



Government of India (Bharat Sarkar)
Ministry of Railways (Rail Mantralaya)
(Railway Board)

RBE No. 41 /2020

No. E(MPP)2009/3/14 Pt.

New Delhi, Dated 05.06.2020

The General Managers,
All Indian Railways/PUs,
Metro Railway/Kolkata
Railway Electrification/Allahabad
DG/RDSO/Lucknow
CAO/DMW/Patiala
CAO/COFMOW/New Delhi
ED/CAMTECH/Gwalior

DG/NAIR/Vadodara
The Directors,
IRITM/Lucknow
IRIEEN/Nasik
IRIMEE/Jamalpur
IRICEN/Pune
IRISET/Secunderabad

Sub: Revised Training Modules for New Assistant Loco Pilots for Dual Traction (Induction training as well as Conversion training programme).

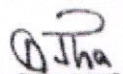
As per Board's letter No. E(MPP)/2009/3/14 dated 05.06.2019 (RBE No. 99/2009), the existing training period of Induction training programme (Dual Traction) and Conversion training programme of Assistant Loco Pilots is 151 days and 48 days, respectively.

2. In view of technological changes and changed job requirements, Ministry of Railways in consultation with Mechanical Directorate and Electrical Directorate has decided to revise the training period of Induction Training Programme (Dual Traction) and Conversion Training Programme of Assistant Loco Pilots as under

- Induction Training Programme (Dual Traction) of ALPs - 109 days
- Conversion Training Programme of ALPs - 36 days

3. The Revised Training Modules/detailed course contents is enclosed herewith. It has been also scanned and uploaded under **E(MPP) Training Circulars** and can be viewed or downloaded from **Railnet**.

D.A: As above


(Ajay Jha)
Joint Director/MPP
Railway Board

No.E(MPP)2009/3/14 Pt.

New Delhi, dated: 05-06-2020

Copy to:

- 1) The General Secretary, NFIR, 3 Chelmsford Road, New Delhi for information. (Copies may be downloaded from E(MPP) Training Circulars/Railnet)
- 2) The General Secretary, AIRF, 4 State Entry Road, New Delhi for information. (Copies may be downloaded from E(MPP) Training Circulars/Railnet)
- 3) The Secretary General, FROA, R.No.256-A, Rail Bhavan, New Delhi for information. (Copies may be downloaded from E(MPP) Training Circulars/Railnet)
- 4) The Secretary General, IRPOF, R.No.268, Rail Bhavan, New Delhi for information. (Copies may be downloaded from E(MPP) Training Circulars/Railnet).
- 5) All Members, Department Council & Secretary Staff side National Council 13-C, Ferozeshah Road, New Delhi. (Copies may be downloaded from E(MPP) Training Circulars/Railnet)
- 6) The Secretary General, AIRPF Association, Room No.256-D, Rail Bhavan, New Delhi. (Copies may be downloaded from E(MPP) Training Circulars/Railnet)
- 7) General Secretary, All India SC & ST Railway Employees Association, 171/B-3, Basant Lane Railway Colony, New Delhi. (Copies may be downloaded from E(MPP) Training Circulars/Railnet).


For Secretary/Railway Board

No.E(MPP)2009/3/14 Pt.

New Delhi, dated: 05-06-2020

Copy to:

- i) PS & ED(PG) to MR, MSR(A) & MSR(K)
- ii) PSO/Sr.PPS to CRB, FC, ML, ME, MM, MS, MT, DG(RHS) & DG(RPF)
- iii) Sr.PPS/PPS/PS to AM(Budget), AM(CE), AM(C&IS), AM (Comml.), AM(Elect), AM(Fin), AM(Mech.), AM(Plg.), AM(Project), AM(PU), AM(Sig.), AM(Staff), AM(RS), AM(T&C), AM(Tele), AM(Traffic), AM(Works), Adv.L (RS), Adv(Vig.), Adv.Fin (Exp), Adv(IR), Adv(Safety), LA, OSD(MIS).
- iv) ED(Plg.), ED(Accts.), EDF(BC), EDCE(B&S), EDCE(G), EDCE(Plg.), ED(CHG), ED(CC), ED(C&IS), ED(E&R), EDEE(Dev), EDEE(G), EDE, ED(RRB), EDE(N), EDE(Res), EDF, EDF€, EDF(S), EDF(B), EDF(RM), EDF(X)I, EDF(X)II, ED(H), EDLM, ED(MIS), EDE(GC), ED(T&MPP), EDME(Chg.), EDME(Fr.), EDME(Tr.), EDME(TOT), EDME(Dev.), EDME(W), ED(PC)I, ED(PC)II, ED(PP), ED(Project), ED(Project)/DMRC, EDRE, ED(Safety), JS, JS(C), JS€, JS(P), IG./RPF(Hqs), IG/RS, ED(S9g.), ED(Stat & Econ.), EDRS(C), EDRS(G), EDRS(P), EDRS(S), EDRS(W), ED(TD), EDTT(M), EDT(MC), EDT(P), ED(T&C), EDCE(P), ED(PM), ED(PG), EDTC-I, EDTC(FM), EDTT(F), EDTT(FM), EDTT(S), EDV(A), EDVE, EDV(T), ED(W).
- v) Chief Commissioner of Railway Safety, Lucknow.
- vi) E(Trg.), E(NG)I, E(NG)II, E(G), F(E)I, F(E)II, F(E)III, E(SCT)I, E(SCT)II branches of Railway Board.

**Revised
Training Module
for
Assistant Loco Pilots**

**Induction Training Programme
(Dual Traction)
&
Conversion Training Programme**

Training of Assistant Loco Pilot in Dual Traction (including Induction training and Conversion Training)

Training Module of Dual Traction			
S.No.	Training Module	Existing Duration	Revised Duration
1	Initial/General Training	3 days	03 days
2	Transportation Training. Demonstration on Fire Fighting & First aid	24 days	25days
3	Basic Elec./Mech. Engg.: c&w; Lobby/Control/FOIS/CMS/etc.	14 days	18 days
4	Traction specific Core subject matter	36 days	40 days (20 each for both traction)
5	Foot Plate Training Interspersed with Training at (3) & (4) above.	20 days min 2500 kms	20 days (10 days each for both type of traction minimum 1250 KMS each.
6	Review and exam	6 days	3 days
	Total(Single Traction)	103 days	-----
11	Conversion Training	36 days	-----
12	Foot Plate Training for other traction after conversion	10 days min 1250 kms	-----
13	Review and exam	2 days	----
	Total (Duel Traction)	151 days	109 days
Training Module of Conversion Training			
S.No.	Training Module	Existing Duration	Revised Duration
1	Conversion Training	36 days	36 days
2	Foot Plate Training for other traction after conversion	10 days min 1250 kms	
3	Review and exam	2 days	
	Total	48 days	36 days

Conversion Training Programme

S.No	Description	Existing module	RBs revised module
	Training Module	Days	Days
1	Traction specific core subject matter	36	25 1/2
2	Foot Plate Training under loco inspector/training instructor	10	10
3	Review & Exam	2	1/2
	Total	48	36

Summary of training module of ALP for Dual traction (109 Days)

Sl. No.	Training Module	Location	Proposed Duration
1.	Indian Railways:- General Information, Fire fighting & First-aid	ZETC/BRCY	03 Days
2.	Transport Training	ZRTI UDZ	24 Days
3.	Carriage & Wagons: Different types of coaches & wagons. Air Brake Brake-pipe, Feed pipe, Aux and control reservoir, distributor valve working, Brake cylinder working, air charging in train, single pipe/Twin pipe working, slack adjuster, angle cock, position of Empty loaded device. Lesson, Demonstration & practical drill on building/re-building of pressure & time taken thereof in train, train parting, releasing of brakes, hand brake working, adjusting slack adjuster, isolation of distributor valves, changing of BP/FP pipe, ACP device resetting, testing of continuity and measurement of air leakage in load. CBC working, Transition Coupling working & attachment/detachment of wagons. Items to be checked during GDR	ZRTI UDZ	03 Days
4.	Basic Electricity: Electric circuit, open circuit, close circuit, short circuit, voltage, current, resistance, ohms law, series & parallel connection, capacitor, conductor/insulator, Symbols, current, voltage, resistance, Ammeter, Voltmeter, protective device e.g. Fuse, relays & contactor, Batteries, Switches, Motor (AC & DC) & its working principal, speed control, Generator/Alternator, convertor, Invertors, Rectifier, Diode, GTO, IGBT etc. Precaution to be taken with various voltages of electricity	ZETC/BRCY	03 Days
5.	Familiarization with OHE and layout & working of various types of electric loco/Sub-system/Sub-assemblies including SIV, Microprocessors & three phase Locos	ZETC/BRCY	22 Days
6.	Different Locomotive operating instructions and trouble shooting	ZETC/BRCY	08 Days
7.	Safety items of loco to be checked while turning out loco from shed, items to be checked while taking over charge from oncoming Crew	ZETC/BRCY	03 Days
8.	Foot plate training for dual traction & on line under Loco Inspector: Working of lobby- Various registers	Concerned Division	20 Days (10 days each for both type)

	maintained under Crew Controller- Sign on/sign off, Caution order, Abnormality reporting, Signal/P-Way/Loco defects, safety circular, Notice book through CMS/register. Booking of Crew, Breath-analyzer Test, CMS working, Speed restriction Boards. Communication & working of Control-Reporting of failures and abnormalities on line through various Phones, VHF sets etc. Controlling of trains by traffic Controller-Charting		of traction Min. 1250Km. each)
9.	Familiarisation with Diesel Traction	DTC/RTM	20 Days
10.	Revision/Examination	ZETC/BRCY DTC/RTM	02 Days 01 Day
Total			109 Days

Summary of content and duration of Proposed Training module for new ALP

Sl. No.	Training Module	Proposed Duration in days
1.	Initial/General Training, Fire Fighting & First Aid	03
2.	Transportation Training C & W, Air brake	25
3.	Basic Elect./Mech Engg., OHE, various systems/sub-systems on Loco	18
4.	Traction specific core subject	40 (20 each for both traction)
5.	Footplate Training, Lobby/Control/FOIS/CMS	20 (10 each for both type of Traction)
6.	Review & Exam	03
Total (Single Traction)		109 for Dual traction

Training Centre	ZETC/BRCY	ZRTI/UDZ	DTC/RTM	Field/Practical Training on Division
No. of Days	41 Days (Including Exam.)	27 Days (Including Exam.)	21 Days (Including Exam.)	20 Days (10 each for both type of Traction) Min. 1250 K. for each traction.

**Revised Training Module of Diesel to Electric Conversion Course
(Conventional & 3 Phase Locomotive)**

Conventional Loco		
Sl. No.	Description	No. of Days
1.	Technical Features, Contractor and relays (Types of relays, wedging of relays, precautions to be taken before and after wedging relays types of contractor, wedging of contractors, precautions to be taken before and after wedging contractors)	01
2.	Power circuit (Trouble shooting in case of QLM drop), Traction Power circuit (Trouble shooting of QOP & QRSI, Auto regression), Aux. power circuit (Trouble shooting of QOA)	01
3.	DJ control circuit & how to energize loco (Trouble shooting of ICDJ, Operation-A, B, C, D-1 & D-2), Wedging precaution of Q118)	02
4.	Aux. Control circuit (Trouble shooting of CCA fuse melting, CCBA and Other fuse melting & its trouble shooting), Battery Charger & Pilot lamp circuit	01
5.	Progression & regression control circuit & trouble shooting of Total loss of tractive effort, Line contractor circuit, Trouble shooting of auto regression	02
6.	Taking over charge from incoming crew, how to isolate RSI-1 & 2, how to reset VCD, location & setting of J & CTF on loco	01
7.	SIV loco & its trouble shooting and Microprocessor loco	02
8.	Operating instructions & trouble shooting in tripping car	03
9.	MU loco operation & Deal loco movement, Equipments fitted on loco roof and Grounding of locomotive	01
10.	Parts of cantilever Assembly and Contact & catenary wire, Action to be taken by loco pilot in case of Panto entanglement, how to pass neutral section	1/2
11.	Examination	1/2
3 Phase Loco		
12.	Traction Power Circuit, how to isolate traction bogie & how to put isolated traction bogie in service, how to isolate Traction convertor	01
13.	Aux. power circuit & Load sharing of Aux. convertors, Pneumatic panel	1/2
14.	Energizing loco, cab changing & Brake systems, how to release parking brakes, MU loco operation, Dead loco movement & grounding of locomotive	01
15.	Location	01
16.	Switches, DDS, VCD, cooling mode operation, difference between priority-1 & 2 faults, how to reset MCBs, hotel load & IGBT, equipments fitted on roof, Pantograph not raising	02
17.	Knorr's Brake System, description of Pneumatic panel, how to ground loco, how to activate PTDC system with location	02
18.	Taking over charge from incoming crew, Operating instructions and trouble shooting	03
19.	Examination	1/2
20.	Loco handling on line with Loco Inspector	10
Total		36

Course Contents

- i) Initial / general training, Fire fighting & First aid (3 days)
- ii) Transportation Training for Assistant Loco Pilots (24 days)
- Legal force of General & Subsidiary rules.
 - Familiarisation with various terminologies used in G&S.R.
 - Types of signals – fixed signals, hand signals, detonating signals, shunt signals, Lower quadrant, Upper quadrant and colour light signals, approach and departure signals, automatic and permissive signals, co-acting signals, repeating signals, IBS signals, Trap and point indicators, catch & slip siding.
 - Working of signals and points, interlocking isolation, authority to pass defective signals.
 - Conditions for taking off outer signal, warning signal, home signal, last stop signal, gate signal, calling on signal, shunt signal.
 - Classification of stations, system of working – Absolute Block system, Automatic Block system, One train only system.
 - Working of trains, Engineering restrictions and caution orders, indicators of permanent and temporary speed restrictions, exchange of signals, whistle codes.
 - Rules for shunting at different class of stations, Rules for single line working on double line sections, rules for working trains in the event of failure of communication on single and double line section.
 - Various forms used in train and shunting operations.
 - Various speed limits under different situations such as on facing points, while running through, while pushing trains, while engine running tender foremost, during failure of head lights, during thick and foggy weather.
 - Special precautions while working in Ghat sections and in Over head electrical sections.
 - Protection of train during accidents and when train stopped in midsection, action in case of fire, train parting and alarm chain pulling, safe train running.
 - Basics of P-Way and S&T systems. Fire fighting and First aid including practical demonstration.

Familiarisation with relevant aspects of Coaches and Wagon for tackling problems on run.

- Rolling stock- Features
- Different types of Rolling stock – Nomenclature
- ROH, IOH, POH of rolling stock.
- Brake system in IR – Air brake system – working method with diagrams, parts & functions, working single pipe and Twin pipe air brake system. Pneumatic brake – working principle, Hand brake in rolling stock.
- Abnormal situations – Flat tyre, Brake binding, Hot axle, open door etc.
- Brake power certificates – kinds – Coaching & Freight trains, percentage of brake power required in goods/mixed/passenger trains, Alarm chain pulling – resetting & isolation. Continuity test, cases of brake binding and releasing, Flat tyre detection and action to be taken.
- LHB coach, Hybrid coach, conventional coach, Hot axle symptoms and action to be taken.
- Guard & Loco Pilot check – clearance from IMS station.
- Brake continuity test and its importance, isolation of distributor valve.

iii) Basics of Mechanical & Electrical Engg. (6 days)

- **Basic Mech. Engg.:** - What is engine, Types of Engines – (i) External combustion and (ii) Internal combustion. Internal combustion engines – (i) Spark ignition (Petrol Engine) and (ii) Compression Ignition (Diesel Engine), working principle of Diesel engine, Two stroke engines, four stroke engine. Parts of engine – Engine block, crank case, crank shaft, cam shaft, cylinder liner, crank case cover, fuel control shaft, water jackets.
- **Basic Electricity:** - Electrical symbols, Electric Circuits, open circuit, close circuit, short circuit, Voltage, Current, Resistance, Ohm's law, Series and parallel connections, Capacitor, Conductor/Insulator, Ammeters, Voltmeters, Protective devices – fuses, relays and contactors, Batteries, DC motor, AC motor, Motor in series/parallel, speed control, Generators/Alternator and Motor working principle, Converter/rectifier and inverter – Diode, GTO, IGBT etc., Precautions to be taken with various voltages of electricity.

iv) Traction specific core subject matter (33 days)

Familiarization with OHE and Lay out & working of various types of electric loco/ sub-system/ sub-assemblies including SIV, Microprocessor and three phase locos.

- Study of various OHE components- Cantilever assembly, Catenary /contact wire, dropper, crossovers, insulator, Neutral sections, Display boards, bonding, implantation, ATD assembly, AT supply etc. Precautions to be followed on electrified territory.
- Study of EM & EP contactors, line & shunting contactors, CTF, Reversers, Master controller, their constructional feature including manual operation and wedging etc.
- Protection relays,- sequential relays, signaling relays including procedure of manual operation and wedging etc.
- Tap Changer and Transformer working.
- Study of Microprocessor based loco & working during wheel slip and Energy cum speed monitoring system (ESMON) setting of train data / time, reading of energy consumed and regenerated.
- Study of three phase loco, working, operation, reading of DDS and troubleshooting of important equipments like parking brake, VCD, Emergency push button etc.
- Study of ARNO converter /SIV, various types of auxiliary motors, AC/DC traction motors their constructional features, cooling system mounting arrangement, Working with SIV external fault condition.
- Various types of bogies and brake rigging, Gear boxes/ cases and points of lubrication.
- Study of location of compressor, baby compressor, Air dryer and the pneumatic including circuit working, emergency brake application.
- Loco roof equipment like pantograph, VCB/DJ and its circuit working, Roof bar, earthing of pantograph including HOM etc.
- Various schedule inspection of loco, IA, IB and IC inspection. Common faults in the loco and location of their faults.

Locomotive operating instructions and trouble shooting

- Duties of Assistant Loco Pilot as per ACTM & other manuals.
- Testing of capability of compressor & pressure leakage in loco and testing of locobrakes. Use of emergency brakes.
- Procedure for passing neutral section. Corridor inspection by Asst. loco pilots checking working of various auxiliaries, oil levels, abnormal sounds or temperature, target of protective relays etc after passing neutral section. Watch on Ammeter, Voltmeter, Speedometer and pneumatic gauges on run.
- Keeping constant lookout of the track looking back in curves for smooth working of train, any abnormal sound etc. and informing TLC for any irregularity. Reading of caution orders, B.P. certificates and following instruction given in C/order.
- Correct method of calling of signal and repeating, exchanging all right with Guard and station staff, safety precaution to be observed on line.
- Changing of cab, manual operation of GR, MU operation.
- Wheel slipping and use of sanders.

- Procedure for stopping a train on a rising gradient. Controlling of heavy loaded train on DN gradients.
- Parting of train on run – causes and steps for avoiding parting of train. Action to be taken in case of train parting on run.
- Protection of train and track in case of accident.
- Checking of stable load.
- Procedure of attaching of dead locos on train and accompanying the dead loco by ALP. Stabling of loco in yards/sheds, use of hand brake/parking-brake etc.
- Procedure for working double headed train.
- Working of train when Headlight defective, horn not working, and pilot lamps not working.
- Working during abnormal conditions like Panto broken/ entangled , OHE hanging, flooded track , foggy weather, wheel floating, fire/ smoke in loco etc.
- Trouble shooting- DJ tripping with relay targets, AUX. machine failures, Traction motor failures, Traction failure, Pneumatic failures.
- Bogie problem, miscellaneous failures, Working with different equipment isolated condition.

Safety items of loco to be checked while turning out of loco from shed, items to be checked while taking over charge from incoming crew.

- Checking of Safety items like Head light, Flasher light, Marker light, Horns, Wipers, Hand brake/ Parking brake, Sanders, Air dryer, Cattle Guard, Side Buffers, CBC & Transition coupling, under frae equipment including brake ragging, Gear cases & battery boxes.
- Fire extinguisher and Wooden wedges location in the loco and their use.
- Safety precaution before energizing the loco, Safety precaution before entering the HT compartment of loco, Safety precaution before carrying out roof inspection of loco, use of ladder provided in the loco, Locating emergency switches of loco, spare fuses.

v) Conversion training from Electric to Diesel ALP (20 days)

Familiarisation with the layout and working of various types of loco / sub-system / sub-assemblies and related trouble shooting.

- Principles of working of Diesel loco and principles of a Diesel engine, types of diesel engines, layout of Alco locos, 4 stroke cycle and Rocker arms assembly, Valve limiting diagram.
- Piston assembly and engine components, components in lower take off end and free end.
- Main drive and engine speeds OSTA setting and resetting.
- Description cylinder head components and cam shaft rotation.
- Identify the components in the fuel oil system, understanding of Governor functions including MCBG, examination of fuel leakage, related trouble shooting.
- Explanation of Turbo super charger and air charging system, related trouble shooting.
- Explanation of the Lube oil system, understanding of CCEM, explosion door, L.L.O.B & O.P.S., Related trouble shooting.
- Explaining cooling water system, temperature switches/purposes. Related trouble shooting.
- Identify components of Expresser, exhauster & compressor explanation of MR air charging, describing unloader assembly, checking of expresser crank case oil level, Breather valve NS16 governor & Auto drain valve. Loco Air brake systems – 28 LAV-1 and IRAB-1, Synchronisation. Related trouble shooting.
- Different pressure gauges and operating handles, reversor, selector handle, throttle handle, automatic brake handle, emergency brake application, various valves in Diesel locos.
- Excitation system including microprocessor and related trouble shooting.
- Transition and related trouble shooting.
- Loco electrical systems and related trouble shooting.
- Starting circuit.

- Various types of generators, motors, circuit breakers, switches, relays & contactors.
- Sequence of starting and shutting down of diesel engine. Precautions to be taken before movement of locomotive.
- Engine shut down automatically.
- Tell-tale signs.

Locomotive operating instructions

- Testing of loco brakes.
- Testing of capability of compressor and pressure leakage in loco.
- Working of train when headlight is defective, horn not working and pilot lamps not working.
- Keeping watch on Ammeter, Voltmeter, speedometer and gauges on run.
- Keeping constant lookout of the track looking back in curves for smooth working of train, any abnormal sound etc. and informing PRC for any irregularity.
- Reading of caution orders, B.P. certificates and following instructions in caution order.
- Correct method of calling out of signals and repeating, exchanging alright with Guard and station staff.
- Procedure for stopping a train on a rising gradient.
- Procedure for stopping a train in a graded section.
- Slowing down and stopping at station platform.
- Parting of train on run cases and steps for avoiding parting of train. Action to be taken in case of train parting on run.
- Procedure for working air brake train.
- Protection of train and track in case of accident.
- Procedure for attaching dead locos on different type of train.
- Checking of brake power and brake efficiency air brake train on run.
- Safety precautions to be observed on line.
- Procedure for working double headed train.
- Controlling of heavy loaded train on DN gradient.
- Checking of stable load.

Safety items of loco and safety equipments provided to running staff and on loco. Examination of locomotive while turning out from shed, taking over from the previous crew including familiarisation with repair book, Trip card, Joint Guard and loco Pilot report.

- Safety precautions before starting the loco.
- Checking of safety items like Head light, Flasher light, Marker light, Horns.
- Wipers, Hand brake / parking brake, sanders, Air dryer, Cattle guard, Rail guard, Side buffers, CBC & transition couplings, under frame equipments including brake rigging, gear cases & battery boxes.
- Fire extinguisher and wooden wedges location in the loco and their use.
- Use of flasher light provided on loco and its operation. Action to be taken on seeing flasher light in opposite direction.
- Practical demonstration of use of safety equipment in loco.
- Locating emergency switches of loco.
- Procedure for shutting down loco. Checking of loco at the time of shed out of loco.
- Duties at the time of signing on – Road register and other registers.
- Checking of loco at the intermediate points and crew changing points on line.
- Stabling of loco in shed or in yard.
- Taking loco out of the shed.
- Coupling of loco with loads or other loco with screw coupling, CBC coupling.
- Reading of locomotive log book and making entries.

- vi) **Footplate training in dual traction & on line under loco inspector**
(20 days - 10 days & min. 1250 Kms each for Electric & Diesel traction,)

Crew lobby and control office training

Crew Lobby

1. Study of different register maintained under Crew controller, Road register, caution order register, Equipment isolation register, Speedometer defect register, punctuality register, Safety folder, speed restriction board, Safety bulletin, abnormality register, Importance of LRD register, vision register, Register of medical test, refresher course attended, Safety camp attended etc.
2. Various standing instruction / circulars issued regarding safety and loco working.
3. Booking of crew, preparation of chart.
4. Breathalyser test, signing on duty and OFF duty register.
5. Crew Management system. Abnormality reporting-Signal defect, P Way Defect & loco defect registers, Safety Bulletin, Notice book.
- 6.

Control office

1. Study of various registers maintained in PRC/TLC room, Section wise register for Goods train, passenger train, PRC/TLC room logbook etc. Maintaining various records regarding schedule inspection carried out, overdue etc.
2. Loco Pilot report to PRC/TLC regarding loco failure punctuality loss and other abnormalities etc. through various means of communication e.g. Phones, VHF set etc.
3. Crew link, loco link, withdrawing locos for schedule inspection, unscheduled repairs, liaison with traffic.
4. Booked speed, Max speed, sectional speed, preparation of various statistical details GTKM for Goods or Passenger train, loco ineffective, hourly statistical, calculation of Avg. Speed.
5. Reading og control graphs, preparation of loco graph.
6. Familiarisation with ICMS and FOIS.
7. Communication & working of Control- Reporting of failures & abnormalities on line through various phones, VHF sets etc. Controlling of trains by traffic controller- charting.

Course cotents for Initial Training of ALP (DSL Traction) Stage : Induction/ Lateral Induction.
Duration- 27 Working days

Course cotents are based on Basic of Mech.and Elect. Engg, Familiarization with lay out and working of various types of loco/sub-system/sub-assemblies and related trouble shooting, Locomotive operating instructions. Safety items of loco and safety equipment prvided to running staff and on loco, Examiniation of locomotive while turning out from shed taking over from the previous crew including Familiaization with Repair book, Trip card, Joint Guard and Loco Pilot Report.

Day	Session	Cotents
1	09.00 to 10.30 hrs	Reporting and familiarzation of organisation (Mechanical wing)
	11.00 to 12.30 hrs	Types of Diesel Locomotives, General Data of IR Dsl locomotives
	13.30. to 14.45 hrs	What is Engine,Introduction of IC & EC engines, Two stroke and Four Stroke Engine, Working principal of Diesel Engine
	15.00 to 16.30 hrs	Parts of Engine, Engine Block, crank case crank shaft cam shaft cylinderliner,crank\ case cover, fuel control shaft, water jackets etc.
2	09.00 to 10.30 hrs	Visit of Engine display model in Lab or Shed
	11.00 to 12.30 hrs	Mechanical items fitted in engine block, i.e. Cylinder head, valve, valve lever mechanasim,FIP, Tappet cover, FIP Cover etc.
	13.30. to 14.45 hrs	Mechanical items fitted in nose compartment and loco pilot cabin
	15.00 to 16.30 hrs	Shed visit on all types of locomotive for location of compotents.
3	09.00 to 10.30 hrs	Various types of Generator, motors, circuit braker, switches, relays & contractor, Electrical items fitted in nose compartment, loco pilot cabin and control stand
	11.00 to 12.30 hrs	Electrical items fitted in nose compartment, loco pilot cabin,.control stand
	13.30. to 14.45 hrs	Electrical items fitted on electric control panel , front panel & Back Panel
	15.00 to 16.30 hrs	Shed visit on all types of locomotives for locoation of Elect.compotents
4	09.00 to 10.30 hrs	Starting Circuit, sequence of starting and shutting down of Diesel engine
	11.00 to 12.30 hrs	Transition, racing, GR operate and setting and related trouble shooting
	13.30. to 14.45 hrs	Diffrent pressure gauge, types of operating handle, reverser, selecter handle, A9 & SA9, BL Key, Emergency valve etc,
	15.00 to 16.30 hrs	Shed visit on all types of locomotives for locoation of compotents/ demostation
5	09.00 to 10.30 hrs	Electrical Items fitted in Radiator Room, short hood and long hood side under frame and Electrical safety items
	11.00 to 12.30 hrs	Mechanical items fitted in Radiator Room, short hood and long hood side,under frame and mechanical safety items.
	13.30. to 14.45 hrs	Fuel oil system, working & Trouble shooting, fuel leakage
	15.00 to 16.30 hrs	Governor function i.e WWG & MCBG,

6	09.00 to 10.30 hrs	Types of Turbo super charger & its working.
	11.00 to 12.30 hrs	Lube oil system(CCEM,explosion dumper, LLOB & OPS, working and its troubleshooting
	13.30. to 14.45 hrs	Compressor/ expresser system building of MR pressure, unloader assembly, checking expressor crank case oil level, Breather valve NS16 governor, Auto drain valve & trouble system.
	15.00 to 16.30 hrs	Shed visit Location of components in Fuel, Lube , compressor/ expressor system & governor.
7	09.00 to 10.30 hrs	Water cooling system, temperature switches/purposes, related trouble shooting
	11.00 to 12.30 hrs	Propulsion control system and its trouble shooting
	13.30. to 14.45 hrs	VCD and its utilization, OSTE setting & resetting
	15.00 to 16.30 hrs	Shed visit Location of components.
8	09.00 to 10.30 hrs	Loco Air Brake system- 28LAV-1
	11.00 to 12.30 hrs	IRAB-1 brake system, Brake pipe, charging & discharging
	13.30. to 14.45 hrs	Loco brake application and releasing in IRAB-1 synchronization working in brake system
	15.00 to 16.30 hrs	Shed visit for demonstration/ Trouble shooting .
9	09.00 to 10.30 hrs	Battery & Battery charging system/ trouble shooting
	11.00 to 12.30 hrs	Trouble shooting Engine not cranking/starting, Loco shut down method, OSTA setting & re setting, Load meter Zero
	13.30. to 14.45 hrs	APU & its utilization Multiple unit working
	15.00 to 16.30 hrs	Shed visit for demonstration
10	09.00 to 10.30 hrs	Trouble shooting engine not racing, application of hand brake,
	11.00 to 12.30 hrs	Tell Tail signs, Engine safety items, shed visit
	13.30. to 14.45 hrs	Types of couplings and coupling operation, type of oil used, quantity & checking procedure
	15.00 to 16.30 hrs	Shed visit for demostration
11	09.00 to 10.30 hrs	Duties of ALP, precaution of Train & Track, correct method of calling of signals and repating and knowledege of wheel slip &, skifdding, cause & prevention,
	11.00 to 12.30 hrs	Real case studies on 10 SPAD films/ action on crew on account of SPAD
	13.30. to 14.45 hrs	
	15.00 to 16.30 hrs	Shed visit,Testing of wipers, senders,airdryer, cattle guard, Rail guard, side buffers Horn, Auto Flasher light, Marker light etc.
12	09.00 to 10.30 hrs	Self test in Alco loco version-3 with CCB1.5 brake system
	11.00 to 12.30 hrs	Procedure of attaching dead loco with train
	13.30. to 14.45 hrs	Special points when making loco dead in case of loco failure en-route, Exam of ALCO Locomotive.

	15.00 to 16.30 hrs	
13	09.00 to 10.30 hrs	Introduction about MEP-660, system fitted on locomotives
	11.00 to 12.30 hrs	Additional items fitted with MEP-660 Starting circuit & advantages of Microprocessor system
	13.30. to 14.45 hrs	Detail of VERNON-2 & VERNON-3 & Motor cut out procedure in version-3,
	15.00 to 16.30 hrs	Knowledge of GM(HHP) locomotive, types of GM locomotive
14	09.00 to 10.30 hrs	Lay out of GM locomotive and difference between ALCO Loco. & GM loco, Types of screen used in GM loco
	11.00 to 12.30 hrs	Componments fitted in nose compartment CCB-1.5 & CCB-2, driver cabinECC(,2,3,4), TCC-1 and TCC-2, centralize air compartment, Generator Room & Engine Room
	13.30. to 14.45 hrs	
	15.00 to 16.30 hrs	Shed visit for location
15	09.00 to 10.30 hrs	Introduction with CCB Brake system and diffrence with IRAB system
	11.00 to 12.30 hrs	General Idea of Hotel Load, Types of Screen used in GM loco
	13.30. to 14.45 hrs	Trouble shooting PCS Knock Out, MR & BP charging
	15.00 to 16.30 hrs	Shed visit for location & practical training
16	09.00 to 10.30 hrs	Oil Points, Locomotive examanation & starting procedure of GM locomotive & shut down procedure. Driver Back up handle in CCB-2 locomotive
	11.00 to 12.30 hrs	Recycling, slef test, motor cutout & sensor by pass procedure
	13.30. to 14.45 hrs	Multiple & dead loco attachment / Banking loco in GM/EMD Loco
	15.00 to 16.30 hrs	Practical training on Locomotive in shed
17	09.00 to 10.30 hrs	Class Test covering (day 13 to 16 cotents)
	11.00 to 12.30 hrs	Control consol & Cab changing procedure
	13.30. to 14.45 hrs	Safety Items in GM locomotives

	15.00 to 16.30 hrs	shed visit for demonstration
18	09.00 to 10.30 hrs	Shed visit for GM locomotive for fuel oil and lube oil and water cooling system
	11.00 to 12.30 hrs	
	13.30. to 14.45 hrs	
	15.00 to 16.30 hrs	
19	09.00 to 10.30 hrs	Train dynamics, checking of stable load and stabbing loco in yard/shed
	11.00 to 12.30 hrs	
	13.30. to 14.45 hrs	Locomotive examination at the time of shed out. Checking loco at Intermediate points/ Crew changing point, equipments provided to ALP.
	15.00 to 16.30 hrs	
20	09.00 to 10.30 hrs	How to fill Repair Book, Trip card & JTRs spare items provided in Loco, Fire extinguisher provided in loco & location, Precaution to be taken in multiple shed (OHE), RCD visit (fuel filling point) in shed
	11.00 to 12.30 hrs	
	13.30. to 14.45 hrs	General Data of G.E loco and its components In Cab-1 & 2
	15.00 to 16.30 hrs	Knowledge about CA-1, Auxiliary Cab & Blower Cab
21	09.00 to 10.30 hrs	Knowledge about engine cab, radiator Room
	11.00 to 12.30 hrs	Knowledge about CA-1, Auxiliary Cab & Blower Cab
	13.30. to 14.45 hrs	Knowledge about engine starting Procedure & shut down procedure, shed/ yard visit as per availability of locomotive
	15.00 to 16.30 hrs	
22	09.00 to 10.30 hrs	Knowledge about VCD, display unit
	11.00 to 12.30 hrs	Dead Loco attaching & detaching
	13.30. to 14.45 hrs	Cab changing procedure and BV working of GE

	15.00 to 16.30 hrs	Knowledge about under frame, shed/yard visit for demonstration
23	09.00 to 10.30 hrs	Multiple unit operation of GE loco
	11.00 to 12.30 hrs	Trouble shooting GE locomotive, Modification if any
	13.30. to 14.45 hrs	
	15.00 to 16.30 hrs	Class test covering day(17 to 22 cotents)
24	09.00 to 10.30 hrs	Reading of caution order, BP certificate and following instruction given in caution order
	11.00 to 12.30 hrs	Keeping watch on the Armature, voltmeter speedometer and gauge on run
	13.30. to 14.45 hrs	Feeding data in speedometer, Head light trouble shooting when gets defective,
	15.00 to 16.30 hrs	Parting of Train on run-causes and steps for avoiding parting of train, Action to be taken in case of train parting
25	09.00 to 10.30 hrs	Fire extinguisher and wooden wedges location in the loco and their use
	11.00 to 12.30 hrs	Use of Flasher lighy provided on loco and its operation, action to be taken on seeing flasher light in opposite direction
	13.30. to 14.45 hrs	Safety precautions before starting of Loco, visit of Control room in shed
	15.00 to 16.30 hrs	Vusit of LMS system in shed
26	9.00-16.30 hrs	Revision, Group discussion & doubt clearing session,
27	9.00-16.30 hrs	Examanation Of GM/GE locomotives, feedback & realising

Note: Training centres are advised to modify the lessonn plan timings as per existing instructions issued by division,/shed for opening / closing of training centre, imparting training either in single shift or in a Two shifts. Course contents may also be modified time and again if any instructions are issued by Railway Board / HQs /Shed and RDSO.

RNG-8

**ASSTT. LOCO PILOT SCALE
DESCRIPTION**

DURATION
24 Days.

COURSE CONTENTS

1. Legal Force of General and Subsidiary Rules.
2. Familiarization with various terminologies used in G & SR.
3. Types of Signals- Fixed signals, Hand signals and Detonating signals, Shunt signals, Lower Quadrant, Upper Quadrant, Color light signals, Approach and Departure signals, Automatic and Permissible signals, Co-acting signals, Repeating Signals, IBS signal, Trap and Point Indicators, Catch and Slip siding.
4. Working of signals and points, Interlocking Isolation, Authority to pass defective signals
5. Conditions for taking off outer signal, Warner signal, Home signal, last stop signal, Gate signal, Calling on signal, Shunt signals,
6. Classification of Stations and their minimum equipment, System of working -Absolute Block System, Automatic Black System, One train only system.
7. Working of trains, Engineering Restrictions, and Caution Order, Indicators of permanent and temporary speed restrictions, Exchange of all Right Signals, whistle codes.
8. Rules for shunting at different class of Stations, Rules for Single line working on double line sections, Rules for working trains in the event of failure of communication on both single and double line sections.
9. Various forms used in train and shunting operations.
10. Various speed limits under different situations such as on facing points, while running through, while pushing trains, while engine running tender foremost, During failure of head lights and marker lights, During thick and foggy weather.
11. Special precautions while working in Ghat sections and in Over Head Electrified Sections.
12. Accidents, classes of Accident, duties of loco pilot during accident and Protection of Trains during Accident in Midsection, Duties of loco pilot when a person is run over Action in cash of fire, Train parting / Dividing and ACP, safe train running.
13. 10 hours rule
14. Fire Fighting and first Aid

**ZONAL RAILWAY TRAINING INSTITUTE
NORTHERN RAILWAY
CHANDAUSI**

UNIT MODULE

MI-1/MP-1

TIME TABLE FOR MI-1/MP-1 (Assistant Loco Pilot)

DAY	PERIOD #1	PERIOD #2	PERIOD #3	PERIOD #4	PERIOD #5	PERIOD #6	PERIOD #7	PERIOD #8
1	M-1	M-2	M-3	M-4	M-5	M-6	M-7	CYB
2	M-8	M-9	M-10	M-11	M-12	M-13	M-14	CYB
3	M-15	M-16	M-17	M-18	M-19	M-20	M-21	CYB
4	M-22	M-23	M-24	M-25	M-26	M-27	M-28	CYB
5	M-29	M-30	M-31	M-32	M-33	M-34	M-35	CYB
6	M-36	M-37	M-38	M-39	M-40	M-41		
7	M-42	M-43	M-44	M-45	M-46	M-47	M-48	CYB
8	M-49	M-50	M-51	M-52	M-53	M-54	M-55	CYB
9	M-56	M-57	M-58	M-59	M-60	M-61	M-62	CYB
10	M-63	M-64	M-65	M-66	M-67	M-68	M-69	CYB
11	M-70	M-71	M-72	M-73	M-74	M-75	M-76	CYB
12	M-77	M-78	M-79	M-80	M-81	M-82		
13	M-83	M-84	M-85	M-86	M-87	M-88	M-89	CYB
14	M-90	M-91	M-92	M-93	M-94	M-95	M-96	CYB
15	M-97	M-98	M-99	M-100	M-101	M-102	M-103	CYB
16	M-104	M-105	M-106	M-107	M-108	M-109	M-110	CYB
17	M-111	M-112	M-113	M-114	M-115	M-116	M-117	CYB
18	FIELD TRAINING							
19	M-118	M-119	M-120	M-121	M-122	M-123	DM-1	CYB
20	M-124	M-125	M-126	M-127	M-128	M-129	DM-2	CYB
21	M-130	M-131	M-132	M-133	M-134	M-135	DM-3	CYB
22	M-136	M-137	M-138	M-139	M-140	M-141	DM-4	DM-5
23	M-142	M-143	M-144	M-145	M-146	M-147	DM-6	DM-7
24	M-148	M-149	M-150	M-151	M-152	M-153		
25	M-154	M-155	M-156	M-157	M-158	M-159	M-160	DM-8
26	M-161	M-162	M-163	M-164	M-165	M-166	M-167	M-168
27	EXAMINATION							

**ZONAL RAILWAY TRAINING INSTITUTE
NORTHERN RAILWAY
CHANDAUSI**

**UNIT MODULE—Mech. – 1
SESSION PLAN FOR ASSISTANT LOCO PILOT**

COURSE CODE:MI-1/MP-1

ELIGIBILITY: Assistant Loco Pilot

OBJECTIVE: To educate the participants about various rule of General & Subsidiary Rules (G& SR). Block working Manual (BWM), Accident Manual, and associated with Special emphasis on abnormal working.

RESOURCES: Lecture. LCD, White Board, Safety Film and Study Tour.

DURATION 27 working Days (including 24 days for Transportation Rule, 1day for Study Tour & 1 Day for disaster management, 1 Day for Examination)

MODULE NO.	DESCRIPTION	PERIODS
<i>RNG-8</i>	<i>TRANSPORTATION RULES (24 DAYS) (7period per day)</i>	<i>168</i>
	<i>DISASTER MANAGEMENT (1DAY)</i>	<i>8</i>
	<i>STUDY TOUR (TRANSPORTATION, 1 DAY)</i>	<i>8</i>
	<i>EXAMS. (TR) (1 DAYS)</i>	<i>8</i>
	<i>COMPUTER LEARNING</i>	<i>24</i>
	TOTAL	216
	<i>216 Divided by Eight Periods per day= 27 days.</i>	

ZONAL RAILWAY TRAINING INSTITUTE
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UNIT MODULE—Mech. — 1
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OBJECTIVE: To educate the participants about various rule of General & Subsidiary Rules (G& SR): Block working Manual (BWM), Accident Manual, and associated with Special emphasis on abnormal working.

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DURATION 27 working Days (including 22 days for Transportation Rule, 1 day for Study Tour & 1 Day for Examination).

Session Code No.	Title	Sub- Title	Time
M-1	Introduction	Welcome to Trainees & ZRTI setup, timing and conduct	45"
M-2		Welcome to Trainees & ZRTI setup, timing and conduct	45"
M-3	Legal force of	General and subsidiary rules	45"
M-4		General and subsidiary rules	45"
M-5		General and subsidiary rules	45"
M-6	Terminologies used in G & SR	Definitions of G.R. & S.R. Ch.-1 from 1 to 5.	45"
M-7		Definitions of G.R. & S.R. Ch.-1 from 6 to 10.	45"
M-8		Definitions of G.R. & S.R. Ch.-1 from 11 to 15.	45"
M-9		Definitions of G.R. & S.R. Ch.-1 from 16 to 20.	45"
M-10		Definitions of G.R. & S.R. Ch.-1 from 21 to 25.	45"
M-11		Definitions of G.R. & S.R. Ch.-1 from 26 to 30.	45"
M-12		Definitions of G.R. & S.R. Ch.-1 from 31 to 35.	45"
M-13		Definitions of G.R. & S.R. Ch.-1 from 36 to 40.	45"
M-14		Definitions of G.R. & S.R. Ch.-1 from 41 to 45.	45"

M-15		Definitions of G.R. & S.R. Ch.-1 from 46 to 50.	45"
M-16		Definitions of G.R. & S.R. Ch.-1 from 51 to 55.	45"
M-17		Definitions of G.R. & S.R. Ch.-1 from 55 to 60.	45"
M-18	Type of Signals	Types of Signals	45"
M-19		Types of Signals	45'
M-20		Fixed signals,	45"
M-21		Fixed signals,	45"
M-22		Hand signals	45'
M-23		Hand signals	45"
M-24		Detonating signals,	45"
M-25		Detonating signals,	45"
M-26		Detonating signals,	45"
M-27		Detonating signals,	45"
M-28		Shunt signals,	45"
M-29		Shunt signals,	45"
M-30		Lower Quadrant,	45'
M-31		Upper Quadrant,	45"
M-32		Color light signals,	45"
M-33		Approach Signals	45'
M-34		Approach Signals	45"
M-35		Departure signals,	45"
M-36		Departure signals,	45"
M-37		Automatic signals,	45"
M-38		Permissive Signal	45"
M-39		Co-acting signals,	45"
M-40		Repeating Signals,	45"
M-41		IBS signal,	45'
M-42		IBS signal,	45"

M-43		IBS signal,	45"	
M-44		Trap and Point Indicators,	45'	
M-45		Catch and Slip siding.	45"	
M-46	<i>Working Signals points and Interlocking Isolation</i>	Working of signals	45"	
M-47		Working of signals	45"	
M-48		Working of points,	45"	
M-49		Working of points,	45"	
M-50		Interlocking,	45"	
M-51		Interlocking,	45"	
M-52		Interlocking,	45'	
M-53		Isolation,	45"	
M-54		Authority to pass defective signals (Approach signal)	45"	
M-55		Authority to pass defective signals(Approach signal)	45'	
M-56		Authority to pass defective signals (Departure signal)	45"	
M-57		Authority to pass defective signals (Departure signal)	45"	
M-58		<i>Conditions for taking off signal</i>	Conditions for taking off outer signal,	45"
M-59			Conditions for taking off outer signal,	45'
M-60	Conditions for taking off Warner signal,		45"	
M-61	Conditions for taking off Warner signal,		45"	
M-62	Conditions for taking off Home signal,		45'	
M-63	Conditions for taking off Home signal,		45"	
M-64	Conditions for taking off last stop signal,		45"	
M-64	Conditions for taking off last stop signal,		45"	
M-65	Conditions for taking off Gate signal,		45"	
M-66	Conditions for taking off Gate signal,		45"	
M-67	Conditions for taking off Calling on signal,	45"		

M-68		Conditions for taking off Calling on signal	45"
M-69		Conditions for taking off Shunt signals,	45'
M-70	Classification of Stations. System of working	Classification of Stations .	45'
M-71		Classification of Stations.	45"
M-72		Classification of Stations.	45"
M-73		Classification of Stations.	45"
M-74		Minimum equipment of Stations,	45"
M-75		Minimum equipment of Stations,	45"
M-76		System of working.	45"
M-77		System of working.	45"
M-78		Absolute Block System,	45'
M-79		Absolute Block System,	45"
M-80		Absolute Block System,	45"
M-81		Absolute Block System,	45'
M-82		Automatic Black System ,	45"
M-83		Automatic Black System ,	45"
M-84		Automatic Black System ,	45"
M-85		Automatic Black System ,	45"
M-86		Automatic Black System ,	45"
M-87		One train only system.	45"
M-88		One train only system	45"
M-89		Following Train System	45'
M-90	Working of trains, Engineering Restrictions,	Working of trains,	45"
M-91		Working of trains,	45"
M-92		Working of trains,	45'
M-93		Engineering Restrictions,	45"
M-94		Engineering Restrictions	45"
M-95		Engineering Restrictions	45"

M-96		Indicators of permanent and temporary speed restrictions,	45"
M-97		Indicators of permanent and temporary speed restrictions,	45"
M-98		Exchange of all Right Signals,	45"
M-99		Exchange of all Right Signals,	45"
M-100		Exchange of all Right Signals,	45'
M-101		whistle codes.	45"
M-102		whistle codes.	45"
M-103		Caution Order,	45'
M-104	Shunting Rules. TSL& TFC	Rules for shunting at different class of Stations,	45"
M-105		Rules for shunting at different class of Stations,	45"
M-106		Rules for shunting at different class of Stations,	45"
M-107		Rules for shunting at different class of Stations,	45"
M-108		Rules for Single line working on double line sections,	45"
M-109		Rules for Single line working on double line sections,	45"
M-110		Rules for Single line working on double line sections,	45"
M-111		Rules for working trains in the event of failure of communication on single line	45'
M-112		Rules for working trains in the event of failure of communication on single line	45"
M-113		Rules for working trains in the event of failure of communication on single line	45"
M-114		Rules for working trains in the event of failure of communication on single line	45'
M-115		Rules for working trains in the event of failure of communication on single line	45"
M-116		Rules for working trains in the event of failure of communication on single line	45"
M-117		Rules for working trains in the event of failure of communication on double line sections.	45"
M-118		Rules for working trains in the event of failure of communication on double line sections.	45"
M-119	Rules for working trains in the event of failure of communication on double line sections.	45"	
M-120	Optg. forms	Various forms used in train and shunting operations.	45"

M-121		Various forms used in train and shunting operations.	45"
M-122		Various forms used in train and shunting operations.	45'
M-123		Various forms used in train and shunting operations.	45"
M-124		Various forms used in train and shunting operations.	45"
M-125	Various speeds	Various speed limits under different situations.	45"
M-126		Various speed limits under different situations.	45"
M-127		Various speed limits under different situations.	45"
M-128		Such as on facing points,	45"
M-129-		While running through,	45"
M130		While pushing trains ,	45"
M-131		While engine running tender foremost,	45"
M-132		During failure of of head lights and marker lights,	45'
M-133		During failure of of marker lights,	45"
M-134		During thick and foggy weather.	45"
M-135	Working in Ghat section, & OHE	Special precautions while working in Ghat sections .	45"
M-136		Special precautions while working in Ghat sections .	45"
M-137		Special precautions while working in Ghat sections .	45"
M-138		Over Head Electrified Sections.	45"
M-139		Over Head Electrified Sections.	45"
M-140		Over Head Electrified Sections.	45'
M-141	Accident , Train parting	Accidents,	45"
M-142		Classes of Accident,	45"
M-143		Classes of Accident,	45'
M-145		Classes of Accident;	45"
M-146		Duties of loco pilot during accident	45"
M-147		Duties of loco pilot during accident	45"
M-148		Protection of Trains during Accident in Midsection,	45"

M-149		Protection of Trains during Accident in Midsection,	45"
M-150		Protection of Trains during Accident in Midsection,	45"
M-151		Duties of loco pilot when a person is run over .	45"
M-152		Action in cash of fire,	45'
M-153		Train parting .	45"
M-154		Train parting .	45"
M-155		Train Dividing .	45'
M-156		Train Dividing .	45"
M-157		ACP , Action in case of ACP,	45"
M-158		Safe train running.	45"
M-159	10- Hour Rule	10- Hour Rule.	45"
M-160		10- Hour Rule.	45"
M-161	Fire Fighting .& first Aid	Fire Fighting .	45"
M162		Fire Fighting .	45"
M-163		Fire Fighting .	45'
M-164		Fire Fighting .	45"
M-165		first Aid	45"
M-166		first Aid	45'
M-167		first Aid	45"
M-168		first Aid	45"

Day wise Proposed revised training module for Initial Course for App. ALP (PE-1).

Duration – 27 Days

Day	First Half	Second Half	Duration
1.	Reporting of class. General information about Indian Railways, fire fighting.	Definition of Current, Voltage, Resistance, Inductance & Capacitance and their measuring instruments, Precaution to be taken with various voltages of Electricity.	01 Day
2.	Electrical symbols, conductors, semiconductors (Diode, GTO, and IGBT), and insulator. Ohm's law, series and parallel connections.	Electrical circuits, open circuits & close circuits, short Circuits. Protective devices – fuses, relays, contactors.	01 Day
3.	AC/DC motor working principle, Motor in series/parallel, speed control, Generators/Alternators working principle. Batteries, Convertor/Rectifier and invertors.	General information about Locomotives, types of Loco's, Technical Data. WAG-5(layout) with general description of all fitted equipments. Contactors & relay with practical demonstration of wedging them.	01 day
4.	Difference between power and control circuits in Locos. Battery charging & Auxiliary compressor control circuit, checking of BA & CHBA voltage, MCPA troubleshooting.	Pneumatic circuit of auxiliary compressor and raising pantograph, Troubleshooting of RS/PR pressure not building up. Description of feeding power circuit-Parts of pantograph, action taken if pantograph not raising, Pantograph testing method, action taken if pantograph broken.	01 day
5.	HPT link, Roof bar, ET-1, ET-2, QLM, HOM, action taken during QLM dropping. Main transformer, GR, GR safety, PHGR, CGR-1, 2, 3, RGR, RPGR.	Description of traction power circuit-RSI, SL, Line contactor, Reverser, Manual setting of Reverser. Shunting Notch and shunting contactor, Q-20, QD, ammeter, Voltmeter.	01 day
6.	Troubleshooting regarding QOP and QRSI dropping. Pilot lamp control circuit –signalling relay, action to be taken during CCLS melting. Description of auxiliary power circuit-TFA, Auxiliary motors chart, Q-30, C-118, R-118, QCVAR. Action taken during QOA & QLA dropping.	Description of auxiliary control circuit, working of various auxiliary motors, control switches, isolation of auxiliary motors. Safety of ARNO convertor, RTPR, Twin beam headlight, DC to DC convertor, battery charger, action taken during CCA fuse melting.	01 day
7.	Air & Vacuum Circuit breaker DJ control circuit, preparation of opening & closing DJ. Manual DJ closing by Q-118, Q-44, Q-45, precautions to be taken after wedging of Q-118 AND Q-44.	Tripping via different relays auxiliaries through DJ closing circuit. Trouble shooting of ICDJ, operation- A, B, C, D-1 & D-2.	01Day
8.	Line contactor control circuit, switch position of HMCS-1 and 2, control circuit of Q-50, Q-51 and SMGR. MP/EEC/Manual operation, Auto Regression circuit (QD). Demonstration of Manual control of GR.	Reason to avoid Electrical braking, dead Loco movement. Hand brake with demonstration	01 day
9.	Description of MR charging circuit, MR pressure not built up, compressor efficiency test, FP charging circuit. Description of BP charging circuit, - Charging & discharging of BP pressure,	BP pressure not built up. BP continuity test. BP leak test of Loco and train, action to be taken during front BP angle cock broken. Description of Independent & Synchronising Loco brake system, Loco brake test.	01 day
10.	VCD, Air dryer, Auto flasher light, BPEMS, Speedometer, ESMON, Direct drive. Checks before energising a Locomotive.	Introduction of SIV Loco, Benefits of SIV in comparison with ARNO of, Equipments removed/provided,	01 day
11.	Tripping and troubleshooting of External & Internal Faults, troubleshooting regarding SIV not working, compressor and Blower not working.	Microprocessor Loco and its benefits, Tripping & Troubleshooting With Version – 3.0 Modifications. TPWS, Various schedule inspection of Loco-IA, IB, IC etc.	01 day

12.	Energising multiple Locomotives, Procedure of cab energising. Different types of COC's and Switches-Position in Trailing & Leading Loco, Tripping & Troubleshooting of MU Loco.	Operating Instructions. Duties of ALP during -Take over charge, Run, Halting at station & Hand over charge. Safety precaution before entering in HT compartment. Train parting (causes and steps for avoiding train parting), wheel slipping, Procedure for stopping a train on a rising gradient, Controlling of heavy loaded Train on Down gradients.	01 day
13.	Troubleshooting in Tripping car.		01 Days
14.	Safety Items To Be Checked & Location at GZB out-pit.		02 Days
15.			
16.	Working during abnormal conditions- Flooded Tracks, Foggy weather, floating Wheel, Fire smoke in Loco, Head light defective and horn not working.	Examination (1 st Paper)	01 Days
17.	Technical Data, Abbreviation, characteristics of three phase Locomotives. Lay Out (General Idea of working).	Description of Cab and A, B, C, D panel. Description of pneumatic panel.	01 Days
18.	SB-1, SB-2, HB-1, HB-2. Battery, Auxiliaries compressor, Types of MCB's.	Traction Power circuit.	01 Days
19.	Auxiliary Power circuit and Load distributions/sharing of three phase 415 v Auxiliaries, Single phase-415/110 Volt Auxiliaries, Harmonic Filter and Regenerative braking.	Main Compressor & reservoir, BP charging and brake system. Parking brake, Memotal, fire alarm, Flasher light. Operation of- constant speed controller, emergency STOP push button.	01 Days
20.	Miscellaneous-Over current relay, catenary voltage out of limit, sanding, working function inactive cab, alarm chain pulling, Train parting	Educating & provide hands on training for reading DDS kept in Model Room.	01 Days
21.	Procedure to energise three phase Loco. Dead Loco attachment. IGBT, Hotel Load, maintenance schedule chart	Banking mode, Procedure of passing neutral section. Modified Three phase Loco. Knorr -Bremse Loco fitted with CCB. How to activate PTDC	01 Days
22.	Location of Three Phase Loco.		01 Days
23.	Studies of Various OHE components- centenary/contact wire, cantilever assembly, droppers. Insulator, Bonding, Implantation.	ATD assembly, Display boards, Precaution to be followed on electrified territory.	01Days
24.	Taking over charge from incoming crew, operating instructions. Troubleshooting of Three Phase Loco.		01 Days
25.	Three Phase multiple Loco. Push Pull system of Three Phase Loco, Loco grounding.	Vigilance control device. How to isolate a bogie by using switch 154. How to operate switch 160, switch 237.1 & switch 152.	01 Days
26.	Control Electronics on/off, cooling mode, Types of faults and code, Reading of DDS.	Modifications- VCU, ECPSW, SOAEB, RTIS & TPSW etc.	01 Days
27.	Exam (2nd paper) and Release.		01 Days
Total			27 Days