



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

NU

February 28, 1984

MEMORANDUM FOR: Darrell G. Eisenhut, Director  
 Division of Licensing, NRR

FROM: J. Nelson Grace, Director  
 Division of Quality Assurance,  
 Safeguards, and Inspection Programs, IE

SUBJECT: MIDLAND IDCVP

REFERENCE: TERA Letter from H. A. Levin to J. W. Cook et al.  
 "Independent Design and Construction Verification  
 (IDCV) Program, Future Direction of the Midland  
 IDCVP," dated February 10, 1984

In its letter of February 10, 1984 (copy enclosed), TERA proposed modifications to the Midland IDCVP. The principal modification involved verification of a limited portion of the design verification sample by reviewing engineering procedures and action plans and their implementation for items not currently completed. TERA estimated that approximately 10 to 20 percent of their sample would be verified in this manner and that 80 to 90 percent of their sample would continue to be verified with emphasis on the quality of the end product. TERA also proposed postponement of the construction verification portion of the IDCVP until completion of Phase 1 of the Midland project Construction Completion Program.

A public meeting is tentatively scheduled to be held March 13, 1984 in Bethesda in which TERA would discuss the proposed modifications to the Midland IDCVP. Comments would be invited from Consumers Power Company and members of the public at this meeting.

We request NRR attendance at the public meeting. Any comments NRR may have on the TERA proposal with respect to the feasibility of the proposed change to the IDCVP would be appreciated. In particular, we would appreciate any comments you may have on whether you believe the original purpose of providing additional

*why wait till  
 end of Phase I?  
 If not now, why  
 not wait till  
 Phase II in the  
 3 applicable  
 areas has been  
 complete?*

CONTACT: James L. Milhoan, IE  
 492-9671

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Darrell G. Eisenhut

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February 28, 1984

assurance on the adequacy of the design and construction process through the IDCVP has been significantly changed by the February 10, 1984 TERA proposal. Comments in advance of the March 13, 1984 meeting would assist us in preparation for the public meeting.

J. Nelson Grace, Director  
Division of Quality Assurance,  
Safeguards, and Inspection Programs  
Office of Inspection and Enforcement

Enclosure:  
TERA Letter

Distribution:

- R. C. DeYoung, IE
- J. M. Taylor, IE
- J. N. Grace, IE
- J. G. Partlow, IE
- E. L. Jordan, IE
- R. F. Heishman, IE
- G. T. Ankrum, IE
- J. L. Milhoan, IE
- H. Wang, IE
- D. G. Eisenhut, NRR
- R. H. Vollmer, NRR
- R. J. Mattson, NRR
- D. Hood, NRR
- R. Warnick, RIII
- J. Harrison, RIII
- C. Norelius, RIII
- R. Spessard, RIII

DCS  
QASIP Reading  
QUAB Reading  
HWang Reading

~~QUAB: QASIP: IE~~  
~~H Wang~~  
~~2/ /84 KJo~~

~~QUAB: QASIP: IE~~  
~~JL Milhoan~~  
~~2/ 23 /84~~

~~QUAB: QASIP: IE~~  
~~GT Ankrum~~  
~~2/ 27 84~~

DD: QASIP: IE  
JG Partlow  
2/ /84

~~D: QASIP: IE~~  
~~JN Grace~~  
~~2/ 28 /84~~

# TERA

*U.S. Nuclear  
Reg. Commission*

PRINCIPAL STAFF			
RA	VP	DPRP	
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PC		DR/IA	
P/O		SCS	
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ENF		File	

*Handwritten initials and marks in the table cells.*

March 15, 1984

Mr. James W. Cook  
 Vice President  
 Consumers Power Company  
 1945 West Parnall Road  
 Jackson, Michigan 49201

Mr. J. G. Keppler  
 Administrator, Region III  
 Office of Inspection and Enforcement  
 U.S. Nuclear Regulatory Commission  
 799 Roosevelt Road  
 Glen Ellyn, Illinois 60137

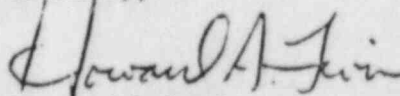
Mr. D. G. Eisenhut  
 Director, Division of Licensing  
 Office of Nuclear Reactor Regulation  
 U.S. Nuclear Regulatory Commission  
 Washington, D.C. 20555

Re: Docket Nos. 50-329 OM, OL and 50-330 OM, OL  
 Midland Nuclear Plant - Units 1 and 2  
 Independent Design and Construction Verification (IDCV) Program  
 Meeting Summary

Gentlemen:

A meeting was held on March 13, 1984, at NRC's Bethesda, Maryland, offices to discuss TERA's plans for completing the Midland Independent Design and Construction Verification Program. A summary is provided as an enclosure.

Sincerely,



Howard A. Levin  
 Project Manager  
 Midland IDCV Program

cc: See Attached Sheet

Enclosure

HAL/sl

*8403220113*

Mr. J. W. Cook  
Mr. J. G. Keppler  
Mr. D. G. Eisenhut

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March 15, 1984

cc: Participants:  
R. J. Erhardt, CPC  
D. Quammy, CPC (site)  
R. Whitaker, CPC (site)  
J. Taylor, NRC, I&E  
R. Burg, Bechtel  
J. Agar, B&W  
J. Karr, S&W (site)  
IDCV Program Service List



TERA CORPORATION

SERVICE LIST FOR MIDLAND INDEPENDENT DESIGN  
AND CONSTRUCTION VERIFICATION PROGRAM

cc: Harold R. Denton, Director  
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Washington, D.C. 20555

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Washington, D.C. 20555

Mr. Ron Callen  
Michigan Public Service Commission  
6545 Mercantile Way  
P.O. Box 30221  
Lansing, Michigan 48909

Mr. Paul Rau  
Midland Daily News  
124 McDonald Street  
Midland, Michigan 48640

**SUMMARY**  
**MEETING TO DISCUSS PLANS FOR**  
**COMPLETION OF THE MIDLAND IDCVP**

A meeting was held on March 13, 1984, at NRC's Bethesda, Maryland, offices to discuss TERA's plans for completing the Midland IDCVP. Attachment 1 identifies the attendees of the meeting which included representatives of TERA, CPC, NRC, and the public. Attachment 2 presents viewgraphs utilized by TERA in a presentation given during the meeting. Within this attachment is the agenda which was used to conduct the meeting.

Jim Milhoan, NRC, I&E Headquarters and John Beck, TERA, opened the meeting with a discussion of the purpose and an introduction of participants. Mr. Beck indicated that TERA would describe in detail, the IDCVP completion plans which were summarized in a letter from TERA to the NRC and CPC on February 10, 1984. It was pointed out that the meeting was being held as a postponement from the originally scheduled date of February 29, 1984, where this topic was to be discussed as part of that routinely scheduled public meeting on OCR status review. The NRC requested the rescheduling as a result of another request by the Government Accountability Project (GAP) to hold the meeting in Bethesda rather than Ann Arbor, Michigan.

Howard Levin, TERA, presented a status summary of IDCVP progress and an overview of current activities. Elements of TERA's February 10, 1984, letter were reviewed with the attendees along with a summary of factors which have influenced the future direction of the IDCVP. Mr. Levin indicated that the fundamental objectives and philosophy of the program have and will continue to remain intact; however, details of execution and timing have been refined to better deal with the status and recent programmatic evolutions of the Midland project. In several cases, the IDCVP has been supplemented with additional verification activities as part of the completion plan.

Frank Dougherty, TERA, reviewed the Independent Design Verification Program (IDVP) methodology, reiterating the continued emphasis on a verification of the "quality of the end product." He identified the fact that several "end products"



are unavailable at this time because certain design-related activities (e.g., fire protection, systems interaction reviews) are in progress. A differentiation was made between these activities which are considered "confirmatory/licensing" in nature verses activities which are part of the primary design completion cycle and the field change/design change reconciliation process which is typical of plants at the Midland stage in the project completion cycle. Approximately 10 to 15 percent of TERA's original sample was identified as being impacted by ongoing design-related activities. These include topical reviews in the areas of tech specs, seismic and environmental equipment qualification, high energy line break accidents/pipe whip and jet impingement, fire protection and systems interaction. Mr. Dougherty described the IDVP approach for assuring that sample selection criteria are met for these topical reviews including the supplementation of the IDVP verification process with a review of project engineering programs for completing ongoing design-related activities.

Donald Tulodieski, TERA, reviewed the status of the Independent Construction Verification Program (ICVP) and the influence of the project evolution upon the ICVP and plans for execution of the ICVP. He emphasized the principal objective of the ICVP as being a verification of the quality of the end product which includes an evaluation of quality documentation as well as physical verification of installed components and commodities. Mr. Tulodieski indicated that in view of programmatic changes to CPC's approach to completing the Midland Project and associated delays in their execution, that the ICVP would have to be delayed to accommodate the fact that "end products" are not available to the extent necessary to support the required focus on verification of the final installation. The precise restart of the ICVP is predicated upon CPC's Construction Completion Program (CCP) Phase i release of items within the IDCVP sample selection boundaries. At that time, estimated to be no earlier than July 1984, it is anticipated that remaining construction work will be fully stused and that supporting quality documentation will be current and consistent with the stused completion. Mr. Tulodieski indicated that in the interim the ICVP focus will be on verifying disposition of identified items and on



a new verification activity associated with the CPC's ongoing Quality Verification Program (QVP). The QVP review will supplement the original ICVP scope to provide additional insight into the process by which CPC will assemble and in many situations, regenerate quality documentation (through re-inspection) which will support the qualification of installed components and commodities.

Howard Levin summarized TERA's formal presentation with an identification of IDCVP enhancements. The meeting was then opened for discussion between the three parties, TERA, CPC, and NRC.

Ted Ankrum, NRC, I&E, Headquarters, described NRC's experience in executing similar programs and the difficulty in assuring that the review sample remained unbiased by additional attention that could potentially (unintentional or otherwise) be applied to items within the sample selection boundaries. He emphasized the importance of the independent reviewers' attention to this potential problem. TERA described details of IDCVP execution which attempt to deal with the potential problem. John Beck reiterated TERA's sensitivity to the issue and the firm's commitment in assuring that the objectives of the IDCVP would be met and remain uncompromised.

Robert Warnick, NRC, Region III, indicated his satisfaction with the IDVP plans and questioned how TERA would approach ICVP execution around the time of CCP Phase I completion considering the fact that CPC's punch lists of "to do" items may be large for specific items within the ICVP sample. He emphasized the importance of maintaining a focus on a verification of the final installed and constructed products. TERA indicated a continued commitment to verification of the quality of the end product and stated that a decision to proceed or not to proceed at that time would be dependent on whether or not the sample selection criteria could be met given the completion status. An attempt will be made to maintain original sampling plans where possible and the sample will not be compromised under any circumstances.





The meeting was opened for comments from interested members of the public. Billie Garde, GAP, presented comments on the February 10, 1984, letter which included GAP comments as well as that of Ms. Barbara Starnis and Ms. Mary Sinclair, both intervenors in the Midland ASLB proceedings. Her principal expressed concerns centered around the potential for the IDCVP to complete execution prior to the final products being complete and the potential for any compromise in the integrity of the sample through substitutions. TERA responded directly by reiterating a commitment to focus review on "end products" and that the sample would not be compromised due to timing considerations. Furthermore, it was pointed out that the bases for sample selection would be addressed in TERA engineering evaluations and that an auditable trail exists documenting all decisions in this regard. TERA committed to identify the percentage of substitutions, should any be required. TERA emphasized that the IDCVP reviewers will remain active until the originally stated IDCVP objectives have been met. A related comment was that the IDCVP may be evolving into a "process audit." TERA indicated that certain process-oriented verification activities were to be added to the program to supplement the end product reviews; however, end product reviews were not being dropped as a consequence. Accordingly, the IDCVP scope was being somewhat enhanced as part of the completion plans.

Several other issues which were related to the agenda were voiced. These included comments on TERA's recently completed evaluation of the effect of cracking on the performance of the diesel generator building, delays in issuance of an AFW system topical report, and proposals associated with a management appraisal of CPC management plans for completion of the Midland project.

The meeting closed with an indication by Jim Milhoan, NRC, that he expected to transmit a letter within two weeks addressing NRC's views on the IDCVP completion plans.



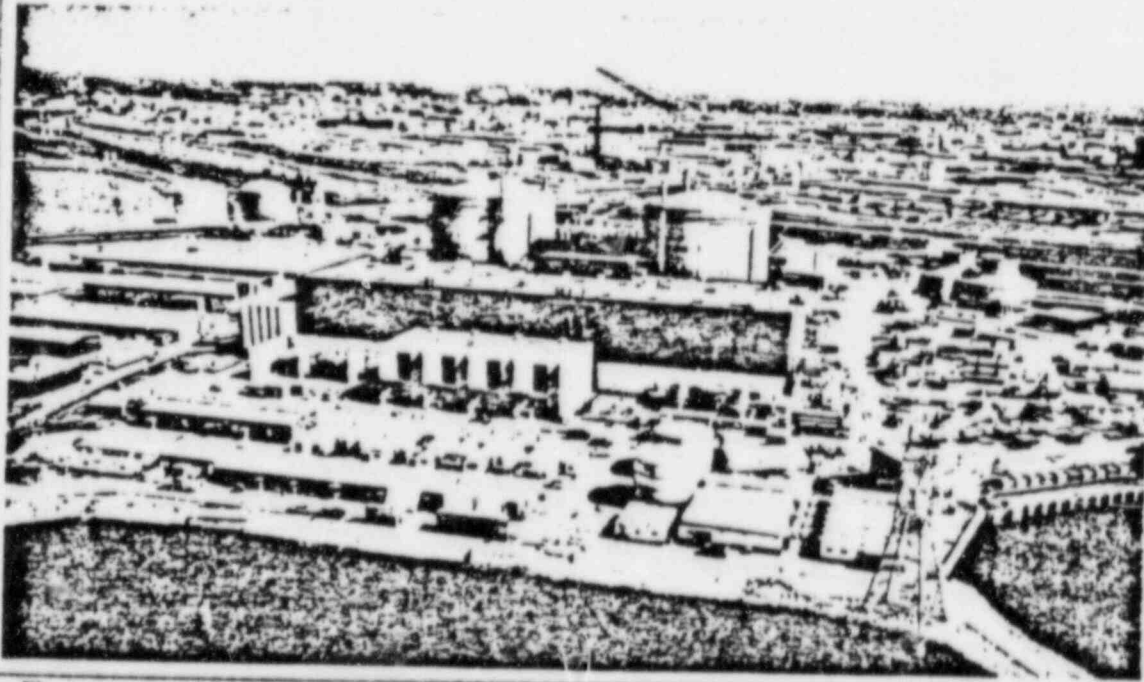
ATTACHMENT I  
MEETING TO DISCUSS PLANS FOR COMPLETION  
OF THE MIDLAND IDC  
MARCH 13, 1984  
1:00 P.M.  
BETHESDA, MD

ATTENDEES LIST

Jim Milhoan	NRC, IE
Ted Ankrum	NRC, IE
Jim Partlow	NRC, IE
John Gilray	NRC, IE
Darl Hood	NRC, NRR
John Hayes	NRC, NRR
H. Wang	NRC, IE
Frank Dougherty	TERA
Don Tulodieski	TERA
John Beck	TERA
Howard Levin	TERA
Bob Warnick	NRC, Region III
Lou Gibson	CPC
Dennis Budzik	CPC
J. Nelson Grace	NRC, IE
L. Cusco	NRC, ELD
George Gower	NRC, IE
J. Lee	NRC, NRR
Billie Garde	GAP



# Midland Independent Design and Construction Verification Program



AGENDA  
MEETING TO DISCUSS PLANS FOR  
COMPLETION OF THE  
MIDLAND IDCVP  
MARCH 13, 1984  
BETHESDA, MD

- PURPOSE - BECK (TERA)
- INTRODUCTION AND BACKGROUND - LEVIN (TERA)
  - STATUS OF THE IDCVP
  - RELATIONSHIP OF THE IDCVP AND ONGOING ACTIVITIES
  - REVIEW OF IDCVP OBJECTIVES/PHILOSOPHY
  - SUMMARY OF IDCVP COMPLETION PLANS
- COMPLETION OF THE DESIGN VERIFICATION - DOUGHERTY (TERA)
  - REVIEW OF IDVP METHODOLOGY
  - EFFECT OF ONGOING DESIGN-RELATED ACTIVITIES
  - SCOPE OF REVIEW/APPROACH TO SAMPLE SELECTION
  - REVIEW AREA STATUS/FUTURE ACTIONS
- COMPLETION OF THE CONSTRUCTION VERIFICATION - TULODIESKI (TERA)
  - CURRENT STATUS AND ACTIVITIES
  - QVP REVIEW
  - FUTURE ACTIVITIES
- SUMMARY OF IDCVP ENHANCEMENTS - LEVIN (TERA)
- DISCUSSION - LEVIN (TERA), ANKRUM (NRC), GIBSON (CPC)
- PUBLIC COMMENTS - AS REQUESTED BY OBSERVERS
- SUMMARY - BECK (TERA)



## PURPOSE

- TO DESCRIBE PLANS FOR COMPLETION OF THE MIDLAND INDEPENDENT DESIGN AND CONSTRUCTION VERIFICATION PROGRAM AS SUMMARIZED IN TERA'S FEBRUARY 10, 1984, LETTER TO NRC AND CPC.



## STATUS

### MIDLAND IDCVP

MSR 9 (2/15/84)

- PERCENTAGE COMPLETE

- IDVP = 64%
- ICVP = 26%
- IDCVP = 51%

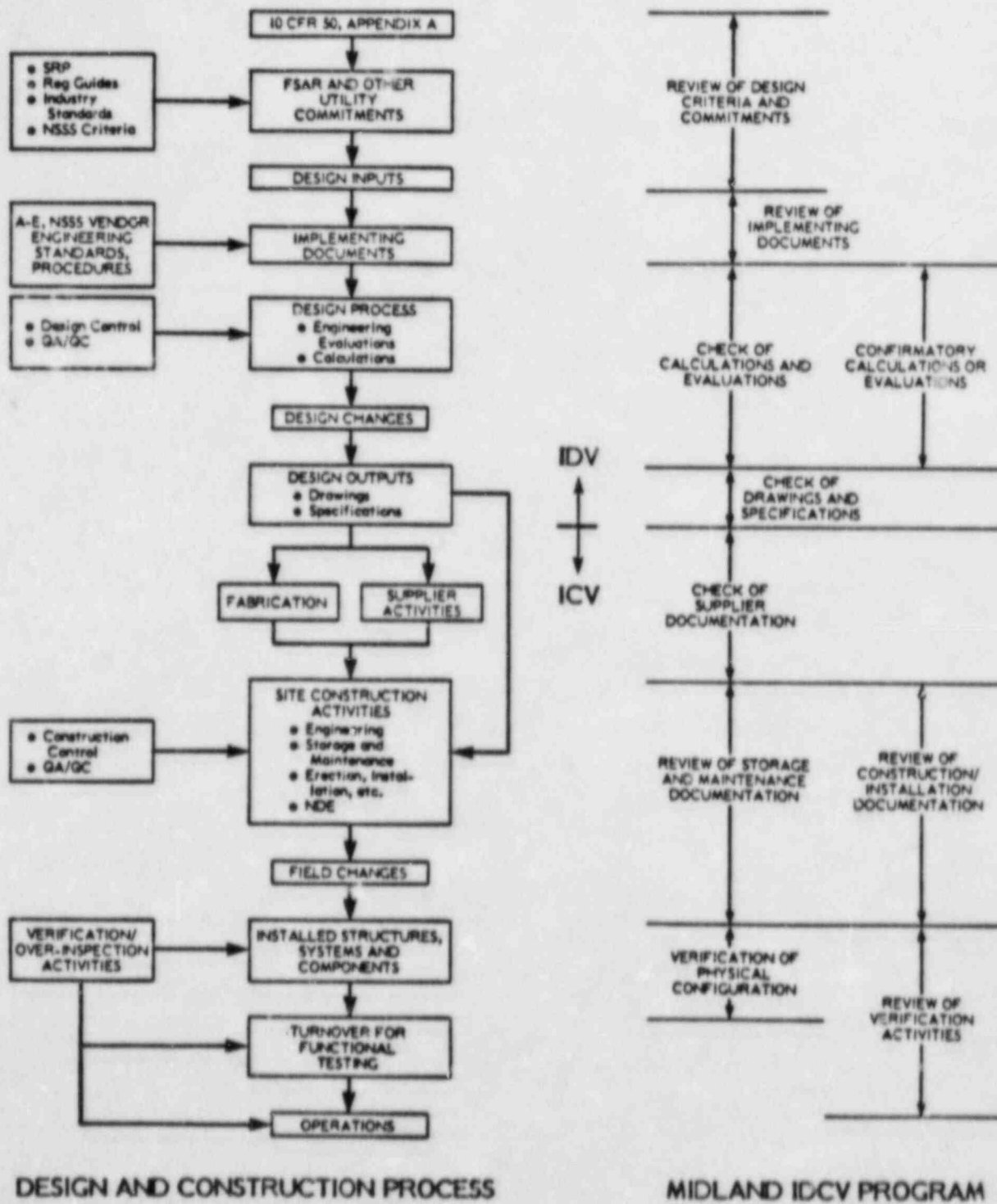
- | OCRs/FINDINGS              | <u>IDENTIFIED</u> | <u>ACTIVE</u> |
|----------------------------|-------------------|---------------|
| - POTENTIAL OPEN ITEMS (P) | 154               | 0             |
| - OPEN ITEMS (O)           | 136               | 16            |
| - CONFIRMED ITEMS (C)      | 97                | 58            |
| - FINDINGS (F)             | 20                | 12            |
| - RESOLVED ITEMS (R)       | 37                | -             |
| - FINDING RESOLUTION (Z)   | 8                 | -             |
| - OBSERVATIONS(B)          | 23                | -             |

$$P = O_A + C_A + F_A + R + Z + B$$

- | CURRENT ACTIVITIES | <u>IDVP</u> | <u>ICVP</u> |
|--------------------|-------------|-------------|
| - BASE SCOPE       | X           |             |
| - OCR DISPOSITION  | X           | X           |
| - REPORTS          | X           |             |



## INTER-RELATIONSHIP BETWEEN THE MIDLAND DESIGN AND CONSTRUCTION PROCESS AND THE MIDLAND IDCV PROGRAM



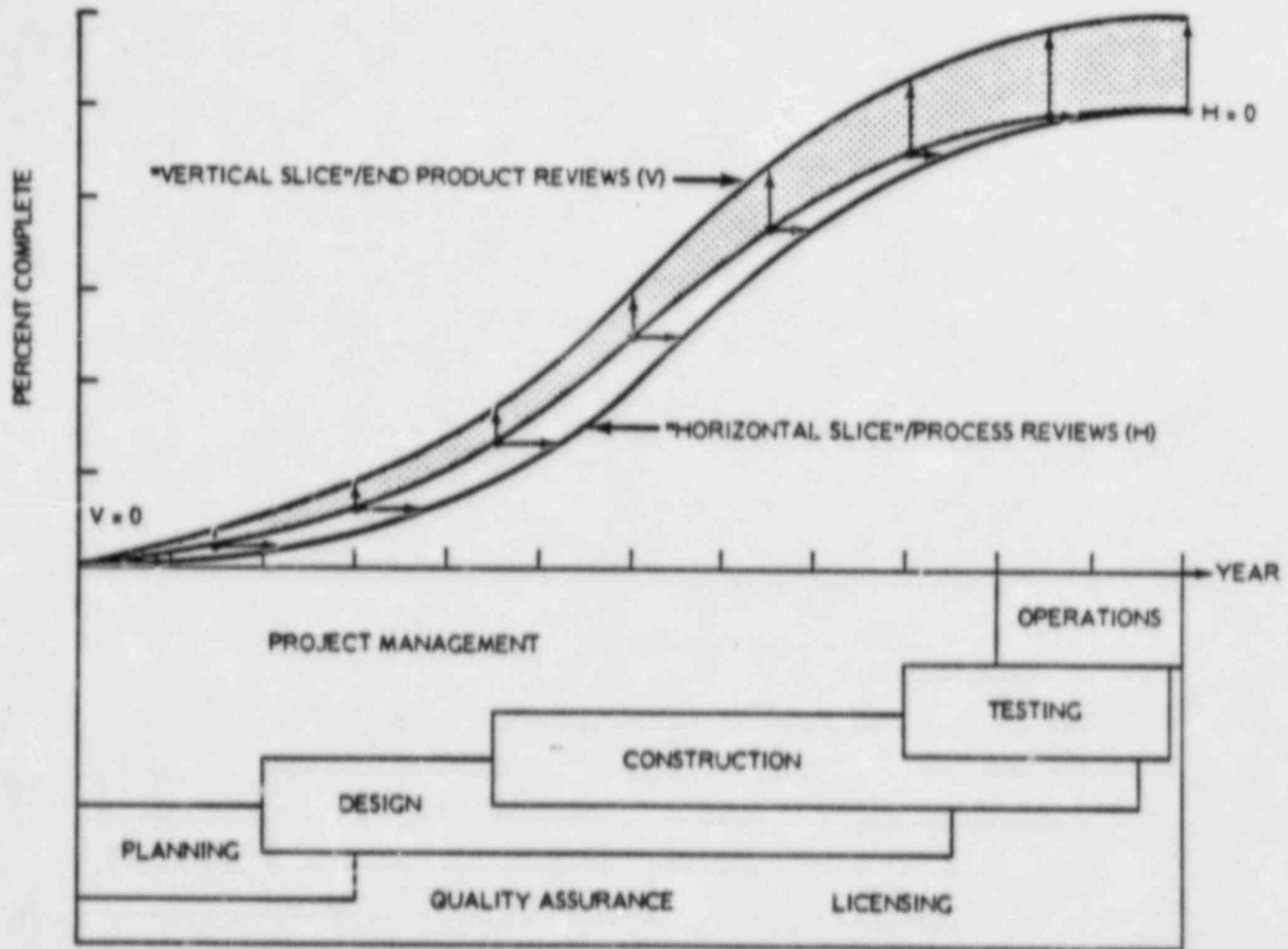
RELATIONSHIP OF THE IDCVP AND  
ONGOING ACTIVITIES

- MIDLAND PROJECT STATUS
  - CONSTRUCTION COMPLETION PROGRAM
  - DESIGN CHANGES/RECONCILIATION
  
- INDEPENDENT VERIFICATION DURING THE PROJECT COMPLETION CYCLE
  - ROLE OF IDCVP VERTICAL SLICE
  - ROLE OF CIO, ETC.





## USE OF INDEPENDENT DESIGN AND CONSTRUCTION VERIFICATION PROGRAMS THROUGH THE NUCLEAR PROJECT COMPLETION CYCLE



**KEY:**

- SPECIFIC DESIGN/CONSTRUCTION VERIFICATION ACTIVITY/ PROGRAM SHOWING RELATIVE EMPHASIS OF VERTICAL AND HORIZONTAL SLICE REVIEWS
- RELATIVE IMPORTANCE OF END PRODUCT REVIEWS AND PROCESS REVIEWS TO AN ASSESSMENT OF QUALITY AT A SPECIFIC PERCENTAGE COMPLETION AND INTERVAL OF TIME

## PHILOSOPHY OF REVIEW

- SELECT A REPRESENTATIVE SAMPLE OF ENGINEERED SYSTEMS, COMPONENTS, AND STRUCTURES WHICH WILL FACILITATE:
  - AN INTEGRATED ASSESSMENT OF IMPORTANT PARAMETERS AFFECTING THE FUNCTIONAL CAPABILITY OF THE THREE SYSTEMS, AND
  - THE ABILITY TO EXTRAPOLATE FINDINGS TO SIMILARLY DESIGNED FEATURES WITH A HIGH DEGREE OF CONFIDENCE
- CONSIDER POSITIVE AND NEGATIVE FINDINGS WHICH WILL ALLOW A BALANCED VIEW OF OVERALL QUALITY
- ASSESS ROOT CAUSE AND EXTENT OF IDENTIFIED FINDINGS
- REVIEW CORRECTIVE ACTION TAKEN TO ADDRESS FINDINGS



## SUMMARY OF IDCVP COMPLETION PLANS

- MAINTAIN EXISTING VERTICAL SLICE APPROACH IN IDVP
  - END PRODUCT EMPHASIS
  - SUPPLEMENTAL REVIEW OF SELECTED ENGINEERING PROCESSES
    - ONGOING CONFIRMATORY PROGRAMS (E.G., FIRE PROTECTION)
  
- POSTPONEMENT OF SELECTED ICVP UNTIL PHASE I OF CCP
  - SUPPLEMENTAL REVIEW OF QVP DOCUMENTATION PROCESSES
  
- FOCUSED REVIEW OF IDENTIFIED PROCESS-RELATED ISSUES RESULTING FROM FINDINGS (E.G., FIELD CHANGE/DESIGN CHANGE CONTROL PROCESS)



### COMPLETION OF THE DESIGN VERIFICATION

- REVIEW OF IDVP METHODOLOGY
- EFFECT OF ONGOING DESIGN-RELATED ACTIVITIES
- SCOPE OF REVIEW/APPROACH TO SAMPLE SELECTION
- REVIEW AREA STATUS/FUTURE ACTIONS



**INITIAL SAMPLE REVIEW MATRIX FOR THE AUXILIARY FEEDWATER SYSTEM  
MIDLAND INDEPENDENT DESIGN VERIFICATION PROGRAM**

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
<b>I. <u>AFW SYSTEM PERFORMANCE REQUIREMENTS</u></b>					
SYSTEM OPERATING LIMITS	X	X	X		
ACCIDENT ANALYSIS CONSIDERATIONS	X				
SINGLE FAILURE	X	X	X	•	
TECHNICAL SPECIFICATIONS	X	X			
SYSTEM ALIGNMENT/SWITCHOVER	X	X			
REMOTE OPERATION AND SHUTDOWN	X				
SYSTEM ISOLATION/INTERLOCKS	X	X			
OVERPRESSURE PROTECTION	X	•	•	•	
COMPONENT FUNCTIONAL REQUIREMENTS	X	X	X		X
SYSTEM HYDRAULIC DESIGN	X	X	X	•	
SYSTEM HEAT REMOVAL CAPABILITY	X	X	X	•	
COOLING REQUIREMENTS	X				
WATER SUPPLIES	X	X			
PRESERVICE TESTING/CAPABILITY FOR OPERATIONAL TESTING	X	•	•		•
POWER SUPPLIES	X	X			•
ELECTRICAL CHARACTERISTICS	X	•	•		
PROTECTIVE DEVICES/SETTINGS	X	X			X
INSTRUMENTATION	X	X	X		X
CONTROL SYSTEMS	X	X	X		•
ACTION SYSTEMS	X				•
NDE COMMITMENTS	X	•			•
MATERIALS SELECTION	X	X			
FAILURE MODES AND EFFECTS	•	•		•	

**KEY**

X - INITIAL SCOPE OF REVIEW

(X) - DELETED SCOPE OF REVIEW

• - ADDED SCOPE OF REVIEW

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

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
<b>II. <u>AFW SYSTEM PROTECTION FEATURES</u></b>					
SEISMIC DESIGN	X				
• PRESSURE BOUNDARY	X	X	X	X	X
• PIPE/EQUIPMENT SUPPORT	X	X	X	X	X
• EQUIPMENT QUALIFICATION	X	X	X		X
HIGH ENERGY LINE BREAK ACCIDENTS	X				
• PIPE WHIP	X	X	X		X
• JET IMPINGEMENT	X				
ENVIRONMENTAL PROTECTION	X				
• ENVIRONMENTAL ENVELOPES	X	X	X		X
• EQUIPMENT QUALIFICATION	X	X	X		X
• HVAC DESIGN	X				
FIRE PROTECTION	X	X	X		
MISSILE PROTECTION	X				
SYSTEMS INTERACTION	X	X	X		
<b>III. <u>STRUCTURES THAT HOUSE THE AFW SYSTEM</u></b>					
SEISMIC DESIGN/INPUT TO EQUIPMENT	X	X	X		X
WIND & TORNADO DESIGN/MISSILE PROTECTION	X				
FLOOD PROTECTION	X				
HELBA LOADS	X				
CIVIL/STRUCTURAL DESIGN CONSIDERATIONS	X				
• FOUNDATIONS	X	X	X		
• CONCRETE/STEEL DESIGN	X	X	X		X
• TANKS	(X)	(X)	(X)		

**KEY**

X - INITIAL SCOPE OF REVIEW

(X) - DELETED SCOPE OF REVIEW

\* - ADDED SCOPE OF REVIEW

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

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
<u>I. MECHANICAL</u>					
● EQUIPMENT	X	X	X	X	X
● PIPING	X		X	X	X
● PIPE SUPPORTS	X		X	X	X
<u>II. ELECTRICAL</u>					
● EQUIPMENT	X	X	X	X	X
● TRAYS AND SUPPORTS	X		•	•	X
● CONDUIT AND SUPPORTS	X		•	•	X
● CABLE	X	X	X	X	X
<u>III. INSTRUMENTATION AND CONTROL</u>					
● INSTRUMENTS	X	X	X	X	X
● PIPING/TUBING	X				X
● CABLE	X		•	•	X
<u>IV. HVAC</u>					
● EQUIPMENT	X	X	X	X	X
● DUCTS AND SUPPORTS	X				X
<u>V. STRUCTURAL</u>					
● FOUNDATIONS	X		X		
● CONCRETE	X		X		X
● STRUCTURAL STEEL	X		X		X
<u>VI. NDE/MATERIAL TESTING PROGRAM</u>					X

KEY

X - INITIAL SCOPE OF REVIEW

⊗ - DELETED SCOPE OF REVIEW

• - ADDED SCOPE OF REVIEW

EFFECT ON IDVP OF  
ONGOING DESIGN-RELATED ACTIVITIES

<u>MEASURE</u>	<u>TOTAL NUMBER</u>	<u>NUMBER AFFECTED</u>	<u>PERCENTAGE AFFECTED</u>
MATRIX XS	352	34	10
LINE ITEMS	127	15	12
ENGINEERING EVALUATIONS	80	12	15



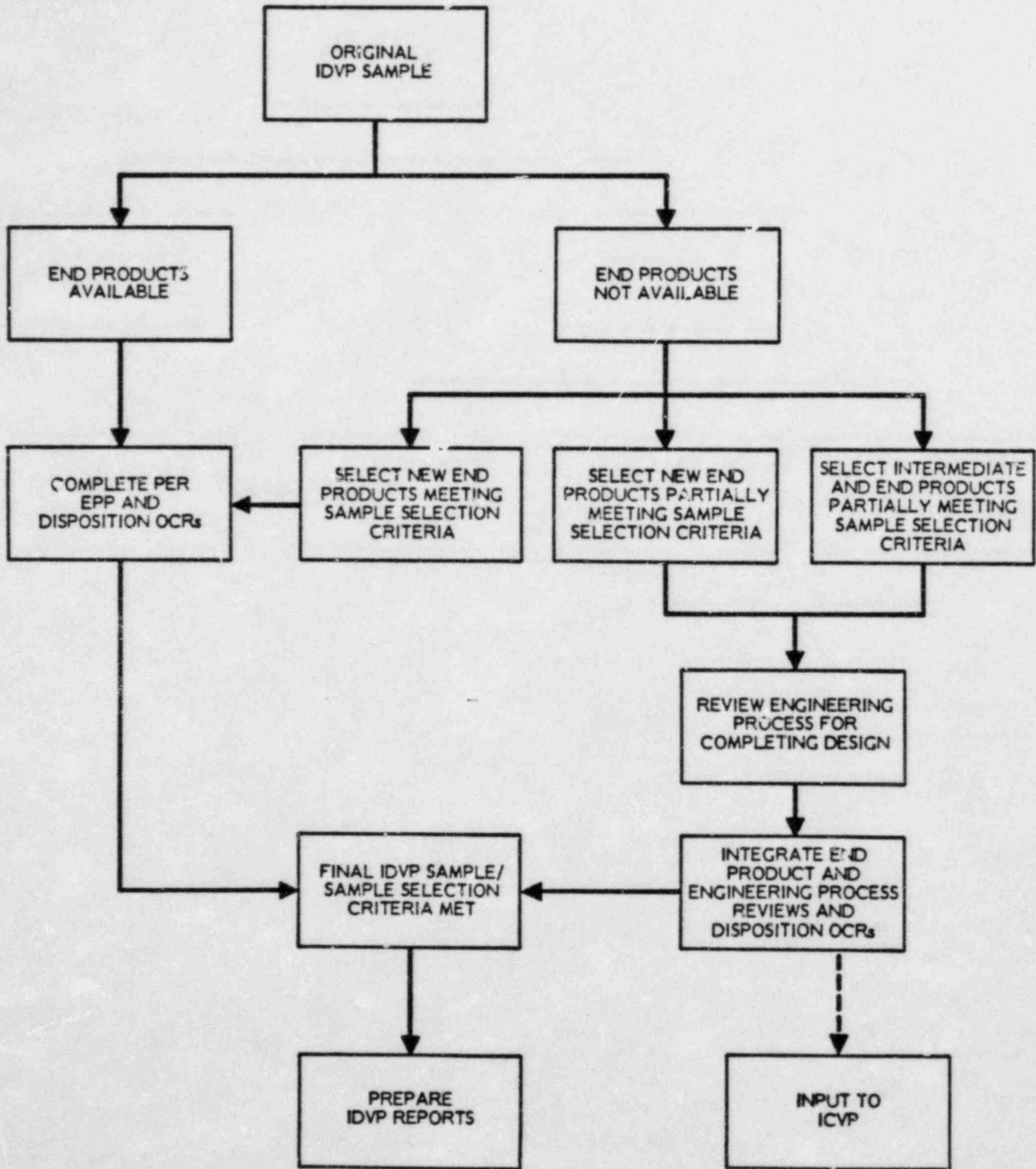


## SAMPLE SELECTION CRITERIA

- IMPORTANCE TO SAFETY
- DESIGN/CONSTRUCTION INTERFACES
- ABILITY TO EXTRAPOLATE RESULTS
- DIVERSITY
- PREVIOUS EXPERIENCE
- TESTABILITY



IDVP REVIEW APPROACH TO SAMPLE SELECTION  
FOR SPECIFIC DESIGN TOPICS



## REVIEW AREA STATUS

### TECH SPECS

<u>STATUS</u>	<u>PROPOSED ACTION</u>
● IN DRAFT FORM	● VERIFY THAT PROCESS ENSURES COMPATIBILITY OF TECH SPECS AND DESIGN
● REVISED IN FSAR AMENDMENT 49	
● SPECIFIC NUMBERS NEED TO BE DEVELOPED	
● TYPICAL OF PLANT AT THIS STAGE	



## REVIEW AREA STATUS

### SEISMIC DESIGN/EQUIPMENT QUALIFICATION

<u>STATUS</u>	<u>PROPOSED ACTION</u>
● APPROXIMATELY 70% COMPLETE	● REVIEW AVAILABLE DOCUMENTATION
● OUTSIDE CONTRACTOR HAS SIGNIFICANT SCOPE	● SUBSTITUTE COMPONENTS FOR INCOMPLETE PACKAGES WHEN NECESSARY
● AFFECTS ALL 3 SYSTEMS IN SAMPLE	● REVIEW SQRT PROCEDURE
● 50% OF PREVIOUSLY SELECTED PACKAGES NOT COMPLETE	
● OCRs INDICATE A NEED FOR ADDITIONAL DOCUMENTATION	



REVIEW AREA STATUS

HIGH ENERGY LINE BREAK ACCIDENT  
PIPE WHIP/JET IMPINGEMENT

<u>STATUS</u>	<u>PROPOSED ACTION</u>
● BASIC EFFORT IS ESSENTIALLY COMPLETE	● REVIEW PROCEDURES
● WALKDOWN FOR FIELD RUN OR FIELD LOCATED ITEMS MUST BE DONE	● USE ICVP TO VERIFY RESULTS



## REVIEW AREA STATUS

### ENVIRONMENTAL PROTECTION/EQ

<u>STATUS</u>	<u>PROPOSED ACTION</u>
● REV. 1 OF EQ REPORT ISSUED 12/82	● NO CHANGE TO PROGRAM ASSUMING LAST PACKAGE IS AVAILABLE
● REV. 2 IS PLANNED	● REVIEW QUALIFICATION PROGRAM FOR PACKAGE IF RESULTS NOT AVAILABLE
● 3 PACKAGES WERE NOT COMPLETE, BUT 2 NOW ARE AND THE LAST ONE IS SCHEDULED PRIOR TO 3/31	● REVIEW TESTING PROGRAM
● ONE OTHER ITEM IS IN TESTING AND IS SCHEDULED FOR MID-YEAR COMPLETION	



## REVIEW AREA STATUS

### FIRE PROTECTION

<u>STATUS</u>	<u>PROPOSED ACTION</u>
● FIRE HAZARDS STUDY BEING REVISED	● REVIEW PROGRAM FOR COMPLETION OF FIRE HAZARDS STUDY
● AFFECTS MULTIPLE AREAS OF PLANT	
● OUTSIDE CONTRACTOR	
● TERA ATTENDED NRC/CPC/ CONTRACTOR MEETING	
● CONTRACTOR REVIEWING – AREAS THAT OUR OCRs INDICATED NEEDED REVIEW	



## REVIEW AREA STATUS

### SYSTEMS INTERACTION

<u>STATUS</u>	<u>PROPOSED ACTION</u>
● PROGRAM HAS BEEN STARTED	● REVIEW PROGRAM IN DETAIL
● TERA HAS REVIEWED PORTIONS OF PROGRAM	● USE ICVP TO VERIFY OF RESULTS
● PROGRAM BEING PERFORMED BY CONTRACTOR	
● FIELD ACTIVITIES IN PROGRESS	





## INDEPENDENT CONSTRUCTION VERIFICATION PROGRAM (ICVP)

- ORIGINAL PLAN FOR ICVP EXECUTION
- INFLUENCE OF MIDLAND PROJECT ENVIRONMENT UPON ICVP COMPLETION
- ALTERATIONS TO ICVP EXECUTION PLAN NECESSARY TO RETAIN PRINCIPAL GOALS AND OBJECTIVES



## ORIGINAL PLAN FOR ICVP EXECUTION

- **PRINCIPAL OBJECTIVE:** VERIFICATION OF THE QUALITY OF END PRODUCTS I.E.,

- DOCUMENTATION/PROCEDURES
- QUALITY VERIFICATION PACKAGES
- INSTALLED COMMODITIES AND COMPONENTS

- **SCOPE**

	<u>AFW SYSTEM</u>	<u>SEP SYSTEM</u>	<u>CRHVAC SYSTEM</u>
1. VENDOR DOCUMENTATION	X	X	X
2. STORAGE AND MAINTENANCE	X	X	X
3. CONSTRUCTION/INSTALLATION DOCUMENTATION	X	X	X
4. PHYSICAL VERIFICATION	X	X	X
5. VERIFICATION ACTIVITIES	X	X	X

- **PLAN FOR EXECUTION OF SCOPE**  
(REVIEWS CONDUCTED IN LOGICAL GROUPINGS)

1. CONSTRUCTION/INSTALLATION DOCUMENTATION  
AND  
PHYSICAL VERIFICATION
2. VERIFICATION ACTIVITIES
3. VENDOR DOCUMENTATION AND STORAGE AND MAINTENANCE



**INFLUENCE OF MIDLAND PROJECT ENVIRONMENT  
UPON ICVP COMPLETION**

- **FACTORS AFFECTING ICVP EXECUTION**

- PROGRAMMATIC CHANGES TO COMPLETE PROJECT
  - + RECERTIFICATION OF "Q"-RELATED WORK
  - + CONSTRUCTION COMPLETION PROGRAM (CCP)
  - + QUALITY VERIFICATION PROGRAM (QVP)
  - + DOCUMENT/RECORD HANDLING PRACTICES
- DELAYS TO PROGRAM EXECUTION
  - + APPROVAL OF CCP/QVP
  - + STOP WORK ORDERS (FCR/FCN)
  - + COMPLETION STATUS OF ZACK WORK

- **INFLUENCE UPON ICVP SCOPE**

	<u>REVIEW CATEGORY</u>	<u>AFW SYSTEM</u>	<u>SEP SYSTEM</u>	<u>CRHVAC SYSTEM</u>
1.	VENDOR DOCUMENTATION	X	X	X
2.	STORAGE AND MAINTENANCE	X	X	X
3.	CONSTRUCTION/INSTALLATION DOCUMENTATION	●	●	⊗
4.	PHYSICAL VERIFICATION	●	●	⊗
5.	VERIFICATION ACTIVITIES	X	X	X



**INFLUENCE OF MIDLAND PROJECT ENVIRONMENT  
UPON ICVP COMPLETION**

- PHYSICAL VERIFICATION - HOW AFFECTED
  - WITH THE EXCEPTION OF ZACK, SELECTED COMMODITIES AND COMPONENTS WITHIN SYSTEM SAMPLE BOUNDARIES WILL BE RECERTIFIED (END PRODUCT UNAVAILABLE)
  - INSTALLED COMMODITIES AND COMPONENTS NOT CONSIDERED PROPERLY STATUSED PENDING COMPLETION OF CCP PHASE I
    - + REINSPECTION (ACCESSIBLE)
    - + RECERTIFICATION (INACCESSIBLE)
    - + "TO DO" PUNCH LIST
  
- CONSTRUCTION/INSTALLATION DOCUMENTATION - HOW AFFECTED
  - REVIEWED INSTRUCTIONS AND PROCEDURES UNDERGOING REVISION (END-PRODUCT DIFFICULT TO DISCERN)
  - FINAL QUALITY VERIFICATION DOCUMENTATION NOT COMPLETE/COLLATED (END-PRODUCT DIFFICULT TO OBTAIN AND VERIFY AS BEST AND FINAL)
  - INSPECTION RECORDS FOR ACCESSIBLE ITEMS TO BE SUPERCEDED BY CCP/QVP RECERTIFICATION PROCESS (END PRODUCT NOT AVAILABLE)



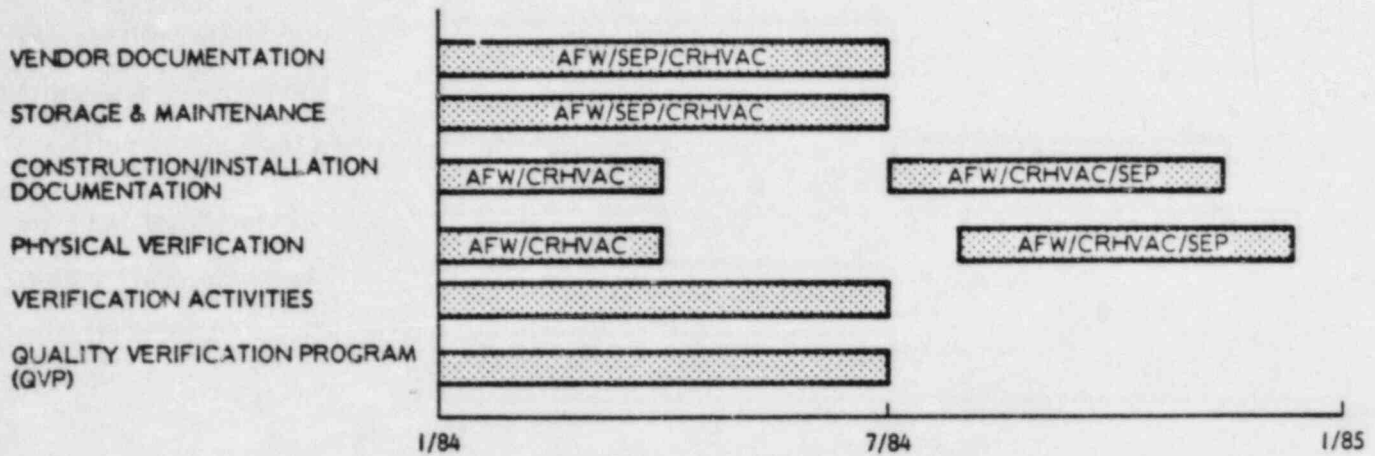
ALTERATIONS TO ICVP EXECUTION PLAN NECESSARY TO  
RETAIN PRINCIPAL GOALS AND OBJECTIVES

- PRINCIPAL OBJECTIVE: VERIFY THE QUALITY OF END PRODUCTS
- SCOPE

<u>REVIEW CATEGORY</u>	<u>AFW SYSTEM</u>	<u>SEP SYSTEM</u>	<u>CRHVAC SYSTEM</u>
1. VENDOR DOCUMENTATION	X	X	X
2. STORAGE AND MAINTENANCE	X	X	X
3. CONSTRUCTION/INSTALLATION DOCUMENTATION	X	X	X
4. PHYSICAL VERIFICATION	X	X	X
5. VERIFICATION ACTIVITIES	X	X	X
6. QUALITY VERIFICATION PROGRAM	X	X	X



- PLAN FOR EXECUTION OF SCOPE



7/84 = ASSUMED DATE FOR CCP PHASE I COMPLETION ON SELECTED COMPONENTS AND COMMODITIES

- NEAR TERM 1-7/84

- OCR/FINDING DISPOSITION
- VERIFICATION OF REVIEW RESULTS
- REVIEW OF QVP PROCESS
  - + INTERFACE WITH STATUS ASSESSMENT TEAMS
  - + REVIEW, IDENTIFY, - AND UNDERSTAND ELEMENTS OF DOCUMENTATION (CONSIDERED) IMPORTANT TO ACCESSIBLE AND INACCESSIBLE ITEMS

- LONG TERM (7/84 - 1/85)

- SITE MOBILIZATION
- CONSTRUCTION/INSTALLATION DOCUMENTATION AND PHYSICAL VERIFICATION REVIEWS



## SUMMARY OF IDCVP ENHANCEMENTS

### PRIMARY

- AID EXTRAPOLATION OF RESULTS AND INTEGRATED ASSESSMENT
- IMPROVED EXECUTION
  - COHESIVE REVIEW
  - LESS SENSITIVE TO EXTERNAL CONSTRAINTS
- TIMELY RESULTS

### SECONDARY

- IMPROVED RESOURCE USAGE/SCHEDULE



# TERA

February 10, 1984

Mr. James W. Cook  
Vice President  
Consumers Power Company  
1945 West Parnall Road  
Jacobsn, Michigan 49201

Mr. J. G. Keppler  
Administrator, Region III  
Office of Inspection and Enforcement  
U.S. Nuclear Regulatory Commission  
799 Roosevelt Road  
Glen Ellyn, Illinois 60137

Mr. D. G. Eisenhut  
Director, Division of Licensing  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Re: Docket Nos. 50-329 OM, OL and 50-330 OM, OL  
Midland Nuclear Plant - Units 1 and 2  
Independent Design and Construction Verification (IDCV) Program  
Future Direction of the Midland IDCVP

Gentlemen:

The current status of the Midland project is a major factor affecting the planned progress of the IDCVP. A portion of the design and construction products originally selected within the IDCVP scope are still in process, impacting an expeditious completion of a "vertical slice" review of the Midland project considering the "quality of the end product." The existing IDCVP methodology has assumed that items within its scope are complete, placing emphasis on an evaluation of the quality of the end product rather than the process by which the items were designed and constructed. A thorough examination has been made to assess means by which the original stated goals of the IDCVP would be met without a needless delay for all Midland project design and construction activities to be completed. We have determined that a limited modification of the IDCVP methodology is required to accomplish these goals. Our modified approach includes:

- Maintaining the existing vertical slice approach to design verification by:
  - Reviewing end products for majority of sample;
  - Reviewing engineering procedures and action plans and their implementation for the remainder of the sample where items are not complete.

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- Postponement of the construction verification until completion of Phase I of the Midland project Construction Completion Program (CCP), thus, taking advantage of the assemblage of relevant quality documentation by the Quality Verification Program (QVP). During the period of postponement, conduct a verification review of selected QVP documentation processes to allow expedited documentation and physical verification after Phase I of the CCP.
- Focused review of identified process-related issues resulting from existing Findings and ongoing work.

Thus, the principal alteration involves verification of a limited portion of the design verification sample by reviewing engineering procedures and action plans and their implementation for items not currently completed. It is estimated that approximately 10 to 20 percent of our sample would be verified in this manner and that 80 to 90 percent of our sample will continue to be verified with emphasis on the quality of the end product. We believe that this approach is superior to the current IDCVP methodology since the results of the "end product" review will be combined with a review of the design programs to assure greater confidence in the conclusions reached.

The following paragraphs address issues relevant to the design and construction verification efforts and details of how our modified approach will be implemented. We anticipate that this approach would allow the design verification to be bifurcated from the construction verification. The design verification could be completed by July of 1984, at which time the results would be available to external parties and the physical verification may potentially re-commence consistent with the status of the CCP.

#### Design Verification

Although the design verification program is proceeding with its original plan of reviewing completed products, some design areas in our sample are currently incomplete or are being revised. Often there are sufficient sets of end products to allow adequate review to be made even though certain design areas are not yet complete. In other cases, it has been necessary to put verification work on "hold" pending further progress in design. We have made an assessment of the current status of the IDV program and the status of the plant design. Presented below is an outline of our recommendations for modification of the IDV program to accommodate the areas which are not currently complete.

At this time, IDV programs can be divided into two major subcomponents: the current program for the areas where sufficient end products exist to allow application of the current program and the proposed modifications for other



design areas. The current program includes dispositioning of Findings and Confirmed Items as well as review of design aspects which are complete or substantially complete.

For design areas still in progress or in revision, we recommend that the review use available end products (or intermediate products) combined with a limited review of the engineering action plans and implementing processes by which the design effort will be completed. This would be accomplished by confirming the status of all design areas and dividing them into those which are substantially complete and those which are subject to the modified program. For each incomplete design area the revised program will require identification of the processes to be used to complete the design area. The processes thus identified will then be appropriately grouped and reviewed using available end or intermediate products as a means of verification of implementation. In concept, this approach represents only a small change from the current program. The current program already calls for review of processes where necessary to disposition Findings or Confirmed Items. Rather than limiting such an approach to Findings, we recommend using it to speed completion of our review of the Midland design and enhance our confidence in extrapolating results.

#### Construction Verification

The ability to bring several aspects of the construction verification program to completion has been, and is in the near term, projected to be influenced by the status of the Midland project CCP. Physical verification reviews and reviews of construction/installation documentation have essentially been suspended or significantly narrowed in scope as a result of CCP status. For the near term, it is suggested that construction verification be suspended until such time as the CCP completes its Phase I activities on IDCVP-selected components and commodities. Proceeding in this fashion allows the CCP to perform the essential "stating" function and allows the Midland project QVP to assemble and verify pertinent documentation, thus enabling an efficient utilization of IDCVP resources when conducting future documentation and physical verification reviews. To date, significant IDCVP resources have been expended in assembling quality documentation which is used to verify the quality of installed and constructed items and support physical verification. Under the suggested approach, the quality data packages can be verified more efficiently, permitting less IDCVP resources to be devoted to this activity in the future by utilizing the documentation packages assembled by the QVP and focusing resources to end product confirmation. To effect this, we would selectively review the QVP documentation process to enhance verification of the quality of the documentation. This will also permit a more direct focus on the IDCVP physical verification.

The near-term focus of the construction verification review will be on further dispositioning of outstanding items and selective review of the QVP documentation process.



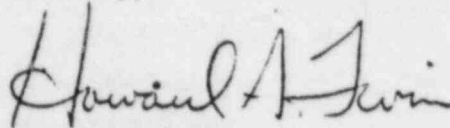
Mr. J. W. Cook  
Mr. J. G. Keppler  
Mr. D. G. Eisenhut

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February 10, 1984

If desired, we will discuss the items presented herein during the next scheduled IDCVP Status Review Meeting to be held at Bechtel's Ann Arbor, Michigan offices on February 29, 1984.

Sincerely,



Howard A. Levin  
Project Manager  
Midland IDCVP

cc: L. Gibson, CPC  
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Midland IDCVP Service List

Attachments

HAL/djb



TERA CORPORATION

SERVICE LIST FOR MIDLAND INDEPENDENT DESIGN  
AND CONSTRUCTION VERIFICATION PROGRAM

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