PERSONAL PROTECTIVE EQUIPMENT (PPE) PROCEDURE

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1. OBJECTIVE:

This procedure describes the basic requirements, applicability, minimum specifications of Personal Protective Equipment (PPE).

2. SCOPE:

Use of Personal Protective Equipment (PPE) for all persons, who enter the operating areas/plants/offices in company premises or project sites.

3. EXPECTED RESULTS

3.1. Uniformity in application & use of PPE.
3.2. Uniformity in quality of PPE.
3.3. Use of PPE as last line of Defense as per hierarchy of controls.

4. ACCOUNTABILITY & RESPONSIBILTIY:

RACI Matrix

Responsibility	Accountability	Consultation	Information
Tata Power employees, Line engineers, supervisors, Contractor employees	Division's Heads/CEOs, Assets Custodian	Safety Advisors, Safety R&P Sub-Committee	SBU Heads, Division's Heads/ Assets Custodian, Safety Advisors, Safety R&P Sub-Committee

4.1. **ACCOUNTABILITY**: Concerned Division's Heads/CEOs/Assets Custodian.

- To ensure that adequate quantity of PPE is available.
- Ensuring appropriate management practices are implemented to make sure that PPE is (a) available, used and maintained and (b) regularly monitored and reviewed to ensure effectiveness.
- Ensuring personnel are trained in the selection, use and maintenance of PPE for all applicable work.

4.2. **RESPONSIBILITY**: Tata Power employees, line engineers, supervisors, contractor employees

- Properly wearing PPE as required.

- Properly caring for, cleaning, maintaining, and inspecting PPE as required.
- Informing the concerned person to either repair or replacement of PPE.

5. GLOSSARY/ DEFINITIONS:

ANSI: American National Standard Institute.

BIS: Bureau of Indian Standard

CE: Conformité Européene

Minimum PPE: Safety Helmet and Safety Shoes are minimum PPEs for whosoever enter the operating areas/plants in company premises or project sites.

OSHA: Occupational Safety and Health Administration, USA.

Personal Protective Equipment (PPE): Equipment that provide barrier between personnel and hazards and help prevent accidents and personal injuries. PPE includes hard hats, goggles, face shields, Hard-toed shoes, respirators, aprons, gloves, full body suits, etc.

Respirator: Approved personal protective equipment for protecting the respiratory system of workers from respiratory hazards.

Shall: Mandatory requirement
Should: Optional requirement

6. Procedure:

6.1 General Requirement:

6.1.1 PPE being last line of Defence, is the least preferred control method to reduce the risk of exposure to a hazard. PPE shall be used as a last line of defense as per Hierarchy of Controls or when no other risk control methods are available and practicable and where required by legislation or to increase the protection in conjunction with other control methods.

6.1.2 Personal Protective Equipment (PPE) shall be used to protect person from hazards as per local legal requirements of state/country.

6.1.3 Use, care & maintenance of PPE including disposal should be done as per manufactures guidelines.

6.1.4 PPE should not be shared with others as it is personal.

6.1.5 PPE shall be conforming to respective code/standard of Bureau of Indian Standards (BIS)/CE (Conformité Européene).

6.1.6 It is recommended to provide PPE kit bag so that both hands of person shall be free while moving or working.

6.1.7 Type, size and specification of Personal Protective Equipment (PPE) shall be as per local legal requirements as applicable. In case of any section of this procedure is in contradiction of local legal requirements, in all such cases local legal requirements shall prevail.

6.1.8 The PPE requirements are to be selected after reviewing the hazards and risks for each site and activity.

6.1.9 PPE must be used, maintained and stored in accordance with the manufacturer's instructions

6.1.10 PPE must be visually inspected before each use and any damaged PPE must not be used

6.1.11 Sites should document and monitor any necessary PPE maintenance or replacement schedules

6.1.12 In general PPE shall be conforming to respective code/standard of Bureau of Indian Standards (BIS). In case there is no BIS on specific PPE, in such case, it shall conform to concerned EN standard and shall be CE (Conformité Européene) marked.

6.1.13 Workers undertaking Job such as welding, cutting etc. shall wear task-specific PPE as per Job Safety Analysis (JSA) such as eyewear, gloves aprons and PPE as identified therein.

6.1.14 PPE should be discarded on completion of shelf-life or when they are not in usable condition to serve intended purpose due to prolong use or wear & tear. Shelf-life of PPE should be as per respective IS Code or manufacturer's recommendations. Refer Annexure-6 for Recommended Useful/Shelf-life of PPE. PPE shall be discarded even before shelf-life if found unworthy to use during visual inspection.

6.1.15 For new or transferred employees, it is the responsibility of reporting manager to ensure that those employees have appropriate safety footwear and other required PPE for the job to be performed.

6.2 PPE SELECTIONS:

6.2.1 **Minimum PPE**: Safety Helmet and Safety Shoes are minimum PPEs for whosoever enter the operating areas/plants in company premises or project sites.

6.2.2 **Location based PPE**: Any person entering to any location/area in the plant shall wear PPEs specified for that location/area and generally displayed at the entrance of the location/area. Refer **Annexure- 2** for some examples of location-based PPEs.

6.2.3 **Activity Based PPE**: Any persons engaged in any activity/job or exposed to risk due to that activity shall wear PPEs mentioned in PTW and JSA of that Activity. Refer **Annexure- 1** for some examples of activity base PPEs.

6.2.4 In case of any contradiction on application of PPE for performing any job, activity-based PPE shall override to minimum PPE and location-based PPE.

6.2.5 **Use of Reflective Jackets**: Tata Power Employees shall use green color reflective jacket and Contract workmen including supervisor shall wear orange color reflective jacket while entering to any location/area in the plant. Overall apron having reflective strips may use as an alternate to reflective jackets. Refer **Annexure- 3** for more details.

6.3 Types of Personal Protective Equipment (PPE)

6.3.1 Head Protections

6.3.1.1 Safety helmet shall be used in area where the risk of fall exists. It is one of the easiest ways to protect an employee's head injury. Safety helmet can protect a person from impact and penetration hazards as well as from electrical shock and burn hazards.

6.3.1.2 Safety helmet shall conform to BIS Standard 2925 (latest version) or provide an equivalent level of protection like CE Marked.

6.3.1.3 Caps and hard hat are not allowed in plant/factory/project premises.

6.3.1.4 Colour of safety helmet shall be as per Annexure -4.

6.3.2 Eye & Face Protections

6.3.2.1 Suitable eye protection shall be provided for all employees, including consultants and employees of contractors and visitors, where there are hazards of flying objects, glare, liquids, injurious light radiation, dust, or molten metal splashes

6.3.2.2 General or minimum protection should be required on an exposure area or a job based upon type of exposure. Special eye protection for hazardous work shall be worn in addition to, or in lieu of, required general area eye protection.

6.3.2.3 Based upon analysis of the potential eye hazards in the workplace and local experience, sites may restrict the wearing of contact lenses in certain locations which shall be appropriately identified. Contact lenses may present potential problems to the wearer under certain conditions, such as: a. extremely dusty environments where particles may get under the lens and cause irritation. b. Extremely hot and/or dry environments, such as around Boiler, furnaces or heaters where the eye may be exposed directly to the radiated energy.

6.3.2.4 Safety Google shall be meet minimum IS Standard IS 14352, welding face shield IS 1179 or provide an equivalent level of protection like CE Marked.

6.3.2.5 Face shields are considered additional protection for high temperatures, high density / impact particles or against chemical splashes and are not an alternative to goggles

6.3.3 Face shields:

6.3.3.1 Face Shields are designed to provide protection for the face and neck from flying particles and sprays of hazardous liquids / Fumes.

6.3.3.2 Face shields are available in many styles and shape sand selection must be made based on protection needed.

6.3.3.3 The window or transparent section of face shield shall be made of suitable plastic. It may be supported in a frame hood, as an addition to headgear, or any manner suitable for the purpose.

Face shields shall be worn over suitable safety spectacles. Splash goggles are recommended under face shields when protection from hazardous liquid splashes is required.

6.3.4 Hearing Protection:

6.3.4.1 Earplugs or earmuffs shall be worn as a protection when personnel are exposed to excessive noise Hearing protection area must be identify and “Hearing Protection Areas” as indicated by signage.

6.3.4.2 Hearing protection shall be selected considering Single-to-Noise Ratio (SNR) and Noise Reduction Rate (NRR) in such a way that user should not be exposed to more than 90 dB of noise level at any time.

6.3.4.3 Specifications for ear protectors shall confirm to BIS Standard 9167: 1779, or an equivalent level of protection like CE Marked.

6.3.5 Work Clothing:

6.3.5.1 The work clothing shall provide basic protection for individual work environments. The normal dress shall be either overalls or long trousers with full sleeve shirts / jackets.

6.3.5.2 Loose clothing shall not be worn, and long hair must be covered when work is performed around machinery with exposed moving parts.

6.3.5.3 Specific Work clothing for chemical handling shall be of Natural latex rubber gloves, neoprene synthetic rubber and vinyl shall be worn by personnel for protection against various chemicals as recommended as MSDS of that chemical.

6.3.5.4 Heat resistant work clothing shall be worn in areas where exposure to high temperature.

6.3.5.5 High-visibility florescent/reflective clothing should be worn at night, in conditions where visibility is poor (such as at dawn and dusk) or where there is a high risk of interaction between personnel and vehicles or mobile plant and equipment.

6.3.5.6 Electrical Arc Resistant Suit conforming to IEC-61482-2 or equivalent standard shall be worn by person when working on electrical

equipment and exposed to hazard of flash over. Rating of such suit shall be as per its application based upon the voltage exposed.

6.3.6 Hand Protection:

6.3.6.1 Selection of appropriate hand protection shall be based on performance characteristics of that protection, the relation of the hand protection to the work being performed, the hazardous conditions present, and the duration of its use.

6.3.6.2 Gloves are available in different materials depending on the protection required (e.g. cotton, rubber, PVC, stainless steel mesh, Kevlar, leather etc.). Selection must be based on the protection required for the hazard involved. They may be of wrist or elbow length. The type of glove to be used shall be asp per JSA requirement.

6.3.7 RESPIRATORY PROTECTION

6.3.7.1 The primary control of contaminated air shall be maintained through engineering methods by proper ventilation, providing exhausts, or providing substitution of less toxic materials.

6.3.7.2 Where engineering remedies are not feasible or are not available, or while they are being evaluated or implemented, and when the atmospheric exposure to a toxic material may exceed the recommended ceiling or time-weighted average limit for a given pollutant, respiratory protection will be required to protect the health of employees.

6.3.7.3 All respiratory protection must comply with BIS Standards: BIS 10245: Part 1 to 46 -/BIS 9623 Recommendations for selection use and maintenance of respiratory protective devices and Selection.

6.3.8 Foot Protection:

6.3.8.1 All employees of the company, consultants, employees of the contractors and visitors shall use appropriate safety shoes while performing their duties during job or while inside company premises.

6.3.8.2 Employees with medical problems who cannot be fitted with safety footwear provided by the approved footwear vendors should be offered safety footwear from another authorized supplier, with specific management approval.

6.3.8.3 Employees must maintain footwear in good state of repair, or the shoes must be replaced with authorization of management.

6.3.8.5 Contract employees and visitors working in areas that require safety footwear or are exposed to foot hazards must wear footwear appropriate for the area.

6.3.8.6 Safety footwear shall comply with the requirements of IS 3737: 1966- Leather safety boots for workers in heavy metal industries or equivalent EN standard.

6.3.9 Fall Protection:

6.3.9.1 for various types of PPE for fall protection, refer Critical Safety Procedure "Work at Height Procedure" Doc. Ref Number: TPSMS/CSP/WAH/004.

6.3.9.2 Full body harness with two lanyards conforming IS 3737 or an equivalent level of protection like CE Marked shall be used for all work at height.

7. RECORDS:

Records of inspection and maintenance of PPE shall be done as per respective checklist provided by Manufacturer and shall be detained minimum for its next schedule of inspection unless otherwise mentioned in related safety procedure.

8. TRAINING & COMMUNICATION

8.1. Training on use of general PPE shall be covered in safety Inductions program and work specific PPE shall be covered during specific safety certification trainings.

8.2. Supervisors must ensure that their employees prior to, utilizing PPE, they have received the appropriate instruction or training on correct use, maintenance, storage, disposal and their limitations.

8.3. Initial Communication to be done through Corporate Communication, Email and subsequently shall be made available at safety portal at Sangam.

9. VERIFICATION

9.1. Verification of implementation shall be done during safety audit, field safety visit and site inspections.

10. EXCEPTION

10.1. Any Exception to this procedure shall only be done as per Document Control Procedure (TPSMS/GSP/DC/014**).**

11. REFERENCES

11.1. Tata Power Safety Management System (TPSMS) Manual
11.2. Tata Power Work at Height Procedure - TPSMS/CSP/WAH/004
11.3. Tata Power Job Safety Analysis (JSA) Procedure - TPSMS/CSP/JSA/009
11.4. Tata Power Hazard Identification & Risk Assessment (HIRA) Procedure - TPSMS/GSP/HIRA/005
11.5. Tata Power Confined Space Entry Procedure - TPSMS/CSP/CSE/003
11.6. BIS Codes on PPE

12. REVIEW:

12.1. Review of this procedure shall be done as and when but not later than once in every three (03) years. Typical Factors like Changes in legislation, Review of Incident Reports, Inspection & Audit findings, Feedback from users, Recommendations in Incident investigation reports may be inputs for the review and revision of the procedure.

12.2. In case release of revised procedure gets delay due to obtaining feedback or any other reasons, safety advisory may be issued immediately to take precautions for the proposed changes in the procedure and revised procedure should be released subsequently.

13. ANNEXURES:

Annexure-1: Typical Examples of Activity/Job based PPEs.

Annexure-2: Typical Examples of Location based PPEs

Annexure - 3: Color Codes for Reflective Jackets

Annexure -4: Color Codes for Safety Helmets

Annexure -5: BIS Codes for PPE

Annexure – 1

Typical (Indicative) Examples of Activity/Job based PPEs.

SN	Activity/Job	PPE Requirement
1	Work at Height	1. Safety Helmet 2. Safety Shoes, 3. Double lanyard full body harness with anchor hooks
2	Mixing asphalt, cement, lime concrete etc.	1. Safety Helmet 2. Safety Shoes, 3. Safety goggles 4. Protective Hand gloves 5. Nose mask 6. Leg guard
3	Welding/Cutting/Grinding	1. Safety Helmet 2. Safety Shoes, 3. Welding screen/goggles, 4. Leather hand gloves, 5. Leather aprons,
4	Stone breaking	1. Safety Helmet 2. Safety Shoes, 3. Safety goggles, 4. Hearing protection, 5. Anti-vibration hand gloves 6. Protective clothing.
5	Electrical Job	1. Safety Helmet 2. Electrical resistant Safety Shoes, 3. Electrical resistant Rubber hand gloves 4. Electrical Arc Resistant Suit (for high voltage or as per Risk)
6	Insulation using glass wool	1. Safety Helmet 2. Safety Shoes, 3. Respiratory Mask 4. Leather Hand gloves, 5 Safety goggles.
7	Workers engaged in coal handling plant, ash handling plant and working in high dust area.	1. Safety Helmet 2. Safety Shoes, 3. Dust mask, 4. Hand gloves, 5. Safety goggles.
8	Working in Wind turbines either for Preventive & breakdown maintenance (PM & BM) activities	1. Safety Helmet 2. Safety Shoes, 3. Double lanyard full body harness with anchor hooks, 4. Fall Arrester, 5. Hand Gloves (cotton)
9	Grass cutting near Solar panels / array / strings	1. Safety Helmet 2. Safety Gum Boot, 3. Safety goggles 4. Hand Gloves (Cotton)

Annexure – 2

Typical (Indicative) Examples of Location based PPEs.

Sr. No.	Location	PPE Requirement
1	Switch yard	1. Safety Shoe 2. Safety Helmet 3. Hand Gloves (Cotton) 4. Safety Goggles
2	Turbine Floor	1. Safety Shoe 2. Safety Helmet 3. Hand Gloves (Cotton) 4. Safety Goggles 6. Ear Plug/Muff
3	Battery room	1. Safety Shoe 2. Safety Helmet 3. Hand Gloves (Rubber) 4. Safety Goggles 5. Rubber Apron/Suite
4	CHP	1. Safety Shoe/Gumboot 2. Safety Helmet 3. Hand Gloves (Cotton) 4. Safety Goggles 6. Nose Mask
5	Boiler Area	1. Safety Shoe 2. Safety Helmet 3. Hand Gloves (Cotton) 4. Safety Goggles
6	Chemical Storage	1. Safety Shoe/Gumboot 2. Safety Helmet 3. Hand Gloves (Rubber) 4. Safety Goggles 5. Rubber Apron/Suite
7	Public Road	1. Safety Shoe 2. Safety Helmet 3. Hand Gloves (Cotton/Rubber) 4. Safety Goggles
8	Consumer Premises / Consumer Sub Stations / Distribution Sub Station	1. Safety Shoe 2. Safety Helmet 3. Hand Gloves (Cotton) 4. Safety Goggles
9	Indoor Switch Gear Rooms	1. Safety Shoe 2. Safety Helmet 3. Hand Gloves (Cotton) 4. Safety Goggles
10	Ash Handling Area	1. Safety Shoe/Gumboot 2. Safety Helmet 3. Hand Gloves (Cotton) 4. Safety Goggles 5. Nose Mask 6. Reflective Jacket
11	Wind farms	1. Safety Shoe 2. Safety Helmet 3. Hand Gloves (Cotton) 4. Safety Goggles
12	Solar Plant	1. Safety Shoe 2. Safety Helmet 3. Hand Gloves (Cotton) 4. Safety Goggles

Annexure – 3

Color Codes for Reflective Jackets

Green for Tata Power Employees	Orange for Contract Workmen

Annexure – 4

Color Codes for Safety Helmets

White for Tata Power Employees	
Blue for Contract Workmen/Associates	
Yellow for Visitors	
Fire & Emergency response team	

Annexure – 5

Personal Protective Equipment (PPE) BIS CODE

(Note: Latest amended code to be referred)

Body

IS 3521	Industrial safety belts and harnesses – Specification
IS 4501	Specification for aprons, rubberized, acid and alkali resistant
IS 6153	Specification for protective leather clothing
IS 7352	Specification for X-ray lead rubber protective aprons
IS 8519	Guide for selection of industrial safety equipment for body protection
IS 8990	Code of practice for maintenance and care of industrial safety clothing

Ears

IS 6229	Method for measurement of real ear protection of hearing protectors and physical attenuation of earmuffs
IS 8520	Guide for selection of industrial safety equipment for eye, face and ear protection
IS 9167	Specification for ear protectors

Eye and Face

IS 1179	Equipment for eye and face protection during welding
IS 5983	Eye protectors
IS 7524 Part 1	Method of test for eye protectors: - Non - optical tests
IS 8521: Part 1	Industrial safety face shields – with plastic visor
IS 8521: Part 2	Industrial safety face shields – with wire mesh visor
IS 8940: 1978	Code of practice for maintenance and care of industrial safety equipment for eyes and face protection
IS 9995: 1981	Specification for visor for non-metal police and firemen's helmets
IS 14352: 1996	Miners safety goggles – Specification

Feet and Legs

IS 1989: Part 1	Specification for leather safety boots and shoes – for miners
IS 1989: Part 2	Specification for leather safety boots and shoes – for heavy metal industries
IS 3737: 1966	Leather safety boots for workers in heavy metal industries
IS 3738: 1998	Rubber boots – Specification
IS 3976: 2003	Protective rubber canvas boots for miners – Specification
IS 4128: 1980	Specification for fireman's leather boots
IS 5557: 1999	Safety Rubber boots – Specification
IS 5852: 1996	Protective steel toe caps for footwear – Specification
IS 6519: 1971	Code of practice for selection, care and repair of safety footwear
IS 7329: 1974	Metal last for safety rubber canvas ankle boots
IS 10348: 1982	Safety footwear for steel plant
IS 10665: 1982	Safety rubber ankle boots for miners
IS 10667: 1983	Guide for selection for industrial safety equipment for protection of foot and leg
IS 11225 1985	Leather safety shoes for women workers in mines and steel plants
IS 11226: 1993	Leather safety footwear having direct molded rubber sole – Specification
IS 11264 1985	Code of practice for manufacture of safety rubber footwear for miners
IS 13295: 1992	Code of practice for manufacture of leather safety boots and shoes for workers in mines and heavy metal industry
IS 14544: 1998	Leather safety footwear with direct moulded PVC soles – Specification
IS 15298: Part 2	Safety, protective and occupational footwear for professional use – Specification for safety footwear

Hands

IS 2573	Specification for leather gauntlets and mittens

IS 4770	Rubber Gloves – electrical purposes – specification
IS 6994 Part 1	Specification for safety gloves – leather and cotton gloves
IS 8807	Guide for selection of industrial safety equipment for protection of arms and hands

Head

IS 2745	Specification for non-metal helmet for firemen and civil defense personnel
IS 2925	Specification for industrial safety helmets
IS 4151	Specification for protective helmets for scooter and motorcycle riders

Respiratory

IS 8318	Colour identification markings for air purifying canisters and cartridges
IS 8347	Glossary of terms relating to respiratory protective devices
IS 8522	Respirators, chemical cartridge
IS 8523	Respirators, canister type (gas masks)
IS 9473	Respiratory protective devices – Filtering half masks to protect against particles – specification
IS 9563	Carbon monoxide filter self-rescuers
IS 9623	Recommendations for the selection, use and maintenance of respiratory protective devices
IS 10245: Part 1 to 46	Breathing apparatus
IS 15322	Particle filters used in respiratory protective equipment – Specification
IS 15323	Gas filters and combined filters used in respiratory protective equipment – Specification

Other

IS 6685	Specification for life jackets
IS 11057	Specification for industrial safety nets

IS 12078	Recommendations for personal protection of workers engaged in handling asbestos

Annexure – 6

Recommended Useful/Shelf-life of PPE

SN	PPE	Useful/Shelf-life (year)	Remark
1	Safety helmet	3	Useful life/ shelf-life may be extended upto 5 years if found worthy to use during visual inspection by CFT. To be Based upon the usage and visual condition or exposed to fall impact.
2	Safety Shoes	1	Based upon the usage and visual condition
3	Full Body Harness	3	Useful life/ shelf-life may be extended upto 5 years if found worthy to use during visual inspection by CFT
4	Safety goggles, face shield & other Eye/Face protection gears	-	Based upon the usage and visual condition
5	Electrical resistant hand glove	1	To be discarded even before shelf-life if found unworthy to use during visual inspection
6	Hand gloves other than Electrical Resistant hand gloves	-	Based upon the usage and visual condition
6	Arc flash Suit	3	Useful life/ shelf-life may be extended upto 5 years if found worthy to use during visual inspection by CFT
7	Fire Retardant Suit	3	Useful life/ shelf-life may be extended upto 5 years if found worthy to use during visual inspection by CFT
8	Nose mask & other respiratory gears	-	Based upon the usage and visual condition
9	Ear plug/ muff	-	Based upon the usage and visual condition
10	Other consumable PPEs	-	Based upon the usage and visual condition