Liaison Note to ITU WP 5B

Recommended Technical Clarifications for ITU-R M.1371-4

# Introduction

IALA thanks ITU WP5B for their liaison note, Annex 33 to 5B/417, and IEC TC 80 AIS WG for their liaison note dated 26th February, 2010. As both liaison notes deal with essentially the same two issues they are both dealt with below.

Considering the control of mobile stations transmitting the satellite detection message 27 led IALA to conclude there is a need to clarify and further detail the use of AIS base stations to control these transmissions. Given the intention to allow national members to control the transmission of message 27 in their own waters, there is a need to define the areas in which message 27 is enabled or suppressed. Otherwise one country’s Base Stations could unintentionally interfere with message 27 transmissions in its neighbour’s waters.

# Message 27 behaviour

AIS Class A mobile stations will be set to always transmit message 27 by default. To allow national authorities to control when vessels are transmitting message 27 in their Base Station Coverage Area a change was made to the Base Station message 4. The Base Station message 4 was set to have mobile units suppress message 27 by default when they receive it, unless the “Transmission Control for Long Range Broadcast Message” bit was set (value = 1) to allow message 27 transmission.

It is believed that the decision to have the message 4 default to suppress message 27 transmission was based on the assumption that if a mobile station received a message 4, it was within range of and being tracked by a shore station, so satellite reception was not needed.

Closer consideration of the testing requirements and operational implementation of the message 27 suppression command, has shown that there could be conflicts in implementation between adjacent base stations. As Base Station RF coverage areas may overlap with that of other Base Stations or extend into another nation’s waters Mobile Stations could receive conflicting commands. Conflicting commands from these Base Stations would make it impossible to predict mobile station behaviour as it cannot be known which Base Station is being received at any given moment.

For this reason, IALA proposes that ITU should consider that the area where message 27 transmissions are intended to be suppressed should be defined by using message 23. Thus an authority could suppress message 27 by transmitting both a message 4 and a message 23 to define the “Base Station Coverage Area.”

This would address the situation where two neighbouring countries have differing requirements for Mobile Stations, ie country A requires message 27 enabled and country B requires message 27 suppressed. If Coverage areas are not defined in Message 23 country B could unintentionally control mobile behaviour in country A’s waters. This situation would always arise if message 4 alone is used to control message 27 transmissions.

IALA proposes that the Base Station Coverage Area for control of Mobile Stations transmitting message 27 should be definitive to address the following issues:

* to avoid unpredictable behaviour from Mobile Stations, when conflicting commands are received from multiple Base Stations;
* deterministic behaviour for satellite data correlation;
* deterministic behaviour for satellite detection of anomalous behaviour by a Mobile Station.

A more detailed description is given below.

Resolution of the issues can be achieved by controlling the transmission of the long range broadcast message 27 by a competent authority using message 4 in conjunction with message 23. Message 23 defines the Base Station Coverage Area and Message 4 commands the Mobile Station to stop transmitting message 27 in this area. When a Class A unit receives message 23 with parameter Station Type set to10 (10=’Base Station Coverage Area’ – new definition required) it will use the lat/long from the message 23 to define the Base Station Coverage Area; all other fields will be ignored. The Base Station Coverage Area should be calculated according to the rules of ITU R. M1371-4 section 4.1.5 Annex 2. The Class A unit must receive both the message 4 with the control set to “off” and a message 23 with the definition of the Base Station Coverage Area; it will then verify that it is within the Base Station Coverage Area and behave appropriately. The control and the Base Station Coverage Area will time out within 3 minutes of the last message 4.

Message 4 receiving areas

Base Station B

RF Footprint for Base Station B

BS B Coverage area for MSG 27 control

Base Station A

RF Footprint for Base Station A

Base Station C

RF Footprint for Base Station C

Base station coverage area

defined by Message 23with Station Type = 10

1. Control of Msg 27 transmissions
2. Control of Msg 27 transmissions

|  |  |
| --- | --- |
|  | Message 27 transmission |
| BS A Coverage area for MSG 27 control | OFF only if valid MSG 4 & 23 command received from Base station A |
| BS B Coverage area for MSG 27 control | OFF only if valid MSG 4 & 23 command received from Base Station B |
| High Seas, RF footprints for all Base Stations | ON |

# AIS Class B SO behaviour

The IEC TC 80 WG 15 requests clarification concerning AIS Class B SO behaviour. IALA recommends the following for each item.

## Polite behaviour in high VDL load scenarios

The Class B SO mobile station shall increase the reporting interval under high VDL load conditions to prevent an overload scenario in congested waters.

The reporting interval for Dynamic Information shall be as shown in Table 2.

1. Dynamic information autonomous reporting intervals for Class B “SO” AIS

|  |  |  |
| --- | --- | --- |
| Condition | Nominal Reporting Interval | Increased Reporting Interval |
| Class B “SO” AIS Mobile Equipment not moving faster than 2 knots | 3 minutes | 3 minutes |
| Class B “SO” AIS Mobile Equipment moving 2 - 14 knots | 30 seconds | 30 seconds |
| Class B “SO” AIS Mobile Equipment moving 14 - 23 knots | 15 seconds | 30 seconds |
| Class B “SO” AIS Mobile Equipment moving faster than 23 knots | 5 seconds | 15 seconds |

The AIS Class B ‘SO’ shall follow the rules set by ITU-R M.1371, and shall increase the reporting interval to ‘Increased Reporting Interval’ in accordance with Table 2 when less than 50% of the slots of each of the last four consecutive frames are Free.

When more than 65% of the slots of each of the last four consecutive frames are Free, the Class B ‘SO’ AIS shall report at the ‘Nominal Reporting Interval’.

## Assignment of AIS Class B SO mobile station

The behaviour regarding group assignment shall be as defined in 1371-4 for Class B CS behaviour.

## Interrogation of AIS Class B SO mobile station

It should be possible to interrogate a Class B SO mobile station for Message 24 B. However the Class B SO mobile station shall not broadcast Message 24B unless interrogated. Message 15 notes are amended accordingly.

## Message 24B Vendor ID

NMEA mnemonic manufacturer codes should be used for Message 24B Manufacturer ID. Manufacturers and or Vendors may request this code via NMEA at [www.nmea.org](http://www.nmea.org).

# Action requested

The ITU WP5B is requested to approve for publication, by IALA, the attached technical clarifications to ITU-R M. 1371-4 (e-NAV8/output/8a).