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 VOSClim 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 VOSClim 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 1 TO RECOMMENDATION 9 (JCOMM-II)

AMENDMENTS TO THE MANUAL ON MARINE METEOROLOGICAL SERVICES AND GUIDE TO MARINE METEOROLOGICAL SERVICES

LAYOUT FOR THE INTERNATIONAL MARITIME METEOROLOGICAL TAPE (IMMT) [VERSION IMMT-3]

Element Number	*Character Number*	*Code*	*Element*	*Coding procedure*
1	1	i_T	Format/temperature indicator	3=IMMT format with temperatures in tenths of °C 4=IMMT format with temperatures in halves of °C 5=IMMT format with temperatures in whole °C
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	Q_c	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

Element Number	*Character Number*	*Code*	*Element*	*Coding procedure*
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
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 CL or, if no CL cloud is present, for CM, 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

Element Number	*Character Number*	*Code*	*Element*	*Coding procedure*	
31	55		Indicator for wave measurement		0 - Wind sea and swell estimated
				Shipborne wave recorder	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
					7 - Wind sea and swell measured
				Other measurement system	8 - Mixed wave measured, swell estimated
					9 - Other combinations measured and estimated
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*	
33	58-59	H_wH_w	Height of wind waves or of measured waves	Half-meter values. Examples: Calm or less than $^1/_4$m to be encoded 00; $3^1/_2$m to be encoded 07; 7m to be encoded 14; $11^1/_2$m 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	National
				2 - Telecommunication channels	
				3 - Publications	
				4 - Logbook	International
				5 - Telecommunication channels	data exchange
				6 - Publications	
41	71		Observation platform	0 - unknown	
				1 - Selected ship	
				2 - Supplementary ship	
				3 - Auxiliary ship	
				4 - Automated station/data buoy	
				5 - Fixed sea station	
				6 - Coastal station	
				7 - Aircraft	
				8 - Satellite	
				9 - Others	

Element Number	*Character Number*	*Code*	*Element*	*Coding procedure*
42	72-78		Ship identifier	Ship's call sign or other identifier encoded as follows: 7 characters call sign Columns 72-78 6 characters call sign Columns 72-77 5 characters call sign Columns 72-76 4 characters call sign Columns 72-75 3 characters call sign Columns 72-74
43	79-80		Country which has recruited the ship	According to the two-character alphabetical codes assigned by the International Organization for Standardization (ISO)
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) 7 & 8 - Not used 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 tR	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	$T_bT_bT_b$	Wet-bulb temperature	In tenths of degree Celsius, sign given by element 50
52	93	a	Characteristic of pressure tendency	WMO code table 0200

Element Number	*Character Number*	*Code*	*Element*	*Coding procedure*
			during the three hours preceding the time of observation	
53	94-96	ppp	Amount of pressure tendency at station level during the three hours preceding the time of observation	In tenths of hectopascal
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 13 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, etc.
65	111		IMMT version	0 = IMMT version just prior to version number being included 1 = IMMT-1 (in effect from Nov. 1994) 2 = IMMT-2 (in effect from Jan. 2003) 3 = IMMT-3 (in effect from Jan. 2006) 4 = IMMT-4 (next version)

Element Number	*Character Number*	*Code*	*Element*	*Coding procedure*
				etc.
66	112	Q_1	Quality control indicator for (h)	0 - no quality control (QC) has been performed in 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 - 8 Reserve 9 - The value of the element 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 -
84	130	Q_{19}	QC indicator for ($t_bt_bt_b$)	- idem -

Element Number	*Character Number*	*Code*	*Element*	*Coding procedure*
85	131	Q_{20}	QC indicator for ships' position	- idem -
86	132	Q_{21}	Minimum quality control standards (MQCS) version identification	1 = MQCS- I (Original version, Feb. 1989) CMM-X 2 = MQCS-II (Version 2, March 1997) CMM-X11 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
	etc.			
			Additional Requirements for the VOSClim Project	
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	143-145	$s_L$hh	Departure of reference level (Summermaximum load line) from actual sealevel. Consider the difference positive when the Summer maximum load line is above the level of the sea and negative if below the water line.	Position 143 (sL) sign position;, 0 = positive or zero, 1 = negative Positions 144-145 (hh); (00-99) is the difference to the nearest whole meter between the Summer maximum load line and the sea level.
92	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.
93	149-151	RWS	Relative wind speed reported in units indicated by i_W (knots or m/s)	Reported in either whole knots or whole meters per second (e.g. 010 knots or 005 m/s). Units established by iW as indicated in Character Number 27.

Note: Since the relative wind speed can be greater than the true wind speed e.g., iW indicates knots and ff = 98, the relative wind speed may be 101 knots; therefore, three positions must be allocated since iW cannot be adjusted and the relative wind speed converted to meters per second as is done in element 15.

94	152	Q22	Quality control indicator for (HDG)	0 - no quality control (QC) has been performed in 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 - 8 Reserve

Element Number	*Character Number*	*Code*	*Element*	*Coding procedure*
				9 - The value of the element missing
95	153	Q_{23}	QC indicator for (COG)	- idem -
96	154	Q_{24}	QC indicator for (SOG)	- idem -
97	155	Q_{25}	QC indicator for (SLL)	- idem -
98	156	Q_{26}	QC indicator for (SL)	- idem -
99	157	Q_{27}	QC indicator for (hh)	- idem -
100	158	Q_{28}	QC indicator for (RWD)	- idem -
101	159	Q_{29}	QC indicator for (RWS)	- idem -

NOTE: Most of the codes (groups of letters) in the IMMT format with the exception of those added for the VOSCLIM Project are defined in the *Manual on Codes* (WMO–No. 306) as they basically mirror the code groups used in FM 13-X SHIP code. Because CBS was not persuaded to expand the FM 13-X SHIP code for the VOSCLIM Project, the additional observed elements (selected codes) will not appear in the WMO *Manual on Codes*. Therefore an effort was made to select unique codes (groups of letters) not defined in the WMO *Manual on Codes* for the elements added to the IMMT-2 format version modified for the VOSCLIM Project. This was deliberately done to try and prevent a difference in meaning for a given code group (identical symbolic letters) in the *Manual* versus that in IMMT. Presumably none of the Character Code formats will be altered in the future by CBS.