

## TEXAS UTILITIES GENERATING COMPANY

P. O. BOX 1002 · GLEN ROSE, TEXAS 76043

June 7, 1984

Thomas A. Ippolito  
 Comanche Peak Project Director  
 Office of Nuclear Reactor Regulation  
 U.S. Nuclear Regulatory Commission  
 Washington, D.C. 20555

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES)  
 Docket Nos. 50-445 and 446  
 CPSES Unit 1 Train A Diesel Generator  
 Inspection Results

- References: 1) CPSES Diesel Generator Requalification  
 Program Plan, April 30, 1984
- 2) T.D.I. Diesel Generator Owners' Group  
 Program Plan, March 2, 1984

Dear Mr. Ippolito:

Texas Utilities, as established in Reference 1, is an active participant in the T.D.I. Diesel Generator Owners' Group and is firmly committed to the implementation of the Owners' Groups' program (Reference 2) for requalification of T.D.I. diesel generators. The purpose of this document is to provide NRC with the results of the inspections performed on the CPSES Unit 1 train A diesel generator in accordance with the referenced programs. The specific inspection findings and actions taken as a result of these inspections are described in the enclosure to this letter. A description of the procedural aspects of this effort is provided below.

The CPSES Unit 1 diesel generators were disassembled in February and March of 1984 for the original purpose of replacing the furnished Type AH pistons with new Type AE pistons. Due to the extent of the Owners' Group's anticipated inspections, however, it was decided to fully disassemble the two engines to permit detailed examination. These inspections are now complete on the train A engine and are nearing completion on the train B engine. The train A engine has been reassembled, and is currently undergoing reperformance of the original, NRC-required diesel generator preoperational test program along with additional testing as recommended by the Owners' Group.

The train A engine inspections were performed in accordance with component inspection plans developed by the Owners' Group specifically for CPSES. These inspection plans covered the 16 generic problem components associated with T.D.I. diesel generators, except for on-engine wiring and fuel injection lines, as well as many other engine components which the Owners' Group technical staff designated for inspection. The on-engine wiring for the CPSES diesel generators was replaced earlier with fully qualified cable and the fuel injection lines are being replaced with shielded tubing. Therefore, no inspections were required for these components.

3001  
 1/1

The types and extent of inspections varied from component to component, but included visual and dimensional checks as well as liquid penetrant, magnetic particle, ultrasonic, eddy-current and radiographic testing. Acceptance criteria were specified by the Owners' Group for most of the inspections, however, some inspection plans called for simply recording all marks or indications found on a component without their being evaluated against a specified acceptance criteria. In such cases, the results were forwarded to the Owners' Group for evaluation. It should also be noted that, in some case where unsatisfactory conditions were found based on visual or liquid penetrant test acceptance criteria, follow-up inspections were performed using one of the more sophisticated techniques, as specified in the inspection plans, to provide further information for evaluation of the suspect areas. Many of these follow-up inspections resulted in the conclusion that the defects found by visual or liquid penetrant testing were, in fact, acceptable.

The inspection plans were carried out by TUGCO Maintenance personnel in accordance with approved CPSES maintenance and quality assurance procedures. Maintenance Action Requests (MAR's) were generated based on the inspection plans in order to provide a detailed, comprehensive and step-by-step schedule of the activities required. All inspections were documented on TUGCO Inspection Report forms with all acceptance criteria clearly specified. Conditions that were found to be unsatisfactory per the Owners' Group acceptance criteria or otherwise in the judgement of TUGCO maintenance personnel were documented on TUGCO Nonconformance Report (NCR) forms.

Disposition of NCR's was handled in three ways: use-as-is, repair/rework, or replace the unsatisfactory component. All replacement components were subjected to the same level of inspections as the components being replaced. Disposition was initiated by TUGCO maintenance and approved by the TUGCO Operations Engineering and Quality Assurance organizations. Verbal concurrence with all NCR dispositions was also obtained from the Owners' Group technical staff. Two of the NCR dispositions, however, are interim only and are being carried out under the direction of the Owners' Group. These two NCR's concern cracks found in the cylinder block and a defect found in the engine base assembly. Conditional releases were obtained for these components, based on Owners' Group recommendations, in order to permit diesel generator reassembly and preoperational testing, while the design reports on these components are being finalized by the Owners' Group. Final recommendations for disposition of these two NCR's will be obtained from the Owners' Group prior to fuel loading of Unit 1.

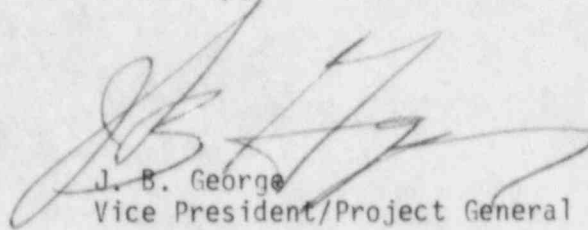
Although final conclusions are not possible until both the train A and train B diesel generators have successfully completed reperformance of the preoperational test program and until the Owners' Group issues its final report on the design review and quality revalidation of the CPSES engines, Texas Utilities believes that the train A inspection findings and the accomplished disposition of unsatisfactory conditions serve as a good indicator that the Owners' Group and CPSES diesel generator programs will result in a fully qualified and reliable onsite electric power system at CPSES.

Mr. Thomas A. Ippolito

June 7, 1984

Page 3 - CPPA-39224

Sincerely,



J. B. George

Vice President/Project General Manager

JBG/SMS/lp

enclosure

cc: H. C. Schmidt  
C. Berlinger (NRC)  
D. Wade  
N. Reynolds  
R. Jones  
J. T. Merritt  
C. L. Ray  
R. B. Priory

CPSSES UNIT 1 TRAIN A DIESEL GENERATOR INSPECTION RESULTS

Attached are the following documents for each component inspected:

- 1) Component Revalidation Checklists, and
- 2) Inspection Plans

The results of each component inspection are summarized in the "Results and Conclusions" box of each Component Revalidation Checklist (CRC). It should be noted, however, that a number of modifications were made in the development of the Inspection Plans that were not incorporated in the CRC's. Therefore, all results stated on the CRC's apply to the tests and acceptance criteria specified in corresponding Inspection Plans.

COMPONENT REVALIDATION CHECKLIST

COMPONENT Turbocharger DOCUMENT NO QR-1  
PART NUMBER MP022/3 SCHEDULED FOR COMPLETION 1  
SNPS PART NUMBER MP-017

TASK DESCRIPTION:

After 100 hours run or pre-op testing program, visually inspect nozzle rings and bearings for adverse wear and/or cracking. Assemble and review existing documentation.

ATTRIBUTE TO BE VERIFIED: 1) Cracks, pits, nicks on fan blades, scoring, pitting, dimensions on turbocharger bearings.  
2) Quality status of component document package.

ACCEPTANCE CRITERIA: 1) No cracks or excessive pitting (indicative of wear) on Turbocharger nozzle rings. 2) Lack of scoring, pitting on bearings. Bearing dimensions per manufacturers tolerances.

REFERENCES: TDI & Turbocharger manual, applicable specifications.

DOCUMENTATION REQUIRED: 1) Quality evaluation report of Turbocharger, fan & bearings. 2) Document Summary Sheet.

GROUP CHAIRPERSON A. Najich PROGRAM MANAGER G. Louis L. C. K. Brown

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

Nicks found on fan blades of both turbochargers. Also, superficial scratches. Left bank impeller had one superficial scratch. Nozzle ring blades showed numerous nicks, some blades bent on trailing edges. Majority of both bank turbine blades had nicks. Right bank had light pitting on 3 blades. Turbocharger bearings showed varying degrees of scoring, pitting, scratches and raised babbits. Shafts, thrust collars and left bank turbine end oil seal were out of tolerance.

Both rotor assemblies were replaced with spares, other unsatisfactory areas were refurbished.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. MP - 22/3
NO. D.G. Insp. 33	Rev 1
	Chg 0

## TITLE

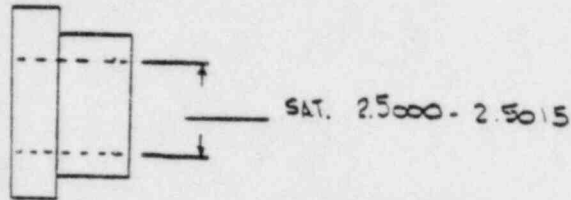
Item No	Attri.	Hold/Not In	Reference	Description/Instructions
1.				<p><u>INSPECTION:</u></p> <ul style="list-style-type: none"> <li>Visually inspect fan blades, nozzle rings, and bearings paying particular attention to: cracks, pits, nicks on the fan blades, scoring and pitting.</li> </ul>
2*				<ul style="list-style-type: none"> <li>Dimensionally check the shaft, oil seals and thrust collar.</li> </ul> <p><u>ACCEPTANCE CRITERIA:</u></p> <ul style="list-style-type: none"> <li>No cracks or excessive pitting (indicative of wear) on fan blades</li> <li>Report any evidence of scoring, pitting on bearings</li> </ul> <p>* Dimensional check of bearings was deleted by Tugco because no equipment was available to measure three point sleeve bearing.</p>

# COMPONENT CONDITION REPORT

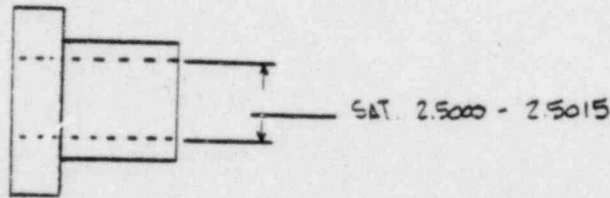
T.P. NO.	ITEM NO.	COMPONENT NO./DESCRIPTION
IR. NO.	IR ITEM NO.	TYPE OF INSPECTION

- \* Document by words or sketches the inspection performed.
- \* Show location of measurements/conditions applicable.

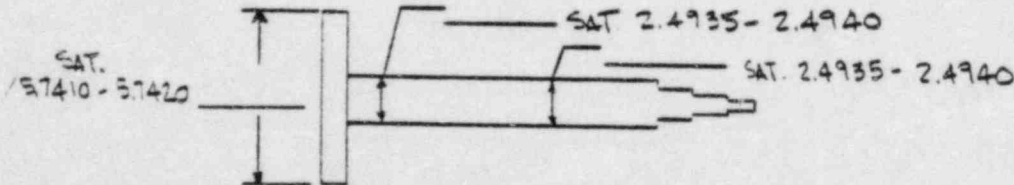
TURBINE END BEARING



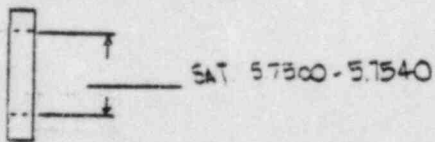
BLOWER END BEARING



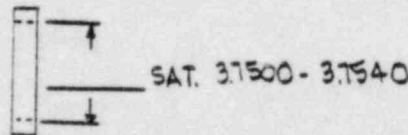
SHAFT DIAMETER



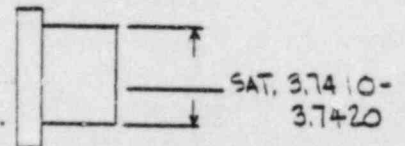
OIL SEAL TURBINE END



OIL SEAL BLOWER END



THRUST COLLAR



PERFORMED BY \_\_\_\_\_

DATE \_\_\_\_\_

QC VERIFIED \_\_\_\_\_

DATE \_\_\_\_\_

COMPONENT REVALIDATION CHECKLIST

COMPONENT Base & Bearing Caps-  
Base Assembly DOCUMENT NO QR-1  
PART NUMBER 02-305A SCHEDULED FOR COMPLETION \_\_\_\_\_  
SNPS PART NUMBER 03-305A

TASK DESCRIPTION:

Perform LP Inspection of main bearing, Saddle area on # 5 bearing on one engine. (Area as indicated on attached sketch). Perform visual inspection of cap mating surfaces for evidence of fretting.

ATTRIBUTE TO BE VERIFIED: Base to be free of cracking or fretting, etc.

ACCEPTANCE CRITERIA: No rejectable linear indication, /no evidence of excessive wear i.e. fretting, erosion or corrosion.

REFERENCES: TDI Instruction Manual & Parts List.

DOCUMENTATION REQUIRED: Acceptable inspection report for the above criteria.

GROUP CHAIRPERSON T. J. Majors PROGRAM MANAGER John L. K. Jones

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSes Unit 1, Train A (Serial No. 76001)

Linear indications found on Nos. 1, 3, and 9 bearing saddles. Owners' Group has evaluated indications on 1 and 9 as acceptable; No. 3 still under evaluation. Conditional release for DG reassembly and testing obtained based on O.G. recommendation. Final disposition recommendation on No. 3 to be obtained from O.G. and implemented prior to fuel load.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_



STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

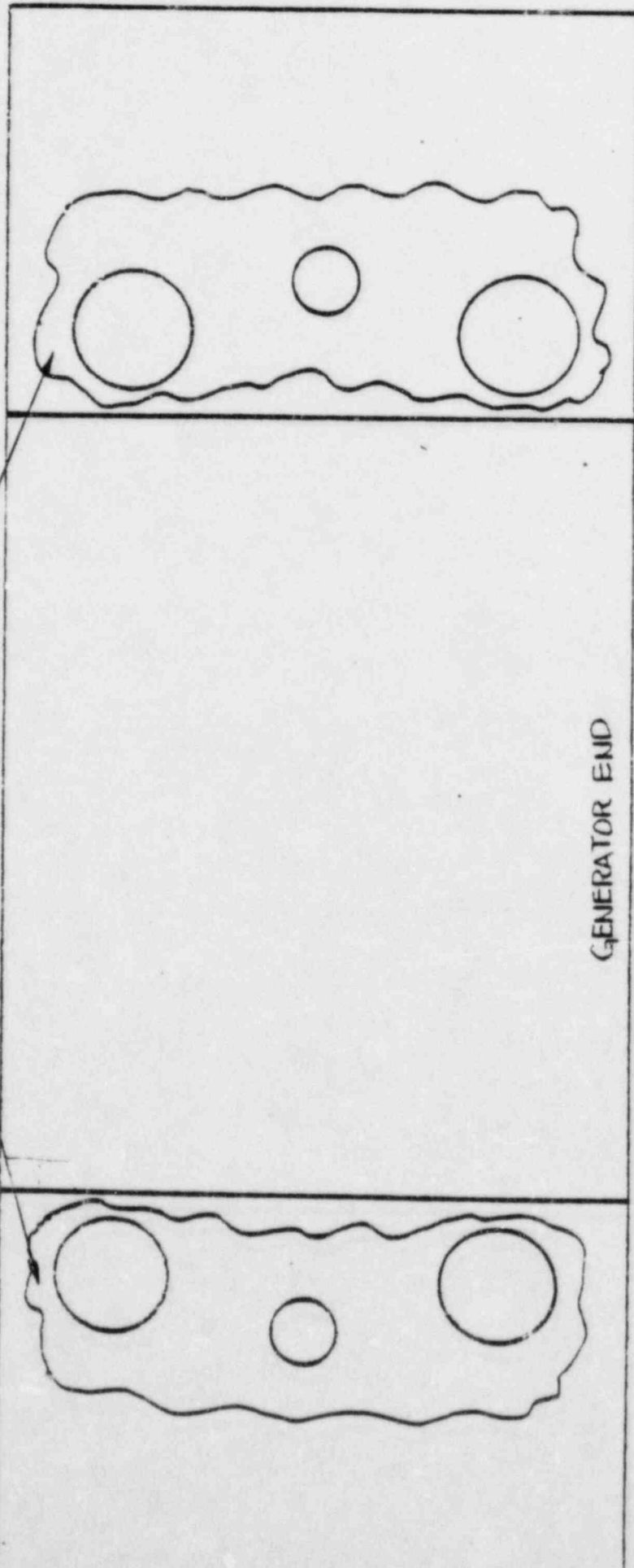
Job Number 11600.63	No. 02-305A	Rev 0	Chg 0
NO. D. G. INSP. - 36			

**TITLE** Base and Bearing Caps - Base Assembly

Item No	Attri.	Hold/ Notif. Point	Reference	Description/Instructions
1			TDI Instruction Manual and Parts	<p><u>INSPECTION</u></p> <ul style="list-style-type: none"> <li>L.P. - Perform an L.P. Inspection of base assembly. No linear indications acceptable. (See attached sketch.)</li> </ul>
2			TDI Instruction Manual and Parts List	<ul style="list-style-type: none"> <li>Visual - Perform visual inspection. Look for signs of fretting, erosion or corrosion</li> </ul>

Quality Control Insp./Engr. N/A	Date
------------------------------------	------

THIS AREA TO BE PT -  
MR 3-25-64



GENERATOR END

MAIN SADDLE BEARING No 5

COMPONENT REVALIDATION CHECKLIST

COMPONENT Base & Bearing Caps-  
Main Bearing Caps. DOCUMENT NO QR-1  
PART NUMBER 02-305D SCHEDULED FOR COMPLETION \_\_\_\_\_  
SNPS PART NUMBER 03-305D

TASK DESCRIPTION:

Perform visual inspection of cap mating surface for evidence of fretting.

ATTRIBUTE TO BE VERIFIED:

Bearing cap mating surface to be free of fretting, etc.

ACCEPTANCE CRITERIA:

No evidence of excessive wear, i.e. fretting, erosion or corrosion.

REFERENCES:

TDI Instruction Manual & Parts List.

DOCUMENTATION REQUIRED:

Acceptable inspection report for the above criteria.

GROUP CHAIRPERSON R. J. Maguire PROGRAM MANAGER G. L. C. K. Fann

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

All caps are satisfactory.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_

STONE & WEBSTER ENGINEERING CORPORATION

Job Number 11600.63	No. 02-305D
NO. D. G. INSP. - 56	Rev 0
	Chg 0

# QUALITY ASSURANCE-INSPECTION PLAN

**TITLE** Base & Bearing Caps - Main Bearing Caps

Item No	Attri.	Hold/ Notif. Point	Reference	Description/Instructions
1			TDI Inst. Manual & Parts List	Perform visual inspection of cap mating surface for evidence of fretting.

Quality Control Insp./Engr. N/A	Date
------------------------------------	------

COMPONENT REVALIDATION CHECKLIST

COMPONENT Lube Oil Fittings  
Internal-Headers DOCUMENT NO QR-1

PART NUMBER 02-307A SCHEDULED FOR COMPLETION                     

SNPS PART NUMBER 03-307A

TASK DESCRIPTION:

- 1) Assemble and review existing documentation.
- 2) Verify as-built conditions to the existing drawings.

ATTRIBUTE TO BE VERIFIED:

- 1) Satisfactory component package.
- 2) As-Built conditions of installed tubing and associated supports.

ACCEPTANCE CRITERIA: 1) Satisfactory component package  
 2) Acceptable inspection report based on attached criteria.

REFERENCES: TDI drawing or supplied as-built

DOCUMENTATION REQUIRED: 1) Documentation Summary Sheet  
 2) Inspection Report  
 3) Component drawing

GROUP CHAIRPERSON *Aj Majors* PROGRAM MANAGER *G. L. C. K. B.*

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

All piping is satisfactory.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number	No.	Rev	Chg
11600.63	02-307A	1	0
NO.			
D. G. INSP - 38			

**TITLE** Lube Oil Fittings - Internal Header Piping

Item No	Attri.	Hold / Note	Reference	Description/Instructions
1				<p>A QC Inspector shall perform a field inspection of the internal header piping. He shall use a copy of the attached sketches to ensure that items 1 thru 9 have been accurately incorporated onto the sketch. A tolerance on all dimensions of <math>\pm 3"</math> shall be considered accurate and acceptable. The following items are to be checked:</p> <ul style="list-style-type: none"> <li>All piping dimensions, including end-to-end dimensions of valves or other in-line equipment (such as flow elements), must be recorded and laid out on the drawing such that their orientation with the global axes can be determined. This includes any AOV/MOV orientation with relation to pipe or global axes.</li> <li>All support location dimensions, (in reference to the pipe), shall be identified and also gang hanger locations must be indicated on the individual isometric.</li> <li>It must be indicated when pipe has been socket welded; for all other cases, butt welds will be assumed. All butt welds at locations other than fittings shall be noted.</li> <li>All fittings, such as ANSI tees, elbows, reducers, reducing elbows, "Y" fittings, laterals, etc., shall be explicitly identified on the Isometric. In the case of an elbow; a 5 diameter bend, or short radius elbow should be identified; otherwise, a standard long radius elbow will be assumed.</li> <li>All branch connections must be located for all piping and explicitly identified. (EX.: Tee, reinforced or unreinforced branch, sockolet, elbolet, latrolet, weldolet, bosses, etc.)</li> <li>Bend radii, orientation or arcs, and either angles, chord lengths or arc lengths between supports for all annular piping configurations.</li> <li>Piping termination points shall be identified indicating equipment ID when applicable (i.e., Jacket Water Pump, Lube Oil Strainers, etc.)</li> <li>All attachment points to the piping shall be noted (i.e., if small bore piping or equipment is supported off large bore flanges or pipe, this should be noted).</li> </ul>
2				
3				
4				
5				
6				
7				
8				

Quality Control Insp./Engr. | Date

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-307A	Rev	Chg
NO. D. G. INSP - 38		1	0

**TITLE** Lube Oil Fittings - Internal Header Piping

Item No	Attrl.	Hold/Not Int.	Reference	Description/Instructions
9				When applicable, the isometrics shall indicate continuation references to adjoining isometrics.
10				The inspector shall "redline" all out of tolerance discrepancies between the as-built and the as-installed piping on the reproduced copy of the isometric. The "redlined" copies of the isometric shall then be transmitted to SWEC site representative.
11*				

\* The reverification deleted by Tugco.

Quality Control Insp./Engr. | Date









































COMPONENT REVALIDATION CHECKLIST

COMPONENT Lube Oil Fittings  
Internal-Headers DOCUMENT NO QR-1  
PART NUMBER 02-307B SCHEDULED FOR COMPLETION 11  
SNPS PART NUMBER 03-307B

TASK DESCRIPTION:

- 1) Assemble and review existing documentation.
- 2) Verify as-built conditions to the existing drawings.

ATTRIBUTE TO BE VERIFIED:

- 1) Satisfactory component package.
- 2) As-Built conditions of installed tubing and associated supports.

ACCEPTANCE CRITERIA: 1) Satisfactory component package  
2) Acceptable inspection report based on attached criteria.

REFERENCES: TDI drawing or supplied as-built

DOCUMENTATION REQUIRED: 1) Documentation Summary Sheet  
2) Inspection Report  
3) Component drawing

GROUP CHAIRPERSON W. J. Majors PROGRAM MANAGER John L. K. Lewis

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

All tubing and fittings are satisfactory.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-3078	rev	Chg
NO. D. G. INSP - 39		1	0

**TITLE** Lube Oil Fittings Internal - Headers "Tubing & Fittings"

Item No	Attr.	No. of Point	Reference	Description/Instructions
1				<p><u>VALIDATION OF TUBING &amp; SCHEMATIC SKETCHES:</u></p> <p>A Q.C. Inspector shall perform a field inspection of tubing and fittings. He should use a copy of the attached sketches to ensure items 1 thru 5 have been accurately incorporated onto the sketch; checking for the following:</p> <ul style="list-style-type: none"> <li>. Tubing runs (without regard to actual dimensions).</li> <li>. Tubing sizes (O.D.)</li> <li>. The relationship to each other of all intermediate fittings: elbows, unions, TPPS, couplings, etc.,* (without regard to actual dimensions).</li> <li>. The relationship to each other of all supports and attachments and to adjacent installed fittings (without regard to actual dimensions).</li> <li>. Tubing terminations point identification - indicating equipment I.D. when applicable (i.e., F.O. Strainers, F.O. Booster Pump).</li> </ul> <p>The inspector shall "redline" any discrepancies between the as-built and the as-installed tubing on the reproduced copy of the isometric in accordance with Attributes 1 through 5. The "redlined" copies of the isometric shall be transmitted to the SWEC site representative.</p> <p>* The reverification deleted by Tugco.</p>
2				
3				
4				
5				
6				
7*				

Quality Control Insp./Engr. | Date











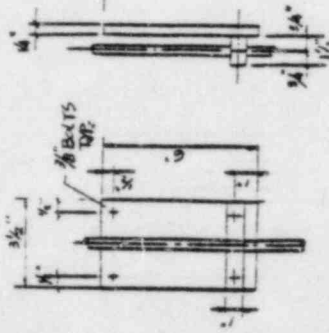
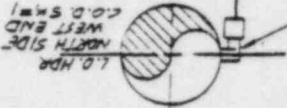
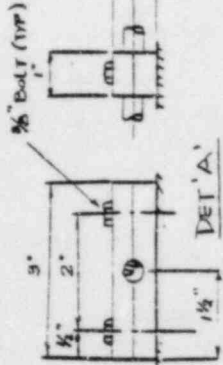
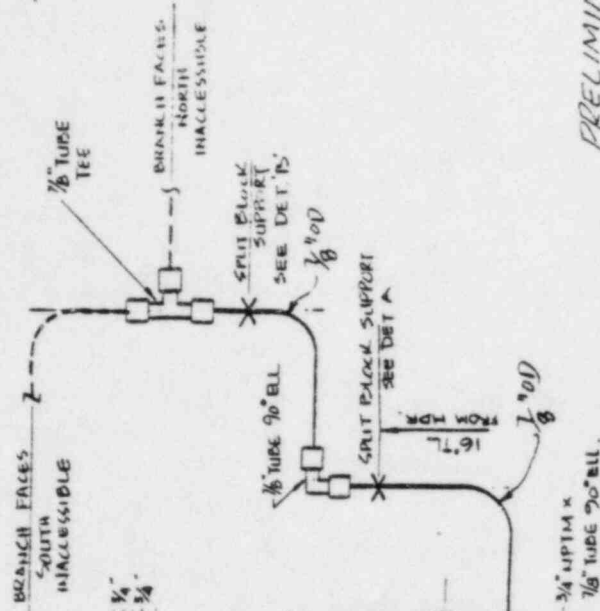












PRELIMINARY

PIPE DETAIL

L.O. HDR TO GEAR CASE (V.051)

LINE NO. 10

LINE NO.	DATE	BY	CHKD	APP'D
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

-ALL DIMENSIONS NOT SHOWN  
-SEE OTHER SHEETS NOTED  
-SEE GEAR CASE DRAWING  
-IF NOT NOTED OTHERWISE NOTED  
-DRAWING APPROVED BY DWG NO.

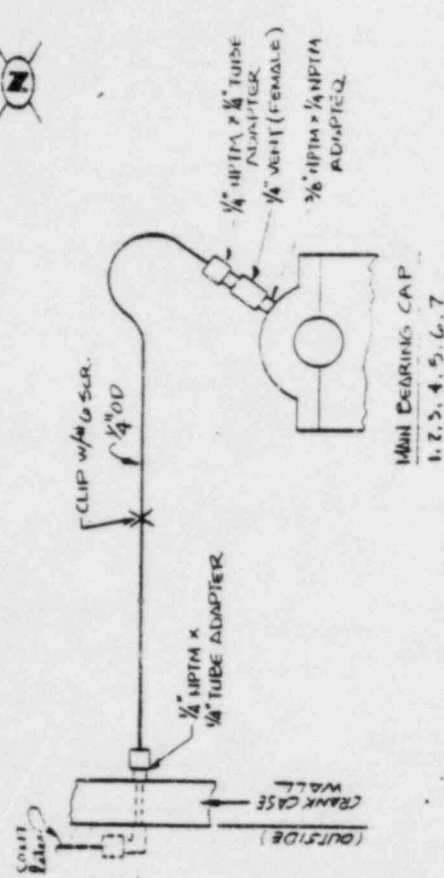
LINE & WEIGHT DIMENSIONS CORRELATION  
SCALE 1" = 10'







SIZE	QUANT	LINE DESIGNATION	DRAWING NO.
1/2"			
3/4"			
1"			
1 1/4"			
1 1/2"			
2"			
2 1/2"			
3"			
3 1/2"			
4"			
4 1/2"			
5"			
5 1/2"			
6"			
6 1/2"			
7"			
7 1/2"			
8"			
8 1/2"			
9"			
9 1/2"			
10"			



MIN BEARING CAP  
1, 2, 3, 4, 5, 6, 7

PRELIMINARY

PIPE DETAIL  
FUSABLE LINK, HEAT  
SECTOR  
UP HT # 1 D/G "A"  
SHEET & WEIGHT INFORMATION  
5K # 14

ALL DIMENSIONS NOT SHOWN  
UNLESS OTHERWISE NOTED  
TOLERANCES UNLESS OTHERWISE NOTED  
UNLESS OTHERWISE NOTED  
UNLESS OTHERWISE NOTED

NO.	DATE	BY	CHKD	APP'D	REV	DESCRIPTION
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						









COMPONENT REVALIDATION CHECKLIST

COMPONENT Lube Oil Fittings  
Internal-Headers DOCUMENT NO. QR-1

PART NUMBER 02-307D SCHEDULED FOR COMPLETION                     

SNPS PART NUMBER 03-307D

TASK DESCRIPTION:

- 1) Assemble and review existing documentation.
- 2) Verify as-built conditions to the existing drawings.

ATTRIBUTE TO BE VERIFIED:

- 1) Satisfactory component package.
- 2) As-Built conditions of installed tubing and associated supports.

ACCEPTANCE CRITERIA: 1) Satisfactory component package  
2) Acceptable inspection report based on attached criteria.

REFERENCES: TDI drawing or supplied as-built

DOCUMENTATION REQUIRED: 1) Documentation Summary Sheet  
2) Inspection Report  
3) Component drawing

GROUP CHAIRPERSON RJ Mayne PROGRAM MANAGER                     

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

All tubing supports are satisfactory.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_

STONE & WEBSTER ENGINEERING CORPORATION

Job Number 11600.63	No. 02-307D
NO. D. G. INSP. - 40	Rev 1
	Chg 0

# QUALITY ASSURANCE-INSPECTION PLAN

**TITLE** Lube Oil Fittings, Internal - "Supports" (Header Piping & Tubing)

Item No	Alt.	Hold/Not Point	Reference	Description/Instructions
1				<p><b>VALIDATION OF ENGINEERING SKETCHES OF INSTALLED PIPING &amp; TUBE "SUPPORTS"</b></p> <p>A Q.C. Inspector shall perform a field inspection of "Supports" on header piping and tubing. He shall use a copy of the attached sketch to ensure that items 1 thru 9 have been accurately incorporated onto the sketch. The following items are to be checked:</p> <ul style="list-style-type: none"> <li>. Support identification and orientation.</li> <li>. Hardware items (U-bolts, clamps, clips, rubber inserts, etc.)</li> <li>. Configuration, size, dimension of structural supporting elements</li> <li>. Location, size and types of bolts and screws</li> <li>. Configuration, size and type of welds</li> <li>. Critical clearances</li> <li>. Notes specifying any special conditions such as inaccessibility, lack of clearance, etc.</li> <li>. Location and size of oversized and/or slotted holes in baseplates</li> <li>. Support attachment points shall be identified</li> </ul> <p>Dimensions which are within the following tolerances shall be considered accurate and acceptable: (For above items 1 - 9).</p> <p>A Structural supporting members shall be <math>\pm 1/2"</math> for each measurement.</p> <p>B <math>\pm 1/4"</math> between bolt or base plate edge.</p> <p>C Clearance gaps between the tube and supporting elements shall not be greater than <math>1/16"</math> in the direction of restraint</p> <p>D Weld thicknesses as noted on sketch shall be a minimum requirement,</p> <p>E Dimensions such as plate thickness shall be a minimum requirement.</p> <ul style="list-style-type: none"> <li>. The inspector shall "redline" all out of tolerance discrepancies between the as-built and the as-installed supports on the reproduced copy of the isometric. The "redlined" copies of the isometric shall then be transmitted to the SWEC site representative.</li> </ul> <p>* The reverification was deleted by Tugco.</p>
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				













COMPONENT REVALIDATION CHECKLIST

COMPONENT Crankshaft & Bearings  
Crankshaft & Turning Gear DOCUMENT NO QR-1  
PART NUMBER 02-310A SCHEDULED FOR COMPLETION \_\_\_\_\_  
SNPS PART NUMBER 03-310A

TASK DESCRIPTION:

- (1) Assemble and review existing documentation
- (2) Perform visual inspection of crankpin journal surface for signs of distress. Document with photographs.
- (3) Perform eddy current inspections of crankpin journal fillets numbers 3 (governor end) 4, 5, 6, 7, 8 (both sides). To be performed on one station engine only.

ATTRIBUTE TO BE VERIFIED:

- (1) Quality status of vendor component package
- (2) Visual inspection of crankpin journal surface for signs of distress.
- (3) Eddy current inspection of crankpin journals

ACCEPTANCE CRITERIA:

- (1) Satisfactory component document package
- (2)&(3) Review of inspection results by design group

REFERENCES:

Applicable site/vendor documents

DOCUMENTATION REQUIRED:

- (1) Document Summary Sheet
- (2)&(3) Inspection Report

GROUP CHAIRPERSON Vain A. Suleta PROGRAM MANAGER JC Kammer

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

Crankshaft is satisfactory. 1 minor scratch visible on Journal No. 3 was machined out.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number	No.		
11600.63	02-310A		
NO.	Rev	Chg	
D. G. INSP - 60	0	0	

**TITLE** Crankshaft

Item No	Attri.	Hold/Notif/oint	Reference	Description/Instructions
1				. Perform a visual inspection of all crankpin journals (crankshaft journals at rods) for signs of scoring, wear or damage. Record results of visual inspection.
2				. Perform eddy current of crankpin journal #3 governor end and journals 4, 5, 6, both sides (each engine). Record results of eddy current inspection.

Quality Control Insp./Engr.	Date
N/A	

COMPONENT REVALIDATION CHECKLIST

COMPONENT Crankshaft Bearings-  
Bearing Shells DOCUMENT NO QR-1  
PART NUMBER 02-310B SCHEDULED FOR COMPLETION. \_\_\_\_\_  
SNPS PART NUMBER 03-310B

TASK DESCRIPTION:

- 1) After 100 Hrs. run or pre-optesting, visually examine sample bearings for excessive wear, or cracking. Minimum sample to include #5 main bearing shells.

ATTRIBUTE TO BE VERIFIED:

- 1) Thickness, presence of scoring, galling, or cracks.

ACCEPTANCE CRITERIA:

- 1) Thickness per TDI Manual, lack of scoring & galling.

REFERENCES:

Vol I, of TDI Manual, design group acceptance criteria.

DOCUMENTATION REQUIRED:

Quality evaluation report

GROUP CHAIRPERSON *RJ Majors*

PROGRAM MANAGER *Ch. [Signature]*

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

Scoring of Babbitt visible on Nos. 3, 7, and 8 top shells and on No. 1 bottom shell. Inclusions visible on No. 1 top and bottom shells. LP showed linear indications in most shells, which were evaluated as surface scratches caused by Babbitt smearing. No. 10 top and bottom shells were replaced with acceptable spares, all others are acceptable for use.

GROUP CHAIRPERSON \_\_\_\_\_

PROGRAM MANAGER \_\_\_\_\_

STONE & WEBSTER ENGINEERING CORPORATION

Job Number 11600.63	No. 02-310B
NO. D. G. INSP. - 41	rev 0
	Chg 0

# QUALITY ASSURANCE-INSPECTION PLAN

**TITLE** Crankshaft Bearings - Bearing Shells

Item No	Attri.	Hold/Point	Reference	Description/Instructions
1			TDI Manual	<u>INSPECTION:</u>
2				. Verify bearing thickness.
				. Visually inspect bearing for presence of scoring, galling or cracks.
			<u>Acceptance Criteria</u>	
3*				. Lack of scoring and galling.
				. Perform LP Inspection of the main bearing shells.

\*LP of main bearing shell was performed per TUGCO direction.

Quality Control Insp./Engr. N/A	Date
------------------------------------	------

## LIQUID PENETRANT ACCEPTANCE CRITERIA

### Acceptance Criteria

4.2.1

Acceptance criteria are generally included in the code or specification which establishes the required examination. Such specified criteria shall be used to determine the specific type, size and location of observed discontinuities.

When acceptance criteria is not specified in the documentation establishing the requirement for the examination, the following relevant indications are unacceptable. Only indications with major dimensions greater than 1/16 inch shall be considered relevant.

#### a) Wrought, Forged or Welded Items:

1. Any crack or linear indication
2. Rounded indications with dimensions greater than 1/8 inch for thickness less than 5/8 inch and greater than 3/16 inch for thickness of 5/8 inch and greater.
3. Four or more indications in line separated by 1/16 inch or less edge to edge.
4. Ten or more indications in any 6 square inches of area whose major dimension is no more than 6 inches with the dimensions taken in the most unfavorable location relative to the indications being evaluated.

#### b) Bolts and Bolting Material Greater than 1 inch Normal Size

1. Any linear nonaxial indications.
2. Linear axial indications greater than 1 inch.

TASK DESCRIPTION NO. QR-10-02-311A

COMPONENT REVALIDATION CHECKLIST

COMPONENT Crankcase-Crankcase Assv DOCUMENT NO QR-1

PART NUMBER 02-311A SCHEDULED FOR COMPLETION                     

SNPS PART NUMBER 99-311A

TASK DESCRIPTION:

- 1) Verify material based on foundary records.
- 2) Visually inspect machines surfaces in nut procket area.

ATTRIBUTE TO BE VERIFIED: 1) Crankcase material composition & strength  
 2) No sharp discontinuities between machine surfaces and casting.

ACCEPTANCE CRITERIA: 1) Submit records to design group.  
 2) Smooth radii between machine/as-cast surfaces.

REFERENCES: Foundary records.

DOCUMENTATION REQUIRED: Visual inspection report-Crankcase material records.

GROUP CHAIRPERSON *R. J. Mays* PROGRAM MANAGER *John C. K...*

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)  
 Material is satisfactory. No machined surfaces on these components.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_



STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-311A
NO. D. G. INSP. - 34	Rev 1
	Eng 0

**TITLE** Crankcase Assembly

Item No	ALLCI.	Ho   d / not   oinl .	Reference	Description/Instructions
1*				<p><u>INSPECTION:</u></p> <ul style="list-style-type: none"> <li>Visually inspect machined surfaces in the nut pocket area of the casting archs for sharp changes in surface configuration.</li> </ul> <p><u>ACCEPTANCE CRITERIA</u></p> <ul style="list-style-type: none"> <li>Smooth radii at any machined surface inner corners.</li> </ul>

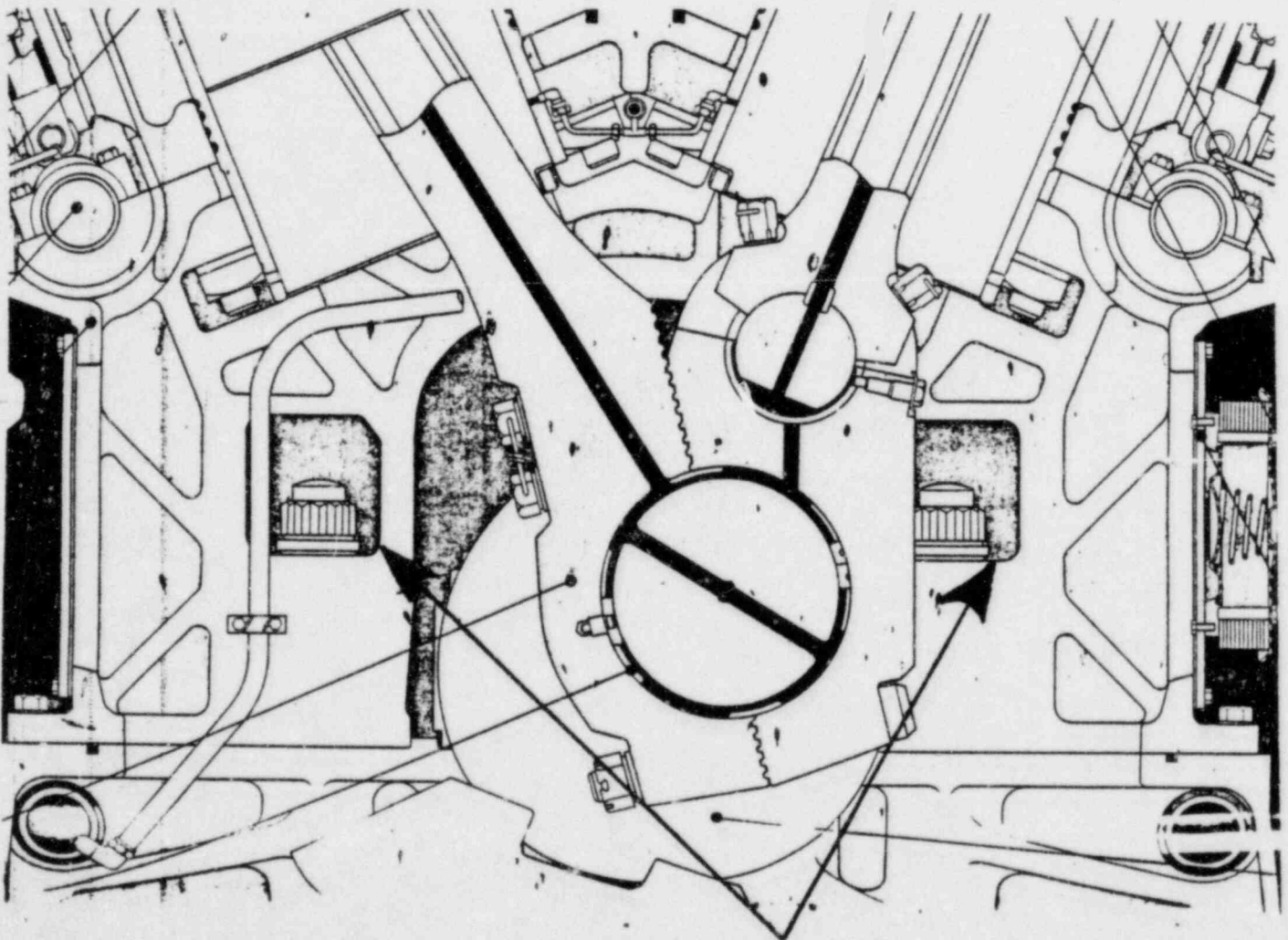
\* Rev. 1 - Clarification

Quality Control Insp./Engr. N/A	Date
------------------------------------	------

# COMPONENT CONDITION REPORT

P. NO.	ITEM NO.	COMPONENT NO./DESCRIPTION
IR. NO.	IR ITEM NO.	TYPE OF INSPECTION

- \* Document by words or sketches the inspection performed.
- \* Show location of measurements/conditions applicable.



NUT POCKET  
AREA

PERFORMED BY \_\_\_\_\_

DATE \_\_\_\_\_

QC VERIFIED \_\_\_\_\_

DATE \_\_\_\_\_

COMPONENT REVALIDATION CHECKLIST

COMPONENT Cylinder Block DOCUMENT NO QR-1

PART NUMBER 02-315A SCHEDULED FOR COMPLETION 11

SNPS PART NUMBER 03-315A

TASK DESCRIPTION:

SEE PAGE 2

ATTRIBUTE TO BE VERIFIED: SEE PAGE 2

ACCEPTANCE CRITERIA: SEE PAGE 2

REFERENCES: SEE PAGE 2

DOCUMENTATION REQUIRED: SEE PAGE 2

GROUP CHAIRPERSON *D.J. Majors* PROGRAM MANAGER *J. L. C. Lewis*

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

LP inspections showed indications at cylinders 4R, 5R, and 6L. Eddy-Current showed GL is satisfactory; 4R and 5R are still under evaluation by the Owners' Group. Conditional release for DG reassembly and testing obtained based on O.G. recommendation. Final disposition recommendation to be obtained from Owners' Group and implemented prior to fuel load.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_

TASK DESCRIPTION:

1. Assemble and review existing documentation.
2. Develop inspection plan for area of concern around cyl. liner, including liner landing dimensional check.
3. Perform LP Insp. of Cyl. Blk. Liner landing along top landing surface, fillet radius, and vertical face adjacent to landing surface. Inspect ~~four liner landings~~ (with liners removed). If linear indication found, increase inspection plan to 100%.
4. LP inspection of engine block top, cylinder head mating surface. Inspection to include area adjacent to stud holes and between adjacent cylinder heads. Inspection plan to ~~include~~ cylinders ~~4L, 5L, 6L or 4R, 5R and 6R~~. Increase to 100% if linear indications found.
5. Perform Eddy-Current exam. of cylinder head stud holes, if required. i.e. linear indications found ~~at stud hole~~.  
INTO THREADS

ATTRIBUTE TO BE VERIFIED:

1. Quality Status of component document package.
2. Establish dimensional data similar to data requested on attached sketch.
- 3&4 LP inspection of cylinder block & liner landing.
5. Eddy-Current inspection of cylinder head stud holes, if linear indications found near bolt stud holes.

ACCEPTANCE CRITERIA:

1. Satisfactory component package.
2. Submit dimensional data for Design Group review.
- 3&4 Review of documentation and test results by design group.
5. Recording criteria in accordance with FaAA Procedure NDE 11.8.

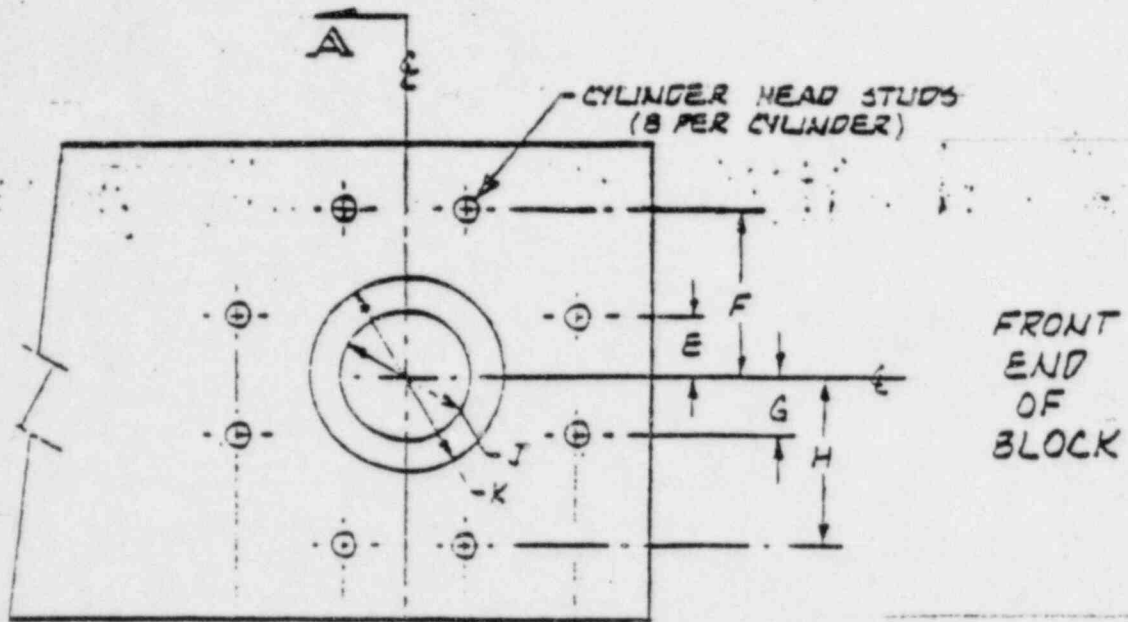
REFERENCES:

TDI Drawing

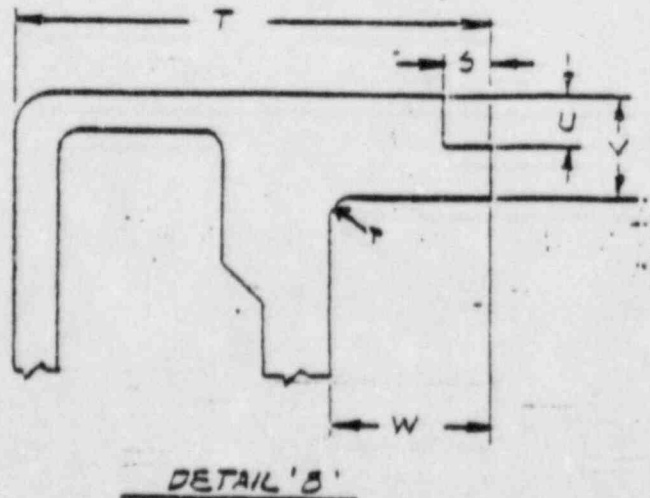
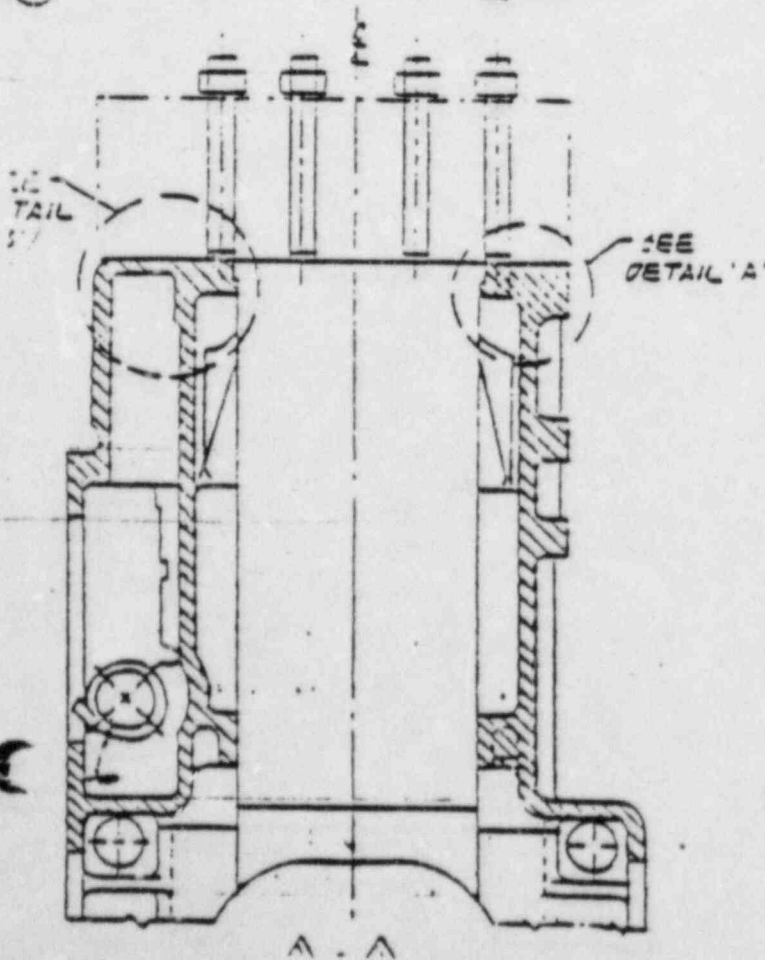
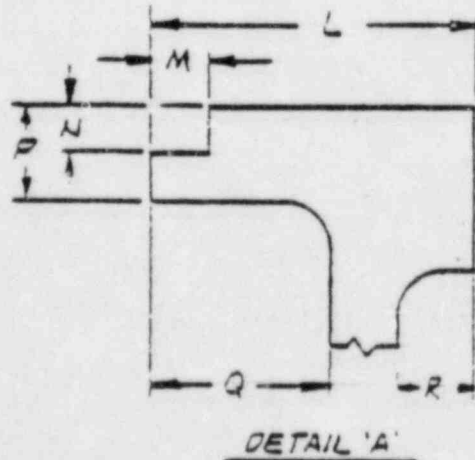
DOCUMENTATION REQUIRED:

1. Document Summary Sheet
2. Inspection Report
- 3&4 Test report & review
5. Test report & review (if applicable)

CYLINDER BLOCK



(TYPICAL FOR  
8 CYLINDERS)



STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-315A	Rev	Chg
NO. D. G. INSP. - 21		1	0

**TITLE** Cylinder Block

Item No	Attri.	Hold/Notif/Point	Reference	Description/Instructions
1.				<p><u>INSPECTION:</u></p> <ul style="list-style-type: none"> <li>Perform as built dimensions for all cylinder block linear landings as shown on attached sketch. (Locations, J, K, M, N, S &amp; U).</li> <li>Perform specified LP inspections of cylinder blocks liner landing along top landing surface, fillet radius and vertical face adjacent to landing surface.</li> <li>Perform specified MT inspection of blocks, cylinder head mating surface, area between stud hole and liner, and between adjacent cylinder head stud holes. 100% inspection.</li> <li>Perform an eddy-current inspection of cylinder head stud holes as required, i.e., linear indications found at stud holes, extending into therads.</li> </ul>
2a				
2b*				
3.				

\* M.T. was performed per UGCO direction, in lieu of PT (See I.P. 21, Rev. 0)

Quality Control Insp./ENG  
N/A

DATE

## ACCEPTANCE CRITERIA

### Acceptance Criteria

4.2.1

Acceptance criteria are generally included in the code or specification which establishes the required examination. Such specified criteria shall be used to determine the specific type, size and location of observed discontinuities.

When acceptance criteria is not specified in the documentation establishing the requirement for the examination, the following relevant indications are unacceptable. Only indications with major dimensions greater than 1/16 inch shall be considered relevant.

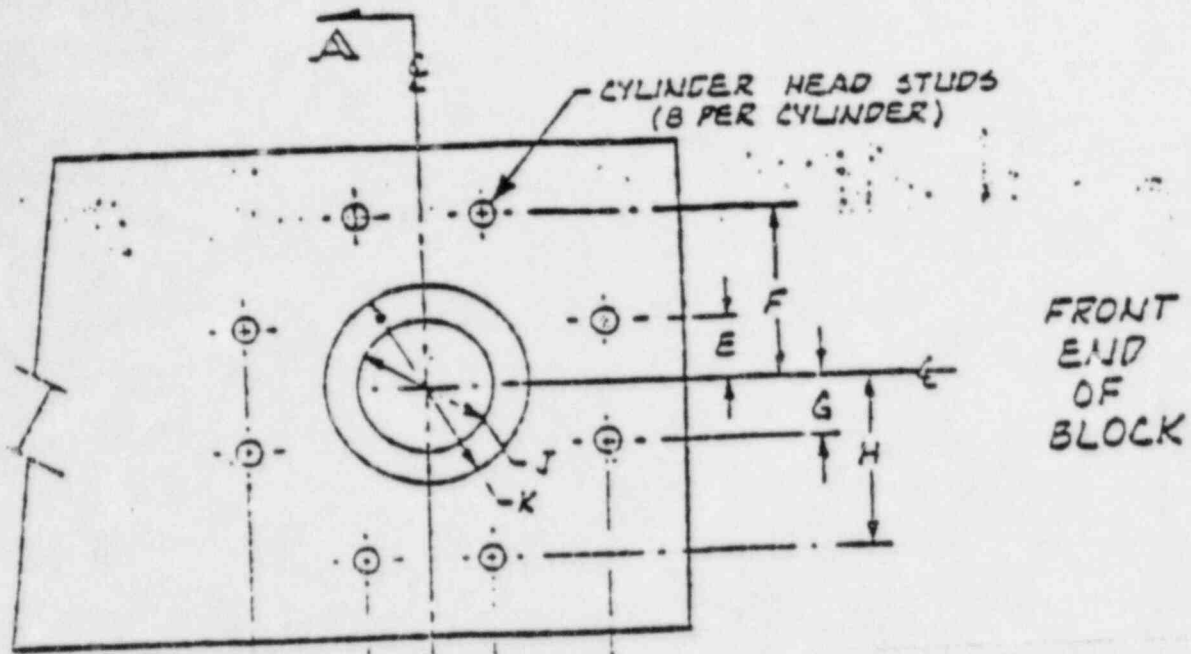
#### a) Wrought, Forged or Welded Items;

1. Any crack or linear indication
2. Rounded indications with dimensions greater than 1/8 inch for thickness less than 5/8 inch and greater than 3/16 inch for thickness of 5/8 inch and greater.
3. Four or more indications in line separated by 1/16 inch or less edge to edge.
4. Ten or more indications in any 6 square inches of area whose major dimension is no more than 6 inches with the dimensions taken in the most unfavorable location relative to the indications being evaluated..

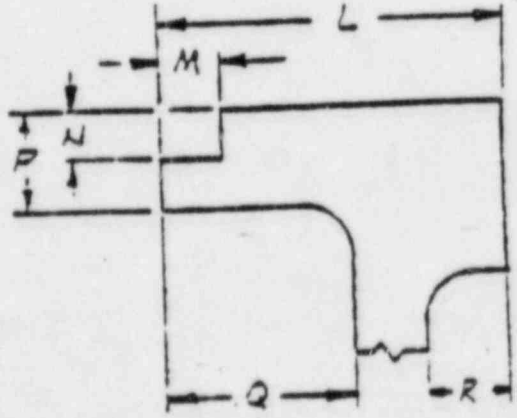
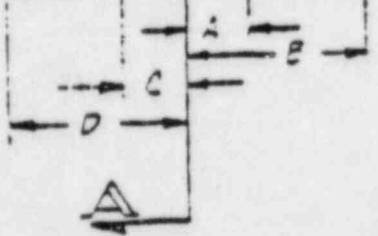
#### b) Bolts and Bolting Material Greater than 1 inch Normal Size

1. Any linear nonaxial indications.
2. Linear axial indications greater than 1 inch.

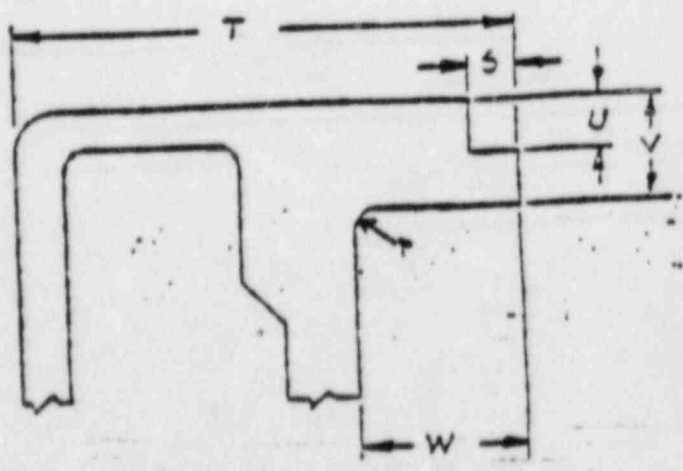
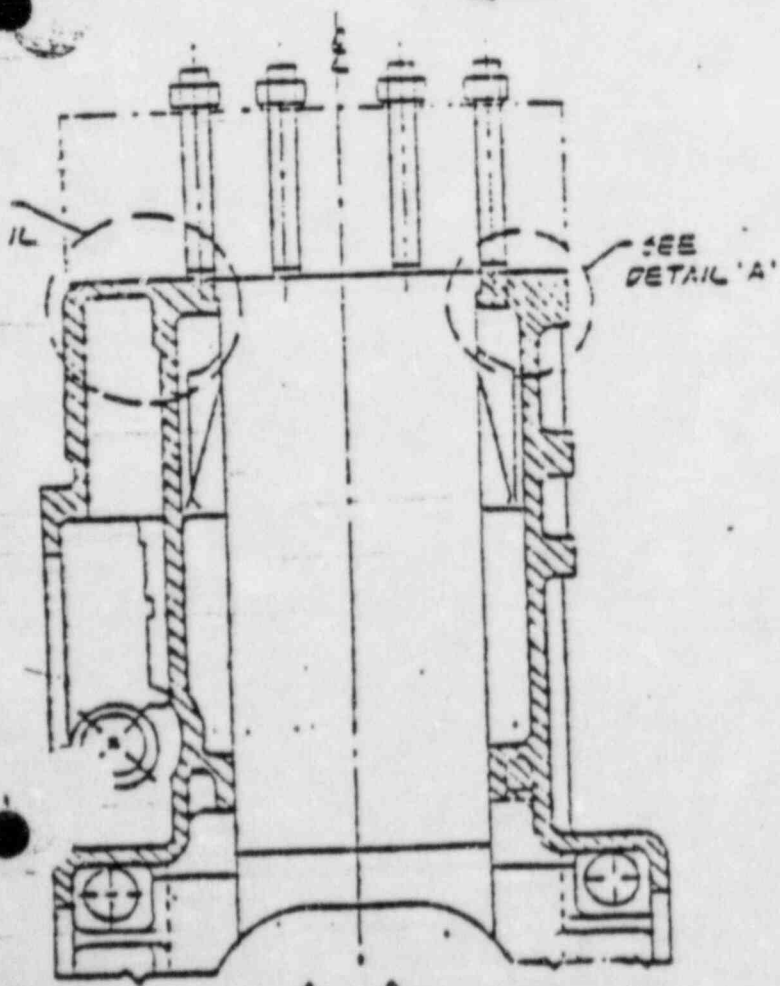
CYLINDER BLOCK



(TYPICAL FOR B CYLINDERS)



DETAIL 'A'



DETAIL 'B'

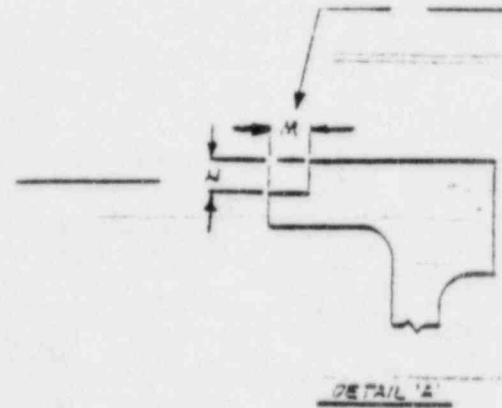
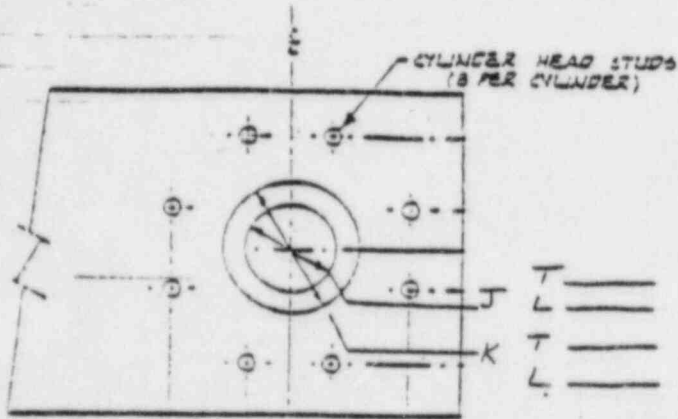


# COMPONENT CONDITION REPORT

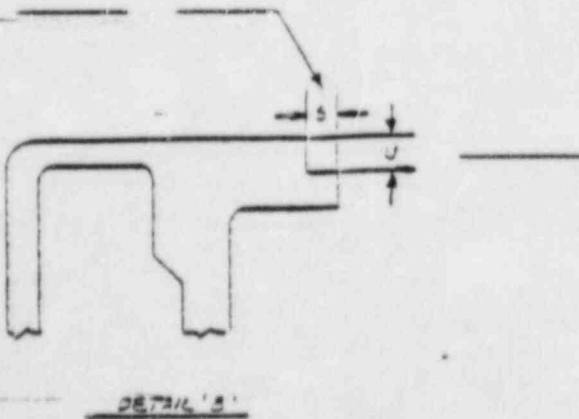
I.P. NO.	ITEM NO.	COMPONENT NO./DESCRIPTION
NO.	IR ITEM NO.	TYPE OF INSPECTION

- \* Document by words or sketches the inspection performed.
- \* Show location of measurements/conditions applicable.

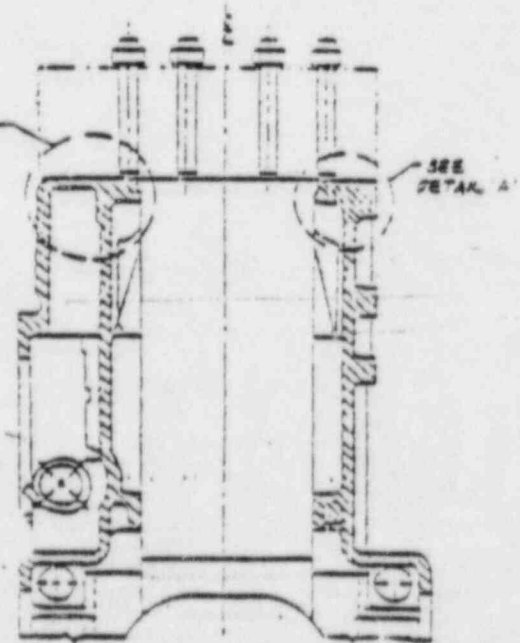
CYLINDER BLOCK



SEE FIG. 1 FOR  
8 CYLINDERS



SEE  
DETAIL 'B'



PERFORMED BY \_\_\_\_\_

DATE \_\_\_\_\_

QC VERIFIED \_\_\_\_\_

DATE \_\_\_\_\_

COMPONENT REVALIDATION CHECKLIST

COMPONENT Cylinder Liner DOCUMENT NO. QR-1  
PART NUMBER 02-315C SCHEDULED FOR COMPLETION \_\_\_\_\_  
SNPS PART NUMBER 03-315C

TASK DESCRIPTION:

- 1) Assemble and review existing documentation
- 2) Verify dimensions including bore, length, height, O.D. and shoulder height. Perform visual inspection of outside pilot Dia. at top where it contacts cylinder block. Look for indications of contact spalling. Visually inspect piston liner over zone or piston travel. Look for indications of scuffing, scoring. 100% sample plan. Document all inspections with photographs.
- 3) Develop inspection plan to verify material properties.

ATTRIBUTE TO BE VERIFIED: SEE PAGE 2

ACCEPTANCE CRITERIA: SEE PAGE 2

REFERENCES: SEE PAGE 2

DOCUMENTATION REQUIRED: SEE PAGE 2

GROUP CHAIRPERSON R. Majumdar

PROGRAM MANAGER John L. C. K. Searns

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

Liner No. 8R was replaced because of a visible casting flaw on the outside diameter. All other cylinders are satisfactory and were machined to conform with the latest TDI cylinder-head product improvement recommendation.

GROUP CHAIRPERSON \_\_\_\_\_

PROGRAM MANAGER \_\_\_\_\_

ATTRIBUTES TO BE VERIFIED:

1. Quality status of component document package and vendor quality rating.
2. Verify dimensions including bore, length, height, O.D. and shoulder height. Perform visual inspection of outside pilot Dia. at top where it contacts cylinder block. Look for indications of contact spalling. Visually inspect piston liner over zone or piston travel. Look for indications of scuffing, scoring. Document all inspections with photographs.
3. Verify material chemistry and properties.

ACCEPTANCE CRITERIA:

1. Satisfactory component package.
- 2a. Liner bore should be within tolerances specified in TDI Instruction Manual.
- 2b. Design Group shall determine acceptable tolerances of other measured dimensions and visual inspections.
3. Design Group shall determine acceptance criterium for material chemistry and properties.
4. Review of inspection results by Design Group.

REFERENCES:

1. TDI Instruction Manual - Sections 5-D & 6-D, Appendix III.

DOCUMENTATION REQUIRED:

1. Document Summary Sheet.
- 2a. Report for acceptable liner bore dimensions.
- 2b. Provide visual inspection report and measured dimensions, as shown on inspection report, to design group for review and acceptability.
3. Perform physical and mechanical properties tests such as chemistry, yield, ultimate tensile stress, elongation, hardness, and metallographic determination of praphite type or percent nodularity at inner surface. Material is reported to be nodular iron. Design Group to review for acceptability.
4. One section of 12" x 12" will be cut from an undamaged center portion of a scrap cylinder liner. This 12" x 12" section shall be used to perform tests required by Item 3 above.

5. NOTE: Upon completion of Items 2 through 4 above, the data shall be submitted to the Design Group for their review and comment.

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-315C
NO. D. G. Insp. - 24	Rev 3 Eng 0

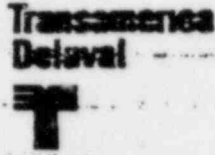
**TITLE** CYLINDER LINER

Item No	ALLI.	Ho not oint	Reference	Description/Instructions
1			Mfr.'s Instr. Manual	<u>INSPECTION:</u> Verify dimensions including bore ( diameter) length, height ID and shoulder height. 100% Inspection.
2			Mfr.'s Instr. Manual	<u>INSPECTION:</u> Perform visual insection of outside pilot diameter where it contacts the cylinder block. Look for indacations of contact, spalling, polishing or erosion. 100% inspection
3			Mfr.'s Instr. Manual	<u>INSPECTION:</u> Visual inspect liner over zone of piston travel. Look for indications of scuffing/scoring. 100% inspection.
4				<u>INSPECTION:</u> Document visual inspections with photographs.
5*				<u>INSPECTION:</u> Verify one section of 12" x 12" cylinder liner was cut and sent to Failure Analysis Associates.
6*				<u>INSPECTION:</u> Verify liners have been modified in accordance with the attached letter.

\*I.P. 24, Rev. 0 required comparator test. Comparator test was deleted when a spare liner became available for destructive testing.

\*I.P. 24, Rev. 2 This is a modification verification at T...

84 04/11 18:50 PO1 \*4155 TDI ENG/COMPRES/OAK



Transamerica Delaval Inc.  
Engine and Compressor Division  
560 63rd Avenue  
P.O. Box 2181  
Oakland, California 94621  
(415) 577-7400

TELECOPY PHONE NUMBER: (415) 577-7535

TO VERIFY, CALL: (415) 577-7530

TELECOPY MESSAGE

DATE April 11, 1984

TO: Texas Utilities Generating Co.  
Melanie Lange

FROM: Lee Duck  
TDI - Oakland

DEPT: # 93

NUMBER OF PAGES ATTACHED TO THIS COVER SHEET: 2

IF YOU HAVE COMMENTS OR QUESTIONS REGARDING THIS TRANSMITTAL, PLEASE  
CONTACT THE VERIFYING NUMBER LISTED ABOVE, OR DIRECTLY CONTACT THE PERSON  
WHO SENT IT. THANK YOU.

84 04/11 18:50 P02 \*4155 TDI ENG/COMPRES/OAK

Transamerica  
Delaval



Transamerica Delaval Inc.  
Engine and Compressor Division  
550 85th Avenue  
P.O. Box 2161  
Oakland, California 94621  
(415) 577-7400

TELECOPY

April 11, 1984

Texas Utilities Generating Company  
P.O. Box 1002  
Glen Rose, Texas 76043

Attention: Melanie Lange

Subject: Comanche Peak Station  
Diesel Generator Unit S/N 76001  
P.O. CP-0034

Reference: Your telecopy dated April 9, 1984.

As previously discussed with Mr. George Mattiuzzi and in our phone conversation, TDI has since modified the cylinder head studs and most recently the cylinder liners to help reduce stress in the stud bore and liner landing areas respectively. Our earlier telecon included your desire to incorporate any related improvements concerning this subject.

In response to your concern of the height of the liner ledge vs. block land, we have no proven data to indicate that liner proudness of up to .008 inch will cause cracks in the liner land area of the block, however, our current standard for production engines is 0 to .003 inch.

In addition, we have determined by strain gauge testing and field experience that a reduction in the upper liner ledge diameter of .005 inch will also help reduce stress. This improvement has resulted in a reduction in the ledge diameter from 19.499/19.501 to 19.494/19.496 inches. In conjunction with this diameter reduction the first step just below the ledge has also been reduced from 18.995/18.997 inches to 18.990/18.992 inches.

Please do not misinterpret these modifications to be a requirement, as TDI has many installations of engines with thousands of operating hours without these improvements, however, since the diesel engine is currently conveniently disassembled, we suggest you consider

84 04/11 18:50 P03 \*4155 IDL ENG/COMPRES/DAK

Transamerica  
Delaval



April 11, 1984  
Texas Utilities Generating Company  
Page 2

incorporating these improvements while it remains cost effective for  
the Utility to do so.

If this office can be of further assistance, please do not hesitate  
to contact us.

Very truly yours,

A handwritten signature in cursive script, appearing to read 'Lee Duck'. The signature is written in dark ink and is positioned above the typed name.

Lee Duck  
Engineer, Customer Service

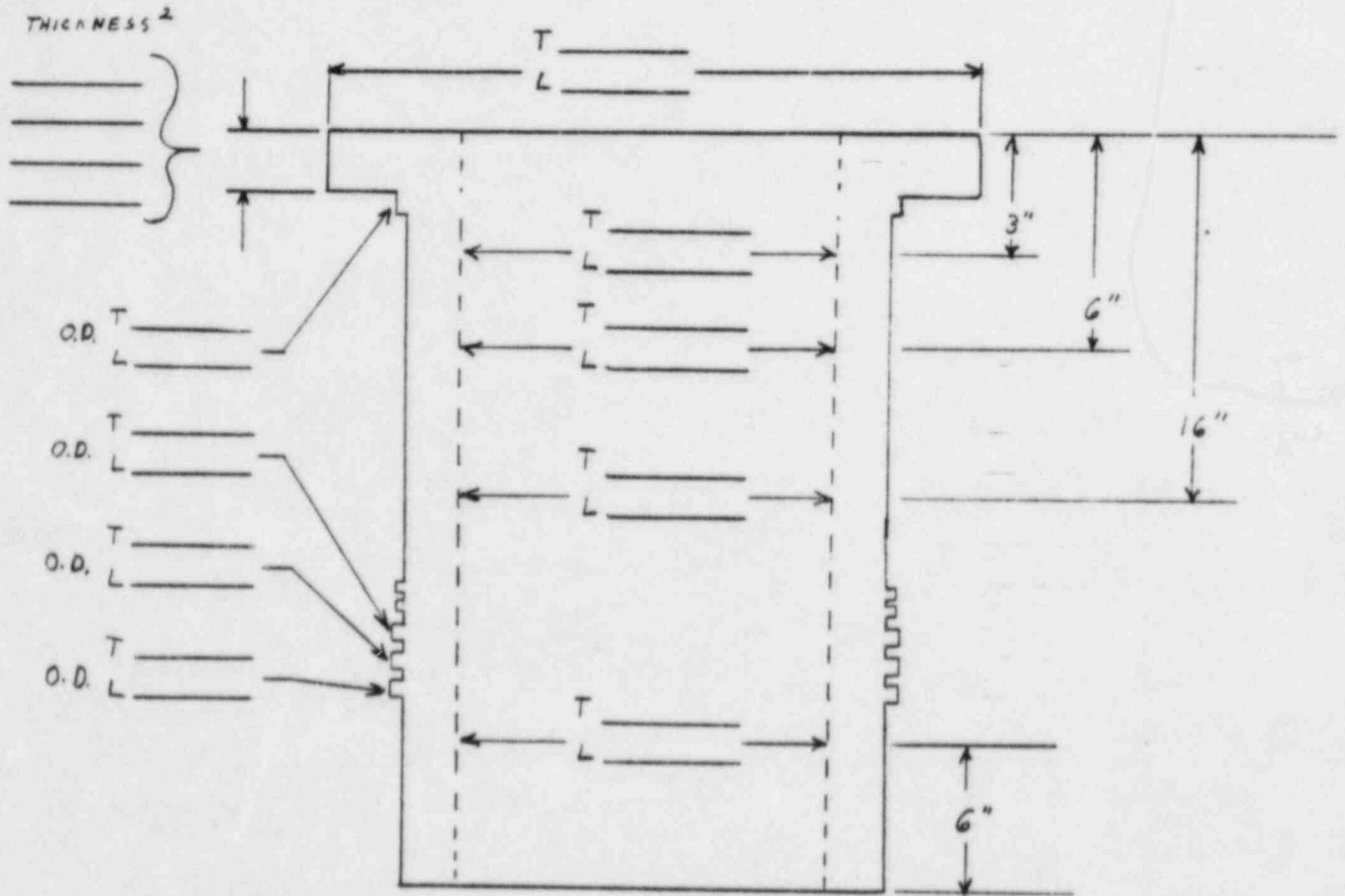
LD/tg

cc: C. Wright - Houston  
C. Bentom - Dallas

# COMPONENT CONDITION REPORT

I.P. NO.	ITEM NO.	COMPONENT NO./DESCRIPTION
IR. NO.	IR ITEM NO.	TYPE OF INSPECTION

- \* Document by words or sketches the inspection performed.
- \* Show location of measurements/conditions applicable.



- NOTES:**
1. TAKE ALL DIAMETER MEASUREMENTS TRANSVERSE (T) AND LONGITUDINAL (L) TO THE ENGINE CENTERLINE
  2. THICKNESS MEASUREMENT TO BE TAKEN FOUR PLACES, 90° APART

PERFORMED BY	DATE
QC VERIFIED	DATE



COMPONENT REVALIDATION CHECKLIST

COMPONENT Cylinder Block Studs DOCUMENT NO QR-1

PART NUMBER 02-315E SCHEDULED FOR COMPLETION \_\_\_\_\_

SNPS PART NUMBER 03-315E

TASK DESCRIPTION:

Perform visual inspection of head studs for signs of distress, 4 cylinder. Record all visible ID numbers. Perform material comparator test on 4 studs per engine. Perform superficial hardness test on one stud per engine. Verify installation torque with existing documentation.

ATTRIBUTE TO BE VERIFIED: Visual inspection of head studs & material comparator test and superficial hardness test.

ACCEPTANCE CRITERIA: Review of documentation & inspection results

REFERENCES: TDI Drawing

DOCUMENTATION REQUIRED: Inspection Report

GROUP CHAIRPERSON RJ Majors PROGRAM MANAGER [Signature]

COMPONENT REVIEW:  
PROJECT IMPROVEMENT

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)  
All studs are satisfactory, but have been replaced with improved (necked) studs from TDI.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-315E	Rev	Chg
NO. U. G. INSP. - 17		1	

**TITLE** Cylinder Block Studs

Item No	Attri.	Ho t p o i n t	Reference	Description/Instructions
1*				
2				<p><u>INSPECTION:</u></p> <ul style="list-style-type: none"> <li>A comparator test is to be performed utilizing a known std. or verifying the availability of a spare or discard which may be comparator tested and sent out for destructive testing at a later date (on four old studs per engine).</li> </ul>
3				<ul style="list-style-type: none"> <li>Perform a superficial hardness test on one old stud per engine.</li> </ul>

\* Item 1 was deleted by Tugco because the new modified studs were purchased from TDI.

COMPONENT REVALIDATION CHECKLIST

COMPONENT Cyl. Blk. Liner & Water Manifold-Nuts DOCUMENT NO QR-1

PART NUMBER 02-315F SCHEDULED FOR COMPLETION 11

SNPS PART NUMBER 03-315F

- TASK DESCRIPTION:
- 1) Assemble & review existing documentation
  - 2) Visual exam of all nuts for identifying marks
  - 3) Verify proper installation & torquing of nuts
  - 4) Visual inspection, sample basis, for forging laps

SEE PAGE 2

ATTRIBUTE TO BE VERIFIED:

SEE PAGE 2

ACCEPTANCE CRITERIA:

SEE PAGE 2

REFERENCES:

SEE PAGE 2

DOCUMENTATION REQUIRED:

GROUP CHAIRPERSON R. J. Mayhew PROGRAM MANAGER Glen Lee C. L. Lane

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

All nuts are satisfactory, some do not have identifying marks.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_

ATTRIBUTE TO BE VERIFIED:

- 1) Quality status of vendor component package quality rating.
- 2) Identifying marking.
- 3) Verify proper installation and torquing of nuts.
- 4) Visual inspection to insure nuts are free from forging laps.

ACCEPTANCE CRITERIA:

- 1) Satisfactory component package
- 2) Record all nut markings.
- 3) Torque values of nuts in compliance with TDI manual.
- 4) Nuts to be free from forging laps.

REFERENCES

TDI Instruction Manual

DOCUMENTATION REQUIRED:

- 1) Document summary sheet
- 2) Inspection report on of nuts for review by design group.
- 3) Report for verification of nuts being properly installed and torqued.

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

**TITLE** Cylinder Block Liner & Manifold Nuts

Job Number 11600.63	No. 02-315F
NO. D.G. INSP. - 32	rev   Chg 1   0

Item No	Attri.	Hold Point	Reference	Description/Instructions
1			TDI Instruction Manual	<p><u>INSTALLATION &amp; TORQUING</u></p> <ul style="list-style-type: none"> <li>. Verify proper installation and torquing of nuts. Torque values of nuts to be in compliance with TDI Manual.</li> <li>. Perform L.P. inspection on all nuts for forging laps.</li> <li>. Perform a visual examination of all nuts for identification markings.</li> </ul> <p>Record all markings.</p> <p><u>ACCEPTANCE CRITERIA</u></p> <ul style="list-style-type: none"> <li>* . Forging lap indications which continue less than 1/32" onto the machined end surfaces are acceptable.</li> </ul> <p>* This was added as a clarification to the acceptance criteria of Rev. 0.</p>
2.				
3.				

Quality Control Insp./Engr. | Date

## ACCEPTANCE CRITERIA

### Acceptance Criteria

4.2.1

Acceptance criteria are generally included in the code or specification which establishes the required examination. Such specified criteria shall be used to determine the specific type, size and location of observed discontinuities.

When acceptance criteria is not specified in the documentation establishing the requirement for the examination, the following relevant indications are unacceptable. Only indications with major dimensions greater than 1/16 inch shall be considered relevant.

#### a) Wrought, Forged or Welded Items:

1. Any crack or linear indication
2. Rounded indications with dimensions greater than 1/8 inch for thickness less than 5/8 inch and greater than 3/16 inch for thickness of 5/8 inch and greater.
3. Four or more indications in line separated by 1/16 inch or less edge to edge.
4. Ten or more indications in any 6 square inches of area whose major dimension is no more than 6 inches with the dimensions taken in the most unfavorable location relative to the indications being evaluated..

#### b) Bolts and Bolting Material Greater than 1 inch Normal Size

1. Any linear nonaxial indications.
2. Linear axial indications greater than 1 inch.

COMPONENT REVALIDATION CHECKLIST

COMPONENT Flywheel Bolting DOCUMENT NO QR-1

PART NUMBER 02-330B SCHEDULED FOR COMPLETION \_\_\_\_\_

SNPS PART NUMBER 03-330B

TASK DESCRIPTION: Assemble existing documentation on flywheel bolting and verify that the torque loads applied meet the latest specified requirements.

ATTRIBUTE TO BE VERIFIED: SEE PAGE 2

ACCEPTANCE CRITERIA: SEE PAGE 2

REFERENCES: TDI INSTRUCTION MANUAL

DOCUMENTATION REQUIRED: SEE PAGE 2

GROUP CHAIRPERSON [Signature] PROGRAM MANAGER [Signature]

COMPONENT REVIEW: \_\_\_\_\_

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

All bolts are satisfactory.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_

ATTRIBUTE TO BE VERIFIED:

- 1) Quality status of vendor component package and vendor quality rating.
- 2) Verify torque loads applied meet latest requirements.

ACCEPTANCE CRITERIA:

- 1) Satisfactory component package.
- 2) Verification that the flywheel bolts are tightened to the value given in accordance to TDI's specifications.

DOCUMENTATION REQUIRED:

- 1) Document Summary Sheet
- 2) Report for verification of proper torques used in tightening flywheel bolts.

CL



L. GENERATOR QUALITY REVALIDATION PROGRAM  
 COMMANCHE PEAK

Sheet 1 of 1

STONE & WEBSTER ENGINEERING CORPORATION

Job Number 1600.63	No. 02-330B	Rev	Chg
NO. G. INSP - 43		0	0

# QUALITY ASSURANCE-INSPECTION PLAN

**TITLE** Flywheel Bolting

Item No	Attri.	Hold/Notif Point	Reference	Description/Instructions
1			TDI Instruction Manual	<u>INSPECTION:</u> . Verify torque loads meet latest requirement.

Quality Control Insp./Engr. N/A	Date
------------------------------------	------

COMPONENT REVALIDATION CHECKLIST

COMPONENT Front Gear Case  
Gaskets and Bolting DOCUMENT NO QR-1

PART NUMBER 02-335B SCHEDULED FOR COMPLETION. 11

SNPS PART NUMBER 03-335B

TASK DESCRIPTION: 1) Assemble & review existing documentation  
2) Verify bolting installations (visual) where accessible.

ATTRIBUTE TO BE VERIFIED: 1) Quality status of vendor component package & vendor quality rating.  
2) Verify front gear case bolt are installed properly.

ACCEPTANCE CRITERIA: 1) Satisfactory component package  
2) Visual inspection of front gear bolts per applicable assembly drawing.

REFERENCES: TDI Instruction manual and gear case parts list

DOCUMENTATION REQUIRED: 1) Document summary sheet  
2) Satisfactory report of proper bolt installations.

GROUP CHAIRPERSON R. J. Mayers PROGRAM MANAGER J. P. ... C. K. ...

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

All bolts and gaskets are satisfactory.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_

STONE & WEBSTER ENGINEERING CORPORATION

Job Number 11600.63	No. 02-335B
NO. DG INSP - 8	Rev Chg 0 0

# QUALITY ASSURANCE-INSPECTION PLAN

**TITLE** Front Gear Case - Gaskets and Bolting

Item No	Attri.	Hold/Notif. Point	Reference	Description/Instructions
1			TDI Parts List & Instruction Manual 03-335	Perform visual inspection of front gear case bolts per applicable assembly drawing (where accessible).

Quality Control Insp./Engr. N/A	Date
------------------------------------	------



TASK DESCRIPTION:

- 1) Assemble and review existing documentation.
- 2) Perform material comparator test on connecting rod and bushing cylinders. Perform superficial hardness test on connecting rods and bushing. Perform material comparator and superficial hardness tests on spares if available. Sample basis.
- 3) Eddy current inspection for female threads in rod box, one engine, 100% inspection.
- 4) MT inspection of conn rod bolts one engine, 100% inspection.
- 5) Visual inspection of conn rod bolt washers and contact surfaces for galling, 100% inspection.
- 6) Verify bolt torque on reassembly 100%. Latest TDI recommended value.
- 7) LP Conn rod box external surfaces in area between conn rod bore and link rod bore (sample basis). ? 100 %
- 8) LP link rod bushing (sample basis). ? 100 %

ACCEPTANCE CRITERIA:

- 1) Quality status of vendor component package.
- 2) To be determined by design group.
- 3) Recording criteria per FaAA Eddy current procedure.
- 4) No relevant linear indications.
- 5) No galling on washers AND CONTACT SURFACES
- 6) Verify at installation.
- 7) 8) See attached sheet.

REFERENCES

- 1) TDI Manual
- 2) Approved Inspection Procedures

DOCUMENTATION REQUIRED:

- 1) Summary Sheet
- 2) Inspection report.
- 3) Photograph any non conforming conditions for review by design group.

LIQUID PENETRANT ACCEPTANCE CRITERIA

4.2

Acceptance Criteria

4.2.1

Acceptance criteria are generally included in the code or specification which establishes the required examination. Such specified criteria shall be used to determine the specific type, size and location of observed discontinuities.

When acceptance criteria is not specified in the documentation establishing the requirement for the examination, the following relevant indications are unacceptable. Only indications with major dimensions greater than 1/16 inch shall be considered relevant.

a) Wrought, Forged or Welded Items:

- 1. Any crack or linear indication
- 2. Rounded indications with dimensions greater than 1/8 inch for thickness less than 5/8 inch and greater than 3/16 inch for thickness of 5/8 inch and greater.
- 3. Four or more indications in line separated by 1/16 inch or less edge to edge.
- 4. Ten or more indications in any 6 square inches of area whose major dimension is no more than 6 inches with the dimensions taken in the most unfavorable location relative to the indications being evaluated.

B) Bolts and Boltng Material Greater than 1 inch Normal Size

- 1. Any linear nonaxial indications.
- 2. Linear axial indications greater than 1 inch.

DIESI

KATOR QUALITY REVALIDATION PROGRAM  
COMANCHE PEAK

Sheet 1 of 2

STONE &amp; WEBSTER ENGINEERING CORPORATION

## QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-340A		
NO. D.C. INSP. - 44		Rev 2	Chg 0

TITLE CONNECTING RODS AND BUSHINGS

Item No	ALTY.	Hof/Total	Reference	Description/Instructions
1				<p><u>INSPECTION:</u></p> <p>NOTE: See Attachment 1 for assembly drawing.</p> <p>NOTE: A comparator test is to be performed utilizing a known std. or verifying the availability of a spare or discard which may be comparator tested and sent out for destructive testing at a later date. (Inspect 4)</p> <p>Perform material comparator test on the following:</p> <ul style="list-style-type: none"> <li>a. Master Rod</li> <li>b. Link Rod</li> <li>c. Rod Box</li> <li>d. Connecting Rod Bushings</li> <li>e. Rod Box Bushing</li> <li>f. Link Rod Pin</li> <li>g. Spares, if available</li> </ul>
2				<p>Perform a superficial hardness test on the following:</p> <ul style="list-style-type: none"> <li>a. Master Rod</li> <li>b. Link Rod</li> <li>c. Rod Box</li> <li>d. Connecting Rod Bushings</li> <li>e. Rod Box Bushing</li> <li>f. Link Rod Pin</li> <li>g. Spares, if available</li> </ul>
3				<p>Perform Eddy Current Inspection of female threads in Rod Box, one engine - 100%.</p>
4				<p>Perform MT Inspection of the following:</p> <ul style="list-style-type: none"> <li>a. Link rod to link rod pin bolts</li> <li>b. Con. rod bolts</li> <li>c. Con rod studs</li> </ul> <p>One engine - 100% <span style="float: right;">* See Rev. 2 Acceptance Criteria</span></p>

Quality Control Insp./Engr. Date  
N/A

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-340A	Rev 2	Chg 0
NO. D. G. Insp. - 44			

**TITLE** CONNECTING RODS AND BUSHINGS

Item No	Alt.	No. of Total	Reference	Description/Instructions
5				<p>Visual Inspect the following for galling:</p> <ul style="list-style-type: none"> <li>a. Link rod to link rod pin bolts, all contact surfaces</li> <li>b. Con. rod bolts (including washers), all contact surfaces</li> <li>c. Con. rod studs (including washers), all contact surfaces</li> </ul> <p>One engine - 100%</p>
6			Mfrs Instruction Manual	Verify bolt torque at reassembly - 100% - to the latest TDI recommended value.
7				<p>Perform 100% LP Inspection on the following: (See Attachment 2 for clarification)</p> <ul style="list-style-type: none"> <li>a. Con. rod box external surfaces in area between crank pin bore and link rod pin bore</li> <li>b. ID of rod box bushing</li> <li>c. ID of con. rod bushings</li> <li>d. Rack area on master and link rod</li> <li>e. OD and ID of 4 spare rod box bushings, if available</li> <li>f. OD and ID of 4 spare con. rod bushings, if available</li> </ul>
8				Photograph all non-conforming conditions for review by the Design Group

Quality Control Insp./Engr. N/A Date



## ACCEPTANCE CRITERIA

### Acceptance Criteria

4.2.1

Acceptance criteria are generally included in the code or specification which establishes the required examination. Such specified criteria shall be used to determine the specific type, size and location of observed discontinuities.

When acceptance criteria is not specified in the documentation establishing the requirement for the examination, the following relevant indications are unacceptable. Only indications with major dimensions greater than 1/16 inch shall be considered relevant.

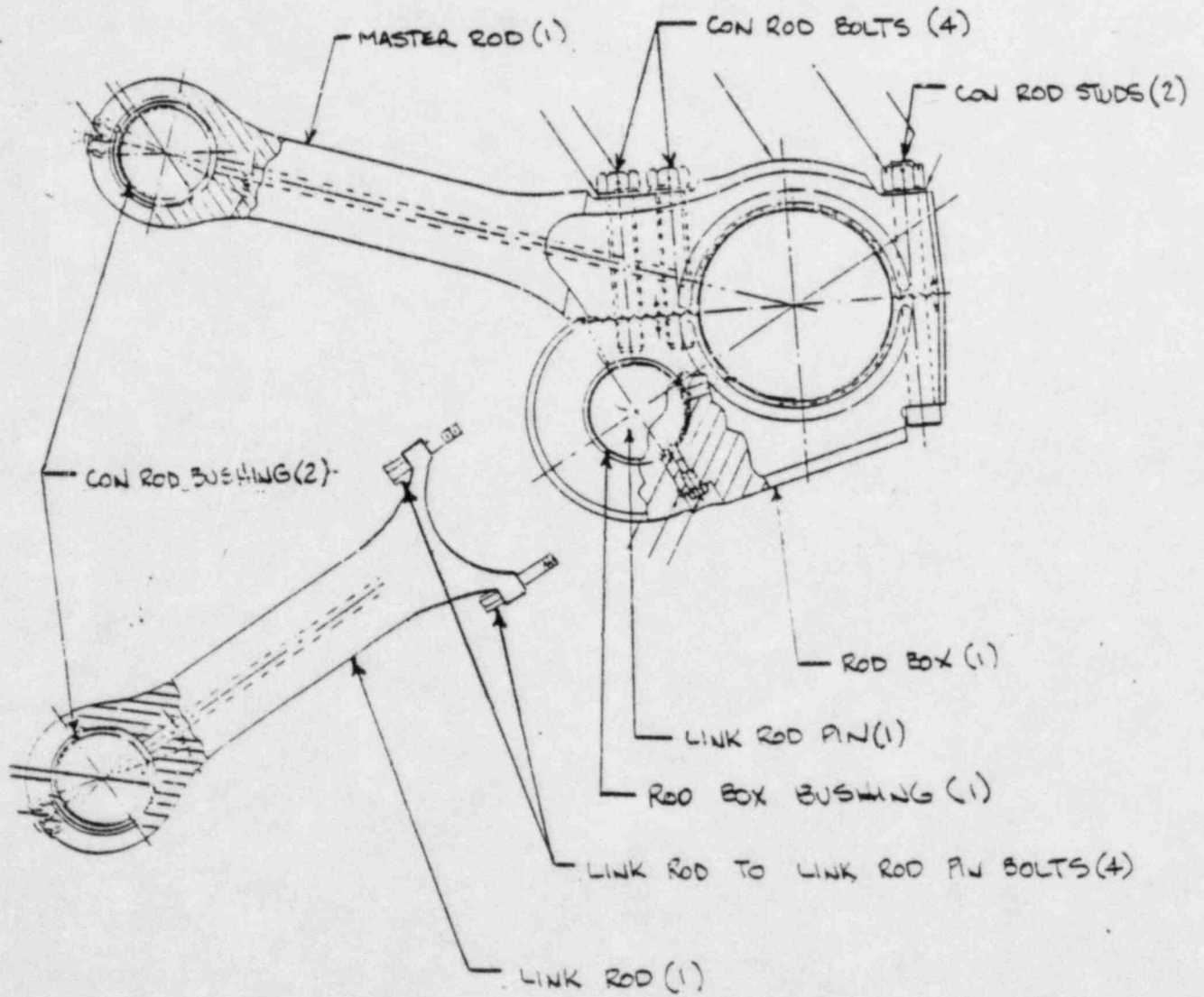
#### a) Wrought, Forged or Welded Items:

1. Any crack or linear indication
2. Rounded indications with dimensions greater than 1/8 inch for thickness less than 5/8 inch and greater than 3/16 inch for thickness of 5/8 inch and greater.
3. Four or more indications in line separated by 1/16 inch or less edge to edge.
4. Ten or more indications in any 6 square inches of area whose major dimension is no more than 6 inches with the dimensions taken in the most unfavorable location relative to the indications being evaluated.

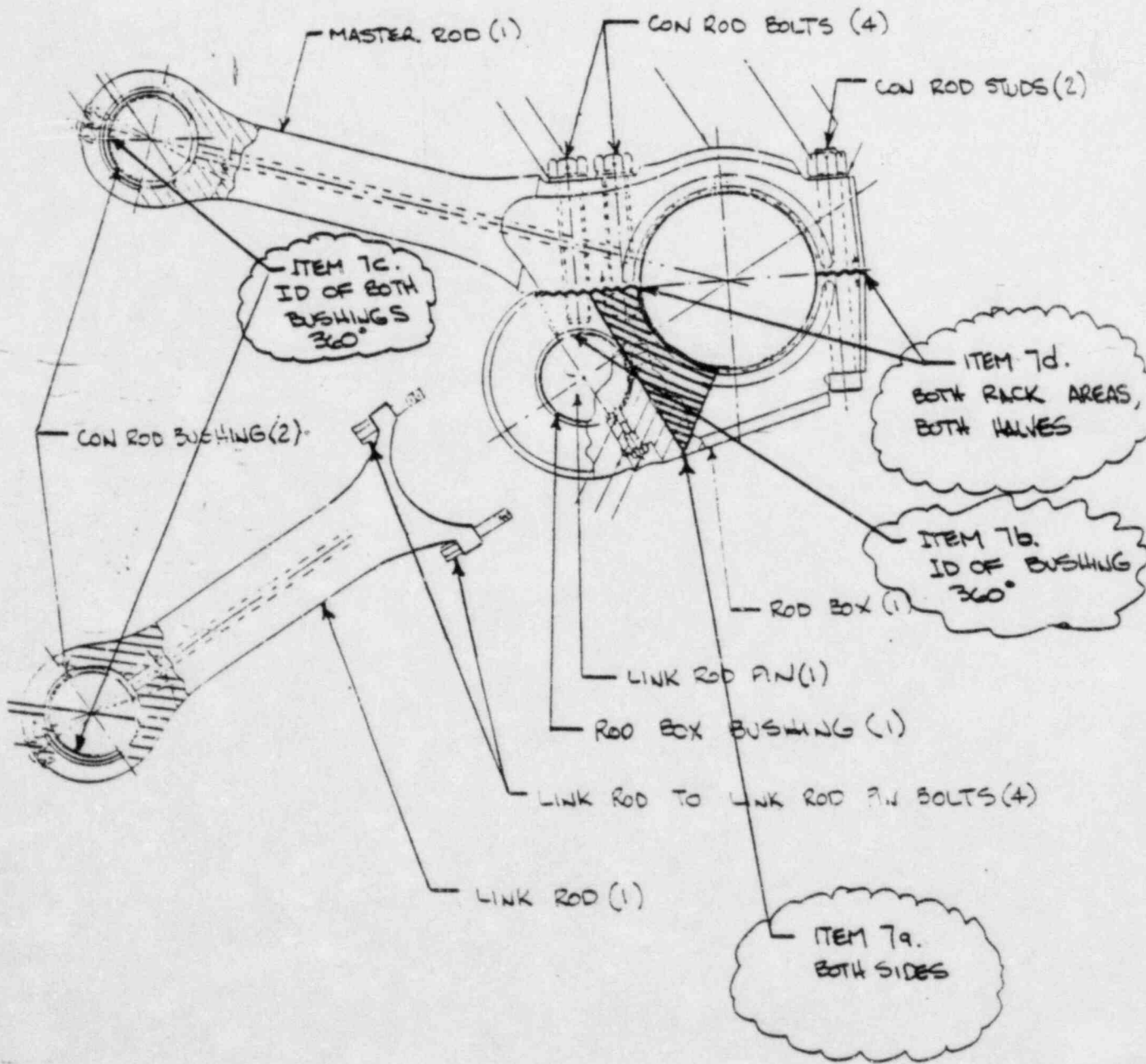
#### b) Bolts and Bolting Material Greater than 1 inch Normal Size

1. Any linear nonaxial indications.
2. Deleted by Tugco NDE Level III

ASSEMBLY DRAWING  
ATTACHMENT 1



LP INSPECTION REQ'D  
ATTACHMENT 2



## COMPONENT REVALIDATION CHECKLIST

COMPONENT Connecting Rod  
Bearing Shells DOCUMENT NO QR-1, Rev. 1

PART NUMBER 02-340B SCHEDULED FOR COMPLETION \_\_\_\_\_

SNPS PART NUMBER 03-340B

## TASK DESCRIPTION:

- 1) RT inspection of upper & lower connrod bearing shells, 100% inspection. Eddy-Current Inspection as required to identify surface discontinuation.
- 2) Visual and LP inspection of bearing shells, 100% inspection.
- 3) Dimensional check.

NOTE: To be performed on all station engines.

## ATTRIBUTE TO BE VERIFIED:

- 1) Existence of internal material defect.
- 2) Existence of surface cracks, scoring or galling.
- 3) Dimensionals in accordance with TDI manual.

ACCEPTANCE CRITERIA: 1) RT acceptance in accordance with FaAA procedure NDE 9.2. Eddy-current utilized to identify subsurface vs. surface discontinuities. 2) Lack of scoring, galling, LP criteria per attached.

REFERENCES: FaAA Procedure NDE 9.2  
TDI Instruction Manual

DOCUMENTATION REQUIRED: Quality summary

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_

## COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

Linear indications are present in all bearing shells, but Eddy-Current tests showed most to be acceptable. A total of 5 shell halves were replaced with satisfactory spares because of inclusions found.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_

## LIQUID PENETRANT ACCEPTANCE CRITERIA

4.2

### Acceptance Criteria

4.2.1

Acceptance criteria are generally included in the code or specification which establishes the required examination. Such specified criteria shall be used to determine the specific type, size and location of observed discontinuities.

When acceptance criteria is not specified in the documentation establishing the requirement for the examination, the following relevant indications are unacceptable. Only indications with major dimensions greater than 1/16 inch shall be considered relevant.

#### a) Wrought, Forged or Welded Items:

1. Any crack or linear indication
2. Rounded indications with dimensions greater than 1/8 inch for thickness less than 5/8 inch and greater than 3/16 inch for thickness of 5/8 inch and greater.
3. Four or more indications in line separated by 1/16 inch or less edge to edge.
4. Ten or more indications in any 6 square inches of area whose major dimension is no more than 6 inches with the dimensions taken in the most unfavorable location relative to the indications being evaluated.

#### B) Bolts and Bolting Material Greater than 1 inch Nominal Size

1. Any linear nonaxial indications.
2. Linear axial indications greater than 1 inch.

STONE & WEBSTER ENGINEERING CORPORATION

Job Number 11600.63	No. 02-340B
NO. D. G. INSP. - 2	Rev 0
	Chg 0

# QUALITY ASSURANCE-INSPECTION PLAN

**TITLE** Connecting Rod Bearing Shells

Item No	Attri.	Hold/Notif. Point	Reference	Description/Instructions
1				<u>INSPECTION:</u> . Perform a liquid penetrant inspection of the con. rod bearing shells. Inspect for the existence of cracks
2				. Radiograph the upper and lower con. rod bearing shells for the existence of internal material defects. (See attached sheet for acceptance criteria. & radiographic technique.) <i>R White 3/20/84</i>
3.				. Perform a visual inspection of the bearings shells for evidence of scoring, galling and signs of excessive wear.
4.				. Perform an eddy-current inspection of upper and lower conn. rod bearing shells if L.P. and RT reveal linear indications which may require further investigation.
5.				. Dimensionally inspect con. rod bearing shells

Quality Control Insp./Engr. <i>N/A</i>	Date
---	------

## LIQUID PENETRANT ACCEPTANCE CRITERIA

4.2

### Acceptance Criteria

4.2.1

Acceptance criteria are generally included in the code or specification which establishes the required examination. Such specified criteria shall be used to determine the specific type, size and location of observed discontinuities.

When acceptance criteria is not specified in the documentation establishing the requirement for the examination, the following relevant indications are unacceptable. Only indications with major dimensions greater than 1/16 inch shall be considered relevant.

#### a) Wrought, Forged or Welded Items;

1. Any crack or linear indication
2. Rounded indications with dimensions greater than 1/8 inch for thickness less than 5/8 inch and greater than 3/16 inch for thickness of 5/8 inch and greater.
3. Four or more indications in line separated by 1/16 inch or less edge to edge.
4. Ten or more indications in any 6 square inches of area whose major dimension is no more than 6 inches with the dimensions taken in the most unfavorable location relative to the indications being evaluated.

#### B) Bolts and Bolting Material Greater than 1 inch Normal Size

1. Any linear nonaxial indications.
2. Linear axial indications greater than 1 inch.

03-340B CONN. ROD BEARING SHELLS

9.0

ACCEPTANCE CRITERIA

9.1

The following is the maximum size and concentration of inclusion, pits and pores allowed in the critical area of an upper bearing shell:

- A) Maximum diameter of a inclusion, pit or pore is 0.050 inches.
- B) Maximum number of multiple inclusions, pits or pores in any given square inch is 100.
- C) Any two inclusions pits or pores separated by less than the diameter of the smallest inclusion shall be considered one inclusion with a diameter including both inclusions.

9.2

The following is the maximum size and concentration of inclusion, pits and pores allowed in the critical area of a lower bearing shell;

- A) Maximum diameter of an inclusion, pit or pore is 0.250 inches.
- B) Maximum number of multiple inclusions, pits or porosity in any given square inch is 100.
- C) Any two inclusions pits or pores separated by less than the diameter of the smallest inclusion shall be considered one inclusion with a diameter including both inclusions.

9.3

No cracks shall be acceptable.

9.4

Crack like indication shall be checked with an eddy-current method to determine whether an indication is relevant or nonrelevant.

9.5

No inclusion, pit, or pore with diameter greater than 0.250 inches is acceptable.





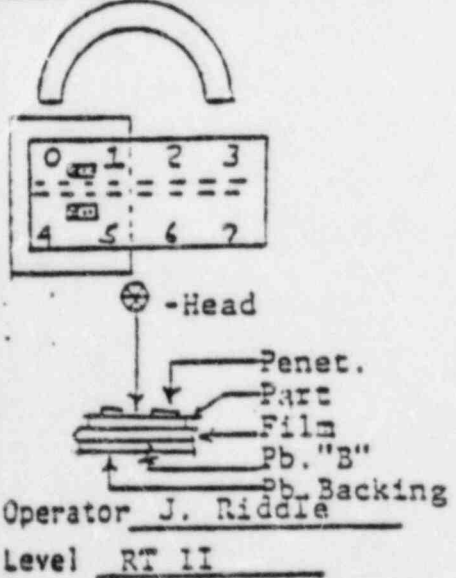
A. MATERIAL	TYPE	Lead Babbit	FABRICATED PROCESS	Aluminum - <input type="checkbox"/> WELDED <input checked="" type="checkbox"/> CAST <input type="checkbox"/> WORKED	
	GEOMETRY	<input type="checkbox"/> PIPE <input type="checkbox"/> PLATE <input type="checkbox"/> ROD <input checked="" type="checkbox"/> OTHER:			
CROSS SECTION THICKNESS	MAX MIN: .625	PIPE DIA. 12.0'	SURFACE CONDITION	<input checked="" type="checkbox"/> MACHINED <input type="checkbox"/> GROUND <input type="checkbox"/> AS FABRICATED <input type="checkbox"/> OTHER	

B. NDE Procedure No. 9.1 Rev. 2	MWR/RR No. N/A	Equipment ID S/N _____	M&TE No. N/A
---------------------------------	----------------	------------------------	--------------

ISOTOPE  TYPE  SIZE  CURIES  SPD	X-RAY		SCREENS Pb
	MAKE Phillips		FRONT .010
	KV RATING @ 250/300		BACK .010
	F SPOT SIZE 2.3x2.3um	FPD 36"	FILTERS N/A
	EXP TIME 85 sec.	KV 250 MA 5.0	Lead Letter "B" <input checked="" type="checkbox"/>

FILM	MFG. DuPont	TYPE 45	SINGLE <input checked="" type="checkbox"/>	DOUBLE <input type="checkbox"/>	NO. OF EXP'S 3	NO. OF FILM 3
------	-------------	---------	--	---------------------------------	----------------	---------------

MAT'L S/S	PENETRATOR 250-1500-1	JOINT DESIGN	
SIZE .62/.68 2-1T	SOURCE SIDE <input checked="" type="checkbox"/>	SINGLE WALL <input checked="" type="checkbox"/>	BACKING RING <input type="checkbox"/>
SHD TEK N/A	FILM SIDE <input type="checkbox"/>	DOUBLE WALL <input type="checkbox"/>	INSERT <input type="checkbox"/>
ASME <input type="checkbox"/>	ASTM <input type="checkbox"/>	OTHER *	OPEN <input type="checkbox"/>
			OTHER <input checked="" type="checkbox"/>



SKETCH  
\*ACCEPTANCE CRITERIA  
See reverse side of page

Date 2-06-84

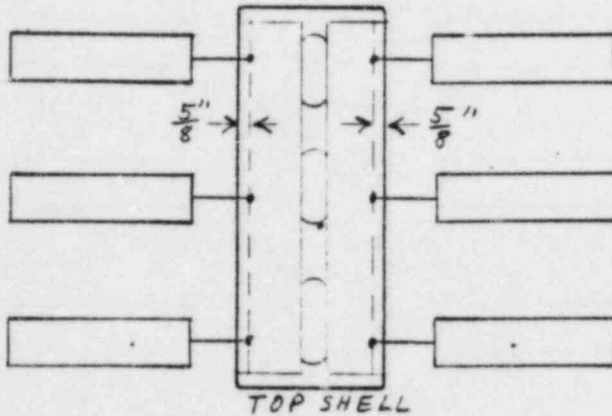
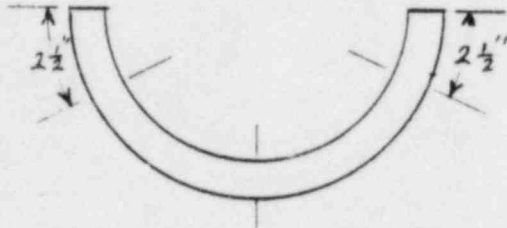
J. Riddle	RT II	<u>Nelson C Swine</u>	RT III
PREPARED BY	NDT LEVEL	APPROVED BY	NDT LEVEL

COMPONENT I.D.  
 BEARING INSERT  
 SYSTEM  
 IR43 DIESEL  
 PLANT/LOCATION  
 DIESEL GEN. ROOM

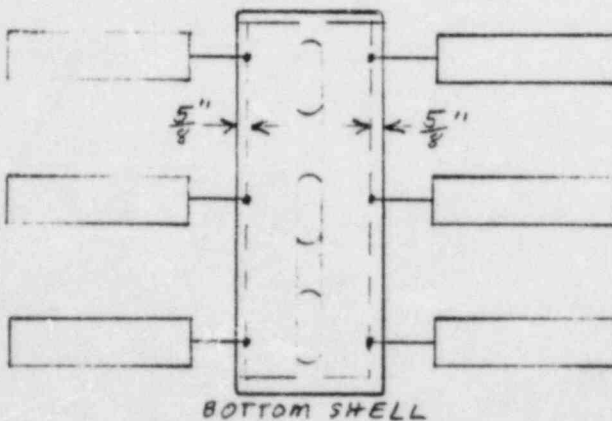
# COMPONENT CONDITION REPORT

P. NO.	ITEM NO.	COMPONENT NO./DESCRIPTION
A. NO.	IR ITEM NO.	TYPE OF INSPECTION

- \* Document by words or sketches the inspection performed.
- \* Show location of measurements/conditions applicable.



MANUFACTURES DATA  
TOP SHELL



MANUFACTURES DATA  
BOTTOM SHELL

**NOTE:**

MEASURE EACH BEARING SHELL  
AT THE SIX POSITIONS INDICATED  
AND RECORD IN THE CORRESPONDING  
BOX

PERFORMED BY \_\_\_\_\_

DATE \_\_\_\_\_

QC VERIFIED \_\_\_\_\_

DATE \_\_\_\_\_

COMPONENT REVALIDATION CHECKLIST

COMPONENT Piston DOCUMENT NO QR-1

PART NUMBER 02-341A SCHEDULED FOR COMPLETION \_\_\_\_\_

SNPS PART NUMBER 03-341A

TASK DESCRIPTION:

- 1) Prior to installation perform LP inspection of new piston skirts. Map all linear indications in stud boss area, document with photographs.
- 2) Assemble and review any documentation.

IF LP FINDS LINEARS THEN ET

ATTRIBUTE TO BE VERIFIED: 1) Linear indications at piston skirt and stud boss area. 2) Quality status of component document package.

ACCEPTANCE CRITERIA: 1) No rejectable indications (see attached) (Document any rejectable indications via photographs) 2) Acceptable document package.

REFERENCES: Piston Assembly Drawing.

DOCUMENTATION REQUIRED: Document Summary Sheet, Inspection Report, Photograph of any cracks.

GROUP CHAIRPERSON *R. J. Kojak* PROGRAM MANAGER *John L. C. S.*

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

New Type AE pistons to replace old type AH pistons. New pistons 5R and 6R had linear indications in stud boss area. These were ground out and the pistons installed.

LIQUID PENETRANT ACCEPTANCE CRITERIA

4.2

Acceptance Criteria

4.2.1

Acceptance criteria are generally included in the code or specification which establishes the required examination. Such specified criteria shall be used to determine the specific type, size and location of observed discontinuities.

When acceptance criteria is not specified in the documentation establishing the requirement for the examination, the following relevant indications are unacceptable. Only indications with major dimensions greater than 1/16 inch shall be considered relevant.

a) Wrought, Forged or Welded Items;

- 1. Any crack or linear indication
- 2. Rounded indications with dimensions greater than 1/8 inch for thickness less than 5/8 inch and greater than 3/16 inch for thickness of 5/8 inch and greater.
- 3. Four or more indications in line separated by 1/16 inch or less edge to edge.
- 4. Ten or more indications in any 6 square inches of area whose major dimension is no more than 6 inches with the dimensions taken in the most unfavorable location relative to the indications being evaluated.

B) Bolts and Bolting Material Greater than 1 inch Normal Size

- 1. Any linear nonaxial indications.
- 2. Linear axial indications greater than 1 inch.

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-341A
NO. D.G. Insp. - 55	Rev Chg 0

**TITLE** PISTON

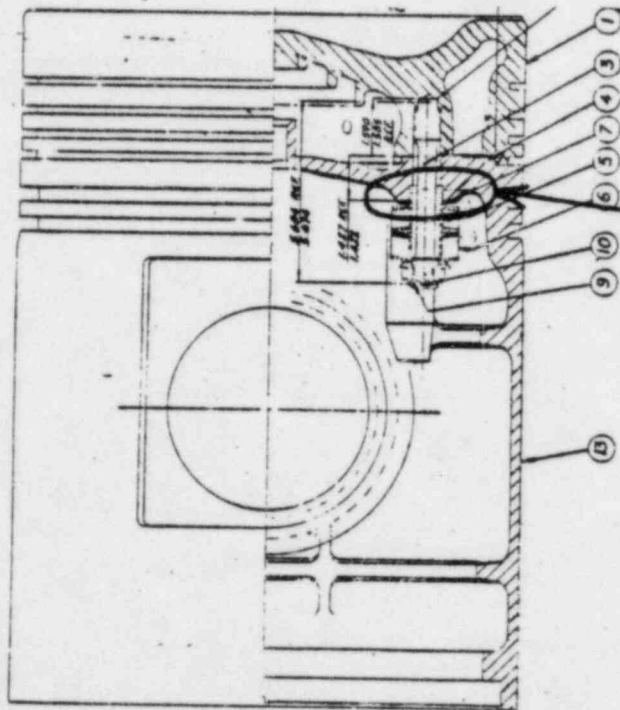
Item No	Attri.	Hold/Not Int.	Reference	Description/Instructions
1				Prior to installation, perform L.P. inspection of new piston skirts. Map all linear indications in stud boss area. Document with photos (rejectable linear indications).

Quality Control Insp./Engr. N/A Date \_\_\_\_\_

# COMPONENT CONDITION REPORT

P. NO.	ITEM NO.	COMPONENT NO./DESCRIPTION
IR. NO.	IR ITEM NO.	TYPE OF INSPECTION

- \* Document by words or sketches the inspection performed.
- \* Show location of measurements/conditions applicable.



AREA TO BE INSPECTED  
(STUD BOSS AREA, QUANTITY -  
FOUR PER SKIRT)

PERFORMED BY \_\_\_\_\_

DATE \_\_\_\_\_

QC VERIFIED \_\_\_\_\_

DATE \_\_\_\_\_

COMPONENT REVALIDATION CHECKLIST

COMPONENT Piston - rings DOCUMENT NO QR-1

PART NUMBER 02-341B SCHEDULED FOR COMPLETION: \_\_\_\_\_

SNPS PART NUMBER 03-341B

TASK DESCRIPTION:

SEE PAGE 2

ATTRIBUTE TO BE VERIFIED: SEE PAGE 2

ACCEPTANCE CRITERIA: SEE PAGE 2

REFERENCES: SEE PAGE 2

DOCUMENTATION REQUIRED: SEE PAGE 2

GROUP CHAIRPERSON RJ Mepine PROGRAM MANAGER Glen L. C. K. L...

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

All piston rings are satisfactory.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_

TASK DESCRIPTION:

- 1) Perform material comparator test on one set of piston rings per engine.
- 2) Verify piston ring installation is in compliance with TDI assembly requirements.
- 3) Assemble and review existing requirements.

ATTRIBUTE TO BE VERIFIED:

- 1) Material comparator test on piston rings.
- 2) Verify piston ring installation is in compliance with TDI & site assembly requirements.
- 3) Quality status of component document package & vendor quality rating.

ACCEPTANCE CRITERIA:

- 1) Satisfactory component document package.
- 2) Piston ring installation in compliance with TDI instruction manual.
- 3) Review of documentation and inspections by design group.

REFERENCES:

- 1) TDI instruction and parts manual.
- 2) Site approved inspection procedures.

DOCUMENTATION REQUIRED:

- 1) Inspection report and review.
- 2) Assemble and review existing documentation.



STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number	No.	rev	Chg
11600.63	02-341B	1	0
NO. D. G. INSP - 4			

**TITLE** Piston Rings

Item No	Attri.	Hold/Notif. Point	Reference	Description/Instructions
1*				<p><u>TESTING:</u></p> <ul style="list-style-type: none"> <li>Verify piston ring installation is in compliance with TDI Instruction Manual and Site Assembly Requirements.</li> </ul>

\*Comparator test on piston rings was recommended for deletion (TER #DR77) by owners group due to chrome plating and small physical dimensions (see IP 4, Rev. 0).

Quality Control Insp./Engr.	Date
N/A	

COMPONENT REVALIDATION CHECKLIST

COMPONENT Piston-Pin Assembly DOCUMENT NO QR-1  
PART NUMBER 02-341C SCHEDULED FOR COMPLETION 11  
SNPS PART NUMBER 03-341C

TASK DESCRIPTION:

SEE PAGE 2

ATTRIBUTE TO BE VERIFIED:

SEE PAGE 2

ACCEPTANCE CRITERIA:

SEE PAGE 2

REFERENCES:

SEE PAGE 2

DOCUMENTATION REQUIRED:

SEE PAGE 2

GROUP CHAIRPERSON *A. J. Majors*

PROGRAM MANAGER *John C. K. Jones*

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

5 wrist pins showed evidence of chrome blistering or chipping, 1 pin showed some scarring. These were replaced with acceptable spares or pins from the TDI factory. All pins showed some evidence of wear.

GROUP CHAIRPERSON \_\_\_\_\_

PROGRAM MANAGER \_\_\_\_\_

TASK DESCRIPTION

- 1) Perform visual inspection for signs of distress and record results.
- 2) Record as-built dimensions on spare pin.
- 3) Perform material comparator test and superficial hardness test on spare and on engine pins, sample basis.
- 4) Perform visual inspection of rolled end plug installation.
- 5) Inspection to be performed on four pistons.
- 6) Assemble and review existing documentation.

ATTRIBUTE TO BE VERIFIED:

- 1) Visual inspection, material comparator and superficial hardness tests on pins and spare.
- 2) Quality status of component document package and vendor quality rating.
- 3) Verify rolled-in oil plugs installed properly.
- 4) Verify piston pin assembly installed properly.

ACCEPTANCE CRITERIA:

- 1) Satisfactory component document package.
- 2) Rolled-in plugs tightly seated and show no evidence of motion between plug and pin surfaces.
- 3) Piston pin assembly installed in compliance with TDI instruction manual.
- 4) Review of documentation and inspection results by design group.

REFERENCES

- 1) TDI instruction manual and parts list.
- 2) LILCO approved inspection procedures.

DOCUMENTATION REQUIRED:

- 1) Inspection report with photographic documentation.
- 2) Assemble and review existing documentation.

CL

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-341C
NO. D. G. INSP. - 27	Rev 0
	Chg 0

**TITLE** Pistons - Piston Pin Assembly

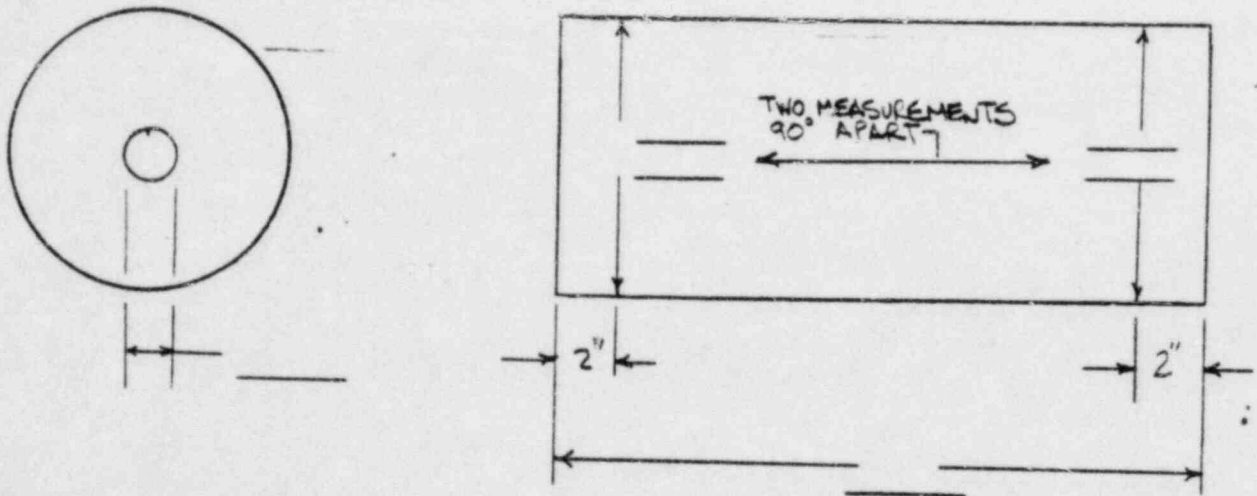
Item No	Attri.	Hold/Not Int.	Reference	Description/Instructions
1			Assembly Dwg. 03-341-	<p><u>INSPECTION:</u></p> <ul style="list-style-type: none"> <li>Verify rolled-in plugs are tightly seated and show no evidence of motion between plug and pin surface.</li> </ul>
2			TDI Dwg. 03-341- TDI Manual Sec. 50 & 60; JTD Connecting Rod Assembly Proc. (Sec. E)	<ul style="list-style-type: none"> <li>Perform a visual inspection of pins for signs of wear, scarring, galling and pitting. Pay particular attention to chrome plating for chipping. Record results. (Document with photographs).</li> <li>Perform an LP inspection of six wrist pins (O.D.) for evidence of chrome cracking.</li> </ul>
3				<p><u>DIMENSIONAL INSPECTION:</u></p> <ul style="list-style-type: none"> <li>Perform and record "as built" dimensions of wrist pin. Use of spare is acceptable.</li> </ul>
4			Mfg. Instructions	<ul style="list-style-type: none"> <li>Perform a materials properties test on three wrist pins per engine.</li> </ul> <p>NOTE: A comparator test is to be performed utilizing a known std. or verifying the availability of a spare or discard which may be comparator tested and sent out for destructive testing at a later date.</p>
5			Mfg. Instructions	<p><u>SPARES</u></p> <ul style="list-style-type: none"> <li>Perform a materials properties test on one (1) spare wrist pin.</li> </ul> <p>NOTE: A comparator test is to be performed utilizing a known std. or verifying the availability of a spare or discard which may be comparator tested and setn out for destructive testing at a later date.</p>
6				<ul style="list-style-type: none"> <li>Perform a superficial hardness test on three wrist pins per engine.</li> </ul>
7				<ul style="list-style-type: none"> <li>Perform superficial hardness test on one (1) spare wrist pin.</li> </ul>

Quality Control Insp./Engr. N/A	Date
------------------------------------	------

# COMPONENT CONDITION REPORT

F.P. NO.	ITEM NO.	COMPONENT NO./DESCRIPTION
IR. NO.	IR ITEM NO.	TYPE OF INSPECTION

- \* Document by words or sketches the inspection performed.
- \* Show location of measurements/conditions applicable.



RECORD SIZE AND LOCATIONS OF OIL HOLES AND OTHER  
MACHINED WEAR

PERFORMED BY \_\_\_\_\_

DATE \_\_\_\_\_

QC VERIFIED \_\_\_\_\_

DATE \_\_\_\_\_

COMPONENT REVALIDATION CHECKLIST

COMPONENT Tappets & Guides-Intake  
Tappet Assembly DOCUMENT NO QR-1  
PART NUMBER 02-345A SCHEDULED FOR COMPLETION 11  
SNPS PART NUMBER 03-345A

TASK DESCRIPTION:  
Dimensional check of roller clearance.

ATTRIBUTE TO BE VERIFIED: Roller clearance measurements on 4 cylinders  
per engine

ACCEPTANCE CRITERIA: 1) Roller clearance measurements within  
acceptable tolerances as given in TDI Manual. 2) Verify that roller is  
free to rotate & no measureable clearance exists between pin & roller.  
REFERENCES: TDI Instruction Manual.

DOCUMENTATION REQUIRED: Inspection Report

GROUP CHAIRPERSON R. J. Maynich PROGRAM MANAGER J. C. K. Seaman

COMPONENT REVIEW: \_\_\_\_\_

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)  
Inspected rollers are satisfactory.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number	No.
11600.63	02-345A
NO.	Rev Chg
D.G. INSP. - 16	0

**TITLE** Tappets and Guides - Intake and Exhaust Tappet Assembly

Item No	Attri.	Hold/Not Int.	Reference	Description/Instructions
1			TDI Instruction Manual, Vol. 1 Appendix 8	. Verify that roller is free to rotate, inspection to be performed on four (4) cylinders per engine.

Quality Control Insp./Engr.	Date
N/A	

COMPONENT REVALIDATION CHECKLIST

COMPONENT Tappets & Guides  
Fuel Tappet Assy DOCUMENT NO QR-1

PART NUMBER 02-345B SCHEDULED FOR COMPLETION: \_\_\_\_\_

SNPS PART NUMBER 03-345B

TASK DESCRIPTION:

Dimensional check of roller clearance.  
 Determine freedom of movement of Pinto Roller.

ATTRIBUTE TO BE VERIFIED:

Roller clearance measurements on 4 cylinders  
 per engine

ACCEPTANCE CRITERIA: 1) Roller clearance measurements within acceptable  
 tolerances as given in TDI Manual. 2) Verify that roller is free to  
 rotate & no measureable clearance exists between pin & roller.

REFERENCES: TDI Instruction Manual.

DOCUMENTATION REQUIRED: Inspection Report

GROUP CHAIRPERSON RJ Mayers PROGRAM MANAGER G. L. C. H. Seaver

COMPONENT REVIEW: \_\_\_\_\_

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

Inspected rollers are satisfactory.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_



D. GENERATOR QUALITY REVALIDATION PROGRAM  
COMANCHE PEAK

Sheet 1 of 1

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-345B	Rev	Chg
NO. D. G. INSP. - 10		0	0

**TITLE** Tappets & Guides - Fuel Tappet Assembly

Item No	Attri.	Hold Point	Reference	Description/Instructions
1			TDI Instruction Manual, Vol. 1 Appendix B	. Verify that roller is free to rotate, inspection to be performed on four (4) cylinders per engine.

Quality Control	Insp./Engr.	Date
N/A		





TASK DESCRIPTION:

After 100 hours run or pre-op testing visually inspect cam lobes for indications of premature wear. Visually inspect bearing support fillet areas of camshaft to determine any longitudinal cracks. Verify any suspect areas via LP and map results.

ATTRIBUTE TO BE VERIFIED:

- 1) Wear on cam lobes.
- 2) Crack on camshaft bearing support fillets.

ACCEPTANCE CRITERIA:

- 1) No scoring or galling on camshaft lobes.
- 2) Longitudinal cracks outside the acceptance limits if LP is required, use acceptance criteria.

REFERENCES:

- 1) Site approved inspection procedures.
- 2) Applicable site/vendor documents.

DOCUMENTATION REQUIRED:

- 1) Inspection report & review
- 2) Documents summary sheet
- 3) Quality evaluation report

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number	No.	Rev	Chg
11600.63	02-350A	0	0
NO. D. G. Insp. - 22			

**TITLE** Camshaft Assembly

Item No	Attri.	Hold/Notif. Point	Reference	Description/Instructions
1.				<p><u>INSPECTION:</u></p> <ul style="list-style-type: none"> <li>Visually inspect the cam lobes for any premature wear indications after the 100 hour run or the pre-operational testing.</li> </ul> <p>Acceptance Criteria: No scoring or galling on camshaft lobes.</p>

Quality Control Insp./Engr. *N/A* Date

COMPONENT REVALIDATION CHECKLIST

COMPONENT Camshaft-Supports, Bolting and Gear DOCUMENT NO QR-1

PART NUMBER 02-350C SCHEDULED FOR COMPLETION 2/4/84

SNPS PART NUMBER 03-350C

- TASK DESCRIPTION:
- 1) Assemble & review existing documentation.
  - 2) Confirm torque values were properly applied on support coupling. If possible, determine torque value on bolts.
  - 3) Perform visual inspection of cam gears.
  - 4) Verify material properties by use of comparator, and superficial hardness tester.

ATTRIBUTE TO BE VERIFIED: SEE PAGE 2

ACCEPTANCE CRITERIA: SEE PAGE 2

REFERENCES: SEE PAGE 2

DOCUMENTATION REQUIRED: SEE PAGE 2

GROUP CHAIRPERSON RJ Meyers PROGRAM MANAGER G. L. C. K. S.

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

All bolts replaced with new 1-1/4" bolts, except for new 1" bolts at 16 locations.

All gears are satisfactory.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_

ATTRIBUTE TO BE VERIFIED:

- 1) Quality status of component, document package and vendor quality rating.
- 2) Torque values applied to bolt.
- 3) Visual inspection of cam gear.
- 4) Verify material material properties.

ACCEPTANCE CRITERIA:

- 1) Satisfactory component package.
- 2) Torque Values as specified.
- 3) Inspect to TDI Manual.
- 4) Design Group shall determine acceptance criterium for material properties.

REFERENCE:

TDI Instruction Manual Section , Parts List, Assembly Drawing.

DOCUMENTATION REQUIRED:

Document Summary Sheet  
Inspection Report

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-350C
NO. D. G. Insp. - 57	rev 0
	Chg -

**TITLE** Camshaft - Supports, Bolting and Gear

Item No	Attri.	Hold Point	Reference	Description/Instructions
1				. Verify, if possible, the bolt torques (cam gear to cam) are to the latest TDI recommended values.
2.				. Perform a visual inspection of cam gears per requirements of TDI Manual.
3.				. Perform superficial hardness tests of cam gears.
4.				. Verify material properties of cam gears by use of comparator tests.

Quality Control Insp./Engr. N/A	Date
------------------------------------	------



## COMPONENT REVALIDATION CHECKLIST

COMPONENT Idler Gear Assembly-  
Crank to Pump Gear DOCUMENT NO QR-1

PART NUMBER 02-355A SCHEDULED FOR COMPLETION \_\_\_\_\_

SNPS PART NUMBER 03-355A

## TASK DESCRIPTION:

- 1) Perform visual inspection for wear, pitting, or any other discontinuities on gear teeth, after 100 hours or pre-operational testing.
- 2) Perform hardness test and material comparator test on gears.

## ATTRIBUTE TO BE VERIFIED:

- 1) No indications of wear on gear teeth.
- 2) Hardness of gear teeth.

ACCEPTANCE CRITERIA: 1) No areas indicative of premature wear, pitting or galling. 2) Hardness and comparator readings to be reviewed for acceptability by design group.

REFERENCES: TDI Manual, TDI drawing.

DOCUMENTATION REQUIRED: Quality inspection report.

GROUP CHAIRPERSON RJ Majich PROGRAM MANAGER John E. C. S. S.

## COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

All gears are satisfactory.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-355A	Rev	Chg
NO. D.G. INSP. - 11		0	0

**TITLE** Crank to Pump Gear Set

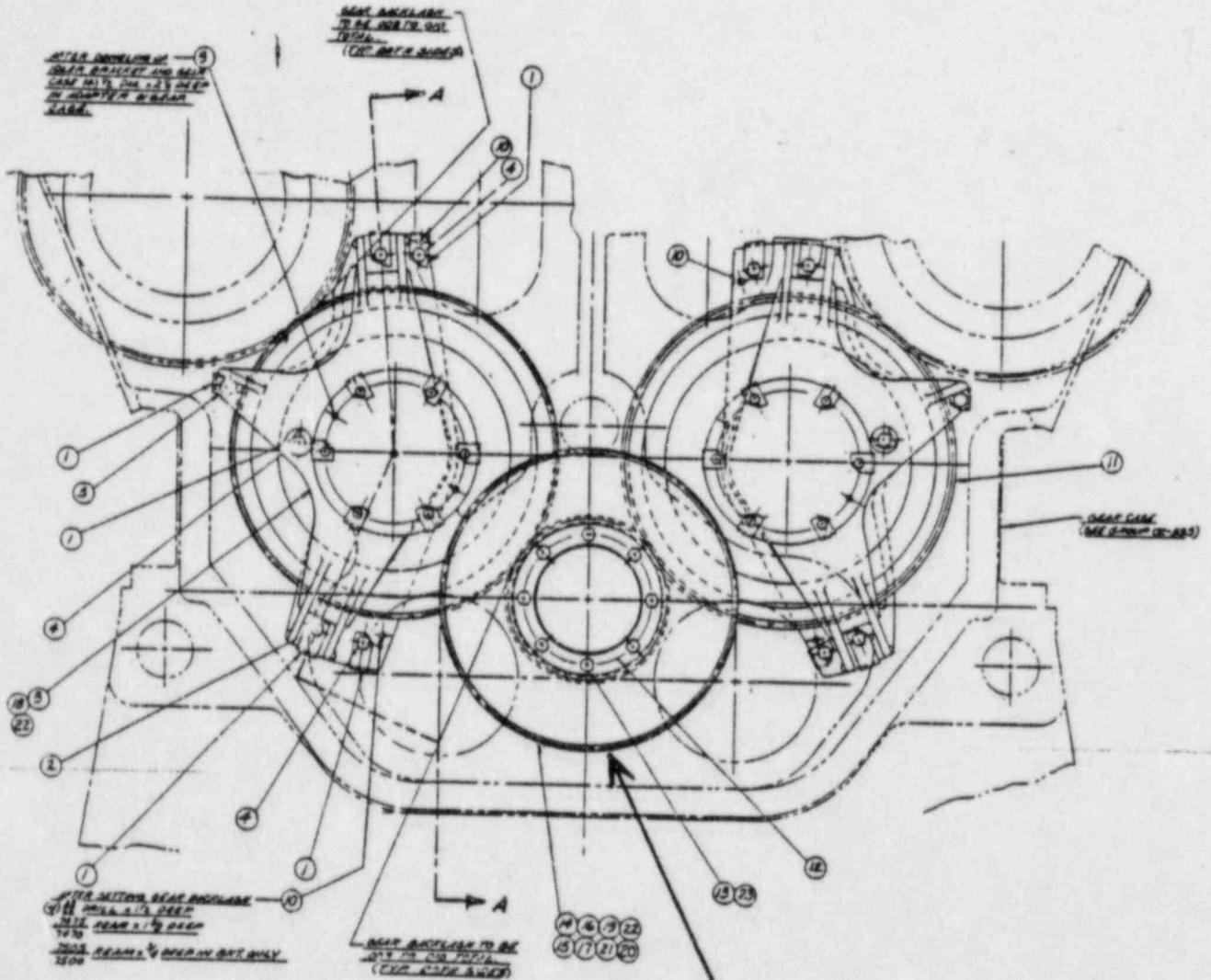
Item No	Attri.	Hold/ Point	Reference	Description/Instructions
1				<p><u>INSPECTION:</u></p> <ul style="list-style-type: none"> <li>Perform visual inspection of the crank to pump gear set for signs of wear, pitting, or any other discontinuities on gear teeth after 100 hour run.</li> </ul> <p>Acceptance Criteria: No areas indicative of premature wear, pitting or galling.</p>
2.				<ul style="list-style-type: none"> <li>Perform hardness and material comparator tests on gears and record.</li> </ul>

Quality Control Insp./Engr. N/A	Date
------------------------------------	------

# COMPONENT CONDITION REPORT

P. NO.	ITEM NO.	COMPONENT NO./DESCRIPTION
IR. NO.	IR ITEM NO.	TYPE OF INSPECTION

- \* Document by words or sketches the inspection performed.
- \* Show location of measurements/conditions applicable.



CRANK TO PUMP DRIVE GEAR (DRIVEN GEARS NOT SHOWN)

PERFORMED BY	DATE
QC VERIFIED	DATE

COMPONENT REVALIDATION CHECKLIST

COMPONENT Idler Gear Assy. DOCUMENT NO QR-1

PART NUMBER 02-355B SCHEDULED FOR COMPLETION \_\_\_\_\_

SNPS PART NUMBER 03-355B

TASK DESCRIPTION:

- 1) Assemble and review existing documentation
- 2) Visual inspection of gear teeth  
(Photograph Gear Teeth) for pitting, wear, chips/nicks.
- 3) Perform hardness test and material comparator test on gears.

ATTRIBUTE TO BE VERIFIED:

See page 2

ACCEPTANCE CRITERIA:

See page 2

REFERENCES: TDI Manual and TDI drawing

DOCUMENTATION REQUIRED: 1) Documentary Summary Sheet  
2) Satisfactory Component Package.

GROUP CHAIRPERSON DJ Majurek PROGRAM MANAGER C.K. Swann

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

All gears are satisfactory.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_

ATTRIBUTE TO BE VERIFIED:

- 1) Quality status of component document package and vendor quality rating.
- 2) Visual inspection for excessive wear after 100 hours operation or pre-operational testing.
- 3) Hardness and material comparitor.

ACCEPTANCE CRITERIA:

- 1) Satisfactory component package.
- 2) No visual signs of excessive wear on gear teeth.
- 3) Hardness and comparitor readings to be reviewed for acceptability by design group.

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-355B	NO. D.G. Insp. - 12	Rev 0	Chg 0
------------------------	----------------	------------------------	----------	----------

**TITLE** Idler Gear Assembly

Item No	Attri.	Hold/Notif/Point	Reference	Description/Instructions
1				<p><u>INSPECTION:</u></p> <ul style="list-style-type: none"> <li>Visually inspect the gear teeth after the 100 hour run or pre-operational testing. Inspect for excessive wear, pitting, chips or nicks. Provide photos of gear teeth</li> </ul>
2				<ul style="list-style-type: none"> <li>Perform hardness and material comparator tests on gears and record.</li> </ul>

Quality Control Insp./Engr. *N/A*      Date







1 ACCEPTANCE CRITERIA:

- 1) Acceptable documentation package.
- 2) Existence of continuous seating, (verify a continuous metallic appearing ring on valve ring contact surface). Verify no carbon deposits exist on valve internals.
- 3)&4) IAW TDI manual.

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-359
NO. D. G. INSP. - 45	Rev Chg 0 0

**TITLE** Air Start Valve

Item No	Attri.	Hold/Not Int.	Reference	Description/Instructions
1				<b>INSPECTION:</b> . Verify continuous metallic appearing ring on valve contact surface. . Verify that no carbon deposit exists on valve internals. . Dimensionally check 100% of the hold down capscrew length. Acceptance 2-3/4" ± 1/16" . Verify proper torque values on hold down capscrews (initial and hot torque), Acceptance per TDI Manual
2				
3				
4				

Quality Control Insp./Engr. N/A DATE

COMPONENT REVALIDATION CHECKLIST

COMPONENT Cylinder Heads DOCUMENT NO QR-1  
PART NUMBER 02-360A SCHEDULED FOR COMPLETION \_\_\_\_\_  
SNPS PART NUMBER 03-360A

TASK DESCRIPTION: After 100 Hrs. or pre-operational testing, perform LP inspection of intake valve seats and exhaust valve seats, plus fire deck area between exhaust valves. UT fire deck area (3 locations) to determine thickness. (Note, upon reinstallation TDI torquing requirements to be strictly adhered to).

ATTRIBUTE TO BE VERIFIED:

Inspect for cracking of head at intake and exhaust valve seats and fire deck thickness between valve seats.

ACCEPTANCE CRITERIA: See attached sheets for LP acceptance criteria.  
Record all firedeck thickness readings.  
TDI manual, Cylinder Head Drawing.

REFERENCES:

Quality inspection report

DOCUMENTATION REQUIRED:

GROUP CHAIRPERSON RJ Majors PROGRAM MANAGER John L. Clark

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

Only 1 old head was satisfactory at all locations inspected. All heads were replaced with new heads from the TDI factory.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_

## LIQUID PENETRANT ACCEPTANCE CRITERIA

4.2

### Acceptance Criteria

4.2.1

Acceptance criteria are generally included in the code or specification which establishes the required examination. Such specified criteria shall be used to determine the *acceptability* of the specific type, size and location of observed discontinuities.

When acceptance criteria is not specified in the documentation establishing the requirement for the examination, the following relevant indications are unacceptable. Only indications with major dimensions greater than 1/16 inch shall be considered relevant.

#### a) Wrought, Forged or Welded Items;

1. Any crack or linear indication
2. Rounded indications with dimensions greater than 1/8 inch for thickness less than 5/8 inch and greater than 3/16 inch for thickness of 5/8 inch and greater.
3. Four or more indications in line separated by 1/16 inch or less edge to edge.
4. Ten or more indications in any 6 square inches of area whose major dimension is no more than 6 inches with the dimensions taken in the most unfavorable location relative to the indications being evaluated.

#### B) Bolts and Bolting Material Greater than 1 inch Normal Size

1. Any linear nonaxial indications.
2. Linear axial indications greater than 1 inch.

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-360A
NO. D. G. INSP. - 13	Rev 2
	Chg N/A

**TITLE** Cylinder Heads

Item No	Attri.	Hold/Not Int.	Reference	Description/Instructions
1				<p><u>VISUAL:</u></p> <ul style="list-style-type: none"> <li>Inspect for cracking of head at intake to exhaust valve seats and fire deck between valve seats.</li> <li>Perform L.P. inspection of intake valve seats and exhaust valve seats. MT the fire deck surface after 100 hours of run time or pre-operational testing.</li> </ul> <p><u>ACCEPTANCE CRITERIA:</u> (See attached)**</p> <ul style="list-style-type: none"> <li>U.T. the thickness of fire deck at six (6) locations, after 100 hours of run time. For locations, see attached drawing.</li> </ul>
2*				
3				

\*MT of entire fire deck surface performed per TUGCO direction, in lieu of L.P. (see I.P. 13, Rev. 0)

\*\* Acceptance Criteria was changed per Owner's Group Recommendation

Quality Control Insp./Engr. | Date

## LIQUID PENETRANT ACCEPTANCE CRITERIA

### Acceptance Criteria

4.2.1

Acceptance criteria are generally included in the code or specification which establishes the required examination. Such specified criteria shall be used to determine the specific type, size and location of observed discontinuities.

When acceptance criteria is not specified in the documentation establishing the requirement for the examination, the following relevant indications are unacceptable. Only indications with major dimensions greater than 1/16 inch shall be considered relevant.

#### a) Wrought, Forged or Welded Items;

1. Any crack or linear indication
2. Rounded indications with dimensions greater than 1/8 inch for thickness less than 5/8 inch and greater than 3/16 inch for thickness of 5/8 inch and greater.
3. Four or more indications in line separated by 1/16 inch or less edge to edge.
4. Ten or more indications in any 6 square inches of area whose major dimension is no more than 6 inches with the dimensions taken in the most unfavorable location relative to the indications being evaluated..

#### b) Bolts and Bolting Material Greater than 1 inch Normal Size

1. Any linear nonaxial indications.
2. Linear axial indications greater than 1 inch.

## ACCEPTANCE CRITERIA

### Inspections:

1. LP inspection of valve seating surfaces.
2. MT of fire deck area, excluding valve seat area.
3. UT fire deck (6 locations) to determine thickness

### Acceptance Criteria:

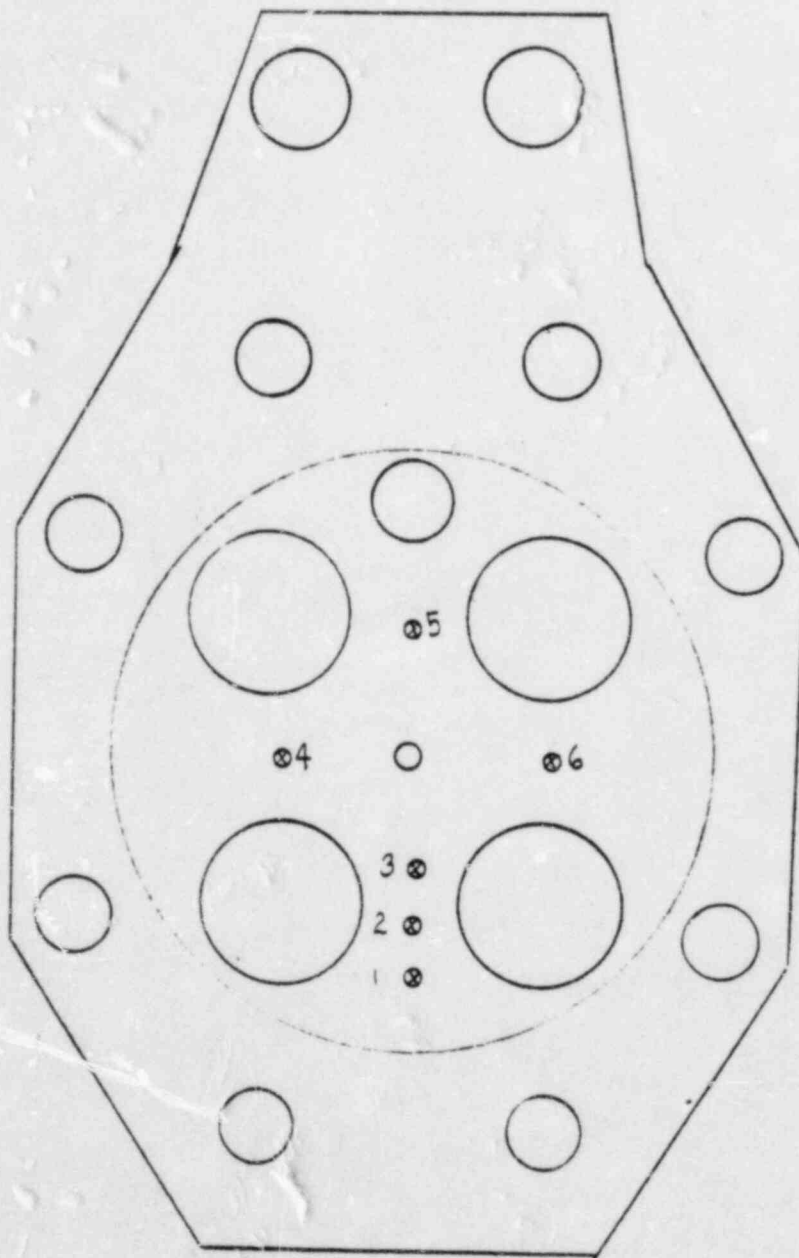
1. No cracks allowed in the seating surface. Pin holes that do not exceed 1/32" diameter numbering 3 or less in one surface, and not closer to each other than 1/8", are acceptable.
2. Acceptance criteria standard is ASTM E-125 for MT
  - 2.1 Relevant indications are:
    - 2.1.1 Hot tears, cracks and seams
    - 2.1.2 Linear inclusions that exceed ASTM E-125, Class I-1C
    - 2.1.3 Shrink that exceeds ASTM E-125, Class II-1
    - 2.1.4 Inclusions that exceed ASTM E-125, Class III-1
    - 2.1.5 Porosity that exceeds ASTM E-125, Class V-1
  - 2.2 Any inclusion, shrink or porosity that exceeds ASTM E-125 is a reportable indication and shall be reported to the Design Group. In addition, Linear inclusions exceeding 1/4" shall also be reviewed by the Design Group.
  - 2.3 Hot tears, cracks, or seams are unacceptable.
  - 2.4 Indications that do not exceed the ASTM E-125 as described in 2.2 and 2.3 reference are acceptable.
3. All fire deck thickness readings to be recorded. Nominal fire deck thickness is 0.500; Minimum thickness is 0.400"

NOTE 1: The actual surface condition (i.e., Pin Holes) is to be measured.  
The liquid penetrant bleed-out is not considered in the valve seat area.

# COMPONENT CONDITION REPORT

I.P. NO.	ITEM NO.	COMPONENT NO./DESCRIPTION
IR. NO.	IR ITEM NO.	TYPE OF INSPECTION

- \* Document by words or sketches the inspection performed.
- \* Show location of measurements/conditions applicable.



- 1 \_\_\_\_\_
- 2 \_\_\_\_\_
- 3 \_\_\_\_\_
- 4 \_\_\_\_\_
- 5 \_\_\_\_\_
- 6 \_\_\_\_\_

\_\_\_\_\_ PERFORMED BY

\_\_\_\_\_ DATE

\_\_\_\_\_ QC VERIFIED

\_\_\_\_\_ DATE



## COMPONENT REVALIDATION CHECKLIST

COMPONENT Cylinder Head Valves  
Intake & Exhaust Valves DOCUMENT NO QR-1PART NUMBER 02-360B SCHEDULED FOR COMPLETION \_\_\_\_\_SNPS PART NUMBER 03-360B

## TASK DESCRIPTION:

After 100 Hrs. run or pre-operational testing visually inspect valve and valve internals to determine valve ring & seat wear. Inspect stems to ensure adequate clearance & dimensions. Sample inspect valve and valve ring to determine materials. Sample lot to be 16 valves per engine.

## ATTRIBUTE TO BE VERIFIED:

SEE PAGE 2

## ACCEPTANCE CRITERIA:

SEE PAGE 2

REFERENCES: TDI Manual

DOCUMENTATION REQUIRED: SEE PAGE 2

GROUP CHAIRPERSON RJ Maguire PROGRAM MANAGER G. L. C. K. Seaman

## COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

All valves showed evidence of inadequate seating; scuffing or erosion on the rings; and scuffing or scoring of chrome. 3 valves were replaced with new valves and the rest were machined to fit the new cylinder heads (see 02-360A).

GROUP CHAIRPERSON \_\_\_\_\_

PROGRAM MANAGER \_\_\_\_\_

ATTRIBUTES TO BE VERIFIED:

- 1) Adequate valve seating.
- 2) Lack of excessive erosion on valve and valve ring.
- 3) Adequate clearance and lubrication of valve stems
- 4) Verify valve stem dimensions on a sample basis; Inspect chrome plate for scuffing/scoring.
- 5) Lack of scuffing, pitting on top of valve stems (contact area with cam).
- 6) Verify adequate friction weld between head & stem via LP.

ACCEPTANCE CRITERIA:

- 1) Uniform linear metallic appearing ring on valve ring.
- 2) No scuffing erosion on valve ring or valve seat area.
- 3) & 4) No scuffing or scoring of chrome plate on valve stems.
- 5) No signs of adverse wear scoring galling on stem surface.
- 6) No linear indications 360° around valve stem at friction weld.

DOCUMENTATION REQUIRED:

Visual inspection report; LP results of friction weld.

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

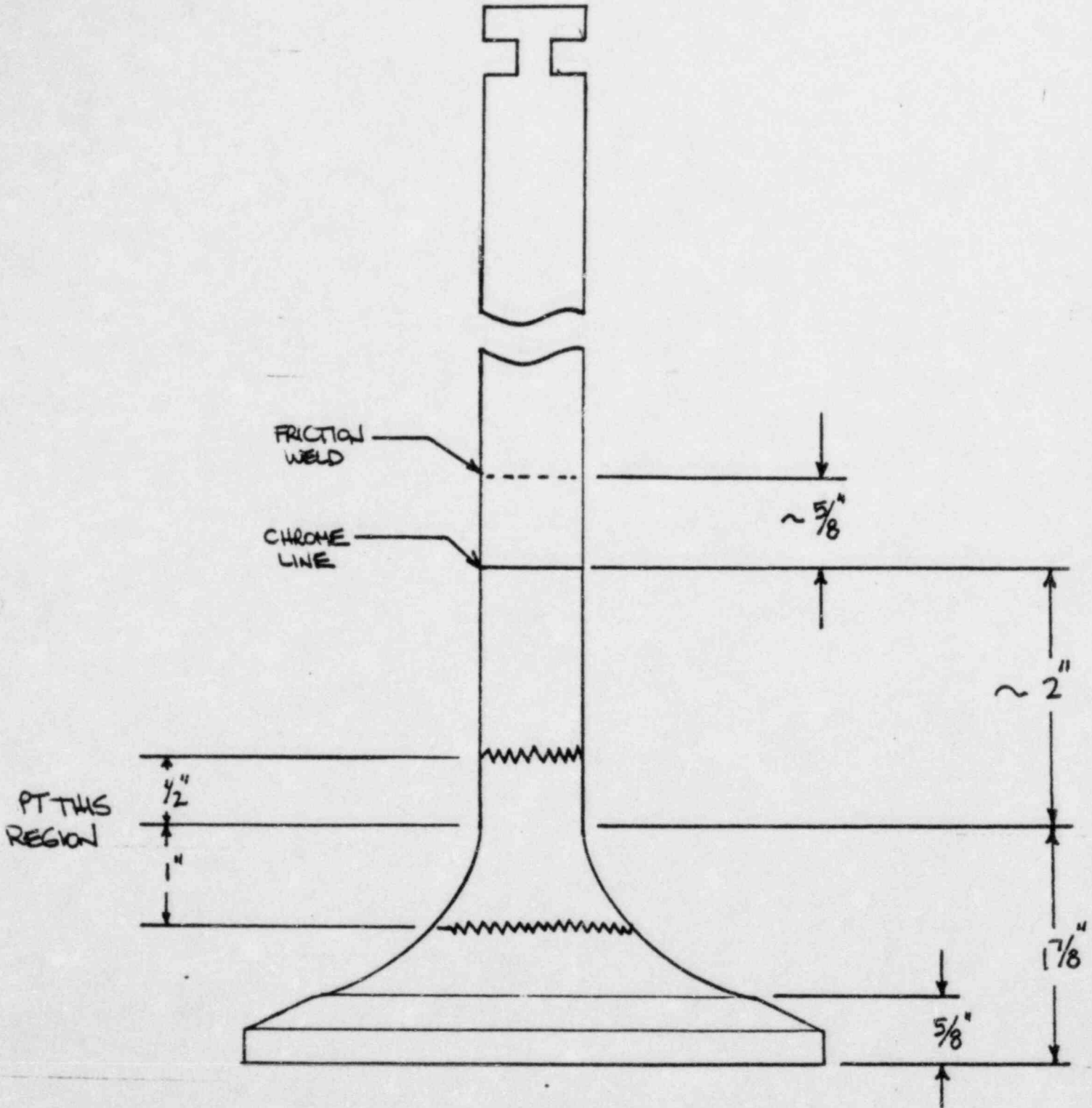
Job Number 11600.63	No. 02-360B	rev 1	Chg 0
NO. D. G. INSP. - 5			

**TITLE** Cylinder Valves - Intake and Exhaust

Item No	Attri.	Hold/NOTICE POINT	Reference	Description/Instructions
1.				<p><u>INSPECTION:</u></p> <ul style="list-style-type: none"> <li>. Perform a visual examination to verify adequate valve seating. Assure a uniform linear metallic appearing ring on valve ring.</li> <li>. Perform a visual examination of valve and valve ring. No scuffing or erosion allowed.</li> <li>. Perform a visual examination of valve stem. No scuffing or scoring of chrome plating, indicative of inadequate clearances or lubrication, allowed.</li> <li>. Perform a dimensional verification of the valve to valve guide clearance.</li> <li>. Visually inspect top of valve stems (contact area with swivel pad) for signs of adverse wear, scoring or galling on stem surface. Report any signs of "Wear".</li> <li>. R.T. the friction weld. Any circumferencial indication, characteristic of lack of fusion, or any evidence of cracking will be basis for rejection. (See attached drawing.)</li> <li>. L.P. the blended radius of the stem head. Evidence of cracking will be cause for rejection. (See attached drawing.)</li> </ul>
2.				
3.				
4.				
5.				
6.				
7.				

Quality Control Insp./Engr. N/A	Date
------------------------------------	------

INTAKE AND EXHAUST VALVES



COMPONENT REVALIDATION CHECKLIST

COMPONENT Valve Spring DOCUMENT NO. QR-1

PART NUMBER 02-360D SCHEDULED FOR COMPLETION 1/1

SNPS PART NUMBER 03-360D

TASK DESCRIPTION:

Visually inspect and document color coded valve spring. Visually inspect springs for cracking.

ATTRIBUTE TO BE VERIFIED: Color Code

ACCEPTANCE CRITERIA:

- 1) Absence of Gray springs w/brown stripe downside.
- 2) Absence of any cracks in valve springs.

REFERENCES:

TDI Instruction Manual, Parts List  
DOCUMENTATION REQUIRED:

GROUP CHAIRPERSON *R. Maguire* Inspection report PROGRAM MANAGER *G. L. C. K. Scan*

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPS Unit 1, Train A (Serial No. 76001)

All valve springs satisfactory.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_

XL GENERATOR QUALITY REVALIDATION PROGRAM  
 COMMANCHE PEAK

Sheet 1 of

STONE & WEBSTER ENGINEERING CORPORATION

Job Number 11600.63	No. 02-360D
NO. D. G. INSP. - 30	Rev Chg 0 0

# QUALITY ASSURANCE-INSPECTION PLAN

## TITLE

Item No	Attri.	Hold/Notif. Point	Reference	Description/Instructions
1				<ul style="list-style-type: none"> <li>. Visual inspect and document color code of valve springs. (Pre-operational inspection)</li> <li>. Provide inspection report.</li> <li>. Acceptance criteria "No gray springs with brown stripes".</li> </ul>

Quality Control Insp./Engr. | Date

COMPONENT REVALIDATION CHECKLIST

COMPONENT Cylinder Head Covers-  
Subcover Assembly DOCUMENT NO QR-1

PART NUMBER 02-362A SCHEDULED FOR COMPLETION \_\_\_\_\_

SNPS PART NUMBER 03-362A

TASK DESCRIPTION: 1) Assemble and review existing documentation on cylinder head covers, sub-cover assembly.  
2) Visual inspection of subcover assembly, web area for indications of cracking, four per engine.  
3) LP inspection of bolt seat area for linear indications only.

ATTRIBUTE TO BE VERIFIED: 1) Quality status of component documentation.  
2) Structural integrity of subcover.  
3) Cracks in bolt seat area.

ACCEPTANCE CRITERIA: 1) Satisfactory component package.  
2) No cracks in subcover web.  
3) No linear indications in bolt seat area.

REFERENCES: TDI Parts manual

DOCUMENTATION REQUIRED: 1) Document Summary Sheet  
2) Inspection Report

GROUP CHAIRPERSON R. J. Maylin PROGRAM MANAGER John Lee C. Lee

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

Linear indications found in bolt boss areas of 4 subcovers (all were inspected). 3 were replaced with satisfactory spares, the other subcover indication was found to be a surface defect such as a machining mark.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-362A
NO. D. G. INSP. - 58	Rev 1
	Chg

**TITLE** Cylinder Head Covers - Subcover Assembly

Item No	Attri.	Hold/Not Viol.	Reference	Description/Instructions
1			TDI Parts Manual	<ul style="list-style-type: none"> <li>Perform visual inspection of subcover assembly, web area for evidence of cracking (four per engine).</li> </ul>
2*			TDI Parts Manual	<ul style="list-style-type: none"> <li>Perform L.P. of subcover assembly machined surfaces in the rocker shaft assembly bolt boss area (vertical and top machined surfaces). Inspect four subcover assemblies. Inspect all subcover assemblies if acceptance criteria is not met.</li> </ul> <p><u>ACCEPTANCE CRITERIA</u></p> <ul style="list-style-type: none"> <li>See attached</li> </ul>

\*Change in sampling criteria, from (4) four to, 100% if acceptance criteria is not met.

Quality Control Insp./Engr. N/A	Date
------------------------------------	------



## LIQUID PENETRANT ACCEPTANCE CRITERIA

### Acceptance Criteria

4.2.1

Acceptance criteria are generally included in the code or specification which establishes the required examination. Such specified criteria shall be used to determine the specific type, size and location of observed discontinuities.

When acceptance criteria is not specified in the documentation establishing the requirement for the examination, the following relevant indications are unacceptable. Only indications with major dimensions greater than 1/16 inch shall be considered relevant.

#### a) Wrought, Forged or Welded Items:

1. Any crack or linear indication
2. Rounded indications with dimensions greater than 1/8 inch for thickness less than 5/8 inch and greater than 3/16 inch for thickness of 5/8 inch and greater.
3. Four or more indications in line separated by 1/16 inch or less edge to edge.
4. Ten or more indications in any 6 square inches of area whose major dimension is no more than 6 inches with the dimensions taken in the most unfavorable location relative to the indications being evaluated.

#### b) Bolts and Bolting Material Greater than 1 inch Normal Size

1. Any linear nonaxial indications.
2. Linear axial indications greater than 1 inch.

COMPONENT REVALIDATION CHECKLIST

COMPONENT Fuel Pump Linkage  
Fuel Pump Control Shaft DOCUMENT NO QR-1

PART NUMBER 02-371A SCHEDULED FOR COMPLETION \_\_\_\_\_

SNPS PART NUMBER 03-371A

TASK DESCRIPTION:

- 1) Verify hardness of shaft by use of superficial hardness.  
Verify linkage material by use of a comparator.
- 2) Assemble & review existing documentation.

ATTRIBUTE TO BE VERIFIED:

- 1) Material properties of components identified.
- 2) Quality status of component Doc. package.

ACCEPTANCE CRITERIA: Document results for input to design group.

REFERENCES: Applicable specifications, vendor documentation.

DOCUMENTATION REQUIRED: Results of chemical & physical analysis  
inspection report.

GROUP CHAIRPERSON *R. J. Maguire* PROGRAM MANAGER *John Lee C. K. Lee*

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

All materials are satisfactory.

GROUP CHAIRPERSON \_\_\_\_\_

PROGRAM MANAGER \_\_\_\_\_

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-371A
NO. D. G. INSP. - 59	Rev   Chg 1   -

**TITLE** Fuel Pump - Linkage/Control Shaft

Item No	Attri.	Hold Point	Reference	Description/Instructions
1				Perform a superficial hardness test on the pump control shaft.
2*				

\* Material verification by comparator was not accomplished. A known standard was not available.

Quality Control Insp./Engr. | Date  
N/A

COMPONENT REVALIDATION CHECKLIST

COMPONENT Fuel Pump-Linkage, Linkage Bearing, Control Shaft DOCUMENT NO QR-1

PART NUMBER 02-371B SCHEDULED FOR COMPLETION \_\_\_\_\_

SNPS PART NUMBER 03-371B

TASK DESCRIPTION:

Visually inspect linkage & Bearings to determine freedom of movement. Inspect oil bearing cups to verify presence of lubricant. Review TDI manual & site documentation to ensure adequate lubrication requirements are defined.

ATTRIBUTE TO BE VERIFIED: 1) Freedom of movement of linkage & bearings. 2) Verify lubricant in bearing cups. 3) Lubrication type schedule is defined by site procedures.

ACCEPTANCE CRITERIA: 1) All linkage moves without unnecessary force. 2) Bearing cups full of lubricant. 3) Site procedures are complete with respect to lubricant.

REFERENCES: TDI manual, site procedures

DOCUMENTATION REQUIRED: Quality inspection report.

GROUP CHAIRPERSON AD Majors PROGRAM MANAGER John L. C. K. ...

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit I, Train A (Serial No. 76001)

Linkage and bearings are satisfactory.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_

STONE & WEBSTER ENGINEERING CORPORATION

Job Number 11600.63	No. 02-371B
NO. D. G. INSP. 53	Rev Chg 0 0

# QUALITY ASSURANCE-INSPECTION PLAN

**TITLE** Fuel Pump - Linkage, Linkage Control Shaft

Item No	Attri.	Hold/Notice Point	Reference	Description/Instructions
1			TDI Inst. Manual	<p><u>INSPECTION</u></p> <ul style="list-style-type: none"> <li>Verify freedom of movement of linkage and bearings. All linkage moves without unnecessary force.</li> </ul>

Quality Control Insp./Engr. N/A	Date
------------------------------------	------

## COMPONENT REVALIDATION CHECKLIST

COMPONENT Intake Manifolds DOCUMENT NO QR-1PART NUMBER 02-375 SCHEDULED FOR COMPLETION \_\_\_\_\_SNPS PART NUMBER 03-375

## TASK DESCRIPTION:

Visually inspect all intake manifolds for cracks at both flange faces. Upon reinstallation ensure that manifold installation does not cause excessive stress on flange bolt holes due to misalignment.

ATTRIBUTE TO BE VERIFIED: 1) Visual inspection for cracking.  
2) Upon reinstallation the responsible organization shall follow recommendations given on the attached sheet.

ACCEPTANCE CRITERIA: 1) Lack of any cracks at flange bolt areas.  
2) Proper installation as outlined on attached sheet.

REFERENCES: TDI Instruction Manual (See attached instruction sheet, given by TDI Service Rep.).

DOCUMENTATION REQUIRED: 1) Inspection verification of flange bolt condition. 2) Verification of reinstallation in accordance with attached sheet.

GROUP CHAIRPERSON P. J. Mayhew PROGRAM MANAGER John L. K. Searns

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

Intake elbow No. 8L had a corner broken off of the head flange. This was replaced with a satisfactory spare.

GROUP CHAIRPERSON \_\_\_\_\_

PROGRAM MANAGER \_\_\_\_\_

- 1) Assure a clean and smooth surface on cylinder head and air inlet manifold.
- 2) Install air elbow and check fit between cylinder head and elbow flange with feeler gauges. Also, check for freedom of movement of capscrews in the flange holes.
- 3) Redrill or elongate flange holes as necessary to ensure freedom of movement of the elbow and the abutment of the elbow flange to the cylinder head.
4. Some filing or scraping may be necessary to assure a reasonably parallel surface, (less than one gasket thickness), between head surface and elbow flange and/or manifold surface and elbow flange.
5. Double gaskets and R.T.V. maybe used to adjust height and/or distance between mating parts.
6. Positively identify elbow to assure proper reinstallation.

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-375
NO. D.G. INSP. - 54	Rev 0
	Chg 0

**TITLE** Intake Manifold, Elbow - Inlet Manifold to Cylinder Head

Item No	Attri.	Hold Point	Reference	Description/Instructions
1			QR-1	<p><u>INSPECTION:</u></p> <ul style="list-style-type: none"> <li>. Perform visual inspection for cracking.                             <ul style="list-style-type: none"> <li>A. No cracks permitted at flange bolt areas.</li> </ul> </li> <li>. Upon reinstallation, ensure that manifold installation does not cause excessive stress on flange bolt holes due to misalignment.</li> </ul> <p><u>PERFORM AND VERIFY INSPECTION AS FOLLOWS:</u></p> <ol style="list-style-type: none"> <li>1. Assure a clean and smooth surface on cylinder head and air inlet manifold.</li> <li>2. Install air elbow and check fit between cylinder head and elbow flange with feeler gauges. Also, check for freedom of movement of capscrews in the flange holes.</li> <li>3. Assure a reasonably parallel surface, (Less than one gasket thickness) between head surface and elbow flange and/or manifold surface and elbow.</li> <li>4. Double gaskets and R.T.V. may be used to adjust height and/or distance between mating parts.</li> <li>5. Positively identify elbow to assure proper reinstallation.</li> </ol>
2				
3				

Quality Control Insp./Engr. N/A	Date
------------------------------------	------



COMPONENT REVALIDATION CHECKLIST

COMPONENT Exhaust Manifold-  
Gaskets & Bolting DOCUMENT NO QR-1

PART NUMBER 02-380B SCHEDULED FOR COMPLETION. \_\_\_\_\_

SNPS PART NUMBER 03-380B

TASK DESCRIPTION:

- 1) Verify proper gasket material and bolting is installed at manifold and flange connections.
- 2) Assemble and review existing documentation.
- 3) Verify at reinstallation, no binding exists on manifold.
- 4) Verify no cracks at manifold-flange weld joint.

ATTRIBUTE TO BE VERIFIED:

SEE PAGE 2

ACCEPTANCE CRITERIA:

SEE PAGE 2

REFERENCES:

SEE PAGE 2

DOCUMENTATION REQUIRED:

SEE PAGE 2

GROUP CHAIRPERSON *P. J. Majors*

PROGRAM MANAGER *J. L. C. K. P...*

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

1 bolt was too long, 1 bolt was the incorrect material, and 2 bolts were damaged. All 4 bolts were replaced with satisfactory spares.

GROUP CHAIRPERSON \_\_\_\_\_

PROGRAM MANAGER \_\_\_\_\_

ATTRIBUTE TO BE VERIFIED:

- 1) Randomly select 3 bolts for visual inspection for identifying markings.  
Verify proper dimensions & installation torque of exhaust pipe flange capscrews, exhaust manifold to support bracket capscrews and exhaust manifold support bracket to block capscrews. Measure depth of tapped portion of hole and length of threaded portion of stud. Measure inside diameter of hole peak-to-peak of threads.
- 2) Quality status of component document package and vendor quality rating.
- 3) Verify proper gasket material.
- 4) Verify at installation no "binding exists on exhaust manifold and no cracks at manifold flange fillet (visually)).

ACCEPTANCE CRITERIA:

- 1) Proper bolt dimensions and installation procedures.
- 2) Proper gasket components per TDI instruction parts list.
- 3) Satisfactory component document package.
- 4) No cracks or carbon deposits at manifold flange fillet area.

REFERENCES:

TDI parts list and manual.

DOCUMENTATION REQUIRED:

- 1) Inspection report including certification that proper installation and torquing procedures were followed.
- 2) Assemble and review existing documentation.

STONE & WEBSTER ENGINEERING CORPORATION

Job Number 11609-63	No. 02-3808		
NO. D. G. INSP. - 31		Rev 0	Chg 0

# QUALITY ASSURANCE-INSPECTION PLAN

**TITLE** EXHAUST MANIFOLD BOLTING AND GASKETS

Item No	Attri.	Hold/No. Point	Reference	Description/Instructions
1			CRC QT-10-02 380B	<u>INSPECTION:</u> <ul style="list-style-type: none"> <li>. Verify installation torque values for the exhaust pipe flange capscrews.</li> <li>. Measure and record exhaust pipe flange capscrew length and length of thread. Measure and record depth of exhaust manifold bolt thread engagement in the head.</li> <li>. Visual inspection. Record material of capscrews (i.e., marking on the hex head).</li> <li>. Record gasket material markings. If markings are not discernable, perform a dimensional inspection.</li> <li>. Verify at installation, no "Binding exists on exhaust manifold and that no cracks exist at manifold flange fillet".</li> </ul>
2				
3				
4				
5				

Quality Control Insp./Engr. N/A	Date
------------------------------------	------

COMPONENT REVALIDATION CHECKLIST

COMPONENT Cylinder Block Covers-  
Gaskets and Bolts DOCUMENT NO QR-1  
PART NUMBER 02-385B SCHEDULED FOR COMPLETION \_\_\_\_\_  
SNPS PART NUMBER 03-385B

TASK DESCRIPTION:

- 1) Assemble and review existing documentation.
- 2) Insure proper bolt torque applied.
- 3) After 100 Hr. run or pre-operational testing, verify gasket material is suitable for the environment.

ATTRIBUTE TO BE VERIFIED: 1) Quality status of vendor component package. 2) Bolt torque. 3) Lack of premature ageing of elastomeric compounds.

ACCEPTANCE CRITERIA: 1) Satisfactory component package. 2) Proper torque applied to bolt in accordance to TDI manual. 3) Lack of cracking: "appearance of newness".

REFERENCES: TDI Manual

DOCUMENTATION REQUIRED: 1) Document Summary Sheet. 2) Report for verification of proper bolt torque.

GROUP CHAIRPERSON R. J. Majors PROGRAM MANAGER G. L. C. K. Burns

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

All gaskets are satisfactory.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_

I. GENERATOR QUALITY REVALIDATION PROGRAM  
COMANCHE PEAK

Sheet 1 of 1

STONE & WEBSTER ENGINEERING CORPORATION

QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-385B
NO. D. G. INSP. - 46	Rev Chg 0 0

TITLE Cylinder Block Covers - Gaskets and Bolts

Item No	Attri.	Hold Point	Reference	Description/Instructions
1			TDI Manual	<p><u>INSPECTION:</u></p> <ul style="list-style-type: none"> <li>Perform a visual inspection on gaskets, for signs of elastomeric compound break-down and cracking.</li> </ul>

Quality Control Insp./Engr.	Date
N/A	

COMPONENT REVALIDATION CHECKLIST

COMPONENT Crankcase Covers/Gaskets & Mounting Hardware DOCUMENT NO QR-1  
PART NUMBER 02-386B SCHEDULED FOR COMPLETION \_\_\_\_\_  
SNPS PART NUMBER 99-386B

TASK DESCRIPTION:

- 1) Verify proper torque.
- 2) Verify no cracking at bolt holes of covers..

ATTRIBUTE TO BE VERIFIED: 1) Proper torque.  
2) Cracks at bolt holes.

ACCEPTANCE CRITERIA: 1) Documentation or installation records indicating proper torque. 2) No cracks at bolt holes as determined visually.

REFERENCES: TDI Manual.

DOCUMENTATION REQUIRED:

GROUP CHAIRPERSON RJ Maguire PROGRAM MANAGER John L. K. Simon

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

All bolt hole areas are satisfactory.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-386B
NO. D. G. INSP. - 37	rev 0
	Chg 0

**TITLE** Crankcase Covers/Gaskets and Mounting Hardware

Item No	Attri.	Hold/Not Point	Reference	Description/Instructions
1			T.D.I. Manual	<p><u>INSPECTION:</u></p> <p>Visually inspect covers at the bolt hole areas for signs of cracks.</p> <p><u>Acceptance Criteria:</u></p> <p>No cracks.</p>

Quality Control Insp./Engr. N/A	Date
------------------------------------	------

COMPONENT REVALIDATION CHECKLIST

Rocker Arms & Pushrod-  
Intake & Intermediate Rocker  
COMPONENT Shaft Assy Incl. Capscrews DOCUMENT NO. QR-1  
PART NUMBER 02-390A SCHEDULED FOR COMPLETION \_\_\_\_\_  
SNPS PART NUMBER 03-390A

TASK DESCRIPTION:

SEE PAGE 2

ATTRIBUTE TO BE VERIFIED: SEE PAGE 2  
ACCEPTANCE CRITERIA: SEE PAGE 2  
REFERENCES: SEE PAGE 2  
DOCUMENTATION REQUIRED: SEE PAGE 2

GROUP CHAIRPERSON *D. J. Maguire* PROGRAM MANAGER *John L. C. S.*

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

Chips or linear indications were found in 3 intermediate rocker arms. 2 rocker arm assemblies were replaced with satisfactory spares and the other was refurbished.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_



TASK DESCRIPTION:

- 1) Perform visual inspection of intake and intermediate rocker arm assemblies for sign of distress.
- 2) Perform material comparator on one rocker arm assembly per engine.
- 3) Review push rod cup installation documentation.
- 4) Assemble and review existing documentation.
- 5) YAS

ATTRIBUTE TO BE VERIFIED:

- 1) Visual inspection, material comparator tests on rocker arm assembly.
- 2) Verification that lip of the socket is not ground more than .062 inches from the socket.
- 3) Quality status of vendor component package and vendor quality rating.

ACCEPTANCE CRITERIA:

- 1) No linear indications/chipped pieces in the outer lips of connector push rod cups in the immediate rocker arms. These cracks occur in the outer unsupported lip of the push rod socket.
- 2) Satisfactory component package.
- 3) Review of documentation and test results by design group.

REFERENCES:

- 1) TDI parts list.
- 2) Site approved inspection procedures.

DOCUMENTATION REQUIRED:

- 1) Inspection report for verification of proper push rod socket installation.
- 2) Document summary sheet.
- 3) Inspection report & review.

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-390A
NO. D. G. INSP. - 20	Rev Chg 0 0

**TITLE** Rocker Arms & Push Rods - Intermediate/Intake Rocker Shaft Assembly

Item No	Attri.	Hold/Notif. Point	Reference	Description/Instructions
1.				<p><u>VISUAL INSPECTION:</u></p> <ul style="list-style-type: none"> <li>Perform a visual inspection of the intake and intermediate rocker arm assemblies for signs of wear or hardened socket chipping.</li> <li>Provide inspection reports.</li> </ul> <p><u>ACCEPTANCE CRITERIA:</u></p> <ul style="list-style-type: none"> <li>No liner indications/chipped pieces in the outer lips of connector push rod cups in the immediate rocker arms.</li> <li>If lip sockets were ground, verify they were not ground more than .062 inches from the socket.</li> <li>A comparator test is to be performed utilizing a known std. or verifying the availability of a spare or discard which may be comparator tested and sent out for destructive testing at a later date. Perform the test on one rocker arm assembly.</li> </ul>
2.				
3.				

Quality Control Insp./Engr.  
N/A

COMPONENT REVALIDATION CHECKLIST

COMPONENT Rocker Arms & Pushrods-  
Exhaust Rocker Shaft Assy DOCUMENT NO QR-1

PART NUMBER 02-390B SCHEDULED FOR COMPLETION \_\_\_\_\_

SNPS PART NUMBER 03-390B

TASK DESCRIPTION:

- 1) Review pushrod cup installation documentation
- 2) Assemble and review existing documentation
- 3) Visually inspect pushrod cups.

ATTRIBUTE TO BE VERIFIED: \_\_\_\_\_

SEE PAGE 2

ACCEPTANCE CRITERIA: \_\_\_\_\_

SEE PAGE 2

REFERENCES: \_\_\_\_\_

SEE PAGE 2

DOCUMENTATION REQUIRED: \_\_\_\_\_

SEE PAGE 2

GROUP CHAIRPERSON \_\_\_\_\_

PROGRAM MANAGER Robert C. K. Senior

COMPONENT \_\_\_\_\_

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

All exhaust rocker arms are satisfactory.

GROUP CHAIRPERSON \_\_\_\_\_

PROGRAM MANAGER \_\_\_\_\_

ATTRIBUTE TO BE VERIFIED:

- 1) Quality status of vendor component package and vendor quality rating.
- 2) Verification that lip of the socket should not be ground more than specified in vendor documentation.
- 3) Visually specified in vendor documents-inspect pushrod cups for cracking.

ACCEPTANCE CRITERIA:

- 1) No linear indications/chipped pieces in the outer lips of connector push rod cups in the immediate rocker arms. These cracks occur in the outer unsupported lip of the push rod socket.
- 2) Push rod socket installation.
- 3) Satisfactory component package.
- 4) Review of documentation and test results by design group.

REFERENCES

- 1) TDI Manual.

DOCUMENTATION REQUIRED:

- 1) Inspection report for verification of proper push rod socket installation.
- 2) Document summary sheet

1 . GENERATOR QUALITY REVALIDATION PROGRAM  
COMANCHE PEAK

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-390B	Rev	Chg
NO. D.G. INSP. - 47		0	0

**TITLE** Rocker Arms and Pushrods - Exhaust Rocker Shaft Assembly

Item No	Attri.	Hold/Point	Reference	Description/Instructions
1				<p><u>INSPECTION:</u></p> <ul style="list-style-type: none"> <li>. If lip sockets were ground, verify they were not ground more than .062 inches from the socket.</li> <li>. Visually inspect pushrod cups.</li> </ul> <p>Acceptance Criteria:</p> <ul style="list-style-type: none"> <li>. No linear indications, cracks or chipped pieces.</li> </ul> <p>NOTE: These indications occur in the outer unsupported lip.</p>
2.				

Quality Control Insp./Engr. Date

N/A

COMPONENT REVALIDATION CHECKLIST

COMPONENT Rocker Arms & Pushrods:  
Pushrods-Intake & Exhaust DOCUMENT NO QR-1  
PART NUMBER 02-390C SCHEDULED FOR COMPLETION 11  
SNPS PART NUMBER 03-390C

TASK DESCRIPTION:

- 1) Verification of installation: Friction welded push rods.
- 2) Assemble existing documentation.

ATTRIBUTE TO BE VERIFIED: 1) Installation of friction welded pushrods  
2) Satisfactory documentation package.

ACCEPTANCE CRITERIA: Type & Documentation of push rods.

REFERENCES: Doc. Summary Sheet.

DOCUMENTATION REQUIRED:

GROUP CHAIRPERSON Aj Majumdar PROGRAM MANAGER J. L. C. H. S.

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

All new push rods are friction welded and are satisfactory.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-390C
NO. D. G. INSP - 48	Rev   Chg 0   0

**TITLE** Pushrods - Intake & Exhaust

Item No	Attr.	Hold Point	Reference	Description/Instructions
1				<p><u>INSPECTION:</u></p> <ul style="list-style-type: none"> <li>Verify that push rods are friction welded. If not verifiable, via documentation, perform a visual verification and provide photos.</li> <li>Perform LP of friction welds.</li> </ul>
2*				

\* LP of friction weld was performed per TUGCO direction.

## LIQUID PENETRANT ACCEPTANCE CRITERIA

### Acceptance Criteria

4.2.1

Acceptance criteria are generally included in the code or specification which establishes the required examination. Such specified criteria shall be used to determine the specific type, size and location of observed discontinuities.

When acceptance criteria is not specified in the documentation establishing the requirement for the examination, the following relevant indications are unacceptable. Only indications with major dimensions greater than 1/16 inch shall be considered relevant.

#### a) Wrought, Forged or Welded Items:

1. Any crack or linear indication
2. Rounded indications with dimensions greater than 1/8 inch for thickness less than 5/8 inch and greater than 3/16 inch for thickness of 5/8 inch and greater.
3. Four or more indications in line separated by 1/16 inch or less edge to edge.
4. Ten or more indications in any 6 square inches of area whose major dimension is no more than 6 inches with the dimensions taken in the most unfavorable location relative to the indications being evaluated..

#### b) Bolts and Bolting Material Greater than 1 inch Normal Size

1. Any linear nonaxial indications.
2. Linear axial indications greater than 1 inch.



TASK DESCRIPTION NO. QR-10-02-390D

COMPONENT REVALIDATION CHECKLIST

COMPONENT Rocker Arms & Pushrods-  
Pushrod Connector DOCUMENT NO QR-1

PART NUMBER 02-390D SCHEDULED FOR COMPLETION: \_\_\_\_\_

SNPS PART NUMBER 03-390D

TASK DESCRIPTION:

- 1) Assemble and review existing documentation
- 2) Install new friction welded push rods.

ATTRIBUTE TO BE VERIFIED: 1) Quality status of vendor component package. 2) Installation of proper rods.

ACCEPTANCE CRITERIA: 1) Satisfactory component package  
2) Installation of friction welded pushrods.

REFERENCES: TDI Manual.

DOCUMENTATION REQUIRED: 1) Document Summary Sheet

GROUP CHAIRPERSON R. J. Mayhew PROGRAM MANAGER G. L. C. K. S.

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

Intermediate push rods are friction welded and are satisfactory.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_

GENERATOR QUALITY REVALIDATION PROGRAM  
COMANCHE PEAK

Sheet 1 of 1

STONE & WEBSTER ENGINEERING CORPORATION

Job Number 11600.63	No. 02-390D
NO. D. G. INSP -49	Rev Chg 0 0

# QUALITY ASSURANCE-INSPECTION PLAN

**TITLE** Rockerarms and Pushrods - Pushrod Connector

Item No	Attri.	No of Joints	Reference	Description/Instructions
1				<p><u>INSPECTION:</u></p> <ul style="list-style-type: none"> <li>Verify that pushrods are friction welded. If not verifiable via documentation, perform a visual verification and provide photos.</li> <li>Perform LP of friction welds.</li> </ul>
2*				

\*LP of friction weld was performed per TUGCO direction.

Quality Control Insp./Engr.	Date
N/A	

## LIQUID PENETRANT ACCEPTANCE CRITERIA

### Acceptance Criteria

4.2.1

Acceptance criteria are generally included in the code or specification which establishes the required examination. Such specified criteria shall be used to determine the specific type, size and location of observed discontinuities.

When acceptance criteria is not specified in the documentation establishing the requirement for the examination, the following relevant indications are unacceptable. Only indications with major dimensions greater than 1/16 inch shall be considered relevant.

#### a) Wrought, Forged or Welded Items:

1. Any crack or linear indication
2. Rounded indications with dimensions greater than 1/8 inch for thickness less than 5/8 inch and greater than 3/16 inch for thickness of 5/8 inch and greater.
3. Four or more indications in line separated by 1/16 inch or less edge to edge.
4. Ten or more indications in any 6 square inches of area whose major dimension is no more than 6 inches with the dimensions taken in the most unfavorable location relative to the indications being evaluated.

#### b) Bolts and Bolted Material Greater than 1 inch Normal Size

1. Any linear nonaxial indications.
2. Linear axial indications greater than 1 inch.



STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-390F
NO. D.G. INSP. - 6	Rev Chg 0 0

**TITLE**      Rocker Arms & Pushrods, Lifters

Item No	Attri.	Hold Point	Reference	Description/Instructions
1			TDI Parts List & Assembly Dwg. 03-390-	INSPECTION: <ul style="list-style-type: none"> <li>Verify the lifters are installed in accordance with TDI Procedures for reassembled engine.</li> </ul>
2				<ul style="list-style-type: none"> <li>Perform a leak down rate test on 2 lifters from each engine.</li> </ul>

Quality Control N/A	Insp./Engr.	Date
------------------------	-------------	------

COMPONENT REVALIDATION CHECKLIST

COMPONENT Rocker Arms & Pushrods- Misc. Bolts & Drivestuds DOCUMENT NO QR-1

PART NUMBER 02-390G SCHEDULED FOR COMPLETION. \_\_\_\_\_

SNPS PART NUMBER 03-390G

TASK DESCRIPTION:

SEE PAGE 2

ATTRIBUTE TO BE VERIFIED: SEE PAGE 2

ACCEPTANCE CRITERIA: SEE PAGE 2

REFERENCES: TDI Instr. Manual & Rocker Arm & Pushrod part list.

DOCUMENTATION REQUIRED: Items 1 & 2) Document Summary Sheet  
Item 3) Inspection Report

GROUP CHAIRPERSON A. J. Maguire PROGRAM MANAGER G. L. ... C. W. ...

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

All bolting is satisfactory.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_

TASK DESCRIPTION:

- 1) Assemble existing documentation on bolting.
- 2) Verify application of proper torque value, by site QC documentation review.
- 3) MT-Inspection of sample capscrews, for linear indication (thread root area only).

ATTRIBUTE TO BE VERIFIED:

- 1) Quality status of vendor component Pkg. & vendor quality rating.
- 2) Proper torque values of capscrews using site QC documentation.
- 3) Inspect capscrews (MT) for linear indications.

ACCEPTANCE CRITERIA:

- 1) Satisfactory component package.
- 2) Documentation of proper torque values used on capscrews per TDI manual.
- 3) No linear indications in thread root area of capscrews.

1 GENERATOR QUALITY REVALIDATION PROGRAM  
COMANCHE PEAK

Sheet 1 of 1

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-390G
NO. D. G. INSP - 50	Rev Chg 0 0

**TITLE** Rocker Arms and Push Rods - Misc. Bolts & Drive Studs

Item No	Attri.	Hold Point	Reference	Description/Instructions
1				<p><u>INSPECTION</u></p> <ul style="list-style-type: none"> <li>Perform MT Inspections of all capscrew thread root areas.</li> </ul> <p>NOTE: No linear indications in thread root area.</p> <ul style="list-style-type: none"> <li>Perform visual inspection of drive studs for irregularities.</li> </ul>

Quality Control Insp./Engr. N/A	DATE
------------------------------------	------



COMPONENT REVALIDATION CHECKLIST

COMPONENT Overspeed Trip: Governor & Accessory Drive Assy DOCUMENT NO QR-1

PART NUMBER 02-410B SCHEDULED FOR COMPLETION. \_\_\_\_\_

SNPS PART NUMBER 03-410B

- TASK DESCRIPTION: 1) Confirm Gear Assembly Material Properties.  
2) Assemble and review existing documentation.  
3) Perform visual inspection of assembled accessory drive gear and measure shaft/bearing clearance. This clearance can be measured by placing dial indicator on gear & manually moving gear in all directions.

ATTRIBUTE TO BE VERIFIED: SEE PAGE 2

ACCEPTANCE CRITERIA: SEE PAGE 2

REFERENCES: SEE PAGE 2

DOCUMENTATION REQUIRED: SEE PAGE 2

GROUP CHAIRPERSON P. J. Majich PROGRAM MANAGER John F. C. K. ...

COMPONENT REVIEW: \_\_\_\_\_

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

Assembly is satisfactory. A missing locking clip was replaced.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_

ATTRIBUTE TO BE VERIFIED:

- 1) Visual inspection of assembled accessory drive & shaft/bearing clearance.
- 2) Visual and LP Inspection of governor shaft dimensional check of shaft in bearing area.
- 3) Quality status of component document package.
- 4) Determine material properties by material testing equipment such as a material comparitor or analyzer for the accessory drive and governor drive assemblies. This shall be determined for the following parts.

DESCRIPTION

Drive Shaft  
Gears  
Gov. Dr. Shaft

NOTE: These TDI drawings identify the material of all of the above parts numbers.

- 5) Perform superficial hardness tests on gear part as identified by above. Tests to be performed on outer gear tooth flat as shown below:

ACCEPTANCE CRITERIA:

- 1) Satisfactory component package
- 2) Review of documentation and test results by design group.

REFERENCES

- 1) Site approved inspection procedures
- 2) TDI Dwgs.

DOCUMENTATION REQUIRED:

- 1) Inspection report & review.
- 2) Documentation summary sheets.

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-410B	Rev 2	Chg 0
NO. D. G. INSP. 52			

**TITLE** Overspeed Trip Governor and Accessory Drive Assembly

Item No	Alt.	Hold Point	Reference	Description/Instructions
1				<p><u>INSPECTION</u></p> <ul style="list-style-type: none"> <li>Perform and record a dimensional inspection of assembled accessory drive and shaft to bearing clearance. This clearance can be measured by placing a dial indicator on gear and manually moving the gear in all directions.</li> </ul>
2*			Mfr. Parts Manual	<p>NOTE: A comparator test is to be performed utilizing a known std. or verifying the availability of a spare or discard which may be comparator tested and sent out for destructive testing at a later date.</p> <ul style="list-style-type: none"> <li>Material property testing is to be performed on the overspeed drive gear.</li> </ul>

\* Comparator tests on the drive shaft and governor drive shaft were recommended for deletion (TER-385) by the Owners Group.

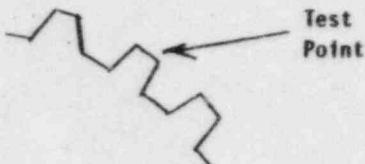
Quality Control Insp./Engr. | Date

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

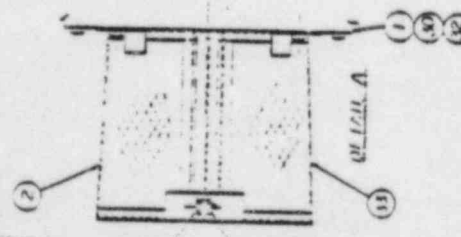
Job Number	No.	Rev	Eng
11600.63	02-4108	2	0
NO.			
D. G. INSP - 52			

**TITLE** Overspeed Trip Governor and Accessory Drive Assembly

Item No	Attri.	No of Joints	Reference	Description/Instructions
6				<p>Perform a superficial hardness test on gears. (Item 8 on Dwg. No. 02-410-1987)</p> <p>Outer flat of gear tooth (Major Diam) as shown.</p> 

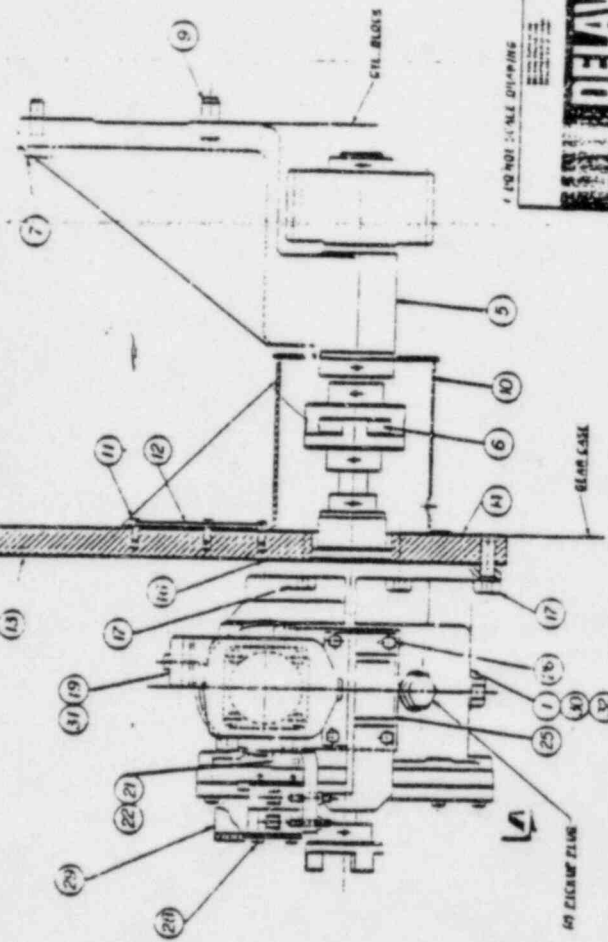
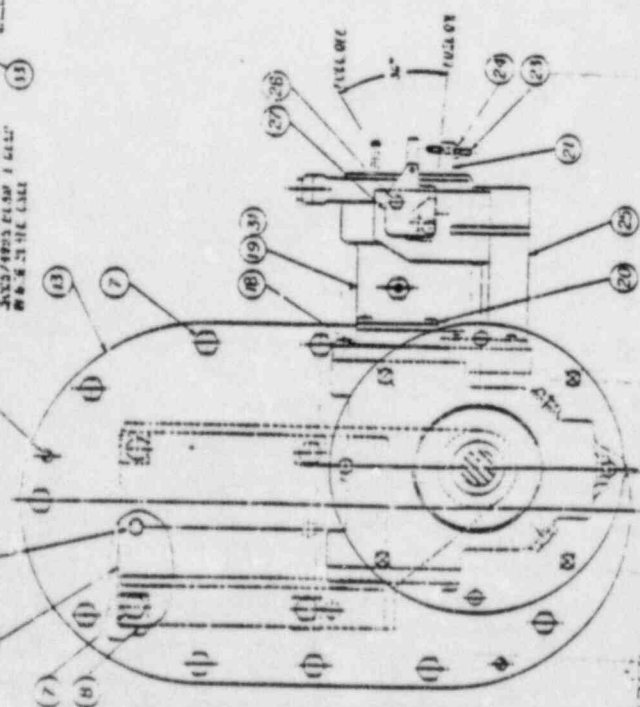
Quality Control Insp./Engr. Date  
R/A

REV	DATE	DESCRIPTION	BY	CHKD
1	10/10/50	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
2	11/15/50	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
3	12/10/50	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
4	1/10/51	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
5	2/10/51	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
6	3/10/51	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
7	4/10/51	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
8	5/10/51	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
9	6/10/51	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
10	7/10/51	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
11	8/10/51	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
12	9/10/51	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
13	10/10/51	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
14	11/10/51	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
15	12/10/51	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
16	1/10/52	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
17	2/10/52	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
18	3/10/52	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
19	4/10/52	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
20	5/10/52	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
21	6/10/52	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
22	7/10/52	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
23	8/10/52	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
24	9/10/52	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
25	10/10/52	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
26	11/10/52	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
27	12/10/52	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
28	1/10/53	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
29	2/10/53	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
30	3/10/53	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
31	4/10/53	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
32	5/10/53	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
33	6/10/53	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
34	7/10/53	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
35	8/10/53	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
36	9/10/53	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
37	10/10/53	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
38	11/10/53	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
39	12/10/53	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
40	1/10/54	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
41	2/10/54	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
42	3/10/54	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
43	4/10/54	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
44	5/10/54	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
45	6/10/54	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
46	7/10/54	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
47	8/10/54	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
48	9/10/54	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
49	10/10/54	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
50	11/10/54	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
51	12/10/54	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
52	1/10/55	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
53	2/10/55	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
54	3/10/55	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
55	4/10/55	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
56	5/10/55	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
57	6/10/55	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
58	7/10/55	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
59	8/10/55	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
60	9/10/55	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
61	10/10/55	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
62	11/10/55	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
63	12/10/55	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
64	1/10/56	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
65	2/10/56	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
66	3/10/56	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
67	4/10/56	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
68	5/10/56	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
69	6/10/56	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
70	7/10/56	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
71	8/10/56	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
72	9/10/56	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
73	10/10/56	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
74	11/10/56	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
75	12/10/56	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
76	1/10/57	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
77	2/10/57	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
78	3/10/57	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
79	4/10/57	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
80	5/10/57	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
81	6/10/57	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
82	7/10/57	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
83	8/10/57	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
84	9/10/57	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
85	10/10/57	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
86	11/10/57	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
87	12/10/57	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
88	1/10/58	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
89	2/10/58	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
90	3/10/58	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
91	4/10/58	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
92	5/10/58	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
93	6/10/58	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
94	7/10/58	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
95	8/10/58	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
96	9/10/58	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
97	10/10/58	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
98	11/10/58	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
99	12/10/58	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]
100	1/10/59	REVISED TO SHOW CHANGES	J. H. [unclear]	[unclear]



9 AFTER REPAIRS W/ALSO USE JUNE ASSE  
 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

15 IN ASSEMBLY CONTAINS  
 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100



1 INQUIRY: FILE DRAWING

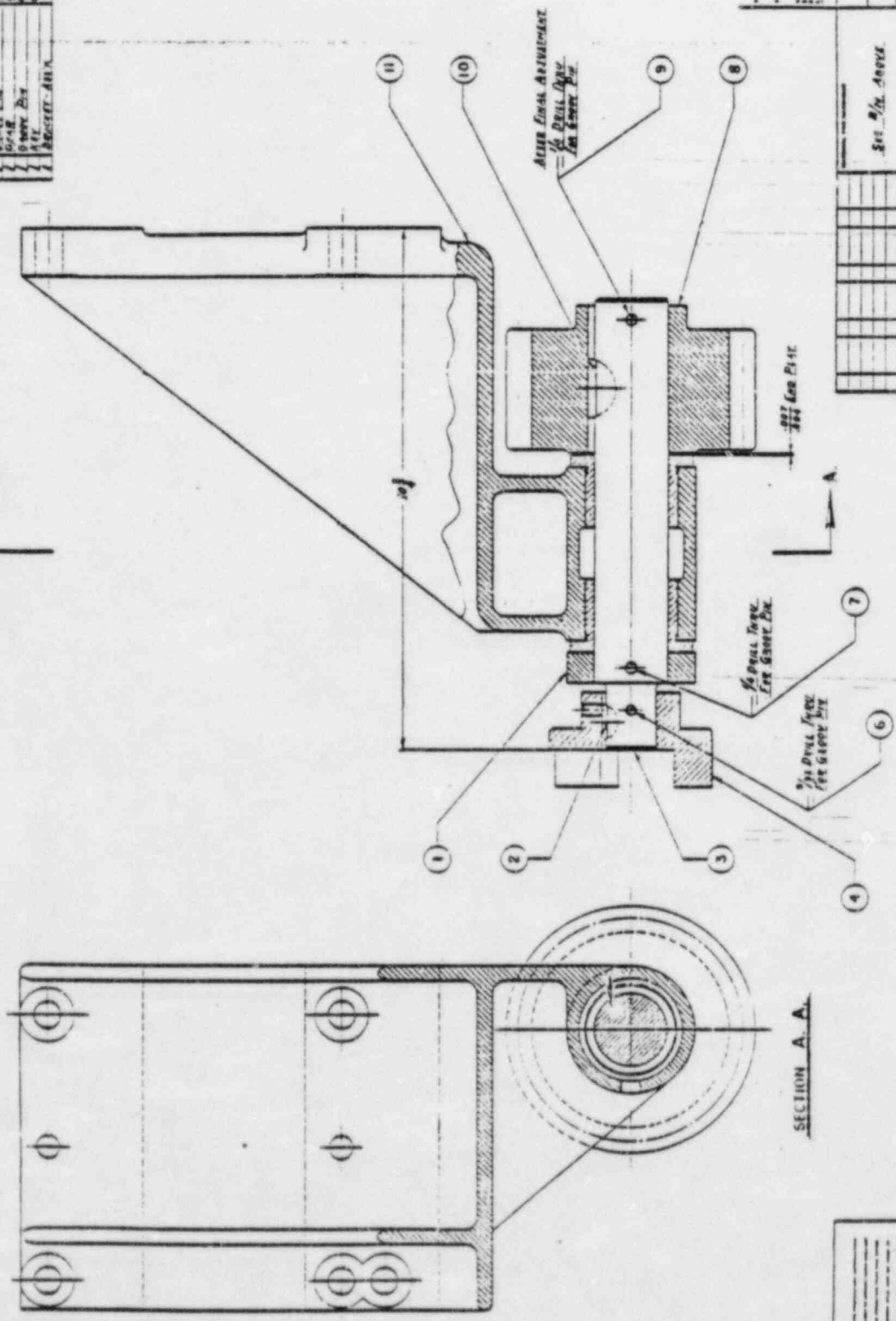
**DELAVAL**

UNION FILED HUB ASSEMBLY

DATE: 10/10/58  
 DRAWN BY: [unclear]  
 CHECKED BY: [unclear]  
 SCALE: 1:1

02 410 06

Part No.	Part Name	Quantity	Remarks
1	COVER PLATE	1	REVISED
2	SCREW	4	REVISED
3	SCREW	4	REVISED
4	SCREW	4	REVISED
5	SCREW	4	REVISED
6	SCREW	4	REVISED
7	SCREW	4	REVISED
8	SCREW	4	REVISED
9	SCREW	4	REVISED
10	SCREW	4	REVISED
11	SCREW	4	REVISED



DATE	2-2-87
BY	J. S. C. B.
APPROVED	
DESIGNED BY	
CHECKED BY	
DATE	02-10-1987

REV	DESCRIPTION	DATE
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		

UNIVERSAL BEARING  
BY LIVING BEARING CO.

ACCESSORY DRIVE ASSEMBLY

SECTION A-A

COMPONENT REVALIDATION CHECKLIST

COMPONENT Overspeed Trip: Couplings  
(Flexible & Spider) DOCUMENT NO QR-1  
PART NUMBER 02-410C SCHEDULED FOR COMPLETION \_\_\_\_\_  
SNPS PART NUMBER 03-410C

TASK DESCRIPTION: 1) Assemble existing documentation on overspeed trip couplings.  
2) Confirm elastomer properties for functionality, by destructive examination of spare coupling element. Verify material is neoprene.  
3) Visual inspection of installed coupling for signs of deterioration.

ATTRIBUTE TO BE VERIFIED: 1) Quality status of vendor component package & vendor quality rating.  
2) Identification of Material 3) Visual inspection of installed coupling for signs of deterioration.

ACCEPTANCE CRITERIA: 1) Satisfactory component package  
2) Evaluation of elastomer material for application by design group (spider-coupling, TDI manual)

REFERENCES: TDI Parts Manual

DOCUMENTATION REQUIRED: 1) Document summary sheet. 2) Report for material identification for over speed trip coupling. 3) Report for visual inspection of coupling.

GROUP CHAIRPERSON R. J. May PROGRAM MANAGER John C. K. ...

COMPONENT REVIEW: \_\_\_\_\_

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

Coupling spider showed some peeling and couplings had some nicks. The spider was replaced with a satisfactory spare and the couplings were refurbished (the peeling of the neoprene on the spider was due to burrs or discontinuities on the coupling which have been removed). A missing setscrew was replaced.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-410C
NO. D. G. INSP. - 9	rev 1
	Chg 0

**TITLE** Overspeed Trip: Coupling (Flexible & Spider)

Item No	Attri.	Ho   d / tot   int	Reference	Description/Instructions
1*				<p><u>INSPECTION:</u></p> <p>*Destructive examination deleted because of the lack of a spare.</p>
2				<p>Perform a visual examination of coupling for signs of wear, deterioration, or other signs of distress. Record observation.</p>

Quality Control Insp./Engr. N/A	Date
------------------------------------	------



TASK DESCRIPTION NO. QR-10-02-402A

## COMPONENT REVALIDATION CHECKLIST

COMPONENT Governor Dr.-Governor & Tach Drive Gear & Shaft DOCUMENT NO QR-1

PART NUMBER 02-402A 411A SCHEDULED FOR COMPLETION \_\_\_\_\_

SNPS PART NUMBER 03-402A

## TASK DESCRIPTION:

- 1) Assemble and review existing documentation
- 2) Verify material properties
- 3) Perform LP/MP of governor drive for fatigue cracks, (after pre-operational or 100 hours running).

## ATTRIBUTE TO BE VERIFIED:

SEE PAGE 2

## ACCEPTANCE CRITERIA:

SEE PAGE 2

## REFERENCES:

SEE PAGE 2

## DOCUMENTATION REQUIRED:

SEE PAGE 2

GROUP CHAIRPERSON *W. J. Mayer*PROGRAM MANAGER *John C. K. Deane*

## COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

All materials are satisfactory.

GROUP CHAIRPERSON \_\_\_\_\_

PROGRAM MANAGER \_\_\_\_\_

ATTRIBUTE TO BE VERIFIED:

- 1) Quality status of component document package.
- 2) Determine material properties by use of comparator for the following items: (Note: NO material identification found)

DESCRIPTION

Governor Drive Shaft  
Tack Drive Gear Shaft  
Tack Drive Gear  
Governor Drive Gear  
Governor Driven Gear

- 3) Perform LP inspections of governor drive for fatigue cracks, in the following areas:
  - a) Gear/shaft contact surfaces and surfaces immediately adjacent.
  - b) Gear pins and bores.
  - c) Vertical shaft/gear keyway.
  - d) Reduced shaft diameter at coupling.

ACCEPTANCE CRITERIA:

- 1) Satisfactory component package.
- 2) Determination of material properties for design review.

REFERENCES:

TDI Dwg. 03-402-03

DOCUMENTATION REQUIRED:

- 1) Documentation Summary Sheet
- 2) Inspection Reports

DIESEL GENERATOR COMPONENT  
QUALITY REVALIDATION

COMPONENT: 02-411A Governor Drive- Governor Drive Gear Shaft

COMANCHE PEAK

QUALITY ASSURANCE INSPECTION PLAN

I.P. NO. 23

D.G. CP1-MEDGEE-01

REV. 2

CHANGE 0

PREPARER: Kroner

DATE: 4-20-84

APPROVAL: Kroner

DATE: 4-20-84

STONE & WEBSTER ENGINEERING CORPORATION

Job Number 11600.63	No. 02-411A
NO. D. G. INSP - 23	Rev Chg 2 0

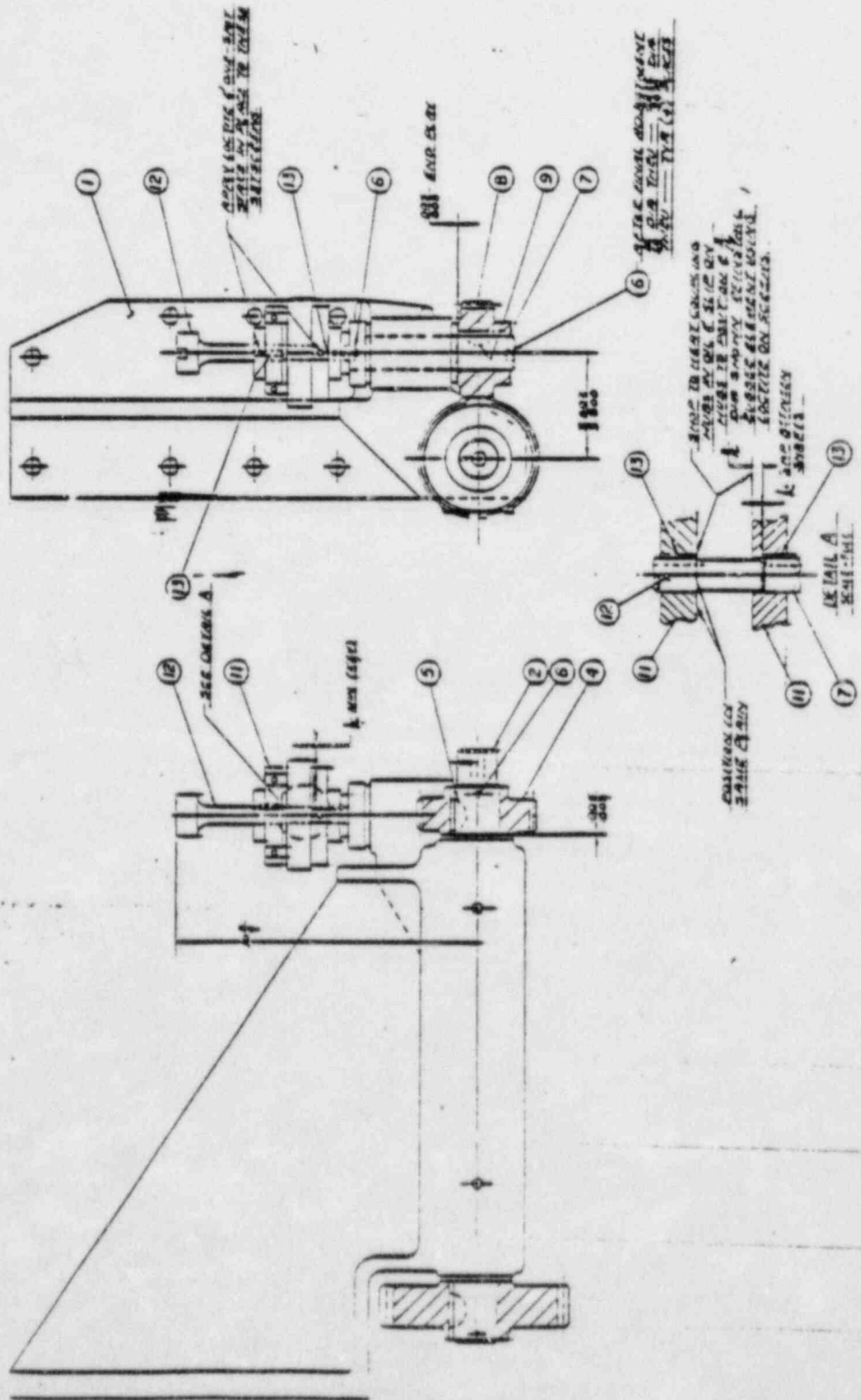
# QUALITY ASSURANCE-INSPECTION PLAN

**TITLE** Governor Drive - Governor Drive Gear Shaft

Item No	Attri.	Hold/Not Int.	Reference	Description/Instructions
1*			TDI Dwg. 02-411-	<p><u>MATERIAL PROPERTIES</u></p> <ul style="list-style-type: none"> <li>Perform a visual inspection of the vertical shaft Koppers coupling (Dwg. 02-411-6199, Item 11) for signs of wear, deterioration or damage. Record observations.</li> </ul> <p>* The L.P. inspection of the shaft was deleted because of accessibility at Tugco request.</p>

Quality Control Insp./Engr. \_\_\_\_\_ Date \_\_\_\_\_

REV	DATE	BY	CHKD	DESCRIPTION
1	10/11/54	J. W. B.	J. W. B.	REVISED TO SHOW CHANGES
2	10/11/54	J. W. B.	J. W. B.	REVISED TO SHOW CHANGES
3	10/11/54	J. W. B.	J. W. B.	REVISED TO SHOW CHANGES
4	10/11/54	J. W. B.	J. W. B.	REVISED TO SHOW CHANGES
5	10/11/54	J. W. B.	J. W. B.	REVISED TO SHOW CHANGES
6	10/11/54	J. W. B.	J. W. B.	REVISED TO SHOW CHANGES
7	10/11/54	J. W. B.	J. W. B.	REVISED TO SHOW CHANGES
8	10/11/54	J. W. B.	J. W. B.	REVISED TO SHOW CHANGES
9	10/11/54	J. W. B.	J. W. B.	REVISED TO SHOW CHANGES
10	10/11/54	J. W. B.	J. W. B.	REVISED TO SHOW CHANGES
11	10/11/54	J. W. B.	J. W. B.	REVISED TO SHOW CHANGES
12	10/11/54	J. W. B.	J. W. B.	REVISED TO SHOW CHANGES
13	10/11/54	J. W. B.	J. W. B.	REVISED TO SHOW CHANGES



FOR DRILL BUSH & SHIM  
 DEVALVE  
 GOVERNOR DRIVE ASSY

COMPONENT REVALIDATION CHECKLIST

COMPONENT Governor Drive:  
Coupling DOCUMENT NO QR-1  
PART NUMBER 02-402B 411B SCHEDULED FOR COMPLETION: \_\_\_\_\_  
SNPS PART NUMBER 03-402B

TASK DESCRIPTION:

- 1) After 100 Hrs. run or preoperational testing, verify coupling material does not degrade (esp. in the oil environment).
- 2) Verify via documentation, that the coupling material installed is neoprene.

ATTRIBUTE TO BE VERIFIED:

- 1) Degradation of coupling material.
- 2) Elastomeric identity of coupling material.

ACCEPTANCE CRITERIA: 1) Lack of gross cracking or gross peeling of coupling material (in comparison to new coupling).  
2) Verification coupling material is neoprene.

REFERENCES: Delavel STR, Vendor documentation

DOCUMENTATION REQUIRED: 1) Document Summary Sheet  
2) Inspection Report for coupling material.

GROUP CHAIRPERSON *P. J. Mayhew* PROGRAM MANAGER *G. L. C. K. L.*

COMPONENT REVIEW: \_\_\_\_\_

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

Coupling is satisfactory.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_

I. GENERATOR QUALITY REVALIDATION PROGRAM  
COMANCHE PEAK

Sheet 1 of 1

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-4028-4110
NO. D. G. INSP. - 51	Rev Chg 0 0

**TITLE** Governor Drive: Coupling

Item No	Attri.	Hold/ Notice/ Point	Reference	Description/Instructions
1.				<p><u>INSPECTION:</u></p> <ul style="list-style-type: none"> <li>Visual inspect for degradation of coupling material.</li> </ul> <p><u>NOTE:</u> Look for cracking or peeling of coupling material (in comparison to a new coupling).</p>

Quality Control Insp./Engr. Date  
N/A

TASK DESCRIPTION NO. QR-10-02-413

COMPONENT REVALIDATION CHECKLIST

COMPONENT Governor Linkage DOCUMENT NO QR-1

PART NUMBER 02-413 SCHEDULED FOR COMPLETION 11

SNPS PART NUMBER 03-413

TASK DESCRIPTION:

- 1) Assemble and review existing documentaiton.
- 2) Verify, via documentation, the presence of loctite at installation.
- 3) Inspect linkage for signs of corrosion and/or wear.

ATTRIBUTE TO BE VERIFIED:

- 1) & 2) Quality status of component document package.
- 3) Visual inspection of linkage assembly.

ACCEPTANCE CRITERIA:

- 1) & 2) Site/vendor documentation, site requirements.
- 3) Lack of pitting and discoloration suggesting oxidation.

REFERENCES:

Vendor manual

DOCUMENTATION REQUIRED:

Document Summary Sheet, Quality Evaluation report

GROUP CHAIRPERSON R. J. Mayfield PROGRAM MANAGER G. J. ... for C.K. Seaman

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

A small amount of rust was found, but no pitting. The rust was removed and the linkage lubricated on reinstallation.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_



STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-413	Rev 0	Chg 0
NO. D.G. INSP. - 28			

**TITLE** Governor Linkage

Item No	Attri.	Hold / Notif. Point	Reference	Description/Instructions
1.				<p><u>VISUAL INSPECTION</u></p> <ul style="list-style-type: none"> <li>Perform a visual inspection of linkage for signs of corrosion, wear, pitting and discoloration, suggesting oxidation. Record observations.</li> </ul>

Quality Control Insp./Engr. N/A	Date
------------------------------------	------

COMPONENT REVALIDATION CHECKLIST

COMPONENT Governor Assembly-  
Heat Exchangers DOCUMENT NO QR-1  
 PART NUMBER 02-415C SCHEDULED FOR COMPLETION 11  
 SNPS PART NUMBER 03-415C

TASK DESCRIPTION:

- 1) Assemble and review existing documentation
- 2) Verify that cooler is mounted below the oil level in the governor

ATTRIBUTE TO BE VERIFIED: SEE PAGE 2

ACCEPTANCE CRITERIA: SEE PAGE 2

REFERENCES: SEE PAGE 2

DOCUMENTATION REQUIRED: SEE PAGE 2

GROUP CHAIRPERSON F. J. Majumdar PROGRAM MANAGER G. L. C. K. Scammon

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

Heat exchanger is mounted below governor oil level.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_

ATTRIBUTE TO BE VERIFIED:

- 1) Quality status of vendor component package and vendor quality rating.
- 2) Verify cooler mounted below oil level in governor.

ACCEPTANCE CRITERIA:

- 1) Satisfactory component package.
- 2) Cooler is mounted below oil level in governor in accordance with TDI manual, Woodward Governor Co., Bulletin 36641B, pages 1-3.

REFERENCES:

TDI Parts Manual - Woodward Governor Co., Bulletin 36641B titled Governor Oil Heat Exchanger.

DOCUMENTATION REQUIRED:

- 1) Document Summary Sheet.
- 2) Inspection Report for verification of cooler mounted below oil level in governor.

1. GENERATOR QUALITY REVALIDATION PROGRAM  
COMANCHE PEAK

Sheet 1 of 1

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-415C
NO. D.G. INSP. - 18	rev   chg 0   0

**TITLE** Governor Assembly - Heat Exchanger

Item No	Attri.	Hold / Notif / Info	Reference	Description/Instructions
1			TDI Parts Manual	<u>VISUALLY INSPECT:</u> Verify that cooler is mounted below oil level in governor.

Quality Control Insp./Engr. N/A	Date
------------------------------------	------

COMPONENT REVALIDATION CHECKLIST

COMPONENT Jacket Water Pump DOCUMENT NO QR-1

PART NUMBER 02-425A SCHEDULED FOR COMPLETION 11

SNPS PART NUMBER 03-425A

TASK DESCRIPTION: SEE PAGE 2

ATTRIBUTE TO BE VERIFIED: SEE PAGE 2

ACCEPTANCE CRITERIA: SEE PAGE 2

REFERENCES: SEE PAGE 2

DOCUMENTATION REQUIRED: SEE PAGE 2

GROUP CHAIRPERSON R. J. Mayr PROGRAM MANAGER John P. C. L...

COMPONENT REVIEW: \_\_\_\_\_

~~RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)~~

Shaft and wear rings showed signs of galling and excessive wear. Entire pump was replaced with a satisfactory spare.

GROUP CHAIRPERSON: \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_

TASK DESCRIPTION:

- 1) Verify material properties of shaft with superficial hardness and material comparator test.
- 2) Disassemble jacket water pump and visually inspect gears to shaft for signs of excessive scoring wear on shaft and pitting or galling on gear teeth. Document any questionable items via photograph and submit to design group.
- 3) LP roots of gear teeth and transition area (gear to shaft).
- 4) Visually inspect clearance ring for evidence of galling or excessive wear. Document any, via photograph, questionable items and submit to design group.
- 5) Assemble to review existing documentation.

NOTE: To be performed on one station engine only, provided no unsatisfactory generic conditions are noted.

ATTRIBUTE TO BE VERIFIED:

- 1) Material properties.
- 2) Lack of galling wear on shaft.
- 3) Lack of any indications parallel to plant of gear teeth or normal to shaft axis at shaft-gear transition area.
- 4) Lack of scoring, galling or reduction of cross-sectional area on wear ring.
- 5) Quality review of component document package.

ACCEPTANCE CRITERIA:

Review of documentation, test and inspection reports by design group.

REFERENCES:

- 1) Site approved test procedures.

DOCUMENTATION REQUIRED:

- 1) Inspection report identifying results of above referenced inspection.
- 2) Documentation Summary sheet.

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-425A
No. D. G. INSP - 35	Rev 1
	Chg 0

**TITLE** Jacket Water Pump

Item No	Attri.	Hold Point	Reference	Description/Instructions
1*				<p><u>INSPECTION</u></p> <ul style="list-style-type: none"> <li>Verify material by use of a comparator test on the shaft. A comparator test is to be performed utilizing a known standard or verifying the availability of a spare or discard which may be comparator tested and sent out for destructive testing at a later date.</li> </ul>
2				<ul style="list-style-type: none"> <li>Check for any galling wear on shaft.</li> </ul>
3				<ul style="list-style-type: none"> <li>Visually inspect for any scoring, galling or reduction of cross-sectional area on wear ring.</li> </ul>
				<p><u>ACCEPTANCE CRITERIA</u></p>
4				<ul style="list-style-type: none"> <li>Diametrical clearances between the wear ring and the impeller shall not exceed .050 inches.</li> <li>Perform a hardness test to verify material on the shaft and impeller.</li> </ul>

\*Comparator test on impeller was deleted. Impeller material is not conducive to meaningful test results (cast bronze). Per Owner's Group recommendation.

Quality Control Insp./Engr. N/A	Date
------------------------------------	------

COMPONENT REVALIDATION CHECKLIST

C  
COMPONENT Intercooler Piping-Coupling  
gaskets, bolting DOCUMENT NO QR-1

PART NUMBER 02-436B SCHEDULED FOR COMPLETION. 11

SNPS PART NUMBER 99-436B

TASK DESCRIPTION:

Verify type of dresser coupling installed.

ATTRIBUTE TO BE VERIFIED: Type of coupling

ACCEPTANCE CRITERIA: Coupling identification per manual.

REFERENCES: Dresser Manual, TDI

DOCUMENTATION REQUIRED:

GROUP CHAIRPERSON RJ Wagner PROGRAM MANAGER John C. K. Jones

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

Coupling is satisfactory.

CL  
GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_



STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-436B	Rev 0	Chg 0
NO. D. G. INSP. - 35			

**TITLE** Intercooler Piping - Coupling

Item No	Attri.	Hold/Notice Point	Reference	Description/Instructions
1			Dresser Manual T.D.I.	<p><u>INSPECTION</u></p> <ul style="list-style-type: none"> <li>Verify type of coupling (4" straight Dresser Style 38). Record any manufacturer's identifying markings.</li> </ul>

Quality Control Insp./Engr. N/A	Date
------------------------------------	------

COMPONENT REVALIDATION CHECKLIST

COMPONENT Starting Air Distributor  
Distributor Assembly DOCUMENT NO QR-1  
PART NUMBER 02-442A SCHEDULED FOR COMPLETION \_\_\_\_\_  
SNPS PART NUMBER 03-442A

TASK DESCRIPTION:

- 1) Assemble & review existing documentation.
- 2) Visually inspect poppets for signs of wear after 100 hrs. run or pre-operational testing to verify proper lubrication
- 3) Perform dimensional check of poppets.

ATTRIBUTE TO BE VERIFIED:

SEE PAGE 2

ACCEPTANCE CRITERIA:

SEE PAGE 2

REFERENCES: Applicable site/vendor documents

DOCUMENTATION REQUIRED: Document summary sheet, quality evaluation report

GROUP CHAIRPERSON R. J. Majors PROGRAM MANAGER G. L. ... C. V. Seaman

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit I, Train A (Serial No. 76001)

Excessive wear found in both assemblies. Both were replaced with satisfactory spares.

GROUP CHAIRPERSON \_\_\_\_\_

PROGRAM MANAGER \_\_\_\_\_

ATTRIBUTE TO BE VERIFIED:

- 1) Quality status of component document package.
- 2) Existence of scoring-wear on poppet surfaces.
- 3) Take 2 readings on the poppets, one at the low cam point and one at the high cam arc. Also, measure the "flat" on the contact face.

ACCEPTANCE CRITERIA:

- 1) The following criterion shall be used to evaluate the significance of the wear observed on the poppet heads. Measurement of the worn area - After having opened the starting air distributor cover, rotate the crankshaft to expose successfully all the poppet heads. For each of the 8 poppets closest to the starting air distributor cover, measure smallest diameter of the worn area on the poppet head. If the largest of these measurements is no larger than 1.5 times the smallest measurement, all poppets are considered to wear evenly. If not, the hardness of all 16 poppet heads will be measured and compared to TDI specifications.
- 2) Dimensional check to be verified by design group.

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-442A	Rev 2	Chg 0
NO. D.G. INSP. - 25			

**TITLE** Starting Air Distributor - Distributor Assembly

Item No	Attri.	Ho   d   A   o   l     o   i   n   t	Reference	Description/Instructions
1 *				<p><u>INSPECTION:</u></p> <p>To verify proper lubrication, perform a visual inspection of poppets for signs of wear or scoring. This inspection to be accomplished after the 100 hr. run or pre-operational testing.</p> <p>* Hardness deleted at TUGCO's request.</p> <p><u>ACCEPTANCE CRITERIA:</u></p> <p>The following criterion shall be used to evaluate the significance of wear observed on the poppet heads. Measurements of the worn area after having opened the starting air distributor cover, rotate the crankshaft to escape successfully all the poppet heads. For each of the 8 poppets closest to the starting air distributor cover, measure smallest diameter of the worn area on the poppet head. If the largest of these measurements is no larger than 1.5 times the smallest measurement, all poppets are considered to wear evenly.</p>

COMPONENT REVALIDATION CHECKLIST

COMPONENT Turbocharger-Bkkt-Air Butter-  
fly Vavle Assy w/Actuator DOCUMENT NO QR-1

PART NUMBER 02-475B SCHEDULED FOR COMPLETION

SNPS PART NUMBER 03-475B

TASK DESCRIPTION: SEE PAGE 2

ATTRIBUTE TO BE VERIFIED: SEE PAGE 2

ACCEPTANCE CRITERIA: SEE PAGE 2

REFERENCES: SEE PAGE 2

DOCUMENTATION REQUIRED: SEE PAGE 2

GROUP CHAIRPERSON *R. J. Majich* PROGRAM MANAGER *James C. L. Jones*

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

Right bank shaft showed pitting at 3 locations and was refurbished.

GROUP CHAIRPERSON  PROGRAM MANAGER

TASK DESCRIPTION:

- 1) Assemble and review existing documentation. Inspect butterfly to shaft attachment pins for signs of distress; document with photographs. Perform on shaft & pins, material comparator test and superficial hardness test. Perform visual inspection of shaft condition, lubrication, wear and distress, document with photographs. Verify installation and alignment of butterfly valve (cold spring of piping on valve reinstallation to be noted).

ATTRIBUTE TO BE VERIFIED:

- 1) Quality status of component document package and vendor quality rating.
- 2) Condition of pins.
- 3) Material comparator and superficial hardness test on pins & shaft.
- 4) Visual inspection of shaft.
- 5) Installation and alignment of butterfly valve.

ACCEPTANCE CRITERIA:

- 1) Satisfactory review of document package.
- 2) Satisfactory condition of pins/hole (lack of signs of wear, distortion, hole elongation, pins fit tight).
- 3) Review of Inspection Results Group.

REFERENCE:

- 1) TDI Parts Manual - Dwg.

DOCUMENTATION REQUIRED:

- 1) Inspection Report
- 2) Document Summary Sheet

STONE & WEBSTER ENGINEERING CORPORATION

Job Number 11600.63	No. 02-475B
NO. D. G. INSP. - 15	Rev 3 Chg 0

# QUALITY ASSURANCE-INSPECTION PLAN

**TITLE** TURBOCHARGER - Bracket-Air Butterfly Valve Assembly (W/Actuator)

Item No	Attri.	No of Joints	Reference	Description/Instructions
1			Mfr's Parts Manual	<p><u>INSPECTION:</u></p> <ul style="list-style-type: none"> <li>Visual inspect butterfly to shaft attachment pins for signs of wear and loosening - distortion - hole elongation - pins fit tight. TDI P/N GC-001-138 on TDI Dwg. No. 03-475-5625, Item 4</li> <li>Document with photographs.</li> </ul>
2			Mfr's Parts Manual	<ul style="list-style-type: none"> <li>Visual inspect shaft for signs of wear - distortion - fretting - galling - structural deformation and cracking.</li> <li>Document with photographs</li> </ul>
3*				<p>*** Material Comparator verification of shaft was not accomplished. A known standard was not available.</p>
4*				<ul style="list-style-type: none"> <li>Material hardness test - perform a superficial material hardness test on TDI P/N 02-475-15-A6, Shaft</li> </ul>
5				<ul style="list-style-type: none"> <li>Verify installation and alignment of butterfly valve (any cold spring of piping on valve reinstallation is to be noted.</li> </ul>
**				<p>NOTE: One valve to be inspected.</p>

\*Superficial, hardness and comparator tests were deleted on pins due to geometric configuration (access to exam surface). See IP 15, Rev. 0

\*\* One valve to be inspected per TIGCO request

Quality Control Insp./Engr.

Date

N/A





COMPONENT REVALIDATION CHECKLIST

COMPONENT Turbocharger-Bracket-  
Bolting & Gasket DOCUMENT NO QR-1

PART NUMBER 02-475D SCHEDULED FOR COMPLETION \_\_\_\_\_

SNPS PART NUMBER 03-475D

TASK DESCRIPTION:

- 1) Verify torque/installation/material of bolting
- 2) Verify proper alignment of system
- 3) Review bolted joint inspection of flanged joint.
- 4) Verify material properties by use of comparitor.

ATTRIBUTE TO BE VERIFIED: SEE PAGE 2

ACCEPTANCE CRITERIA: SEE PAGE 2

REFERENCES: SEE PAGE 2

DOCUMENTATION REQUIRED: SEE PAGE 2

GROUP CHAIRPERSON R.J. Maynor PROGRAM MANAGER John C.K. Pearson

COMPONENT REVIEW: \_\_\_\_\_

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

Numerous bolts had no markings or incomplete thread engagement. Also, lock-washers were missing on many bolts. Bolts and lockwashers were replaced as necessary.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_

ATTRIBUTE TO BE VERIFIED:

- 1) Verify torque/installation of bolting
- 2) Verify material Chemistry & Properties
- 3) Capscrews installed as specified in TDI Instruction Manual.

ACCEPTANCE CRITERIA:

- 1) Bolted joint connections torqued to values specified in TDI Instruction Manual.
- 3) Design group shall determine acceptance criterium for material Chemistry & Properties.

REFERENCES:

TDI Instruction Manual

DOCUMENTATION REQUIRED:

Inspection Report

SEGNE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-475D		
NO. D. G. INSP. - 19		Rev 2	Chg -

**TITLE** Turbocharger - Bracket Bolting

Item No	Attr.	Hold/Point	Reference	Description/Instructions
1**			Mfr. Instruction Manual	
2				Perform a visual examination of the bracket bolting for proper installation (i.e. gross misalignment and incomplete engagement of threads should be recorded).
3*				Perform a visual examination of all bolts for material identification markings. Record all markings.
<p>** Delete the verification of torque because during the correction of the installation problems, <del>the</del> the bolting was re-torqued to the latest TDI values.</p> <p>* Comparator test was deleted because of the lack of a known standard and the material identification markings being recorded.</p>				

Quality Control Insp./Engr. | Date

COMPONENT REVALIDATION CHECKLIST

COMPONENT Control Panel Assembly Terminal  
Boards/Switches, Wiring DOCUMENT NO QR-1

PART NUMBER 02-500N SCHEDULED FOR COMPLETION: \_\_\_\_\_

SNPS PART NUMBER 03-500N

TASK DESCRIPTION:

- 1) Verify panel and contents meet applicable standards
- 2) Visual exam for cleanliness

ATTRIBUTE TO BE VERIFIED: SEE PAGE 2

ACCEPTANCE CRITERIA: SEE PAGE 2

REFERENCES: Applicable specifications, vendor documentation

DOCUMENTATION REQUIRED: Quality checklist to summarize data and identify non-conformance to ratingor mounting.

GROUP CHAIRPERSON RJ Majors PROGRAM MANAGER G. L. C. K. S.

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

Panel assembly had dust and extraneous materials. Assembly was cleaned.

GROUP CHAIRPERSON \_\_\_\_\_ PROGRAM MANAGER \_\_\_\_\_

ATTRIBUTE TO BE VERIFIED:

Verify via inspecting installed components that electrical rating of wiring, terminal boards, terminal lugs and switches are in compliance with applicable specifications. Verify that panel and its contents are seismically qualified.

ACCEPTANCE CRITERIA:

Electrical ratings meet or exceed applicable specifications and components are mounted properly.

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-500N
NC: D. G. INSP. - 29	Rev 0 Chg -

**TITLE** Control Panel Assembly Terminal Boards, Switches, Wiring

Item No	Attri.	Hold Point	Reference	Description/Instructions
1				<p><u>INSPECTION:</u></p> <ul style="list-style-type: none"> <li>Perform visual examination for cleanliness (e.g., dust &amp; external material).</li> </ul>

Quality Control Insp./Engr.	Date
-----------------------------	------

COMPONENT REVALIDATION CHECKLIST

COMPONENT L.O. Sump Tank: Mis. Fittings  
Gkts. Pipe & Blng Mat'l Valve DOCUMENT NO QR-1

PART NUMBER 02-540B SCHEDULED FOR COMPLETION \_\_\_\_\_

SNPS PART NUMBER 03-540B

TASK DESCRIPTION: Verify bolted joint connections are tight (w/exception of pipe flange joints, no torque requirements are provided; use leak tightness criteria). Assemble and review existing documentation.

ATTRIBUTE TO BE VERIFIED: Bolted joint connections to be verified.  
Quality status of component package & vendor quality rating

ACCEPTANCE CRITERIA: Bolted joint connections torqued to values specified in TDI Instruction Manual; torque tables.

REFERENCES: TDI Instruction Manual & L.O. Sump Tank Parts List

DOCUMENTATION REQUIRED: Inspection Report, Document Summary Sheet, Quality Evaluation Report

GROUP CHAIRPERSON RJ Majors PROGRAM MANAGER James C. Jones

COMPONENT REVIEW:

RESULTS AND CONCLUSIONS: CPSES Unit 1, Train A (Serial No. 76001)

All bolts and gaskets are satisfactory.

GROUP CHAIRPERSON \_\_\_\_\_

PROGRAM MANAGER \_\_\_\_\_

STONE & WEBSTER ENGINEERING CORPORATION

# QUALITY ASSURANCE-INSPECTION PLAN

Job Number 11600.63	No. 02-540B		
NO. D. G. INSP - 1		Rev 0	Chg 0

**TITLE** Lube Oil Sump Tank - Misc. Fittings, Gaskets, Pipe, Valve - "Bolting Materials"

Item No	Attri.	Hold/Not In	Reference	Description/Instructions
1				<p><u>INSPECTION:</u></p> <ul style="list-style-type: none"> <li>Visually verify bolted joint connections are tight. (No torque evaluation required; perform system leakage test at operating pressure).</li> </ul> <p>NOTE: To be performed on all station engines.</p> <p>NOTE: It is not the intention of this Inspection Plan to require the opening of the tank for inspection of internal bolting. Tightness of valve bolting is to be verified on the external drain valve. The valve location may not be reflected on TDI drawings.</p>

Quality Control Insp./Engr. N/A	Date
------------------------------------	------