TOTE LNG Conversion and Construction
Niche Ro/Ro Liner Service to Alaska

Speed - 10 hour port turnaround

Flexibility - all equipment types

Vehicles
Dedicated Service

- Dedicated service between Washington and Alaska
- Weekly Round Trip
The Problem

The North American Emission Control Area (ECA)
Possible Methods of Compliance

• Do nothing: Current pricing for compliant fuel is an increase of 40% over current fuel, more in 2015

• Install exhaust gas cleaning system: Scrubbers use existing fuel with added costs

• Convert to Natural Gas: Potentially lower fuel costs, meets current and future emissions requirements, cleanest of all options
The Solution

Convert to LNG

- Secure, reliable fuel source
- Technically feasible with our vessels
- Cost saving over all other solutions
- Provides greater emissions benefits
- Provides greater community opportunities
- Began analysis of LNG in 2010
Fuel Cost Comparison

2011 - 2012 Fuel Cost Comparison - $/Bbl

Week Starting
EPA & USCG Partnership

• Aug. 2012 - limited waiver from North American ECA during conversion to LNG
• First permit issued under Annex VI, Reg. 3
• Required completion Sept. 2016
The Conversion Project

- Procure a supply of LNG
- Convert the vessel to operate on LNG
- Receive regulatory approval to fuel and operate on LNG
- Improve public perception of LNG
Benefits of LNG

Low Cost Energy
• LNG costs 41% less than IFO-380

Stable Pricing
• Large fixed capital costs
• Low feed-stock costs
• Domestic sourcing reduces volatility from geopolitical impacts

Clean
• Sulfur Oxide (SOx) emissions are 95% lower than ECA limits
• Reduces SOx, Particulate Matter (PM) and Nitrous Oxide (NOx) by almost 100%

Safe
• Zero fatalities over the 40-year life of the industry
Project Overview

- First conversion in the world of vessels of this type
- Eight MAN engines will be converted to dual fuel diesel – LNG propulsion
- Exchange four auxiliary engines for four dual fuel engines
- 4 year timeline
- Estimated $80+ million budget for vessel conversion
New Auxiliary Diesel Generators

New Auxiliary Diesel Configuration
MAN 9L Engine in Modified Compartment (AFTER)
Phased Project

35-40% of work will be conducted underway, limiting the out of service time to regular dry docking schedule

- Structural components built during regulatory dry docking in Q1 2014
- Use of regularly scheduled single-sailing weeks
- LNG available for in-port use in Q2/3 2014
Shore Side Capacity

• Project helps establish long-term supplies of LNG for use by other sectors of the transportation industry in the Puget Sound
Gas/LNG Supply

Puget Sound Energy is preferred provider

• Local company with good reputation
• Cost of capital and returns are based on utility model
• LNG pricing model is built up from cost, not down from the price of diesel
Breaking Barriers

- Environmental benefits will extend throughout the region
- Break through supply barriers that have constrained the growth of LNG in the transportation industries
New Vessel Project
New Vessel Project

• Replace existing steam vessels with new motor ships
• First container ships using LNG as fuel, not the first cargo ships fueled by LNG
• First application of slow speed, diesel cycle dual fuel propulsion engine
• Providing all of the benefits previously mentioned
New Vessel Design
Project Drivers

- Need to replace existing vessels
- Emission control area coming to Puerto Rico, eventually to the entire Caribbean
- 2020 world wide fuel sulfur limits for vessels of .5% (1/2 percent)
- 2016 tier III engine requirements limiting NOX for large displacement marine engines
Thank You

Questions?

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