ROLE OF C&M IN IR

Introduction

- C&M organisation is the Quality Control wing of IR.
- In IR, it
  - Monitors the technical quality aspect of different production or repair related activities
  - Conducts routine Quality assurance testings
  - Perform inspection and certification of incoming raw materials and finished products (in specific cases)
  - Carries on R&D on material & process related issues
  - Conducts Failure investigation of failed components and suggesting remedial action

Hierarchy of C&M

EDMC

AEDMC

Director, Dy.CCMT, Professor

Dy. Dir, CMT, Asst. Prof.

ARO, ACMT, Lec.

CRA, CMS, CI

SRA, CMA

General Work pattern

- RDSO (Research, Development & Standards Organisation)
  - Headed by EDMC, the team of AEDMC, Dir., Dy.Dir.,ARO, CRA & SRA looks after various jobs concerning whole IR
- Zonal Railways & PUs
  - Headed by Dy.CCMT/CMT/ACMT the team looks after jobs pertaining to that Zone/PU
- At IRIMEE
  - Headed by Prof.(EM), the team trains in-service C&M and Mech. Officers & Supervisors
- Reporting to higher Mech. Officer in work Stn. Or RB

Responsibility at Workshop

- ‘Mechanical Manual’ defines our responsibility as
  - A Chemist and metallurgist is usually attached to the major workshop with a Technical Laboratory equipped to carryout all the necessary Chemical ad metallurgical tests.
  - He is responsible for quality control on manufacturing and other operation in the workshop and shed involving special knowledge of modern chemical and metallurgical techniques keeping in view the maximum out turn of the workshop/shed.
  - Most of the analytical works required by the railways are carried out by him in addition to his normal duties in connection with the work in the shop to which he is attached.

Role of C&M at Workshop

- To ensure quality of all incoming raw materials with special emphasis on paints, brake blocks etc.
- To ensure the quality of all products manufactured in the shop by adopting various quality control process.
- To set & monitor different parameters of various metallurgical processes being carried out at the shop like heat treatment, casting etc. To optimise quality outturn.

Role of C&M at Workshop

- To carry out ultrasonic flaw detection (USFD) of all axles entering workshop to detect cracks.
- To ensure safety and reliability of other rolling-stock items by adopting different NDT techniques for detection of service induced cracks and thereby avoiding in-service failure leading to accidents or delays.

Role of C&M at Workshops

- To give technical guidance/suggestions to different shops and divisions in chemical and metallurgical fields
- Failure investigation of items like axles, rails, draw bars, coupling etc. with an aim to take preventive measures.
- Proof-load testing of draw gear components like screw coupling, draw bar, draw hooks etc. during POH.
- To cater the needs of Engineering, Electrical, Security and Commercial departments by rendering testing facilities for items sent by them from time to time.

Role of C&M at Dsl. Loco Shed

- Quality control of
  - Lub oil
  - Hsd oil
  - Coolant water
- Ultrasonic testing of axles of diesel locos.
- Zyglo and MPT of Loco components.
- Quality control testing of rubber items
- Spectroscopic wear analysis of
  - Lub oil
  - Bearing Grease

Role of C&M at Elec. Loco Shed

- Quality control of
  - Incoming Transformer Oil
  - Dissolved Gas Analysis of Transformer Oil by GC
- Ultrasonic testing of axles & traction motor armature shaft of Electric locos.
- DPT and MPT of Loco components.
- Quality control testing of rubber items
- Spectroscopic wear analysis of Bearing Grease

Role of C&M at PUs

- Generally the same function as in ZR Workshops
- Some additional function at PUs manufacturing Wheel & Axle
  - Real time Spectro analysis of liq. Metal
  - Real time monitoring of Heat Treatment
  - Real time analysis of coated sand
  - Real time Visual, UT & MPT of Wheel & Axle
- In fact, that becomes the main function

Role of C&M at RDSO

- Quality assurance testing including type test of various items like paint, rubber & composite, electrode, etc.,
  - For the purpose of capability assessment and approval of firms.
- Inspection and acceptance of a few components like rubber items, Mn-steel Points & crossing, ERC etc. which require specialised knowledge.

Role of C&M at RDSO

- Liaison & monitoring of activities of large scale manufacturers like DSP & RSP engaged in manufacturing wheels, axles and rails.
- Developing code of practice of ultrasonic testing of axles and shafts of various designs and imparting training to C&M staff of zones all over India.
- Developing mechanised USFD testing of rails with data-logger. and imparting training to Engg. staff of zones all over India

Role of C&M at RDSO

- Failure investigation, either of large consequences or epidemic in nature, of railway components to
  - Establish the cause of failure
  - Suggest various preventive measures like
  - Modification in product or process
  - In-service maintenance
  - Periodicity of inspection etc..
- Interacting with other disciplines to give various C&M related inputs for developing or modifying components.

Role of C&M at IRIMEE

- Delivering technical inputs on various fields:
  - Metallurgy
  - Welding
  - Rubber, Plastic & composite
  - Corrosion
  - Alternate Fuels & Materials
  - Pollution etc..
- Planning and organising different technical courses for in-service Officers & Supervisors of Mechanical & Metallurgical areas

Thank U