



The Deck Log

Newsletter

Master Mariners of Canada (MMC)

NL Division

April – June 2024

Any opinions, expressed in this newsletter, are those of the author and do not necessarily represent the views of the Master Mariners of Canada (MMC), NL Division. Editor: Glenn Fiander

April 11th, 2024

The monthly meeting, for April, took place at the Crow's Nest (5 present) and was also conducted by MS Teams (3 present).

Divisional Master, Captain Jim Parsons opened the meeting and welcomed all members present at the Crow's Nest and via MS Teams. The agenda was accepted and no further items were added. The minutes of the March meeting were accepted.

2024 Councillors:

Captain Kris Drodge was elected for the position of Assistant Div. Master – Special Events.

The following are the Councillors for 2024 – 2025:

Divisional Master: **Captain Jim Parsons**

Deputy Div. Master: **Captain Jamie White**

Treasurer: **Captain Sean Quinlan**

Assistant Div. Master – Membership: **Captain Richard Edwards**

Assistant Div. Master – Special Events: **Captain Kris Dodge**

Secretary: **Captain Ray Dalton**

Treasurer's report:

Captain Sean Quinlan was not present but sent updated membership numbers.

Membership (April 8th, 2024)

Full: 24 Associate: 3 Cadet: 10 Honorary: 3 Senior: 1 Lifetime: 1 Corporate: 3

Captain Jim Parsons was seeking clarification on the process for issuing cheques from the MMC NL Div., if the Treasurer is not available.

Membership report:

Captain Richard Edwards gave an update and stated that there were 13 members that had not paid their membership dues for 2024. Captain Edwards planned to send an email to remind them.

A resolution was made to have Jennifer Howell made an honorary member of the MMC due to her dedicated work for the Nautical Skills Competition. The motion was passed unanimously.



April 11th Monthly Meeting

National Update:

Captain Fabian Lambert was to meet with members of CAMTI to discuss formation of a national skills competition. CAMTI is the group of the marine training institutes made up of the Fisheries and Marine Institute of Memorial University of Newfoundland (Marine Institute), the British Columbia Institute of Technology (BCIT), Camosun College, Georgian College, Holland College, Nautical Institute - Nova Scotia Community College (NI - NSCC), The Collège communautaire du Nouveau-Brunswick (CCNB), Institut Maritime du Quebec (IMQ), and an associate member - the Canadian Coast Guard College (CCGC).

Link: [Camti | Canadian Association of Marine Training Institute](#)

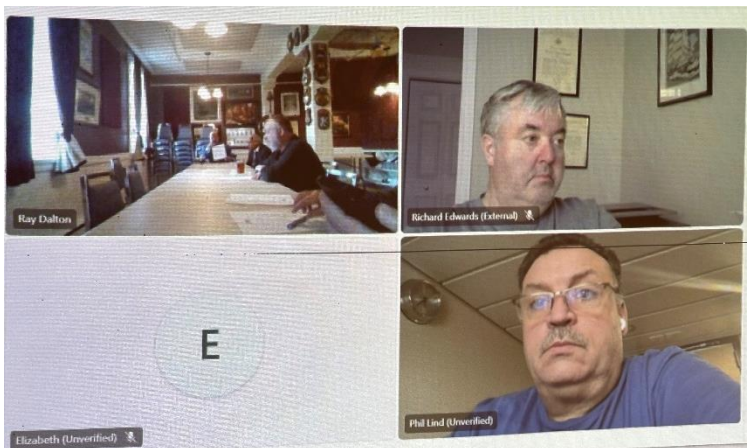
Mentorship Program:

There was a question raised from one of our cadet members, regarding Mentoring. The following is quoted in the MMC website:

Mentorship

The Master Mariners of Canada engage with the maritime community to improve the knowledge and expertise of maritime professionals. One of its mandates is to mentor cadets and junior officers.

As a recognized organization, the Master Mariners of Canada provides cadets and junior officers the opportunity to contact experienced maritime professionals for advice and guidance. These mentors share expertise and help inspire, guide and empower emerging maritime professionals. This process can assist mentees in learning from experienced professionals, building meaningful relationships, and further expanding their careers.



April 11th Monthly Meeting

US training ship *State of Maine*:

Captain Kris Drodge had contacted the *State of Maine* Captain and coordinators and planned to meet with them. An organizing committee had some members, but was expected to grow in the following weeks.

Draft events discussed between Captain Drodge and *State of Maine* coordinators:

- Navigation simulator exercise, having some MI cadets vs. their cadets for a good friendly competition. Also, a suggestion to include other IAMU schools in exercise (if possible with streaming and sharing scenario).
- Officers social and dinner at the Crow's Nest.
- Tours of the Marine Institute facilities.
- Dinner onboard the vessel for MI and Master Mariner of Canada guests.

Nautical Science Students year-end BBQ:

Discussion was held regarding the year-end BBQ for Nautical Science Students. Captain Jim Parsons stated that he would work with the Nautical Science Society and Captain Kent Waddleton to determine best date and venue.

Fundraising dinner with seafarers' wellness center (SWC):

Captain Kris Drodge had some ideas of possibly the MMC hosting a fundraising dinner for the SWC. He believed this would be a solid charitable effort from MMC to support a local movement to bring back the SWC. A formal dinner, with possibly a live auction, could bring in some much-needed funds and provide exposure to the group. It could also include an MMC award ceremony, presentation, etc.

Ocean School:

Transport Canada says 43% of marine workforce set to retire over next 10 years.

The industry and National Film Board of Canada have launched a new campaign, targeting 11 to 17 year olds, in an effort to spur on more of an interest in the sector as a possible career.

It's called *Shipping on the Seaway* — a multimedia "educational experience" that's part of something referred to as [Ocean School](#). The online web portal is filled with immersive 360-degree tours of Canada Steamship Lines freighters.

Link: [Shipping on the Seaway | Ocean School \(nfb.ca\)](#)

Divisional Master's report:

Captain Jim Parsons provided an update on "Imagine Marine Conference"

The Canadian Marine Careers Foundation, in partnership with the Master Mariners of Canada, were accepting proposals for presentations and speakers ahead of the inaugural **Imagine Marine Conference**, taking place October 2-3, 2024 at the Shaw Centre in Ottawa, Ontario. This 1.5-day event will tackle the marine industry's

talent crisis head-on, with programming content to **Elevate Marine's Recruitment and Retention Game.**

The conference will welcome attendees from all segments of the marine sector, including education and training organisations, vessel operators, ports, shipyards, government agencies, marine services and suppliers, along with workforce development experts and other stakeholders.

May 9th, 2024

The monthly meeting, for May, took place at the Crow's Nest (10 present) and was also conducted by MS Teams (4 present). One member phoned in.

Divisional Master, Captain Jim Parsons opened the meeting and welcomed all members present at the Crow's Nest and via MS Teams.

The agenda was adopted as presented and the minutes from the previous meeting were adopted without any changes.

At the March monthly meeting, a decision was made that MMC-NL Div. would financially support the reforming of the Nautical Science Society by giving a donation of \$500.00 to get it up and running. Captain Parsons indicated that the donation had yet to be paid due to the Treasurer being at sea and unable to sign the cheque. A discussion ensued and it was indicated that there is a requirement (for a non-profit organization like MMC) that there be two signatures on a cheque issued by the Division. Treasurer Captain Sean Quinlan was unable to attend the early part of the meeting. On arrival, he indicated that two others are approved to sign cheques: Captain Anthony Paterson and Captain Drew McNeil.

Captain Roy Marsh indicated that mentoring of students had been discussed at the previous meeting. He inquired about the process to facilitate that mentoring including (i.e., How would a student requiring mentoring get in touch with a mentor within MMC-NL Div.?) His previous experience with the mentoring of cadets indicated that direct initial contact between students and mentor could cause issues. With no control of numbers, an individual mentor could become overwhelmed with requests for assistance.

Captain Chris Hearn indicated that 3rd year Nautical Science students are currently in the process of preparing for orals. He suggested that Division members might be able to assist. Perhaps MMC members might be able to offer themselves as examiners and give individual students a mock set of orals. Perhaps students might be able to access MMC members for guidance with individual questions/subject areas. Captain John Ennis indicated that there is a specific orals course for 3rd year Nautical Science students. The lead instructor for the course is currently Captain Kent Waddleton. After some further discussion, it was decided that the best course of action would be to contact Captain Waddleton to determine if/in what capacity the Division could be of assistance.

Officer Reports

- Divisional Master, Captain Jim Parsons reported:

The Division didn't take part in the Battle of the Atlantic Ceremony, this year, which was held in Conception Bay South due to ongoing renovations at the National War Memorial in St. John's. MMC

did not receive an invitation, despite being under the impression that we would. Former Division Master, Captain Eben March reported that the organizers, HMCS *Cabot*, might need to be prompted to provide an invitation. He also indicated that personnel changes at HMCS *Cabot* might have led to the oversight. Captain Parsons indicated that a process needs to be put in place to ensure that we get ongoing invitations for future years.

- Treasurer, Captain Sean Quinlan reported:

As of May 9th, 2024, the balance in the division bank account: \$29,236.35.

Dues collected from January 1st to May 10th, 2024: \$7,905. It was noted that some members had not yet paid their dues for this year.

Dues to be paid to National, to date, for the year: \$3,952. This is usually paid to National in June.

Full Members:	33
Associate Members:	4
Cadet Members	10
Corporate Members	9
(from 2 corporate memberships)	
Honorary Members	3
Senior Members	3
<u>Lifetime Members</u>	<u>1</u>
Total Members	63

Those who are members, under corporate memberships, can vote. Those members would be asked to abstain if the subject of the vote could be heavily influenced by their group of votes.

- Membership

Assistant Div. Master – Membership, Captain Richard Edwards indicated he would get a list from the Treasurer and advise those who had not paid dues for the current year.

National Membership Chair, Captain Phil Lind indicated that the mechanics of the corporate memberships has to be worked out. Membership applications should include the names of the individuals included under that membership, along with information regarding the level of certification for each individual. From discussion, it was determined that online applications should go to both Captain Lind and Captain Edwards.



May 9th Monthly Meeting

- Special Events

At the April meeting, Captain Kris Drodge had advised that the US training ship *State of Maine* would be visiting St. John's in July. Captain Drodge was unable to attend the meeting to provide an update. Captain Parsons indicated that a dinner at the Crow's Nest, a dinner onboard the vessel, and a student competition (at the Marine Institute) were being planned. Stand by for further updates.

- Secretary

Secretary, Captain Ray Dalton was out of the country and unable to attend the meeting. At the March meeting, Captain Dalton indicated that there was a \$500 prize available for an essay on shipboard safety to be awarded to a Nautical Science student registered as a cadet member of the MMC-NL Div. Captain Parsons indicated that the Nautical Science students have been notified of the opportunity. No submissions have been received. Another request for submissions will be sent out. A cadet member, Kyle Bugley was at the meeting and indicated that he would remind fellow students as well. Captain Parsons indicated that if there are no takers now, the offer could be made again in the Fall.



May 9th Monthly Meeting

Captain Chris Hearn provided an update regarding the planned Seafarer's Wellness Centre. He indicated that there is no problem finding volunteers to work on the project.

To fund the mission:

The International Seafarers Mission has contributed £30,000, to get things going.

- They are to meet with the Port Authority to discuss placing a levy (voluntary) on ships visiting St. John's.
- They will meet with companies that are regular users of the port.
- They will approach municipal, provincial and federal governments.
- A presentation was to be made to the COMPASS group in June.
- Rio Tinto (mine operator in Labrador & big supporter of missions elsewhere) has asked what they can do to help.

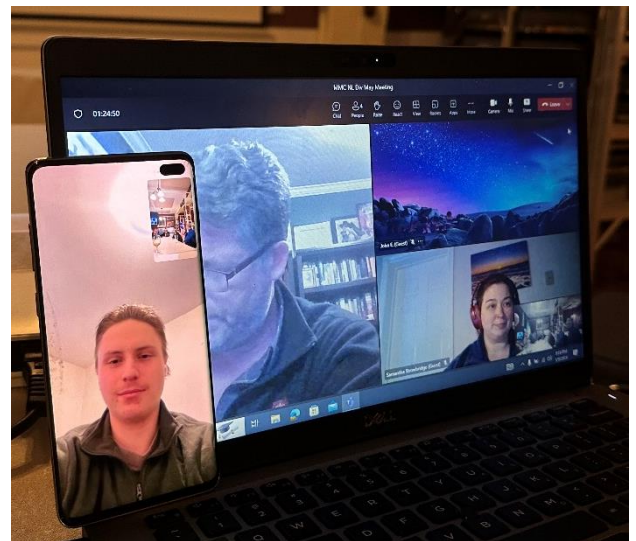
Ideally, they don't want to pay for space in the first year. Possible locations for the mission:

- The Longshoreman's Union has offered space in their building on Water Street.
- George Street United Church wants to have a discussion.
- A 3rd location is also being considered.
- During the meeting, there was a question as to whether the old Breakwater Books building was available. The heritage building, just West of the National War Memorial, recently fell under provincial government ownership.

The mission will be a foundation/charity. There will be a meeting with a lawyer, hopefully for free, to ensure that things are done correctly.

Missions in Halifax and Hamilton have been helpful by sharing documentation.

Captain Parsons indicated that a year-end BBQ was planned with the Nautical Science students to be held on Thursday, 30th May at North Bank Lodge in Pippy Park. MMC-NL Div. will cover the costs. The cadets are responsible for getting the food and making venue arrangements for the alcohol-free event. There will be an online sign-up sheet for those who plan to attend. Contact was made with Hayden Landa, cadet member and Vice-president of the Nautical Science Society, during the meeting. He confirmed that the BBQ would be going ahead, as planned.



May 9th Monthly Meeting

Captain Eben March, National Master, indicated that MMC had been asked to support the building of a National Battle of the Atlantic Memorial. The memorial is to be built in London, Ontario. Many seafarers from that region served during the war. After completion, it is hoped that the National Park Service will provide ongoing upkeep. The contribution goal, set by National, is \$5,000. It is proposed that the Divisions will provide \$500 each and National will cover the rest. Those present were all in favor of a \$500 contribution. The proposal will be circulated to members. Unless objection is raised within NL Division before 24th May, the contribution will be made.

Captain March indicated that a new MMC Division is planned for the province of Quebec. While the Montreal Division has shut down, potential members are scattered around the province. There is no group large enough to form a division, with all the positions that entails. The plan would be for the new division to meet remotely, with the positions (Master, Treasurer, Secretary, etc.) filled by members located around the province.

The Nautical Institute, British Columbia Branch, held a seminar (titled Maritime Arctic) in Victoria, BC on May 1st to 3rd. Captain Chris Hearn presented a paper, and two cadets from the Marine Institute attended. Cadets from across the country, and some from the US, were in attendance. Captain John Ennis asked how the MI cadets had made out. Captain Hearn indicated the cadets did a good job of representing the Marine Institute as did the cadet participants overall. He noted that some of the cadets were smartly dressed, in uniforms, making them stand out from the rest. This led to a conversation, at the seminar, as to the merits/issues relating to cadets wearing uniforms.

Captain Parsons announced an International Association of Maritime Universities (IAMU) project relating to electronic navigation to be submitted in collaboration with maritime schools in Croatia, Slovenia, and Poland. Captain Parsons will update accordingly if successful.

Captain Samantha Strowbridge announced that she is expecting a child. All present gave a round of applause and expressed their congratulations.

May 30th, 2024

A year-end BBQ was held with the Nautical Science students, at North Bank Lodge in Pippy Park. MMC-NL Div. covered the costs and the cadets were responsible for getting the food, preparing the food and making venue arrangements for the alcohol-free event.



May 30th BBQ

Nautical Trivia

In the Oct. – Dec. 2021 edition of the Deck Log, I asked what the worlds largest container ship was. The answer was the *Ever Ace* and is now the *MSC Irina* (updated in the In the Oct. – Dec. 2023 edition of the Deck Log). Both older issues are found on the MMC website.

Question, what is the world’s fastest container vessel?

Answer: Seven container ships, originally built as the Maersk B class, having a maximum speed of 37 knots.

Vessel Names	<i>Maersk Boston</i> (2006), <i>Maersk Baltimore</i> (2006), <i>Maersk Beaumont</i> (2007), <i>Maersk Bentonville</i> (2007), <i>Maersk Brooklyn</i> (2007), <i>Maersk Brownsville</i> (2007), <i>Maersk Buffalo</i> (2007). Some names have changed.
Length	294 m
Beam	32 m
Draft	13 m
Displacement	25,848 t
Gross Tonnage	48,853 t
Container Capacity	4,196 TEU
Propulsion	68,640 kW (93,360 hp) 12 cylinder diesel engine. Single shaft with 6 bladed propeller & single rudder.
Cruising Speed	29.2 knots, 54 km/h
Maximum Speed	37 knots, 69 km/h
Fuel Consumption	300 t per day (cruising speed), 50 t per day (12 knots)
Crew	20



***Maersk Boston* Source:**

<https://www.shipspotting.com/photos/248597?navList=gallery&imo=9313905&viewType=normal&sortBy=newest&page=13>

These vessels were designed for a high speed container service between China and the United States. High fuel consumption, at the designed 29 knot operating speed, made them uneconomical. Most were laid up, almost

immediately after being built. Other high speed container services operating at a more sedate 22 to 24 knots. The vessels did eventually find work and are still in operation. Operating at more economical speeds of 20 knots or less.

A speed of 37 knots, for a 25,848 t vessel, is quite impressive. Given the fuel consumption at 29 knots, the fuel consumed at 37 knots is likely to be equally impressive. For large monohull vessels, the maximum speed is unmatched. Excepting the laid up liner SS United States (at 43 knots). More on that, and other high speed vessels, in the next issue of the Deck Log.

Unknown is the reasoning for having the capability to achieve a maximum speed 8 knots above planned service speed. Also the streamlined hull shape, required to achieve such a top speed, would reduce container carrying capacity. Perhaps there was a plan to utilize the vessels for potential military use. Such as high speed cargo transport, in times of war. However, can find no evidence to support this theory.



MSC Leandra V (formerly Maersk Buffalo) Source:

<https://www.shipspotting.com/photos/3591615?page=1&navList=moreOfThisShip&perPage=8&imo=9313943&lid=3591617>

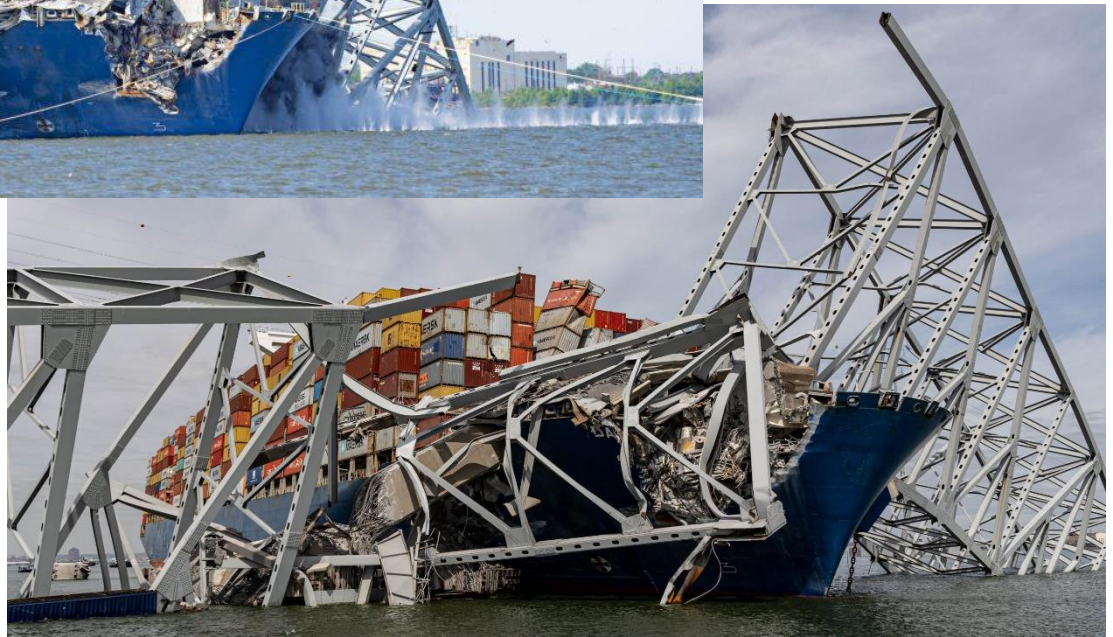
In the News

Collision

As reported in the last edition., on March 26th, 2024 the container ship MV *Dali* collided with a pillar of the Francis Scott Key Bridge, in the port of Baltimore. The collision caused a large portion of the bridge to collapse. Tragically, six workers, who were on the bridge at the time of the collision, lost their lives. On May 20th the vessel was successfully refloated and moved to a dock in Baltimore harbour. The vessel having been trapped under a collapsed section of the bridge. That section having to be removed in a controlled explosion (see next page).

The final cause of the collision has yet to be determined. See the following link, to access the preliminary NTSB report. <https://gcaptain.com/ntsb-preliminary-report-on-baltimore-bridge-collapse-released/>

Also see updated info here: https://gcaptain.com/ntsb-provides-update-on-dali-crash-investigation/?subscriber=true&goal=0_f50174ef03-bc5021583f-139902913&mc_cid=bc5021583f&mc_eid=8fb15eb136



MV *Dali* shown under a section of the collapsed Francis Scott Key Bridge & controlled explosion.

Source top photo: https://gcaptain.com/ntsb-provides-update-on-dali-crash-investigation/?subscriber=true&goal=0_f50174ef03-bc5021583f-139902913&mc_cid=bc5021583f&mc_eid=8fb15eb136

Source bottom photo: https://gcaptain.com/baltimore-bridge-salvage-and-wreck-removal-megathread/?subscriber=true&goal=0_f50174ef03-75ec7a6a4f-

Twelve weeks following the crash, the vessel was ready to depart for repairs in Norfolk Virginia with a diminished crew. This raises a topic given little coverage in the media. What happened to the crew during those 12 weeks?

1. All 21 crew remained onboard the vessel (even during those controlled explosions).
2. No shore leave while the vessel was trapped under the bridge. None when they finally got alongside the dock, as their visas had expired.

3. After about 3 weeks, all their electronic devices were confiscated by the FBI. Part of the ongoing investigation. Cutting contact with the outside world. After some time, they were given replacement cell phones, but all sim cards were not returned.
4. Even though no individual has been blamed for the accident, the crew had a fear of criminal liability.
5. They did receive support from their respective unions, embassies and international organizations representing seafarers.

As the *Dali* heads off to a US shipyard, for repair, a court has permitted eight crew members to return home. The remainder will continue to reside in the U.S., due to ongoing litigation surrounding the crash. Those staying will be relocated to hotels or apartments and will contribute to the ongoing investigation. Lawyers for the City of Baltimore had been making efforts to prevent crew members from leaving the U.S., due to the ongoing legal proceedings related to the incident. The legal team asserted that the crew's testimonies are essential for the ongoing civil litigation to ascertain who is responsible for the costs and damages resulting from the incident. The city is demanding a jury trial and requesting that the courts hold the ship's owners fully accountable for the collapse of the bridge.

At least the crew have not been put in jail, as might happen/has happened after shipping incidents in different parts of the world. Some might say that a stay of undefined length, while this case works its way through the legal system, is a form of incarceration.

Articles regarding the welfare of the *Dali* crew are out there. However, they are not front & center. You have to search specifically, to find them. The following quoted from a CNN article, regarding what the crew has been through, puts the plight of the seafarer into perspective. Article found at:

<https://www.cnn.com/2024/05/18/us/baltimore-bridge-dali-ship-crew/index.html>

'We take their sacrifices for granted'

The plight of the Dali's crew highlights the personal sacrifices made by workers who often leave their families for months at a time to provide goods that many consumers use every day.

"I think most of us think of the items that we use on a daily basis show up on Amazon or ... Walmart, etc. The reality is 90% of the cargo in the world is carried on vessels," said Schifflin, the director of the Center for Mariner Advocacy.

"Vessels are manned by seafarers. And to most of us – the vast majority of us – they're invisible. We don't even know they're there. And I think a lot of times, we take their sacrifices for granted."

Latest on the National Shipbuilding Strategy

On June 28th, work began at the Irving Shipbuilding yard in Halifax, on the first test module for a new class of 15 guided-missile destroyers Canada has ordered, as part of its National Shipbuilding Strategy (NSS).

The class is based on BAE Systems' Type 26 warship design which is also being built in the United Kingdom and Australia. Canada announced the selection of the design in 2018.

Although an existing design, changes are required to meet Canadian requirements. Construction has started without the design being complete and without knowing what the final costs will be. There is an estimated final contract award date in late 2024/early 2025. With full-rate construction anticipated to begin in 2025 and first vessel delivery in the early 2030s.

National Defense currently estimates between \$56 and \$60 billion CAD for both design and construction of the vessels. Parliamentary Budget Officer, Yves Giroux, estimates the cost to be around \$84 billion. In 2016, the

estimate was \$26 billion. Standby for further updates on this one. See this article for some of the concerns being raised. <https://ottawacitizen.com/news/national/defence-watch/government-to-begin-construction-on-new-warships-despite-not-knowing-the-final-cost-or-design>



Artist rendering of the Canadian Surface Combatant. **Source:**

<https://www.defensenews.com/naval/2021/02/26/canadas-new-frigate-is-getting-heavier-more-expensive/>

Have you written any articles or papers that you feel might be of interest to those who read the Deck Log? Do you know the authors of any articles or papers that might be of interest to those who read the Deck Log? Space is being made available here, and in future newsletters, for those who may wish to have those articles or papers published/republished.

Please forward any submissions to glenn.fiander@mi.mun.ca, for consideration. If you are not the author, please have the author provide consent to publish. Any submissions will be published, as received, without any editing. The editor reserves the right to not publish any submissions that may be deemed inappropriate. Such decisions would be made in consultation with the members of MMC NL Division.

I will start this off with an article that I had published in the January 2024 edition of Seaways, the journal of the Nautical Institute. The article was written in conjunction with a presentation given at the 3rd Global RTP Nautical Institute DP Conference, held September 20th - 21st, 2023. Extra figures from that presentation, in addition to those in the Seaways article, have been added here.

See article starting on the next page.

Are DPOs Overconfident in the Technology?

Captain Glenn Fiander AFNI

The reliability of modern DP systems is extremely high. As a result, DP Operators (DPOs) seldom have to deal with major problems. Is this resulting in an overconfidence in the DP systems, by the DPOs? To the extent that they are not as prepared, as they could be, to deal with problems.

Today, DP vessels are used for a wide variety of applications. Some examples:

- Offshore supply vessels located in close proximity to installations (Figure 1), perhaps with hoses connected for liquid/bulk cargo transfer. DP has to hold position within the limitations of the hoses/crane outreach.
- Instead of supply operations, perhaps in close proximity to a platform, with divers or ROV deployed (Figure 1a). Holding station within limitations of the diver/ROV umbilicals.
- Vessel positioned next to a platform with a walk to work gangway deployed. With personnel transiting to and from the platform (Figure 1b). Holding station within the limitations of the gangway.
- Vessel laying power or fiber optic cable (Figure 1c). No collision risk here, as no platform nearby. Excepting when a cable lay begins or ends at a platform. The cable lay vessel still has to maintain station within the length/tension limits of the cable.



Figure 1: Supply Vessel Operations at Rig



Figure 1a: Diving Operations



Figure 1b: Gangway Deployed

Source: <https://iro.nl/app/uploads/2018/12/ampelmann-image-2-003-verkleind.jpg>

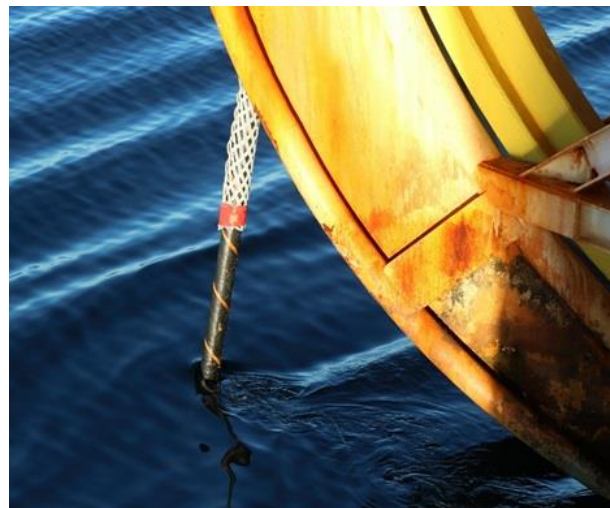


Figure 1c: Laying Cable

The vast majority of DP operations include potential for vessel/asset damage, due to DP system failure or incorrect DPO response to DP system failures. The challenge facing the DPO is that:

- **DP problems are often instant and may require rapid decision-making.**
- **Making instant decisions is very easy.**
- **Making the correct decision is much more difficult.**

Let's take a look at one specific type of operation (Tandem Offshore Loading) in more detail.

For tandem operations conducted offshore in Canada & in the North Sea, there is usually 70 to 80 metres separation between the FPSOs (Floating Production Storage & Offloading) / FSUs (Floating Storage Units) and shuttle tankers. For tandem operations in Brazil, the vessels may be up to 150 metres apart.

In figure 2, below, the vessel and the FPSO are in close proximity, just 72 metres apart. The shuttle tanker is connected via a hose, carrying 6,000 to 7,000 m³ of crude per hour (at maximum rate), and a hawser (weak link 300 tonnes). To protect the hose, the shorter hawser would take the load, should the tanker lose position control and move away from the FPSO.

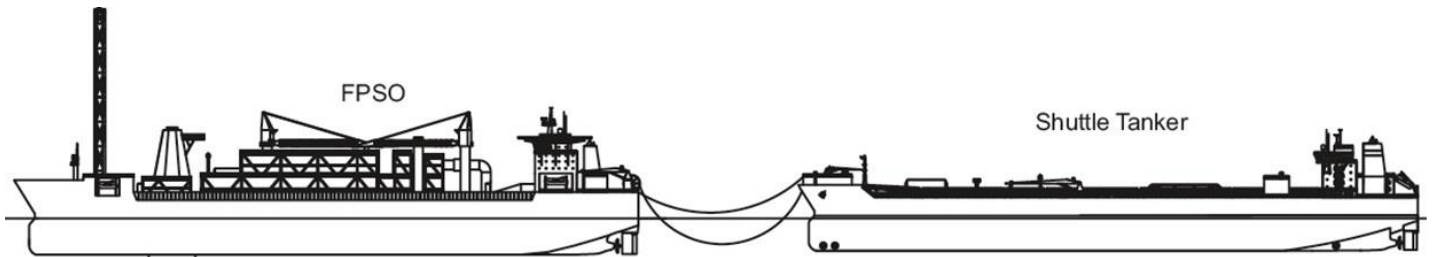


Figure 2: Tandem Loading Operation

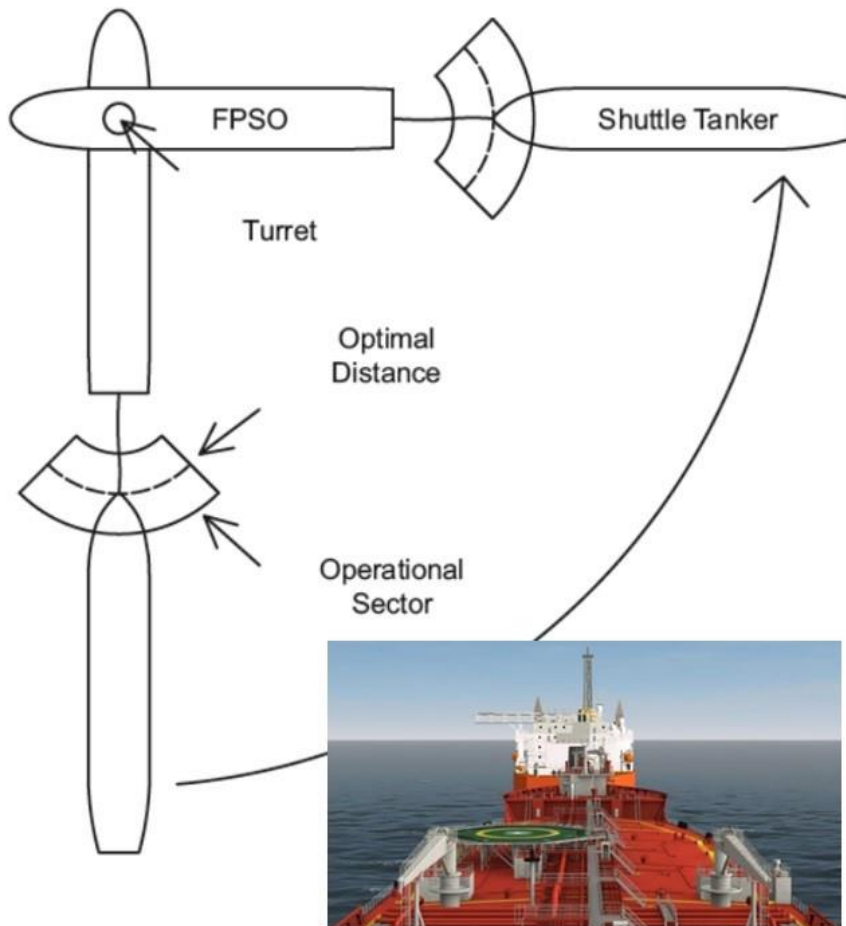


Figure 3: Weathervaning/Stationkeeping During Tandem Loading Operation.

Figure 3, left, shows our FPSO moored to, and weathervaning around, a turret. Permitting the FPSO to keep its heading into the prevailing environment. FPSOs/FSUs may or may not have heading control. Some FPSOs are spread moored with a fixed heading. The aim of the DP system is to weathervane the tanker, while keeping the bow of the tanker within the sector shown. Ideally in line with the FPSO and at the optimal distance. Getting outside the operational area risks collision with the FPSO and/or damage to the hose/hawser.

Offshore loading, like any DP operation, has many things that can go wrong. The type of failures experienced can vary, from operation to operation. Let's look at just one possibility: a failure that causes full thrust to be produced by the main propeller. Causing a 'drive-off' of the shuttle tanker, towards the FPSO. This is one of the most serious failures that can occur during an offshore loading operation – maybe the most serious. With the possible consequence of collision, if action is not taken in a timely manner. It is most often due to main propeller failure or a position reference system failure.

The following is a brief overview of the process that the DPO might follow, to react to the drive-off and avoid a collision. Keep in mind that this is just one of many failures that a DPO must be prepared to deal with.

Evaluation of potential drive-off:

- DPO detects tanker movement. Is it a drive-off? Vessel movement could be normal vessel movement on DP.
- A drive-off is suspected. What might be causing it? Drive-offs have occurred due to propulsion, position reference, software/hardware or DP sensor issues.
- Check thruster displays, on the DP system (Figure 3a, below), for thrust indications. The first indication of a drive-off is likely to be abnormal thrust indication on the DP thruster displays, along with a possible increase in thruster/generator (noise/vibration). In simulated drive-offs, the first DP alarms occurred 9 to 12 seconds after the drive-off commenced.
- Thrust indication on the DP console could be due to faulty feedback signal. Cross check and confirm thruster settings on thruster control panel displays (Figure 3b, below).

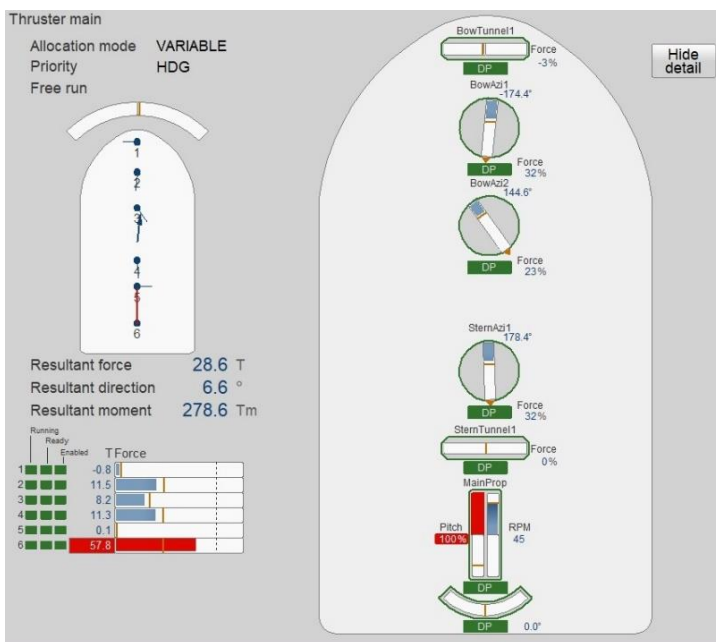


Figure 3a: DP Console Thruster Display



Figure 3b: DP Thruster Control Panel

- What is the vessel speed? Is it increasing? Which direction is the vessel moving? (The drive-off might be away from the FPSO.) Check DP system speed displays, position reference system displays (Figure 3c), doppler speed log, if fitted.
- What is the distance to the FPSO? Check DP system for bow to stern distance. Confirm distance using position reference system displays (Figure 3c). i.e. Artemis (or XPR 100), DARPS (likely x 2). Depending on the vessel, RADIUS/Fanbeam as well (if fitted).
- Are there any DP alarms? There could be a dozen, or more, from start of failure to point of collision. In a simulated drive-off, on one shuttle tanker, there were 12 drive-off related alarms over 2 minutes 44 seconds, from start of failure to collision. Some tankers have a specific drive-off alarm, appearing in the center of the DP console display. It can indicate an actual drive-off or has been seen to occur due to a jump in a position references (i.e. no drive-off occurring).
The DPO has to be instantly aware of what all the alarms mean. As we will see below, there is often no time to learn the meaning of the alarms when they are displayed in a failure situation.

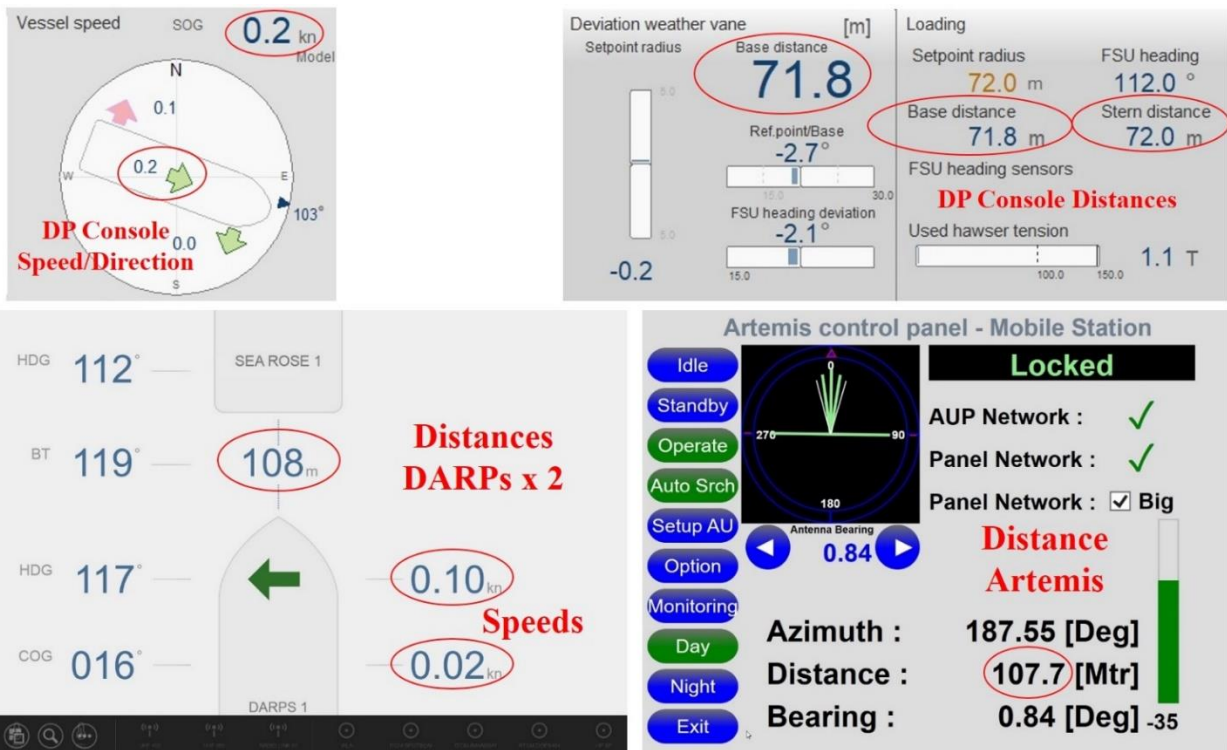
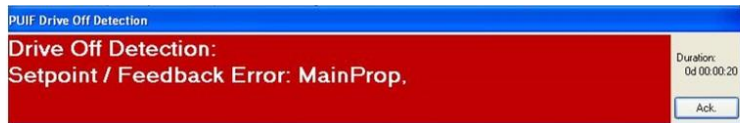


Figure 3c: Speeds & distances displayed on DP console displays & position reference system displays.



17:16:44	13/05/06	Alarm	Bow beyond base	
17:16:43	13/05/06	Alarm	FSU hawser limits critically high	ESD_2 67.371 45.000
17:16:42	13/05/06	Alarm	Bow base heading deviation high	ESD_2 40.588 30.000
17:16:42	13/05/06	Alarm	FSU hawser limits too high	ESD_1 41.039 30.000
17:15:42	13/05/06	Alarm	Distance to base critically short	ESD_2 44.530 45.000
17:15:22	13/05/06	Alarm	Distance to base too short	ESD_1 54.748 55.000
17:14:56	13/05/06	Alarm	Drive off high speed	4096
17:14:48	13/05/06	Alarm	Drive off high force	
17:14:48	13/05/06	Alarm	Position exceeds fore limit	5.000 5.191
17:14:42	13/05/06	Warning	Prop main high force	80
17:14:25	13/05/06	Alarm	Drive off setpoint feedback	8
17:14:15	13/05/06	Warning	Prop main prediction error	pitch 79.077 -11.973

Figure 3d: DP alarms during drive-off.

Reacting to a Drive-off: what next?

The DPO determines that a drive-off is occurring, due to a main propeller that has failed to full ahead. The DPO has to take action. There is no one solution that covers all situations and there are multiple variables to consider.

- How much cargo is onboard (displacement)? The heavier the vessel, the more difficulty to stop or manoeuvre.

- Is the tanker single or twin screw? With twin screw, the second propeller can run astern, to slow forward motion - but likely not stop it, as astern thrust will be less than the thrust of the propeller that has failed to full ahead. The second propeller will also provide a means of surge control, if the DPO decides to stop the failed propeller (see below).
- Is the tanker fitted with azimuth thrusters? The azimuths can run astern to slow forward motion. Depending on number fitted, they may have enough thrust to slow and stop the vessel by counteracting the main propeller thrust. Again, they also provide a means of surge control, if the failed propeller is stopped.
- How responsive are the thrusters/propellers to joystick/manual commands, if DPO decides to select manual control (see below)?

The following options, for dealing with the drive-off, are presented in no particular order. Depending on the circumstances, the DPO may decide on an alternate solution.

Reacting to the Drive-off (Option #1)

The DPO determines that there is enough time/distance available to stop the vessel, if pitch control of the main propeller is restored (Figure 4, right). Astern pitch is commanded to stop the tanker within the separation distance to FPSO stern, using either manual thruster controls or joystick. Control might be restored when switching from DP to joystick/manual control, or through quick intervention by the engineers.

Alternatively, the DPO may decide to shut down the failed propeller (emergency stop) and use the other main propeller/azimuth thrusters to stop the tanker within the separation distance to FPSO stern. Using either the manual thruster controls or joystick.

Reacting to the Drive-off (Option #2)

This is variation of Option #1. The DPO is unsure if the vessel can be stopped before there is a collision with the FPSO. In this case, the vessel is stopped while changing heading to turn the tanker's bow away from the stern of the FPSO (Figure 5, next page), using either the manual thruster controls or joystick. The normal loading distance, for the simulation shown in Figure 5, is 72m.

Reacting to the Drive-off (Option #3)

The DPO determines that it is unlikely that the vessel can be stopped before collision. Instead, the failed propeller is kept running. No attempt is made to stop the tanker, and the vessel's momentum is used to advantage. The tanker passes to port or starboard of the FPSO. The normal loading distance, for the simulation shown in Figure 6 (next page), is 72m. No action was taken until the tanker was at 45m from the FPSO. Manual thruster control was used to manoeuvre around the FPSO. Joystick control was unlikely to be successful, at the distance where avoiding action was taken.



Figure 4: Reacting to drive-off Option #1



Figure 5:
Reacting to drive-off
Option #2

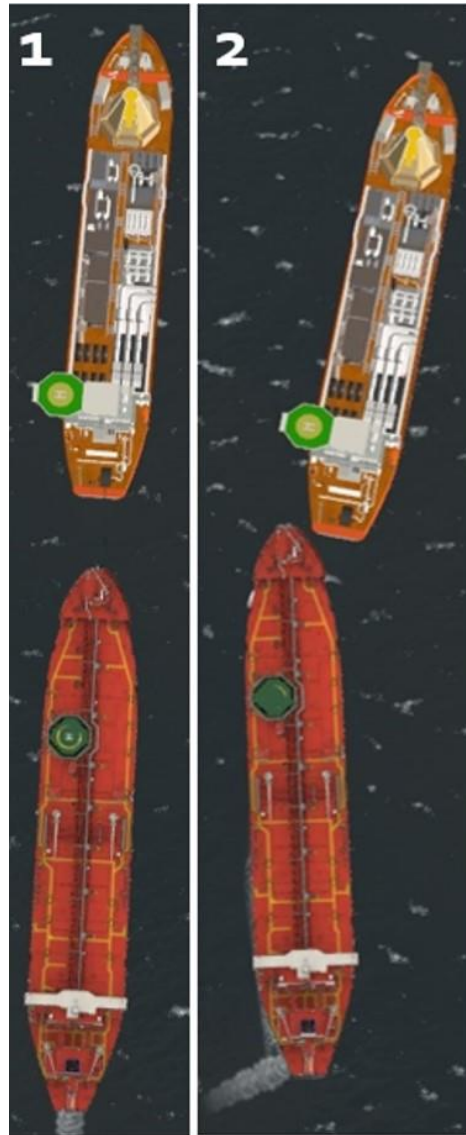
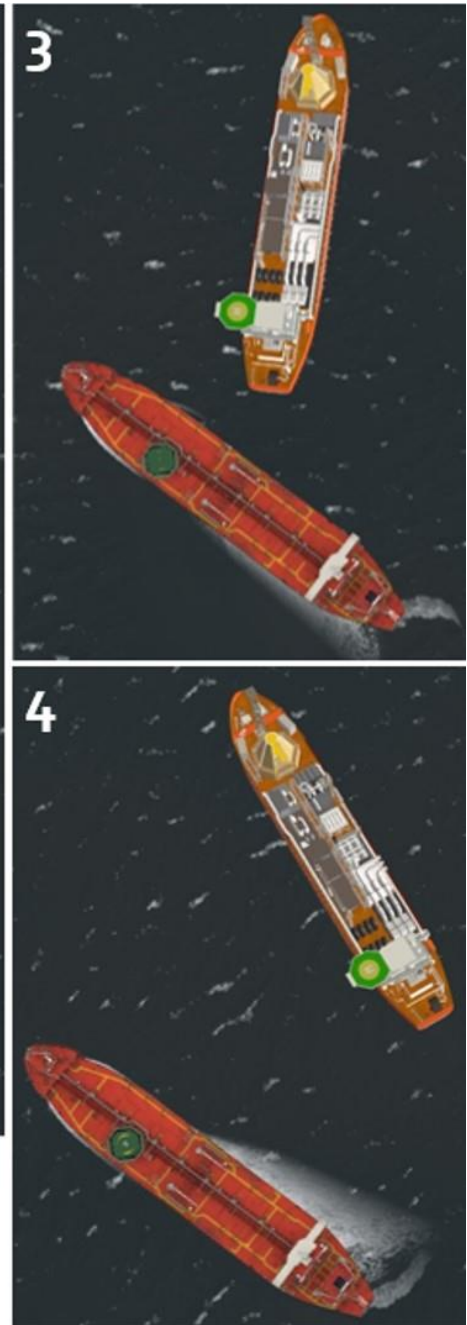


Figure 6:
Reacting to drive-off
Option #3



Additional factors affecting reaction:

- Reduced visibility in fog, or at night, may reduce situational awareness of the DPO. (See Figure 6a)
- There may be a supply vessel conducting cargo operations at the FPSO. Perhaps blocking one of the possible escape routes, when using option #3. (See Figure 6a)
- The FPSO and shuttle tanker may not be in alignment, at the time of the failure. This may reduce the passing/turning options to one side, depending on where the tanker is situated. (See Figure 6a)
- For most of a tandem loading operation, there is a hose and hawser running between the FPSO/FSU and the shuttle tanker, excepting some operations that have hose only. Part of the emergency process would be activation of the emergency shut down system (ESD). This stops the crude supply pumps, closes valves and disconnects the hawser and hose in 42 to 45 seconds. Activation would be a task for the 2nd DPO on watch.

- For safety purposes, crew in the vicinity of the hose/hawser have to be notified before any ESD is activated
- On some tankers, activation is automatic if the tanker reaches operational alarm limits. Damaging or parting a hose pumping up to 7,000 m³ of crude per hour is not desirable. The hawser used, in these examples, has a weak link that breaks at 300 tonnes. Should the hawser be placed under strain, a force of up to 300 tonnes could have an impact of the maneuverability of the tanker. The DPO must verify hose/hawser disconnection, before any manoeuvre can take place.
- It will be necessary to communicate with the FPSO, regarding the emergency situation. This is a task for the 2nd DPO on watch - but it is a key part of the process.
- Advise the Master, if not already present on the bridge.
- Communication with the engine room, regarding the failed propeller.



Figure 6a: Additional factors during drive-off

To successfully deal with a drive-off or suspected drive-off, ideally the DPO:

- Is focused on the DP system and the DP operation.
- Closely monitors the operation of the DP system (at all times) while at the DP desk.
- Is prepared (as far as practical) to deal with any failures that may occur.
- Understands the meaning of any alarms that may occur and knows how to respond to them.
- Minimizes distractions, when at the DP desk. This means not performing duties other than DP (i.e. radio communications, radar watch, etc.), not engaging in conversations other than those related to the DP operation, and not being distracted due to ongoing activity on the bridge.
- Is aware of the maneuvering capabilities of the vessel and practiced in the use of all systems used to maneuver the vessel.
- Is not fatigued. The DPO is well rested and shares DP duties during the DP watch. i.e. No excessive time on DP desk.

Once again:

**DP problems are often instant and may require rapid decision-making.
 Making instant decisions is very easy.
 Making the correct decision is much more difficult.**

Reaction times

How much time does the DPO have to analyze and react to the drive-off described above? Figure 7, below, provides us with some real world numbers.

Case	Vessel-to-Vessel initial physical distance (meters).	Time (seconds) taken for DPO to take action (after drive-off commenced).	Consequence	Time to collision (seconds)
1	75	100	Collision	120
2	70	80	Collision	140
3	80	50	Collision	130
4	75	30	No Collision	-
5	70	Probably 40	No Collision	-

Figure 7: Reaction times to drive-off (Vinnem & Liyanage)

The information is sourced from a paper written by Jan Erik Vinnem and Jayantha P. Liyanage from the University of Stavanger, Norway. The paper ‘Human-Technical Interface of Collision Risk Under Dynamic Conditions: An Exploratory Learning Case from the North Sea’ was published in the *International Journal of Technology and Human Interaction*, Volume 4, Issue 1.

The data in figure 7 is sourced from actual DP incidents and shows that, in a drive-off scenario similar to that described above, a DPO has minimal time to analyze the situation, make a decision and react. In general, reaction to a drive-off needs to occur within 30 to 45 seconds of the incident occurring, to avoid a collision. In less than 60 seconds, in the case of a near miss.

For comparison, I conducted a simulated version of the drive-off incident illustrated in Figure 6. The tanker started at 72m from the FPSO. I decided to take action only when the tanker reached 45m from the FPSO (the inner limit of the operational sector, as shown in Figure 3). At the point where I initiated recovery action, 106 seconds had elapsed (since the drive-off began) and the tanker was moving at 0.7 knots. Delaying my response to this point meant that aggressive maneuvering was required. I went hard over on the rudder and 100% on all the thrusters (bow to port/stern to starboard), to turn and avoid the FPSO. Then hard over the other way and thrusters 100%, in the opposite direction, to avoid the tanker stern colliding with the FPSO.

From Figure 6 we can see that the maneuver was certainly a near miss. From the start, I had the benefit of knowing exactly what the fault was, at what point I was going to react and how I was going to react. These luxuries not available to a DPO on a real tanker. In the real world, the delay responding would likely have resulted in a collision. Without prior knowledge of the failure, there would probably been a collision in the simulated world as well.

I ran the simulation a second time and took no avoiding action. Collision occurred 160 seconds, after drive-off commencement, at a speed of 0.9 knots.

These are tight timelines for a successful response to the DP failure, and there are serious consequences if the response is not correct. The same can be said for many other types of DP operations.

A routine job – until it’s not

Over the years I have heard/read a number of statements such as: ‘The Job of a DPO is 95% boredom and 5% blind panic’. There have been variations in the percentages used and never any data to back them up. The

statement implies that the majority of DP operations are routine. Major DP failures don't happen very often and many DPOs can go an entire career without ever having to deal with a major incident.

The statement is not meant to imply that DPOs panic when faced with a problem. Perhaps it would be better to describe the response as alarm, anxiety or nervousness.

Why does this panic/alarm/anxiety/nervousness occur?

- Situations occur and the DPO isn't sure what to do.
- The DPO hasn't properly prepared for failures and doesn't know what to do.
- Failures occur and the DPO can't determine what has gone wrong.
- The DPO may not understand what the alarms mean – they have never seen the problem before.

The result could be decisions that are made in haste and the possibility of incidents becoming more serious than they might otherwise be.

Likewise, the statement is not meant to indicate that all DPOs are bored – a state that could also be described as lack of concern or apathy. I have taken part in DP operations where fellow DPOs have been heard to say 'this is boring'. I have also been on DP operations where the DPO is so engaged with conducting the routine of the operation (not failures) that such a statement would not even be contemplated.

Why Boredom/Lack of Concern/Apathy?

- Long periods of inactivity. After connection has been made, the offshore loading operation described above, takes about 20 hours to transfer a full load of crude. During that time the DPOs primary task, when at the DP desk, is to sit and monitor the DP system. At times having to take action, should the tanker's bow approach or get outside the operational sector.
- Major problems occur relatively infrequently, if ever. In Eastern Canada, FPSO operations started in 2000. Since then, I am aware of one incident where a tanker has had a drive-off towards a FPSO. More details in 'Incident 2 (Shuttle Tanker)' below. One such incident, in 23 years, doesn't exactly leave DPOs on guard for another such occurrence.

Consequences of boredom/lack of concern/apathy

- The DPO is more easily distracted by ongoing activity on the bridge.
- Starts performing duties other than DP (i.e. radio communications).
- Engages in conversations, other than those related to the DP operation.
- Mind wanders and the DPO isn't paying attention. Mind wanders to other things (home, leave, etc.).
- Decides to check their cell phone.
- Things get missed. If not paying close attention, the DPO might be delayed in noticing the propeller failing to full, at the start of a drive-off. Given the time constraints mentioned above, this delay could result in a collision.
- The DPO is not as alert as could be.

While I'm not aware of any incidents where there was indication that the DPO panicked, the bored DPO is another matter. There was a DP incident where the DPO was in a relaxed state (perhaps bored), as shown in the re-enactment in Figure 8, next page. The DPOs foot touched the DP Standby button twice, within 4 seconds. This resulted in the DP system being switched to Standby, during an offshore loading operation. The incident was reported to IMCA and published in the *2015 DP Station Keeping Review 2015* (IMCA M233, Incident #1510, page 19).

Incident reports

The following reports outline two similar situations with two different reactions from the DPOs:

Incident 1 (Shuttle Tanker)

- Vessel set up for Class 2 operation. With two bow tunnels, two stern tunnels and two main propellers.
- Half blackout caused loss of one bow and one stern tunnel and one main propeller.
- Shortly after, the remaining bow and stern tunnels failed due to problems with the Uninterruptable Power Supply (UPS) providing power for thruster control signals. The UPS was receiving power from the switchboard that had blacked out (wiring not connected properly and/or faulty batteries).
- The tanker remained on DP, with one propeller online and the engine at full astern.
- With only one propeller online, the tanker has no possibility of DP control. The DP system continued attempts to maintain control.
- At 149m from the FPSO, with hawser taught, the DP commanded full ahead on the engine.
- At 37m from the FPSO, the Master took joystick control of the vessel.
- Collision with the FPSO took place at 2.4 knots, with a total incident time of 4 min. 50 sec.



Figure 8: Relaxed DPO

There was not much time here to analyse and react. The investigation report indicated that speed was too high and the Master had taken joystick control too late to avoid collision.

There was possibly an overconfidence in the ability of the DP system to control the situation.

Incident 2 (Shuttle Tanker)

- A single screw tanker, loading under DP control, was moving slowly towards FPSO, due to software fault.
- Crew unsure why the vessel was moving. There were alarms, but the DP system does not have a specific alarm which indicates that there is a fault in the software.
- On reaching 45m (normal loading 70m), the DP commands full astern.
- At 70m from the FPSO, the DP system commanded full ahead on the main propeller.
- This caused concern, as it could have indicated drive-off towards the FPSO.
- Control was switched to manual and the tanker moved clear of the FPSO.

Here, the Master indicated that he was unsure what the DP was doing. There was no confidence in the performance of the DP system and manual control was selected.

Are DPOs Overconfident in the Technology?

If being prepared for failures and being able to successfully deal them is a measure, then for some DPOs is no – they are not overconfident. All DPOs are not getting it wrong. ‘Incident 2 (Shuttle Tanker)’ previous page, is an example. A review of DP incidents will find many more examples of DPOs successfully dealing with emergency situations.

However, that same review will show situations where DPOs are not so successful. For many of those, the answer is possibly yes. Overconfidence in the DP system, in “Incident 1 (Shuttle Tanker)” previous page, was a possible contributing factor.

For the majority of DPOs, who never face a major failure, we do not know the confidence level.

Only if they are involved, in a DP incident, will we know how the remainder (and majority) of DPOs will perform.

Where time is no object

Here is an incident with no time constraints, no doubt about what the fault is, and no urgent need to react to the fault. The incident was reported to IMCA and published in the *DP Station Keeping Review 2018* (IMCA M248, pages 21 & 22).

Incident (Supply Vessel)

- Cargo operations with vessel meeting Class 2 requirements.
- The vessel had the redundancy required to handle the worse case failure.
- Blow on situation, due to SE crane not being available (see Figure 9, right).
- One of the two stern azimuths failed. The failure was not worse than the designed worse case failure and the vessel maintained position.
- With only one azimuth remaining on the stern, redundancy was lost.
- As redundancy had been lost, operations were suspended and the plan was to move outside the 500m zone for investigation of the problem.
- The DPO switched from auto DP to manual control, and the vessel became unable to maintain its position. Light contact was made with the platform, before vessel control was regained.
- IMCA Review: ‘This decision was incorrect and the DPO had a lack of knowledge regarding how the system should perform. Had DP control been maintained, the vessel could have been manoeuvred away from the platform without harm.’

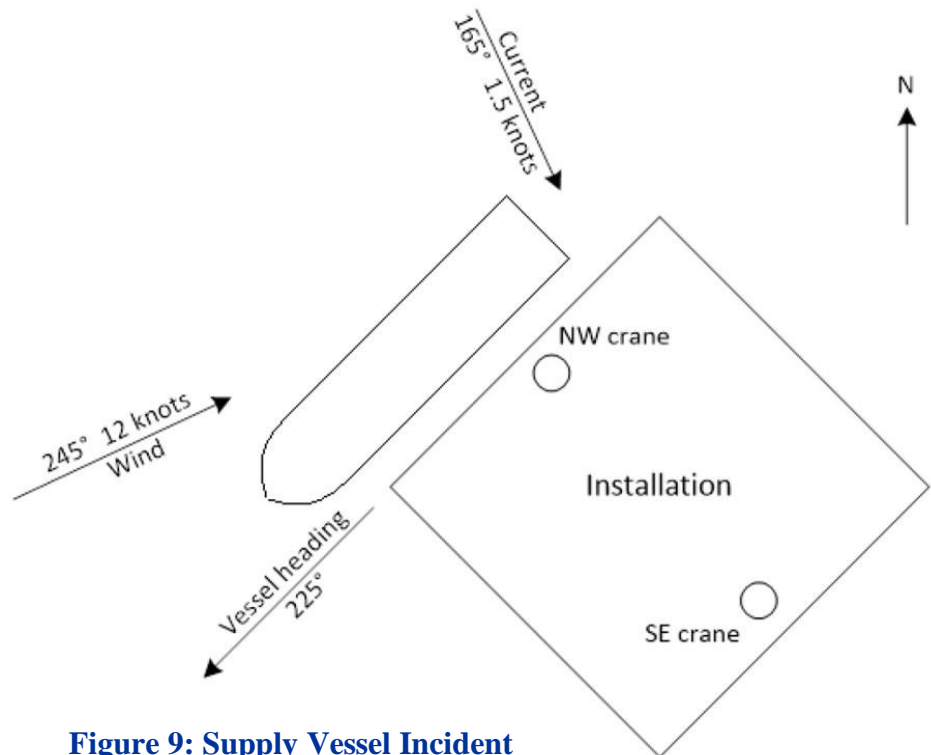


Figure 9: Supply Vessel Incident

Exactly what happened, to cause the contact with the platform, is unclear. From other such reported incidents, I come up with the following possibilities:

- The switch was made to manual control and the DPO did not apply sufficient thrust to counteract the environment. Information, on thrust required to hold position/heading, would have been displayed on the DP console, before manual control was selected.
- Thrust was applied, even momentarily, in the wrong direction. DPO was not aware of control orientation (i.e. which direction to push the levers).
- Switch over procedure was incorrect. The DPO thought that they were in control at a particular bridge station, when they were not. This led to a loss of time to obtain control and apply thrust.
- When auto DP was deselected, thruster setpoints would have went to zero (as noted in the report). Any delay, in applying thrust manually, would cause the vessel to move towards the platform.

Why the decision was made to switch to manual control, is unknown. That aside, any of the four possibilities listed above (there may be more) could have been overcome with some planning, practice on switchover procedures and practice holding station using the manual controls.

Does overconfidence in the DP system play a role here? The vast majority of DP operations run without problems. Is confidence, in the DP, so high that some DPOs don't bother to practice/are not required to practice (in this example) switching to and controlling the vessel manually.

Overcoming overconfidence

Some possible actions to mitigate any overconfidence, in the DP system, that DPOs may have:

- Emphasise the issues with becoming overconfident in the technology, during initial Induction/Simulation and Refresher/Revalidation training. I am not sure how the training centres currently deal with this. Possibly an addition/change to learning objectives might be required.
- During training, review as many DP incidents as possible. This is a component of the current DP Simulation, Refresher & Revalidation courses and a component of the new CPD training requirements.
- Conduct practical refresher training, to permit DPOs to practice dealing with DP failures. This is part of Simulation/Refresher/Revalidation course training but nothing done after that. The shuttle tanker industry requires that DPOs do mandatory theory/practical training every 2.5 years. They get to practice failures such as the drive-off that I described. They get to see all the variables and just how little time they have to achieve a successful conclusion. This is information that they likely will never need to use in practice, but information that is essential for them to have.

On a final note, in the drive-off scenario described, the problem started with the tanker 72m from the FPSO. The supply vessel, in Figure 1, is no more than 10 to 15m away from the rig. Possibly giving much less time, than available for the shuttle tanker drive-off, to analyze and react to a problem that has the vessel moving towards the rig. DPOs should be confident in the technology. It does work well. They should also be prepared, in the event that it does fail.