



Tennessee Valley Authority, Post Office Box 2000, Spring City, Tennessee 37381-2000

DEC 11 2006

10 CFR 50.55a

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C. 20555-0001

Gentlemen:

In the Matter of ) Docket No. 50-390  
Tennessee Valley Authority )

**WATTS BAR NUCLEAR PLANT (WBN) UNIT 1 - SECOND 10-YEAR  
INSERVICE TESTING INTERVAL - REQUEST FOR ADDITIONAL  
INFORMATION (RAI) CONCERNING RELIEF REQUEST PV-02 (TAC NOS.  
MD2527, MD2528, MD2529, MD2530)**

The purpose of this letter is to provide TVA's response to NRC's request for additional information dated October 20, 2006. The subject Relief Request was submitted June 30, 2006, as part of WBN's Second 10-year Inservice Testing Interval Program which is scheduled to begin by May 27, 2007.

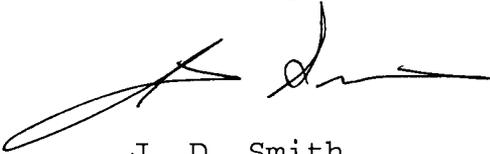
Enclosure 1 provides TVA's response to the requested information. Enclosure 2 provides revised Relief Request PV-02 and also revises the start and end date of the Second 10-Year Inservice Testing Interval. Enclosure 3 provides photographs and a mechanical drawing of the essential raw cooling water screen wash pump discharge piping.

A047

**DEC 11 2006**

There are no regulatory commitments associated with this submittal. If you have any questions concerning this matter, please call me at (423) 365-1824.

Sincerely,



J. D. Smith  
Manager, Site Licensing  
and Industry Affairs (Acting)

Enclosures

cc (Enclosures):

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## ENCLOSURE 1

### WATTS BAR NUCLEAR PLANT (WBN) UNIT 1 SECOND 10-YEAR INSERVICE TESTING INTERVAL RELIEF REQUEST PV-02 REQUEST FOR ADDITIONAL INFORMATION (RAI)

This Enclosure provides TVA's response to NRC's request for additional information dated October 20, 2006 concerning Relief Request PV-02 for WBN's Second 10-Year Inservice Testing Interval. This relief request was previously approved for WBN in Supplemental Safety Evaluation Report (SSER) 14, (NUREG-0847) for the First 10-Year Inservice Testing Program as PV-04. A similar relief request was also recently approved by NRC on July 27, 2006, for Sequoyah Nuclear Plant's Third 10-Year Inservice Testing Interval as Relief Request RP-01. Enclosure 2 provides a revised Relief Request PV-02 and a correction to the start and end date of the Second 10-Year Inservice Testing Interval. TVA's response to the requested information is provided below:

#### RAI PV-02-01

*ISTB-3550 requires that when measuring flow rate, a rate or quantity meter be installed in the pump test circuit. Please address why relief was not requested from the requirements of ISTB-3500.*

#### TVA RESPONSE

ISTB-3550 states: "...when measuring flow..." WBN's Inservice Testing (IST) pump test program considers the screen wash pump system to be a fixed resistance system with no flow measurement. Since flow is not measured, TVA is not referencing ISTB-3550 with the proposed relief request.

#### RAI PV-02-02

*Please provide additional information on the test methodology utilized to ensure that flow rate is established at a consistent reference point during the Group A and comprehensive pump tests.*

#### TVA RESPONSE

WBN plans to perform the test by setting the system resistance to the same point for each test with the throttle valves full open. Pump flow rate is not measured. The remaining variable that could affect system resistance is the condition of the spray nozzles. The spray nozzles will be inspected during each test performance with corrective action initiated as necessary, thus providing assurance that the spray nozzle condition will not

ENCLOSURE 1

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1  
SECOND 10-YEAR INSERVICE TESTING INTERVAL  
RELIEF REQUEST PV-02  
REQUEST FOR ADDITIONAL INFORMATION (RAI)

affect flow rate. WBN has reviewed the maintenance history for nozzle plugging and determined that nozzle plugging is infrequent. The nozzles are inspected by operations personnel during spraying operation with corrective maintenance initiated as required. With system resistance maintained constant for each test, pump degradation would be identified through changes in the pump differential pressure. Differential pressure is calculated using inlet (based upon the lake level or suction pressure) and discharge pressures. The pump can be trended for degradation based on differential pressure at this point. Vibration readings will also be taken at this reference point. The pumps will be tested in this manner for both the quarterly Group A and the biennial Comprehensive Test.

**RAI PV-02-03**

*Please address the effect of potential flow degradation due to spray nozzle fouling on the quarterly test acceptance criteria and the comprehensive pump test acceptance criteria.*

**TVA RESPONSE**

TVA has revised the relief request to add actions to inspect the condition of the spray nozzles during testing and to initiate corrective actions as required. Enclosure 2 provides the revised Relief Request PV-02. Revision bars note the changes to this relief request.

**RAI PV-02-04**

*The relief request states that the physical configuration of this piping is such that no portion of the piping meets the requirements for adequate installation of a permanent flow measuring device. Please provide additional information with regard to the feasibility of installing flow instrumentation or using temporary flow instrumentation (i.e., modifications required, detailed description of piping runs with respect to installation of temporary flow instrumentation). Please discuss in greater detail the feasibility of installing temporary flow instrumentation during the comprehensive pump test.*

## ENCLOSURE 1

### WATTS BAR NUCLEAR PLANT (WBN) UNIT 1 SECOND 10-YEAR INSERVICE TESTING INTERVAL RELIEF REQUEST PV-02 REQUEST FOR ADDITIONAL INFORMATION (RAI)

#### TVA RESPONSE

Photographs and a Mechanical Intake Pumping Station Piping and Equipment drawing of the screen wash pump system (See Section D-8) are provided in Enclosure 3 to show the piping configuration. TVA has determined that a significant plant modification would be required to install flow instruments for this system. A plant modification would include rerouting three-inch diameter piping and the associated piping supports for four pumps.

The feasibility of installing temporary flow instrumentation was considered by TVA for utilizing portable ultrasonic flow instrumentation during testing. Accurate and repeatable flow measurement requires the ultrasonic flow sensor to be positioned on straight runs of piping (preferably horizontal). The standard recommendation for flow measuring devices requires placement of the measurement point ten pipe diameters distance upstream and five pipe diameters distance downstream to allow for straight undisturbed flow stream for accurate flow measurement. This requires a minimal run of piping of 45-inches in length. The current system piping configuration has no sections that provides the necessary configuration or that could be easily modified. The longest run of piping is 36-inches in length. Therefore, TVA has determined that a significant plant modification would be required to install temporary flow instruments for this system.

ENCLOSURE 2

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1  
EXCERPT FROM TVA'S  
SECOND 10-YEAR INSERVICE TESTING INTERVAL PROGRAM  
REVISED RELIEF REQUEST PV-02

## 1.0 INTRODUCTION

The rules for the Inservice Testing of pumps and valves for the Second Ten Year Interval, are contained in the ASME OM Code 2001 Edition, through the 2003 Addenda with corrections. The 2003 Addenda included several editorial errors that were corrected in the 2005 Addenda. These are tabulated in Appendix E. The Second Ten Year Interval for the Watts Bar Nuclear Plant (WBN) starts on May 27, 2007 and will end on May 26, 2016. Title 10, Part 50, Section 55a of the Code of Federal Regulations (10CFR50.55a) and the Watts Bar Technical Specifications (TS) require that Inservice Testing be met throughout the service life of the nuclear power plant and updated at each 10 year interval. This program provides the technical requirements for implementing the Inservice Testing (IST) Program for WBN. The intent of this program is to identify pump and valve degradation and ensure that the proper corrective action is taken such that operational readiness is maintained at all times.

This Summary Description identifies the pumps and valves for which IST will be performed at WBN Unit 1 to comply with the requirements of 10CFR50.55a. The testing required by this program will be accomplished through the WBN Surveillance Testing Program.

## 2.0 PUMP INSERVICE TESTING PROGRAM

Except for relief requested under the provisions of 10CFR50.55a, the IST Program for pumps shall be conducted in accordance with ASME OM Code, ISTB, 2001 Edition with Addenda through 2003. Table 1 summarizes the IST Program for pumps at WBN. Each Inservice Test Quantity to be measured and reference to related relief requests is listed. Specific details of the relief requests are provided in Appendix B.

### 2.1 Pump Groups

- A. Group A Pumps** - The OM Code defines Group A pumps as those pumps that are operated continuously or routinely during normal operation, cold shutdown, or refueling operations. Watts Bar considers the following pumps to be Group A pumps along with the basis for grouping:
1. Charging Pumps - The CCPs are utilized during plant operation for normal charging and letdown activities.
  2. Motor Driven Auxiliary Feedwater Pumps – The MD AFW pumps are utilized during startup from refueling outages to fill the steam generators and to maintain steam generator level prior to initiation of normal feedwater.
  3. Boric Acid Transfer Pumps - The BAT pumps are in service for recirculation of the boric acid tanks during normal operation.
  4. Component Cooling System Pumps - The CCS pumps operate continuously during normal plant operation to supply cooling water to essential and non-essential heat loads as well as cooling water to the RCP motor bearings and thermal barriers.
  5. Chilled Water Pumps - The Chilled Water pumps are in service during normal operation to supply cooling to various loads.

<b>WBN 1</b>	<b>WATTS BAR NUCLEAR PLANT SECOND INSERVICE INTERVAL INSERVICE TESTING PROGRAM FOR PUMPS AND VALVES</b>	Page 61 of 73
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## APPENDIX B

Page 4 of 10

**Tennessee Valley Authority  
Watts Bar Nuclear Plant, Unit 1  
Second 10-Year Interval  
Request for Relief Number PV-02**

### I. Systems/Components For Which Relief Is Requested

ERCW Screen Wash Pumps (1-PMP-67-431-A, 1-PMP-67-440-B, 2-PMP-67-437-A, 2-PMP-67-447-B) (1-47W845-1)

### II. Code Requirement

ASME OM Code, ISTB-5121(b), "The resistance of the system shall be varied until the flow rate equals the reference point. The differential pressure shall then be determined and compared to its reference value. Alternatively, the flow rate shall be varied until the differential pressure equals the reference point and the flow rate determined and compared to the reference flow rate value." The ASME OM Code of Record for the Second Inservice Interval is 2001 Edition with Addenda through 2003.

### III. Code Requirement From Which Relief Is Requested

Relief is being requested from measuring the pump flow rate during Inservice Testing of the Screen Wash Pumps.

### IV. Basis for Relief

No in-line instrumentation exists to measure flow and the physical configuration of the pump and piping does not allow the use of portable flow measuring equipment such as ultrasonics. Piping from the discharge of the screen wash pumps is open-ended to the spray nozzles at the traveling screen and is relatively short with multiple elbows, reducers, and valves in different planes. The physical configuration of this piping system is such that no portion of the piping meets the requirements for adequate installation of a permanent flow measuring device. Therefore, measured flow readings from an installed device may not be repeatable nor representative of actual pump flow. Significant system modifications, such as piping rerouting and support redesign, would be required to obtain a configuration that would provide reliable flow readings.

Flow is not the critical parameter for these pumps. The nature of their operation is to ensure that sufficient pressure is maintained at the spray nozzles during flushing operations of the traveling water screens to ensure that sufficient force is exerted on the debris accumulated on the screen to remove it. This can be verified by verifying the effectiveness of the flushing operation.

### V. Alternative Examinations

WBN plans to perform the test by setting the system resistance to the same point for each test with the throttle valves full open. Pump Flow rate will not be measured. The remaining variable that could affect system resistance is the condition of the spray nozzles. The spray nozzles will be

WBN 1	WATTS BAR NUCLEAR PLANT SECOND INSERVICE INTERVAL INSERVICE TESTING PROGRAM FOR PUMPS AND VALVES	Page 62 of 73
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## APPENDIX B

Page 5 of 10

inspected during each test performance with corrective action initiated as necessary, thus providing assurance that the spray nozzle condition will not affect flow rate. WBN has reviewed the maintenance history for nozzle plugging and determined that nozzle plugging is infrequent. The nozzles are inspected by operations personnel during spraying operation with corrective maintenance initiated as required. With system resistance maintained constant for each test, pump degradation would be identified through changes in the pump differential pressure. Differential pressure is calculated using inlet (based upon the lake level or suction pressure) and discharge pressure. The pump can be trended for degradation based on differential pressure at this point. Vibration readings will also be taken at this reference point. The pumps will be tested in this manner for both the quarterly Group A and the biennial Comprehensive Test.

### VI. Justification for the Granting of Relief

Based upon the above discussion, the alternative test provides an acceptable level of quality and safety. Authorization to implement the proposed alternative is requested in accordance with 10CFR50.55a(3)(i).

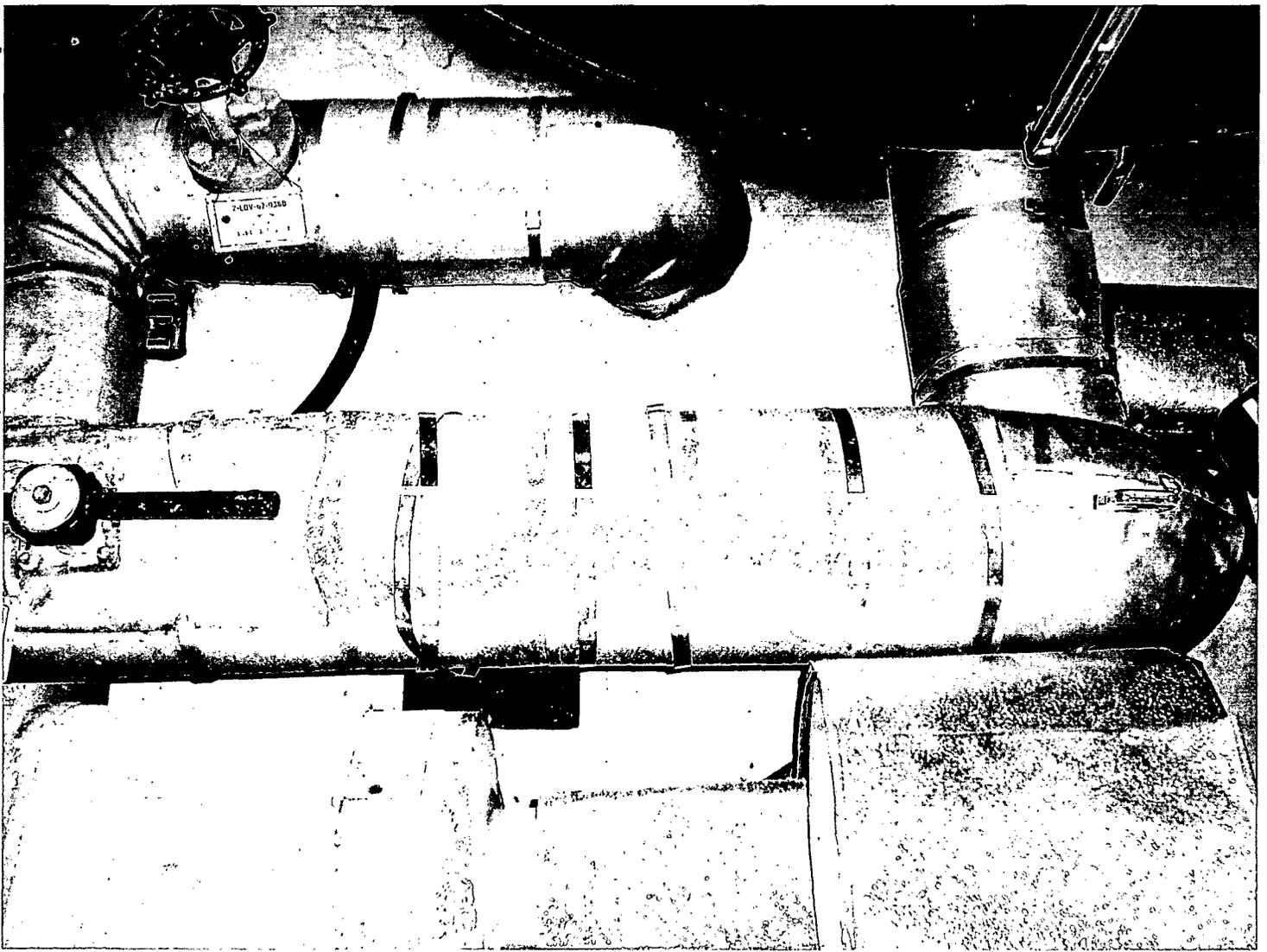
This relief request was approved for the First Ten Year Interval.

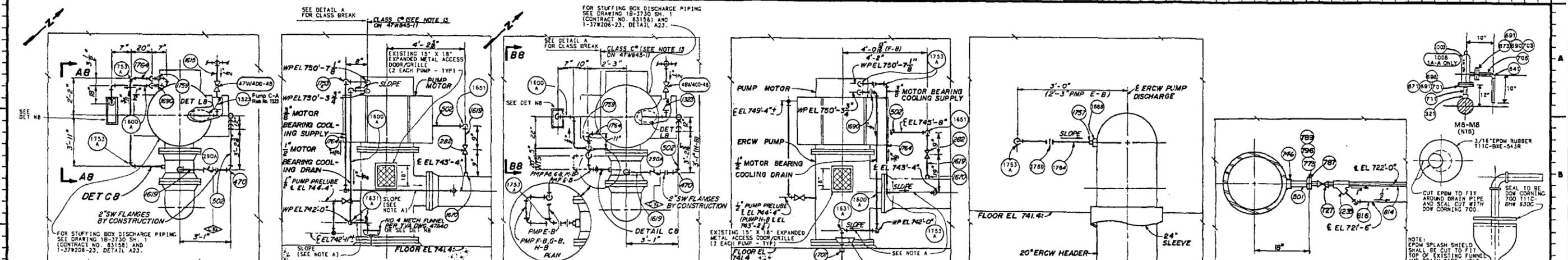
### VII. Implementation Schedule

Relief is requested for the Second Inservice Interval, which is described in Section 1.0 of the Program Description.

ENCLOSURE 3

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1  
SECOND 10-YEAR INSERVICE TESTING INTERVAL  
PHOTOGRAPH AND MECHANICAL DRAWING OF  
ERCW SCREEN WASH PUMP DISCHARGE PIPING





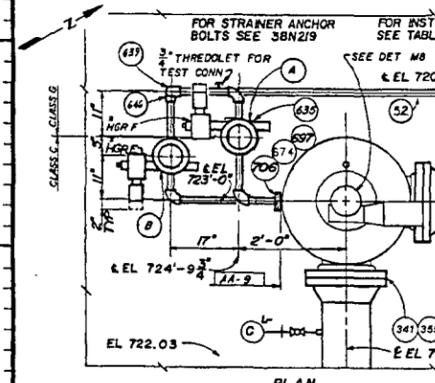
NOTE A: SEE DRAWINGS H-206-001-0589 THRU -0659 FOR SLOPE REQUIREMENTS. 0659 FOR SLOPE REQUIREMENTS.  
 NOTE B: FOR PIPING DIMENSION ON THE 3/8" MOTOR BEARING COOLING SUPPLY AND 1/2" DRAIN LINE SHOW ON DETAILS A & B. THESE DIMENSIONS ARE FOR REFERENCE ONLY. SEE DRAWINGS H-206-001-0588 THRU -0659 FOR PIPE CONFIGURATION AND DIMENSIONS.

DETAIL A8  
 TYPICAL FOR ERCW PUMPS A-A, B-A, C-A, D-A  
 SCALE: 1/2" = 1'-0" (37W206-1)

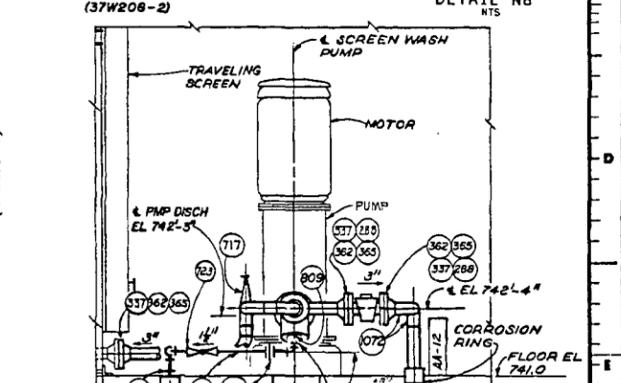
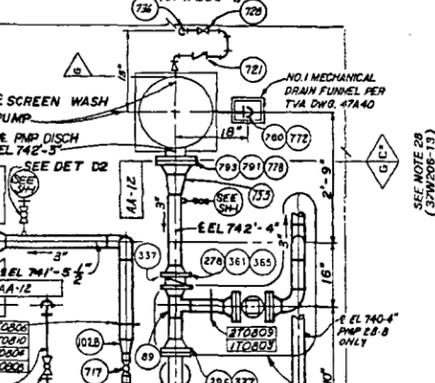
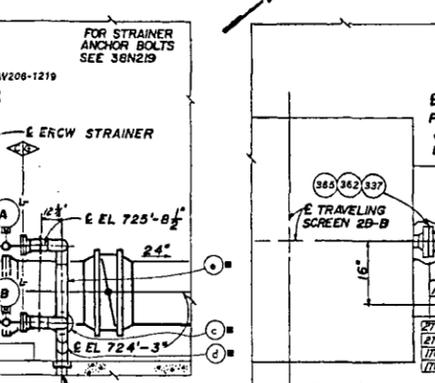
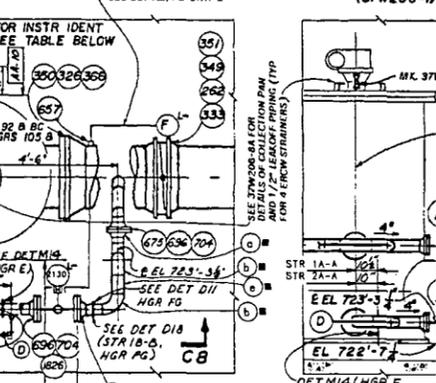
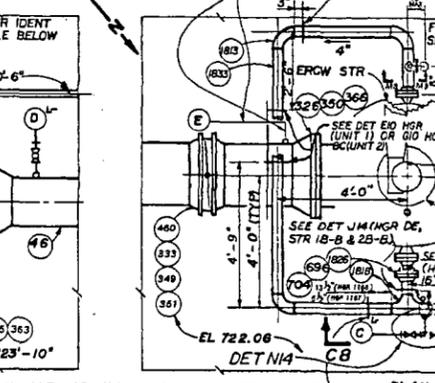
DETAIL B8  
 TYPICAL FOR ERCW PUMPS E-B, F-B, G-B, H-B  
 SCALE: 1/2" = 1'-0" (37W206-1)

DETAIL C8  
 TYPICAL ERCW BRG COOLING WATER SUPPLY  
 SCALE: 1" = 1'-0" (37W206-1)

DETAIL D8  
 RCW PUMP PRELUDE SUPPLY  
 SCALE: 1" = 1'-0" (37W206-2)



DETAIL E8  
 HPPF STRAINER A-A AS SHOWN  
 HPPF STRAINER B-B OPPOSITE HAND  
 SCALE: 1/2" = 1'-0" (37W206-2)



INSTR IDENT FOR HPPF STRAINERS

LINE	MARK NUMBER	ALTERNATE MARK NUMBER
A	675	1826 NOTE
B	681	1813 NOTE
C	665	1818 NOTE
D	684	1815 NOTE
E	713	1833 NOTE

INSTR IDENT FOR ERCW STRAINERS

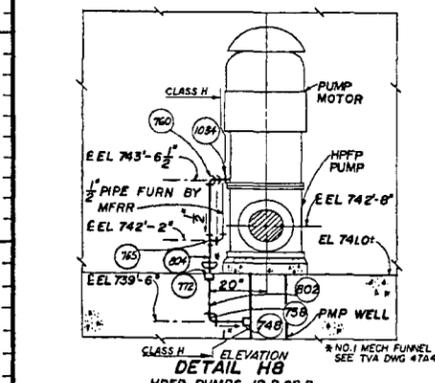
LINE	MARK NUMBER	ALTERNATE MARK NUMBER
A	675	1826 NOTE
B	681	1813 NOTE
C	665	1818 NOTE
D	684	1815 NOTE
E	713	1833 NOTE

TABLE A

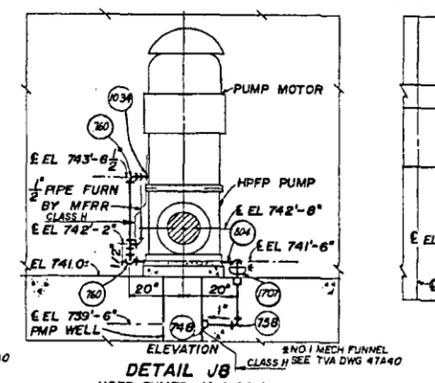
LINE	MARK NUMBER	ALTERNATE MARK NUMBER
A	675	1826 NOTE
B	681	1813 NOTE
C	665	1818 NOTE
D	684	1815 NOTE
E	713	1833 NOTE

HANGER IDENTIFICATION FOR SCREENWASH PIPING DET G8 & ERCW STR B-W DET F8

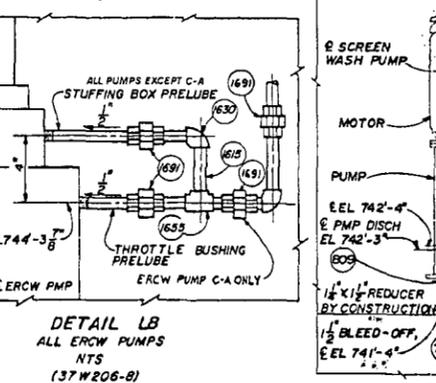
HGR	UNIQUE NUMBER	PUMP OR STR
HGR A	37A206-B-3	PMP 1A-AIDET (G8)
	37A206-B-5	PMP 2A-A
	37A206-B-7	PMP 1B-B
	37A206-B-9	PMP 2B-B
HGR B	37A206-B-4	PMP 1A-A
	37A206-B-6	PMP 2A-A
	37A206-B-8	PMP 1B-B
	37A206-B-10	PMP 2B-B
HGR BC	886	STR 1A-AIDET (F8)
	884	STR 2A-A
	887	STR 1B-B
	885	STR 2B-B
HGR DE	1088	STR 1B-B
	1189	STR 2B-B
HGR FG	1090	STR 1B-B
	1143	STR 2B-B
	1092	STR 1A-A
	1142	STR 2A-A
HGR H	1085	STR 1A-A
	1083	STR 2A-A
	1086	STR 1B-B
	1084	STR 2B-B



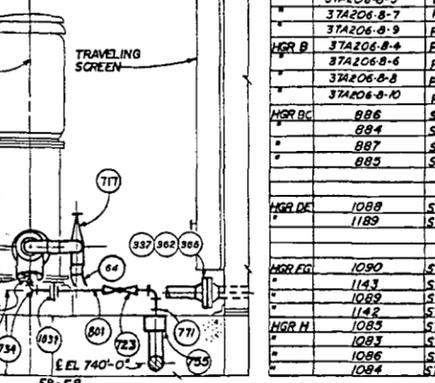
DETAIL H8  
 HPPF PUMPS B-B, C-B, D-B  
 SCALE: 1/2" = 1'-0" (37W206-1)



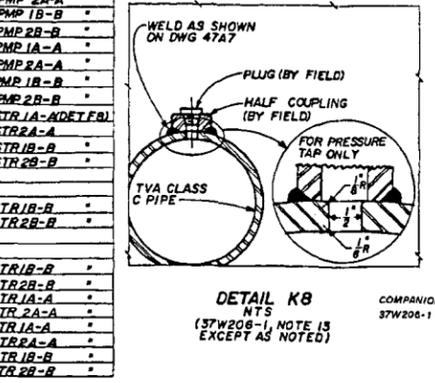
DETAIL J8  
 HPPF PUMPS A-A, B-A  
 SCALE: 1/2" = 1'-0" (37W206-1)



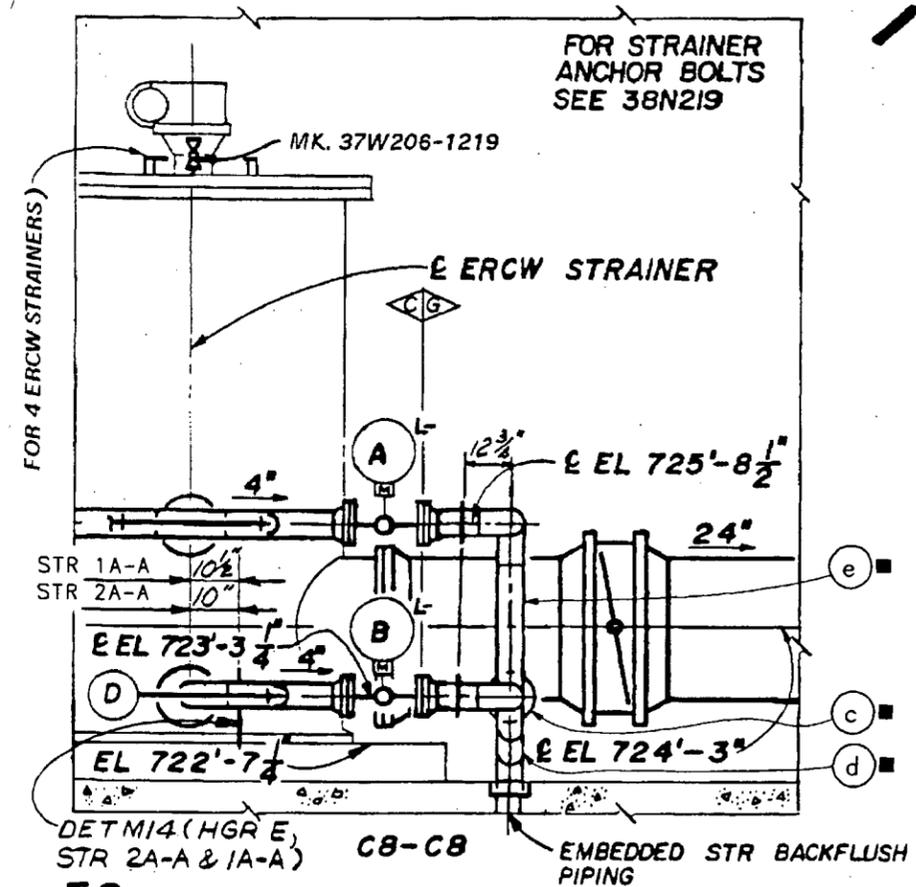
DETAIL LB  
 ALL ERCW PUMPS  
 NTS (37W206-8)



DETAIL K8  
 NTS (37W206-1, NOTE 13 EXCEPT AS NOTED)



DETAIL M8  
 NTS



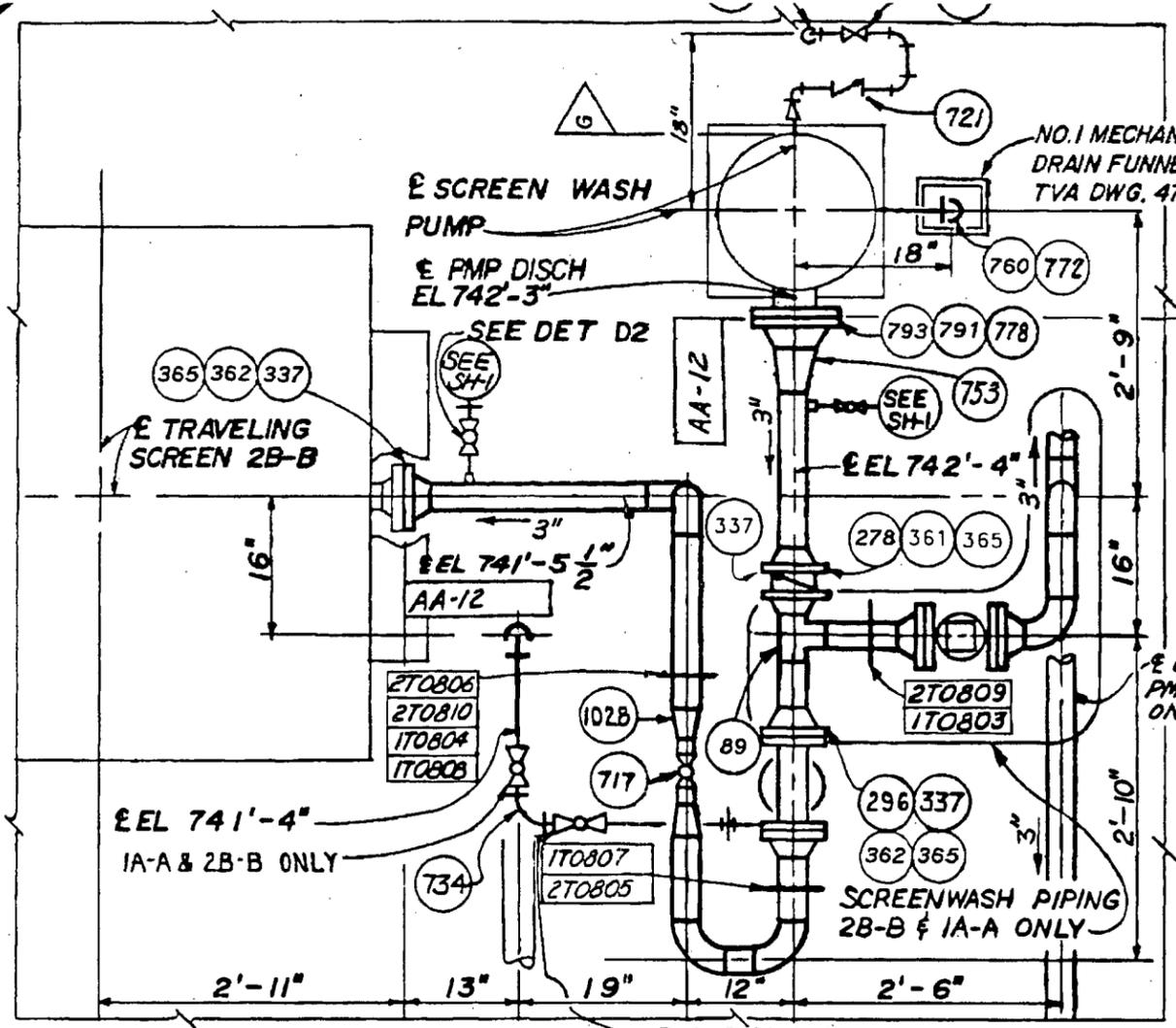
**F8**  
 STR 1A-A, 2A-A, 1B-B, & 2B-B  
 1/2" = 1'-0"  
 16-2)

TABLE A

LINE SEGMENT	ORIGINAL MARK NUMBER	ALTERNATE MARK NUMBER
a	675	1826 NOTE *
b	661	1813 NOTE *
c	665	1818 NOTE *
d	664	1815 NOTE *
e	713	1833 NOTE *

NOTE\* FOR THE CLASS G PORTION OF THE BACKWASH AND FLUSH LINES QA III MATERIAL MAY BE USED.

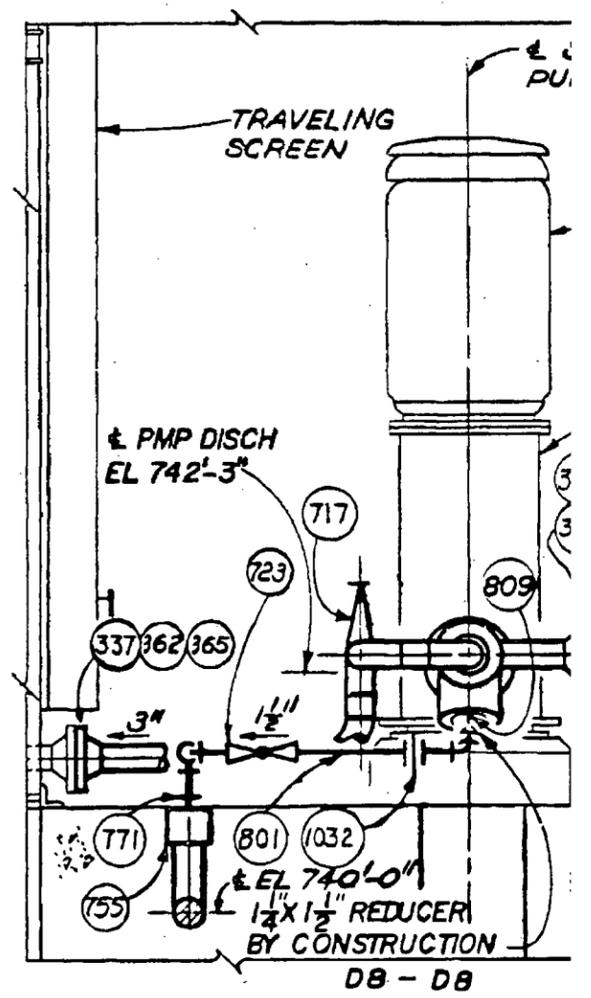
OR MATERIAL SEE TABLE A (THIS SHEET)



SEE NOTE 28 (37W206-13)

**DETAIL G8**

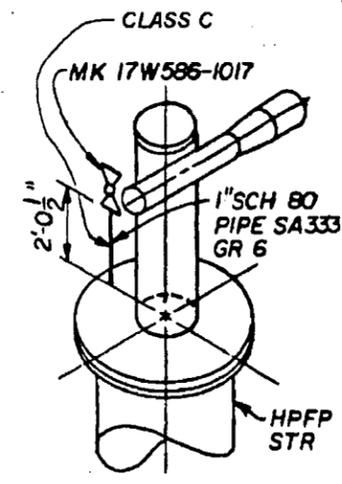
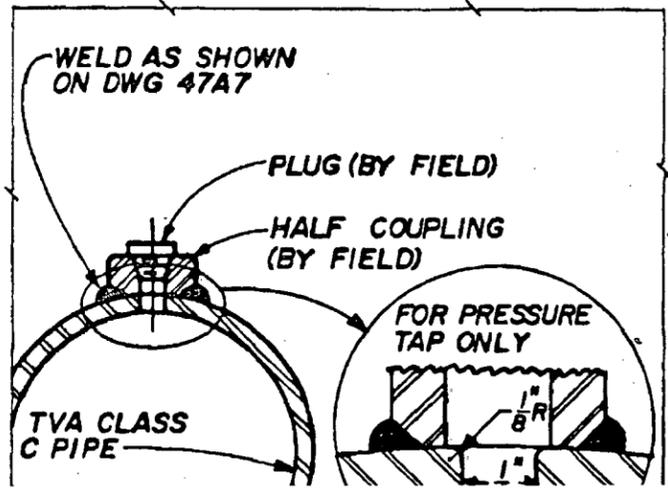
SCREEN WASH PIPING 1B-B & 2B-B, AS SHOWN  
 SCREEN WASH PIPING 1A-A & 2A-A, OPP HAND  
 SCALE: 3/4" = 1'-0"  
 (37W206-1)



NOTES:  
 1. SEISMIC CATEGORY I, RIGOROUSLY ASME PIPING DIMENSIONS SHOWN ONLY. THIS INCLUDES CATEGORY I TO COMPLETE THE PROBLEM BOUNDARY DIMENSIONS ARE SHOWN ON THE 20 (37W206-200 SERIES) AND/OR SMA ISOMETRICS (H-206-SERIES). FOR AND MODIFICATIONS REFER TO ANY SBMP ISOMETRICS. THIS NOTE IS UNIT 1 STRUCTURAL BOUNDARIES W

HANGER IDENTIFICATION FOR SCREENWASH PIPING DET G8 & ERCW STR BW DET F8

HGR	UNIQUE NUMBER	PUMP OR STR
HGR A	37A206-8-3	PMP 1A-A (DET G8)
"	37A206-8-5	PMP 2A-A "
"	37A206-8-7	PMP 1B-B "
"	37A206-8-9	PMP 2B-B "
HGR B	37A206-8-4	PMP 1A-A "
"	37A206-8-6	PMP 2A-A "
"	37A206-8-8	PMP 1B-B "
"	37A206-8-10	PMP 2B-B "
HGR BC	886	STR 1A-A (DET F8)
"	884	STR 2A-A
"	887	STR 1B-B "
"	885	STR 2B-B "
HGR DE	1088	STR 1B-B "



REV	CHANGE	REF	PREPARE
EE	GSDS	GJB	
REVISED PER W.O. 05-82398			
DESIGN	RE LANCASTER		
DRWN	S.J. DICKENS		
CHKD	J.H. O'BRYEN, B. HUGGINS		
SUPV	H.L. COOK		
SCALE: 1/2" = 1'-0"			
WATER SUPPLY UNITS 1 & 2 INTAKE DUMPING STAT			

