



Report On the E-NAV Test Bed Project in Shanghai- Yangshan Port

CHINA MSA



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Overview & Requirements Analysis

1 Background of the project

Importance of yangshan port

- | Development of port and shipping economic of yangshan port has become an important support to deepen national strategy
- | It is the biggest artificial deep-water port
- | The volumes of containers has accounted for nearly half the total number in Shanghai port

Unfavorable factors in sailing

- | only the annual average economic benefit impact of port production enterprise is as high as 640 million yuan due to poor visibility caused the ship grounded or dredge.
- | Surrounding is fishing grounds , and the port is located in the north-south intersection route of coastal seaborne artery, forming, medium and small vessels and fishing boats gathered water traffic intersection area, in which has a high frequency for water accident. This puts forward new challenge to maritime security.

Purposes of construction

- | Improve navigational safety guarantee system in poor visibility
- | Provide comprehensive, timely, reliable and efficient navigation information and facility Services for vessels
- | Provide a comprehensive support service platform for command scheduling management
- | As a information sharing, survival and relying on platform of comprehensive business management such as shipping companies, ports, freight forwarders, logistics and so on

2 Requirements Analysis

Requirements of navigators for navigation facility services

- a) Real-time **access to** the accurate position location information of the ship itself;
- b) **Sense** dynamic information of small vessels or fishing boat , which is uninstalled AIS shipborne equipment or installed beidou satellite positioning terminal equipment in channel;
- c) Obtain real-time **Hydrometeorological information** (mainly flow velocity, flow direction, wind direction, wind speed and visibility) of important segment;
- d) Forecast the accurate hydrologic meteorological or warn gusty special weather conditions;
- e) High precision, large-scale chart and nautical chart information amendment;

2 Requirements Analysis

A Requirements of navigators for navigation facility services

- f) Perfecting allocation of navigation mark and obtaining position, light characteristics, actual working condition of navigation mark;
- g) Obtaining **navigation safety early warning information** to advance knowledge navigation situation and completing the danger forecasting;
- h) Providing high reliability and high precision **berthing and departing auxiliary positioning device** for ships;
- i) Developing **new intelligent navigation equipment** which will integrate and display the information related to service requirement content through wireless communication link on the intelligent navigation screen, forming intelligent collision warning for navigators to operate applicate;
- j) Used to improve effective observation visual range of **noctovisor** and other auxiliary observation equipment under poor visibility.

2 Requirement analysis

B Requirement of navigation facilities services from all the stakeholders

- a) Acquiring **all kinds of ship dynamic** in yangshan port and the surrounding waters;
- b) Acquiring real-time hydrometeorological information(mainly flow velocity, flow direction, wind direction, wind speed and visibility) of important segment;
- c) Forecasting the accurate hydrologic meteorological or warning gusty special weather conditions;
- d) High precision, large-scale chart and nautical chart information amendment;
- e) Monitoring the dynamic of large container ship and providing early warning information;
- f) **Sharing navigation safety information** with each stakeholder

Main Project Components

A. Develop the navigation safety facilities

- a) Differential positioning systems(There are three types, different ranges and position accuracy)

Give full play to the high precision and high reliable positioning characteristics of beidou satellite and construct new four CORS stations in yangshan port and near waters, to offer high precision differential positioning services to ships.

Remould the two existing AIS coast stations(dajishan and xiasanming) in the waters near yangshan port, to allow it spreading differential GPS correction, to make positioning accuracy of ships installed AIS shipborne receiver within 5m, in effective cover range of AIS shore station.



Upgrade and remould DBDS/DGPS dual-mode differential reference station of dajishan , and realize the sub-meter level positioning accuracy within the effective range of 300 km.



b) Provide Aids to navigation, hydrographic survey and charting information more efficiently

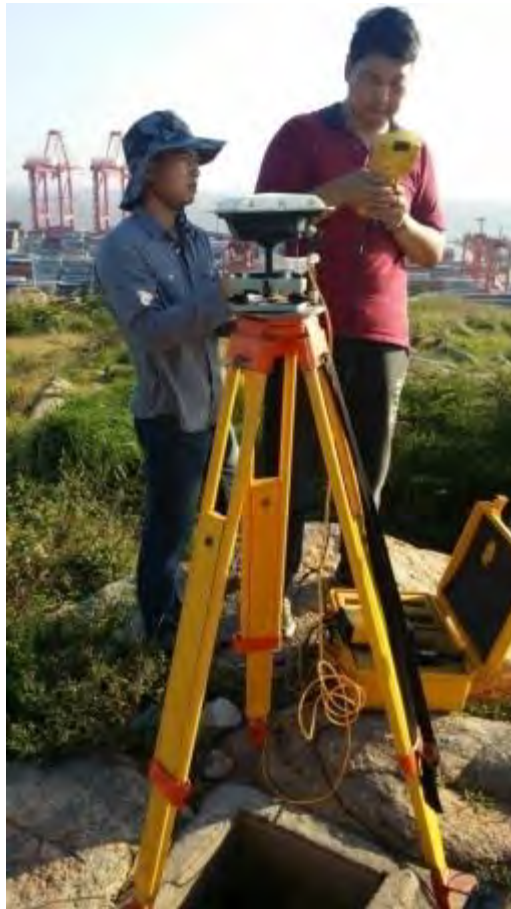
Optimize distribution and application of Aids to navigation, improve identification of Aids to navigation, install the AIS Aids to navigation, be equipped with radar transponder, set virtual AIS Aids to navigation for specific temporarily requirements.

Adjustment of Aids to navigation distribution of outer channel in yangshan port



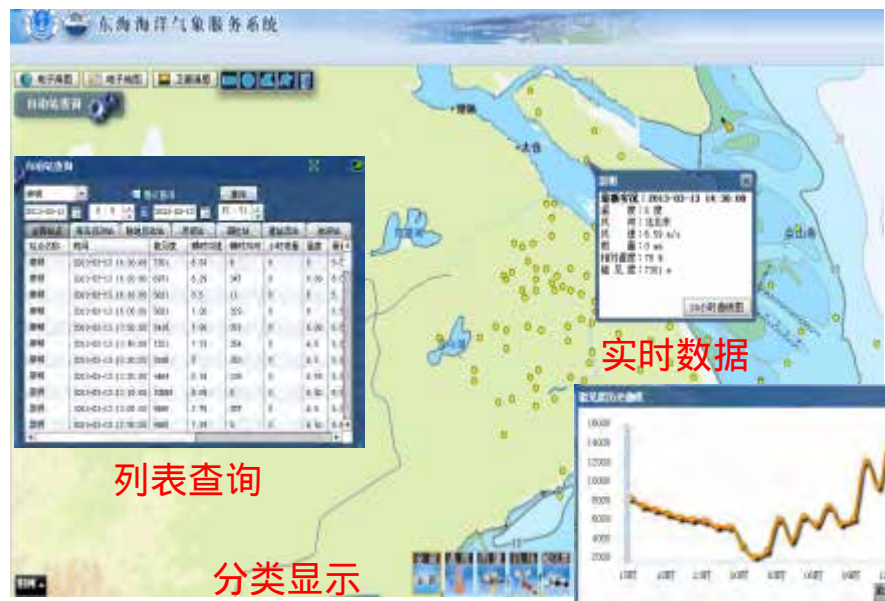
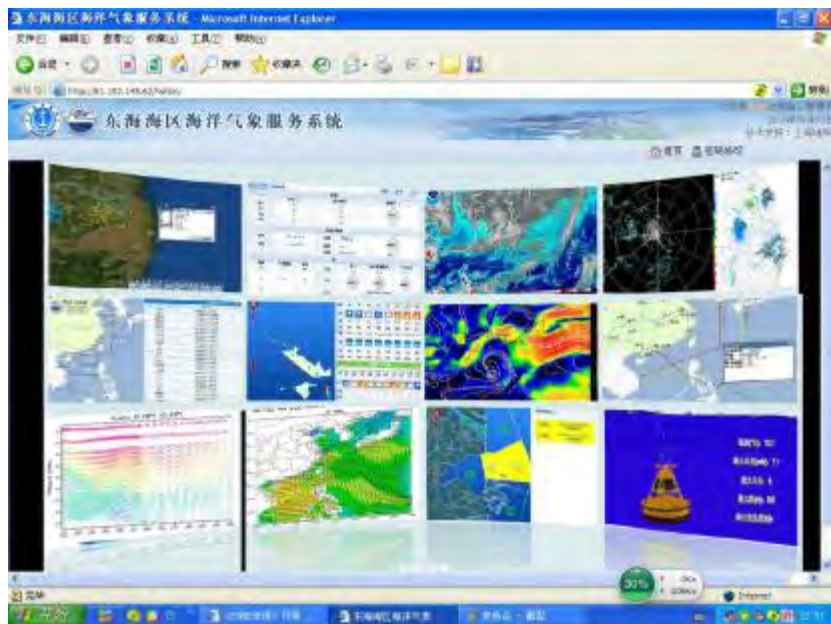
Adjustment of Aids to navigation distribution of inner passage in yangshan port

Complete high resolution waterway and port area survey and mapping, and provide large scale official paper chart and electronic chart.



The application of marine meteorological service system in China east Sea

In 2010, the east China sea maritime security center cooperation with Shanghai Ocean (center) Station, take the complementary advantages and information sharing mechanism, promote the research and development and popularization and application of marine meteorological service system in the east China sea.



Fill some meteorological and hydrological monitoring sites and their application.

In outer channel, caution area, and port area, install hydrometeorological and visibility monitoring sensor on aids to navigation in the key position of navigation safety, and integrate the information. In a small reef waters and H55 lighted buoy collect tide information.



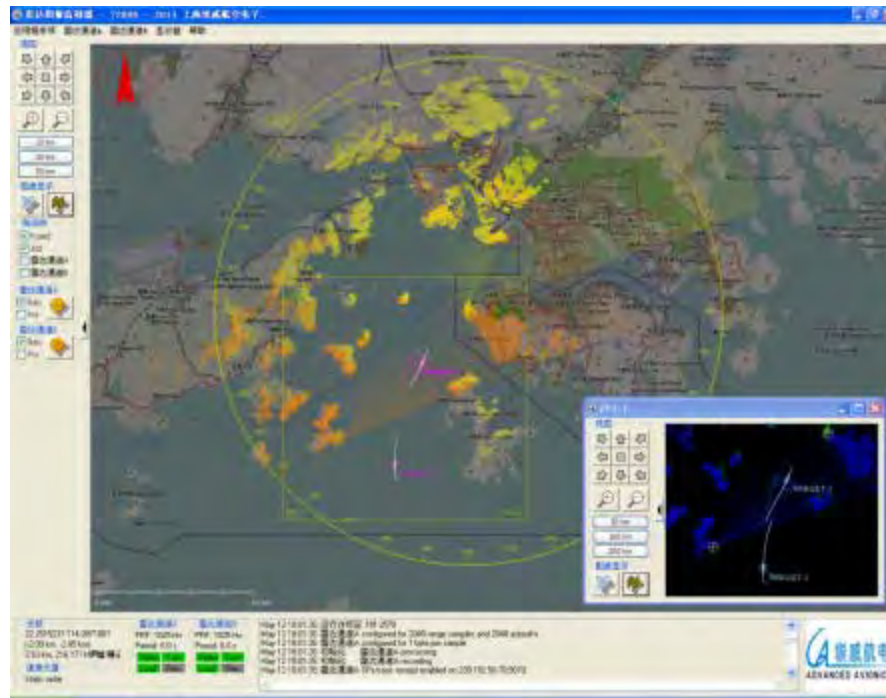
c) Develop and remould main hardware equipment to meet the requirement of mariners

Develop intelligent navigation and berth equipment used on ships

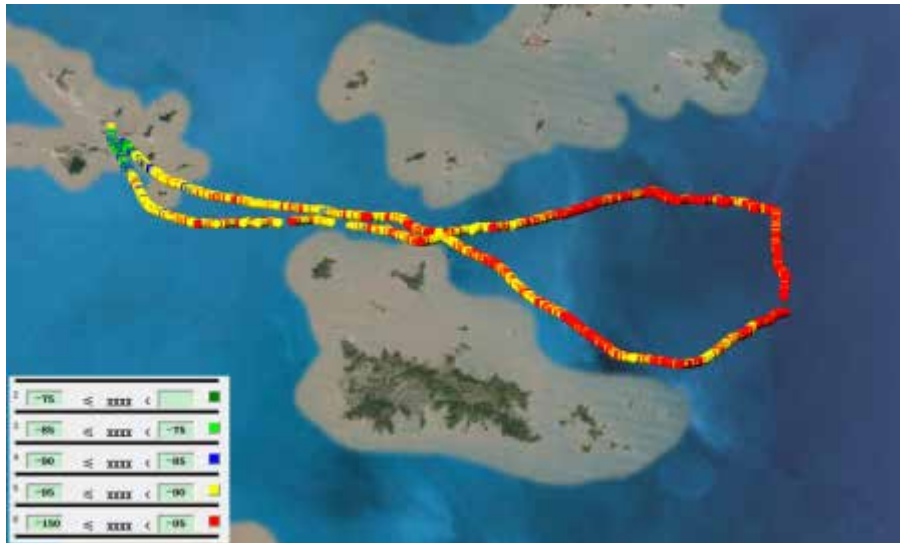


Install and use solid-state digital radar , to identify, track and broadcast small target information

After the filtration, recognition and format conversion, the small target data is broadcasted by AIS base station.



Extend 3G corporation; remould the existing VHF communication equipment;
real-time delivery navigation service information;



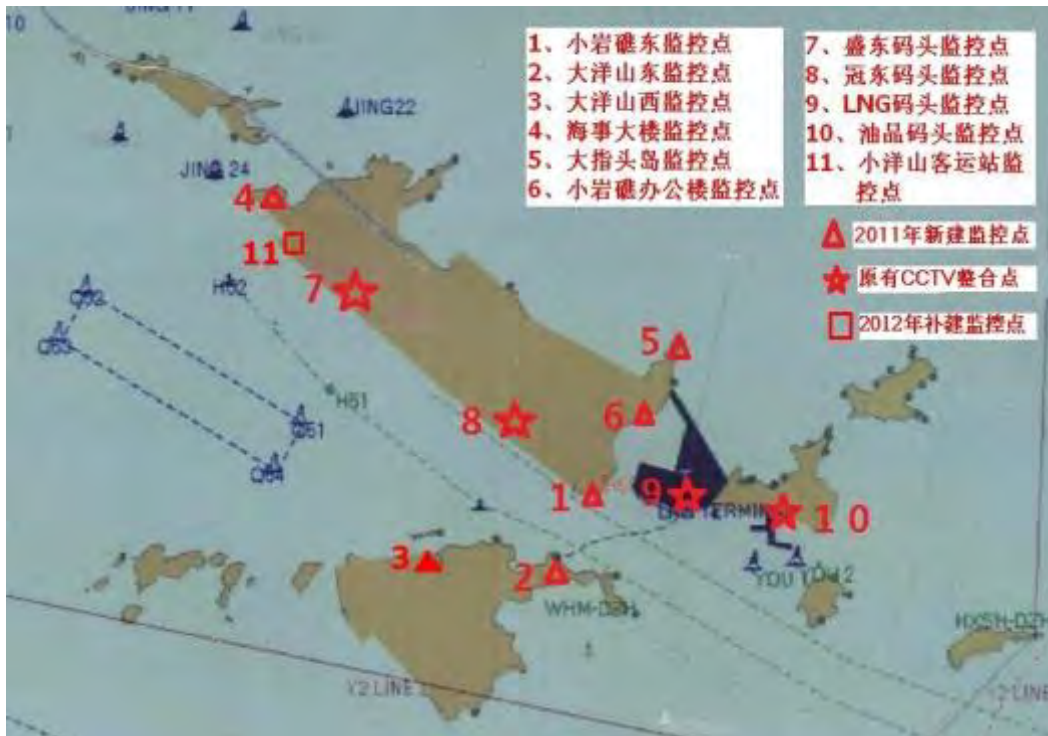
Install and use directional sound amplification system equipment and on-the-spot cruise regulatory voice remind safety services



Test improving effective observation visual range of noctovisor and other auxiliary observation equipment under poor visibility



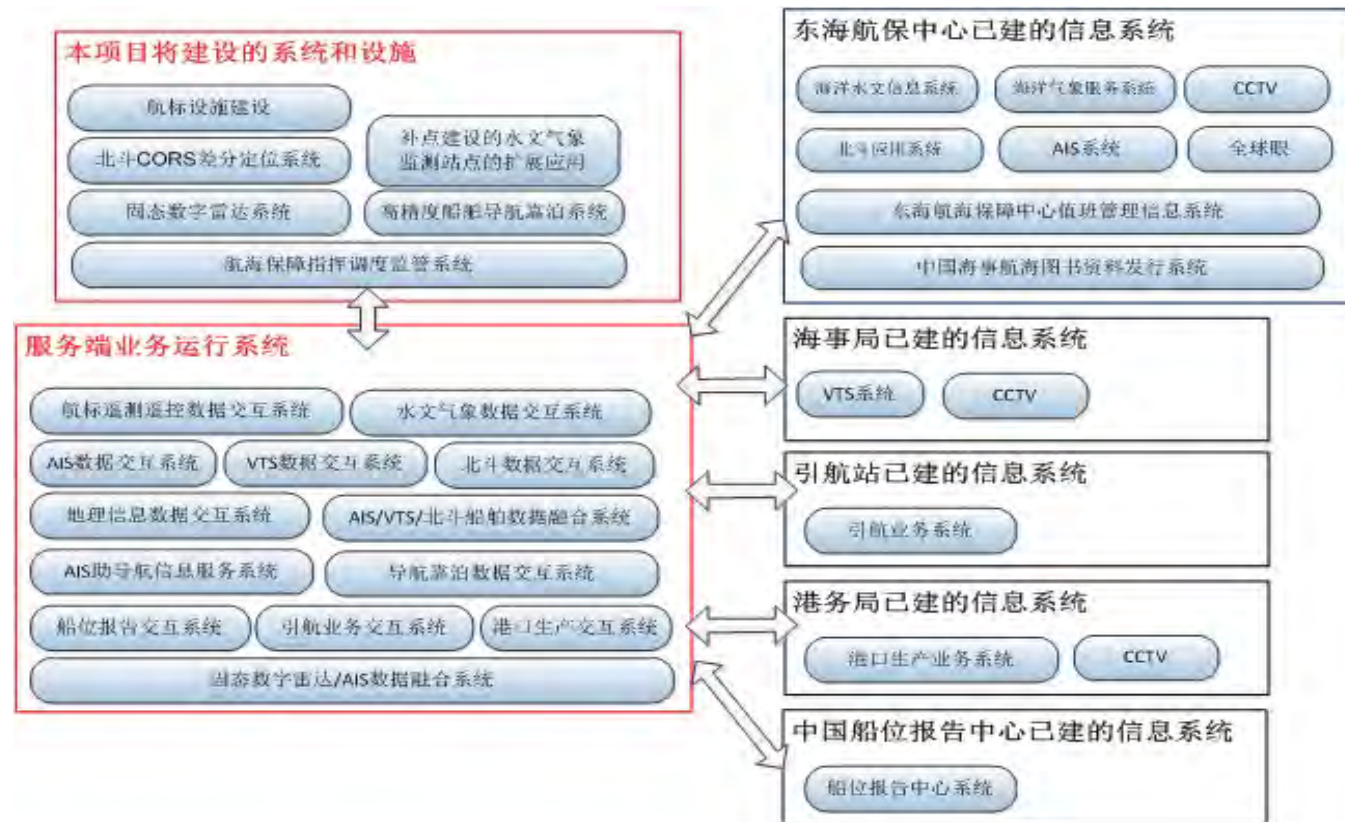
Sharing information from CCTV video terminals of each stakeholder



Main Project components

B. Develop an integrated platform to support port operation and a cloud data center

a) Development of command dispatching supervision platform and construction of cloud data maintenance center



b) The data source of this platform

- Ø AIS system access, display a variety of vessels ' information which has installed shipborne AIS receiver;
- Ø VTS system access, display shore-based radar echo information of Yangshan Port;
- Ø Beidou satellite ship positioning terminal information access, display the location information of various types of small vessels or fishing vessels which installed Beidou satellite;
- Ø Duty management information system in East Sea of China access, display Aids tables, Aids dynamic information and Aids telemetry and telecontrol management information;
- Ø Chinese maritime nautical books and materials distribution system access, electronic chart display information and publishing data download updates ;
- Ø Shanghai Pilot Station , the Yangshan Port sub-stations, pilot scheduling management system access , display the ship Pilotage scheduling arrangements ;
- Ø Shanghai Port Group , the production business component and the control room management systems access, display port berths handling conditions and ship production operations scheduling ;
- Ø China Ship Reporting system access, display the port of destination shipping information and position dynamic of yangshan port.

- Ø Access to marine meteorological service system of east sea area, and show meteorological information of the existing observation site;
- Ø Access to marine hydrological information service system of east sea area, and show hydrological information of the existing observation site;
- Ø Access to information existing CCTV video terminal of each stakeholder

Light ship hydrologic meteorological stations



Real-time query of meteorological hydrological information

Mobile ocean hydrological station

c) Upgrade and integration of work systems

- Ø maritime traffic information public service platform of Xiamen port .Two phase construction since 2010, users reflect is good.

厦门港海上交通信息公共服务平台
Xiamen Port Maritime Traffic Info Public Service Platform

航行更安全! 靠岸更便捷!

首页 | 航行全要素 | 港口公告 | 政务公开 | 海事公告 | 法律法规 | 海事服务 | 水文气象 | 航行及靠离泊方法 | 航标信息 | 装卸锚地码头 | AIS数据分析 | 典型事故案例

49] 航行警告XMI0010(0号灯浮恢复工作) • [2010-03-29] NAVTEX航行警告XMI0009(帆船展) • [2010-03-28] 航行警告

遥感影像地图服务

港口通告 更多...

- 厦门港口管理局关于黄舫轮等任免的通知 2010-09-15
- 厦门港口管理局关于王琛轮等任免的通知 2010-09-15
- 厦门港2010年9月份主要航道水深通告 2010-09-15
- 厦门港口管理局关于厦门国际码头有限公司危险品货物港口作业... 2010-09-15
- 厦门港口管理局关于厦门海福石化码头有限公司危险品货物港口... 2010-09-15
- 厦门港口管理局关于厦门欣喜船务工程有限公司审定的意见 2010-09-09
- 厦门港口管理局关于大厝小嶼轮渡轮渡码头改建工程项目引... 2010-09-03

航行通告 更多...

- 厦门港东屿港区二期工程工程8标段作业增加船期 2010-08-17
- 厦门港东屿港区一期工程方石泊位整修安装 2010-08-11
- 厦门港东屿港区二期工程工程8标段作业增加船期 2010-08-11
- 新永德西北岛游码头整修安装 2010-07-16
- 厦门港东屿港区13#泊位整修码头工程水城疏浚作业 2010-07-14
- 航标动态 2010-07-12
- 厦门港东屿港区二期工程工程8标段作业增加船期 2010-07-01

调度计划队列浏览

船舶名称: 重置: 泊位名称: [输入几个关键字即可]

[发布日期范围] 始: 止:

[靠离泊时间范围] 全部 始: 止: 刷新: 重置: 刷新

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操作	发布日期	船期号	船舶名称	靠离	靠离时间	泊位名称	状态
计划位置 实际位置 查看详情	2010-09-20	VEDM3	SINO TRAVEL SHENZHEN	靠	2010-09-20 12:00:00		正常
计划位置 实际位置 查看详情	2010-09-20	1022	DEK SUKAM	靠	2010-09-20 12:00:00	东屿港区10#-11#	正常
计划位置 实际位置 查看详情	2010-09-20	0000	FEYDREA	靠	2010-09-20 10:00:00	东屿港区20#	正常
计划位置 实际位置 查看详情	2010-09-20	0000	PA WITELLOEIT	靠	2010-09-20 09:00:00	东屿港区20#	正常
计划位置 实际位置 查看详情	2010-09-20	0000	MANUPRI	靠	2010-09-20 09:00:00	东屿港区10#-11#	正常
计划位置 实际位置 查看详情	2010-09-20	0000	DOOL AUSTRALIA	靠	2010-09-20 09:30:00	东屿港区10#-11#	正常
计划位置 实际位置 查看详情	2010-09-20	0000	MSD MAD 108	靠	2010-09-20 04:30:00	东屿港区1#-5#	正常
计划位置 实际位置 查看详情	2010-09-20	0000	MINYUEN	靠	2010-09-20 04:00:00	东屿港区20#	正常

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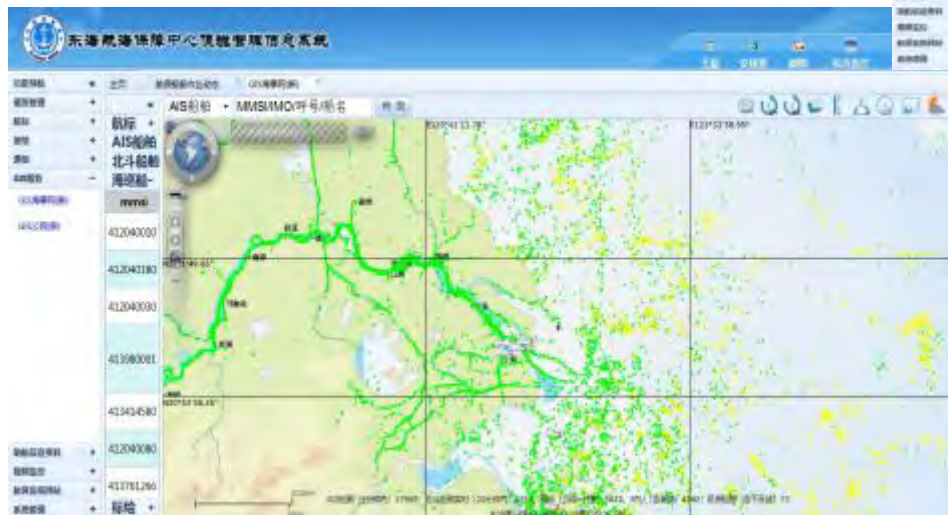
Display and query of port scheduling plan

∅ The management information system, accomplishment in 2013.

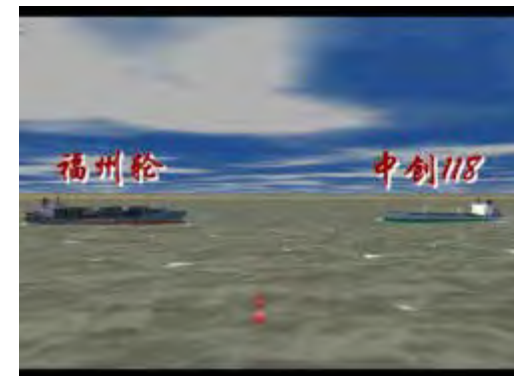
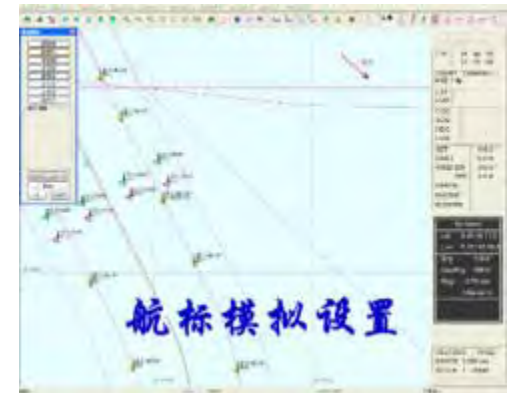
东海航海保障中心值班管理系统

船舶船舶作业动态管理

船名	日期	船位	船舶动态	航次	航路/作业	备注/作业
海远船001	2014-09-08	海远1000	广德	0402001		
海远船002	2014-09-09	海远1005	绍兴	0402002		
海远船003	2014-09-08	海远1000	绍兴	0402003		
海远船004	2014-09-08	海远1005	绍兴	0402004		
海远船005	2014-09-09	海远1000	绍兴	0402005		
海远船006	2014-09-09	海远1005	绍兴	0402006		
海远船007	2014-09-09	海远1000	绍兴	0402007		
海远船008	2014-09-08	海远1005	绍兴	0402008		
海远船009	2014-09-08	海远1000	绍兴	0402009		
海远船010	2014-09-08	海远1005	绍兴	0402010		
海远船011	2014-09-08	海远1000	绍兴	0402011		
海远船012	2014-09-08	海远1005	绍兴	0402012		
海远船013	2014-09-08	海远1000	绍兴	0402013		
海远船014	2014-09-08	海远1005	绍兴	0402014		
海远船015	2014-09-08	海远1000	绍兴	0402015		
海远船016	2014-09-08	海远1005	绍兴	0402016		
海远船017	2014-09-08	海远1000	绍兴	0402017		
海远船018	2014-09-08	海远1005	绍兴	0402018		
海远船019	2014-09-08	海远1000	绍兴	0402019		
海远船020	2014-09-08	海远1005	绍兴	0402020		



Ø 3D simulator navigation risk assessment application system of shanghai port(decision support).



- Ø This is a short introduction about our e-Yang Shan Port Demo Platform, so there is no expanding to state on each branch function.
- Ø if you want know deeply about our platform, please send the request to by e-mail to the roadman9999@126.com, Liang zhang from China MSA
- Ø Thank you for your patience!

Devote to **informatization**

March toward **E-navigation**

Let's **strive together**

Thank you!

