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## RECOMMENDATION 9 (JCOMM-II)

### MODIFICATIONS TO THE INTERNATIONAL MARITIME METEOROLOGICAL TAPE (IMMT) FORMAT AND MINIMUM QUALITY CONTROL STANDARDS (MQCS)

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

**NOTING:**

- (1) The *Manual on Marine Meteorological Service* (WMO-No. 558) Volume 1, Appendices 1.13 and 1.15,
- (2) The final report of the first session of the JCOMM Expert Team on Marine Climatology, JCOMM Meeting Report No. 32,

**RECOGNIZING** that the current Minimum Quality Control Standards (MQCS-IV) do not extend to the additional elements introduced for the VOSClm Project at JCOMM-I,

**CONSIDERING:**

- (1) That the IMMT format remains the primary format for the exchange of marine climatological data, for both the MCSS and the VOSClm Project,
- (2) The importance of the MQCS to the quality of the data contained in the MCSS data archives,
- (3) The importance to the Global Collecting Centres of maintaining both the IMMT and the MQCS up-to-date,

**RECOMMENDS:**

- (1) That the amendments to the *Manual on Marine Meteorological Services* 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 of the IMMT format (IMMT-3) be implemented generally for all data collected as from 1 January 2007;
- (3) That the new version of the Minimum Quality Control Standards (MQCS-V) also be implemented generally for all data collected from 1 January 2007;

**REQUESTS** the Expert Team on Marine Climatology to continue to review the implementation and value of the revised format and quality control standards, to provide technical assistance to the Members/Member States concerned as required and to propose further amendments to the format and standards 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 standards.

ANNEX 2 TO RECOMMENDATION 9 (JCOMM-II)

**AMENDMENTS TO THE MANUAL ON MARINE METEOROLOGICAL SERVICES (WMO-No. 588) AND  
GUIDE TO MARINE METEOROLOGICAL SERVICES (WMO-No. 471)**

**MINIMUM QUALITY CONTROL STANDARDS  
MQCS-V (VERSION 5, JUNE 2004)**

$\Delta$  = space (ASCII 32)

<i>Element</i>	<i>Error</i>	<i>Action</i>
1	$i_T \neq 3-5, \Delta$	Correct manually otherwise = $\Delta$
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 $\neq$ 1, 3, 5, 7 Q = $\Delta$	Correct manually and $Q_{20} = 5$ , otherwise $Q_{20} = 4$ $Q_{20} = 2$
7	$L_a L_a L_a \neq 000-900$ $L_a L_a L_a = \Delta \Delta \Delta$	Correct manually and $Q_{20} = 5$ , otherwise $Q_{20} = 4$ $Q_{20} = 2$
8	$L_o L_o L_o L_o \neq 0000-1800$ $L_o L_o L_o L_o = \Delta \Delta \Delta \Delta$ $L_a L_a L_a = L_o L_o L_o L_o = \Delta \Delta \Delta (\Delta)$	Correct manually and $Q_{20} = 5$ , otherwise $Q_{20} = 4$ $Q_{20} = 2$ 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 latitude 00–39.9	Correct manually otherwise $Q_{20} = 3$
	Change in longitude > 1.0°/hr when latitude 40–49.9	Correct manually otherwise $Q_{20} = 3$
	Change in longitude > 1.4°/hr when latitude 50–59.9	Correct manually otherwise $Q_{20} = 3$
	Change in longitude > 2.0°/hr when latitude 60–69.9	Correct manually otherwise $Q_{20} = 3$
	Change in longitude > 2.7°/hr when latitude 70–79.9	Correct manually otherwise $Q_{20} = 3$
9		No checking
10	$h \neq 0-9$ $h = \Delta$	Correct manually and $Q_1 = 5$ , otherwise $Q_1 = 4$ $Q_1 = 9$
11	$VV \neq 90-99$ $VV = \Delta \Delta$	Correct manually and $Q_2 = 5$ , otherwise $Q_2 = 4$ $Q_2 = 9$
12	$N \neq 0-9, \Delta$ $N < N_h$	Correct manually and $Q_3 = 5$ , otherwise $Q_3 = 4$ Correct manually and $Q_3 = 5$ , otherwise $Q_3 = 2$
13	$dd \neq 00-36, 99$ $dd = \Delta \Delta$ dd versus ff $dd = 00, ff \neq 00$  $dd \neq 00, ff = 00$	Correct manually and $Q_4 = 5$ , otherwise $Q_4 = 4$ $Q_4 = 9$  Correct manually and $Q_4$ or $Q_5 = 5$ otherwise $Q_4 = Q_5 = 2$ 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 $ff = \Delta \Delta$	Correct manually and $Q_5 = 5$ , otherwise $Q_5 = 3$ $Q_5 = 9$
16	$s_n \neq 0, 1$	Correct manually, otherwise $Q_6 = 4$
17	$TTT = \Delta \Delta \Delta$ If $-25 > TTT > 40$ then when latitude < 45.0 $TTT < -25$ $TTT > 40$ when latitude $\geq 45.0$ $TTT < -25$ $TTT > 40$	$Q_6 = 9$     $Q_6 = 4$ $Q_6 = 3$  $Q_6 = 3$ $Q_6 = 4$
<b>TTT versus humidity parameters</b>		
	$TTT < WB$ (wet bulb) $TTT < DP$ (dew point)	Correct manually and $Q_6 = 5$ , otherwise $Q_6 = Q_{19} = 2$ Correct manually and $Q_6 = Q_7 = 5$ , otherwise $Q_6 =$ $Q_7 = 2$
18	$s_f \neq 0, 1, 2, 5, 6, 7, 9$	Correct manually, otherwise $Q_7 = 4$
19	$DP > WB$ $DP > TTT$ $WB = DP = \Delta \Delta \Delta$	Correct manually and $Q_7 = 5$ , otherwise $Q_7 = Q_{19} = 2$ Correct manually and $Q_7 = 5$ , otherwise $Q_7 = Q_6 = 2$ $Q_7 = 9$
20	$930 > PPPP > 1050$ hPa $870 > PPPP > 1070$ hPa $PPPP = \Delta \Delta \Delta \Delta$	Correct manually and $Q_8 = 5$ , otherwise $Q_8 = 3$ Correct manually and $Q_8 = 5$ , otherwise $Q_8 = 4$ $Q_8 = 9$
21	$ww = 22-24, 26, 36-39, 48, 49,$ $56, 57, 66-79, 83-88, 93-94$ and latitude < 20° 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 $Q_9 = 4$     $Q_9 = 5$ , otherwise $Q_9 = 4$
22, 23	$W_1$ or $W_2 = 7$ and latitude < 20° $W_1 < W_2$ $W_1 = W_2 = \Delta \Delta \Delta \Delta$	Correct manually and $Q_9 = 5$ , otherwise $Q_9 = 4$ Correct manually and $Q_9 = 5$ , otherwise $Q_9 = 2$ $Q_9 = 9$

24-27	N = 0 and $N_h C_L C_M C_H \neq 0000$ N = $\Delta$ and $N_h C_L C_M C_H \neq \Delta\Delta\Delta\Delta$ N = 9 and not ( $N_h = 9$ and $C_L C_M C_H = \Delta\Delta\Delta$ ) N= $\Delta$ and $N_h C_L C_M C_H = \Delta\Delta\Delta\Delta$	Correct manually and $Q_3 = 5$ , otherwise $Q_3 = 2$ Correct manually and $Q_3 = 5$ , otherwise $Q_3 = 2$ Correct manually and $Q_3 = 5$ , otherwise $Q_3 = 2$ $Q_3 = 9$
28	$s_n \neq 0, 1$	Correct manually otherwise $Q_{10} = 4$
29	$T_w T_w T_w = \Delta\Delta\Delta$ if $-2.0 > T_w T_w T_w > 37.0$ then when latitude < 45.0 $T_w T_w T_w < -2.0$ $T_w T_w T_w > 37.0$ when latitude $\geq 45.0$ $T_w T_w T_w < -2.0$ $T_w T_w T_w > 37.0$	$Q_{10} = 9$ Control manually and $Q_{10} = 5$ , otherwise $Q_{10} = 4$ Control manually and $Q_{10} = 5$ , otherwise $Q_{10} = 3$ Control manually and $Q_{10} = 5$ , otherwise $Q_{10} = 3$ Control manually and $Q_{10} = 5$ , otherwise $Q_{10} = 4$
30	Indicator $\neq 0-7, \Delta$	Correct manually, otherwise $\Delta$
31	Indicator $\neq 0-9, \Delta$	Correct manually, otherwise $\Delta$
32	$20 < P_w P_w < 30$ $P_w P_w \geq 30$ and $\neq 99$ $P_w P_w = \Delta \Delta$	$Q_{11} = 3$ $Q_{11} = 4$ $Q_{11} = 9$
33	$35 < H_w H_w < 50$ $H_w H_w \geq 50$ $H_w H_w = \Delta \Delta$	$Q_{12} = 3$ $Q_{12} = 4$ $Q_{12} = 9$
34	$d_{w1} d_{w1} \neq 00-36, 99$ swell <sub>1</sub> = swell <sub>2</sub> = $\Delta$	Correct manually and $Q_{13} = 5$ , otherwise $Q_{13} = 4$ $Q_{13} = 9$
35	$25 < P_{w1} P_{w1} < 30$ $P_{w1} P_{w1} \geq 30$ and $\neq 99$	$Q_{13} = 3$ $Q_{13} = 4$
36	$35 < H_{w1} H_{w1} < 50$ $H_{w1} H_{w1} \geq 50$	$Q_{13} = 3$ $Q_{13} = 4$
37	$I_s \neq 1-5, \Delta$	Correct manually, otherwise $\Delta$
38	$E_s E_s \neq 00-99, \Delta\Delta$	Correct manually, otherwise $\Delta\Delta$
39	$R_s \neq 0-4, \Delta$	Correct manually, otherwise $\Delta$
40	Source $\neq 0-6$	Correct manually, otherwise $\Delta$
41	Platform $\neq 0-9$	Correct manually, otherwise $\Delta$
42	No call sign	Insert manually, mandatory entry
43	No country code	Insert manually
44		No quality control
45	$Q \neq 0-6, 9$	Correct manually, otherwise $\Delta$
46	$i_x \neq 1-7$	Correct manually, otherwise $\Delta$
47	$i_R = 0-2$ and $RRR = 000, \Delta\Delta\Delta$ $i_R = 3$ and $RRR \neq 000, \Delta\Delta\Delta$ $i_R = 4$ and $RRR \neq \Delta\Delta\Delta$ $i_R \neq 0-4$	Correct manually, otherwise $Q_{14} = 4$ Correct manually, otherwise $Q_{14} = 2$ Correct manually, otherwise $Q_{14} = 2$ Correct manually, otherwise $Q_{14} = 4$
48	$RRR \neq 001-999$ and $i_R = 1, 2$	Correct manually and $Q_{14} = 5$ , otherwise $Q_{14} = 2$
49	$t_R \neq 0-9, \Delta$	Correct manually and $Q_{14} = 5$ , otherwise $Q_{14} = 4$
50	$s_w \neq 0, 1, 2, 5, 6, 7, 9$	Correct manually, otherwise $Q_{19} = 4$
51	WB < DP WB = $\Delta\Delta\Delta$ WB > TTT	Correct manually and $Q_{19} = 5$ , otherwise $Q_{19} = Q_7 = 2$ $Q_{19} = 9$ Correct manually and $Q_{19} = 5$ , otherwise $Q_{19} = Q_6 = 2$
52	$a \neq 0-8$ $a = 4$ and $ppp \neq 000$  $a = 1, 2, 3, 6, 7, 8$ and $ppp = 000$  $a = \Delta$	Correct manually and $Q_{15} = 5$ , otherwise $Q_{15} = 4$ Correct manually and $Q_{15}$ or $Q_{16} = 5$ , otherwise $Q_{15} = Q_{16} = 2$ Correct manually and $Q_{15}$ or $Q_{16} = 5$ , otherwise $Q_{15} = Q_{16} = 2$ $Q_{15} = 9$
53	$250 \geq ppp > 150$ $ppp > 250$ $ppp = \Delta\Delta\Delta$	Correct manually and $Q_{16} = 5$ , otherwise $Q_{16} = 3$ Correct manually and $Q_{16} = 5$ otherwise $Q_{16} = 4$ $Q_{16} = 9$

54	$D_s \neq 0-9, \Delta$	Correct manually and $Q_{17} = 5$ , otherwise $Q_{17} = 4$	
	$D_s = \Delta$	$Q_{17} = 9$	
55	$V_s \neq 0-9, \Delta$	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	$c_i \neq 0-9, \Delta$	Correct manually, otherwise $\Delta$	
60	$S_i \neq 0-9, \Delta$	Correct manually, otherwise $\Delta$	
61	$b_i \neq 0-9, \Delta$	Correct manually, otherwise $\Delta$	
62	$D_i \neq 0-9, \Delta$	Correct manually, otherwise $\Delta$	
63	$z_i \neq 0-9, \Delta$	Correct manually, otherwise $\Delta$	
86	Minimum quality control (MQC) standards version identification	1 = MQC-I (Original version, Feb. 1989) 2 = MQC-II (Version 2, March 1997)	CMM-X C M M -
XII		3 = MQC-III (Version 3, April 2000)	SGMC-
VIII		4 = MQC-IV (Version 4, June 2001)	
JCOMM-I		5 = MQC-V (Version 5, July 2001)	ETMC-I
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 $Q_{25} = 4$	
	$SLL = \Delta\Delta$	$Q_{25} = 9$	
	$SLL > 32$	correct manually and $Q_{25} = 5$ , otherwise $Q_{25} = 3$	
91	$sL \neq 0,1$	correct manually and $Q_{26} = 5$ , otherwise $Q_{26} = 4$	
	$sL = \Delta$	$Q_{26} = 9$	
	$hh \neq 00 - 99$	correct manually and $Q_{27} = 5$ , otherwise $Q_{27} = 4$	
	$hh = \Delta\Delta$	$Q_{27} = 9$	
	$hh \geq 13$	correct manually and $Q_{27} = 5$ , otherwise $Q_{27} = 3$	
	$hh < -01$	correct manually and $Q_{27} = 5$ , otherwise $Q_{27} = 4$	
92	$RWD \neq 000 - 360, 999$	correct manually and $Q_{28} = 5$ , otherwise $Q_{28} = 4$	
	$RWD = \Delta\Delta\Delta$	$Q_{28} = 9$	
93	$RWS \neq 000 - 999$	correct manually and $Q_{29} = 5$ , otherwise $Q_{29} = 4$	
	$RWS = \Delta\Delta\Delta$	$Q_{29} = 9$	
	$RWS > 110$ kts	correct manually and $Q_{29} = 5$ , otherwise $Q_{29} = 3$	
	<b>RWD versus RWS</b>		
	$RWD = 000, RWS \neq 000$	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 $Q_{28} = Q_{29} = 2$	
	<b>Specifications for quality control indicators <math>Q_1</math> to <math>Q_{29}</math></b>		
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	Reserved for GCC		
7	Reserved for GCC		
8	Reserve		
9	The value of the element is missing		