



Platform Holly Replacement Crane Project

Prevention First
October 20, 2010

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VQ
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NYSE.

Platform Holly Replacement Crane



Platform Holly

- Constructed in 1966
- Pre-dates modern design codes
- Pre-dates modern seismic criteria



Platform Holly Replacement Crane



Existing Situation

- Crane (1966 vintage) wearing out, parts are obsolete
- De-rated to 9,100# @ 80'
- Pre-dates modern dynamic lift standards
- Slow hook speed (30 fpm)
- Does not support modern supply vessel operations (longer reaches required)
- Tier 0 2-cycle engine
- Platform not in conformance with modern seismic standards

Project Goal

- Provide crane with safer dynamic ratings to support operations
- 20,000# dynamic @ 80'
- Higher hook speeds – safer operations (50 to 77 fpm)
- Address API and seismic design deficiencies
- Reduce Engine emissions

Platform Holly Replacement Crane

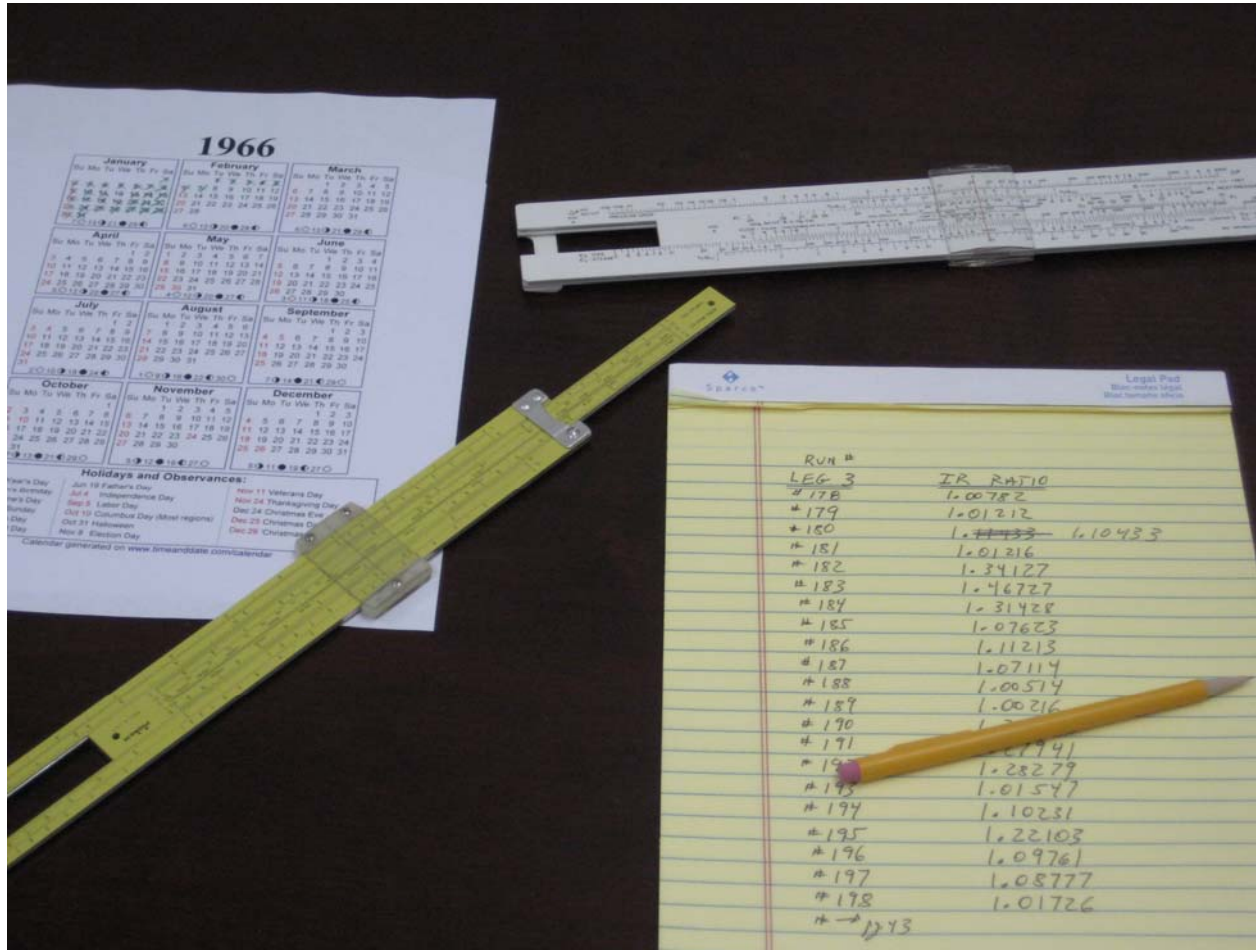


- Crane originally ordered in 2006, for 2007 delivery and installation
- An issue arose:
 - Parallel project (structural analysis modeling) identified structural issues that had to be resolved, as part of 1,000 year seismic upgrade

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Back in the day.....



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Platform Holly

- Original stress calculations all done by hand
- IBM 360 was newly available, but FEA programs still in development – no commercial access yet available



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- Engineer speak:
- ***“Quasi-static, modal, and non-linear transient dynamic analyses.... indicated need for increased damping coefficients....to minimize displacements and scalar time period for spectral response.....”***

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- Translation:
 - ***“Platform Holly wiggles like a bowl of jelly...”***

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- Engineer speak:
 - ***“Provide additional joint shear, load-transfer capacity and increased cross-sectional moment of inertia to reduce stress and likelihood of column buckling, punch-through and increased torsional and lateral stiffness...”***

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Translation:

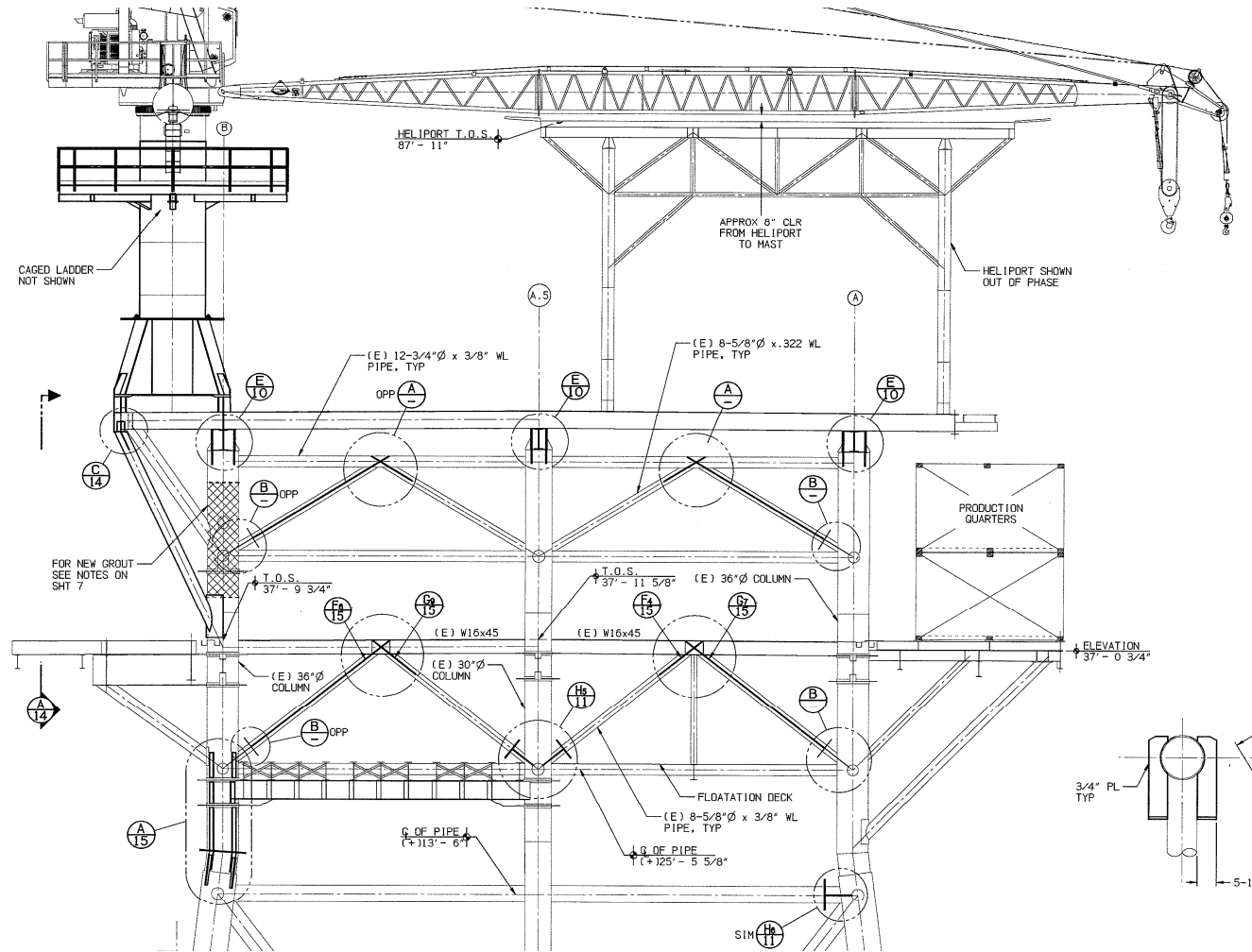
- ***“Add steel.”***

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- Decision made to finalize structural modeling and combine seismic goals with crane installation. Engineering/permitting May 2007 – Mar 2008
- Crane placed into vendor's storage (12 months)
- Interference walk down (Nov 2007 – Mar 2008)
- On-site structural work started April 2008

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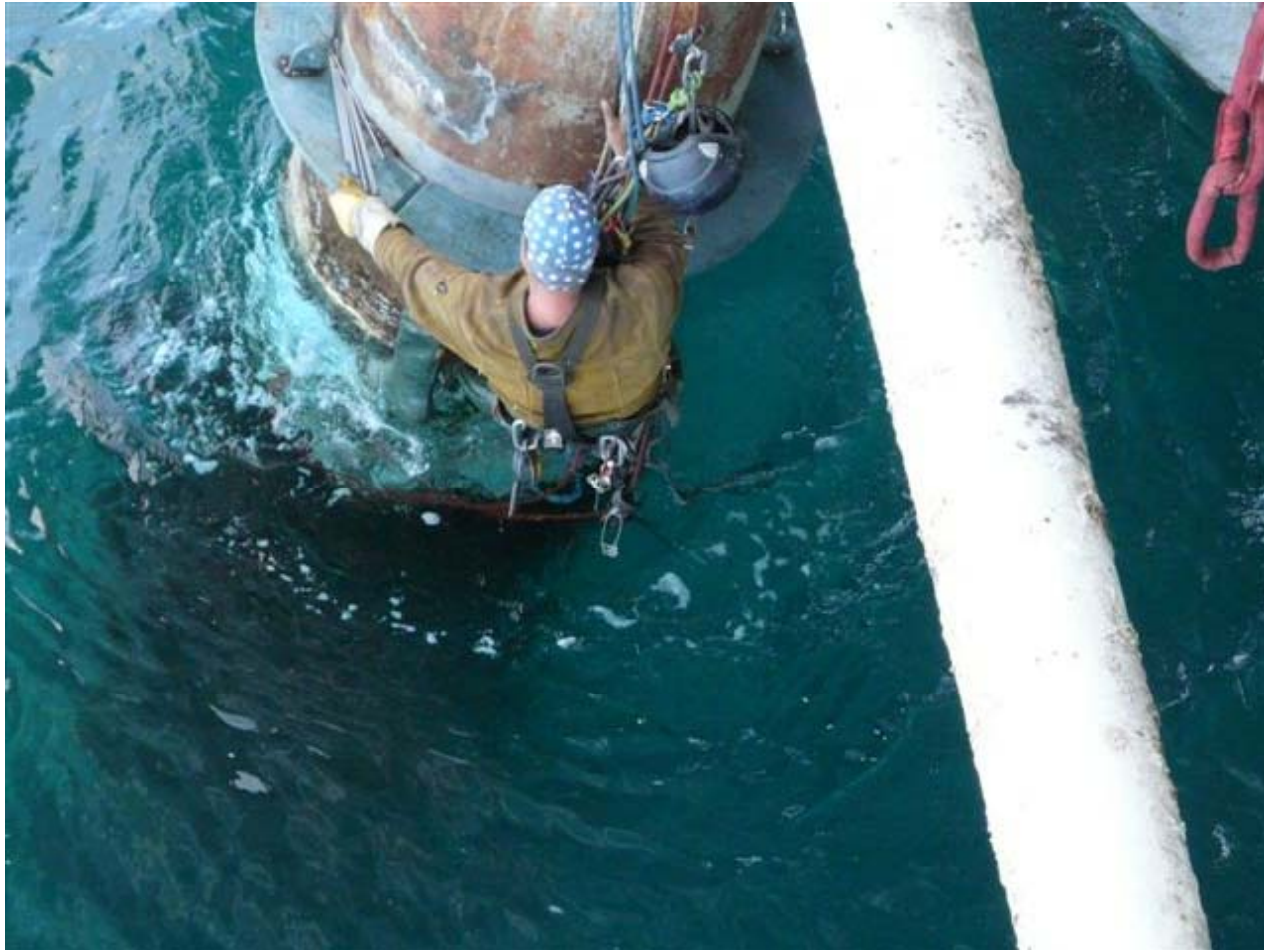


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- As a result of structural upgrades, Platform Holly is now “***Better than New***”

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Resident Inspector....



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Existing leg used to be a fuel tank...



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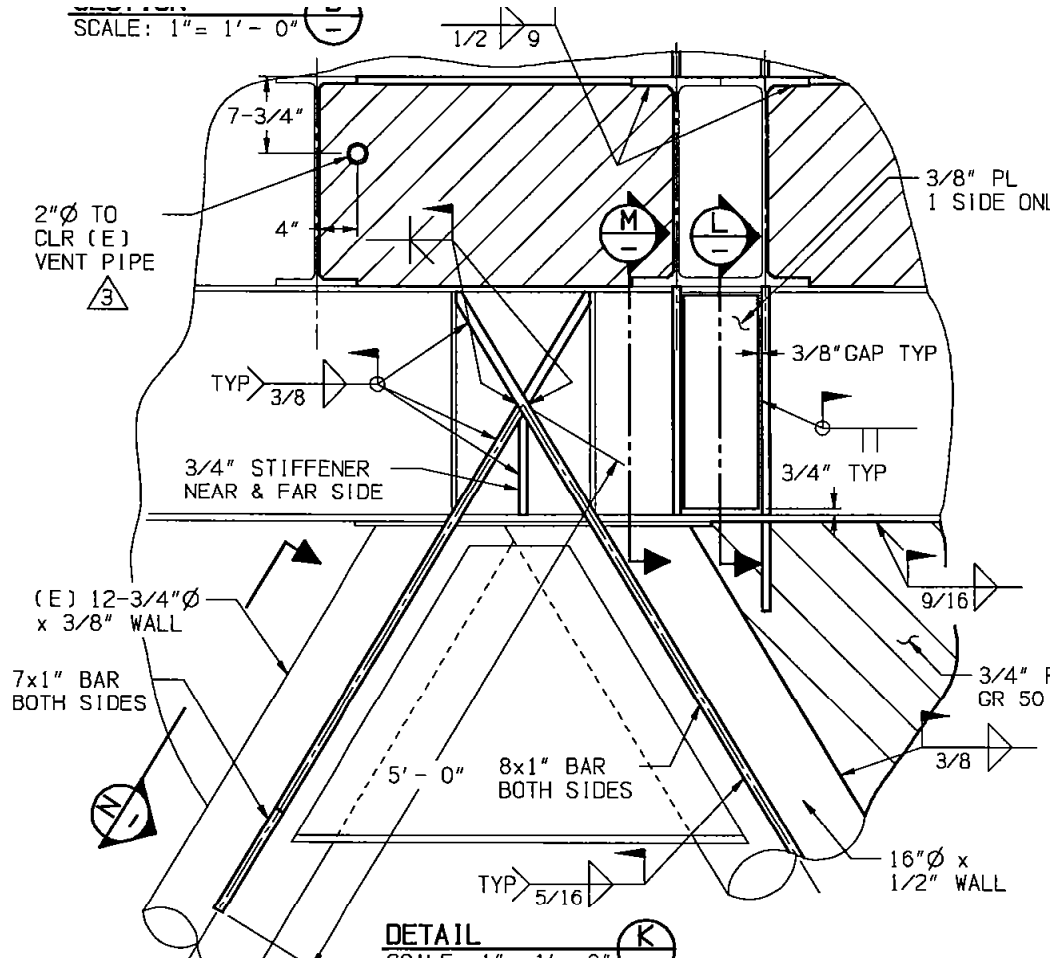
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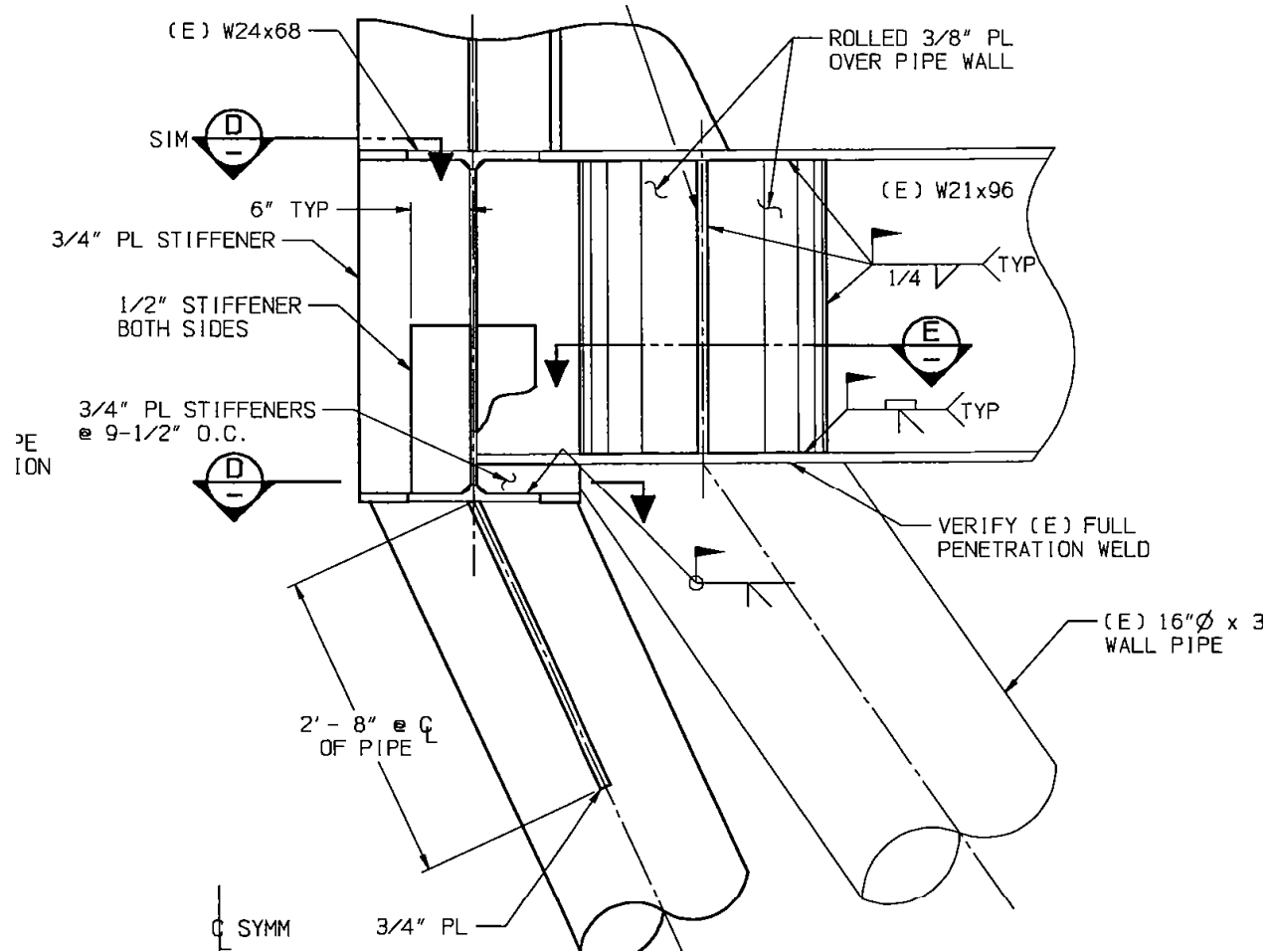
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- Whew! Glad that is done (April – September, 2008)

- Now it's time for the bullfrog!
 - Scarce. \$400/day since March 2008
 - Set September 12, 2008

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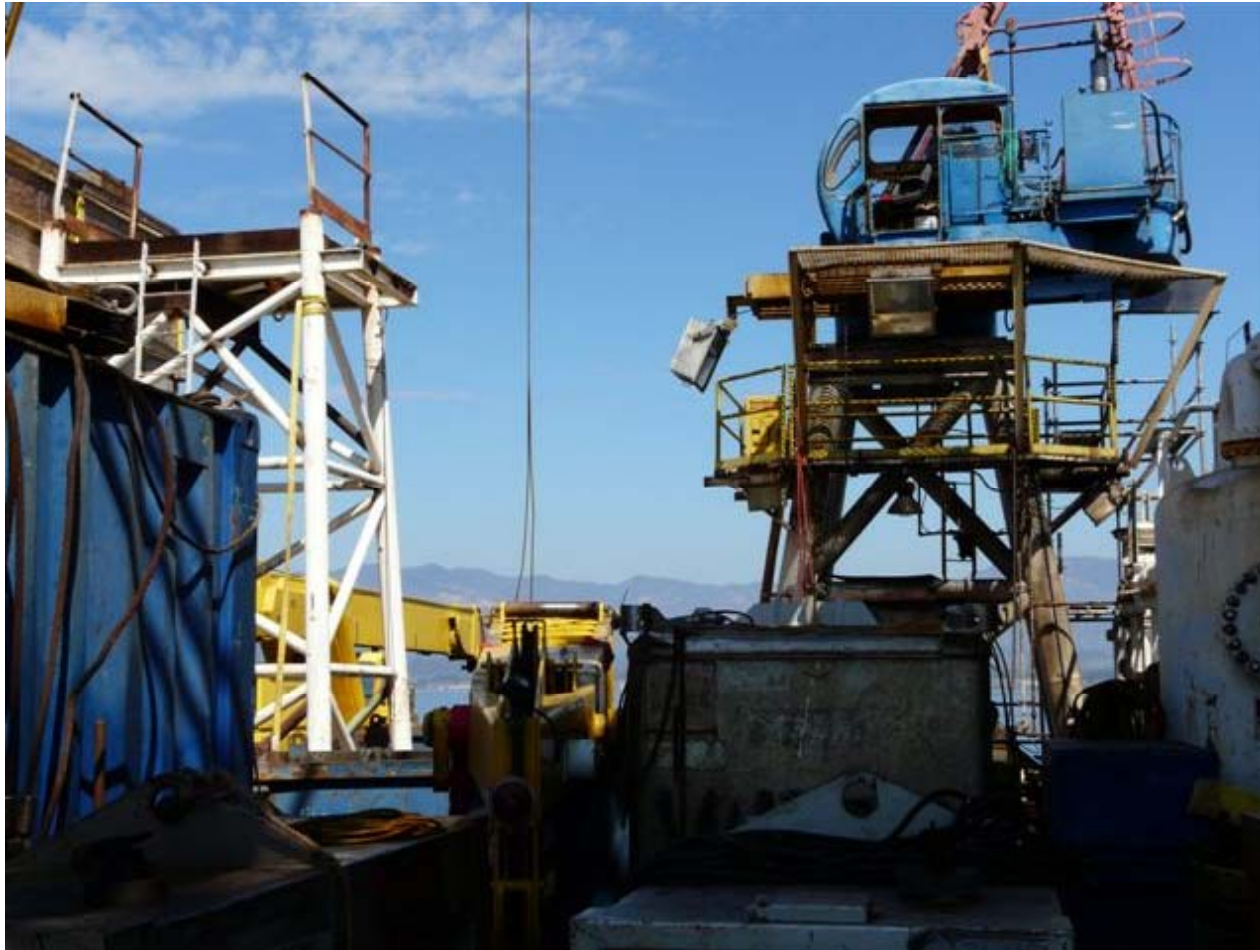


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- Time to tear out the old!
 - Work started September 13, 2008

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- Opening the deck....
 - Work began September 24, 2008

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Platform Holly Replacement Crane



Platform Holly Replacement Crane



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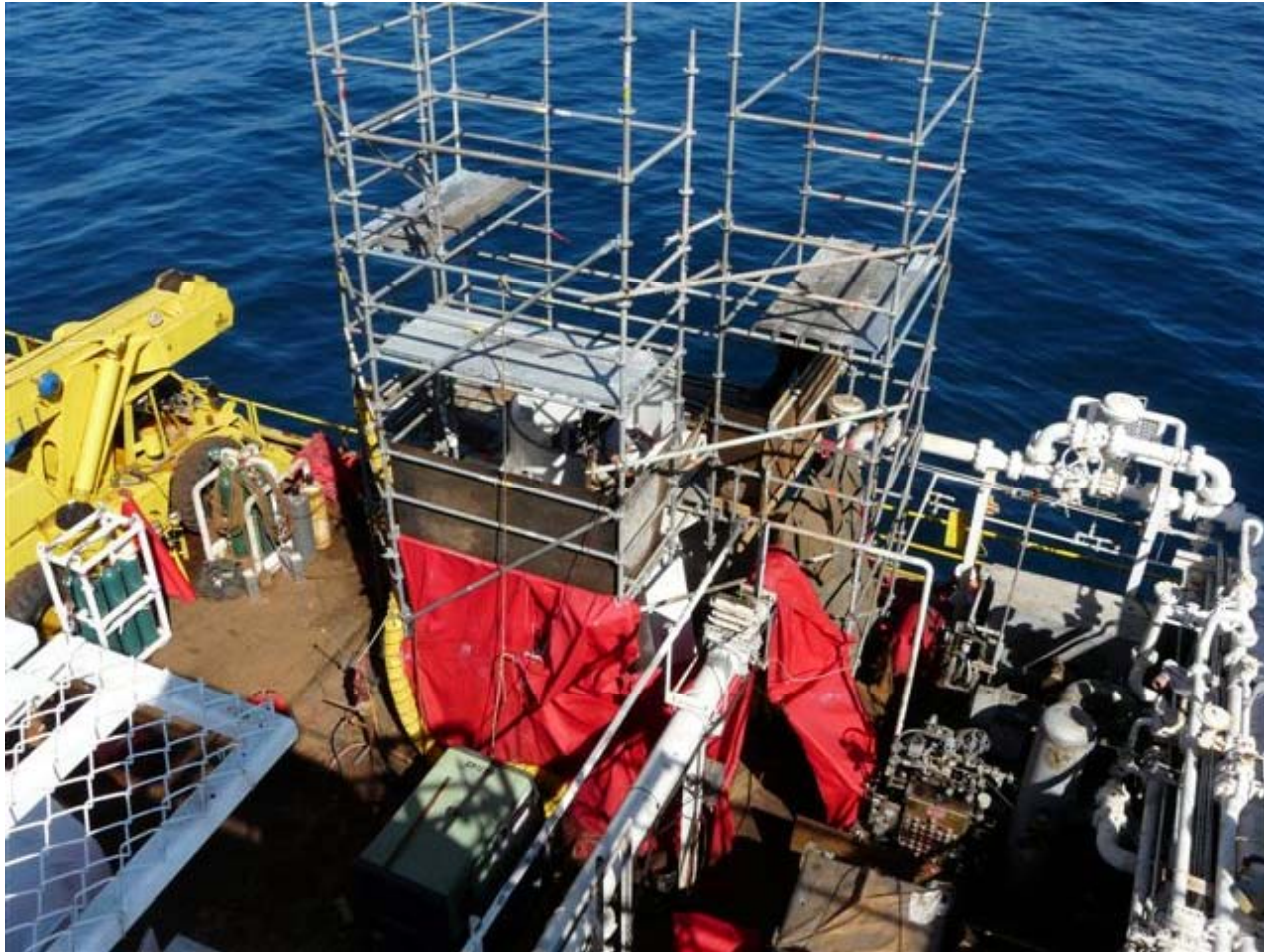


- Set the new pedestal (2 big pieces)
 - October 1, 2008 base
 - October 9, top
 - October 15, bearing

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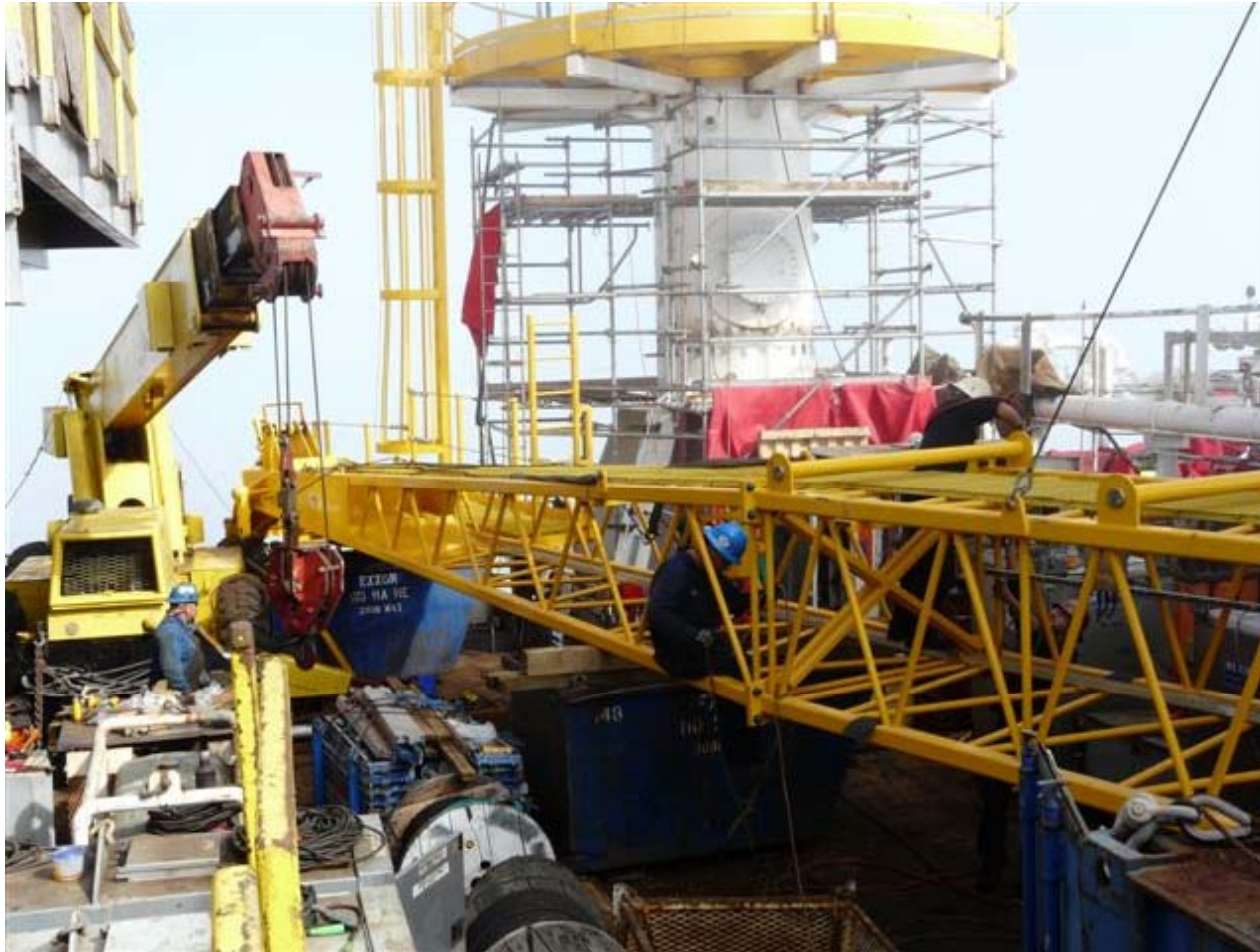
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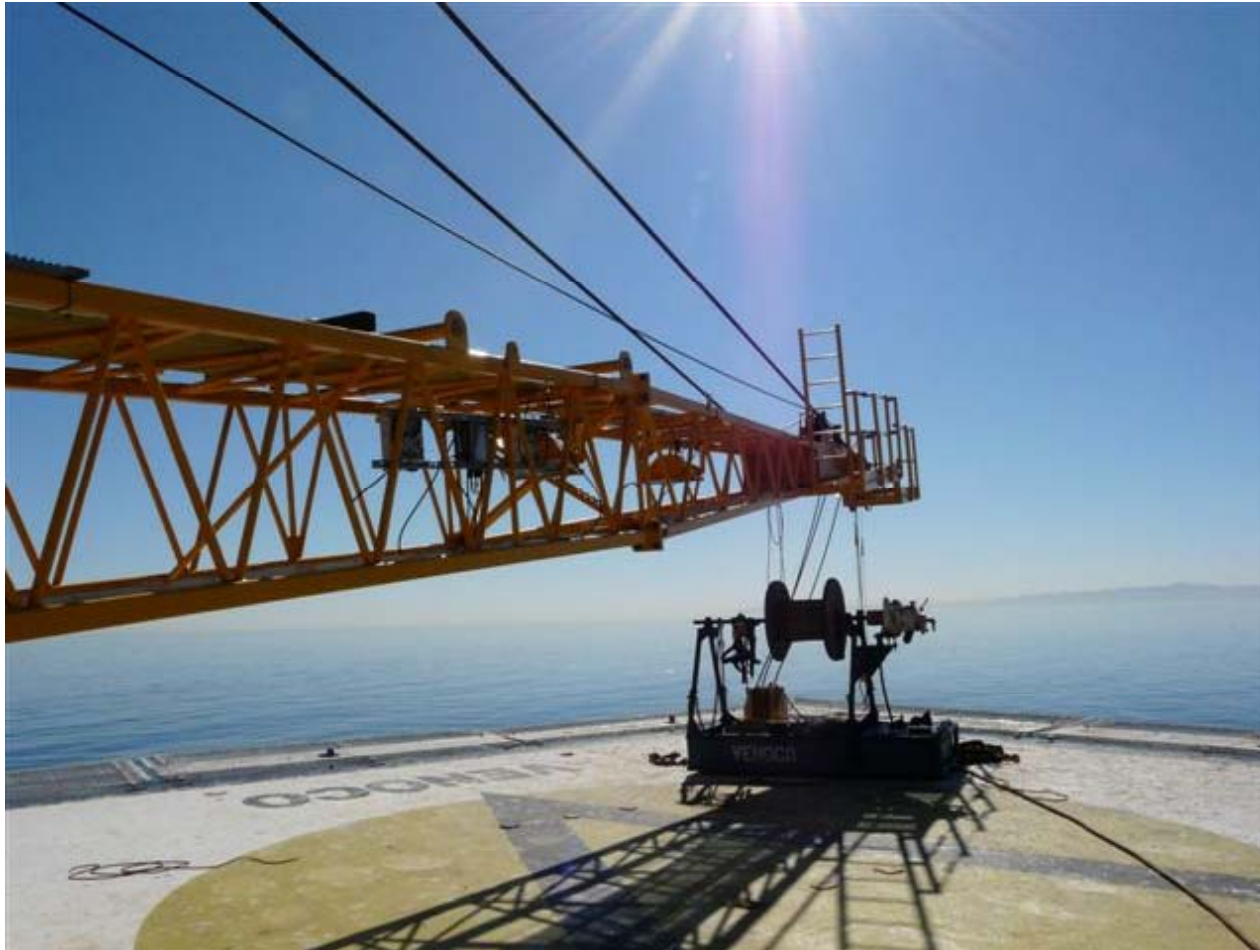
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Platform Holly Replacement Crane



- We still have a leg to grout....
 - Intended grouting contractor was a no-show
 - Found replacement guy with small truck
 - Performed grouting October 24, 2008

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Platform Holly Replacement Crane



Platform Holly Replacement Crane



Platform Holly Replacement Crane



Platform Holly Replacement Crane



- EPA Tier 3, 0.01 g/bhp-hr pm, SBCAPCD Source testing....
 - November 4, 2008
 - Level 3 verified catalyst available in Summer 2009
 - Re-test with CARB Level 3 verified catalyst (Aug 2009)

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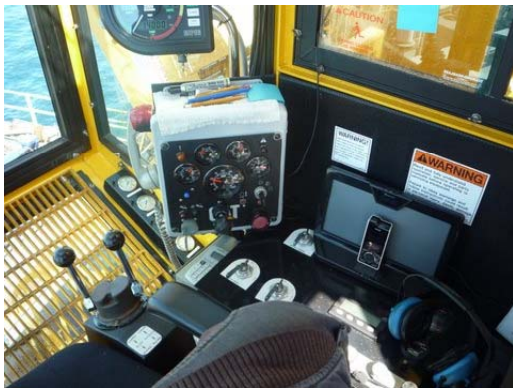
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- Crane is first and only crane ever for NOV with a “Dummy Load” engine circuit
 - Permits DPF filter regeneration
 - Crane runs well with only occasional regeneration needed.



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- And finally the new fuel and water tanks....

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Resident Inspectors signed off project



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➤ What did this all cost?

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➤ Planning, permitting	\$ 195K
➤ Structural Modeling/Seismic	\$ 380K
➤ Crane	\$1,100K
➤ Pedestal	\$ 295K
➤ Bullfrog Standby	\$ 162K
➤ Bullfrog Rental	\$ 210K
➤ Structural Construction	\$ 2,220K
➤ Crane Erection	\$ 705K

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➤ \$ 5.2MM

Platform Holly Replacement Crane



- 49,000 #s of steel reinforcement installed
- 30,000 sticks of weld rod
- 34,000 man-hours
- Not a single incident or accident of any kind

Platform Holly Replacement Crane



VENOCO, INC



THOMAS & BEERS



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- THANK YOU!
- George Ramsay
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