



# Ship-based Robotics

**An Enabling Technology for Manned and Autonomous Vessels**

Tremough Innovation Centre, University Campus, Penryn, Cornwall

26th September 2019



**Ship-based Robotics - An Enabling Technology for Manned and Autonomous Vessels**

# Technical Market Research

**Paul Weston**

Director

Weston Marine Consultancy Limited



## Ship-based Robotics - An Enabling Technology for Manned and Autonomous Vessels

### Contents:

1. Review the Intervention Tasks to support offshore renewable energy and similar activity.
2. Review the available tools, processes and deployment methods needed to perform intervention tasks and identify which could be used in an automated manner from an ASSP.
3. Other services



## Ship-based Robotics - An Enabling Technology for Manned and Autonomous Vessels

### Intervention Task:

What is an intervention task?

*“The ability to provide a service to assist in an activity to increase it’s potential output”.*

Identify intervention tasks

Collate / tabulate intervention tasks

Identify industries / Activities that could benefit from the ASSP



## Ship-based Robotics - An Enabling Technology for Manned and Autonomous Vessels

### INTERVENTION TASKS: Industry: Sub-Sector

**Oil & Gas:** Platforms, FPSO, Drill Ship, Loading Buoy, Tanker, Supply Vsl, Decom

**Renewables:** Floating Wind, Offshore Wind, Tidal, Wave, Ocean Thermal

**General Maritime:** Survey/Science: ASV, AUV, Floating

Search & Rescue: Search, Rescue, Recovery

Subsea: Well Head, Inspection, Maintenance, Recovery, Survey

Maritime: Linkspan, Lifeboat Launch, Payload Transfer

Autonomous: Subsea, Surface

Salvage: Prep, Lift, Recover

Marine Civils: Nearshore, Offshore, Onshore

Survey: Deploy, ROV, Scan, Recovery

Aquaculture: Fish





## Ship-based Robotics - An Enabling Technology for Manned and Autonomous Vessels

### Intervention Task: Activity

<b>Cable end retrieval:</b>	<b>126</b>	<b>AUV/ASV transfer:</b>	<b>107</b>	<b>Pilot transfer:</b>	<b>23</b>
<b>ROV manipulators:</b>	<b>125</b>	<b>AUV LAR:</b>	<b>102</b>	<b>Blade tip insp':</b>	<b>22</b>
<b>Recovery:</b>	<b>125</b>	<b>Casualty recovery:</b>	<b>101</b>	<b>Satellite rec'ry:</b>	<b>12</b>
<b>Payload transfer:</b>	<b>124</b>	<b>Equipment maint':</b>	<b>77</b>	<b>Rocket SpaceX:</b>	<b>10</b>
<b>Ship-ship transfer:</b>	<b>119</b>	<b>Spares:</b>	<b>93</b>	<b>Plane refuel:</b>	<b>3</b>
<b>Access:</b>	<b>118</b>	<b>Crew transfer:</b>	<b>71</b>		
<b>ASV recovery:</b>	<b>116</b>	<b>Refuelling:</b>	<b>61</b>		
<b>Product transfer:</b>	<b>116</b>	<b>Davit operation:</b>	<b>60</b>		
<b>Launching:</b>	<b>111</b>	<b>Turrets mooring:</b>	<b>52</b>		



**Ship-based Robotics - An Enabling Technology for Manned and Autonomous Vessels**

**IDENTIFY INDUSTRIES / ACTIVITIES THAT COULD BENEFIT FROM ASSP:**

**INDUSTRY:**

**Oil & Gas**

**Offshore Wind**

**General Maritime**

**INTERVENTION TASK:**

**Launch & Recovery**

**Handling of Cables and Mooring Ropes**

**Crew Transfer**

**Transfer of Goods**





**Ship-based Robotics - An Enabling Technology for Manned and Autonomous Vessels**

## **Processes and Tooling: Platforms**

**Floating – Over the side, Moonpool Deployment, ROVS, AUVs,**

**Offshore – Windfarm installation, walk to work, crew transfer**

**On land – crane demolition**



## **Ship-based Robotics - An Enabling Technology for Manned and Autonomous Vessels**

### **Intervention: Tooling**

- **ROV Manipulators: cable cutting, camera boom, cleaning brush, jetting systems, gasket change out, manipulator jaw**
- **Offshore: hyd release shackle, pipe cutter, jacket external lifting tool, buoyancy clamp, flanged pile upending tool, transition piece lifting tool, Amplemann system**
- **Pipe recovery tool, heave compensating tool – Maxine**
- **Floating: crane, davit, A frame, lifeboat launch**



## **Ship-based Robotics - An Enabling Technology for Manned and Autonomous Vessels**

### **Summary**

**Diverse application**

**Concentrate on known industries**

**Autonomous industry further down the line**

**Build one**

**Interested parties already keen to engage**