PLAINTIFF'S EXHIBIT
SH-3310

10

12/11/85

CCU SLURRY PRODUCT PUMPS
P-9693 LOOSE IMPELLER NUT

On Monday, December 9, 1985, the slurry product pump, P-9693 was pulled out due to electric driver overloading and shutting down.

Inspection revealed that (1) the impeller nut was off shaft and lodged in impeller eye, (2) heat check cracks starting at impeller eye spreading out radially (3) heat check cracks on case liner starting at suction nozzle at eye and spreading out radially, (4) two (2) loose case liner studs (item S2), (5) one (1) loose case liner nut (item N2).

Lawrence Pump Co. (OEM) was informed of the loosening impeller nut problem and a solution requested. They will send recommendation. Their verbal recommendation is:

1. Tack weld nut to impeller. Use a hi nickel weld rod. Use Ni Rod 55.
   Two (2) tack welds 180 degrees apart.
   Weld will probably crack due to parts metalurgy but weld will allow enough obstruction to prevent nut from loosening. This is normally done by Lawrence.

Or.

2. Assemble pump less case. Torque nut to proper spec.
   (A) Drill a small hole axially thru nut (as per the existing set screw) and into shaft end. Drive a pin thru hole and "stake" it.
   (B) Remove existing impeller nut set screw. Drill small hole into shaft end. Replace set screw with longer set screw if necessary and "stake" it.

3. The seal sleeve gasket at sleeve and shaft shoulder (item G-14) is a Jonh- Mansville 1/16" asbestos gasket. The gasket could be causing the problem by compressing and allowing nut to become loose.
   They recommend replacing asbestos gasket with 1/16" metal gasket. Sealing would be done by the seal sleeve o-ring (item OR2). The metal gasket would keep parts in same position.
   This may not be necessary if the impeller nut is properly secured.

P-9693 Loose Impeller Nut (cont'd)

Mentioned to Lawrence was the loose liner studs and nut and our repair. They saw no problem with the repair method. They did not offer any suggestions nor was any asked.

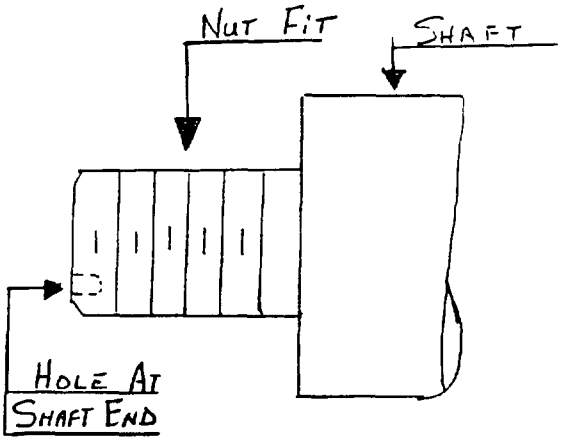
MED proposed fix to the loosening impeller nut and the loose studs and nut.

1. Repair pump per standard procedures.

2. Follow the Lawrence Pump recommendation no. 2 (A). (See Page 1)

   (i.e. drill thru set screw hole into shaft end approx. 1/8" deep. Use long enough set screw to "stake".)

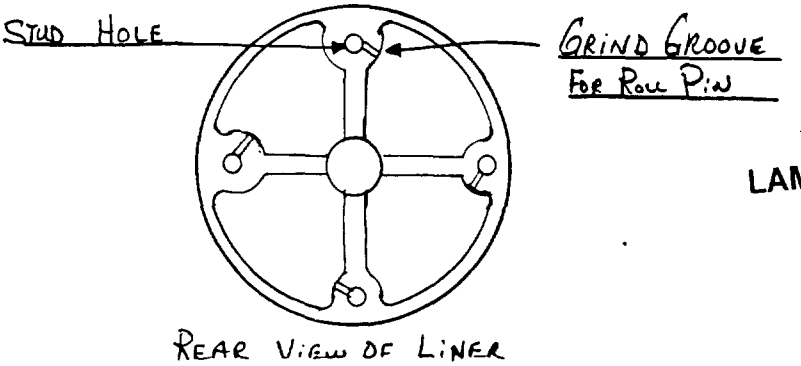
EXAMPLE



3. **LOOSE LINER STUDS AND NUTS**
   (Do the following on case and head liners.)

   Studs. Do the following

   a) Grind a straight round hole perpendicular to the stud hole in liner. Select a gound hole size to that of an available roll pin.
   (See drawing below)



REAR VIEW OF LINER

LAM 016675

DPMC-13388

P-9693 Loose Impeller Nut (cont'd)

b) Install studs. drill roll pin size hole in stud at previously grind hole in liner.

c) Install roll pin. DO NOT ALLOW ROLL PIN TO INTERFERE WITH PROPER LINER INSTALLATION.

NUTS

a) Once liner has been properly install, tie wire each nut to each stud.

MED also recommend a similar repair to the spare pump, P-9694 when it is pulled for repairs. The revisions would assure that neither the impeller nut, nor the studs, nor the nuts would come loose will pump is in service.

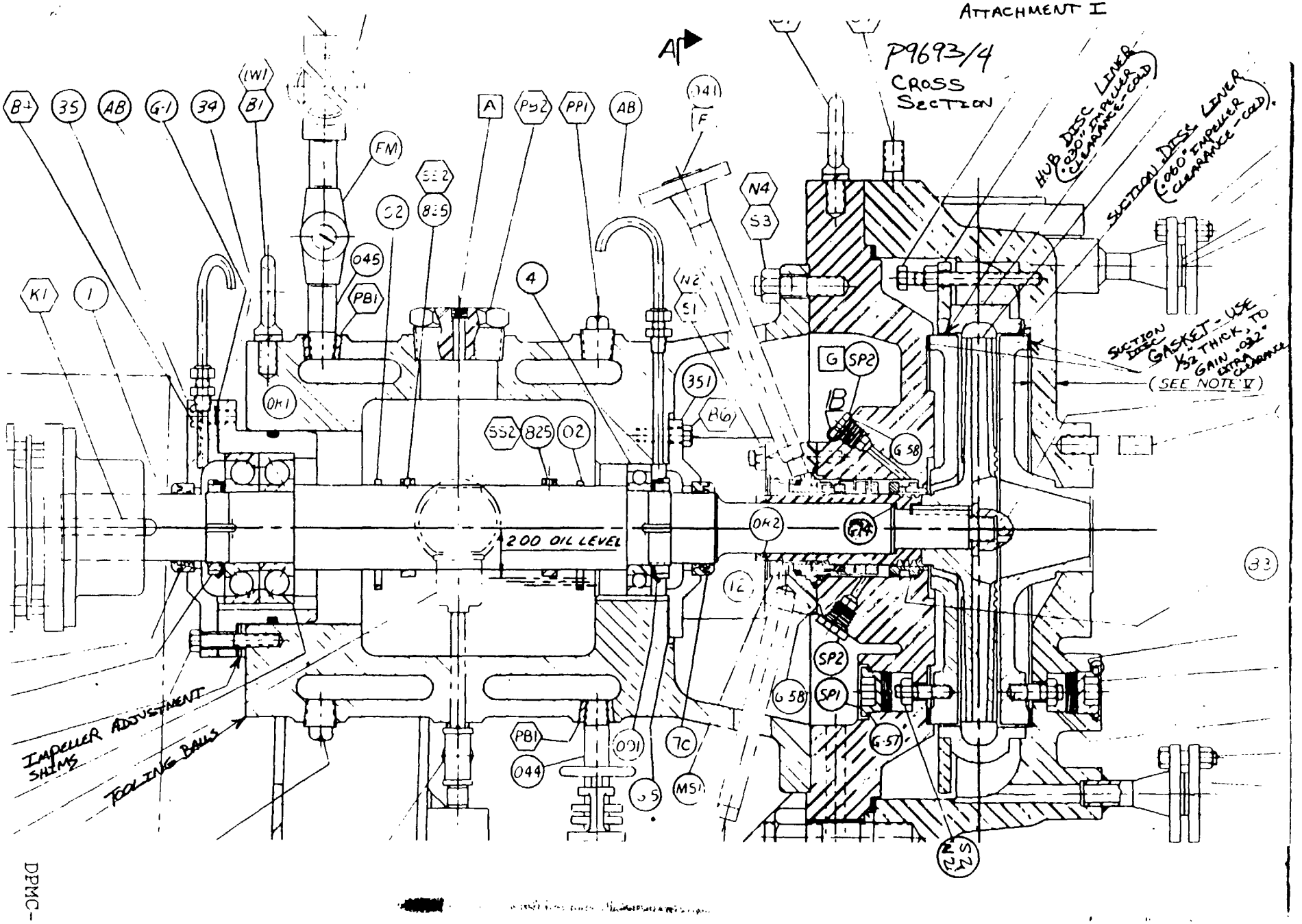
Call me at x6762, if there are any questions.

J.H. Babineaux

cc: W.E.Carrington
C.W.Jones
R.L.Jones
T.Q.Queener
K.J.Savoie
D.A.Tiede
Equipment File P-9693, P-9694

BIG SATELLITE
12/2/85 TQQ
Return Document to File
Record Copy in File
Information Copy
Record copy in ____ Satellite

ATTACHMENT I



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DPMC-13390

SM-32-MC (REV. 4-79)

Shell Oil Company • Shell Chemical Company
Interoffice Memorandum

NOVEMBER 15, 1985

FROM: P. L. BARNETT, SR. SECRETARY - PRESSURE EQUIPMENT DEPARTMENT

TO: L. MIRABEAU, ETSO - AROMATICS DEPARTMENT

SUBJECT: MATERIALS UNDER TEST - TEST #10

Attached is Test #10 results, having been inspected in August, 1985 and completed by inspector for Aromatics Area, W. Harnamji.

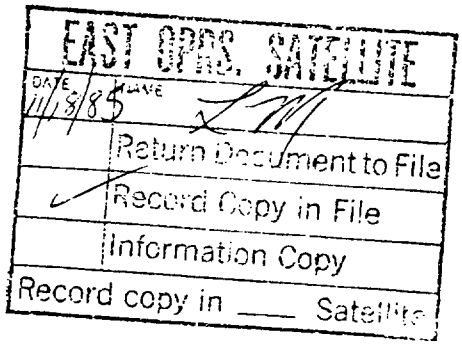
In accordance with Complex Order E-2, I am submitting the results to you for your consideration.

Please advise in writing whether or not you would like this test to remain under test.

P. L. Barnett

Attachment

cc: G. S. Lancaster
M. C. Montana
M.U.T. File



LAM 016678

CIBZ8531904

DPMC-13391

MATERIAL UNDER TEST

TEST NO. 10

Description of Material Under Test "FLEXITE" SUPER NON ASBESTOS FILLER SPIRAL WOUND GASKET

Manufacturer FLEXITALLIC Approved: Yes X No ___

Purpose of Test TO REPLACE SPIRAL WOUND ASBESTOS FILLED GASKETS WITH NO INCREASE IN COST. AND ALSO REPLACE SPIRAL WOUND GRAFOIL FILLED GASKETS WHICH ARE COSTLIER.

Initiator of Test WILLIS HARNAMJI

Location of Test AROM WEST ACU1.

Inspection Interval 1 YEAR changed to 2 years.

Test Considered But Rejected ___ Reason: ___

Date of Test: Start 5-83 Finish 8-85

Job or Work Order No. 36161

Test Results: ALL GASKETS

These gaskets proved to be successful in benzene, toluene, xylene, heat medium steam and in vacuum service over a period of two years.

It was also noticed that they performed better than Grafoil or Asbestos in heat medium service at 590°F, 175 psig.

Reason for extending the test was due to the installation of a new heat medium furnace at the ACU in July, 1984.

W. Harnamji 11/14/85

ETSO BYRON WOOD BW 5-26-85 WILLIS HARNAMJI 5-26-85

Evaluator Date

Process Manager R.N. ROBINSON W.H.

Specialty Group INSPECTION

LAM 016679

DPMC-13392

SM-32-MC (REV. 4-79)

Shell Oil Company • Shell Chemical Company
Interoffice Memorandum

MAY 23, 1985

FROM: S. M. WALTMON, INSPECTOR - PRESSURE EQUIPMENT DEPARTMENT

TO: R. SNODGRASS, JR. - MAINTENANCE - CENTRAL-MAINTENANCE

SUBJECT: SGP COATINGS/DU PONT

On May 21, 1985 the SGP Unit's tank farm, west of the main pipe rack was inspected for the DuPont Paint Program.

The majority of the equipment is painted and has a red lead primer. All applicable safety precautions will have to be followed for protection against the lead primer.

All painted equipment has sufficient metal thickness for sandblasting.

Note: On the following equipment, do not blast to white metal:

(1) All orifice nipples and valve.
(2) Packing glands of control valves.

A small amount of equipment is Denso wrapped; spot repairs at breaks in the wrapping can be hydroblasted and spot painted.

The remainder of the equipment is insulated and will only require coatings to uninsulated nozzles, manways and appurtenances outside of insulation. Caution should be exercised while blasting around insulated equipment as the majority of the insulation is asbestos.

As in the past, you will grease gear operators valve stems, gauges and gauge glasses prior to painting. After completion of this area, all grease and protective devices shall be removed prior to moving to next section.

This letter addressed the soundness of the equipment only. All work will have to be coordinated through Operations (J. B. Whitehead, Ext. 6693).

Follow established safety practices and remain alert at all times. Remember this unit is operating and any leaks or damage to equipment should be reported immediately.

S. M. Waltmon

S. M. Waltmon

cc: DuPont Paint Co. - DPMC
Scott McTigue

cc: DPMC
L. R. Broering
W. E. Carrington
D. S. Christensen
T. Q. Queener
V. M. Romero
J. B. Whitehead
S. W. Wilson
Pressure Equipt. Files

EAST OPNS. SATELLITE
DATE 5/24/85 NAME DSC
Return Document to File
Record Copy in File
Information Only
Record Copy

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DPMC-13393

LAM 016680

Materials And Equipment

1985 10 5C.

LAM 016673