COURSE MODULE

Course No. CE 31: Refresher SSE/JE

Duration:2Weeks Effective Days:12

S. N.	CM No.	Subjects	Periods	Total Periods
1	31.1	**Electrical & Electronics:**		10
		Electrical Components: Battery, Alternator, Self Starter, Relay	1	
		Engine Circuits and Troubleshooting.	1	
		Engine Circuits and Troubleshooting.	1	
		ZF Circuits and Troubleshooting.	1	
		Electronics Components: Transducers & Op Amp.	1	
		Power Supply PCBs.	1	
		Programmer Unit, Logic Plan & Multi-check.	1	
		Tamping Unit Control Circuit.	1	
		Leveling & Lifting Control Circuit.	1	
		Demonstration o**f** Multi-check. & Programmer Unit in electronic model room.	1	
2	31.2	**Hydraulics, Pneumatics & Mechanical:**		10
		Hydraulic Components: Pumps, Motors & Valves, and Troubleshooting.	2	
		Tamping Unit, Lifting & Lining Unit, Bushes & Bearings, Fast wearing mechanical parts and Troubleshooting	2	
		Power Transmission: Types, Mechanical & ZF Hydro-dynamic Gear Box and other related Assemblies and Troubleshooting.	2	
		Hydraulic Circuits and their Demonstration using Models/FluidsimH Software and Work exercises.	2	
		Pneumatic Components & Circuits and their demonstration using Models/Fluidsim P Software and Work exercises, Brake system in Machines (KE Valve).	2	
3	31.3	**I.C. Engine:**		10
		Working Principle of 4 Stroke Diesel Engine (Diesel cycle), Deviations between Actual Working cycle and Theoretical cycle.	1	
		Main Systems of I.C. Engine: Air Supply System and Troubleshooting	2	
		Main Systems of I.C. Engine: Fuel Supply System and Troubleshooting	2	
		Main Systems of I.C. Engine: Lubricating System & Cooling System and Troubleshooting.	2	
		Maintenance Steps to improve Performance & Maintenance Schedules of Cummins Engine.	2	
		Firing orders, VT diagram, Adjustment of Valve (Tappet) clearance & Injection timing.	1	
4	31.4	**Track Machines & Working Principles:**		12
		Provisions of IRTMM, Basic features of Track Machines &.Tamping Quality Control..	1	
		Rules for movement and Block working including action in case of machine breakdown. Planning and utilization of 50 ton Jack kept on machine for quick restoration during derailment and rerailment Techniques.	1	
		Periodic maintenance and TM Reports and Machine Manufacture's	1	

		/OEM's Literature		
		Operation, Main Assemblies & Troubleshooting of all tamping machines and DTS	1	
		Operation, Main Assemblies & Troubleshooting of all tamping machines and DTS	2	
		Operation Main Assemblies & Trouble shooting of BCM, SBCM & BRM	2	
		Operation Main Assemblies & Trouble shooting of PQRS, TRT T-28. UTV and RBMV.	2	
		Working Principles of Lining including Design Mode of working of Tamping Machines.	2	
5	**31.5**	**P.Way, Establishment, Stores & Accounts**		**4**
		Constituents of Railway Track, Points& Crossings, Curves, IRPWM Provisions on Regular Track Maintenance.	1	
		Provisions on Works incidental to Regular Track Maintenance, Maintenance of Track in Track Circuited Areas & Electrified Areas & Precautions during Machine working in Electrified Areas	1	
		Categorioes of Engineering Works, Engineering Fixed Signals/Indicators: Temporary and Permanent; Emergency Protection of track: Single Line & Double Line, Detonators & Flare Signals	1	
		HOER, Leave, Pass, D&AR & Conduct Rules. Stock heads of Accounts, Disposal of released and surplus materials, Indenting procedure, Issue note and Write-off statement. Stock verification and Inventory Control Technique.	1	
6	**31.6**	**Computer:**		**8**
		Introduction to Automatic Guiding Computer (ALC) Hardware & Win ALC Software.	1	
		Working in Geometry, Measuring Run & Design Mode	1	
		Hands on training on calculating Vm values in 4-point lining and Versine ,X and K values for 3 point lining and Levelling using OEM'S manual.	1	
		CMS and CWS	1	
		DRP (Data recording Processor)	1	
		Hands On training on using ALC measuring run data to computing best Curve. Also making data file for known Track Geometry and Front Offsets.	3	
7	**31.7**	**Technical Film Show**	2	**2**
8	**31.8**	**Library**	2	**2**
9	**31.9**	**Visit to CPOH & Track Machines Working Site**	8	**8**
10	**31.10**	**Introduction &Valediction**	2	**2**
		Total	**68**	**68**

Note: 1. Eligibility: SSE/JE.

2. **To bridge the gap between theory and practical, 1 visit to CPOH and 1 day visit to Track Machines Working Site shall be arranged for demonstration and proper understanding of machineworking.**
3. **Practical demonstration in Model rooms shall be given along with theoretical sessions as and when required besides Practical sessions specifically earmarked for Model Rooms.**