

Navigating Complex Risks and Strategic Investments



Tom Phipps – Director Risk & Insurance

May 2025

BC Ferries – Navigating Complex Risks and Strategic Investments

- **Company Overview**
- **Risks to Navigate**
 - **Crewing**
 - **Safety**
 - **Fleet Management and Maintenance**
 - **Capital Planning and Strategic Investment**
- **Questions**



BC Ferries Overview

Strategic Plan



Our Vision

Trusted, valued.

Our Mission

We connect communities and customers to people and places important to their lives



Our Values

**Safe
Caring
Honest**

**Collaborative
Respectful
Sustainable**

BC Ferries Overview

Our Strategic Goals

Our strategic goals set the direction for all activities at BC Ferries.

Customer & Community Centred

Customers feel respected, heard & valued.



Focused on Core Operations

Deliver safe, reliable, environmentally conscious ferry services at contracted service levels.



Supporting our Employees

Create a safe, healthy and adaptive workplace where people want to work.



Pursue Climate Change Initiatives

Reduce our environmental impact and invest in climate change initiatives.



Manage our Company Well

Continuously manage risk, improve efficiencies and explore value-added innovation while delivering our long-range Capital Plan.



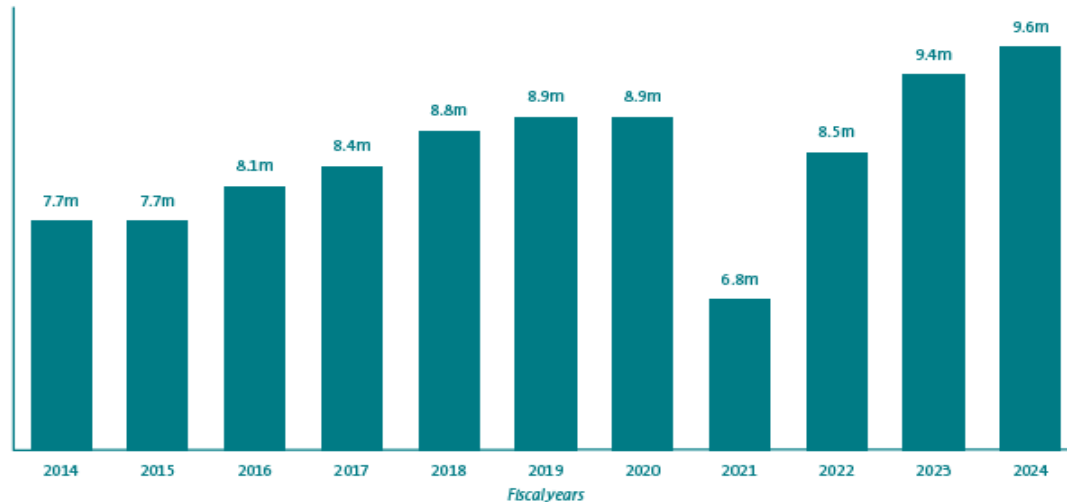
BC Ferries Overview

BCF Snapshot

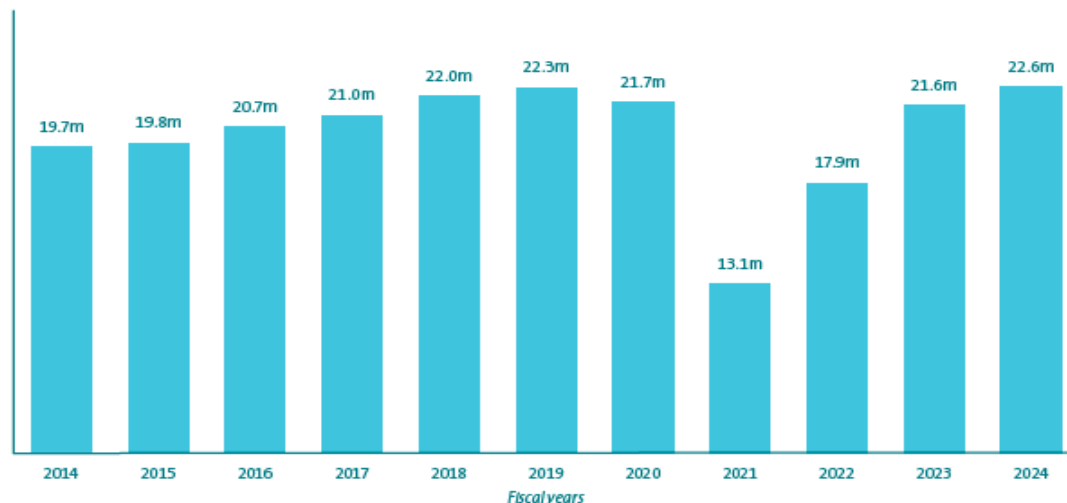
One of the largest ferry operators in the world

System Traffic for Fiscals 2014 to 2024

Vehicles



Passengers



Navigating Risk: Crewing Our People



BC Ferries

5,400+

Average number of employees

22

Years of labour stability

45

Average age of workforce

10

Average years of service



Navigating Risk: Crewing

Safety Culture: Training

SEA (Standardized Education and Assessment)

Formalized training programs covering

- 10 areas
- 51 Roles



SEA Home [Login](#)

Welcome to SEA Web (Version 1.0) – your resource for Standardized Education and Assessment for BC Ferries. Look for the icon to the left throughout the site. Click it to tell us what you think and to let us know what we can do to improve.

If you need a bit more information to help get you started using SEA [click here](#)

Important Links

- [Competence Surfer](#)
- [Videos](#) (Apr 20, 2016)
- [SEA QRG](#)
- [Passage Plans](#)

Please Select: Department: Position:

1st Engineer Phase 1: Self-Study	Instructions for Self-Study >>
	Self Study (read for Summative Exam) >>
	Student Handbook (read for Phase 2 and Clearance Exam) >>
Survey	SEA Candidate Survey (complete after SEA Training and Clearance) >>
Video/ Presentations	Spotter Job Aid (Handsignals used during Bunkering) >>
	Lockout Procedure Training Video [9:54] (FEBRUARY 9, 2016) >>
	Worksite Inspection Presentation Download PPT file (10M - 44 slides approx 2-2.5 hour presentation) >>
	CO₂ Safety System Video [6:11] (OCTOBER 29, 2015) >>

Trainers and Administrators: Please log in for additional content.

Navigating Risk: Safety

Safety Culture: Training Stats

Safety is our highest value.

Maintaining a safe environment for our customers and employees requires our continued focus and diligence.



Invested
\$20 million
in employee development
and training



Provided
32,000
training days related
to safe sailing



CONTINUING EDUCATION

We are one of the largest training organizations in Canada, and train employees for lifelong careers at BC Ferries. Training for safe sailing is a top priority.

WE PERFORM
1,000 DRILLS
EVERY YEAR TO ENSURE THE HIGHEST
SAFETY STANDARDS FOR BC FERRIES'
VESSELS AND CREWS

Navigating Risk: Safety

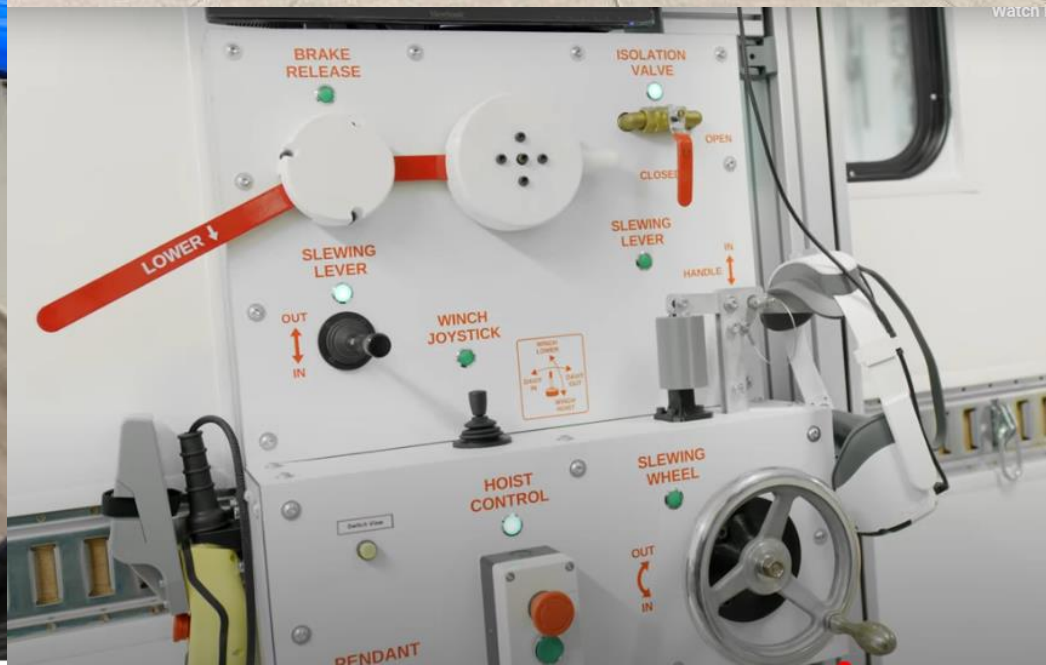
Fire Drills and Scenarios

- Drills cover realistic scenarios
- Vessel specific scenarios are developed
- Written reports of drills are used to highlight the possible risks
- All members of the fire party must have a current fit test certificate and must meet all the criteria for respirator use



Navigating Risk: Safety

Safety Culture: Rescue Boat Simulators



Navigating Risk: Safety

Safety Culture: Simulation Training Center (STC)

Two new simulators (Bridge A & B)

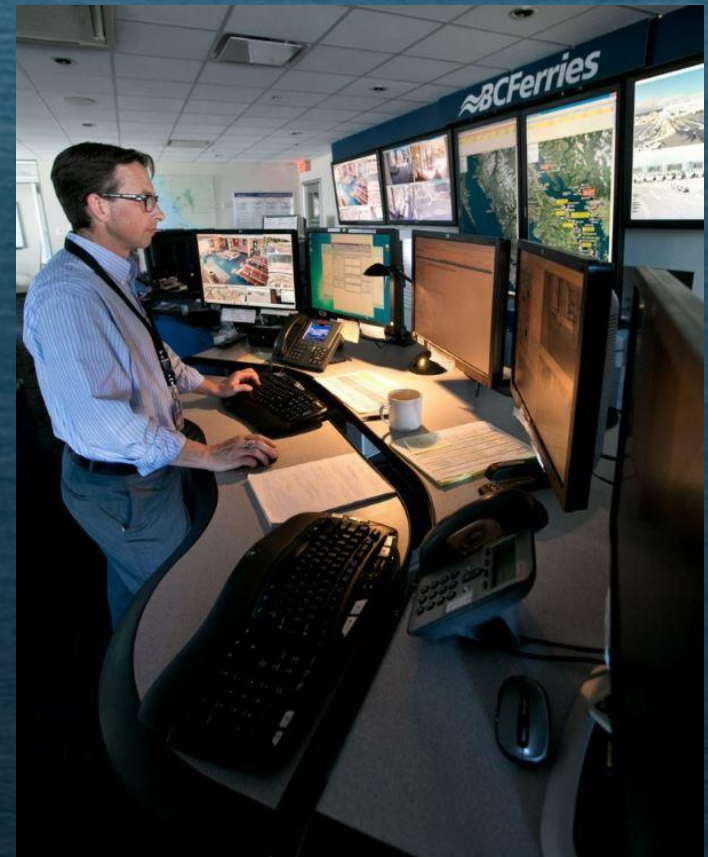
- Accident re-creation
- Propulsion practice
- SEA training availability
- Route familiarization
- Suitability interviews
- Bridge Team/ individual assessments
- Heavy weather practice
- Policy application and practice
- Critical failure practice



Navigating Risk: Safety

Safety Culture: 24/7 Operations and Security Center

- Opened in 2010
- 5 workstations with minimum 5 employees at all times (OS Officers, Customer Care Rep, Service Recovery Rep, Marine Superintendent)
- 2350+ Cameras throughout the fleet
- Real time monitoring of vessels (AIS), operations, and safety systems
- Incident management support for entire fleet
- Emergency Operations Centre (EOC) for large incident management



Navigating Risk: Safety Operational Limitation Matrix



Operational Limitations Matrix

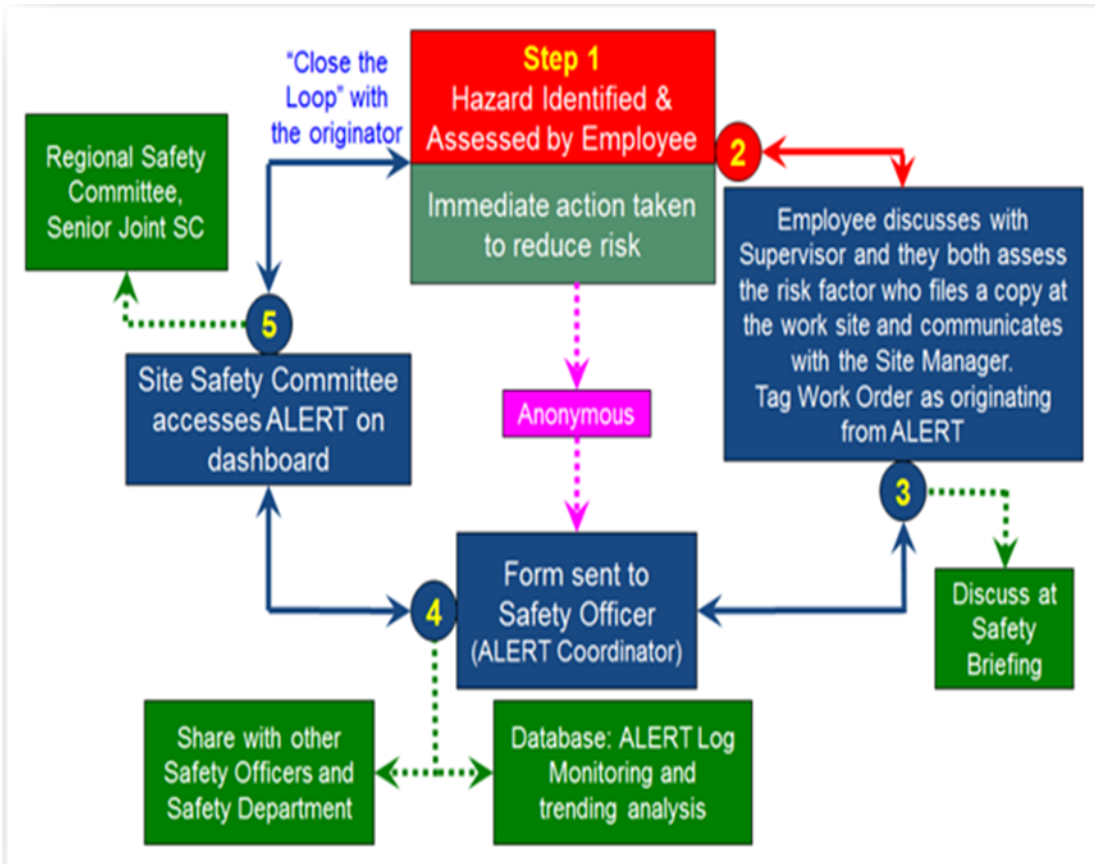
Legend: **RED** indicates 'do not commence a sailing, inform as approp', **AMBER** indicates 'consult prior to commencing a sailing, inform as approp', and **GREEN** indicates 'commence a sailing, inform as approp'

Area of Concern	Recommendation to Commence a Sailing	Reference	Control Measures (risk mitigation)	Notes
Weather Related Limitations				
Berth 2 Tsawwassen, sustained winds >30 Kts SE.				
		VSM 07.01.06.050 - Heavy Weather Precautions. VSM 07.01.06.050 - Heavy Weather Precautions.		
Crewing				
		See Section 6 VSM.		
		See Section 6 VSM.		
		See Section 6 VSM.		
		See Section 6 VSM.		
		See Section 6 VSM.		
		BC Employment Standards Act Sect 4 Article 36(2).		
Propulsion and Power Plant				

Navigating Risk: Safety

Safety and Training - ALERT Handbook

An **ALERT** is a tool used to identify a hazard or situation which could cause injury or harm to a person, damage to equipment, or damage to the environment

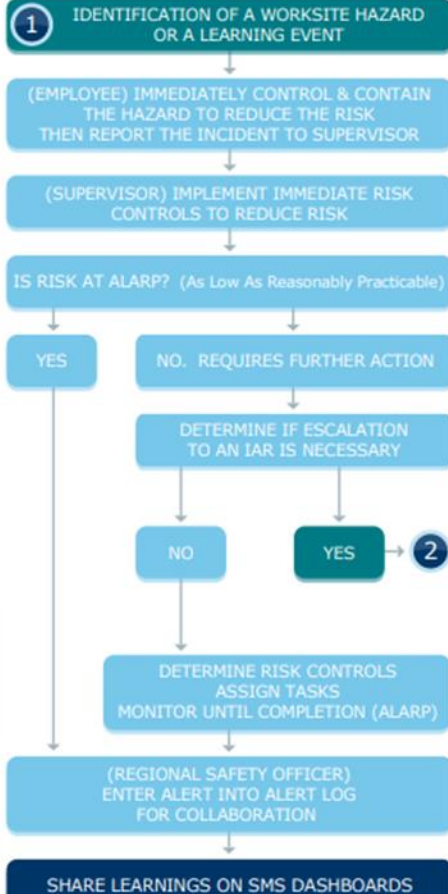


	ALL	
	LEARNING	
	EVENTS	
	REPORTED	
	TODAY	

Navigating Risk: Safety Investigations

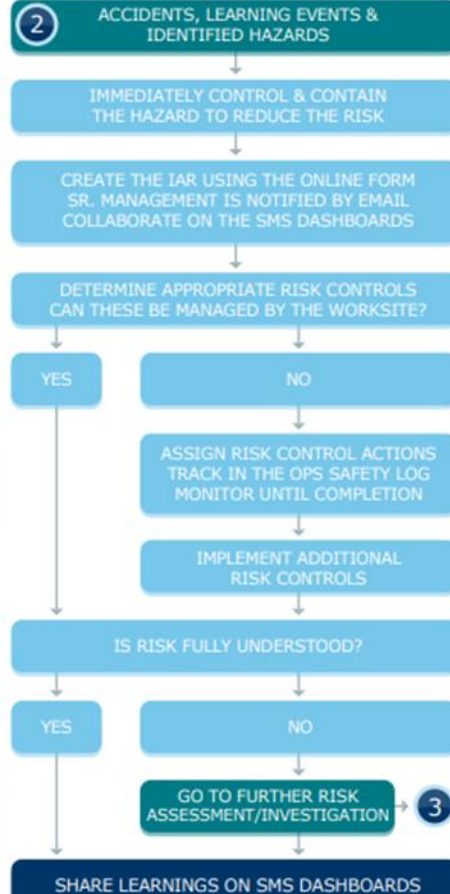
ALERT

FRONT LINE EMPLOYEE ◀ ▶ SUPERVISOR/MANAGER

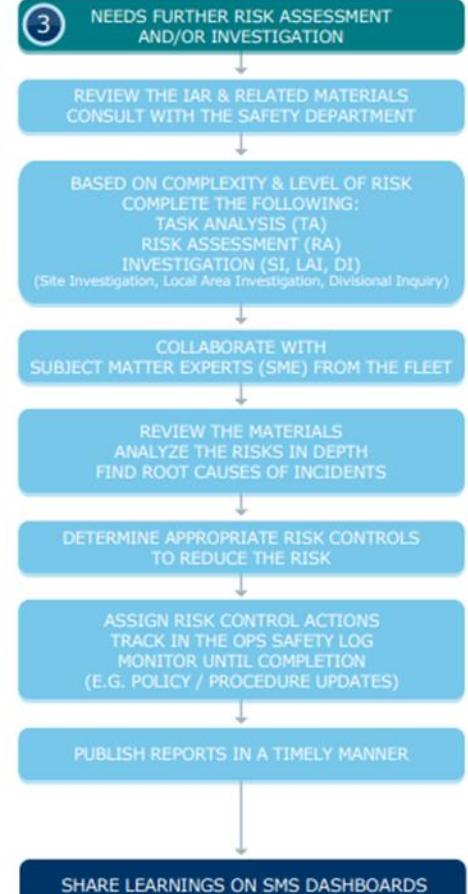


INITIAL ASSESSMENT REPORT (IAR)

SUPERVISOR/MANAGER ◀ ▶ SENIOR MANAGER



TASK ANALYSIS (TA) RISK ASSESSMENT (RA) INVESTIGATION (SI/LAI/DI)



Navigating Risk: Safety


Risk Assessments: Electric Vehicles

RISK LEVELS		BCF RISK ACCEPTABILITY / TOLERANCE
15+	Extreme Risk	Intolerable: Must NOT proceed. Find an alternative method and re-assess.
10 - 15	High Risk	Tolerable with Continuous Review: Should only proceed if permitted by SOPs or by authority of a Senior Manager, and if all possible control measures are in place and risk has been reduced to ALARP.
5 - 10	Medium Risk	Tolerable with Periodic Review: Can proceed if all control measures are in place before start of the activity and risk has been reduced to ALARP.
1 - 10	Low Risk	Acceptable with Periodic Review: Simple control measures are in place; people have core skills and awareness, and risk at ALARP.

RISK LEVEL SUMMARY ⁴¹		
Categories	Risk with Existing Controls	Residual Risk After Proposed Recommended Controls
1. High Voltage (Batteries) – Electrical Shock		
2. Li-ion Battery Thermal Runaway – Fire Management		
3. Vapour Cloud – Toxic Gas Management		
4. Cooling – Fire Management		
5. Ventilation – Fire and Toxic Gas Management		
6. Fire Profile – Fire Management		
7. Re-ignition – Fire Management		
8. Clean up – Toxic Substance Management		

Current EV Fire and Safety Practices

- BC Ferries has completed a Facilitated Risk Assessment for EV's
- FRA: One Low Risk Rating (Acceptable) and Seven Medium Risk Ratings (Tolerable)
- No EV incidents to-date
- Emergency Response & Firefighting Context
- Procedures for aiding with Electric Vehicles
- Regular reviews of the company's EV risks are to be expected.



Fleet Operations Manual

Fire Response Vehicle Decks					Page 1 of 5
No.	Chapter	Specific Audience <i>(who should be notified)</i>	Sponsor	Approver	
08.30.011	Emergency Response Procedures and Checklists	All Department Employees	Snr. Mgr Operational Readiness	Ex. Dir. Fleet Operations	
INTRODUCTION					

Navigating Risk: Safety Dangerous Goods



DANGEROUS GOODS

*Information For
Commercial Operators*



DANGEROUS GOODS *Information for the General Public & Non-Commercial Operators*



Dangerous Goods Policy

DANGEROUS GOODS SHIPPING DOCUMENT CHECKLIST

Shipping Document Must Contain:

- **THE DATE** must include day, month, and year.
- **CONSIGNOR/SHIPPER'S NAME AND ADDRESS**

• DESCRIPTION OF THE GOODS

- UN Number (example UN1230)
- Dangerous goods shipping name (if applicable, the Technical Name in parenthesis immediately after the shipping name for DG subject to TDG Special Provision 16)
- Primary Class, (and Subsidiary Class if applicable, example 3(6.1))
- Packing Group in roman numerals, if applicable (example I, II, or III)
- Flashpoint or flashpoint range, if Class 3
- Marine Pollutant (Yes or No)
- Quantity and the unit of measure: Kg, L, or NEQ (example: 250 L Drums)
- For each shipping name the total quantity (kg or L), or for small means of containment (MOC) the number of small MOC that require a label to be displayed (example 6 x 250 L)

- **24 HOUR NUMBER** – a complete telephone number of an individual, organization, or agency who can provide technical information of the dangerous goods without breaking the telephone connection made by the caller.

- **CONSIGNOR'S CERTIFICATION** – Printed Name (legible) and Signature. Must be completed by the consignor or an individual acting on behalf of that consignor and must set out that individual's name.

Shipping Document May Contain:

- The number of small means of containment (i.e., capacity of 450 L or less) that require labels (example 6 x 205 L)
- The statement "not odorized"
- The Emergency Response Assistance Plan (ERAP) reference number and the ERAP telephone number
- For a pesticide that is a marine pollutant being transported on a ship, the name and concentration of the most active substance in the pesticide
- Compatibility group letter following the primary class for explosives.
- If applicable, the words "toxic by inhalation" or "toxic – inhalation hazard" for dangerous goods subject to TDG Special Provision 23

WASTE

- **May Require a Waste Manifest:** If the waste is a dangerous good, a waste manifest or DG shipping document is required.

PRODUCTS CONTAINED IN DAMAGED OR LEAKING PACKAGING MUST NOT BE TRANSPORTED.

Note: This document is limited to some of the requirements for completing/reviewing a Shipping Document. There are additional requirements for approving shipments.

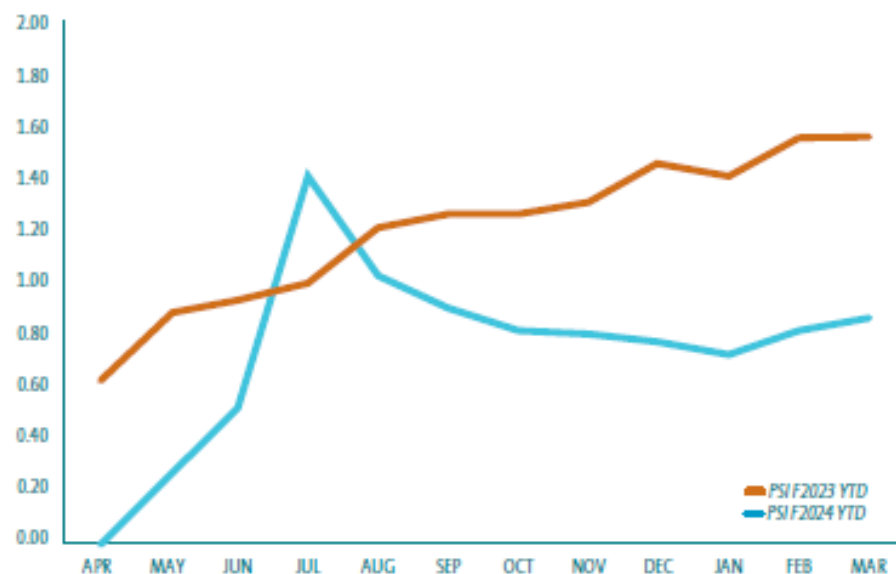
Navigating Risk: Safety

Safety Culture: KPIs



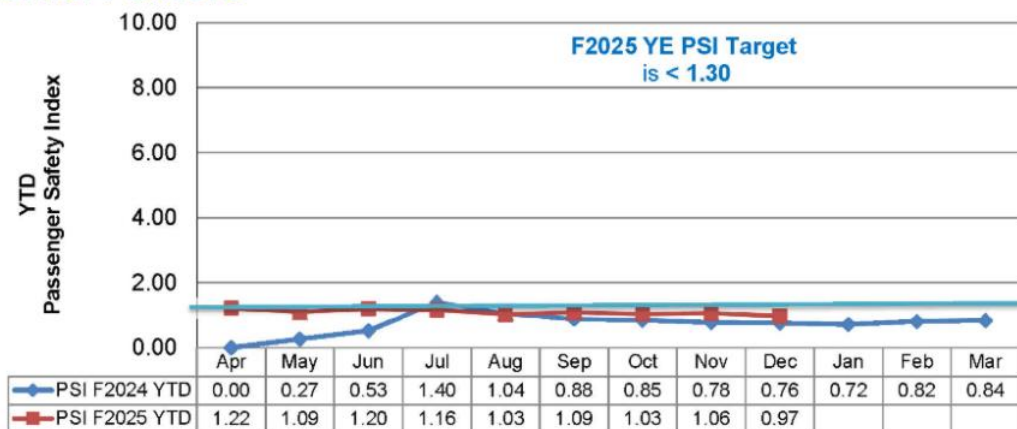
Passenger Safety Index

Number of injuries per one million passengers



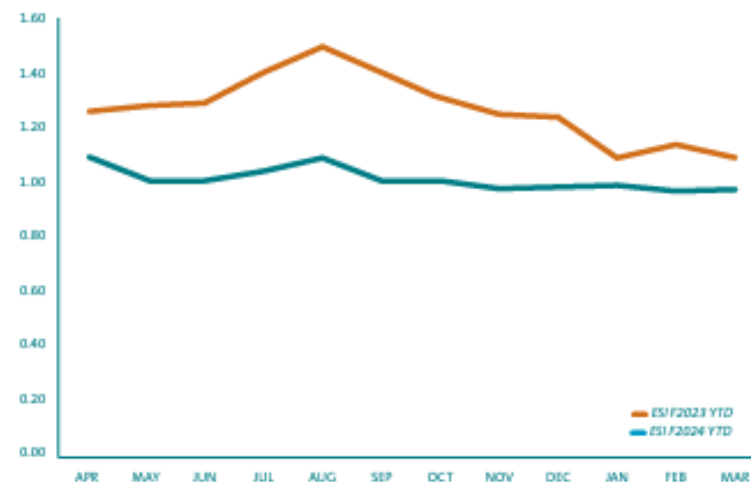
Passenger Safety Index (PSI)

Internal Factors



Employee Safety Index

Employee injury frequency rate times severity rate divided by 1,000 full-time equivalents



Fleet Management and Maintenance

Fleet Maintenance Program

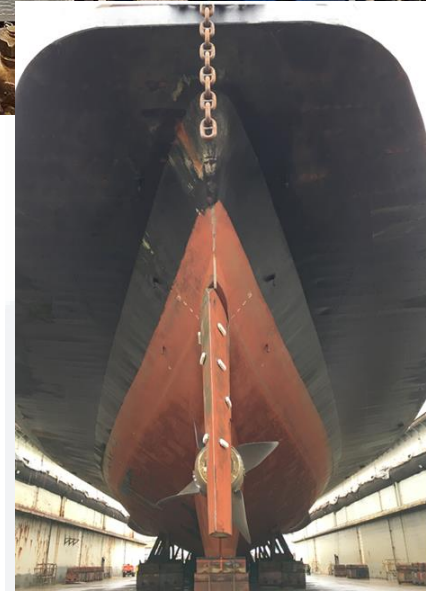
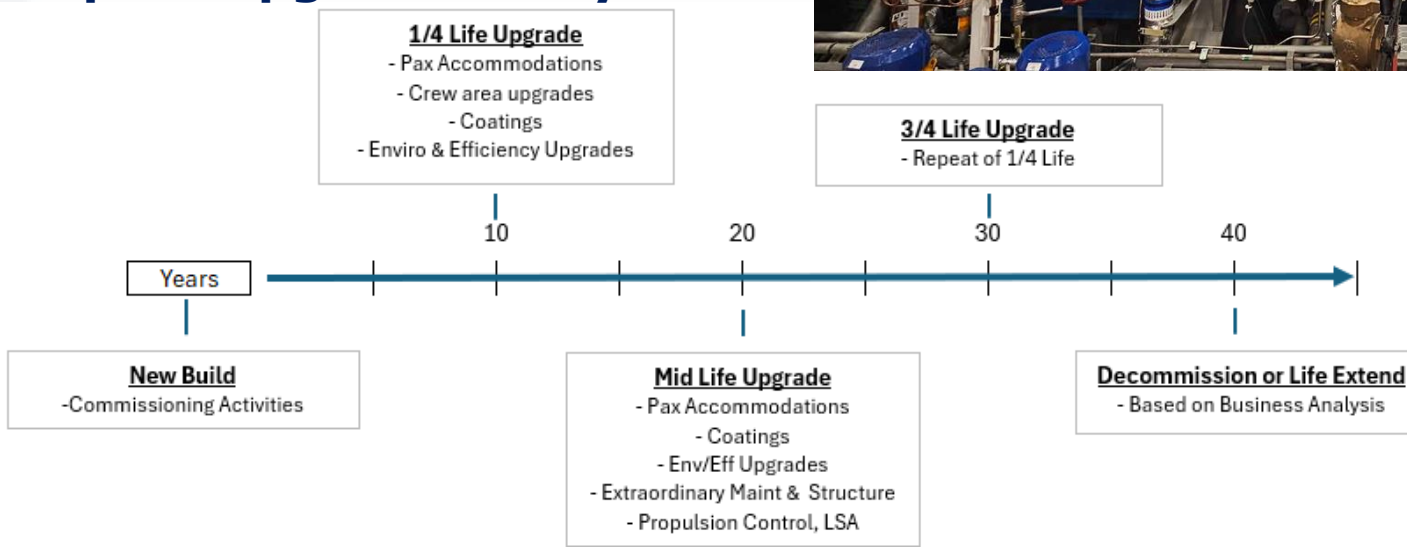
Annual Maintenance

- Removed from service annually to recertify and perform maintenance work not able to be done while operational

Refits – Two in five years - Major overhaul and inspections

- Dry-docking
- Hull and Superstructure
- Propulsion
- Generator
- Major Mechanical

Capital Upgrade Lifecycle



Fleet Management and Maintenance

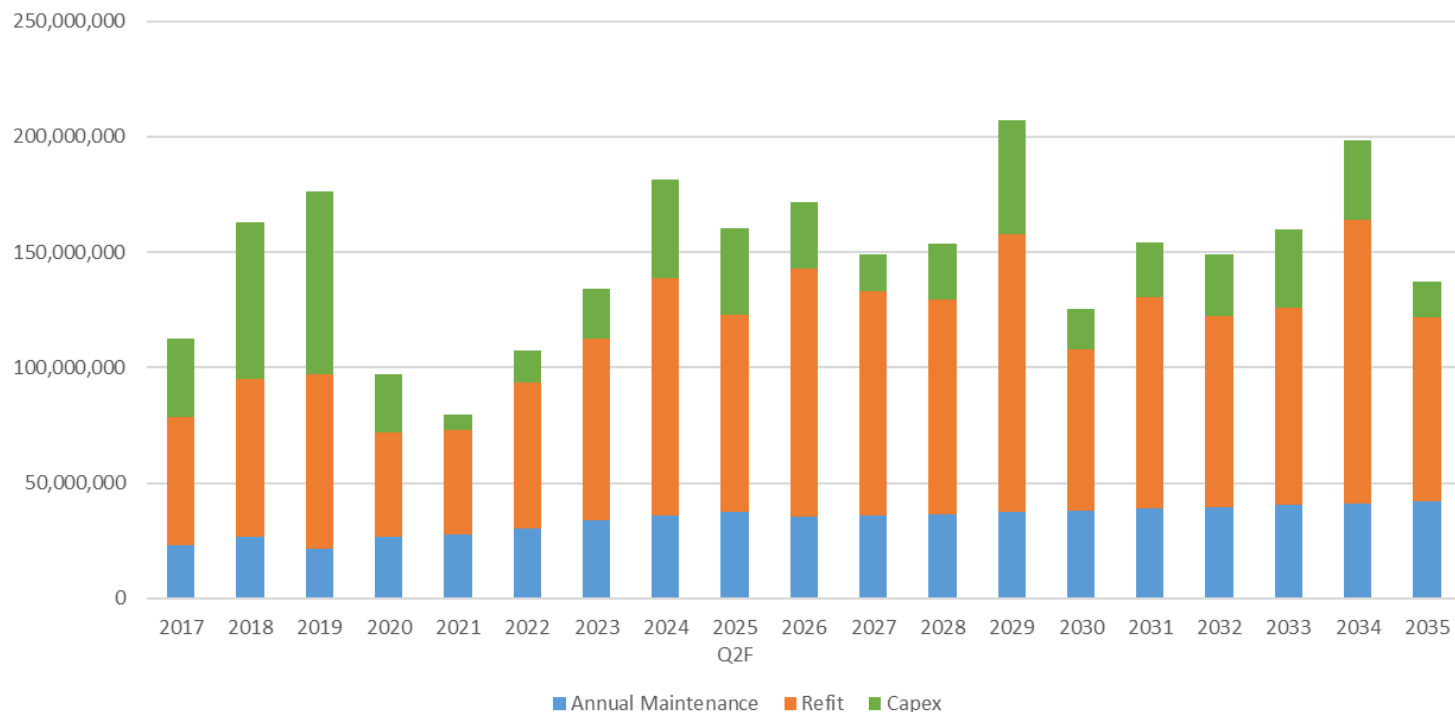
Fleet Maintenance Spending

Safety and Reliability are Core Objectives

- Annual Maintenance remains constant per year
- Refit spending
- Capital spend



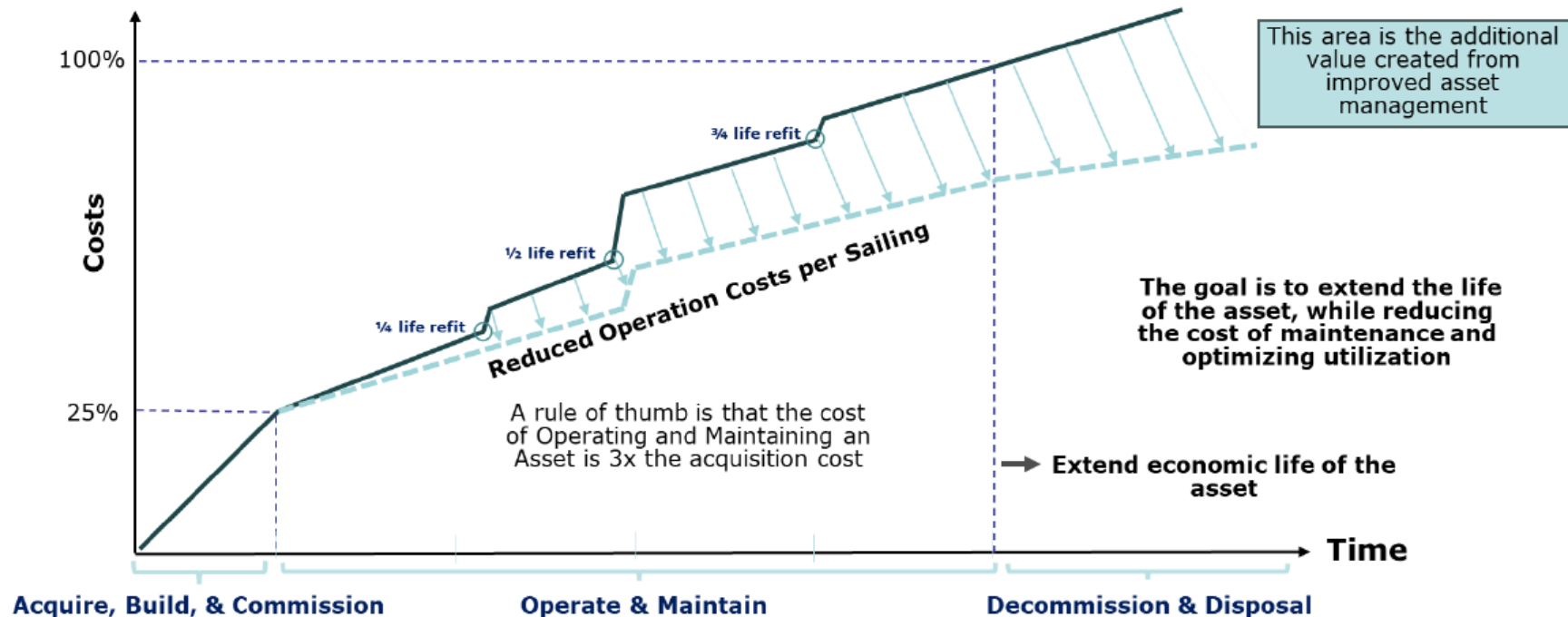
Vessel Maintenance, Refit and Capital Upgrades: Actual and Plan



Fleet Management and Maintenance Asset Management Implementation

Move To Asset Management

Core Value Proposition of Effective Asset Management



Effective asset management aims to bring the following benefits

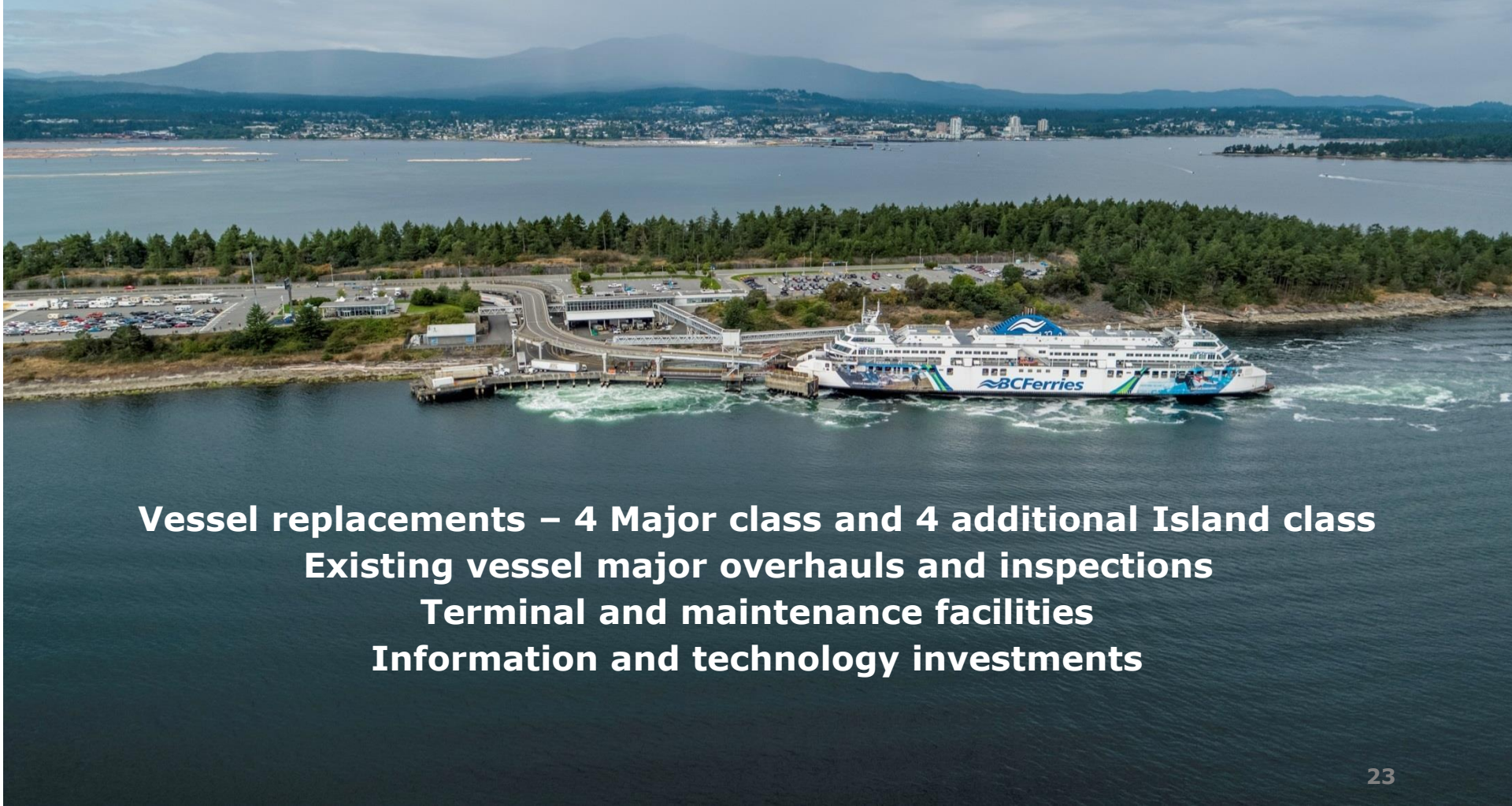
- 1 Reduce Acquire, Build, & Commission Costs
- 2 Reduce Refit Costs
- 3 Extend Economic Life of Asset
- 4 Reduce Operate & Maintain Costs

Capital Planning and Investment

Capital Plan

Capital Plan over 10-12 years

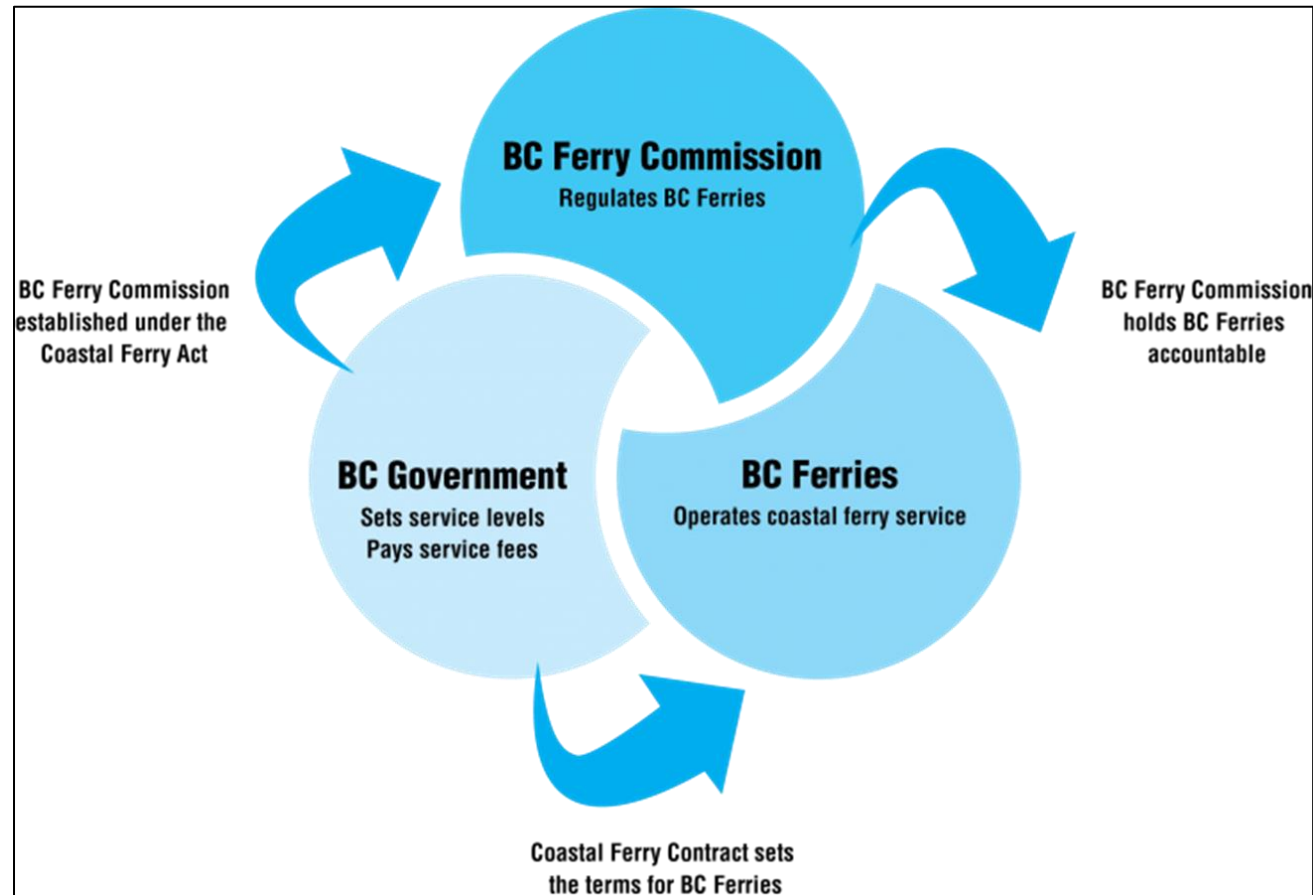
Significant investments in Vessels, IT, and Terminals to 2036



Vessel replacements – 4 Major class and 4 additional Island class
Existing vessel major overhauls and inspections
Terminal and maintenance facilities
Information and technology investments

Regulatory Structure

- An independent regulated ferry service contractor that serves the public interest
- Province reviews and sets service levels
- Ferry Commissioner establishes a price cap on fares for each next four-year performance term
- Performance Term 6 (April 1, 2024 – March 31, 2028)



British Columbia

B.C. Ferries CEO warns of 30% fare hike in 2028

Nicolas Jimenez says costs have spiked, creating 'a growing funding gap' for the operation

CBC News · Posted: Nov 28, 2024 5:49 PM PST | Last Updated: November 28



The CEO of B.C. Ferries is warning the company may need to increase fares by 30 per cent or more in 2028, when the current fare structure expires.

Nicolas Jimenez says in a written statement the corporation had forecast last year that such a price rise would be needed to keep up with operating and capital costs, but costs since then have spiked, including a 40 per cent jump in shipbuilding expenses.

The rising costs have created "a growing funding gap" that Jimenez says will require "a sustainable funding model" to address.

ADVERTISEMENT

Last year, the province said it was providing \$500 million to B.C. Ferries to help keep fares down, while the Office of the B.C. Ferries Commissioner had set annual fare increases of 3.2 per cent until 2027.

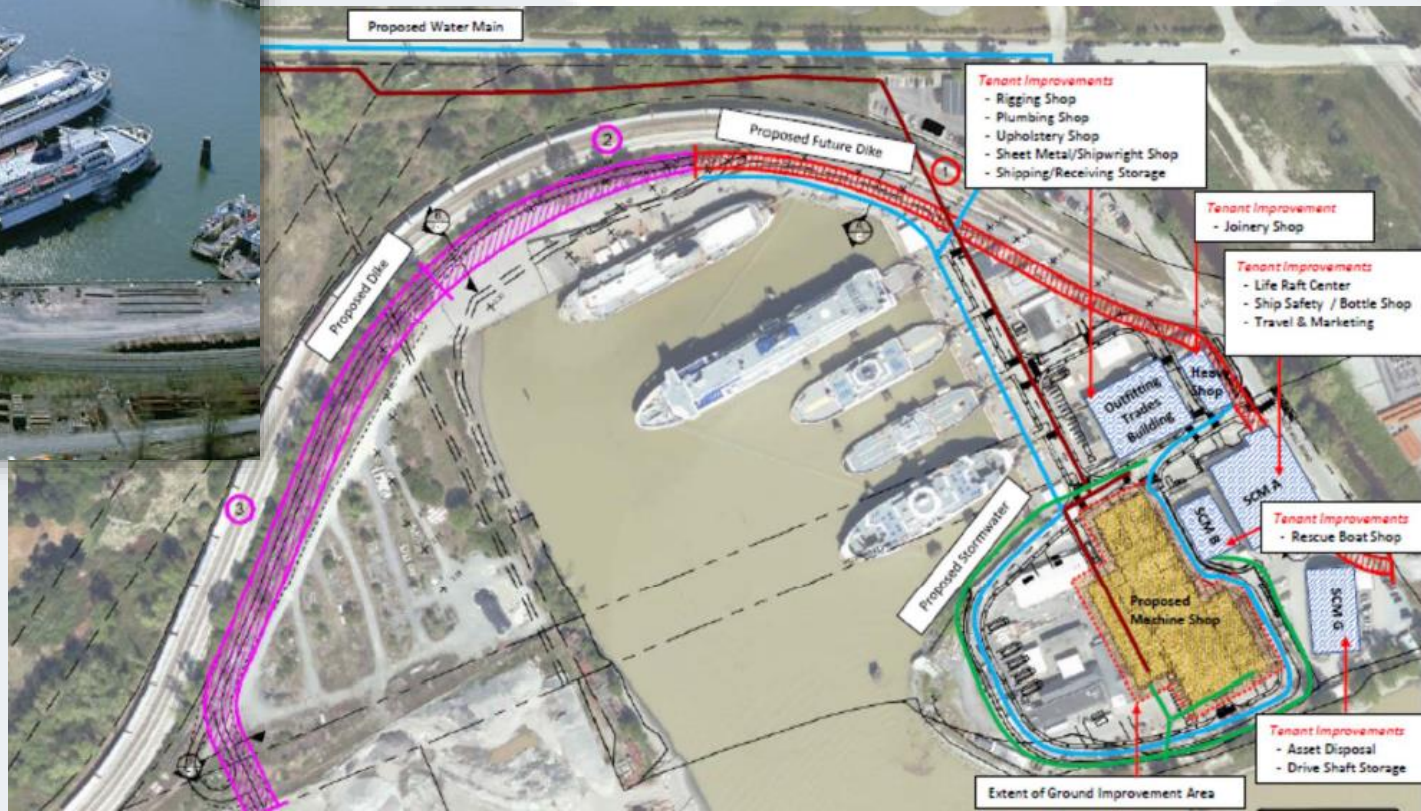
	Yr1	Yr2	Yr3	Yr4
Annual	1.09	1.09	1.09	1.09
Compound		1.19	1.30	1.41
Annual	1.03	1.03	1.03	1.03
Compound		1.06	1.09	1.13

-0.29

Capital Planning and Investment

Fleet Maintenance Facility *Redevelopment*

Redevelop our ship maintenance facility to replace end-of-life structures and improve site efficiency



Capital Planning and Investment

Fleet –Capital Plan

New Vessels
(4 NMV, 4 additional Island Class)

Vessel upgrades and major
vessel overhauls



BC Ferries' third Island Class vessel launches at Damen Shipyard in Romania.



Island Class: the most efficient and quietest battery-hybrid ferries world-wide

The Island Class vessels will be delivered with **800 kWh** of battery energy storage capacity and can be upgraded to **2,000 kWh**

Battery-hybrid power system improves efficiency and reduces emissions

Integrated propulsion and ship services power system reduces the number of diesel generators

At 14 knots, the Island Class is faster than the vessels they will replace.

The exhaust system reduces NOx emissions through selective catalytic reduction

Designed to be fully accessible without elevators, reducing energy consumption, operating cost & complexity

Vessel completely outfitted with LED lighting

Twin-propellers designed to reduce underwater radiated noise

Machinery is vibration isolated to reduce underwater and ambient noise

Low friction & biofouling resistant hull coating reduces fuel consumption

Ocean Networks Oceanographic Sensors monitor the marine environment

Heat recovery system uses waste thermal energy to heat the vessel



Capital Planning and Investment

New Major Vessels

Requirements
Definition

Food Services/
Catering

Community
Engagement

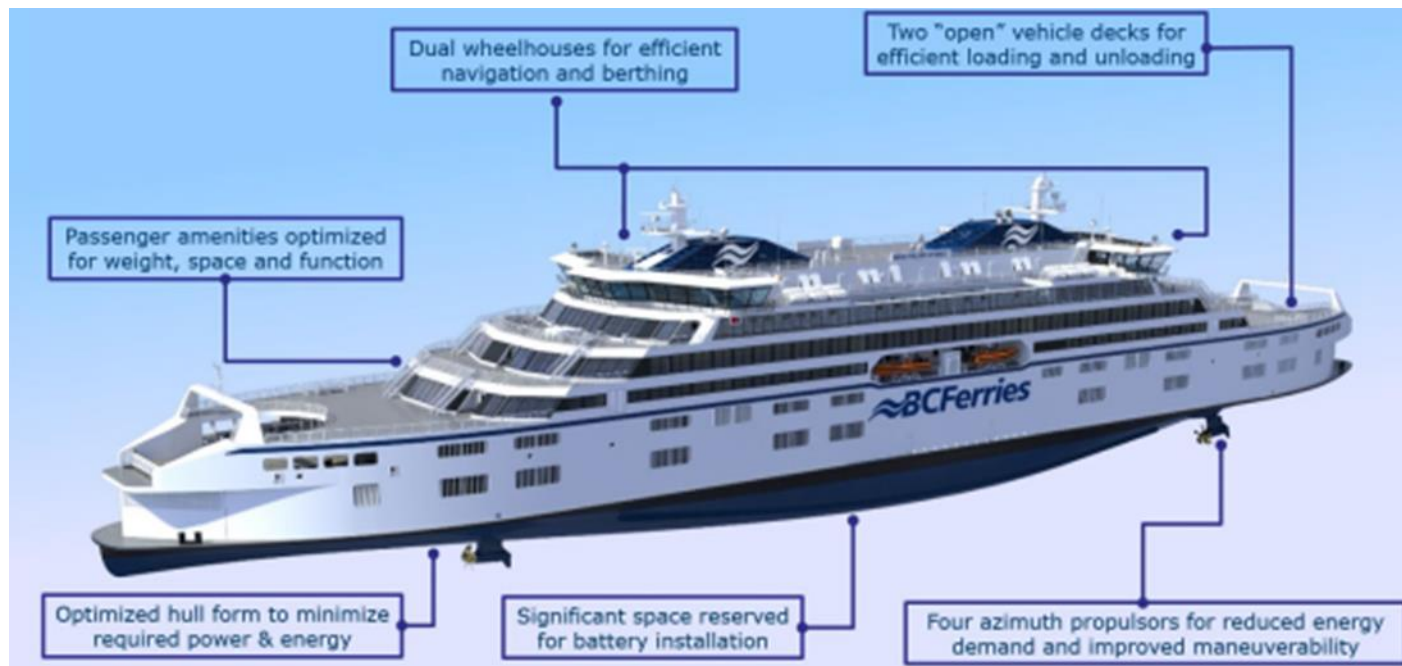
Energy

Vessel Disposal

Operational
Technology

Technical Design

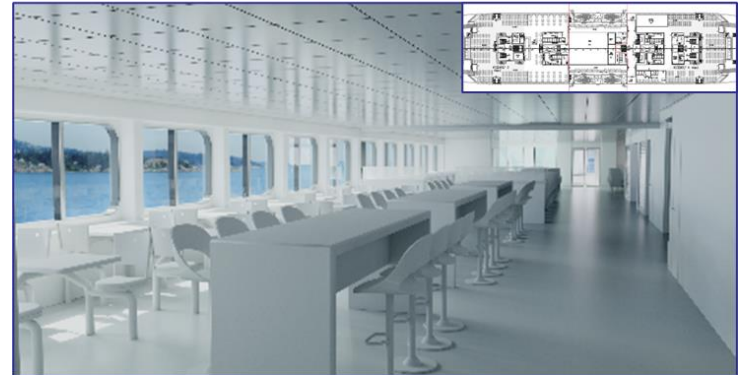
Terminal
Interface



Capital Planning and Investment

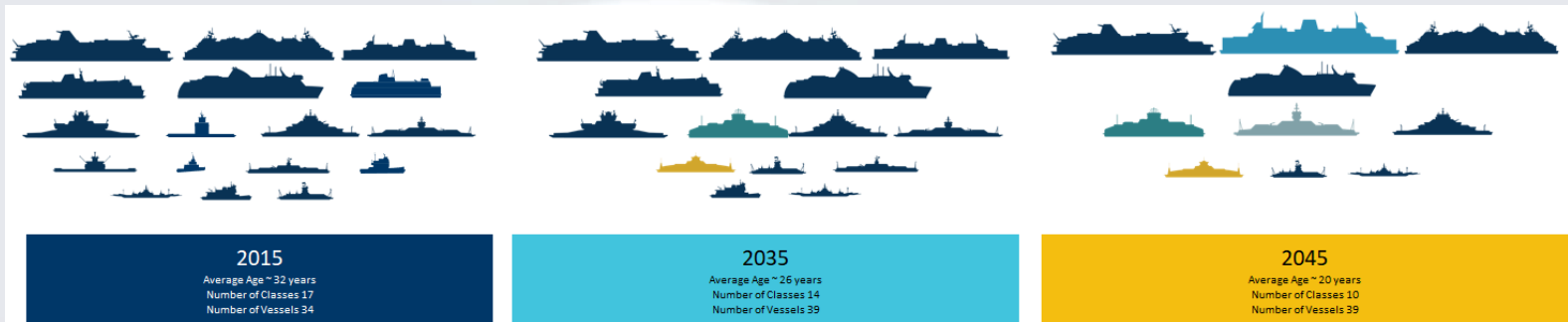
New Major Vessels

- NMV design is in accordance with Fleet Master Plan critical requirements.
 - 360 AEQ (2200 lane meters);
 - 2100 passengers and crew;
 - Operable on all BCFS major routes;
 - Low Underwater Radiate Noise
 - Low Greenhouse Gas (GHG) Emissions,
 - High energy efficiency
- NMV design is complies with maximum length & weight for berths.
- NMV reflects extensive effort achieve maximum efficient performance on major routes.



Capital Planning and Investment

Standardization of the Fleet



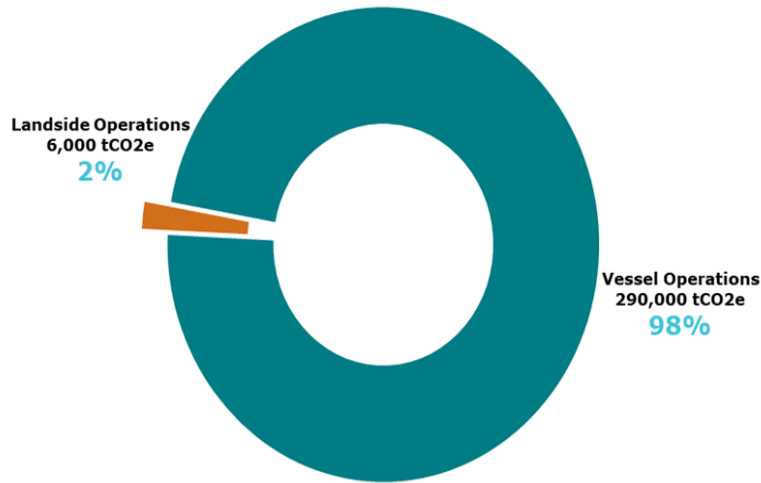
Future BCF Fleet will reduce classes to develop a fleet that is more efficient to deploy, operate and maintain

- Started with 15 classes with an end goal of 7
- Common operational and maintenance procedures
- Highly interoperable and flexible fleet
- Reducing the number of unique single vessel classes

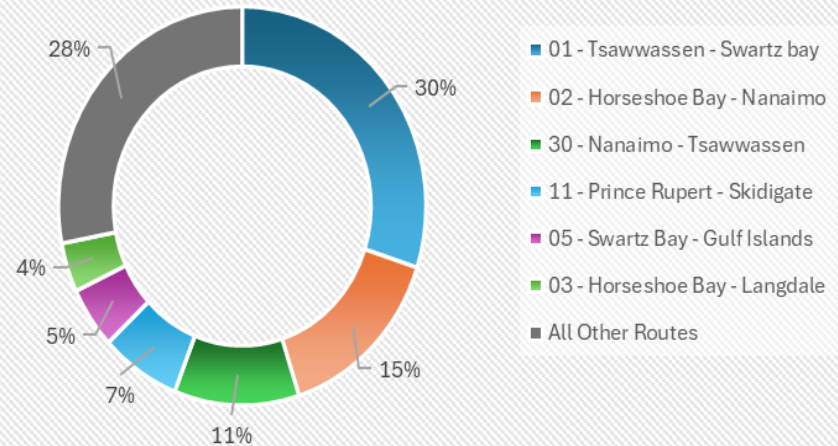
Group	Class	2020	2025	2035	2045	2055
Major	C-Class	5	5	4		
	Coastal	3	3	3	3	3
	NMV			2	7	9
	Spirit	2	2	2	2	
	V-Class	1	1	1		
Northern	Northern	3	3	3	3	3
Intermediate	Cap/CUMB	2	2	2		
	Century	1	1	1		
	ISKY	1	1	1	1	
	Bowen Class	3				
	Salish	3	4	4	4	4
	Shuttle				3	4
Minor	Q-Class	2	2	1		
	Island	2	6	10	13	13
	K-Class	3	3	3	1	
	T-Class	2	2			
Unique	Unique	2	2	2	2	3
Average Age		29	28	26	20	25
Number of Classes		15	14	14	10	7
Number of Vessels		35	37	39	39	39

Capital Planning and Investment Strategy for Emissions Reduction

Company GHG Emissions F2024



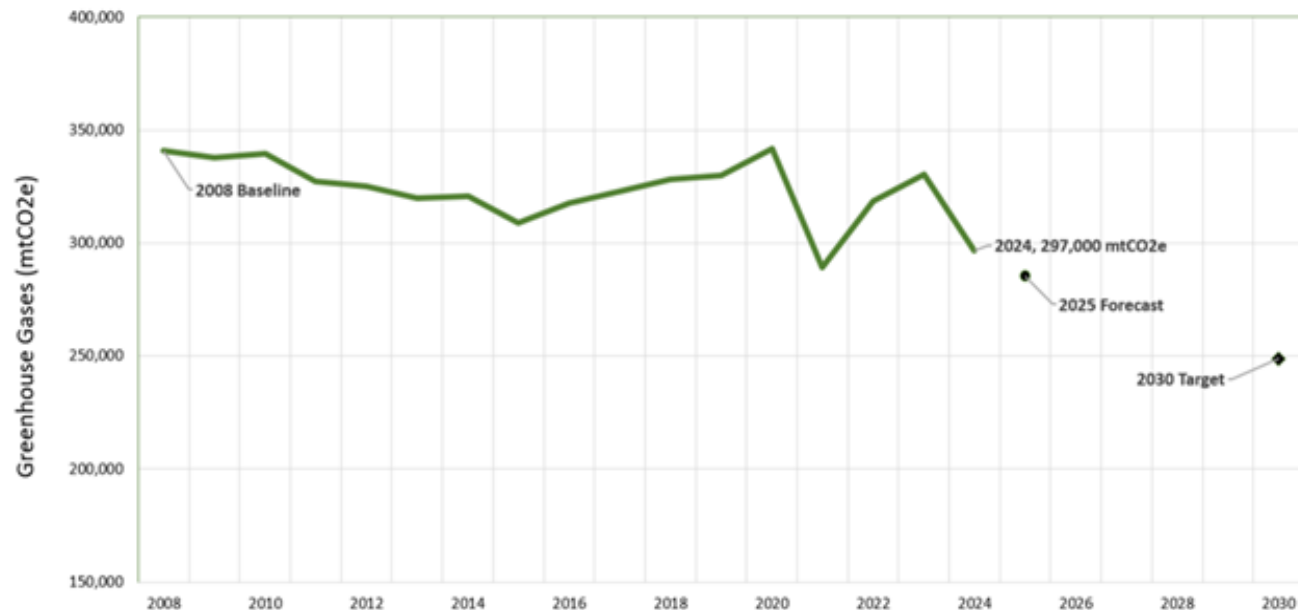
Top 6 Routes with > 10,000 tCO₂e



NMV's will replace legacy vessels which contribute to 68% of total company's CO₂ emissions

BC Ferries' strategy for decarbonization includes:

1. Use of alternative Fuels
2. Electrification
3. Operational Efficiencies
4. Advanced Technologies
5. Fleet Modernization



Questions?

