

# **Integrated Safety System for Small Vessels**

**Host Organization:** Cochin Shipyard

## **Preamble to the Problem:**

Presently small vessels like fishing trawlers, boats and other miniature vessels do not have any safety mechanisms for anti-collision with other vessels. This often leads to collision of small vessels with huge ships especially during night time when the visibility is close to zero.

Attention is drawn towards a recent collision of Panama registered cargo ship with fishing boat off the coast of Kerala which killed 2 Indian fishermen and injured 11 others (20 nautical miles off the Kochi coast). “There was no warning and after hitting the boat, they sailed away without stopping.” says a fisherman who survived the accident. The big ships would not have even felt the impact. Numerous such near miss accidents happen often in open waters where small boats, trawlers and fishing vessels operate.

As per the standard operating procedures, very few vessels are having Compass, GPS, VHF etc as navigation and communication aids. But there are no specific collision detection and prevention devices with these small ships.

In this connection an effective fool proof mechanism should be made available in these small vessels in general to make them safer during navigation during night. We would suggest developing a device using a combination of sensors like Low Intensity Radar, AIS, GPS or by other suitable methods which would help/assist fishing boats, trawlers or small vessels from manoeuvring away from big ships.

Small vessel users have a tendency to switch off generators and all power supply during night time while in mid sea (when they are not navigating or when they are laying their nets). This may lead to switching off of all safety devices and even all lighting. This will make big vessels very difficult to identify small vessels. Hence the new device should be free from externally powered sources

## **Problem Statement:**

The objective of the PS is to develop a device that can forewarn host fishing vessels the presence of larger vessels in the vicinity which is otherwise not possible through the naked eyes at night. The participants are expected to document the project describing the working, detailed expenses and also a plan of action for mass production.

Since there are no ships in vicinity you will be required to program the device for Aeroplanes(i.e if you are using AIS and GPS to solve the PS). The contestants should present with a reliable method for testing the device otherwise.

The participants are required to submit the documentation and video on or before 15th december.

### **Objectives:**

1. **Appropriate Notification(150 marks):** The device should be able to provide an audible warning to the occupants and to the upcoming ship when the proximity is very close (configurable).
2. **Self-sufficient battery management system(100 marks):** The device should be impossible to switch off manually and should have minimum period of battery life of at least 6 months.
3. **Inexpensive(100 marks):** The device should be very cheap so that it can be installed freely under government subsidy into the small vessels. The existing ones are integrated with various facilities and cost a minimum of 50000INR, due to which they are not very practical despite the subsidised price of around 35000INR. The points will not be awarded relatively but based on feasibility of application(0, 50 or 100)
4. **Documentation(150 marks):** This must include detailed write-up on the project including costs and implementation in the real world. This carries a total of 100 points. Also a video is to be submitted elaborating on the write-up that explains reliability of the device. Which carries 50 points.(emphasising mainly on implementation and description of the design)

### **Bonus tasks:**

1. **Warn the coast guards (100 marks):** The device should be able to alert the nearby Coast Guard or local authorities in case of any accidents, sinking of the vessel, in case of fire and in case of any emergencies
2. **Restrict from entering foreign waters(100 marks):** Device must be able to warn users if the vessel is going out of territorial waters and if it is straying into waters of other countries
3. **Inform near future sea conditions/ sea state (100 marks):** to the occupants of the vessel