

Manual on Marine Meteorological Services

Volume II – Regional Aspects

2012 edition



**World
Meteorological
Organization**

WMO-No. 558

Weather • Climate • Water

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EDITORIAL NOTE

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INTRODUCTION

1. The material contained in Volume II does not form part of the *Technical Regulations* (WMO-No. 49) and is applicable only to the Members of the regional associations (RA) concerned. The words “shall” and “should” as used in this volume have their dictionary meanings and do not have the regulatory character mentioned in the Introduction to Volume I and in the Introduction to the WMO *Technical Regulations*.

2. Volume II is divided into sections corresponding to the six Regions of WMO, namely:

Region I Africa;
Region II Asia;
Region III South America;

Region IV North America, Central America and the Caribbean;
Region V South-west Pacific;
Region VI Europe.

3. Detailed descriptions of services provided at a regional level, maps showing the sea areas for which Members of RA II provide forecasts, and the nomenclature of the sub-areas in use, can be found in *Weather Reporting*, Volume D – Information for Shipping (WMO-No. 9) : http://www.wmo.int/pages/prog/www/ois/Operational_Information/Vold_en.html. Appropriate links to Volume D are also available on the JCOMM Website for GMDSS : <http://weather.gmdss.org/>.

1. REGION I

AFRICA

1.1 Regional practice concerning storm warnings

1.1.1 The provisions applicable to storm warnings issued in regions where tropical cyclones may be encountered are given in the Appendix to this Volume.

1.1.2 The contents of the warnings in Region I (Africa) and the order in which the items are given are as shown in the Appendix, with the additions and explanations as follows:

- (a) Under Appendix item (a), warnings for near gales (Beaufort force 7) will also be issued;
- (b) Under Appendix item (b), the international six-figure date-time group will be used.

Note: Information concerning the origin of the warning, such as map time or data from a satellite, should be given.

- (c) Under Appendix item (c), the following terminology will be used:

<i>Observation</i>	<i>Corresponding wind speed (Beaufort scale)</i>
Weak tropical disturbance	Up to 7
Moderate tropical depression	8–9
Severe tropical depression	10–11
Intense tropical cyclone	12 or over
Tropical disturbance of unknown intensity	Unknown

- (d) Under Appendix item (d), the information will be given in the following way:
 - (i) Positions of centre of disturbance are to be given in degrees (and tenths if possible);
 - (ii) Latitude and longitude are to be given in words, not figures;
 - (iii) The degree of uncertainty of the position of the centre is to be given by the radius, expressed in nautical miles, of the circle in which the centre is located;
- (e) Under Appendix item (e), the speed of movement of the centre is to be given in knots and the direction is to be given to the nearest of sixteen points of the compass or in degrees to the nearest ten, indicated in words;
- (f) Under Appendix items (f) and (h), the information is to be given, if possible, for different distances from the centre in the various sectors (distances in nautical miles);
- (g) Under Appendix item (h), wind speeds are to be given in knots, distances in nautical miles;
- (h) Under Appendix item (h), further movements or developments are to be given only when they can be forecast with reasonable confidence.

1.1.3 The classification of weather disturbances adopted for use in the South-west Indian Ocean area of RA I is as follows:

<i>Classification</i>	<i>Corresponding DVORAK T-number</i>	<i>Corresponding maximum wind speed (knots)</i>	<i>Corresponding international hurricane scale number</i>
Zone of disturbed weather			
Tropical disturbance			
Tropical depression	1–2	15–33	
Moderate tropical depression/storm	2–3	34–47	
Severe tropical depression/storm	3–4	48–63	
Tropical cyclone	4–5	64–90	1–2
Intense tropical cyclone	5–6	90–115	2.5–3.5
Very intense tropical cyclone	6	115	3.5
Extra-tropical depression			

1.2 **Tropical cyclone operational plan for the South-west Indian Ocean**

The arrangements for tropical cyclone warnings for the South-west Indian Ocean, formulated under the regional component of the WMO Tropical Cyclone Programme and approved by RA I (Resolution 14 (VIII-RA I)), are contained in the *Tropical Cyclone Operational Plan for the South-west Indian Ocean* (WMO/TD-No. 577).

1.3 **Coordinated common system for the designation of marine forecast areas in Metarea II marine areas (Atlantic Ocean – south-west Europe and north-west Africa)**

Considering that the designation of common forecast areas in Metarea II will enhance the coordination of marine meteorological support to various marine activities, RA I has adopted the coordinated common system of marine forecast areas as described below. The areas were adopted by Resolution 11 (XIII-RA I).

<i>Area number</i>	<i>Marine area name and boundaries</i>
1	Faraday: Between 45°N and 48°27'N, between 22°W and 35°W
2	Romeo: Between 45°N and 48°27'N, between 12°W and 22°W
3	Altair: Between 40°N and 45°N, between 22°W and 35°W
4	Charcot: Between 40°N and 45°N, between 12°W and 22°W
5	Acores: Between 35°N and 40°N, between 22°W and 35°W
6	Josephine: Between 35°N and 40°N, between 12°W and 22°W
7	Irving: Between 30°N and 35°N, between 22°W and 35°W
8	Madeira: Between 30°N and 35°N, between 13°W and 22°W
9	Meteor: Between 25°N and 30°N, between 22°W and 35°W
10	Canarias: Between 25°N and 35°N, between 13°W and 22°W
11	Pazenn: Between 45°N and 48°27'N, between 6°W and 12°W
12	Iroise: Between 47°30'N and 48°27'N, from the coast of France to 6°W
13	Yeu: Between 46°30'N and 47°30'N, from the coast of France to 6°W
14	Rochebonne: Between 45°N and 46°30'N, from the coast of France to 6°W
15	Cantabrico: From the coast of Spain to 45°N, from the coast of France to 7°W
16	Finisterre: Between 41°50'N and 45°N, between 7°W and 12°W
17	Porto: Between 39°N and 41°50'N, from the coast of Portugal to 12°W
18	San Vicente: Between 35°N and 39°N, between 7°30'W to 12°W
19	Cadiz: From 35°N to the coast of Spain, between 6°W and 7°30'W
20	Gibraltar Strait/Estrecho: Between the line Gibraltar/Ceuta and 6°W from the coast of Morocco to the coast of Spain
21	Casablanca: Between 32°N and 35°N, from the coast of Morocco to 13°W
22	Agadir: Between 30°N and 32°N, from the coast of Morocco to 13°W
23	Tarfaya: From the coast of Morocco to 30°N, from the coast of Morocco to 13°W
24	Cape Verde: Between 15°N and 25°N, between 22°W and 35°W
25	Cap Blanc: Between 20°N and 25°N, from the coast of Africa to 22°W
26	Cap Timiris: Between 15°N and 20°N, from the coast of Africa to 22°W
27	Sierra Leone: Between 7°N and 15°N, from the coast of Africa to 35°W
28	Gulf of Guinea: Between the equator and 7°N, from the coast of Africa to 20°W
29	Pointe Noire: Between 6°S and the equator, from the coast of Africa to 20°W

1.4 **Coordinated common system for the designation of marine forecast areas in the Metarea III (W) marine areas (western Mediterranean Sea)**

The table below provides the characteristic points used to define the boundaries of the

common marine areas. Considering that the designation of common forecast areas in Metarea III will enhance the coordination of marine meteorological support to various marine activities, RA I has adopted the coordinated common system of marine forecast areas as described below. The areas were adopted by Resolution 12 (XIII-RA I).

<i>Characteristic points</i>	<i>Latitude</i>	<i>Longitude</i>
Gibraltar	36°9'N	5°21'W
Cap de Gata	36°44'N	2°16'W
Cap de Palos	37°38'N	0°40'W
Cap de la Nao	38°44'N	0°14'E
Cap en Serra	38°54'N	1°36'E
Cap Gala Figuera	39°20'N	3°10'E
Cap Pera	39°43'N	3°28'E
Cap Bagura	41°57'N	3°12'E
Montpellier	43°36'N	3°53'E
Saint Raphael	43°26'N	6°46'E
Cap Corse	43°N	9°21'E
Bouches de Bonifacio	41°23'N	9°10'E
Cap Teulada	38°52'N	8°38'E
Cap Carbonara	39°7'N	9°33'E
Cap Falcone	40°57'N	8°12'E
Cap Linaro	42°1'N	11°52'E
Cap Palimuro	40°2'N	15°15'E
Cap San Vito	38°12'N	12°43'E
Cap Lilibeo	37°48'N	12°26'E
Cap Bon	37°1'N	11°8'E
Cap Roux	36°57'N	8°47'E
Jijel	36°50'N	5°43'E
Cherchel	36°36'N	2°11'E
Port Say	35°4'N	2°30'W
Ceuta	35°53'N	2°15'W

2. REGION II

ASIA

2.1 **Regional practice concerning storm warnings**

2.1.1 The provisions applicable to storm warnings issued in regions where tropical storms may be encountered are given in the Appendix to this Volume.

2.1.2 Maritime countries in Region II (Asia) that are affected by tropical storms should issue storm warnings with the contents and order of items given in the Appendix, with the following reservation: Under (c) (ii), the term “tropical storm” is used instead of “moderate tropical storm”. (Refer to the General Summary section of the work of I-RA II, paragraph 36.)

2.2 **Forecast areas and nomenclature for use in weather bulletins for shipping in the south-eastern part of Region II**

Maps showing the sea areas for which Members of RA II provide forecasts, and the nomenclature of the sub-areas in use, can be found in *Weather Reporting*, Volume D – Information for Shipping (WMO-No. 9) : http://www.wmo.int/pages/prog/www/ois/Operational_Information/VolD_en.html. Appropriate links to Volume D are also available on the JCOMM Website for GMDSS : <http://weather.gmdss.org/>.

3. REGION III

SOUTH AMERICA

The provisions applicable to storm warnings issued in regions where tropical cyclones may be encountered are given in the Appendix. There is at present

no information regarding regional practice with respect to Region III (South America) appropriate for inclusion in this section.

NORTH AMERICA, CENTRAL AMERICA AND THE CARIBBEAN

4.1 **Regional practice concerning storm warnings**

4.1.1 The provisions applicable to storm warnings issued in regions where tropical cyclones may be encountered are given in the Appendix.

4.1.2 The following terminology is used in Region IV (Resolution 27 (78-RA IV)):

- (a) Tropical cyclone: A non-frontal cyclone of synoptic scale, developing over tropical or subtropical waters and having a definite organized circulation;
- (b) Hurricane: A warm-core tropical cyclone in which maximum average surface wind (1-minute mean) is 64 knots or greater;
- (c) Tropical storm: A well-organized warm-core tropical cyclone in which the maximum average surface wind (1-minute mean) is in the range of 34–63 knots, inclusive;
- (d) Tropical depression: A tropical cyclone in which the maximum average surface wind (1-minute mean) is 33 knots or less.

4.1.3 Marine tropical cyclone advisories are prepared only by the United States hurricane centres. They are prepared for all tropical depressions, tropical storms or hurricanes within a centre's area of responsibility. Advisories will cease when tropical cyclones drop below depression stage or have gone inland and winds over the water have dropped below gale force. All marine advisories on tropical storms and hurricanes will contain 12-hour and 24-hour forecast periods only. (This information is taken from *Regional Association IV (North America, Central America and the Caribbean) Hurricane Operational Plan* (WMO/TD-No. 494)).

4.2 **Hurricane operational plan**

The arrangements for tropical cyclone warnings, formulated under the regional component of the WMO Tropical Cyclone Programme and approved by RA IV (Resolution 27 (78-RA IV)), are contained in the *Regional Association IV (North America, Central America and the Caribbean) Hurricane Operational Plan* (WMO/TD-No. 494)).

SOUTH-WEST PACIFIC

5.1 **Regional practice concerning storm warnings**

5.1.1 The provisions applicable to storm warnings issued in regions where tropical cyclones may be encountered are given in the Appendix.

5.1.2 The contents of storm warnings and the order of items as given in the Appendix will be used throughout Region V (South-west Pacific), but

any Member may use, for item (c) "Type of disturbance", the specifications most appropriate to its local requirements.

5.1.3 All depressions, storms and typhoons originating within or entering the Philippine area of responsibility are identified in the tropical cyclone bulletins issued by the Philippine Weather Bureau by Filipino feminine nicknames ending in the letters "ng". (Notification of the Permanent Representative of the Philippines.)

EUROPE

6.1 Coordinated common system for the designation of marine forecast areas in the Baltic Sea

6.1.1 Considering that the designation of common forecast areas in the Baltic Sea will enhance the coordination of marine meteorological support to various marine activities, RA VI has adopted the coordinated common system of marine forecast areas as described below (Resolution 21 (VIII-RA VI)).

6.1.2 The basis for the uniform system is a three-level division of the forecast areas: main areas, sub-areas, local areas.

6.1.3 The main areas are described by their geographical names. Maps showing the sea areas for which Members of RA II provide forecasts, and the nomenclature of the sub-areas in use, can be found in *Weather Reporting, Volume D – Information for Shipping (WMO-No. 9)* : http://www.wmo.int/pages/prog/www/ois/Operational_Information/VoID_en.html. Appropriate links to Volume D are also available on the JCOMM Website for GMDSS : <http://weather.gmdss.org/>.

6.1.4 Sub-areas within the main area are described, in general, according to the principle compass points (for example, eastern part, southern part, and the like). Exceptions are the sub-areas of 4 and 12, for which the use of geographical names is recommended, that is, “4 W – Sea of Aaland”, “4 E – Archipelago Sea”, “12 W – The Belts” and “12 E – The Sound”.

6.1.5 Local areas are distinguished by their local names, for example, “Bight of Hanoë” and “Gulf of Gdansk”.

(a) The names of the main forecast areas are as follows:

1	Bay of Bothnia
2	The Quark
3	Sea of Bothnia
4	Sea of Aaland and Archipelago
5	Gulf of Finland
6	Gulf of Riga
7	Northern Baltic
8	Central Baltic

9	South-eastern Baltic
10	Southern Baltic
11	Western Baltic
12	The Belts and the Sound
13	Kattegat
14	Skagerrak
15	Lake Vaenern

(b) The boundaries between main forecast areas are as follows:

Between area 1 and 2	Ratan–Stubben
Between area 2 and 3	Jarnasudde–Halsógrund
Between area 3 and 4	Parallel 60°30'N
Between area 4 and 7	Parallel 59°50'N
Between area 5 and 6	Parallel 59°N
Between area 5 and 7	Meridian 23°E
Between area 7 and 8	Parallel 58°20'N
Between area 6 and 8	Meridian 22°E
Between area 8 and 9	Parallel 56°30'N
Between area 9 and 10	Meridian 17°E
Between area 10 and 11	Falsterbo–Arkona
Between area 11 and 12	Falsterbo–Stevns, Kappel Kirke–Kelsner–Vejsnaes Nakke–Gammel Pol
Between area 12 and 13	Sjaellands Odde–Hjelm/ Gaasehage, Kullen– Gilbjerghoved
Between area 13 and 14	Skagen–Pater Noster
Between area 14 and the North Sea	Hanstholm–Lindesnes

Notes:

- For practical reasons, when exchanging the forecasts between the meteorological services, the number of the area can be used instead of the whole name. However, when issuing the forecast for the marine user, the number, if used, should always be used together with the name of the respective area.
- When subdividing a main area into sub-areas the number, if used, and the name of the main area should always be mentioned first.
- When deciding on the names of the main areas in the various national languages, great care should be taken to assure the best possible correspondence between these and the English names.
- The numbers identifying forecast areas, when used for telecommunication purposes, should be prefaced by the letter “N”.
- The date of implementation of the coordinated common system described above is 1 August 1984.

6.2 Coordinated common system for the designation of marine forecast areas in the North Sea

6.2.1 Considering that designation of common forecast areas in the North Sea will facilitate the coordination of marine meteorological support to various marine activities, RA VI has adopted the coordinated common system of marine forecast areas as described below (Resolution 22 (VIII-RA VI)).

6.2.2 The basis for the uniform system is a two-level division of the forecast areas: main areas and sub-areas.

6.2.3 Sub-areas within a main area can, if the meteorological situation necessitates, be described according to the points of the compass, for example "north Viking", "east German Bight", and "west Humber". Numbering and boundaries of the main areas are as follows:

(a) Names and numbers of the main forecast areas are as follows:

N1	Viking
N2	Northern Utsire
N3	Southern Utsire
N4	Forties
N5	Cromarty
N6	Forth
N7	Tyne
N8	Dogger
N9	Fisher
N10	German Bight
N11	Humber
N12	Thames
N13	Dover

(b) The boundaries between main forecast areas:

Between area N1 and N2	Meridian of 4°E
Between area N1 and N3	Meridian of 4°E
Between area N1 and N4	Parallel of 58°30'N
Between area N2 and N3	Parallel of 59°N
Between area N3 and N4	Meridian of 4°E
Between area N3 and N9	Parallel of 57°45'N
Between area N4 and N5	Meridian of 1°W
Between area N4 and N6	Meridian 1°W
Between area N4 and N9	Meridian of 4°E
Between area N5 and N6	Parallel of 57°N
Between area N6 and N7	Line from 57°N 1°W to 55°40'N 1°50'W

Between area N7 and N8	Line from 57°N 1°W to 54°15'N 0°45'E
Between area N7 and N11	Parallel of 54°15'N
Between area N8 and N10	Meridian of 4°E
Between area N9 and N14	Line from Lindesnes to Hanstholm
Between area N9 and N10	Parallel of 56°N
Between area N10 and N11	Line from 54°15'N 4°E to 53°35'N 4°40'E, thence meridian of 4°40'E
Between area N11 and N12	Parallel of 52°45'N
Between area N12 and N13	Parallel of 51°15'N
Southern boundary of area N13	Line from 50°45'N 0°15'E to 50°15'N 1°30'E

Notes:

1. For practical reasons, when exchanging forecasts between the meteorological services, the number of the area instead of the whole name can be used. When issuing the forecast for the marine user, the number, if used, should always be used together with the name of the respective area.
2. When deciding on the names of the main areas in the various national languages, great care should be taken to assure the best possible correspondence between these and the English names.
3. The numbers identifying forecast areas, when used for telecommunication purposes, should be prefaced by the letter "N".
4. The date of implementation of the coordinated common system described above is 1 August 1984.

6.3 Coordinated common system for the designation of marine forecast areas in Metarea II marine areas (Atlantic Ocean – south-west Europe and north-west Africa)

Considering that the designation of common forecast areas in Metarea II will enhance the coordination of marine meteorological support to various marine activities, RA VI has adopted the coordinated common system of marine forecast areas as described below. The areas were adopted by Resolution 17 (XIII RA-VI).

Area number	Marine area name and boundaries
1	Faraday: Between 45°N and 48°27'N, between 22°W and 35°W
2	Romeo: Between 45°N and 48°27'N, between 12°W and 22°W
3	Altair: Between 40°N and 45°N, between 22°W and 35°W
4	Charcot: Between 40°N and 45°N, between 12°W and 22°W

Area number	Marine area name and boundaries
5	Acores: Between 35°N and 40°N, between 22°W and 35°W
6	Josephine: Between 35°N and 40°N, between 12°W and 22°W
7	Irving: Between 30°N and 35°N, between 22°W and 35°W
8	Madeira: Between 30°N and 35°N, between 13°W and 22°W
9	Meteor: Between 25°N and 30°N, between 22°W and 35°W
10	Canarias: Between 25°N and 35°N, between 13°W and 22°W
11	Pazenn: Between 45°N and 48°27'N, between 6°W and 12°W
12	Iroise: Between 47°30'N and 48°27'N, from the coast of France to 6°W
13	Yeu: Between 46°30'N and 47°30'N, from the coast of France to 6°W
14	Rochebonne: Between 45°N and 46°30'N, from the coast of France to 6°W
15	Cantabrico: From the coast of Spain to 45°N, from the coast of France to 7°W
16	Finisterre: Between 41°50'N and 45°N, between 7°W and 12°W
17	Porto: Between 39°N and 41°50'N, from the coast of Portugal to 12°W
18	San Vicente: Between 35°N and 39°N, between 7°30'W to 12°W
19	Cadiz: From 35°N to the coast of Spain, between 6°W and 7°30'W
20	Gibraltar Strait/Estrecho: Between the line Gibraltar/Ceuta and 6°W, from the coast of Morocco to the coast of Spain
21	Casablanca: Between 32°N and 35°N, from the coast of Morocco to 13°W
22	Agadir: Between 30°N and 32°N, from the coast of Morocco to 13°W
23	Tarfaya: From the coast of Morocco to 30°N, from the coast of Morocco to 13°W
24	Cape Verde: Between 15°N and 25°N, between 22°W and 35°W
25	Cap Blanc: Between 20°N and 25°N, from the coast of Africa to 22°W
26	Cap Timiris: Between 15°N and 20°N, from the coast of Africa to 22°W
27	Sierra Leone: Between 7°N and 15°N, from the coast of Africa to 35°W

Area number	Marine area name and boundaries
28	Gulf of Guinea: Between the equator and 7°N, from the coast of Africa to 20°W
29	Pointe Noire: Between 6°S and the equator, from the coast of Africa to 20°W

6.4 Coordinated common system for the designation of marine forecast areas in Metarea III (W) marine areas (western Mediterranean Sea)

The table below provides the characteristic points used to define the boundaries of the common marine areas. Considering that the designation of common forecast areas in Metarea III will enhance the coordination of marine meteorological support to various marine activities, RA VI has adopted the coordinated common system of marine forecast areas as described below. The areas were adopted by Resolution 18 (XIII RA-VI).

Characteristic points	Latitude	Longitude
Gibraltar	36°9'N	5°21'W
Cap de Gata	36°44'N	2°16'W
Cap de Palos	37°38'N	0°40'W
Cap de la Nao	38°44'N	0°14'E
Cap en Serra	38°54'N	1°36'E
Cap Gala Figuera	39°20'N	3°10'E
Cap Pera	39°43'N	3°28'E
Cap Bagura	41°57'N	3°12'E
Montpellier	43°36'N	3°53'E
Saint Raphael	43°26'N	6°46'E
Cap Corse	43°N	9°21'E
Bouches de Bonifacio	41°23'N	9°10'E
Cap Teulada	38°52'N	8°38'E
Cap Carbonara	39°7'N	9°33'E
Cap Falcone	40°57'N	8°12'E
Cap Linaro	42°1'N	11°52'E
Cap Palimuro	40°2'N	15°15'E
Cap San Vito	38°12'N	12°43'E
Cap Lilibeo	37°48'N	12°26'E
Cap Bon	37°1'N	11°8'E
Cap Roux	36°57'N	8°47'E
Jijel	36°50'N	5°43'E
Cherchel	36°36'N	2°11'E
Port Say	35°4'N	2°30'W
Ceuta	35°53'N	2°15'W

APPENDIX

PROVISIONS APPLICABLE TO STORM WARNINGS ISSUED IN REGIONS WHERE TROPICAL CYCLONES MAY BE ENCOUNTERED

The content and order of items for a storm warning issued by radio for the high seas in regions where tropical cyclones may be encountered are as follows:

- (a) Type of warning and corresponding wind speed:

<i>Type of warning:</i>	<i>Wind speed (Beaufort scale)</i>	<i>Wind speed (knots)</i>
Gale warning	8 or 9	34–47
Storm warning	10 or over	48 or more
Hurricane (or local synonym) warning	12	64 and over
Tropical disturbance of unknown intensity	Uncertain	

Note: Near-gale warnings of wind of Beaufort force 7 (28–33 knots) may be issued as an optional form of warning.

- (b) Date and time of reference in UTC;
 (c) Type of disturbance (for example, low, hurricane, and the like) with a statement of central pressure of deep lows in hectopascals; tropical cyclones are classified as follows:

Tropical depression	Winds up to 34 knots
Moderate tropical storm	Winds 34–47 knots
Severe tropical storm	Winds 48–63 knots
Hurricane (or local synonym)	Winds 64 knots and over
Tropical disturbance of unknown intensity	Wind speed uncertain

Note: The definition of a tropical cyclone is contained in the *International Meteorological Vocabulary* (WMO-No. 182) and the classification of tropical cyclones is left to the Regions concerned.

- (d) Location of disturbance to be given in terms of latitude and longitude;
 (e) Direction is to be given in points of the compass and speed in either metres per second or knots (units used shall be indicated);
 (f) Extent of the affected area;
 (g) Wind speed and direction, with the following considerations:
 (i) Wind speeds should be given, if possible, for different distances from the centre in the various sectors of the storm area;
 (ii) Wind direction shall be given in points of the compass and not in degrees;
 (iii) Wind speeds should be given in Beaufort force notation and, if known, in metres per second or in knots. If metres per second or knots are used, these units should be indicated in the text of the message;
 (h) Sea and swell conditions in the affected area;
 (i) Further indications, if any.

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