(For Official Use Only)

सत्यमेव जयते

GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS

Monsoon Patrolling

CAMTECH/C/2006/PATROLLING/1.0
November - 2006

*C*entre
for
*A*dvanced
*M*aintenance
*TECH*nology

उच्च अनुरक्षण प्रौद्योगिकी केन्द्र

EXECELLENCE IN MAINTENANCE

Maharajpur, Gwalior - 474 020 (INDIA)
✆ : 0751 - 2470869 & Fax : 0751 - 2470841

Monsoon Patrolling

Foreword

Various type of track patrolling is carried out to ensure that the track components are intact and the track is safe for running of trains. This booklet gives correct knowledge of monsoon patrolling.

This booklet mainly focuses on duration of patrolling, preparation of patrol chart, selection of Patrolman, Equipment of Patrolmen, systematic patrolling, duties of Patrolman, action in case of damage & inspection by Engineering official.

Civil engineering branch of CAMTECH has made excellent effort to bring out the booklet on monsoon patrolling. I hope, this booklet will certainly prove to be a valuable source of technical knowledge and will be quite helpful to civil engineering supervisors & field staff in Railways.

CAMTECH/Gwalior ***Kul Bhushan***
Date : 29.11.2006 ***Executive Director***

Preface

During the monsoon, certain specified section of the railway line, shall be patrolled to detect damage by flood i.e. breaches, settlements, slips and scours. Thus, monsoon patrolling plays a vital role for maintaining the track for safe movement of trains.

The objective of this booklet is to provide basic information and technical details regarding monsoon patrolling. It covers duration of patrolling, patrol chart & patrol book, Equipments, systematic patrolling, selection of Patrolman & duties, action in case of damage & inspection by Engineering official. This booklet does not supersede any existing instructions from Railway Board, RDSO & Zonal Railways and the provisions of IRPWM, G&SR etc on the subject. *This booklet is not statutory and contents are for the purpose of guidance only.*

I am grateful to Shri Neeraj Shrivastava, STA/Civil/CAMTECH, who went through the complete text, collected information, data etc and done editing work. Nice data entry has done by Shri Ramesh Bhojwani, Console Operator, IRCAMTECH.

We welcome any suggestion for addition and improvements from our readers.

CAMTECH/Gwalior ***A.K. Dadarya***
Date : 24.11 .2006 ***Director / Civil***

CONTENTS

Sr. No.	Description	Page Nos.
	Foreword	*i*
	Preface	*ii*
	Content	*iii*
	Correction Slip	*iv*
1.0	Introduction	01
2.0	Duration of Monsoon Patrolling	02
3.0	Patrol chart & Patrol book	03
4.0	Selection of Patrolman	09
5.0	Equipment of Patrolmen	10
6.0	Systematic Patrolling	12
7.0	Action when damage is observed	16
8.0	Inspection of Patrolling by Engineering Officials	22
	Notes	24

***

ISSUE OF CORRECTION SLIPS

The correction slips to be issued in future for this booklet will be numbered as follows:

CAMTECH/2006/C/PATROLLING/1.0/CS. # XX
date ……

Where "XX" is the serial number of the concerned correction slip (starting from 01 onwards).

CORRECTION SLIPS ISSUED

Sr. No. of C.Slip	Date of issue	Page no. and Item No. modified	Remarks

Go to index

CHAPTER – 1

Introduction

To ensure that the track components are intact and the track is safe for running of trains without any obstructions patrolling of track is carried out. Various type of track patrolling are carried out i.e. Keymen's daily patrol, gang patrol during abnormal rainfall or storm, security patrolling during civil disturbances and for movement of VIP specials, night patrolling during monsoon, watchmen at vulnerable locations, hot/cold weather patrolling on LWR/CWR track, mobile watchman on LWR/CWR track.

India is a tropical country and vagaries of weather, particularly of monsoons, are well known. Some sections of the railway do get severely affected due to rains, causing threat to the safety of the track and traffic. Hence during monsoon, night patrolling is carried out by Patrolman in a programmed way on specified sections of the railway to detect damage by flood, such as breaches, settlements, slips and scours and immediate action taken to protect trains, when so warranted.

***

Go to index

CHAPTER – 2

Duration of Monsoon Patrolling

2.0 Duration of monsoon patrolling

The sections will be identified and notified by the Divisional Engineer for monsoon patrolling. For every such section, the Divisional Engineer shall prescribe the period of the year for monsoon patrolling (generally between from **1st June to 31 October**). Patrolling should be started on these notified sections on the dates specified. If the local conditions warrant, the Permanent Way Inspector of the section concerned may introduce or continue night patrolling outside the stipulated dates, duly advising all concerned.

***

Go to index

CHAPTER – 3

Patrol Chart & Patrol Book

3.0 Patrol chart

The Divisional Engineer will prepare patrol charts for each of the sections where monsoon patrolling is to be done, taking into consideration the train timings of the timetable in force during this period.

3.1 Principal governing the preparation of patrol charts

- A single Patrolman will carry out ordinary patrolling, but in regions where danger from wild animals, dacoits and other risks as in ghat sections exist, patrolling in pairs may be introduced with the approval of the Chief Engineer.

- All trains carrying passengers between sunset and sunrise get the maximum protection possible.

- Each block section will be treated as a unit and the length will be divided into equal beats. The length of each patrol beat should not normally

exceed 5 km. Where the block section is more than 10 km an intermediate flag station or any other suitable point may be fixed as intermediate station, to keep the length of beat at about 5 km.

- The walking speed of a Patrolman may be taken as 3 kmph.

- Daily maximum distance covered by a Patrolman should not normally exceed 20 km.

- A period of at least half hour rest is desirable between consecutive beats.

- If one set of Patrolmen is not able to cover all the trains in the section due to high frequency of train services, a second set of Patrolmen may be introduced to reduce the interval.

- For giving better protection to all the passenger trains between sunset and sunrise, first plot the scheduled paths of all passenger trains and then plot the patrol movement in such a way, so as to minimise the time interval between patrolling of the beat and passage of train.

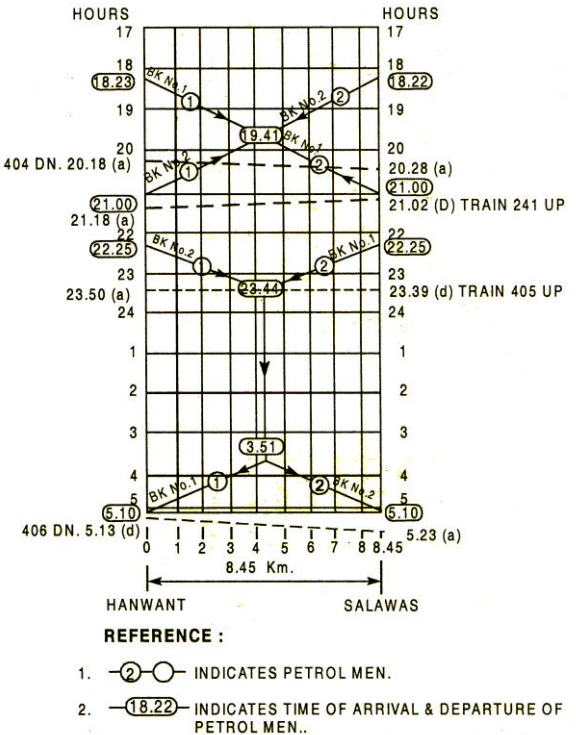
- Patrol charts should show all vulnerable locations where stationary watchmen are posted.

3.2 Distribution of patrol chart

Copies of patrol charts should be supplied by the Divisional Engineer to the Assistant Engineers, Permanent Way Inspectors, Divisional Operating Manager (for distribution to the Control staff), Station Masters and Foremen of running sheds to acquaint Drivers of passenger trains before commencement of the monsoon.

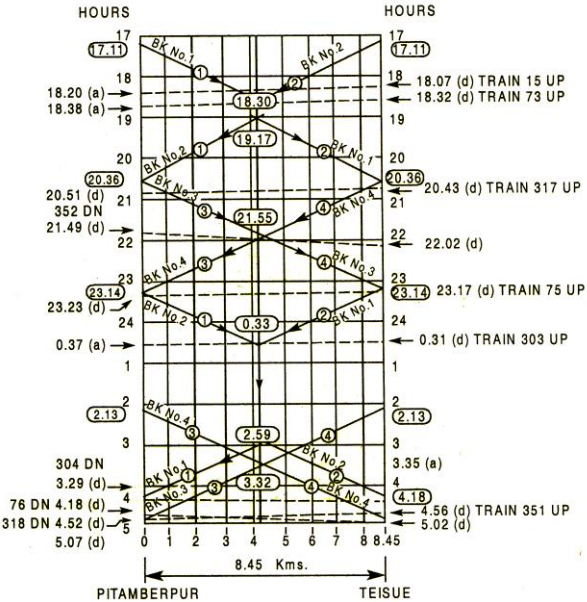
3.3 Patrol book

- Patrol book containing sufficient number of pages should be supplied to each patrolman with a tin case.
- The books shall be serially numbered to correspond with the number of patrol on each section.
- The first page of the book shall contain the name of Patrolman, Kilometrages of patrol section and its number.
- The remaining pages will contain columns for date, station, time of arrival and departure and signature of Station Master.



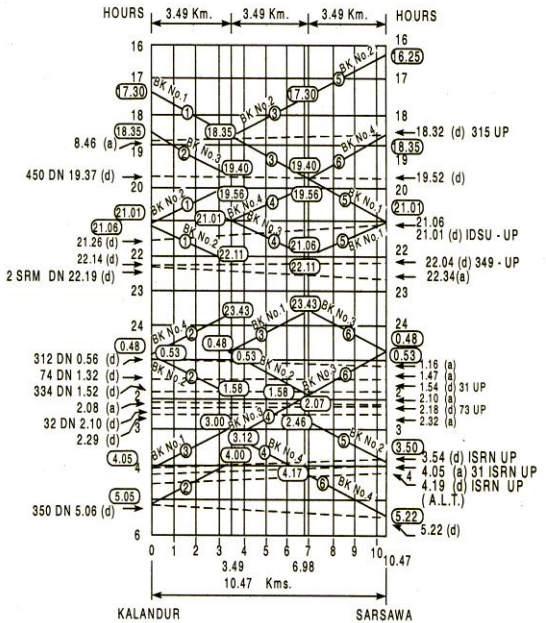
Patrol Chart (Branch line low density traffic)

(2 Beats Length & single Set of Patrolmen)



Patrol Chart (Main line heavy density traffic)

(2 Beats Length & 2 Sets of Patrolmen)



Reference :

1. Petrolmen (1) (3) & (5) Exchange book No. 1 & 2.
2. Petrolmen (2) (4) & (6) Exchange book No. 3 & 4.

Patrol Chart (Main line heavy density traffic)

(3 Beats Length & 2 Sets of Patrolmen)

***

Go to index

CHAPTER – 4

Selection of Patrolman

4.0 Selection of Patrolman

- Intelligent, experienced, trustworthy and literate man (who can read bridge and telegraph post numbers) should be selected from the permanent gangs by Permanent Way Inspectors to work as Patrolman.
- Twice the number required should be selected to serve as leave reserve and rest giver Patrolman.
- Patrolman should be sent to the Divisional Medical Officer for prescribed **vision test**.

***

Go to index

CHAPTER – 5

Equipment of Patrolmen

5.0 Equipment

Each Patrolman shall be provided with the following equipment :

- One staff
- Number plate 15 cm square (numbered consecutively from the beginning of each Permanent Way Inspector's length in white letters on black background)
- 12 fog signals in a tin case
- Two tricolour hands signal lamps
- Protective clothing according to local dress regulations
- One matchbox
- Two red flags and one green flag (day patrol only)
- Patrol book in a tin case

- One three cell electric torch
- Whistle thunderer
- One haversack
- Three flare signals (fusees) on double/multiple lines, ghat, suburban and automatic block territories and one fusee on single line sections

Where patrolling is undertaken in pairs or stationary patrol consists of two men, the equipment need not be duplicated but the additional Patrolman will be provided with an extra hand signal lamp, whistle thunderer and protective clothing.

***

Go to index

CHAPTER – 6

Systematic Patrolling

6.0 Patrolling

- Patrolmen shall be on duty at the time specified for each in the patrol chart. The Patrolman whose beat commences/terminates at a station shall present the patrol book in his possession to the Station Master / Block hut-in-charge.

- The Station Master / Block hut-in-charge will enter in the patrol book, the time of arrival and departure and sign the book. Station Masters will see that the Patrolmen come on duty sober and fully equipped, that their lamps are trimmed and filled with oil and that they leave for their patrol duty in time. The Station Master/Block hut-in-charge will also record the time of arrival and departure in his Diary/Train Register Book.

- The Patrolman shall then patrol his length at the end of which, he will exchange his patrol book with that of the next Patrolman and retrace his beat. The intermediate patrol does likewise. In this way each

patrol book will be conveyed from one station to the other and back again.

- Where stations are close together, the patrol books may be passed through one or more intermediate stations before it is returned to the original station. The Station Master of each intermediate station will enter the date and actual time of arrival and departure of the Patrolman and sign the book.

- If a Patrolman on arrival at the end of his beat does not find the next patrolman to take over the book, he must proceed ahead, until he meets him. The Patrolman should report the absence of any man from his beat to the Mate the next day.

- If a Patrolman does not turn up within **15 minutes** of his scheduled arrival, the Station Master on duty must stop run through trains proceeding into the block section and advise the Station Master at the other end of the section to take similar action and also advise the Controller. He must issue a Caution Order to all trains proceeding into the block section advising the Driver to be on the alert and specify a speed restriction of 40 Kmph during the day when the visibility is clear and 15 Kmph during the night or during the day when visibility is not clear. He shall also initiate action to ascertain the reason for the Patrolman not turning up by either sending a

Gangman or Pointsman, if available, in the concerned section. The Caution Orders will be issued until the Patrolman has arrived and reported that the line is safe for passage of trains.

6.1 Duties of Patrolmen

a) Walk to and fro the beat in accordance with the chart pertaining to his "patrol-section" looking out for subsidence, slips, signs of erosion, trees blown across the track during storms or any other causes likely to endanger the safety of line. Bridges and their approaches should be especially watched.

b) Apprehend damage to line when

- The flood exceeds danger level at any of the bridges.
- When there is damage to the protection work or on approaches even before danger level is reached.
- The water on one side of the embankment is at much higher level than on the other side.
- When any obstruction such as a fallen tree is blocking the waterway of bridge.
- The track shows signs of settlement.

c) Take immediate steps to stop trains when any portion of the line is likely to be rendered unsafe due to abnormal rain or flood or any other cause.

d) When no danger is apprehended, stand on the cess on the left hand side facing the train and exhibit his number plate, turning the light of his lamp on to it, so that the number can be seen from the passing train. He should also blow the whistle, when the engine and the brake-van of the train pass him.

e) Obtain the signature of the Station Master/Block Hut in-charge on duty at the Station/Block Hut concerned for his arrival and departure and exchange patrol books with adjacent Patrolmen.

f) Exchange the reports as to the conditions on their beats with adjacent Patrolmen and stationary Watchmen on the way.

g) Heed instructions from drivers who may report a condition of danger at a kilo-meterage and proceed to the place indicated and take necessary measures.

***

Go to index

CHAPTER – 7

Action when damage is observed

7.0 Action when damage is observed

In the event of any portion of the line being breached or otherwise rendered unsafe for traffic the following procedure shall be observed for protection of the track.

7.1 Where two patrolmen are employed

- **Protection of line**

a) The second lamp should be lit and danger signals shown at once in both the directions.

b) The two Patrolmen shall then proceed in opposite directions showing the danger signals (red flag by day and red light by night) and place one detonator at 600 M on BG and 400 M on MG/NG and three detonators at 10 meters apart at 1200 M on BG and 800 M on MG/NG from the site of obstruction/ damage.

On the double line the detonators must be placed on the line, in the direction on which the trains will approach.

On metre gauge sections where trains run at maximum permissible speed of more than 75 kmph the distance at which the detonators are to be placed shall be specified by the administration.

c) When the nature of obstruction is such that it is impossible for either of Patrolmen to get across the gap (as in washaway), one of the men should show the danger signal and endeavour to stop trains approaching the gap from the other side and the other patrolman should protect his side with the detonators etc as detailed in sub para (b) above.

- **Reporting the damage to Station Master and Gangmate**

  After protecting the track, one of the two Patrolmen who is nearest to the station and in case mentioned in (c) above, after protecting the track, the Patrolman who has protected the track will proceed in all haste showing the danger signal, to the Station Master of the danger. On his way back, if he meets with any gang-quarter, he should inform the Gangmate of the occurrence.

After protecting the track the other Patrolman will proceed to the site of obstruction, and remain there showing the danger signal, until the first Patrolmen

joins him. In case the Patrolman has not been able to locate the gang hut on his way back from the station, one of them should proceed to the gang hut and inform the Gangmate.

7.2 When one patrol man is employed

- **Protection of line**

a) When damage on single line

i) Place a red lamp during the night and a red flag during the day in a prominent position to warn a train, which may approach from one direction. Then run in the opposite direction from which direction train is likely to come, with a danger signal (red flag by day and red light by night) and place one detonator at 600 M on BG and 400 M on MG/NG and three detonators at 10 meters apart at 1200 M on BG and 800 M on MG/NG from the site of obstruction/damage.

On Metre gauge sections where trains run at maximum speed of more than 75 Kmph, the

distances at which the detonators are to be placed shall be specified by the administration.

ii) Return to the site of obstruction/damage and protect the other side with detonators similarly.

iii) In the event of it being impossible to get the other side of the obstruction/damage (as in washaway) place the red lamp / red flag so that it can be seen from as great distance as possible by a train approaching from that direction and protect the other side with the detonators etc as detailed in sub para (a) (i) above.

b) When damage on double line

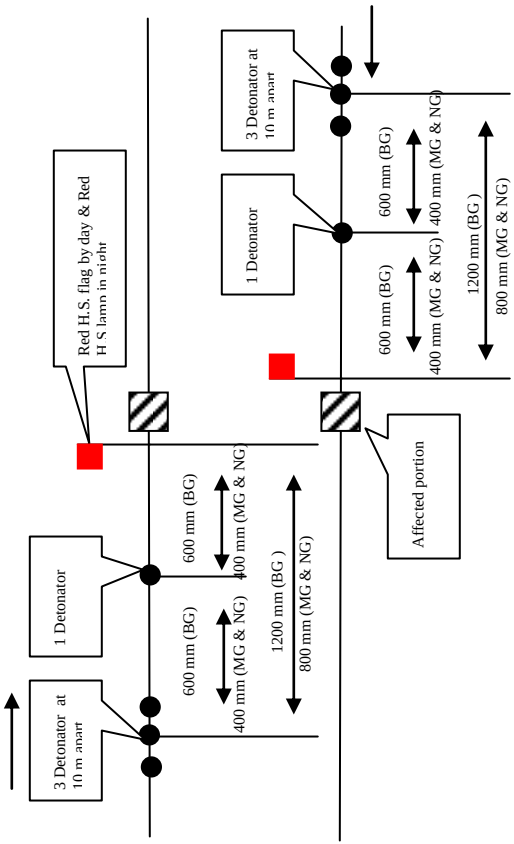
i) Place the red flag/lamp in prominent position so as to warn an approaching train on one track. Then run along the other track on which train is expected first and place the detonators as shown in sub para (a) (i) above.

ii) Run back and protect with detonators the line on which the lamp/flag was prominently placed.

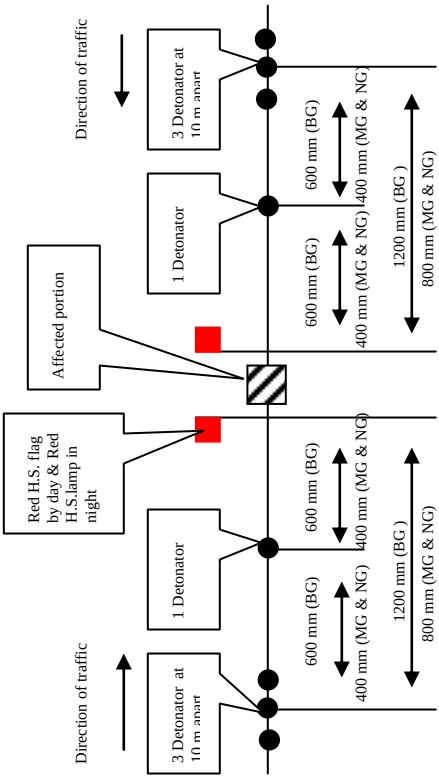
- **Reporting the damage to the Station Master**

The Patrolman will return to the site of obstruction after protecting the line in both the directions and shall remain at the place of obstruction and send word about

the danger through the first railway employee or other persons he is able to contact at the spot itself.



PROTECTION ON DOUBLE LINE



TRACK PROTECTION ON SINGLE LINE

Go to index

CHAPTER – 8

Inspection of Patrolling by Engineering Officials

8.0 Inspection of Patrolling at Nights

- **By Permanent Way Inspectors**

Official	By Train	By Trolley
PWI III/II PWI in-charge	Once a fortnight Once a month	Frequency to be prescribed by the Chief Engineer depending on the local condition.

- **By Assistant Engineer**

He shall cover his entire sub-division once in a month by Train, Push trolley or Motor trolley in the night and check the patrolmen.

8.1 Inspection of Patrol Books

The Permanent Way Inspector must examine the patrol books; initial the entries each time during trolley inspection and take up irregularities. The Assistant Engineer should examine the patrol books during his inspection.

8.2 Supplies and Inspection of Equipment

The Permanent Way Inspectors will be responsible for supplying of equipment and periodical distribution of consumable stores like kerosene oil, match box etc to the Patrolmen. The Mate will be responsible for seeing that the Patrolman posses the correct equipment.

The permanent way Inspector should check the equipment of all Patrolmen once a month. Record the results in patrol book and take steps to recoup deficiencies.

8.3 Instructions and Tuition

The Permanent way Inspector will be responsible for instructing the Patrolmen in their duties, in the rules for the protection of the lines and in acquainting them with all vulnerable points on their beats. In addition to oral instructions, the Permanent Way Inspector shall by practical demonstrations, drill the Patrolmen in their detailed duties and responsibilities.

***



NOTES



1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	
12.	
13.	
14.	
15.	

OUR OBJECTIVE

To upgrade Maintenance Technologies and Methodologies and achieve improvement in productivity and performance of all Railway assets and manpower which inter-alia would cover Reliability, Availability, and Utilisation.

The contents of this booklet are for guidance only & are **not statutory**. It also does not supersede any existing instructions from Railway Board, RDSO and zonal Railways & the provisions of IRPWM, G&SR on the subject.

Contact person	:	Director (Civil)
Postal Address	:	Centre for Advanced Maintenance Technology, Maharajpur, Gwalior (M.P.) Pin code – 474 020
Phone	:	(0751) - 2470869, 2470803
Fax	:	(0751) - 2470841