1   Waterways Management Message Version: 2

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DAC: 367   FI: 35

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Summary of changes:

Release Version 2c:

  - Updated usage notes.

Release Version 2b:

  - Updated usage notes.

Release Version 2:

  - Added better linkage between vessels in subtype 0 (list) and subtype 2 (name).
  - Revised message version field definition to limit it to 15 versions in accordance with RTCM recommendation.
  - Fixed error in documentation that had message version field in a different place for the addressed version of the message.
  - Updated usage notes.
  - Added new subtype 2 message to define a vessel name for a vessel in list with unknown MMSI.
  - Added ice convoy as a type.
  - Set version to 2.

Release Version 1b:

  - Corrected some typos in the description fields, no change to message format.

Release Version 1a:

  - Changed usage notes to reflect Linked Text message vs. Text Description message. No change to message format.

Release Version 1:

  - Changed DAC to 367 to reflect final message. Set version to 1.

  - Added message version field.

  - Added precision field to specify lat/long precision.

> - Clarified number of characters for name.
>
> **Previous changes to drafts:**
>
>   - Modified message to include parameters: lockage type, chamber and vessel status.
>
>   - Modified message to include specific time for each vessel rather than relative time.
>
>   - Added message type Vessels Awaiting Lockage.

1.1   Introduction

The Waterways Management message can be used to facilitate vessel traffic movement in confined waters. More "directive" than advisory, this message can be broadcast (e.g., information for all ships or a group of ships) or addressed (e.g., information/direction to a single ship). Examples include: lock, gate, narrows, or single passage area.

There are three sub-types of this message;
        1) for providing a position/name of the waterway feature,
        2) for providing a list of vessels and their sequence order/times, and
        3) to specify a name (or IMO number) for a vessel with unknown MMSI.

Specific information for each vessel includes: sequence time, direction, and vessel MMSI. The complete list of message types is contained in Table 1.

1.2   Usage Notes

- The message can be broadcast or addressed, depending on which alternative is more appropriate.
- If message sub-type 0 is used, then a message sub-type 1 must also be sent to define the position for the sub-type 0 sequence. The message sub-type 1 can be transmitted less frequently than the sub-type 0 if desired.
- The Message Linkage ID can be used to link additional text (e.g., a separate Linked Text message). However, the same source MMSI needs to be included in both the Waterways Management and the Linked Text message.
- If there are no vessels in the queue then the MMSI of 0000000000 can be used for the first vessel with the time being the time of the data report.
- If the MMSI of the vessel is unknown then an MMSI of 1000000003-1000001023 can be used. The name or other identifier of the vessel is then transmitted in a subpart 2 message with the same number 3 – 1023 used to link the vessel name with the position in the queue. These numbers will be used sequentially by the competent authority transmitting the lock queue and then re-used once the range is exhausted. A range of

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- Subtype 2's sent as needed along with the subtype 0's to specify name or number for vessels with unknown MMSI. Anywhere from 0 to 7 subtype 2's sent with each subtype 1 message.
- New subtype 2 messages should be generated each time the vessel list is updated (subtype 0 message).
- A message version number is encoded as part of the message; if the received version number is different than what the display system has been programmed for, the data should be ignored.
- Positions are in WGS 84 Datum.
- Typical transmission sequence would be subtype 1 message at a longer interval (10min perhaps) and then subtype 0 and 2 at a shorter interval (perhaps 3 min).
- The display system should remove the WWM message from the display 60 minutes after the time of the last vessel in the list unless a removal message is received sooner.

1.3 Message Format

Table 1: Waterways Management Message Type

Value	Description	Value	Description
0	Lock	7	Traffic Advisory
1	Gate	8	Cleared to Enter / Proceed
2	Narrows	9	Not Cleared to Enter / Do not Proceed
3	Bridge	10	Proceed to Berth
4	Restricted channel -- one vessel at a time – could be alternating directions – no passing or overtaking	11	Proceed to _____ (defined in linked Text Msg)
5	Estimated Arrival Time	12	Vessels Awaiting Lockage
6	Assigned Arrival Time	13	Ice Convoy (specify speed and spacing in Linked text Message)
		14-15	Undefined

Table 2: Waterways Management Subtype 0 (Broadcast) – Vessel List

	Parameter	# of Bits	Description
Standard Message Header	Message ID	6	Identifier for Message 8; **always 8.**
	Repeat Indicator	2	Used by the repeater to indicate how many times a message has been repeated. 0 – 3; 0 = default; 3 = do not repeat any more. **Set to 0 (default).**
	Source MMSI	30	MMSI number of source station. This varies according to the transmitter ID.
	Spare	2	Not used. **Set to zero.**
Binary Data	Designated Area Code	10	Designated area code (DAC). This code is based on the maritime identification digits (MID). (See Rec. ITU-R M.1371-3 § 2.1, Annex 5). **Set to 367 (US).**
	Function Identifier	6	Function identifier. The meaning should be determined by the authority that is responsible for the area given in the designated area code. **Set to 35.**
	Application Data — Message Linkage ID	10	Identifier for the Waterways Management event. This number uniquely identifies an event and is used to connect additional information with the event. Source MMSI and this ID uniquely identify the event. Set to 0-1023 by message originator; 0 = not available = default.
	Waterways Management Type	4	Waterways Management Type as per Table 1. Set to 0-15 according to type.
	Waterways Management Subtype	2	Message subtype. 0 = Sequence; 1 = Name/Position; 2 = Vessel Name; 3 = (reserved for future use). **Set to 0 – Sequence.**
	Vessel 1	56	First vessel. Structured as in Table 3.
	Vessel 2	56	Optional second vessel. Structured as in Table 3.
	Vessel 3	56	Optional third vessel. Structured as in Table 3.
	Vessel 4	56	Optional fourth vessel. Structured as in Table 3.
	Vessel 5	56	Optional fifth vessel. Structured as in Table 3.
	Vessel 6	56	Optional sixth vessel. Structured as in Table 3.
	Vessel 7	56	Optional seventh vessel. Structured as in Table 3.
Total bits		**128 - 520**	**1-3 Slot Binary Message**

Table 3: Vessel List Description

Parameter		# of Bits	Description
Vessels	Vessel MMSI	30	Standard MMSI. Non-valid MMSI numbers are used to represent things other than vessels or vessels without MMSIs in the sequence. 0000000000 = no vessels in queue = default. 1000000000 = additional lockage for MMSI previous in sequence; 1000000001 = non-AIS vessel (e.g. pleasure boats); 1000000002 = ice/debris. 1000000003 - 1000001023 = unknown MMSI – Use WM Subtype 2 to specify name, the last 4 digits of the "MMSI number" number are used to positively link the vessel in the list with the name in the subtype 2 message.
	UTC Day	5	UTC Day of vessel time stamp 1 – 31; 0 = UTC day not available = default.
	UTC Hour	5	UTC Hour of vessel time stamp 0 – 23; 24 = UTC hour not available = default; 25 - 31 (reserved for future use).
	UTC Minute	6	UTC Minute of vessel time stamp 0 – 59; 60 = UTC minute not available = default; 61 - 63 (reserved for future use).
	Vessel Status	2	Status of the vessel (provides definition for time stamp) 0 = in the lock; 1 = vessel arrived at check-in point 2-3 = (Reserved for future use).
	Chamber	3	Defines which chamber for case of multichamber operations 0 = unknown/not applicable = default. 1-7 = chamber number as defined by USACE LPMS.
	Direction	1	Direction of the ship. Up/Down or In/Out is defined by the river flow or channel marking. 0 = Up or In; 1 = Down or Out.
	Lockage Type	4	Type of lockage as per USACE LPMS System 0 = undefined or not applicable = default; 1 = O = open pass; 2 = F = fast double 3 = J = jackknife; 4 = K = knockout 5 = N = navigable pass; 6 = S = straight 7 = T = barge transfer; 8 = V = setover 9 = Z = other = see additional text info.
		56	**Total Bits**

Table 4: Waterways Management Subtype 1 (Broadcast) – WM Place Identification

	Parameter	# of Bits	Description
Standard Message Header	Message ID	6	Identifier for Message 8; **always 8.**
	Repeat Indicator	2	Used by the repeater to indicate how many times a message has been repeated. 0 – 3; 0 = default; 3 = do not repeat any more. **Set to 0 (default).**
	Source MMSI	30	MMSI number of source station. This varies according to the transmitter ID.
	Spare	2	Not used. **Set to zero**
Binary Data	Designated Area Code	10	Designated area code (DAC). (See Rec. ITU-R M.1371-3 § 2.1, Annex 5). **Set to 367 (US).**
	Function Identifier	6	Function identifier. The meaning should be determined by the authority that is responsible for the area given in the designated area code. **Set to 35.**
	Message Linkage ID	10	Binary identifier for the Waterways Management event. This number uniquely identifies an event and is used to connect additional information with the event. Source MMSI and this ID uniquely identify the event. Set to 0-1023 by message originator.
	WM Type	4	Waterways Management Type as per Table 1. Set to 0-15 according to type.
	Subtype	2	Message subtype. 0 = Sequence; 1 = Name/Position; 2 = Vessel Name; 3 = (reserved for future use). **Set to 1 – Name/Position.**
	Message Version	6	Sequential number used to indicate the message version in steps of 1. 0 = test message = default; 1 – 15 = message version; 16 – 63 (don't use). **Set to 2.**
	Position — Longitude	28	Longitude of the center in 1/10,000 minute. (±180°) East = positive (as per 2's complement); West = negative (as per 2's complement); 181° (6791AC0h) = not available = default.
	Position — Latitude	27	Latitude of the centre in 1/1,0000 minute (±90°) North = positive (as per 2's complement); South = negative (as per 2's complement); 91° (3412140h) = not available = default.
	Precision	3	Precision of the Lat/Long. Data to be truncated to the number of decimal places specified in this parameter. 0-4 decimal places. Default = 4 (no truncation). 5-6 = Reserved; 7 = Do not use.

	Parameter		# of Bits	Description
		Orientation	9	Orientation of area in 1-degree increments. Bearing measured clockwise from true North, from position above. 0 – 359 degrees; 360 = data unavailable = default; 361-510 (reserved for future use); 511 (don't use).
		Description	N*6	Name/Description of what the item is. Variable number of 6-bit ASCII characters. 6-bit ASCII characters as per ITU-R M.1371-3, Table 44. Number of slots for this message is a function of how many characters used. N should be 35 or less, this will keep total number of slots to a maximum of 2.
		Spare	1-7	From 1 to 7 spare bits are added to make the total message length an even number of bytes. Set all spare bits to 0.
Total bits			152 - 360	**1-2 Slot Binary Message.**

Table 5: Waterways Management Subtype 2 (Broadcast) – Vessel Name

	Parameter	# of Bits	Description
Standard Message Header	Message ID	6	Identifier for Message 8; **always 8.**
	Repeat Indicator	2	Used by the repeater to indicate how many times a message has been repeated. 0 – 3; 0 = default; 3 = do not repeat any more. **Set to 0 (default).**
	Source MMSI	30	MMSI number of source station. This varies according to the transmitter ID.
	Spare	2	Not used. **Set to zero.**
Binary Data	Designated Area Code	10	Designated area code (DAC). This code is based on the maritime identification digits (MID). (See Rec. ITU-R M.1371-3 § 2.1, Annex 5). **Set to 367 (US).**
	Function Identifier	6	Function identifier. The meaning should be determined by the authority that is responsible for the area given in the designated area code. **Set to 35.**
	Application Data — Message Linkage ID	10	Identifier for the Waterways Management event. This number uniquely identifies an event and is used to connect additional information with the event. Source MMSI and this ID uniquely identify the event. Set to 0-1023 by message originator; 0 = not available = default.
	Waterways Management Type	4	Waterways Management Type as per Table 1. Set to 0-15 according to type.
	Waterways Management Subtype	2	Message subtype. 0 = Sequence; 1 = Name/Position; 2 = Vessel Name; 3 = (reserved for future use). **Set to 2 – Vessel Name.**
	Vessel Number	10	Number used to link the vessel name with the vessel in the current list. 0 -2 = reserved; 3-1023 = match to MMSI 1000000003 – 1000001023 in the subtype 0 message.
	Descriptor Type	3	Describes what the text field that follows contains. 0 = Name (default); 1 = IMO number; 2 = State number; 3 – 6 (reserved for future use); 7 = Other
	Vessel Name	N*6	Name of the Vessel. Variable number of 6-bit ASCII characters. 6-bit ASCII characters as per ITU-R M.1371-3, Table 44. Number of slots for this message is a function of how many characters used. N should be 35 or less, this will keep total number of slots to a maximum of 2.
	Spare	1-7	From 1 to 7 spare bits are added to make the total message length an even number of bytes. Set all spare bits to 0.
Total bits		95 – 295	**1-2 Slot Binary Message**

Table 6: Waterways Management Subtype 0 (Addressed) – Vessel List

		Parameter	# of Bits	Description
Standard Message Header		Message ID	6	Identifier for Message 6; **Set to 6 addressed**, acknowledgement needed.
		Repeat Indicator	2	Used by the repeater to indicate how many times a message has been repeated. See § 4.6.1, Annex 2; 0-3; 0 = default; 3 = do not repeat any more. **Set to 0 (default).**
		Source MMSI	30	MMSI number of source station. Varies according to the transmitter ID.
		Sequence number	2	0 - 3; refer to ITU-R M.1371-3, Annex 2, § 5.3.1
		Destination MMSI	30	MMSI number of destination station.
		Retransmit Flag	1	Retransmit Flag should be set upon retransmission. 0 = no retransmission = default; 1 = retransmitted.
		Spare	1	Not used. **Set to zero.**
Binary Data		Designated Area Code	10	Designated area code (DAC). (See Rec. ITU-R M.1371-3 § 2.1, Annex 5). **Set to 367 (US).**
		Function Identifier	6	Function identifier. **Set to 35.**
	Application Data	Message Linkage ID	10	Identifier for the Waterways Management event. This number uniquely identifies an event and is used to connect additional information with the event. Source MMSI and this ID uniquely identify the event. Set to 0-1023 by message originator.
		WM Type	4	Waterways Management Type as per Table 1. Set to 0-15 according to type.
		Subtype	2	Message subtype. 0 = Sequence; 1 = Name/Position; 2 = Vessel Name; 3 = (reserved for future use). **Set to 0 – Sequence.**
		Vessel 1	56	First vessel. Structured as in Table 3.
		Vessel 2	56	Optional second vessel. Structured as in Table 3.
		Vessel 3	56	Optional third vessel. Structured as in Table 3.
		Vessel 4	56	Optional fourth vessel. Structured as in Table 3.
		Vessel 5	56	Optional fifth vessel. Structured as in Table 3.
		Vessel 6	56	Optional sixth vessel. Structured as in Table 3.
		Vessel 7	56	Optional seventh vessel. Structured as in Table 3.
Total bits			**160 - 496**	**1-3 Slot Binary Message**

Table 7: Waterways Management Subtype 1 (Addressed) – WM Place Identification

	Parameter	# of Bits	Description
Standard Message Header	Message ID	6	Identifier for Message 6; **Set to 6 addressed**, acknowledgement needed.
	Repeat Indicator	2	Used by the repeater to indicate how many times a message has been repeated. 0 = default; 3 = do not repeat any more. **Set to 0 (default**)
	Source MMSI	30	MMSI number of source station. Varies according to the transmitter ID.
	Sequence number	2	0 - 3; refer to ITU-R M.1371-3, Annex 2, § 5.3.1
	Destination MMSI	30	MMSI number of destination station.
	Retransmit Flag	1	Retransmit Flag should be set upon retransmission. 0 = no retransmission = default;1 = retransmitted.
	Spare	1	Not used. Set to zero.
Binary Data	Designated Area Code	10	Designated area code (DAC). (See Rec. ITU-R M.1371-3 § 2.1, Annex 5). **Set to 367 (US).**
	Function Identifier	6	Function identifier. **Set to 35.**
Application Data	Message Linkage ID	10	Identifier for the Waterways Management event. This number uniquely identifies an event and is used to connect additional information with the event. Source MMSI and this ID uniquely identify the event. Set to 0-1023 by message originator.
	WM Type	4	Waterways Management Type as per Table 1. Set to 0-15 according to type.
	Subtype	2	Message subtype. 0 = Sequence; 1 = Name/Position; 2 = Vessel Name; 3 = (reserved for future use). **Set to 1 – Name/Position.**
	Message Version	6	Sequential number used to indicate the message version in steps of 1. 0 = test message = default; 1 – 15 = message version; 16 – 63 (don't use). **Set to 2.**
Position	Longitude	28	Longitude of the center in 1/10,000 minute (±180°). East = positive, West = negative (as per 2's complement); 181° (6791AC0h) = not available = default.
	Latitude	27	Latitude of the center in 1/10,000 minute (±90°). North = positive, South = negative (as per 2's complement); 91° (3412140h) = not available = default.

		Parameter	# of Bits	Description
		Precision	3	Precision of the Lat/Long. Data to be truncated to the number of decimal places specified in this parameter. 0-4 decimal places, Default = 4 (no truncation); 5-6 = Reserved; 7 = Do not use.
		Orientation	9	Orientation of WM Feature in 1 degree increments. Bearing measured clockwise from True North, from position above. 0 – 359 degrees; 360 = data unavailable = default; 361-510 (reserved for future use); 511 (don't use).
		Description	N*6	Name/Description of the Waterways Management Feature. Variable number of 6-bit ASCII characters. 6-bit ASCII characters as per ITU-R M.1371-3, Table 44. Number of slots for this message is a function of how many characters used. N should be 35 or less, this will keep total number of slots to a maximum of 2.
		Spare	1-7	From 1 to 7 spare bits are added to make the total message length an even number of bytes. Set all spare bits to 0.
Total bits			184 - 392	**2 Slot Binary Message**

Table 8: Waterways Management Subtype 2 (Addressed) – Vessel Name

	Parameter		# of Bits	Description
Standard Message Header	Message ID		6	Identifier for Message 6; **Set to 6 addressed**, acknowledgement needed.
	Repeat Indicator		2	Used by the repeater to indicate how many times a message has been repeated. 0 = default; 3 = do not repeat any more. **Set to 0 (default)**
	Source MMSI		30	MMSI number of source station. Varies according to the transmitter ID.
	Sequence number		2	0 - 3; refer to ITU-R M.1371-3, Annex 2, § 5.3.1
	Destination MMSI		30	MMSI number of destination station.
	Retransmit Flag		1	Retransmit Flag should be set upon retransmission. 0 = no retransmission = default;1 = retransmitted.
	Spare		1	Not used. Set to zero.
Binary Data	Designated Area Code		10	Designated area code (DAC). (See Rec. ITU-R M.1371-3 § 2.1, Annex 5). **Set to 367 (US).**
	Function Identifier		6	Function identifier. **Set to 35.**
	Application Data	Message Linkage ID	10	Identifier for the Waterways Management event. This number uniquely identifies an event and is used to connect additional information with the event. Source MMSI and this ID uniquely identify the event. Set to 0-1023 by message originator.
		WM Type	4	Waterways Management Type as per Table 1. Set to 0-15 according to type.
		Subtype	2	Message subtype. 0 = Sequence; 1 = Name/Position; 2 = Vessel Name; 3 = (reserved for future use). **Set to 2 – Vessel Name.**
		Vessel Number	10	Number used to link the vessel name with the vessel in the current list. 0 -2 = reserved; 3-1023 = match to MMSI 1000000003 – 1000001023 in the subtype 0 message.
		Descriptor Type	3	Describes what the text field that follows contains. 0 = Name (default); 1 = IMO number; 2 = State number; 3 – 6 (reserved for future use); 7 = Other
		Vessel Name	N*6	Name of the Vessel. Variable number of 6-bit ASCII characters. 6-bit ASCII characters as per ITU-R M.1371-3, Table 44. Number of slots for this message is a function of how many characters used. N should be 35 or less, this will keep total number of slots to a maximum of 2.
		Spare	1-7	From 1 to 7 spare bits are added to make the total message length an even number of bytes. Set all spare bits to 0.
Total bits			**127 - 327**	**1-2 Slot Binary Message**