CBJ ASSEMBLY/DOCKS AND HARBORS BOARD JOINT COMMITTEE ON CRUISE SHIP DOCKS

NAVIGATION STUDY MEETING AGENDA

For Wednesday, October 14, 2009

I. Call to Order (Noon in the CBJ Assembly Chambers)

II. Roll Call (Sanford, Dybdahl, Preston, and Fisk)

III. Approval of Agenda

IV. Public Participation on Non-Agenda Items (not to exceed five minutes per person or 20 minutes total)

V. Items for Action

1. Juneau Harbor Navigation Study

   Presentation by Port Director

   Public Comment

   Committee Discussion/Action

VI. Staff &Member Reports

VII. Committee Administrative Matters

VIII. Adjournment

CITY/BOROUGH OF JUNEAU
ALASKA'S CAPITAL CITY

Port of Juneau

To: Assembly/Docks and Harbors Board Committee on Cruise Ship Docks

CC:

From: John M. Stone, P.E. Port Director

Date: October 7, 2009

Re: Juneau Harbor Navigation Study

At our October 14, 2009 meeting, we will review the Juneau Harbor Navigation Study. The study examined the navigation impacts of three cruise ship dock proposals under consideration: the Gold Creek Alternative, the City Dock Replacement Alternative, and the Merchant's Wharf/Goldbelt Alternative. The primary objective of our meeting is to adopt the study and transmit it to the Assembly.

Highlights of the study follow:

1. The Gold Creek Alternative has the least navigational impacts. The Merchant's Wharf/Goldbelt Alternative has the most navigational impacts.

2. The pilots recommend that site specific current and wind data be obtained if the Gold Creek Alternative is pursued to further assess environmental affects on berth operations.

3. The Merchant's Wharf/Goldbelt Alternative will be difficult, and possibly impossible, to permit because it eliminates the emergency anchorage in Juneau Harbor. The alternative also eliminates the Wings of Alaska Seaplane Base, the Seadrome Float, the city docks for cruise ship operations, and encumbers most of inner Juneau Harbor.

4. During high wind events, the City Dock Alternative will affect operation of the Franklin Dock. Tug assist may be needed to help ships departing the Franklin Dock clear ships tied up at the new cruiseship terminal position.

Navigation is one of several factors that should be considered in selecting an alternative. Other important selection factors include:

1. Project Financing
2. Economic Benefits and Impacts to the Community
3. Permitting and Regulatory Approvals
4. Constructability
5. Traffic, Congestion, and Land Use Management
6. Public and Stakeholder Acceptance

At the meeting, we should also discuss if/how you want to address these factors.

Call me at 586-0294 if you have questions.

Attachments

Safe, Secure, Efficient and Environmentally Responsible Maritime Operations
1000 Harbor Way, Juneau, Alaska 99801
Ph: (907) 463-2607

June 26, 2009

Mr. John Stone
Port Director
City of Juneau
155 S. Seward St.
Juneau, AK 99801

Dear Mr. Stone,

The Marine Exchange of Alaska has completed the final component of the navigation evaluation of the various cruise ship dock and pier alternatives being considered for the Port of Juneau. This final phase involved simulated vessel dockings and departures using the Pacific Maritime Institute (PMI) ship simulator model modified for the Port of Juneau.

This navigation evaluation that was initiated in the fall of 2008 and continued through the spring of 2009 entailed the following;

- Development, dissemination, review and analysis of questionnaires to the potentially impacted maritime stakeholders and regulatory agencies regarding the proposed cruise ship docks and piers and their potential navigational impacts.

- Analysis of historical cruise ship approaches and departures from existing Juneau mooring facilities obtained by AIS (Automatic Identification System) data received of vessel transits in the Port (cruise ships, tugs and other vessels) the last several years.

- Presentation of preliminary findings in a report to the Port of Juneau and public posting and presentation of the data and findings to the public in December 2008.

- Conduct of simulated cruise ship arrivals and departures under various environmental and physical factors to and from existing and potential new facilities by pilots and cruise ship masters on a ship simulator configured for the proposed docks and piers.

Upon completion of the above as well as conducting extensive discussions with the Southeast Alaska Pilots the Marine Exchange of Alaska finds the following;

1. All proposed dock and pier alternatives present both positive and negative impacts to maritime navigation in the Port. The positive impacts are all dock options will reduce to varying extents, the need to anchor vessels in the port which limits maneuvering room for vessels. The negative impacts are each option provides some reduction of navigable

waters and sea room. although the Gold Creek proposal is the least restrictive to navigation in the harbor.

2. The currently available tugs in the Port are not of sufficient size and capability to adequately address some of the more challenging cruise ship arrival and departure maneuvering complications that may develop at times due to partially disabled vessels, heavy winds and strong currents, exacerbated by the maneuvering challenges the new proposed docks and piers will present.

3. The limited weather and current data for the Port area under consideration makes it difficult to clearly understand all environmental impacts on vessels' navigation. The historical wind strength and direction is valuable for determining the challenges of making approaches and departures to present and proposed facilities, however, the closest National Weather Station sensor at the Juneau Airport reports similar but different conditions than experienced in the Port.

4. The Gold Creek dock is the option most affected by both winds and currents that will likely prevent some departures and arrivals of cruise ships under the strongest of wind (greater than 25 knots) conditions. The scheduling of the most maneuverable ships, i.e. azipods, at this facility would minimize scheduling disruptions. The Merchant's Wharf option also poses some challenges in strong southeasterly winds.

5. Due to the large sail area of cruise ships, sustained winds in excess of 25 knots complicate maneuvering requiring additional caution and increased power demands on the main propulsion and thrusters when making approaches and departures.

6. Sequencing of vessels' arrivals and departures can reduce some of the navigational challenges presented by docks and piers when stronger winds and or currents are encountered.

7. It is estimated less than 5% of cruise ship ports calls and departures will be complicated by the weather and current conditions, sustained winds of more than 25 knots, combined with the physical obstruction the new proposed docks or piers will present.

8. The installation of a current and wind sensor in the Port with the information broadcast via AIS to incoming vessels should be explored with NOAA and the Port stakeholders to provide accurate, real time environmental information to cruise ship masters and pilots to assist determining how to safely approach, depart or abort maneuvers until conditions improve.

Summary: The simulator evaluation revealed the navigational challenges of making approaches and departures to the Port of Juneau presented by the dock and pier options being considered can be safely addressed under most weather conditions encountered in the Port by cruise ships with properly operating propulsion systems under the command of experienced mariners. However, the proposed facilities if developed, will present varying levels of added navigational challenges for vessels arrivals and departures when strong winds are encountered. The specific navigational factors presented by each of the proposed mooring options under consideration identified by this study are as follows:

- Port of Juneau Steamship and Cruise Ship Terminal Docks: The proposed floating docks will extend further off the shore line and more south towards the Franklin Dock reducing maneuvering room for vessels making approaches and departures to the Franklin Dock thus requiring some modification of the present maneuvers made for arrivals and departures. The ship simulator runs and past AIS transit reports show the reduced sea room can be safely addressed by skilled mariners navigating properly operating vessels in calmer weather conditions encountered in the Port, however, will complicate maneuvers when a vessel is at anchor and during higher wind conditions.

- The Merchant's Wharf Pier: This mooring proposal presents navigational challenges in mooring of vessels at the adjacent Port Steamship Dock, the adjacent Coast Guard/NOAA facility and to anchored vessels. Present cruise ship approaches to the Port's cruise ship terminal with the bow south will be prevented if this pier option is developed. Receiving permit approval from the Army Corps of Engineers for this facility will likely be difficult due to the Coast Guard's concerns over the pier extending into navigable waters as the service prefers vessel moorage options lay parallel along the shore thus minimizing incursions and obstructions into navigable waters. As noted in the previous report, this option prevents current float plane operations from continuing.

- The Gold Creek Dock: The position of this dock presents a challenging navigational situation during higher wind conditions which occur approximately 5% of the time, in which cases vessels' beams will be exposed to the prevailing winds during approaches and departures. In most cases these challenges may be adequately addressed by scheduling the most maneuverable vessels to this facility (i.e. azipod vessels), using tugs to assist or by delaying arrival or departures until the winds abate. Approaches and departures may be further complicated by the tidal currents that are strongest in this area of the harbor. While this dock option presents some navigational challenges, it has the least impact on other existing docks and on the anchorage area of all the options under consideration. Should this dock be built the engineers should explore how far the dock may be angled to reduce the affects of the wind on vessels' hulls. Additionally, as noted above, on site current and wind sensors should be installed and the data broadcast to vessels' masters and pilots real time via AIS or other means to assist them in assessing the environmental factors that need to be compensated when making approaches and departures.

Sincerely,

Captain Edward E Page
U.S. Coast Guard (Retired)

Enclosure: (1) Ship Simulator Results

Report on Observations and Findings of Port of Juneau's
Ship Simulator Evaluation Conducted at Pacific Maritime Institute

26 June 2009

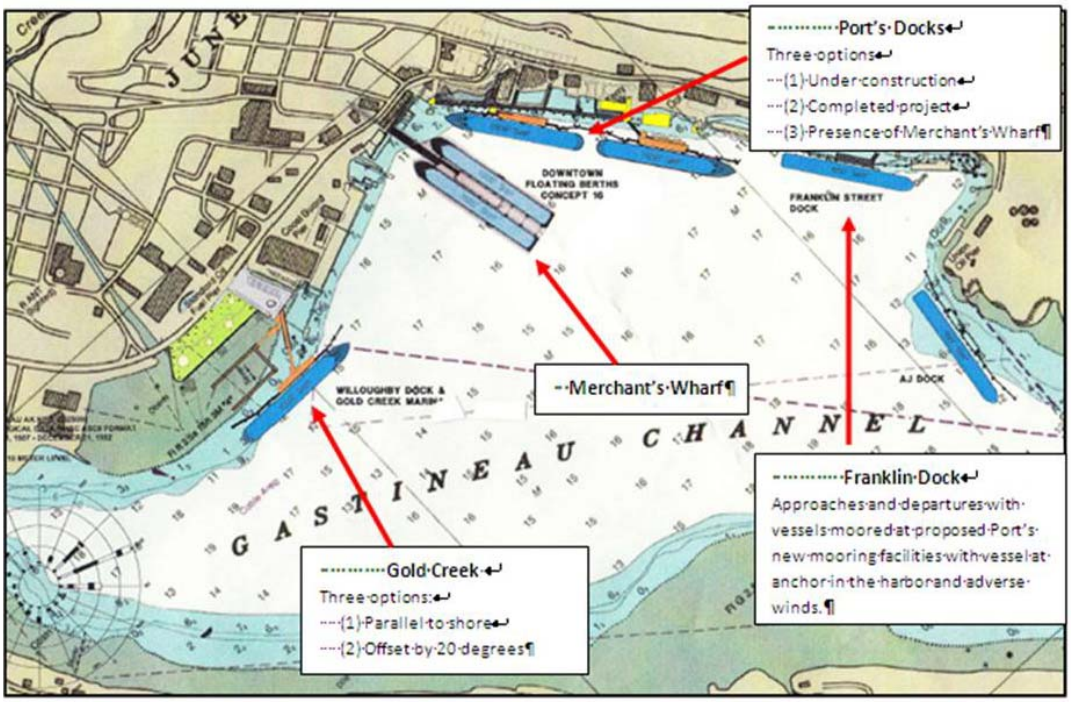
Report by Captain Ed Page, USCG (Ret)

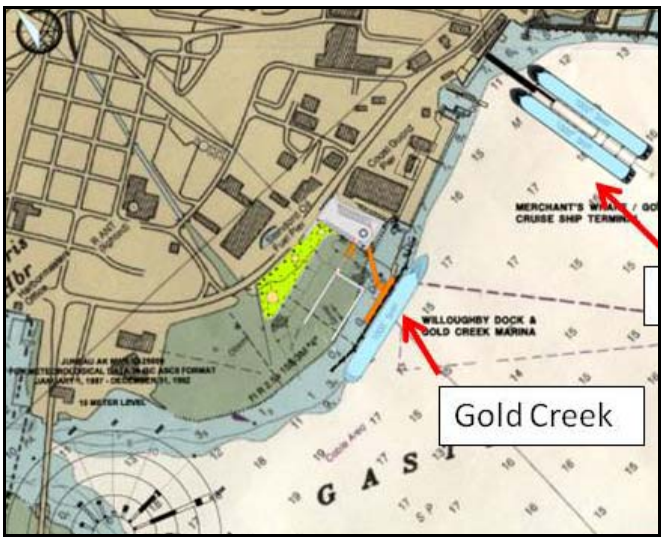
Overview: The Class-A Full-mission bridge simulator at Pacific Maritime Institute (PMI) in Seattle was used to evaluate and validate the Marine Exchange of Alaska's assessment of various mooring facilities under consideration for future construction in the Port of Juneau to accommodate larger, Post Panamax, cruise ships. The preliminary Navigation Assessment relied on prior AIS (Automatic Identification System) recorded transits of cruise ships arriving and departing the Port as well as interviews with stakeholders and surveys.

The PMI ship simulator was modified to display the proposed cruise ship mooring facilities and used two of the largest cruise ship models presently available (one conventional screw and one azipod vessel) as well as a smaller less maneuverable cruise ship to make several approaches and departures to various berths under different weather conditions. Additionally, approaches and departures were made with vessels moored at adjacent berths and at anchor to determine under which conditions a vessel may safely approach and depart new berths or existing berths without the need for tug assistance. The pilot cards for the vessels used in the evaluation are provided below. The PMI simulator provided excellent realism in making these evaluations.

The evaluation group consisted of Southeast Alaska Pilots Association (SEAPA) pilots Captains Hans Antonsen, Jeff Baken, Don Charles and Larry Vose; Captain Prash Karnik, Deputy Director Nautical Operations for Holland America Lines and Captain Craig Street of Princess Cruises. These individuals volunteered to assist at PMI in the conduct of various maneuvers at the facilities under consideration in this study.

The docks and piers that were evaluated are depicted on the following page with the Gold Creek Dock evaluated at two different angles to shore to determine if a more southerly angle would minimize the wind forces on the beam.





Gold Creek Dock Angled More Parallel to the Shore

The following assumptions and factors were incorporated in the conduct of the simulated mooring and departure evolutions conducted to evaluate the dock options under consideration.

1. Current was not input into the tests as the tidal current data for Juneau Harbor is not well mapped for simulation purposes and is variable and localized at different locations in the Harbor. While there are currents in the harbor that at times complicate vessel maneuvers, they are generally less than one knot in the vicinity of the facilities being evaluated with the potential exception being at the Gold Creek facility where additional current information from NOAA has been sought.

2. The most frequent, dominant winds in the Port are from the southeast and northwest. Due to the large sail area of cruise ships the wind is typically the primary environmental

factor affecting the safe maneuvering of vessels. In light of this, multiple simulated moorings and departure maneuvers were conducted under various wind conditions.

3. For study purposes, all vessel propulsion capabilities (i.e. engines and thrusters) were considered to be fully operational. Full power was not used in the maneuvers to allow reserve capacity for safety reasons (e.g. extremis situations). Limited capacity (e.g. use of two versus three thrusters) was likewise not simulated.

4. The largest ship model for vessels calling on Juneau was the Diamond Princess class of vessel.

5. Radiance of the Seas azipod vessel was also used in some simulated runs.

6. In addition to conducting approaches and departures under various environmental conditions, maneuvers were also conducted with a large cruise ship anchored in the harbor to evaluate potential impacts as well.

7. All approaches and departures to the Franklin Dock were conducted with a large cruise ship (Diamond Princess class) to present the physically/spatially most challenging mooring and departure conditions.

8. While the PMI computer modeling simulator provides an excellent representation on how vessels maneuver under various conditions, it does not provide an exact representation in all cases.

9. Shiphandling is as much an art as it is a science and the six seasoned mariners participating in these simulations revealed there are a multitude of possible maneuvers for arriving/departing a given berth. Some maneuvers were attempted as a consensus approach, while others were done to test the limits or simply to get a feel for the range of available options under simulated conditions without the risk of having any real consequences. The simulation exercises confirmed the professional intuition and judgment of the evaluation group.

The pilot cards for the vessels used in the simulator runs are provided on the following page, followed by the graphics and summary of the various navigational evolutions evaluated.

View

Type of engine	Slow Speed Diesel (2 x 20000 kW)
Type of propeller	FPP
Thruster bow	Yes
Thruster stern	Yes

General information

Vessel type	Passenger cruise ship 5_v12
Displacement	60636.0 t
Max speed	22.2 knt

Dimensions

Length	945.9 ft
Breadth	123.0 ft
Bow draft	28.1 ft
Stern draft	28.1 ft
Height of eye	104 ft

View

Type of engine	Medium Speed Diesel (2 x 20000 kW)
Type of propeller	Z-Drive
Thruster bow	Yes
Thruster stern	None

General information

Vessel type	Radiance_Class_Cruise_ship
Displacement	54149.0 t
Max speed	24.6 knt

Dimensions

Length	961.9 ft
Breadth	123.0 ft
Bow draft	26.7 ft
Stern draft	26.7 ft
Height of eye	79 ft

View

Type of engine	Medium Speed Diesel (2 x 14580 kW)
Type of propeller	CPP
Thruster bow	Yes
Thruster stern	None

General information

Vessel type	Passenger cruise ship 1 (Dis.
Displacement	24841.0 t
Max speed	24.0 knt

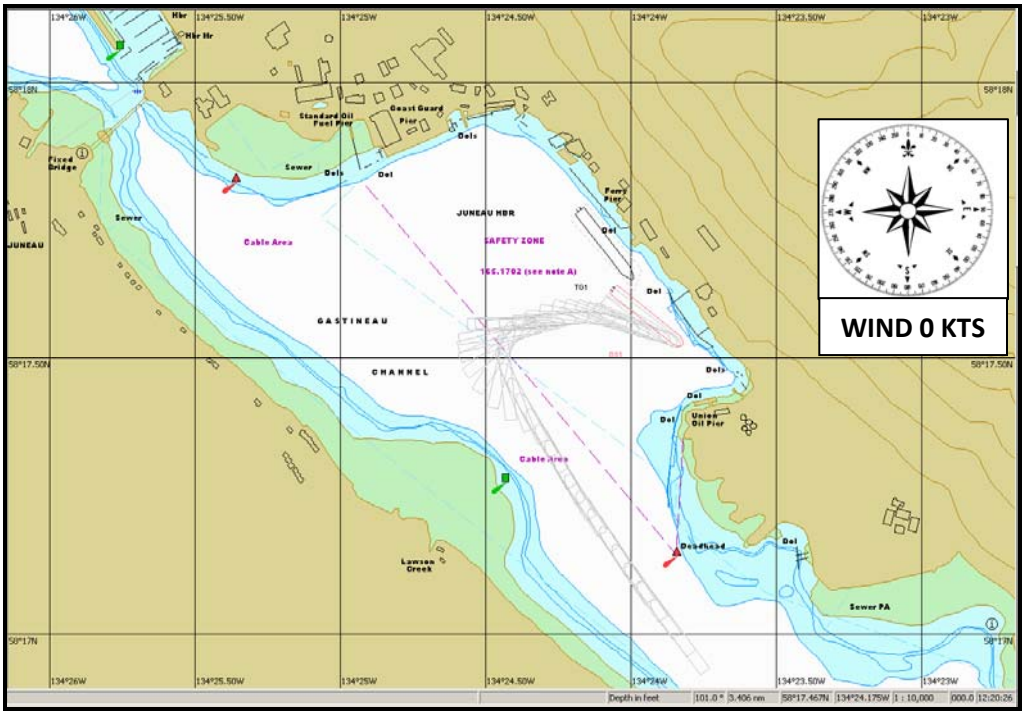
Dimensions

Length	757.5 ft
Breadth	95.8 ft
Bow draft	26.3 ft
Stern draft	26.3 ft
Height of eye	81 ft

The following graphics and discussion report the mooring and departures simulated, the conditions programmed into the computer and the findings.

Scenario One

Franklin Dock Approach



Scenario: Franklin Dock approach during calm conditions with a large cruise ship moored at the adjacent proposed Port dock. No environmental conditions.

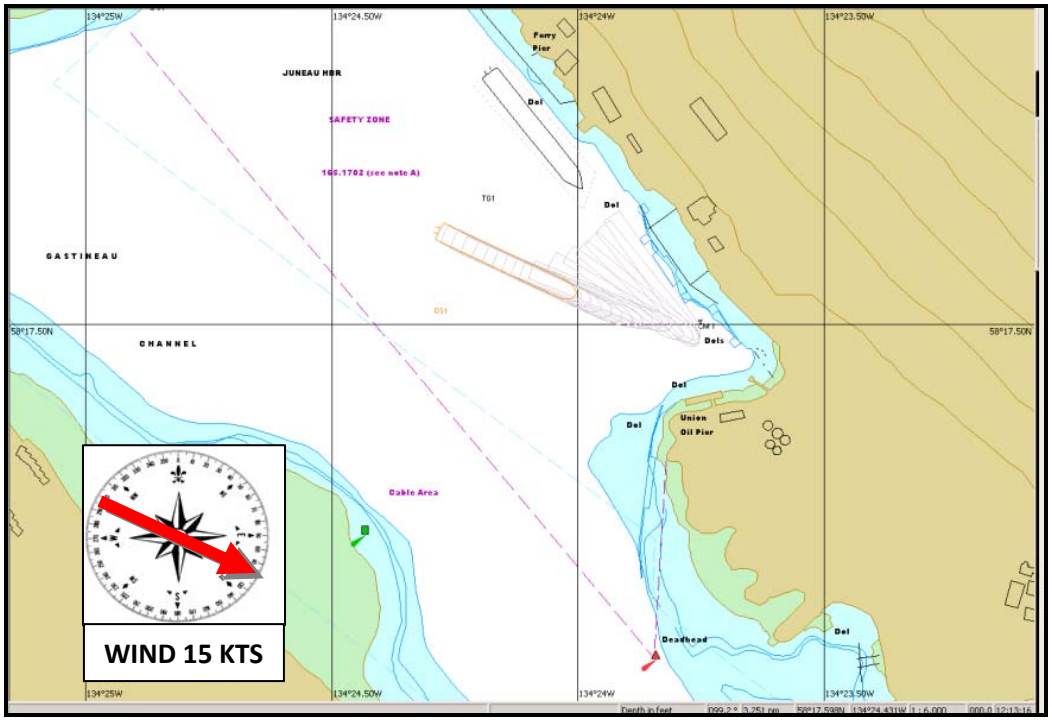
Ship: Passenger Cruise Ship 5 V12 (Princess Diamond Class)
Current: 0 knt
Wind: 0 knt
Waves: 0 ft

Findings:

The evaluation group's professional opinion is that, in general, the approaches to the Franklin Dock would be steeper with a vessel alongside a revised Cruise Terminal facility that extends into the harbor beyond the present Cruise Terminal dock. With no wind or current, this maneuver appears to be within reasonable safety parameters, the primary concerns being decreased turning room in the harbor and the potential for either a steeper approach or an approach that requires more time and maneuvering to pull the vessel up parallel to the dock and walk it in once clear of the Cruise Terminal facility (similar to Scenario 8).

Scenario Two

Franklin Dock Departure



Scenario: Franklin Dock Departure during moderate wind conditions with a large cruise ship moored at the adjacent proposed Port dock.

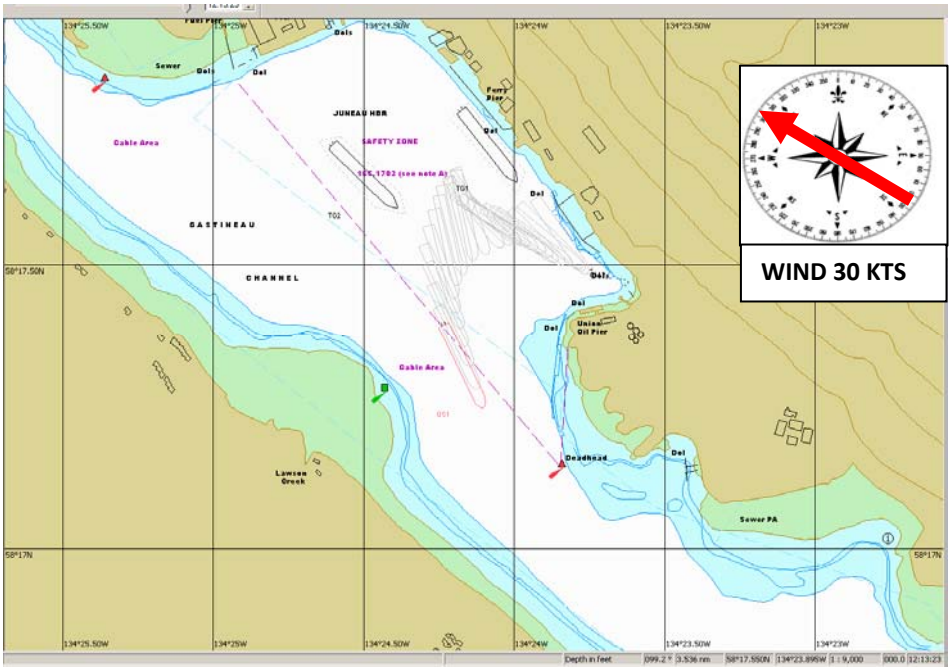
Ship:	Passenger Cruise Ship 5 V12 (Diamond Princess – conventional propulsion)
Contours:	30 Seconds
Current:	0 knt
Wind:	15 knt from 290˚
Waves:	0 ft

Findings:

The evaluation group's professional opinion is that, in general, the departure from the Franklin Dock would require the stern of the vessel to be angled steeper into the harbor prior to gaining sternway with a vessel alongside a revised Cruise Terminal facility that extends further into the harbor beyond the present dock. The departure under these conditions appears to be within reasonable safety parameters. The departure may require more time and maneuvering inputs to angle the stern into the wind or to walk the vessel parallel off dock prior to backing into the harbor once clear of the Cruise Terminal facility.

Scenario Three

Franklin Dock Departure with Vessel at Anchor



Scenario: Franklin Dock Departure during adverse wind conditions with a large cruise ship moored at the adjacent proposed Port dock and a vessel at anchor.

Ship:	Passenger Cruise Ship 5 V12 (Diamond Princess- conventional propulsion)
Contours:	30 Seconds
Current:	0 knt
Wind:	30 knt from 135˚
Waves:	0 ft

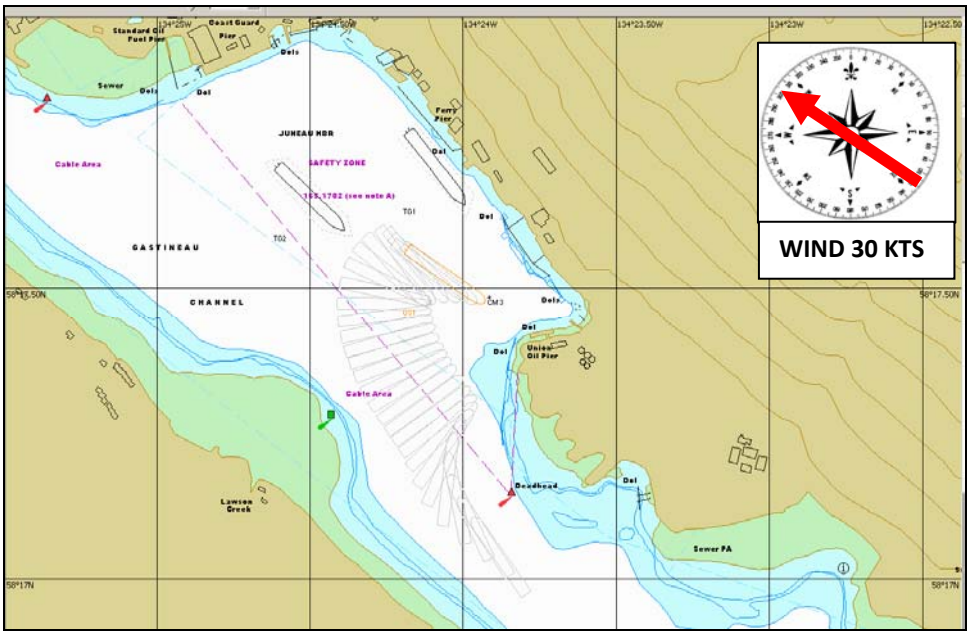
Findings:

The evaluation group's professional opinion is that this maneuver is at the upper limits of safety as it is much more dependent on all vessel systems on line and functioning at full capability. As with the unmooring with no wind, the departure from the Franklin Dock would be steeper and/or require more maneuvering inputs to walk the ship parallel off-dock with a vessel alongside a revised Cruise Terminal facility that extends further into the harbor. In any case, care must be exercised to ensure the vessel is maneuvered well into the harbor prior to achieving sternway – a limitation compared to existing conditions.

In addition to the maneuvering restrictions imposed to avoid the vessel at anchor, a vessel at anchor also limits the sea room for a departing vessel to transit from astern to ahead and obtain steerageway (7 knots) to ensure safe departure and clearance past the Rock Dump. This anchored vessel complication also exists with the docks presently in place.

Scenario Four

Franklin Dock Approach with Vessel at Anchor



Scenario: Franklin Dock Arrival during adverse wind conditions with a large cruise ship moored at the adjacent proposed Port dock

Ship:	Passenger Cruise Ship 5 V12 (Diamond Princess- conventional propulsion)
Contours:	30 Seconds
Current:	0 knt
Wind:	30 knt from 135˚
Waves:	0 ft

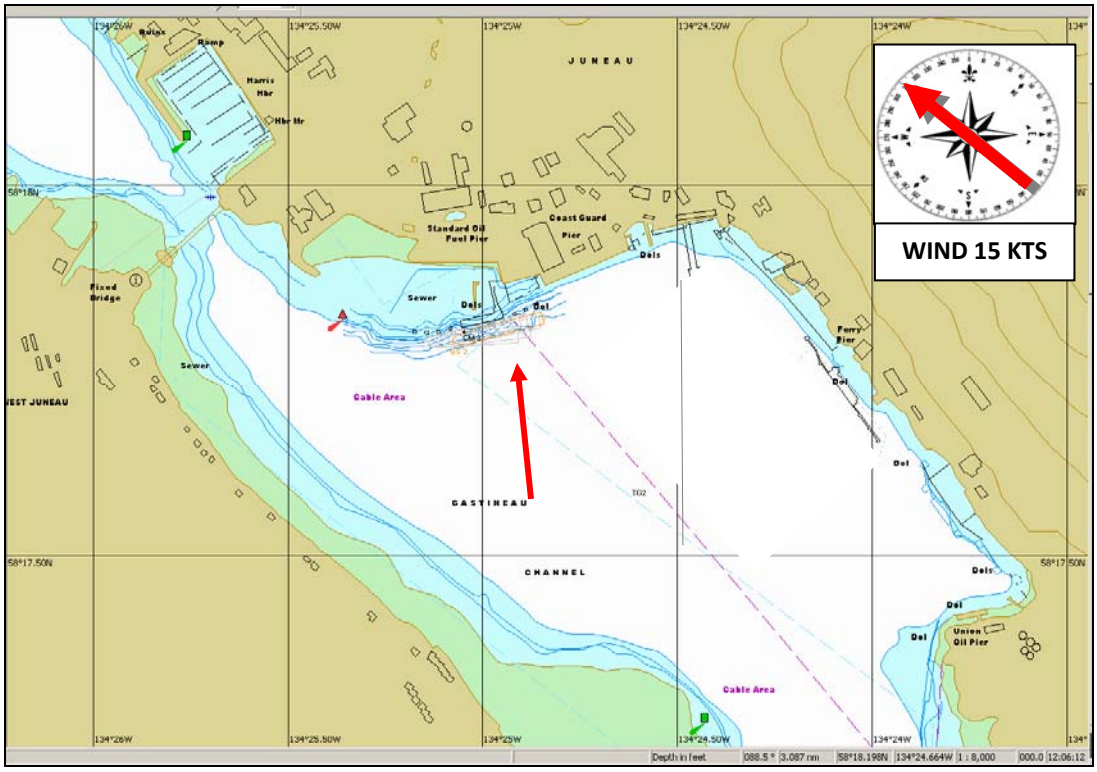
Findings:

The evaluation group's professional opinion is that this maneuver is at the upper limits of safety as it is much more dependent on all vessel systems on line and functioning at full capability (similar to Scenario Three). Specifically, there is less room for the docking vessel to reach ahead while turning for the berth (than is presently available) and it is therefore critical to ensure the vessel is brought through the wind sooner (than under present circumstances) for a safe approach. This simulation dramatizes this concern as the vessel was turned quite early in the approach due to the presence of the vessel at anchor complicated by reduced maneuvering room due to the presence of the vessel at the proposed City's Cruise Terminal dock. The option also remains for the vessel to go deeper into the harbor prior to turning; and snap the vessel around, however this maneuver cuts down on available leeway as the vessel makes the turn for the approach. This unorthodox maneuver was determined to be uncomfortably close to the anchored vessel however was done to determine limitations.

Any additional physical limitations in the harbor (e.g. anchored vessels) exacerbates the restrictions introduced by extending the City's Cruise Terminal dock into the harbor.

Scenario Five

Gold Creek Dock Departure



Scenario: Gold Creek Departure during moderate wind conditions.

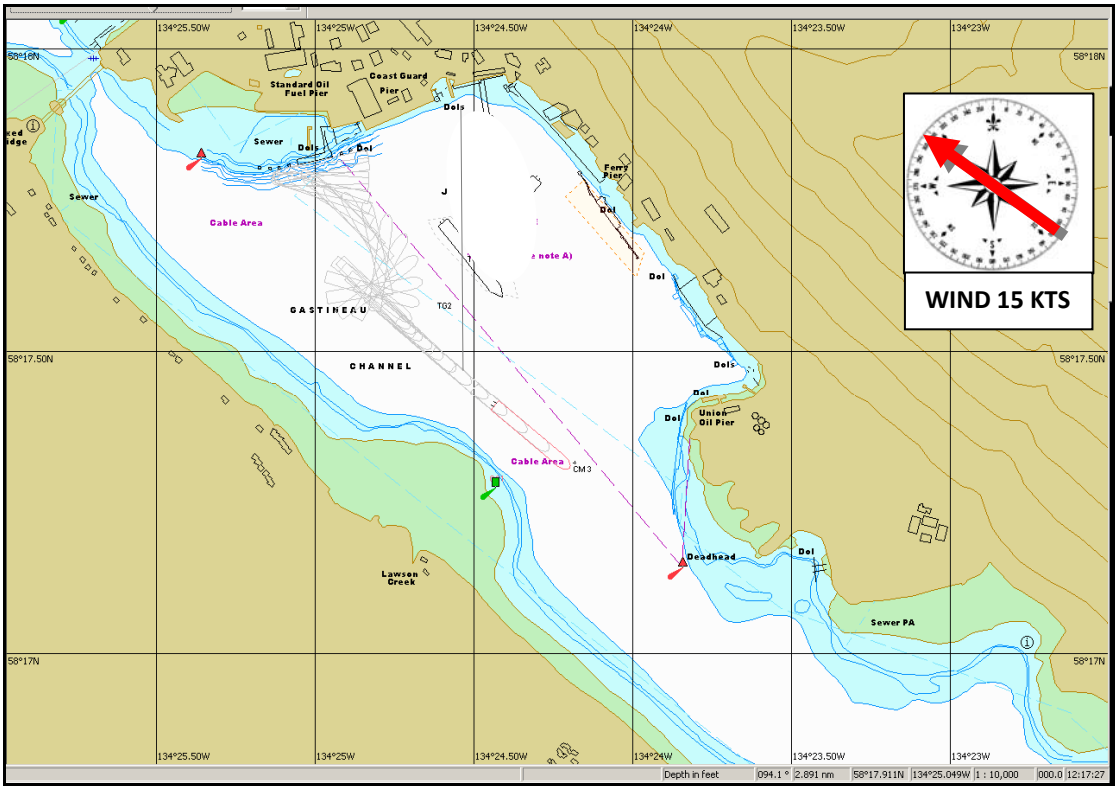
Ship:	Passenger Cruise Ship 1 (Small cruise ship with no stern thrusters)
Contours:	30 Seconds
Current:	0 knt
Wind:	15 knt from 130˚
Waves:	0 ft

Findings:

Complications were encountered unmooring this vessel under these conditions. A ship with no stern thruster is unable to lift the stern off-dock and then back clear without the use of tugs. A nearly beam-on wind of this magnitude, combined with limited turning room if able (or once able) to clear the berth is at or beyond the safe limits of operation using full power with no reserves and without tug assistance. Even with tug assistance, this maneuver would require two tugs of significant bollard pull to safely accomplish this maneuver (again with all ship propulsion systems operating at full capability). This scenario is representative of older days when most vessels had less power, specifically no stern thrusters, which would make this proposed facility much more of a challenge than would now be expected with the most modern vessels calling on Juneau.

Scenario Six

Gold Creek Dock Departure with Vessel at Anchor



Scenario: **Gold Creek dock Departure during moderate wind conditions with vessel at anchor.**

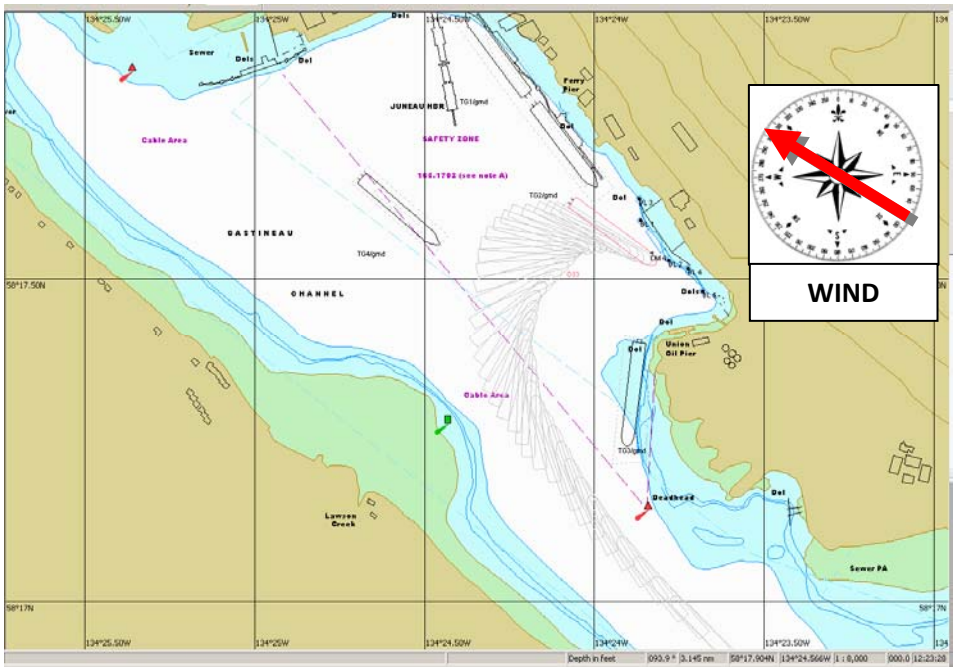
Area: Juneau
Ship: Passenger Cruise Ship 5 V12 (Diamond Princess- conventional propulsion)
Contours: 30 Seconds
Current: 0 knt
Wind: 15 knt from 130˚
Waves: 0 ft

Findings:

The evaluation group's opinion is that this scenario is within reasonable safety parameters. Given the most common winds in the harbor, this facility provides for substantial maneuvering room/options once the vessel is clear of the berth. With no ship at anchor one would expect to back more into the center of the harbor prior to bringing the vessel about.

Scenario Seven

Franklin Dock Approach with Vessel at Anchor and on Berth at Port's and A.J. Docks



Scenario: Franklin Dock Arrival during adverse wind conditions with large cruise ship moored at the adjacent proposed City of Juneau dock and another cruise ship anchored in the harbor.

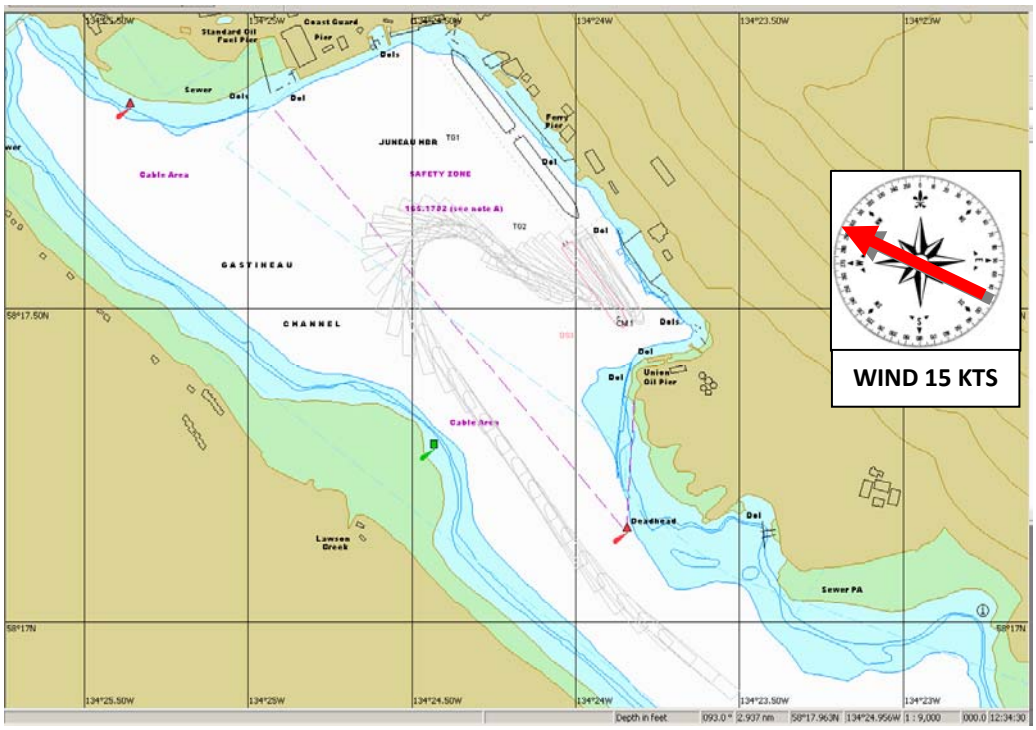
Ship:	Passenger Cruise Ship 5 V12 (Diamond Princess- conventional propulsion)
Contours:	30 Seconds
Current:	0 knt
Wind:	20 knt from 125˚
Waves:	0 ft
Visibility:	10 nm

Findings:

This is an undesirable mooring situation due to the presence of an anchored vessel in conjunction with a vessel moored at the extended City Cruise Ship Terminal dock that incurs a reduced safety margin. Although the evaluation group's professional opinion is that this maneuver can be safely completed, it is much more dependent on all vessel systems on line and functioning at full capability. Specifically, the vessel must be turned upwind of the anchored vessel while ensuring the head is brought through the wind to limit reaching onto the vessel moored at the cruise terminal facility extending into the harbor. The proposed position of the cruise terminal extending away from and as importantly south of the existing berth (towards the Franklin Dock) suggests either a shallower turn with the head brought to the wind sooner than under existing conditions or driving the vessel into the area between the anchored vessel and the berth and snapping it about for the approach to the berth. In either case, the safety margin is reduced. Increased incidence for use of the anchor was discussed as a potential consideration in this scenario.

Scenario Eight

Franklin Dock Approach with Vessel on Berth at Port's Dock



Scenario: Franklin Dock Arrival during moderate wind conditions with large cruise ship moored at the adjacent proposed City of Juneau dock.

Scenario: Franklin Dock Arrival during moderate wind conditions with large cruise ship moored at the adjacent proposed City of Juneau dock.

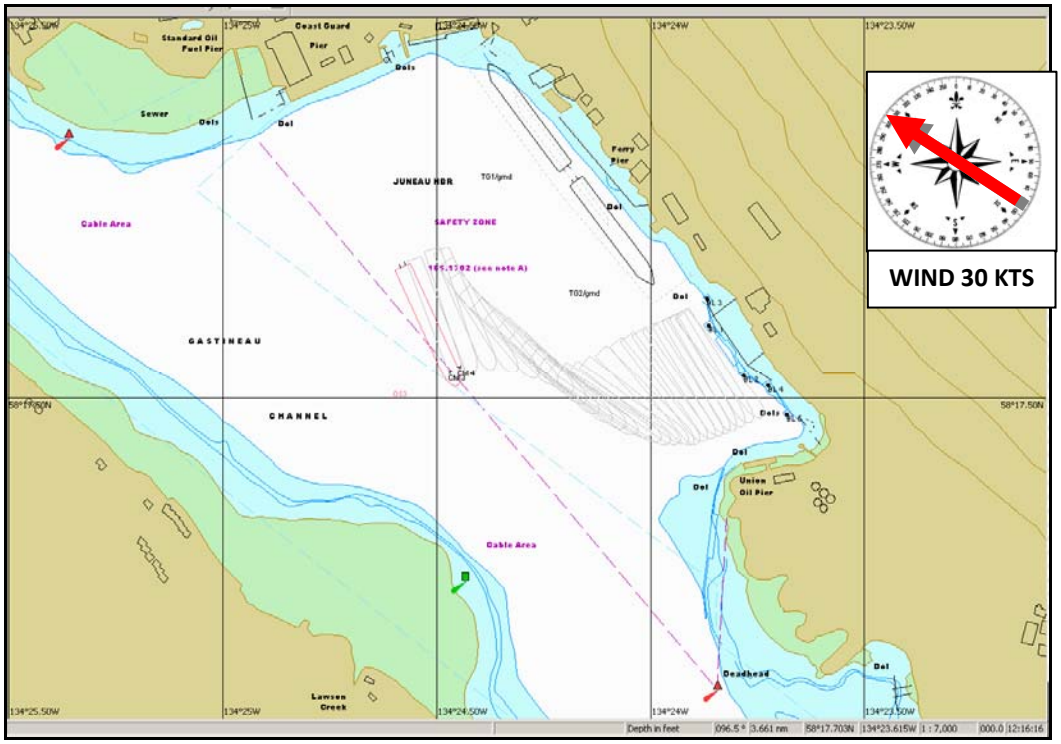
Ship:	Passenger Cruise Ship 5 V12 (Diamond Princess- conventional propulsion)
Contours:	30 Seconds
Current:	0 knt
Wind:	15 knt from 120˚
Waves:	0 ft

Findings:

As with Scenario 4, the evaluation group's professional opinion is that this maneuver can be safely completed albeit with the considerations as noted. In this scenario (at half the wind velocity and slightly more ESE) the option to take the vessel deeper into the harbor to turn was evaluated. This approach required more reliance on the vessel's thrusters to move the vessel sideways to the berth and is likely a typical maneuver to address the modifications to the City's Cruise Ship Terminal which decreases safety margins, especially during high wind conditions. Consistent with the previous scenarios, great concern is had to ensuring the vessel head is through the wind while well out in the harbor/off the moored vessel, prior to working the vessel to the dock. Additionally, as previously noted, this maneuver will consume more resources (primarily time) not only maneuvering to dock, but also running lines and securing the vessel.

Scenario Nine

Franklin Dock Departure with Vessel on Berth at Port's Dock



Scenario: Franklin Dock Departure under adverse wind conditions with large cruise ship moored at the adjacent proposed City of Juneau dock.

Ship:	Passenger Cruise Ship 5 V12 (Diamond Princess- conventional propulsion)
Contours:	30 Seconds
Current:	0 knt
Wind:	30 knt from 120˚
Waves:	0 ft

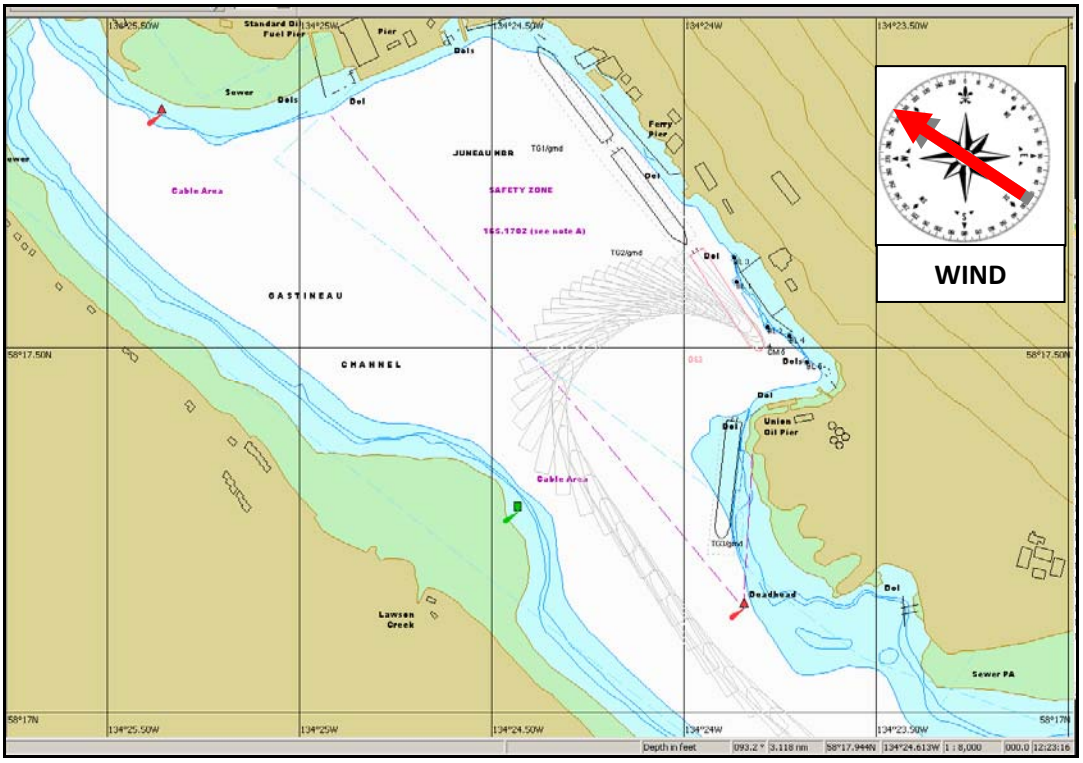
Findings:

As with Scenario 3, the evaluation group's professional opinion is that this maneuver can be safely completed consistent with previous comments. In this scenario (strong wind at slightly more ESE) the option to take the vessel deeper into the harbor to turn was evaluated to ensure adequate run for steerage prior to the Lawson Creek area. Consistent with the previous scenarios, great concern is had to ensuring the vessel is further off-the dock prior to moving astern. In summary, this maneuver requires more time and more tools for maneuvering.

Scenario Ten

Franklin Dock Approach with

Vessel on Berth at Port's Dock and at AJ Dock



Scenario: Franklin Dock Approach during adverse wind conditions with large cruise ship moored at the adjacent proposed City of Juneau dock.

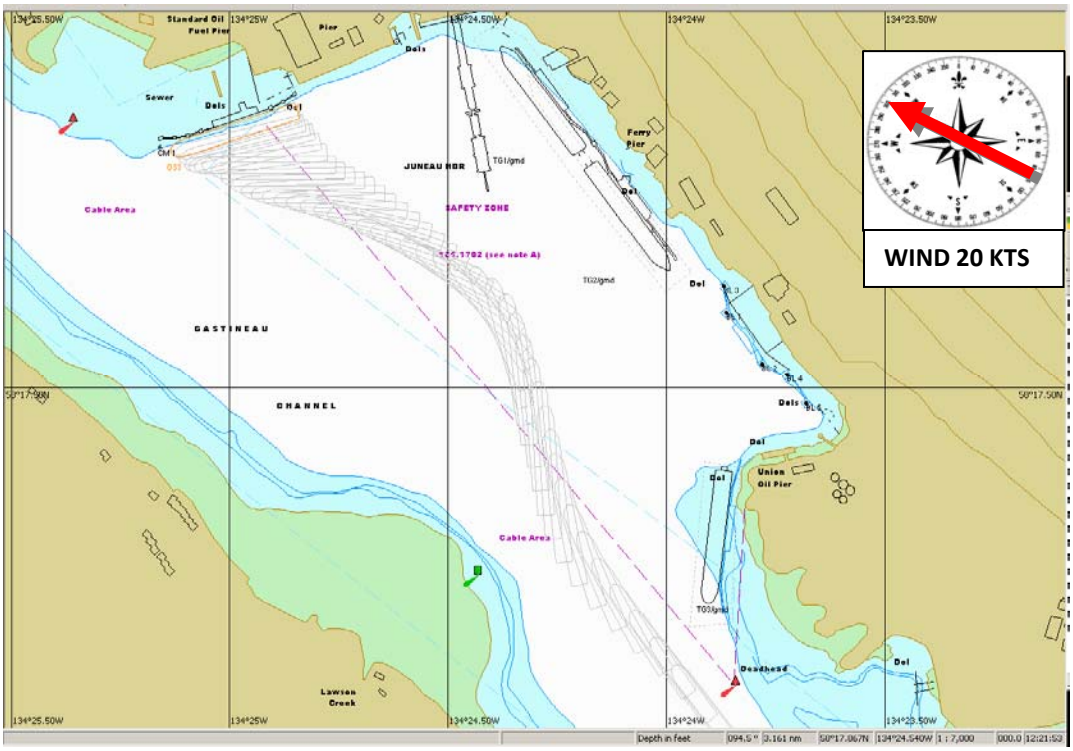
Ship:	Passenger Cruise Ship 5 V12 (Diamond Princess- conventional propulsion)
Contours:	30 Seconds
Current:	0 knt
Wind:	20 knt from 130˚
Waves:	0 ft

Findings:

As may be expected, this scenario is somewhere between the calm conditions and the heavy wind (30 knots). However, the option of approaching deeper into the harbor is also considered viable. This is a typical approach without the proposed City Cruise Ship Terminal modifications that reveals the reduced safety margins between the inbound and the moored vessel that will require a modified approach to the dock if the City Cruise Ship Terminal is modified as proposed.

Scenario Eleven

Gold Creek Dock Arrival



Scenario: **Gold Creek Arrival during adverse wind conditions.**

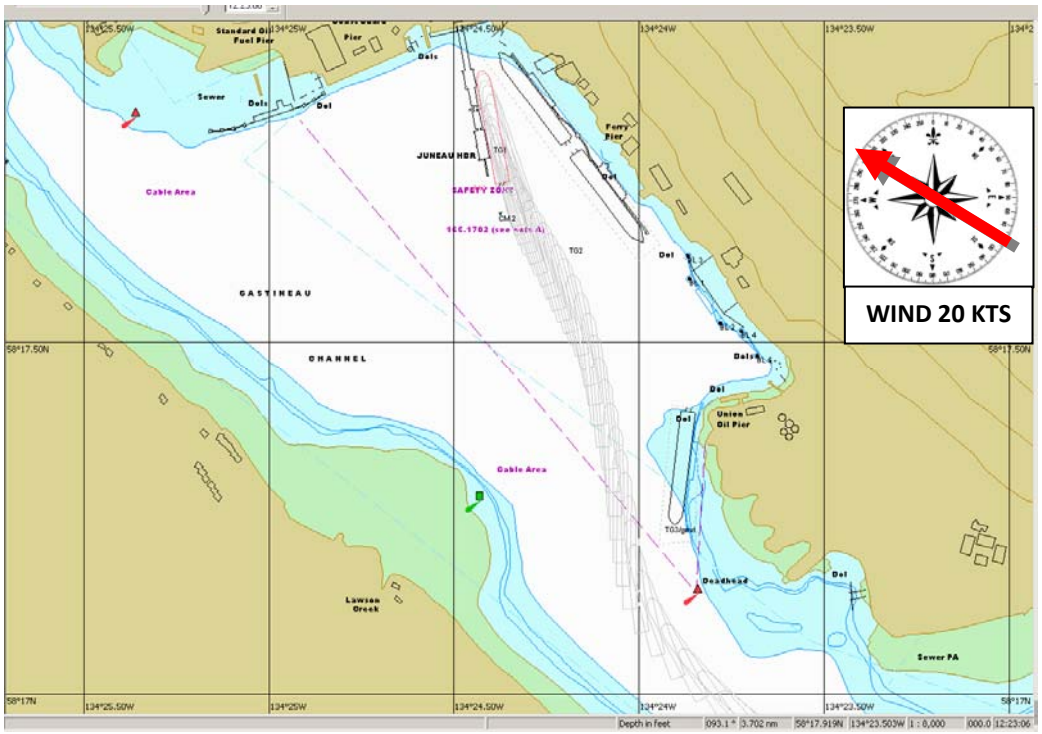
Ship: Passenger Cruise Ship 5 V12 (Diamond Princess- conventional propulsion)
Contours: 30 Seconds
Current: 0 knt
Wind: 20 knt from 125˚
Waves: 0 ft
Visibility: 10 nm

Findings:

The evaluation group's professional opinion is that, in general, the preferred approaches to the proposed Gold Creek facility would be starboard-side-to, particularly given a slightly better dock angle to the harbor/dominant winds and given the known current that runs under the Juneau Douglas Bridge and around the flats at Gold Creek. Except in the strongest of winds, this facility appears to be quite viable under most conditions.

Scenario Twelve

Merchant's Wharf Arrival Vessel's Port Side To the Pier



Scenario: **Merchant's Wharf Approach during adverse wind conditions.**

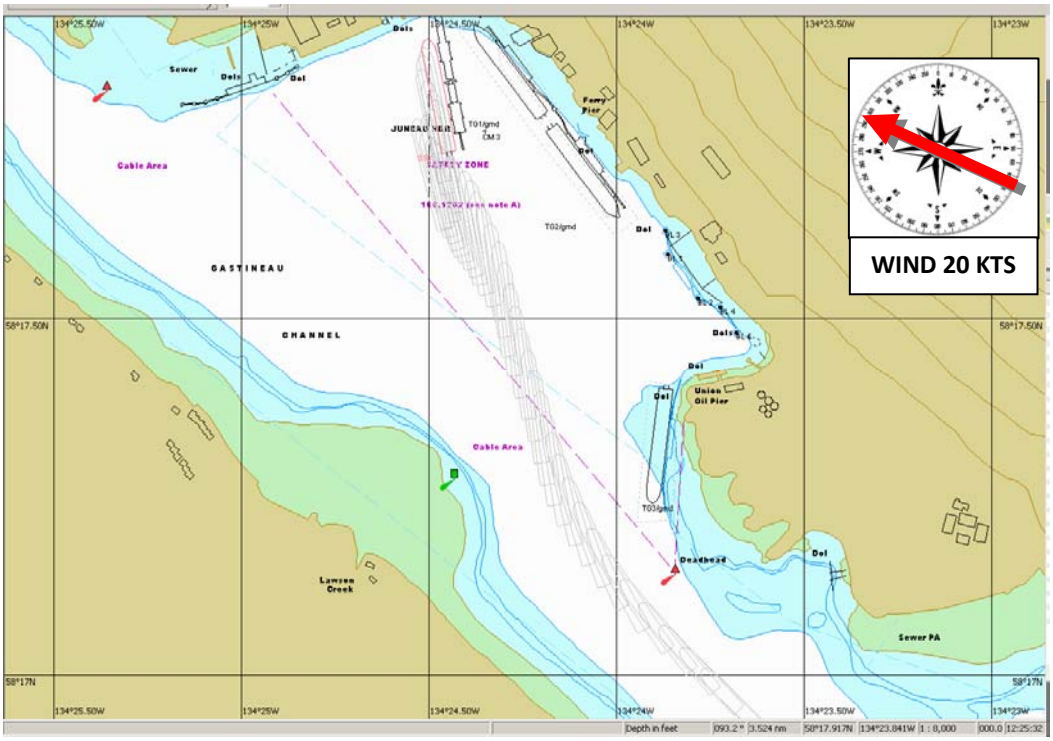
Ship: Passenger Cruise Ship 5 V12 (Diamond Princess- conventional propulsion)
Contours: 30 Seconds
Current: 0 knt
Wind: 20 knt from 125˚
Waves: 0 ft
Area: Juneau

Findings:

The evaluation group's professional opinion is that, in general, the approaches to the Merchant's Wharf may be more viable if the facility head were located more to the west (at the western end of Merchant's Wharf). With strong winds from the SE, this facility will present some challenges for mooring to either side. On the east side the challenge will be to hold the stern high-enough to the wind without closing in on vessels or facilities moored at the Alaska Steam or Cruise Terminal Facilities. Of note, there was significant discussion concerning the ability to safely berth at this facility with a vessel moored at the Alaska Steamship Dock.

Scenario Thirteen

Merchant's Wharf Arrival with Vessel's Starboard Side to the Dock



Scenario: **Merchant's Wharf Approach during adverse wind conditions.**

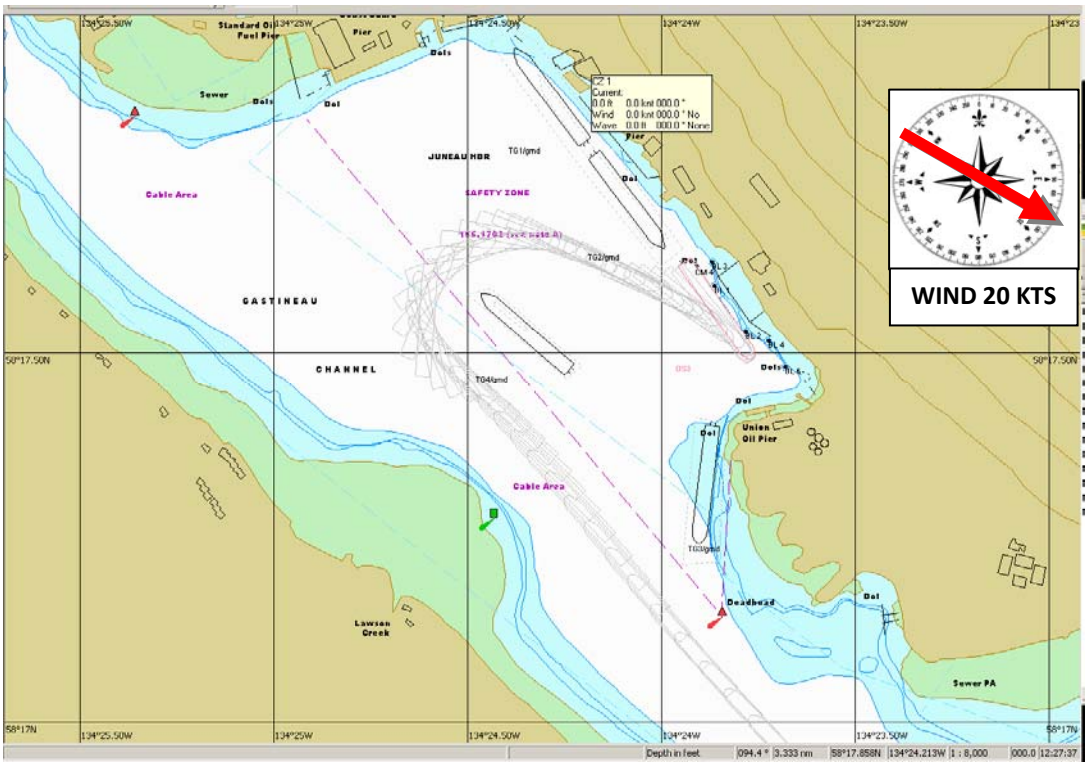
Ship: Passenger Cruise Ship 5 V12 (Diamond Princess- conventional propulsion)
Contours: 30 Seconds
Current: 0 knt
Wind: 20 knt from 125˚
Waves: 0 ft

Findings:

The orientation considerations for the Merchant's Wharf remain valid for this scenario, in fact, significant difficulties may be expected in strong SE winds, particularly in the ability to maintain an approach and hold position alongside.

Scenario Fourteen

Franklin Dock Arrival Vessel at Anchor and at Port's Dock



Scenario: **Franklin Dock Approach during adverse wind conditions.**

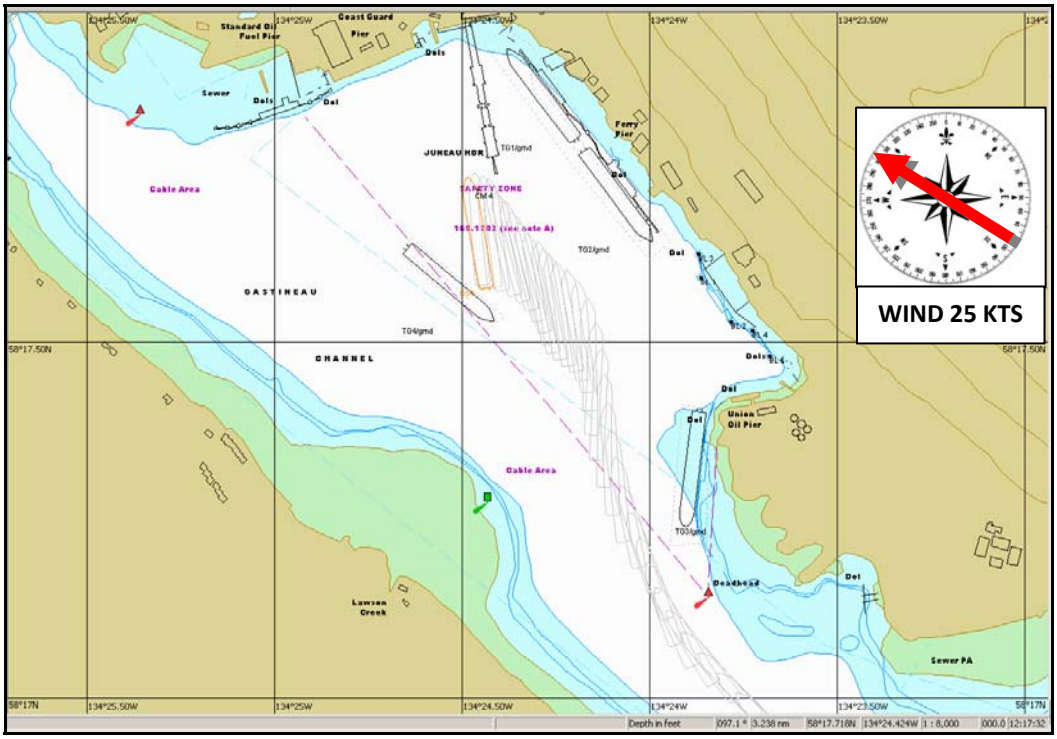
Ship: Passenger Cruise Ship 5 V12 (Diamond Princess- conventional propulsion)
Contours: 30 Seconds|
Current: 0 knt
Wind: 20 knt from 305
Visibility: 10 nm

Findings:

In general, a NW wind presents less of a complication for this scenario than the more frequent SE winds. The anchored vessel for the most part, does not complicate this maneuver with the wind from the north and the impact of the extended City Cruise Ship Terminal is less (than in other scenarios).

Scenario Fifteen

Merchant's Wharf Arrival Vessel at Anchor



Scenario: **Merchant's Wharf Approach during adverse wind conditions with vessel at anchor**

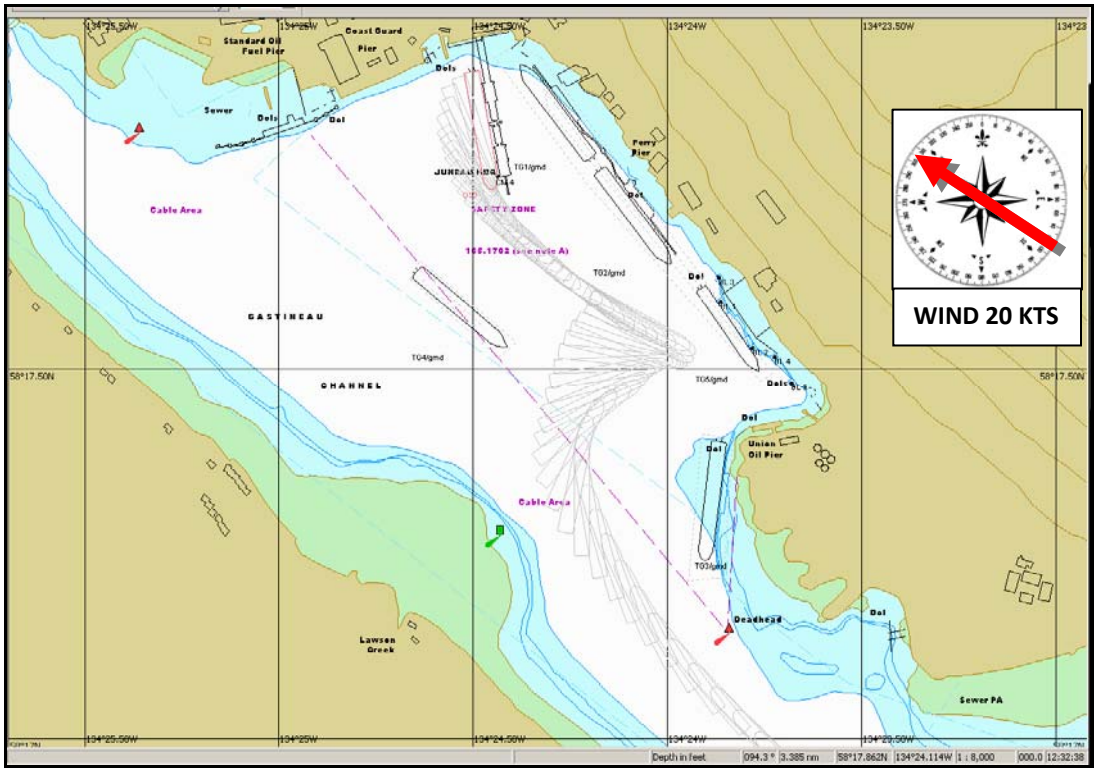
Ship: Passenger Cruise Ship 5 V12 (Diamond Princess- conventional propulsion)
Contours: 30 Seconds|
Current: 0 knt
Wind: 25 knt from 125˚
Visibility: 10 nm

Findings:

Significant complications exist with this scenario. The concerns with approach and holding to the dock identified in Scenario 13 are amplified with a vessel at anchor. The presence of a Merchants Wharf facility may force vessels at anchor to position more towards the southeast in the harbor (closer to the harbor entrance) than is presently the case. This has the potential to place an anchored vessel more squarely in the path of vessels approaching all docks Overall, the margins of safety are too low to consider this maneuver.

Scenario Sixteen

Merchant's Wharf Arrival with Vessel at Anchor



Scenario: **Merchant's Wharf Approach during adverse wind conditions with vessel at anchor**

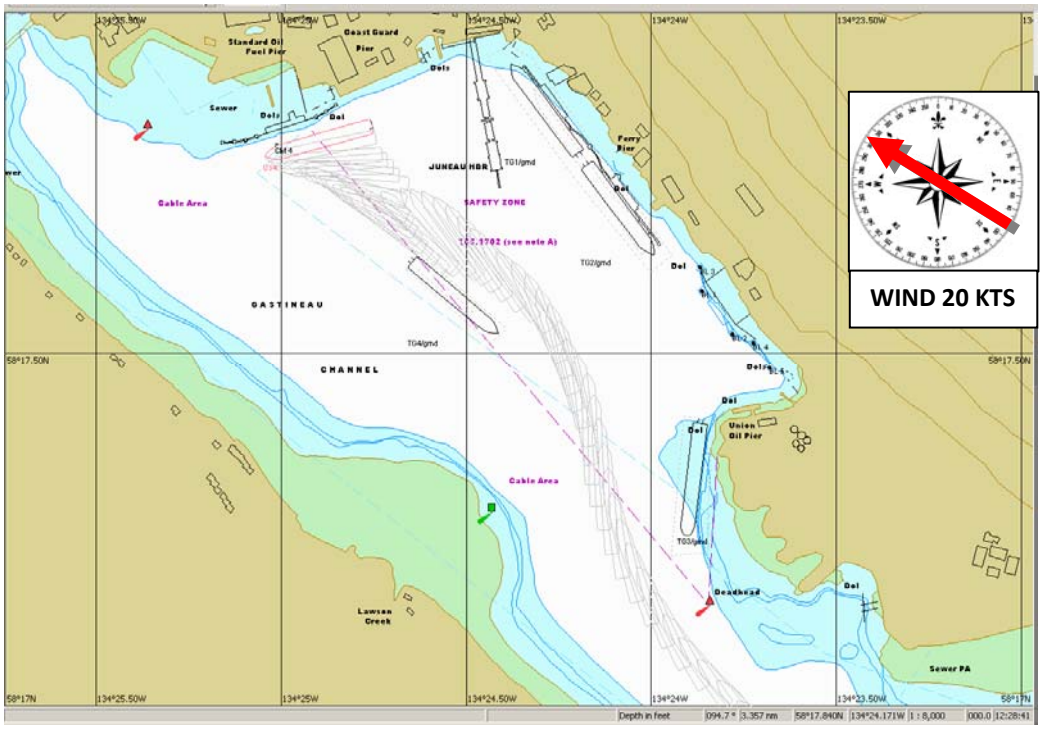
Ship: Passenger Cruise Ship 5 V12 (Diamond Princess- conventional propulsion)
Contours: 30 Seconds|
Current: 0 knt
Wind: 20 knt from 125˚
Visibility: 10 nm

Findings:

This scenario (backing into the west side of the proposed Merchants Wharf facility) requires precise shiphandling and will add significant time to the docking maneuver. The considerations for this approach combine the same considerations for an approach on the Franklin Dock (in these conditions), as well as the landing to the west side considerations addressed in previous scenarios. This maneuver should not be considered routine. It was done to test and evaluate the viability of this approach.

Scenario Seventeen

Gold Creek Arrival with Vessel at Anchor



Scenario: Gold Creek Approach during adverse wind conditions with vessel at anchor

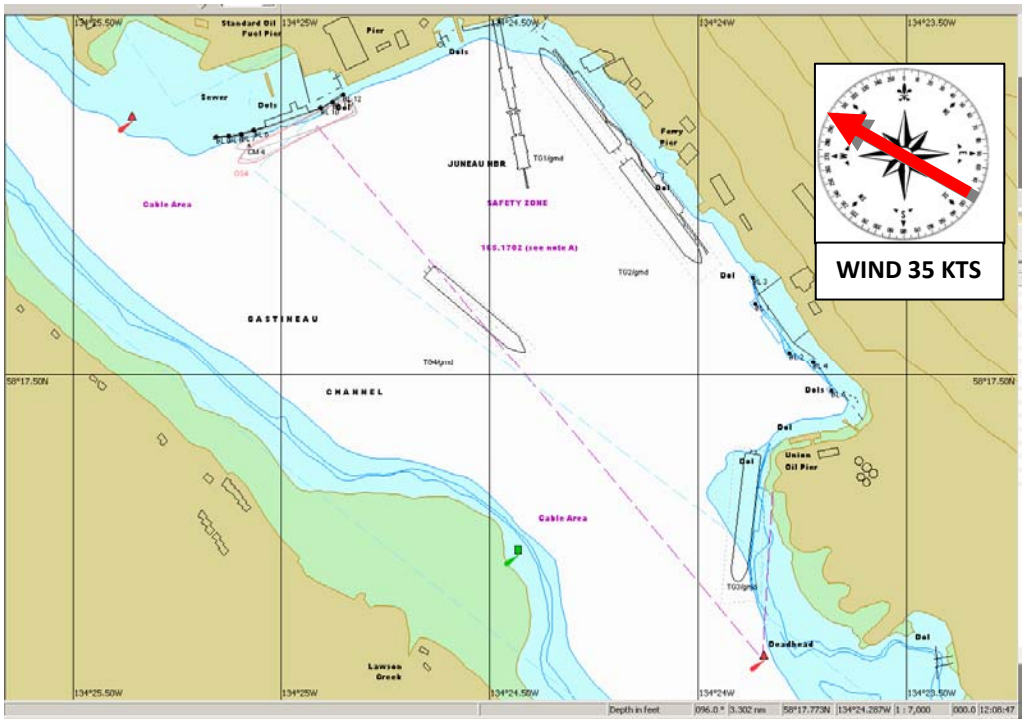
Ship:	Radiance Class Cruise Ship (Azipods)
Contours:	30 Seconds|
Current:	0 knt
Wind:	20 knt from 125˚
Visibility:	10 nm

Findings:

This scenario demonstrates limitations introduced in harbor maneuvering with the addition of the Merchant's Wharf facility – particularly as it relates to second-stage, follow-on port development. In addition to eliminating the port-side approaches to the Alaska Steam and Cruise Terminal docks (necessary for some vessels to have proper gangways), the approach to a Gold Creek facility would also be inhibited. If the anchored vessel lies as indicated and does not obstruct the approach to the Gold Creek facility, the primary consideration remains controlling the downwind landing to the dock itself. This scenario demonstrates how the Merchant's Wharf Pier limits maneuvering room available to vessels anchoring and vessels mooring at existing facilities. It also will impact any potential, second stage, follow on development, such as a Gold Creek Dock option.

Scenario Eighteen

Gold Creek Dock Departure with Vessel at Anchor



Scenario: **Gold Creek Departure during adverse wind conditions with vessel at anchor**

Ship: Radiance Class Cruise Ship (Azipods)
Contours: 30 Seconds|
Current: 0 knt
Wind: 35 knt from 125˚
Visibility: 10 nm

Findings:

Findings:

Complications encountered unmooring this vessel under these conditions. A nearly beam-on wind of this magnitude, combined with limited turning room if able (or once able) to clear the berth is beyond the safe limits of operation. Even with tug assistance, this maneuver would require two tugs with significant bollard pull to safely accomplish this maneuver (again with all ship propulsion systems operating at full capability). Although an azipod equipped vessel may be expected to lift the stern off-dock in strong winds, holding the bow off the dock while continuing to back clear of the berth and an anchored ship may not be within proper safety planning parameters.

Summary of Observations and Findings:

The following is a compendium of the comments and observations made by the SEAPA Pilots and the Holland America Line and Princess Cruise Line representatives in the conduct of the above simulator runs.

Gold Creek Dock:

1. The enormous sail area of cruise ships (combined with the "balcony effect" in which the balconies on vessels catches the wind leading to increased impact of winds on vessels' maneuverability) and the forces imposed by winds greatly complicates safe moorings and departures during higher wind states, generally over 15 knots when the wind is on the beam. Presently the AJ Dock is considered one of the most challenging cruise ship docks to moor at and depart from in Juneau due to its relationship to the wind that is nearly beam on the vessels. The general opinion is that the Gold Creek Dock will present some navigational and maneuvering challenges due to the dock's aspect to the wind (somewhat beam on) and the nearby currents that are stronger near the channel under the Juneau-Douglas Bridge.

2. For some scenarios, the Gold Creek dock was skewed by 30 degrees as per the pilots' recommendations to reduce the wind and observable current affects on vessels. (See page 2). The evaluation group supports this approach despite the fact the simulator could not accurately reflect the reduced affects of wind on the vessels' hulls. The evaluation group's experience differs from the simulator behavior, specifically with regard to the balcony effect and changes to the angle of attack. The group's opinion is that a 30 degree change in the angle of the Gold Creek facility would be material.

3. The safety parameters <u>departing</u> the Gold Creek facility with a strong beam (SE) wind (over 20 knots) are less than other facilities in Juneau that are oriented differently. This may require greater incidence of tug standby/use departing than other docks in Juneau require. This is similar to the present experience for certain vessels going <u>on-dock</u> at the AJ Dock in strong SE winds where tug assistance has been necessary. If the consideration is for an anchored ship, the harbor rules should require a vessel requiring tug assistance to depart to wait for the departure of the anchored vessel.

4. The frequency of winds in Juneau Harbor is such that most of the time mooring and unmooring at the proposed Gold Creek Dock would not pose unsafe or insurmountable problems (provided, as stated earlier, no significant degradation of vessel maneuvering capabilities). However, all agree this dock appears well suited for azipod equipped vessels, particularly when unmooring in stronger SE winds.

5. Anchored vessels always introduce limitations on approaches and departures by other vessels, however would have less impact on the Gold Creek arrivals and departures.

6. This option preserves the basic integrity of the harbor over all other options with respect to turning room, approach angles and anchoring options than any of the other facilities under consideration.

7. During actual construction of this facility, the impact on the harbor and the use of other berths is expected to be minimal.

Merchants' Wharf Pier:

1. The alignment of this pier could be better aligned with the primary wind encountered and to allow for more sea room forward with a vessel at the Alaska Steam Dock.

2. When berthing on the Northeast Side, the final position is very close to another vessel moored at the Steam Ship berth. Berthing alongside the South Side of this pier would therefore be preferred. Scheduling of arrival/departures would need to be coordinated with ships mooring at the Steam Ship Dock needing to be first in, last out.

3. As this pier protrudes approximately 1,000 feet into the harbor, it would severely impact anchoring of vessels in the harbor as it will change the anchoring dynamics in the Port decreasing the allowable swing and the limiting the locations where vessels may safely anchor.

4. Approach to the berth is constricted when there is another vessel at anchor (approach needs to be made to the North, passing close to the end of the berth then turn towards berth left as late as possible).

5. This pier as presently configured will prevent safe arrivals and departures at the Port's "Steamship Dock" as the clearances are too tight to ensure safe maneuvers. Moving the Merchant's Wharf Pier to a location west of the present location may alleviate this concern as could the sequencing of vessel arrivals and departures. In all cases, this pier would prevent the present practice of mooring cruise ships with the port side to the Port's Cruise Terminal which is required due to the relatively shallow water and/or gangway placement.

6. This option would have the most impact on the harbor during construction.

7. This option would dramatically change the character of the Juneau harbor as a turning and anchoring basin for large vessels and would change the traffic patterns for small vessel transits to and from the cold storage and the intermediate float and also interfere with the current floatplane taxiways.

8. This option would significantly limit approaches/departures from the Coast Guard/NOAA facility.

Port's Dock Modifications and Franklin Dock:

1. What was learned and expected is that the approaches and departures to the Franklin Dock will be affected, at times significantly, by a new facility with a ship on it that extends into and south in the harbor. Specifically, the current approach to sweep the turn to the Franklin Dock will have to be modified. The result is generally that more time and more control inputs will be required to maneuver to this facility.

2. The new floating berths are further South and East than the current location, and thus impact the approaches and departures to and from the Franklin Dock. This complicating factor could be alleviated through sequencing the arrival and departure of vessels, however, this was not explored during these evaluations as safe approaches and departures were made with vessels moored at the proposed modified Port docks.

3. The City Cruise Ship Terminal extension in conjunction with anchored vessels further complicates approaches to and departures from the Franklin Street Dock.

General:

1. This navigation simulation attempted to frame the safety parameters for different vessels operating to and from and in the vicinity of proposed facilities under varied environmental and physical conditions. These simulated maneuvers, although successful, reflect the very thin margin of error and it should not be interpreted that because they can be accomplished in a simulator, the planning factors may be relaxed. Again, the simulation exercises confirmed the professional intuition and judgment of the evaluation group as each proposed facility will have limitations.

2. As is the case with any mooring facility, every dock and pier option being considered presents its own challenges and complicating factors. This navigational simulation identified the safe operating parameters for various vessels under different environmental and physical conditions. The upper safe operating parameters for docking of the Diamond Princess class vessel is established by Princess Cruise Lines at 25 knots, thus this simulator evaluation explored maneuvering in higher wind states. -These simulated maneuvers, although successful, reflect a thin margin of error and it should not be interpreted that because they can be accomplished in a simulator, the planning factors may be relaxed.

3. It was noted that during the majority of the Cruise Ship Season winds are predominantly from the SE up to 20Kts (greater than 20kts can be experienced on occasion) and that although less common, winds can also be experienced from the NW.

4. There are currently no plans to change or increase the tugs available in the Port. With all of the berthing options above use of tugs would inevitably increase with additional

costs to the operating companies.

5. Running of mooring lines at berths needs to be considered. Due to thruster wash use of line boats is not a possibility. Winches should be installed at new/existing berths where approaches are impacted.

6. Installation of current meters and wind gauges within the harbor that transmit real time information to vessels' masters and pilots would be of great benefit and improve navigational safety.

Reported prepared by: Captain Ed Page, Marine Exchange of Alaska

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tel. 907.463.3223 fax 907.463.4841

Fax Transmittal Form

TO
John Stone

FROM
Reed Stoops

Date sent: 8/13/09
Time sent:
Number of pages including cover page: 2

MESSAGE:

Please contact Reed with any questions.

907.463.3223 phone

reedstoops@aol.com

Franklin Dock Enterprises, LLC

350 N. Franklin Street, Suite 2, Juneau, AK 99801
tel. 907.463.3223 | fax 907.463.4841

August 12, 2009

John Stone
Port Director
Docks and Harbors
City and Borough of Juneau
155 S Seward
Juneau, Alaska 99801

Dear John:

While I will be out of town on August 14th for the presentation of the navigation study, I did review the report.

At this point, I would like to simply note that the potential conflicts posed by possible construction of a new larger CBJ berth at the site of the current city cruise terminal facility are of great concern to Franklin Dock Enterprises.

The study concludes that both arrivals and departures at our existing Franklin Dock would be operating with a much smaller margin of safety in moderate and adverse wind conditions. Slower and more complicated maneuvers by our customer ships would be necessary in any case.

We will be reviewing the study further with Princess and other cruise companies which currently utilize our dock and will provide further information to you.

Limitations to use of our dock which are of concern to our customers will result in our opposition to the construction of the new city docks as currently configured.

Sincerely,

Reed Stoops
Franklin Dock Enterprises