معهد التكوين السككي
INSTITUT DE FORMATION FERROVIAIRE

SHARING EXCELLENCE

TRAINING CATALOG

VOLUME 3

ROLLING STOCK

2021 Edition

معهد التكوين السككي
INSTITUT DE FORMATION FERROVIAIRE

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BIRTH OF IFF

ONCF and SNCF, engaged in a **sustainable partnership**, have enabled the successful operation of **the first high-speed link of the African continent.**

October 2007
Intergovernmental agreement for the creation of the Tanger-Casablanca LGV.

September 2011
Preliminary MOU for the Establishment of the IFF

April 2013
Final MOU for the creation of the IFF

March 30, 2015
First training sessions

From this partnership, serving the success of the high-speed line, was born the railway Training Institute (IFF), which had the privilege of being entrusted with **the training of the operators of the high speed.**

The Institute's vocation is to be **a reference player in rail training**. It offers an extensive catalogue of all the skills that are useful for conventional or **high speed rail operations**, as well as **rail freight** and **logistics,** but also available for **urban and peri-urban transport.**

The trainings provided by IFF aim for **excellence** and are intended for the employees of the rail and guided transport actors.

MISSIONS AND VALUES

Four values guide our action : **Customer orientation, Sharing, Excellence and respect.**

We have defined them jointly with our trainers and referents, which provide training and share their expertise under this spirit.

Their concrete realization is the focus of our attention.

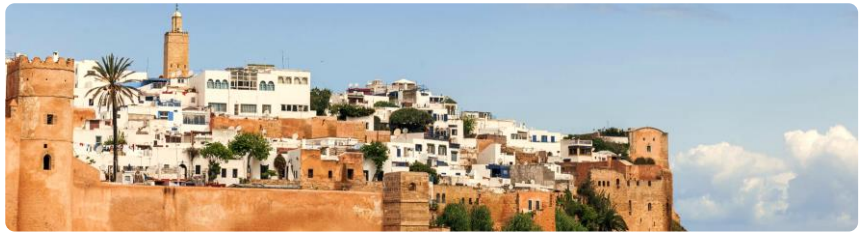
GET TRAINED AT **IFF**

Rabat, capital of Morocco is the great political and administrative center of the country, where the royal palace, government authorities and embassies are located.

Rabat is also a commercial and industrial city where tourism and local crafts play a major economic role.

Located in the north of the country, on the **Atlantic coast**, on the left bank of the mouth of the **Bouregreg** and facing the city of Salé, Rabat is a capital where life is good.

It has been the seat of Mohammed V University and several cultural and educational institutes, such as **IFF since 2015**.



Kasbah of Oudayas

Rabat downtown

Mediterranean climate

- Average maximum temperature: 21.9 ° C
- Average minimum temperature: 12.5 ° C

Official languages

- Arab
- Amazigh

Spoken language

- French

Currency

- Moroccan Dirham (MAD)

Landmarks

- Tour Hassan
- Kasbah of Oudayas
- Chellah
- The National Library
- The National Theater
- Etc.

GET TRAINED AT **IFF**

An ideal geographical location

Located in the very heart of the **Agdal district** in Rabat, the Railway Training Institute (IFF) is a 5-minute walk from the **Rabat-Agdal train station**.

The area is also well served by public transport:
- **Tramway**, Avenue de France station
- Various lines of **buses and taxis**



Educational resources

Covering an area of **3 000 sqm**, IFF has been designed to offer its trainees a warm welcome and a work environment conducive to learning:

- **18 training rooms** including 8 equipped with interactive digital boards **(TNI)** spread over 2 floors
- **7 practical work rooms** with **educational models**
- **A multifunctional driving simulator** composed of:

  - 6 independent driving cabins
  - 2 instructor positions
  - 1 observer post

  It makes it possible to reproduce the driving consoles of several machines in various configurations, such as:

  - **E1400 ONCF locomotive** (ALSTOM Prima II locomotive) in Freight or Passenger configuration
  - **Electric Multiple Unit (TSR - ANSALDO BREDA)** in single or double unit
  - **High speed Train (Alstom Avelia – Euroduplex)** in single and double configuration

- **A wifi connection** available to all trainees
- **A restaurant area** completely renovated in 2019

THEY RECOMMEND OUR TRAINING

Jean Robert AVATOLI – Railway HRD At SETRAG (Gabon)

«I The training modules provided and the modern teaching methods make the IFF a suitable environment for developing excellence skills. »

Abdoul Aziz DIOP– Engineer - Project manager at ANCF - Senegal

«This institute has allowed us to have a global vision regarding training in the railway sector and we believe that Senegal, ONCF and IFF will in the future be able to establish a collaboration to train railway workers in Senegal. »

Ahmed BENSAID –Stationmaster at ONCF

«On behalf of our 2019 stationmaster promotion, I would like to thank IFF for the efforts that allowed us to have a good time at the institute. This training took place in good conditions thanks to the magnificent instructors and to the IFF staff.»

Houria BENNI SADOUKI – Training manager at SNCF (France)

« As a sponsor of this new learning journey, I could see that beyond the theme, this group work allows participants a real collective work which develops their listening, analysis and synthesis skills and offers the opportunity to discover a multicultural working environment. The support and methodology of the training coach make it easier to step back and make this experience a real moment of personal development. »

Christian MAGNI – Deputy General Manager of SETRAG (Gabon)

«I was pleased to spend two training months at IFF to acquire knowledge in rail exploitation field. Thanks to this training, I've been appointed Assistant to the CEO of SETRAG. »

* All the modules we offer are systematically subject to a trainee satisfaction test.

THEY TRUST US

ONCF

SNCF

ETRAG
Société d'Exploitation du Transgabonais

Supratours

SIANA
Société Marocaine de Maintenance des Rames à Grande Vitesse

CARRE

OUIGO

seter

MASTERIS
PARIS STRASBOURG LILLE LONDON

CHEMINS DE FER DE LA CORSE
CAMINI DI FERRU DI A CORSICA

SITARAIL

COMILOG
The manganese source®

SCIF

MANAGEMENT HEADWORD

Represented by
Mr Karim Eddine CHENNOUF

Chairman of the Management Board

Represented by
Mr Christophe MARTIN

General Manager

50% IFF 50%

IFF is a limited company registered under the Moroccan law, with a Management Board and a Supervisory Council, held at parity by ONCF and SNCF

THE RAILWAY TRAINING INSTITUTE SHARING EXCELLENCE

The Railway Training Institute (IFF) opened its doors on March 30, 2015 in Rabat.

Co-developed by SNCF and ONCF, our training courses – more than a hundred - aim to be **innovative**. They are led by the **best specialists** from both companies, as well as by **selected partners**.

From the first months, the commitment of the shareholders and the entire team were able to make the institute a success.

Thus, since 2015, nearly **6.000 trainees yearly**, mainly from SNCF and ONCF, benefit from our training.

In 2017-2018, **more than 17.000 training days** were dedicated to preparing the operation of **high-speed line** in Morocco.

The year 2020 marked a new stage through the development of **distance learning** (virtual classes), thus constituting the first phase of a digitizing content process.

An **85% satisfaction rate** expressed by interns illustrates the ambition for excellence that drives us. These results are shared with limited partners who trust IFF.

Since its creation, IFF has been able to attract the confidence of new operators from **France, Spain, Morocco** in addition to some **West African countries**, in particular **Gabon, Senegal and Ivory-Coast**, by relying on its know-how to develop adapted training.

We are extremely proud of this confidence and the achieved results.

TRAINING FORMS

COMMERCIAL, PASSENGER SERVICE

This training is made up of training modules ranging from taking up a commercial manager's position to serving travelers. The design of this training was carried out with the integration of new business concepts, human and managerial resources.

This method includes scenarios, role plays, case studies, individual and collective exercises for anchoring theoretical knowledge and putting into practice new postures and professional reflexes.

معهد التكوين السككي
INSTITUT DE FORMATION FERROVIAIRE

IFF MA 01/ EN

TECHNOLOGY OF BEARINGS UNITS

TARGET AUDIENCE

Maintenance technicians of running gear (rolling stock).

GOALS

- Locate and understand the operating principle of running gear;
- Know the monitoring pattern of an axle and carry out dimensional readings.

PREREQUISITES

Visual acuity checked, have a technology mechanical degree or equivalent, with minimal experience of 6 months in the field.

EDUCATIONAL MODALITIES

Exercises, practical work (measurements), group work and exchange of good practices ...

DURATION: 4,5 Days

PROGRAM

- Locate and understand the role of the various stakeholders in the axle maintenance;
- Understand the different roles of the axle under the vehicle and the resulting constraints:
- Understand the role of each of the constituent elements of a gear box and know the different types of axles, wheels, boxes and their components;
- Understand the general structure of the documents (axle maintenance);
- Carry out dimensional readings of an axle using the measuring equipment: internal face gap gauge, device for measuring the profile comparator;
- Have basic knowledge of metrology;
- Describe the monitoring framework of an axle
- Understand the reasons for quality management for running gear.

• **Level 2 assessment:** Assessment of skills acquired at the end of training ➡ **Yes**

IFF MA 03 / EN

EXPERTISE OF AXLES FOR LOCOMOTIVES AND PASSENGER COACHES

TARGET AUDIENCE

Rolling stock maintenance technicians.

GOALS

Master the process and know how to use the tools to carry out an expertise on an axle under vehicle, including the drafting of a damage report.

PREREQUISITES

- Minimum of 6 months experience in running gear activity
- Completion of (IFF MA 01) "Fundamentals of running gear technology"

EDUCATIONAL MODALITIES

Theory and practice on real axles.

DURATION: 4,5 Days

PROGRAM

- Know the terminology and the role of each of the components of a box-lift axle;
- Know the identification of an axle, know how to make recordings including a damage report;
- Know the general architecture of axle maintenance documents; Know the axle maintenance documentation;
- Determine the maintenance interval of an axle Identify the information necessary to carry out an expertise on an axle under the vehicle;
- Know how to carry out the expertise of an axle under vehicle and know the various other control points (boxes);
- Know the different degradations of an axle: Know how to carry out a dimensional survey;
- Know how to place the axles on the vehicle;
- Know how to store and handle axles.

• **Level 2 assessment:** Skills assessment acquired at the end of training ➡ **Yes**

IFF MA 06/ EN

OPTIMISATION OF AXLE REPROFILING

TARGET AUDIENCE

Rolling stock maintenance technicians.

GOALS

- Identify the various defects on wheels, their origins and consequences, and optimize reprofiling.

PREREQUISITES

- Visual acuity checked, minimum 6 months experience in the rolling stock maintenance.
- To have attended the training course (IFF MA 01) "Basic rolling element technology".

EDUCATIONAL MODALITIES

Exercises, practical work, workshop visit, exchange of experience and practices, demonstration units, videos.

DURATION: 4,5 Days

PROGRAM

- Know the vocabulary and technology of wheels
- Identify the different defects on wheels, their origins and their consequences;
- Explain the reprofiling method according to the defects concerned;
- Ensure the required quality by reprofiling and removing the minimum of metal;
- Apply the relevant maintenance documents.

• **Level 2 assessment:** Assessment of skills acquired at the end of training ➡ **Yes**

IFF MA 07/ EN

Expertise on 2760B grease, Expertise on bearings

TARGET AUDIENCE

Technicians in maintenance of running gear (rolling stock).

GOALS

Identify the various anomalies and degradations of the grease and carry out the expertise of a bearing.

PREREQUISITES

- Have a minimum of 6 months experience in running gear activity
- Have followed the IFF MA 01 course "Basic technology of running gear "

EDUCATIONAL MODALITIES

Exercises, practical work, workshop visit, discussions experience and practices, demonstration bodies, videos.

DURATION: 4,5 Days

PROGRAM

- Define the mode of action of grease in a bearing
- Identify anomalies and degradations associated with lubrication and take corrective actions
- Differentiate between types of bearings according to their technologies, their roles and uses Identify the markings appearing on bearings, the various faults, their origins and their consequences
- Record the results of the checks carried out (statements using appropriate vocabulary
- Apply health and safety rules related to risks inherent in the equipment and products used
- Apply the relevant maintenance documents

• **Level 2 assessment:** Assessment of skills acquired at the end of training ➡ **Yes**

IFF MA 08/ EN

EXPERTISE OF REMOVED AXLES

TARGET AUDIENCE

Maintenance operators having to practice running gear maintenance.

GOALS

This training will allow trainees to develop their theoretical and practical knowledge to carry out expertise of axles removed from rolling stock.

PREREQUISITES

Have followed IFF MA 01 course "Basic technology of running gear "

EDUCATIONAL MODALITIES

Method active, exercises, work in subgroups and practical work in Workshop.

DURATION: 2 Days

PROGRAM

- Reminder on quality assurance
- Identification of axles according to their particularities Identification of the location and confirmation of the reasons for removal and damage
- Finding and saving information about the axle
- Define levels of intervention and their hierarchy
- Knowing how to fill in a review report
- Know how to fill out a damage report

- **Level 2 assessment:** Assessment of skills acquired at the end of training ➡ **Yes**

IFF MA 10/ EN

COLD TIMING ON CYLINDRICAL SEAT

TARGET AUDIENCE

Operators or mechanical technicians.

GOALS

At the end of the training, the trainee will be able to capture an element by the cold setting method with diagram, respecting the prescriptions of maintenance.

PREREQUISITES

- Verified visual acuity
- Have a minimum of 2 years experience in the activity
- Have followed IFF MA 01 training "Basic technology of running gear ".

EDUCATIONAL MODALITIES

Exercises, practical work, site visit, discussions of experience and practices, demonstration bodies, videos.

DURATION: 3,5 Days

PROGRAM

- Know how to identify the constituent elements of an assembly (wheel, disc)
- Know how to check the compatibility of the components before wedging (construction and manufacturing criteria, geometry, calculation of tightening and clamping force
- Assemble the elements (the steps of preparation, positioning the unbalances, running a wedging
- Analyze and validate a calibration diagram
- Check an axle mounted with the appropriate tools (know the dimensional readings to be carried out after setting)
- Identify the good practices of a calibration and and the risks which may lead to non-conformity.

• **Level 2 assessment:** Assessment of skills acquired at the end of training ➡ **Yes**

IFF MA 44/ EN

BEARING PARTS (Module for managers)

TARGET AUDIENCE

Managers and supervisors of rolling stock maintenance.

GOALS

- Contribute to the technical leadership of managers in the field of Rolling Stock;
- Become aware of the need for rigorous behavior in areas affecting the safety of railway operations;
- Ensure compliance maintenance of bearing parts operations to ensure safe railway operations;
- Ensure compliance with training plans for their staff;
- Be driven by a continuous improvement dynamic.

PREREQUISITES

Hold a management position (supervisor or manager) related to the maintenance of rolling elements.

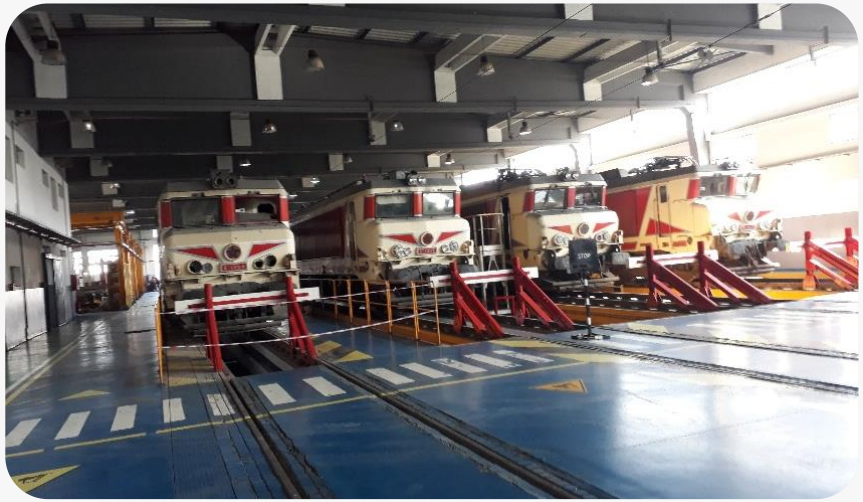
EDUCATIONAL MODALITIES

Educational demonstrators, videos, a railway axle, tools necessary for the practical part, trainee training document.

DURATION: 4,5 Days

PROGRAM

- Master the regulatory and normative arsenal framework
- Explain the Rolling Stock axle maintenance policy
- Master the architecture of the axle maintenance documentation
- Explain the different roles and stresses of the wheelset under a vehicle in service
- Master the terminology and the role of each of the components of a wheelset
- Understand the interactions with the Infrastructure
- Understand the technical nature of the axle product
- Exchange technical information with the technicians
- Identify the main defects on an axle (axle, wheels, gearboxes).



- **Level 2 assessment:** Assessment of skills acquired at the end of training ➡ **Yes**

IFF MA14 / EN

ULTRASONIC TESTING (UT), LEVEL 1, AXLE APPLICATION

TARGET AUDIENCE

- Operators
- Non-Destructive Testing Managers

GOALS

Understand the purposes of non-destructive testing and know how to perform ultrasonic testing of axles.

PREREQUISITES

- Visual acuity checked;
- Have a minimum of 3 months experience in the running gear business;
- Have followed the IFF MA01 "Basic technology of running gear" training.

EDUCATIONAL MODALITIES

- Training combining theory and practice in a workshop equipped with several ultrasonic test stands for the axles, all standard equipment and fittings will be used during the training.

DURATION: 3 Weeks

PROGRAM

- Master the knowledge related to axle maintenance and know the faults encountered in maintenance;
- Determine the principles, purposes and limits of non-destructive testing;
- Understand and implement the technique by transmission, reflection and resonance;
- Operate ultrasound devices, know how to calibrate them (distance, sensitivity); Know how to probe an axle by atheizing a straight probe (control of rolling tables);
- Understand the physical phenomena involved in ultrasound tests;
- Know how to probe an axle on an oblique path (use a prism, respect the positioning, know the principles of a study of trajectories, search for beginnings following an END sheet);
- Know the oblique soundings in combined routes;
- Know how to probe an organ by automatic phased array control (immersion controls).

• **Level 2 assessment:** Skills assessment acquired at the end of training ➡ **Yes**

IFF MA15/ EN

MAGNETIC PARTICLE TESTING (MT),LEVEL 1, EXAMINATION

TARGET AUDIENCE

Operators / Non-Destructive Testing Managers.

GOALS

Understand the purposes of Non-Destructive Testing and know how to carry out a magnetic particle test of an axle.

PREREQUISITES

Visual acuity verified, have a minimum of 3 months experience in the running gear activity;
Have followed IFF MA01 "Basic technology of running gear" training.

EDUCATIONAL MODALITIES

Training combining theory and practice in a workshop equipped with several magnetic particle test stands with axles with characteristic defects. All standard equipment and devices will be used during the training.

DURATION: 4,5 Days

PROGRAM

- Understand the purposes of Non-Destructive Testing and more generally the purposes of rolling stock maintenance;
- Understand the notions of magnetism, know the different ways of creating a magnetic field, know how to characterize this field;
- Implement all the operations to carry out the magnetic particle inspection of the axles;
- Perform a magnetic particle test of an axle;
- Check, adjust, calibrate the devices and perform the tests according to the rules of use (lighting, checking liquors, surface conditions, field intensity, etc.);
- Magnetic particle examination of an axle shaft or wheel, and detection of axle faults regardless of position;
- Interpret, evaluate the results and record the survey sheets (fault reports);
- Apply the health and safety rules related to the risks inherent to the equipment and products used.

• **Level 2 assessment:** Skills assessment acquired at the end of training ➡ **Yes**

IFF MA16/ EN
PENETRANT TESTING (PT)- LEVEL 1

TARGET AUDIENCE

Operators / Non-Destructive Testing Managers.

GOALS

Perform a penetrant test, understand the purpose of Non-Destructive Testing as well as the physico-chemical phenomena implemented in PT.

PREREQUISITES

- Visual acuity verified, have a minimum of 3 months experience in the running gear activity;
- Have followed IFF MA01 "Basic technology of running gear" training.

EDUCATIONAL MODALITIES

Training combining theory and practice in a workshop equipped with several test stands by penetrant testing on railway parts.
All standard equipment and devices will be used during the training.

DURATION: 4,5 Days

PROGRAM

- Determine the purposes of non-destructive testing and have sufficient knowledge in the field of maintenance of railway components and structures;
- Know the manufacturing processes and the behavior of materials, and the different non-destructive testing methods;
- Know the main physico-chemical phenomena involved in PT;
- Know the equipment, products and the main procedures necessary for PT, be able to implement all the operations prior to PT;
- Put into practice the different PT techniques (interpret the procedure, prepare the surfaces, apply the developer);
- Detect and classify faults, know how to record the results of the checks carried out;
- Apply the health and safety rules related to the risks inherent to the equipment and products used.

• **Level 2 assessment:** Skills assessment acquired at the end of training ➡ **Yes**

IFF MA 17/ EN

EXAMINATION BY PENETRANT TESTING OF ORGANS AND STRUCTURES LEVEL 2

TARGET AUDIENCE

Non-Destructive Testing Managers.

GOALS

- Establish operating procedures for penetrant testing
- Direct and provide specific technical assistance to Penetrant Testing operators (level 1).

PREREQUISITES

- Visual acuity checked, one year as Penetrant Testing Operator;
- To have attended d the IFF MA 16 training "Penetrant Testing of Organs and Structures - Level 1".

EDUCATIONAL MODALITIES

- Training combining theory and practical application in a workshop equipped with several penetrant testing stands on railway parts.
- All standard equipment and apparatus will be used during the training.

DURATION: 4,5 Days

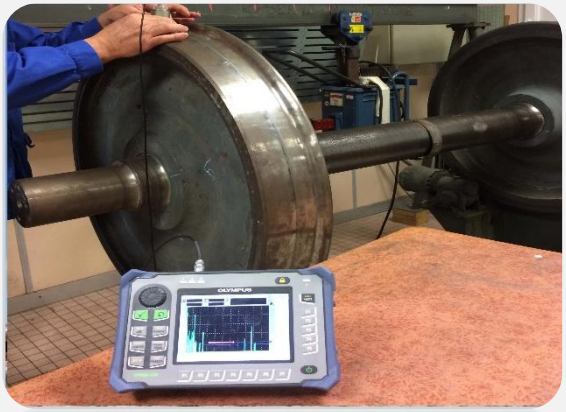
PROGRAM

- Understand the purpose of NDT and its evaluation context (organization, documents, facilities...);
- Distinguish the different metallurgical defects affecting organs and structures according to their elaboration and use;
- Know the physico-chemical phenomena involved in penetrant testing, be able to describe simply the principle of penetrant testing;
- Detect anomalies during the tests and verifications during the phases related to the light phenomena (grading and photometric units, photometric spectrum...);
- Use the tools and accessories during a study in order to draw up a test sheet;
- Classify the different penetrant testing ranges and to propose a method for the elaboration of a test sheet according to the characteristics of the organ to be tested;
- List the necessary products, implement the operations to be carried out during the test and define the illumination conditions to draw up a test sheet.

• **Level 2 assessment:** Assessment of skills acquired at the end of training ➡ **Yes**

IFF MA 18/ EN

ULTRASONIC EXAMINATION OF ORGANS AND STRUCTURES - LEVEL 2



TARGET AUDIENCE

Non-Destructive Testing Managers.

GOALS

- Establish ultrasonic inspection procedures;
- Guide and advise ultrasonic operators effectively (level 1).

PREREQUISITES

Visual acuity checked, minimum 3 months experience in ultrasonic inspection;
Have completed the IFF MA 14 "Ultrasonic Examination, Axle Application-Level 1" course

EDUCATIONAL MODALITIES

Training combining theory and practical application in a workshop equipped with several ultrasonic axle testing stands. All standard equipment and apparatus will be used during the training.

DURATION: 13,5 days

PROGRAM

- Have sufficient knowledge for the training (assessment of knowledge as an ultrasonic operator level 1)
- Know and understand the principles and purposes of non-destructive testing and basic metallurgical phenomena;
- Identify the possibilities and limits of NDT according to the cases and quote the principles of safety of operation;
- Define the different defects contained in the parts according to their manufacture, use or maintenance of the rolling stock;
- Understand the physical phenomena related to wave propagation (repeat basic mathematics);
- Explain and demonstrate the consequences of the transport of energy on an ultrasonic wave in one medium or on its passage through a second medium;
- Use straight or oblique soundings to control wheels or axles;
- Set up the means to produce ultrasound using natural piezoelectric pellets;
- Be able to detect anomalies in a work situation.

• **Level 2 assessment:** Assessment of skills acquired at the end of training ➡ **Yes**

IFF MA 19/ EN

MAGNETOSCOPIC EXAMINATION LEVEL 2

TARGET AUDIENCE

Non-Destructive Testing Managers.

GOALS

- Know how to carry out magnetic particle examinations (level 1);
- Lead and assist level 1 MT technicians.

PREREQUISITES

- Visual acuity checked, minimum experience of one year as a MT operator.
- Must have completed the IFF MA 15 "Axle Examination - Level 1" course.

EDUCATIONAL MODALITIES

- This training combines theory and practical experience in a workshop equipped with several MT test stands with axles and other railway parts with characteristic defects.
- All standard equipment and apparatus will be used during the training.

DURATION: 9 Days

PROGRAM

- Know and understand the principles and purposes of non-destructive testing, to appreciate its possibilities and limitations;
- Define the different defects contained in the parts according to their manufacture, their use and the maintenance of the rolling stock;
- Know the physical phenomena involved in magnetic particle testing;
- Know the influence of currents on MT;
- Choose and implement the most suitable equipment for a MT test;
- Set up the most suitable lighting conditions for magnetic particle inspection;
- Know how to interpret the results of the inspection in the event of doubt on the part of the MT operator and to know how to decide what action to take;
- Write and structure a test sheet from a previously established specification.

- **Level 2 assessment:** Assessment of skills acquired at the end of training ➡ **Yes**

IFF MA 21 / EN

BRAKE SYSTEM FOR RAILWAYS

TARGET AUDIENCE

Brake maintenance technicians, brake maintenance team leaders.

GOALS

- Understand the principle of the braking system and its importance in rail transport, identify the different brake components and their integration into the braking system, understand the physical phenomena involved in braking.

PREREQUISITES

Have a minimum of 3 months experience in the field of equipment maintenance.

EDUCATIONAL MODALITIES

- Training combining theory and practice in a brake workshop equipped with several complete and functional pneumatic models using all the components of a brake system.

DURATION: 4,5 DAYS

PROGRAM

- Know the role of braking, the different types of braking and the role of braking equipment;
- Describe the operation of the brake and the air production system;
- Know the physical phenomena involved;
- Know the operation of a UIC distributor and an AAR distributor;
- Know the operation of a mechanic's valve;
- Describe how the anti-anxiety overload works
- Reconstruct a brake system by identifying the different operating states;
- Know the principle of definition of braked masses.

• **Level 2 assessment:** Assessment of skills acquired at the end of training ➡ **Yes**

IFF MA 22 /EN

DESCRIPTION OF THE BRAKING SYSTEMS COMMON TO ALL ROLLING STOCK

TARGET AUDIENCE

Brake maintenance technicians, brake maintenance team leaders.

GOALS

Knowing how to perform and interpret a brake test and understand the detailed operation of a distributor and a mechanic's valve.

PREREQUISITES

- Have a minimum of 3 months experience in the field of equipment maintenance.
- Have taken the IFF MA 21 course "Initiation to the brake system".

EDUCATIONAL MODALITIES

- Training combining theory and practice in a brake workshop equipped with several complete and functional pneumatic models using all the components of a brake system.

DURATION: 4,5 Days

PROGRAM

- Understand the general operation of the mechanic's valve (with manipulation on a model);
- Know how the distributors work (SW4, C3W, Oerlikon Est3D, Est4D and AAR);
- Know the operation of the modern mechanic's valve, type PBA;
- Perform and interpret a brake test;
- Know the different stages of the brake operation through manipulations on models and several examples of graphic bands;
- Know how to read and interpret a graphic tape or a brake test report.

- **Level 2 assessment:** Skills assessment acquired at the end of training ➡ **Yes**

IFF MA 23/ EN

TECHNOLOGY OF BEARINGS UNITS

TARGET AUDIENCE

Maintenance technicians of running gear (rolling stock).

GOALS

- Locate and understand the operating principle of running gear;
- Know the monitoring pattern of an axle and carry out dimensional readings.

PREREQUISITES

Visual acuity checked, have a technology mechanical degree or equivalent, with minimal experience of 6 months in the field.

EDUCATIONAL MODALITIES

Exercises, practical work (measurements), group work and exchange of good practices ...

DURATION: 4,5 Days

PROGRAM

- Locate and understand the role of the various stakeholders in the axle maintenance;
- Understand the different roles of the axle under the vehicle and the resulting constraints:
- Understand the role of each of the constituent elements of a gear box and know the different types of axles, wheels, boxes and their components;
- Understand the general structure of the documents (axle maintenance);
- Carry out dimensional readings of an axle using the measuring equipment: internal face gap gauge, device for measuring the profile comparator;
- Have basic knowledge of metrology;
- Describe the monitoring framework of an axle
- Understand the reasons for quality management for running gear.

• **Level 2 assessment:** Assessment of skills acquired at the end of training ➡ **Yes**

IFF MA 27/ EN
BRAKE SYSTEM FOR FREIGHT TRAINS

TARGET AUDIENCE

Brake maintenance technicians and team leaders.

GOALS

- Understand the principle of the Freight equipment braking system;
- Identify the various components linked to braking adapted to the load;
- Make the necessary adjustments.

PREREQUISITES

- Have a minimum of one year experience in the field of equipment maintenance;
- Have followed the IFF MA-21 and IFF MA22 modules.

EDUCATIONAL MODALITIES

Training combining theory and practice in a brake workshop equipped with several complete and functional pneumatic models using all the components of the brake system.

DURATION: 4,5 DAYS

PROGRAM

- Know the braking role linked to freight equipment
- Describe the function of braking adapted to the load
- Know the brake linkage adjustment mode
- Be able to detect anomalies
- Know how to use the MTTA brake test mobile device.

- **Level 2 assessment:** Assessment of skills acquired at the end of training ➡ **Yes**

IFF MA 46/ EN

BRAKE FOR "GENERAL MOTORS" LOCOMOTIVES

TARGET AUDIENCE

Brake maintenance technicians, managers brake maintenance team.

GOALS

- Understand the principle of the hardware braking system GM locomotives
- Identify the different organs linked to the braking of these locomotives
- Know how to put GM locomotives into the vehicle

PREREQUISITES

- Have at least one year's experience in the field of hardware maintenance
- Have followed the IFF MA 21 and IFF MA 22 modules

EDUCATIONAL MODALITIES

Training combining theory and practice in a workshop brake equipped with several pneumatic models complete and functional implementing all brake system components.

DURATION: 4,5 Days

PROGRAM

- Reminder of the roles of the braking system components
- Know the role and operation of the pressure J 1
- Know the role and operation of the mechanic 26 C
- Know the role and operation of the distributor 26 F
- Integrate the different components into a brake circuit
- Know how to put in the vehicle

• **Level 2 assessment:** Assessment of skills acquired at the end of training ➡ **Yes**

IFF MA 29 / EN

Power electronics module, technology and maintenance (theoretical part)

TARGET AUDIENCE

- Electrical Operator
- Electrical Manager

GOALS

- Understand the principles of electrical systems Filters, power components, static converters;
- Maintenance and safety of power circuits.

PREREQUISITES

- A minimum of 3 months experience in the field of equipment maintenance.
- Have taken the MA 40 training.

EDUCATIONAL MODALITIES

Training combining theories and practical applications in a room equipped with the power units of the Engines, and educational models.

DURATION: 4,5 DAYS

PROGRAM

- Understand the working principle of Filters;
- Analyze the details of each power component;
- Understand the operation of the different generations of rectifiers;
- know how mixed bridges work;
- Understand how the different generations of choppers work;
- Understand the operation of the different generations of inverters;
- Reminder of safety rules;
- Post mortem analysis and diagnosis;
- Procedure for replacing power components;
- Studies of diagrams, and Manipulations on models.

• **Level 2 assessment:** Assessment of skills acquired at the end of training ➡ **Yes**

IFF MA 40 / EN

ELECTRICAL EQUIPMENT TROUBLESHOOTING MODULE

TARGET AUDIENCE

Maintenance operators having to occupy a workstation for troubleshooting the electrical circuits of Rolling Stock.

GOALS

Apply the troubleshooting methodology recommended for the Hardware function in the field of electrical troubleshooting operations.

PREREQUISITES

Agents with knowledge in the electrical field.

EDUCATIONAL MODALITIES

Exercises, practical troubleshooting work on models, pair work and exchange of good practices.

DURATION: 9 Days

PROGRAM

- Generic troubleshooting methodology reminders
- Electrical reminders
- Reading diagrams
- Defects on electrical circuits
- Troubleshooting on models

• **Level 2 assessment:** Assessment of skills acquired at the end of training ➡ **Yes**

IFF MA 41/ EN

ELECTRICAL TROUBLESHOOTING FUNDAMENTALS

TARGET AUDIENCE

Technician (Bac level or above)

GOALS

• Build the business reasoning of the convenience store (acquire a mental know-how, a technique of research and problem solving, a methodology common to all type of diagnosis
•Develop a problem-solving technique (logical progression
•Know how to implement the diagnostic methodology
•Complies with basic maintenance reflexes and business-related actions unrelated to a machine, a technique, or one technology in particular
•Search collector compiler all information useful to refine the diagnosis
•Record traceability information by having awareness of the need to make recordings of quality.

PREREQUISITES

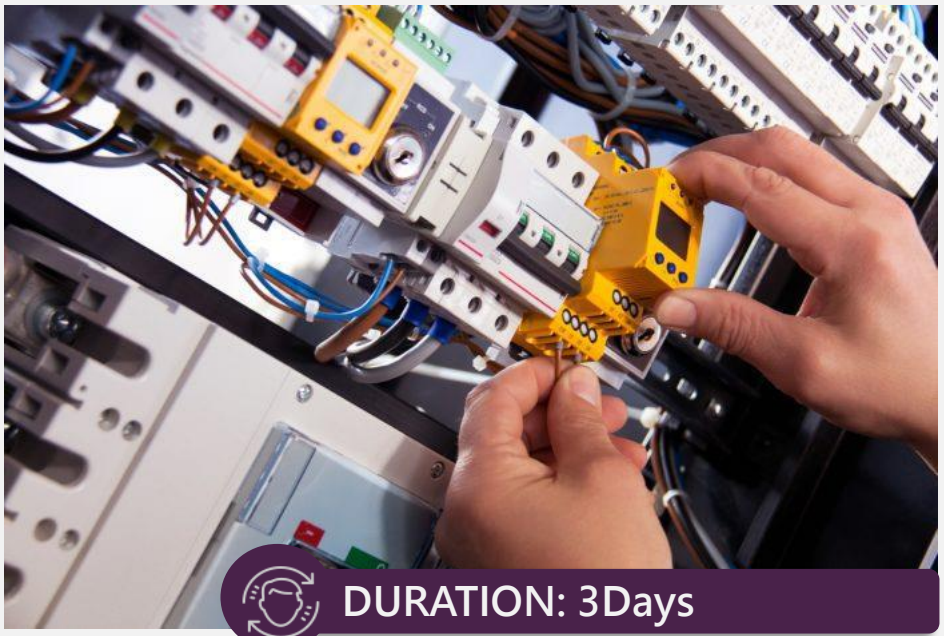
Knowing how to read, understand and use documentation, diagram (electronic, mechanical).

EDUCATIONAL MODALITIES

Schematics interactive and technical simulations.

PROGRAM

- Presentation of the context and challenges of training.
- Analyze the troubleshooting process and steps.
- Final synthesis.



DURATION: 3Days

•**Level 2 assessment:** Assessment of skills acquired at the end of training ➡ **Yes**

IFF MA 30.8 / EN

RAILWAY ELECTRICAL RISK TRAINING - THEORY

TARGET AUDIENCE

Operators/technicians of the material domain having to justify a railway electrical qualification.

GOALS

- Acquire all of the general theoretical principles essential to the prevention of electrical risk.
- Know the principles of electrical lockout of a machine or industrial equipment.
- Know the instructions relating to first aid to be given to victims of an electrical accident.

PREREQUISITES

Have knowledge of electrical installations.

EDUCATIONAL MODALITIES

- Active teaching method, exercises, group work and exchange of good practices, videos.

DURATION: 9 Days

PROGRAM

- Electric quantities and voltages;
- Dangers of electric current and its effects on the human body;
- Appropriate collective and individual protective equipment;
- First aid to be given to victims of electrical accidents;
- General principles of prevention to be applied during an electrical operation;
- General principles of prevention to be applied in the event of deterioration of an insulation;
- Different operations, roles and content of an accreditation title
- Requirements of the authorization concerned.

- **Level 2 assessment:** Assessment of skills acquired at the end of training ➡ **Yes**

IFF MA13 / EN
EQUIPMENT TECHNIQUES INITIATION SESSION

TARGET AUDIENCE

Newly hired executives in fields relating to rolling stock (studies, engineering, maintenance, etc.).

GOALS

Master the principles governing the technical and technological choices of rolling stock.

PREREQUISITES

Understand the role of rolling stock maintenance in the overall environment of railway operations by having already completed an integration course or customer service oriented training.

EDUCATIONAL MODALITIES

Conferences on rolling stocks principles led by internationally recognized rail experts.

DURATION: 9 Days

PROGRAM

- State the issues and challenges of all technical disciplines intrinsic to railway rolling stock;
- Define the principles governing technical and technological choices;
- Determine the particularities applied to the railway sector;
- Control changes.

• **Level 2 assessment:** Skills assessment acquired at the end of training ➡ **Yes**

IFF MA 30.2 / EN

DISCOVERY OF RAILWAY TECHNOLOGIES

TARGET AUDIENCE

New technicians hired in the Hardware Maintenance Department for the following functions:

- Workshop maintenance technician
- Logistics service agent
- Supply service agent
- Maintenance management technician

GOALS

- Situate the company in its environment socio-economic, institutional, competitive, etc…
- Position yourself as an actor within the company and its entity;
- Identify the different sub-systems, integrated into the global "train" system;
- Explain the policy and issues of maintenance of the material, the concepts of the organization of maintenance, the need to apply the rules that arise;
- Explain the rules and present the necessary tools to maintenance management.

PREREQUISITES

Agent with a technician diploma, completed with an internship observation at the industrial maintenance workshops of the rolling stock.

EDUCATIONAL MODALITIES

- Active approach: Brainstorming, affirmative approach: videos and exposed,
- Participatory approach: group work and exchange of good practices, videos.
- Interrogative approach: questioning

PROGRAM

- Global rail-guided transport system technology: electric / thermal traction, tracks, materials, Safety of the Railway Operation.
- Presentation of the rolling stock
- Configuration management: what is the configuration installed rolling stock and why install it.
- Industrial logistics: principles of the MAT logistics system, general organization of supplies.
- Participatory innovation: definition and principles
- Intellectual property: principles and policy

DURATION: 3 Days

- **Level 2 assessment:** Assessment of skills acquired at the end of training ➡ **Yes**

IFF MA 30.3

Introduction to Quality, Safety, Security, Safety of Railway Operations, Environment (Q3SE)

TARGET AUDIENCE

Maintenance and logistics operators in a rolling stock maintenance facility.

GOALS

- Get involved in the continuous improvement process.
- Measure the importance of compliance with the activities related to the safety and railway operation.
- Act with aim of preventing occupational risks.
- Be an actor and driving force in the company's safety approach.
- Be an actor and driving force in the company's environmental approach.

PREREQUISITES

- Have at least a 6 months 'experience.

EDUCATIONAL MODALITIES

Participative approach, group work and exchange of good practices, videos.

PROGRAM

- Appropriation of the Q3SE approach in a cross cutting way,
- Safety of railway operations.
- Personnel safety and Human Factors.
- Environment.
- Safety.
- Quality.

DURATION: 4 Days

- **Level 2 assessment:** Assessment of skills acquired at the end of training ➡ **Yes**

IFF MA 30.4/ EN

Application of Maintenance Rules

TARGET AUDIENCE

Rolling stock maintenance agents.

GOALS

- Select and apply a maintenance document and those referred to, in order to guarantee the conformity of carried out operations.
- Fill in the documents relating to the traceability of a maintenance operation.
- Propose and justify the evolution of a maintenance rule.

PREREQUISITES

To have followed the IFF MA 30.01 training.

EDUCATIONAL MODALITIES

Exercises, practical work, group work and exchange of good practices, videos.
The equipment maintenance policy and in particular the organization of maintenance.

DURATION: 3 Days

PROGRAM

- The equipment maintenance policy, including the organization of maintenance.
- Its challenges, including those of the Rolling stock production System.
- Implementation of maintenance (role of the different actors), the feedback and its consequences in terms of training, evolution of maintenance rules and modifications.
- Dismantling, assessment and reassembly of a repairable part of the equipment, e.g a shock absorber (or equivalent).
- Use of the identification labels for repairable parts of the Equipment and presentation of the traceability sheets.

- **Level 2 assessment:** Assessment of skills acquired at the end of training ➡ **Yes**

IFF MA 30.5 / EN

BOLTED ASSEMBLIES - TIGHTENING TESTS

TARGET AUDIENCE

Operators and Equipment Maintenance Manager.

GOALS

Understand the purposes of bolted joints and know how to make quality screwed assemblies.

PREREQUISITES

Basic knowledge with an experience of a year (at least) in the mechanical field.

EDUCATIONAL MODALITIES

Training combining theory and practice in a workshop equipped with standard tools and equipment to carry out the training.

DURATION: 2 Days

PROGRAM

- Apply tightening methodologies to achieve quality assemblies
- List the types and conditions of assembly, the methods of tightening, control techniques and the use of the corresponding tools
- Describe the main characteristics of the different elements constituting the assembly
- Apply the golden rules of screwed assemblies
- Be proactive in case of detection of no-conformity

- **Level 2 assessment:** Assessment of skills acquired at the end of training ➡ **Yes**

IFF MA 30.6 / EN

MECHANICAL TECHNIQUE

TARGET AUDIENCE

Rolling stock maintenance technicians.

GOALS

To be able to use the basic knowledge of mechanical.

PREREQUISITES

"Have general knowledge in mechanics (BTEC Higher Diploma / Diploma Advanced Technician).

EDUCATIONAL MODALITIES

Active teaching method, Practical work in the workshop, videos ...

DURATION: 6 Days

PROGRAM

- Integrate basic safety rules in the workshop
- Explain the structure of a plan
- Apply the rules of technical drawing
- Identify the tools necessary for the realization and measurement of machined parts
- Identify the different types of screws
- Extract from the plans the information necessary for
- production of parts
- Make a mechanical part
- Tracing, drilling, tapping, Threading, Deburring
- Implement the necessary tools
- Apply company standards (5s)

• **Level 2 assessment:** Assessment of skills acquired at the end of training ➡ **Yes**

IFF MA 30.7 / EN

Stripping – Crimping - Wiring and Low Measurement voltage

TARGET AUDIENCE

Maintenance Operators having to occupy a function concerning interventions on electrical circuits of the Rolling stock.

GOALS

- Carry out stripping, crimping and cabling recommended for the Railway equipment function
- Appropriate technical documentation and carry out electrical measurements (low voltage diagram)

PREREQUISITES

None.

EDUCATIONAL MODALITIES

Exercises, practical work on the various operations (crimping, wiring and low measurement tension), sub-group work and exchange of good practice.

PROGRAM

- Crimp connections for lugs, clips, extensions and ferrules, crimping connector contacts electrical wiring
- Stripping definition, vocabulary, tools, risks of poor stripping Crimping definition, vocabulary, risks of a bad crimping
- Wiring definition, realization and control of a connection Perform electrical measurements (low diagram voltage) potential difference, Intensity and resistance.

DURATION: 5 Days

- **Level 2 assessment:** Assessment of skills acquired at the end of training ➡ **Yes**

IFF MA 52/ EN

Integration of new recruits (Rolling stock Technician)

TARGET AUDIENCE

Young recruits with technician, specialized technician or higher level.

GOALS

- Discover the railway environment, organization and technology of rolling stock
- Identify the different series of rolling stock and describe the principles governing technical and technological choices as well as the preventive maintenance policy for rolling stock.
- To know the principles of Safety, Security, Reliability, Availability of rolling stock

PREREQUISITES

- Immersion in a facility and discovery of the railway environment.

EDUCATIONAL MODALITIES

Exercises, practical work, group work and exchange of good practices, videos.
The equipment maintenance policy and in particular the organization of maintenance.

PROGRAM

- Railway environment: organization and technology of rolling stock
- Maintenance of rolling stock: maintenance policy and different types of maintenance (preventive, corrective and modular)
- Rolling Stock Technology : Description and Operation
- Different series of equipment and describe the principles governing technical and technological choices
- Principles of Safety, Security, Reliability and Availability of rolling stock.

DURATION: 5 Days

- **Level 2 assessment:** Assessment of skills acquired at the end of training ➡ **Yes**

CONTACT US

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