Innovation – Moving to Outcomes

Ports: Risk and Change

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“The future is already here. It’s just not very evenly distributed.”

William Gibson
(author, futurist)

Outline

- What is risk?
- Examples of marine risks
- Common factors in marine incidents
- Trends affecting marine industry?
- When will ships start using other fuels?
- When will ships move to electric propulsion?
- Why will ships become autonomous?
- When will ships will become autonomous?
- How will autonomous ships affect the nature of seaborne traffic?
- How will these changes affect New Zealand ports?

What is Risk

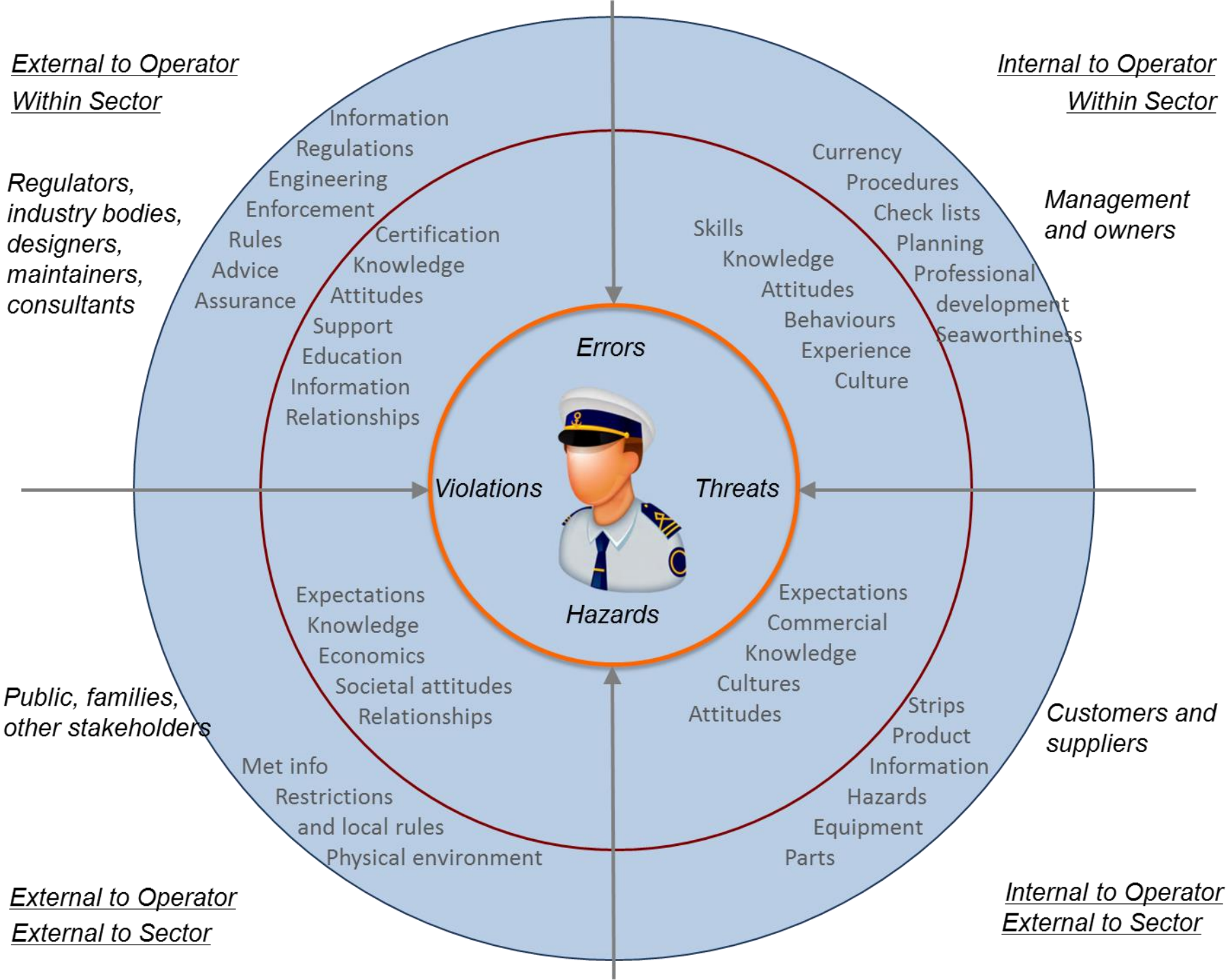
- ISO 31000:2018 Risk Management:

Risk is the effect of uncertainty on objectives.

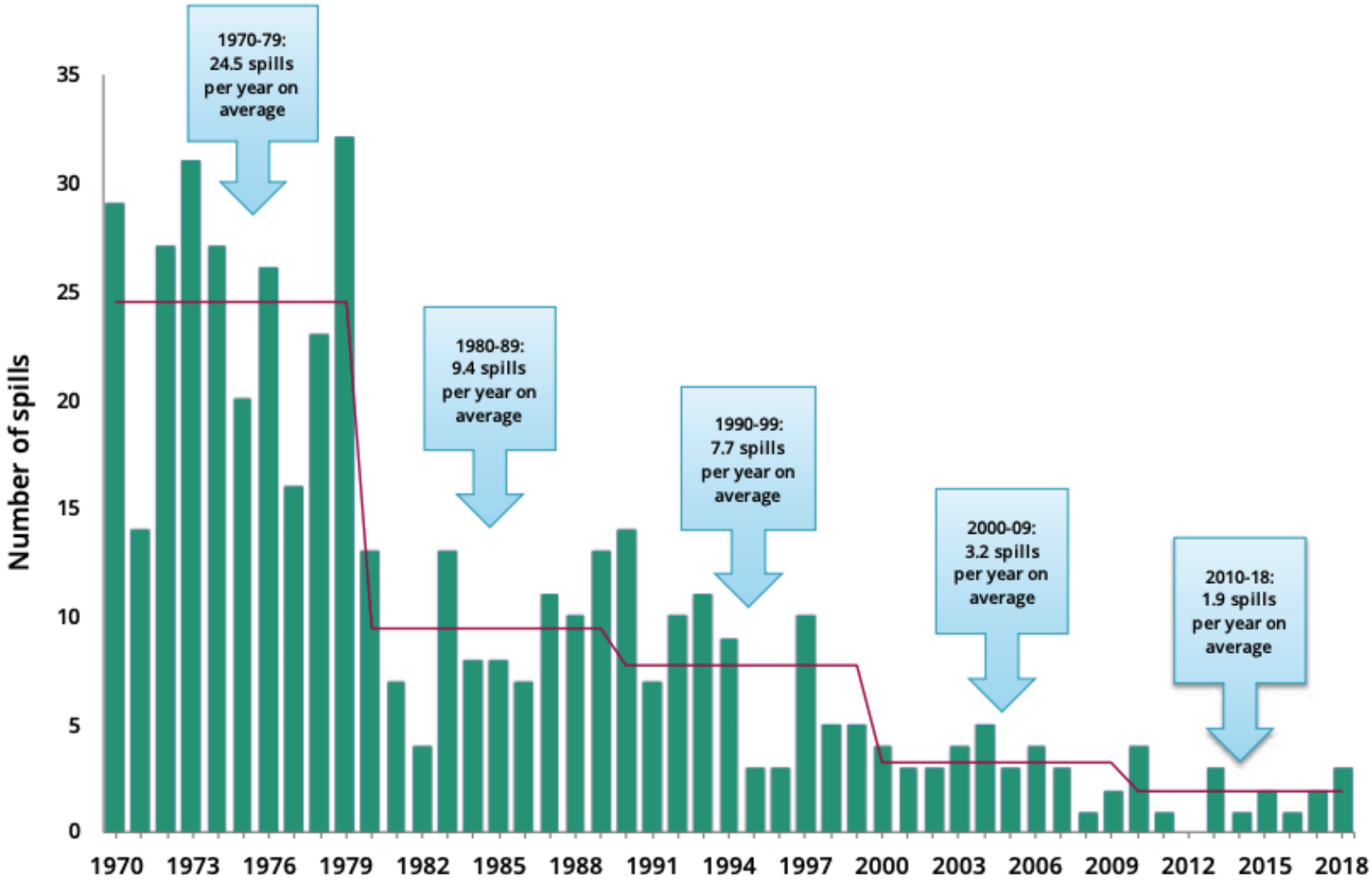
Maritime Risks

Human Factors

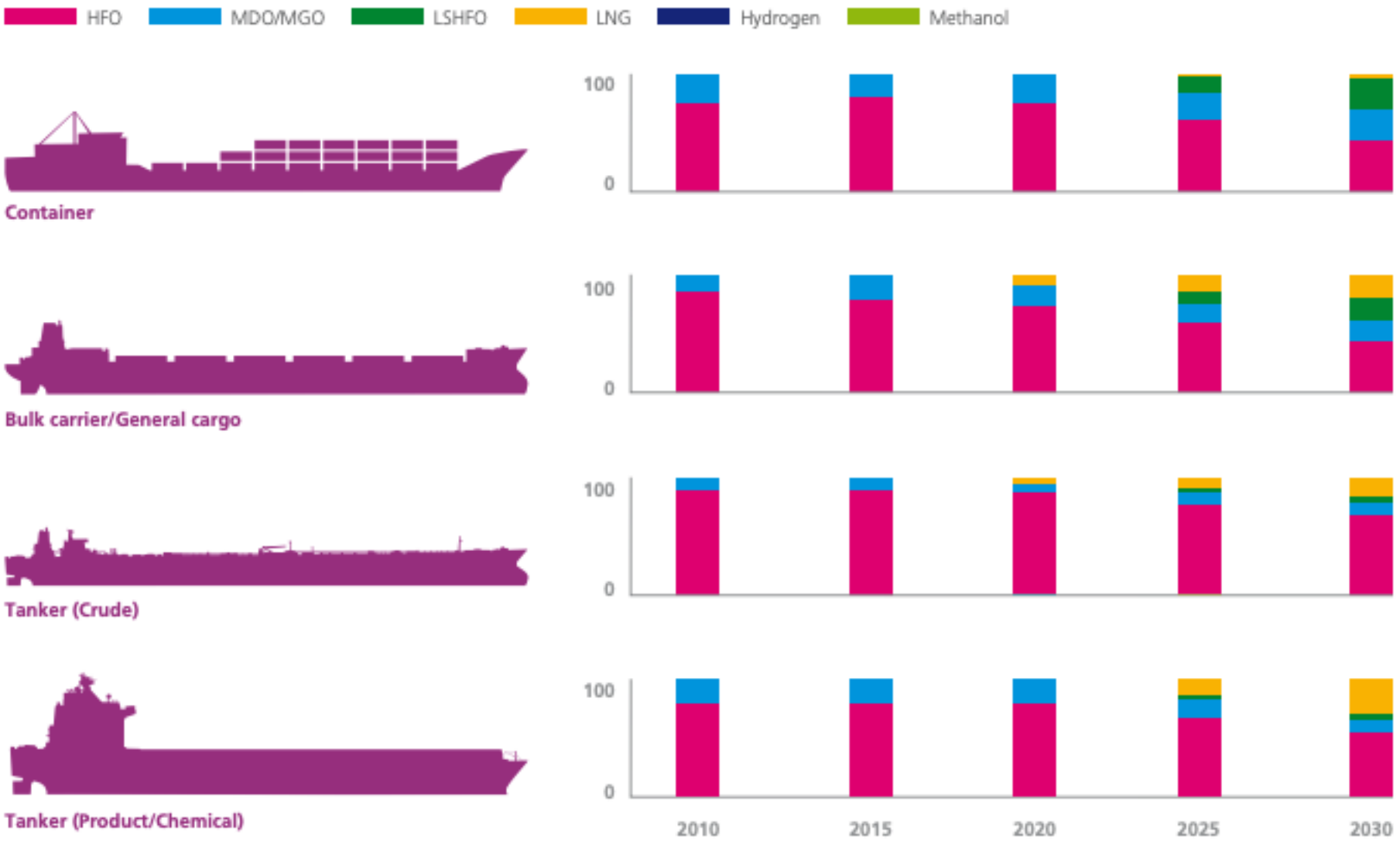
- Why are humans at the core of all these incidents?
- Humans are at the centre of the marine safety system


External to Operator
Within Sector
Internal to Operator
Within Sector
Regulators, industry bodies, designers, maintainers, consultants
Management and owners
Public, families, other stakeholders
Customers and suppliers
External to Operator
External to Sector
Internal to Operator
External to Sector
Information
Regulations
Engineering
Enforcement
Rules
Advice
Assurance
Certification
Knowledge
Attitudes
Support
Education
Information
Relationships
Currency
Procedures
Check lists
Planning
Professional development
Seaworthiness
Skills
Knowledge
Attitudes
Behaviours
Experience
Culture
Errors
Violations
Threats
Hazards
Expectations
Knowledge
Economics
Societal attitudes
Relationships
Expectations
Commercial
Knowledge
Cultures
Attitudes
Met info
Restrictions
and local rules
Physical environment
Strips
Product
Information
Hazards
Equipment
Parts

Shipping – Forces for Change

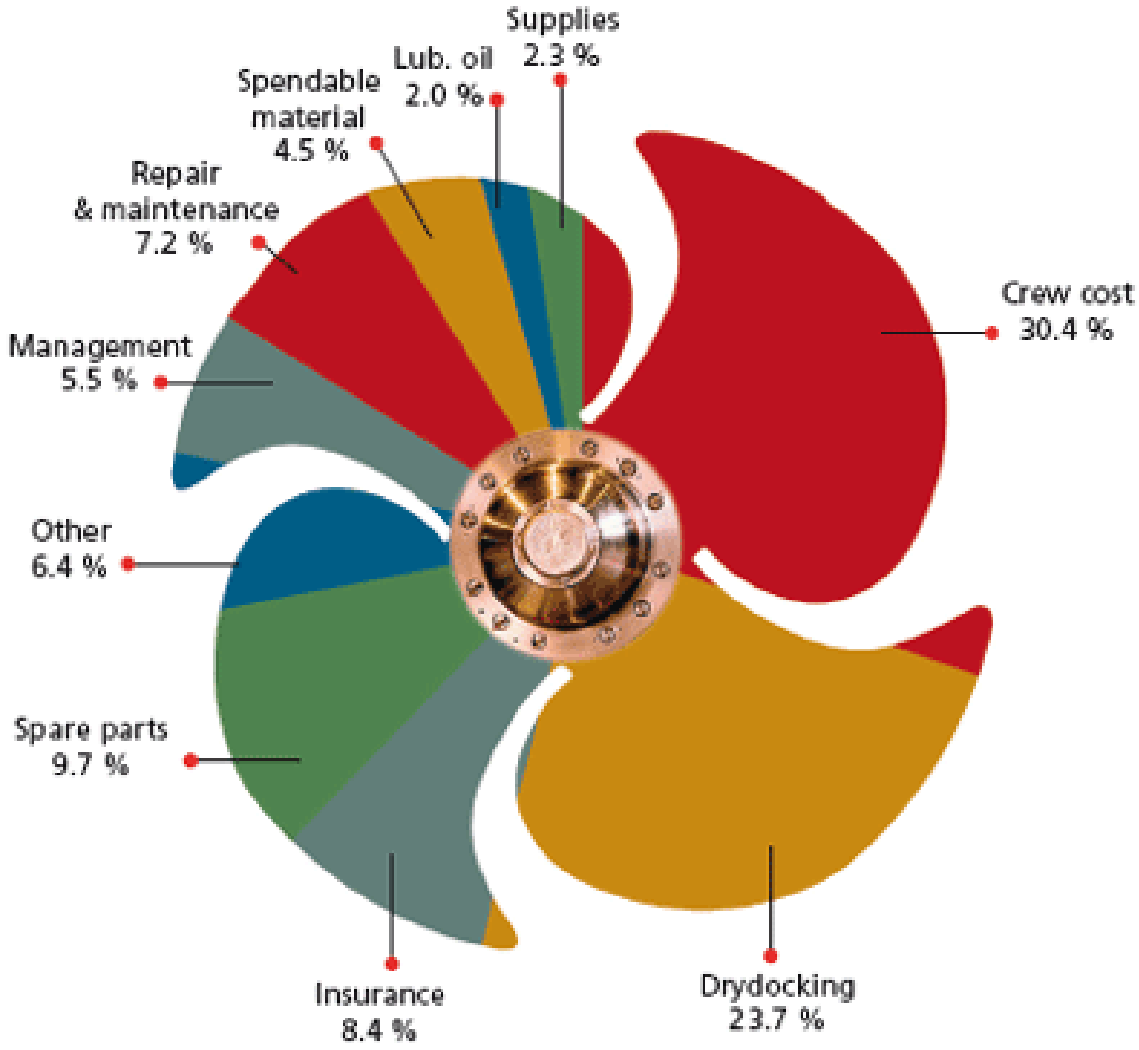


Shipping – Responses



Why Go Autonomous?

1. Cost.
2. Risk.
3. Safety.



What will Autonomous Shipping Be Like?

Where is autonomous shipping at?

US Navy's Anti-Submarine Drone Ship Sailed Autonomously From San Diego to Hawaii and Back

The *Sea Hunter* became the first ship to successfully autonomously navigate from San Diego to Pearl Harbor, Hawaii, and back.

By Franz-Stefan Gady
February 06, 2019

Image Credit: DARPA

Electric Propulsion

Drivers for Autonomous Vessels

Pro:

- SOLAS – safety of life at sea
- Lower risk
- Savings in crew space and build costs (5%)

Cons:

- No crew to take action if something goes wrong
- Need more reliability (e.g. twin propulsion, better fuel, = higher cost)
- No insurance premium reduction (initially)

Effects of Autonomous Vessels

Personal predictions:

- Autonomous vessels will follow dynamic courses using wind assisted propulsion
- Electric propulsion will become more common and will be required to access some ports
- Current hub and spoke shipping model will give way to point-to-point services, arresting trend towards larger vessels (Boeing 787 vs Airbus A380)
- Once lower risk is demonstrated, safety and wreck removal costs will become key drivers of change
- Crewed cargo ships will come to be seen as a hazard due to “erratic” behavior and will eventually be banned
- Once a tipping point is reached, change will come quickly

Effects on NZ Ports?

- Risk of wreck removal liability: additional caution in risk management
- Pressure groups – against any encroachment of marine space
- Point-to-point may mean reduced need to extend size and depth of berths
- Additional capacity may need to come from more berths, not larger
- Automation at port tied in with automation on ships – interoperable or Mac vs Windows?
- Increase in point to point may relieve consolidation pressure on ports.
- Internal NZ rationale for maintaining ports (c.f. Oamaru).
- Shore power supplies required?

A revolution in the making

Shipping is at the eye of another revolution:

- Oars to sails
- Wood to steel hulls
- Sail to steam
- Paddle to screw propulsion
- Coal to oil
- General cargo to containers

- Each of these revolutions had one main dimension.
- The current forces of change upon the global shipping industry are both strong and multi-dimensional.
- Creates many threats and many opportunities
- Risk management

Evolution or Revolution?

The pace of revolution

- Usually slower than pundits initially imagine

But:

- Effects are often more profound than initially thought

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Questions and Comments?