The Absolute Value of Safety

Christopher J. Wiernicki | November 16, 2017
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Working Together
Strong Fleet Safety Performance

- Over past 10 years, ABS classed fleet outperformed the industry average:
  - 46% fewer Serious Hull & Machinery Casualties
  - 42% fewer Serious Overall Casualties

- Strong fleet safety performance demonstrates
  - Effectiveness of the complete lifecycle safety network
  - Quality of the owners and operators of ABS classed vessels

Casualties per 1,000 Vessels per Year - Seagoing Vessels >500GT
3 Yr. Rolling Average – Overall casualties includes operational casualties
Source: Informa (LMIU) Database
ABS CyberSafety® Program

- Cyber Security
- Automated Systems Safety
- Data Integrity
- Software Verification
Technology Evolution

FOURTH INDUSTRIAL REVOLUTION

INDUSTRY 1.0
Mechanization, steam power, weaving loom
1784

INDUSTRY 2.0
Mass production, assembly line, electrical energy
1870

INDUSTRY 3.0
Automation, computers and electronics
1969

INDUSTRY 4.0
Cyber Physical Systems, Internet of Things, networking
TODAY

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Digitization and Connectivity

- Connectivity
- Sensors
- Data
- Autonomy

**Navigation and Operation**
- Speed
- Location
- Time to arrival
- Cargo planning
- Fuel

**Seas and Weather**
- Wave radar
- Wind direction and intensity

**Health**
- Strain and fatigue monitoring
- Optical fiber
- Acoustic emissions
- Machinery functions
- Corrosion
- Coatings

**Performance**
- Efficiency
- Emissions
- Fuel switching

**Compliance**
- Ballast water
- Emission control
- Noise

**Responses**
- Ship motion
- Slamming
- Vibration

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Autonomous and Autonomy
Path to Autonomy

- Sensing and Monitoring
- Health and Performance Monitoring
- Performance Optimization
- Software Integrity
- Cybersecurity
- Machine Learning and Decision Making
- Autonomy

Levels:
- Automated
- Smart
- Semi-Autonomous
- Autonomy
Verification and Validation

Verification
• Are we doing the thing right?

Validation
• Are we doing the right thing?
Working Together
Summary

• Rapid Change in Technology
• Path to Autonomy
  - Cyber
  - Digitization
  - Data
  - Connectivity
• The Absolute Value of Safety
• People
Thank You

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