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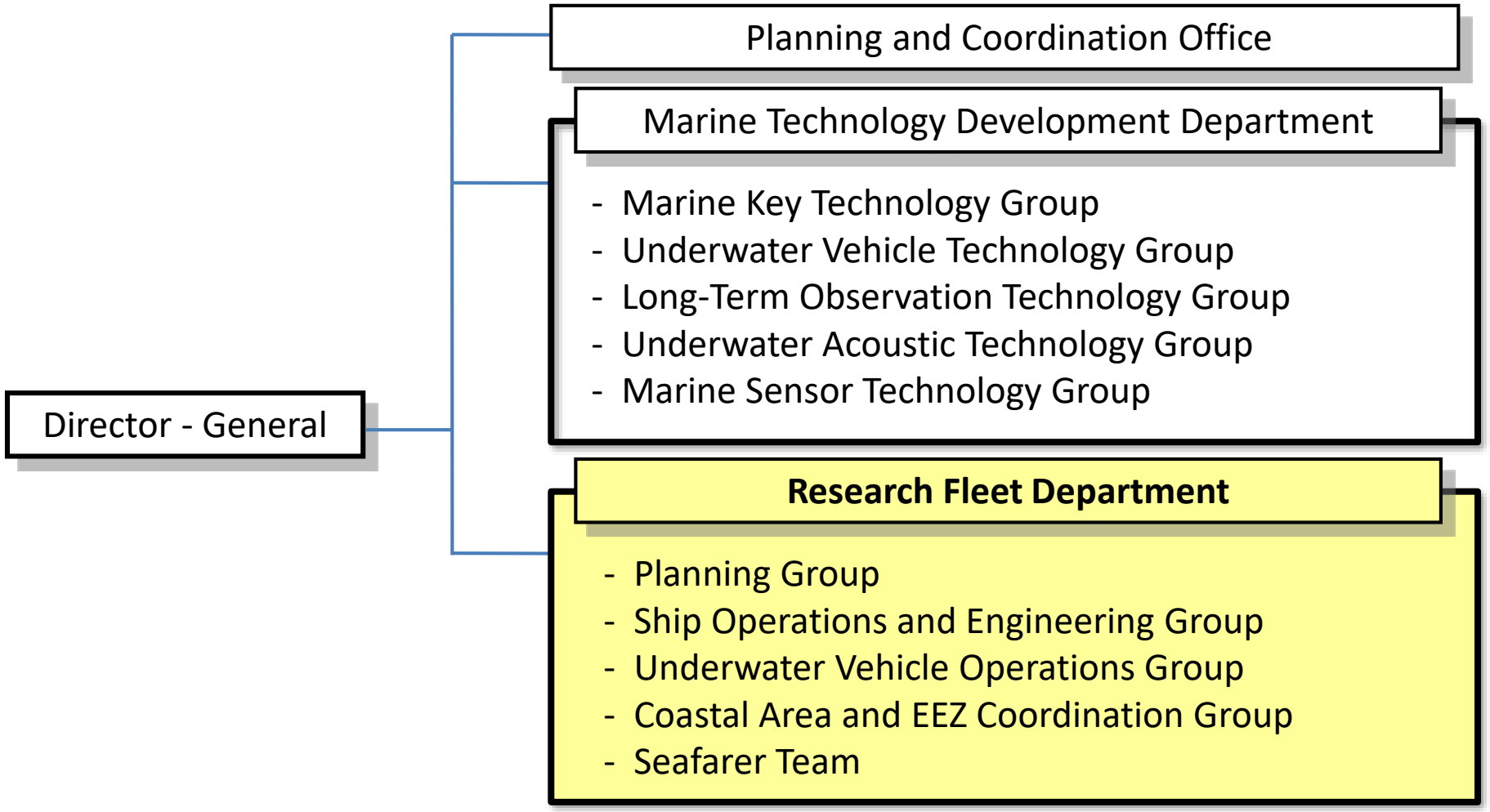
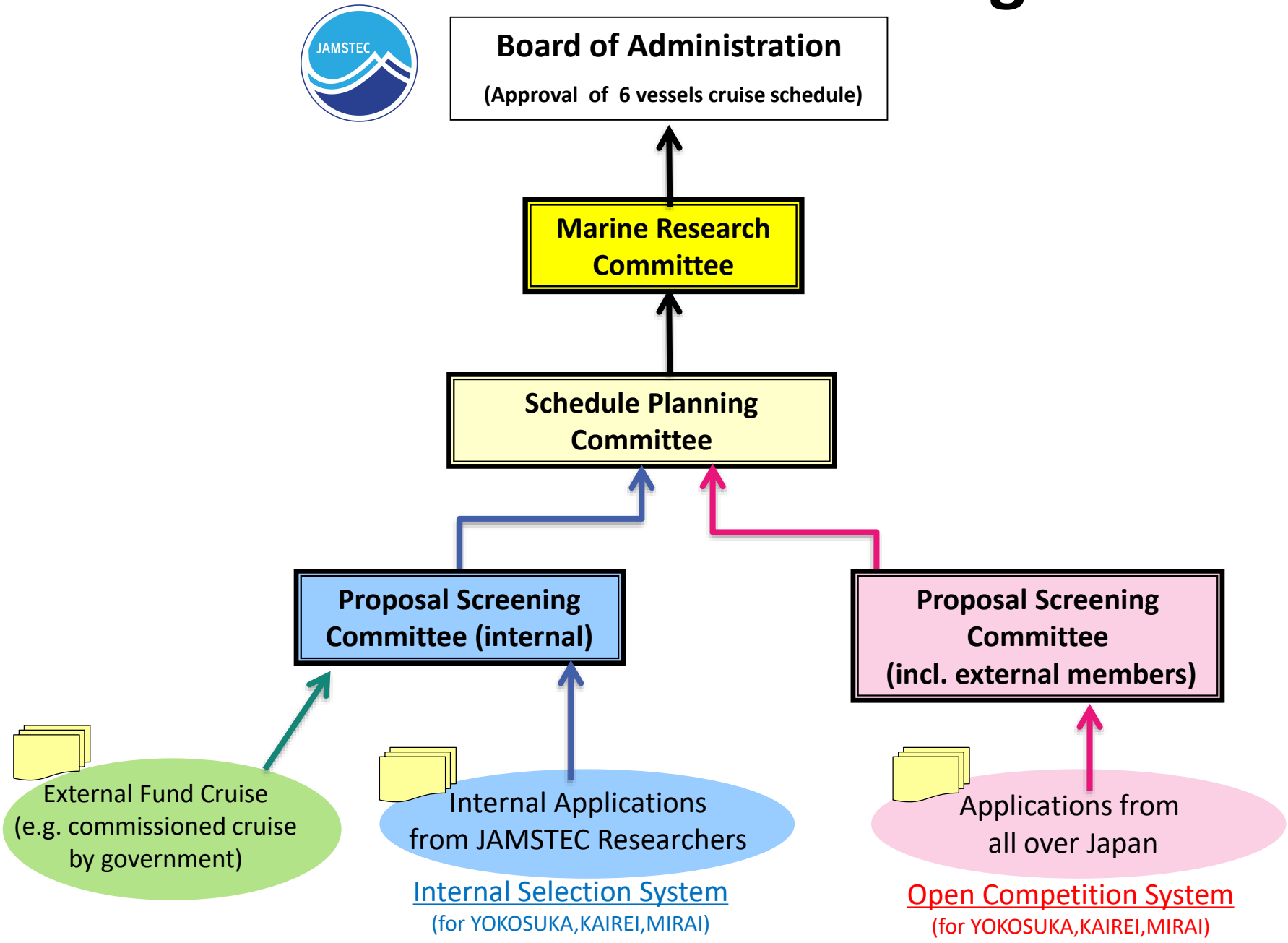
Introduction of Cruise Planning and Trends in Cruise Days

Research Fleet Department
Yuko MORI

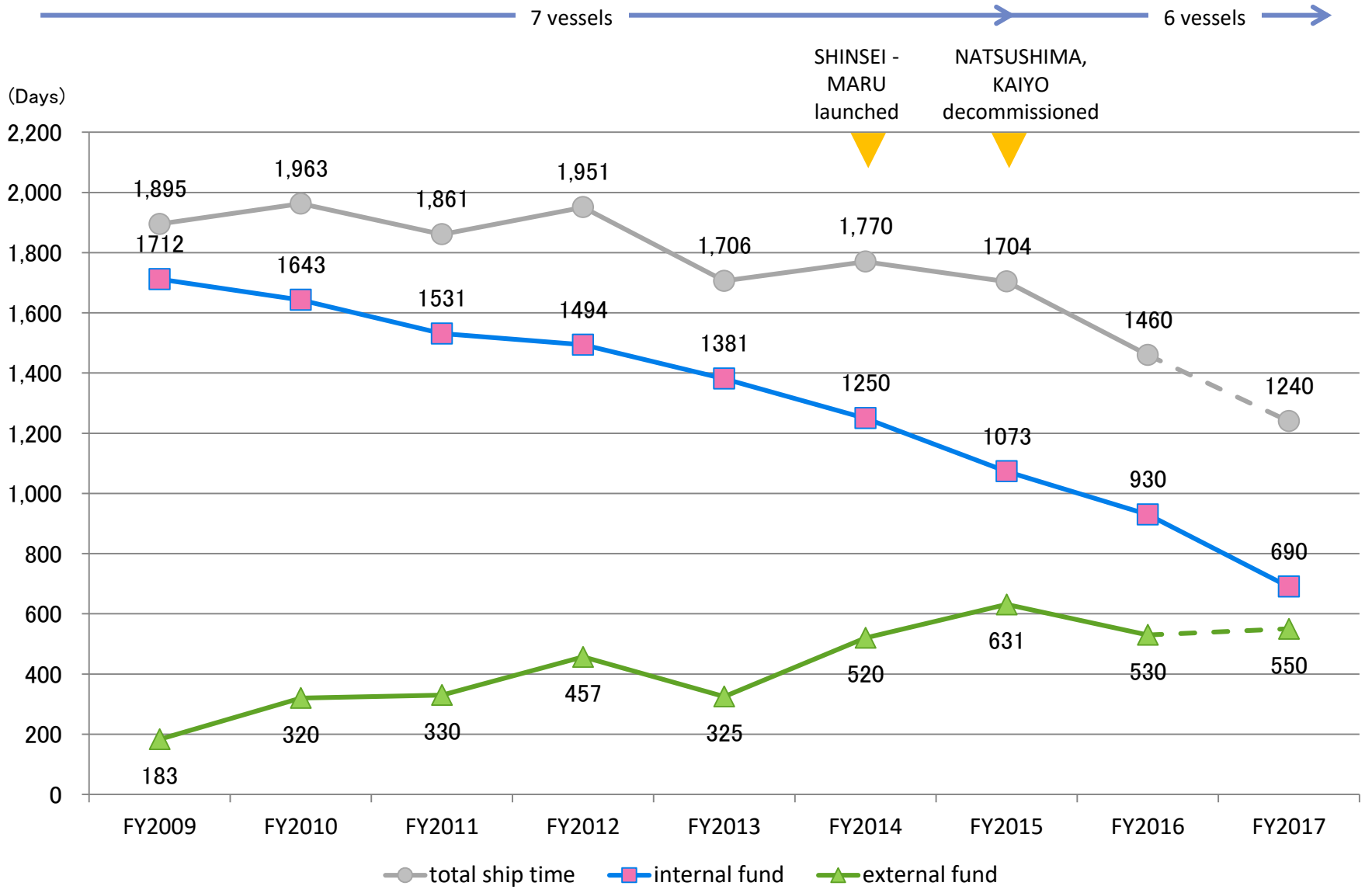
Structure of MARITEC
(Marine Technology and Engineering Center)



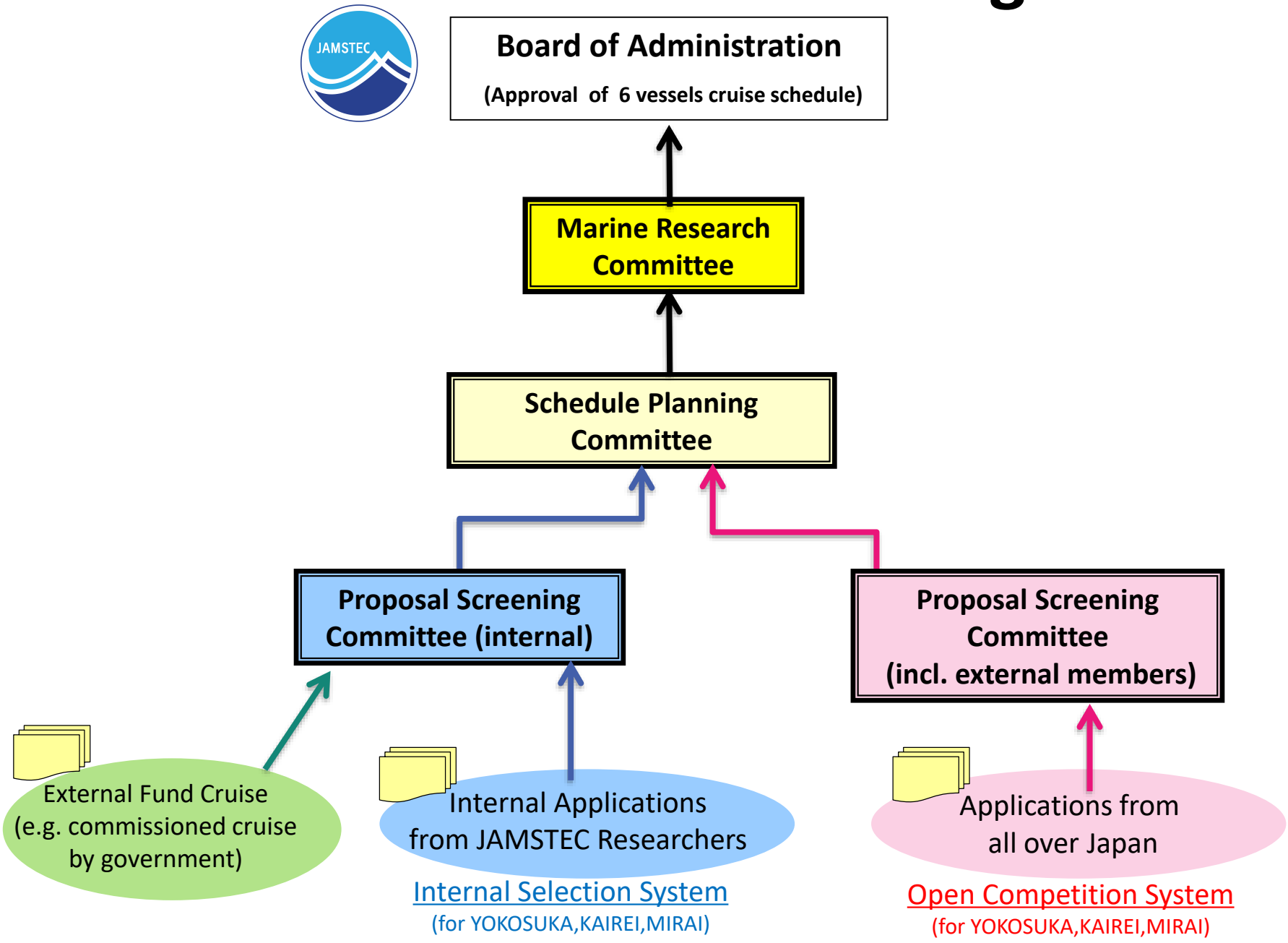
Flow of Cruise Planning



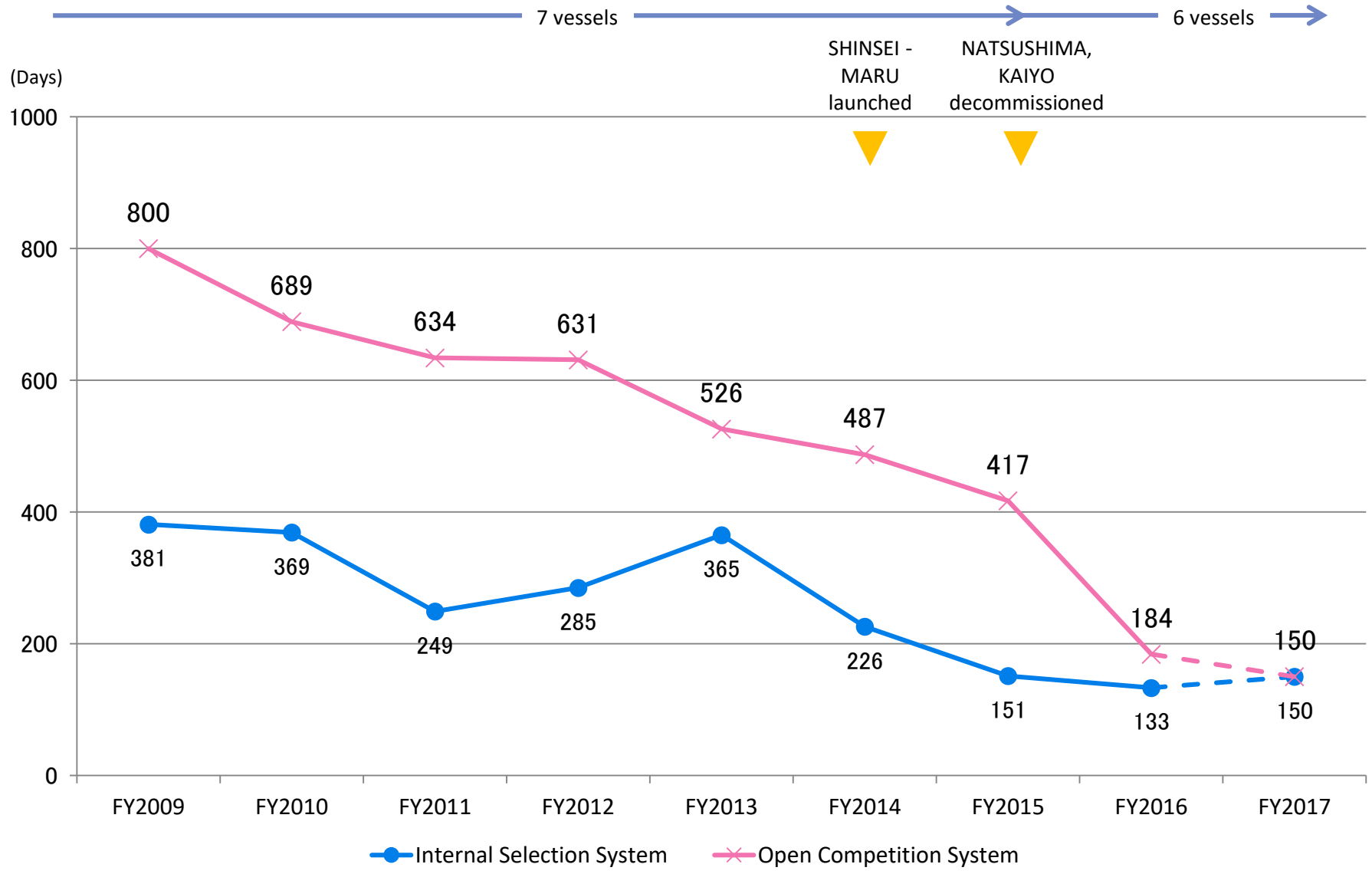
Trends In Cruise Days; External Fund and Internal Fund



Flow of Cruise Planning



Trends in Cruise Days; Breakdown of Internal Fund Cruise




Thank you for your kind attention!
よこすか
YOKOSUKA
Next is Mr. Yanagitani→

New Research Vessel “KAIMEI”

MASANOBU YANAGITANI

JAMSTEC/MARITEC

Research Fleet Department

Operation and Engineering Group

Research Vessel “KAIMEI”

Equipment

- Seismic survey
  (2D,3D,High-resolution 3D)
- Sea floor sampling
  (40m PC, Boring machine system, Power Grab)
- ROV,AUV
- CTD Water sampler (Cable 10,500m)

Principal Particulars

Over length	100.5 m
Breadth	20.5 m
Draft(Designed)	6.0 m
Gross tonnage	5,747 ton
Service speed	12.0 knot
Range(at 12.0knot)	abt. 9,000 knot
Accommodation	65 persons（27 crew members, 38 researchers）
Main propulsion	Electric motor 2,400kW × 2
Propeller system	Azimuth thruster, 5Breaded × 2

“KAIMEI”

Training cruise ***From April～***

1. ROV
2. CTD
3. Deep Tow
4. AUV
5. GPC (Giant Piston core)
6. PG (Power Grab)

➡ **Training**

7. MCS（Multi Channel Seismic System）
8. BMS (Boring Machine System)

➡ **Not Delivered**

ROV Cruise

Operation depth : 3,000m

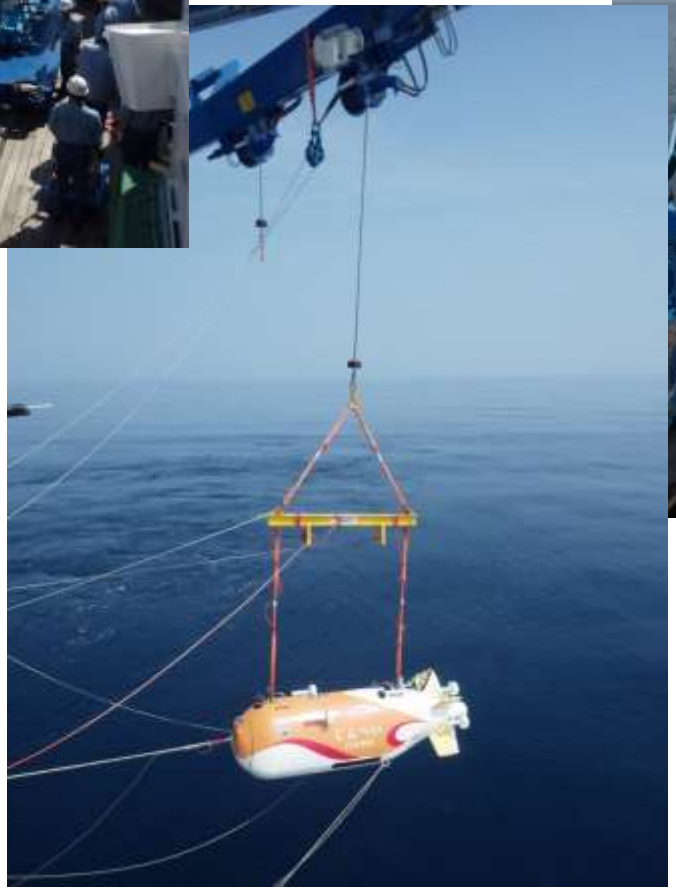
CTD Cruise

Fiber material cable winch （10,500m)

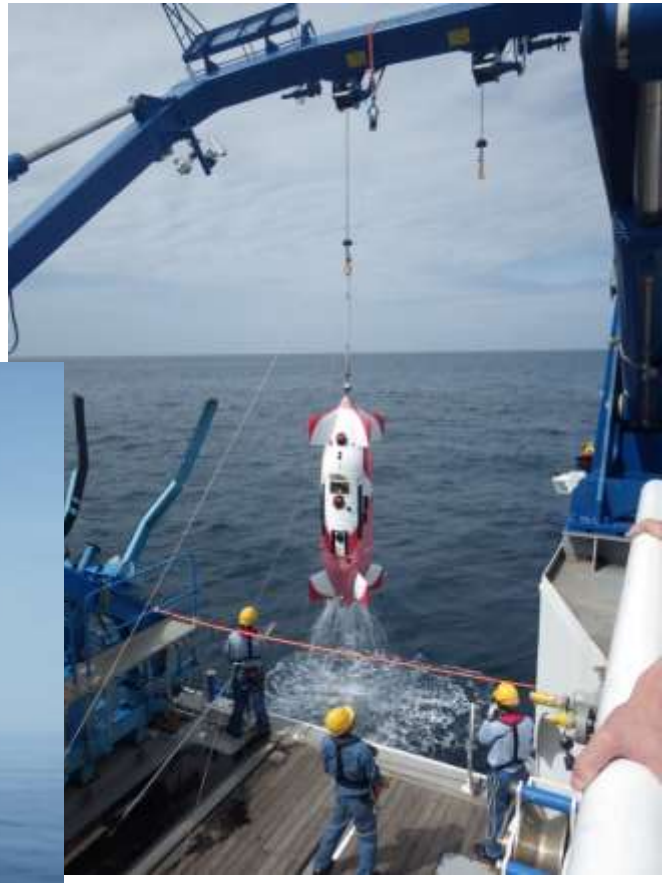
CTD Gantry Crane

AUV Cruise

Fit out the AUVs



Launch for
AUV “JINBEI”



Recovery for
AUV “YUMEIRUKA”

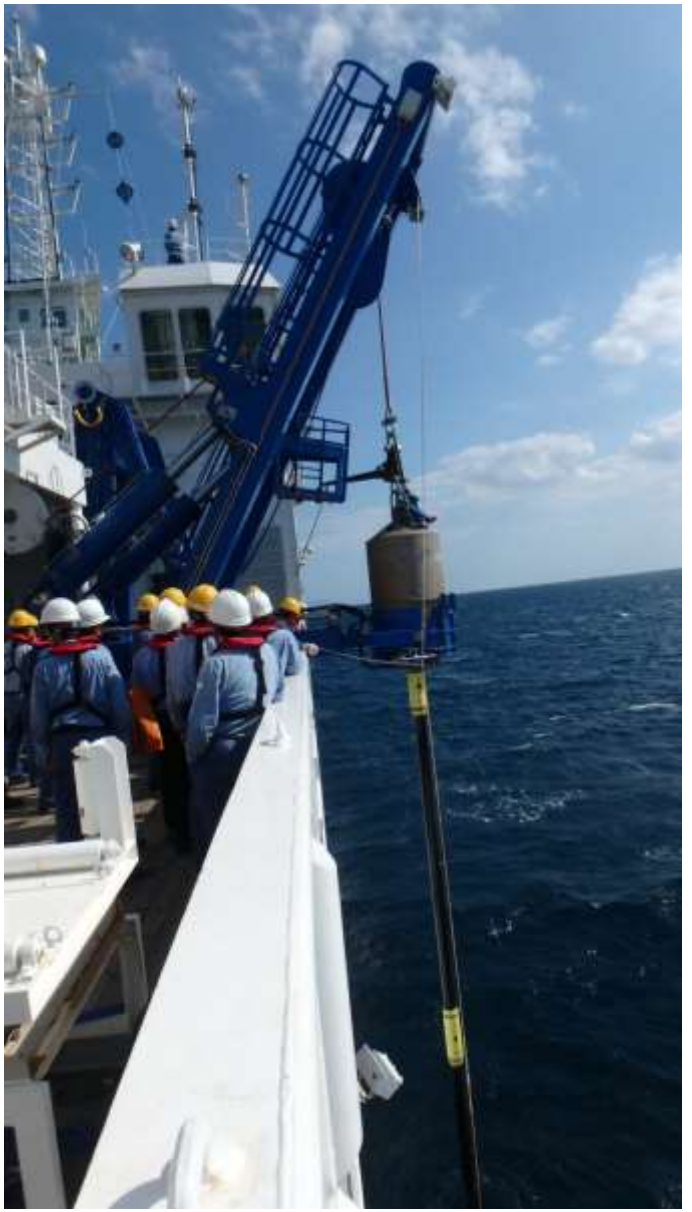
Giant Piston Core Cruise

Φ110mm

× 40m

Giant Piston Core Cruise

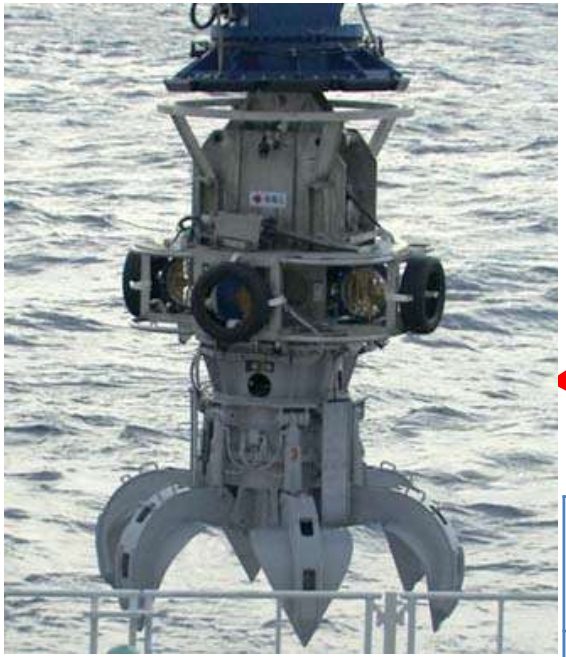
20m GPC ⇨ Success

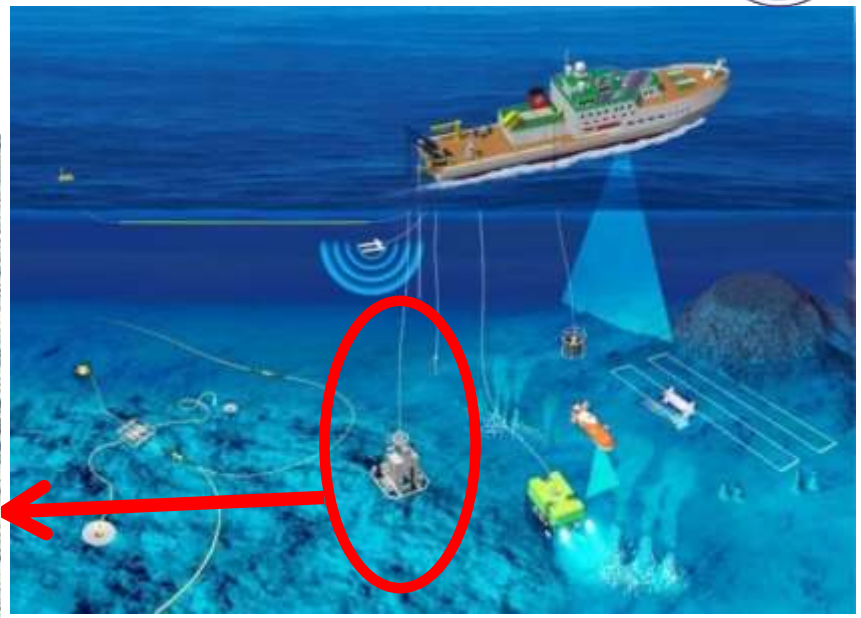


Giant Piston Core Cruise

40m GPC ➡ Need to gain more experience!

Power Grab Cruise





Clam shell type for soft muddy seafloor

6-claws type for hard rocky seafloor

L × W × H	open: 2.8 × 2.4 × 4.0m close: 2.5 × 2.4 × 4.2m
weight	In air 6.0 ton In water 5.0 ton
Depth	6,000m
Ability	capacity 1m³ Cutting power 43kN
Camera system	HDTV camera

Power Grab

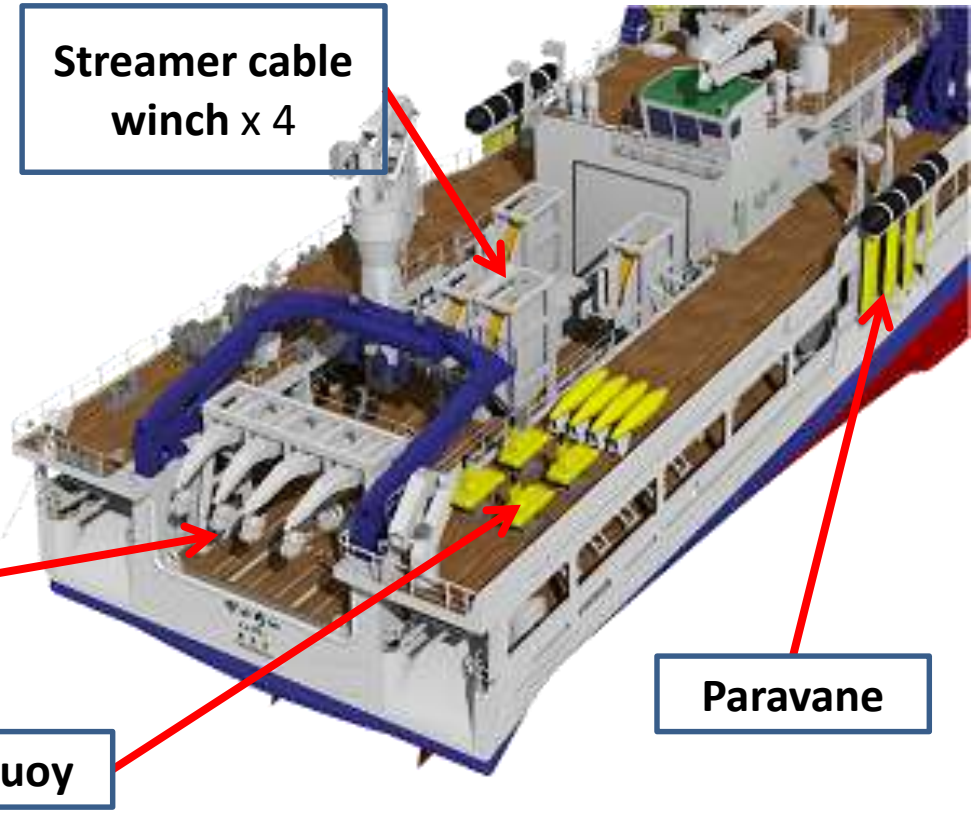
6-claws type for hard rocky sea floor

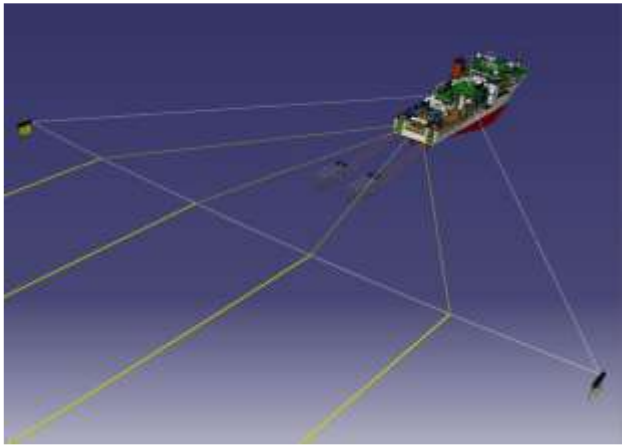
Clam shell type for soft muddy seafloor

Camera System

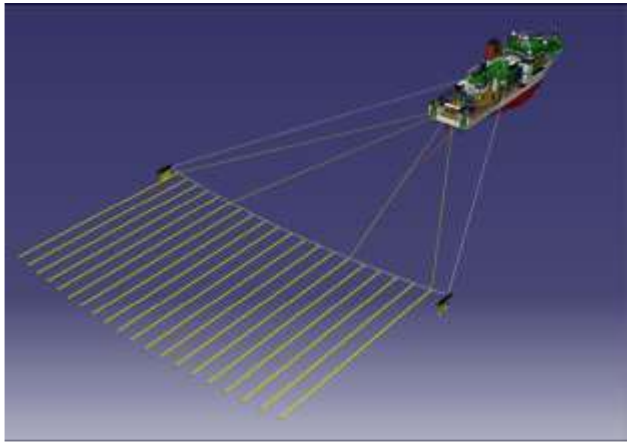
Multi Channel seismic System : MCS

- 3D (Streamer cable)
- HR 3D (Streamer cable)
- 2D (Streamer cable)

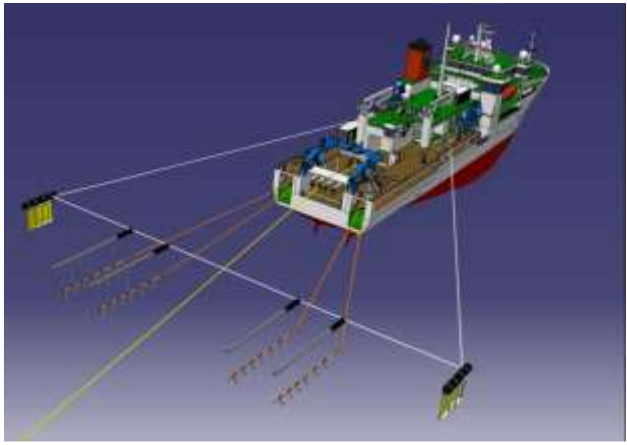




3D (3,000m × 4)



HR3D (300m × 20)



2D (12,000m)

MCS Fit out

Streamer cable winch ×4

Gantry Crane

Boring Machine System

L × W × H	3.0m x 3.1m x 5.9m
Depth	3,000 m
weight	13 ton
Drillng ability（diameter × Max. coring）	
➢ ϕ61.1mm × 30m（coring）	
➢ ϕ123mm × 7.5m（coring）	
➢ ϕ450mm × 2.0m（pipe）	

The future

Next is Mr. Oshima→

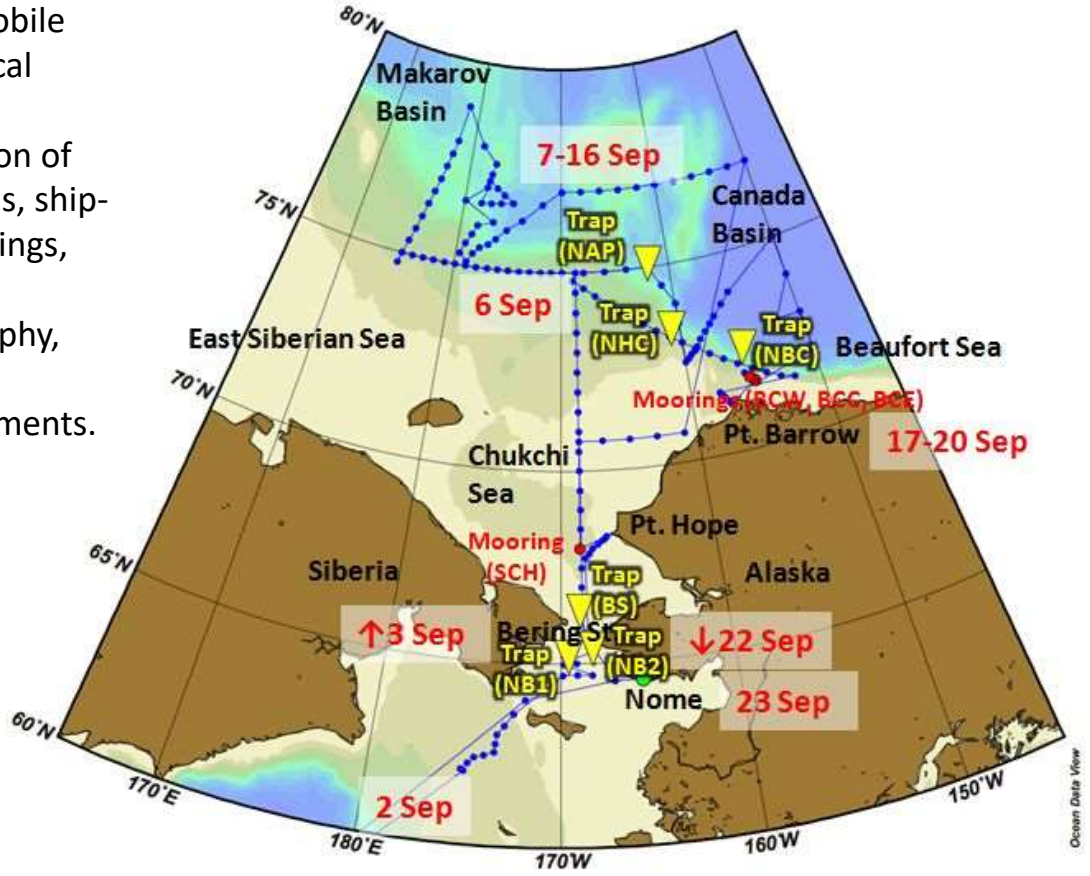
R/V Mirai Arctic Ocean cruise in 2016

- **The Research Vessel Mirai (R/V Mirai)** belonging to Japan Agency for Marine-Earth Science and Technology (JAMSTEC) will conduct hydrographic, marine biogeochemical, and meteorological surveys in the Arctic Ocean during September, 2016.

- **The objective of this cruise** is to quantify on-going changes in the ocean, atmosphere, and ecosystem, which are related to the recent Arctic warming and sea ice reduction.

-**The observational activities** consist of CTD/XCTD/UCTD, drifting buoy deployments, mobile float observation with camera and sensors, optical measurements, water samplings, plankton net samplings, sediment samplings, visual observation of marine animals, wave and sea spray observations, ship-board ocean current and surface water monitorings, meteorological measurements and samplings, radiosondes, Doppler radar, sea bottom topography, gravity, and magnetic field measurements, and mooring and sediment trap recoveries & deployments.

R/V Mirai (JAMSTEC)



Following US code for R/V MIRAI act Arctic Ocean 2016

- Non Tank Vessel Response Plan
- Vessel General Permit
- Alternative Planning Criteria 50/12/3 mil Rule
- Enrollment Alaska Network
- Public vessel
- Ice Pilot Captain on sign for this voyage
- Next Target IMO Polar code 01/JAN/2017

REQUIRED INCIDENT NOTIFICATIONS IN UNITED STATES WATERS

IN THE EVENT OF AN INCIDENT*, EMERGENCY, SPILL OR THREAT OF A SPILL IN THE U.S.A. OR CANADA, THE MASTER MUST NOTIFY THE QI IMMEDIATELY VIA TELEPHONE:

QI EMERGENCY PHONE **+1 703 683 4700 *(24 HRS)***
ALTERNATE EMERGENCY PHONE **+1 215 492 5473 *(24 HRS)***

IF THE MASTER IS UNABLE TO REACH THE QI FOR ANY REASON, THE MASTER MUST ENSURE THAT THE BELOW, REQUIRED NOTIFICATIONS ARE MADE IMMEDIATELY.

1. National Response Center (NRC) (24 hrs.) Phone: +1 202 267 2675

If unable to reach National Response Center, contact Local Coast Guard on Channel 16

2. Oil Spill Removal Organization (OSRO) (24 hrs.)

National Response Corp. (NARCO) All U.S. COTP Zones (offshore & onshore)	Main Phone +1 631 224 9141

3. Salvage, Shipboard Firefighting, and Emergency Lightering Resource (SMFF) (24 hrs.)

T&T Salvage, LLC All U.S. COTP Zones (offshore & onshore)	24 Hour Phone: +1 713 534 0700
Resolve Marine Group All U.S. COTP Zones (offshore & onshore)	24 Hour Phone: +1 954 764 8700

Resolve Marine Group: For the vessel Mina

4. U.S. Coast Guard - On-Scene Coordinator/Captain of the Port
See COTP Zone Notifications Page in NTVRP Geographic Specific Appendix I

5. State and Local Authorities
See COTP Zone Notifications Page in NTVRP Geographic Specific Appendix I

6. Owner/Operator/Manager
See Chapter 5

Ensure that Owner/Operator/Manager, P&I Club Home Office, P&I Club Local Correspondent and Port Agent are notified.

- All notifications are to be initiated immediately, or within 30 minutes of incident discovery, at most.
- Record name of agency, point of contact and report number (if provided) for all notifications including National Response Center.
- See Chapter 2 of this Plan for more information regarding required notifications.

*If the vessel is disabled for any reason within 12 miles of the U.S. shoreline, the U.S. Coast Guard is to be notified within one hour of the disability. This includes but is not limited to grounding, loss of main propulsion, primary steering, component/control system causing reduced maneuverability, fire, flooding, collision, or situation creating possibility of oil spill.

United States Management System for 2013 NPDES Vessel General Permit Compliance

Developed For:

Nippon Marine Enterprises, Ltd.

14-1 Ogawa-Cho
Yokosuka City Kanagawa
Pref 238-0004
Japan

12 Dec 2013

THE STATE of ALASKA
GOVERNOR SEAN PARNELL

Department of Environmental Conservation

DIVISION OF SPILL PREVENTION & RESPONSE
INDUSTRY PREPAREDNESS PROGRAM
Marine Vessels Section

410 Willoughby Ave., Ste 303
PO Box 111800
Juneau, AK 99811-1800
Main: 907.465.5254
Fax: 907.465.5245

File No 410.38

May 18, 2016

Hiroyuki Oswa
Japan Agency for Marine-Earth Science and Technology
2-15, Natsushima-cho
Yokosuka, 237-0061 JAPAN

Subject: **Request for Public Vessel Determination Nontank Vessel *Mirai* (IMO # 6919423).**

Dear Mr. Oswa:

The Alaska Department of Environmental Conservation, (department) received an application submitted by Gallagher Marine Systems, LLC on May 17, 2016 requesting an updated public vessel determination for the vessel *Mirai*, IMO # 6969423.

The vessel is owned by the Japan Agency for Marine-Earth Science and Technology (JAMSTEC)). JAMSTEC has an agreement with the Nippon Marine Enterprises, Ltd, as the operator. The application describes the mission of the vessel *Mirai* (while operating in Alaska state waters) as research related to resolving of the arctic ocean circulation. JAMSTEC has operational control over the mission and the vessel. Research completed under the vessels mission will not be used for commercial purposes or sold.

Based on the information provided about the mission of the vessel *Mirai*, the department finds the vessel *Mirai*, meets the definition of a public vessel under Alaska Statue 46.04.900(21). This determination will remain valid for five years (May 18, 2021) from the date of this letter as long as the status of the owner or operator and the mission of the vessel remain unchanged. If change to the mission of the vessel or owner/operator a new "Exemption as a Public Vessel" application form will be needed.

A department determination that the vessel *Mirai* meets the definition of a public vessel under AS 46.04.900(21), exempts the vessel *Mirai* from the nontank vessel requirements of AS 46.04.040 and 46.04.055. Discharge reporting per AS 46.03.755 is required. Spill placards are attached and should be placed on board the vessel while operating in Alaska state waters. For questions contact Shauna McMahon at 907-465-5233 or dec.nontankvessel.cofr@alaska.gov.

Sincerely,

Shauna McMahon
Environmental Specialist

Electronic cc w/ enclosures: Bob Matson, DEC

	Charts of area on board? Y N
NPOC/DATE:	LPOC/Date:

THE NETWORK
ALASKA MARITIME PREVENTION & RESPONSE NETWORK

CERTIFICATE OF PARTICIPATION

ALTERNATIVE PLANNING CRITERIA FOR **NON-TANK VESSELS**
WESTERN ALASKA AND PRINCE WILLIAM SOUND CAPTAIN OF THE PORT ZONES

The Alaska Maritime Prevention & Response Network (Network) hereby confirms the non-tank vessel (NTV) owner/operator or VRP Planholder identified below has agreed to and confirmed in writing that the vessel(s) identified on this certificate will:

1) ***Be bound by and comply with the operating procedures in the Alternative Planning Criteria [APC] for non-tank vessels operating in or transiting through the Western Alaska and Prince William Sound COTP Zones, as approved by the U.S. Coast Guard; and,***

2) ***Contribute to the development and operation of the maritime safety net provided by the Network.***

3) ***Request deviations from the operating procedures in the APC-NTV from the Captains of the Port Western Alaska and/or Prince William Sound, as applicable.***

Updates or amendments to the NTV APC can be found at www.ak-mprn.org

The Network, as the regional response resource provider of oil spill response and prevention capabilities prescribed in the NTV APC, hereby provides the below owner/operator or VRP Planholder and the following vessels access to all of the OSRO and oil spill response resources and risk reduction measures, including operating procedure compliance, as enhanced over time, secured by the Network.

VESSEL PLANDHOLDER: Nippon Marine Enterprises,LTD.

VESSEL NAME	IMO/OFFICIAL NUMBER
MIRAI	6919423

Effective Date: 6/1/2016 **Expiration Date:** 6/30/2017

On behalf of the Alaska Maritime Prevention & Response Network, this Certificate of Participation is authorized by:

BUDDY CUSTARD
President & Chief Executive Officer
Alaska Maritime Prevention & Response Network

6/1/2016
EFFECTIVE DATE

ALASKA MARITIME PREVENTION AND RESPONSE NETWORK CORPORATE SEAL 2011 ALASKA

AK-MPRN.ORG

HOW THE **POLAR** CODE PROTECTS THE ENVIRONMENT

OIL

DISCHARGES
Discharge into the sea of oil or oily mixtures from any ship is prohibited

STRUCTURE
Double hull and double bottom required for all oil tankers, including those less than 5,000dwt (A/B ships constructed on or after 1 January 2017)

HEAVY FUEL OIL
Heavy fuel oil is banned in the Antarctic (under MARPOL). Ships are encouraged not to use or carry heavy fuel oil in the Arctic

LUBRICANTS
Consider using non-toxic biodegradable lubricants or water-based systems in lubricated components outside the underwater hull with direct seawater interfaces

INVASIVE SPECIES

INVASIVE AQUATIC SPECIES
Measures to be taken to minimize the risk of invasive aquatic species through ships' ballast water and biofouling

SEWAGE

DISCHARGES I
No discharge of sewage in polar waters allowed (except under specific circumstances)

TREATMENT PLANTS
Discharge is permitted if ship has an approved sewage treatment plant, and discharges treated sewage as far as practicable from the nearest land, any fast ice, ice shelf, or areas of specified ice concentration

DISCHARGES II
- Sewage not comminuted or disinfected can be discharged at a distance of more than 12nm from any ice shelf or fast ice
- Comminuted and disinfected sewage can be discharged more than 3nm from any ice shelf or fast ice

GARBAGE

PLASTICS
All disposal of plastics prohibited (under MARPOL)

FOOD WASTES I
Discharge of food wastes onto the ice is prohibited

FOOD WASTES II
Food wastes which have been comminuted or ground (no greater than 25mm) can be discharged only when ship is not less than 12nm from the nearest land, nearest ice shelf, or nearest fast ice

ANIMAL CARCASSES
Discharge of animal carcasses is prohibited

CARGO RESIDUES
Cargo residues, cleaning agents or additives in hold washing water may only be discharged if: they are not harmful to the marine environment; both departure and destination ports are within Arctic waters; and there are no adequate reception facilities at those ports. The same requirements apply to Antarctic area under MARPOL

CHEMICALS

DISCHARGES
Discharge of noxious liquid substances (NLS) or mixtures containing NLS is prohibited in polar waters

BACKGROUND INFO

- THE INTERNATIONAL CODE FOR SHIPS OPERATING IN POLAR WATERS WILL ENTER INTO FORCE ON 1 JANUARY 2017
- IT APPLIES TO SHIPS OPERATING IN ARCTIC AND ANTARCTIC WATERS: ADDITIONAL TO EXISTING MARPOL REQUIREMENTS
- IT PROVIDES FOR SAFE SHIP OPERATION AND PROTECTS THE ENVIRONMENT BY ADDRESSING THE UNIQUE RISKS PRESENT IN POLAR WATERS BUT NOT COVERED BY OTHER INSTRUMENTS

DEFINITIONS

SHIP CATEGORIES
Three categories of ship designed to operate in polar waters in:
A) at least medium first-year ice
B) at least thin first-year ice
C) open waters/ice conditions less severe than A and B

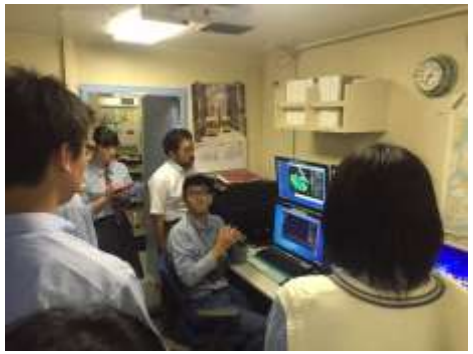
FAST ICE: Sea ice which forms and remains fast along the coast, where it is attached to the shore, to an ice wall, to an ice front, between shoals or grounded icebergs

ICE SHELF: A floating ice sheet of considerable thickness showing 2 to 50m or more above sea-level, attached to the coast

IMO INTERNATIONAL MARITIME ORGANIZATION

Out reach for next Generation

Onbo



Challenge of JAMSTEC

Kazuhiro Maeda JAMSTEC/MARITEC

R/V KAIMEI


R/V SHINSEI MARU


R/V HAKUHO MARU


R/V MIRAI


R/V YOKOSUKA


R/V KAIREI

Ocean Policy of Japan

Advanced Technology Development for Arctic Region Observation

- Research Vessel Building for Arctic Region
- AUV Development for ice-infested waters

Development of Next-Generation Deep Sea Exploration System

- Full-Depth Remotely Operating Vehicle
- Largely Extending Depth for Autonomous Underwater Vehicle
- Human Occupied Vehicle Development

Arctic observation in Japan

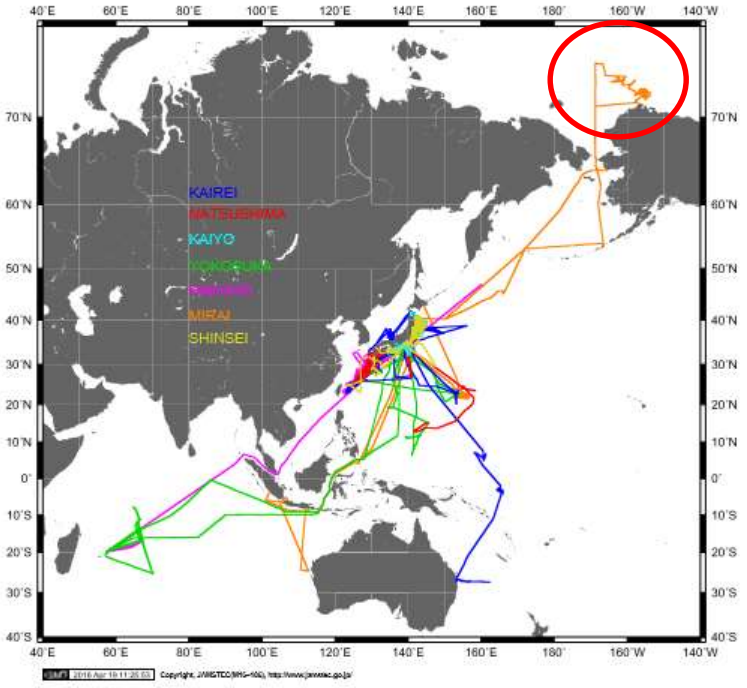
Japan Arctic Research Network Center
J-ARC Net

HOKKAIDO UNIVERSITY Arctic Research Center

National Institute of Polar Research (NIPR)
Arctic Environment Research Center

Japan Agency for Marine-Earth Science and Technology
Institute of Arctic Climate and Environment Research (IACE)

ArCS Arctic Challenge for Sustainability



http://www.arcs-pro.jp/en/index.html

MR15-03 cruise
24th Aug – 22nd Oct 2015

Research Vessel Building for Arctic Region

Operation Ability in North Pole Area

- Ice-resistant Structured Ship? or Ice Breaker?

High Sea Worthiness and International Cooperation

- From Equatorial to Arctic Region
- Room and research space to accept many researchers from other field of studies

Most Advanced Technology for Oceanographic Observation

- CTD with advanced depth research ability
- Doppler Rader, Sea Ice Rader

High Speed, High Accuracy and High Efficient Analysis on board

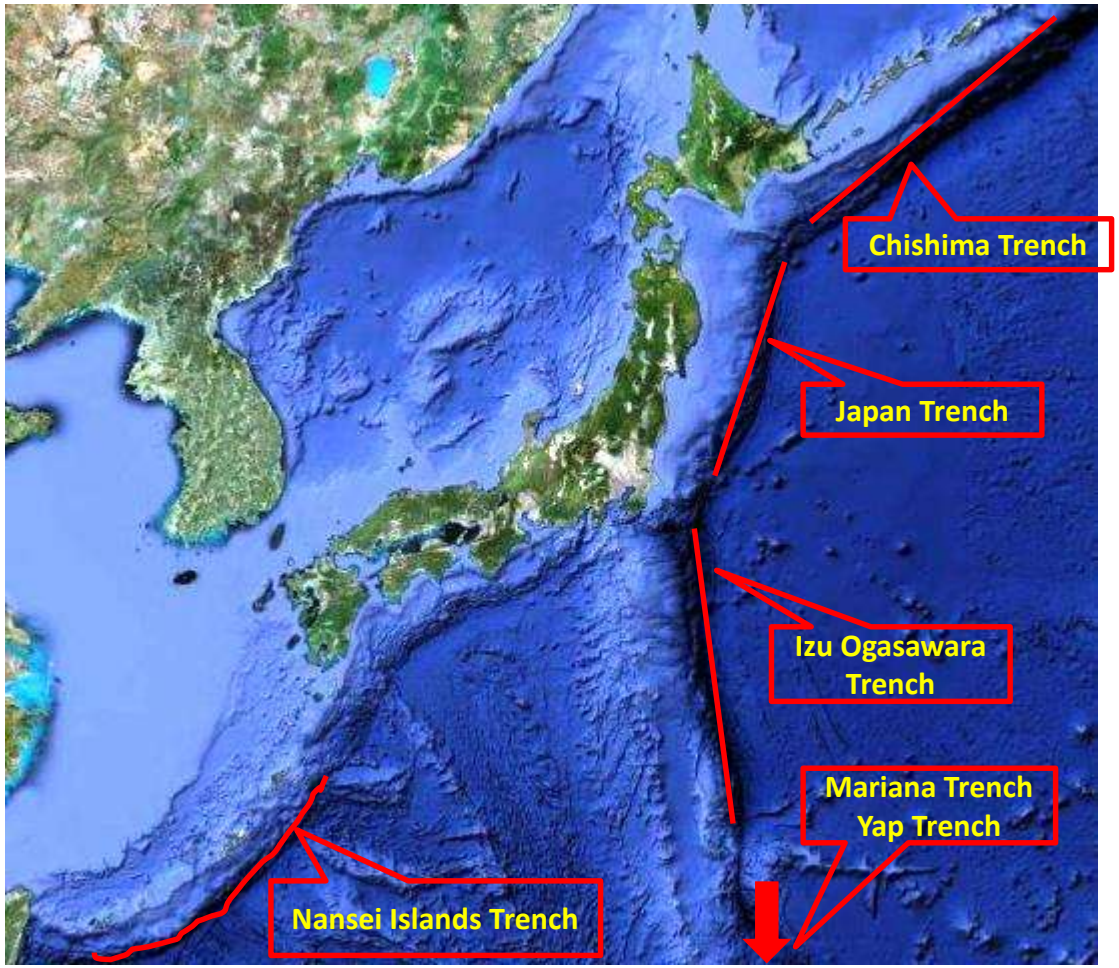
- Smart Laboratory System for Labor-saving Analysis

Advanced Environmental Load Reducing System

- Clean Energy Saving System
- Apply Polar Code

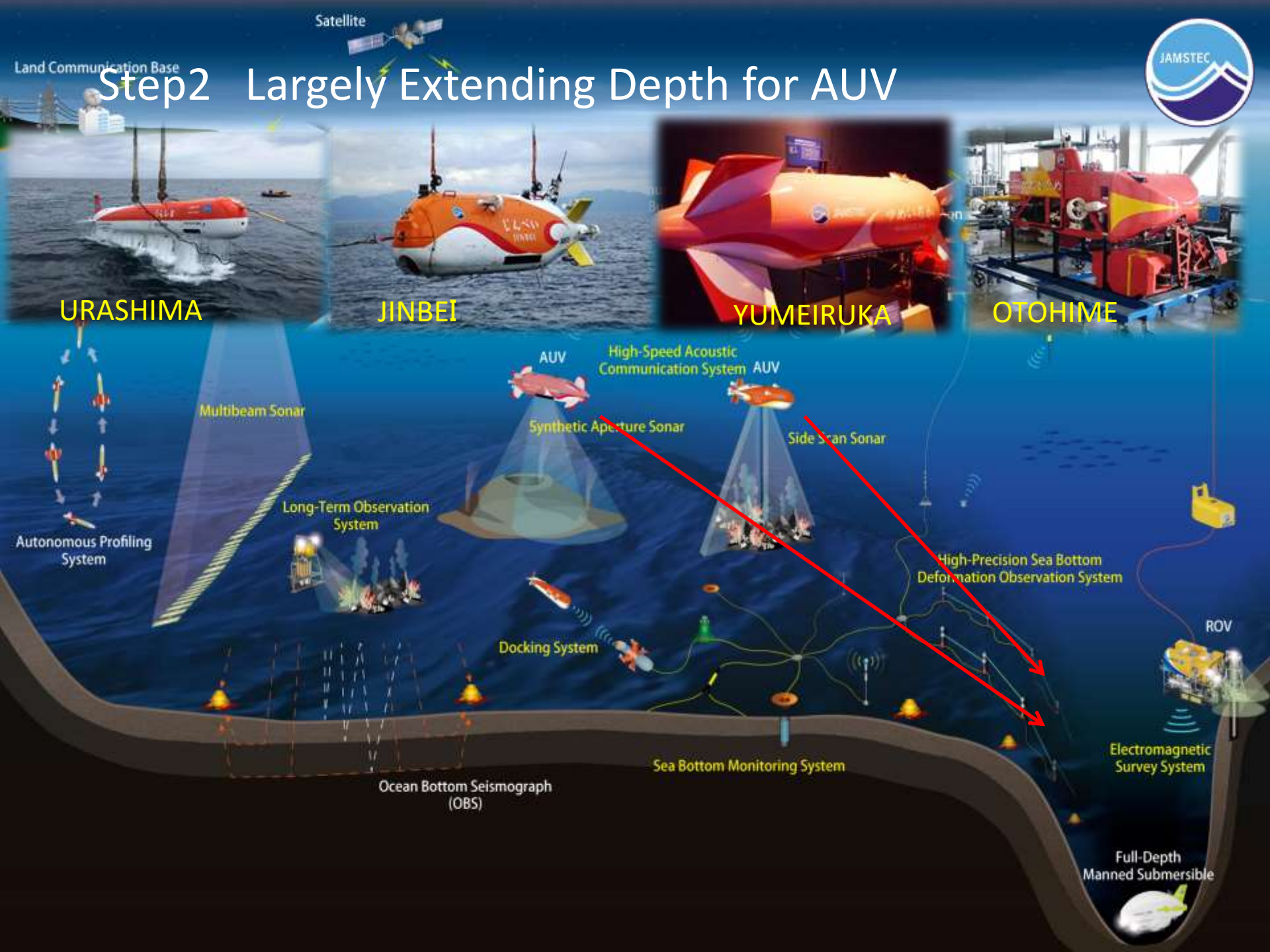
Technology for Next-Generation Deep Sea Exploration System

"Technology Development for Full-Depth Research System"



Step1　Full-Depth ROV

Step2　Largely Extending Depth for AUV



Step3　Full-Depth HOV

Technology of Full-Depth ROV & AUV → Utilize for Human Occupied Vehicle

- Strengthen pressure resistant of pressure resistant shell
- Increase of manpower who are able to undertake research during navigation
- Extension of investigation time in the deep sea
- Improvement of Communication Technology etc

Final Objective of all Technology Development is Building

of *"Shinkai 12000"!*

Challenge of JAMSTEC

Recently, non-science related research cruises using JAMSTEC's Vessel are increasing , such as resources investigation in EEZ or environmental research .

We recognize that these cruises are crucial, because they have big influence on budget distribution for research cruises operation by government.

However, our objective is to assist pure science or technology in unknown area , such as undiscovered deepest part of Mariana Trench .

To realize our objective efforts by engineers and operators as well as cooperation with researchers are indispensable.

Above all, we are convinced that the sufficient budget will be approved when our efficient outreach is accepted and appreciated by the public.

Thanks for your attention !