

Course Module		
CourseNo.: CE-51		Course Name: Course on Track Machines for IRSE (P)officers
Duration: 2Weeks		Days- 12
Module No. & Sub-discipline	Contents	Periods
51.1	Introduction: History of Mechanization on Indian Railways, Induction of various Track Machines in chronological order, type of machines, Weightage factor of machines.	2
	IRTMM: Track Machine organization Duties of Divisional officers and staff in charge of P. Way.	2
	IRTMM: Planning, Operation & Monitoring of different track machines, Rules for movement & working, Competency certificates. Safety precautions and action in case of emergency.	2
	RDSO reports on Repair & Maintenance of machines: RDSO TM Reports, maintenance schedules, workshops (CPOH, ZMD, SMD, Mobile workshop)	1
	IRTMM: Brief on other Chapters of IRTMM, Weightage factor of machines. Life and Condemnation of machines. Staff requirement and infrastructure facilities, Stores.	1
51.2 Engine	Internal Combustion Engine: General idea of Engines, Various types of engines used on machine with their general data and Demonstration in Model Room.	1
51.3 Electrical & Electronics	Introduction to Electrical and Electronic of Machines: General idea about Electrical & Electronics, Various Electrical & Electronic components , different power supply PCBs ,Safety & Warning Systems on machines, Understanding of Driving System Tamping Unit control System, PLC & Multicheck Systems, Lining & Levelling Control Systems	1
51.4 Hydraulics, Pneumatic and mechanical assemblies.	Introduction to Hydraulics, Pneumatic and mechanical assemblies: General idea of Hydraulic & Pneumatic Systems, Mechanical Assemblies of Tamping Machines, Mechanical Assemblies of Ballast Handling Machines, Braking system in machines in general.	1

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51.5 Track Machines & Working Principles	WST/New Duomatic/VPR: Main features, Main assemblies and components, Technical Data, Power transmission (Driving & Working) and differences between them.	1
	09-32-CSM/09-3X (Tamping Express) + DTS: Main features, Main assemblies and components, Technical Data, Power transmission (Driving & Working) and differences between them.	2
	UNI-2S/ UNI-3S/ UNI-4S/MPT: Main features, Main assemblies and components, Technical Data, Power transmission (Driving & Working) and differencesbetween them.	1
	RM-80/ RM-80-92U/ RM-76/HOBCM, MDU: Main features, Main assemblies and components, Technical Data, Power transmission (Driving & Working) and differences between them.	2
	FRM-80/ FRM-85: Main features, Main assemblies and components, Technical Data, Power transmission (Driving & Working) and differences between them, Safety during working.	1
	TLE: Main features, Main assemblies and components, Technical Data, Base Depot Layout, Turning Square Arrangement and AuxiliaryTrack. Pre-requisites, Pre-relaying operations, Post relaying operations and precautions during.	1
	T-28: Main features, Main assemblies and components, Technical Data, Pre-block operations, operations during block, Post block operations, and precautions during.	1
	TRT: Main features, Main assemblies and components, Technical Data, Operations prior to deployment, Manual operations during block, Post block operations and precautions during.	1
	DGS: Main features, Main assemblies and components, Technical Data, Specific guidelines. Kershaw BRM: Main features, Main assemblies and components, Technical Data, Specific guidelines. Plasser BRM: Main features, Main assemblies and components, Technical Data, Specific guidelines. UTV and RBMV: Main features Main assemblies and components, Technical Data, Specific guidelines.	1
	RGM: Main features Main assemblies and components, Technical Data, Specific guidelines.	2

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51.6 Track Machines & Working Principles	Quality control in Plain Track Tamping Machines: Pre-requisites, Pre-tamping Operations, Operations during tamping and Post tamping Operations, Specific guidelines. Quality control in Point & Crossing Tamping Machines: Pre-requisites, Pre-tamping Operations, Operations during tamping and Post tamping Operations, Specific guidelines.	1
	Quality control in Ballast Cleaning Machines: Pre-requisites, Operations prior to deployment, Operations during Traffic Block and Operations after deployment, Specific guidelines. Quality control in Shoulder Ballast Cleaning Machines: Pre-requisites, Operations prior to deployment, Operations during Traffic Block and Operations after deployment, Specific guidelines.	1
	Lining: Principle, Types (4 Point & 3 Point lining method). 4 Point lining method: Principle & Left over error. 3 Point lining method: Principle & Left over error versine calculation.	2
	Levelling system: Types, Double chord system, General lift, ramp in & ramp out, Criteria for selection of Base line, Levelling in smoothening mode. K correction, X-Correction in vertical curves.	2
	Detail of Lining System: 4 Point lining method: Calculation of Vmvalue on Transition Curve, Direction of Toggle switch, Calculation of Vmvalue for Reverse Curve & non-suitability of 4 Point lining on Straight, Feeding method of Vmvalue at Reverse and Compoundcurve. 3 Point lining method: Calculation of 'V' value for each machine & Method of feeding 'V' value.	4
	Design lining, Laser lining and measuring run (introduction to ALC) method, Survey for Alignment correction. Design leveling, Survey for vertical Profile correction.	2

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51.7 Track Machines & Working Principles	Method of feeding of Cant on CSM, Method of feeding of Cant on other machines, Method of Calculation of Correction value ('K' Value), Use of ALC & DAR	2
	Field Survey of Track Data for Design Lining and Design Leveling, Tabulation of data, Plotting on graphpaper, Calculation for desired Slew and target heights.	8
	ALC, DRP, CMS, CWS, working of ALC and Hands-On training on computation and feeding into ALC in different modes of tamping.	4
51.8 Machine Driving & Operations	Exposure to driving and working as in field of machine at CPOH/CSP.	4
51.9 Field Visits	Visit to OEM i.e. Plasser India Faridabad.	6
	Visit to Tamping Machine working site	6
51.10 Examination & Valediction	Introduction and validation	2
	Total	68

Note: Eligibility: Newly Recruited IRSE officers.