MIDLAND INDEPENDENT DESIGN AND CONSTRUCTION VERIFICATION PROGRAM
MONTHLY STATUS REPORT
NUMBER 1
PERIOD INCEPTION THROUGH MAY 27, 1983

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MIDLAND INDEPENDENT DESIGN AND CONSTRUCTION VERIFICATION PROGRAM (IDCV) MONTHLY STATUS REPORT NUMBER 1 PERIOD INCEPTION THROUGH MAY 27, 1983

1.0 Introduction and Purpose

Monthly Status Reports have been instituted by agreement between the Consumers Power Company (CPC), the Nuclear Regulatory Commission (NRC) and TERA to provide parties external to TERA's IDCV project team with up-to-date information relative to program progress and any important issues identified during the reporting period. This initial report covers the period from project inception through May 27, 1983. A description of the scope, reporting periods and report issuance dates for Monthly Status Reports, as well as a summary of the background of the IDCV program are presented in this initial report. Subsequent reports will include only those items discussed in section 3.0.

2.0 Midland IDCV Program Background

The Nuclear Regulatory Commission (NRC) issued a letter on July 9, 1982 which requested that Consumers Power Company (CPC) provide for an independent assessment of the design adequacy of the Midland plant. CPC responded to this request on October 5, 1982 by submitting an outline of the scope of a proposed independent review program. A public meeting was held on October 25, 1982 at the NRC's Bethesda, Maryland offices to discuss details of the proposed program, the scope of which included an evaluation of the Midland Unit 2 Auxiliary Feedwater (AFW) system. During this meeting, the NRC requested that the scope of the independent design assessment program be expanded, including an assessment of the quality of construction. The NRC requested that CPC identify three candidate systems for scope expansion based upon their contribution to plant risk, from which one system would be selected.

CPC responded to NRC by a letter dated December 3, 1982 which identified the Standby Electric Power system (diesel generator), Safeguards Chilled Water system and Containment Isolation system as candidate systems. A public meeting was held on February 8, 1983 at Midland, Michigan to discuss details of the program related to the evaluation of the AFW system and to provide status.

On March 22, 1983 the NRC selected the Standby Electric Power system and the Control Room HVAC system for scope expansion. Proposed elements of the scope of evaluation for these systems as well as the AFW system were discussed at another public meeting held on April 13, 1983 at the NRC's Bethesda, Maryland offices.

TERA Corporation has been selected by CPC to scope, manage, and implement the Midland Independent Design and Construction Verification (IDCV) Program. By a letter dated May 3, 1983, the NRC approved the selection of TERA. The selection is based upon the firm's technical qualifications, experience, and independence from the Midland project. Such independence includes all individuals who may contribute to the IDCV Program.

The Engineering Program Plan (EPP), Revision 2, dated May 18, 1983, has been established to outline the scope, philosophy of review, methodology, independence requirements, organization, control, documentation, reporting, and quality assurance requirements for the Midland IDCV Program. The Project Quality Assurance Plan (PQAP), Revision 3, dated May 18, 1983, has been established to define the documented, auditable, control measures necessary to ensure the quality of services provided by TERA.

3.0 Scope

The following items are included in Monthly Status Reports:

- IDCV Program Status Summary
- Tracking System Summary for Open, Confirmed and Resolved (OCR) Item Reports, Finding Reports and Finding Resolution Reports

- Current Confirmed Item Reports, Finding Reports and Finding Resolution Reports
- Financial Status Report (CPC only)

4.0 Reporting Period and Issuance Dates

The reporting period shall generally be on a calendar month basis with issuance of the corresponding Monthly Status Report around mid-month of the month following the end of the reporting period. The reporting period for this initial Monthly Status Report is from project inception through May 27, 1983, the date of this report. The second Monthly Status Report will be issued in mid-July, covering the period from May 27, 1983 through June 30, 1983.

5.0 IDCV Program Status Summary

5.1 Programmatic Activities

Attachment 1 provides the chronology for major project milestones during the reporting period. This chronology will be maintained up-to-date and included in future reports.

Several milestones warrant special highlight. On March 22, 1983, the NRC selected the Standby Electric Power (SEP) system and the Control Room HVAC (CR-HVAC) system for inclusion within the IDCV program scope. This selection along with the previously identified Auxiliary Feedwater (AFW) system completes the scope identification process for the IDCV program. A public meeting was held on April 13, 1983 to discuss details of TERA's AFW system review and conceptual plans for the SEP system and CR-HVAC system reviews. Comments were assimulated from CPC, NRC and interested members of the public. TERA responded to this direction by further development of the existing program to incorporate the revised scope. On May 18, 1983, TERA issued Revision 2 of the Engineering Program Plan and Revision 3 of the Project Quality Assurance Plan, reflecting the full scope of the IDCV program.

During the period of March-April, TERA transmitted information to the NRC relative to corporate and individual independence and professional qualifications. The NRC reviewed this information and on May 3, 1983 documented their formal acceptance of TERA to conduct the IDCV program and acceptance of the scope of the AFW system review. The NRC is currently reviewing TERA's proposed scope of review for the SEP system and CR-HVAC system as defined in Revision 2 of the Engineering Program Plan.

5.2 Design Verification Activities

5.2.1 Introduction and Background

Independent Design Verification (IDV) review activities during the reporting period of this status report focused upon the development and establishment of resources, programs, and organizational interfaces necessary to execute the IDV review methodology and making substantial progress in the IDV review for the AFW system. The methodology, as described in the IDCV Engineering Program Plan, strives to establish a consistent set of review activities applicable to systems, components, structures, and materials subject to IDV review. These review activities have been categorized into five areas as follows:

- Review of Design Criteria and Commitments
- Review of Implementing Documents
- Check of Calculations or Evaluations
- Confirmatory Calculation or Evaluation
- Check of Drawings and Specifications

The intent of this portion of the status report is to present and summarize important IDV activities undertaken during the reporting period relative to review progress made in the above five categories for each of the 45 design topics within the scope of the AFW system review. Future reports will be limited to significant activities on topics which have been completed during the month or on which substantial progress has been made.

The programatic development was completed for the Standby Electric Power (SEP) system and the Control Room HVAC (CR-HVAC) system during the reporting period. Preliminary review activities were also initiated and will be reported in the next Monthly Status Report.

It is estimated that the AFW system IDV review is 60-75% complete relative to the initial scope defined in Revision 0 of the Engineering Program Plan. This estimate does not include any efforts required to resolve existing issues identified in section 6.0.

5.2.2 IDV Topic Summaries

The IDV Topics and summaries of the scope for the AFW system are presented in section 3.1.3 of Revision 2 of the Engineering Program Plan. The corresponding Initial Sample Review Matrices are presented in Figure I for convenience. The following sections provide a topic-by-topic summary of progress:

I.1-1 SYSTEM OPERATING LIMITS

Applicable operating limits for various components of the AFW system have been extracted from documents such as the FSAR and the Babcock and Wilcox (B&W) Balance-of-Plant Criteria Document. The review includes a check for completeness of specified parameters and bounding values and a check for consistency from document to document.

A check of appropriate calculations and evaluations is being conducted to verify that the specified limits are either capable of being met or are used correctly as input to assure proper system or component operation.

The limits identified in this review are being utilized in the review of other topics related specifically to component operability.

INITIAL SAMPLE REVIEW MATRIX FOR THE AUXILIARY FEEDWATER SYSTEM MIDLAND INDEPENDENT DESIGN VERIFICATION PROGRAM[1]

TOPIC NUMBER	DESIGN AREA	SCOPE OF REVIEW: REVIEW OF DESIGN CRITERIA AND COMMITMENTS	REVIEW OF IMPLEMENTING DOCUMENTS	CHECK OF CALCULATIONS AND EVALUATIONS	CONFIRMATORY CALCULATION OR EVALUATION	CHECK OF DRAWINGS AND SPECIFICATIONS
	AFW SYSTEM PERFORMANCE REQUIREMENTS					
1.1-1	SYSTEM OPERATING LIMITS	X	X	X		
1.2-1	ACCIDENT ANALYSIS CONSIDERATIONS	X	•			
1.3-1	SINGLE FAILURE	X	X	X	•	
1.4-1	TECHNICAL SPECIFICATIONS	X	X			
1.5-1	SYSTEM ALIGNMENT/SWITCHOVER	X	X			
1.6-1	REMOTE OPERATION AND SHUTDOWN	X				
1.7-1	SYSTEM ISOLATION/INTERLOCKS	X	X			
1.8-1	OVERPRESSURE PROTECTION	X	•	•	•	
1.9-1	COMPONENT FUNCTIONAL REQUIREMENTS	X	X	X		X
1.10-1	SYSTEM HYDRAULIC DESIGN	X	X	X	•	
1.11-1	SYSTEM HEAT REMOVAL CAPABILITY	X	X	X	•	
1.12-1	COOLING REQUIREMENTS	X				
1.13-1	WATER SUPPLIES	X	X			
1.14-1	PRESERVICE TESTING/CAPABILITY FOR OPERATIONAL TESTING	X	•	•		
1.15-1	POWER SUPPLIES	X	X			•
1.16-1	ELECTRICAL CHARACTERISTICS	X	•	•		
1.17-1	PROTECTIVE DEVICES/SETTINGS	X	X			X
1.18-1	INSTRUMENTATION	X	X	X		X
1.19-1	CONTROL SYSTEMS	X	X	X		•
1.20-1	ACTUATION SYSTEMS	X				•
1.21-1	NDE COMMITMENTS	X	•			•
1.22-1	MATERIALS SELECTION	X	X			
1.23-1	FAILURE MODES AND EFFECTS	•	•		•	

KEY

X - INITIAL SCOPE OF REVIEW

(X) - DELETED SCOPE OF REVIEW

• - ADDED SCOPE OF REVIEW

NOTE

1. INITIAL SAMPLE DOCUMENTED IN REV. 0 AND 1 OF THIS PLAN HAS BEEN MODIFIED EFFECTIVE 4/13/83

FIGURE 1

INITIAL SAMPLE REVIEW MATRIX FOR THE AUXILIARY FEEDWATER SYSTEM MIDLAND INDEPENDENT DESIGN VERIFICATION PROGRAM (CONTINUED)[1]

TOPIC NUMBER	DESIGN AREA	SCOPE OF REVIEW: REVIEW OF DESIGN CRITERIA AND COMMITMENTS	REVIEW OF IMPLEMENTING DOCUMENTS	CHECK OF CALCULATIONS AND EVALUATIONS	CONFIRMATORY CALCULATION OR EVALUATION	CHECK OF DRAWINGS AND SPECIFICATIONS
	AFW SYSTEM PROTECTION FEATURES					
II.1-1	SEISMIC DESIGN	X				
II.2-1	• PRESSURE BOUNDARY	X	X	X	X	X
II.3-1	• PIPE/EQUIPMENT SUPPORT	X	X	X	X	X
II.4-1	• EQUIPMENT QUALIFICATION	X	X	X		X
II.5-1	HIGH ENERGY LINE BREAK ACCIDENTS	X				
II.6-1	• PIPE WHIP	X	X	X		X
II.7-1	• JET IMPINGEMENT	X				
II.8-1	ENVIRONMENTAL PROTECTION	X				
II.9-1	• ENVIRONMENTAL ENVELOPES	X	X	X	X	X
II.10-1	• EQUIPMENT QUALIFICATION	X	X	X		X
II.11-1	• HVAC DESIGN	X				
II.12-1	FIRE PROTECTION	X	X	X		
II.13-1	MISSILE PROTECTION	X				
II.14-1	SYSTEMS INTERACTION	X	X	X		
	STRUCTURES THAT HOUSE THE AFW SYSTEM					
III.1-1	SEISMIC DESIGN/INPUT TO EQUIPMENT	X	X	X		X
III.2-1	WIND & TORNADO DESIGN/MISSILE PROTECTION	X				
III.3-1	FLOOD PROTECTION	X				
III.4-1	HELBA LOADS	X				
III.5-1	CIVIL/STRUCTURAL DESIGN CONSIDERATIONS	X				
III.6-1	• FOUNDATIONS	X	X	X		
III.7-1	• CONCRETE/STEEL DESIGN	X	X	X		X
III.8-1	• TANKS	(X)	(X)	(X)		

KEY

X - INITIAL SCOPE OF REVIEW

(X) - DELETED SCOPE OF REVIEW

• - ADDED SCOPE OF REVIEW

NOTE

1. INITIAL SAMPLE DOCUMENTED IN REV. 0 AND 1 OF THIS PLAN HAS BEEN MODIFIED EFFECTIVE 4/13/83

FIGURE 1

I.2-1 ACCIDENT ANALYSIS CONSIDERATIONS

The FSAR has been reviewed to determine those events for which the AFW system would be expected to play a role either in mitigation or recovery. The system was also reviewed to determine if there were any plausible means by which it could cause an accident or exacerbate an existing accident.

A meeting was held with Babcock and Wilcox to gather information related to the design requirements for the auxiliary feedwater system. Further review of CPC/Bechtel actions in response to the B&W-developed Anticipated Transient Operation Guidelines document has been deemed necessary and will be accomplished.

The review scope also was expanded somewhat to review calculations regarding the required system heat removal capability under accident conditions. This subject is being considered further under Topic I.11-1, System Heat Removal Capability.

I.3-1 SINGLE FAILURE

Applicable criteria have been extracted from the FSAR, NRC Regulations, and the B&W Balance-of-Plant Criteria document. Applicable documents such as piping and instrumentation diagrams and electrical schematics have been reviewed to determine whether the system can meet these criteria.

It has been determined that two complementary actions are necessary to verify the design relative to the capability of the AFW system to withstand a single failure. First, a confirmatory evaluation of the system is being conducted to verify the design from a single-failure-proof standpoint, especially regarding power supplies. This effort will concentrate mainly on the portions of the system comprising the pumps' suction and the steam discharge to the steam-driven turbine.

Concurrently, a Failure Modes and Effects Analysis will be performed, as documented under Topic I.23-1.

I.4-1 TECHNICAL SPECIFICATIONS

The draft Midland Technical Specifications contained in the FSAR have been reviewed as they relate to the AFW system. The finalization of these specifications is on-going as well as the NRC's review. TERA is monitoring this process and when complete, the IDCV review will verify that the specifications are complete, consistent with NRC Standard Technical Specifications, and reflect commitments made in the FSAR.

I.5-1 SYSTEM ALIGNMENT/SWITCHOVER

Applicable criteria have been drawn from such sources as the NRC Regulations, FSAR, B&W Balance-of-Plant Criteria document and the NRC Standard Review Plan and applicable Branch Technical Position.

The pertinent Piping and Instrumentation Diagram was reviewed to ascertain whether the criteria had been implemented. In addition, a CPC letter regarding specific switchover design capabilities, and the process by which they were derived, was reviewed. Finally, available procedures were reviewed to determine what guidance will be available to operators regarding alignment and switchover. These procedures are in draft form; further review will be undertaken later in the IDCV process.

The switchover of AFW control from the main control room to the auxiliary shutdown panel is under review as part of the control systems topic and also will be covered as part of the fire protection review.

I.6-1 REMOTE OPERATION AND SHUTDOWN

Applicable criteria are included in the NRC Regulations, the FSAR, and the B&W Balance-of-Plant Criteria document. These criteria have been reviewed to

determine their completeness and consistency. Results of the review also included several systems capabilities requiring further review under other topics. For example, the capability to control the system and shut down the plant from the auxiliary shutdown panel, and the regulatory guidance for manual actuation and control, are under review as part of the applicable electrical, instrumentation and control topics.

I.7-1 SYSTEM ISOLATION/INTERLOCKS

Criteria for this topic are contained in the NRC Regulations, the FSAR, the B&W Balance-of-Plant Criteria document, and the NRC Standard Review Plan. The applicable piping and instrumentation diagram was reviewed to determine whether the criteria had been implemented into the design.

Further review is being devoted to specific aspects of the design process, including a Design Change Approval Request relating to AFW pump low suction pressure trips.

I.8-1 OVERPRESSURE PROTECTION

The criteria for this topic review were drawn from the FSAR and applicable codes and standards. Independent confirmatory calculations were performed for selected sections of piping to determine whether overpressure protection devices were needed. Attention was given to resolution of Management Corrective Action Report 65 and its related updates and submittals to the NRC. These deal with a potential AFW system suction piping overpressure problem discovered at an operating plant and applicable to the Midland design. The IDCV team will continue to follow the corrective action taken.

Site-requested changes to piping design pressure ratings are under review. This is an active review topic.

I.9-1 COMPONENT FUNCTIONAL REQUIREMENTS

The component functional requirements review is progressing in parallel with reviews in several other topics as AFW system design criteria are translated into corresponding component specifications for parameters such as flow rates, allowable pressure drops, NPSH, voltage, device settings and similar characteristics. The review has also included IDV confirmation of functional requirement parameters. For example, the functional requirements for the AFW pumps are being independently confirmed as confirmatory calculations related to the topic reviews of System Hydraulic Design and System Heat Removal are completed. Reviews of test data are also in progress to confirm that specific components can meet their specified functional requirements. The components shown in Table I have been initially selected for this review. Because of its dependency on many topic reviews, this topic will be among the last to be completed.

I.10-1 SYSTEM HYDRAULIC DESIGN

Significant progress has been made in the System Hydraulic Design review area. The identification of design criteria and confirmatory calculations which are part of this review are essentially complete. Several Bechtel calculations have received preliminary reviews to date. Completion of the reviews of these calculations and selection of those calculations to complete the sample is currently in progress. An initial identification of implementing documents to be reviewed has been made.

I.11-1 SYSTEM HEAT REMOVAL CAPABILITY

Progress in the System Heat Removal Capability review area parallels that of the System Hydraulic Design review area. Identification of design criteria and development of confirmatory calculations is essentially complete. A B&W calculation concerning heat removal requirements has been reviewed. An initial identification of implementing documents to be reviewed has been made.

I.12-1 COOLING REQUIREMENTS

The criteria for cooling requirements have been identified and reviewed. This review has provided input to the selection of calculations and other documents to

TABLE 1

MIDLAND IDCV
SUPPLIER DOCUMENTATION REVIEW
March 8, 1983

Item No.	Component ID			Gen		Fnct			Weld NDE	Mat		
	Type	ID No.	P.O. No.	Cmpl	Dwgs	Reqs	EQ	SQRT	QA	Props	Misc	Comments
1.	Pump	2P-005A	M-14	X	X	X		X	X	X	X	
2.	Motor	2P-005A	M-14	X	X	X		X	X	X	X	
3.	Pump	2P-005B	M-14	X	X	X		X	X	X	X	
4.	Turbine	2G-005B	M-14	X	X	X			X	X	X	
5.	Valve	2LV-3975AIV	J-255	X	X	X	X	X	X	X	X	
6.	Operator	2LV-3975AI	J-255	X	X	X	X	X			X	
7.	Valve	2MO-3965AV	M-117	X	X	X	X		X	X	X	
8.	Operator	2MO-3965A	M-117	X	X	X	X				X	
9.	Valve	2MO-3993A2V	M-398		X	X		X				
10.	Operator	2MO-3993A2	M-398		X	X		X				
11.	Valve	2XV-3989	M-118	X	X	X						
12.	Operator	2XV-3989AI	M-118		X	X						
13.	Valve	25V-3969A	J-256	X	X	X			X	X	X	
14.	Valve	2MO-3226V	M-117		X	X	X					
15.	Operator	2MO-3226	M-117		X	X	X					
16.	Valve	2MO-3277AV	M-117		X	X	X	X	X			
17.	Operator	2MO-3277A	M-117		X	X	X	X				
18.	Heat-X	2E-105A	M-14		X	X		X				

TABLE 1 (CONTINUED)

Item No.	Component ID Type	ID No.	P.O. No.	Gen Cmpl	Dwgs	Fnct Reqs	EQ	SQRT	Weld NDE QA	Mat Props	Misc	Comments
19.	Panel	2C-114	J-202		X	X		X				
20.	MCC	2BP-03	E-45		X	X	X	X				
21.	SwGear	2A-05	E-205	X	X	X		X			X	
22.	Cable		E-26A		X	X	X				X	600V
23.	Transmitter	2PT39000B1	J-245		X	X	X					
24.	Transmitter	2FT3969A	J-245	X	X	X					X	
25.	Transmitter	2FT3975AB	J-245		X	X	X	X				
26.	Transmitter	2LT3298	J-245		X	X						
27.	Transmitter	2LT3975AA2	J-245	X	X	X	X	X			X	
28.	Indicator	2LIK3975AA2	J-204		X	X						
29.	Switch	2ZS3975A1	J-255X	X	X	X		X			X	
30.	Cable		E-60		X	X	X					Instru.
31.	Air Cooler	2VM-54A	M-149	X	X	X		X			X	
32.	Elec. Penet.		E-20A				X					
33.	Piping				X				X	X		
34.	Pipe supports				X				X	X		
35.	Cable Tray				X					X		
36.	Tray Supports				X					X		
37.	Conduit				X							

TABLE 1 (CONTINUED)

Item No.	Component ID Type	ID No.	P.O. No.	Gen Cmpl	Dwgs	Fnct Reqs	EQ	SQRT	Weld NDE GA	Mat Props	Misc	Comments
38.	Conduit Supports				X					X		
39.	Instru. Piping									X		
40.	HVAC Ducts (later)											
41.	HVAC Supports (later)											
42.	Rebar									X		
43.	Str. Steel								X	X		
44.	Inserts								X	X		

be reviewed in the Equipment Qualification and Component Functional Requirements review areas.

I.13-1 WATER SUPPLIES

The criteria for the AFW water supplies have been identified and reviewed. This review has provided input to the selection of calculations and other documents to be reviewed in the System Hydraulic Design and Component Functional Requirements review areas. For example, the criteria for switchover from condensate storage to service water have been used as an input to reviewing calculations in the System Hydraulic Design area. Implementing documents for review of the Water Supply area have been identified.

I.14-1 PRESERVICE TESTING/CAPABILITY FOR OPERATIONAL TESTING

Criteria for the review of preservice testing requirements and operational testing capability are being identified in conjunction with other review areas, including the Technical Specification Review Area. The scope of review in this area has been expanded to include a review of implementing documents and engineering evaluations supporting test programs. This will serve as input to the ICV review. This expansion is based upon the desire to further verify system conformance with design criteria and commitments through an evaluation of tests that serve to establish the adequacy of the design and the capability of the system to function as planned.

I.15-1 POWER SUPPLIES

The applicable design criteria for AFW power supplies have been identified from NSSS vendor, regulatory and industry requirements. The Midland FSAR is the primary implementing document design which has been checked to verify the proper consideration of the design criteria determined from the criteria review. The AFW system logic and schematic diagrams have been reviewed to ensure that requirements relative to the quality of power supplies (diversity and redundancy) are met. In particular the review included the assurance that the AFW system is operable in the event of loss of offsite power and station blackout.

I.16-1 ELECTRICAL CHARACTERISTICS

Design criteria relevant to the electrical characteristics of cable physical separation, system electrical separation, cable and raceway sizing and terminal voltage on power circuits have been identified. The Midland FSAR sections implementing these criteria have been reviewed to verify that the criteria have been considered in the design process. Cable sizing calculations have been reviewed as applied to seven power circuits in the AFW system. The cable routing design process is being reviewed to ensure consideration of cable separation criteria in that process.

I.17-1 PROTECTIVE DEVICES/SETTINGS

Design criteria relevant to this topic have been identified. The Midland FSAR has been reviewed to ensure that the criteria have been documented and that commitments have been made to meet the criteria. The schematic diagrams for all motor-operated valves in the AFW system have been reviewed to ensure incorporation of thermal overload and opening torque swtich bypass features. The AFW pump motor schematic is being reviewed against the committed design criteria. The evaluation of the electrical penetration assembly protection scheme are under review to ensure compliance with design criteria.

I.18-1 INSTRUMENTATION

The instrumentation and alarms required to operate, monitor and protect the AFW system, as determined by design criteria, commitments and expected plant operations, have been reviewed against those specified for the AFW system to verify the adequacy of the instrumentation. Selected instrument accuracies under applicable plant operating conditions have been reviewed and evaluated. Instrument loop diagrams for steam generator water level indication have been reviewed for proper circuit electrical design. The calculation for steam generator low water level setpoint has been reviewed for compliance with design criteria. Major instrument package procurement specifications have been reviewed to verify that the design criteria have been considered in the purchase of the instrument hardware.

I.19-1 CONTROL SYSTEMS

Design criteria and commitments governing the steam generator water level and AFW turbine control systems have been checked to verify the inclusion of necessary regulatory, industry, and system performance requirements. The Midland FSAR has been reviewed to verify that the necessary requirements were used as input to the control system design. An evaluation of control system characteristics such as time response, component characteristics, and separation from actuation systems has been performed. A very limited FMEA review has been made (See Topic I.23-1, Failure Mode and Effects). Control system circuitry design (voltages, currents, polarity) has been reviewed to verify that selected components will function as intended in the steam generator water level control system. The circuitry design review has included instrument loop diagrams, logic diagrams, and valve and motor schematic diagrams.

I.20-1 ACTUATION SYSTEMS

The auxiliary feedwater actuation system (AFWAS - which includes FOGG, "Feed Only Good Generator") design criteria and commitments have been reviewed to verify the proper consideration of regulatory requirements, industry codes and standards, and plant operational requirements. AFW system logic diagrams and schematic diagrams for all motor operated valves and the AFW pump motor have been reviewed against the design commitments. In addition, the AFWAS procurement specification is being reviewed against the design criteria and commitments.

I.21-1 NDE COMMITMENTS

Design criteria, commitments and implementing documents related to nondestructive examination have been identified and are under review against applicable industry codes and standards. A detailed checklist has been developed to assist in this activity. As commitments and proper translation into specifications and field procedures are verified, this input is being factored directly into the ICV review process to verify that these have been properly

implemented. The review of implementing documents and specifications was added to the scope of the IDV to support the expanded NDE/Material Testing program documented in section 5.3.1 of this report.

I.22-1 MATERIAL SELECTION

This topic will be initiated in June, 1983 and will be reported upon in future status reports.

I.23-1 FAILURE MODES AND EFFECTS

This topic has been added to the scope of the IDV to verify conclusions reached about system and component failure modes and effects under various operating conditions.

The topic review will be initiated by continuing where the FSAR evaluation ended. It is intended, at the present time, that emphasis will be placed on components of the electrical, instrumentation and control systems. Criteria from other review areas will be consolidated as an initial step in preparing the planned confirmatory evaluation.

II.1-1 SEISMIC DESIGN

The seismic design chain, criteria and commitments applicable to the design of the Midland plant were identified and reviewed with particular emphasis on specific aspects of the criteria applicable to AFW components and systems and structures that house these components and systems. In view of several major perturbations during the design process, a significant portion of time was devoted to the identification and understanding of the seismic design chronology for the plant. The knowledge gained from this activity was utilized to assist IDV reviewers in the selection of issues and methodologies on which to concentrate the review. The selection of specific structural elements/features, components and systems was also influenced by this activity.

II.2-1 SEISMIC DESIGN -- PRESSURE BOUNDARY

Progress on this topic has been made in two principal areas. A confirmatory seismic stress analysis is nearing completion for a portion (i.e. one piping problem) of AFW piping and supports on the "B" train inside the Unit 2 containment building. The line evaluated runs from the containment penetration to the first anchor which is approximately midway along the "B" train line on its paths from the containment penetration to the steam generator ring header for the AFW discharge. IDV analysts will soon be in the process of comparing the results of their analyses with Bechtel's analyses to independently confirm the adequacy of implementation of the design methodology and results. The comparison includes the contribution of seismic stress at critical locations, predicted support loads for all supports along the line and a design verification for representative support types. The model was developed by the IDV analysts without prior benefit or knowledge of Bechtel's methodology and in particular, specific modeling assumptions. The IDV analysts utilized the dimensional as-built data that was independently compiled through the ICV field verification program related to the program activity, Verification of Physical Configuration (see sections 5.3.1 and 5.3.6 of this report). In a separate activity, IDV reviewers identified and initiated a review of pertinent criteria, implementing documents, calculations and specifications applicable to ASME Code considerations associated with the pressure boundary integrity of a portion of the AFW discharge piping located in the auxiliary building. Future activities will include a review of Bechtel's recent configuration changes associated with the AFW piping and supports inside containment as well as a review of field engineering for small bore piping.

II.3-1 SEISMIC DESIGN -- PIPE/EQUIPMENT SUPPORT

This topic closely parallels that of Topic II.2-1 which is associated with pressure boundary integrity and ASME Code considerations. As discussed, piping supports are chosen for evaluation consistent with the selection of piping lines to permit an integrated evaluation of the seismic design capabilities of the total system. Progress to date has been discussed for piping supports. The anchorage and

support for AFW equipment is under evaluation as part of Topic II.4-1. For components selected for evaluation under this topic (see Table I), selected calculations, drawings and specifications are being checked to verify adequate seismic capability in accordance with seismic design criteria and commitments.

II.4-1 SEISMIC DESIGN -- EQUIPMENT QUALIFICATION

In addition to a review of seismic equipment qualification design criteria and commitments and implementing documents, the principal progress on this topic has been to select a sample of components for review (see Table I) and to acquire existing SQRT qualification "packages" from Bechtel. Progress has been slowed because Bechtel's seismic equipment qualification process is in early stages of completion. Complete SQRT packages are being reviewed along with the process for completing additional packages.

II.5-1 (including II.6-1 and II.7-1) HELB/PIPE WHIP/JET IMPINGEMENT

Criteria for this group of review area have been identified and preliminary reviews conducted. Implementing documents, calculations, and drawings will be reviewed upon completion of the confirmatory calculation in the Seismic Design review area.

II.8-1 (Including II.9-1, II.10-1 & II.11-1) ENVIRONMENTAL PROTECTION/ENVIRONMENTAL ENVELOPES/EQUIPMENT QUALIFICATION/HVAC DESIGN

The criteria and commitments for this group of review areas have been identified and reviewed. A sample of equipment for the review of calculations and evaluations, primarily associated with the Equipment Qualification Report, has been made as shown in Table I. Reviews of the selected equipment qualification packages have been initiated. A confirmatory calculation in the

environmental envelopes review area has been initiated. HVAC design criteria have been identified.

II.12-1 FIRE PROTECTION

Steps have been completed to organize the review of fire protection for the AFW system into subtopics. These topics are:

- Safe shutdown analyses
- Associated circuits analyses
- Fire hazards analyses
- Remote shutdown transfer switches/isolation devices
- Fire barriers
- Fire detection systems
- Suppression systems
- Emergency lighting

FSAR commitments, documentation of the fire protection program, and CPC submittals to NRC related to a comparison to 10CFR50 Appendix R and to BTP CMEB 9.5-1 have been reviewed. Interactions with Bechtel personnel have taken place to identify and collect design documentation pertaining to the AFW fire protection features, and to discuss fire protection program status and approaches in key areas. Detailed design and analysis information has been received. Verifications and reviews were initiated for two of the eight fire protection subtopics, namely fire barriers and emergency lighting. It is expected that these two subtopics and the remaining six will be completed in the next reporting period.

II.13-1 MISSILE PROTECTION

The review scope for the Missile Protection review area consists of a review of criteria and commitments. This review is currently in progress.

II.14-I SYSTEMS INTERACTION

Criteria for this review are defined in the Bechtel/CPC program for determination and resolution of potential systems interactions. This program was obtained for review after discussion with key Bechtel personnel involved in the program.

The program will be reviewed for completeness and consistency. System walkdowns in selected areas will be observed, and selected data sheets and recommendations will be reviewed.

III.1-I SEISMIC DESIGN/INPUT TO EQUIPMENT

In parallel with discussions and reviews associated with the seismic design chronology, substantial progress has been made relative to the understanding and review of modeling procedures and techniques utilized to generate in-structure seismic input (e.g. floor response spectra). This activity has taken more effort than anticipated to identify the complex history associated with the seismic design chain and verify that the various perturbations were adequately handled by the project designers and analysts. Particular attention has been focused on the acquisition and review of information related to the effects of floor flexibility on predicted floor response spectra. Emphasis is being placed on the proper specification, use, and transfer of floor response spectra between interfacing groups both internal and external to Bechtel.

III.2-I WIND AND TORNADO/MISSILE PROTECTION
III.3-I FLOOR PROTECTION
III.4-I HELBA LOADS

The criteria and commitments associated with these topics have been identified and the review commenced. Progress will be reported in future reports.

III.5-I CIVIL-STRUCTURAL DESIGN CONSIDERATIONS

Progress has been made on this topic in two principal areas. First efforts to identify design criteria such as that incorporated within Bechtel's

Civil/Structural Design Criteria document and the FSAR have been completed and the review is continuing. Secondly, efforts are continuing in a review of project experience within the civil/structural discipline to identify important issues that have surfaced during the project, review how these have been resolved and verify that these do not exist in the same or similar form elsewhere.

III.6-1 FOUNDATIONS

The concentration of this topic is on structural aspects of foundation design verses soil mechanics aspects. Accordingly, a portion of the auxiliary building foundation has been selected for detailed structural review. Efforts to date have focused on an identification of foundation design criteria, a review of project experience to understand the design chronology and important loading conditions and the collection of pertinent calculations. The detailed structural review is just being initiated and will be reported upon in future reports.

III.7-1 CONCRETE/STEEL DESIGN

Specific structural elements (e.g. shear walls, floor diaphram) have been selected for detailed review and evaluation. Emphasis is being placed upon an evaluation of the project's capability to transfer loading information both internally and externally from one organization (e.g. analytical groups) to another (e.g. design groups) and on the proper identification and interpretation of this information. Input from other IDV topics is important relative to information gained in the review of the various loading conditions that affect structural elements. The specific use and implementation of this information is being verified through a review of design calculations. These calculations are being reviewed to verify the design organization's capability to properly size and detail concrete and steel structural elements.

5.3 Construction Verification Activities

5.3.1 Introduction and Background

Independent Construction Verification (ICV) review acitvities during the reporting period of this status report focused upon the development and establishment of resources, programs, and organizational interfaces necessary to execute the ICV review methodology and initiation of the ICV review. The methodology, as described in the IDCV Engineering Program Plan, strives to establish a consistent set of review activities applicable to systems, components, structures, and materials subject to ICV review. These review activities have been categorized into five areas as follows:

- Review of Supplier Documentation
- Review of Storage and Maintenance Documentation
- Review of Construction/Installation Documentation
- Review of Selected Verification Activities
- Verification of Physical Configuration

The intent of this portion of the status report is to present and summarize important ICV activities undertaken during the reporting period and to categorize these activities using the above five review categories. Sections 5.3.2 through 5.3.6 address each of these review categories respectively. The ICV review categories and Topics for the AFW System are presented in section 3.2.3 of Revision 2 of the Engineering Program Plan. The corresponding Initial Sample Review Matrix is presented in Figure 2 for convenience.

Events external to the ICV review program have had significant impact on the program. Accordingly, the following discussion summarizes the background of events which have had an influence on where the ICV review is today and where it is to be directed in the future.

In a letter to the NRC dated October 5, 1982, CPC outlined a proposed scope for the planned Midland independent design review program. In addition to a design

INITIAL SAMPLE REVIEW MATRIX FOR THE AUXILIARY FEEDWATER SYSTEM MIDLAND INDEPENDENT CONSTRUCTION VERIFICATION PROGRAM[1]

TOPIC NUMBER	SYSTEM/COMPONENT	SCOPE OF REVIEW: REVIEW OF SUPPLIER DOCUMENTATION	REVIEW OF STORAGE AND MAINTENANCE DOCUMENTATION	REVIEW OF CONSTRUCTION/ INSTALLATION DOCUMENTATION	REVIEW OF SELECTED VERIFICATION ACTIVITIES	VERIFICATION OF PHYSICAL CONFIGURATION
	MECHANICAL					
I.1-1c	• EQUIPMENT	X	X	X	X	X
I.2-1c	• PIPING	X		X	X	X
I.3-1c	• PIPE SUPPORTS	X		X	X	X
	ELECTRICAL					
II.1-1c	• EQUIPMENT	X	X	X	X	X
II.2-1c	• TRAYS AND SUPPORTS	X		•	•	X
II.3-1c	• CONDUIT AND SUPPORTS	X		•	•	X
II.4-1c	• CABLE	X	X	X	X	X
	INSTRUMENTATION AND CONTROL					
III.1-1c	• INSTRUMENTS	X	X	X	X	X
III.2-1c	• PIPING/TUBING	X				X
III.3-1c	• CABLE	X		•	•	X
	HVAC					
IV.1-1c	• EQUIPMENT	X	X	X	X	X
IV.2-1c	• DUCTS AND SUPPORTS	X				X
	STRUCTURAL					
V.1-1c	• FOUNDATIONS	X		X		
V.2-1c	• CONCRETE	X		X		X
V.3-1c	• STRUCTURAL STEEL	X		X		X
VI.1-1c	NDE/MATERIAL TESTING PROGRAM					•

KEY

X - INITIAL SCOPE OF REVIEW

(X) - DELETED SCOPE OF REVIEW

• - ADDED SCOPE OF REVIEW

NOTE

1. INITIAL SAMPLE DOCUMENTED IN REV. 0 AND 1 OF THIS PLAN HAS BEEN MODIFIED EFFECTIVE 4/13/83

FIGURE 2

verification component, this program included a verification of physical configuration of selected structures and components for the AFW system. A public meeting was held on October 25, 1982 at NRC's Bethesda, Maryland offices where the details of this program were discussed. The NRC indicated that they would like the proposed program to be expanded to include a review of an additional system with increased emphasis on the verification of the quality of construction including additional verification of physical configuration.

TERA responded to NRC and CPC direction by developing an expanded Independent Construction Verification (ICV) program centered around the five previously discussed review categories. The scope of this revised program was documented in Revision 0 of the EPP dated November 29, 1982. Details of the ICV and IDV were discussed at public meetings held on February 8, 1983 at Midland, Michigan and April 13, 1983 at NRC's Bethesda, Maryland offices.

TERA's initial field verification activities were initiated the week of November 29, 1982 with a physical configuration verification of the AFW system piping and supports inside containment. In early December 1982, CPC instituted their Construction Completion Program (CCP). Under direction from NRC and CPC, TERA was asked to hold certain portions (in particular, physical configuration verification) of the ICV review in obeyance pending resolution of critical interfaces with the CCP and other on-going construction related programs. Accordingly, only reviews of supplier documentation, storage and maintenance documentation and selected verification activities proceeded.

On March 22, 1983, the NRC selected the Standby Electric Power system and the HVAC system assuring control room habitability as additional systems for IDCV review. Revision 2 of the EPP dated May 18, 1983 incorporates these systems into the scope of the ICV as well as the IDV.

During the April 13, 1983 public meeting, the NRC, CPC and TERA agreed that the scope of ICV activities within the prescribed sample selection boundaries could proceed irrespective of the stage of construction completion. This direction enables the ICV review to obtain better insight into the quality of:

- Completed construction activities
- On-going construction processes from the standpoint of how these will impact future completed construction products
- Remedial and corrective actions taken in response to on-going construction review efforts such as the CCP

At the current time, the ICV scope has been fully defined and the review process is gearing up to full speed, consistent with critical interfaces with on-going construction related programs.

The events described above have enabled the initiation of all planned ICV review activities which are described below and in the following sections.

- The sample selection boundaries for the ICV review of the AFW system were firmly established and implemented into the ICV review program. Development of the AFW System sample selection boundaries was performed through the joint efforts of IDV and ICV reviewers. Additional, detailed discussions were undertaken by Lead IDV and ICV personnel to identify which components, structures, and material within the sample selection boundaries would be subject to detailed ICV review. The selection process employed the sample selection criteria as defined in the EPP and resulted in the designation of the items shown in Table I as being subject to initial ICV review.
- The ICV review activities associated with the AFW System were expanded in scope. The additional review activities and the reason these activities were factored into the ICV review program are as follows:

System/Component	Scope of Review Added	Reason(s)
- Electrical Cable Trays & Supports Conduit & Supports I&C Cable	- Review of Construction/Installation Documentation & Review of Selected Verification Activities	- Project experience - Monitor the outputs of the on-going over inspection program for cable separation as directed by NRC
- NDE/Material Testing Program	- Verification of Physical Configuration	- Project experience - NRC direction

- As a result of adding the NDE/Material Testing Program as an integral part of the AFW system ICV review, Lead ICV personnel commenced the development of this program. Program execution will involve first the selection of the sample and sample size, selection of the specific components and material to be tested, determination of the type(s) of testing to be performed, testing, and evaluation and documentation of the test results. To assist in executing the NDE/Material Testing Program, Lead ICV program personnel initiated the solicitation and review of proposals from material testing firms who have exhibited the capability to accomplish required testing in a professional, objective manner. Selection of a material testing firm has not been completed; review of proposals and identification of material testing firm capabilities continues.

- Important interfaces between the Lead ICV program personnel and reviewers and IDV personnel have been tested and utilized to ensure their effectiveness and efficacy. Additionally, critical interfaces with site-construction personnel have evolved to the point where ICV reviewers can acquire needed information and are afforded the flexibility and latitude necessary to be effective in the ICV review program.

5.3.2 Review of Supplier Documentation

The overwhelming majority of resources expended in executing the ICV review activities has been devoted to defining the detailed steps of the Supplier Documentation Review and performing the review steps. These activities are of substantial importance to the remaining portions of the ICV review, because they establish the documented resource which is used as initial input to evaluating remaining construction activities. Additionally issues and trends determined as a result of performing the review of supplier documentation have alerted, and will continue to alert, ICV reviewers to outputs in the construction process which require a greater degree of scrutiny. In essence, the results of the review of supplier documentation establishes the reference for the effective continuance of the ICV review process.

During the period of this status report the following important activities have been undertaken as part of the review of supplier documentation.

- Detailed review matrices for components within the AFW system sample selection oundary were developed as a joint effort with IDV reviewers and serve to direct the activities of the ICV reviewers performing the review of supplier documentation. The review of supplier documentation has been broken down into discrete review categories as follows:

  - General Completion - Overall review of documentation to ensure that the supplier package is generally complete for Document Categories required by specification for the component.

  - Drawings - Review of supplier drawings for conformance to specification requirements for the component, subcomponent or part.

  - Functional Requirements - Review of supplier documentation for conformance of major functional requirements to specifications.

  - Environmental Qualification - Review of supplier documentation for conformance to specification requirements.

  - Seismic Qualification - Review of supplier documentation for conformance to specification requirements.

  - Welding, NDE, QA - Review of supplier documentation for conformance to specification requirements for the component, subcomponent or part.

  - Material Properties - Review of supplier certified material property reports for conformance to specification requirements for the component, subcomponent or part.

  - Miscellaneous - Review of instruction manuals, cleaning and coating procedures, storage and handling instructions and shipping procedures for conformance to specification requirements for the component, subcomponent or part.

  In practice, an ICV or IDV reviewer is assigned one or more of these review categories for a specific component or group of components identified for ICV review.

  As of the writing of this report, the majority of the activities necessary to perform the following documentation reviews for the AFW system have been completed:

- General Completion
- Drawings
- Functional Requirements
- Miscellaneous

As a result of conducting the above reviews, approximately 1,000 documents have been reviewed for applicability, catalogued, and categorized as to the type of document - i.e., drawing, welding procedure, seismic qualification report, etc.

The "Environmental" and "Seismic Qualification" reviews are tied closely to the IDV review process and have progressed to the stage of completion identified for selected components in the IDV review portion of this status report.

The "Welding, NDE, QA" documentation review has focused upon identifying the derivation of the requirements, the completeness and consistency of the requirements and the cataloguing of vendor-supplied documentation which satisfies the requirements for welding, NDE, and QA aspects of selected fabricated components. Further, more detailed review of the vendor-supplied documentation has not been aggressively pursued pending finalization of the degree of involvement of an outside material testing firm (see Section 5.3.1 of this status report) in the ICV review program.

The review necessary to verify the adequacy of Material Properties by reviewing certified material property reports has most recently been initiated and, as a result, not much progress has been made toward completing this review during the current reporting period.

- To ensure that a consistent method and set of data are used and collected during the review of supplier documentation, detailed checklists were prepared and implemented. The checklists, and associated implementing Project Instruction (PI-3201-007), direct the ICV reviewer to sources of information and direct the recording of required information onto a standardized form. As of the writing of this report, five checklists have been prepared and used to conduct the review of vendor supplied documentation. The title and a brief description of each checklist used in this protion of the ICV review are as follows:

  - Documentation Verification Form (DVF)

Checkoff lis utilized to record those requirements imposed upon suppliers and vendors which define the specific documents to be submitted to fulfill and satsify procurement and specification requirements;

- Documentation Availability Checklist (DAC)

The DAC is used to document the process and sources of information used to complete the Documentation Verification Form and to provide a consistent, standard format for documenting the results of evaluating the completeness of vendor documentation submittals;

- Supplier Documentation Functional Review (SDFR) Form

The SDFR provides the format and directs the recording of data relevant to the following of specific categories of vendor-supplied documentation:

a) Instructions (operating, maintenance, etc.)
b) Cleaning & Coating Procedures
c) Certified Material Reports
d) Supplier Shipping Procedures;

- Supplier Documentation Adequacy (SDA) Verification Form

This form is used in conjunction with the SDFR to evaluate the adequacy of the vendor's documentation submittal; and

- Time-Base Evaluation (TBE) Form for Vendor Documentation Submittals

This form provides the format for establishing a method to evaluate the timeliness of certain vendor documentation submittals associated with a specific component. Vendor documentation submittals are compared on a time-base against two key events in the construction process:

a) Date component is received at the site

b) Date component is withdrawn from storage for installation.

- Commencement of the supplier documentation review required a greater-than-anticipated scope of task initiation activities. These activities were necessary to develop an understanding of the following.

- Relationship of site vendor files to vendor files retained in Ann Arbor;

- Distinctions made between supplier documentation included as part of a QA data package and that documentation included as part of the vendor document control system;

- Location of different document control centers and their principal file holdings and scope of responsibilities;

- Information required to access needed documents and records; and

- Location and operation of systems utilized to index needed information.

- As of the writing of this report, activities undertaken with regard to supplier documentation reviews, have been focused upon the collection and assimilation of vendor-supplied information. Current and near term activities of the ICV reviewers are and will be directed toward a thorough evaluation and assessment of the significance of findings resulting from the review of supplier documentation.

5.3.3 Review of Storage and Maintenance Documentation

This review is intended to ascertain the stored and as-installed condition of selected components of the systems selected as part of the IDCV program. Discrete activities which constitute this review include the following:

- Documentation Review and Observation of Receipt Inspections;

- Documentation Review and Observation of Warehouse Storage Practices;

- Documentation Review and Observation of In-place Maintenance Practices; and

- Visual Inspection of Installed/Stored Components.

The progress made to date in conducting this review has all been associated with the components selected in the AFW System. Activities undertaken to date include the following:

- Checklists have been prepared and implemented which direct the acquisition and recording of information and data which characterize the receipt inspection, storage and maintenance activities. Detailed Project Instructions (PI-3201-007) have been prepared which provide ICV reviewers with an explanation in the use of the following checklists:

  - Receipt Inspection Checklist; and

  - Storage and Maintenance Checklist.

- Data required by the checklists have been collected and completed for the components selected with the AFW System sample selection boundaries. The components selected for this review are shown in Table 1.

  Current and near-term activities involve the evaluation of the collected data and an assessment and recording of the significance of any issues resulting from the evaluation.

- ICV reviewers, in a joint effort with the IDV reviewers, prepared the review matrices for the Control Room HVAC and Standby Electric Power Systems. The matrices require a review of storage and maintenance documentation applicable to the following categories of components within the sample boundaries of the indicated systems.

  Standby Electric Power System

  - Mechanical Equipment
  - Electrical Equipment and Cable
  - Instruments and Instrument Cable

  Control Room HVAC System

  - Mechanical Equipment
  - Instruments
  - HVAC Ducts & Supports

  Specific components within each of the above categories are currently being identified.

5.3.4 Review of Construction/Installation Documentation

As of the writing of this report, no resources have been expended in performing the actual review of construction/installation documentation. Activities undertaken to date have been directed toward the selection of specific components within the AFW System sample selection boundaries which will be subject to this review.

5.3.5 Review of Selected Verification Activities

During this reporting period ICV reviewers commenced the review of selected outputs from the cable separation and pipe support over-inspection program which relate directly to cables and pipe supports within the ICV review sample selection boundaries of the AFW System. These activities were conducted at the site and focused upon the collection of required documentation, including procedures and drawings, and the evaluation of the procedures to discern the methodology employed by the over-inspection programs. This evaluation is necessary to identify those outputs of the program which are most representative of the final products of the over-inspection process and therefore those products which should be subject to ICV review. Evaluation of selected outputs was initiated and continues. Near term activities relate to continued detailed evaluation of selected outputs from the program that relate to the AFW system and the extension of these evaluations to include the Control Room HVAC and Standby Electric Power Systems.

5.3.6 Verification of Physical Configuration

As a first and important review associated with the verification of the physical configuration of selected components within the sample selection boundaries of the AFW system, ICV reviewers conducted a review of selected AFW System pipe, hangers, and supports. This review involved not only the careful selection of those pipes, hangers and supports to ensure a comparative basis for other, similar reviews and extrapolation to similar items, but also extensive field verification and measurement.

The review involved the field measurement of pipe, hangers, and supports of the "B" Auxiliary Feedwater train, inside the Midland Unit 2 containment building. Subsequent to acquisition of field measurements and verification of identity and orientation, the collected data were compared against design documentation and documentation used as input to representative stress and seismic design calculations. The results of these efforts have been summarized into an engineering evaluation report which highlights the salient findings of the review and evaluation and documents the methodology utilized in conducting the physical configuration verification.

Near term activities relate to completing the review of issues arising from the physical configuration verification of selected AFW System pipe, hangers, and supports and selecting similar samples associated with the Control Room HVAC and Standby Electric Power systems.

6.0 Summary of Open, Confirmed and Resolved (OCR) Item Reports, Finding Reports and Finding Resolution Reports

Attachment 2 provides TERA's Tracking System Summary for Open, Confirmed and Resolved (OCR) Item Reports, Finding Reports and Finding Resolution Reports. This tool assists TERA in tracking the disposition of issues as they progress through the review process. Attachment 3 provides re-typed copies of all existing Confirmed Item Reports. To date no items have progressed to the Findings stage of the reporting process which is documented in Project Instruction PI-3201-008 and can be found as part of Appendix B of the Project Quality Assurance Plan.

A meeting will be held on June 3, 1983 at Bechtel's Ann Arbor, Michigan offices to obtain additional information reltaive to the Confirmed Items presented in Attachment 3.

ATTACHMENT I

PROJECT CHRONOLOGY

MIDLAND INDEPENDENT DESIGN AND CONSTRUCTION VERIFICATION PROGRAM TERA PROJECT 3201 THROUGH 5/27/83

Date	Milestone
September 2, 1982	TERA proposal to CPC for Midland Independent Design Verification (IDV) Program
September 20, 1982	CPC letter of intent to use TERA for Midland IDV
September 24, 1982	TERA identification of IDV goals, objectives, system selection criteria, methodology, tasks, and schedule (outline presented to CPC on 9/28/82)
September 28, 1982	Meeting of CPC, TERA, and MAC in Jackson to develop submittal to NRC addressing IDV and INPO evaluation programs. TERA selects candidate system for IDV program
September 30, 1982	TERA submittal of corporate Quality Assurance Plan to CPC for their review and acceptance
October 5, 1982	CPC submittal of Midland Independent Review Program to NRC
October 12, 1982	CPC approval of TERA corporate Quality Assurance Plan
October 25, 1982	Presentation on Midland IDV and INPO programs to NRC at NRC's Bethesda offices
October 27, 1982	TERA conceptual development of IDV program modifications to further address the quality of construction (telecopy to CPC)
October 28, 1982	CPC decision to separate IDV and INPO evaluation programs

ATTACHMENT 1

Date	Milestone
November 2, 1982	Introductory meeting at the Midland site to initiate IDV and INPO programs
November 3, 1982	Midland site tour and walkdown of the AFW system
November 4, 1982	TERA project team meetings in Jackson to review Midland project experience (e.g., 50.55e reports, NRC inspection reports, etc.); identification of information needs
November 5, 1982	Meeting of TERA, CPC and Bechtel management in Ann Arbor to discuss programmatic details of the IDV program, logistics for TERA-Bechtel interaction on the IDV; review of Bechtel organization, interfaces, etc.; identification of information needs
November 11, 1982	NRC issues meeting summary for October 25, 1982 meeting
November 15, 1982	TERA issues Revision 0 of the Midland Independent Design and Construction Verification (IDCV) Project Quality Assurance Plan
November 23, 1982	CPC approval of TERA Project Quality Assurance Plan
November 29, 1982	TERA issues draft Engineering Program Plan for interim use and comments
November 29 - December 3, 1982	TERA field verification team is on-site conducting physical configuration verification of AFW system piping and supports inside containment
December 3, 1982	CPC submittal to NRC of response to NRC comments during October 25, 1982 meeting; CPC commits to separate IDV and INPO evaluation, identifies candidate systems for adding an additional system to the IDV scope, expansion of IDV program to include a verification of the quality of construction of the IDV systems; details of IDV interactions and INPO reporting

ATTACHMENT 1

Date	Milestone
December 6, 1982	TERA project team meets individually with Bechtel group supervisors and group leaders to give a programmatic overview of the expanded IDCV; identify elements of the design process, interfaces, logistics for conducting the IDCV review; identify information, etc.
December 8-15, 1982	Lead technical reviewers interview Bechtel personnel as part of the IDCV review process; identification of information needs
December 10, 1982	Agreement reached with Bechtel on proprietary information
December 16, 1982	TERA completes Engineering Program Plan
January 17-21, 1983	TERA design review team in Ann Arbor
January 24, 1983	TERA begins ICV program -- review of supplier documentation, storage, and maintenance documentation
January 24-26, 1983	TERA construction review team on-site reviewing supplier documentation and storage and maintenance documentation
January 25-27, 1983	TERA design review team in Ann Arbor
February 7-11, 1983	TERA construction review team on-site
February 8, 1983	Public meeting on Midland Construction Completion Program and Independent Design and Construction Verification Program
February 9, 1983	TERA transmits Engineering Program Plan (EPP) and Project Quality Assurance Plan (PQAP) to the NRC
February 17, 1983	TERA issues Revision 1 of the EPP and Revision 2 of PQAP

ATTACHMENT 1

Date	Milestone
February 28 - March 4, 1983	TERA construction review team on-site and design review team at Ann Arbor
February 28, 1983	TERA meeting with B&W in Lynchburg
March 1, 1983	TERA meets with Bechtel management in Ann Arbor to clarify requests for information
March 2, 1983	Project team meeting, Ann Arbor
March 11, 1983	Project quality assurance audit conducted by the Project Quality Assurance Engineer
March 18, 1983	TERA transmits information to NRC regarding corporate and individual independence, professional qualifications, scope of review, reporting and auditability, and program status
March 21-25, 1983	TERA construction review team on-site and TERA design review team at Ann Arbor
March 22, 1983	NRC selects Standby Electric Power System as the second system and the HVAC system assuring control room habitability as the third system for the IDCV program
March 24, 1983	NRC provides TERA with a service list for Midland IDCV program
March 28, 1983	NRC issues the protocol for the Midland IDCV program
March 30, 1983	TERA transmits supplemental information to NRC regarding affidavits of independence and professional qualifications, including additional affidavits by individuals previously employed by NRC

Date	Milestone
April 8, 1983	Project quality assurance audit report issued by the Project Quality Assurance Engineer
April 9, 1983	Senior Review Team meets to review project status, review OCRs, and develop recommendations for the project team
April 13, 1983	Meeting at NRC, Bethesda, including TERA, CPC, GAP, and NRC. TERA presents synopsis of progress to date of AFW system review, plus discussion of topics to be reviewed for the two additional systems (Standby Electric Power; Control Room HVAC) selected by NRC. All parties discuss protocol for Midland IDCV Program
April 21, 1983	TERA transmits supplemental information to NRC regarding affidavits of independence for individuals previously employed by NRC
May 3, 1983	NRC letter, Novak to Cook (CPC) stating acceptance of TERA Corporation to conduct IDCV Program and acceptance of Engineering Program Plan for the Auxiliary Feedwater System
May 18, 1983	TERA issues general Revision 2 of the EPP and Revision 3 of the PQAP to incorporate the addition of the Standby Electric Power System and Control Room HVAC System to the IDCV scope, update personnel qualifications, add project instructions and reference new protocol for communications
May 18, 1983	TERA meets with NRC, I&E HQ management to discuss consideration of the Midland IDCV program within NRC's response to the Ford Amendment legislation.
May 27, 1983	TERA issues first Monthly Status Report.

Attachment 2

OCR, FINDING REPORT, AND FINDING RESOLUTION REPORT TRACKING SYSTEM

MIDLAND INDEPENDENT DESIGN AND CONSTRUCTION VERIFICATION PROGRAM

OCR No.	Resp. LTR	Potential Open Item	Open Item	Confirmed Item	Resolved Item	Finding Report	Finding Resolution Report	Topic		Comments
001	RPS	12/21/83	3/4/83	3/4/83				I.4-I	Tech Specs	
002	RPS	12/21/83	3/4/83	3/4/83				I.4-I	Tech Specs	
003	RPS	1/3/83	3/4/83		3/4/83			I.8-I	Overpressure Protection	
004	RPS	1/3/83	3/4/83		3/4/83			I.8-I	Overpressure Protection	
005	RPS	1/4/83	3/4/83	3/4/83				I.I-I	System Operating Limits	
006	RPS	1/12/83	3/4/83		3/4/83			I.2-I	Accident Analysis Considerations	
007	RPS	1/12/83	3/4/83		3/4/83			I.2-I	Accident Analysis Considerations	
008	LB	1/19/83	3/4/83					I.19-I	Control Systems	
009	CS	1/20/83	3/4/83		3/4/83			II.I-I	Seismic Design	
010	FAD	1/20/83	3/4/83	4/14/83				I.10-I	Hydraulic Design	
011	LB	1/27/83	3/4/83	3/4/83				I.19-I	Control Systems	
012	LB	2/7/83	3/4/83	3/4/83				I.15-I	Power Supplies	
013	RPS	2/8/83	3/4/83					I.5-I	Syst. Align./Switchover	

OCR, FINDING REPORT, AND FINDING RESOLUTION REPORT TRACKING SYSTEM

MIDLAND INDEPENDENT DESIGN AND CONSTRUCTION VERIFICATION PROGRAM

(Continued)

OCR No.	Resp. LTR	Potential Open Item	Open Item	Confirmed Item	Resolved Item	Finding Report	Finding Resolution Report	Topic		Comments
014	RPS	2/8/83	3/4/83					I.5-1	Syst. Align./Switchover	
015	CS	2/10/83	3/4/83					III.1-1	Seismic Design/Input to Equipment	
016	CS	2/10/83	3/4/83					III.5-1	Civil/Stu Design Consid.	
017	FAD	2/17/83	3/4/83	3/4/83				I.11-1	Heat Removal Cap	
								I.10-1	Hydraulic Design	
018	FAD	2/17/83	3/4/83	3/4/83				I.11-1	Heat Removal Cap.	
019	LB	2/21/83	3/4/83					I.18-1	Instrumentation	
020	FAD	2/24/83	3/4/83	3/4/83				I.11-1	Heat Removal Cap.	
								I.9-1	Comp. Func. Req.	
021	FAD	2/24/83	3/4/83					II.10-1	Eq. Qual.	Rev. 1, 4/14/83
022	LB	2/24/83	3/4/83					I.19-1	Control Syst.	
023	LB	2/28/83	3/4/83					I.18-1	Instrumentation	
								I.19-1	Control	

OCR, FINDING REPORT, AND FINDING RESOLUTION REPORT TRACKING SYSTEM

MIDLAND INDEPENDENT DESIGN AND CONSTRUCTION VERIFICATION PROGRAM

(Continued)

OCR No.	Resp. LTR	Potential Open Item	Open Item	Confirmed Item	Resolved Item	Finding Report	Finding Resolution Report	Topic		Comments
024	RPS	3/1/83	3/4/83					I.2-I	Acc. Anal. Consid.	
025	RPS	3/1/83	3/4/83	3/4/83				I.2-I	Acc. Anal. Consid.	
026	RPS	3/1/83	3/4/83					I.8-I	Overpress. Prot.	
027	FAD	3/1/83	3/4/83	3/4/83				I.9-I	Comp. Func. Req.	
								II.9-I	Env. Eng.	
028	FAD	3/2/83	3/4/83	4/14/83				I.9-I	Comp. Func. Req.	
029	LB	2/22/83	3/4/83		3/4/83			I.18-I	Instrumentation	
								I.19-I	Control System	
030	LB	1/19/83	3/4/83		3/4/83			I.19-I	Control System	
031	CS	2/11/83	3/4/83	3/4/83				I.3-Ic	Pipe Supports	
032	CS	2/11/83	3/4/83	3/4/83				I.3-Ic	Pipe Supports	

OCR, FINDING REPORT, AND FINDING RESOLUTION REPORT TRACKING SYSTEM

MIDLAND INDEPENDENT DESIGN AND CONSTRUCTION VERIFICATION PROGRAM

(Continued)

OCR No.	Resp. LTR	Potential Open Item	Open Item	Confirmed Item	Resolved Item	Finding Report	Finding Resolution Report	Topic		Comments
033	CS	2/11/83	3/4/83	3/4/83				I.3-Ic	Pipe Supports	
034	CS	2/11/83	3/4/83	3/4/83				I.3-Ic	Pipe Supports	
035	CS	2/11/83	3/4/83	3/4/83				I.3-Ic	Pipe Supports	Rev. 1, 5/25/83
036	CS	2/11/83	3/4/83	3/4/83				II.2-I	Pressure Boundary	Rev. 1, 5/25/83
037	CS	1/20/83	3/4/83	3/4/83				III.1-I	Seismic Design/Input to Equipment	
038	LB	3/1/83	3/4/83	3/4/83				I.15-I	Power Supplies	
039	LB	3/30/83	4/14/83					II.10-I	Env. Eq. Qual.	
040	LB	3/8/83	4/14/83					I.16-I	Elec. Characteristics	
041	LB	3/25/83	4/14/83					I.15-I	Power Supplies	
042	LB	3/31/83	4/14/83					I.10-I	Env. Eq. Qual.	
043	FAD	3/15/83	4/14/83					I.10-I	System Hydraulic Design	
044	FAD	3/15/83	4/14/83					II.10-I	Env. Eq. Qual.	
045	Tulo	3/17/83	4/14/83	5/25/83				II.1-IC	Electrical Equipment/ Storage & Maintenance	
046	Tulo	3/17/83	4/14/83	5/25/83				I.1-IC	Mechanical Equipment/ Storage & Maintenance	

ATTACHMENT 3

CURRENT CONFIRMED ITEM REPORTS

MIDLAND INDEPENDENT DESIGN AND CONSTRUCTION VERIFICATION
OPEN, CONFIRMED AND RESOLVED (OCR) ITEM REPORT

TYPE OF REPORT: OPEN _____ CONFIRMED X
RESOLVED _____ ITEM

FILE NO. 3201-008
DOC NO. 3201-008-C-001
REV. NO. 0

DATES REPORTED TO: LTR 3/3/83 SRT _____
PRINCIPAL-IN-CHARGE 3/7/83

PROJECT TEAM/PROJECT MGR. 3/3/83
CPC/DESIGN ORG. _____

STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:

AFW system operability and surveillance requirements in Technical Specifications

IDCV PROGRAM AREA OR TASK (IF APPLICABLE):

Topic I.4-1, Technical Specifications

DESCRIPTION OF CONCERN:

A commitment made in response to NRC requests has not been incorporated into the Midland Technical Specifications. That commitment involved NUREG-0611, Appendix III, recommendation GS-6 regarding verification of proper AFW system valve lineup. It is not clear that the Technical Specifications do incorporate the means to assure dual valve lineup after maintenance. Also, the associated draft procedure does not incorporate a requirement for valve lineup verification (See OCR-014).

SIGNIFICANCE OF CONCERN:

Valve lineup after maintenance or testing may not be correct.

RECOMMENDATION X OR RESOLUTION _____:

Process in accordance with Project Quality Assurance Plan.

COMMENTS BY SRT (IF REQUIRED):

REFERENCES (INCL. RELATED OCR ITEM REPORT NO.):

FSAR, REV. 47

SIGNATURE(S):

RPS	RPS	HAL	JWB	N/A JWB
OCR ITEM REPORT ORIGINATOR	LTR	PROJECT MANAGER FOR PROJECT TEAM	PRINCIPAL-IN-CHARGE	SRT (IF REQUIRED)
3/3/83	3/3/83	3/4/83	3/14/83	
DATE	DATE	DATE	DATE	DATE

MIDLAND INDEPENDENT DESIGN AND CONSTRUCTION VERIFICATION
OPEN, CONFIRMED AND RESOLVED (OCR) ITEM REPORT

TYPE OF REPORT: OPEN _____ CONFIRMED X
RESOLVED _____ ITEM

FILE NO. 3201-008
DOC NO. 3201-008-C-002
REV. NO. 0

DATES REPORTED TO: LTR 3/3/83 SRT _____
PRINCIPAL-IN-CHARGE 3/7/83

PROJECT TEAM/PROJECT MGR. 3/3/83
CPC/DESIGN ORG. _____

STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:

AFW system operability and surveillance requirements in Technical Specifications.

IDCV PROGRAM AREA OR TASK (IF APPLICABLE):

Topic I.4-1, Technical Specifications

DESCRIPTION OF CONCERN:

Midland Technical Specifications do not meet NRC B&W Standard Technical Specifications in that:

An action statement is needed to require immediate action if both AFW systems are inoperable.

SIGNIFICANCE OF CONCERN:

Lack of action statement may result in inadequate plant protection.

RECOMMENDATION X OR RESOLUTION _____:

Process in accordance with Project Quality Assurance Plan.

COMMENTS BY SRT (IF REQUIRED):

REFERENCES (INCL. RELATED OCR ITEM REPORT NO.):

Midland Technical Specifications (Rev.33) in FSAR; NUREG-0103, REV. 4, FALL 1980

SIGNATURE(S):

RPS	RPS	HAL	JWB	N/A JWB
OCR ITEM REPORT ORIGINATOR	LTR	PROJECT MANAGER FOR PROJECT TEAM	PRINCIPAL-IN-CHARGE	SRT (IF REQUIRED)
3/3/83	3/3/83	3/4/83	3/14/83	
DATE	DATE	DATE	DATE	DATE

MIDLAND INDEPENDENT DESIGN AND CONSTRUCTION VERIFICATION
OPEN, CONFIRMED AND RESOLVED (OCR) ITEM REPORT

TYPE OF REPORT: OPEN _____ CONFIRMED X
RESOLVED _____ ITEM

FILE NO. 3201-008
DOC NO. 3201-008-C - 005
REV. NO. 0

DATES REPORTED TO: LTR 3/3/83 SRT _____ PROJECT TEAM/PROJECT MGR. 3/3/83
PRINCIPAL-IN-CHARGE 3/7/83 CPC/DESIGN ORG. _____

STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:

Entire AFW system

IDCV PROGRAM AREA OR TASK (IF APPLICABLE):

Topic I.1-1, System Operating Limits

DESCRIPTION OF CONCERN:

Balance of plant criteria are inconsistent with regard to AFW system flowrate requirements and other design parameters. OCRs C-017, C-018, C-020, C-027 and O-028 also apply.

SIGNIFICANCE OF CONCERN:

Nuclear steam supply system performance requirements for the AFW system may not be adequately or consistently reflected in the balance of plant design.

RECOMMENDATION X OR RESOLUTION _____:

Process in accordance with Project Quality Assurance Plan.

COMMENTS BY SRT (IF REQUIRED):

REFERENCES (INCL. RELATED OCR ITEM REPORT NO.):

FSAR, REV. 47; B&W BOP Criteria Document 36-1004477, REV. 01 (6/25/82)
OCRS

SIGNATURE(S):

RPS	RPS	HAL	JWB	N/A JWB
OCR ITEM REPORT ORIGINATOR	LTR	PROJECT MANAGER FOR PROJECT TEAM	PRINCIPAL-IN-CHARGE	SRT (IF REQUIRED)
3/3/83	3/3/83	3/4/83	3/14/83	
DATE	DATE	DATE	DATE	DATE

MIDLAND INDEPENDENT DESIGN AND CONSTRUCTION VERIFICATION
OPEN, CONFIRMED AND RESOLVED (OCR) ITEM REPORT

TYPE OF REPORT: OPEN _____ CONFIRMED X
RESOLVED _____ ITEM

FILE NO. 3201-008
DOC NO. 3201-008-C-010
REV. NO. _____

DATES REPORTED TO: LTR 3/29/83 SRT _____ PROJECT TEAM/PROJECT MGR. 3/31/83
PRINCIPAL-IN-CHARGE 4/18/83 CPC/DESIGN ORG. _____

STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:

AFW - piping and valves

IDCV PROGRAM AREA OR TASK (IF APPLICABLE):

Hydraulic Design (I.10-1)

DESCRIPTION OF CONCERN:

In calculation of the volume of water available during the transfer from the condensate storage to service water suction source it was assumed that all Category I piping was full of water. However, the water might leak out prior to the service water becoming available because of the lack of Category I check valves.

The recommendation of OCR-3201-008-0-010 was implemented. It was determined that the AFW pumps could have a loss of suction during switchover to service water.

SIGNIFICANCE OF CONCERN:

Although unstated, except by inference in calculations, the AFW design criteria call for prevention of any occurrance of the pump running dry. Under some sequences of events it may be possible for the AFW pump to lose suction.

The AFW pumps could be damaged by running dry.

RECOMMENDATION X OR RESOLUTION _____:

1. Process per PQAP.
2. Review seismic analysis of suction piping to evaluate assumption in Bechtel's analysis of the switchover to service water that credit can be taken for piping upstream of Category I/non-Category I interface.

COMMENTS BY SRT (IF REQUIRED):

REFERENCES (INCL. RELATED OCR ITEM REPORT NO.):

SIGNATURE(S):

OCR ITEM REPORT ORIGINATOR	LTR	PROJECT MANAGER FOR PROJECT TEAM	PRINCIPAL-IN-CHARGE	SRT (IF REQUIRED)
FAD	FAD	HJR	Joe Buck	
3/29/83	3/29/83	4/14/83	5/10/83	
DATE	DATE	DATE	DATE	DATE

MIDLAND INDEPENDENT DESIGN AND CONSTRUCTION VERIFICATION
OPEN, CONFIRMED AND RESOLVED (OCR) ITEM REPORT

TYPE OF REPORT: OPEN _____ CONFIRMED X
RESOLVED _____ ITEM

FILE NO. 3201-008
DOC NO. 3201-008-C-011
REV. NO. 0

DATES REPORTED TO: LTR 3/4/83 SRT _____ PROJECT TEAM/PROJECT MGR. 3/4/83
PRINCIPAL-IN-CHARGE 3/7/83 CPC/DESIGN ORG. _____

STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:

AFW "Feed Only Good Generator" (FOGG) Control

IDCV PROGRAM AREA OR TASK (IF APPLICABLE):

Topic I.19-1, Control Systems

DESCRIPTION OF CONCERN:

The B&W BOP criteria document (36-1004477-01- Draft) section 3.12 requires that control for FOGG be available at both the MCR and the Auxiliary Shutdown Panel. The FOGG interlocks are controllable (invertable) from the MCR but are not controllable from the Auxiliary Shutdown Panel.

SIGNIFICANCE OF CONCERN:

B&W BOP criteria regarding control of FOGG from Auxiliary Shutdown Panel are not met.

RECOMMENDATION X OR RESOLUTION _____:

Project team confirms concern and has determined that design interface between B&W and Bechtel should be reviewed further.

COMMENTS BY SRT (IF REQUIRED):

REFERENCES (INCL. RELATED OCR ITEM REPORT NO.):

SIGNATURE(S):

RPS	RPS	HAL	JWB	N/A JWB
OCR ITEM REPORT ORIGINATOR	LTR	PROJECT MANAGER FOR PROJECT TEAM	PRINCIPAL-IN-CHARGE	SRT (IF REQUIRED)
3/4/83	3/4/83	3/4/83	3/14/83	
DATE	DATE	DATE	DATE	DATE

MIDLAND INDEPENDENT DESIGN AND CONSTRUCTION VERIFICATION
OPEN, CONFIRMED AND RESOLVED (OCR) ITEM REPORT

TYPE OF REPORT: OPEN _____ CONFIRMED X
RESOLVED _____ ITEM

FILE NO. 3201-008
DOC NO. 3201-008-C-012
REV. NO. 0

DATES REPORTED TO: LTR 2/7/83 SRT _____ PROJECT TEAM/PROJECT MGR. 3/3/83
PRINCIPAL-IN-CHARGE 3/7/83 CPC/DESIGN ORG. _____

STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:

FOGG Interlock

IDCV PROGRAM AREA OR TASK (IF APPLICABLE):

Topic I.15-1, Power Supplies

DESCRIPTION OF CONCERN:

The Midland FSAR and the B&W balance of plant criteria document (36-1004477-01) require that the AFW system be capable of operating for two hours in a station blackout condition (loss of all AC). The FOGG interlock relays for channel AA and BA are powered from Class 1E AC (lost during blackout). This would cause valves 2MO-3277A and B to shut, cutting off steam to the AFW turbine and causing loss of AFW function during blackout.

SIGNIFICANCE OF CONCERN:

The AFW system may not be functional during station blackout conditions.

RECOMMENDATION X OR RESOLUTION _____:

Although limited Failure Modes Effects Analyses (FMEAs) have been performed on AFW, a systematic analysis should be done which considers all applicable plant conditions.

COMMENTS BY SRT (IF REQUIRED):

REFERENCES (INCL. RELATED OCR ITEM REPORT NO.):

OCR 3201-008-0-038 & C-038
Drawings E-158Q SH41, 42, 24, 25

SIGNATURE(S):

LB	LB	HAL	JWB	N/A JWB
OCR ITEM REPORT ORIGINATOR	LTR	PROJECT MANAGER FOR PROJECT TEAM	PRINCIPAL-IN-CHARGE	SRT (IF REQUIRED)
2/7/83	2/9/83	3/4/83	3/14/83	
DATE	DATE	DATE	DATE	DATE

MIDLAND INDEPENDENT DESIGN AND CONSTRUCTION VERIFICATION
OPEN, CONFIRMED AND RESOLVED (OCR) ITEM REPORT

TYPE OF REPORT: OPEN _____ CONFIRMED X
RESOLVED _____ ITEM

FILE NO. 3201-008
DOC NO. 3201-008C - 017
REV. NO. 0

DATES REPORTED TO: LTR 3/3/83 SRT _____
PRINCIPAL-IN-CHARGE 3/7/83

PROJECT TEAM/PROJECT MGR. 3/3/83
CPC/DESIGN ORG. _____

STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:
AFW Pumps

IDCV PROGRAM AREA OR TASK (IF APPLICABLE):
Component Functional Requirements (I.9-1)
System Heat Removal Capability (I.11-1)
System Hydraulic Design (I.10-1)
(Criteria & Commitments/Review of Calcs)

DESCRIPTION OF CONCERN:
There are inconsistencies in the minimum required AFW flow. B&W document BAW 1612, Rev. 1, (Ref. 1) lists values of 500 gpm and 720 gpm. The B&W BOP Criteria Document (Ref. 2) requires 850 gpm and a B&W calculation (Ref. 3) is consistent with this value, although (as reported in other OCRs) this calculation may not be consistent with appropriate design parameters. The 850 gpm figure may not provide enough water to remove the heat being generated at the time specified in the B&W Criteria Document (i.e. 30 sec after reactor trip).

SIGNIFICANCE OF CONCERN:

This would result in a temperature increase in the primary system until the decay heat rate falls to the point where 850 gpm is adequate.

RECOMMENDATION X OR RESOLUTION _____:

Process per Project Quality Assurance Plan.

COMMENTS BY SRT (IF REQUIRED):

REFERENCES (INCL. RELATED OCR ITEM REPORT NO.): (1) Conceptual Design Study for Auxiliary Feedwater System Feed Rate Control for B&W 177-Fuel Assembly Plant, BAW 1612, Rev. 1. (2) BOP Criteria - Aux Feedwater Sys (36-1004477, Rev.1). (3) B&W AFW Calculation 32-0525, Rev. 00.

SIGNATURE(S):

FD	FD	HAL	JWB	N/A JWB
OCR ITEM REPORT ORIGINATOR	LTR	PROJECT MANAGER FOR PROJECT TEAM	PRINCIPAL-IN-CHARGE	SRT (IF REQUIRED)
3/3/83	3/3/83	3/4/83	3/14/83	
DATE	DATE	DATE	DATE	DATE

MIDLAND INDEPENDENT DESIGN AND CONSTRUCTION VERIFICATION
OPEN, CONFIRMED AND RESOLVED (OCR) ITEM REPORT

TYPE OF REPORT: OPEN _____ CONFIRMED X
RESOLVED _____ ITEM

FILE NO. 3201-008
DOC NO. 3201-008-C-018
REV. NO. 0

DATES REPORTED TO: LTR 3/3/83 SRT _____ PROJECT TEAM/PROJECT MGR. 3/3/83
PRINCIPAL-IN-CHARGE 3/7/83 CPC/DESIGN ORG. _____

STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:

AFW System (general)

IDCV PROGRAM AREA OR TASK (IF APPLICABLE):

System heat removal capability (I.11-1)

DESCRIPTION OF CONCERN:

There are inconsistencies in the information presented in the listed references concerning the decay heat curve used to determine the heat load which the AFW must be capable of removing. The AFW calculation performed by B&W (Ref. 1) uses a B&W decay heat curve. FSAR page 10A-17 item (e) states that 1.0 x ANS 5.1 (Ref. 2) heat curve whereas FSAR page 10.4-37 states that the design is in conformance with the method of the NRC's Branch Technical Position APCSB 9.2 (Ref. 3). B&W Document BAW 1612 (Ref. 4) uses the ANS curve plus 20% which is consistent with Reference 3. Ref. 3 requires a 20% margin to be added to the ANS curve. The actual design basis is not clearly identified.

SIGNIFICANCE OF CONCERN:

If the heat load used for analysis is less than the ANS curve (Ref. 2) plus 20% the calculated heat removal requirement will be too low and could consequently result in undersizing the AFW pumps.

RECOMMENDATION X OR RESOLUTION _____:

Process per Project Quality Assurance Plan

COMMENTS BY SRT (IF REQUIRED):

REFERENCES (INCL. RELATED OCR ITEM REPORT NO.): (1) B&W Calculation for AFW 32-0525, Rev.00. (2) American Nuclear Society Standard 5.1-1979. (3) NRC Branch Technical Position APCSB 9.2. (4) B&W 1612(Rev. 1), Conceptual Design Study.

SIGNATURE(S):

FAD	FAD	HAL	JWB	N/A JWB
OCR ITEM REPORT ORIGINATOR	LTR	PROJECT MANAGER FOR PROJECT TEAM	PRINCIPAL-IN-CHARGE	SRT (IF REQUIRED)
3/3/83	3/3/83	3/4/83	3/14/83	
DATE	DATE	DATE	DATE	DATE

MIDLAND INDEPENDENT DESIGN AND CONSTRUCTION VERIFICATION
OPEN, CONFIRMED AND RESOLVED (OCR) ITEM REPORT

TYPE OF REPORT: OPEN _____ CONFIRMED X
RESOLVED _____ ITEM

FILE NO. 3201-008
DOC NO. 3201-008-C-020
REV. NO. 0

DATES REPORTED TO: LTR 3/3/83 SRT _____ PROJECT TEAM/PROJECT MGR. 3/3/83
PRINCIPAL-IN-CHARGE 3/7/83 CPC/DESIGN ORG. _____

STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:
AFW System (general)

IDCV PROGRAM AREA OR TASK (IF APPLICABLE): System Hydraulic Design (I.10-1)
System Heat Removal Capability (I.11-1)
Component Functional Requirements (I.9-1)

DESCRIPTION OF CONCERN: There are inconsistencies in inlet water temperatures used in AFW analyses. The B&W criteria* (section 2.14) require the use of 90°F inlet water temperature for AFW system design. B&W's "Specific Design Criteria for Safety Grade AFW Control System" document (4100) describes 90°F as "typical". BAW 1612, Rev. 1 (section 2.1) makes use of a 100°F value in calculating minimum flow requirements. The FSAR contains analyses indicating a maximum service water temperature of 105°F. Bechtel calculation FM 4117-28 uses a max. SW temperature of 108°F.

*(Document #36-1004477, Rev. 1)

SIGNIFICANCE OF CONCERN:
Use of a 90°F temperature when 105°F can occur results in an underestimate of the quantity of water required to remove the heat being generated in the primary system. This in turn affects the AFW system heat removal capability, its hydraulic design basis and the sizing of components.

RECOMMENDATION X OR RESOLUTION _____:

Process per Project Quality Assurance Plan

COMMENTS BY SRT (IF REQUIRED):

REFERENCES (INCL. RELATED OCR ITEM REPORT NO.): (1) Bechtel Calculation FM4117-28 (Rev.0). (2) B&W Balance of Plant Criteria for AFW (36-1004477,Rev.01). (3) B&W Conceptual Design Study (BAW-1612,Rev.1). (4) B&W Specific Design Criteria for Safety Grade AFW Control System (86-1119130, dated 4/80).

SIGNATURE(S):

FAD	FAD	HAL	JWB	N/A JWB
OCR ITEM REPORT ORIGINATOR	LTR	PROJECT MANAGER FOR PROJECT TEAM	PRINCIPAL-IN-CHARGE	SRT (IF REQUIRED)
3/3/83	3/3/83	3/4/83	3/14/83	
DATE	DATE	DATE	DATE	DATE

MIDLAND INDEPENDENT DESIGN AND CONSTRUCTION VERIFICATION
OPEN, CONFIRMED AND RESOLVED (OCR) ITEM REPORT

TYPE OF REPORT: OPEN _____ CONFIRMED X
RESOLVED _____ ITEM

FILE NO. 3201-008
DOC NO. 3201-008-C-025
REV. NO. 0

DATES REPORTED TO: LTR 3/3/83 SRT _____ PROJECT TEAM/PROJECT MGR. 3/3/83
PRINCIPAL-IN-CHARGE 3/7/83 CPC/DESIGN ORG. _____

STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:

AFW system operability under postulated accident conditions - "FOGG" system may function in detrimental manner

IDCV PROGRAM AREA OR TASK (IF APPLICABLE):

Topic I.2-1, Accident Analysis Considerations

DESCRIPTION OF CONCERN: The "Feed Only Good Generator" system may perform in a detrimental manner under conditions of steam generator tube failure followed by loss of offsite power. Its design would force it to direct feed to the "bad" steam generator only because FOGG logic directs feed to the steam generator with the higher pressure based upon a delta pressure measurement between thw two SGs. Without prompt operator action, the steam-driven pump could be flooded and rendered inoperable as a result of leaking primary coolant. The FSAR analysis assumes operator action (no time delay mentioned) to "invert" FOGG and send flow to good generator such that the SG tube rupture is recognized & mitigated in sufficient time. The basis for this assumption is not clear. With a single failure of the motor driven AFW pump, all AFW may be rendered inoperable.

SIGNIFICANCE OF CONCERN:

Failure of operator to take action quickly could result in total loss of AFW (taking into account single failure).

RECOMMENDATION X OR RESOLUTION _____:

Process in accordance with Project Quality Assurance Plan.

COMMENTS BY SRT (IF REQUIRED):

REFERENCES (INCL. RELATED OCR ITEM REPORT NO.):

Topic 1.2-1 Engineering Evaluation; FSAR Revision 47.

SIGNATURE(S):

RPS	RPS	HAL	JWB	N/A JWB
OCR ITEM REPORT ORIGINATOR	LTR	PROJECT MANAGER FOR PROJECT TEAM	PRINCIPAL-IN-CHARGE	SRT (IF REQUIRED)
3/3/83	3/3/83	3/4/83	3/14/83	
DATE	DATE	DATE	DATE	DATE

MIDLAND INDEPENDENT DESIGN AND CONSTRUCTION VERIFICATION
OPEN, CONFIRMED AND RESOLVED (OCR) ITEM REPORT

TYPE OF REPORT: OPEN _____ CONFIRMED X
RESOLVED _____ ITEM

FILE NO. 3201-008
DOC NO. 3201-008- C- 027
REV. NO. 0

DATES REPORTED TO: LTR 3/3/83 SRT _____
PRINCIPAL-IN-CHARGE 3/7/83

PROJECT TEAM/PROJECT MGR. 3/3/83
CPC/DESIGN ORG. _____

STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:
AFW (general)

IDCV PROGRAM AREA OR TASK (IF APPLICABLE):
Component Functional Requirements (I.9-1)
Environmental Envelopes (II.9-1)

DESCRIPTION OF CONCERN: The FSAR contains references to the following power levels: (a) 2452 MWt - license power level, (b) 2552 MWt - power level for calculation of core inventories for accident analyses, (c) 2603 MWt - power level for containment analysis.

The 2552 MWt power was used in the B&W AFW calculation (Ref. 1). The 2603 MWt is 102% of 2552. FSAR page 10A-17 (Item a) states that 102% of maximum power level is used for AFW analysis. Thus the power level for AFW analysis should be 2603 MWt.

SIGNIFICANCE OF CONCERN:
If 2552 MWt was used, the heat load which must be removed by the AFW will be underestimated compared to the heat load associated with operation at 2603 MWt resulting in undersizing of AFW components. Furthermore, other analyses may need to be performed at 2603 MWt.

RECOMMENDATION X OR RESOLUTION _____:

Process per Project Quality Assurance Plan.

PIC

COMMENTS BY ~~SRT~~ (IF REQUIRED):
Before doing any confirmatory AFW flow requirements analyses, determine the rationale for the use of 2552 MWt by B&W, and discuss core power level to be used with project manager and PIC.

JWB

REFERENCES (INCL. RELATED OCR ITEM REPORT NO.):
Ref 1: B&W AFW Calculation 32-0525, Rev. 00

SIGNATURE(S):

FAD	FAD	HAL	JWB	N/A JWB
OCR ITEM REPORT ORIGINATOR	LTR	PROJECT MANAGER FOR PROJECT TEAM	PRINCIPAL-IN-CHARGE	SRT (IF REQUIRED)
3/3/83	3/3/83	3/4/83	3/14/83	
DATE	DATE	DATE	DATE	DATE

MIDLAND INDEPENDENT DESIGN AND CONSTRUCTION VERIFICATION
OPEN, CONFIRMED AND RESOLVED (OCR) ITEM REPORT

TYPE OF REPORT: OPEN _____ CONFIRMED X
RESOLVED _____ ITEM

FILE NO. 3201-008
DOC NO. 3201-008-C-028
REV. NO. _____

DATES REPORTED TO: LTR 3/29/83 SRT _____
PRINCIPAL-IN-CHARGE 4/13/83

PROJECT TEAM/PROJECT MGR. 3/31/83
CPC/DESIGN ORG. _____

STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:

AFW System

IDCV PROGRAM AREA OR TASK (IF APPLICABLE):
Component Functional Requirements (I.9-1)
(Review of Criteria and Commitments)

DESCRIPTION OF CONCERN:

The AFW system design may not meet a B&W interface requirement that auxiliary feedwater temperature be at least 40°F. B&W's BOP criteria for AFW (Ref. 1) requires a 40°F minimum AFW temperature. This criterion is consistent with the B&W document for reactor coolant system analysis (Ref. 2) which is used in analysis of reactor coolant system components. Bechtel calcluation FM-4117-28 (Ref. 3) uses a 32°F temperature as a worst case winter temperature. The recommendation contained in the original was implemented, but no addition analyses were identified.

SIGNIFICANCE OF CONCERN:

If the interface requirement is not met, analyses of the reactor coolant system components could become invalid.

RECOMMENDATION X OR RESOLUTION _____:

Process per PQAP.

COMMENTS BY SRT (IF REQUIRED):

REFERENCES (INCL. RELATED OCR ITEM REPORT NO.):
(1) B&W Criteria for AFW (36-1004477, Rev. 1)
(2) B&W Functional Contract Specification for Reactor Coolant System (18-1092000012-04)
(3) Bechtel Calculation FM-4117-28

SIGNATURE(S):

FAD	FAD			
OCR ITEM REPORT ORIGINATOR	LTR	PROJECT MANAGER FOR PROJECT TEAM	PRINCIPAL-IN-CHARGE	SRT (IF REQUIRED)
3/29/83	3/29/83	4/14/83	5/10/83	
DATE	DATE	DATE	DATE	DATE

MIDLAND INDEPENDENT DESIGN AND CONSTRUCTION VERIFICATION
OPEN, CONFIRMED AND RESOLVED (OCR) ITEM REPORT

TYPE OF REPORT: OPEN _____ CONFIRMED X
RESOLVED _____ ITEM

FILE NO. 3201-008
DOC NO. 3201-008- C- 031
REV. NO. 0

DATES REPORTED TO: LTR 3/3/83 SRT _____ PROJECT TEAM/PROJECT MGR. 3/3/83
PRINCIPAL-IN-CHARGE 3/7/83 CPC/DESIGN ORG. _____

STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:

AFW System Pipe Supports

IDCV PROGRAM AREA OR TASK (IF APPLICABLE):

Topic I.3.1c - Pipe Supports
Verification of Physical Configuration

DESCRIPTION OF CONCERN:

Refer to OCR's C-32 thru 35, same program area as above, for description of four hangers field measured by TERA to be out of installation tolerance limits.

SIGNIFICANCE OF CONCERN:

The construction deviation control process is not functional.

RECOMMENDATION X OR RESOLUTION _____:

1. Review further the construction deviation control process to determine extent of breakdown.

2. Process per Project Quality Assurance Plan.

COMMENTS BY SRT (IF REQUIRED):

REFERENCES (INCL. RELATED OCR ITEM REPORT NO.):

Dwg 7220-H-639 SH 14 (Q), Rev 11
Spec 7220-M-326 (Q) Rev 8 "Install., Inspect. & Doc. of Pipe Supports"

SIGNATURE(S):

CS	CS	HAL	JWB	N/A JWB
OCR ITEM REPORT ORIGINATOR	LTR	PROJECT MANAGER FOR PROJECT TEAM	PRINCIPAL-IN-CHARGE	SRT (IF REQUIRED)
3/3/83	3/3/83	3/4/83	3/14/83	
DATE	DATE	DATE	DATE	DATE

MIDLAND INDEPENDENT DESIGN AND CONSTRUCTION VERIFICATION
OPEN, CONFIRMED AND RESOLVED (OCR) ITEM REPORT

TYPE OF REPORT: OPEN _____ CONFIRMED X
RESOLVED _____ ITEM

FILE NO. 3201-008
DOC NO. 3201-008-C-032
REV. NO. 0

DATES REPORTED TO: LTR 3/3/83 SRT _____ PROJECT TEAM/PROJECT MGR. 3/3/83
PRINCIPAL-IN-CHARGE 3/7/83 CPC/DESIGN ORG. _____

STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:

AFW System Pipe Supports

IDCV PROGRAM AREA OR TASK (IF APPLICABLE):

Topic I.3-1c - Pipe Supports
Verification of Physical Configuration

DESCRIPTION OF CONCERN:

Hanger H-10, a horizontal snubber, was field measured by TERA to be about 3'-0" from its design location (along the direction of the pipe axis) which exceeds the allowable tolerance for snubbers of 0'-6". Construction deviation information was not forwarded for approval and processing by engineering as required by procedures.

SIGNIFICANCE OF CONCERN:

1. The piping analysis for this portion of the system may be affected as a result of this change leading to higher support loads and piping stresses than calculated.
2. The construction deviation control process does not appear to be functioning for this case (refer to separate OCR for recommendation).

RECOMMENDATION X OR RESOLUTION _____:

1. Input this information to the TERA confirmatory piping analysis for further evaluation.
2. Process per Project Quality Assurance Plan

COMMENTS BY SRT (IF REQUIRED):

REFERENCES (INCL. RELATED OCR ITEM REPORT NO.):

Dwg 7220-H-639 SH 14 (Q), Rev. 11
Spec 7220-M-326 (Q), Rev. 8 "Install., Inspect. & Doc. of Pipe Supports"

SIGNATURE(S):

CS	CS	HAL	JWB	N/A JWB
OCR ITEM REPORT ORIGINATOR	LTR	PROJECT MANAGER FOR PROJECT TEAM	PRINCIPAL-IN-CHARGE	SRT (IF REQUIRED)
3/3/83	3/3/83	3/4/83	3/14/83	
DATE	DATE	DATE	DATE	DATE

MIDLAND INDEPENDENT DESIGN AND CONSTRUCTION VERIFICATION
OPEN, CONFIRMED AND RESOLVED (OCR) ITEM REPORT

TYPE OF REPORT: OPEN _____ CONFIRMED X
RESOLVED _____ ITEM

FILE NO. 3201-008
DOC NO. 3201-008-C-033
REV. NO. 0

DATES REPORTED TO: LTR 3/3/83 SRT _____ PROJECT TEAM/PROJECT MGR. 3/3/83
PRINCIPAL-IN-CHARGE 3/7/83 CPC/DESIGN ORG. _____

STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:
AFW System Pipe Supports

IDCV PROGRAM AREA OR TASK (IF APPLICABLE):
Topic I.3-1c Pipe Supports
Verification of Physical Configuration

DESCRIPTION OF CONCERN:
Hanger H-7, a vertical rigid hanger, was field measured by TERA to be about 3'-0" from its design location (along the direction of the pipe axis) which exceeds the allowable tolerance of 1'-0". Construction deviation information was not forwarded for approval and processing by engineering as required by procedures.

SIGNIFICANCE OF CONCERN:
1. The piping analysis for this portion of the system may be affected as a result of this change leading to higher support loads and piping stresses than calculated.
2. The construction deviation control process does not appear to be functioning for this case (refer to separate OCR for recommendation).

RECOMMENDATION X OR RESOLUTION _____:
1. Input to TERA confirmatory piping analysis for further evaluation.
2. Process per Project Quality Assurance Plan.

COMMENTS BY SRT (IF REQUIRED):

REFERENCES (INCL. RELATED OCR ITEM REPORT NO.):
Dwg 7220-H-639 SH 14 (Q), Rev. 11
Spec 7220-M-326 (Q), Rev. 8 "Install., Inspect. & Doc. of Pipe Supports..."

SIGNATURE(S):

CS	CS	HAL	JWB	N/A JWB
OCR ITEM REPORT ORIGINATOR	LTR	PROJECT MANAGER FOR PROJECT TEAM	PRINCIPAL-IN-CHARGE	SRT (IF REQUIRED)
3/3/83	3/3/83	3/4/83	3/14/83	
DATE	DATE	DATE	DATE	DATE

MIDLAND INDEPENDENT DESIGN AND CONSTRUCTION VERIFICATION
OPEN, CONFIRMED AND RESOLVED (OCR) ITEM REPORT

TYPE OF REPORT: OPEN _____ CONFIRMED X
RESOLVED _____ ITEM

FILE NO. 3201-008
DOC NO. 3201-008-C-034
REV. NO. 0

DATES REPORTED TO: LTR 3/3/83 SRT _____ PROJECT TEAM/PROJECT MGR. 3/3/83
PRINCIPAL-IN-CHARGE 3/7/83 CPC/DESIGN ORG. _____

STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:

AFW System Pipe Supports

IDCV PROGRAM AREA OR TASK (IF APPLICABLE):
Topic I.3-1 - Pipe Supports
Verification of Physical Configuration

DESCRIPTION OF CONCERN:

Hanger H-4, a vertical spring hanger, was field measured by TERA to be located on the opposite side of a 90° elbow (along the axis of the pipe) which exceeds the allowable tolerance. Construction deviation information was not forwarded for approval and processing by engineering as required by procedures.

SIGNIFICANCE OF CONCERN:

1. The piping analysis for this portion of the system may be affected as a result of this change leading to a higher support loads and piping stresses than calculated.
2. The construction deviation control process does not appear to be functioning for this case (refer to separate OCR for recommendation).

RECOMMENDATION X OR RESOLUTION _____:

1. Input to TERA confirmatory piping analysis for further evaluation.
2. Process per Project Quality Assurance Plan.

COMMENTS BY SRT (IF REQUIRED):

REFERENCES (INCL. RELATED OCR ITEM REPORT NO.):
Dwg 7220-H-639 SH 14 (Q), Rev 11
Spec 7220-M-326 (Q), Rev 8 "Install., Inspect., & Doc. of Pipe Supports..."

SIGNATURE(S):

CS	CS	HAL	JWB	JWB N/A
OCR ITEM REPORT ORIGINATOR	LTR	PROJECT MANAGER FOR PROJECT TEAM	PRINCIPAL-IN-CHARGE	SRT (IF REQUIRED)
3/3/83	3/3/83	3/4/83	3/14/83	
DATE	DATE	DATE	DATE	DATE

MIDLAND INDEPENDENT DESIGN AND CONSTRUCTION VERIFICATION
OPEN, CONFIRMED AND RESOLVED (OCR) ITEM REPORT

TYPE OF REPORT: OPEN ____ CONFIRMED X
RESOLVED ____ ____ ITEM

FILE NO. 3201-008
DOC NO. 3201-008-C-035
REV. NO. (1) One

DATES REPORTED TO: LTR 5/10/83 SRT ____
PRINCIPAL-IN-CHARGE 5/26/83

PROJECT TEAM/PROJECT MGR. 5/20/83
CPC/DESIGN ORG. ____

STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:

AFW System Pipe Supports

IDCV PROGRAM AREA OR TASK (IF APPLICABLE):

Topic 1.3-1c Pipe Supports
Verification of Physical Configuration

DESCRIPTION OF CONCERN:

Hanger H-11, a vertical rigid hanger was field measured by TERA to be at the proper elevation but mis-located by 1'-3" according to drawing dimensions from DP-260. Further measurements show DP-260 at proper elevation, but dimensions do not match elevations shown for DP-260 or 265. Steel locations and penetration locations support elevations as measured.

SIGNIFICANCE OF CONCERN:

1. Drawing errors of this nature are not consistent with pipe analysis and may indicate the probability of other drawing errors that would develope loading higher than design levels.

2. The construction deviation control process and drawing checking process does not appear to be functioning.

RECOMMENDATION X OR RESOLUTION ____:

1. Investigate quality paperwork to determine effectiveness of acceptance procedures and feed back of results of design group for determination of acceptance resolution.

2. Investigate shop drawing approval and establish feed back to design and drawing of dimension/elevation nonconformance.

COMMENTS BY SRT (IF REQUIRED):

REFERENCES (INCL. RELATED OCR ITEM REPORT NO.):

Drawing 7220-H639 Sh. 14(Q), Rev. 11 & Engineering Evaluation 3201-001-001, Pgs 7 & 8

SIGNATURE(S):

RCS	DBT	HAL	JB	
OCR ITEM REPORT ORIGINATOR	LTR	PROJECT MANAGER FOR PROJECT TEAM	PRINCIPAL-IN-CHARGE	SRT (IF REQUIRED)
5/10/83	5/20/83	5/25/83	5/27/83	
DATE	DATE	DATE	DATE	DATE

MIDLAND INDEPENDENT DESIGN AND CONSTRUCTION VERIFICATION
OPEN, CONFIRMED AND RESOLVED (OCR) ITEM REPORT

TYPE OF REPORT: OPEN _____ CONFIRMED X
RESOLVED _____ ITEM

FILE NO. 3201-008
DOC NO. 3201-008-C-036
REV. NO. (1) One

DATES REPORTED TO: LTR 5/11/83 SRT _____
PRINCIPAL-IN-CHARGE 5/26/83

PROJECT TEAM/PROJECT MGR. 5/20/83
CPC/DESIGN ORG. _____

STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:

AFW System Piping

IDCV PROGRAM AREA OR TASK (IF APPLICABLE):
Topic 11.2-1 Pressure Boundary
Drawing Review

DESCRIPTION OF CONCERN:

The offset dimensions to the reactor centerline are not consistent with dimensions given along pipe centerline as follows. Distances between DP 270 and 280, 280 and 285, 300 and 306. Differences range from 5/16 and 7/16. Drawings that have been signed have not been adequately checked.

SIGNIFICANCE OF CONCERN:

Inconsistencies in design drawings could lead to deviation of constructed structures, systems and components from design assumptions.

RECOMMENDATION X OR RESOLUTION _____:

1. Investigate shop drawing approval system to establish method of resolution and feed back to design and drafting.

COMMENTS BY SRT (IF REQUIRED):

REFERENCES (INCL. RELATED OCR ITEM REPORT NO.):

Drawing 7220-H-639 (Q), Sh. 14, Rev. 11 & Eng. Eval. 3201-001-001, page 9

SIGNATURE(S):

RCS	DBT	HAL	JB	
OCR ITEM REPORT ORIGINATOR	LTR	PROJECT MANAGER FOR PROJECT TEAM	PRINCIPAL-IN-CHARGE	SRT (IF REQUIRED)
5/10/83	5/20/83	5/25/83	5/27/83	
DATE	DATE	DATE	DATE	DATE

MIDLAND INDEPENDENT DESIGN AND CONSTRUCTION VERIFICATION
OPEN, CONFIRMED AND RESOLVED (OCR) ITEM REPORT

TYPE OF REPORT: OPEN _____ CONFIRMED X
RESOLVED _____ ITEM

FILE NO. 3201-008
DOC NO. 3201-008-C-037
REV. NO. 0

DATES REPORTED TO: LTR 3/3/83 SRT _____ PROJECT TEAM/PROJECT MGR. 3/3/83
PRINCIPAL-IN-CHARGE 3/7/83 CPC/DESIGN ORG. _____

STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:

AFW System - All

IDCV PROGRAM AREA OR TASK (IF APPLICABLE):

Topic III.1-1 - Seismic Design
Review of Design Criteria

DESCRIPTION OF CONCERN:

FSAR Figures 3.7-2 through 3.7-53 are not current as they are not consistent with FSAR text nor the models and response spectra for the containment and auxiliary building. The FSAR updating process is not consistent nor timely.

SIGNIFICANCE OF CONCERN:

FSAR errors could lead to the utilization of improper input to the design process.

RECOMMENDATION X OR RESOLUTION _____:

1. Review further information regarding the FSAR updating process.
2. Process per Project Quality Assurance Plan.

COMMENTS BY SRT (IF REQUIRED):

REFERENCES (INCL. RELATED OCR ITEM REPORT NO.):

FSAR, Rev. 46, Section 3.7
Spec. 7220-G-6, Rev. 7 and G-7, Rev. 9, Containment & Aux. Bldg. Response Spectra

SIGNATURE(S):

CS	CS	HAL	JWB	N/A JWB
OCR ITEM REPORT ORIGINATOR	LTR	PROJECT MANAGER FOR PROJECT TEAM	PRINCIPAL-IN-CHARGE	SRT (IF REQUIRED)
3/3/83	3/3/83	3/4/83	3/14/83	
DATE	DATE	DATE	DATE	DATE

MIDLAND INDEPENDENT DESIGN AND CONSTRUCTION VERIFICATION
OPEN, CONFIRMED AND RESOLVED (OCR) ITEM REPORT

TYPE OF REPORT: OPEN _____ CONFIRMED X
RESOLVED _____ ITEM

FILE NO. 3201-008
DOC NO. 3201-008-C-038
REV. NO. 0

DATES REPORTED TO: LTR 3/1/83 SRT _____ PROJECT TEAM/PROJECT MGR. 3/3/83
PRINCIPAL-IN-CHARGE 3/7/83 CPC/DESIGN ORG. _____

STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:

AFW Pump Turbine Minimum Flow Valve

IDCV PROGRAM AREA OR TASK (IF APPLICABLE):

Topic I.15-1, Control/Power Supplies

DESCRIPTION OF CONCERN:

Under condition of loss of all AC (station blackout), the AFW pump minimum flow valve 2SV-3969B would not be operable because it is powered from Class 1E AC power. The Midland FSAR and B&W BOP criteria document (36-1004477) both require that AFW be operable for two hours under station blackout. During this period of time flow through the minimum flow line may be necessary to prevent damage to the pump.

SIGNIFICANCE OF CONCERN:

Failure to provide minimum flow would cause consequential damage to the AFW turbine driven pump during station blackout.

RECOMMENDATION X OR RESOLUTION _____:

Process per Project Quality Assurance Plan.

COMMENTS BY SRT (IF REQUIRED):

REFERENCES (INCL. RELATED OCR ITEM REPORT NO.):

OCR 3201-008-0-012 & C-012 ; Drawing E-158(Q) SH 29, 29A, 29B, 29C

SIGNATURE(S):

LB	LB	HAL	JWB	N/A JWB
OCR ITEM REPORT ORIGINATOR	LTR	PROJECT MANAGER FOR PROJECT TEAM	PRINCIPAL-IN-CHARGE	SRT (IF REQUIRED)
3/1/83	3/1/83	3/4/83	3/14/83	
DATE	DATE	DATE	DATE	DATE

MIDLAND INDEPENDENT DESIGN AND CONSTRUCTION VERIFICATION
OPEN, CONFIRMED AND RESOLVED (OCR) ITEM REPORT

TYPE OF REPORT: OPEN _____ CONFIRMED X
RESOLVED _____ ITEM

FILE NO. 3201-008
DOC NO. 3201-008-C-045
REV. NO. _____

DATES REPORTED TO: LTR 3/17/83 SRT _____ PROJECT TEAM/PROJECT MGR. 5/20/83
PRINCIPAL-IN-CHARGE 5/26/83 CPC/DESIGN ORG. _____

STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:

Auxiliary Feedwater System: AFW Pump Motor 2P005A

IDCV PROGRAM AREA OR TASK (IF APPLICABLE):

ICV: Review of Storage and Maintenance Documentation

DESCRIPTION OF CONCERN:

1. Manufacturer's recommended storage instructions require motor shaft rotation every two weeks while motor is in storage (Ref: Vendor Doc. No. 7220-M14-68).

2. Bechtel procedure governing in-place maintenance (F-10-247) requires rotation of motor shaft every 90 days, exceeding the maximum duration between shaft rotations, as recommended by the vendor, by a factor of 6.

SIGNIFICANCE OF CONCERN:

- Failure to comply with manufacturer's recommended shaft rotation schedule for the motor may have a deleterious effort upon the shaft bearing surfaces, shaft bearings, and rotating elements of the motor.

RECOMMENDATION X OR RESOLUTION _____:

- Recommend motor inspection by manufacturer's rep. and ICV reviewer of motor bearing surfaces.

COMMENTS BY SRT (IF REQUIRED):

REFERENCES (INCL. RELATED OCR ITEM REPORT NO.):

Bechtel Storage Procedure F-10-247
Vendor Document No. 7220-M14-68

SIGNATURE(S):

MBJ	DBT	HAL	JB	
OCR ITEM REPORT ORIGINATOR	LTR	PROJECT MANAGER FOR PROJECT TEAM	PRINCIPAL-IN-CHARGE	SRT (IF REQUIRED)
3/17/83	5/20/83	5/25/83	5/27/83	
DATE	DATE	DATE	DATE	DATE

MIDLAND INDEPENDENT DESIGN AND CONSTRUCTION VERIFICATION
OPEN, CONFIRMED AND RESOLVED (OCR) ITEM REPORT

TYPE OF REPORT: OPEN _____ CONFIRMED X
RESOLVED _____ ITEM

FILE NO. 3201-008
DOC NO. 3201-008-C-046
REV. NO. _____

DATES REPORTED TO: LTR 3/17/83 SRT _____
PRINCIPAL-IN-CHARGE 5/26/83

PROJECT TEAM/PROJECT MGR. 5/20/83
CPC/DESIGN ORG. _____

STRUCTURE(S), SYSTEM(S), OR COMPONENT(S) INVOLVED:

Auxiliary Feedwater Pumps = 2P005A & 2P005B

IDCV PROGRAM AREA OR TASK (IF APPLICABLE):

ICV: Review of Storage & Maintenance Documentation

DESCRIPTION OF CONCERN:

1. Pump manufacturer's recommended storage instructions require pump to be stored under vacuum with VPI crystals (dessicant) to maintain Relative Humidity at less than 50%.
2. Bechtel Procedure for storage of pumps, Proc. #F-10-118, does not require vacuum nor humidity check per item #1 above.
3. Further to concern, review of records indicates pump have been open, subject to flooding & other damage, & several NCR's remain open against the AFW pump turbine

SIGNIFICANCE OF CONCERN: indicating maintenance problems which have not been addressed nor closed out.

Failure to comply with the vendor's recommended storage instructions coupled with the long time (since 1978) the pumps and turbine have been in storage (both in the warehouse and in place) raise concerns as to the existence of internal damage to the pumps and turbine resulting from rust, corrosion, and foreign materials.

RECOMMENDATION X OR RESOLUTION _____:

- Recommend pumps and turbine disassembly and inspection.
- Disassembly and inspection should be witnessed by manufacturer's rep. and ICV reviewer.

COMMENTS BY SRT (IF REQUIRED):

REFERENCES (INCL. RELATED OCR ITEM REPORT NO.):

Bechtel Procedure F-10-118 and Storage and Maintenance Checklist GN-3-118

SIGNATURE(S):

MBJ	DBT	HAL	JB	
OCR ITEM REPORT ORIGINATOR	LTR	PROJECT MANAGER FOR PROJECT TEAM	PRINCIPAL-IN-CHARGE	SRT (IF REQUIRED)
3/17/83	5/20/83	5/25/83	5/27/83	
DATE	DATE	DATE	DATE	DATE