revise to show current status." This note apparently applies to confirmation Item 6 which relates to the revision of Section 2 of the Scaling Calculation Manual.

3. Calculation 1-SC-55-52, Rev. 4, Page 20, Section D-1 and D-2, reference Westinghouse Precautions, Limitations, and Setpoints (PLSS), Rev. 2, as the source of the Lo and Lo-Lo Tavg. interlock setpoints. Rev. 3 of the PLSS was issued in January 1988. The calculation (issued 3/2/88) did not reference the latest revision of the PLSS.

4. Calculation 1-SC-55-72, Rev. 0, Page 13, states that Vwest - Vwestpoint = 0.40 VDC. The -0.40 VDC value should be -0.04 VDC.

5. Calculation 1-SC-55-52, Rev. 4, Pages 21 and 23, reference Westinghouse Scaling Manual Supplement, Rev. 2, as a source of setpoint values. This reference is not appropriate since it is based on Rev. 2 of the PLSS. Rev. 3 of the PLSS has been issued since Rev. 2 of the Scaling Manual (October 1983).

6. Calculation 1-SC-55-52, Rev. 5, Figure 1, shows device JY-41CE as an NCM1 card, whereas DCA 88878 indicates that this device is an NCM4 card.

7. Calculation 1-SC-55-28, Rev. 5, Page 8, states that Bench Calibration Accuracy for Summing Amplifier 1-JY-410A is ± 0.10% of span or ± 0.10 VDC. The span is 0 - 10 VDC, thus the correct value should be ± 0.01 VDC.

8. Calculation 1-SC-28-19, Rev. 4, Page 11 improperly references a previous revision of the same calculation for the setpoint value for loss of feedwater pump speed rather than referencing a controlled, up-to-date source of setpoint data such as the PLAS or Instrument Setpoint List.

9. Calculation 1-SC-55-28, Rev. 5, Page 8 calculates gain for NBA1 card 1-JY-410A as "RI = 50K ohms/0.1 = 500K ohms, use 499K ohms." No explanatory note was indicated for using a 499K ohm resistor in place of the calculated value of 500K ohms.

10. Calculations 1-SC-55-01, Rev. 8 and 1-SC-55-02, Rev. 7 are designated "No Confirmation Required"; however, Note 1 on the cover sheet states "Confirmation Required for values in Table 1 Breakpoints by W".

11. Calculation 1-SC-55-01, Rev. 8, Page 5 for component 1-TY-0413M states that the output is 1.417 to 7.833 VDC. The 7.833 VDC value should be 7.783 VDC.

12. Calculations 1-SC-55-01, Rev. 8, Page 8, and 1-SC-55-02, Rev. 7, Page 8, for devices 1-PB-0403D and 1-PB-0405D state that the alarm setpoint is "greater than -20 psi Valve (close, hysteresis)". The notation, "Valve (close, hysteresis)" does not apply to the alarm function.

13. Calculation 1-SC-55-02, Rev. 7, Page 9 shows the output from device 1-TY-0413P as 1.417-7.783 VDC. The 1.417 VDC value should be 1.667 VDC as shown on Page 5 of the calculation.

14. Calculations 1-SC-55-01, Rev. 8, and 1-SC-55-02, Rev. 7, Page 7 use a deadband of 0.667% for bistables 1-PB-0403C and 1-PB-0405C. No justification or explanation was provided for the use of this deadband value.

15. Appendix H of the Scaling Calculation Manual (1-SC-0000-H), Rev. 1, Page 10, Item 4, identifies an output accuracy ±0.38% of span for NAL cards. All scaling calculations using NAL cards state that the output accuracy is ±0.25%. (A note on page 10 of Appendix H points out this discrepancy in Westinghouse reference documents).

16. The Level program "from" devices on page 22 (Figure 1) of Calculation 1-SC-28-23 and on Westinghouse Process Control Block Diagram 8758D39, Sheet 33, Rev. 5, are shown as 1-FY-0606X and 1-FY-606Y. Westinghouse IWD8810D96, Sheet 30, Rev. 7, shows these devices as FY/506X and FY/505Y, respectively.

17. Calculation 1-EC-38-23, Rev. 2, contains the following discrepancies:

A. Westinghouse drawing 8810D86, Sheet 23, shows that the output of device 1-FT-0618 goes directly to device 1-FT-0609. The Figure 1 representation in the calculation shows the signal to 1-FT-0609 as being processed by device 1-FT-0610D before going to 1-FT-0609.

B. The output of 1-FT-610B is shown on Figure 1 of the calculation as going to 1-FT-8181. Westinghouse drawing 8810D86, Sheet 23, shows this output as going to 1-FT-8181A.

C. Figure 1 shows output of bistable 1-FB-0610B is shown as "LO $0.7X10^6$ lb/hr". Page 10 of the calculation shows this output as "HI 0.7×10^6 lb/hr."

D. Figure 1 of the calculation shows devices 1-LC-0619, 1-LC-0650, and 1-LC-0610 as NC81 Cards, whereas Sheets 11, 13, and 14 of the calculation show them as NC811 cards.

E. Page 13 of the calculation shows the input to 1-LC-650 as coming from 1-LT-0610, whereas the referenced Westinghouse FSD 8810D26, Sheet 27, shows this source as 1-LT-610.

F. Page 15 of the calculation shows bench calibration accuracy of device 1-FT-0610 as 0.0% mV. This should be 0.0% VDC.

G. Page 15 also shows the MTD (1-LT-0660) clock to be a T^2 output while the jumpers shown will give a linear clock rate.

18. Calculation 1-EC-40-01, Rev. 3 contains the following discrepancies:

A. The calculation references NCD-2313-41-1254-12, Rev. 4 which is a voided document.

B. Appendix B of the Scaling Calculation Manual (1-EC-0000-B) is not referenced in the calculation as a source of the application notes for the MTD card.

C. Page 8 of the calculation contains no values for gain or bias setting for the NC81 card used in the loop.

D. The calculation identifies a device on the Hot Shutdown Panel as 1-FT-0181A, whereas Westinghouse FSD 8710D63, Sheet 27, Rev. 6, identifies this device as 1-FT-0181F.

19. Calculations 1-EC-37-19 and 1-EC-34-19 did not identify the jumper patterns required to implement the binary timer range code. Also, the characters 1000 and 0000 were not identified as binary codes.

20. Calculation 1-EC-33-19, Rev. 4, had "Confirmation Required" removed, yet the cover sheet was checked "Confirmation Required, Yes."

21. Calculation 1-SC-43-01, Rev. 3, lists the appropriate Shop Order Number and specification sheets for the indicators, manual auto station, and orifice plate in the loop but fails to include the sheet revision numbers for these components.

Response

Extent of Condition

The scaling calculations have the potential for exhibiting the cited condition; however, none of the cited conditions individually or collectively, impact the results or usefulness of the final calculations.

Corrective Action

As the scaling calculations are being revised to complete the actions stated in response to Deficiency 88-1469-01. these transposition errors, omissions, and inconsistencies, as well as any other discrepancies detected during the revision cycle of all the calculations will be corrected.

Cause

The cited conditions are the result of inadvertent omissions in the preparation and review process.

Preventive Action

The preparers, reviewers, and independent reviewers have been trained to the enhanced program requirements.

Completion Date

Prior to fuel load, the safety-related scaling calculations will be revised by personnel trained to the revised Scaling Calculations Manual (1-SC-0000) and applicable project procedures. The calculations will be revised as necessary to ensure they are technically correct, meet procedural requirements, have "Confirmation Required" annotations removed and are consistent with applicable design documents.

Prior to operation above 5% power, the non-safety related scaling calculations will be revised by personnel trained to the revised Scaling Calculations Manual (1-SC-0000) and applicable project procedures. The calculations will be revised as necessary to ensure they are technically correct, meet procedural requirements, have "Confirmation Required" annotations removed and are consistent with applicable design documents.

AIP-89-1488, DEFICIENCY NO. 89-1488-04

Deficiency Title: Inadequate Timer Identification

Requirement:

ANSI N45.2.11-1984, Section 3.1 "...The design input shall be specified...to the level of detail necessary to permit the design activity to be carried out in a correct manner..."

Deficiency:

Contrary to the above, Scaling Calculations 1-SC-37-18 and 1-SC-84-19 did not specify the type of timer module required (Westinghouse produces four timer modules, none of which are directly interchangeable).

Reasons

Cause/Discussion

The scaling calculation identifies the timing function as having an accuracy of ±1-% and being installed in PMCH Location 1. The Westinghouse Instruction Book for Process Instrumentation and Control identifies Groups 1 and 2 timer modules as having an accuracy of ±10% and Groups 3 and 4 timer modules as having an accuracy of ±1%. In addition, Groups 1 and 3 modules must be installed in PMCH Locations 1, 3, 6, or 8, while Groups 2 and 4 modules must be installed in PMCH Locations 2, 4, 5, or 7.

Requirement	Module Group
± 10% Accuracy	1 or 2
PMCH Location 1	1 or 3

Therefore, the only timing module which meets the criteria of the scaling calculation is the Group 1 module. Thus, sufficient information was provided for the end user to determine the correct module.

Extent of Condition

All scaling calculations containing NFL cards with timer modules will be reviewed and revised as required.

Preventive Action

The Scaling Calculations Manual has been revised to require the specific timer group number to be stipulated in the scaling calculation.

Corrective Action

As the calculations are revised, the specific timer group number will be stipulated.

Completion Date

Prior to fuel load, the safety-related scaling calculations will be reviewed by personnel trained to the revised Scaling Calculations Manual (1-SC-8800) and applicable project procedures. The calculations will be revised as necessary to assure they are technically correct, meet procedural requirements, have "Confirmation Required" annotations removed and are consistent with applicable design documents.

Prior to operation above 5% power, the non-safety related scaling calculations will be reviewed by personnel trained to the revised Scaling Calculations Manual (1-SC-8800) and applicable project procedures. The Calculations will be revised as necessary to assure they are technically correct, meet procedural requirements, have "Confirmation Required" annotations removed and are consistent with applicable design documents.

ATP-89-1488, DEFICIENCY NO. 89-1488-05

Deficiency Title: Technically Incorrect DCA

Requirement:

PP-023, "Processing of Design Change Authorizations (DCA's) and Component Modification Cards (CMC's)," Rev. 6, Section 5.3, states "The Responsible Engineers are responsible for: Ensuring that the design change is technically satisfactory..."

Deficiency:

Contrary to the above:

1. DCA-88869, Rev. 0 failed on Pages 10, 11, and 16 to properly reflect the required timer circuit. The DCA calls for a Time-Delay-Drop-Out logic, whereas the Westinghouse 7300 series process instrumentation only provides Time-Delay Pick-Up logic. Additional logic elements required to implement the function described in the DCA were not included in the Circuit development.

2. DCA-88869, Rev. 1, failed to identify Drawing 8368A96, Sheets 11 and 12, as the PROM program on the Interconnection Wiring Diagrams.

Response

Cause

1. The Responsible Engineer attempted to implement the timing function differently than is shown on the Instrumentation and Control diagram and did not utilize sufficient logic elements to completely implement the time delay drop out logic required.

2. Inadvertent omission.

Extent of Condition

This was the only PROM logic design modified by CEDD; therefore, this is considered an isolated case.

Preventive Action

In that this is an isolated case, no further action is required.

Corrective Action

DCA-89869 has been revised to correct the PROM-02 logic and to identify drawing 8358A95, Sheets 11 and 12, as the PROM program on the IWD.

Completion Date

All actions completed.

ATP-89-1468, DEFICIENCY NO. 89-1468-06

Deficiency Title: Failure to Update "Approved-Except-as-Noted" Drawings

Requirement:

NEO 3.06, "Reporting and Control of Deficiencies," Section 6.4 states "The organization responsible for resolving the DR has the responsibility for development, implementation, and verification of the actions necessary to correct the deficient conditions..."

Deficiency:

Contrary to the above, Westinghouse Interconnection Wiring Diagram 8815D36, Sheets 2 and 3 were not updated to incorporate the "Approved-Except-as-Noted" (AEN) annotations as required by Deficiency Report C-87-06180.

Note: The auditors extended their review to include all remaining "Approved-Except-as-Noted" drawings for the Westinghouse supplied BOP process instrumentation. This review identified seven additional drawings stamped "Approved-Except-as-Noted", each of which had been properly revised by DCA to incorporate the annotations.

Response

Extent of Condition

A review of all IWD drawings determined the extent of this condition is limited to the two drawing sheets identified by the audit team.

Cause

The requirement cited governs the closure of a DR by verifying that all actions required were in fact complete. This particular effort required the review and updating of numerous vendor documents in a very concerted effort followed by a verification that the entire effort was completed. The condition cited reflects that two sheets of a document "Approved-Except as Noted" had not been updated. This is not representative of the DR closure process but just an inadvertant oversight by the individual involved in verifying that all of the documents had been updated.

Preventive Action

In that all the drawings have been reviewed and revised as required, no further action is required.

Corrective action

IWD 8815D36, Sheets 2 and 3, have been revised to incorporate the "as-built" drawing comments.

Completion Date

All actions completed.

ATP-89-1688, DEFICIENCY NO. 89-1688-07

Deficiency Title: Failure to Distribute Confirmation Removal Updates

Requirement

Procedure PC-213-02, Rev. 3, "Distribution Control" states in paragraph 6.9.1 "Design change documentation, except final DCAs/CNs and "No Change Required" DCAs and CNs shall be distributed to controlled copy holders and maintained at the same location as the affected documents, except for DCC Satellites. Distribution for satellites will be on an as required basis."

Deficiency

On one occasion, involving approximately scaling calculations. Interoffice Correspondence (IOC) related to removal of confirmation from those scaling calculations were not distributed to DCC satellites for required distribution.

Response

Cause

The referenced notification of confirmation updates had been backlogged by document control pending procedure updates to provide instructions for processing the documentation. When the documentation was forwarded to the Document Control Distribution Group, the updates were filed but no distribution was performed.

Extent of Condition/Preventive Action

Since confirmation receipt by ICC on an issued sealing calculation represents no change to the technical content of the calculation, this oversight had no adverse impact on controlled recipients. This was an isolated occurrence and distribution of confirmation notices is an in-process function of Document Control.

Corrective Action

The backlogged notifications are in the process of being distributed.

Completion Dates

Distribution of backlogged notifications will be completed by 11/13/89.

ATP-89-1488, DEFICIENCY NO. 89-1488-08

Deficiency Title: Failure to Distribute PIP Master Index Sheets

Requirement

ECE 5.19, Rev. 2, "Review of Vendor Documents, Section 6.3.p, states, in part, "the Master Index Sheets and the Associated PIP documents shall be distributed to the controlled copies of the PIP".

Deficiency

Contrary to the above, approximately 18 Westinghouse WFT letters with their respective attached Master Index Sheets were not distributed to holders of controlled copies of the PIP Master Index.

Response

Cause

The referenced WFT updates to the Westinghouse PIP Master Index were backlogged as a result of a departmental reorganization and a transfer of the responsibility for distribution of the PIP updates.

Extent of Condition

Although the index was not distributed, the applicable Westinghouse documents were reflected, with the current engineering review status in the Document Control VDI/VEC data base (Design Drawings Index) and all applicable PIP documents had been transmitted to and were retrievable at the site engineering records center.

Corrective/Preventive Action:

Distribution of the backlogged WPT letters was completed as of 10/26/89. The distribution of PIP updates is an in-process function of the DCC Vendor Document Group.

Completion Date:

Backlogged WPT distribution completed 10/26/89.

QTR-89-1658, DEFICIENCY NO. 89-1658-01

Deficiency Title: Inadequate Programmable Read Only Memory (PROM) Activities

Requirement:

ANSI N45.2.11-Draft 3, Revision 2, Section 4.1 states:

"Design activities shall be prescribed and accomplished in accordance with procedures of a type sufficient to ensure that applicable design inputs are correctly translated into specifications, drawings, procedures or instructions".

Background:

Programmable Read Only Memories (PROMs) are physically identical electronic components used to implement required control system logic. While these devices look the same and are physically interchangeable, they can (by design) contain different electrical circuits. Also, PROMs are not permanently affixed to a circuit board by soldering or crimping and can be removed for replacement purposes. Changes in system design require that new PROMs be programmed to reflect the specific change.

PROMs currently installed in the Westinghouse 7300 Series instrumentation were originally programmed, identified, installed, and the system tested by Westinghouse before shipment to CPSES. The original system configuration has been maintained through the use of existing printed circuit board procedures.

Deficiencies:

1. Contrary to the above requirement, PROMs are not consistently identified within the design document set. For example:

   A. Scaling Calculation 1-EC-IE-16, Rev. 4, Page 9, identifies the instrument tag number and the respective PROM card locations, but does not reference the PROM Library nor identify which PROM is to be used in which PROM location.

   B. The PROM Library drawing 2323A96 references the instrument tag number for only four of the ten PROMs in this set of drawings.

C. IND 8815D81, Sheet 41, Rev. 7, provides the instrument tag number, but does not include the PROM Library drawing number. Other INDs appropriately list both the tag number and library drawing number for other PROM-related NFL cards.

2. Contrary to the above, there is no PROM specific procedure which describes the controls to be used for programming PROMs, for verification of PROM programs, and for physical identification of programmed PROMs. The procedure should address the application of all types of Westinghouse 7300 series PROMs at CPSES.

Response

Item 1

Extent of Condition

A. The scaling calculations utilizing a PROM on an NFL circuit card will be reviewed (and revised as necessary) to ensure the proper identification of the PROM and applicable program from the PROM Library. PROMs utilized on NFD cards use a standard PROM program and PROM location. This information is contained in Appendix E of the scaling calculations manual (and doesn't need to be duplicated in the individual calculation)

B. The corrective action provided below addresses the entire extent of the condition.

C. the INDs containing NFL cards with PROMs will be reviewed (and revised as necessary) to ensure the proper PROM Library drawing number is listed.

Preventive Action

The Scaling Calculations Manual (1-GC-0000) has been revised to include specific directions for identification of PROMs with respect to scaling calculations and specific drawing which provide a source of this information.

Corrective Action

A. The scaling calculation will be revised to identify the PROM and the applicable program from the PROM Library.

B. The ESF PROM Library (0000A06 drawing series) will be revised to reference the applicable instrument tag numbers for the PROMs used on NFL circuit cards.

C. DCA-[illegible] has been issued to revise IND 8815D81, Sheet 41, to depict the applicable PROM Library drawing.

Completion Date

11/30/89

Item 2

Cause

The need for a procedure had not been identified for this work since this is a routing work activity accomplished by trained technicians and no generic problems have been identified.

Corrective Action

Operations I&C will develop and issue procedure IKC-211 for the control of burning and identification activities associated with 7300 system PROMS.

Extent of Conditions

7300 System PROMS

Preventive Action

See Corrective Action

Completion Date

11/30/89

ATP-[illegible], OBSERV/ACTION NO. [illegible]

Relevant Document: Westinghouse Interconnection Wiring Diagrams (IWDs)

Description of Condition:

A majority of the Westinghouse NSSS IWDs have outstanding Design Change Authorizations (DCAs) posted against them, some of which were dispositioned in the 1983 to 1986 timeframe.

Recommendation:

Incorporate outstanding DCAs to Westinghouse NSSS loops.

Response

A review of outstanding DCA's against the Westinghouse NSSS IWD's was conducted. In no instance did the number of DCAs exceed the procedural requirements. Therefore, no additional action is required at this time.

ATP-89-1488, OBSERVATION NO. 89-1488-02

Relevant Documents: Westinghouse Scaling Manual (WCAP-9696)

Description of Condition:

The Westinghouse Scaling Manual and its supplements, which contain scaling methodology and data used in the preparation of scaling calculations, have not been updated since 1983. While no instances were found where incorrect methodology or data were used in a calculation, there is a potential for this to occur.

Recommendation:

Update this document and maintain it current.

Response

The Westinghouse scaling manual and its supplements will be reviewed and entered into the Design Document Control system. Thereafter it will also be maintained as a site design controlled document.

Completion Date

The Westinghouse Scaling Manual along with its supplements have been reviewed and are currently in the Design Document Control system.