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COMMISSION FOR MARITIME METEOROLOGY

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OF THE
SECOND SESSION

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TABLE OF CONTENTS

LIST OF REPRESENTATIVES

ATTENDING THE SECOND SESSION OF THE COMMISSION FOR MARITIME METEOROLOGY

1. Officers of the session

C.E.N. Frankcom	President
J.W. Termijtelen	Vice-President

2. Representatives of Members of WMO

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J. Dury	delegate	
K.T. McLeod	delegate	Canada
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J.W. Termijtelen	delegate	Netherlands Antilles
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J.B. Blanc de Portugal	delegate	Portuguese East Africa
J.B. Blanc de Portugal	delegate	Portuguese West Africa
F. Balem	principal delegate	Spain

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A.B. Crawford	delegate	Union of South Africa
H.C. Shellard	principal delegate	United Kingdom
P. Bracelin	delegate	
A.R. Belton	delegate	
R.R. Kippen	observer	
W.F. McDonald	principal delegate	United States
P.R. Drouilhet	delegate	
N.A. Lieurance	delegate	
A.E. Sik	adviser	
J.J. Schule	adviser	
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Y.V. Istoshine	delegate	
A.V. Popov	delegate	
K.P. Ryshkow	delegate	
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C. Duplančić	delegate	Yugoslavia

3. Representatives of international organizations

T. Laevastu	observer	FAO
A. Viglieri	observer	IHB
R.L. Zwemer	observer	UNESCO
H.U. Roll	observer	IUGG
M. Krause	observer	PIANC
J.D. Parker	observer	CIRM

4. Representatives of WMO Secretariat

K. Langlo	chief technical division
M.A. Alaka	technical officer
R.L. Munteanu	technical officer

5. Secretariat of the session

H. Panzram
Miss M. Bechtold

AGENDA

Ag. item No.		Relevant documents*	Reference in Minutes	Resolutions	Recommendations	Annexes
1.	Consideration of the report on credentials		I, para.3			
2.	Consideration of the draft agenda and adoption of the agenda	1, 80	I, para.5			
3.	Report by the president of the commission		III, para.2			
4.	Appointment of committees for the session		I, para.4 II, para.1			
5.	Reports by the chairmen of the working groups established by the first session of CMM					
5.1	Report by the chairman of the Working Group A	22, 77	III, para.8			
5.1.1	The descriptive terms for wave heights	23, 60, 76, 77, 106	III, para.8.1 IV, para.5.2		10	
5.1.2	Definition of the term "storm warning"	24, 32, 77, 110, 141	III, para.8.2 VIII, para.14		20, 30	
5.1.3	International award (plaque) for selected ships	25, 36, 77, 103	III, para.8.3 IV, para.6.2		20	
5.1.4	Code for reporting sea ice by aircraft	65, 77, 135	III, para.8.5 VIII, para.7	6		
5.1.5	International exchange of blank weather maps for use by selected ships	26, 77, 100	III, para.8.4 IV, para.5.1		21	
5.1.6	Proposals re amendments to Code Forms FM 21.A, 22.A and 23.A, in view of the new International Ice Nomenclature, for submission to the president of the Commission for Synoptic Meteorology	22, 138	VIII, para.11		11	
5.1.7	Examination of the international ice codes as presented in IMO publication No. 9, fascicule I, section I-C-1, and recommendation regarding ice observations in coded form from ships	66, 135	VIII, para.7	6	12	
5.1.8	Revision of the text of WMO publication No. 8. TP.3, chapter 10, paragraph 10.9 (Ice)	2, 135	VIII, para.7			
5.2	Report by the chairman of Working Group B	37	III, para.9			
5.2.1	Measurement of sea surface water temperature	35, 51, 54, 134	VIII, para.6		4	1
5.2.2	Measurement of rainfall at sea	45, 52, 114	VI, para.2	2	6	
5.2.3	Definition of "gust"	48, 60, 109	IV, para.5.5	2		
5.2.4	Reporting visibility	57, 67, 102, 139	VIII, para.12	2	5	
5.2.5	Revision of wind speed equivalents of the Beaufort scale	3, 58, 62, 83, 131	VIII, para.3		1, 2, 3	
5.2.6	The possibility of applying "atmospherics" techniques	59, 60, 108	IV, para.5.4	2		
5.3	Report by the chairman of Working Group C	31	III, para.10			
5.3.1	Application of meteorology to the carriage of goods at sea	72, 94, 118	V, para.4			
5.4	Report by the chairman of Working Group D	19, 127	III, para.11 VI, para.7	4	26	
5.4.1	Climatic atlases	68, 69, 70				
5.4.2	Checking of data	98				
5.4.3	Utilizing existing marine climatic atlases for a World Climatic Atlas					
5.4.4	A review of the existing marine data in the possession of maritime countries and the most practicable method of processing them so as to make them readily available for international purposes (climatology, research, etc.)	70				
5.4.5	A consideration of the "models" for climatological summaries referred to under resolution 3 (CAeM-I)					
5.5	Report by the chairman of Working Group on sea ice	29	III, para.7			
5.5.1	Code for the reporting of ice from land stations	66, 135	VIII, para.7	6	12	
5.5.2	International Ice Nomenclature	71, 135	VIII, para.7	6		
5.5.3	Photographic illustrations of the Ice Nomenclature	143	VII, para.2	6		
6.	Other technical items					
6.1	International Geophysical Year	46, 74, 104	IV, para.6.3			2
6.1.1	Upper air observations aboard whaling ships during the International Geophysical Year	11, 85, 105	IV, para.6.4			
6.1.2	The possibility of improving the network of observations from merchant ships between 35°S and 55°S and in other relatively sparse oceanic areas during IGY	12, 39, 44, 123	VII, para.6		14	3
6.1.3	Consideration of the best method of preparing and making available maritime data in the form approved for use during IGY	13, 93, 129	VIII, para.2			4

* The underlined documents are those considered in plenary.

Ag. item No.		Relevant documents*	Reference in Minutes	Resolutions	Recommendations	Annexes
6.2	Consideration of the report on the scheme for reports from whaling ships	8, 87, 126	V, para.6			
6.3	Selected, supplementary and auxiliary ships. The further recruitment of observing ships and consideration of a possible scheme whereby each maritime country agrees in the future to provide a minimum number of voluntary observing ships based on a certain percentage of world tonnage	16, 81, 84, 120	V, para.3 VII, para.3		8 16	5
6.4	Improvement of the network of observations from ships in areas where merchant shipping is normally sparse	9, 42, 60, 95, 97, 101, 113, 128	IV, para.6.1 IV, para.6.5 VIII, para.1		14, 17, 18, 19, 23	6, 7
6.5	Reporting of precipitation group 7RRjj by ships	18, 33, 132	VIII, para.4		7	
6.6	Problems arising from the cancellation of IMO resolutions by the eighth session of the Executive Committee					
6.6.1	Reconsideration of certain IMO resolutions relating to maritime meteorology	5, 82, 125	VII, para.7	2	15, 28, 29	
6.6.2	Consideration of the status and contents of WMO publication No.9. TP.4, volume D	27, 47, 75, 79, 121	VII, para.4		31	8, 11
6.7	A review of the resolutions and recommendations adopted by the first session of CMM	28, 60, 122	VII, para.5	1 5	24, 25	9, 12
6.8	The possibility of using a short forecast code as an alternative to the present system of issuing weather bulletins for shipping in English as well as in the language of the issuing country	6, 50, 130	VII, para.8		22	
6.9	Consideration of the maritime portion of the WMO Technical Regulations adopted by the Second Congress	34, 47, 67, 81, 89, 137	VIII, para.10		30	10
6.10	Liaison with other international bodies, e.g., international fishing commissions	10, 38, 55, 61, 112	V, para.2		32	
6.11	A general consideration of the code forms FM 21.A, 22.A and 23.A at present in use for the transmission of radio weather messages from ships	4, 15, 41, 43, 49, 91, 96, 107, 115, 140	IV, para.5.3 VIII, para.13		9	
6.12	Investigation of thunderstorm frequency at sea	7, 111	IV, para.5.6		27	
6.13	Adjustments of the oceanic areas allocated to certain countries for the reception of reports from ships and for the issue of weather bulletins to ships	30, 46, 53, 56, 60, 92, 117, 136	VIII, para.9			
6.14	The WMO Guide to international meteorological instruments and observing practice (WMO publication No. 8.TP.3 (1954), chapter 10	14, 47, 76, 88, 133	VIII, para.5	2		
6.15	Aerological observations from merchant ships	17, 60, 86, 119	V, para.4	2	13	
6.16	Inspection of instruments by meteorological liaison officers	21, 90, 121	VII, para.4			
6.17	Proposed modification to the code for reporting the state of the sea surface	20, 116	V, para.3			
6.18	The rôle of CMM in any future structure of WMO technical commissions	73, 99, 124	V, para.5		33	
7.	Election of president and officers		V, para.1			
8.	Establishment of working groups	40, 64, 142	VI, para.1.2 VIII, para.8 VIII, para.15	2, 3, 4, 5, 6		

The underlined documents are those considered in plenary.

GENERAL SUMMARY OF THE WORK OF THE SESSION

DATE AND PLACE OF THE SESSION

1. The second session of the Commission for Maritime Meteorology of the World Meteorological Organization took place at Hamburg, from 16 October to 1 November 1956, and was held at the Headquarters of the Deutsche Wetterdienst (Seewetteramt).

OPENING OF THE SESSION

2. The session was opened at 10 a.m. on 16 October, and the president of the commission, Mr. C.E.N. Frankcom, presided.

Ministerialdirektor, Mr. Schubert, who was representing the Bundesminister für Verkehr, welcomed the delegates and guests and pointed out that the maritime character of this session, which aspires to achieve practical results for the benefit of merchant shipping, helps in a particularly fruitful manner to establish better understanding and closer contact between nations. He mentioned the historic development of the World Meteorological Organization and the fact that the Commission for Maritime Meteorology had already held a session in Hamburg some 25 years ago. He closed his speech with his best wishes for the work of the session.

Mr. Bell, president of the Deutsche Wetterdienst, then spoke in welcome of the delegates and guests. He outlined the development of the German Weather Service especially with regard to maritime meteorology. He reminded delegates of the work of the Deutsche Seewarte, of which the Seewetteramt is the successor, and of the names of the great personalities in German meteorology. He then closed with his best wishes for a successful conference.

In his reply to the two speakers, the president of the CMM thanked both of them for their presence at the opening session. He spoke about the development and the importance of the seaport Hamburg. He suggested that Hamburg was thus a particularly suitable place to hold a conference on maritime meteorology. He outlined the tasks of the session and closed his speech with his thanks to the director of the Seewetteramt, Mr. Baumann, for the comfort and convenience the delegates found when arriving.

Goodwill messages for the success of the conference were received from the German Foreign Minister, Mr. von Brentano, and from the Secretary-General of the World Meteorological Organization.

REPRESENTATION AT THE SESSION

3. Sixty-two delegates, observers and advisers participated at the session. For details see page 1.

The Secretary-General of WMO was represented by Mr. K. Langlo, Mr.

M.A. Alaka and, for part of the session, by Mr. R.L. Munteanu.

GENERAL ORGANIZATION OF THE SESSION

4. The commission held 8 plenary meetings.

The local secretariat was provided by the Deutsche Seewetterdienst (Seewetteramt), and the arrangements which were made were very satisfactory and efficient. The accommodation provided for the session was admirable. All documents were produced speedily and, although simultaneous interpretation was unobtainable, the business of the plenaries and committees proceeded very smoothly. The plenary conference room was spacious and excellent accommodation was provided for the president, the chairmen of committees and the WMO Secretariat. In addition, a very comfortable lounge was provided for the convenience of delegates at which refreshments were readily available all day. (This proved to be a great asset.)

The main work of the conference was divided among the three following committees :

Committee "R", under the chairmanship of Mr. van Duijnen Montijn (Netherlands), dealt with all questions relating to the Technical Regulations, administration, operational questions concerning voluntary observing ships and items of a similar nature.

Committee "T", under the chairmanship of Mr. McDonald (USA), dealt with all the more technical items on the agenda, e.g., observational procedure, marine instruments and proposals concerning codes.

Both the above committees also dealt with specific aspects of maritime climatology.

Committee "I", under the chairmanship of Mr. Thomsen (Denmark), dealt with all questions concerning sea ice.

The various items on the agenda, aside from those relating to ice, were initially divided between Committees "R" and "T" on a provisional basis; later a certain amount of readjustment was made after consultation with the Co-ordination Committee. The two committees established smaller sub-committees as and when necessary.

Committees "R" and "T" were unlimited in membership, and all delegates were free to take part in the discussions as they thought fit. Items scheduled for discussion in these two committees were posted in advance in order to enable one-member delegations to choose the committee in which they wished to participate during any given day.

Committee "I" was restricted to ice experts.

The above arrangement which was somewhat similar to that adopted at the first session of the commission proved to be highly satisfactory. Mr. Langlo and Mr. Alaka acted as secretaries to the Committees "R" and "T" respectively and, in consultation with the chairmen, prepared all draft reports. They did

a very efficient job.

The working languages were English and French; 142 documents were considered during the conference.

In addition to the main work dealing with the items on the agenda, the following lectures were given during the course of the conference :

(a) A series of lectures on the subject of "Meteorology as applied to the navigation of ships" consisting of :

An introduction to the problem by Mr. Frankcom

Some aspects of meteorological navigation by Mr. Rodewald

Weather routing of ships by Mr. Schule and Mr. Lieurance.

(b) A lecture on "Special cloud observations" (illustrated by coloured slides) by Mr. Bergeron.

(c) A short lecture by Mr. Terada on some aspects of technical activities of a marine meteorological nature undertaken by the Japanese Meteorological Service.

Each lecture was followed by a short discussion. It is hoped that the WMO Secretariat will be able to publish the text of some of these lectures in mimeographed form at an early date for the benefit of all CMM members, in view of the wide interest in these important subjects. The time devoted to these lectures enabled the conference secretariat to "catch up" with the documentation.

A series of lectures was also given on meteorological factors affecting the fishing industry aboard the German fishery research vessel "Anton Dohrn" which also acts as a "forecasting ship" for the German fishing fleets. Members had an opportunity of inspecting this very well-equipped ship and seeing something of her meteorological and oceanographical equipment.

COMMENTS ON THE VARIOUS ITEMS OF THE AGENDA

Consideration of the report on credentials (Agenda item 1)

5. A list of the individuals present and the capacities in which they were attending the session was prepared by the representatives of the Secretariat on the basis of credentials received. This list was announced by the president and was unanimously accepted. Since no objections were raised by delegates to any name on the list, it was not found necessary to establish a Credentials Committee.

Consideration of the draft agenda and adoption of the agenda (Agenda item 2) (Doc. CMM-II/1 with 3 addenda)

6. The agenda was adopted without discussion.

Report by the president of the commission (Agenda item 3)

7. The president's report is contained in document CMM-II/63. This report outlined the work of the commission since the first session of the commission, and briefly explained the reasons for the inclusion of certain items on the agenda of the second session. The president stressed the importance of endeavouring to further improve the network of observations from the oceans, particularly for the IGY. During the discussion of the report, certain delegates drew attention to the omission of their ships from the current list of selected ships.

Appointment of committees for the session (Agenda item 4)

Nomination Committee

8. The following delegates were appointed :

G. Baumann (Federal Republic of Germany)
C.V. Bunnag (Thailand)
J.A. van Duijnen Montijn (Netherlands)
W.F. McDonald (USA)
A. Nyberg (Sweden), chairman
J. Blanc de Portugal (Portugal, Portuguese East Africa and Portuguese West Africa).

Drafting Committee

9. The following delegates were appointed :

E. Bruzon (France)
K.P. Ryshkow (USSR)
A.E. Sik (USA).

The above delegates were assisted by Mr. Alaka (WMO Secretariat).

Working Committees

10. See paragraph 4 above.

Co-ordination Committee

11. This committee was composed of the president and the vice-president of the commission, the three chairmen of the working committees and the representatives of the Secretariat, Mr. Langlo and Mr. Alaka (WMO).

Reports by the chairmen of the working groups established by the first session of the commission (Agenda item 5)

12. The following four working groups had been established at the first session of the commission to deal with the general work of the commission between sessions :

Working Group "A" (organization of synoptic observations over the oceans)

The first chairman of this working group, Mr. Hennessey (since deceased), was succeeded by Mr. Hay who later resigned from the commission and was in turn succeeded by Mr. H.C. Shellard (UK).

Working Group "B" (methods of observations at sea)

Chairman : Mr. K.T. McLeod (Canada).

Working Group "C" (applied meteorology - with particular reference to the carriage of cargo at sea)

Chairman : Mr. F.W. McDonald (USA).

Working Group "D" (problems involving international accord in maritime climatology)

Chairman : Mr. J.W. Termijtelen (Netherlands).

A fifth working group had been established subsequent to the third session of the Executive Committee in order to reconsider the international ice nomenclature which had been submitted by the first session of the commission.
Chairman : Mr. Thomsen (Denmark).

The chairman of each of these working groups presented his report. With the exception of the International Ice Nomenclature, none of the items dealt with by these working groups had been finalized despite the fact that Working Groups "A", "B", "C" and "D" had met at Hamburg during the two days immediately preceding the opening of the conference (an arrangement which proved to be very helpful for their work). These preliminary activities of the working groups very much facilitated the work of the second session of the commission.

The reports of the chairmen of these working groups were referred to the relevant working committees for action.

The following is a summary of the proceedings of the conference showing how each specific agenda item was dealt with.

Report by the chairman of the Working Group "A" - Organization of synoptic observations over the oceans (Agenda item 5.1)

The descriptive terms for wave heights (Agenda item 5.1.1)

13. This item arose from a request by the president of the Commission for Synoptic Meteorology that the Commission for Maritime Meteorology should reconsider during its second session the descriptive terms for wave heights with a view to improving the correspondence between these terms and the relevant wave heights, on the one hand, and between the English and the equivalent metric units, on the other hand. Recommendation 10 was adopted with this end in view.

Definition of the term "storm warning" (Agenda item 5.1.2)

14. This matter was studied by CMM Working Group "A" prior to the second

session. It arose because of a certain confusion connected with the many uses of the word storm. There was considerable debate on this subject because of its complicated nature and of the difficulty of finding a solution which would satisfy a majority of those concerned. Finally, it was recommended that paragraphs 10.2.2, 10.2.2.1 (b) and 10.2.2.1 (h) of the WMO Technical Regulations (Meteorological Service for Shipping) should be amended as indicated in the annex to recommendation 30. Recommendation 2 (adopted, after debate, by a majority vote of 13 against 2) deals with another aspect of the question and recommends a change in certain descriptive terms of the Beaufort scale.

International award (plaque) for selected ships (Agenda item 5.1.3)

15. This item is related to recommendation 15 (CMM-I), which had suggested the possibility of selected ships flying an international pennant, and which had been referred back to CMM for further study. At the present session, the possibility of issuing an international "plaque" by the WMO to those selected ships which had done particularly good meteorological work was considered but was judged to be impracticable. It was thought that such awards should preferably be made on the national level (recommendation 20 refers).

Code for reporting sea ice by aircraft (Agenda item 5.1.4)

16. A code for this purpose had been studied by CMM Working Group "A" and had been referred to the president of the Commission for Aeronautical Meteorology. Its provisional adoption for international use was recommended by recommendation 6 (CAeM-I) and is still under consideration by the Commission for Synoptic Meteorology. The Commission for Maritime Meteorology considered that this code needed to be amended since its terminology is at variance with the Abridged International Ice Nomenclature now adopted by WMO. The matter was entrusted to a working group charged with designing a new set of international ice codes (see item 5.1.7 and resolution 6). The new codes are in the process of completion and will be referred to the President of WMO for urgent action in view of the approaching IGY during which the use of the new codes is envisaged.

International exchange of blank weather maps for use by selected ships (Agenda item 5.1.5)

17. This item concerns a proposal that an economical method should be evolved for providing blank weather maps (of all ocean areas) on an international basis to enable simple synoptic maps to be prepared aboard voluntary observing ships (recommendation 21 deals with the subject).

Proposals re amendments to the sea ice groups of code forms FM 21.A, 22.A and 23.A as a result of the New International Ice Nomenclature (Agenda item 5.1.6)

18. This item merely involved a factual amendment to certain specifications, but the commission took the opportunity of making a further minor amendment to one specification (recommendation 11 refers).

Examination of international ice codes as shown in IMO publication No. 9, fascicule I, section I-C-1 and recommendation regarding ice observations in coded form from ships (Agenda item 5.1.7)

19. This item was introduced because the existing "international ice codes" are obsolete and there is a need for a new code for making ice reports both from ships and shore. The relevant committee considered this question in detail and recommendation 12 gives their conclusions. Details of a new code were practically completed at the session, but have been referred, as a matter of urgency, to a working group for finalizing in time for use during IGY (see also item 5.1.4).

Revision of the text of WMO publication No. 8.TP.3, chapter 10, paragraph 10.9, (Ice) (Agenda item 5.1.8)

20. It was agreed that action on this should be deferred until a new set of ice codes has been adopted for reports from ships, shore and aircraft.

Report by the chairman of the Working Group "B" - Methods of observations at sea (Agenda item 5.2)

Measurement of sea surface water temperature (Agenda item 5.2.1)

21. This question was included in the agenda as a result of recommendation 18 (CIMO-I), and because it is a problem concerning which an exchange of views is always fruitful. Recommendation 4 deals with the subject. Document CMM-II/35 which gives some useful background to the subject is reproduced as annex 1 to this report.

Measurement of rainfall at sea (Agenda item 5.2.2)

22. Resolution 10 (CMM-I) had instructed a working group to study this general problem. A letter from the Secretary of the eighth Pacific Science Congress (Manila, November 1953) received by the Secretary-General of WMO confirmed the importance of making precipitation observations at sea. The CMM working group worked in collaboration with a permanent working group established by CIMO to study this general question. The session took note of the fact that the measurement of precipitation at sea is difficult and that no entirely satisfactory solution to the problem has yet been found. It therefore decided (resolution 2) that the matter should again be referred to a working group for further study (see also recommendation 6).

Definition of "gust" (Agenda item 5.2.3)

23. This question had been referred to a CMM working group by the president of CMM as a result of recommendation 25 (CIMO-I), and the resulting recommendation of the working group on the subject from the maritime view point had been referred to the president of CIMO for action. The eighth session of the Executive Committee had also considered the question in the light of a report prepared by the president of CAeM in consultation with the presidents of CAe, CBP, CIMO and CSM, and decided to leave further action to the Secretary-

General. The latter decided to adopt provisionally the definitions proposed by the president of CAeM. The commission agreed that these definitions are acceptable to CMM but that the matter should be kept under review with regard to the maritime aspects. This task was allocated to a CMM working group (see resolution 2).

Reporting visibility (Agenda item 5.2.4)

24. This item refers to the alternative methods of reporting "visibility index" or "minimum visibility", which had been discussed in correspondence between the presidents of CAeM and CMM and the relevant CMM working group (vide recommendation 26 (CAeM/MET 4)). The commission considered this question and adopted recommendation 5. It was agreed that this was a very complex problem which should be studied further; it was accordingly referred to a CMM working group (see resolution 2).

Revision of wind speed equivalents of the Beaufort scale (Agenda item 5.2.5)

25. This question had been given preliminary study by the relevant CMM working group as a result of proposals made by Japan and the United Kingdom, and subsequently, as a result of a lengthy paper submitted by the Netherlands.* After lengthy discussion by the relevant committee, recommendation 1 was adopted by a majority vote of 13 votes, against 3, with 11 abstentions.

Under this agenda item, as a result of a request by FAO recommendation 3 which refers to multi-lingual descriptive terms of the Beaufort scale, was adopted.

Possibility of applying "atmospherics" techniques aboard ships (Agenda item 5.2.6)

26. This item arose as a result of recommendation 29 (CAe-I) and it had been given preliminary study by the relevant CMM working group. The relevant committee recommended that this subject needed further study by a new CMM working group (see resolution 2).

Report by the chairman of the Working Group "C" - Applied meteorology (Agenda item 5.3)

The application of meteorology to the carriage of goods at sea (Agenda item 5.3.1)

27. This question had been referred to a working group by the first session of the commission. As a result, a comprehensive booklet on the subject has been prepared. The commission recommended certain amendments and the addition of another annex. It decided that the amended version should be approved by the president of CMM and then submitted to the Secretary-General for publication as a "Technical Note". This is a good example of the application of meteorology to economic needs, and the representative of the British Chamber

* "The equivalent velocities for the Beaufort estimates of the wind force at sea" by G. Verploegh.

of Shipping who attended the session confirmed the impression that such a booklet will be welcomed by the shipping industry.

Report by the chairman of the Working Group "D" - Problems involving international accord in maritime climatology (Agenda item 5.4)

28. This item embraces the whole subject of marine climatic atlases and includes :

(a) consideration of the most practicable and economical method of preparing these atlases and of ensuring that the data from which they are compiled are as accurate and comprehensive as possible;

(b) international agreement as to a minimum number of elements which should be included in any future marine climatic atlases. It is an item which is also related to the project of a World Climatic Atlas.

Working Group "D" had given the question considerable study, but the commission decided that it was a complex question which needed further study by a working group (see resolution 4), recommendation 26 also refers.

The models for climatological summaries referred to in resolution 3 (CAeM-I) were also discussed under this general item (item 5.4.5); it was decided that for maritime purposes atlases were preferable to tables or summaries portraying climatological information.

Report by the chairman of the Working Group on sea ice (Agenda item 5.5)

Code for the reporting of ice from land stations (Agenda item 5.5.1)

29. This item had been referred to a CMM working group at the request of the president of the Commission for Synoptic Meteorology, bearing in mind that the existing "Ice codes" are out of date. The commission decided that there was a need for such a code, particularly in view of the activities in the Antarctic during the IGY. The relevant committee has recommended that the existing ice codes be cancelled (recommendation 12); a proposed new code based upon that which has been recommended for use by aircraft (see item 5.1.4) is under urgent consideration by a small working group (resolution 6) and will be referred to the President of WMO for urgent action (see also item 5.1.7).

International Ice Nomenclature (Agenda item 5.5.2)

30. As this nomenclature has only recently been adopted for international use, no specific action was needed at the present session, but certain recommendations for amendment have been received, and these have been referred to a new working group for consideration prior to the third session of the commission (resolution 6). The commission agreed that for IGY purposes "Extent of ice" would be reported in tenths, in plain language as well as in coded reports.

Photographic illustrations of the Ice Nomenclature (Agenda item 5.5.3)

31. Prior to the second session it had been agreed by the relevant working

group that illustrations were necessary for this nomenclature. It was therefore arranged that CMM members should bring ice photos to the session. From these, a total of seventy-six photos were selected by the relevant committee. The commission decided that the following steps should be taken with regard to this item :

(a) To ensure availability to IGY participants, a preliminary limited edition of the illustrated nomenclature should be published immediately by the most direct and economical means. A possible format for such an edition is given in document CMM-II/143.

(b) The president of CMM should request the Secretary-General of WMO to investigate the possibility of WMO bearing the cost of the negatives for the preliminary edition, with the understanding that each Member interested should bear the cost of such sets of prints as they may require.

(c) The preliminary edition should urge all users to submit additional photos for the final publication.

(d) That Mr. F. Nusser (Germany) should be charged with the preparation of the preliminary edition.

A Working Group on sea ice (see resolution 6) has been allocated the task of preparing the final publication of the Illustrated Nomenclature, after comments on the preliminary edition are available.

Other technical matters (Agenda item 6)

International Geophysical Year (Agenda item 6.1)

32. Under this general item, the commission studied the whole programme of IGY from the maritime viewpoint taking into consideration Mr. Van Mieghem's comments.

The comments of the session on certain maritime aspects of the meteorological programme of IGY recommended by CSAGI are given in annex 2 to this report.

A circular letter to the directors of meteorological services concerned is being sent by the Secretary-General, giving advice about the scope of meteorological work to be carried out aboard voluntary observing ships during the IGY.

Upper air observations aboard whaling ships during IGY (Agenda item 6.1.1)

33. This item concerns a proposal which was made by the Special Committee on the International Geophysical Year (CSAGI), and which had been referred to all CMM members by the president by correspondence. No country other than Japan was able to implement the proposal.

The Japanese delegate indicated the willingness of his country to make regular aerological observations aboard its whaling ships provided that it received some financial help which would assist in defraying part of the expenses involved. The commission considering that the realization of the Japanese scheme would be a valuable contribution to the IGY decided to request the President of WMO, as a matter of urgency, to authorize the Secretary-General

to investigate without delay ways and means whereby funds could be found to implement the Japanese project. It was suggested that it may be profitable to contact CSAGI, requesting it to bring the problem to the attention of the national IGY committees. The results of these investigations should be brought to the notice of Japan as soon as possible.

The possibility of improving the network of observations from merchant ships between 35°S and 55°S and in relatively sparse oceanic areas during IGY (Agenda item 6.1.2)

34. This item is included in view of the obvious necessity of doing everything possible to provide an adequate network. The relevant committee considered this question in detail, and recommendation 14 outlines a scheme upon which urgent action is needed. Amplification of this scheme is outlined in annex 3 to this report.

The commission recommended that the following statement be included in the minutes and in the abridged final report of the session :

> "The CMM requests the Secretary-General of WMO to forward the following comment to CSAGI : The World Meteorological Organization will take any steps possible to ensure that the "mother stations" and the "Antarctic Weather Central" receive the necessary cypher to enable them to decode the re-broadcasted collectives of reports received from whaling ships. With reference to the WMO scheme for these weather messages (Res. 24 (EC-III)), it is, however, not possible to provide individual cyphers to enable them to identify the names of the ships which according to agreement have to be kept secret."

Consideration of the best method of preparing and making available maritime data in the form approved for use during IGY (Agenda item 6.1.3)

35. In view of the number of countries which use punch-cards for climatological purposes (based upon the international maritime punch-card), and the fact that the "Form 2" prepared by the Secretariat could not be used for machine tabulation purposes, the commission has recommended an alternative form for use with punch-card procedure. Detailed proposals are contained in annex 4.

Consideration of the president's report on the scheme for reports from whaling ships (Agenda item 6.2)

36. An analysis of the manner in which the scheme has operated since it was instituted in 1952 (recommendation 14 (CMM-I)), left no doubt that it has been very successful. The commission instructed the president to include the following in the final report of the session :

> "Considering the competitive nature of the whaling industry and the arduous conditions under which the ships work, the CMM decides to request the Secretary-General of WMO to express on behalf of the Organization its appreciation to the masters, officers and owners of the whaling ships for their ready co-operation in the scheme for reports from whaling ships.
>
> "When sending this letter, the Secretary-General is requested to add

as an appendix a list of those whaling ships which have participated in the scheme in the period between the first and second sessions of CMM.

Copies of the letter should be sent to the International Whaling Commission."

One of the chief factors in the successful operation of the scheme is good telecommunications. In this connexion, the commission has requested the Secretary-General to draw the attention of the director of the Australian meteorological service to the difficulties experienced by Japanese whalers in contacting station VIS (Sidney) (vide document CMM-II/126).

Selected, supplementary and auxiliary ships (Agenda item 6.3)

37. In an effort to increase the number of voluntary observing ships, the president had suggested the possibility of each maritime country recruiting at least a certain percentage of their tonnage. Having considered statements by various members about the number of their recruited ships, the session decided that for various reasons they could not recommend such a proposal. A summary of the relevant committee's comments and the statements of individual members are included in annex 5. The comments of the committee were approved by the commission.

The commission also passed two recommendations on this general question : recommendation 8 refers to the need for all merchant ships to have reliable instruments aboard and recommendation 16 refers to the general requirement for more selected ships especially those plying in waters where observations are sparse.

Improvement of the network of observations from ships in areas where merchant shipping is normally relatively sparse (Agenda item 6.4)

38. In contrast with item 6.1.2, this item refers to the permanent network of observations from oceans and not only to that during the IGY. The commission considered various recommendations and comments which had been received from certain regional associations and from other international bodies. It "noted with satisfaction resolution 10 (I-RA I) and decided to request the Secretary-General to invite the attention of the other regional associations to this resolution in order that these associations might consider taking similar steps".

In view of the importance of improving the network of marine observations, the commission has recommended a continuation, after the IGY, of the scheme outlined in recommendation 14. The commission also agreed in principle to the plan for obtaining additional weather information from shipping in certain specified areas proposed by the Union of South Africa in document CMM-II/42 (see annex 6) and drew up certain principles for the guidance of meteorological services concerned. These principles are given in annex 7.

The following recommendations were also passed under this item :

- Recommendation 17 suggests a method whereby ships flying the "Flags of convenience of Panama, Honduras, Liberia and Costa Rica" might be recruited as voluntary ships.

- Recommendation 18 refers specifically to the desirability of ships making observations in fine weather as well as in bad weather when in tropical waters.

- Recommendation 19 refers to the provision of messages from voluntary observing ships in coastal waters where there is frequently a considerable scarcity of such observations.

- Recommendation 23 provides for a simplified uniform address for ships' radio weather messages addressed to the shore, the object being to economize and to simplify the voluntary observers' work.

Finally, the commission decided that the Secretary-General be requested to study the problem arising from the fact that certain coastal radio stations do not maintain a 24-hour radio watch (vide document CMM-II/97) and to confer about this question with the presidents of regional associations.

Reporting of precipitation group 7RRjj by ships (Agenda item 6.5)

39. This item arose as a consequence of increasing interest and experimentation in obtaining measurements of precipitation from oceans. At present provision is made for reporting precipitation from stationary ships in accordance with regional instructions, but no provision has yet been made for reporting precipitation aboard mobile ship stations. In view of the experiments on precipitation measurements aboard mobile weather stations being carried out by Members, it was not considered premature to provide for a uniform international procedure for reporting precipitation against the time when a satisfactory raingauge will be developed for use on mobile voluntary observing ships. Recommendation 7 (and annex) refers to this subject and makes a suggestion about code specifications.

Problems arising from the cancellation of IMO resolutions by the eighth session of the Executive Committee (Agenda item 6.6)

Reconsideration of certain IMO resolutions relating to maritime meteorology (Agenda item 6.6.1)

40. Resolution 26 (EC-VIII) cancelled, with effect from 1 July 1956, all IMO resolutions taken over by IMO. However, recognizing that certain of these resolutions may not have outlived their usefulness, the Executive Committee decided to refer these particular resolutions to the appropriate body for reconsideration. The commission considered the relevant resolutions and instructed the president to include the following statements in the abridged final report of the session :

"Automatic weather stations (resolution 40 (CD Washington, 1947)) - Considering the lack of information on automatic weather stations at sea, and the importance of such stations as a means of extending the meteorological networks into ocean areas where reports are sparse, the CMM requests the CIMO to study :

(a) The potentialities of such a station;

(b) Means of promoting further development of automatic weather stations."

Aerological observations from merchant ships (resolution 41 (CD Washington, 1947))- "Noting that no information on the technique of making upper air observations from merchant ships is at present included in WMO publication No. 8, the CMM requests the Secretary-General, in consultation with the presidents of CIMO and CMM, to include a brief note on the technique of such observations based upon a draft to be prepared by the US Weather Bureau."

The question of "Measurement of true wind at sea" (resolution 54 (CD Washington, 1947)) was referred to a new CMM working group for continued study (see resolution 2 (CMM-II)).

Various IMO resolutions relating to marine climatology were also referred to the new relevant CMM working group concerned for study, with a view to their inclusion in the marine section of the Climatological Guide.

Recommendations 15, 28 and 29 (CMM-II) refer to resolutions 36 (CD Washington, 1947), 3 (IMC Salzburg, 1937) and 1 (IMC De Bilt, 1933) respectively.

Consideration of status and contents of WMO publication No. 9.TP.4, volume D (Agenda item 6.6.2)

41. It was arranged, after consultation with the Secretary-General, that the commission would advise about the contents of WMO publication No. 9.TP.4, volume D (Information for shipping). The Secretariat prepared a very helpful working paper. The proposals of the commission on this item are contained in recommendation 31 and in annex 8 to this report. See also statement under item 6.7 concerning the insertion of the substance of some of the resolutions and recommendations of the first session of CMM in volume D.

A review of resolutions and recommendations adopted by the first session of CMM (Agenda item 6.7)

42. Resolution 7 (CMM-I) had referred to the desirability of issuing the Abridged Cloud Atlas in a brief and simple form suitable for distribution to all ships. Having studied a copy of the recently published Abridged Cloud Atlas, 1956, the commission passed recommendation 25 proposing that an abbreviated edition of the Abridged Atlas (Marine Cloud Album) should be prepared to meet the specific needs of voluntary observers at sea. Resolution 5 entrusts the task of preparing the text and selecting the photographs of the proposed Marine Cloud Album to a working group.

Recommendation 2 (CMM-I) was reconsidered and the following improvements in the presentation of the international list of selected and supplementary ships, WMO publication No. 47.TP.18, 1956 edition, were recommended :

(a) Column 12 should be simplified as follows :
- Ships equipped with radio telephone should be noted "T".
- Ships equipped with medium-wave radio equipment should be noted "M".
- Ships equipped with short-wave radio equipment should be noted "S".

(b) The expression "open scale" in the description of barographs is not generally understood, and should therefore be dropped. No distinction between types of barographs should be made.

(c) Abbreviations should be used in column 3.

(d) Information on auxiliary ships should not be included in the publication.

Recommendation 4 (CMM-I) forms the subject of recommendation 24 (CMM-II) which refers to WMO representation at a future ITU conference to deal with maritime communications problems.

The following statement was approved for insertion in the abridged final report in connexion with recommendation 5 (CMM-I) :

"The Commission for Maritime Meteorology requests the Secretary-General to invite the attention of Members to resolution 22 (EC-III), in due time before the next Ordinary Administrative Radio Conference of the International Telecommunication Union."

The following statement concerning the insertion of the substance of some of the resolutions and recommendations of the first session of CMM into the text of volume D was approved for inclusion in the abridged final report of the session :

"The Secretary-General is requested to insert the substance of resolutions 3, 4, 5, 6, 9, 12 (CMM-I); and recommendations 3, 6, 9, 12, 13, 14, 25, 27, 29, 31 (CMM-I), into the text of volume D of WMO publication No. 9."

A summary of the decisions of the commission on the resolutions and recommendations of the first session of CMM is contained in resolution 1 (CMM-II).

The possibility of using a short forecast code as an alternative to the present system of issuing weather bulletins for shipping in English, as well as in the language of the issuing country (Agenda item 6.8)

43. This item was included because it is clear from WMO publication No. 9. TP.4, volume D, that certain countries find themselves unable, for various reasons, to issue forecasts and bulletins in English as well as in their own language. Recommendation 22 suggests a code which might be used on occasions when it is not possible to use English.

Consideration of the maritime portion of the WMO Technical Regulations adopted by the Second Congress (Agenda item 6.9)

44. Resolution 19 (Cg-II) directed the Executive Committee to review the Technical Regulations during the second financial period. The president of CMM considered that the session should propose to the Executive Committee any desirable amendments or improvements. Recommendation 30 (with annex) deals with this question and makes detailed proposals.

Liaison with other international bodies, e.g., International Fishing Commissions (Agenda item 6.10)

45. This item was included at the suggestion of the Secretary-General in view of the advice that the Secretariat had been able to provide two international fishing commissions after consultation with the president of CMM. The FAO representative at the session warmly welcomed a proposal for closer co-operation with the various bodies concerned. Recommendation 32 refers.

A general consideration of the code forms (FM 21.A, 22.A and 23.A) at present in use for the transmission of radio weather messages from ships (Agenda item 6.11)

46. As the original code forms which had been introduced by IMO resolution 161 (CD Washington, 1947) were slightly modified by the first session of CSM, it seemed appropriate that these should be given some consideration by the second session of CMM, bearing in mind the obvious objections to frequent changes in codes.

The commission, at the request of Australia and Netherlands, considered the desirability of recommending some amendments to the wave group ($1d_Wd_WP_WH_W$) with the object of ensuring that both sea and swell waves would be invariably reported. The session decided against any amendment, but recommendation 9 (and annex) suggests a clarification of the observing and reporting procedure.

A proposal from El Salvador that the commission should recommend a change in the ww code to cover specific maritime aspects in the tropics was rejected by the commission, as was a proposal from Japan that ships should report sea temperature in their radio weather messages instead of temperature difference between air and sea.

On the suggestion of Mr. Bergeron (Sweden) the commission has recommended that the code group ICHdf (vide recommendation 54 (CSM-I)) might usefully be tried out aboard ships during the IGY, and a suggestion was made that it might perhaps at a later stage replace the present 8-group.

Investigation of thunderstorm frequency at sea (Agenda item 6.12)

47. As a result of consultation between the Secretary-General and the president of CMM certain maritime countries provided maritime data for inclusion

in the WMO publication "World Distribution of Thunderstorm Days". The commission took the opportunity of considering the oceanic portion of this book and adopted recommendation 27.

Adjustments of the oceanic areas allocated to certain countries for the reception of reports from ships and for the issue of weather bulletins to ships (Agenda item 6.13)

48. A committee considered this question and amended maps "A" and "B" of resolution 37 (CD Washington, 1947) to incorporate changes resulting from decisions made since the Conference of Directors (Washington, 1947) and at the second session of CMM. The corrected maps "A" and "B" will be reproduced in volume D of publication No. 9 (document CMM-II/136 refers).

WMO Guide to International Meteorological Instrument and Observing Practice (WMO publication No. 8, 1954, chapter 10) (Agenda item 6.14)

49. The session provided a useful opportunity for members to discuss this chapter which deals with marine observations.

The relevant committee made certain proposals for amendment. The Commission considered that any amendments should be made only after thorough study and referred the matter to a working group (see resolution 2).

Aerological observations from merchant ships (vide recommendation 22 (CMM-I)) (Agenda item 6.15)

50. Recommendation 2 (I-RA II) recommended that aerological observations be made aboard certain merchant ships especially during IGY. The relevant committee, appreciating the importance of these observations and noting the plans for extending experimental observations being made aboard US ships, adopted recommendation 13, which is designed to encourage such experiments. The question was also assigned to a CMM working group for continued study (see resolution 2).

Inspection of instruments by meteorological liaison officers (Agenda item 6.16)

51. This item was included in the agenda as a result of recommendation 3 (I-RA II).

The session agreed that the following statement should be inserted in WMO publication No. 9, volume D, part D, chapter II :

> "When enlisting new ships, other than selected and supplementary ships for weather reporting, port meteorological liaison officers should in all cases check the reliability of ships' meteorological instruments. They should not institute such reporting service from ships unless the barometers and thermometers reach an acceptable standard of reliability."

Proposed modification to the code for reporting state of the sea surface (Agenda item 6.17)

52. This item arose from a United Kingdom proposal that code 30 be related to code 75 in order to facilitate "State of the sea" observations aboard an aircraft. The commission decided that the problem was a national one and that it would be premature to change codes until further studies have been made by the different countries concerned.

The rôle of CMM in any future structure of WMO technical commissions (Agenda item 6.18)

53. This item was included in the agenda by the president of CMM as a result of the various proposals which were made at the Second Congress, concerning the future structure of the technical commissions and of the fact that resolution 15 (Cg-II) had been referred to the Executive Committee for action (Doc. EC-VIII/5, president CMM comments in Doc. Cg-II/72 and Doc. CMM-II/73 refer). This question was considered at the session in committee and plenary, and recommendation 33 is submitted.

Election of the president and officers (Agenda item 7)

54. Mr. H. Thomsen (Denmark) was elected president and Mr. K.T. McLeod (Canada) vice-president in succession to Mr. C.E.N. Frankcom and Mr. J.W. Termijtelen respectively.

Establishment of working groups (Agenda item 8)

55. In order to carry out the essential work of the commission between the second and third sessions of CMM, the following working groups were established :

Working Group I - Marine climatology (see resolution 4)

Working Group II - Sea ice (see resolution 6)

Working Group III - Organizational and operational matters (see resolution 3)

Working Group IV - Technical problems (see resolution 2)

Working Group V - Preparation of the Marine Cloud Album for use by observers at sea (see resolution 5).

CLOSURE OF THE SESSION

56. The retiring president, on behalf of the commission, thanked Mr. Baumann and his staff for the admirable arrangements which had been made for the efficient working of the session and for the convenience and comfort of the delegates. He expressed appreciation for the hard work which had been done by all the local secretariat staff, by the interpreters and by the delegates themselves and particularly the chairmen of committees. He also thanked all

those who had been so kind and hospitable to the members of the commission and had thus not only helped the work of the conference but had made the stay of the delegates in Hamburg so pleasant.

Mr. Thomsen, the president elect, paid tribute to the work of the retiring president during his term of office.

CONCLUSIONS

57. There was an exceptionally cordial atmosphere throughout the conference and everybody worked very hard.

Thanks to the efficiency of chairmen of committees, evening sessions were a rarity. The length of time allocated for the conference proved to be almost exactly adequate but delegates had only one Saturday afternoon and one Sunday for relaxation. No less than 18 of those present during the conference had had considerable marine experience either as professional seamen, as meteorologists or as oceanographers. There is no doubt that this was an asset for the work of the conference. The presence of two port meteorological officers (Messrs. Crawford and Goodfellow) was particularly helpful.

Recommendations and resolutions were adopted by the plenary meetings in draft form and apart from matters of substance were entrusted to the drafting committee in consultation with the president and the representatives of the WMO Secretariat.

RESOLUTIONS ADOPTED AT THE SESSION

Res. 1 (CMM-II) - DISPOSAL OF RESOLUTIONS AND RECOMMENDATIONS OF THE FIRST SESSION OF THE COMMISSION FOR MARITIME METEOROLOGY

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING all resolutions and recommendations of the first session of the Commission for Maritime Meteorology; and

CONSIDERING,

(1) That it is undesirable to continue in effect a number of these decisions because their temporary nature has made them obsolete;

(2) That these decisions become redundant as soon as they are incorporated in resolutions of the Executive Committee, the Technical Regulations or in other WMO publications;

(3) That decisions which have not been incorporated in relevant WMO publications should be assembled and published as an annex to the abridged final report of the second session of the Commission for Maritime Meteorology;

(4) That a number of decisions will become redundant as soon as the substance thereof has been incorporated in WMO publication No. 9. TP.4, volume D;

DECIDES,

(1) To continue in effect and reproduce as an annex to the abridged final report of the second session of the Commission for Maritime Meteorology the full text of recommendations 6, 10, 25 and 27 (CMM-I);*

(2) To cancel resolutions 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12 (CMM-I);

(3) That the following recommendations have become redundant : 1, 2, 3, 4, 5, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 26, 28, 29, 30 and 31 (CMM-I), and recommendation 32 (56-CMM).

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* See annex 12.

Res. 2 (CMM-II) - WORKING GROUP ON TECHNICAL PROBLEMS

The COMMISSION FOR MARITIME METEOROLOGY,

CONSIDERING that a number of technical problems will need to be kept under constant review between sessions of the commission;

DECIDES,

(1) To establish a Working Group on technical problems with terms of reference as follows :

Promotion of research in maritime meteorology, investigation of improved methods of observation, co-ordination of results and circulation of reports with particular reference to the following :

(a) Precipitation measurement at sea

(b) Sea water temperature

(c) Revision of WMO publication No. 8, chapter 10

(d) Observations and reporting of waves

(e) Visibility

(f) Gust (application of definitions)

(g) Atmospherics

(h) Measurement of true wind at sea;

(2) To invite the following experts to serve on the working group :

(a) H.U. Roll (Federal Republic of Germany), chairman
A. Arrieu (France)
H.C. Shellard (United Kingdom)
F. Spinnangr (Norway)
G. Verploegh (Netherlands)
L.A. Zakharov (USSR);

(b) A representative from each of the following countries :
Poland
Portugal
Portuguese West Africa
United States of America.

Res. 3 (CMM-II) - WORKING GROUP ON ORGANIZATIONAL AND OPERATIONAL MATTERS

The COMMISSION FOR MARITIME METEOROLOGY,

CONSIDERING that a number of organizational and operational

matters will need to be kept under constant review between sessions of the commission;

DECIDES,

(1) To establish a Working Group on organizational and operational matters with the following terms of reference :

(a) Continuing review of the voluntary observing ships scheme;

(b) Consider requests for changes in forecasting areas and reporting areas;

(c) Study the possibilities and follow the developments with regard to establishing aerological observations from merchant ships;

(2) To invite the following experts to serve on the working group :

(a) C.E.N. Frankcom (United Kingdom), chairman
G. Baumann (Federal Republic of Germany)
A.B. Crawford (Union of South Africa)
W.P. Goodfellow (Hong Kong)
J.A. van Duijnen-Montijn (Netherlands)
K. Terada (Japan);

(b) A representative from each of the following countries :
France
Poland
Portugal
Portuguese East Africa
Portuguese West Africa
United States of America
Union of Soviet Socialist Republics.

Res. 4 (CMM-II) - WORKING GROUP ON MARINE CLIMATOLOGY

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING resolution 25 (EC-VIII); and

CONSIDERING,

(1) That the Executive Committee working group is not preparing specifications for marine climatic atlases;

(2) That there is a need for preparing new climatic charts for ocean areas;

(3) That such new charts will form an integral part of the envisaged World Climatic Atlas;

(4) That the Guide to climatological practice should contain a chapter on marine climatology;

DECIDES,

(1) To establish a Working Group on marine climatology with the following terms of reference :

(a) To prepare specifications of requirements to be met by marine climatic atlases;

(b) To prepare guidance material on meeting these requirements;

(c) To make recommendations as to the best procedure to follow in collecting marine and climatological data and in preparing new marine climatic atlases, which would constitute the marine section of the World Climatic Atlas;

(d) To work in close co-operation with the Executive Committee Working Group on climatic atlases and with the Secretariat of the Organization;

(e) To prepare, if possible before 1 December 1956, a first draft of a chapter on marine climatology to be included in the Guide to climatological practice now under preparation for submission to the second session of the Commission for climatology;

(2) To invite the following experts to serve on the working group :

J.A. van Duijnen Montijn (Netherlands), chairman
N. Lieurance (United States of America)
M. Rodewald (Federal Republic of Germany)
H.C. Shellard (United Kingdom).

Res. 5 (CMM-II) - WORKING GROUP ON THE MARINE CLOUD ALBUM FOR USE BY OBSERVERS AT SEA

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING recommendation 25 (CMM-II); and

CONSIDERING that a marine cloud album, i.e., an abbreviated form of the Abridged Cloud Atlas, for use by marine observers is required;

DECIDES,

(1) To establish a working group for the purpose of preparing the text and making the selection of photographs for the marine cloud album on the basis of the Abridged Cloud Atlas 1956;

(2) To invite the following experts to serve on the working

group :

T. Bergeron (Sweden), chairman
A.V. Popov (USSR)
C.E.N. Frankcom (United Kingdom).

Res. 6 (CMM-II) - WORKING GROUP ON SEA ICE

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING recommendation 12 (CMM-II); and

CONSIDERING,

(1) That a new set of ice codes should be made available as soon as possible for use in reporting ice by aircraft, ships and shore stations;

(2) That a further study of the Abridged International Ice Nomenclature is desirable;

(3) That the text of WMO publication No. 8.TP.3, chapter 10, paragraph 9 (Ice), needs to be brought up to date as soon as new ice codes have been designed and adopted;

DECIDES,

(1) To establish a Working Group on sea ice with the following terms of reference :

(a) Designing a set of codes for reporting sea ice by aircraft, ships and shore stations. This task should be regarded as urgent;

(b) Studying the Abridged International Ice Nomenclature for possible improvements;

(c) Revising the text of WMO publication No. 8.TP.3, chapter 10, paragraph 9;

(d) Preparing the Illustrated International Ice Nomenclature for final publication after comments on the preliminary edition are available (see item 5.5.3 of general summary of the session);

(e) Devising an international system of ice symbols for use in the preparation of ice charts;

(2) To invite the following experts to serve on this working group :

J.J. Schule (United States of America), chairman
Y.V. Istoshine (USSR)
F. Nusser (Federal Republic of Germany).

RECOMMENDATIONS ADOPTED BY THE SESSION

Rec. 1 (CMM-II) - EQUIVALENT SPEEDS FOR THE BEAUFORT NUMBERS

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING that the equivalent speeds for the Beaufort scale numbers which were provisionally adopted for international use in 1947 are not entirely satisfactory and in particular not representative for estimates of the wind force at sea;

CONSIDERING,

(1) That the adoption of a more suitable set of wind speed equivalents is of basic importance for wind observation at sea;

(2) That the table of speed equivalents in the annex to this recommendation provides a desirable solution for wind observation at sea; and

(3) That over land the situation with respect to wind observations may be somewhat different;

RECOMMENDS,

(1) That the table of wind speed equivalents given in the annex to this recommendation be adopted for international use at sea and that WMO code 30 be amended accordingly;

(2) That consideration be given to the application of the same wind speed equivalents over land.

A N N E X

Maritime conversion scale

Beaufort number	Metres / second		Nautical miles per hour	
	mean	limits	mean	limits
0	0	< 0.6	0	< 1
1	1.5	0.7 - 2.3	3	1 - 4
2	3.4	2.4 - 4.4	7	5 - 8
3	5.6	4.5 - 6.6	11	9 - 12
4	7.8	6.7 - 8.9	15	13 - 16

(Please turn over)

Beaufort number	Metres / second		Nautical miles per hour	
	mean	limits	mean	limits
5	10.2	9.0 - 11.3	19	17 - 21
6	12.6	11.4 - 13.8	24	22 - 26
7	15.1	13.9 - 16.4	29	27 - 31
8	17.7	16.5 - 19.0	34	32 - 36
9	20.4	19.1 - 21.8	39	37 - 42
10	23.3	21.9 - 24.8	45	43 - 48
11	26.5	24.9 - 28.2	52	49 - 55
12	-	> 28.2	-	> 55

Rec. 2 (CMM-II) - CHANGES IN THE DESCRIPTIVE TERMS OF THE BEAUFORT SCALE

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING,

(1) That according to the WMO Technical Regulations, paragraph 10.2.2.1, gale warnings are issued only for winds of not less than force 8 and storm warnings for winds of force 10;

(2) That in WMO code table 30 winds of force 7 and 10 are termed "moderate gale" and "whole gale" respectively, while a storm refers to a wind of force 11;

CONSIDERING that the lack of correspondence between the use of the words "gale" and "storm" in the Beaufort scale and for the purpose of warnings, may lead to some confusion;

RECOMMENDS that the descriptive terms for Beaufort numbers 7, 8, 10 and 11 be revised as follows :

Force	Descriptive term
7	Near gale
8	Gale
10	Storm
11	Violent storm

Rec. 3 (CMM-II) - MULTILINGUAL DESCRIPTIVE WIND TERMS

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING a proposal from the United Nations Food and Agriculture

Organization that multilingual descriptive terms of the Beaufort numbers should be made readily available to fishermen;

CONSIDERING that this request refers to an international code but that it would not be feasible to issue a single table containing these terms in the language of all the countries issuing weather bulletins;

RECOMMENDS that the Secretary-General be instructed to obtain from Members issuing weather bulletins for fishermen a list of descriptive terms of the Beaufort numbers in their national language, and to supply such lists on request to interested Members.

Rec. 4 (CMM-II) - MEASUREMENT OF SEA SURFACE TEMPERATURE

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING that significant differences in temperature exist between the sea surface and 3 to 5 metres below when mixing is slight and insolation considerable;

CONSIDERING the difficulties involved in measuring the true temperature of the sea surface under the operating conditions of merchant ships;

RECOMMENDS,

(a) That Members continue experimental work with a view to developing a method which will give representative measurements of the surface temperature under varying conditions of sea and insolation, which would be practical for use aboard merchant ships and which would minimize human errors; and

(b) That Members should exchange technical notes on the subject and make comparative studies using various methods.

Rec. 5 (CMM-II) - REPORTING VISIBILITY

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING,

(1) The revised text of WMO publication No. 8.TP.3, chapter 10, paragraph 10.5.2, which recommends the recording and reporting of least visibility to the exclusion of other methods;

(2) That some countries at present use other methods;

CONSIDERING,

(1) That the problem of reporting visibility is complex and no one solution has been found which would be satisfactory to all countries;

(2) That this problem is being assigned to a working group of the Commission for Maritime Meteorology;*

RECOMMENDS that the following note should be inserted at the end of paragraph 10.5.2 of the revised chapter 10 of WMO publication No. 8 :

"N o t e :
It is recognized that in addition to the above procedure other methods of recording and reporting visibility have been adopted by certain countries as a national practice (see WMO publication No. 9, volume B, part B-1 of chapter III)."

Rec. 6 (CMM-II) - MEASUREMENT OF PRECIPITATION AT SEA

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING,

(1) Resolution 2 (CMM-II);

(2) That no entirely satisfactory solution has been found to the problem of measuring precipitation at sea with the desired accuracy; and

(3) That studies are being made by several Members in search of a suitable solution;

RECOMMENDS,

(1) That Members pursuing studies of this problem should keep the Secretary-General informed of their programmes and the progress made; and

(2) That the Secretary-General should transmit the information to the presidents of the Commissions for Maritime Meteorology and for Instruments and Methods of Observation, and should make it generally available to Members.

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* See resolution 2 (CMM-II).

Rec. 7 (CMM-II) - CODE FOR REPORTING PRECIPITATION FROM MOBILE SHIP STATIONS

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING,

(1) That there is a great need for obtaining measurements of precipitation from oceanic areas;

(2) That such observations are already being made regularly on some fixed ship stations;

(3) That experiments are being carried out to introduce these observations on mobile ship stations;

CONSIDERING that there is a need for providing a uniform world-wide procedure for making and reporting precipitation observations especially from mobile ship stations;

RECOMMENDS,

(1) That the use of the code group 7RRjj be extended to include mobile ship stations reporting in code form FM 21.A;

(2) That the specifications for this group should be as given in the annex to this recommendation.

A N N E X

Suggested specifications for the code group 7RRjj

1. 7 Indicator figure
2. RR Amount of precipitation using WMO code 74
3. jj Duration of precipitation in the code T_RT_R as follows:

Code figure	Hours	Minutes	Code figure	Hours	Minutes
00	No precipitation		06	0	30
01	0	5	07	0	35
02	0	10	08	0	40
03	0	15	09	0	45
04	0	20	10	0	50
05	0	25	11	0	55

Code figure	Hours	Minutes
12	1	0
13	1	5
50	4	10
51	4	15
	etc.	
83	6	55
84	7	0

Code figure	Hours Minutes
90	RR refers to a period of approximately 12 hours
91	RR refers to a period of approximately 18 hours
92	RR refers to a period of approximately 24 hours or greater

Rec. 8 (CMM-II) - METEOROLOGICAL INSTRUMENTS ON BOARD SHIPS

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING,

(1) The International Convention for Safety of Life at Sea (London 1948), chapter V, regulation 4, paragraph a;

(2) That all merchant ships need a barometer and thermometers for the daily use of their officers;

(3) That the dependability of these instruments has a bearing upon the safety of the ship because it will facilitate the master's appreciation of a potentially dangerous meteorological situation;

(4) That the meteorological instruments installed by some shipping companies in their ships are not sufficiently reliable or properly exposed;

(5) That a number of ships equipped with such uncertified instruments are navigating in waters from which very few meteorological reports are being received; and

CONSIDERING,

(1) The need for recruiting such ships as voluntary observing ships of one category or another; and

(2) The desirability of improving the quality of meteorological reports from such ships;

RECOMMENDS,

(1) That Members concerned be requested to approach their shipping companies with a view to :

(a) Informing them of the value of accurate weather forecasts for shipping and that such forecasts are highly dependent on reliable observations made with reliable instruments;

(b) Urging that good quality meteorological instruments be installed aboard their ships following the advice of the meteorological service with regard to the specifications and siting of the instruments;

(2) That the Commission for Instruments and Methods of Observation be requested to advise as to the desired specifications of meteorological instruments for use on board observing ships of various categories, and that these specifications be included in WMO publication No. 8.

Rec. 9 (CMM-II) - OBSERVING AND REPORTING SEA WAVES

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING that the existing instructions in WMO publication No. 9, volume B, for reporting waves do not always provide for distinguishing between sea and swell;

CONSIDERING the importance of information on the direction and characteristics of swell, as distinct from wind waves;

RECOMMENDS,

(1) That the instructions on reporting waves, given in WMO publication No. 9, volume B, chapter I, part A-1 c, paragraph (7)(v), under FM 21.A, should be altered to read as in the annex to this recommendation;

(2) That Members concerned should encourage their marine observers to adhere to these instructions.

A N N E X

Instructions on observing and reporting waves

($1d_w d_w P_w H_w$) - This group should be included in the report. It is mandatory for Ocean weather stations. As a rule, when wave observations are reported and when swell is present, at least two ($1d_w d_w P_w H_w$) groups

should be included, the first group relating to wind waves, the second to waves of the predominant swell system. When more than one swell system is present, more ($1d_Wd_WP_WH_W$) groups may be included in the report.

Rec. 10 (CMM-II) - DESCRIPTIVE TERMS FOR WAVE HEIGHT

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING resolution 1 (CSM-I); and

CONSIDERING,

(1) That in the present code for the state of sea (WMO code 75), the equivalents for metric and English units could be made more accurate;

(2) That the correspondence between the descriptive terms and the height of waves could be improved;

(3) That the term "mean maximum height" in columns (3) and (4) of code 75 is ambiguous and probably misleading;

(4) That the waves in the centre of a hurricane are not necessarily phenomenal;

RECOMMENDS that WMO code 75 - State of sea - should be amended in accordance with the annex to this recommendation.

A N N E X

Code figure	Descriptive terms	Height * Metres	Height * Feet (approximately)
0	Calm (glassy)	0	0
1	Calm (rippled)	0 - 0.1	0 - 1/3
2	Smooth (wavelets)	0.1 - 0.5	1/3 - 1 2/3
3	Slight	0.5 - 1.25	1 2/3 - 4
4	Moderate	1.25 - 2.5	4 - 8
5	Rough	2.5 - 4	8 - 13
6	Very rough	4 - 6	13 - 20
7	High	6 - 9	20 - 30
8	Very high	9 - 14	30 - 45
9	Phenomenal	over 14	over 45

* The average wave height as obtained from the larger well-formed waves of the wave system being observed.

N o t e : The exact bounding height is to be assigned for the lower code figure, e.g. a height of 4 metres is coded as 5.

Rec. 11 (CMM-II) - DESCRIPTIVE TERMS FOR ICE

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING,

(1) That the new Abridged International Ice Nomenclature adopted by the World Meteorological Organization introduces terms which differ from the corresponding terms in the present ice code (WMO code table 19);

(2) That this ice code does not provide the means of reporting the presence of icebergs;

CONSIDERING,

(1) That it is not desirable to make radical changes in codes which would make existing national code-books and log-books obsolete;

(2) That nevertheless uniformity in the terms used in the Ice Nomenclature and in the ice code is desirable;

(3) That the ice code should permit reporting the presence of icebergs;

RECOMMENDS that WMO code table 19 should be amended to read as in the annex to this recommendation.

A N N E X

c_2 - Description of kind of ice

Code figure	
0	No ice (0 may be used to report ice blink and then a direction must be reported)
1	New ice
2	Fast ice
3	Pack ice/drift ice
4	Packed (compact) slush or sludge
5	Shore lead
6	Heavy fast ice
7	Heavy pack ice/drift ice
8	Hummocked ice
9	Icebergs

N o t e : BERGS can be reported in the above code or in plain language.

Rec. 12 (CMM-II) - CANCELLATION OF INTERNATIONAL METEOROLOGICAL ORGANIZATION ICE CODES

The COMMISSION FOR MARITIME METEOROLOGY,

CONSIDERING,

(1) That the ice codes published in IMO publication No. 9, fascicule I, section I-C-1 are obsolete; and

(2) That no Member is using these codes;

(3) That new ice codes are being designed;*

RECOMMENDS that section I-C-1 of IMO publication No. 9, fascicule I, relating to ice codes, should be cancelled.

Rec. 13 (CMM-II) - AEROLOGICAL OBSERVATIONS ON BOARD SHIPS

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING the valuable experiments by the United States and other Members and the general interest shown by a number of other Members in promoting programmes for making aerological observations by merchant ships;

CONSIDERING that such observations are essential to the future of meteorology and will provide a valuable source of data from the oceans which comprise over 70 per cent of the surface of the globe;

RECOMMENDS,

(1) That Members concerned should be encouraged to develop programmes of aerological observations from ships; and

(2) That reports of progress in developing such observations be made available to the Secretary-General for co-ordination with all interested Members.

Rec. 14 (CMM-II) - SURFACE REPORTS FROM SHIPS IN SHORT FORM FOR USE DURING THE INTERNATIONAL GEOPHYSICAL YEAR

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING,

(1) That there is a need for obtaining as many and as complete

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* See resolution 6 (CMM-II).

observations as possible during the International Geophysical Year from ships in areas where observations are sparse;

(2) That many ships, other than selected and supplementary ships, navigating in these waters are equipped with barometers and thermometers which, though uncertified, might nevertheless be of some value for meteorological observations;

CONSIDERING,

(1) That the present code form for surface reports from ships in short form (FM 23.A) does not permit the reporting of pressure and temperature from such ships;

(2) That it is desirable to introduce a procedure whereby pressure and temperature can be reported by these ships at least during the International Geophysical Year;

RECOMMENDS,

(1) That as a temporary arrangement during the International Geophysical Year, ships reporting in code form FM 23.A, should be allowed to report pressure and temperature in a fifth and optional group, provided that the instruments used for these observations are checked by a port meteorological officer;

(2) That the fifth group be given the form (PPXTT), where PP stands for the last two figures of the pressure in whole millibars, X indicates that the ship is not a selected or supplementary ship and TT is air temperature in degrees Celsius or Fahrenheit;

(3) That the decision of the President of the World Meteorological Organization on the use of the group (PPXTT) as an optional group during the International Geophysical Year be promulgated as soon as possible to all Members concerned;

(4) That the Commission for Synoptic Meteorology be requested to take steps to introduce the group (PPXTT) as a drop-out group in code form FM 23.A on a permanent basis.

Rec. 15 (CMM-II) - COLLECTION OF ADDITIONAL INFORMATION FROM OCEAN AREAS

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING resolution 36 (CD Washington, 1947);

CONSIDERING that meteorological services should constantly bear in mind the various ways of obtaining information from ocean areas, in addition to the observations from mobile ship stations and Ocean weather stations;

RECOMMENDS that Members concerned be reminded of the following possible means of obtaining additional information from ocean areas :

(a) Ordinary or automatic weather stations on islands and buoys,* both anchored and free-floating;

(b) Sferics and radar networks;

(c) Observations of wave characteristics from networks of automatic wave-recorders, and other suitable instruments;

(d) Organization of meteorological observations aboard research vessels;

(e) Microseismic observation networks;

(f) Constant level meteorological balloons.

Rec. 16 (CMM-II) - SELECTED SHIPS

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING that the world total of voluntary observing merchant ships is gradually increasing and now numbers 2,800 compared with a total of 2,400 at the time of the first session of the Commission for Maritime Meteorology;

CONSIDERING,

(1) That selected ships constitute the essential backbone of the scheme for providing accurate and detailed weather reports from the oceans;

(2) That there is still a need for more selected ships, especially those plying in waters where reports are sparse;

(3) That up-to-date information about selected ships is of considerable practical help to Members and to the commission;

RECOMMENDS,

(1) That all Members concerned be urged to continue their efforts to increase the number of their selected ships, especially those navigating in waters where observations are sparse;

(2) That all selected ships be encouraged to send radio weather messages to the appropriate radio stations wherever their voyages take them;

* These buoys should be such that they do not constitute a danger to navigation.

(3) That Members recruiting selected ships advise the Secretariat of the World Meteorological Organization as to particulars of those ships in accordance with paragraphs 2.6.1.6 and 2.6.1.7 of the Technical Regulations.

Rec. 17 (CMM-II) - RECRUITING OF SHIPS REGISTERED UNDER THE FLAGS OF PANAMA, HONDURAS, COSTA RICA AND LIBERIA

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING that a number of vessels flying the flags of Panama, Honduras, Costa Rica and Liberia have not been recruited as selected, supplementary or auxiliary ships; and

CONSIDERING the desirability of recruiting these vessels to furnish reports especially from areas where ships' weather messages are sparse;

RECOMMENDS,

(1) That the owners of ships of Panamanian, Honduran, Costa Rican and Liberian registry be contacted by the Secretary-General for the purpose of inviting them to co-operate in furnishing reports, especially from sparse areas;

(2) That the Secretary-General notify Members of the replies received, in order that they can arrange with their port liaison officers to recruit ships of the above-mentioned registry to furnish reports; and

(3) That Members concerned should supply, through their port liaison officers, codes and reporting instructions to the ships thus recruited.

Rec. 18 (CMM-II) - OBSERVATIONS FROM SHIPS IN TROPICAL WATERS

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING the request from El Salvador which invites attention to the importance of reports from ships in tropical waters regardless of weather conditions experienced;

CONSIDERING that the same principle applies to all tropical waters for forecasting purposes;

RECOMMENDS that Members concerned should draw the attention of captains and ships' officers to the importance of sending weather reports when plying in tropical waters during good as well as during bad weather.

Rec. 19 (CMM-II) - METEOROLOGICAL INFORMATION FROM COASTAL WATERS

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING,

(1) That some Members have instructed their ships to commence furnishing weather observation messages only after the vessels have reached a definite distance from the coast;

(2) That a scarcity of ships' observation messages from coastal waters often results because there are no lightships or off-shore island stations in such areas to furnish weather reports;

CONSIDERING,

(1) That in coast station reports, wind direction and speed data especially are often influenced by local topography and are not representative of coastal water conditions;

(2) That winds over coastal waters, particularly near rugged coasts, may differ considerably from those over the open sea, a condition which greatly affects shipping, small craft and fishing boats operating near the coast;

(3) That in coastal waters, sea water temperature readings often show large differences from those made at coast stations and on the open sea;

(4) That swell observations from coastal waters are highly important;

(5) That inquiries with respect to marine casualties occurring in coastal waters often indicate difficulties in weather observations and meteorological service to shipping;

(6) That the transition in meteorological conditions from shore stations to the open sea are often very pronounced in coastal water areas and that an urgent need exists to gain more knowledge in this respect for scientific as well as for practical purposes; and

(7) That owing to preoccupation with navigational duties, ships in coastal waters may not be in a position to furnish reports at each main standard time;

RECOMMENDS that Members concerned should arrange with their ships to endeavour to furnish radio weather messages at main standard times while they are in coastal waters.

Rec. 20 (CMM-II) - AWARDS TO VOLUNTARY OBSERVING SHIPS

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING resolution 16 (EC-III) relating to recommendation 15 (CMM-I), and recommendation 4 (I-RA III);

CONSIDERING,

(1) That a need exists for stimulating the interest among ships officers in providing frequent and reliable weather observations from the sea;

(2) That one way of promoting enthusiasm in weather observing aboard ships is to issue awards to those ships or ships' officers which, in the opinion of the Members concerned, merit such awards; and

(3) That there would be difficulties in issuing these awards on an international basis through the World Meteorological Organization;

RECOMMENDS that Members' services concerned which have not already a system of stimulating interest among ships' officers in voluntarily making and reporting weather observations should be urged to institute such a system either by making awards for outstanding services or by any other means they consider necessary or sufficient.

Rec. 21 (CMM-II) - INTERNATIONAL EXCHANGE OF BLANK WEATHER MAPS

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING the growing practice of plotting and analysing weather maps aboard ships;

CONSIDERING the desirability of encouraging this practice amongst ships' officers;

RECOMMENDS,

(1) That Members concerned, issuing or planning to issue blank weather maps to their own ships should also make these maps available to ships of other nations on request;

(2) That the size of these maps should be such that they can be conveniently used in chart rooms but that, in any case, they should cover a major ocean area and adjacent seas if possible.

Rec. 22 (CMM-II) - THE POSSIBILITY OF ISSUING WEATHER BULLETINS FOR SHIPPING IN CODE

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING,

(1) That paragraph 10.2.3.6 of the WMO Technical Regulations states that parts II and III of weather bulletins for shipping should be broadcast in the language of the issuing Member and in English;

(2) That a number of countries cannot issue these weather bulletins in English;

CONSIDERING,

(1) That, where English cannot be used, it would be an advantage to shipping if weather forecasts could be issued in a suitable short forecast code, in addition to the plain language of the issuing Member;

(2) That certain shipping interests have indicated that the use of such a code would be of considerable value;

(3) That it is possible to design a code which is not only adequate but also short and simple to apply;

RECOMMENDS,

(1) That the Commission for Synoptic Meteorology be asked to design, as a matter of urgency, a code along the lines suggested in the annex to this recommendation;

(2) That, subsequent to the appropriate action being taken by the Commission for Synoptic Meteorology, paragraph 10.2.3.6 of the WMO Technical Regulations be amended to read :

"Parts II and III of the weather bulletin should be broadcast in the language of the issuing Member and in English."

N O T E : Where English cannot be used, part III should be broadcast in the language of the issuing Member and in a short forecast code.

(3) That, when a code has been approved, Members concerned should arrange to have specification cards printed and issued to the ships concerned for easy reference.

A N N E X

A suggested short forecast code for use in issuing weather bulletins to shipping

I. Form of message

1.	Region	D F W V G	(OOFFO)	(XXXXT)
2.	Region	$D_1F_1W_1V_1G_1$	(OOF_1F_1O)	($XXXXT_1$)
		$D_2F_2W_2V_2G_2$	(OOF_2F_2O)	($XXXXT_2$)

N O T E S :

(1) The region to which the forecast applied will be indicated by the insertion of the appropriate letters A, B, C, ... etc. after the word "Region".

(2) Form 1 is used when conditions are expected to remain unchanged.

(3) Form 2 is used when changes are expected, in which case G, G_1, G_2 ... etc. indicate the period of validity of each group.

(4) If F (or F_1, F_2 ... etc.) is expected to exceed force 9, then it is coded as 9 and an extra group OOFFO (or OOF_1F_1O ... etc.) is inserted, FF (or F_1F_1 ... etc.) being the forecast Beaufort wind force (10-12).

(5) When the temperature is expected to be below 0°C (32°F) an extra group XXXXT (or $XXXXT_1$ ... etc.) is added.

II. Specifications

a D, D_1, D_2, ... etc. — Wind direction using WMO code 20

b F, F_1, F_2, ... etc. — Beaufort wind force (WMO code 30)

c W, W_1, W_2, ..., etc. — Weather (WMO code 90A)

d V, V_1, V_2, ..., etc. — Visibility (WMO code 85 omitting code figures 8 and 9, or WMO code 84, 90-99 decade, omitting the initial figure 9)

e G, G_1, G_2, ..., etc. — Period of validity

Code figure	Specification
0	No change during the forecast period or during the remainder of the period
1	In the evening
2	During the night
3	During the night and in the morning
4	During the day
5	Early in the morning
6	During the forenoon
7	During the afternoon
8	Occasionally
9	When the sky clears

f T, T_1, T_2, ..., etc. — Temperature

Code figure	Specification
0	Temperature below 0°C (32°F) and remaining below 0°C (32°F)
1	Not used
2	Temperature rising without going above 0°C (32°F)
3	Temperature rising to a value above 0°C (32°F)
4	Temperature rising without going above -5°C(23°F)
5	Temperature rising to a value above -5°C (23°F)
6	Not used
7	Temperature falling to a value below 0°C (32°F)
8	Temperature falling without going below -5°C(23°F)
9	Temperature falling to a value below -5°C (23°F)

Rec. 23 (CMM-II) - STANDARDIZATION OF ADDRESSES OF SHIPS' RADIO WEATHER MESSAGES

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING the many different addresses employed by Member services throughout the world for collecting ships' weather messages; and

CONSIDERING,

(1) That difficulties have been encountered by ships when addressing their meteorological messages to different collection centres;

(2) That for reasons of simplicity and economy, it is desirable to standardize addresses;

(3) That the ITU meteorological service identification "OBS" must be included in meteorological messages transmitted from observing ships to coastal stations;

RECOMMENDS,

(1) That Members be requested to standardize their address for ships' weather messages, if possible, by arranging with their own telecommunication companies or administrations to employ "MET" as the first word in the address, e.g., "MET, OSLO";

(2) That the Secretary-General discuss with the International Telecommunication Union the possibility of shortening the address of ships' weather messages further by employing only one word to serve as both the message identifier and meteorological collection centre address, e.g., "OBS, OSLO" or "MET, OSLO".

Rec. 24 (CMM-II) - REPRESENTATION OF THE WORLD METEOROLOGICAL ORGANIZATION AT THE NEXT ORDINARY ADMINISTRATIVE RADIO CONFERENCE OF THE INTERNATIONAL TELECOMMUNICATION UNION

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING the Final Acts of the International Telecommunications and Radio Conferences, Buenos Aires 1952;

CONSIDERING the need to obtain further changes in existing international radio regulations to improve the collection and transmission of weather messages to and from ships;

RECOMMENDS,

(1) That the World Meteorological Organization be represented at the next Ordinary Administrative Radio Conference of the International

Telecommunication Union by the Telecommunications technologist of the Secretariat;

(2) That the representative of the World Meteorological Organization at this conference should be guided by the instructions contained in the annex to this recommendation.*

Rec. 25 (CMM-II) - CLOUD ALBUM FOR USE BY OBSERVERS AT SEA

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING,

(1) Resolution 7 (CMM-I);

(2) The size and text of the Abridged International Cloud Atlas;

CONSIDERING,

(1) That the Cloud Atlas intended for marine observers should be as short and simple as possible and that its size should be convenient for easy handling;

(2) That the Abridged Cloud Atlas is too long and complex for convenient use by observers aboard ship, especially in view of the specific conditions under which these observers must work and of the fact that they are in general not professional meteorologists;

RECOMMENDS,

(1) That an abbreviated edition of the Abridged Cloud Atlas, especially intended for use by marine observers (a marine cloud album) should be made available;

(2) That the album should be based on the text and photographs of the Abridged Cloud Atlas;

(3) That the album should contain about forty pictures of the sky corresponding to each code figure, illustrating the most characteristic aspect;

(4) That the size of the album should be made as small as the present photographs will allow;

(5) That the new text accompanying each photograph should be made available in mimeographed form to all interested meteorological

* See annex 9.

services in order that they may prepare a marine cloud album in their own language;

(6) That no printing other than mimeographing of the new text should be undertaken by the World Meteorological Organization;

(7) That sets of bare plates of the photographs selected for the marine cloud album be made available to Members by purchase from the Secretariat of the Organization;

(8) That funds be made available to finance a meeting of the working group established by CMM-II* for the purpose of preparing the text and selecting the photographs for the proposed marine cloud album.

Rec. 26 (CMM-II) - MARINE CLIMATIC ATLASES

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING,

(1) Resolution 25 (EC-VIII);

(2) Resolution 4 (CMM-II);

CONSIDERING,

(1) (a) That a great part of the existing marine climatological data is available only in meteorological log-books and on forms, and that these data, if made easily available, might be of considerable value to all interested in marine meteorology and climatology, both for scientific and operational purposes;

(b) That it would be reasonable that Members who would undertake the punching of these data should be given financial compensation;

(2) That the Working Group on marine climatology, established by the second session of the Commission for Maritime Meteorology, will need financial support from the Organization in order to proceed efficiently with its task;

RECOMMENDS that favourable consideration be given to the possibility of making funds available for the above-mentioned purposes, in the first instance for financing a meeting of the working group.

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* See resolution 5 (CMM-II).

Rec. 27 (CMM-II) - WORLD DISTRIBUTION OF THUNDERSTORM DAYS

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING with satisfaction the appearance of WMO publication No. 21.TP.21 - World Distribution of Thunderstorm Days; and

CONSIDERING,

(1) The great scientific value and practical use of such tables and global distribution maps, provided they contain data giving a sufficient coverage over the oceans;

(2) That at least twice as many ships' observations are available, mostly on punch cards and that the International Geophysical Year might well provide the opportunity for collecting a homogeneous set of data from one year;

(3) That these observations would be essential to make such tables and maps fulfil the condition as in (1) above;

(4) That the base map and the meteorological analysis of the frequency distributions on these maps need to be improved;

RECOMMENDS that a joint working group with members from the Commissions for Maritime Meteorology and for Climatology should be appointed to study this question further with regard to a more complete utilization of available data.

Rec. 28 (CMM-II) - EXCHANGE OF ENERGY BETWEEN THE OCEANS AND THE ATMOSPHERE

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING that the programme of the International Geophysical Year will be devoted, inter-alia, to investigations of large scale problems of energy exchange at the sea surface; and

CONSIDERING the importance of continuing studies of energy exchange between the seas and the atmosphere, including the amount of heat stored and released by the oceans;

RECOMMENDS,

(1) That Members should arrange for :

(a) Radiation measurements at sea and observations of such other elements as required in making studies of energy exchange;

(b) Meteorologists and oceanographers to work together in carrying out investigations of energy exchange between the oceans and the atmosphere;

(2) That the Commission for Instruments and Methods of Observation be invited to furnish guidance on implementing such a programme by Members' services.

Rec. 29 (CMM-II) - IDENTIFICATION OF THE SUBDIVISIONS OF THE MARSDEN TEN-DEGREE SQUARES

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING resolution 1 (IMC, De Bilt 1933);

CONSIDERING the desirability for card punching purposes :

(a) To use figures instead of letters to indicate the five-degree squares;

(b) To have international agreement on the numbering of the two-degree squares;

RECOMMENDS that the identifications of the subdivisions of the Marsden ten-degree squares should be as shown in the annex to this recommendation.*

Rec. 30 (CMM-II) - PROPOSED AMENDMENTS TO THE TECHNICAL REGULATIONS RELATING TO MARITIME METEOROLOGY

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING resolution 19 (Cg-II);

RECOMMENDS that the Technical Regulations relating to maritime meteorology as contained in WMO publication No. 49.BD.2, 1st edition 1956, should be amended as indicated in the annex to this recommendation.**

Rec. 31 (CMM-II) - CONTENTS OF WMO PUBLICATION No. 9.TP.4, VOLUME D

The COMMISSION FOR MARITIME METEOROLOGY,

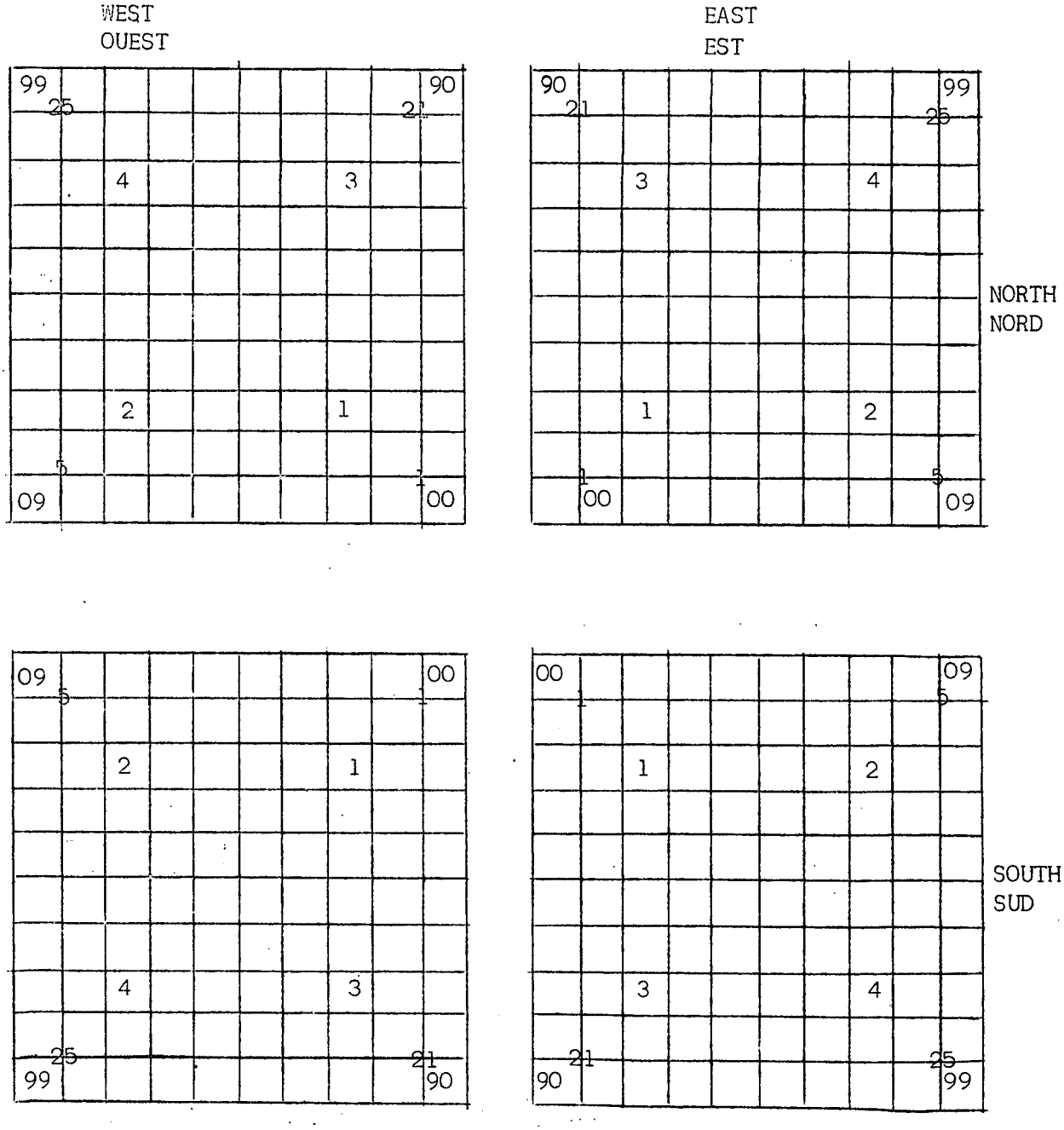
NOTING that WMO publication No. 9.TP.4, volume D, part A, has been issued and distributed to Members, while the parts B, C, D, E and F remain to be prepared;

(contd. page 53)

* See page 52.
** See annex 10.

ANNEX TO RECOMMENDATION 29

SUBDIVISIONS OF THE MARSDEN TEN-DEGREE SQUARES



CONSIDERING that some modifications in the lay-out of the proposed part D, chapter I, would be desirable in order to improve the effectiveness of this publication for use by ships;

RECOMMENDS that the Secretary-General be requested to follow the planned general lay-out as shown in the annex to this recommendation* in preparing publication No. 9.TP.4, volume D - Information for shipping.

Rec. 32 (CMM-II) - ESTABLISHING RELATIONS WITH THE INTERNATIONAL FISHERIES ORGANIZATIONS

The COMMISSION FOR MARITIME METEOROLOGY,

CONSIDERING,

(1) That data on average prevailing conditions from month to month and their variability, in form of climatological and hydrological atlases, are required when planning fisheries in new areas;

(2) That the recent important changes in the distribution and abundance of aquatic fauna throughout the seas of the world are apparently related to meteorological factors including climatic trends;

(3) That weather forecasts and climatological information are significant factors in planning and executing fishing operations, in the use of gear and in the storage of fish;

(4) That fishing is carried out mainly by the smaller vessels and in parts of the oceans where storms are most frequent;

(5) That the sea fishing interests of to-day represent a large group of users whose need for meteorological and climatological information may be greater than that of the cargo carrying fleets;

(6) That, in view of the valuable experience gained in some countries, e.g., in Germany and Norway, on co-operation between fishing and weather services, special efforts must be made for the benefit of the fishermen to ensure for them the use of all available weather information, since it is felt, that the fishing fleets of the world are not generally as aware as they should be of the current possibilities of obtaining weather information which would greatly help their operations;

(7) That the most practical way to approach this organizing problem is to establish through the Secretary-General of the Organization continuous liaison between the World Meteorological Organization (Commission for Maritime Meteorology) and the international fisheries and

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* See annex 11.

other organizations of which the organizations listed in the annex probably are the most important;

(8) That the amount of data available from sea areas far from the international shipping lanes, which is at present insufficient, could be substantially increased through continuous liaison between the fisheries organizations and the World Meteorological Organization, by encouraging more fishing vessels to make and report meteorological observations;

RECOMMENDS,

(1) That a small working group of the Commission for Maritime Meteorology be established on which a representative of the United Nations Food and Agriculture Organization and, if necessary, of other interested organizations should be invited to participate;

(2) That the terms of reference of the working group be as follows :

(a) Collect additional information about the need of extended collaboration between the Organization and international fisheries organizations and with other organizations with whom collaboration is considered useful;

(b) Prepare recommendations on ways and means of further extending the collaboration of the Organization with international organizations of fisheries;

(c) Investigate the possibilities of co-ordinating weather services for the use of fishermen both in coastal areas and in the common fishing grounds;

(3) That the Secretary-General be requested to invite the attention of Members to the importance of the above considerations.

ANNEX

Food and Agriculture Organization of the United Nations
General Fisheries Council for Mediterranean
Indo-Pacific Fisheries Council
International Council for Exploration of the Sea
International Commission for the North-West Atlantic Fisheries
Caribbean Fisheries Commission
International North Pacific Fisheries Commission
Inter-American Tropical Tuna Commission
South Pacific Commission
International Whaling Commission
Commission for Regime of High Seas
UNESCO (International Advisory Committee for Marine Sciences),

and also :

International Union of Geodesy and Geophysics
International Association for Physical Oceanography
International Hydrographic Bureau.

Rec. 33 (CMM-II) - RESPONSIBILITY OF THE WORLD METEOROLOGICAL ORGANIZATION IN THE FIELD OF MARITIME METEOROLOGY

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING resolution 15 (Cg-II);

CONSIDERING,

(1) The document submitted by the president of the Commission for Maritime Meteorology to Second Congress on the structure of technical commissions, with which the commission is in full agreement;

(2) The action taken by the Executive Committee on this resolution at its eighth session* by which members of the commission are disturbed because of the possible implications as to the future rôle of scientific and technical experts in the World Meteorological Organization;

(3) The fact that maritime meteorology is a specialized branch of meteorology, particularly since :

(a) It deals with observations on board ships, including voluntary observing ships, necessitating special observing techniques with instruments designed for use at sea;

(b) It is concerned with special aspects of such subjects as waves, ice, radiation, evaporation, exchange of heat and other special problems requiring the attention of experts in marine meteorology to conduct the necessary research for developing observational technique;

(c) It is closely related to shipping and fishing operations as well as to oceanography;

(4) The need for assisting shipping industries of all countries with regard to special problems arising on board ship, in which meteorology plays an important rôle;

(5) The desirability that all Members interested in maritime meteorology be given the opportunity for mutual exchange of opinions and experience in this field, in order to achieve the best possible

* See paragraphs 192-197 in the general summary of the eighth session of the Executive Committee, WMO publication No. 53.RC.13.

co-operation and co-ordination of the work carried out by various Members of the Organization;

RECOMMENDS that, whatever the future structure and functions of the technical commissions may be, the Organization should include one specific permanent body consisting of experts on maritime meteorology designated by interested Members to deal with all meteorological questions of a specifically maritime character.

ANNEX 1

MEASUREMENT OF SEA SURFACE WATER TEMPERATURE

(Submitted by the chairman of Working Group B)

References: 1. WMO Technical Note No. 2

2. Resolution 11 (CMM-I)

3. Recommendation 18 (CIMO-I)

4. Measurements of sea surface temperature for meteorological purposes - Audvin Amot.

Much study and investigation have been directed to the problem of obtaining accurate sea surface water temperatures. This close attention has gradually overcome much of the past uncertainty regarding the real differences between surface water temperatures and those at the depth of the intake and has brought out fairly clearly the limitations in both bucket and intake methods. Development of preferred instrumentation has proceeded slowly but surely and will inevitably lead to a distant reading intake thermometer arrangement, read directly on the bridge, and an insulated bucket and set of observing procedures which are as accurate and simple as can be provided. The former is likely to be expensive and limited to a slow increase in the number of equipped ships, and the latter awaits further development.

WMO Technical Note No. 2, part I, reviews the overall subject, points out the small differences in readings of both methods, taking into account the human factor, stresses the gradually increasing speeds of ships and corresponding difficulty involved in bucket measurements and points out the overriding factors involving wind speed, latitude and ship in motion, as against stationary or nearly so.

Comments provided by members of Working Group B on the general question, with particular reference to what temperature was really wanted, and the respective merits at this time of the two methods, reflected the thinking, the present practice, and proposed changes in methods in the individual countries. The individual comments show careful thought. Attempts to coordinate view-points would both load to a loss of individual consistency and lose the localized progress and line of present reasoning. The individual comments are therefore provided in turn and summarized below with an attempt at suggesting action now required by CMM.

NETHERLANDS

(a) I quite agree with you that it is the skin temperature which we want to know. If the wind force is at least 4 Beaufort, we may assume that the surface layers are sufficiently mixed but during calms it seems very difficult to observe the exact skin temperature.

(b) I prefer the bucket method, in the first place because it estimates more the skin temperature, but also because I think the bucket method more accurate, provided the necessary precautions are being made. First of all, it will be necessary to provide the selected ships with an insulated bucket, the Netherlands selected ships do not yet dispose of these receptacles and still use an ordinary canvas bucket. Several years ago we tried to get the insulated bucket from the British service, but it seemed that the model developed in that country was not yet quite satisfactory. Mr. Brooks too mentions some shortcomings. During our conference in London I also had the impression that the experiments with this bucket were not yet finished. After that no new developments came to my knowledge.

Perhaps you know that there exists also the German insulated bucket (Marine-Pütz), experiments with this bucket showed quite satisfactory results (H.U. Roll, Annalen der Meteorologie, Vol. 4, 1951, pages 439-443). Personally, I think the capacity of this bucket rather small.

Recapitulating I think it of primary importance that the CIMO advise us about an insulated bucket of a satisfactory model which can be procured at a moderate price.

UNITED STATES

(1) In my opinion, the ideal arrangement would be to obtain temperature data for the sea surface or skin. However, the establishment of this specification at the present time is unrealistic when we consider the large number of ships that record sea temperature data by means of the intake method. While the ideal arrangement should be our objective, further development of techniques and equipment are essential before it can be achieved. Since ships are recording sea temperatures by bucket and intake methods, the only alternative is for forecasters and researchers to bear in mind the discussions in WMO Technical Note No. 2 when evaluating the data.

(2) In spite of difficulties in making accurate intake and bucket measurements, it appears that we must continue to rely on these methods for getting the data. If direct readings of intake temperatures on the bridge were feasible on ships, this would be helpful to ship-observers. In the United States, we have been testing experimentally aboard a weather ship a telethermometer unit for getting sea temperature data from the intake. The sensing element of the unit is housed in a small stainless steel well which is inserted in the ship's intake pipe with the cable running to the ship's weather office. The equipment is now undergoing modification so as to permit direct readings of intake temperature data on the bridge also. While further tests of the equipment remain to be made, experiments so far show that accurate intake readings to the nearest whole degree are feasible. It is doubtful, however, whether this equipment will permit readings with an accuracy better than 0.5°F.

NORWAY

(1) I include copy of a letter dated 22 February 1955 to the president of CMM. I hope that the paper mentioned therein will reach you shortly (by Audvin Amot).

Our opinion is that the condenser intake method is the most reliable and practicable, and that it gives the skin surface temperature (which is what the forecasters want) with great accuracy on account of the turbulence in the upper metres caused by the wind. Only in calm or nearly calm weather there may be considerable differences between 0 and 4 (-5) m depth, but such weather rarely occurs in middle and high latitudes. In low latitudes, however, the bucket method probably has to be used. Practically all the Norwegian selected ships use the intake method, either fitted with a sea thermograph or a sea thermometer in a steel pocket having mercury at the bottom so as to secure a rapid transport of heat to the thermometer bulb.

UNITED KINGDOM

(a) The requirements of forecasters, climatologists and research workers in respect of sea surface temperature are not the same. The increasing speeds of modern ships make the measurement of the temperature of the surface of the sea in contact with the air, i.e. the skin surface temperature, very difficult from the practical standpoint with the canvas bucket at present in use; while with the faster ships it has already become impossible.

(b) Although many advantages would follow if all ships measured the same thing, we consider it would be undesirable at this stage to recommend which method of measurement should be standardized. We would prefer that efforts should be directed towards developing the most efficient means of observing the temperature both of the surface layer and at a depth of a few feet ("intake" temperature).

If "intake" temperatures were measured by all ships, the forecaster would know more about the observation he is getting, since the temperature of the sea at a depth of a few feet is a more representative and stable parameter than the skin surface temperature and errors due to variations of depths of intakes are trivial. With wind of Force 4 and above, at all seasons, and in temperate and high latitudes in the winter half-year, the difference between the sea surface and "intake" temperature is negligible.

We realize that there are serious practical difficulties in the way of measuring intake temperatures for meteorological purposes, where:

(i) the observation would usually be taken by a person who is not under the direct control of the officer responsible for reporting the meteorological observations of the ship;

(ii) the installation of a thermometer sufficiently near the side of the ship to be sure that the temperature of the water has not been affected by its passage through the ship is, or may be, expensive;

(iii) errors may be introduced when passing information from the engine-room by telephone or voice-pipe.

These are very real difficulties and should be recognized by the WMO. Nevertheless, the first duty of the Organization is to state what information would be most useful to the meteorologist. In our view the ideal solution will probably be found in having an intake thermometer suitably sited and giving a distant reading on the ship's bridge, but this is unlikely to be used widely, owing to expense and difficulties of installation.

Since the practical difficulties mentioned above do seem to preclude, for the time being, a widespread adoption of intake temperature methods, it is considered desirable to develop a cheaper, smaller, and more robust bucket, with better heat insulation than is at present available. The British Meteorological Office is developing such a bucket, made of rubber, with thermometer incorporated in the bucket.

ITALY

(a) I think that, for synoptic purposes, and even for many climatological questions, the sea surface temperature which it would be necessary to measure, would be that of the surface layer (skin temperature).

I think also that it would not be easy to determine the intrinsic accuracy of the methods at present followed, because the bathythermographic measurements and the well-known variability of the conditions of the propagation of sound horizontally in sea water, have already sufficiently demonstrated that in the top metres the vertical temperature gradient can present values which go from 0° to more than 20°F in 10 metres! The temperature which is measured is obviously that of the mixture of skin temperatures of a badly defined depth.

A change in this measurement situation would suppose a radical change in methods, which I do not think possible within a reasonable length of time, even if something has been advocated: for example, in one of the London meetings with Dr. Brooks, we have had occasion to examine the possibility of determining the surface temperature with a bathythermograph towed on the surface in a float, which, in tracing a small part of the temperature-pressure curve during the inevitable immersions, would permit determination of the "skin temperature" at the meeting point of the traced curve with the line of no pressure: it seemed that this instrument could be reduced to the dimensions of the Dines or meteorograph, simple and cheap. I had to note that, as for all instruments, a gradual development is necessary; and to conclude that the day of adoption of a different instrumentation from the present is not determinable.

Under these conditions of uncertainty on the limited accuracy of the present measurements, and on their future, it seems quite natural that the instructions on the accuracy of the readings and the possibility of these readings in thermometers, may reasonably be in conformity with the propositions of Mr. Perlat.

COMMENTS

Until equipment and methods of observing, generally accepted as satisfactory, are available for the intake and bucket methods of observing, both methods must be acceptable. Each has its area of strong preference, the intake - fast ships, windy weather; bucket - calm, sunny conditions in high latitudes. It is agreed that the water temperature required is that at/or near the surface, and that from a practical standpoint, this is difficult to measure.

The commission may wish to:

(a) Review progress up to the present in development of improved instrumentation for both methods;

(b) Determine practical limits imposed on each method by the human factors involved;

(c) Combine the requirements for the observational data with limitations involved in observing, and determine for CIMO as precise a set of basic requirements as seems reasonably possible;

(d) Keep the subject under continuous review so that procedures can be maintained in accord with development.

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CIMO recommendation 18 suggested that the requirements for precision of reading of sea thermometers should be 1°F or 0.5°C instead of 0.2°F or 0.1°C as at present. The annex to recommendation 2, paragraph 2.1.5.5.1, also reads "Thermometers SHALL be read to 0.1°C or 0.2°F or closer for psychrometric purposes and to 0.5°C or 1.0°F or closer for other purposes."

The president of CMM requested the opinion of the presidents of CIMO, CSM, CCl and CAe and asked Working Group B to consider the question of desired precision.

The presidents replied as follows:

The president of CIMO (summarized) - The accuracy of an instrument reading is not determined by setting a code which provides for transmission of a measurement with a given accuracy. Rather the accuracy depends on the nature of the phenomenon, the possibilities of observation and the purpose served by having this measurement. Although sea and air temperature differences are often small, it seems difficult, if not impossible, to achieve frequently a precision of 0.1°C as some desire. Technical Note No. 2 suggests the best that can be expected is an intake temperature is 0.5°F and that it is impossible to meet the demand for 0.2°F. Also that graduation of thermometer to 0.5°F is sufficient as too fine a division only leads to mistakes.

Reports indicate that $\frac{1}{2}$°C is the upper limit to the difference between temperatures observed by bucket and intake condenser methods. The trend is therefore in favour of adopting a reasonable accuracy in readings. The difficulties in scale reading make $\frac{1}{2}$° the best scale value from this point of view - for both Fahrenheit and Centigrade scales. The president of CIMO suggested a compromise "that specifications for marine thermometers, as regards accuracy of reading, should be 0.5°F or 0.25°C instead of 0.2°F and 0.1°C."

The president of CSM - The difference between sea surface and air temperatures is considered of the utmost importance by synoptic meteorologists. All efforts should be made to determine and report this difference with the highest accuracy. While realizing that under certain conditions measurements of sea surface temperature at one and the same place show a relatively high standard deviation and that there exists therefore a reason to read the temperature with less accuracy, I am still in favour of the old rule for requirement of precision (0.1°C).

The president of CCl - I consider that the proposal to reduce the precision required from 0.2°F to 1°F is an unfortunate step backwards. The difference between sea and air temperature is of importance to the synoptic meteorologist, and it is also important to the climatologist who wishes to study the energy exchange between ocean and atmosphere, in the fashion of Sverdrup and Jacobs. Anything that tends to blunt the accuracy of measurement of sea temperature is thus contrary to the interests of climatology.

The president of CAe - I entirely agree with the opinion of the president of CSM. It is obvious that the ocean surface temperature must be measured with a degree of accuracy greater than 0.5°C since the difference ($T_S T_S$) between air and sea temperatures has to be given accurate to within 0.5°C in the synoptic code. Again, from a purely scientific standpoint it is desirable to know the sea surface temperature as accurately as possible. In this connexion, the programme of the IGY provides for the study of the interaction between the atmosphere and the oceans and the sea temperature is one of the essential elements for this study.

The working group's comments brought out the following points:

All but 1 or 2 United States ships obtain sea temperatures from intake readings. Instructions specify reading to the nearest 0.2°F or 0.1°C but the weather logs show that the data are recorded to the nearest half or whole degree by ships' observers. Can we expect observers to obtain and record to an accuracy greater than 0.5°F or 0.25°C? For the present this seems to be a preferred specification.

Norway is strongly in favour of reading to 0.1°C both for air and sea temperatures, since, for forecasting, the difference is needed with the highest accuracy possible. The United Kingdom considers the degree required in observed temperatures (air and sea) should be maintained at 0.1°C (0.2°F). The Netherlands advises the proposal to read with an accuracy of 0.25°C which is quite unacceptable. The international punch-card provides three columns only so that a further choice to the nearest tenth would be needed. Sea thermometers are graduated in 0.2°C, so reading to an accuracy of 0.25°C would be far more difficult. An accuracy of 0.2°C could be accepted, and no serious objections are held to 0.5°C, as it is thought that a greater accuracy has not much sense.

It is evident that the desires of the users, and the limitations in the ability to provide, have determined two forms of accuracy requirement. If the accuracy of data provided is of the order of the nearest 0.5°C only, are the users justified in attaching a significance of greater accuracy to the observations by requesting the use of finer limits? It appears that the limitations in the instruments, in the observers and the purpose to be served, as raised by the president of CIMO, are of prime concern and determine the value to be attached to the significance of the data transmitted.

The commission may wish to:

(a) Determine if a compromise is possible;

(b) Decide which set of accuracy limits should now be used for sea surface temperatures, and advise the users accordingly;

(c) Keep the problem under continuous survey so that an adjustment to precision can be made if instrumentation and methods of observing improve.

ANNEX 2

COMMENTS OF THE SECOND SESSION OF THE COMMISSION FOR MARITIME METEOROLOGY ON THE METEOROLOGICAL PROGRAMME OF THE INTERNATIONAL GEOPHYSICAL YEAR

The commission commented on the following statements appearing in the meteorological programme of IGY which was adopted during the second session of CSAGI held in Rome in 1954:

(a) "That automatic weather buoys should be used in the southern seas where no synoptic surface observations are available. These buoys can measure and transmit water temperature, air temperature and pressure and the wind close to the sea surface."

(b) "That action should be taken without delay to standardize all the weather instruments to be used during IGY and that WMO should therefore organize in good time, well in advance of IGY, a worldwide comparison of all the radiosondes in use."

(c) "That cloudiness should be measured accurately at upper air stations (including weather ships) and on board merchant ships (especially those which depart from the usual commercial routes) with a view to a general analysis of radiation data, on a planetary scale."

The comments of the commission on the above statements were as follows:

(a) The statement on the use of automatic weather buoys was considered too optimistic.

(b) Meteorological services having voluntary observing ships should be urged to make a special effort to ensure that all instruments used aboard observing ships during the IGY are being checked against standard instruments.

(c) Meteorological services having voluntary observing ships should be requested to impress upon the observers on board these ships the importance of having the cloud observations made with special care during the IGY.

ANNEX 3

THE POSSIBILITIES OF IMPROVING, DURING THE INTERNATIONAL GEOPHYSICAL YEAR, THE NETWORK OF OBSERVATIONS FROM MERCHANT SHIPS BETWEEN 35°S AND 55°S AND IN OTHER OCEANIC AREAS WHERE OBSERVATIONS ARE RELATIVELY SPARSE

The commission recommends that the following instructions be included in the final report of the session, and also later on in the brochure on IGY, which will be issued by the WMO Secretariat in co-operation with the EC Working Group on the IGY:

(a) "Port meteorological officers of all maritime countries should be instructed to make special efforts, prior to and during the IGY, to find out what ships of any nationality are sailing from their ports on voyages which will take them into any part of the Southern Ocean or into unfrequented parts of the Atlantic, Pacific or Indian Oceans.

(b) The general principle should be to ensure that every such ship is visited with a view to securing the co-operation of her master and officers to make observations in some way or other.

(c) A concerted effort should be made to persuade as many as possible of these ships which have not been recruited as selected or supplementary ships at least to report in a short code form throughout the period they are in the areas referred to above during the IGY and to complete a log-book or form.

(d) The meteorological services of countries having ships plying in areas with sparse observations should send to port meteorological officers concerned (through their meteorological service) a supply of simplified code cards and handy-sized log-books or forms for recording the observations made during the IGY. All ships co-operating in this scheme should be requested to send the completed records to the meteorological service concerned at the end of the voyage or when the record is complete.

(e) A sufficient number of handy maps of the world showing areas where the ship is requested to report, and the radio stations, will be provided by the WMO Secretariat to the meteorological services concerned. This map should be supplied to the ship together with the necessary code-card, log-book or forms.

(f) For the purpose of obtaining the best possible observations from observing ships during the IGY, the attention of the meteorological services is invited to the provisions concerning checking of instruments and reports from ships as laid down in Technical Regulations 2.5.2.2, 2.5.2.3 and 2.5.2.5."

More details concerning the use of simplified code cards is given in the report on agenda item 6.4. It is emphasized that during the IGY all ships reporting in a short code form should also complete the log-book or forms since only the recorded data is to be used for the purposes of the international collection of IGY data by WMO.

ANNEX 4

CONSIDERATION OF THE BEST METHOD OF PREPARING AND MAKING AVAILABLE MARITIME DATA IN THE FORM APPROVED FOR USE DURING IGY

A plan has been accepted by the Executive Committee whereby all reports received from selected, supplementary and auxiliary ships during the IGY are to be published. When the log-books from the ships have been received and checked at the parent meteorological service, it will be the duty of that meteorological service to transfer these observations on to special forms the layout of which is contained in Form No. 2 annexed to CMM-II/Doc. 13. The forms will be collected at the Secretariat and a large number of forms will be photographed on one microcard. Sets of microcards can then be purchased from the Secretariat. It is not practical to use Form 2 when machine methods are used.

CMM-II has therefore studied ways and means of preparing and compiling alternative forms and makes the following comments and suggestions:

(a) For economical reasons the forms should be filled in to the greatest possible extent so that the number of microcards can be kept to a minimum. The number of microcards would no doubt be kept to a minimum if punch cards were used and these cards were tabulated in one establishment. However, this seems difficult to arrange but the working group recommends the lowest possible number of tabulating offices.

(b) All services which can do so should prepare their own punch cards.

As far as is known at present the following countries will tabulate their own cards: France, Germany, Japan, Netherlands, U.K., U.S.S.R., U.S.A. Any other country punching its own cards may tabulate them or make a bilateral agreement with one of the above mentioned countries, or with any other country using tabulation methods.

(c) If a national service is unable to punch its own cards or have them punched by a commercial firm then Form 2, detailed information of which has already been sent to Members by the Secretary-General, should be filled in using either a typewriter or handwriting and then despatched to the Secretary-General.

(d) A standard form [Form 2 (b)] suitable for use with tabulating machines is in attachment B to this annex.

(e) Recommendations regarding the instructions for the use of Form 2 (b) are shown in attachment A and should be issued to Members by the Secretary-General. The working group suggests that the commission asks the Secretary-General to consider this report and especially take the following action:

(1) To send a circular letter to Members asking them whether they plan to tabulate their own cards and if so whether they are willing to tabulate cards from other countries also.

(2) When all replies to the above letter have been received, to inform Members, who have no tabulating methods, of the countries which they may approach with a view to making a bilateral agreement for tabulating their data.

ATTACHMENT A TO ANNEX 4

RECOMMENDED INSTRUCTIONS FOR COMPLETING IGY FORM 2 (b)

1. The observations on Standard Form 2 (b) should be given in the same order as found in the international code. However, when using tabulating machines, arrangements should be taken into account to conform with the international punch-card. Provision should be made for:

Wind speed (ff)	3 columns fff (for values greater than 99 knots)
Air temperature (TT)	4 columns TTTT (for tenths of degrees and negative values)
Amount of pressure change (pp)	3 columns ppp (for values greater than 99)
Difference air-sea temperature (T_sT_s)	4 columns (for tenths of degrees and negative values)
Dew point (T_dT_d)	3 columns (for negative values)
Height of waves (H_w)	2 columns (for values greater than 30½ feet)

Thus Form 2 (b) would contain in

Group 1 $QL_aL_aL_aL_oL_oL_o$	7 figures
Group 2 Nddff	6 figures
Group 3 VVwwW	5 figures
Group 4 PPPTT	7 figures
Group 5 $N_hC_LhC_MC_H$	5 figures
Group 6 D_sv_sapp	6 figures
Group 7 $T_sT_sT_dT_d$	7 figures
Group 8 $d_wd_wP_wH_w$	5 figures

2. In the international punch-card there is a choice in the units used for temperature (°F or °C), wind direction (compass points or tens of degrees) and wind speed (Beaufort force or knots).

An indication of the units used should be given in the heading of Form 2 (b) in the following way:

	Used Units		
	Wind		Number of
Temperature	Direction	Speed	identification
Celsius	Compass points	Beaufort	1
Celsius	Compass points	Knots	2
Celsius	Tens of degrees	Beaufort	3
Celsius	Tens of degrees	Knots	4
Celsius	Compass points	m/s	5
Fahrenheit	Compass points	Beaufort	6
Fahrenheit	Compass points	Knots	7
Fahrenheit	Tens of degrees	Beaufort	8
Fahrenheit	Tens of degrees	Knots	9

3. The heading of the form should show the following:

Year Month Day Country Identification

All these data are given in figures and the figure for country is to be decided by the Secretary-General.

4. The time (GG) should be printed on the first tabulated line of each form and should only be re-printed when it changes. This applies also to the octant (Q).

The observations are tabulated line by line. When there is a change of time, two clear lines should be left and when there is only a change of octant one clear line. In the case where observations from more than one country are being tabulated on the same form, three clear lines must be left between each country.

5. A form should contain only observations made on one day. The top of the form should be stamped with the heading as shown in attachment B.

6. Form 2 (b) should be kept to a standard length (to be decided by the Secretary-General).

FORM 2(b) / FORMULAIRE 2(b)

IGY/AGI 1957-58

Synoptic surface observations - Sea stations / Observations synoptiques en surface - Stations maritimes

Year/année 56 Month/mois 02 Day/jour 17 Country/pays 17 Identification 8

GGQ	$L_aL_aL_aL_oL_oL_o$	Ndd	ffffVV	wwW	PPP	TTT	N_hC_Lh	$C_MC_HD_sv_sa$	ppp	$T_sT_sT_s$	$T_dT_dd_wd_wP_wH_wH_w$
000	603038	630	34978	58	056	058	684	002	04-031		04499 7
	597012	502	19850	20	139	037	425	60332	20-028	-02053	6
	603038	820	30966	12	079	038	873	008	51-047		00203 7
	601029	505	23851	58	109	046	435	65243	13-025	-0049	8
	603038	631	16980	22	137	014	555	20002	10-073	-04023	7
356	907 0	805	38967	17	250	-014	854	005	12-052	-04054	9
	568028	611	27988	58	309	-053	685	332	16-106	-08603	2
	569070	805	28970	17	254	-034	854	007	07-075	-04053	6
	597035	735	04981	52	282	022	784	002	18-012	-02023	5
	573018	610	30988	68	292	-043	696	323	00-107	-06623	2
	569069	509	20970	32	272	-046	554	00002	22-082	-06092	4
	597030	702	14981	58	244	017	583	60233	21-033	-02023	6
	576012	712	34978	58	280	-015	755	322	31-079	-07624	3
	597011	336	25980	21	203	025	385	00232	23-035	-01023	6

NOTE:

In the interest of uniformity and of easy reading of the microcard, it is recommended that the overall height of the form should be 21.0 cm.

Par souci d'uniformité et pour faciliter la lecture des microcartes, il est recommandé que la hauteur totale du formulaire soit de 21.0 cm.

ANNEX 5

REPORT OF WORKING COMMITTEE "R" ON ITEM 6.3 - SELECTED, SUPPLEMENTARY AND AUXILIARY SHIPS

The committee heard statements of the chairman and of various delegations concerning the present state of affairs with regard to the recruitment of selected and supplementary ships. A short summary of these statements is given in the following paragraphs:

The chairman gave an interesting statistical picture of the situation with regard to the recruitment of ships in various countries based upon the 1955 edition of the WMO publication 47 - International list of selected and supplementary ships. There are a number of uncertainties with regard to the total number of such ships in the world, but it seems likely that some 3-400 additional ships have been recruited since CMM-I.

The delegate of Norway stated that because of its heavy financial burden in operating a number of arctic stations of great international benefit, Norway was not in a position to make any great increase in the number of its selected ships at present. It was explained that a great number of Norwegian ships were recruited by other countries.

The delegate of the United States stated that the amount of money made available each year for payment of message tolls determines the number of ship reports that can be collected by the United States.

The United States will endeavour to collect as many ship reports as possible consistent with funds made available for this purpose.

The delegate of the United Kingdom pointed out the importance of finding out what difficulties were hindering a further development of the selected ship scheme and stated that his country had already recruited a substantial percentage of the world total of voluntary observing ships and that any difficulty in recruiting further ships in the U.K. was a financial one.

The delegate of Finland believed that his country would be able to increase the number of its selected ships in the near future.

The delegate of Sweden could not promise a great increase in the number of its selected ships, but recruiting was proceeding, and he believed that 30 new ships might be recruited in three years' time.

The delegate of Japan pointed out that the shipowners had little understanding of the nature of meteorological observations aboard their ships and suggested that insurance companies might be approached to obtain a lower premium for ships equipped with certified meteorological instruments.

The delegate of Germany informed the meeting that Germany was not in a position to increase its number of selected ships at present. He recommended that shipowners should be encouraged to equip their ships with instruments suited for meteorological purposes.

The delegate of the U.S.S.R. stated that his country had around 300 selected ships and that about half of them were navigating in foreign waters. Their main difficulties were connected with the transmittance of the messages, since most of their ships have only one radio-operator. In connexion with the statements made by previous speakers, he suggested that more emphasis should be laid upon the need for:

(a) providing more instruments,

(b) educating marine observers,

(c) informing shipowners of the value of making meteorological observations on board their ships.

The delegate of Spain said that his country would be prepared to recruit a number of selected ships in the near future.

The delegate of Indonesia explained that his country had not yet been able to recruit selected ships due to financial and other difficulties.

The observer of Greece stated that the difficulties in his country were mainly of a financial character.

The delegate of Italy also referred to some difficulties in his country, mainly of financial character, in recruiting selected ships. However, he gave the assurance that efforts would be made in increasing the actual number of their selected ships.

The delegate of France pointed out that with the present situation regarding the number of personnel dealing with maritime meteorology, it would be difficult to visit more ships than is being actually done.

The delegate of Poland stated that his country had not yet been able to recruit selected ships, but the matter was under consideration, and he hoped that some ships could be recruited in the first instance for reporting from the Baltic Sea and later on from the oceans.

The delegate of Belgium informed the meeting that his country would endeavour to recruit ten more ships in 1957.

The delegate of the Netherlands stated that although the number of Netherlands selected ships was already considerable a further increase in the number might be expected.

The delegate of Portugal stated that although his country has already recruited 37 per cent of the gross total tonnage of its merchant ships (that percentage being probably 60 per cent of the total tonnage of the Portuguese ships actually able to perform meteorological observations and report them by radio), his country will endeavour to recruit more selected ships.

The delegate of Viet-Nam explained that as from 1957 six Viet-Namese ships will report on winds, state of sky and state of sea, and should be inserted in the list of supplementary ships.

Note: The delegate of Hong Kong subsequently informed the Secretariat that the Hong Kong fleet of voluntary observing ships could not be increased at present but that each year more of these ships were being equipped with certified instruments to British selected ship standard.

The various suggestions for increasing the number of selected and supplementary ships put forward in the documents and during the debate were discussed by the committee and the following conclusions arrived at:

(a) The committee did not find it appropriate to recommend that Members be requested to recruit a certain percentage of their tonnage as selected or supplementary ships.

(b) The committee agreed that all possible efforts should be made to convince shipowners of the advantages of equipping their ships with good quality instruments which could be used for meteorological observations.

(c) The committee further agreed that CIMO should be requested to advise on the desired specifications of meteorological instruments for use at sea in order that instruments installed in the ships by the shipowner in accordance with these specifications could be used for meteorological purposes (vide recommendation 8).

(d) The committee also agreed that one of the most promising methods of obtaining more ship reports from sparse areas was to make use of ships equipped with uncertified instruments. The committee agreed that steps should be taken to recruit as many as possible of such ships, and that they should be requested to report in the short code form for ship reports adding (PPXTT) as an optional group (vide recommendation 14).

ANNEX 6

PROPOSED PLAN FOR ADDITIONAL WEATHER INFORMATION FROM SHIPPING IN CERTAIN SPECIFIED AREAS

(Submitted by South Africa)

1. The great increase in flying across the oceans and throughout the world now calls for greater meteorological coverage.

2. Certain areas of the oceans of the world are not adequately covered by the present "selected ship" scheme, although it is well known that shipping does in fact exist in these waters.

3. Ships crossing these oceans have in fact been visited by the port meteorological officers of certain countries (e.g. Canada, New Zealand, South Africa, U.S.A., etc.) and a considerable measure of success has been achieved by especially requesting radio weather messages from ships of different nationalities which do not belong to the "selected ship" scheme. As far as South Africa is concerned, British, Norwegian, Swedish, French, Greek, Italian and Brazilian ships are amongst many different nationalities who have kindly co-operated as voluntary observing ships whilst in South African waters. A tremendous amount of goodwill exists amongst seamen to assist, especially when codes are displayed in a simple manner and not too much is requested in the way of keeping records, etc.

4. The particular scheme has been so successful, that it is felt that the time may well have arrived when such a scheme could be put on an international basis, so that other countries may benefit too.

5. Without in any way interfering with the present "selected ship" scheme, it is proposed to add a class "D" to the existing scheme, which would more or less give the following categories:

CLASS "A"	Full "selected ships" with full sets of instruments and full codes.
CLASS "B"	"Supplementary ships" with limited instruments and limited codes.
CLASS "C"	The present "auxiliary ships".
CLASS "D"	Every other ocean-going ship, with ship's own instruments and simplified codes.
	(N.B. This is not intended to be a different code, but the ordinary international code presented in a simple form (enclosed)).

6. Classes "A", "B" and "C" ships would report in all areas of the world according to instructions which they now have.

7. Class "D" ships would report only when they are off the regular shipping routes of the world; and to leave no doubt as to where they should report, every ship of category "D" should be provided with a map of the world showing clearly these areas. These areas are to be defined by the countries taking part in the scheme. A copy of this map must be supplied to every class "D" ship for display in the ship's chart-room.

8. On this map should also be shown all the coast radio stations which agree to accept meteorological telegrams without charge to the ship or shipping company.

9. Some countries with large merchant fleets cannot possibly recruit classes "A", "B" and "C" ships in proportion to their fleets. All countries, however, should be able to recruit practically all their ships into class "D" because basically under the scheme each ship need only be supplied with one code card, one small map and a signal pad alone. However, the best arrangement would be for each ship to have the following items:

(a) Simplified code card (appendix A).

(b) Map of the world showing areas where the ship is obliged to report and the radio stations which will accept the messages free of charge.

(c) Signal pad (appendix B).

(d) Barometer conversion table to millibars for ships which are supplied with barometers reading in inches and millimetres.

10. The minimum requirement for every ocean-going ship in the world is a simplified code card (item (a) above). If this item alone were supplied to every ship, a tremendous advance would have been made and such a scheme could not be described as being costly.

11. Class "D" ships should take every opportunity to have their barometers checked and set, if possible, to read mean sea level pressure. A correction tally could be supplied by services for any alteration in the setting to be recorded as a correction which would obviously have to be applied when reading the barometer. Port meteorological officers in different parts of the world could easily attend to this matter.

12. Class "D" ships, when coding up their weather reports, may "X" the tenths figure of the coded barometric pressure, especially if the reliability of their barometer is open to doubt (see attached code card for example). This does not basically alter the international code in any way, but is an extension of the general idea of using "X" for any unknown or unmeasurable phenomenon. The argument here is that an unreliable barometer cannot read pressures to one-tenth of a millibar, therefore this can be "X"-ed. An unreliable pressure (from a class "D" ship in a valuable area) of say 1014.3

millibars would thus be coded as 14X, and the forecasters would at once know the reliability of the value. (This scheme has been in operation in South African waters from certain ships for several years with marked success.

13. From a shipping point of view, confusion exists today because there are so many different addresses throughout the world for radio weather messages. Amongst them are the following:

FLEET WEATHER CENTRAL	OBS
WEATHERDUN WIRE	METEO
WEATHER	METEOR
OBS WEATHER	AGRIMETEORO
OBSERVER	PHISERAR
OBSERVATORY	etc.

It is proposed to standardize the position. Ships offering weather reports should be allowed to address them simply to "MET" ..... (followed by the appropriate coastal radio station). The coastal radio station should then be responsible for forwarding the "MET" telegram to the correct centre.

14. Participating meteorological services should co-ordinate and link up their existing weather forecast areas to the needs of world shipping generally.

15. Participating meteorological services should approach shipping companies for general approval to this scheme. Companies might consider consulting meteorologists when ordering barometers and thermometers for their ships when purchasing instruments in the first place.

16. In the case of Panamanian, Costa Rican and Liberian ships, the countries of registry may not be able to consider the scheme of supplying all their shipping with class "D" codes. In this case, the CMM may consider approaching the owners for their co-operation. If the owners are not prepared to supply the necessary code card, the CMM might consider supplying the necessary forms through some other means.

17. The code card (attached) would of course have to be translated into the different languages of the owners. This should be done on a standard basis so that the meanings of the codes remain unchanged (similar forms in English, Greek, Swedish, Norwegian, Italian and French have been used for some years in Cape Town).

SPECIMEN OF SIMPLIFIED CODE CARD FOR USE OF AUXILIARY REPORTING SHIPS DURING IGY

SHIGY $YQL_aL_aL_a$ $L_oL_oL_oGG$ Nddff VVwxW PPxTT

GROUP No. 1

SHIGY

Abbreviation for "Ship observation during the IGY." The prefix SHIGY should be included in each message

GROUP No. 2

$YQL_aL_aL_a$

Y = Day of the week

1 = Sunday
2 = Monday
3 = Tuesday
4 = Wednesday
5 = Thursday
6 = Friday
7 = Saturday

Q = Longitude and hemisphere indicator

NORTHERN HEMISPHERE

0 = 0° - 90° WEST
1 = 90° - 180° WEST
2 = 90° - 180° EAST
3 = 0° - 90° EAST

SOUTHERN HEMISPHERE

5 = 0° - 90° WEST
6 = 90° - 180° WEST
7 = 90° - 180° EAST
8 = 0° - 90° EAST

$L_aL_aL_a$ = Latitude in degrees and tenths*

Example: 31°28'S = 31,4
$L_aL_aL_a$ = 314

GROUP No. 3

$L_oL_oL_oGG$

$L_oL_oL_o$ = Longitude in degrees and tenths*

Examples: 04°05'E = 04.0
$L_oL_oL_o$ = 040
102°10'E = 102.1
$L_oL_oL_o$ = 021

Note : The hundreds digit is omitted

* Tenths are obtained by dividing the number of minutes by 6, disregarding the remainder

GROUP No. 3 (continued)

GG = GMT of the observation to the nearest hour

00 = 0000 GMT
06 = 0600 GMT
12 = 1200 GMT
18 = 1800 GMT

Note: Please take the observations as near to these times as possible.

GROUP No. 4

Nddff

N = Cloud coverage

0 =
1 =
2 =
3 = (WMO -
4 = SPECIFICATIONS
5 = CODE 60)
6 =
7 =
8 =
9 =

dd = True direction of the wind over sea surface to the nearest 10°

dd	Pts of compass	Degrees
00	CALM	
02	NNE	20°
04	NE	40°
06	ENE	60°
08	E	80°
10	ESE	100°
12	SE	120°
14		140°
16	SSE	160°
18	S	180°
20	SSW	200°
22	SW	220°
24		240°
26	WSW	260°
28	W	280°
30	WNW	300°
32	NW	320°
34	NNW	340°
36	N	360°

GROUP No. 4 (continued)

ff = Wind speed over sea surface in KNOTS

Knots ff		Equivalent Beaufort force
00	=	Calm
02	=	1
05	=	2
09	=	3
13	=	4
18	=	5
24	=	6
30	=	7
37	=	8
44	=	9
52	=	10
60	=	11
68	=	12

GROUP No. 5

VVwxW

VV = Visibility

90 =
91 =
92 =
93 = (WMO -
94 = SPECIFICATIONS
95 = CODE 84)
96 =
97 =
98 =
99 =

w = Present weather

0 =
1 =
2 =
3 = (WMO -
4 = SPECIFICATIONS
5 = CODE 90 A)
6 =
7 =
8 =
9 =

Note : Choose the highest figure applicable

GROUP No. 5 (continued)

x is invariably to appear in the message in this group

W = Past weather during the preceding 6 hours

0 =
1 =
2 =
3 = (WMO -
4 = SPECIFICATIONS
5 = CODE 90)
6 =
7 =
8 =
9 =

GROUP No. 6

PPxTT

PP = Last two figures of the atmospheric pressure in whole millibars

Examples :	MBS		PP
	1016.0	=	16
30.32"	= 1026.8	=	27
745 mm	= 993.2	=	93

x is invariably to appear in the message in this group

TT = Outside air temperature in degrees F or C

Examples :	TT
57°F	= 57
19°C	= 19
6°C	= 06
-2°C	= 52

Note : 50 is added to temperatures below 0°C

INSTRUCTIONS :

1. In the interests of trans-ocean flying as well as safety of life at sea, your ship is earnestly requested to transmit radio weather reports when off the regular shipping routes.
2. The map provided shows clearly the areas from which weather reports are so urgently needed. DISPLAY IT PROMINENTLY IN YOUR CHART-ROOM.
3. Address reports to the nearest coastal radio station shown on the map. There is NO CHARGE to ships for radio WEATHER messages to these stations.
4. The co-operation of all ships will enable weather services to provide better and more reliable shipping and aviation forecasts.
5. Whenever possible, have your barometer checked and remember to apply the appropriate correction.

RADIO WEATHER REPORT

PREFIX	SHIP	NUMBER	WORDS	DATE FILED	TIME FILED

SERVICE INSTRUCTIONS

SENT TO	DATE SENT	TIME SENT	SENT BY

ADDRESS

SHIGY	$YQL_aL_aL_a$	$L_oL_oL_oGG$	Nddff	VVwxW	PPXTT
SHIGY					

PLAIN LANGUAGE REMARKS : _____

_____

Signature : _____

ANNEX 7

INSTRUCTIONS ON THE IMPLEMENTATION OF THE SCHEME DESCRIBED IN ANNEX 6

With regard to the implementation of the scheme for additional report from ships in sparse areas, suggested in annex 6, the commission agreed that the following principles should be recorded in the final report of the session for guidance of the meteorological services concerned:

(a) The scheme should apply only to ships not recruited in the voluntary observing ships system.

(b) Elements and specifications used in the respective code form should conform with the WMO regulations.

(c) For the scheme to be successful, some kind of simplified code card must be used (see attachment A to annex 6).

Because of language problems, each national service should produce its own simplified code cards, taken the card prepared at CMM-II as a guide.

(d) A supply of radio message forms (see attachment B to annex 6) and, if necessary, a barometer conversion table should also be supplied.

(e) A map of the specified sparse areas, in which these ships are asked to report, is also necessary.

An up-to-date map was prepared at CMM-II, and this should either be produced in bulk by WMO and distributed to meteorological services according to their requirements, or if this is not possible, reproduced by national services from master copies.

(f) National services, either through their port meteorological officers or their shipping companies, should put a copy of the code card, message forms and map on board as many as possible, both of their own ships and any other ships, visiting their ports, not covered by the existing voluntary observing system.

ANNEX 8

COMMENTS OF THE SECOND SESSION OF CMM ON WMO PUBLICATION No.9.TP.4,VOLUME D

1. Part A should include map B of resolution 37 (CD Washington, 1947), as brought up to date by CMM-II.

2. Part B should include:

2.1 Only those radio shore stations that accept weather messages free of charge to the ships;

2.2 A statement that all radio shore stations listed in the tables which follow will accept weather messages free of charge to ships;

2.3 A statement to the effect that selected and supplementary ships may forward their reports to any one of the shore stations responsible for the area in which they are navigating,unless otherwise instructed by their parent meteorological service;

2.4 The map annexed to resolution 25 (EC-III) entitled: "Map showing density of weather reports over the oceans", as brought up to date by CMM-II;

2.5 Map A of resolution 37 (CD Washington, 1947), as brought up to date by CMM-II.

3. Part D.

3.1 The title of chapter 1, part D should be:
"WMO practices and procedures concerning meteorological reports, and the provisions of meteorological service for shipping";

3.2 The information planned for chapter 7, part E, entitled "Reporting practices" should be transferred to chapter 1, part D;

3.3. This chapter should contain an up-to-date revision of part C, fascicule IV, including:

(a) The substance of WMO resolutions listed in appendix C, document 27/CMM-II;

(b) Technical regulations relating to reports from ships as well as service to shipping;

(c) General arrangements to supplement the text of the Technical Regulations;

(d) The relevant reporting practices and information supplementing chapter 10, WMO publication No.8.TP.3; and

(e) Some guidance on preparing weather maps on shipboard.

3.4 Each section of chapter 1 should begin with the applicable Technical Regulations of each subject with marginal references as to its source, followed by further details of agreed practices;

3.5 Chapter 1 should be prepared by the Secretariat in consultation with the president of CMM;

3.6 The following statement should be inserted in the appropriate section of chapter 2, part D:

"When enlisting new ships, other than selected and supplementary ships for weather reporting, port meteorological liaison officers should in all cases check the reliability of the ships' meteorological instruments. They should not institute such reporting service from ships unless the barometers and thermometers read an acceptable standard of reliability."

4. All important changes in volume D should be agreed to by CMM but minor revisions owing to actions of the Executive Committee and Congress to be incorporated by the Secretariat after consulting the president of CMM; the president to decide when any amendment should be referred to CMM members for prior concurrence.

Resolutions and recommendations approved by CMM hereafter should indicate whenever the substance thereof should be included in WMO publication No.9.TP.4, volume D, or in any other appropriate WMO publication.

The contents of volume D will be as shown in the outline attached to recommendation 31.

Further reference to the content of volume D is contained in annex 11 to this report.

ANNEX 9

Annex to recommendation 24 (CMM-II)

GUIDANCE TO THE REPRESENTATIVE OF THE COMMISSION FOR MARITIME METEOROLOGY TO THE ORDINARY ADMINISTRATIVE RADIO CONFERENCE OF THE INTERNATIONAL TELECOMMUNICATION UNION

I. Facilitating the collection of weather observations from the oceans

(a) Priority - Radio Regulations (Atlantic City, 1947) chapter XV- Radiotelegrams - article 38: Order of priority of communications in the mobile service.

The order of priority of communications in the mobile service is as follows:

1. Distress calls, distress messages and distress traffic
2. Communications preceded by the urgency signal
3. Communications preceded by the safety signal
4. Communications relative to radio direction-finding bearings
5. Radiotelegrams relative to the navigation and safe movement of aircraft
6. Radiotelegrams relative to the navigation, movements and needs of ships, weather observation, messages destined for an official meteorological service
7. Government radiotelegrams for which priority right has been claimed
8. Service radiotelegrams relating to the working of the radiocommunication service or to radiotelegrams previously transmitted
9. All other communications.

Prior to the 1947 Atlantic City Convention ships' weather messages were included in category 9 in the order of priority for transmitting all messages. Since ships' messages are now included in category 6 it appears that this priority for transmission of ship messages is now satisfactory and no further efforts in this connexion need be stressed by the WMO representative.

(b) Times of observations for ship reports

In many cases the times of observations for ship reports fall outside the hours of duty of the radio-operators. This may have two consequences:

(i) some of the observations are missed altogether;
(ii) some of the observations are greatly delayed.

Only ships with a continuous service and ships with 16 hours service in 2 zones, have no difficulties in this respect. The great majority, viz. the ships with 8 hours service and the "single operator" ships which generally follow the same watch-keeping schedule, have to take special measures.

A proposal to change the existing watch-keeping schedules solely to benefit meteorological services would be unreasonable.

The only way to meet the above difficulties is to draw the attention of marine observers to resolution 112 (CD Washington, 1947) and to invite them in certain cases to send messages of observations taken during the time that their WT station is closed as soon as the WT service has been resumed.

(c) Radio equipment of the ships and relaying of weather messages

The number of ocean-going ships fitted only for medium frequency transmission is quickly decreasing. However, ships with less powerful and less modern radio equipment still exist and when they are in mid-ocean they cannot clear their weather messages without retransmission through other ships.

Article 9 of the additional Radio Regulations (Atlantic City, 1947) states:

1. Stations of the mobile service must, if the sender so requests, serve as intermediaries for the exchange of radiotelegrams originating in or destined for other stations of the mobile service; the number of intermediary stations of the mobile service is, however, limited to two.

2. .....

3. The transit charge, whether two intermediary stations are concerned or only one, is fixed uniformly at forty gold centimes (0 fr.40) per work pure and simple, without the collection of a minimum charge. When two stations of the mobile service have participated, this charge is divided equally between them.

In regulation 4, paragraph V of chapter V of the International Convention on Safety of Life at Sea, 1948, the Contracting Parties undertake to encourage ships that cannot reach the land station, to have their weather messages relayed by an ocean weather station or some other ship that can reach the land station.

There seems no doubt that ocean weather stations will offer their intermediary service free of cost, but the question of cost in case the messages are retransmitted by other ships needs consideration.

(d) Congestion in busy areas and other difficulties in the delivery of weather messages

It is difficult to judge how far congestion at certain land stations is a cause of delay or dropping out of weather messages. The right way to get an insight into this question is to request the masters of ships to report all cases when difficulties arise. So far a number of incidental complaints have been received.

Sometimes it appears that radio-operators on board passenger steamers forget that weather messages have priority over private telegrams and news reports with the result that these messages suffer delay or have been dropped altogether.

The above questions mainly lie on the national level and it seems up to the meteorological services of maritime countries to look into them and to take measures for improvement.

When the failing of land stations of foreign countries is reported the complaints can be brought to the notice of the meteorological services of these countries through the WMO.

II. Seeking uniform agreement that ship tolls and shore tolls on ships' weather messages be waived

In article 4, paragraph 2051, Additional Radio Regulations (Atlantic City, 1947) the charges on all meteorological radiotelegrams are reduced by at least 50 per cent.

These charges are:

(a) Ship charge
(b) Land station charge
(c) Charge for transmission over the general telecommunication network.

It is most important to ensure that no charges are incurred by the ships for sending weather messages. It is known that the operating companies of certain countries (e.g. USA, Great Britain, Netherlands) make no ship charges for weather messages sent to shore stations authorized to handle such traffic. This obviously is a great advantage especially because it avoids complications when the ships make weather reports to foreign stations.

Annex D, recommendation 15 of the International Convention on Safety of Life at Sea, 1948, is worded as follows:

> "The conference, recognizing the value to safety at sea of radio weather messages from ships transmitted to appropriate shore stations in accordance with regulation 4 of chapter V of the present convention, recommends that each government should endeavour to arrange that such messages shall be free of cost to the ship concerned."

It would be in line with this recommendation if other countries could reach the same arrangement. A recommendation to this effect might be issued by the WMO to the various maritime countries.

To a certain extent the same applied to the land station charge. The owners of the ships must not get a bill for the cost of weather reports. In accordance with resolution 37 (CD Washington, 1947) the meteorological service in whose area a ship is navigating when sending the messages and to whom the message must be addressed, bears the cost incurred.

The question of how much the shore station will charge the meteorological messages seems to be an internal affair of the various countries and ought to be settled on the national level.

It goes without saying that all problems would be solved if weather messages could be classified in the category of telegrams of "immediate general interest", which, according to paragraph 2042 of the Additional Radio Regulations, are exempt from all charges. At present the following messages fall within this category:

(a) Distress messages and replies thereto;
(b) Messages originating in mobile stations notifying the presence of icebergs, derelicts and mines, or announcing cyclones and storms;
(c) Messages announcing unexpected phenomena threatening air navigation or the sudden occurrence of obstacles at airports;
(d) Messages originating in mobile stations notifying sudden changes in the position of buoys, the working of light-houses, devices connected with buoyage, etc.;
(e) Service messages relating to the mobile service.

Radio weather messages which concern tropical storms are by regulations 2 and 3, chapter V (International Convention on Safety of Life at Sea, 1948) listed as "danger messages". It is suggested that radio weather messages concerning temperate zone storms can also legitimately be considered as "danger messages", particularly for vessels operating in coastal waters. The number of shipping casualties, due to temperate zone storms, is still very considerable. Similarly, fog constitutes a considerable danger to navigation. It is suggested that it would not be unreasonable to consider that all radio weather messages emanating from a ship are items of "immediate general interest" not only to shipping but also to aviation, or other forms of transport, and to almost all human activities.

Adoption of the above proposal would solve at the same time the problem of the cost of relaying weather reports from ships by other ships.

III. Representation of the World Meteorological Organization in regard to frequency requirements for maritime purposes

~~Generally speaking~~ it seems that the number and variety of frequencies ~~for maritime~~ purposes shown in the table of frequency allocations, ~~Radio Regulations, chapter III,~~ is sufficient. If, however, difficulties should arise which cannot be settled locally or between neighbouring countries, these difficulties ought to be brought to the notice of the WMO. The Secretariat may, if necessary, submit the matter to the ITU either by correspondence or at the next Ordinary Administrative Radio Conference of that union.

訂正表

Page 85 - Annex 9 - III - Amend first sentence to read :

Generally speaking, it seems that the number and variety of frequencies for maritime services shown in the table of frequency allocations, Radio Regulations, chapter III, is sufficient for the purposes of maritime meteorology.

ANNEX 10

Annex to recommendation 30 (CMM-II)

PROPOSED AMENDMENTS TO TECHNICAL REGULATIONS RELATING TO MARITIME METEOROLOGY

Amend the following definitions to read:

Auxiliary ship station. A station situated aboard a moving ship and established by a Member with the voluntary co-operation of the owners of the ship and the ship's captain. It is normally not equipped with certified meteorological instruments and makes reports on request in certain areas and under certain conditions in the short code form for surface reports from ships, or in plain language.

Mobile ship station. A station situated aboard a moving ship.

Ocean weather station. A fixed maritime location occupied by a ship equipped and staffed to observe the elements specified in 3.1.1.2 and 4.1.1.1 and report the observations for international exchange.

Selected ship station. A station situated aboard a moving ship and established by a Member with the voluntary co-operation of the owners of the ship and the ship's captain. It is equipped with a full set of certified meteorological instruments, and makes reports in the full code form for surface reports from ships.

Supplementary ship station. A station situated aboard a moving ship and established by a Member with the voluntary co-operation of the owners of the ship and the ship's captain. It is equipped with a limited set of certified meteorological instruments, and makes reports in the abbreviated code form for surface reports from ships.

Delete the Note following paragraph 2.2.1.5.

Add the following new paragraph after 2.2.1.5:

2.2.1.5.A

Members should also recruit ships registered under the flags of countries other than their own to furnish meteorological reports. In each case, the Member recruiting a ship registered under the flag of another Member should immediately notify the Member concerned of the action taken.

Amend paragraph 2.2.1.6 to read:

The recruitment programme of each Member should endeavour to make the maximum possible contribution to the network of mobile ship stations in each ocean area.

Add the following Note after the new paragraph 2.2.1.6.

N O T E : A map showing the density of ship reports received from all oceans is included in publication No. 9. TP.4, volume D.

Amend paragraph 2.2.1.7 to read:

Arrangements by Members for ships' surface observations should aim at securing collectively a density of ships' reports...

Amend paragraph 2.2.1.8 to read:

Arrangements by Members for ships' upper air stations, wherever they are established, should aim at securing...

Amend paragraph 2.5.2.2 (c) to read:

(c) To maintain liaison with the owners or local agents of ships of all nationalities with a view to enlisting the ships' co-operation in furnishing meteorological reports in accordance with paragraphs 2.2.1.5 and 2.2.1.5.A (new), provided that the basic instructions for meteorological reports from the ships are not modified by such action.

Add the following new sentence at the end of paragraph 2.5.2.4:

If the ship in question was recruited by another Member, the Member receiving the complaint should forward it to the Member concerned.

Amend paragraph 3.1.1.3(q) to read:

(q) Height of waves.

Replace the Note in paragraph 3.3.1.7 by the following:

N O T E : For specific instructions relative to furnishing by ships special meteorological reports in accordance with the Convention for Safety of Life at Sea, see publication No. 9. TP.4, volume D.

Add at the end of paragraph 3.5.1.3 the reference "(see 8.2.1.4)".

Amend paragraph 3.5.1.4 to read:

A Member should collect the meteorological log-books from all ships it has recruited.

Add new paragraph:

3.5.1.4.A

A Member receiving meteorological log-books from a ship belonging to another Member should, if requested, loan these log-books to the Member with which the ship is registered.

Amend paragraph 8.2.1.4 to read:

The international maritime punch card given in annex VI* should be used for permanent records of synoptic surface observations made at sea stations.

Amend paragraph 10.2.2 to read:

Gale warnings, storm warnings and warnings of tropical cyclones

Amend paragraph 10.2.2.1(b) to read:

(b) Type of warning: English	Corresponding wind Beaufort
Gale warning	Force 8 or 9
Storm warning	Force 10 or over

Warning of tropical cyclones

Tropical cyclones to be classified as indicated in WMO publication No. 9. TP.4, volume D, part D, chapter I.

Amend paragraph 10.2.2.1(h) to read:

(h) Beaufort force and, if known, wind speed in knots or in metres per second, and wind direction in various sections of affected areas.

(Page 88 - Annex 10 - Add at the end of the annex :)

訂正表

Add at the end of paragraph 10.2.3.6 :

N O T E : Where English cannot be used, Part III should be broadcast in the language of the issuing Member and in a short forecast code.

Amend paragraph 10.2.3.7 to read :

Synopsis and forecasts shall be given in plain language except as provided for under 10.2.3.6, Note.

Amend paragraph 10.2.3.10 to read :

All positions should be given in terms of latitude and longitude, or with reference to well-known landmarks.

Add new paragraph :

10.2.3.10.A

Forecast areas should preferably be delineated with reference to well-known landmarks or in terms of latitude and longitude. In coded bulletins, as provided for in the Note to paragraph 10.2.3.6, letters and/or figures may be used to designate forecast areas.

Attachment to annex 10

MODEL OF INTERNATIONAL MARITIME PUNCH-CARD

TO BE PRINTED ON THE CARD

Country of origin

Marsden system or latitude and longitude

Fahrenheit or Centigrade

Compass points or tens of degrees

Beaufort force or knots

Universal columns

Optional columns

		Optional Alternatives
1	Country of origin	
2 3	Year	
4 5	Month	
6 7	Day of month	
8		Octant (Q)
9 10	Marsden square	Latitude (degrees and tenths) ($L_aL_aL_a$)
11 12	1° square	Longitude (degrees and tenths) ($L_oL_oL_o$)
13	0.1° latitude	
14	0.1° longitude	
15 16	GMT	
17	Total cloud in oktas (eighths)	
18 19	Wind direction (true) in points	Wind direction (true) in tens of degrees
20 21	Beaufort force	Wind speed in knots
22 23	Visibility (VV)	(All symbolic letters have the meanings specified in WMO publication No. 9, volume B)
24 25	Present weather (ww)	
26	Past weather (W)	
27 28 29 30 31	Barometer (corrected)	
32 33 34	Air temperature to 0.1° (°F or °C)	
35 36 37	Wet bulb temperature to 0.1° (°F or °C)	
38	Low cloud, amount in oktas (eighths)	
39	Low cloud, type C_L	
40	Low cloud, height (h)	
41	Medium cloud, type (C_M)	
42	High cloud, type (C_H)	
43 44 45	Temperature of sea water to 0.1° (°F or °C)	
46 47 48	Air-sea temperature difference to 0.1° (°F or °C)	
49 50	Waves, direction (d_wd_w)	
51	Waves, period (P_w)	
52 ... 80	Waves, height	

ANNEX 11

Annex to recommendation 31 (CMM-II)

LAY-OUT OF PUBLICATION No.9. TP.4, VOLUME D
INFORMATION FOR SHIPPING

Introduction

PART A - Meteorological broadcast schedules

Region I - Africa
Region II - Asia
Region III - South America
Region IV - North and Central America
Region V - South-West Pacific
Region VI - Europe

PART B - Shore stations accepting ships' reports

Region I - Africa
Region II - Asia
Region III - South America
Region IV - North and Central America
Region V - South-West Pacific
Region VI - Europe

PART C - List of meteorological liaison officers in ports of the world

Region I - Africa
Region II - Asia
Region III - South America
Region IV - North and Central America
Region V - South-West Pacific
Region VI - Europe

PART D - International regulations concerning ships' reports and the provision of information for shipping

Chapter I - WMO practices and procedures concerning meteorological reports from ships at sea and the provision of meteorological service for shipping

Chapter II - General regulations determined by the International Convention for Safety of Life at Sea (London 1948) . . . . . .

Chapter III - Regulations determined by the International Conventions governing telecommunications which are applicable to meteorological services

PART E - Meteorological and non-meteorological codes and observation practices

Chapter I - Code forms

Chapter II - Meaning of symbolic words and groups

Chapter III - Specifications of symbolic letters or groups of letters

Chapter IV - Specification of code figures (code tables)

Chapter V - Regional codes

Chapter VI - Non-meteorological codes (various ICE codes, Q-code)

PART F - Glossary of meteorological terms in English, French, Spanish and Russian

PART G - Miscellaneous

Chapter I - Equivalents, constants and tables

Chapter II - The universal time system

LAY-OUT OF CHAPTER I, PART D, VOLUME D
OF WMO PUBLICATION No. 9. TP.4

WMO practices and procedures concerning meteorological reports from ships at sea and the provision of meteorological service for shipping

1. Definitions
(Relevant definitions from the Technical Regulations)

2. Meteorological observing stations
(Recruitment of voluntary ships, based on relevant paragraphs of chapter 2, Technical Regulations, volume I)

3. Supervision of mobile ship stations
(Port liaison officers, based on relevant paragraphs of chapter 2, Technical Regulations, volume I)

4. Information relating to stations
(Reference to list of selected ships, chapter 2 of Technical Regulations, volume I)

5. Surface observations from mobile ship stations. Composition of observations, times of observation, observing and reporting programme

6. Reporting practices
(Including recording and preservation of observations, supplementing information given in chapter 10, publication No. 8. TP.3)

7. Upper air observations from mobile ships
(A short note only)

8. Meteorological codes
(One sentence only with cross reference to part E of volume D)

9. Meteorological telecommunications
(Based on relevant parts of chapter 6, Technical Regulations, volume I)

10. Maritime climatological practices
(Based on relevant parts of chapter 8, Technical Regulations, volume I)

11. Meteorological service for shipping
(Based on chapter 10, Technical Regulations, volume I and the relevant resolutions of the Executive Committee).

ANNEX 12

Annex to resolution 1 (CMM-II)

RECOMMENDATIONS ADOPTED BEFORE THE SECOND SESSION AND MAINTAINED IN FORCE

Rec.6 (CMM-I) - DELAY IN RECEIPT OF SHIPS' MESSAGES OWING TO TRANSMISSION DIFFICULTIES

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING resolution 37, paragraphs 3(a), (b), (CD Washington, 1947),

CONSIDERING,

(1) That selected and supplementary ships have experienced difficulties in clearing reports with land stations in certain reporting areas;

(2) The importance of receiving ships' weather messages with the least possible delay in transmission;

RECOMMENDS to the Executive Committee that meteorological services of countries whose ships encounter such difficulties repeatedly should communicate promptly with the meteorological service concerned giving full particulars as to dates and times and send a copy to the president of the Commission for Maritime Meteorology.

Rec.10 (CMM-I) - DEFINITIONS OF LENGTH, HEIGHT, PERIOD AND SPEED OF WAVES

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING resolution 63 (CD Washington, 1947); and

CONSIDERING that international definitions of length, height, period and speed of waves are required in amplification of this resolution,

RECOMMENDS that the following definitions be included in resolution 63 (CD Washington, 1947):

Wave length: The horizontal distance between successive crests or troughs (It is equal to the wave period multiplied by the wave speed).

Wave height: The vertical distance between trough and crest.

Wave period: The time between the passage of two successive wave crests past a fixed point (It is equal to the wave length divided by the wave speed).

Wave speed: The distance travelled by a wave in a unit of time (It is equal to the wave length divided by the wave period).

For meteorological purposes the average value of each of the above characteristics is used, as obtained from the larger well formed waves of the wave system being observed.

Rec.25 (CMM-I) - SPECIFICATION FOR HEIGHT OF WAVES

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING resolution 64, paragraph (c), (CD Washington,1947),

CONSIDERING,

(1) That the descriptive terms for height of waves recommended therein are not of general application, in that their customary interpretation by users is in terms of the steepness of the waves and not of height only;

(2) The undesirability of introducing more than one set of descriptive terms for height of waves;

RECOMMENDS to the Executive Committee that, in regions where the correspondence between the descriptive terms and the height of waves given in the paragraph referred to is not applicable, the actual height of waves in feet or metres be used when supplying weather information and forecasts for shipping, publications, pilots, etc.

Rec.27 (CMM-I) - SPECIAL RADIO STORM WARNING BULLETINS FOR TROPICAL AREAS

The COMMISSION FOR MARITIME METEOROLOGY,

NOTING resolution 44 (CD Washington,1947) and recommendation 1, (Conference on storm warning procedures, Manila, May 1949),

CONSIDERING,

(1) That recommendation 1 (Manila 1949) has been implemented and proved to be satisfactory for use in storm warning bulletins for ships in western north Pacific waters, including the China seas;

(2) That provisions of recommendation 1, with slight modifications may be found useful in other parts of the world where tropical cyclones are encountered; and

(3) That resolution 44 (CD Washington, 1947) is considered to be sufficiently flexible to allow the use of more detailed specifications to meet regional purposes and does not require amendment;

RECOMMENDS to the Executive Committee that the provisions based on Manila recommendation 1, as given in the annex to this recommendation, be brought to the attention of regional associations which are concerned with tropical cyclones for consideration.

A N N E X

(Reference IMO resolution 44 CD Washington, 1947)

Suggested content and order of items for storm warning bulletins issued on marine broadcasts by W/T for shipping on the high seas in regions where tropical cyclones may be encountered.

1. International call (TTT)

2. Statement of type of warning

	Corresponding wind	Beaufort force
(Warning	Up to 33 kts.	Up to 7
(Tropical disturbance of unknown origin	Wind speed uncertain	-
Gale warning	34-47 kts.	8-9
Storm warning	48-63 kts.	10-11
Hurricane (or local synonym warning)	64 kts. and over	12 and over

(Note: The dual use of the word "Warning" alone will not give rise to misunderstanding, as the text of the bulletin will make it clear).

3. Time of reference GMT in the international six figure date time group.

4. Type of disturbance (low, monsoon gale, tropical storm, etc.)

Tropical cyclones to be classified as:

(a)	Tropical depressions:	Winds up to 33 kts.
(b)	Moderate tropical storms:	Winds from 34 to 47 kts.
(c)	Severe tropical storms:	Winds from 48 to 63 kts.
(d)	Hurricanes (or local synonym):	Winds 64 kts. and over
(e)	Tropical disturbance of unknown intensity:	Wind speed uncertain

5. Location of disturbance:

   (a) Position of storm centre to be given in degrees (and tenths when possible) of latitude and longitude.

   (b) Latitude and longitude to be given in words and not in figures to avoid errors in transmission.

   (c) Information to be given as to the degree of certainty with which the centre is located.

6. Direction and speed of movement of disturbance. Speed of storm centre to be given in knots; direction to the nearest of sixteen points of the compass, or in degrees to the nearest ten.

7. Extent of affected area.

8. Force and direction of wind in various sections of affected area. Wind speeds should be given, if possible, for different distances from the centre in the various sectors of the storm area. Wind speeds to be given in knots; distances in nautical miles.

9. Further indications (if any).

LIST OF DOCUMENTS DISTRIBUTED BEFORE AND DURING THE SECOND SESSION OF THE COMMISSION FOR MARITIME METEOROLOGY

Doc. No.	Title of Document	Agenda Item	Submitted by
1	Provisional agenda	-	President of CMM
2	Explanatory memorandum	-	President of CMM
3	Revision of wind speed equivalents	5.2.5	Netherlands
4	Observing and reporting sea waves	6.11	Netherlands
5	Reconsideration of certain IMO resolutions in the field of maritime meteorology	6.6.1	Secretary-General
6	The possibility of using a short forecast code as an alternative to the present system of issuing weather bulletins for shipping in English as well as in the language of the issuing country	6.8	President of CMM
7	Investigation of thunderstorm frequency at sea	6.12	President of CMM
8	Consideration of the report of the scheme for reports from whaling ships	6.2	President of CMM
9	Improvement of the network of observations from ships in areas where merchant shipping is normally relatively sparse	6.4	President of CMM
10	Establishing relations with international fisheries	6.10	Secretary-General
11	Upper air observations aboard whaling ships during the IGY	6.1.1	President of CMM
12	The possibility of improving the network of observations from merchant ships between 35°S and 55°S and in other relatively sparse oceanic areas during the IGY	6.1.2	President of CMM
13	Consideration of the best method of preparing and making available maritime data in the form approved for use during the IGY	6.1.3	President of CMM

Doc. No.	Title of Document	Agenda Item	Submitted by
14	WMO Guide to international meteorological instrument and observing practice (WMO publication No.8.TP.3, 1954) chapter 10	6.14	President of CMM
15	A general consideration of the codes (FM 21.A, 22.A and 23.A) at present in use for the transmission of radio weather messages from ships	6.11	President of CMM
16	Selected, supplementary and auxiliary ships	6.3	President of CMM
17	Aerological observations from merchant ships	6.15	President of CMM
18	Reporting of rainfall group 7RRjj by ships	6.5	President of CMM
19	Report by the chairman of Working Group D	5.4	Chairman of Working Group
20	Proposed modification to the code for reporting state of sea surface	6.17	United Kingdom
21	Inspection of instruments by meteorological liaison officers	6.16	President of CMM
22	Interim report submitted by Working Group A	5.1	Working Group A
23	The descriptive terms for wave height	5.1.1	Working Group A
24	Definition of the term "storm warning"	5.1.2	Working Group A
25	International award plaque for selected ships	5.1.3	Working Group A
26	International exchanges of blank weather maps	5.1.5	Working Group A
27	Consideration of the status and contents of WMO publication No.9.TP.4, volume D	6.6.2	Secretary-General
28	A review of resolutions and recommendations adopted by CMM-I	6.7	Secretary-General

Doc. No.	Title of Document	Agenda Item	Submitted by
29	Report by the chairman of Working Group on Ice Nomenclature to CMM-II	5.5	Chairman of Working Group
30	Adjustments of the oceanic areas allocated to certain countries for the reception of reports from ships and for the issue of bulletins to ships	6.13	Secretary-General
31	Preliminary report from chairman of Working Group on applied meteorology and climatology	5.3	Chairman of Working Group C
32	Storm warnings for tropical areas	5.1.2	President of RA II
33	Reporting of precipitation group 7RRjj by ships	6.5	Netherlands
34	Consideration of the maritime portion of the WMO Technical Regulations	6.9	Secretary-General
35	Measurement of sea surface temperature	5.2.1	Chairman of Working Group B
36	Estimate of cost of award plaques for selected ships	5.1.3	Secretary-General
37	Report by chairman of Working Group B	5.2	Chairman of Working Group B
38	Establishing relations with the International Advisory Committee on marine sciences	6.10	Secretary-General
39	Observations from whaling ships and voluntary observation ships in the Southern Seas during IGY	6.1.2	Secretary-General
40	Financing of meetings of working groups of technical commissions	?	President of CMM

Doc. No.	Title of Document	Agenda Item	Submitted by
41	Proposals for amendment of the ww-code	6.11	Secretary-General
42	Proposed plan for additional weather information from shipping in certain specified areas	6.4	South Africa
43	Observing and reporting sea waves	6.11	Australia
44	The possibility of improving the network of observations from merchant ships between 35°S and 55°S and in other relatively sparse oceanic areas during IGY	6.1.2	President of CMM
45	Measurement of rainfall at sea	5.2.2	Chairman of Working Group B
46	Report on the fourth session of CSAGI	6.1	Secretary-General
47	International marine punch-card	6.6.2 6.9	Secretary-General
48	Definition of gust	5.2.3	Chairman of Working Group B with Note by the Secretary-General
49	A proposed amendment to Code FM 21.A	6.11	Secretary-General
50	The possibility of using a short forecast code as an alternative to the present system of issuing weather bulletins for shipping in English as well as in the language of the issuing country	6.8	United Kingdom
51	Measurement of sea surface water temperature	5.2.1	United Kingdom
52	Measurement of precipitation at sea	5.2.2	United Kingdom
53	Adjustments of the oceanic areas allocated to certain countries for reception of reports from ships and for the issue of weather bulletins to ships	6.13	Japan

Doc. No.	Title of Document	Agenda Item	Submitted by
54	Measurement of sea surface water temperature aboard ships	5.2.1	Federal Republic of Germany
55	Weather forecasts for trawlers by shipboard weather stations	6.10	Federal Republic of Germany
56	Allocation to Egypt of sea areas for reception of ships' reports and for issue of bulletins to ships	6.13	Secretary-General at the request of Egypt
57	Reporting visibility	5.2.4	Chairman of the Working Group B
58	Revision of wind speed equivalents of the Beaufort scale	5.2.5	Chairman of the Working Group B
59	The possibility of applying atmospheric techniques aboard ships	5.2.6	Chairman of the Working Group B
60	Recent developments in ICAO with reference to selected agenda items	5.1.1 5.1.2 5.2.6 6.4 6.7 6.13 6.15	ICAO
61	The need for and significance of summary information in maritime meteorology in respect of fisheries	6.10	FAO
62	Multi-lingual descriptive wind terms	5.2.5	Secretary-General
63	President's report to the commission		President CMM
64	Establishment of working groups by CMM-II	8	United States
65	Code for reporting sea ice by aircraft	5.1.4	United States

Doc. No.	Title of Document	Agenda Item	Submitted by
66	Code for reporting sea ice by ship and land stations	5.1.7 5.5.1 5.2.4	United States
67	Reporting of visibility	5.2.4	United States
68	Principles for consideration in the development of marine section of the World Climatic Atlas for scientific users	5.4.1	United States
69	Sequential analysis of ships weather observations	5.4.1	United States
70	A proposal for international collection of marine meteorological data for marine section of the World Climatic Atlas	5.4.1 5.4.4	United States
71	International Ice Nomenclature	5.5.2	United States
72	Meteorological problems of the carriage of goods at sea	5.3.1	Federal Republic of Germany
73	The rôle of CMM in any future structure of WMO technical commissions	6.18	President CMM
74	Meteorological observations from naval vessels during IGY	6.1	President CMM
75	International exchange of ships reports from merchant ships	6.6.2	President CMM
76	Descriptive terms of wave height	5.1.1	Netherlands delegation
77	Final report by the acting chairman of Working Group A	5.1	Chairman of the Working Group A
78	Suggested allocation of agenda items to working committees	-	President CMM
79	Consideration of status and contents of volume D of WMO publication No.9. TP.4	6.6.2	Netherlands delegation

Doc. No.	Title of Document	Agenda Item	Submitted by
80	Approved agenda	2	
81	Voluntary observing ships recruited by a Member who is not the Member with whom the ships are registered	6.3 6.9	Netherlands delegation
82	Reconsideration of certain IMO resolutions in the field of maritime meteorology	6.6.1	Netherlands delegation
83	Revision of wind speed equivalents of the Beaufort scale	5.2.5	United Kingdom
84	Comments on CMM-II/Doc.16	6.3	Portugal
85	Upper air observations on board whaling ships	6.1.1	Japan
86	A proposal by Ecuador	6.15	Ecuador
87	Comments concerning provisional agenda item 6.2	6.2	Japan
88	Revision of the text of the WMO Guide to international meteorological instruments and observing practice	6.14	French delegation
89	Analysis messages in IAC or IAC FLEET	6.9	Canada
90	Provision of meteorological supply cases to observers on selected and supplementary ships	6.16	Canada
91	Observation and reporting of elements concerning the state of the sea	6.11	French delegation
92	Adjustment of the oceanic areas allocated to certain countries for the reception of reports from ships	6.13	Spain
93	Observations on agenda item 6.1.3	6.1.3	Polish delegation
94	Report by the chairman of the Working Group C	5.3	Chairman of the Working Group C

Doc. No.	Title of Document	Agenda Item	Submitted by
95	Meteorological observations in the Pacific Ocean	6.4	El Salvador
96	Adaptation of synoptic code to tropical needs	6.11	El Salvador
97	Reception of meteorological messages from ships by shore stations	6.4	French delegation
98	Checking the accuracy of data	5.4.2	Working Group D
99	Observations on agenda item 6.18	6.18	Polish delegation
100	Report on the international exchange of blank weather maps	5.1.5	Committee T
101	Standardization of addresses of ships' radio weather messages	6.4	Committee R
102	Reporting visibility	5.2.4	United States
103	International award (plaque) for selected ships	5.1.3	Committee R
104	International Geophysical Year	6.1	Committee R
105	Upper air observation aboard whaling ships during the IGY	6.1.1	Committee R
106	The descriptive terms for wave heights	5.1.1	Committee T
107	Observing and reporting sea waves	6.11	Committee T
108	The possibility of applying atmospherics techniques aboard ships	5.2.6	Committee T
109	Definition of "gust"	5.2.3	Committee T
110	Storm warnings for tropical areas	5.1.2	President CMM
111	Investigation of thunderstorm frequency at sea	6.12	Committee T
112	Liaison with other international bodies e.g. international fishing commissions	6.10	Committee R

Doc. No.	Title of Document	Agenda Item	Submitted by
113	Observations from ships in tropical waters	6.4	Committee R
114	Measurement of precipitation at sea	5.2.2	Committee T
115	Reporting the location of clouds from ships, and especially from ocean weather stations	6.11	Swedish delegation
116	Proposed modification to the code for reporting state of sea surface	6.17	Committee T
117	A report from Viet-Nam	6.13	President CMM
118	Application of meteorology to the carriage of goods at sea	5.3	Committee R
119	Aerological observations from merchant ships	6.15	Committee T
120	Selected, supplementary and auxiliary ships	6.3	Committee R
121	Consideration of status and contents of WMO publication No.9. TP.4, volume D	6.6.2	Committee R
122	Review of resolutions and recommendations adopted by CMM-I	6.7	Committee R
123	The possibilities of improving the network of observations from merchant ships between 35°S and 55°S and in other relatively sparse oceanic areas during IGY	6.1.2	Committee R
124	The rôle of CMM in any future structure of WMO technical commissions	6.18	Committee R
125	Reconsideration of certain IMO resolutions relating to maritime meteorology	6.6.1	Committee R
126	Consideration of the report on the scheme for reports from whaling ships	6.2	Committee R
127	Report by the chairman of Working Group D	5.4	Committee R

Doc. No.	Title of Document	Agenda Item	Submitted by
128	Improvement of the network of observations in areas where merchant shipping is normally relatively sparse	6.4	Committee R
129	Consideration of the best method of preparing and making available maritime data in the form approved for use during IGY	6.1.3	Committee R
130	The possibility of using a short forecast code for issuing weather bulletins in English	6.8	Committee T
131	Revision of wind speed equivalents of the Beaufort scale	5.2.5	Committee T
132	Reporting of precipitation group 7RRjj by ships	6.5	Committee T
133	WMO Guide to international meteorological instruments and observing practice	6.14	Committee T
134	Measurement of sea surface temperature	5.2.1	Committee T
135	Questions concerning sea ice	5.1.4 5.1.7 5.1.8 5.5.1 5.5.2	Committee I
136	Adjustments of ocean areas allocated to certain countries for the reception of reports from ships and for the issue of bulletins to ships	6.13	Committee R
137	Consideration of the maritime portion of the WMO Technical Regulations adopted by Second Congress	6.9	Committee R
138	Proposals re amendments to code forms FM 21.A, 22.A and 23.A in view of the new International Ice Nomenclature	5.16	Committee T
139	Reporting visibility	5.2.4	Committee T

Doc. No.	Title of Document	Agenda Item	Submitted by
140	General consideration of codes (FM 21.A, FM 22.A and FM 23.A) at present in use for the transmission of radio weather messages	6.11	Committee T
141	Definition of the term "storm warning"	5.1.2	Committee T
142	Working groups (sea ice, technical problems, organizational matters)	8	President CMM
143	Photographic illustrations of the Ice Nomenclature	5.5.3	Committee I