

# **Workshop Organisation & Function**

*Appreciation Module for IRTS(P)*

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# INTRODUCTION: RAILWAY ROLLING STOCK

## □ *LOCOMOTIVES*

- **Electrical** Locomotives : WAM4, WAP4, WAP5, WAP7, WAG7, WAG9, WAG12
- **Diesel** Locomotives
  - 1) **ALCO** Locos: WDM2, WDM3A, WDM3D
  - 2) **HHP** Locos: WDP4D, WDG4, WDG4D, WDG5, WDS6, YDM4

## □ *Coaching* Stock

- 1) **LHB** coaches : AC, non-AC, Power Cars, Parcel Van, Saloons
- 2) **ICF** coaches: AC, non-AC, Brake Van, Inspection Cars, Camp Coaches

□ **Wagons**: BOXN, BOXNHL, BLC, BCN, BCCN, BTPN etc.

□ **Others**: ART/SPART, ARME/SPARME, SPIC, 140T Breakdown Crane, Tower Cars

# INTRODUCTION

- ❖ The Mechanical Department deals with every aspect of rolling stock on IR, including its *production, maintenance, operation* plus *design & innovation*
- ❖ Rolling stock is a *specialized technology* requiring care & regular upgrade
- ❖ It is a *high-value asset requiring regular maintenance over a long term* for optimum performance during its codal life of more than 25 or 30 years
- ❖ Maintenance *schedules* of different classes of rolling stock can be broadly classified, by usage *duration*, from *light schedule to major schedule (POH)* (*Rolling Stock Maintenance Schedules*)

ROLLING STOCK CATEGORY	SHOP MAINTENANCE SCHEDULE		
ICF Coach (AC and non-AC)	IOH – 9 months (bogie repair) POH – 18 months (2 years for first POH)		
DEMU/MEMU	IOH – 9 months (bogie repair) POH – 18 months (2 years for first POH)		
OCVs/SPVs (IOH/POH) *RDSO recommended Feb 2021	Observation Car & ART/ARME	12 / 48 months	
	Camp Coach, Tower Car, RE coach	24 / 48 months	
LHB coach (AC and non-AC)	<b>SS-1</b>	<b>SS-2</b>	<b>SS-3</b>
	18 months	36 months	72 months
BG Wagon	POH – 4.5 years (6 years for first POH)		
Locomotives	POH – 8 years		

# SIGNIFICANCE OF POH AND IOH SCHEDULES

- **IOH** = Intermediate Overhaul and **POH** = Periodic Overhaul of rolling stock
- These are **major maintenance schedules** of deep maintenance
- **IOH** – attention to **undergear** (bogie frame, wheels, air brake) and **shell**
- In **POH**, each subassembly is separately disassembled and maintained
- POH involves separate, **individual inspection and repair or replacement** of parts and subparts of various components (**unit exchange**)
- In POH, some **design upgrade** or **amenity refurbishment** is also carried out, e.g. retrofitment of ICF coach with CBC, window and exhaust fan in toilet etc

# WORKSHOP FUNCTION

- **CARRIAGE WORKSHOPS**

- **WAGON WORKSHOPS**

- **LOCOMOTIVE WORKSHOPS**

- **OTHER WORKSHOPS**

1. Periodic Maintenance (POH) of Railway Rolling Stocks

2. Intermediate Overhaul (IOH) of coach bogies and wheels

3. Manufacture or repair of rolling stocks or components on special order for—

- i. Other Zonal Railways/Production units

- ii. Other Government Department

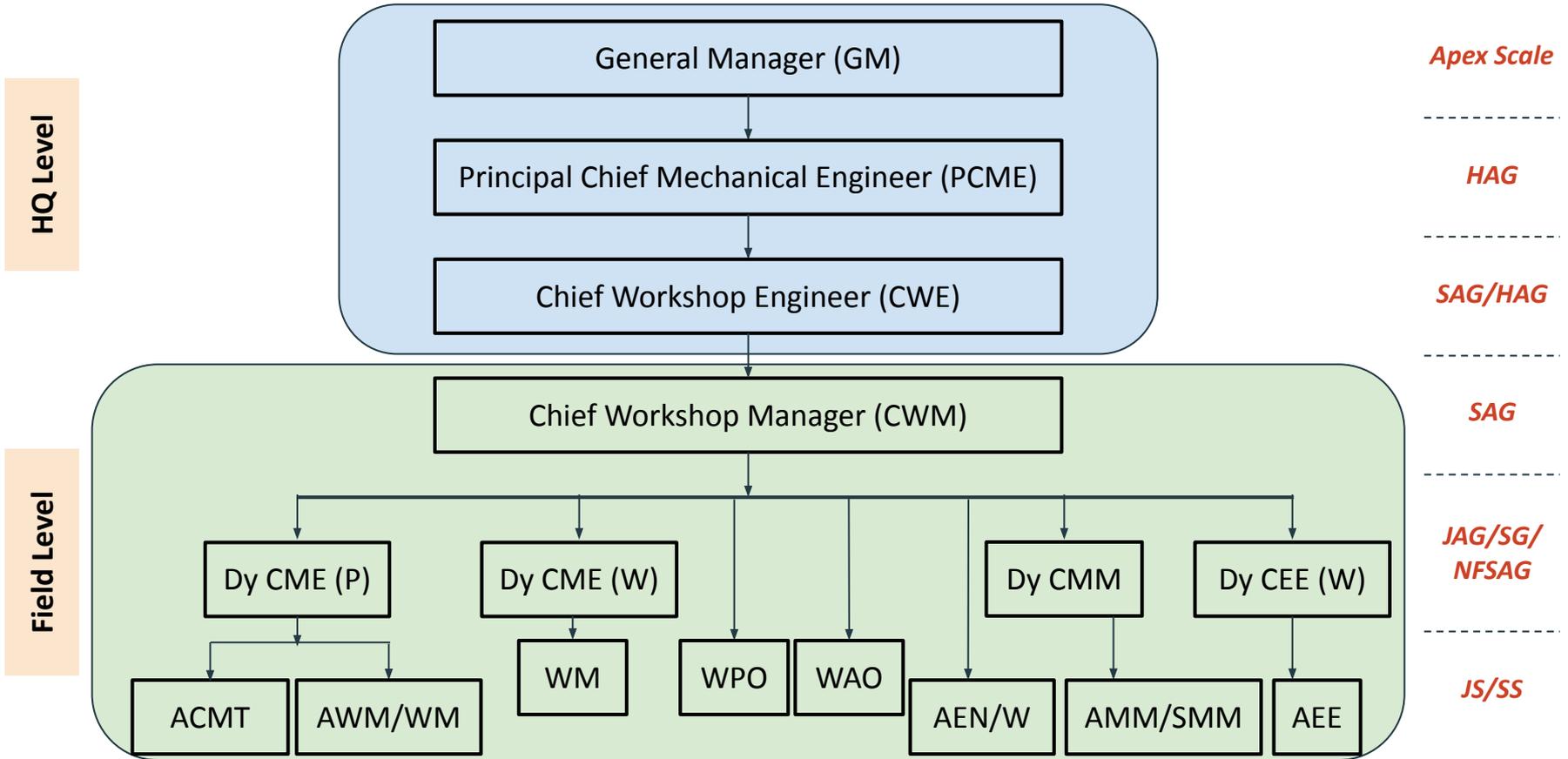
- iii. Others

4. Overhaul of rolling stock wheelsets

# SIGNIFICANCE OF WORKSHOP

- Workshops conduct *major maintenance schedules* (POH of coaches and wagons, IOH of bogies), retrofitment, modifications, refurbishment, etc.
- Thus, workshops are also the site of some advanced **M&P and T&P**
- In addition, Workshops must *procure and hold material and spares* as required and so are generally attached with a **Stores Depot**
- Workshops generally have a *large coach- or wagon- holding* as WIP
- Smaller units are often dependent upon the Workshop for major repairs
- Workshop can act as an *innovation centre* for IR

# WORKSHOP ORGANISATION



# WORKSHOP ORGANISATION: OBSERVATIONS

- ***Autonomous organizational structure*** with officers & staff of many Departments: ***interdisciplinary*** nature of functioning
- The Chief Workshop Manager (CWM) is an ***interdepartmental head directly responsible to HQ*** and assisted by his own team
- No running line, so ***no Traffic*** department
- However, there is still ***some interaction between Workshop and*** divisional operations and hence, ***the Traffic department***

# LIST OF WORKSHOPS

Railway	Name of the Workshop
1. Eastern Railway	(i) Locomotive Workshop, Jamalpur (ii) Railway Workshop, Kanchrapara (iii) Carriage Workshop, Lilluah (iv) Budge Budge Bogie Workshop, Howrah
2. East Central Railway	(i) Mechanical Workshop, Samastipur (ii) Carriage Workshop, Harnaut
3. East Coast Railway	(i) Carriage Workshop, Mancheshwar
4. Northern Railway	(i) Carriage & Wagon workshop, Alambagh (ii) Mechanical Workshop, Amritsar (iii) Locomotive Workshop, Charbagh (iv) Carriage & Wagon Workshop, Jagadhri (v) Carriage & Wagon Workshop, Kalka
5. North Central Railway	(i) Wagon POH Workshop, Jhansi (ii) Rail Spring Karkhana, Gwalior
6. North Eastern Railway	(i) Railway Mechanical Workshop, Gorakhpur (ii) Mechanical Workshop, Izatnagar

# LIST OF WORKSHOPS

Railway	Name of the Workshop
7. Northeast Frontier Railway	(i) Railway Workshop, Dibrugarh (ii) Rly. Workshop, New Bongaigoan (iii) Rly. Workshop, Tindhari
8. North Western Railway	(i) Carriage Workshop, Ajmer (ii) Locomotive Workshop, Ajmer (iii) Railway Workshop, Bikaner (iv) Carriage Workshop, Jodhpur
9. Southern Railway	(i) Locomotive Workshop, Golden Rock (ii) Carriage Workshop, Perambur (iii) Locomotive Workshop, Perambur
10. South Central Railway	(i) Lallaguda Railway Workshop (ii) Carriage Workshop, Tirupati (iii) Wagon Workshop, Guntupalli
11. South Eastern Railway	(i) C&W Workshop, Kharagpur (ii) Diesel Multiple Unit (DMU) Manufacturing Factory, Haldia
7. Northeast Frontier Railway	(i) Railway Workshop, Dibrugarh (ii) Rly. Workshop, New Bongaigoan (iii) Rly. Workshop, Tindhari

# LIST OF WORKSHOPS

Railway	Name of the Workshop
12. South East Central Railway	(i) Wagon Repair Workshop, Raipur (ii) Motibagh Railway Workshop, Nagpur
13. South Western Railway	(i) Carriage Repair Workshop, Hubli (ii) Mysore Railway Workshop
14. Western Railway	(i) Bhavnagar Railway Workshop (ii) Loco, Carriage & Wagon Workshop, Dahod (iii) Railway Workshop, Junagarh (iv) Carriage Repair Workshop, Lower Parel (v) Railway Workshop, Mahalaxmi (vi) C&W Workshop, Pratap Nagar, Vadodara
15. West Central Railway	(i) Coach Mid-life Rehabilitation Workshop, Bhopal (ii) Wagon Workshop, Kota
16. Central Railway	(i) Carriage Workshop, Matunga (ii) Locomotive Workshop, Parel (iii) C&W Workshop, Kurduwadi, Solapur

# INTERACTION OF WORKSHOP ORG. & TRAFFIC

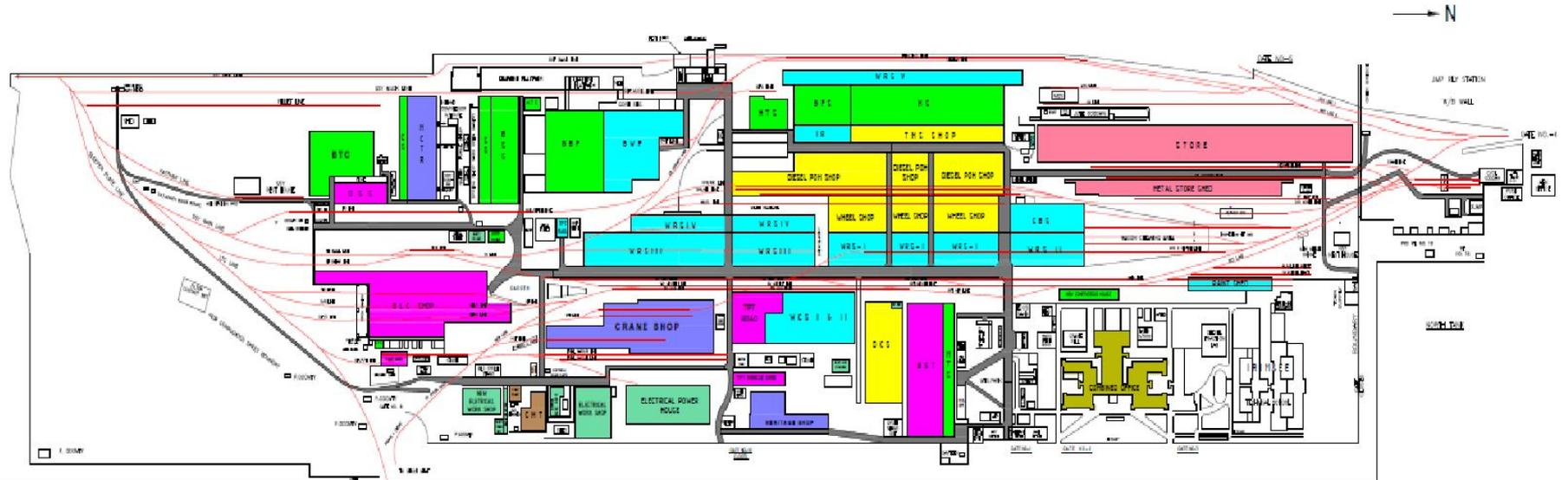
- Traffic Department is a *key stakeholder* for customer service
- Mechanical and Traffic hence *interact constantly* at level of both *policy-making* and *routine operation*
- Direct interaction *between Workshop organization and Traffic* is generally *minimal and sporadic*, but is *important* when it happens
- Much of this interaction *happens through C&W and Power* wings of the divisional OL Mechanical Department

# INTERACTION OF WORKSHOP ORG. & TRAFFIC

- *Rolling Stock POH programme and targets* are decided at Board level by interaction with the Traffic department – **All targets** of POH, IOH, conversion, retrofitment, etc are based on Traffic needs
- Rolling Stock **Calling-In Programme (CMP)** is decided by **zonal HQ** in consultation with the **C&W (OL)** who are servicing Traffic needs. Thus, **POH schedule or extensions** are decided

# INTERACTION OF WORKSHOP ORG. & TRAFFIC

LAYOUT OF JAMALPUR WORKSHOP AS ON 01.02.2020



# INTERACTION OF WORKSHOP ORG. & TRAFFIC

***Routine Shunting & Movement*** between Workshop and OL:

- Shunting and movement of ***POH feed*** (stock detached for POH) from Depot or Yard to Workshop Transfer Line
- Shunting and movement of ***off-POH*** coaching or wagon ***stock*** from Workshop Out-Line to Depot or Yard ***for Traffic use***
- Movement of ***special rolling stock categories*** (VPU of RMC, say) in and out of the Workshop ***on time***

# INTERACTION OF WORKSHOP ORG. & TRAFFIC

## *Ancillary involvement for on-line difficulties:*

- *Off-POH failures or delays causing on-line punctuality loss* – quality issues during train formation by off-POH coaches, say
- *Failures* in off-POH coaches on-line (*100 days' failure*)
- *Excess holding* in Workshop (some *bottleneck causing high cycle time*) may cause *saturated transfer line* or even *shortage* for OL use

# INTERACTION OF WORKSHOP ORG. & TRAFFIC

## *Out-of-course interactions:*

- **EQs!** Workshop EQ often accommodated in Divisional quota
- **Repair Orders (RO)** – such as repair of Commercial **cash boxes** or **line boxes** for inspection staff, etc.
- POH or Retrofitment and refurbishing of **Inspection Car, Training Car** for CTIs and other **SPVs**

# CONCLUSIONS

- The Workshop is a ***significant functional and technical unit***
- Having no running component, it does not have its own field officers for running, but ***relies heavily on the Division*** for this
- However, by leveraging its ***own resources*** under an autonomous hierarchy, it can be a manifold ***asset to Divisional functioning***
- Overall, this ***interaction may be sporadic but it is very important***