



Pacific Chapter

Western Dredging Association

Fall 2014 Conference



Port of Portland Navigation Division

Dredge Oregon

The Port of Portland's Fleet of Dredges 1898 to Present

- 1898-1921 – Portland 600 HP 20” 13,750,880 Cu. Yds
- 1902-1918 – Columbia I 1600 HP 30” 58,568,671
- 1912-1930 – Willamette 1600 HP 30” 34,021,462
- 1916-1930 – Tualatin 2000 HP 30” 33,492,103
- 1921-1938 – Columbia II 2700 HP 30” see Col. I
- 1925-1965 – Clackamas 2700 HP 30” 127,146,900
- 1965-Present – Oregon 5000 HP 30” 242,444,923

TOTAL 506,848,000 Cubic Yards



U.S. Army Corps of Engineers Contract

- Port owns and operates the Dredge OREGON
- Current 5 Year Contract 2011–2016
- Very Unique Contract Between Port and COE
- At Cost Reimbursement – No Profit



Operational Overview

- Dredge Oregon Operates 24 hours, 5-6 days each week
- Typical Season Starts in June and ends in Oct. or Nov.
- Standby for few months
- Perform Major Maintenance preparing for another season
- \$10 – \$16 M budget



DREDGE OREGON

In 1891, to maintain Portland's position as a West Coast commercial center, the Oregon Legislature created the Port of Portland for the purpose of dredging and maintaining the Columbia River channel at a depth of 25 feet. The Port leased its first dredge from the city of Portland and launched a partnership with the U.S. Army Corps of Engineers that still exists. Today, the Port owns the Dredge Oregon, a nonpropelled, cutter (suction) dredge with steel superstructure and hull. It can dredge 2,000 to 3,000 cubic yards of material per hour with a diesel-powered engine. The Dredge Oregon works in the lower Columbia and Willamette rivers.

30-inch pipeline Dredge Oregon

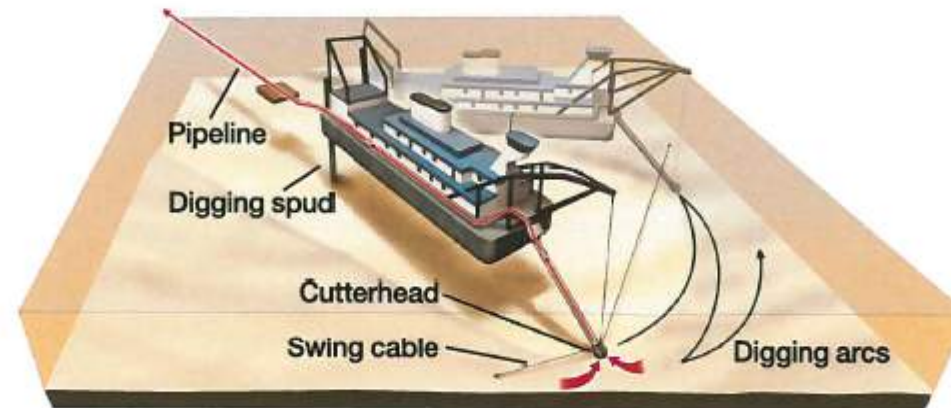
Type: 30-inch hydraulic pipeline dredge, nonpropelled, steel hull and superstructure, cutter (suction)

Built: 1965, Bauer Dredging Co.

Rebuilt: 1979, Northwest Marine Iron Works, Inc.

Repowered: 2014, Vigor Marine

Length, overall.....	265 feet
Length of hull.....	180 feet
Beam, overall	52 feet
Suction pipe, inner diameter	33 inches
Discharge pipe, inner diameter	30 inches
Dredging depth	85 feet maximum, 12 feet minimum
Width of cut.....	450 feet maximum, 100 feet minimum
Pumping engine	EMD model SE 20-710G4C-T3, 2 cycle diesel, 5000 bhp @ 900 rpm
Cutter gear box	Lufkin reduction ratio 32.71:1
Auxiliary generators.....	3 each CAT model C32, V12, 4 stroke diesel, 1047 bhp @ 1,800 rpm
Cutter motor	480 volts, 800 hp @ 900 rpm
Swing motor	150 hp
Spud motor	150 hp
Suction mouth.....	Open elliptical
Spuds	One pair 107 feet long, and one pair 110 feet long, fabricated steel with cast steel points
Fuel capacity	82,000-gallon No. 2, diesel average
Total crew	42 men and women, including shore crew
Draft.....	11 feet



THE PORT OF PORTLAND
DREDGE "OREGON"

• 1965 •

DESIGNED AND CONSTRUCTED BY:
BAUER DREDGING CO., INC., PORT LAVACA, TEXAS
W. H. BAUER, PRESIDENT - T. I. MILLIET, ENGINEER

★
PUMP DESIGNED BY:
GEORGE PELTON, CHICAGO, ILLINOIS

★
CONSTRUCTION INSPECTION BY:
A. J. HEINEMAN, MARINE MANAGER
J. H. FLETCHER, CHIEF ENGINEER - DREDGE



Dredge OREGON Repower

- Crew Reluctant to Change...
- Largest Polluter of emissions
- High Fuel Costs
- Parts Availability
- Reliability
- Maintenance Costs

Dredge OREGON Repower

- Replace Main Engine, Pump, Two Generators, Electrical Controls and Cutter Motor

BENEFITS OF THE REPOWER

- Lower Maintenance/Operating Costs
- Improve Fuel Economy
- Lower Emissions
- Increase pumping distance to 10,000 feet

Dredge Oregon Repower

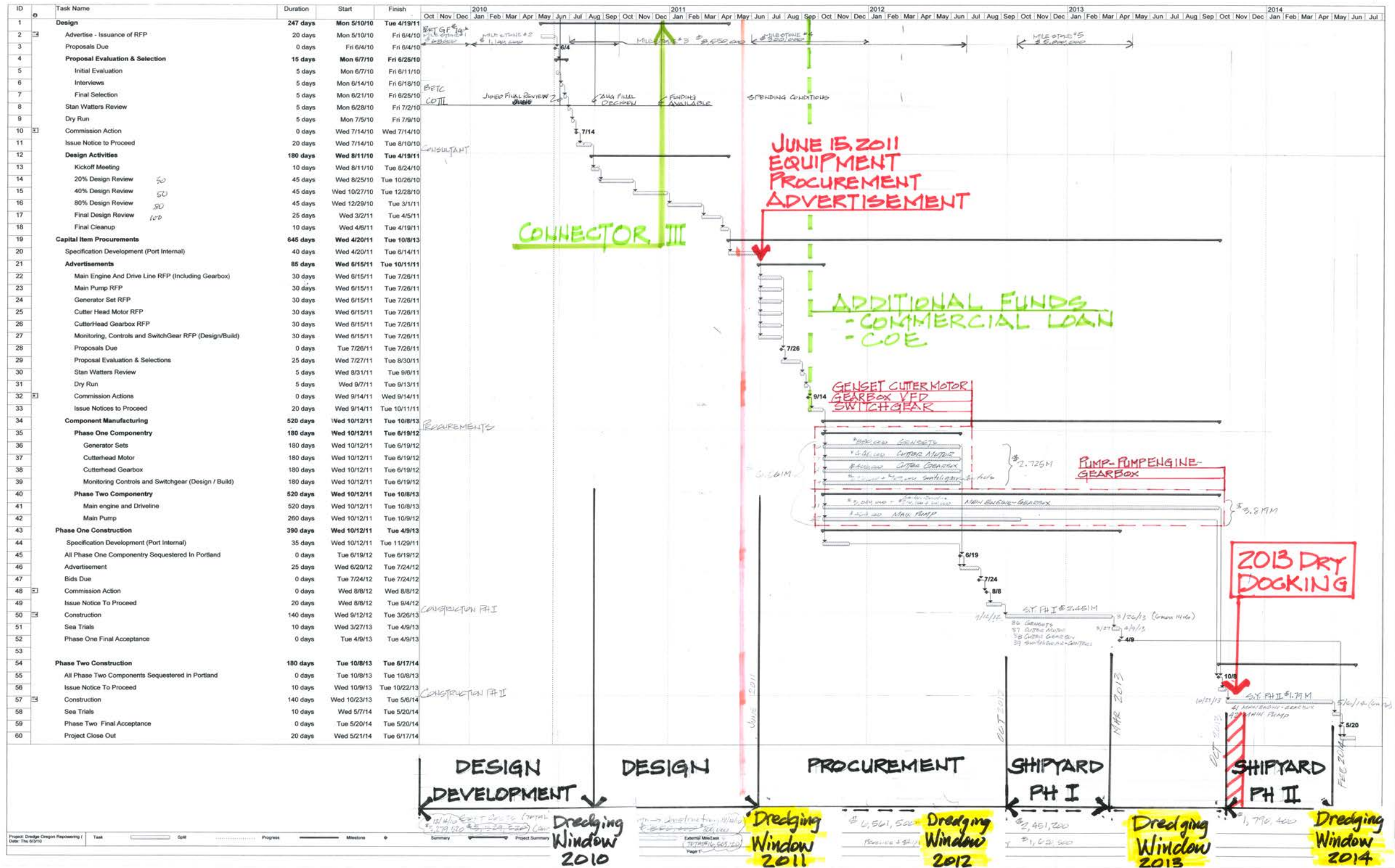
Shipyard Phase 1 and Phase 2



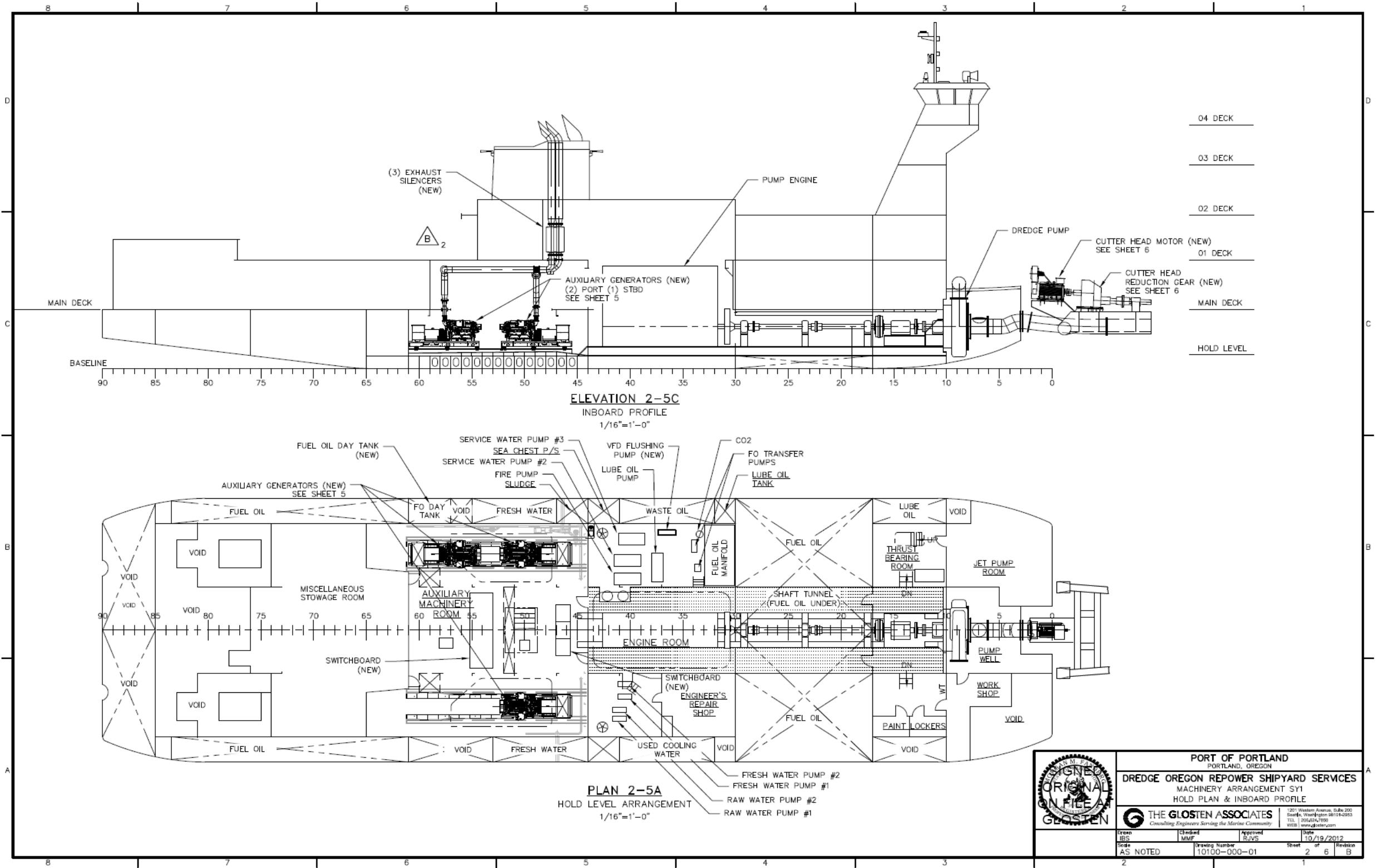
Dredge Oregon



Repower Schedule



Repower Equipment - Shipyard Phase 1



SY1 Dry Docking

Going on Dry Dock



Lifted on Dry Dock



SY1 Genset Removal

Old JS-8 Removal



Bottom Access



SY1 Generators

Old Starboard JS-8 Genset

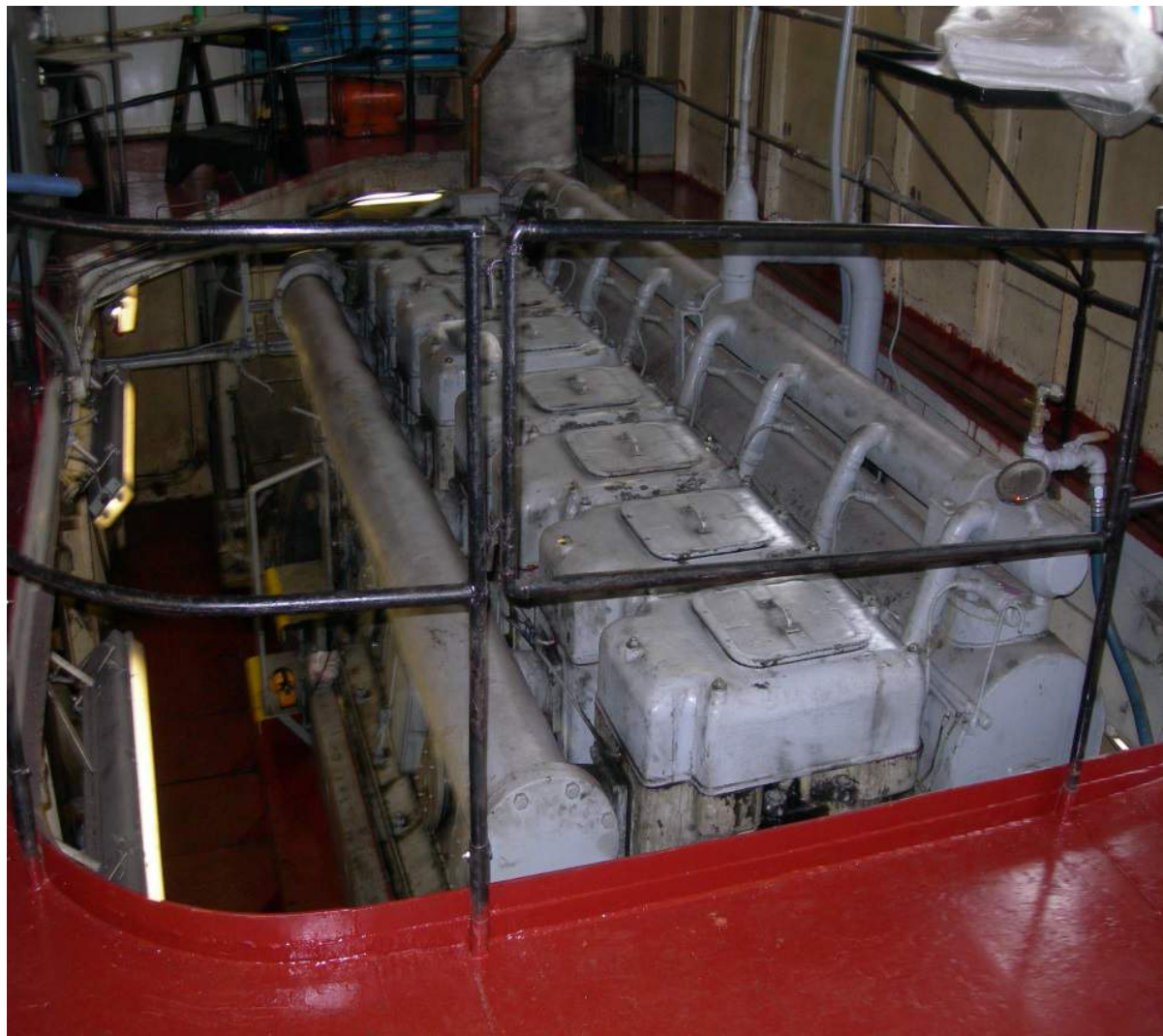


New CAT C32 Genset



SY1 Generators

Old Port JS-8 Genset



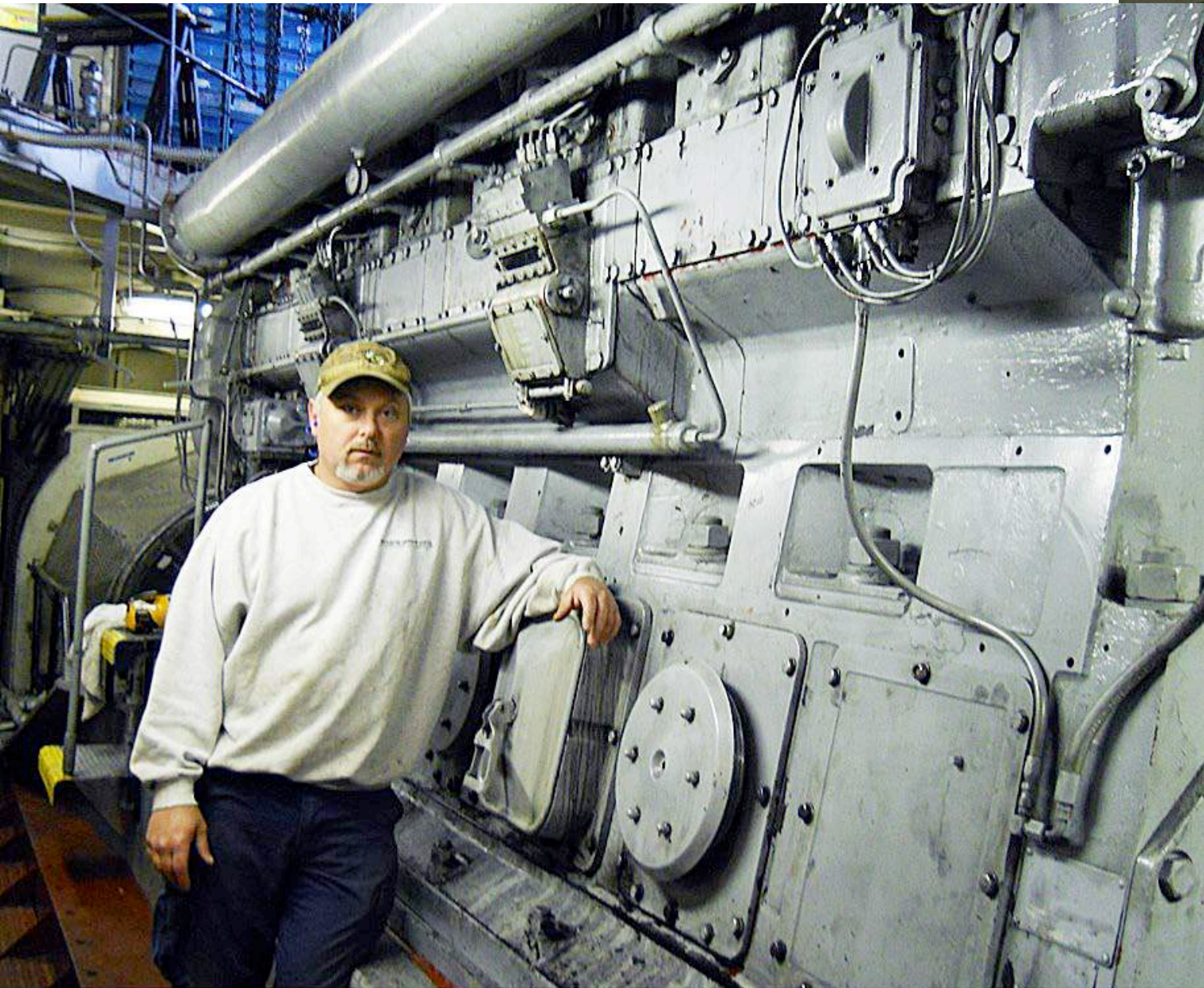
New CAT C32 Gensets



SY 1 Genset

New

Old and



SY 1 Switchgear

Old 480v Switchgear



New 480v Switchgear



SY1 Distribution System

Old 208v Distribution System



New 208v Distribution System



SY1 Cutter Motor and Gearbox

Old Cutter Mtr-Gearbox



New Cutter Mtr-Gearbox



SY1 Variable Frequency Drive

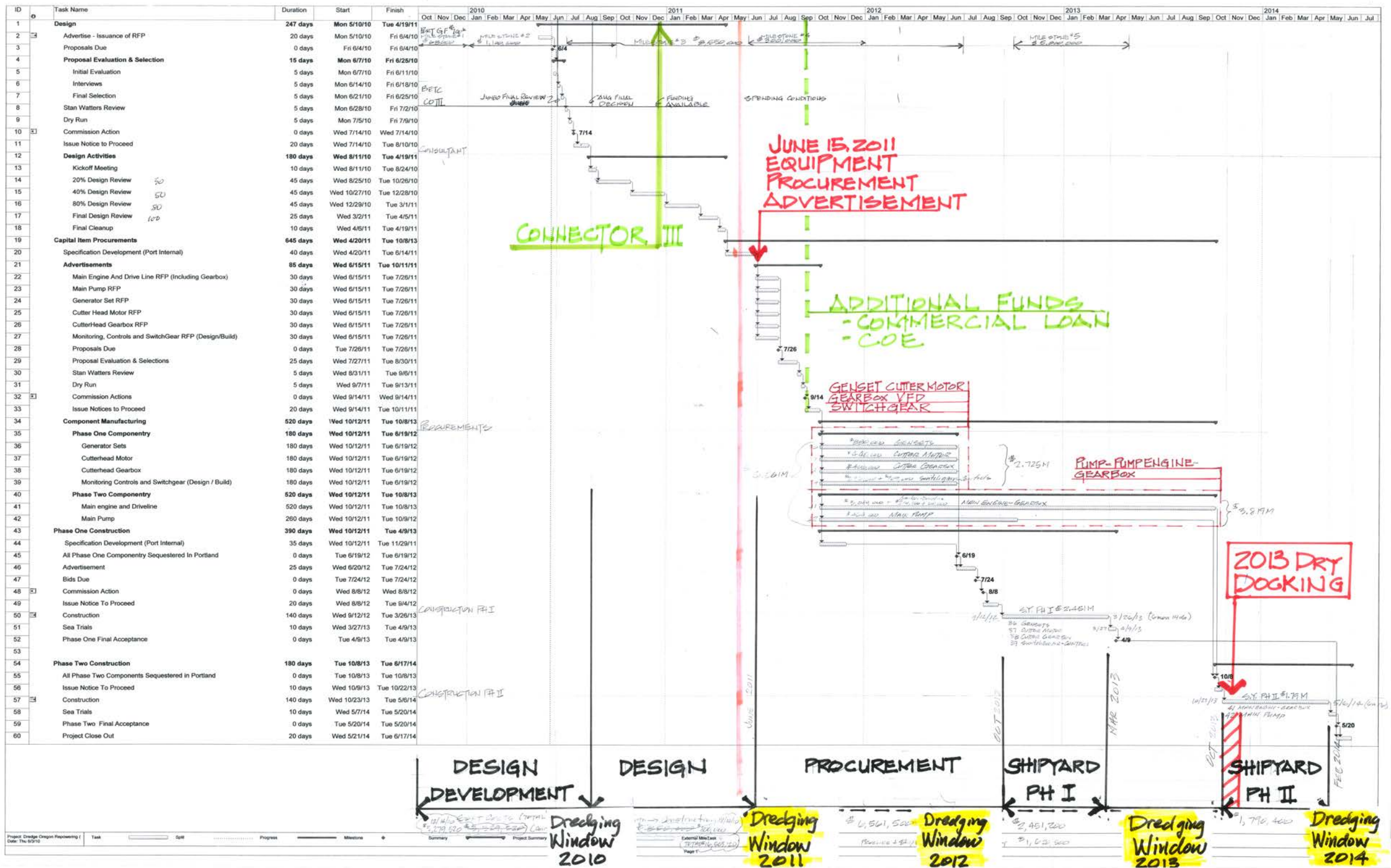
Old Drive Room



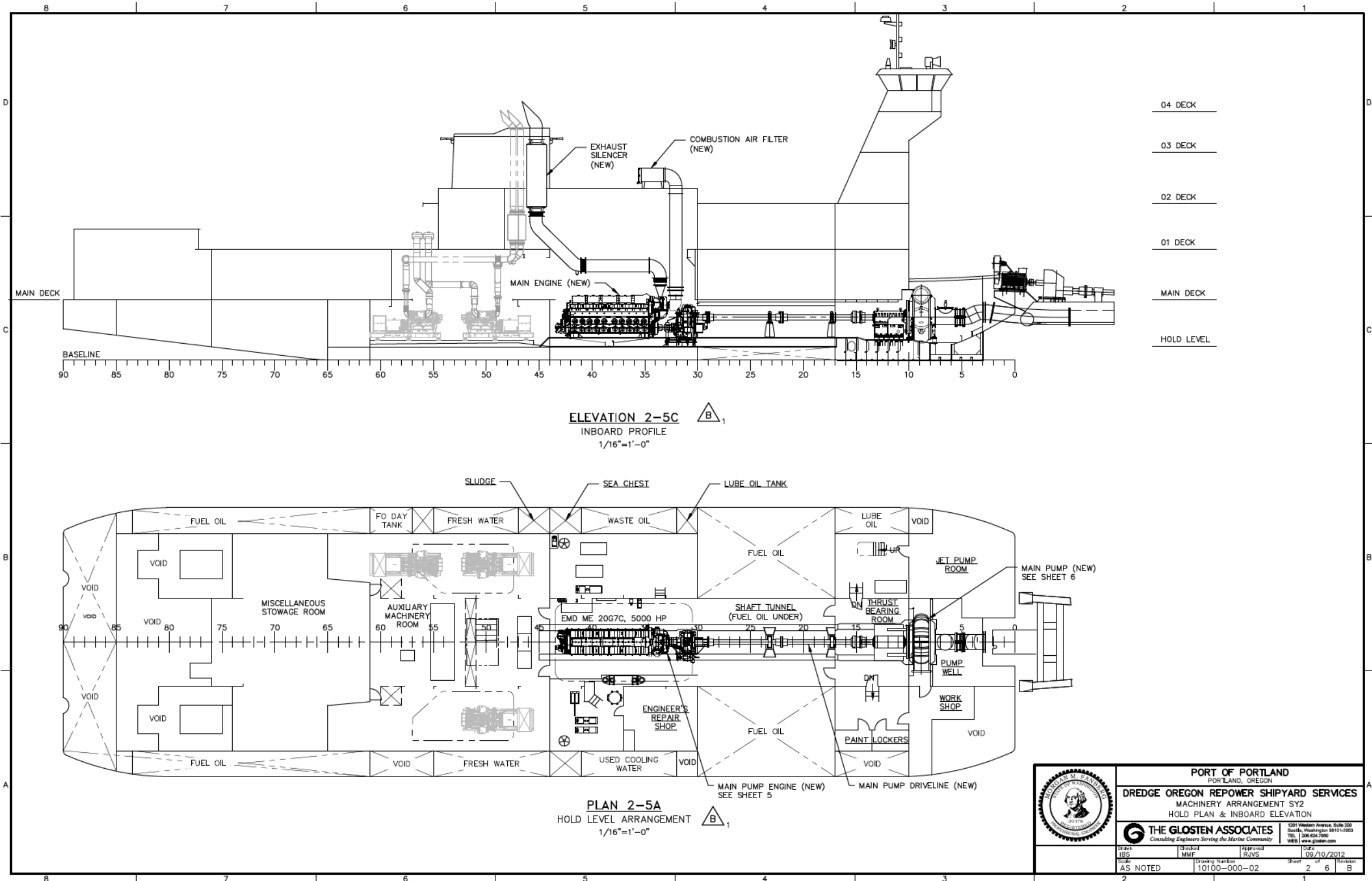
New Drive Room VFD



Repower Schedule



Repower Equipment - Shipyard Phase 2



	PORT OF PORTLAND PORTLAND, OREGON		
	DREDGE OREGON REPOWER SHIPYARD SERVICES MACHINERY ARRANGEMENT SY2 HOLD PLAN & INBOARD ELEVATION		
	THE GLOSTEN ASSOCIATES Consulting Engineers Serving the Marine Community 1201 Western Avenue, Suite 200 Seattle, Washington 98110-2993 TEL: 206.424.7160 WEB: www.glosten.com		
	Drawn: JBS	Checked: MMF	Approved: RJVS
Scale: AS NOTED	Drawing Number: 10100-000-02	Sheet: 2 of 6	Revision: B

SY2 Pump Foundation



SY2 Dry Docking – Fuel Tank Replating



SY2 Cooper Bessemer LSV-16 Removal

Starting LSV Removal



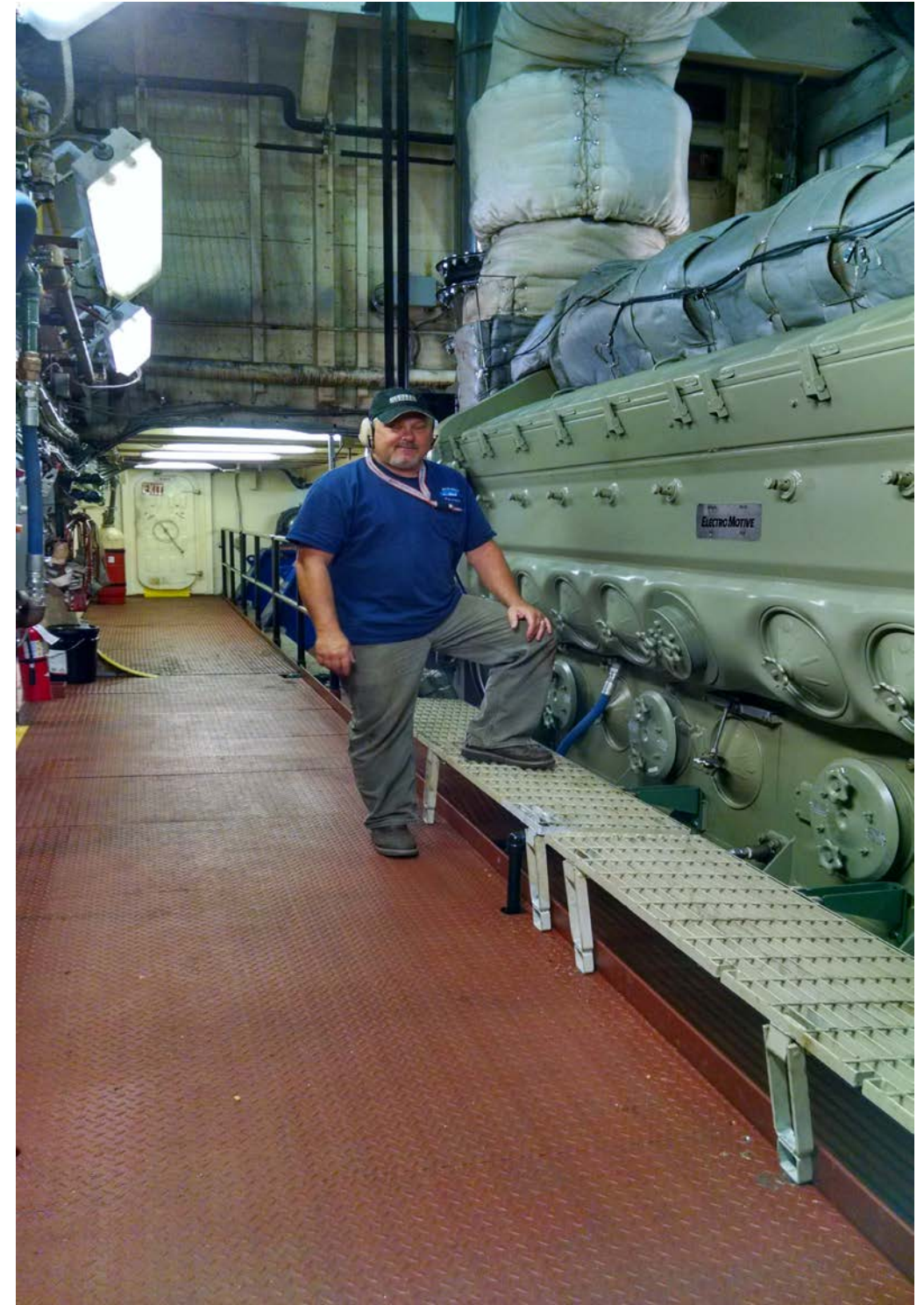
Clearing the Hatch



SY2 New EMD 710-20



SY 2 LSV and EMD



SY2 Pump Engine

Old LSV-16 Pump Engine



New EMD 710-20 Pump Engine



SY2 Pump

Old Pump



New GIW Pump



SY2 Engineers Operating Station

Old Engineer's Control Panel



New Engineer's Control Panel



SY2 Engineers Engine Monitoring

Old Engine Gauges



New Engine Gauges



SY2 Lever Room

Old Lever Room Control Panel



New Lever Room Control Panel



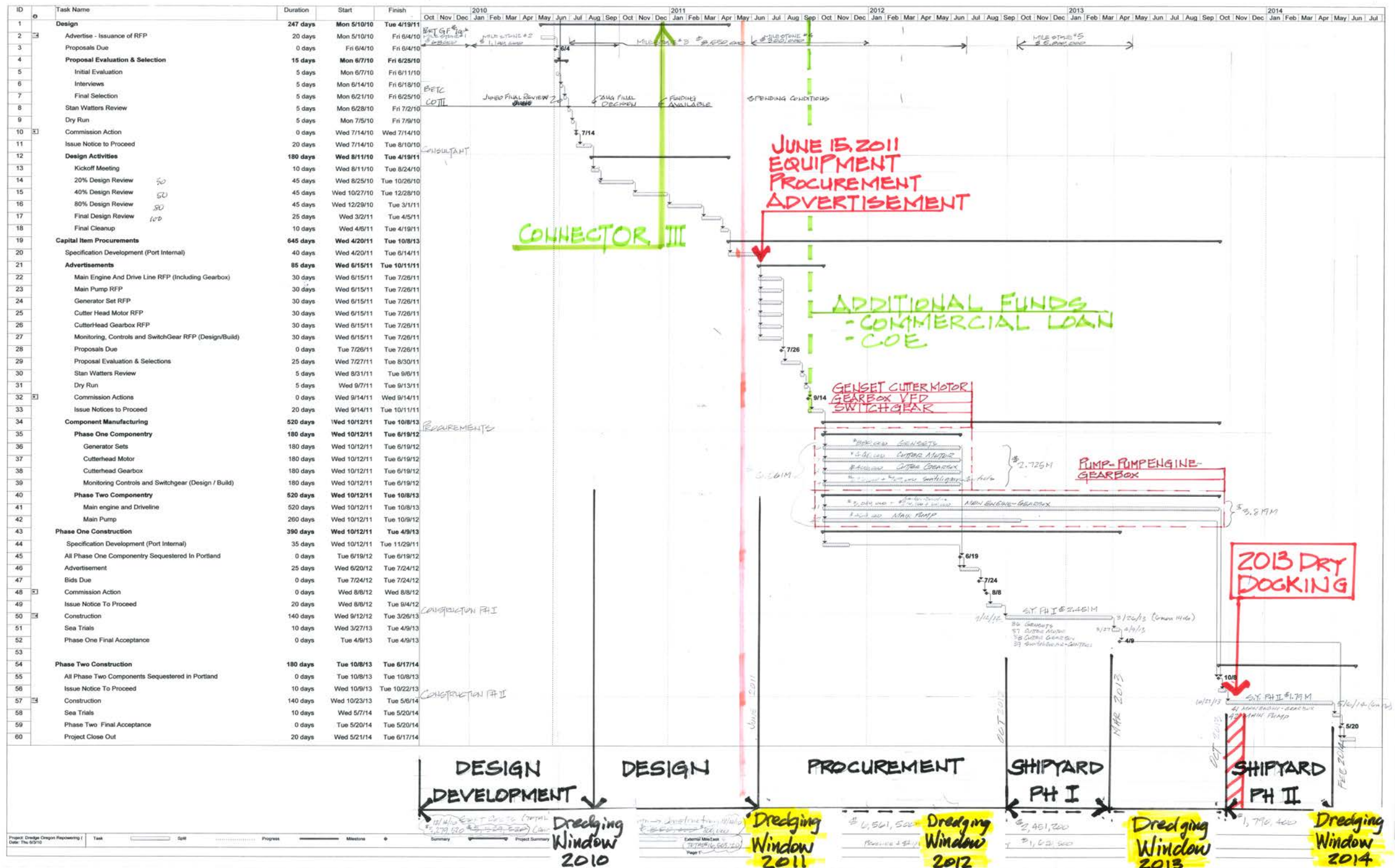
Restrictor Plate Harbor Test



Restrictor Plate 17" Orifice



Repower Schedule



Dredge OREGON Repower

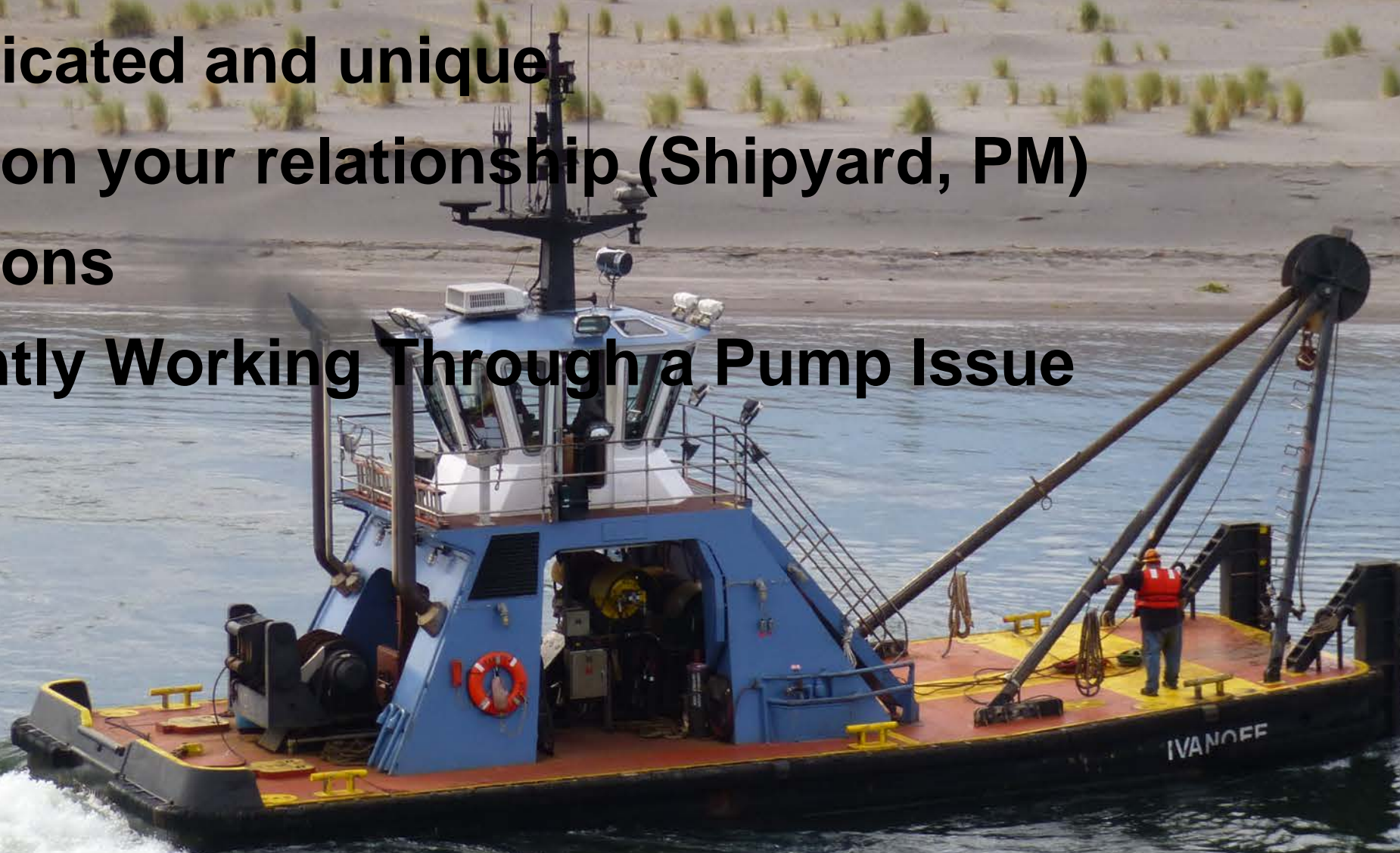
- **ISSUES:**

Complicated and unique

Strain on your relationship (Shipyard, PM)

Vibrations

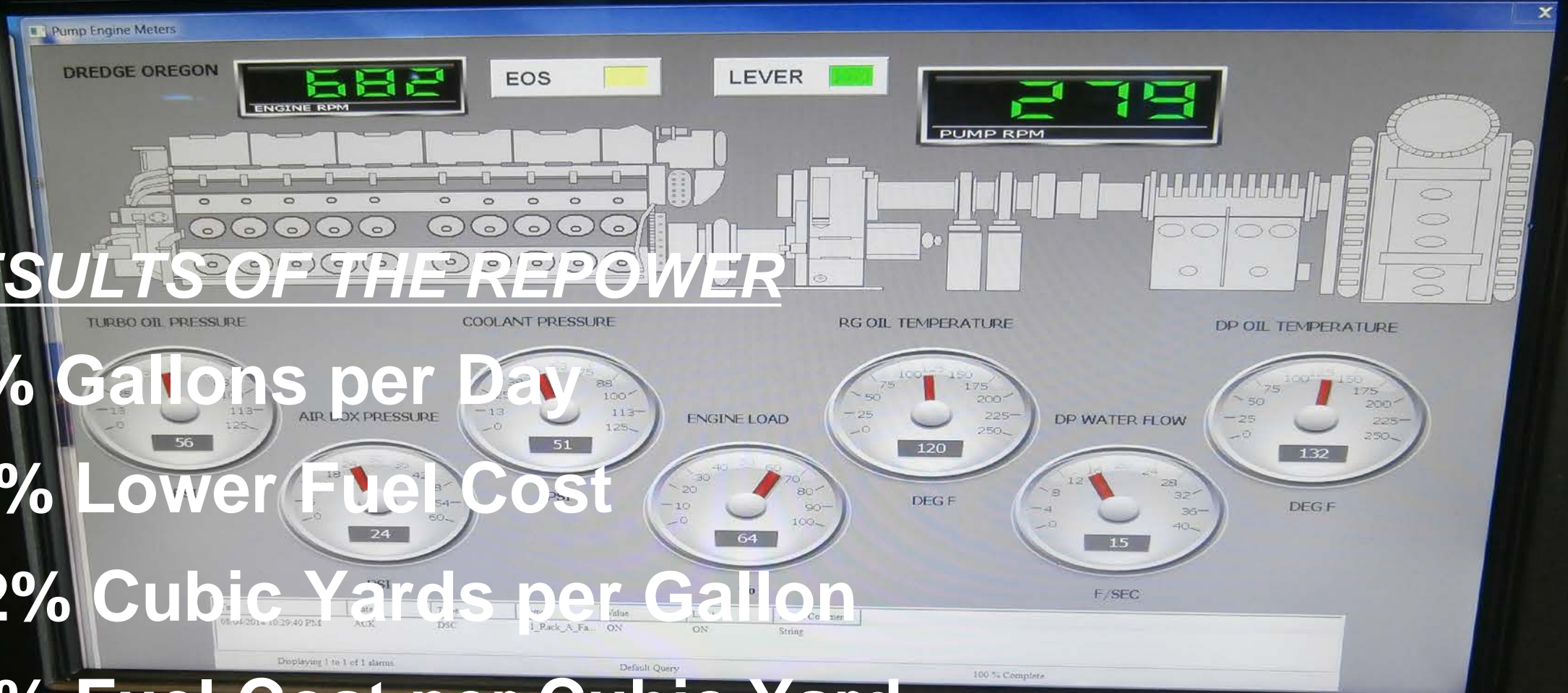
Currently Working Through a Pump Issue



• After Three Months of Operation:

RESULTS OF THE REPOWER

- -24% Gallons per Day
- -26 % Lower Fuel Cost
- + 32% Cubic Yards per Gallon
- - 26% Fuel Cost per Cubic Yard
- Increased pumping distance to 12,100 feet
- Fewer fuel delivery charges
- Impressed Crew



Dredge Oregon

