Hazard Detection – The Missing Piece of the DP Jigsaw

Russ Miles
Guidance Marine
Hazard Detection
- the missing piece of the DP jigsaw

Russ Miles
Chief Technical Officer
Guidance Marine Ltd
The Case for Hazard Detection:

UK merchant vessels >= 100gt casualties by type, 2014

Marine Accident Investigation Branch Annual Report 2014
The Case for Hazard Detection:

MSF 500m Zone Incident Report
What is Hazard Detection?

Sensors:

- We know where we are.
- We know the forces acting on the vessel.
- As a Bridge Alarm and/or A DP Hazard feed.

- **Position Reference Systems (PRS)**
  - DGPS
  - Underwater Acoustics
  - Laser
  - Microwave
  - Trawlwire

- **Environmental Sensors**
  - Compass
  - Wind
  - Vertical Reference Torsion

- **Hazard Detection**
  - Microwave
  - Laser
  - Visual / Camera
Marine ADAS

Russ Miles
Chief Technical Officer
Guidance Marine Ltd
Advanced Driver Assistance System

- Lane-Change Assistance
- Blind-Spot Detection
- Parking Assistance/Vision
- Cross-Traffic Alert
- Side Impact
- Self-Parking
- Lane-departure warning
- Parking Assistance
- Brake Assistance/Collision Avoidance
- Adaptive Cruise Control
- Ultrasonic
- Radar Application
ADAS Capabilities

- Adaptive Cruise Control
- Automatic headlight control
- Collision avoidance and Pre-crash
- Intersection assistant
- Lane departure warning
- Blind spot monitor
- Parking assistance
- Automatic parking
- Traffic Sign Recognition
The Advanced Driver Assist System package, which employs a camera and mid-range radar, underpins a comprehensive suite of new advanced safety technologies introduced across Honda’s new product line-up during 2015. Available as an option on the entry-level model, and available as standard on all other grades, the Advanced Driver Assist System includes Intelligent Speed Assist, Forward Collision Warning, Lane Departure Warning, Traffic Sign Recognition system, and High-beam Support System.
Sensor modalities

- Radar
- Lidar
- Camera
- Infrared
- Ultrasonics
Marine Hazard Detection System
Capabilities

- Drive-on protection
- Collision avoidance
- Traffic surveillance
- Gap maintenance
- Berthing assistance
Enabling technologies
What have we got and what’s coming?

Russ Miles
Chief Technical Officer
Guidance Marine Ltd
Radar

- ARPA
- CPA
- Guard zones
Radar

Poor support for close manoeuvring:

• Low resolution
• High minimum range
• High peak power
FMCW radar

RadaScan View
Parking sensor

Why not put parking sensors on a boat?

- Low maximum range, ~5m
- Noisy environment
Marine “parking sensor”

RangeGuard

Range to Target (m)

12.39
RangeGuard™ is a freestanding, independent range finder and hazard detector manufactured by Guidance.

It operates at 24GHz.

It monitors the near vessel area >50m and sends alarms/DP feeds as required.

A number of RangeGuard™ sensors
Safe Surround