FACT SHEET ON THE HARBOUR CRAFT TRANSPONDER SYSTEM (HARTS)

Background

The Maritime and Port Authority of Singapore (MPA), the Police Coast Guard (PCG) and the Republic of Singapore Navy (RSN) have always worked closely to enhance maritime security within Singapore's port waters.

The Harbour Craft Transponder System (HARTS) is one such initiative. Jointly implemented by MPA, PCG and RSN, the system is designed to automatically track and monitor small powered harbour and pleasure craft in Singapore port waters. All MPA-licensed powered harbour and pleasure craft are required to carry the HARTS transponders which automatically send out the craft's identities, positions, courses and speeds to the relevant authorities.

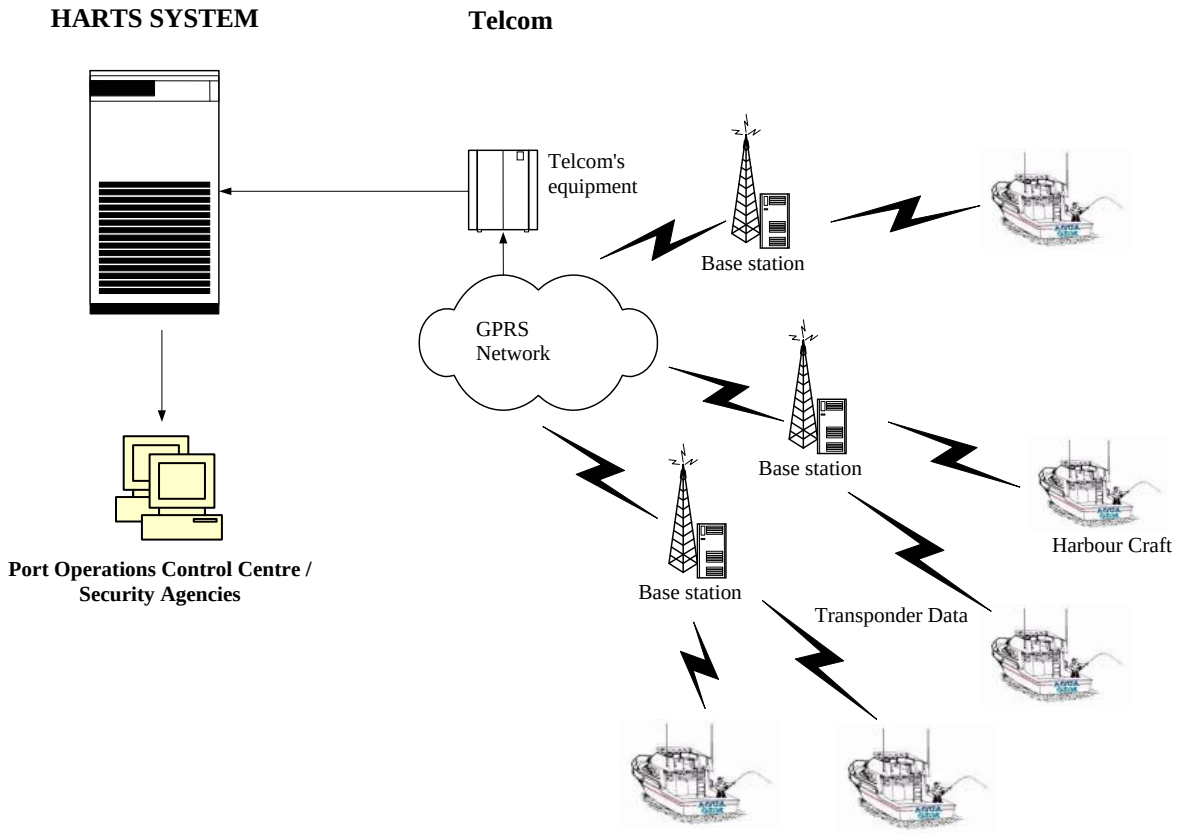
Singapore is the first country in the world to implement a system like HARTS as an added security measure to monitor potential threats and ensure the safety of vessels and lives in our port.

Information received from HARTS and other surveillance systems such as radars enable the three agencies to monitor the movements of these craft and take the necessary preventive action in the event of any suspicious activity. This would also serve as a deterrent to potential terrorists.

The tender for the system which included fitting the HARTS transponders on some 2,800 licensed craft was awarded to ST Electronics (Info-Comm Systems) Pte Ltd at a cost of S$3.48m. Installation of the transponders began in Jul 05 and was completed in Dec 06. HARTS commenced operations in Jan 07. The three agencies have put in place a joint Standard Operating Procedure (SOP) to monitor the craft and respond to alerts.

HARTS complements the other security measures already in place in the Singapore port. These include the Harbour and Pleasure Craft Security Codes which ensure that masters of harbour craft and pleasure craft plying within port waters comply with general security standards, and a Ship Self-Security Assessment Checklist, which small craft are required to submit prior to entering the port. Together, these measures underscore our nation's commitment in making the Port of Singapore safe and secure for the many ships that call here for trade.

Overview of HARTS System



The HARTS set-up comprises three main components as follows:

i) HARTS transponders fitted onboard the craft

ii) Wireless communication link

iii) A shore-based tracking system

Real time data from the transponder such as craft identity, position, speed, course and other information are transmitted to a shore-based system via the wireless communication link. The data received is then processed by system servers and sent to the operator workstations at the control centres of the security agencies.

To ensure minimum or no intervention from craft driver, a ‘black-box’ design has been adopted for the HARTS transponder to be installed onboard the craft. The GSM/GPRS (Global System for Mobile communications/General Packet Radio Service) offered by the local Telco (Telecommunications Service Providers) was selected for the wireless communication link.

HARTS Transponder

The main function of the HARTS transponder is to transmit the craft's identity and positional data to the control centre via the GSM/GPRS network. Each transponder consists of three main components:

i) A GPS Receiver

ii) A GPRS Modem

iii) A Processor/Controller

The GPS Receiver receives positioning data from the GPS satellites and enables the craft to know its current position. The Processor/Controller gathers the data from the GPS receiver including other useful information (e.g. craft's identity), processes the data and sends it to the GPRS modem. The GPRS Modem then transmits the data to the shore-based system via the GSM/GPRS link.

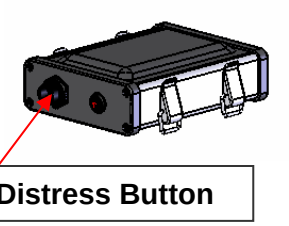
There are two types of transponders –

i) Fixed-mounted transponders are used on bigger craft with onboard power supply (eg. harbour launches, tugs and ferries)

ii) Portable transponders are used on smaller craft (eg. *sampans* and open-top speedboats)

Key features of the HARTS include:

- A 'Panic Button' to alert the shore-based authorities in the event of a security threat. The alert is sent to MPA, PCG and RSN simultaneously. A procedure is in place for the authorities to respond to the incident accordingly.



- Security features to ensure that each transponder unit will only work on the authorised craft.
    - Mounting bracket contains a unique ID
    - ID on bracket must match that of transponder
    - If ID is incorrect, a security alert will be sent to control centre

- Ability to transmit craft identity, position, course and speed to shore-based authorities.

- Use of existing telecommunications infrastructure (GPRS network) for transmission of data from the transponder unit to the shore-based control centres

- The monitoring station which is the user interface terminal that allows the operator to visually monitor and tracks the harbour craft. Each monitoring station is a workstation PC with a graphic display monitor and has the necessary application software. The harbour craft data received from the transponder is displayed as target tracks on an Electronic Navigational Chart (ENC) of the Singapore Port Waters. The basic features of the monitoring station include:

    - Real-time traffic display
    - Target data
    - Operation alarms when violation is detected
    - Recording and play back of historical harbour craft tracks