Recommendation 9 (JCOMM-III)

**MODIFICATIONS TO THE INTERNATIONAL MARITIME METEOROLOGICAL TAPE FORMAT
AND MINIMUM QUALITY CONTROL STANDARD**

THE JOINT WMO/IOC TECHNICAL COMMISSION FOR
OCEANOGRAPHY AND MARINE METEOROLOGY,

Noting:

(1)   The *Manual on Marine Meteorological Services* (WMO-No. 558), Volume I, Appendix I.13 – Layout for the International Maritime Meteorological Tape, and Appendix I.15 – Minimum Quality Control Standards,

(2)   The final report of the second session of the JCOMM Expert Team on Marine Climatology (JCOMM/MR-No. 50),

Considering:

(1)   That the International Maritime Meteorological Tape (IMMT) format is the primary format for the exchange of marine climatological data, for both the Marine Climatological Summaries Scheme (MCSS) and the VOSClim,

(2)   The importance of the Minimum Quality Control Standard (MQCS) to the quality of the data in the MCSS archives,

(3)   The importance to the Global Collecting Centres of keeping both the IMMT and the MQCS up to date,

Recognizing the need for including information on the source of observations (electronic or paper logbook) in IMMT; as well as the need for taking account in MQCS of increased deck cargo height of modern cargo vessels,

Recommends:

(1)   That the amendments to the *Manual on Marine Meteorological Services* (WMO-No. 558) and the *Guide to Marine Meteorological Services* (WMO-No. 471), as detailed in Annexes 1 and 2 to this recommendation be approved, and included in the appropriate appendices in the Manual and Guide;

(2)   That the new version (IMMT-IV) of the IMMT format be implemented generally for all data collected as from 1 January 2011;

(3)   That the new version of the Minimum Quality Control Standard (MQCS-VI) be also implemented generally for all data collected as from 1 January 2011;

Requests the Expert Team on Marine Climatology to continue to review the implementation and value of the revised format and quality control standard, to provide technical assistance to the Members/Member States concerned as required and to propose further amendments to the format and standard as necessary;

Requests the Secretary-General of WMO to provide appropriate technical advisory assistance to Members/Member States concerned, as required, in the implementation of the revised format and standard.

Annex 1 to Recommendation 9 (JCOMM-III)

AMENDMENTS TO THE *MANUAL ON MARINE METEOROLOGICAL SERVICES* (WMO-No. 558) AND *GUIDE TO MARINE METEOROLOGICAL SERVICES* (WMO-No. 471)

LAYOUT FOR THE INTERNATIONAL MARITIME METEOROLOGICAL TAPE (IMMT) FORMAT
IMMT-IV (Version 4)

Notes:
(a)   Highlighting marks noteworthy changes (including additional clarification Notes in [brackets]) with respect to IMMT-III.
(b)   The representation for missing data in any field is all blank(s).
(c)   Many of the "Codes" in the IMMT format match "symbolic letters" as defined in the *Manual on Codes* (WMO–No.306) for the traditional alphanumeric (FM 13-XII Ext.) SHIP code. However, the elements added for the VOSClim (as introduced for IMMT-II), for example, did not appear in WMO–No.306, thus an effort was made to select unique new Codes to avoid conflicts in meaning between symbolic letter groups in WMO–No.306 versus Codes defined only in IMMT.

Element number	Character number	Code	Element	Coding procedure
1	1	i_T	Format/temperature indicator	3 – temperatures in tenths of °C 4 – temperatures in halves of °C 5 – temperatures in whole °C [Note: codes 1–2 were previously used to refer to the obsolete IMMPC format; current codes all refer to the IMMT format]
2	2–5	AAAA	Year UTC	Four digits
3	6–7	MM	Month UTC	01–12 January to December
4	8–9	YY	Day UTC	01–31
5	10–11	GG	Time of observation	Nearest whole hour UTC, WMO specifications
6	12	Qc	Quadrant of the globe	WMO code table 3333
7	13–15	$L_aL_aL_a$	Latitude	Tenths of degrees, WMO specifications
8	16–19	$L_oL_oL_oL_o$	Longitude	Tenths of degrees
9	20		Cloud height (h) and visibility (VV) measuring indicator	0 – h and VV estimated 1 – h measured, VV estimated 2 – h and VV measured 3 – h estimated, VV measured
10	21	h	Height of clouds	WMO code table 1600
11	22–23	VV	Visibility	WMO code table 4377
12	24	N	Cloud amount	Oktas, WMO code table 2700; show 9 where applicable
13	25–26	dd	True wind direction	Tens of degrees, WMO code table 0877; show 00 or 99 where applicable
14	27	i_w	Indicator for wind speed	WMO code table 1855
15	28–29	ff	Wind speed	Tens and units of knots or meters per second, hundreds omitted; values in excess of 99 knots are to be indicated in units of meters per second and i_w encoded accordingly; the method of estimation or measurement and the units used (knots or meters per second) are indicated in element 14

Element number	Character number	Code	Element	Coding procedure		
16	30	s_n	Sign of temperature	WMO code table 3845		
17	31–33	TTT	Air temperature	Tenths of degrees Celsius		
18	34	s_t	Sign of dew-point temperature	0 – positive or zero measured dew-point temperature 1 – negative measured dew-point temperature 2 – iced measured dew-point temperature 5 – positive or zero computed dew-point temperature 6 – negative computed dew-point temperature 7 – iced computed dew-point temperature		
19	35–37	$T_dT_dT_d$	Dew-point temperature	Tenths of degrees Celsius		
20	38–41	PPPP	Air pressure	Tenths of hectopascals		
21	42–43	ww	Present weather	WMO code table 4677 or 4680		
22	44	W_1	Past weather	WMO code table 4561 or 4531		
23	45	W_2	Past weather	WMO code table 4561 or 4531		
24	46	N_h	Amount of lowest clouds	As reported for C_L or, if no C_L cloud is present, for C_M, in oktas; WMO code table 2700		
25	47	C_L	Genus of CL clouds	WMO code table 0513		
26	48	C_M	Genus of CM clouds	WMO code table 0515		
27	49	C_H	Genus of CH clouds	WMO code table 0509		
28	50	s_n	Sign of sea-surface temperature	WMO code table 3845		
29	51–53	$T_WT_WT_W$	Sea surface temperature	Tenth of degrees Celsius		
30	54		Indicator for sea-surface temperature measurement	0 – Bucket thermometer 1 – Condenser inlet 2 – Trailing thermistor 3 – Hull contact sensor 4 – "Through hull" sensor 5 – Radiation thermometer 6 – Bait tanks thermometer 7 – Others		
31	55		Indicator for wave measurement	Shipborne wave recorder	0 – Wind sea and swell estimated 1 – Wind sea and swell measured 2 – Mixed wave measured, swell estimated 3 – Other combinations measured and estimated
				Buoy	4 – Wind sea and swell measured 5 – Mixed wave measured, swell estimated 6 – Other combinations measured and estimated
				Other measurement system	7 – Wind sea and swell measured 8 – Mixed wave measured, swell estimated 9 – Other combinations measured and estimated

Element number	Character number	Code	Element	Coding procedure
32	56–57	P_WP_W	Period of wind waves or of measured waves	Whole seconds; show 99 where applicable in accordance with Note (3) under specification of P_WP_W in the *Manual on Codes* (WMO No. 306).
33	58–59	H_WH_W	Height of wind waves or of measured waves	Half-meter values. Examples: Calm or less than ¼m to be encoded 00; 3½m to be encoded 07; 7m to be encoded 14; 11½m to be encoded 23
34	60–61	$d_{W1}d_{W1}$	Direction of predominant swell waves	Tens of degrees, WMO code table 0877; encoded 00 or 99 where applicable. Blanks = no observation of waves attempted.
35	62–63	$P_{W1}P_{W1}$	Period of predominant swell waves	Whole seconds; encoded 99 where applicable (see under element 32)
36	64–65	$H_{W1}H_{W1}$	Height of predominant swell waves	Half-meter values (see under element 33)
37	66	I_s	Ice accretion on ships	WMO code table 1751
38	67–68	E_sE_s	Thickness of ice accretion	In centimetres
39	69	R_s	Rate of ice accretion	WMO code table 3551
40	70		Source of observation	0 – Unknown 1 – Logbook (paper) 2 – National Telecommunication channels 3 – National Publications 4 – Logbook (electronic) 5 – Global Telecommunication channels (GTS) 6 – International Publications [Note: Formerly (usage now discontinued): codes 1–3 also referred to "National data exchange," and codes 4–6 also referred to "International data exchange"; distinction added between paper and electronic logbook]
41	71		Observation platform	0 – Unknown 1 – Selected ship 2 – Supplementary ship 3 – Auxiliary ship 4 – Registered VOSClim ship 5 – Fixed sea station (e.g., rig or platform) 6 – Coastal station [Note: 7 – Reserved] [Note: 8 – Reserved] 9 – Others/data buoy [Note: Formerly (usage now discontinued): code 4 referred to "Automated station/data buoy;" and codes 7–8 referred to "Aircraft" and "Satellite," respectively]
42	72–78		Ship's call sign	Ship's call sign stored left-justified (with right-blank fill) as follows: 7-character call sign: columns 72–78 6-character call sign: columns 72–77 5-character call sign: columns 72–76 4-character call sign: columns 72–75 3-character call sign: columns 72–74
43	79–80		Country which has recruited the ship	According to the 2-character alphabetical codes assigned by the International Organization for Standardization (ISO)

Element number	Character number	Code	Element	Coding procedure
44	81		National use	
45	82		Quality control indicator	0 – No quality control (QC) 1 – Manual QC only 2 – Automated QC only /MQC (no time-sequence checks) 3 – Automated QC only (inc. time sequence checks) 4 – Manual and automated QC (superficial; no automated time-sequence checks) 5 – Manual and automated QC (superficial; including time-sequence checks) 6 – Manual and automated QC (intensive, including automated time-sequence checks) [Note: 7 and 8 – Reserved] 9 – National system of QC (information to be furnished to WMO)
46	83	i_X	Weather data indicator	1 – Manual 4 – Automatic : If present and past weather data included Code tables 4677 and 4561 used 7 – Automatic : If present and past weather data included Code tables 4680 and 4531 used
47	84	i_R	Indicator for inclusion or omission of precipitation data	WMO code table 1819
48	85–87	RRR	Amount of precipitation which has fallen during the period preceding the time of observation, as indicated by t_R	WMO code table 3590
49	88	t_R	Duration of period of reference for amount of precipitation, ending at the time of the report	WMO code table 4019
50	89	s_w	Sign of wet-bulb temperature	0 – positive or zero measured wet-bulb temperature 1 – negative measured wet-bulb temperature 2 – iced measured wet-bulb temperature 5 – positive or zero computed wet-bulb temperature 6 – negative computed wet-bulb temperature 7 – iced computed wet-bulb temperature
51	90–92	$T_b T_b T_b$	Wet-bulb temperature	In tenths of degree Celsius, sign given by element 50
52	93	a	Characteristic of pressure tendency during the three hours preceding the time of observation	WMO code table 0200
53	94–96	ppp	Amount of pressure tendency at station level during the three hours preceding the time of observation	In tenths of hectopascal

Element number	Character number	Code	Element	Coding procedure
54	97	D_s	True direction of resultant displacement of the ship during the three hours preceding the time of observation	WMO code table 0700
55	98	v_s	Ship's average speed made good during the three hours preceding the time of observation	WMO code table 4451
56	99–100	$d_{w2}d_{w2}$	Direction of secondary swell waves	Tens of degrees, WMO code table 0877; encoded 00 or 99 where applicable. Blanks – no observation of waves attempted.
57	101–102	$P_{W2}P_{W2}$	Period of secondary swell waves	Whole seconds; encoded 99 where applicable (see under element 32)
58	103–104	$H_{W2}H_{W2}$	Height of secondary swell waves	Half-meter values (see under element 33)
59	105	c_i	Concentration or arrangement of sea ice	WMO code table 0639
60	106	S_i	Stage of development	WMO code table 3739
61	107	b_i	Ice of land origin	WMO code table 0439
62	108	D_i	True bearing of principal ice edge	WMO code table 0739
63	109	z_i	Present ice situation and trend of conditions over the preceding three hours	WMO code table 5239
64	110		FM code version	0 – previous to FM 24-V 1 – FM 24-V 2 – FM 24-VI Ext. 3 – FM 13-VII 4 – FM 13-VIII 5 – FM 13-VIII Ext. 6 – FM 13-IX 7 – FM 13-IX Ext. 8 – FM 13-X 9 – FM 13-XI A – FM 13-XII Ext. [Note: etc. for future configurations]
65	111		IMMT version	0 – IMMT version just prior to version number being included 1 – IMMT-I (in effect from Nov. 1994) 2 – IMMT-II (in effect from Jan. 2003) 3 – IMMT-III (in effect from Jan. 2006) 4 – IMMT-IV (this version) [Note: etc. for future configurations]
66	112	Q_1	Quality control indicator for (h)	0 – no quality control (QC) has been performed on this element 1 – QC has been performed; element appears to be correct

Element number	Character number	Code	Element	Coding procedure
				2 – QC has been performed; element appears to be inconsistent with other elements
				3 – QC has been performed; element appears to be doubtful
				4 – QC has been performed; element appears to be erroneous
				5 – The value has been changed as a result of QC
				6 – The flag as received by the GCCs was set to "1" (correct), but the element was judged by their MQCS as either inconsistent, dubious, erroneous or missing
				7 – The flag as received by the GCCs was set to "5" (amended) but the element was judged by their MQCS as inconsistent, dubious, erroneous or missing
				[Note: 8 – Reserved]
				9 – The value of the element is missing
67	113	Q_2	QC indicator for (VV)	- idem -
68	114	Q_3	QC indicator for (clouds: elements 12, 24–27)	- idem -
69	115	Q_4	QC indicator for (dd)	- idem -
70	116	Q_5	QC indicator for (ff)	- idem -
71	117	Q_6	QC indicator for (TTT)	- idem -
72	118	Q_7	QC indicator for ($T_dT_dT_d$)	- idem -
73	119	Q_8	QC indicator for (PPPP)	- idem -
74	120	Q_9	QC indicator for (weather: elements 21–23)	- idem -
75	121	Q_{10}	QC indicator for ($T_WT_WT_W$)	- idem -
76	122	Q_{11}	QC indicator for (P_WP_W)	- idem -
77	123	Q_{12}	QC indicator for (H_WH_W)	- idem -
78	124	Q_{13}	QC indicator for (swell: elements 34–36, 56–58)	- idem -
79	125	Q_{14}	QC indicator for (i_RRRRt_R)	- idem -
80	126	Q_{15}	QC indicator for (a)	- idem -
81	127	Q_{16}	QC indicator for (ppp)	- idem -
82	128	Q_{17}	QC indicator for (D_s)	- idem -
83	129	Q_{18}	QC indicator for (v_s)	- idem -

Element number	Character number	Code	Element	Coding procedure
84	130	Q_{19}	QC indicator for ($T_bT_bT_b$)	- idem -
85	131	Q_{20}	QC indicator for ships' position	- idem -
86	132	Q_{21}	Version identification for Minimum quality control standards (MQCS)	1 – MQCS- I (Original version, Feb. 1989): CMM-X 2 – MQCS-II (Version 2, March 1997) CMM-XII 3 – MQCS-III (Version 3, April 2000) SGMC-VIII 4 – MQCS-IV (Version 4, June 2001): JCOMM-I 5 – MQCS-V (Version 5, July 2004): ETMC-I 6 – MQCS-VI (this version, to be agreed) [Note: etc. for future configurations]

Additional Requirements for VOSClim:

Element number	Character number	Code	Element	Coding procedure
87	133–135	HDG	Ship's heading; the direction to which the bow is pointing, referenced to true North	(000–360); e.g. 360 = North 000 = No Movement 090 = East
88	136–138	COG	Ship's ground course; the direction the vessel actually moves over the fixed earth and referenced to True North	(000–360); e.g. 360 = North 000 = No Movement 090 = East
89	139–140	SOG	Ship's ground speed; the speed the vessel actually moves over the fixed earth	(00–99); Round to nearest whole knot
90	141–142	SLL	Maximum height in meters of deck cargo above Summer maximum load line	(00–99); report to nearest whole meter
91	143	s_L	Sign of departure of reference level	0 = positive or zero, 1 = negative
92	144–145	hh	Departure of reference level (Summer maximum load line) from actual sea level	(00–99) is the difference to the nearest whole meter between the Summer maximum load line and the sea level. Consider the difference positive when the Summer maximum load line is above the level of the sea and negative if below the water line.
93	146–148	RWD	Relative wind direction in degrees off the bow	Relative wind direction; e.g. 000 = no apparent relative wind speed (calm conditions on deck). Reported direction for relative wind = 001–360 degrees in a clockwise direction off the bow of the ship. When directly on the bow, RWD = 360.
94	149–151	RWS	Relative wind speed indicated by i_w (knots or m s^{-1})	Reported in either whole knots or whole meters per second (e.g. 010 knots or 005 m s^{-1}). Units established by i_w (element 14) [Note: RWS is a 3-character field to store values of RWS larger than ff (if i_w indicates knots), e.g. ff=98 knots, RWS=101 knots; see also element 15.]
95	152	Q_{22}	QC indicator for (HDG)	[Note: coding as for element 66]
96	153	Q_{23}	QC indicator for (COG)	- idem -

Element number	Character number	Code	Element	Coding procedure
97	154	Q24	QC indicator for (SOG)	- idem -
98	155	Q25	QC indicator for (SLL)	- idem -
	156		blank	[Note: Formerly (usage now discontinued): QC indicator for (sL); now Q27 serves as the indicator for both sL and hh]
99	157	Q27	QC indicator for (sL and hh)	- idem -
100	158	Q28	QC indicator for (RWD)	- idem -
101	159	Q29	QC indicator for (RWS)	- idem -

Fields new for IMMT-IV:

Element number	Character number	Code	Element	Coding procedure
102	160–163	RH	Relative humidity	Tenths of Percentage
103	164	RHi	Relative humidity indicator	0 – Relative humidity in tenths of Percentage, measured and originally reported 1 – Relative humidity in whole Percentage, measured and originally reported [Note: 2 – Reserved] 3 – Relative humidity in tenths of Percentage, computed 4 – Relative humidity in whole Percentage, computed
104	165	AWSi	AWS indicator	1 – Automated Weather Station (AWS) 2 – Automated Weather Station plus Manual Observation
105	166–172	IMOno	IMO number	Seven digits (or left justified with right-blank fill)

Annex 2 to Recommendation 9 (JCOMM-III)

AMENDMENTS TO THE *MANUAL ON MARINE METEOROLOGICAL SERVICES* (WMO-No. 558) AND THE *GUIDE TO MARINE METEOROLOGICAL SERVICES* (WMO-No. 471)

MINIMUM QUALITY CONTROL STANDARD (MQCS)
MQCS-VI (Version 6)

Notes:
(a)   Highlighting marks changes with respect to MQCS-V.
(b)   See the specifications for setting quality control Indicators Q_1 to Q_{29} at the end of this annex.
(c)   Δ = space (ASCII 32).

Element	Error	Action
1	$i_T \neq 3 - 5$, Δ	Correct manually otherwise 3
2	AAAA $\neq$ valid year	Correct manually otherwise reject
3	MM $\neq$ 01 - 12	Correct manually otherwise reject
4	YY $\neq$ valid day of month	Correct manually otherwise reject
5	GG $\neq$ 00 - 23	Correct manually otherwise reject
6	$Q_c \neq 1, 3, 5, 7$	Correct manually and $Q_{20} = 5$, otherwise $Q_{20} = 4$
	$Q_c = \Delta$	$Q_{20} = 2$
7	$L_aL_aL_a \neq$ 000-900	Correct manually and $Q_{20} = 5$, otherwise $Q_{20} = 4$
	$L_aL_aL_a = \Delta\Delta\Delta$	$Q_{20} = 2$
8	$L_oL_oL_oL_o \neq$ 0000-1800	Correct manually and $Q_{20} = 5$, otherwise $Q_{20} = 4$
	$L_oL_oL_oL_o = \Delta\Delta\Delta\Delta$	$Q_{20} = 2$
	$L_aL_aL_a = L_oL_oL_oL_o = \Delta\Delta\Delta(\Delta)$	Correct manually otherwise reject

Time sequence checks

	Change in latitude > 0.7°/hr	Correct manually otherwise $Q_{20} = 3$
	Change in longitude > 0.7 °/hr when lat. 00–39.9	Correct manually otherwise $Q_{20} = 3$
	Change in longitude > 1.0 °/hr when lat. 40–49.9	Correct manually otherwise $Q_{20} = 3$
	Change in longitude > 1.4 °/hr when lat. 50–59.9	Correct manually otherwise $Q_{20} = 3$
	Change in longitude > 2.0 °/hr when lat. 60–69.9	Correct manually otherwise $Q_{20} = 3$
	Change in longitude > 2.7 °/hr when lat. 70–79.9	Correct manually otherwise $Q_{20} = 3$
9	Indicator $\neq$ 0–3, Δ	Correct manually, otherwise Δ
10	h $\neq$ 0–9	Correct manually and $Q_1 = 5$, otherwise $Q_1 = 4$
	h = Δ	$Q_1 = 9$
11	VV $\neq$ 90–99	Correct manually and $Q_2 = 5$, otherwise $Q_2 = 4$
	VV = $\Delta\Delta$	$Q_2 = 9$
12	N $\neq$ 0–9, Δ	Correct manually and $Q_3 = 5$, otherwise $Q_3 = 4$
	N < N_h	Correct manually and $Q_3 = 5$, otherwise $Q_3 = 2$
13	dd $\neq$ 00–36, 99	Correct manually and $Q_4 = 5$, otherwise $Q_4 = 4$
	dd = $\Delta\Delta$	$Q_4 = 9$
	dd versus ff	
	dd = 00, ff $\neq$ 00	Correct manually and Q_4 or $Q_5 = 5$ otherwise $Q_4 = Q_5 = 2$
	dd $\neq$ 00, ff = 00	Correct manually and Q_4 or $Q_5 = 5$ otherwise $Q_4 = Q_5 = 2$
14	$i_w \neq$ 0, 1, 3, 4	Correct manually, otherwise $Q_5 = Q_{29} = 4$
15	ff > 80 knots	Correct manually and $Q_5 = 5$, otherwise $Q_5 = 3$
	ff = $\Delta\Delta$	$Q_5 = 9$
16	$s_n \neq$ 0, 1	Correct manually, otherwise $Q_6 = 4$
17	TTT = $\Delta\Delta\Delta$	$Q_6 = 9$
	If –25 > TTT > 40 then when Lat. < 45.0	
	TTT < –25	$Q_6 = 4$
	TTT > 40	$Q_6 = 3$
	when Lat. ≥ 45.0	
	TTT < –25	$Q_6 = 3$
	TTT > 40	$Q_6 = 4$

TTT versus humidity parameters

	TTT < WB (wet bulb)	Correct manually and $Q_6 = 5$, otherwise $Q_6 = Q_{19} = 2$
	TTT < DP (dew point)	Correct manually and $Q_6 = Q_7 = 5$, otherwise $Q_6 = Q_7 = 2$
18	$s_t \neq$ 0, 1, 2, 5, 6, 7	Correct manually, otherwise $Q_7 = 4$
19	DP > WB	Correct manually and $Q_7 = 5$, otherwise $Q_7 = Q_{19} = 2$
	DP > TTT	Correct manually and $Q_7 = 5$, otherwise $Q_7 = Q_6 = 2$
	WB = DP = $\Delta\Delta\Delta$	$Q_7 = Q_{19} = 9$
20	930 > PPPP > 1050 hPa	Correct manually and $Q_8 = 5$, otherwise $Q_8 = 3$
	870 > PPPP > 1070 hPa	Correct manually and $Q_8 = 5$, otherwise $Q_8 = 4$
	PPPP = $\Delta\Delta\Delta\Delta$	$Q_8 = 9$
21	ww = 22–24, 26, 36–39, 48, 49, 56, 57, 66–79, 83–88	Correct manually and $Q_9 = 5$, otherwise $Q_9 = 4$

Element	Error	Action
	93–94 and latitude <20°	Correct manually and Q_9 = 5, otherwise Q_9 = 3
	if i_x = 7: $w_a w_a$ = 24–25, 35, 47–48, 54–56, 64–68, 70–78, 85–87 and latitude <20°	Correct manually and Q_9 = 5, otherwise Q_9= 4
22, 23	W_1 or W_2 = 7 and latitude <20°	Correct manually and Q_9 = 5, otherwise Q_9= 4
	$W_1 < W_2$	Correct manually and Q_9 = 5, otherwise Q_9 = 2
	$W_1 = W_2$ = ww = ΔΔΔΔ	Q_9 = 9
24–27	N = 0, and $N_h C_L C_M C_H \neq$ 0000	Correct manually and Q_3 = 5, otherwise Q_3 = 2
	N = Δ, and $N_h C_L C_M C_H \neq$ ΔΔΔΔ	Correct manually and Q_3 = 5, otherwise Q_3 = 2
	N = 9, and not (N_h =9 and $C_L C_M C_H \neq$ ΔΔΔ	Correct manually and Q_3 = 5, otherwise Q_3 = 2
	N=Δ, and $N_h C_L C_M C_H$=ΔΔΔΔ	Q_3 = 9
28	$s_n \neq$ 0, 1	Correct manually otherwise Q_{10} = 4
29	$T_w T_w T_w$ = ΔΔΔ	Q_{10} = 9
	if −2.0 > $T_w T_w T_w$ > 37.0 then when Lat. < 45.0	
	$T_w T_w T_w$ < −2.0	Control manually and Q_{10} = 5, otherwise Q_{10} = 4
	$T_w T_w T_w$ > 37.0	Control manually and Q_{10} = 5, otherwise Q_{10} = 3
	when Lat. ≥ 45.0	
	$T_w T_w T_w$ < −2.0	Control manually and Q_{10} = 5, otherwise Q_{10} = 3
	$T_w T_w T_w$ > 37.0	Control manually and Q_{10} = 5, otherwise Q_{10} = 4
30	Indicator ≠ 0–7, Δ	Correct manually, otherwise Δ
31	Indicator ≠ 0–9, Δ	Correct manually, otherwise Δ
32	20 < $P_w P_w$ < 30	Q_{11} = 3
	$P_w P_w$ ≥ 30 and ≠ 99	Q_{11} = 4
	$P_w P_w$ = ΔΔ	Q_{11} = 9
33	35< HwHw < 50	Q_{12} = 3
	$H_w H_w$ ≥ 50	Q_{12} = 4
	$H_w H_w$ = ΔΔ	Q_{12} = 9
34	$d_{w1} d_{w1}$ ≠ 00–36, 99	Correct manually and Q_{13} = 5, otherwise Q_{13} = 4
	$swell_1 = swell_2$ = Δ	Q_{13} = 9
35	25 < $P_{w1} P_{w1}$ < 30	Q_{13} = 3
	$P_{w1} P_{w1}$ ≥ 30 and ≠ 99	Q_{13} = 4
36	35 < $H_{w1} H_{w1}$ < 50	Q_{13} = 3
	$H_{w1} H_{w1}$ ≥ 50	Q_{13} = 4
37	I_s ≠ 1–5, Δ	Correct manually, otherwise Δ
38	$E_s E_s$ ≠ 00–99, ΔΔ	Correct manually, otherwise ΔΔ
39	R_s ≠ 0–4, Δ	Correct manually, otherwise Δ
40	Source ≠ 0–6	Correct manually, otherwise Δ
41	Platform ≠ 0–9	Correct manually, otherwise Δ
42	No call sign	Insert manually, mandatory entry
43	No country code	Insert manually
44	No Quality Control	
45	Q ≠ 0–6, 9	Correct manually, otherwise Δ
46	i_x ≠ 1–7	Correct manually, otherwise Δ
47	i_R = 0–2 and RRR = 000, ΔΔΔ	Correct manually, otherwise Q_{14} = 4
	i_R = 3 and RRR ≠ ΔΔΔ	Correct manually, otherwise Q_{14} = 2
	i_R = 4 and RRR ≠ ΔΔΔ	Correct manually, otherwise Q_{14} = 2
	i_R ≠ 0– 4	Correct manually, otherwise Q_{14} = 4
48	RRR ≠ 001–999 and iR = 1, 2	Correct manually and Q_{14} = 5, otherwise Q_{14} = 2
49	t_R ≠ 0–9, Δ	Correct manually and Q_{14} = 5, otherwise Q_{14} = 4
50	s_w ≠ 0, 1, 2, 5, 6, 7	Correct manually, otherwise Q_{19} = 4
51	WB < DP	Correct manually and Q_{19} = 5, otherwise $Q_{19}=Q_7$=2
	WB = ΔΔΔ	Q_{19} = 9
	WB > TTT	Correct manually and Q_{19}= 5, otherwise $Q_{19}=Q_6$=2
52	a ≠ 0–8	Correct manually and Q_{15} = 5, otherwise Q_{15} = 4
	a = 4 and ppp ≠ 000	Correct manually and Q_{15} or Q_{16} = 5, otherwise $Q_{15}=Q_{16}$=2
	a =1,2,3,6,7,8 and ppp=000	Correct manually and Q_{15} or Q_{16} = 5, otherwise $Q_{15}=Q_{16}$ = 2
	a = Δ	Q_{15} = 9
53	250 ≥ ppp > 150	Correct manually and Q_{16} = 5, otherwise Q_{16} = 3
	ppp > 250	Correct manually and Q_{16} = 5 otherwise Q_{16} = 4
	ppp = ΔΔΔ	Q_{16} = 9
54	D_s ≠ 0–9	Correct manually and Q_{17} = 5, otherwise Q_{17} = 4
	D_s = Δ	Q_{17} = 9

Element	Error	Action
55	$V_s \neq$ 0–9	Correct manually and Q_{18} = 5, otherwise Q_{18} = 4
	$V_s = \Delta$	Q_{18} = 9
56	$d_{w2}d_{w2} \neq$ 00–36, 99, $\Delta\Delta$	Correct manually and Q_{13} = 5, otherwise Q_{13} = 4
57	25 < $P_{w2}P_{w2}$ < 30	Q_{13} = 3
	$P_{w2}P_{w2} \geq$ 30 and $\neq$99	Q_{13} = 4
58	35 < $H_{w2}H_{w2}$ < 50	Q_{13} = 3
	$H_{w2}H_{w2} \geq$ 50	Q_{13} = 4
59	$c_i \neq$ 0–9, Δ	Correct manually, otherwise Δ
60	$S_i \neq$ 0–9, Δ	Correct manually, otherwise Δ
61	$b_i \neq$ 0–9, Δ	Correct manually, otherwise Δ
62	$D_i \neq$ 0–9, Δ	Correct manually, otherwise Δ
63	$z_i \neq$ 0–9, Δ	Correct manually, otherwise Δ
64	version $\neq$ 0–9, A, Δ	Correct manually, otherwise Δ
65	version $\neq$ 0–4, Δ	Correct manually, otherwise Δ
86	Minimum Quality Control Standard (MQCS) version identification	1= MQCS-I (Original version, Feb. 1989) CMM-X 2= MQCS-II (Version 2, March 1997) CMM-XII 3= MQCS-III (Version 3, April 2000) SGMC-VIII 4= MQCS-IV (Version 4, June 2001) JCOMM-I 5= MQCS-V (Version 5, July 2004) ETMC-I 6 = MQCS-VI (this version, to be agreed)
87	HDG $\neq$ 000–360	Correct manually and Q_{22} = 5, otherwise Q_{22} = 4
	HDG = $\Delta\Delta\Delta$	Q_{22} = 9
88	COG $\neq$ 000–360	Correct manually and Q_{23} = 5, otherwise Q_{23} = 4
	COG = $\Delta\Delta\Delta$	Q_{23} = 9
89	SOG $\neq$ 00–99	Correct manually and Q_{24} = 5, otherwise Q_{24} = 4
	SOG = $\Delta\Delta$	Q_{24} = 9
	SOG > 33	Correct manually and Q_{24} = 5, otherwise Q_{24} = 3
90	SLL $\neq$ 00–99	Correct manually and Q_{25} = 5, otherwise Q_{25} = 4
	SLL = $\Delta\Delta$	Q_{25} = 9
	SLL > 40	Correct manually and Q_{25} = 5, otherwise Q_{25} = 3
91	$s_L \neq$ 0,1	Correct manually and Q_{27} = 5, otherwise Q_{27} = 4
92	hh $\neq$ 00–99	Correct manually and Q_{27} = 5, otherwise Q_{27} = 4
	hh = $\Delta\Delta$	Q_{27} = 9
	hh >= 13	Correct manually and Q_{27} = 5, otherwise Q_{27} = 3
	hh < –01	Correct manually and Q_{27} = 5, otherwise Q_{27} = 4
93	RWD $\neq$ 000 – 360, 999	Correct manually and Q_{28} = 5, otherwise Q_{28} = 4
	RWD = $\Delta\Delta\Delta$	Q_{28} = 9
94	RWS $\neq$ 000–999	Correct manually and Q_{29} = 5, otherwise Q_{29} = 4
	RWS = $\Delta\Delta\Delta$	Q_{28} = 9
	RWS > 110 kts	Correct manually and Q_{29} = 5, otherwise Q_{29} = 3

RWD versus RWS

	RWD = 000, RWS $\neq$ 000	Correct manually and Q_{28} or Q_{29} = 5, otherwise Q_{28} = Q_{29} = 2
	RWD $\neq$ 000, RWS = 000	Correct manually and Q_{28} or Q_{29} = 5, otherwise Q_{28} = Q_{29} = 2

Specifications for setting quality control Indicators Q_1 to Q_{29}

0	No quality control (QC) has been performed on this element
1	QC has been performed; element appears to be correct
2	QC has been performed; element appears to be inconsistent with other elements
3	QC has been performed; element appears to be doubtful
4	QC has been performed; element appears to be erroneous
5	The value has been changed as a result of QC
6	The original flag is set "1" (correct) and the value will be classified by MQCS as inconsistent, dubious, erroneous or missing
7	The original flag is set "5" (amended) and the value will be classified by MQCS as inconsistent, dubious, erroneous or missing
8	Reserve
9	The value of the element is missing