



Trans Mountain Expansion Project

24th B.C. Tug Conference

May 13, 2022

Agenda



1. Introduction
2. Project Update
3. Support Vessel Services
 - Condition 133
 - Selection of KOTUG Canada
 - Need for safety and efficiency in passage of TM tankers
 - Environmental Initiatives
4. Next steps

TMEP - 55% complete

- Progress is over 55.2% as of April 30, 2022
- Pipe Length Welded
 - 539 km
- Pipe Length in the Ground
 - 477 km
- Strip & Grade
 - 638 km
- All major HDDs complete or in progress
 - Fraser River initiated Oct 2021, remains in progress.

Pipelines 48.2% complete

Lower Mainland 65.5% complete

Facilities 81.8% complete

*All values as of April 30, 2022



Kamloops, BC



Popkum, BC

Marine Engagement



- Marine Progress Report – semi-annual report outlines progress against marine shipping-related conditions and commitments for TMEP
- Busy year of engagement ahead:
 - Escort Tug – introduction to regime and stakeholders
 - WCMRC verification of the Enhanced Response Regime
 - Engagement with Indigenous groups on marine matters including: marine mammal protection and marine safety
- Our work in addition to ongoing work by the Government of Canada (GOC), led by Transport Canada, Coast Guard, DFO and ECCC to promote innovation, enhance marine safety and environmental protection:
 - 8 TMX Accommodation Measures
 - 16 CER Recommendations to GOC
 - Ocean Protection Plan - \$1.5B
 - Blue Economy Strategy

CER Conditions for TMEP (Marine)



91 – Plan for marine spill prevention and response commitments **COMPLETE**

132 – Marine Mammal Protection Program

- **At least three months prior to commencing operations**, a Marine Mammal Protection Program that focuses on effects from the operations of Project-related marine vessels

133 – Confirmation of marine spill prevention and response commitments *Three months prior to loading the first tanker* confirmation that it has implemented:

- 133. a) ***Enhanced tug escort***: tankers from Westridge Marine Terminal to have a tug escort suitable for foreseeable meteorological and ocean conditions and be based on tanker and cargo
- 133. b) ***Enhanced marine oil spill response regime*** with dedicated resources staged within the study area capable of delivering 20,000 tonnes of capacity within 36 hours of notification and initiating a response within: i) Two hours for spills in Vancouver Harbour and ii) Six hours for the remainder of the Salish Sea

134 – Updated Vessel Acceptance Standard

- **At least three months prior to loading the first tanker**, and thereafter on or before January 31 of each of the first five years after commencing operations, an updated Vessel Acceptance Standard and a summary of any revisions

144 – Ongoing implementation of marine shipping-related commitments

- **On or before January 31 of each year after commencing operations**, a report signed by an officer of the company, documenting the continued implementation of Trans Mountain's marine shipping-related commitments

Marine Spill Response Enhancements

44 new vessels (doubling the fleet)

135 new employees



Opportunities for First Nations, local businesses and communities

Marine Legacy – Partnerships



WCMRC

- \$150M for oil spill response regime enhancements,
 - doubling the response capacity together with significant reduction in response time within a defined Increased Response Area (IRA)
 - 2 hours in the port
 - 6 hours at any location until Buoy J



KOTUG Canada

- Joint venture between KOTUG International (KOTUG) and Horizon Maritime
 - KOTUG has a rich history dating back to 1911
 - Horizon Maritime has operated since 1990 in Norway and Canada
- KOTUG Canada will operate three (3) vessels in the area



Marine Legacy - Oil Spill Response



- WCMRC has entered a long-term time-charter with KOTUG Canada for one large OSV to act as “Oil-spill-response-vessel” (OSRV)
- Meaningful partnership established with “Sc”ianew First Nations” in Beecher Bay in support of KOTUG Canada’s operations
- Dedicated floating mooring facility to be installed at Beecher Bay, forming home of KOTUG Canada’s fleet and adjacent to the WCMRC base in Beecher Bay
- The OSRV will allow WCMRC to mount a large-scale response within six hours anywhere along the shipping lanes.



Marine Legacy - Oil Spill Response

- Large existing OSV selected for “OSRV” role with;
 - 200 tonnes continuous bollard pull
 - 75.00 meters length overall (LOA)
 - Heavy duty towing winches for emergency towing
 - Fire-fighting Class 1
 - Over 1,000 tonnes of oil storage capacity
 - Two (2) fast rescue crafts installed on both sides of the vessel
 - 530m3 deck space to accommodate
 - 4,000 feet of offshore boom
 - A high-speed sweep system
 - High-capacity skimming system
- OSRV to be upgraded with enhanced hull coating to improve;
 - Reduced emissions
 - Reduced underwater noise
 - Fuel efficiency



Escort Tug Vessel Deployment Area

Tanker Escort	NM	KM
QA - RR	80	148
RR - BJ	67	124
Total (QA - BJ)	147	272



TRANSMOUNTAIN

**TMEP MARINE SHIPPING SPILL
PREVENTION AND RESPONSE OVERVIEW**

NOV 13, 2019

- Canadian Marine Spill Response Base (Future)
- Trans Mountain Facility

- Shipping Lanes (used by TM Traffic)
- Shipping Lanes
- Tug Escort (tethered)
- Tug Escort (tethered - Future)
- Pilot Embarkation/Disembarkation

- Tug Escort (un tethered - Commenced 2015)
- Tug Escort (un tethered - Future)

Marine Legacy - Escort Tugs

- KOTUG Canada has been selected to be the exclusive tanker escort service provider for laden tankers between Buoy QA and Buoy J
- Tanker vessels will be required to arrange this service as a prior condition of acceptance at Westridge Terminal
- Improves the already robust marine safety regime in the area with;
 - Significant increase in availability of emergency towing capacity
 - Enhanced marine fire-fighting and (Oil) spill response capacity
- KOTUG has ensured suitable backup arrangements are available to guarantee vessel availability
- Escort Tugs to be based in Beecher Bay, centrally located between Buoy QA and Buoy J.
- Does not affect current harbour tug services at Westridge Terminals



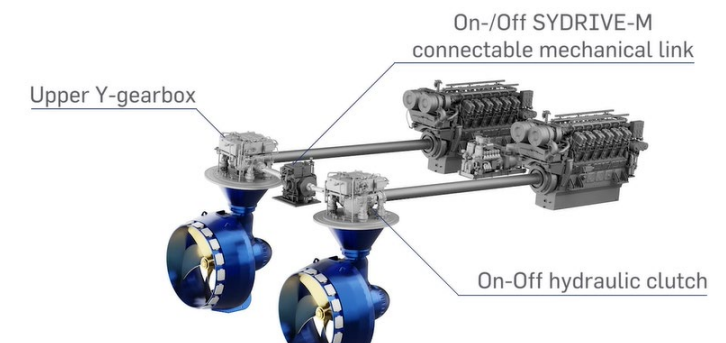
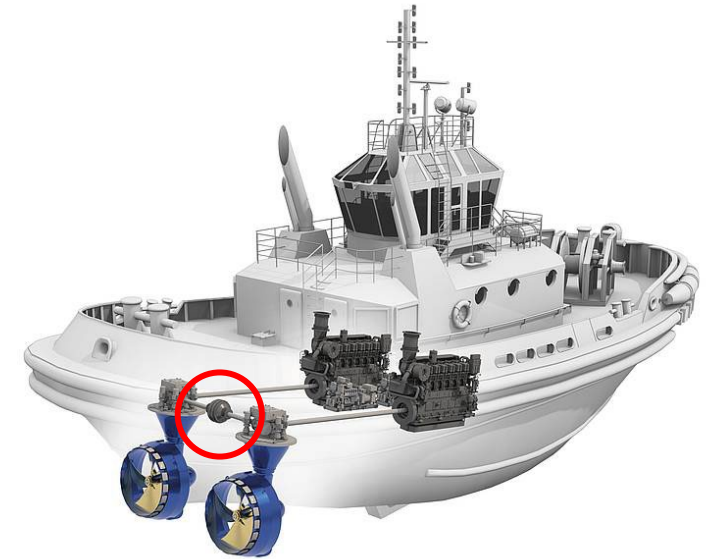
Marine Legacy - Escort Tugs

- KOTUG Canada will operate two (2) identical large Escort Tugs with
 - 110 tonnes continuous bollard pull
 - 55.00m length overall (LOA)
 - Azimuth Stern Drive (ASD) propulsion
 - Double drum winches forward and aft
 - Escort Notation
 - Fire-Fighting Class II
 - Oil Recovery (ORO) class with capacity up to 450m3 per Escort Tug
- Escort Tugs will be upgraded with enhanced propulsion systems and hull coating to improve;
 - Reduced emissions
 - Reduced underwater noise
 - Fuel efficiency



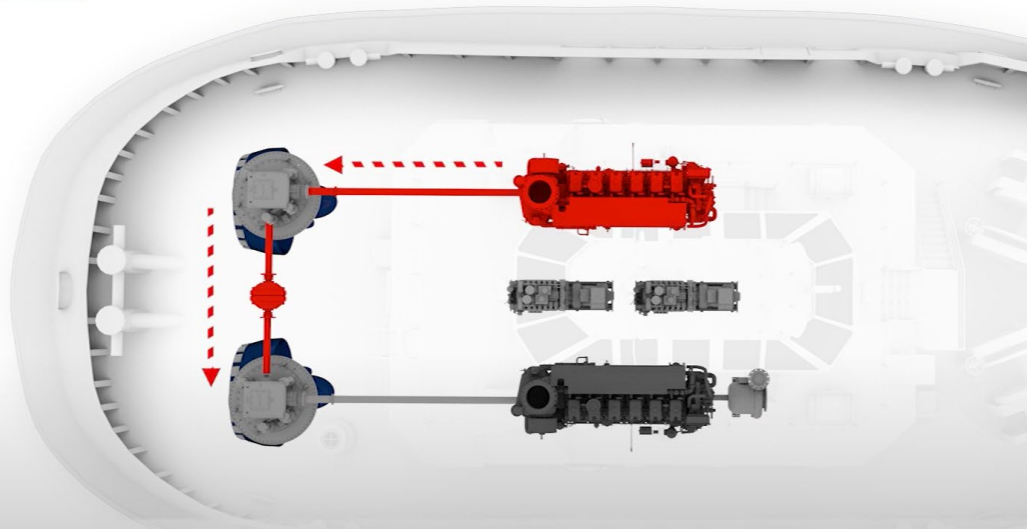
Marine Legacy – Vessel modifications

- KOTUG Canada to upgrade the Escort Tugs in two ways:
 - Propulsion system (thrusters)
 - Marine coating
- KOTUG Canada has opted to use a mechanical cross-link system provided by marine component manufacturer (SCHOTTEL), called the SY-DRIVE M system.
- This upgrade solely consist of changing the existing thrusters for the SCHOTTEL SY-Drive M thrusters without any further modification required to the installed machinery (main and auxiliary engines)
- When no full speed or bollard pull is required, the cross-link connection enables the vessel to utilize a single engine driving the two thrusters
- When full speed (> 12 knots) or high power (bollard pull) is required, the vessel switches on the second engine and drive each thruster with a subsequent main engine



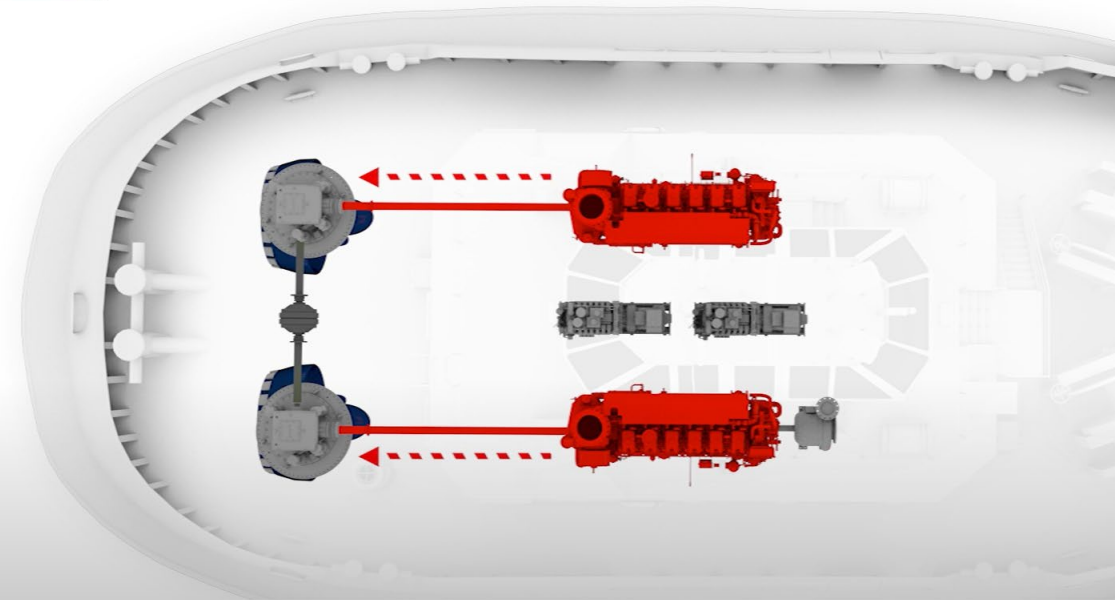
Marine Legacy - Vessel modifications

Cross-link system engaged during free sailing



- Both thrusters connected and powered by only one main engine
- Second engine remains off, saving operating hours and maintenance costs
- Fuel cost and carbon emission reduction by better engine loading

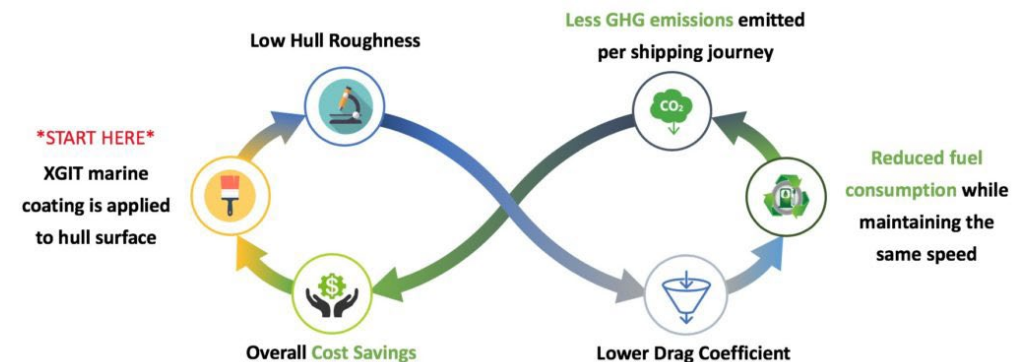
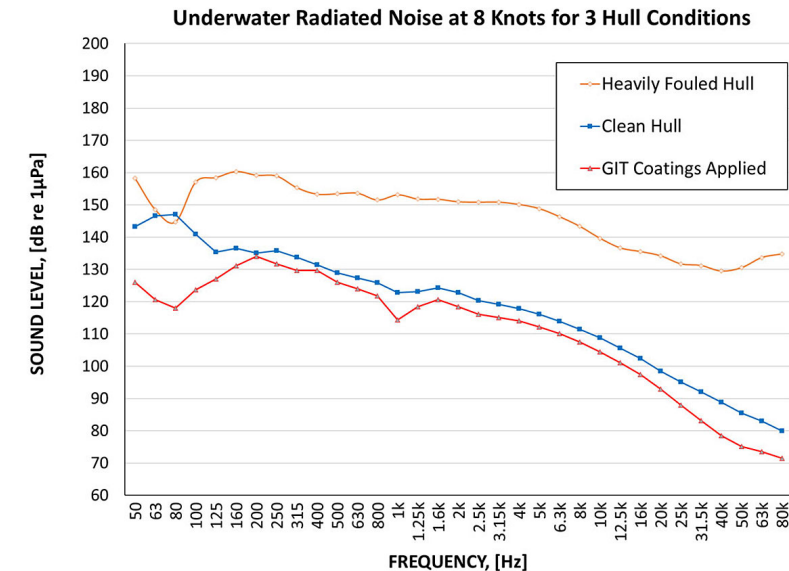
Cross-link system disengaged during full power



- Identical functionality like any conventional direct propulsion system
- Only needed if full power is required

Marine Legacy – Vessel modifications

- To further reduce emissions and underwater noise, KOTUG Canada has worked together with Canadian company *Graphite Innovation and Technologies* (GIT) and will apply on both the Escort Tugs and OSRV the so-called “X-GIT” coating
- This is a non-toxic and world’s first patented graphene-based technology specifically tailored to increase fuel efficiency and hydrodynamic performances.
- Due to extensive testing, the GIT Coating shows significant reductions in noise compared to heavily fouled or clean hulls
- The coating will reduce hull roughness and subsequently reduces green-house-gasses (GHG) due to the lower drag coefficient
- The coating will be provided on both the vessel’s hulls and propellers to further reduce underwater noise



Marine Legacy – Vessel modifications



The ship's underwater noise has 3 main sources:

- mechanical noise
- propeller noise
- hydrodynamic noise.

The mechanical and propeller noise is the most relevant. In the case of the Propeller, X-GIT product line will be able to create a smooth and “polish-like” profile that will result in reduced noise underwater radiated noise level.

The coated propeller will also reduce defects and cavitation extent, reducing overall hydrodynamic noise.

lower maintenance
costs

reduce
biofouling

improve
longevity of ship hull

eliminate
toxic metals

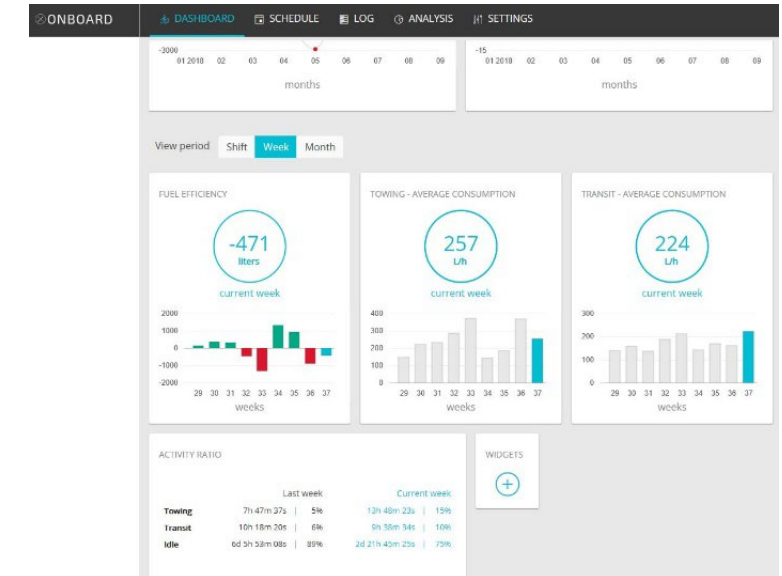
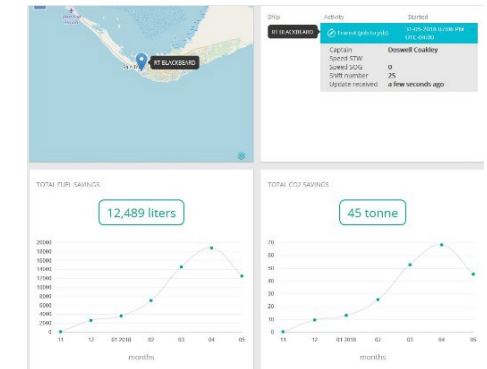
reduce
corrosion

decrease propeller
underwater radiated noise

Marine Legacy – Vessel modifications



- As CO2 emissions originate from the level (and content) of fuel consumed, KOTUG Canada deems it important to closely monitor the actual fuel consumption used on board by using a specialized fuel monitoring system.
- KOTUG has developed an in-house fuel monitoring system called “OnBoard”.
- This system tracks live the fuel consumption levels onboard and can use this data to set KPI's in order to promote fuel reduction used.
- This tool is used both internally (for awareness and education) as well as external (transparency)



Next Steps

- Engagement with marine regime and other stakeholders to prepare for In-Service
- Identify key stakeholders and seek to integrate to future operating systems and processes
- Ensure all necessary systems and services are available in advance of TMEP in-service



We Want To Hear From You



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