

# Tata Power Skill Development Institute - Maithon



**TPSDI**  
**TATA POWER**  
SKILL DEVELOPMENT INSTITUTE  
Power Skills for Life

*A CSR Initiative*

## About TPSDI

Tata Power Company is India's largest integrated power company with a presence across all the segments of the power sector - Generation (thermal, hydro, solar, and wind), Transmission, Distribution, Fuel Security and Logistics, and Power Trading. Tata Power has been lighting up lives in the nation for over a hundred years. In 2015, its centenary year of operations, Tata Power, true to the Tata Group philosophy of giving back to the society a significant portion of its earnings, launched the Tata Power Skill Development Institute as a non-profit corporate social responsibility initiative under the Tata Power Community Development Trust.

TPSDI is mandated to provide modular training and certification in power sector and allied skills leading to employability and advancement. TPSDI harnesses the rich experience of Tata Power employees to bring "Power Skills for Life!" to prepare youth and others for the huge opportunities coming up in the power sector in the country. TPSDI-Maithon is the third integrated training hub established by TPSDI across India. TPSDI-Shahad (Center of Excellence for Power System Skills) and TPSDI-Trombay (Center for Excellence Power Plant Skills), both in Maharashtra, are already operational. TPSDI-Mundra, in Gujarat, is the planned fourth training hub.

## TPSDI - Maithon

Conveniently located adjacent to the premises of Tata Power's joint venture with the Damodar Valley Corporation - Maithon Power Limited (MPL) at Dambhui village in Jharkhand's Dhanbad district is TPSDI's Centre for Power Sector and Allied Skills. TPSDI - Maithon is a training center that provides the extensive space and the infrastructure needed to conduct courses across the whole range of Electrical, Mechanical, and other skills. Considering the objective of building employability skills in the youth, TPSDI - Maithon would also offer various other employability skills to meet local needs and address industry requirement.



**Centre for Fitter Skills**

**Centre for Welding and Fabrication Skills**

**Centre for Rigging Skills**

**Centre for Electrician Skills**

**Centre for Solar Photovoltaic Skills**

**Centre for Allied Electrical and Mechanical Skills**

**Centre for Industrial Safety Skills**

**Centre for Other Employability Skills**



## Training Infrastructure and Facilities at TPSDI - Maithon

- Well-equipped Mechanical and Electrical laboratories for hands-on experience
  - Workshop practice with Bench Fitting, Drilling, Grinding, and other equipment
  - Welding and Fabrication Centre for various Welding Skills - Gas cutting, Gas Welding, Manual Metal Arc Welding (MMAW), Metal Inert Gas Welding (MIG) and Tungsten Inert Gas (TIG) welding skills
  - Basic Rigging training facilities
  - Scaffolding - Safe Erection and Dismantling training facilities
  - Allied Electrical Skills like Wiring - Domestic and Industrial, Motor Repair and Rewinding, Power Meter Installation, etc.
  - Solar PV Facilities - Roof Top solar installation and maintenance and solar PV pump set installation and maintenance skills
  - Safety, Health and Environment –training facilities to train people on Working at Heights, Confined Space Entry, Electrical Safety, Fire Safety, Lock Out and Tag Out (LOTO), Permit To Work (PTW) etc.
  - Fully-equipped classrooms with HD projectors
  - Fully-equipped Computer Lab for IT-enabled learning
  - Power plant experts with vast experience as instructors and demonstrators for guided learning and mentoring.
  - Library and Reference Books to supplement classroom teaching and other methods of learning
- Site Visit for On-The-Job Learning:**
- Thermal Power Plant
  - Electrical Switchyard & Power Plant, Electrical Maintenance Setup
  - Power Plant Mechanical Maintenance, Coal Handling System, Steam Generating System, Turbine and Auxiliaries, etc.,
- The following facilities at TPSDI - Maithon make it a complete training centre:**
- Canteen
  - Emergency Medical Services

## TPSDI - Maithon Training Offerings

### Technical Helper - Mechanical



#### What the Course Covers

- Fundamentals of various Power Plant equipment
  - Basics of industrial safety, health, and environment
  - Exposure to
    - ◆ Different types of hand tools
    - ◆ Bench fitting practices
    - ◆ Different types of Rigging equipment & tools
    - ◆ Gas Cutting & Welding equipment
    - ◆ Power Transmission Equipment e.g. Gears, Belts & Pulleys, Chain & Sprocket, Shafts & Couplings
    - ◆ Bearings, Seals & Lubricants
    - ◆ Valves and packings
  - 5S - Safe cleaning and storing of tools & equipment
- Course Outcome:** Successful trainees shall be able to work, under supervision, on various routine mechanical jobs by supporting fitters, gas cutters, welders, or riggers

## Assistant Fitter



### What the Course Covers

- Basics of various Power Plant equipment
- Basics of industrial safety, health, and environment
- Basic skilling on
  - ◆ Use of different types of Hand Tools
  - ◆ Bench fitting practices
  - ◆ Different types of Rigging equipment & tools
  - ◆ Power Transmission Equipment e.g. Gears & Gear Drives, Belt & Pulley Drives, Chain & Sprocket Drives, Shafts & Couplings
  - ◆ Rolling contact Bearings, Seals and Lubricants
  - ◆ Low pressure Valves maintenance and packings
  - ◆ Single stage Centrifugal Pump maintenance

**Course Outcome:** *Successful trainees shall be able to work, under supervision, as an Assistant Fitter assisting a Fitter/Senior Fitter*

## Mill-Wright Fitter



### What the Course Covers

- Power Plant equipment
- Industrial safety, health, and environment
- Skilling on
  - ◆ Hand tools and precision bench fitting practices
  - ◆ Different types of Rigging equipment and tools

- ◆ Maintenance of Power Transmission equipment
- ◆ Alignment of shafts, gears,
- ◆ Rolling and Sliding contact Bearings, Seals and Lubricants
- ◆ High pressure Valves maintenance and packings
- ◆ Multistage Centrifugal Pump maintenance

**Course Outcome:** *Successful trainees shall be able to work on maintaining, under supervision, basic equipment in a power plant*

## Gas Cutter



### What the Course Covers

- Industrial safety, health, and environment
- Safe operating procedure of Oxy-Acetylene cutting equipment
- Gas cutting parameters - selection of cutting nozzle size and Oxy-Acetylene gas pressure
- Marking and punching required shape and size on MS plate using template
- Straight cutting and bevel cutting practice to cut different thickness of metal

**Course Outcome:** *Successful trainees shall be able to work, under supervision, with oxy-acetylene equipment*

## General Welder



### What the Course Covers

- Industrial safety, health, and environment
- Different types of welding processes and

their application

- Arc welding procedure and technique
- Principles of metal arc welding, advantages and limitations
- Arc welding tools, equipment and safety precautions
- Setting up arc welding plant and work piece edge preparation
- Selecting welding electrode based on work piece
- Straight line and weaving beads practice on M.S. plate by arc welding
- Fillet "T" Joint, Lap Joint & Single "V" Butt Joint on M.S. Plate in flat, horizontal and vertical position by arc welding

**Course Outcome:** Successful trainees shall be able to work, under supervision, with Arc Welding Plant and carry out general welding jobs

### Gas Welder



#### What the Course Covers

- Industrial safety, health, and environment
- Different types of welding processes and their application
- Gas welding procedure and technique
- Principles of gas welding, advantages and limitations
- Brazing principles, selection of nozzle size, filler metals and fluxes
- Gas welding tools, equipment and safety precautions
- Setting up gas welding plant
- Setting up oxy-acetylene flame for welding
- Work piece preparation
- Selecting welding filler rod based on work piece
- Fusion on M.S. sheet with and without filler rod

**Course Outcome:** Successful trainees shall be able to work, under supervision, with Gas Welding machine and carry out gas welding and brazing jobs

### Tungsten Inert Gas (TIG) Welder



#### What the Course Covers

- Industrial safety, health, and environment
- Introduction to TIG welding and its applications
- Advantages and limitations of TIG welding process
- TIG welding tools and accessories - types and their applications
- Power sources for TIG welding, AC and DC high frequency unit
- Setting up AC/DC TIG Welding Plant
- Types of polarities and application
- Tungsten electrode – types and uses, size and preparation
- Work Piece preparation – plate and pipes
- Selection of welding wire based on work piece
- Single and double "V" butt joint on pipes up to 5G position using TIG Welding process

**Course Outcome:** Successful trainees shall be able to work, under supervision, with TIG Welding Plant and carry out TIG welding jobs

### Metal Inert Gas (MIG) Welder



#### What the Course Covers

- Industrial safety, health, and environment
- Different types of MIG welding processes and their application
- Various gases and gas mixtures used in MIG welding and their application
- MIG welding procedure and techniques
- MIG welding equipment, torches, wire

feed system - types and their applications

- Principles of Co2 welding plant, advantages and limitations
- CO2 welding tools, equipment and safety precautions
- Setting up Co2 welding plant
- Work piece preparation
- Selecting welding wire based on work piece
- Open Corner, Fillet "T" and lap joint in horizontal position on M.S. plate using MIG welding process

**Course Outcome:** Successful trainees shall be able to work, under supervision, with MIG Welding Plant and carry out MIG welding jobs

## Rigger



### What the Course Covers

- Industrial safety, health, and environment
- Common engineering and rigging terms
- Wire rope terms, configuration, lay, strengths, inspection criteria, common uses
- Various types of slings and their uses
- Various devices used in rigging, safety, uses and inspection criteria
- Types of cranes and their safety features, uses
- Communication set up for safe lifting operations
- Hazard identification for lifting operations
- Lifting and lowering for safe rigging operations

**Course Outcome:** Successful trainees shall be able to work, under supervision, as Riggers and should be able to rig and direct load to destination

## Domestic Wireman



### What the Course Covers

- Basics of electricity
- AC and DC Circuits
- Wiring principles and methods, drawing and using electric circuits for various kinds of house and industrial uses like power, lighting, appliances, etc.
- Laying of single phase and three phase electric circuits
- Hands-on learning of various types of conduits, casing and capping, concealed wiring, etc.
- Hands-on learning on mounting and dismantling of various electrical accessories and fixtures and connection – switches, lights, etc.
- Laying circuits for telecommunication, cable TV, CCTV, fire alarm system, etc.
- Installation, repair and maintenance of geysers, fans, iron, and other modern appliances
- Installation and connection of electrical protections like fuse, RCCB, MCB, earthing system, etc.
- Installation, repair, and maintenance of distribution transformer, switch gear, feeder pillar and distribution boards, AC, DC drives, motors, pumps, contactors and starters
- Installation and maintenance of battery, battery chargers, invertors, and UPS
- Installation and wiring of single-phase and three-phase energy meters
- Testing and trouble shooting
- Safety practices including Lock Out Tag Out (LOTO) and Permit to Work (PTW) procedures for cable jointing and termination

**Course Outcome:** Successful trainees should be able to work as a wireman under supervision

## Industrial Electrician



### What the Course Covers

- Installation, repair and maintenance of AC, DC drives, starters, contractors
- Single phase and 3 phase motors
- Installation and maintenance of battery, battery chargers, inverters and UPS
- 3 phase industrial wiring, installation of 3 phase energy meters including earthing
- Testing and trouble shooting
- Safety practices including Lock Out Tag Out (LOTO) and Permit to Work (PTW)
- Regulatory norms and practices

**Course Outcome:** Successful trainees should be able to work as an Industrial Electrician under supervision

## Solar Power Installer



### What the Course Covers

- Solar Photovoltaic (PV) cells and their uses
- Installation, connection and maintenance of solar panels for off grid and grid connection
- Installation, connection and maintenance of PV batteries
- Installation of off-grid, on-grid and hybrid inverters
- Identifying location for PV installation
- Zero-defect installation for PV system
- Marking and labelling different components of the PV system
- Identifying and rectifying installation errors
- Identifying and troubleshooting problems in a PV system
- Monitor, clean and maintain PV Systems
- Install and maintain solar home and street lighting
- Overview of designing a PV System

**Course Outcome:** Successful trainees should be able to work as a Solar Power Installer under supervision

## Solar Power Technician



### What the Course Covers

- Solar Photovoltaic (PV) cells and their uses
- Connection and maintenance of solar panels for off grid and grid connection
- Connection and maintenance of PV batteries
- Install off-grid and on-grid inverters
- Marking and labelling different components of the PV system
- Identifying and rectifying installation errors
- Identifying and troubleshooting problems in a PV system
- Monitor, clean and maintain PV Systems
- Install and maintain solar home and street lighting

**Course Outcome:** Successful trainees should be able to work as a Solar Power Technician under supervision

## Safety Courses



TPSDI - Maithon conducts various specialized training courses in the area of safety. These courses enable people to work safely and responsibly. TPSDI's safety training covers a variety of possible safety scenarios and roles in the power industry.

### Safety training at TPSDI - Maithon covers the following areas:

- Safety basics - personal protective

equipment (PPE), Job Safety Analysis (JSA), Hazard Identification Risk Assessment (HIRA), Emergency preparedness

- Occupational health and safety
- Confined Space Entry and Shoring and Sloping
- Working at Heights including Safe Scaffolding
- Safety in use of Electricity
- Lock Out and Tag Out (LOTO) and Permit to Work (PTW)

- Fire hazards, fire protection and life support
- Safety in use of Hand Tools and Power Tools
- Welding Safety
- Material Handling and Safety
- Mobile Crane Rigging and Slings Safety

The safety modules can be administered separately or together.

## C o n t a c t T P S D I

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