

# PASSENGER VESSEL SAFETY



**National Transportation Safety Board  
Cruise Ship Safety Forum  
Washington, DC – March 25, 2014**

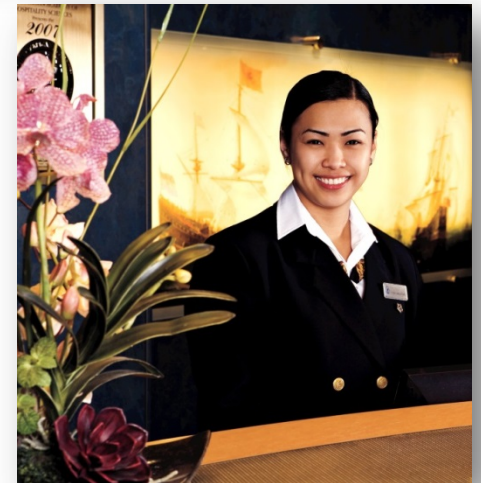
**Cyril Tatar  
Vice President, New Builds  
Holland America Line**



# Holland America Line

## 140-year Proud History

- Dutch Flag
- Headquarters in Seattle and Rotterdam
- 16,000 employees
- 415 ports-of-call
- All 7 continents including Antarctica
- Mission Statement:  
*Through excellence, we create  
once-in-a-lifetime experiences,  
every time*



Holland America Line

*A Signature of Excellence*



## Signature-Class



*ms Eurodam*



*ms Nieuw Amsterdam*

## Mid-size Ships



*ms Prinsendam*

## Vista-Class



*ms Zuiderdam*



*ms Oosterdam*



*ms Westerdam*



*ms Noordam*

## Rotterdam-Class



*ms Rotterdam*



*ms Volendam*



*ms Amsterdam*



*ms Zaandam*

## Statendam-Class



*ms Statendam*



*ms Maasdam*



3 *ms Ryndam*



*ms Veendam*



# Safety Culture

## Identifying and Mitigating Risk

- Safety Management System  
Health, Environment, Safety, Security and Sustainability (HESS)
- Collect and Interpret Data from Operations
- Failure Mode & Effect Analysis (Reliability)
- Audits (Internal & External)
- Reporting & Incident Investigations
- Training & Readiness





# Lessons Learned:

## Upgrading systems in existing fleet

### ■ Fire Prevention & Protection:

- Main Diesel Engine Insulation (Hot Boxes)
- Thermographic Inspections (Cameras)
- Main Electrical Switchboard A60 Class Insulation
- Main Diesel Engine Fuel Isolation Valves & Spray Guards
- Power Supply and Automation Cables Insulation

### ■ Fire Detection:

- Triple-Infrared Fire Detectors
- No Activation Delays
- Machinery Space CCTV - Coverage & Interface with Fire Detection
- Mooring Decks Coverage



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# Lessons Learned:

## Upgrading systems in existing fleet

### ■ Fire Suppression:

- Water Mist Extended Coverage and Pump Redundancy
- CO2 Total Flooding for Machinery Spaces
- Dedicated Bilges Fire Suppression System
- Mooring Decks Drenching System

### ■ Redundant & Backup Power:

- Redundant Engine Rooms – Propulsion Continuity
- Rerouting of Power, Automation and Propulsion Cables
- Redundant Main Electrical Switchboard
- Essential and Comfort Systems beyond SOLAS Minimums



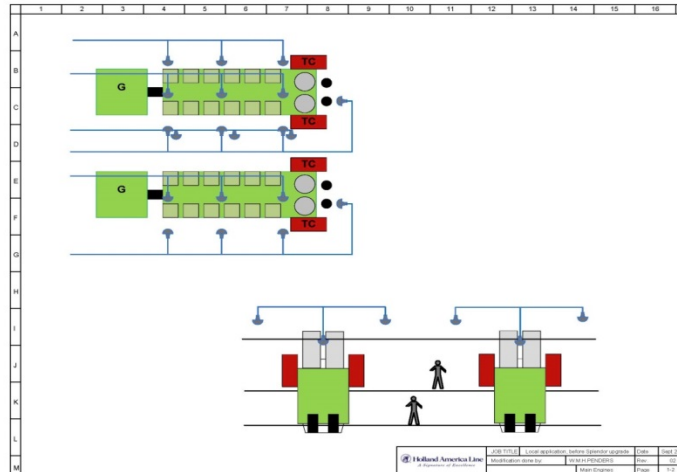
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# Lessons Learned: Upgrading systems in existing fleet

**BEFORE**

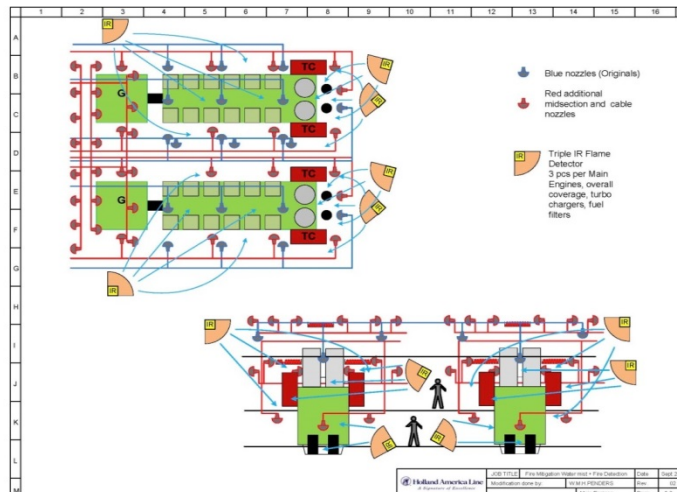


Water Mist nozzles added to:

- ✓ All engines
- ✓ Incinerators and boilers
- ✓ Overhead cabling in ER

- Added Triple IR Detectors
- One Triple IR or two smoke sensors activation and elimination of release delays
- Expanded pump capacity / relocated pumps and valves
- Hi-fog Control Units in ECR

**AFTER**



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# Continuous Improvement: Projects Under Development & Pilot Tests

- Main Diesel Generator:
  - Double-wall Fuel Hoses (Automatic Leak Detection)
  - Fuel Vibrations Damper — Metal Bellows Accumulators
- RFID Tracking of Engine Room Personnel
- Mobile Technology & Remote Access: Real-time Updates and Display for the On Scene Commander (OSC) and Emergency Response Teams
- Advanced Planned Maintenance and Condition Monitoring Systems — Ship Performance Analytics



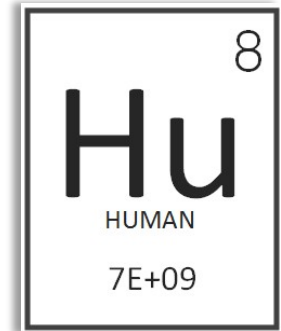
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# The Human Element

## Training and readiness



### Individual:

- STCW & Mandatory Certifications
- Classroom & Computer Based Training (Onboard)
- CSMART Training Center (Shoreside)

### Teams:

- Touch Drills
- Fleet Operational Safety Training
- Live Firefighting Team Training (Off the ship)
- Fleet Captain and Chief Engineers (Mentors)
- Bridge & Engine Room Resources Management Standards



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# Emergency Response Organization Preparedness

## Real-time Exercises

- Shoreside ERC
- Full Integration of Ships
- External Agency Participation
- Remote Access
- Regular Quarterly Exercises
- Complex scenarios included:
  - ✓ Fire at sea in Antarctica
  - ✓ Explosion at sea in Caribbean
  - ✓ Float Plane Crash into Ship Docked in Alaska



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# Proactive Design for New Builds

## Engineering and ergonomics

Lessons Learned and New Standards Incorporated into New Build Specifications:

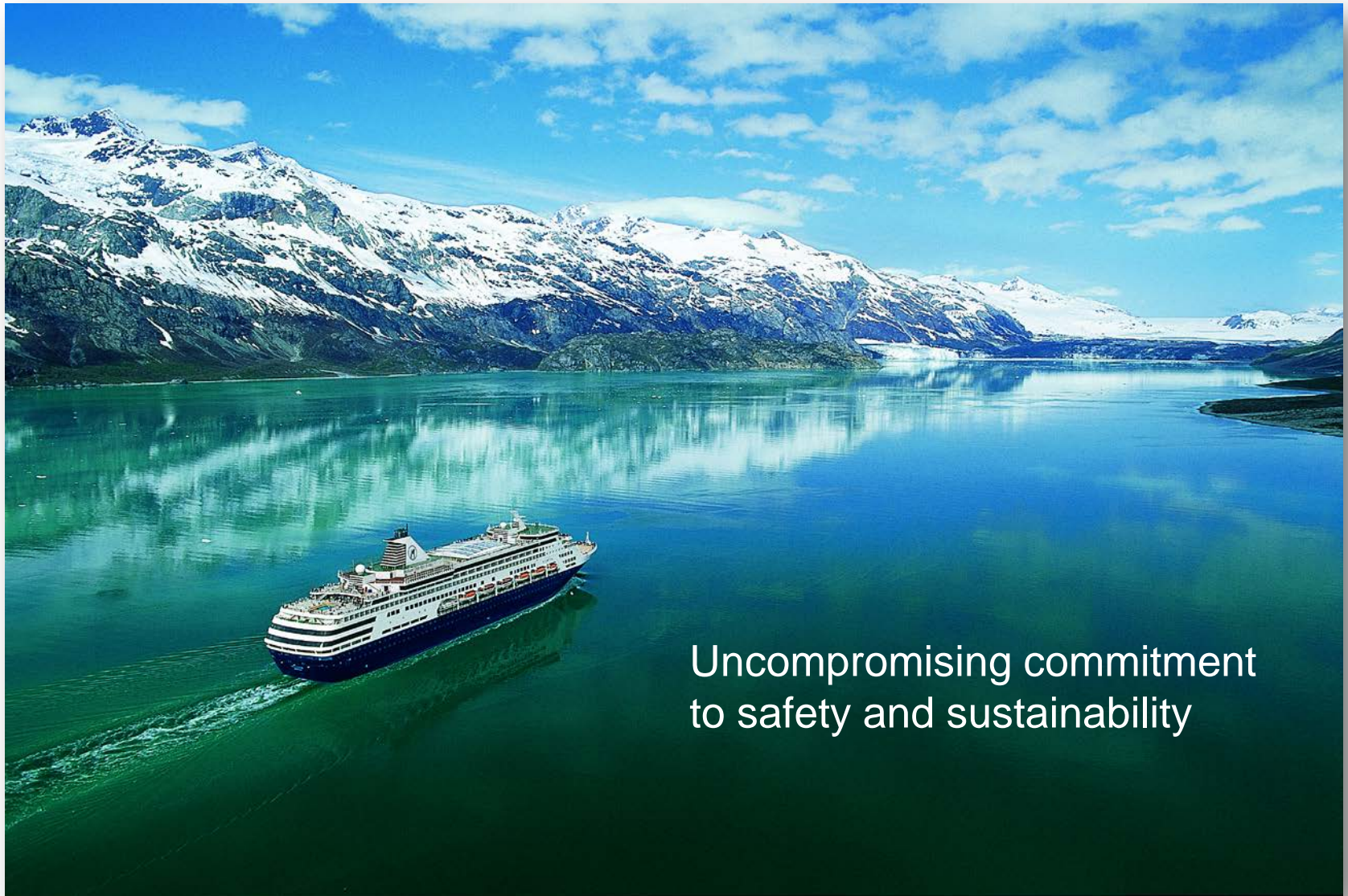
- Segregation of Propulsion and Power Generation Systems
- Machinery Fire Prevention, Detection and Suppression Systems (Total flooding, IR Detectors, Redundant Fixed Fire Fighting System)
- Flooding Detection and Sensors  
Predictive Damage Stability Calculations
- Essential Systems & Expanded Comfort Services
- Incident Management: Safety Center (ERC) and Electronic Decision Support Systems
- Bridge and Engine Control Room Design



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Uncompromising commitment  
to safety and sustainability



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