

FY2019 results report

for Nippon Scotland Joint Ocean Innovation Program

The development of autonomous maintenance technologies applying the technologies of industrial robot arm.

Kawasaki Heavy Industries, Ltd.

Description

Object

The development of **autonomous maintenance technologies** applying the technologies of industrial robot arm.

Key technologies

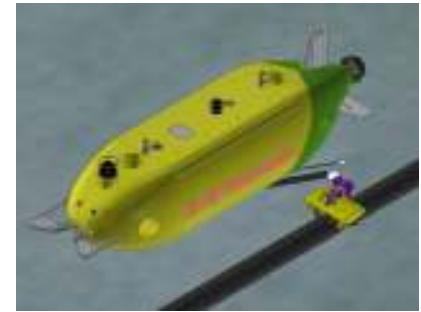
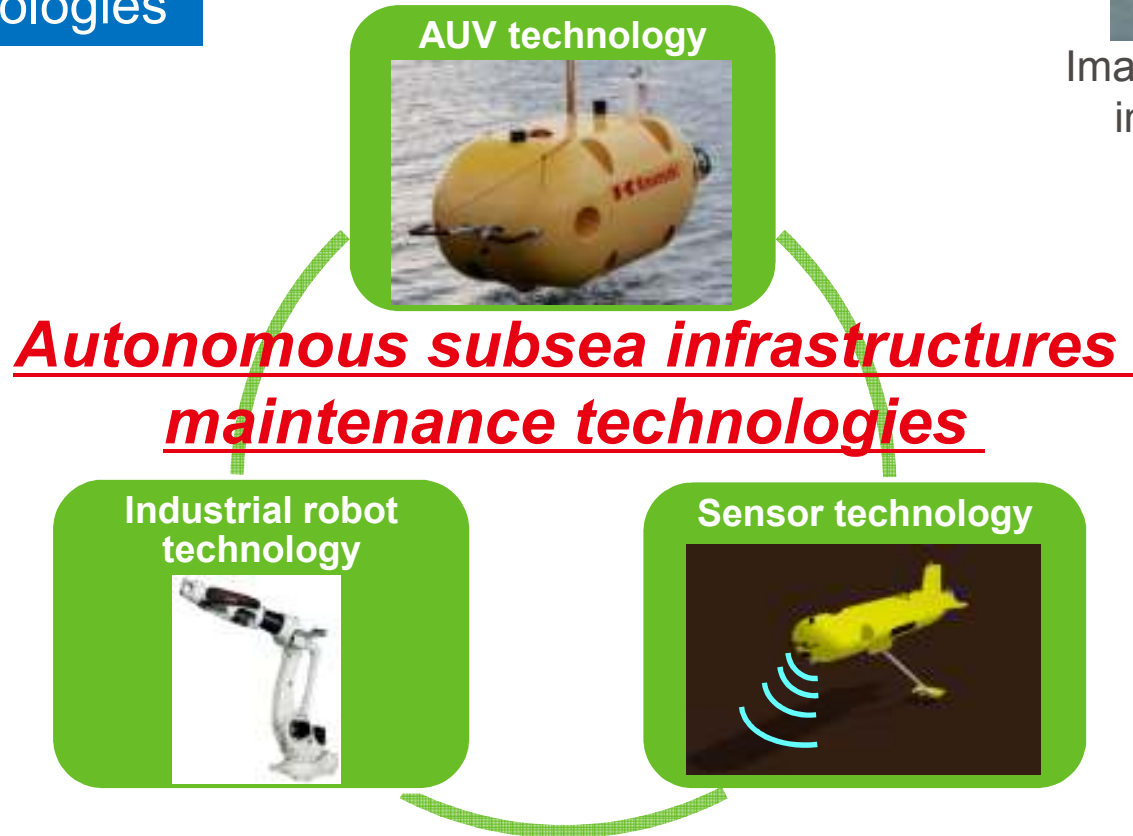
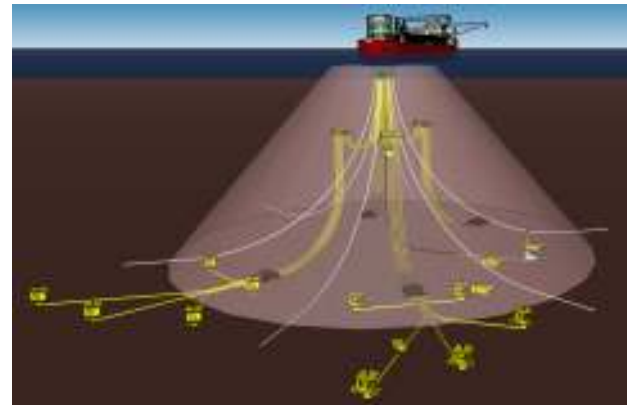


Image of subsea pipeline inspection with AUV

Description

Where to apply

- Subsea infrastructure inspection
 - Inspection for decommissioning and continuous research after decommissioning
- etc.



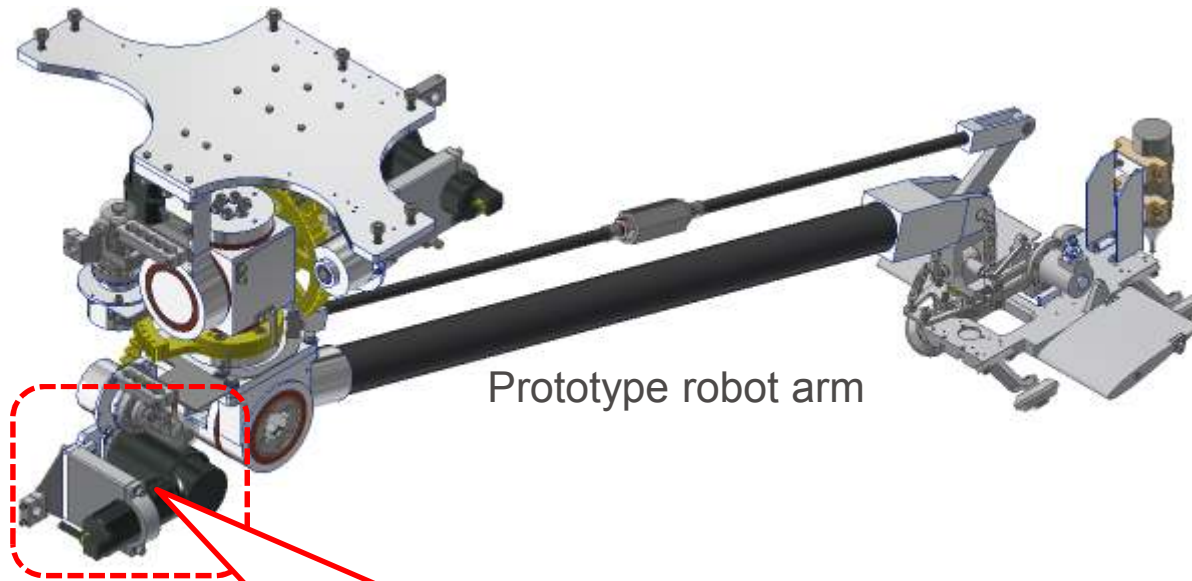
Structure and role

Parties	Japanese side	Scottish side
Key technologies	AUV & Robot arm	Sensor
Lead company	Kawasaki Heavy Industries Ltd.	Hydrason Solutions Limited
Partners	Kobe University	Heriot Watt University

Result for 2nd year

- New water pressure resistant motor -

- New design water pressure resistant motor



High response
for
robot arm

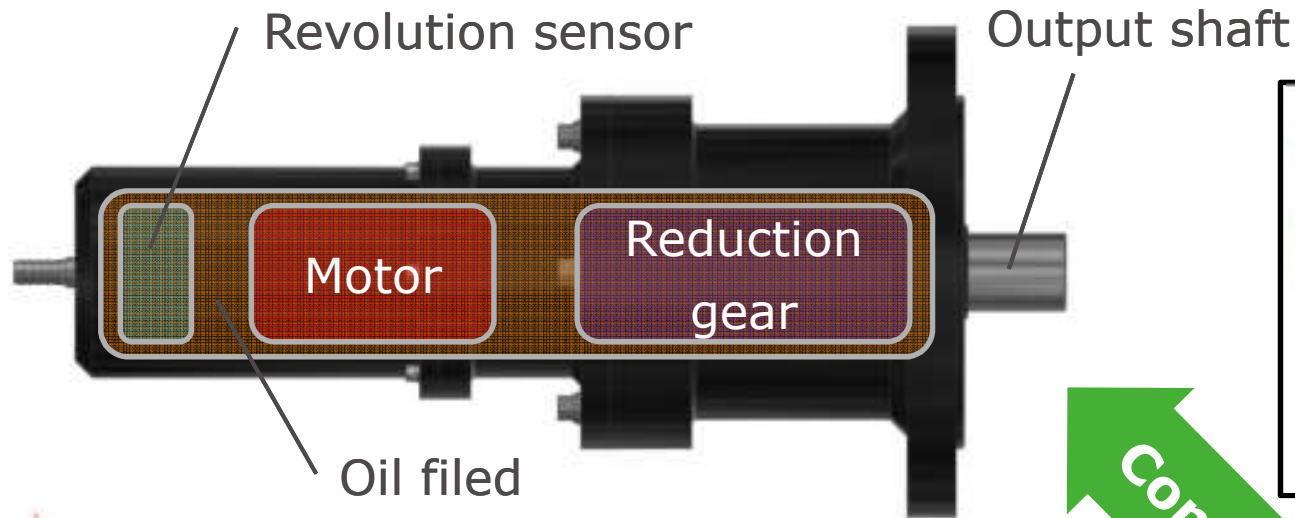
New water pressure
resistant motor



Result for 2nd year

- New water pressure resistant motor -

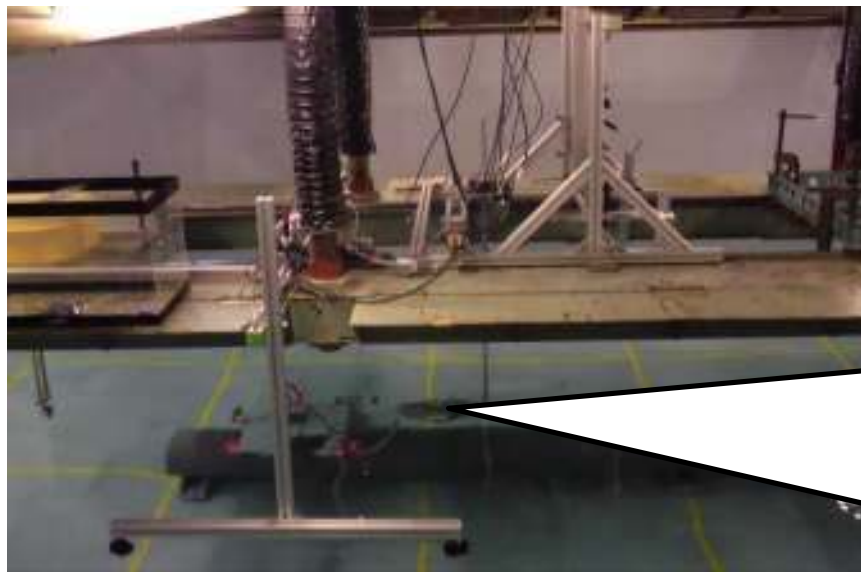
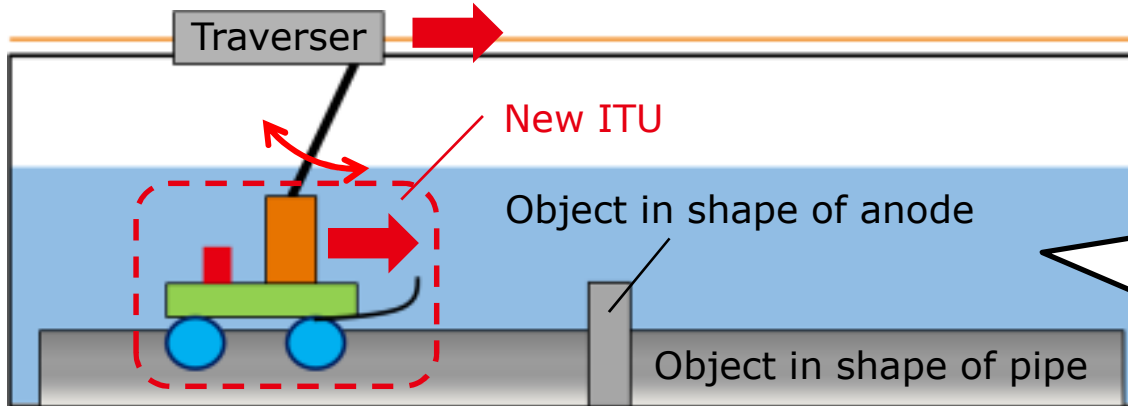
- New design water pressure resistant motor(prototype)



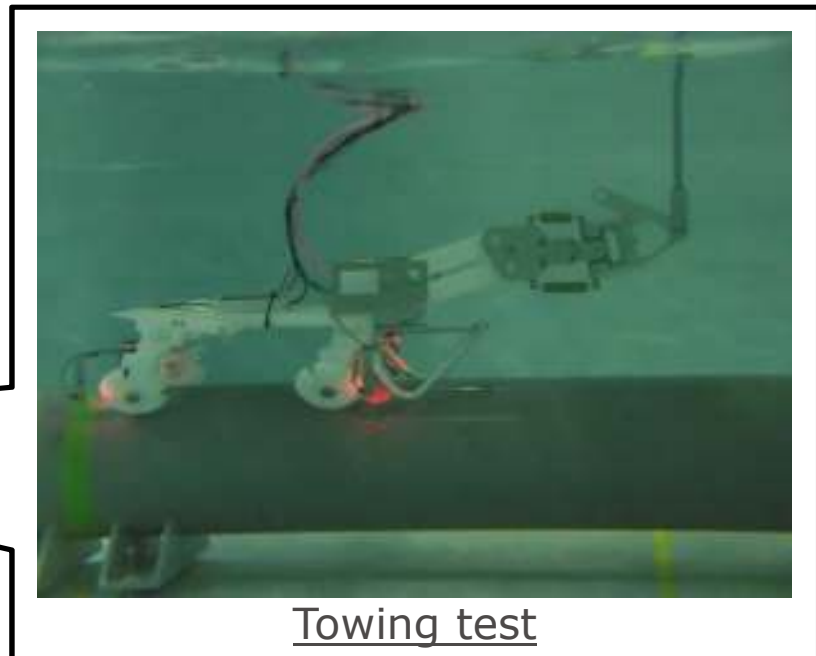
Result for 2nd year

- New device for stability of robot arm end "ITU" -

■ Tank test of new design ITU



Test devices



Towing test

Result for 2nd year

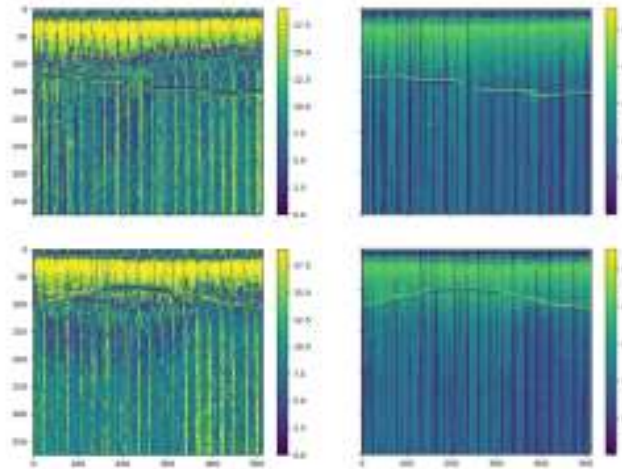
- WBS(WideBand Sonar) development -



Wideband Sonar

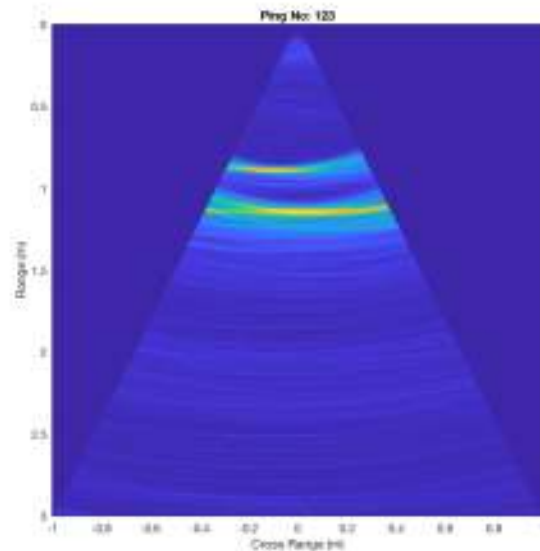
Sensor R&D:

- Improved signal quality
- Better LF performance

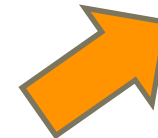


Detection R&D:

- Sediment acoustic models
- Object acoustic models
- Wideband beamforming
10-150 kHz



**AUV Integration
Sea Trials (2020)**



Kawasaki, working as one for the good of the planet
“Global Kawasaki”