Waterways Management Message Version: 1.1

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Please post any suggested changes to the working version on the AIS SharePoint Site located at:

https://km3.alionscience.com/sites/ais/default.aspx

For access to the SharePoint Site contact: gwjohnson@alionscience.com

Summary of changes from previous version:

- 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 Waterways Management Message

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 two sub-types of this message; 1) for providing a position/name of the waterway feature, and 2) for providing a list of vessels and their sequence order/times. Specific information for each vessel includes: sequence time, direction, and vessel MMSI. The complete list of message types is contained in Table 5.

1.1 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 text message). However, the same source MMSI needs to be included in both the Waterways Management and Text Description 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 can be used. An additional text message (with the message linkage ID) can be used to transmit the vessel name as text if desired.

Table 1: Waterways Management Subtype 0 (Broadcast)

	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 366 (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.
		WM Type	4	Waterways Management Type as per Table 5. Set to 0-15 according to type.
		Subtype	2	Message subtype. 0 = Sequence; 1 = Name/Position; 2-3 = (reserved for future use). **Set to 0 – Sequence.**
		Vessel 1	56	First vessel. Structured as in Table 6.
		Vessel 2	56	Optional second vessel. Structured as in Table 6.
		Vessel 3	56	Optional third vessel. Structured as in Table 6.
		Vessel 4	56	Optional fourth vessel. Structured as in Table 6.
		Vessel 5	56	Optional fifth vessel. Structured as in Table 6.
		Vessel 6	56	Optional sixth vessel. Structured as in Table 6.
		Vessel 7	56	Optional seventh vessel. Structured as in Table 6.
		Total bits	**128 - 520**	**1-3 Slot Binary Message**

Table 2: Waterways Management Subtype 1 (Broadcast)

	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 366 (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	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 5. Set to 0-15 according to type.
			Subtype	2	Message subtype. 0 = Sequence; 1 = Name/Position; 2-3 = (reserved for future use). **Set to 1 – Name/Position.**
		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.
			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.
			Orientation	9	Orientation of area in 1 degree increments. Bearing measured clockwise from 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 less than 30, 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	**144 - 320**	**1-2 Slot Binary Message.**

Table 3: Waterways Management Subtype 0 (Addressed)

	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 366 (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 5. Set to 0-15 according to type.
		Subtype	2	Message subtype. 0 = Sequence; 1 = Name/Position; 2-3 = (reserved for future use). **Set to 0 – Sequence.**
		Vessel 1	56	First vessel. Structured as in Table 39.
		Vessel 2	56	Optional second vessel. Structured as in Table 6.
		Vessel 3	56	Optional third vessel. Structured as in Table 6.
		Vessel 4	56	Optional fourth vessel. Structured as in Table 6.
		Vessel 5	56	Optional fifth vessel. Structured as in Table 6.
		Vessel 6	56	Optional sixth vessel. Structured as in Table 6.
		Vessel 7	56	Optional seventh vessel. Structured as in Table 6.
Total bits			**160 - 496**	**1-3 Slot Binary Message**

Table 4: Waterways Management Subtype 1 (Addressed)

	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 366 (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 5. Set to 0-15 according to type.
			Subtype	2	Message subtype. 0 = Sequence; 1 = Name/Position; 2-3 = (reserved for future use). **Set to 1 – Name/Position.**
		Position of WM feature	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.
			Orientation	9	Orientation of WM Feature in 1 degree increments. Bearing measured clockwise from 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 less than 30, 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				**176 - 352**	**2 Slot Binary Message**

Table 5: 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	13-15	Undefined

Table 6: 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 = unknown MMSI – Additional text message can be used to send vessel name as text.
	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 = not applicable = default. 1-7 = chamber number as defined by USACE OMNI.
	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 Omni 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**