

**AMENDMENTS TO THE MANUAL ON MARINE METEOROLOGICAL SERVICES AND  
GUIDE TO MARINE METEOROLOGICAL SERVICES  
MINIMUM QUALITY CONTROL STANDARD (MQCS)  
MQCS-6a (Version 6a, Draft 22 June 2010)**

**Note: highlighting marks changes with respect to MQCS-5**

**highlighting marks changes with respect to MQCS-6**

**NOTE:** See the specifications for setting quality control Indicators  $Q_1$  to  $Q_{29}$  at the end of this Annex

$\Delta$  = space (ASCII 32)

| <u>Element</u>              | <u>Error</u>   | <u>Action</u>   |
|-----------------------------|--|---|
| 1                           | $i_T \neq 3 - 5, \Delta$   | Correct manually otherwise <b>3</b>   |
| 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                           | $Q_c \neq 1, 3, 5, 7$<br>$Q_c = \Delta$  | Correct manually and $Q_{20} = 5$ , otherwise $Q_{20} = 4$<br>$Q_{20} = 2$  |
| 7                           | $L_a L_a L_a \neq 000-900$<br>$L_a L_a L_a = \Delta\Delta\Delta$   | Correct manually and $Q_{20} = 5$ , otherwise $Q_{20} = 4$<br>$Q_{20} = 2$  |
| 8                           | $L_o L_o L_o L_o \neq 0000-1800$<br>$L_o L_o L_o L_o = \Delta\Delta\Delta\Delta$<br>$L_a L_a L_a = L_o L_o L_o L_o = \Delta\Delta\Delta(\Delta)$ | Correct manually and $Q_{20} = 5$ , otherwise $Q_{20} = 4$<br>$Q_{20} = 2$<br>Correct manually otherwise reject   |
| <u>Time sequence checks</u> |  |   |
|                             | Change in latitude $> 0.7^\circ/\text{hr}$   | Correct manually otherwise $Q_{20} = 3$   |
|                             | Change in longitude $> 0.7^\circ/\text{hr}$<br>when lat. 00-39.9   | Correct manually otherwise $Q_{20} = 3$   |
|                             | Change in longitude $> 1.0^\circ/\text{hr}$<br>when lat. 40-49.9   | Correct manually otherwise $Q_{20} = 3$   |
|                             | Change in longitude $> 1.4^\circ/\text{hr}$<br>when lat. 50-59.9   | Correct manually otherwise $Q_{20} = 3$   |
|                             | Change in longitude $> 2.0^\circ/\text{hr}$<br>when lat. 60-69.9   | Correct manually otherwise $Q_{20} = 3$   |
|                             | Change in longitude $> 2.7^\circ/\text{hr}$<br>when lat. 70-79.9   | Correct manually otherwise $Q_{20} = 3$   |
| <b>9</b>                    | <b>Indicator <math>\neq 0-3, \Delta</math></b>   | <b>Correct manually, otherwise <math>\Delta</math></b>  |
| 10                          | $h \neq 0-9$<br>$h = \Delta$   | Correct manually and $Q_1 = 5$ , otherwise $Q_1 = 4$<br>$Q_1 = 9$   |
| 11                          | VV $\neq 90-99$<br>VV = $\Delta\Delta$   | Correct manually and $Q_2 = 5$ , otherwise $Q_2 = 4$<br>$Q_2 = 9$   |
| 12                          | N $\neq 0-9, \Delta$<br>$N < N_h$  | Correct manually and $Q_3 = 5$ , otherwise $Q_3 = 4$<br>Correct manually and $Q_3 = 5$ , otherwise $Q_3 = 2$  |
| 13                          | dd $\neq 00-36, 99$<br>dd = $\Delta\Delta$<br>dd versus ff<br>dd = 00, ff $\neq$ 00<br><br>dd $\neq$ 00, ff = 00                                 | Correct manually and $Q_4 = 5$ , otherwise $Q_4 = 4$<br>$Q_4 = 9$<br><br>Correct manually and $Q_4$ or $Q_5 = 5$ otherwise<br>$Q_4 = Q_5 = 2$<br>Correct manually and $Q_4$ or $Q_5 = 5$ otherwise<br>$Q_4 = Q_5 = 2$ |
| 14                          | $i_w \neq 0, 1, 3, 4$  | Correct manually, otherwise $Q_5 = Q_{29} = 4$  |
| 15                          | ff $> 80$ knots<br>ff = $\Delta\Delta$   | Correct manually and $Q_5 = 5$ , otherwise $Q_5 = 3$<br>$Q_5 = 9$   |
| 16                          | $s_n \neq 0, 1$  | Correct manually, otherwise $Q_6 = 4$   |
| 17                          | TTT = $\Delta\Delta\Delta$   | $Q_6 = 9$   |

| <u>Element</u>                        | <u>Error</u>   | <u>Action</u>   |
|---------------------------------------|--|---|
|                                       | If -25 > TTT > 40 then<br>when Lat. < 45.0<br>TTT < -25<br>TTT > 40<br>when Lat. ≥ 45.0<br>TTT < -25<br>TTT > 40   | Q <sub>6</sub> = 4<br>Q <sub>6</sub> = 3<br><br>Q <sub>6</sub> = 3<br>Q <sub>6</sub> = 4  |
| <u>TTT versus humidity parameters</u> |  |   |
|                                       | TTT < WB (wet bulb)<br>TTT < DP (dew point)  | Correct manually and Q <sub>6</sub> = 5, otherwise Q <sub>6</sub> =Q <sub>19</sub> = 2<br>Correct manually and Q <sub>6</sub> = Q <sub>7</sub> = 5, otherwise<br>Q <sub>6</sub> = Q <sub>7</sub> = 2  |
| 18                                    | s <sub>t</sub> ≠ 0, 1, 2, 5, 6, 7  | Correct manually, otherwise Q <sub>7</sub> = 4  |
| 19                                    | DP > WB<br>DP > TTT<br>WB = DP = ΔΔΔ   | Correct manually and Q <sub>7</sub> = 5, otherwise Q <sub>7</sub> =Q <sub>19</sub> = 2<br>Correct manually and Q <sub>7</sub> = 5, otherwise Q <sub>7</sub> = Q <sub>6</sub> = 2<br>Q <sub>7</sub> = Q <sub>19</sub> = 9  |
| 20                                    | 930 > PPPP > 1050 hPa<br>870 > PPPP > 1070 hPa<br>PPPP = ΔΔΔΔ  | Correct manually and Q <sub>8</sub> = 5, otherwise Q <sub>8</sub> = 3<br>Correct manually and Q <sub>8</sub> = 5, otherwise Q <sub>8</sub> = 4<br>Q <sub>8</sub> = 9  |
| 21                                    | ww = 22-24, 26, 36-39, 48, 49, 56,<br>57, 66-79, 83-88<br>93-94<br>and latitude < 20°<br>if i <sub>x</sub> = 7:<br>w <sub>a</sub> w <sub>a</sub> = 24 - 25, 35, 47-48, 54-56,<br>64-68, 70-78, 85-87<br>and latitude < 20°   | Correct manually and Q <sub>9</sub> = 5, otherwise Q <sub>9</sub> = 4<br><br>Correct manually and Q <sub>9</sub> = 5, otherwise Q <sub>9</sub> = 3<br><br>Correct manually and Q <sub>9</sub> = 5, otherwise Q <sub>9</sub> = 4   |
| 22, 23                                | W <sub>1</sub> or W <sub>2</sub> = 7 and latitude < 20°<br>W <sub>1</sub> < W <sub>2</sub><br>W <sub>1</sub> = W <sub>2</sub> = ww = ΔΔΔΔ  | Correct manually and Q <sub>9</sub> = 5, otherwise Q <sub>9</sub> = 4<br>Correct manually and Q <sub>9</sub> = 5, otherwise Q <sub>9</sub> = 2<br>Q <sub>9</sub> = 9  |
| 24-27                                 | N = 0, and N <sub>h</sub> C <sub>L</sub> C <sub>M</sub> C <sub>H</sub> ≠ 0000<br>N = Δ, and N <sub>h</sub> C <sub>L</sub> C <sub>M</sub> C <sub>H</sub> ≠ ΔΔΔΔ<br>N = 9, and not (N <sub>h</sub> = 9 and<br>C <sub>L</sub> C <sub>M</sub> C <sub>H</sub> ≠ ΔΔΔ<br>N = Δ, and N <sub>h</sub> C <sub>L</sub> C <sub>M</sub> C <sub>H</sub> = ΔΔΔΔ  | Correct manually and Q <sub>3</sub> = 5, otherwise Q <sub>3</sub> = 2<br>Correct manually and Q <sub>3</sub> = 5, otherwise Q <sub>3</sub> = 2<br>Correct manually and Q <sub>3</sub> = 5, otherwise Q <sub>3</sub> = 2<br><br>Q <sub>3</sub> = 9   |
| 28                                    | s <sub>n</sub> ≠ 0, 1  | Correct manually otherwise Q <sub>10</sub> = 4  |
| 29                                    | T <sub>w</sub> T <sub>w</sub> T <sub>w</sub> = ΔΔΔ<br>if -2.0 > T <sub>w</sub> T <sub>w</sub> T <sub>w</sub> > 37.0 then<br>when Lat. < 45.0<br>T <sub>w</sub> T <sub>w</sub> T <sub>w</sub> < -2.0<br>T <sub>w</sub> T <sub>w</sub> T <sub>w</sub> > 37.0<br>when Lat. ≥ 45.0<br>T <sub>w</sub> T <sub>w</sub> T <sub>w</sub> < -2.0<br>T <sub>w</sub> T <sub>w</sub> T <sub>w</sub> > 37.0 | Q <sub>10</sub> = 9<br><br>Control manually and Q <sub>10</sub> = 5, otherwise Q <sub>10</sub> = 4<br>Control manually and Q <sub>10</sub> = 5, otherwise Q <sub>10</sub> = 3<br><br>Control manually and Q <sub>10</sub> = 5, otherwise Q <sub>10</sub> = 3<br>Control manually and Q <sub>10</sub> = 5, otherwise Q <sub>10</sub> = 4 |
| 30                                    | Indicator ≠ 0-7, Δ   | Correct manually, otherwise Δ   |
| 31                                    | Indicator ≠ 0-9, Δ   | Correct manually, otherwise Δ   |
| 32                                    | 20 < P <sub>w</sub> P <sub>w</sub> < 30<br>P <sub>w</sub> P <sub>w</sub> ≥ 30 and ≠ 99<br>P <sub>w</sub> P <sub>w</sub> = ΔΔ   | Q <sub>11</sub> = 3<br>Q <sub>11</sub> = 4<br>Q <sub>11</sub> = 9   |
| 33                                    | 35 < H <sub>w</sub> H <sub>w</sub> < 50<br>H <sub>w</sub> H <sub>w</sub> ≥ 50<br>H <sub>w</sub> H <sub>w</sub> = ΔΔ  | Q <sub>12</sub> = 3<br>Q <sub>12</sub> = 4<br>Q <sub>12</sub> = 9   |
| 34                                    | d <sub>w1</sub> d <sub>w1</sub> ≠ 00-36, 99<br>swell <sub>1</sub> = swell <sub>2</sub> = Δ   | Correct manually and Q <sub>13</sub> = 5, otherwise Q <sub>13</sub> = 4<br>Q <sub>13</sub> = 9  |
| 35                                    | 25 < P <sub>w1</sub> P <sub>w1</sub> < 30<br>P <sub>w1</sub> P <sub>w1</sub> ≥ 30 and ≠ 99   | Q <sub>13</sub> = 3<br>Q <sub>13</sub> = 4  |
| 36                                    | 35 < H <sub>w1</sub> H <sub>w1</sub> < 50<br>H <sub>w1</sub> H <sub>w1</sub> ≥ 50  | Q <sub>13</sub> = 3<br>Q <sub>13</sub> = 4  |
| 37                                    | I <sub>s</sub> ≠ 1-5, Δ  | Correct manually, otherwise Δ   |

| <u>Element</u> | <u>Error</u>   | <u>Action</u>  |
|----------------|--|--|
| 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 $RRR = 000$ , $\Delta\Delta\Delta$             | Correct manually, otherwise $Q_{14} = 4$   |
|                | $i_R = 3$ and $RRR \neq \Delta\Delta\Delta$                    | Correct manually, otherwise $Q_{14} = 2$   |
|                | $i_R = 4$ and $RRR \neq \Delta\Delta\Delta$                    | Correct manually, otherwise $Q_{14} = 2$   |
|                | $i_R \neq 0-4$   | Correct manually, otherwise $Q_{14} = 4$   |
| 48             | $RRR \neq 001-999$ and $iR = 1, 2$                             | 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             | $s_w \neq 0, 1, 2, 5, 6, 7$                                    | Correct manually, otherwise $Q_{19} = 4$   |
| 51             | $WB < DP$  | Correct manually and $Q_{19} = 5$ , otherwise $Q_{19}=Q_7=2$   |
|                | $WB = \Delta\Delta\Delta$                                      | $Q_{19} = 9$   |
|                | $WB > TTT$   | Correct manually and $Q_{19} = 5$ , otherwise $Q_{19}=Q_6=2$   |
| 52             | $a \neq 0-8$   | Correct manually and $Q_{15} = 5$ , otherwise $Q_{15} = 4$   |
|                | $a = 4$ and $ppp \neq 000$                                     | 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 $Q_{15}=Q_{16} = 2$  |
|                | $a = \Delta$   | $Q_{15} = 9$   |
| 53             | $250 \geq ppp > 150$   | Correct manually and $Q_{16} = 5$ , otherwise $Q_{16} = 3$   |
|                | $ppp > 250$  | Correct manually and $Q_{16} = 5$ otherwise $Q_{16} = 4$   |
|                | $ppp = \Delta\Delta\Delta$                                     | $Q_{16} = 9$   |
| 54             | $D_s \neq 0-9$   | Correct manually and $Q_{17} = 5$ , otherwise $Q_{17} = 4$   |
|                | $D_s = \Delta$   | $Q_{17} = 9$   |
| 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             | $c_i \neq 0-9$ , $\Delta$                                      | 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 $\Delta$   |
| 64             | version $\neq 0-9$ , A-C, $\Delta$                             | Correct manually, otherwise $\Delta$   |
| 65             | version $\neq 0-4$ , $\Delta$                                  | Correct manually, otherwise $\Delta$   |
| 86             | Minimum Quality Control Standard (MQCS) version identification | 1= MQCS-I (Original version, Feb. 1989) CMM-X<br>2= MQCS-II (Version 2, March 1997) CMM-XII<br>3= MQCS-III (Version 3, April 2000) SGMC-VIII<br>4= MQCS-IV (Version 4, June 2001) JCOMM-I<br>5= MQCS-V (Version 5, July 2004) ETMC-I<br>6 = MQCS-VI (this version, to be agreed) |
| 87             | $HDG \neq 001-360$   | 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 $Q_{24} = 4$   |
|                | $SOG = \Delta\Delta$   | $Q_{24} = 9$   |

| <u>Element</u>  | <u>Error</u>   | <u>Action</u>  |
|---|--|--|
| 90  | SOG > 33<br>SLL ≠ 00-99<br>SLL = ΔΔ<br>SLL > 40  | Correct manually and Q <sub>24</sub> = 5, otherwise Q <sub>24</sub> = 3<br>Correct manually and Q <sub>25</sub> = 5, otherwise Q <sub>25</sub> = 4<br>Q <sub>25</sub> = 9<br>Correct manually and Q <sub>25</sub> = 5, otherwise Q <sub>25</sub> = 3 |
| 91  | s <sub>L</sub> ≠ 0,1   | Correct manually and Q <sub>27</sub> = 5, otherwise Q <sub>27</sub> = 4  |
| 92  | hh ≠ 00 – 99<br>hh = ΔΔ<br>hh >= 13<br>hh < -01  | Correct manually and Q <sub>27</sub> = 5, otherwise Q <sub>27</sub> = 4<br>Q <sub>27</sub> = 9<br>Correct manually and Q <sub>27</sub> = 5, otherwise Q <sub>27</sub> = 3<br>Correct manually and Q <sub>27</sub> = 5, otherwise Q <sub>27</sub> = 4 |
| 93  | RWD ≠ 000 - 360, 999<br>RWD = ΔΔΔ  | Correct manually and Q <sub>28</sub> = 5, otherwise Q <sub>28</sub> = 4<br>Q <sub>28</sub> = 9   |
| 94  | RWS ≠ 000 - 999<br>RWS = ΔΔΔ<br>RWS > 110 kts  | Correct manually and Q <sub>29</sub> = 5, otherwise Q <sub>29</sub> = 4<br>Q <sub>28</sub> = 9<br>Correct manually and Q <sub>29</sub> = 5, otherwise Q <sub>29</sub> = 3  |
| <u>RWD versus RWS</u>   |  |  |
|   | RWD = 000, RWS ≠ 000   | Correct manually and Q <sub>28</sub> or Q <sub>29</sub> = 5, otherwise<br>Q <sub>28</sub> = Q <sub>29</sub> = 2  |
|   | RWD ≠ 000, RWS = 000   | Correct manually and Q <sub>28</sub> or Q <sub>29</sub> = 5, otherwise<br>Q <sub>28</sub> = Q <sub>29</sub> = 2  |
| <b><u>Specifications for setting quality control Indicators Q<sub>1</sub> to Q<sub>29</sub></u></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   | 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  |  |