Input paper: [[1]](#footnote-2) ENAV27-5.1.6.2

Input paper for the following Committee(s): check as appropriate Purpose of paper:

**□** ARM **□** ENG **□** PAP **x** Input

**X** ENAV **□** VTS **□** Information

Agenda item [[2]](#footnote-3)

Technical Domain / Task Number 2 …Working Group 3: G1139/VDES………………………………

Author(s) / Submitter(s) Dalian Maritime University, The Navigation Guarantee Center of North China Sea……………………

Change Proposal for G1139

# Summary

Based on an official output document of VDES in ITU WP5B meeting, a change proposal is hereby provided for G1139 under eNAV27, and asks WG3 to consider these changes for revision of G1139.

## Purpose of the document

Input to revision of G1139, as attachment.

# Action requested of the Committee

We would like to ask the committee to consider and adopts our proposals.

Attachment

| **Comment Number:**  **Name-#** | **Change Log item # or source document** | **Annex / Section** | **Section, Table, Figure** | **Type of change** | **Reason for the change, or what you want to accomplish** | **Proposed change to IALA G-1139, short editorial changes can be include here (large changes should be documented below)** |
| --- | --- | --- | --- | --- | --- | --- |
| 1 | 20210120 re-numbering\_Revisions to G1139 | 3 | 4.4.3.3 | Clarification | The "flags" included in the overhead is not contained in the frame structure, need to be clarified. | The “flags” might refer to Link ID, could change “Link ID”. |
| 2 | 20210120 re-numbering\_Revisions to G1139 | 3 | 4.5.6 | Deletion | "The assigned mode" is only metioned in this section. The details of the assigned mode are not specified. | Propose to consider deleting this paragraph. |
| 3 | 20210120 re-numbering\_Revisions to G1139 | 4 | 4.9.2 | Change | The resource allocation message should be sent in response to an End Fragment(#76), rather than Continuation Fragment(#75) | Change “Continuation Fragment(#75)” to “End Fragment(#76)” |
| 4 | 20210120 re-numbering\_Revisions to G1139 | 4 | 4.9.3 | Alignment | The names of ACK/NACK masks are inconsistent. | NACK mask 1, NACK mask 2, NACK mask 0, NACK mask, (4.9.3 in Annex 4)  NACK mask (3.10.12 in Annex 5)  NACK mask (3.10.13 in Annex 5)  Proposal: only use ACK/NACK mask as in Annex 3. |
| 5 | 20210120 re-numbering\_Revisions to G1139 | 4 | 4.9.3 | Change | In the description of ACK/NACK mask, a data transfer session should ended with an End Fragment, rather than Continuation Fragment | Change ”Continuation Fragment” to ”End Fragment”. |
| 6 | 20210120 re-numbering\_Revisions to G1139 | 4 | 7, 8 | Deletion | These two paragraphs are inconsistent with the VDES architecture described in 1.1 of Annex 1, which indicates the utilize the OSI layers 1 to 4. Session layer and presentation interface layer are not included. | Propose to delete these two paragraphs. |
| 7 | 20210120 re-numbering\_Revisions to G1139 | 5 | 3.7 Table 62 | Correction | Some of the frequencies of the channel pairs are wrong | See below for more details |
| 8 | 20210120 re-numbering\_Revisions to G1139 | 5 | 3.10.6 | Correction | The first ship station ID should be “Ship Station ID 1” | Change ”Ship Station ID” to ”Ship Station ID 1” |
| 9 | 20210120 re-numbering\_Revisions to G1139 | 5 | 3.11 | Improvement | The content of the retry mechanism is ambiguous, the usage of ACK/NACK mask need to be clarified.  The retry mechanism need to consider the different data channel settings in bulletin boards and the number of retransmissions defined in Media Access Control. |  |

**Comments:**

**4.4.3.3 Long transmission packets**

A station may occupy a maximum of 3 consecutive slots, as defined by the Link ID, for one (1) continuous transmission. Only a single application of the overhead (ramp up, training sequence, flags, CRC, guard time) is required for a long transmission packet.

**4.5.6 Assigned**

A station operating in the assigned mode takes into account the transmission schedule of the assigning message when determining when it should transmit.

**4.9.2 Resource allocation**

Table 35

**Resource Allocation**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Resource allocation** | | | | |
| **Field no** | **Value (Dec)** | **Size (Bytes)** | **Function** | **Content** |
| 1 | 004 | 1 | Type |  |
| 2 | 0 to 216-1 | 2 | Length | Total size in bytes, variable. |
| 3 | 0 to 232-1 | 4 | Source ID | The Unique Identifier of the transmitting station as described in § 2.4, Annex 1. |
| 4 | 0 to 232-1 | 4 | Destination ID | The Unique Identifier of the ship being assigned a Logical Channel as described in § 2.4, Annex 1. |
| 5 | 0-255 | 1 | Logical Channel Tx | Logical Channel assigned to the session for transmission. Transmission only applies to data slots.(1) LC of 255 indicates no resource. |
| 6 | 0-255 | 1 | Logical Channel Rx | Logical Channel assigned to the session for reception. Reception only applies to data signalling slots.(1) LC of 255 indicates no resource. |
| 7 | 0-255 | 1 | Link ID | The link ID that must be used in the TDMA channel. This will apply to Messages 74, 75, 76 and 13. |
| 8 | 1-255 | 1 | TDMA frame delay | The number of TDMA frames to delay before the resource may be used. Resource may only be assigned from the start of the next TDMA frame. Default 1. (2) (3) |
| 9(4) | 0 | 1 | Session ID | Session ID. |
| 10 | 0-255 | 1 | CQI | Received Channel Quality Indicator as defined in § 1.2.8 Annex 2. |

Notes:

(1) The resource allocation message will always be sent on the signalling channel when being sent in response to a Resource Request (#90) message and will always be sent in the assigned TDMA channel when sent in response to a End Fragment (#76). When the Resource Allocation message is being sent in the assigned TDMA channel, then the message must be transmitted in the same VDE packet as the Ack (#13) message. See Fragment Continuation for more details.

(2) When assigning a Logical Channel, then both the Logical Channel Tx and the Logical Channel Rx must have identical TDMA channel numbers. The assigned LCs may have the same Physical Channels for simplex communication and different Physical Channels for duplex communication.

(3) The TDMA frame delay allows for the efficient transferral of Logical Channels from one vessel to another with as little as possible wasting of slots.

(4)The Session ID is reserved for future use.

**4.9.3 Ack/Nack**

Table 36

**ACK/NACK**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ACK/NACK** | | | | |
| **Field no** | **Value (Dec)** | **Size (Bytes)** | **Content** |  |
| 1 | 013 | 1 | Type |  |
| 2 | 0 to 216-1 | 2 | Length | Total size in bytes. |
| 3 | 0 to 232-1 | 4 | Source ID | The Unique Identifier of the transmitting station, as described in § 2.4, Annex 1. |
| 4 | 0 to 232-1 | 4 | Destination ID | The Unique Identifier of the receiving station, as described in § 2.4, Annex 1. |
| 5(1) | 0 | 1 | Session ID | Session ID of data session. |
| 6 | 0 to 216-1 | 2 | ACK/NACK mask 0 | When a packet was not received, then its corresponding bit must be set to one to Not Acknowledge the packet.  Each ACK/NACK mask corresponds to a data transfer session that started with a Start Fragment and ended with a Continuation Fragment. If the Start Fragment is not received, then the least significant bit is set.  The first Continuation Fragment corresponds with the next bit, and so on, with the End Fragment being represented by the last bit. If there were 10 fragments and the End Fragment was not received, then the ACK/NACK mask must be logically or-ed with 0x0200.  NACK/NACK mask 2 represents the latest TDMA frame received directly before this message response.  NACK/NACK mask 1 represents the second to last TDMA frame received.  NACK/NACK mask 0 represents the third to last TDMA frame received. |
| 7 | 0 to 216-1 | 2 | ACK/NACK mask 1 |
| 8 | 0 to 216-1 | 2 | ACK/NACK mask 2 |
| 9 | 0-255 | 1 | CQI | Received Channel Quality Indicator averaged over the last TDMA frame received as defined in § 1.2.8 Annex 2. |
| 10 | 0-255 | 1 | ACM or EDN | 0: Maintain Link ID.  1: Increment Link ID (higher rate)  2: Decrease Link ID.  3: End Delivery Notification  The Link ID may only be changed if all the fragments have been successfully received and the ACK/NACK mask is set to 0. Changing the Link ID must not change the channel bandwidth. |
| 11 | 0-255 | 1 | Power setting | 0: Maintain Power Level  1: Increase Power Level (Reserved for future use).  2: Decrease Power Level (Reserved for future use). |

**7 Session layer**

The session handling of PI sentence data requires close integration with the link layer. The responsibility of the session layer was therefore moved to the link layer.

**8 Presentation interface layer**

VDES supports a presentation interface to be specified in detail by the applicable international standards.

**3.7 VDE-SAT default bulletin board**

The default VDE-SAT bulletin board defines six Channel Pairs, labelled A to F, each with an associated VDE slotmap. The default channel pairs have been defined to support the frequencies and bandwidths allocated for VDE-SAT services, as detailed in Table 62.

Table 62

**Default VDE-SAT Channel Pairs**

A screenshot of a video game

Description automatically generated

**3.10.6 Resource Allocation**

Table 74

**Resource Allocation**

|  |  |  |  |
| --- | --- | --- | --- |
| **Field no** | **Size (Bytes)** | **Function** | **Content** |
| 1 | 1 | Type | Type = 12 |
| 2 | 2 | Payload size | Size of fields 3 to 22.  Payload size = 32 |
| 3 | 4 | Ship Station ID 1 | The Unique Identifier of the ship station, as described in § 2.4, Annex 1.  0 for broadcast. |
| 4 | 1 | Logical Channel 1 | Logical Channel assigned for data transmission. Only applies to data slots. LC of 255 indicates no resource. |
| 5 | 1 | Link ID 1 | Link ID that must be used in Logical Channel 1. Transmission direction can be inferred from link ID. |
| 6 | 1 | Session ID 1 | Satellite assigned session ID, range 1-255.  0 used for short message |
| 7 | 1 | Uplink link CQI 1 | Reception Link ID that must be used in Logical Channel Rx. |
| 8 | 4 | Ship Station ID 2 | The Unique Identifier of the ship station, as described in § 2.4, Annex 1.  0 for broadcast. |
| 9 | 1 | Logical Channel 2 | Logical Channel assigned for data transmission. Only applies to data slots. LC of 255 indicates no resource. |
| 10 | 1 | Link ID 2 | Link ID that must be used in Logical Channel 2. Transmission direction can be inferred from link ID. |
| 11 | 1 | Session ID 2 | Assigned session ID. |
| 12 | 1 | Uplink link CQI 2 | Reception Link ID that must be used in Logical Channel Rx. |
| 13 | 4 | Ship Station ID 3 | The Unique Identifier of the ship station, as described in § 2.4, Annex 1.  0 for broadcast. |
| 14 | 1 | Logical Channel 3 | Logical Channel assigned for data transmission. Only applies to data slots. LC of 255 indicates no resource. |
| 15 | 1 | Link ID 3 | Link ID that must be used in Logical Channel 3. Transmission direction can be inferred from link ID. |
| 16 | 1 | Session ID 3 | Assigned session ID. |
| 17 | 1 | Uplink link CQI 3 | Reception Link ID that must be used in Logical Channel Rx. |
| 18 | 4 | Ship Station ID 4 | The Unique Identifier of the ship station, as described in § 2.4, Annex 1.  0 for broadcast. |
| 19 | 1 | Logical Channel 4 | Logical Channel assigned for data transmission. Only applies to data slots. LC of 255 indicates no resource. |
| 20 | 1 | Link ID 4 | Link ID that must be used in Logical Channel 4. Transmission direction can be inferred from link ID. |
| 21 | 1 | Session ID 4 | Assigned session ID. |
| 22 | 1 | Uplink link CQI 4 | Reception Link ID that must be used in Logical Channel Rx. |

**3.11 Retry mechanism**

During data transmission, it is expected that data fragments can be lost occasionally. When some data fragments are not received, the receiving station shall transmit an ACK/NACK message (#13/#29) and flag the lost fragment slots in the ACK/NACK mask parameter.

The transmitting station shall retry transmission of each individual fragment for a maximum of N consecutive data channels before giving up, excluding the original fragment transmission in a data channel.

The receiving station shall request retransmission of data fragments for a maximum of N attempts. N is given in the MAC message field 10.

It is also possible that the ACK/NACK message (#13/#29) is not received by the transmitting station. It is for this reason that the NACK message (#13/#29) contains redundancy for three ACK/NACK masks, referencing the previous three data channels.

When the transmitting station does not receive and ACK/NACK message, it shall continue as if all the fragments has been acknowledged. If there were any errors, then the transmitting station will see this when it receives the next ACK/NACK message. If no ACK/NACK message is received within N data acknowledgement signalling channels, then the transmitter shall stop transmitting immediately.

1. Input document number, to be assigned by the Committee Secretary [↑](#footnote-ref-2)
2. Leave open if uncertain [↑](#footnote-ref-3)