Ocean Infinity ships, technology & assets — scale, precision and speed

- 3 x multi-purpose support vessels
- 6000m AUVs
- USVs
- High resolution sensors
- 6000m WROVs
- Salvage capability to 6000m (cranes, winches, etc)
- Hull mounted MBES system on all vessels
<table>
<thead>
<tr>
<th><strong>Seabed Constructor</strong></th>
<th><strong>Island Pride</strong></th>
<th><strong>Normand Frontier</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Design</strong></td>
<td>MT 6022 MKII</td>
<td>UT 737 CD</td>
</tr>
<tr>
<td><strong>Year</strong></td>
<td>2014</td>
<td>2014</td>
</tr>
<tr>
<td><strong>Length</strong></td>
<td>115.4m</td>
<td>103.3m</td>
</tr>
<tr>
<td><strong>Breadth</strong></td>
<td>22m</td>
<td>21m</td>
</tr>
<tr>
<td><strong>Accommodation</strong></td>
<td>102 PAX</td>
<td>90 PAX</td>
</tr>
<tr>
<td><strong>Crane</strong></td>
<td>250 Ton AHC</td>
<td>125 Ton AHC</td>
</tr>
<tr>
<td><strong>Moonpool</strong></td>
<td>7.2m x 7.2m</td>
<td>7.2m x 7.2m</td>
</tr>
<tr>
<td><strong>Main Deck</strong></td>
<td>1300 m²</td>
<td>800 m²</td>
</tr>
<tr>
<td><strong>Design</strong></td>
<td>YARD OSCV</td>
<td></td>
</tr>
<tr>
<td><strong>Year</strong></td>
<td>2014</td>
<td></td>
</tr>
<tr>
<td><strong>Length</strong></td>
<td>122.8m</td>
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</tr>
<tr>
<td><strong>Breadth</strong></td>
<td>23m</td>
<td></td>
</tr>
<tr>
<td><strong>Accommodation</strong></td>
<td>100 PAX</td>
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</table>
ROV Fleet (2 per vessel)

6000m Work Class ROVs

- Schilling HD
- Krystdesign KD
Autonomous Surface Vehicles (ASV)

- 150hr endurance
- Multiple payload option

Heavy lift System (x2)
- 45T at 6000m
- 250T at 3000m

Safety
AUV Sensor payload

- HiSAS 1032, Kraken MINSAS 120
- Edgetech side scan sonar
- EM2040 multibeam echosounder
- Edgetech sub-bottom profiler
- Cathx color camera
- Conductivity/temperature/depth (SAIV)
- Self compensating OFG magnetometer
- FLNTU turbidity/visibility Sensor

Length = 6.2m  
Diameter = 0.875m  
Weight = 1,850kg  
Speed = 2-6kts  
Mission duration = 60-100hr
15 Hugin autonomous underwater vehicles
• ~27,000+ survey hours
• 140,000 Lkm
• 181,000 Sqkm
• ~700 missions
• Off the shelf technology — built to OI specifications
AUV hanger
HARDWARE SOLUTIONS

• Managing large data sets –
• Up to 90Gb per hour of survey
• Security, encryption, redundancy and time/speed critical

STORAGE
ALL-FLASH ARRAYS

• Scalable network architecture
• Networking and communication challenges
• From seabed to shore — acoustic communications, wireless/RF, wired networking, VSAT, cloud storage & physical servers

NETWORK
LOW-LATENCY SWITCHES

• Post mission analysis
• Data processing
• Delivery to stakeholders
• Automating workflows
• Future developments AI, ATR, machine learning & cloud computing

COMPUTE
HIGH-DENSITY SERVERS

High resolution, high quality data and information
OCEAN INFINITY – MULTIPLE AUV OPERATIONS

- R&D THROUGH REAL WORLD OPERATIONS:
  - Without supervision from surface vessels, under ice, long endurance missions, challenging weather
  - L&R systems, infrastructure improvements, A-comms, RF, V-Sat, networking & navigation systems
Ocean Infinity – AUV operations
**MH370 Area Coverage**

**Ocean Infinity Search Area**
4.5 months of operations, 1 vessel - 8 AUVs
125,134km² (36,483nm²)

**ATSB Search Area**
27 months of operations, 3 deep-tow vessels and 1 AUV
121,502km² (35,425nm²)
La Minerve — lost 1968

UTC
Date: 21/07/2019
Time: 17:10:35

East: 718626.95 m
Nor: 4738193.31 m
HDG: 186.02
Depth: 2230.22m
Alt: 2.24 m

Dive # 72

POI-11 Visual Inspection
ARA San Juan search

Mosaic of original 75kHz wide area search data
500m range scale, 50m altitude, 3.6kts, 20% overlap.
Overall consistent good quality SSS data, minimal data gaps and minimal lower probability of detection (LPD) areas.
Search areas 1-14
Multibeam Backscatter image:
Defines ridge line and impact crater
Four large sections at top of ridge, while smaller pieces and sail are on down slope.
GEOLOGICAL ANOMALIES
Magnetometer Signature, draped over SSS
Plug the gaps / Infill the gaps and “Map the Gaps”

- Leap of faith?
- Categorise autonomous data
- Data Assured standards
- Utilise ALL the tools in your toolbox
- Incentivise and encourage
- Need for a targeted and prioritised survey plan
- Collaboration
- IT IS ALL ABOUT THE DATA