

Prevention First 2018

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**Port of Long Beach
welcomes TAQAH – deepest
draft tanker to call in U.S.**



**Port's Main Channel
is 76 feet deep**



**Andeavor technology
increases safe draft from
65 feet to 68.7 feet**



**New record of 2.1 million barrels
unloaded from one tanker**



Enough to make 42 million
gallons of gasoline



**Innovation means fewer
ships, less pollution**





Long Beach Deep Draft Tanker Under Keel Clearance Project



The Pitch Problem in a Long Period Southerly Swell

Zero Pitch



11' Static Under Keel Clearance (UKC)

1 degree of Pitch



10' increase in draft for a 1,100 foot tanker reduces the UKC to 1'

ABOUT PROTIDE

- PROTIDE is used in the ports of Rotterdam, Amsterdam and Emshaven
- Calculates Vertical Ship Motion (Pitch, Roll and Squat). UKC and Bottom Touch Probability

USES PREDICTED

- Water levels
- Currents
- Wave conditions
- Channel depth
- Ship Course and speed
- Ship dimensions

SHARED VALUE GOALS

Increase safety

- By reducing the risk of an accidental grounding due to pitch or roll

Increase efficiency

- Provide Pilots and Ship Captains the information necessary to adjust arrival time based on the forecasted conditions to transit directly to the berth

Reduce emissions

- Enable VLCCs to avoid; lightering, double handling cargo and additional tanker to offload the lightered crude oil, thereby reducing stack and hydrocarbon emissions

Reduced risk during transportation and transfer of crude oil

- Fewer transfers at Pacific Area Lightering (offshore)
- Transfers in protected harbors at berth
- More efficient use of port infrastructure

Reduced personnel exposure

- Mooring operations
- Crew fatigue

Reduced demurrage

- VLCC's
- Daughter vessels



Investing in **STRONG PORTS** by collaborating with our partners on the Dynamic Under Keel Clearance Program

