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| **BRANCH OFFICE :** | **Mumbai** |  |  |

| **IAF Scope** | **Field of Inspection** | **Type / Range of Inspection** | **Authorization Level** | **Minimum Educational Qualification** | **Minimum Requirement for Level 3** | **BASIS OF AUTHORIZATION** | |
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| **17**  **BASIC METALS & FABRICATED METAL PRODUCTS** | Basic Metals : Ferrous & Non-Ferrous Alloys & Non-metals | Steels in the shape of Billets, Blooms, Slabs, Raw Material in the form of Plates, Sheets, Strips, Wires, Pipes, Tubes & Tubulars, Pipe & Tube fittings, Rolled section, Structural shapes, Forgings, Bars in different shapes, Flanges, Fasteners, Strainer plates, Metallic & Non-Metallic Gaskets, |  | Diploma / BE Mech, Prod, Ind Engg. OR Equivalent Diploma Degree**\***. | BE Mech, Prod, Ind Eng OR Equivalent.  6 Months/ Training/ 1 to 3 Days Supervised working |  | |
| Castings, Cast steel pipes, Line pipes, Foundation Bolts, Instrumentation fittings, Tools, Coated Steel Products, Raw material for Railways and other Scopes. |  |  | |
| Welding Consumables | Electrodes, Bare filler wires |  |  | |
| Un-Pressurized Vessels / Items | Storage Tanks, Demister pads, Tower internals & Trays, Flare stacks, Chimneys, Steel pipes for sewage, Silos, Hoppers |  | BE Mech, Prod, Ind Eng OR Equivalent.  1 Year/ Training/ 1 to 3 Days Supervised working |  | |
| Pressurized Vessels /Items | Strainers, Steam Traps, Expansion Bellows, Gas Cylinders, Heat Exchangers, Distillation columns with Internals, Reactors, Storage Tanks, Piping Fabrication, installation/testing onshore , offshore & projects, Steel pipe for water, Valves, |  |  | |
| Multi-wall Pressure Vessels |  |  | |
| Fabricated Structures | Welded Structures, Supports for Onshore and Offshore Purpose, Industrial Roofs, Platforms, Gratings, |  |  | |
| Precision components | Precision Machined components, Bearings, Bushes, Assembly Components & Measurements by Precision Measuring instruments. |  | 6 Months/ Training/ 1 to 3 Days Supervised working |  | |
| **18**  **MACHINERY & EQUIPMENT** | Turbines | Gas Turbines |  | Diploma / BE Mech, Prod, Ind Engg. OR Equivalent Diploma Degree**\***. | 1 Year/ Training/ 1 to 3 Days Supervised working |  | |
| Steam Turbines |  |  | |
| Pumps | Centrifugal Pump, Reciprocating Pump, Positive Metering Pump |  | 6 Month/ Training/ 1 to 3 Days Supervised working |  | |
| Rotating equipment | Compressors, Dryers, Axial & Centrifugal Fans, Blowers, cooling tower package, |  | 1 Year, / Training/ 1 to 3 Days Supervised working |  | |
| Gear Box, Rotors |  |  | |
| Equipment | FRP Pressure Vessels & tanks, All type of valves, |  |  | |
| Testing Equipment | Calibration of UTM, Hardness testing Machine, Impact Testing Machine, & other testing Equipment. |  | 6 Months, / Training/ 1 to 3 Days Supervised working |  | |
| Appliances | Domestic Appliances ( Electrical & Non-Electrical), Diesel Generators, Industrial Mixers, Agitators, Heaters |  |  | |
| HVAC | HVAC Systems, |  | 1 Year, / Training/ 1 to 3 Days Supervised working |  | |
| Lifting Equipment | All types of Cranes, Lifting Equipment & Accessories, Conveyor systems, Chains, Machine tools |  |  | |
| **19**  **ELECTRICAL EQUIPMENT** | HT & LT Motors | Rotating Electrical Machines, Three Phase Induction motors, |  | Diploma / BE Electricals, Electronics, Electronics and Tele OR Equivalent Diploma Degree**\***. | 6 Months, / Training/ 1 to 3 Days Supervised working |  | |
| Transformers | Power Transformers, Dry type power transformers, Voltage transformers, outdoor type three phase distribution transformers, Control Transformers for switchgear and control gear |  |  | |
| Insulated Wires & cables / Cable trays | Cross linked polyethylene insulated PVC sheathed cables, PVC Insulated light & heavy duty electric cables, Aerial bunched Cables, Cable trays, Glands, Bus duct, |  |  | |
| Reactors | Shunt Reactors, Current limiting & neutral Earthing reactors, Damping reactors, Tuning reactors, Earthing transformers arc suppression reactors, smoothing reactors, |  |  | |
| Relays | Electrical relays for power system protection and other systems . |  |  | |
| Switch Gear | HV,MV,LV Switchgears & control gears/ Assemblies, Junction box, |  |  | |
| Variable frequency drives | Transformers & Inductors (Power, Audio, Pulse & switching) for Electronic component, semi-conductor convertors, |  |  | |
| Electrical Measuring instruments | Direct acting indicating, analogue electrical measuring instruments, Testing equipment for AC/DC Electrical Energy meters, |  |  | |
| Accumulators, Primary cells & batteries | Lead acid batteries, Dry cell & batteries, Vented type nickel cadmium batteries, Lead acid batteries. |  |  | |
| Battery charger, invertors, Convertors | Rectifiers & invertors, Uninterrupted power systems(UPS), Solid state invertors, |  |  |  | |
| Flame proof Enclosures | Flame proof equipment/device |  |  | |
| Transmitters | Transmitters for use in process control systems, |  |  | |
| Analysers & Measuring Instruments | Electrochemical Analysers , RTD/Thermocouple, pressure Gauges, Level Gauges, and related Instruments. |  |  | |
| Flow meters | Coriolis flow meters, Ultrasonic flow meters, Orifice plate flow meters, and other types of Meters. |  |  | |
| Industrial process control equipment (PLC, DCS, SCADA, CCTV) | Instrument system for process industry, Programmable controllers, Electrical surge protection, Instrumentation products, Industrial process control equipment, Fire & gas detection systems, EPBX Systems, |  | 1 Year/ Training/ 1 to 3 Days Supervised working |  | |
| Gas leak detectors | Detectors used in low pressure liquefied petroleum gas burning appliances, |  |  | |
| Fire detection systems | Fire detection & Alarming system |  |  | |
| Safety related system/devices | Vacuum circuit breaker, Isolator panel, APFC panels, Control Panels |  |  | |
| Optical fiber cables | Optical fiber cables |  |  | |
| **22**  **OTHER TRANSPORT EQUIPMENT** | Basic Metals : Ferrous & Non-Ferrous Material, Alloys & Coating Materials | Raw material : Plates, Structural members, Forgings, Castings, Pipes, Tubes, Fittings, Hard wares, Rails ,and other related items. |  | Diploma / BE Mech, Prod, Ind Engg. OR Equivalent Diploma Degree**\***. |  | |  |
| Raw material : Paints, Varnishes, Sealants, Gaskets, Consumables of welding |  |  |
| Mechanical items | Bogies for freight wagon : Liquid, bulk power tank, funky mining, industrial locomotives & refurbishing, diesel electric locomotives, coupler & draw gears, renewable parts, scroll compressor, coupling system, braking system, air spring suspension, anti- vibration part, axle boxes, rail casting, rolling bearing, springs, axles, wheels, bogie performance test, bogie body linking, deflection damping device, |  |  | |  |
| Door units, framework, steps, Side frame, bolster, shell body, roof |  |  |  | |  |
| Electrical items | Interior paneling & wiring : Signaling, tele-communication, display units, cable for coupling of coaches: continuity of cables, termination, earthing, flash test, HVAC system, alternator & invertor, |  | Diploma / BE Electricals, Electronics, Electronics and Tele OR Equivalent Diploma Degree**\***. |  | |  |
| Lighting & fans, annunciation, A/C control panels, IT panels convertors & invertors, dynamos, junction box, |  |  |
| **26**  **GAS SUPPLY** | City Gas Distribution Network, | Gas Transmission & distribution piping systems, LPG , CNG pipelines, NG transmission pipelines, CGD Networks, Gas, Oil, Acid transportation lines or equivalent systems |  | Diploma / BE Mech, Prod, Petrochemical Engg., Ind Engg. OR Equivalent Diploma Degree**\***. |  | |  |
| Cross country / Subsea Pipelines | Transportation system, Installation & commissioning for liquid hydrocarbon & other liquids or equivalent system |  |  |
| **28**  **CONSTRUCTION** | Site survey & infrastructure | Identification of soils, Excavation, Geo-survey, soil classification, backfilling, Compaction & control of soils for embankment & subgrade |  | Diploma / BE Civil, Structural OR Equivalent Diploma Degree**\***. |  | |  |
| Concreting | Admixtures, Plain Cement concrete(PCC), Reinforced cement concrete (RCC) & high performance concrete (HPC), Grouting, Testing of Concrete Mix Design, Concrete batching & mixing plant, Ready mixed concrete & other related activities of Foundation & Building structures, |  |  | |  |
| Admixtures, PCC, RCC, HPC & other related activities of Dams, Metro/Mono-rail & other massive structures |  |  |
| Admixtures, Pre-stressed concreting for Road & Bridges, |  |  |
| Pile driving | Design, Casting & driving of pile, Installation test & In-situ-Testing |  |  | |  |
| Drainage systems | Construction or installation checks of Building drainage/Drainage system, |  |  | |  |
| Masonry works | Brickworks, Concrete blocks, Unreinforced masonry work/Installation checks |  |  |
| Firefighting systems | Installation & Maintenance check of fire hydrant, Hose Reels, Automatic fire detection & Alarm system, |  | Graduation with Safety / firefighting systems certification OR experience. |  |
| Mechanical Electrical & Plumbing (MEP) works | Plumbing, Water supply, Electrical Wiring installation, commissioning checks |  | Diploma / BE  For Plumbing : Mech, Prod, Petrochemical Engg., Ind Engg.  For Electrical Wiring Installation:  Electricals, Electronics, Electronics and Tele OR Equivalent Diploma Degree**\***.  OR Equivalent Diploma Degree**\***. |  |
| Building finishing works | Building finishing Works like Plastering, False ceiling, Tiles, Flooring, Painting, Varnishing, & related works |  | Diploma / BE Civil, Structural OR Equivalent Diploma Degree**\*** |  |
|  | Quality Assurance  (GENERAL/SCOPE -22) | ITP, procedures for critical items, vendor evaluation of large organizations, Pre inspection meetings at large scale manufacturers, Kick off meetings with client. |  | Diploma / BE OR Equivalent Diploma /Degree**\*** |  | |  |
| Review/ Approval of ITP, procedures, vendor evaluation, pre inspection meetings, furnace calibration. |  |  |
| Laboratory tests | Check Testing at Lab of Material as per Codes & Standards. |  | Diploma / BE Mech, Prod, Petrochemical Engg., Ind Engg. OR Equivalent Diploma Degree**\***. |  | |  |
| Welding & Brazing | Qualification and Review of WPS/PQR/WPQ as per Codes & Standards. |  |  | |  |
| NDT-Mechanical | RT |  |  | |  |
| UT |  |  |
| PT |  |  |
| MT |  |  |
| VISUAL EXAMINATION |  |  |
| EDDY CURRENT TESTING |  |  |
| LEAK TESTING |  |  |
| VACUUM BOX TESTING |  |  |
|  | NDT-Civil | VISUAL EXAMINATION |  | Diploma / BE Civil, Structural OR Equivalent Diploma Degree**\*** |  |
| ULTRASONIC PULSE VELOCITY TEST |  |  |
| REBOUND HAMMER TEST |  |  |
| VACUUM BOX TESTING |  |  |
| PULL OUT TEST |  |  |
| VERTICAL 7 LATERAL TEST, PLATE LOAD TEST |  |  |
| SPECIAL PENETRATION TEST |  |  |
| SLUMP TEST |  |  |
| LEAK TESTING |  |  |
|  | NDT - Electrical | VISUAL EXAMINATION |  | Diploma / BE Electricals, Electronics, Electronics and Tele OR Equivalent Diploma Degree**\***. |  | |  |
| HIGH VOLTAGE TEST |  |  |
| INDUCED OVERVOLTAGE TEST |  |  |
| OVER VOLTAGE TEST |  |  |
| OVER SPEED TEST |  |  |
| PARTIAL DISCHARGE TEST |  |  |
| IMPULSE TEST |  |  |
| MEGGER TEST |  |  |
| FLASH TEST |  |  |
| HYDR0 / LEAK TEST |  |  |

**\*If interviewer / evaluator /assessor find if the candidate is suitable for carrying out the inspection for item / items in other discipline / disciplines than his academic qualification based on candidate’s experience/ training, interviewer / evaluator /assessor can recommend the candidate for authorisation in that other field based on his assessment.**

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| --- | --- | --- | --- |
| Legend - for Authorization level | Legend - for Basis of Authorization |  |  |
| 1 – Can work under supervision.  2 – Can work individually under guidance of seniors.  3 – Can work independently , guide and monitor, others.  4 - Can train, monitor, guide & evaluate others. | A – Professional Qualification / Past Experience till date  B - Interview Assessment  C - Training Imparted / Inspection Under Supervision  D – Supervised Inspection completed  E – Re-Assessment : Quiz / Interview | Updated on (Date): 02.01.2023  Updated by (Name & Signature):  Designation: QHSE Mumbai | Reviewed and authorised by Regional head:  Name & Signature :  Designation: |

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| 09 | Jan 2023 | Added Optical fiber cables in scope 19 | SHRIKANT PATIL | PRAVIN KHERDE | SANDEEP DESHPANDE |
| 08 | June 2021 | Added minimum requirement for each inspection Activity | SHRIKANT PATIL | PRAVIN KHERDE | SANDEEP DESHPANDE |
| 07 | FEBRUARY 2019 | Extended Authorisation 03 for monitoring. | SHRIKANT PATIL | PRAVIN KHERDE | SANDEEP DESHPANDE |
| 06 | AUGUST 2017 | SCOPE 22 – ROLLING STOCK ACTIVITIES ADDED. BASIS OF AUTHORIZATION ADDED. FIELD OF INSPECTION REVISED IN LINE WITH NABCB CERTIFICATE DETAILS. | I.P. CHANDNA | NATARAJAN S. | AMIT NAIK |
| 05 | APRIL 2016 | SCOPE 28 - CIVIL ACTIVITIES ADDED | I.P. CHANDNA | AMIT NAIK | SANDEEP DESHPANDE |
| **REVISION NUMBER** | **DATE** | **REASON FOR REVISION** | **PREPARED BY** | **REVIEWED BY** | **APPROVED BY** |
| **REVISION HISTORY** | | | | | |