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# Internet of Things at sea: using AIS and VHF over satellite in remote areas

**This research focuses on alternative communication means for vessels in difficult conditions and remote areas. Even if maritime transport accounts for 70-80% of global trade, only around 30% of the vessels carry ordinary satellite communications equipment.**

The Internet of Things and exchange of sensor information must be supported also while sailing in remote areas. Visibility of cargo throughout the transport chain has become more important. The novelty of this research is to use existing Automatic Identification System (AIS) transceivers to transmit information related to remote monitoring and controlling.

There are two major problems of using AIS for such applications. One is to determine when the Automatic Identification System Low Earth Orbit satellite is available.

Another is that AIS satellites can fail to register data, even when in radio range of the ship, as the ship antenna is constructed for horizontal radiation. These analyses used AIS data for a ferry in Norway with 50% satellite coverage. Estimates show that AIS satellites can normally detect up to 30% of transmitted AIS messages without any changes in antenna configuration.

In the High North region, the delay was quite long due to limited coverage. However, more satellites and full coverage in the area will reduce the delay to a second or less •