



R/V Kairei Cruise Report

KR15-E03

Sea trial of ROV “KAIKO Mk-IV”

Sagami Bay

January.22, 2015 - January.23, 2015

Japan Agency for Marine-Earth Science and Technology
(JAMSTEC)

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1. Cruise Information

- 1) Cruise ID : KR15-E03
- 2) Name of vessel : R/V Kairei
- 3) Cruise Title : Sea trial of ROV "KAIKO Mk-IV"
- 4) Chief scientist : Hidehiko Nakajoh, MARITEC, JAMSTEC
- 5) RePresentative of Scientice Party : Hiroyuki Osawa, MARITEC, JAMSTEC
- 6) Title of the proposal : Resource generation environment research cruise of manganese crust at deep sea by ROV " KAIKO Mk-IV".
- 7) Cruise period : 2015/1/22 ~ 2015/1/23
- 8) Ports of call : Yokosuka (JAMSTEC) ~ Yokosuka (JAMSTEC)
- 9) Experiment Area :

Sagami Bay (water depth of 500m ~ 1,200m)

The test area is within one mile radius of the circle centered at 35°00.0'N, 139°13.0'E.

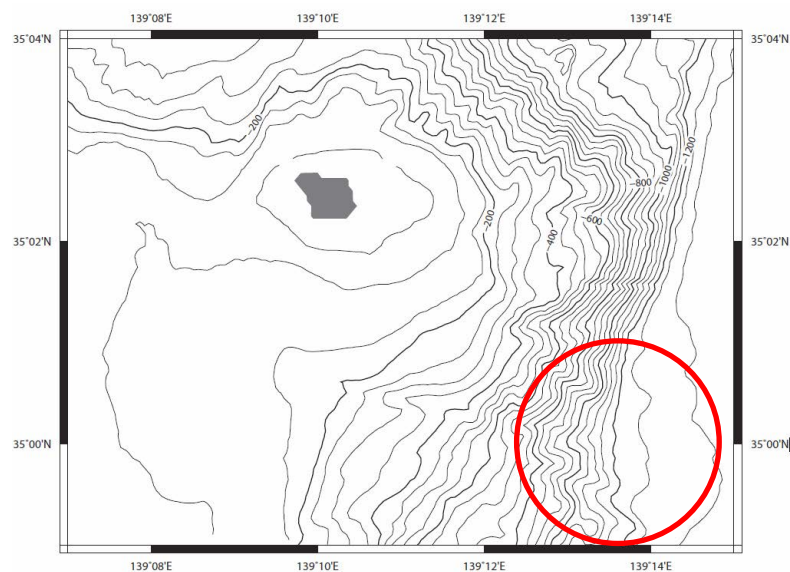


Figure 1: Test area

2. Researchers

Chief scientist: Hidehiko Nakajoh (JAMSTEC)

Science party (List)

Kazuyoshi Hirata (JAMSTEC)

Fumitaka Sugimoto (JAMSTEC)

Yuuri Kurata (JAMSTEC / Yokohama National University)

Kenta Akiyama (JAMSTEC)

Satoshi Ogura (JAMSTEC)

Yoshinobu Nannbu (JAMSTEC)

Mitsuru Torigoe (JAMSTEC)

Masayuki Watanabe (JAMSTEC)

Sayuri Matsumoto (PARI)

Tomoo Sato (RARI)

Masakazu Matsushima (Mitsui Engineering & Shipbuilding Co., Ltd.)

Wataru Murata (Mitsui Engineering & Shipbuilding Co., Ltd.)

Kenji Ide (Mitsui Zosen Systems Research Inc.)

3. Cruise Log

KR15-E03 Schedule

Date (2015)	Note	Test Area	contents
22, January (Thursday)	Departure Dive#642	Sagami Bay	Comprehensive test at sea
23, January (Friday)	Arrived at YOKOSUKA		Remove fittings

4. Summary

The sea trial of ROV "KAIKO Mk-IV" (vehicle), which was connected launcher part of ROV "KAIKO 7000II" system, during KR15-E03 cruise was carried out with purpose of comprehensive test at sea, but the test during the dive was stopped unexpectedly by equipment trouble.

5. Equipment

5-1. ROV system: KAIKO Mk-IV

KAIKO Mk-IV is a new work class ROV applied for various deep-sea explorations such as submarine resource explorations and so on (Figure 2). Several advanced technologies developed in JAMSTEC, such as INS, buoyancy material, optical / power composite cable and so on, are adapted to this vehicle.

She has a hydraulic power unit (55kW) targeting improvement in its work capability. High performance thrusters and manipulators that are mounted on the vehicle are driven by supplied hydraulic pressure with the hydraulic power unit.

The vehicle's mission is to survey deep ocean areas that are impossible to survey with manned submersibles and deep ocean areas that are dangerous due to complicated topography.

The KAIKO Mk-IV vehicle is capable of diving to a maximum depth of 7,000 m and was deployed from its own launcher, which is also fitted with various operational sensors.

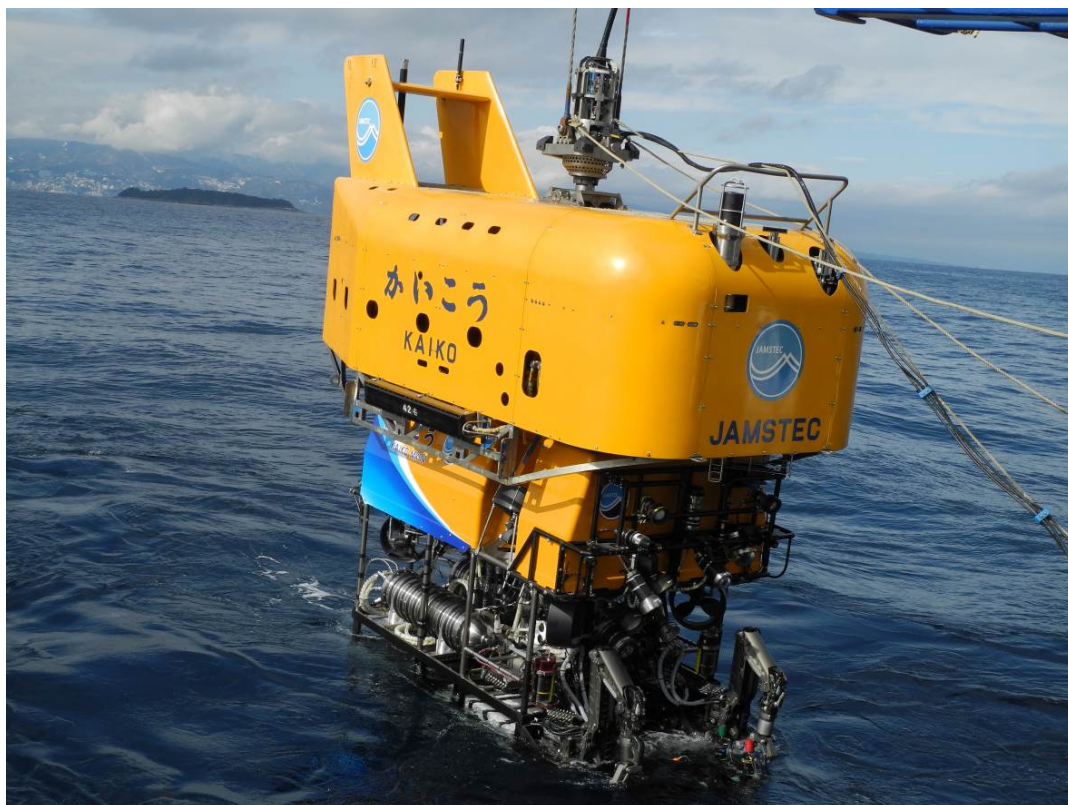


Figure 2: KAIKO Mk-IV (JAMSTEC)

Table 1: Specifications

	Vehicle	Launcher
Length	3.0 m	5.2 m
Width	2.0 m	2.6 m
Height	2.6 m	3.2 m
Weight in air	5,500 kg	5,800 kg
Depth	7,000 m	11,000 m
Payload weight	200 kg (in water), 300 kg (in air)	
Power	3,200 V AC 3 phase from surface vessel via launcher	
Thrusters	forward/reverse: 4, vertical: 3 (total max. thrust force: 3.4kN)	
Payload	SBE-49 CTD (conductivity, temperature and depth) 2 × wide angle colour HDTV cameras, 1 × CCD colour TV camera, 1 × digital still camera (18 megapixels) 1 × wide angle underwater fisheye camera, halogen lights, 400 W HMI lights, LED lights, DO	CTD (conductivity, temperature and depth), side scan sonar, sub-bottom profiler, monochrome TV camera for monitoring coupling operations, secondary cable for monitoring, monochrome TV camera
Manipulators	2 × manipulators (7-function master-slave)	
Navigation	Monochrome TV camera, altimeter, depth sensor, flasher, obstacle avoidance sonar, INS, DVL, ARGOS	Obstacle avoidance sonar, altimeter, depth sensor, compass
Cables	Optical/power composite cable: primary cable: 45 mm (diameter) × 12,000 m secondary cable: 29.5 mm (diameter) × 250 m	Optical/power composite cable: primary cable: 45 mm (diameter) × 12,000 m, secondary cable: 29.5 mm (diameter) × 250 m

6. Notice on Using

Notice on using: Insert the following notice to users regarding the data and samples obtained.

This cruise report is a preliminary documentation as of the end of the cruise.
This report may not be corrected even if changes on contents (i.e. taxonomic classifications) may be found after its publication. This report may also be changed without notice. Data on this cruise report may be raw or unprocessed. If you are going to use or refer to the data written on this report, please ask the Chief Scientist for latest information.
Users of data or results on this cruise report are requested to submit their results to the