MUMBAI PORT TRUST

Vessel Traffic System (Overview)

Need of Vessel Traffic System

With increase in Maritime Traffic, need for a more effective system offering higher levels of safety and throughput was felt and accordingly Radar based Vessel Traffic System was installed and commissioned in Mumbai harbour for safe navigation, traffic monitoring and surveillance purpose in May 1997. Hence Maritime safety and national security are primary concerns for Ports & national Authorities.

System Architecture of new State_of_the _art Vessel Traffic Management System installed at Mumbai Harbour

Mumbai Port had placed the order to supply and install the new state-of-the-art VTS with M/s Atlas Elektronik, Germany in Nov 2009 for safe navigation, surveillance and security of the entire Mumbai Harbour, including the Outer Anchorage and Jawaharlal Nehru Port Trust (JNPT) and same was installed & commissioned on 03-09-2011. **It consist of multiple sensors viz. 3 Radars, Radio Direction Finder, Differential Global Positioning System, 5 Long range video cameras, 4 Automatic Identification System, Met & Hydro sensors with 4 Microwave & VHF communication links along with various subsystems like Multi-tracker, VTMS Server, software and Display Stations**. The various sensors detect and track the ships in the outer anchorages, approach and harbour area covering about 450sq.Kms. The system has 3 main Radar Stations, one each at Colaba Point, Jawahar Deep and JNPT. The data from the Sensors are transmitted through digital Microwave Links to the control Stations at BPX and JNPT comprise individual ship tracks, the video and the Supervisory Control for further augments the identification of ships from database.

The multi-tracker and communication software at the control centers process the signals received from sensors, producing accurate information on the range, distance, speed and other relevant navigational data about the ships, which is available on real-time basis on graphic workstation at the BPX and JNPT harbour control centers. As a result, the overall human involvement is drastically reduced in all respects of safe harbour operations. Another benefit derived is higher levels of decision making. All these will add upto vastly improved utilization of Approach and Channel and improved throughput potential of the marine traffic at Mumbai Harbour.

A unique feature of this VTS at Mumbai Harbour is its integration with Differential Global Positioning System (DGPS) & AIS with CCTV cameras. The voice and video recording facilities have also been included in this system. The VTMS Control Stations at MbPT and JNPT are provided with 21" graphic display monitors and 17" data terminals and integrated marine wireless communication. A basic interface for integrating ship information and a database is available which is already upgraded for integration with PORTMIS. System as such shall not work on individual stand alone subsystems unless it is integrated with all sensors. subsystems and processes

with system VTS software to get desired results for safe navigation and surveillance for harbour.

Typical Harbour layout with VTMS installation along with System architecture is enclosed.

Major Features:

(i) Traffic guidance and control

(ii) Anchorage monitoring

(iii) Ship arrival and departure planning

(iv) Extensive management information

(v) Interface to external port management system

(vi) Support for local hydrographic surveys

(vii) Disaster control and rescue management

One of the principal distinguishing features of the system is that it is thought to be the first of its type to combine a number of major elements, sensors and subsystems within a totally integrated, open architecture type VTS assembly. The elements comprise the following;

(viii) Three separate VTS control centers with digital wide area network links, each designed for both independent and joint operations.

(ix) VHF radio communications system.

(x) Radio direction finder system

(xi) Long range digital video surveillance system

(xii) Differential GPS transponder system incorporating IALA specification radio transponders.

(xiii) Integrated remote weather sensor system.

(xiv) Mobile hydrographic survey system inclusive of DGPS positioning.

(xv) Simultaneous multi-sensor tracking based on tracking sensors like AIS,GPS & Radio Direction Finder

(xvi) Linked and synchronized database management system with displays.

(xvii) Chart-based integrated VTMS operator workstations.

(xviii) Digital communication links (Microwave) between all sensors and control centers.

Major beneficiaries of the VTMS System are :

(i) Mumbai Port Trust

(ii) Jawaharlal Nehru Port Trust

(iii) Indian Navy

(iv) Coast Guard

(v) Custom Authority

(vi) Coastal Police-Maharashtra