

Possible Interference to S Band Radar

Submitted by NAVAREA I

SUMMARY

Executive Summary: With the increasing developments in communication systems in and around major Ports of the World, their approaches and other coastal area, this paper invites members to discuss current or future contingency plans to inform mariners of the possible effects on the function of equipment carried on board ships.

Action to be taken: Paragraph 4

Related documents: None

Background

1. Nations are facing increasing demands to release radio spectrum in public ownership or to use it more efficiently to improve services to industry and the public. One of the uses in question is wireless broadband transmitters which make use of the WiMax format, another is the LTE format which will drive future 4G mobile telephone networks. There are many different characteristics, powers and directions of transmission for these signals. It is understood that transmitters are already operating (at 2.4, 2.6 and 3.5 GHz) in Ireland, Sweden, Germany, Denmark and USA (there may well be others including Gibraltar?).

2. In the UK one area that is planned for these signals will occur at about 2.6GHz which is below though adjacent to part of the maritime spectrum in which S Band radars operate. These radars utilise both magnetron and "solid state" transmitters. Research in the UK indicates that there is some effect on maritime radars from these signals. These effects are primarily a reduced probability of detection of targets which might otherwise have been observed by the mariner. This reduction has been studied scientifically but not yet through practical trials. The mariner may not be aware, from the radar receiver, that their equipment is suffering a reduced probability of detection, unlike other forms of interference which are sometimes observable as spokes, speckles and so on. It is thought that the range at which these effects take place is fairly small (< 2miles dependant upon the configuration and location of the transmission signals) though potentially of significance to mariners in congested areas near the coast and in restricted visibility. The research also appears to indicate that with 2.6 GHz transmission sources "solid state" radars are more likely to be affected than magnetron radars, the reverse apparently being true at higher frequencies with potentially increased ranges of effect.

Discussion

3. Do other NAVAREAs have any experience of providing warning information to mariners about reduced effective operation of their on-board equipment (especially but not exclusively S Band Radar) due to EM transmissions from shore based installations?

Action requested of the Sub-Committee

4. The Sub-Committee is invited to:
- a. include this topic as a regular agenda item so that members can monitor the situation and report back to future WWNWS-SC meetings.
 - b. ask members to supply any examples where navigation warnings have been issued concerning electro-magnetic radiation interference from shore which might be experienced by the mariner.
 - c. consider the need for a standard format for messages concerning possible degeneration of S Band Radar systems in areas of Wi-Max/LTE coverage and propose a new example to be included in the IMO/IHO/WMO MSI Manual.