





**RESEARCH DESIGNS AND STANDARDS ORGANISATION**  
**Manak Nagar, Lucknow -226011**

**TM-DM-7.5.1-1**

**Directorate Manual of Track Machine & Monitoring Directorate**

**1.0 Amendment History**

S.	Date of Amendment	Version	Reasons for Amendment
1.	30/07/2018	1.0	First Issue under new documentation system for ISO 9001: 2015. Approved by ED/TM on NP-1 of TM/ISO 9001:2015 /QMS/Approval on dated 01/08/2018.
2.	15/11/2019	2.0	Changes in para 4.1.2.1 and added new paras as per ISO 9001: 2015 standards.

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## 2.0 Purpose

To lay down the operating procedures of Track Machine & Monitoring Directorate in accordance with ISO 9001:2015 Quality Management System.

## 3.0 Scope of application

Applicable respective activities to all quality units of Track Machine & Monitoring Directorate.

## 3.1 Directorate Activities

- Testing of track components such as Elastic Rail Clips, Sleepers, Rails and Dynamic testing of track components on Track Panel Fatigue Testing equipment, calibration of helical springs etc. for improvement in quality of above products being procured by Zonal Railways.
- To measure different track parameters by Track recording Cars on Indian Railways as per scheduled programme.
- To develop vendors /suppliers for Small Track Machines & P-Way Measuring tools, for quick and efficient maintenance of track according to the directives issued by MR/ ISO Cell.
- To lay down new specifications and revise existing specifications of Track Machines, to prepare maintenance schedules and inspection checklist for track machines after consultation with the Zonal Railways.
- To prepare & issue the deployment plan & GDMS for monitoring of RGM in IR and also prepare the new specification of different RGMs.
- To prepare the drawings and specifications of the components of the On Track Machines

## 3.2 Infrastructure

**Track Lab:** Deals with the testing of rails, sleepers and track components as per test scheme.

**Track Recording Cars:** TRCs deal with monitoring of track parameters.

## 3.3 Organization

These records are being maintained in separate files as per following:

S.No.	Document No	Title
1.	TM- D-5.1.1-1	Organization chart
2.	TM- D-5.1.1-2	Responsibilities of officers of Track Machine Directorate

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#### 4.0 Context of the organization

#### 4.1 Understanding the organization and its context

##### 4.1.1 Track Laboratory Unit:

###### External Issues:

- Calibration of various tools & equipments used in the track laboratory.
- Field trials for newly developed track components.
- Collection of field data based on test scheme submitted by other directorates.

###### Internal Issues:

- Fatigue testing of track components.
- Static testing of track components i.e. ERCs, Helical Springs etc.

##### 4.1.1.1 Track Lab does testing of following items:

Calibration of Helical springs.

Calibration verification of load cells in laboratory.

Testing of Elastic Rail Clips.

Testing of Rails, Sleeper, Welded joints on Track Panel Fatigue Testing Equipment



Any other item as per test scheme submitted by concerned directorate.

**4.1.1.2** Testing for calibration of helical spring shall be done as per work instruction No TM-WI-7.5.2-1 Ver. 1.0. Helical springs are used in Toe load measuring device to measure the toe load of Elastic Rail Clips in the field. These helical springs are submitted by approved firms directly to track laboratory for calibration against purchase order issued by different Zonal Railways.

**4.1.1.3** Calibration verification of load cells in laboratory shall be done as per work instruction TM-WI-7.5.2-2 Ver. 1.0. Electronic toe load measuring device are being used to measure the toe load of Elastic Rail Clips in the field. These load cells are submitted by approved firms directly to track laboratory for calibration verification against purchase order issued by different Zonal Railways.

**4.1.1.4** Testing of Elastic Rail Clips shall be done as per work instruction No. TM-WI-7.5.2-3 Ver.1.0.

**4.1.1.5** Testing on Track Panel Fatigue Testing Equipment: Testing on track panel fatigue testing equipment is done as per work instruction no. TM-WI-7.5.2-4 Ver. 1.0. Samples provided by the concerned directorate / zonal railways shall be tested as per test scheme submitted by the directorate. For testing on this machine, following process maps are applicable

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#### 4.1.2 Track Recording Car Unit:

##### External Issues:

Track Monitoring of various track routes of IR for assessment of track health for timely maintenance by Zonal Railways.

- IOH/POH of various TRCs in Zonal Railways workshops.

##### Internal Issues:

- Provision of necessary staff in TRC Units.
- Analysis of Track recording results.
- Procurement, up-gradation, replacement and maintenance of Track Monitoring systems.
- Maintenance of DG sets provided in TRCs.
- Provision of test stretches based on TRC results for oscillation trials of various rolling stock.

##### 4.1.2.1 Frequency of recording, as per para 606 of IRPWM is as under:

The Board Gauge routes should be monitored by TRC as per the following frequencies (except for the routes where track recording is to be dispensed with):

(i)	Routes with existing speeds above 130 kmph	- once in 2 months.
(ii)	Routes with existing speed 110 kmph and up to 130 kmph	- once in 3 months.
(iii)	Routes with existing speed 100 kmph and up to 110 kmph	- once in 4 months.
(iv)	Routes with existing speed upto 100 kmph kmph	- once in 6 months.

##### 4.1.2.2 Recording of Track by Track Recording Car

Recording is being done in TMM Dte as per work instruction No. TM-WI-7.5.2-5 Ver 1.1

#### 4.1.3 Small Track Machine Unit:

##### External Issues:

- Multi-sourcing of vendors for various small track machines & P-way tools for maintenance of railway track.
- Development of new small track machines.
- To prepare technical specification of a new Small Track Machine and review the exist specification of Small Track Machine based on feedback of all stakeholders.

##### Internal Issues:

- To take comments & suggestion by the railways for developing/upgrading vendors of Small Track Machines & P-way tools.
- To prepare the approved list of vendors.
- To prepare policy guidelines for developing of vendors.

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4.1.3.1 Development of vendors for Small Track Machines & P-Way Measuring Tools shall be done as per work instructions No. TM-WI-7.5.2 Ver. 1.0.

#### 4.1.4 Heavy/Large Track Machine Unit:

##### External Issues:

- To prepare technical specification of various on track machines based on stakeholders feedback.
- To prepare maintenance schedule & inspection check list of various on track machines, based on Zonal Railways feedback.
- To collect technical data & technical clarification of track machines from firms for preparation of Speed Certificates.

##### Internal Issues:

- To take comments from other directorates for issue of Speed Certificates.
- To get technical clarifications from other directorates for finalization of technical specifications of track machines.
- To collect comments & data from other directorates for issue of technical guidelines.

4.1.4.1 (i) To study the instructions/suggestions/comments of Railway Board/Zonal Railways and to study availability of latest technologies of track machines in the world for preparation of new specification/revising existing specification of track machines. Draft is prepared and uploaded on RDSO website following prevailing ISO guidelines. After finalization, the same is approved by EDTM. Working of this activity is governed by work instruction No. TM-WI-7.5.2-6 Ver. 1.0.

(ii) Study of OEM's literature on concerned machine, Visit to working sites of Large Track Machines on Indian Railways, Meeting with Operators of machines /Experts of Machines in Zonal railways. After that issuing the draft, provisional and final copies of the prepared document as applicable to Zonal railways for comments/implementation. Working of this unit is governed by work instruction No. TM-WI-7.5.2-6 Ver. 1.0.

#### 4.1.5 Rail Grinding Machine (RGM)

##### External Issues:

- Monitoring of RGMs according to master & monthly deployment plan.
- Collection of raw data of track for analysis of GDMS from all concern zonal railways.
- Time-to-time collection of GMT details of different sections from concern zonal railways.

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- To take comments & suggestions from railways and firms for preparing technical specifications.

**Internal Issues:**

- To prepare master and monthly deployment plan of RGMs
- Analysis of GDMS data
- To prepare technical specifications of RGMs

**4.1.5.1** Traffic data collected from railways & deployment plan of RGM is prepared and issued to the concern railways Working of this unit is governed by work instruction No. TM-WI-7.5.2-7 Ver.1.0.

**4.2 Understanding the needs and expectations of interested parties**

- All zonal railways and suppliers are interested parties of TMM Dte.
- The requirement of zonal railways is to maintain the track as per the standard parameters for smooth running of the trains.

**4.3 Determining the scope of the quality management system**

The TMM Dte. determine the scope by the external and internal issues and the requirements of relevant interested parties.

**4.4 Quality management system and it processes**

**4.4.1** The TMM Dte. prepares manuals, specification, MS, IC, CSP, drawings and speed certificates etc.

**4.4.2** Work Instruction & Process Map are prepared to support the operation of QMS

**5 Leadership**

**5.1 Leadership and commitment**



**5.1.1 General**

It is maintained in document no.TM-D-5.5.1-1(Quality, units, codes and organization chart) & document no. TM-D-5.5.1-2(Responsibility of officers)

**5.1.2 Customer focus**

TMM dte. takes feedback from internal and external customers then prepare and sent the customer satisfaction index to MR/ISO Cell.

**5.2 Policy**

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### 5.2.1 Establishing the quality policy

The quality policy of the RDSO is maintained in document no.QO-QP-5.2.1-1.

### 5.2.2 Communicating the quality policy

The hardcopy of quality policy is circulated to the every staff of TMM Dte and pasted in every unit of the Dte also for understanding, learning and following it.

### 5.3 Organizational roles, responsibilities and authorities

The TMM dte. maintains the QMS documents as per ISO 9001:2015 guidelines of MR/ ISO Cell.

## 6.0 Planning

### 6.1 Actions to address risks and opportunities

Risks and opportunities are prepared as per external and internal issues. It is maintained in document No. TM-D-6.1-0 (Risk Analysis & envisaged Opportunities of TMM Directorate.

### 6.2 Quality objectives and planning to achieve them

The TMM Dte. prepares quality objectives every financial year and maintains in document no.TM-M-6.2.1-1(Master list of Quality Objectives of TMM Dte.)

### 6.3 Planning of changes

The changes shall be done as per guidelines of MR/ISO Cell.

## 7.0 Support

### 7.1 Resources

#### 7.1.1 General

Head of the Directorate manages the resources, staff, infrastructure & environment.

#### 7.1.2 People

Head of the Directorate manages staff.

#### 7.1.3 Infrastructure

Head of the Directorate manages infrastructure

#### 7.1.4 Environment for the operation of process

Head of the Directorate manages the necessary requirements for the working of the staff.

**7.1.5 Monitoring and measuring resources**

**7.1.5.1 General**

**7.1.5.2 Measurement traceability**

The TMM Dte. prepares Master list of measuring equipments and maintains in document no. TM-M-7.1.5.2-1 (Master list of Measuring Equipments of TMM Dte.)

**7.1.6 Organizational knowledge**

**7.2 Competence**

Required training is provided concerned staff of TMM Dte. as per document no. TMF-7.2-1

**7.3 Awareness**

TMM Dte. circulate the quality policy and relevant quality objectives to the officials of the directorate.

**7.4 Communication**

TMM Dte. communicates all the QMS documents through email & rdso website (ISO Cell)

**7.5 Documented information**

The required QMS documents as per ISO guidelines are maintained in the Mater List of Documents TM-M-7.5.1-1

**8.0 Operation**

**8.1 Operational planning and control**

TMM Dte. provide services to customers (zonal railways) & various directorates of RDSO.

**8.3 Design and development of products and services**

Not applicable to TMM Dte.

**8.4 Control of externally provided processes, products and services**

Not applicable to TMM Dte.


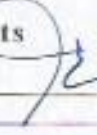
**8.5 Productions and service provision**

Not applicable to TMM Dte.

**8.6 Release of products and services**

Not applicable to TMM Dte.

**8.7 Control of nonconforming outputs**

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Not applicable to TMM Dte.

**9. Performance evaluation**

**9.1 Monitoring, measurement, analysis and evaluation**

**9.1.1 General**

Performance evaluation is maintained in the minutes of DRM.

**9.1.2 Customer satisfaction**

It is maintained in document no TM-D-9.1.2-2 (Annual Report on Customer Satisfaction Index) and sent to MR/ISO Cell on the basis of the customer feedback.

**9.1.3 Analysis and evaluation**

Data recorded by TRCs are analyzed and sent to concerned railways for implementation.

**9.2 Internal audit**

Not applicable to TMM Dte. It is conducted by MR/ISO Cell.

**9.3 Management Review**

**9.3.1 General**

The directorate conducts DRM (Directorate Review Meeting) in every six months. MR/ISO Cell conducts MRM (Management Review Meeting) once in a year.

**9.3.2 Management Review Inputs**

Agenda of the Directorate is provided to the MR/ISO for the MRM.

**9.3.3 Management Review Outputs**

Minutes of the MRM is prepared by MR/ISO Cell and circulated to all Directorates.

**10. Improvement**

Improvement in QMS document is done as per MR/ISO guidelines.

**10.1 General**

**10.2 Non conformity and corrective action**

**10.2.1** If any NCR arises by the auditor then action is to be taken for resolving & closing the NCR by the Directorate.


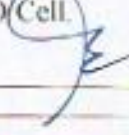
**10.2.2** Directorate maintained the documents related to NCR and its corrective action.

**10.3 Continual Improvement**

The directorate continually improves the suitability, adequacy and effectiveness of the quality management system.

**11.0 Referenced Documents**

All apex documents issued by MR/ISO Cell.

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## 12.0 Referenced Documents of External Origin:

12.1 National /International standards & specifications, all manuals and IR Codes issued by Rly. Board.

12.2 OEM's Literature for concerned machine

## 13.0 Associated Records

Directives issued by MR/ISO Cell.

## 14.0 Responsibility and Authority



Change, review & approval of 3 tier documents for respective quality units of TMM Directorate are following:

### 14.1 Track Lab

Activity	Responsible	Approver	Supporting	Consulted	Informed
Creation, maintenance of	DTM-I	EDTM	Staff of Track Lab	ISO/TM	All concerned officer through intranet
Compliance of directives	DD/ARE	DTM-I	Staff of Track Lab	ISO/TM	All concerned officer through intranet
Requirement of deviation from directives of MR	EDTM	DG	DTM-I	ISO/TM & MR	All concerned officer through intranet

### 14.2 Track Recording Car Unit

Activity	Responsible	Approver	Supporting	Consulted	Informed
Creation, maintenance of	DTM-IV	EDTM	Staff of TRC	ISO/TM	All concerned officer through intranet
Compliance of directives	DD/ARE	DTM-IV	Staff of TRC	ISO/TM	All concerned officer through intranet
Requirement of deviation from directives of MR	EDTM	DG	DTM-IV	ISO/TM & MR	All concerned officer through intranet

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### 14.3 Small Track Machine Unit

Activity	Responsible	Approver	Supporting	Consulted	Informed
Creation, maintenance of	DTM-I	EDTM	Staff of Small Machine	ISO/TM	All concerned officer through intranet
Compliance of directives	DD/ARE	DTM-I	Staff of Small Machine	ISO/TM	All concerned officer through intranet
Requirement of deviation from directives of MR	EDTM	DG	DTM-I	ISO/TM & MR	All concerned officer through intranet

### 14.4 Large Track Machine Unit

Activity	Responsible	Approver	Supporting	Consulted	Informed
Creation, maintenance of	DTM-III	EDTM	Staff of Large Machine	ISO/TM	All concerned officer through intranet
Compliance of directives	DD/ARE	DTM-III	Staff of Large Machine	ISO/TM	All concerned officer through intranet
Requirement of deviation from directives of MR	EDTM	DG	DTM-III	ISO/TM & MR	All concerned officer through intranet

### 14.5 RGM Unit

Activity	Responsible	Approver	Supporting	Consulted	Informed
Creation, maintenance of	DTM-III	EDTM	Staff of Large Machine	ISO/TM	All concerned officer through intranet
Compliance of directives	DD/ARE	DTM-III	Staff of Large Machine	ISO/TM	All concerned officer through intranet
Requirement of deviation from directives of MR	EDTM	DG	DTM-III	ISO/TM & MR	All concerned officer through intranet

## 15.0 Abbreviations

S. No.	Abbreviations	Definition
1.	EDTM	Executive Director Track Machine.
2.	DIR/JD	Director/Joint Director
3.	MR	Management Representative
4.	DD	Deputy Director
5.	ARE	Assistant Research Engineer
6.	TM	Track Machine and Monitoring
7.	LM/HM	Large Machine/Heavy Machine
8.	STM	Small Track Machine
9.	TRC	Track Recording Car
10.	TRC (UG)	Track Recording Car/Up-gradation
11.	TL	Track Laboratory
12.	TMS	Track Management System
13.	RGM	Rail Grinding Machine
14.	OSTM	Office Superintendent Track Machine
15.	SSRE	Senior Section Research Engineer
16.	SSE/Engg	Senior Section Engineer /Engineering
17.	SSE/D	Senior Section Engineer /Design
18.	JE/Engg	Junior Engineer/Engineering
19.	JRE	Junior Research Engineer
20.	JE /D	Junior Engineer/Design
21.	DTE	Directorate
22.	OEM	Original Equipment Manufacturer
23.	STR	Schedule of Technical Requirement
24.	ToT	Transfer of Technology
25.	IMTE	Inspection Measuring and Testing Equipment
26.	C	Check sheet
27.	D	Quality System Directive
28.	F	Form
29.	G	Quality System Guideline
30.	M	Master List
31.	S	Schedule
32.	DM	Directorate Manual
33.	QO	Quality Organisation
34.	WI	Work Instruction
35.	PM	Process Map
36.	RF	Record Formats
37.	T	Template

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38.	QM	Quality Manual
39.	QP	Quality Policy
40.	Obs.	Observation
41.	NCR	Non Conformity Report
42.	MRM	Management Review Meeting
43.	DRM	Directorate Review Meeting
44.	IA	Internal Audit
45.	GDMS	Grind Data Management System

**16.0 Customer of the Directorate**

**16.1 Internal:** Motive Power, Testing, Carriage, Track Design, Track Installation, B&S and QA/Civil Directorate.

**16.2 External:** Railway Board, Zonal railways through SAG or higher grade officers and any outside organization with whom RDSO enters into management.

