Marine Pilotage in British Columbia

Pacific Pilotage Authority Canada
Marine Pilotage in BC

Unique model – the entire coast is a mandatory pilotage area and is the largest in the world.
Prevention is the Best Cure

- **PREVENTION** - RESPONSE - LIABILITY COMPENSATION
- Piloting falls under the **first pillar**
  - Excellent safety record at 99.96%
  - There has never been an oil spill from a tanker under pilotage on the West Coast
  - High level of training – ½ million $ per annum
  - Full participation in Risk Assessments (Industry, CHS, CCG, TC)
    - Navigational Aid recommendations in the north
    - Introduction of Portable Pilotage Units
    - Simulations, both fast time and real time
    - Tethered tugs
  - Standard Operating Procedures for piloting energy vessels
  - PPA participates in TERMPOL reviews
New Projects

PPA’s policy for all new terminals or major modifications to existing terminals/operations:

- Bathymetry
- Simulations
- Pilot training
Marine Pilotage in BC

Changes over the past few years:

- Portable pilot units
- Updated tethered tug manoeuvres
- Bollard pull certification for tugs
- Updated bathymetry
- GA plans for berths
Current Tanker Procedures

- Tethered tug escorts in designated areas
- **Two pilots** on the bridge
- Slack water, daylight transits where required
- Independent Portable Pilotage Units (PPU)
Current Tanker Procedures

• Mooring Arrangement Plan of vessel provided to PPA prior arrival

• Pilots verify SWL of towing bollards and fairleads on the vessel
Tethered Tug Simulations

### Test 1: 50 Tonnes Steering Force/10 sec Response Delay

<table>
<thead>
<tr>
<th>Vessel</th>
<th>Maximum X-Track Distance</th>
<th>Distance Run to Regain Heading</th>
<th>Time to Arrest Initial Turn-rate (8 and turning back)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HANDYMAX 177m</td>
<td>361 metres</td>
<td>645 metres</td>
<td>1 min 23 sec/400 metres</td>
</tr>
<tr>
<td>HANDY 142m</td>
<td>186 metres</td>
<td>782 metres</td>
<td>2 mins 18 sec/555 metres</td>
</tr>
</tbody>
</table>

### Test 2: 70 Tonnes Steering Force/10 sec Response Delay

<table>
<thead>
<tr>
<th>Vessel</th>
<th>Maximum X-Track Distance</th>
<th>Distance Run to Regain Heading</th>
<th>Time to Arrest Initial Turn-rate (8 and turning back)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HANDYMAX 177m</td>
<td>239 metres</td>
<td>702 metres</td>
<td>1 min 52 sec/455 metres</td>
</tr>
<tr>
<td>HANDY 142m</td>
<td>116 metres</td>
<td>819 metres</td>
<td>1 min 5 sec/317 metres</td>
</tr>
</tbody>
</table>

### Test 3: 80 Tonnes Steering Force/10 sec Response Delay

<table>
<thead>
<tr>
<th>Vessel</th>
<th>Maximum X-Track Distance</th>
<th>Distance Run to Regain Heading</th>
<th>Time to Arrest Initial Turn-rate (8 and turning back)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HANDYMAX 177m</td>
<td>222 metres</td>
<td>644 metres</td>
<td>1 min 37 sec/433 metres</td>
</tr>
<tr>
<td>HANDY 142m</td>
<td>120 metres</td>
<td>490 metres</td>
<td>1 min 1 sec/305 metres</td>
</tr>
</tbody>
</table>

### Test 4: 110 Tonnes Steering Force/10 sec Response Delay

<table>
<thead>
<tr>
<th>Vessel</th>
<th>Maximum X-Track Distance</th>
<th>Distance Run to Regain Heading</th>
<th>Time to Arrest Initial Turn-rate (8 and turning back)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HANDYMAX 177m</td>
<td>159 metres</td>
<td>560 metres</td>
<td>1 min 16 sec/360 metres</td>
</tr>
<tr>
<td>HANDY 142m</td>
<td>113 metres</td>
<td>480 metres</td>
<td>1 min 1 sec/305 metres</td>
</tr>
</tbody>
</table>
Tethered Tugs

Tethered tug escort required in Boundary Pass & Haro Straits for tankers ≥ 40k DWT when carrying product

Two pilots on the bridge in this area
Analyses & Studies

Analyses of escort tug usage for small vessels;
Efficacy of tethered tug manoeuvres;
Ship squat;
Live trials;
Squat Measurements

Live squat measurements in harbour & river waters

\[ S_{b_{E}} = 0.113B \left( \frac{T}{h} \right)^{0.27} F_{nh}^{1.8} \quad 1.08 < h/T < 2.75 \]

\[ S = 2.20 \frac{V^{2}}{g} S_{2}C_{b} \quad \text{where} \quad S_{2} = \frac{A_{s}}{A_{t} - A_{j}} \]

\[ S_{b_{R}} = C_{v}C_{F}K_{\Delta T}T \]

\[ S_{s_{R}} = C_{v}K_{\Delta T}T \]

\[ S_{b_{H_{o}}} = 1.96 \frac{V}{L_{pp}^{2}} \frac{F_{nh}^{2}}{\sqrt{1 - F_{nh}^{2}}} \]

\[ S_{b_{D}} = 1.05 \frac{V_{2}T}{h} C_{b} \]

\[ S_{b_{C}} = 2.4 \frac{V}{l_{pp}^{2}} \frac{F_{nh}^{2}}{\sqrt{1 - F_{nh}^{2}}} K_{s} \]

\[ S = l_{3}(F_{rh})^{3} \quad \text{where} \quad F_{rh} = \frac{V_{s}}{\sqrt{gh}} \]

\[ \Delta t_{\max} = C_{o} \frac{C_{B}B}{l_{pp}} \frac{F_{nh}^{2}}{\sqrt{1 - F_{nh}^{2}}} \]

Note: \( L_{pp}/B = R_{L,B} \) and \( h/T = R_{h,T} \)
Administrative Control

BoD members nominated by the govt.; Pilot Training & Examination Committee; Safety & Operations Review Committee; Industry Navigation & Pilotage meetings; Regulatory oversight; ERM; ISO/ISM; Quarterly KPIs
Questions

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