

Creating the Safety at Sea

*Japan Coast Guard
Maritime Traffic Safety Services*



大阪湾海上交通センターと明石海峡大橋

For the Safety and Efficiency of Maritime Transport

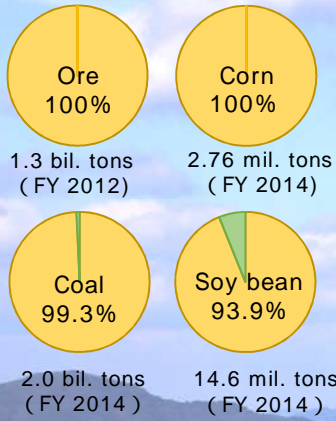


Maritime Traffic Safety Service Policies

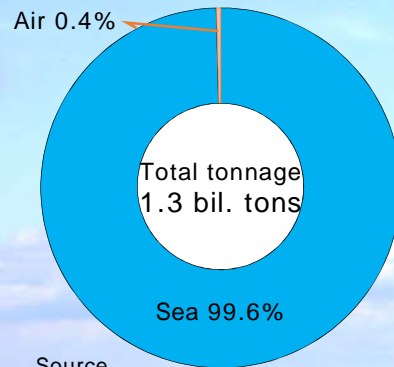
As a maritime nation, Japan has benefited from seas in all respects including transport means of goods and energy materials, fishing industry, maritime recreational activities, etc.

Japan Coast Guard is promoting variety of maritime traffic safety policies and services in response to the recent rapidly changing social and economic environment.

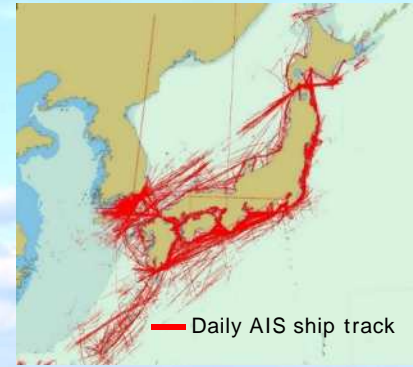
Import of natural resources, etc.



Means of transport for overseas trade



Coastal Ship Movements



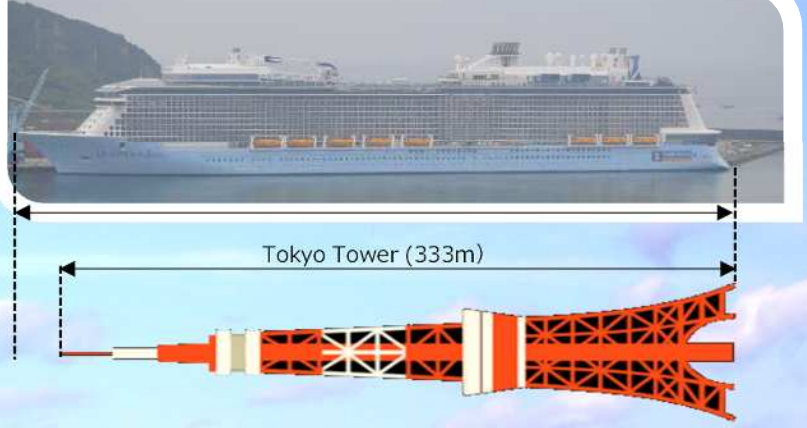
Source

- Price based : 2014 Treasury Stat.
- Q'ty based : 2014 Port Stat.
- Sea/Air proportion :
2014 Treasury Stat. (Price)
2014 Port Stat. (Q'ty)



Maritime Traffic Safety Service Policies

Passenger Ship QUANTUM OF THE SEAS (167,800 GRT, 348m)



Major maritime accidents in the recent history

Although the trend is declining, a lot of human lives and properties have been lost by maritime accidents in Japanese coastal waters every year. Risk of impacts on the national economy by maritime traffic damage by major accident is an ever lasting concern.

Collision of M/Vs YUYO-MARU No.10 and PACIFIC ALICE



9 Nov. 1974
Nakanose-Traffic Routel /Tokyo Bay

【Vessels involved】
YUYO-MARU No.10
LPG · Petrol tanker
43,723 GRT
PACIFIC ALICE
General cargo vessel
10,874GRT



【Case summary】
PACIFIC ALICE collided YUYO-MARU's starboard and collision sparks ignited the spilled cargo petrol gas for explosion.

Oil spill from M/V NAKHODKA



2 Jan. 1997
Off the coast of Shimane

【Vessel involved】
M/V NAKHODKA
Oil tanker
13,159 GRT

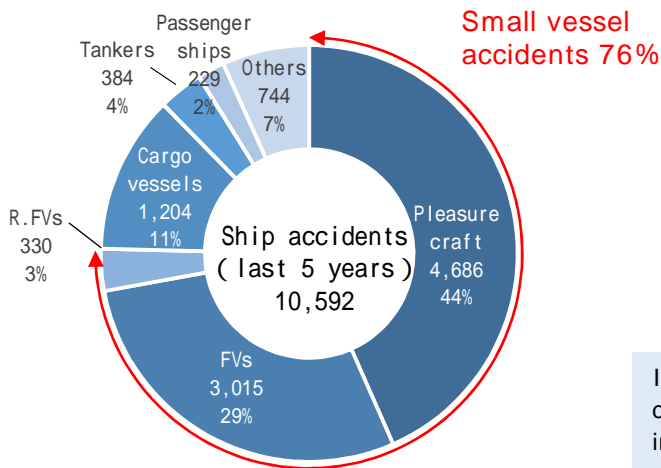
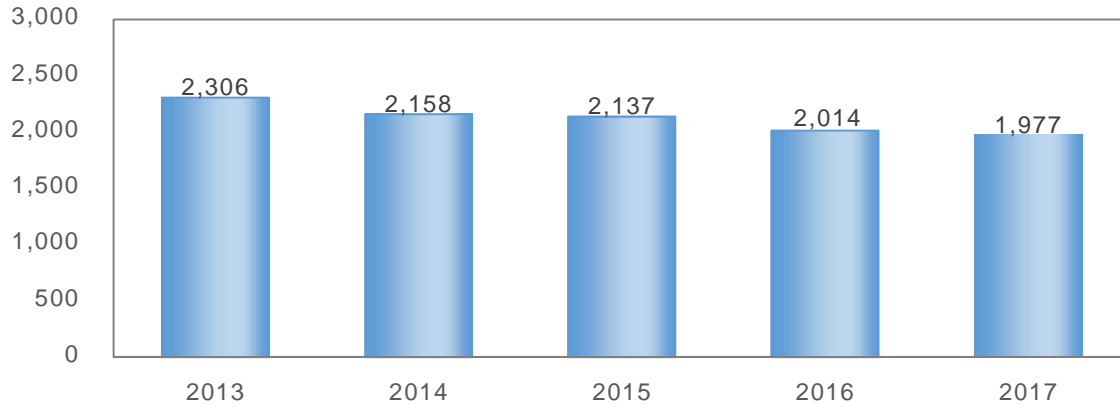


【Case summary】
The cracked hull parted while sailing. The stern sunk and the bow drifted ashore. 6,200 tons of spilled heavy oil caused serious pollution to the coast of the Sea of Japan.

Maritime Traffic Safety Service Policies

Accidents of Ships

Average of 2,000 ship accidents occur in Japan every year, about 80 % of which are small vessel (recreational boats, fishing boats, etc.) accidents.



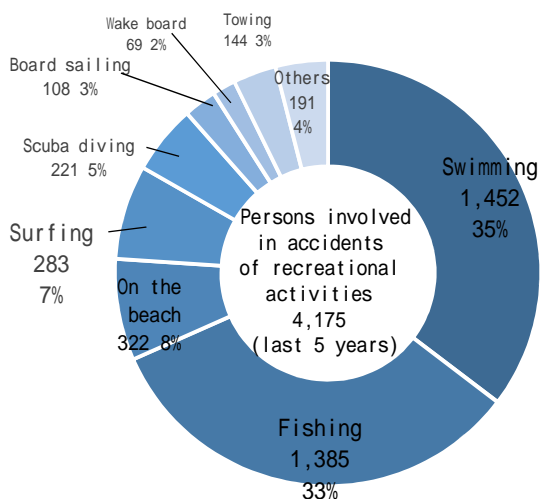
【 Example: Capsized Fishing boat 】



In February 2017, a missing fishing boat was found capsized and two crewmembers were rescued from inside but died afterwards. Other two are still missing.

Accidents related to maritime recreational activities

Of the accidents related to coastal recreational activities, those while swimming are the largest in number while the second relates to recreational fishing. These account for 70% of the total.



【 Example: accident in pleasure fishing 】



In December 2017, an angler fell from the beach cliff into the sea while fishing and was injured. His friend informed the Coast Guard by dialing 118 and the fell-over was found and rescued by the Coast Guard helicopter.

Basic Policies

The 4th Traffic Safety Policy Vision (FY 2018~)

JCG plans and publicizes its maritime traffic safety policies and practical measures to be taken in the forthcoming 5 years. This policy package is named 'JCG Traffic Safety Policy Vision'. Based on the 4th Vision approved in 2018 by the Government Transportation Policy Council, JCG is implementing a variety of measures to enhance maritime safety to co-op with rapidly changing social and technological environment.

<Points of the 4th Vision >

- Wider scope to include 'maritime safety creation', in addition to 'maritime traffic safety'
- Enhancement of 'self help' and 'mutual help'
- Promotion of safety measures to respond to new tasks
- Enhancement of safety measures

<Summary >

- 1 . Responding to a variety of maritime activities
- 2 . Contribution to efficiency and productivity of maritime industries
- 3 . Co-operation with local communities
- 4 . Integration and utilization of maritime activity related information
- 5 . Safety of 2020 Tokyo Olympic and Paralympic Games

<Vision Goals >

- 1 . Reduction of accidents of ships
- 2 . Prevention of major accidents in congested sea areas
- 3 . Reduction of collision/grounding cases in congested areas
- 4 . Reduction of accidents in ports under severe weather conditions including typhoon

Basic Plan on Ocean Policy (FY2018~) Cabinet Decision

Established in accordance with the Basic Act on Ocean Policy. In this framework, JCG is explicitly responsible for the maritime accident prevention, including traffic safety measures, law enforcement, operational instructions for safety, etc.

The 4th Social Capital Priority Improvement Plan (FY2015~2020) Cabinet Decision

Established in accordance with the Act on Priority Plan for Social Infrastructure Development. JCG is explicitly responsible for the following:

- Life-cycle prolongation of aids to navigation facilities
- Secure and efficient maintenance of aids to navigation
- Reinforcement of aids to navigation strength against earthquakes and wave shocks

The 10th Fundamental Traffic Safety Program (FY2016~2020)

Decision of the Central Transportation Policy Council (Chairman: Prime Minister)

Adopted by Traffic Safety Policies Basic Act. JCG is explicitly responsible for the following:

- 1 . Reduce the ship accidents to less than 2,000 per year in coastal areas by 2020 (excluding foreign flag ships which do not call Japanese ports).
- 2 . Maintain the collision/grounding accidents in low level in the highly congested sea areas and no major accident with grave social impact in those areas shall occur.

Tourism Vision implementation Program for 2018

Decision of the Ministerial Council for Tourism Promotion (Chairman: Prime Minister)

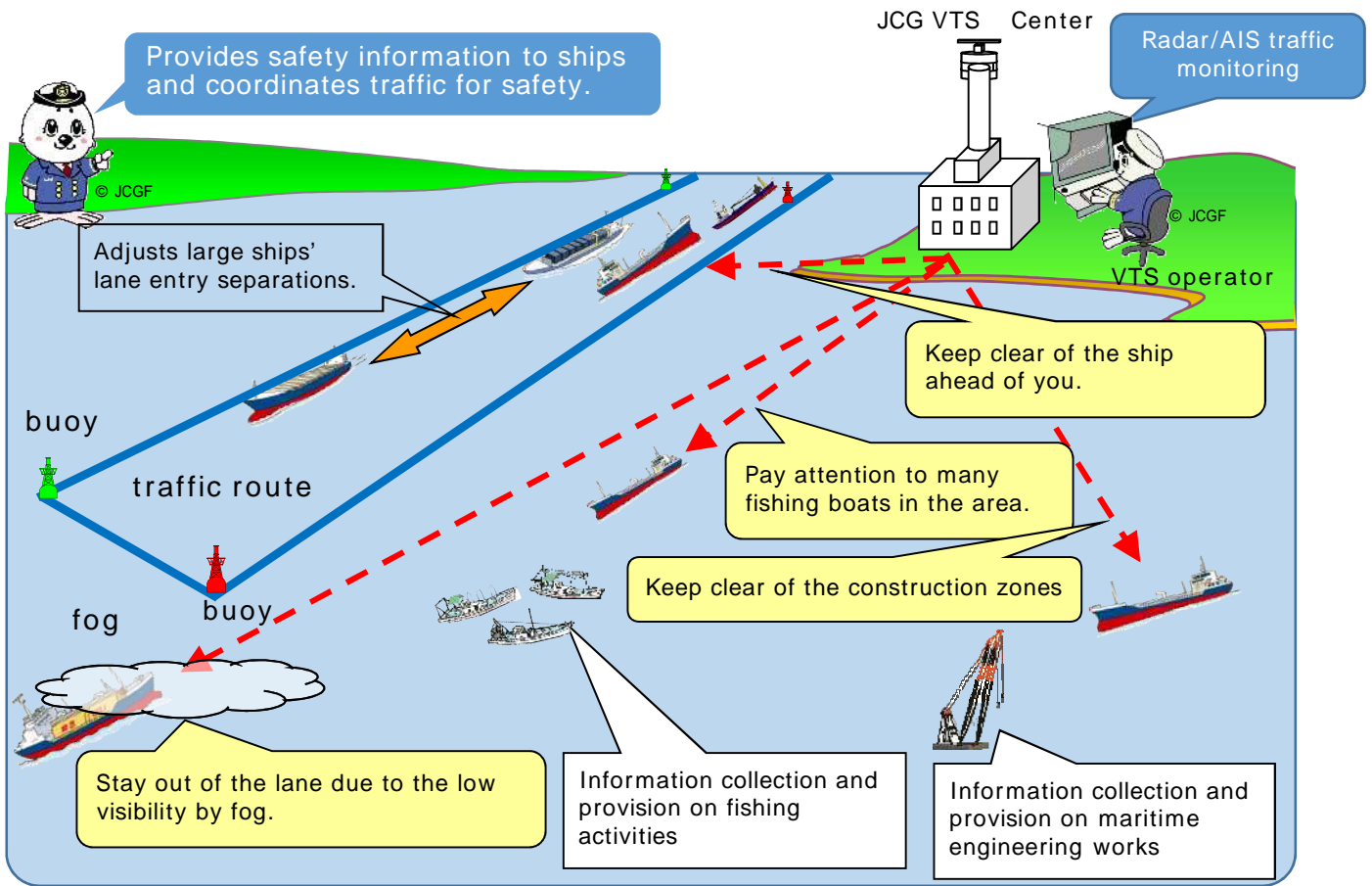
Lighthouses are included in the Program as one of the national tourism resource infrastructures.

Declaration on the Creation of World Leading Digital Nation and the Basic Plan for utilization of National Data for 2018 (Cabinet Decision)

Established by the Basic Law on the Promotion of National Data. Promotion on the public use of maritime activity related information is included in the Plan as the action item of the Coast Guard.

Safety Measures in Highly Congested Sea Areas

JCG Vessel Traffic Service Center, in accordance with Maritime Traffic Safety Act, provides various safety services (information provision, navigational instruction, traffic coordination, etc.) in the highly congested areas including Tokyo Bay, Ise Wan, Seto Naikai and Kanmon strait.



JCG Vessel Traffic Service Centers



Bisan Seto
(Utazu)
July 1987



Kurushima Kaikyo
(Imabari)
Jan 2004



Kanmon Kaikyo
(Kita-Kyushu)
June 1994



Osaka Bay
(Awaji)
July 1993



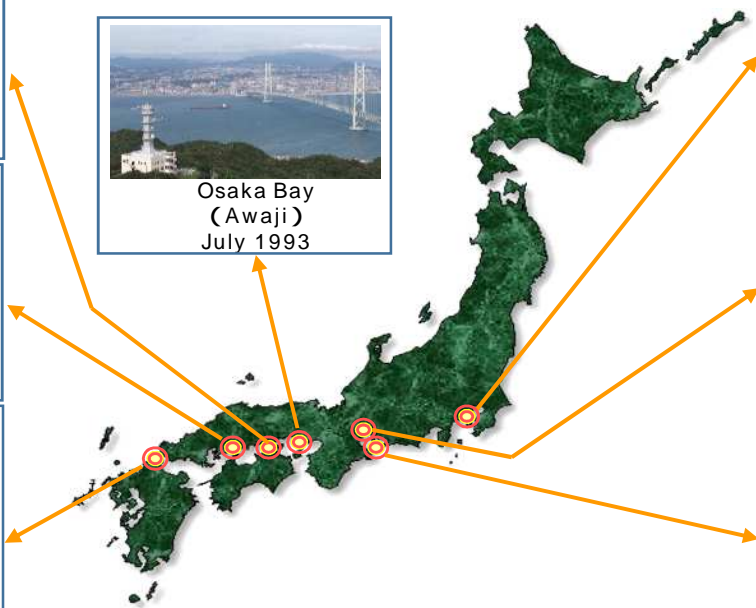
Tokyo Bay
(Yokohama)
Feb. 1997
(Relocated in Jan.2018)



Nagoya-Ko
(Nagoya)
July 1994



Ise Wan
(Tahara)
July 2003



VTS: Vessel Traffic Service
Safety Information provision and traffic advisory services for vessels

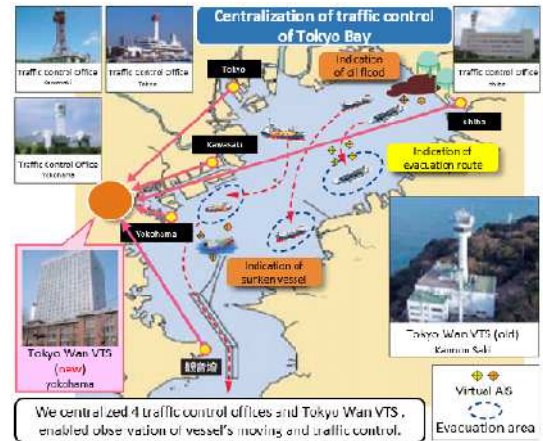
Safety Measures in Highly Congested Sea Areas

'New VTS in Tokyo Bay and the amendment of the Maritime Traffic Safety Act'

With the background of increasing of dangerous cargo transportation by large vessels, JCG renovated the VTS facilities in Tokyo Bay to relocate one VTS Center and to centralize the services of 4 port traffic control offices as well as to build additional radar stations, etc.

Maritime Traffic Safety Act was also amended and has been in force since January 2018.

This amendment enables JCG to issue necessary relocation/evacuation orders to ships in the designated sea areas in disasters as tsunami. It is also expected that shipping efficiency be improved by centralizing the services of 4 separate traffic control offices in the Tokyo Bay.

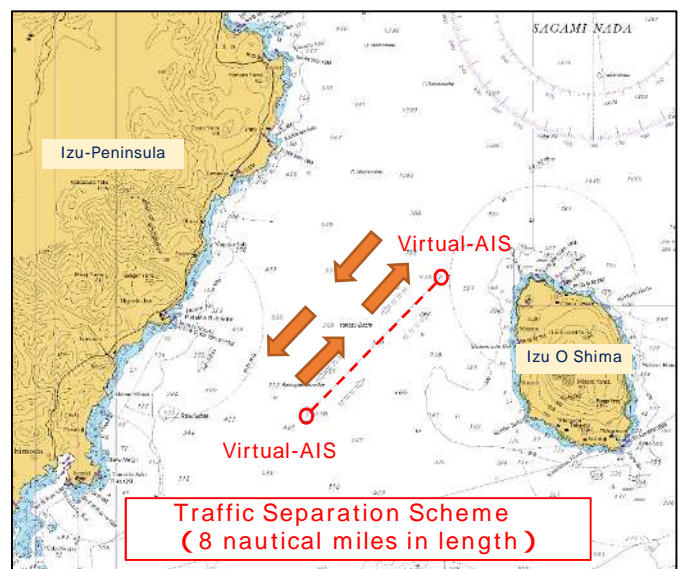


Vessel Traffic Service Center in Tokyo Bay

Safety Measures in Traffic Congested Sea Areas

New Traffic Separation Rule in Izu O Shima Area

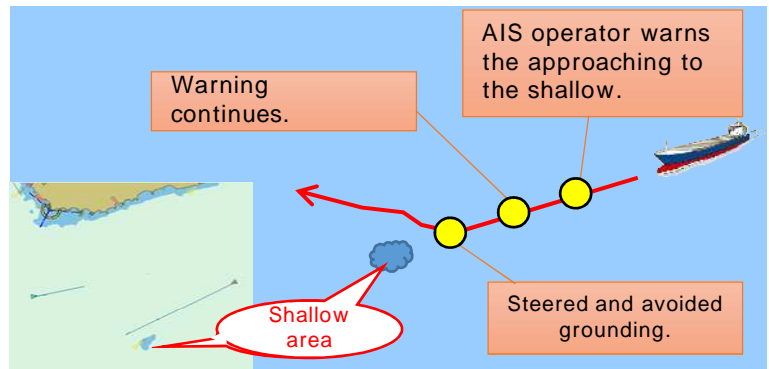
New traffic separation scheme for the sea area between Izu Peninsula (Shizuoka) and Oshima (Tokyo) based on the IMO resolution on Ships' Routing was established as measures to reduce and mitigate collision accidents in the area and started operation on 1 January 2018. This is the first traffic separation scheme using virtual AIS in the world proposed by JCG and adopted by IMO Maritime Safety Committee in June 2017. This traffic separation scheme is expected to reduce collision accidents by ships' orderly navigations.



Coastal Safety Measures

Provision of Information by Automatic Identification System (AIS)

JCG operates the nationwide coastal AIS network and provides safety related information to ships to prevent grounding, anchor dragging, etc. by broadcast or on individual basis.



Port Safety Measures

Engineering Works and Events in Ports

In the designated large ports, JCG officer is responsible for the regulation of ports as the Captain of the Port based on the Act on Port Regulations. His authoritative functions include the issuing of navigation instruction, permission of engineering works and/or events in ports, berthing/anchoring instruction, dangerous cargo handling regulations, etc.



Office of the Captain of the Port



Navigation restriction due to an event



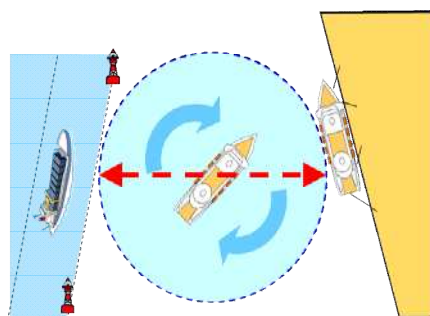
Engineering work in the port (Misumi/Kumamoto)

Navigational Safety in Ports

JCG, in coordination with the parties concerned, establishes safety measures for the large ships' operation in ports, including the investigation of necessary safety margins of turning basin and lane breadth, deployment of tug boats, etc. JCG will further use the simplified computer simulation program to expedite the safety measures deliberations and share information between stakeholders when large cruise passenger ships enter ports for the first time.



Mega cruise ship



Safety margins in maneuvering area



Visual simulation of maneuvering

Promotion of General Maritime Safety

Safety Measures for Small Vessels

JCG continuously engages in the in-depth analysis of situations and causes of maritime accidents from all possible perspectives. Investigation results are fed back to all public and private sector parties concerned and will be used for further safety promotion activities.



Safety promotion for fishermen



Kids safety program



Hosting of safety meetings



ICT based information promulgation



Cooperation with private sectors



Intra-governmental meeting

'JBWSS 2018 – Public Relation Activities for Preventing Maritime Accidents'

As one of the safety promotion activities by JCG, Japan Boating & Water Safety Summit (JBWSS 2018) Symposium on the Water Safety and Safe Boat Operations was held at Echujima Campus of Toyo Maritime University on 6 June 2018, in cooperation with MLIT Maritime Bureau and the JBWSS Partnership Council with participations of a number of public and private organizations and shared safety information and experiences through rescue demonstration, panel discussion, etc.

JCG also participated in the IBWSS (International Boating & Water Safety Summit), a multi national public-private network forum for boating safety held at Lexington (US) from 4 to 7 March 2018 upon invitation from NSBC (IBWSS organizer) to gather information as 2017.



JCG Director General's address at JBWSS 2018



JBWSS 2018 Panel discussion

Aids to Navigation

Aids to Navigation Operations

JCG operates all aids to navigation, including the lighthouses, for the safety and efficiency of ships' navigation by providing assistance to determining their positions and by alerting dangerous objects, etc.



Aids to Navigation Deployment and Maintenance

JCG is responsible for deploying and maintaining the aids to navigation for shipping safety and their operating efficiency. JCG challenges to design and implement the optimum aids to navigation to meet the modern navigational requirements.

<Lighthouses>



They are built on the cape or on the tip of breakwater to be an indicator to vessels.

Special attention is paid to preserving historically and culturally valuable lighthouses constructed in Meiji Era.

[Inubo-Saki L/H (Chiba-Pref.) constructed in 1874]

<Buoys>



Buoys indicating traffic lanes and obstructions are replaced at 4-year interval for maintaining their proper functioning.

[Akashi Kaikyo traffic route western buoy (Hyogo-Pref.)]

<Vessel Traffic Service Centers >

Located and operated for highly congested sea areas for information provision and traffic advisory.



[Kurushima Kaikyo VTS / Ehime-Pref.]

<Use of renewable energy >

Environment friendly and disaster tolerant energy sources are widely used for navigational-aids.



[50,000W solar power L/H Daini-kaiho/Chiba-Pref.]

Aids to Navigation Services

Maintenance of Aids to navigation

JCG is responsible for the maintenance and failure recovery of aids to navigation.



Routine maintenance



Failure recovery response



Disaster Prevention Measures and Responses

JCG is in the process of recovering the damaged aids to navigation in Tohoku earthquake disaster in 2011 and comprehensive structure reinforcing.

<Recovery and reinforcement >

129 aids to navigation were seriously damaged in Tohoku earthquake disaster in March 2011. JCG has, in addition to devoting to their recovery, been reinforcing the structural design of lighthouses across the country to cope with future disasters.



Damaged L/H



Conventional L/H



Structure reinforcement



Recovered L/H



Reinforced L/H

Preservation of Historical Lighthouses

64 lighthouses constructed in Meiji Era are carefully preserved and contributes to local communities.



Kakezuka L/H
1897/119 years old



Rusts and corrosions



Covering by Titanium foil
Top coating



Titanium foil anti-corrosion treatment was applied for life prolongation.

International Relations

IMO (International Maritime Organization)

IMO is one of the UN Specialized Agencies responsible for maritime safety and marine environment protection.

- Recent JCG activity at IMO relating to maritime safety

Japan's first recommended shipping route off the western coast of Izu O Shima Island was proposed to IMO and adopted in June 2017. It is in force from January 2018.



IMO Maritime Safety Committee

IALA (International Association of Marine Aids to Navigation and Lighthouse Authorities)

IALA is a non-governmental organization comprising of national and private aids to navigation authority members. IALA is working to coordinate the world-wide aids to navigation policies to enhance shipping safety and efficiency while preserving marine environment.

- Chairmanship of IALA e-Navigation Committee by a JCG officer

JCG officer was appointed the Chairman of IALA e-Navigation Committee to deal with modern technologies for shipping safety and their standardization including VHF Data Exchange System (VDES)



IALA e-Navigation Committee (Chairman at the center)

VDES: future VHF (Very High Frequency) high-speed data maritime communication system

Assistance to Developing Countries

Capacity building of VTS (Vessel Traffic Service) 1 operators in ASEAN countries

Based on the ASEAN-Japan Transport Partnership (AJTP) framework, 2 'Capacity building project for VTS operators' was initiated to provide assistance to ASEAN countries' VTS operator training. ASEAN Regional Training Center was established in Malaysia in July 2017 and started training.



ASEAN Regional Training Center (Malaysia)

1 VTS : Safety Information provision and traffic advisory services for vessels

2 AJTP : Transport cooperation framework established in 2003.

Technical Development

State of the Art Maritime Communication System

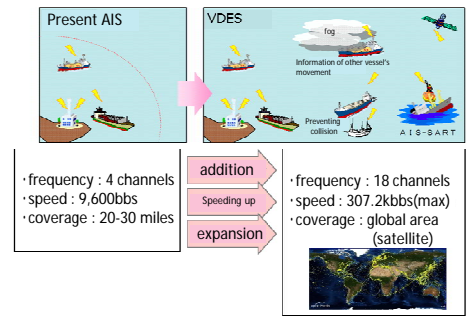
JCG is leading the international development and standardization effort of VDES

(VHF Data Exchange System)

Initiative to develop and standardize the future high-speed maritime communication system by VHF



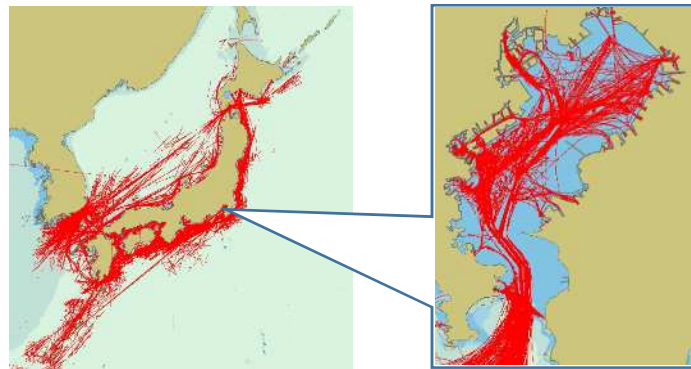
IALA Workshop on VDES Development



A I S /VDES comparison

Use of Big Data for Maritime Traffic Safety

Analysis of large volume past AIS tracks may provide useful and important information to identify potentially dangerous sea areas and ships likely to encounter maritime accidents. Research is underway to determine such analysis methods.



AIS tracks (1 April 2018)

Tokyo bay area

Innovative Light Source Development

COB LED is a long life light source with high illumination power suitable for future aids to navigation.

COB (Chip on Board) : numerous LED chips directly embedded on a circuit board.



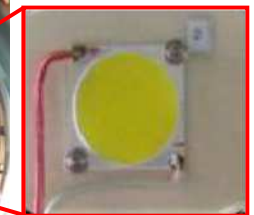
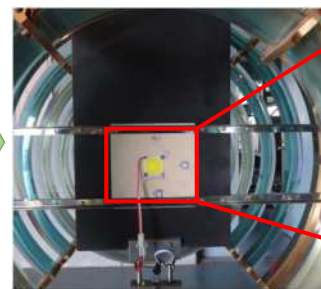
Conventional light bulbs



Halogen lamp
(1,000 hours)



Metal halide lamp
(6,000 hours)



COB
(60,000 hours)

New Method of Facility Maintenance

Investigation in the use of UAV is underway for aids to navigation maintenance purposes.

Safe and efficient lighthouse maintenance work will be made possible by means UAVs.



Support of Local Sightseeing through Lighthouses

Initiatives in cooperation with local communities

In recognition of historical and cultural values of lighthouses, JCG supports local communities in promoting their sightseeing activities while contributing to maritime safety. In practice, JCG promotes open lighthouse events and promulgates information on the history of lighthouses and their services.



Park and promenade (Noma-Saki)



Unique design LH (Otsuchi Port)



LH Restaurant (Mihogaseki)



Open lighthouse event (Samekado)



Lighting up (Inubo-Saki)



Lighthouse museum (Inubo-Saki)

Many lighthouse lovers and supporters provide understanding and assistance for lighthouse services.



'Lighthouse girl'



Hesaki LH Preservation Association



Nippon Foundation 'Sea and Japan Project'/Japan Romanticist Association

150th Anniversary of Lighthouse

2018 marks the 150th anniversary of Japan's first modern lighthouse of Kannon-Saki construction work commencement on 1 November 1868.

Taking this opportunity, JCG holds a variety of events across the country as follows, to further promote maritime safety and enhance



Cooperation with local communities:

- Open lighthouse events
- Digital lighthouse cards
- Anniversary Postage
- Exhibitions
- Other events



Permanent opening of Shiriya-Saki LH

Facilities and Resources of Service



Irago Channel patrol



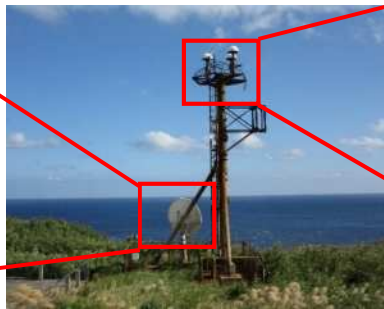
Aids to navigation service vessel KOUN



Buoy servicing



VSAT antenna



DGPS Rx antennae

Tokara-Nakanoshima DGPS station and its antennae

JCG operates differential GPS stations which transmit position augmentation data, satellite health status, etc. for accurate positioning services. (to be abolished in March 2019)

Legislations Related to JCG Maritime Traffic Safety Services

JCG Maritime Traffic Safety Department is responsible for maritime traffic safety related legislations including the Act on Preventing Collision at Sea, Maritime Traffic Safety Act, Act on Port Regulations, etc. JCG is also in charge of Navigational Aids Act which covers aids to navigation administration.

Act on Preventing Collision at Sea

Objective : Prevention of ships' collisions at sea for shipping safety

Applied area : All sea areas

- Rules of the road
- Lights and objects to be indicated by ship
- Signals by ships etc.

Maritime Traffic Safety Act

Objective : Special traffic safety rules in the designated highly congested sea areas.

Applied area : Tokyo Bay, Ise Bay and Setonaikai

- Obligation to navigate in the designated traffic lanes and to observe avoidance/special navigation rules.
- Traffic control for large ships in the traffic lanes.
- Restrictions on engineering works.

Act on Port Regulations

Objective : Safety and order in ports..

Applied area : Designated 500 ports

- Restrictions on mooring, sailing rules in ports.
- Restrictions on dumping, engineering works, etc.
- Restrictions on dangerous cargo handling for disaster prevention.

Navigational Aids Act

Objective : Shipping safety and efficiency by deploying and operating necessary aids to navigation
 aids to navigation: Lighthouses, buoys, signal facilities, radio beacons, etc. constructed in coastal areas including ports and straits for navigational safety purposes by means of lights, objects, acoustic means, radio waves, etc.

< JCG Maritime Information and Communication Information System >

JCG provides coastal weather information observed at lighthouses across the country as well as maritime safety related information including engineering works, etc., which can be easily accessed via internet.

Smart phone site

Weather

Wind data is displayed by tapping the weather icon.

Sea area info

Potentially dangerous area can be checked by tapping relevant icons.

Position

Co-ordinate data



Safety related local information

Local info provided by JCG offices

Urgent information

Urgent information related to navigational safety are displayed by tapping icons.

Weather warnings

Weather warnings issued from the Meteorological Agency are displayed by tapping icons.

More detailed information will be displayed by further tapping the icons of each information titles.



© JCGF

Smart phone site



Emergency information subscription

JCG emergency information on weather, disaster, etc. are provided to subscribers 24 hours by e-mail.

For new subscription

<http://www7.kaiho.mlit.go.jp/micsmail/reg/touroku.html>



Access now from PC or Smart phones!

MICS

search

< Staff recruitment for maritime traffic safety related services >

Note: Japanese nationals only

Engineering career staff

University graduate/post graduate level (Engineering)

Policy planning, research and development, etc.

Coast Guard School Students

High School graduate level

IT Systems Course and VTS Operators Course

Civil Engineers

Civil Engineering Certificate holders with field service experience background

Design, construction and maintenance of aids to navigation facilities

JCG Professional Officer Recruitment

<http://www1.kaiho.mlit.go.jp/saiyo/index.html>

Civil Service Recruitment

<http://www.jinji.go.jp/saiyo/saiyo.htm>

Coast Guard School Recruitment

<http://www.kaiho.mlit.go.jp/ope/saiyou/bosyu.html>

Coast Guard School

<http://www.kaiho.mlit.go.jp/school/index.html>



JCG Portal