

Port Warnings

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Port Warnings

1. Introduction

In accordance with international procedure, ports are warned and advised to hoist "Signals" whenever adverse weather is expected over the ports for the oceanic areas, in which it is located due to the tropical cyclone. However, regional difference exists. The warning messages normally contain information on the location, intensity, direction and speed of movement of the tropical cyclone and the expected weather over the port.

The India Meteorological Department (through the area cyclone warning centres (ACWCs)/ cyclone warning centres (CWCs) maintains a port warning service by which the port officers are warned by high priority telegrams about disturbed weather likely to affect their ports. On receipt of the warning telegrams from the ACWC/CWC, the port officers hoist appropriate visual signals prominently on signal masts so that they are visible from a distance. Mariners and other sea-faring people, including fishermen who may not be literate, are generally aware of the meaning of these signals and the port authorities are always ready to explain them whenever necessary. At some ports, the meanings of the signals are displayed in English as well as in the local languages prominently on a notice board. While the India Meteorological Department is responsible for issuing the warnings, the port authorities arrange the display of signals. In addition to hoisting the signals, the port officers have, in most cases, make arrangements for disseminating the warnings received by them, to country craft and sailing vessels in the harbours.

2. Systems of Storm Warning Signals

A uniform system of storm warning signals was introduced at all the ports in India from 1st April 1898 and it is still in vogue with very little change. The system consists of :

(i) General System

A General System with eleven signals, the first two of which (signals No. I and II) indicate the existence of distant disturbed weather, the next eight (signals III to X) indicate that the port itself is threatened by bad weather and the last one (signal No. XI) indicates that the communication with the ACWC/CWC had broken down and that in the opinion of the local Port Officer, there is danger of bad weather. Signals No. I and II are called Distant Signals and the rest Local signals. The ports where this system of signals is in use are called General ports.

(ii) Extended System

An Extended System which in addition to the eleven signals of the General System, has six Section signals to indicate the location of the disturbance. These additional signals are hoisted along with Distant Signals. This system is a special case of the General System and is in use only at a few ports on the east coast (Bay of Bengal). These ports are : Sagar Island, Kakinada, Chennai, Cuddalore and Nagapattinam. These ports are called Extended ports. There is no port under the Extended System on the west coast.

(iii) Brief System

A Brief Systems consisting of only five of the signals of the General Systems (viz. Signal Nos. III, IV, VII, X and XI). These are hoisted in association with prospects of bad weather at the port itself caused by disturbances out at sea. This system of signals is in use in ports frequented mainly by smaller vessels engaged in local traffic and these ports are called Brief Ports.

(iv) Ports Without Signals

In addition, there are some minor ports where no signals are hoisted but which get a special type of warning message; they are called Ports without

signals. For purposes of warning, these ports are treated as Brief ports and corresponding port warnings are issued when adverse weather threatens them although no signals are advised to be hoisted. These warning messages will contain information on the location and direction of movement of the disturbance and the expected weather over the port.

3. Meanings of Signals

The meanings of the various signals are given in Appendix I. Details of the specifications of the visual signals used during day time and lamp signals used during night are given in the departmental publication Code of Storm Warning Signals for use at Indian maritime Ports – Sixth edition, 1984.

3.1. Distant Signals

Distant signals are hoisted only at ports under General and Extended Systems and not at Brief ports. There are two Distant Signals : Distant cautionary signals No. I (DC I) and Distant Warning signal No. II (DW II).

DC I is hoisted at a port when the system out at sea is a depression or a deep depression and while the local weather at the port itself is not likely to be affected immediately, ships leaving the port may run into danger during their voyage. Discretion has, therefore, to be exercised while assessing such a probability, taking into account the location of the weather system out at sea with reference to the port and the estimated direction and speed of movement of the system. When the system has intensified into a storm and still out at sea. Distant Warning signal No. II (DW II) is to be hoisted. If there is a risk of the port itself experiencing bad weather, the appropriate local signal is to be hoisted in preference to the Distant signals. Thus, when a port having a Distant signal is also likely to have squally weather although the depression/storm is still away, the obvious action will be to change the Distant signal to LC-III. Nothing precludes hoisting of LC-III at a port where Distant signal is to be hoisted if the port is expected to have squally weather. In general, when a weather situation warrants more than one signal, the highest numbered signal is hoisted.

Unless one of the Local signals is more appropriate and hoisted, the

Distant signal is also hoisted at Arabian Sea Ports when a disturbance from the Bay is crossing the peninsula and may develop into a depression/cyclone after entering the Arabian Sea.

3.2. Sections Signals

When a Distant signal (DC I or DW II) is hoisted at an Extended port, an appropriate Section (or Locality) signal must also be hoisted. For the purpose of Locality signals, Bay of Bengal has been divided into six sections as given below

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|-------------|---|--|
| Section I | : | North Bay area to the north of Lat. $18\frac{1}{2}^{\circ}\text{N}$ |
| Section II | : | West Central Bay – lies south of I and is bounded on the south by Lat. 13°N and on the east by Long. $88\frac{1}{2}^{\circ}\text{E}$. |
| Section III | : | East Central Bay – lies south of I and east of II. It is bounded on the south by Lat. 13°N and on the east by a line from the point, Lat. 13°N , Long. 93°E to Diamond Island, the Arakan Coast and thence upto Lat. $18\frac{1}{2}^{\circ}\text{N}$. |
| Section IV | : | Southwest Bay – lies south of II, and west of Long. 86°E |
| Section V | : | Southeast Bay – lies east of IV, south of II, III and west of Long. 93°E . |
| Section VI | : | Andaman Sea – lies east of III and V. |

The southern boundary for Sections IV, V and VI is lat. 5°N .

3.2. Change In Section Signals

The section signal will be changed when the center of the system moves from one section into another, even if there is no material change in other respects. Similarly, if DC I is changed to DW II or vice versa, Section signals are also to be repeated in the message, even if there is no change in the Section signal(s).

3.2.1. Number Of Section Signals

Generally the Locality signal Number is of that section in which the center of the depression/storm is situated. If, however, the center is near the boundary of a division, two Locality signals are asked to be hoisted, the first indicating the division in which the center is actually situated and the second the division nearest to the first. In the event of a center being near the corner where three divisions meet, three Locality signals are asked to be hoisted, the first indicating the division in which the storm is estimated to be centred, the second the nearest adjoining division and the third, the remaining division. Examples :

Storm Centre	Locality Signals
Lat. 16oN – Long. 86oE	II
Lat. 16oN – Long. 88oE	II and III
Lat. 16oN – Long. 89oE	III and II
Lat. 18oN – Long. 87½oE	II, I & III
Lat. 19oN – Long. 89½oE	I, III & II

3.3. Local Cautionary Signal Number Three (LC – III)

LC – III is a signal very frequently hoisted at the ports. It is hoisted at a port which is likely to experience squally weather. Squally weather is meant to cover occasional or frequent squalls with rain or persistent type of strong gusty winds (mean wind speed not less than 20 kt.) accompanied by rain. Such conditions are associated with low pressure systems or onset and strengthening of monsoon. Mean wind speed exceeding 33 kt. associated with cyclonic storms are generally covered by signals higher than LC-III. The significance of the word generally in the previous sentence is to permit the hoisting of LC-III at ports outside the inner storm area where wind speed may exceed 33 kt.

3.3.1. LC-III In Association With The Monsoon

The general convention not to keep LC-III hoisted too long requires an

amplification in the case of squally weather associated with the monsoon. LC-III should be hoisted (a) when squally weather is expected in the port due to the first advance of the monsoon or (b) whenever after the monsoon has been established, it is expected to strengthen markedly following a period of weak or moderate monsoon and cause associated markedly squally weather at the port. If the occasions of hoisting this signal are regulated by these considerations, then it will follow that the signal should also remain hoisted for such time as the associated threat of squally weather at the port remains. The criterion followed for hoisting LC-III under condition (b) above is that the expected wind speed should be 30 kt. or more. This minimum limit of 30 kt has been adopted with a view to restrict the number of occasions on which LC-III will have to be hoisted. The term markedly squally weather will always be used in all such messages.

When advice to hoist LC III or to keep LC III hoisted is given to a port, there should be a reference in the message to the likelihood (or continuance) of squally weather at the port, like squally weather likely (or likely continue) at your port next hours. However, in messages to hoist higher signals, no such elaboration is made and the associated weather in such cases is to be inferred by the Port Officer.

3.4. Local Warning Signal Number Four (LW IV)

When a cyclonic storm has actually formed, LW IV is hoisted at ports which could possibly be struck later by the storm, since the existence of a storm can often be determined before its direction of motion can be fixed. It is a preliminary stage when the direction of motion of the system is yet to be fixed with certainty and serves as a prelude to the possibility of Danger or Great Danger signals at a later time. From the specification of the signal, it is evident that LW IV by itself is not associated with any particular severity of weather. When the direction of movement becomes definite (i.e. when the coast and the ports where the storm will strike is indicated in the sea area bulletin), LW IV will be replaced by Danger or Great Danger signals as appropriate at the ports expected to be affected directly by the storm and LC-III at ports where squally weather associated with the storm is expected to prevail. (Refer to para 6.5.2).

Hence normally Great Danger or Danger signals at some ports and LW IV at other ports at the same time for the same disturbance are not hoisted.

3.5. Danger and Great Danger Signals

Danger signals are hoisted when the storm is of slight or moderate intensity and Great Danger Signals when the storm is severe. The intensity refers to the intensity of the storm at and about its center and not to the intensity or severity of the weather in different parts of the cyclone. In the circumstances, hoisting of Great Danger signals at some ports and Danger signals at other ports at the same time to convey the varying severity of the effect of the cyclone at the different ports is inconsistent with the existing specifications of the signals. While Danger or Great Danger signals should be hoisted at such ports which will be affected by the inner storm area (where wind speed may exceed 33 kt.), LC – III may be hoisted at the same time at such of the ports outside the inner storm area as may be considered necessary

4. Some General Rules regarding Signals

4.1 Signals Conform To Intensity Of Systems

As a general rule, signals have to conform strictly to the existing intensity of the system. If some rapid development is expected, the office should keep a careful and continuous watch on the basis of the special observations and issue suitable modifications as and when necessary. They (the signals) are stepped up or down, as and when necessary, depending upon the intensity of the system.

4.2. Typical Progression Of Signals

A typical progression of signals is the Distant Cautionary (DC I), Distant Warning (DW II), Local Warning (LW IV) and Danger or Great Danger. During such a succession of signals, it is essential that the change from Cautionary to Warning be accompanied by a verbal description of the change of the system from a depression or area of squally weather or disturbed weather to a storm. This progression does not however over-rule the practice of having LC III with the declaration of storm at ports towards which the storm is not heading but which

may still experience squally weather. This progression does not also over-rule if occasion demands, the changing of signals by two stages like replacing of DW II by Danger or LC III by Great Danger. Similarly there is nothing to preclude replacing an existing Danger/Great Danger signal by LC-III, when the threat to the port is removed by the system moving away but squally weather is still likely over the port for some more time.

4.3. Signals Not To Be Kept Hoisted Longer Than Necessary

Signals should not be kept hoisted longer than necessary, so as not to adversely affect the operations at a port. When a storm is crossing or crossed the coast, in general, discretion is allowed in stepping down from Danger signal to LC-III or no signal at all depending upon whether the return of the weather to normal is foreseen to take place through successive stages or quickly.

When the system is over land and the port is likely to continue to experience bad weather with same severity, appropriate signals can be kept hoisted at that port.

4.4. Informatory messages due to Steep Pressure Gradient

Informatory messages are sent to ports about strong winds in association with steep pressure gradients but no signals are hoisted. However, as per local practice at ACWC Kolkata, CWC Bhubaneswar and ACWC Mumbai and CWC Ahmedabad, LC-III is hoisted under such condition also.

4.5. Informatory Messages For Brief Ports

Informatory messages are also sent to Brief ports without any advice to hoist any signal when disturbances currently out at sea, are likely to affect the ports during the next 48 hours.

5. Text of Warnings to Ports

Ports under General, Extended and Brief systems should receive warning

messages consisting of relevant portions of sea area bulletins along with instructions to hoist the appropriate signals. The port warning messages are expected generally to conform to the radio weather messages issued to shipping. The bulletins issued by ACWCs at Kolkata, Chennai and Mumbai are to be the basis on which port warnings and other action will be initiated by the CWCs at Bhubaneswar, Visakhapatnam and Ahmedabad respectively till the system is picked up by the radars at Paradip, Machilipatnam, Visakhapatnam and Bhuj.

For the benefit of ships lying at ports which may not receive sea area bulletins, the central pressure of the system is also included in the port warning messages from the stage of cyclonic storm onwards.

The number of the signal to be hoisted is given in plain language to avoid errors in transmission. Similar procedure should also be followed for other items such as latitude and longitude of center of the storm etc.

In all messages to ports subsequent to the one advising the hoisting of a signal, the words keep signal number -----hoisted should be mentioned till the signal is lowered or replaced by another signal.

The ports without signals also receive messages whenever adverse weather threatens them due to a disturbance. These messages may be similar to the one to the adjoining ports with signals and will contain information on the location and direction of movement of the system and the expected weather over the ports in brief. Only the advice to hoist any signal is omitted in the messages.

6. Transmission of messages to ports

Port warning messages are normally sent by fax. Immediate telephone calls also are made to Port Officers regarding the disturbed weather at their ports.

Police W/T facilities can also be utilized for passing on the port warning messages to such of the ports where Police W/T stations are existing, in the following cases : (i) when the meteorological telecommunication channels have either failed or (ii) when there is a likelihood of the messages getting unduly delayed. The procedure for dissemination of storm warning messages over Police W/T grid has been laid down in DDGF Forecasting Circular No. 3/1969.

7. Frequency of messages to ports for hoisting the signals

7.1. For Distant Signals

It is sufficient if ports with Distant signals (DC I or DW II) get a message once a day, usually based on 0300 UTC chart. However, in between, if there is a necessity to change the section to another, fresh messages are to be sent to the concerned Extended ports. Or, if the system changes in intensity from depression to storm (or vice versa), even without change of position necessitating change of signal from DC I to DW II (or vice versa), fresh messages are to be sent to the General and Extended ports concerned.

7.2. For LC III Or Higher Signals

When LC III or higher signals are hoisted, the concerned ports should get a message each time a sea area bulletin is issued i.e. thrice a day in the depression stage and at least six

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times a day when the system is a cyclonic storm.

7.3. For Ports without signals

Ports without signals should be informed at least once in 24 hours or whenever there is a change in signals in the nearby Brief port. There seems to be differences in the practice followed at ACWCs Chennai and Mumbai.

Whenever there is threat to the port due to cyclonic disturbance the following port warning signals are displayed to caution the fishermen and port officials.

PORT WARNING SIGNALS

Signal/ Flag No.		NAME	Symbols		Description
			Day	Night	
1.	Distant bad weather	DC1			Depression far at sea. Port NOT affected.
2.		DW2			Cyclone far at sea. Warning for vessels leaving port.
3.	Local bad weather	LC3			Port Threatened by local bad weather like squally winds.
4.		LW4			Cyclone at sea. Likely to affect the port later.
5.	Danger	D5			Cyclone likely to cross coast keeping port to its left
6.		D6			Cyclone likely to cross coast keeping port to its right.
7.		D7			Cyclone likely to cross coast over/near to the port.
8.	Great danger	GD8			Severe cyclone to cross coast keeping port to its left
9.		GD9			Severe cyclone to cross coast keeping port to its right
10.		GD10			Severe cyclone to cross over /near to the port.
11.		XI			<u>Communication failed with cyclone warning office.</u>