

| Format No: ER 5/10– F2, JOB SAFETY ANALYSIS (JSA), IB THERMAL POWER STATION, OPGC   |  |  |                                   |  |  |   |              |
|---|--|--|-----------------------------------|--|--|---|--------------|
| Serial No.  | Department   | Equipment                                | Location                          | Job description:   |  |   |              |
|   | Facility Management  | Warehouse                                | Main Plant                        | Fencing of Warehouse Area  |  |   |              |
| JSA performed by:   | Signature  | Reviewed & Approved by                   | Signature                         | Date of Issue  | Date of revision   |   | Revision No- |
| HAZARD TEXT/TYPE ( For reference to identify the Hazard type )  |  |  |                                   |  |  |   |              |
| PHYSICAL HAZARDS  | PHYSICAL HAZARDS   | PHYSICAL HAZARDS                         | ELECTRICAL HAZARDS                | CHEMICAL/ GAS HAZARDS  | EXCAVATION   | OTHERS  |              |
| Noise   | Fall from height   | Force (Push/Pull)                        | Shock/ Electrocutation            | Flammable/ Explosive substances  | Collapse/Sliding   | Fire  |              |
| Radiation   | Fall (Slip/Trip)   | Caught in/on or between                  | Static electricity                | Inhalation of toxic fumes  | Underground live cable damage  | Heavy Wind/Rain   |              |
| Confined space  | Fall down/below  | Struck by/against                        | Arcflash/ blast                   | Ingestion/Absorption   | ERGONOMICS   | Dust exposure   |              |
| Exposure to pressurised Steam/Air   | Fall of Objects from height  | Extreme weather (Hot/Cold)               | BIOLOGICAL HAZARDS                | Body/Eye Contact   | Poor Posture   | Oil spill   |              |
| Contact with Hot surface  | Contact with moving parts  | Poor illumination                        | Snake/Insect bite/Virus infection | Spillage   | Repeatative motion   | Human factor  |              |
| PPEs to be used   | Safety shoes, hand gloves ,safety helmet, Nose mask, Ear plug/muff, Safety goggles, reflective vest, etc.  |  |                                   |  |  |   |              |
| Tools required  | Hoe, pick axe, spade, digging bar, measuring box, head pan, masonry trowel, circular saw, float, ladder, line and pins, measuring box, measuring tape, plumb bob, sand screen, spade, spirit level, tile cutter, wheel barrow, hand saw, |  |                                   |  |  |   |              |
| <b>Important Note-</b> While deciding hazard control measures, consider hierarchy of hazard control steps in order of preference. |  |  |                                   |  |  |   |              |
| SEQUENCE OF BASIC STEPS   | SAFETY, HEALTH & ENVIROMENT HAZARDS  | SAFE JOB STEPS / HAZARD CONTROL MEASURES |                                   |  |  | Are control Measures adequate to mitigate the risk (Yes/No) |              |
|   |  | Elimination/ Substitution                | Engineering                       | Administrative   | PPE  |   |              |
| Excavation work   | Electrocution/Shock from underground/burried cables  |  |                                   | Ensure the proper isolation and put local LOTO on the RCCB/Main switch. Ensure zero voltage before starting the job. Use insulation mat while doing isolation. | Safety shoes, hand gloves ,safety helmet, safety goggles, nose mask, ear plug/muff | Yes   |              |
|   | Body injury (Slip/trip)  |  |                                   | Have a 360 degree vision and be alert about the area of work. Use proper and healthy tools.  | Safety shoes, hand gloves ,safety helmet, safety goggles, nose mask, ear plug/muff | Yes   |              |
|   | Body eye conact/ hand/leg injury while digging/manual excavation   |  |                                   | Engage inline experienced work person, Use healthy and tested Tools.   | Safety shoes, hand gloves ,safety helmet, safety goggles, nose mask, ear plug/muff | Yes   |              |
|   | Poor Posture   |  |                                   | Take Rest in between the job. Do not overstretch your body. Keep in mind about your body limits.   | Safety shoes, hand gloves ,safety helmet, safety goggles, nose mask, ear plug/muff | Yes   |              |
|   | Collapse/sliding of soil   |  |                                   | Keep the excavated soil at a distance of 1 mtr from the excavated pit/trench. Barricade the area of work.  | Safety shoes, hand gloves ,safety helmet, safety goggles, nose mask, ear plug/muff | Yes   |              |
|   | Dust/Ash/fumes   |  |                                   | Keep dust/fume mask with you. Use wherever needed.Check, whether the filters of the mask are clean before using. Use clean masks.                              | Safety shoes, hand gloves ,safety helmet, safety goggles, nose mask, ear plug/muff | Yes   |              |
|   | Fall of person inside excavated pit/trench   |  |                                   | Barricade the working area with hard barrication. Use caution tapes and barriers wherever required.  | Safety shoes, hand gloves ,safety helmet, safety goggles, nose mask, ear plug/muff | Yes   |              |

| SEQUENCE OF BASIC STEPS                              | SAFETY, HEALTH & ENVIROMENT HAZARDS | SAFE JOB STEPS / HAZARD CONTROL MEASURES |  |   |  | Are control Measures adequate to mitigate the risk (Yes/No) |
|--|-------------------------------------|--|--|---|--|---|
|  |                                     | Elimination/ Substitution                | Engineering  | Administrative  | PPE  |   |
| Cement Concrete work                                 | Body injury (Slip/trip)             |  |  | Have a 360 degree vision and be alert about the area of work. Use proper and healthy tools.   | Safety shoes, hand gloves ,safety helmet, safety goggles, nose mask, ear plug/muff, gum boots. | Yes   |
|  | Body eye conact/ hand injury        |  |  | Engage inline experienced work person, Use healthy and tested Tools. Use rubber hand gloves to avoid direct contact with cement.                                  | Safety shoes, hand gloves ,safety helmet, safety goggles, nose mask, ear plug/muff, gum boots. | Yes   |
|  | Poor Posture                        |  |  | Take Rest in between the job. Do not overstrech your body. Keep in mind about your body limits.   | Safety shoes, hand gloves ,safety helmet, safety goggles, nose mask, ear plug/muff, gum boots. | Yes   |
| Dismantling, Cutting, Fabrication & Erection work    | Electrocution                       |  |  | Ensure the insulation of grinding and steel cutting machine and its cable. Ensure that the power source is from a 30mA sensitive RCCB.                            | Safety shoes, hand gloves ,safety helmet, safety goggles, nose mask, ear plug/muff             | Yes   |
|  | Inhalation of toxic fumes           |  |  | Use good quality nose mask.   | Safety shoes, hand gloves ,safety helmet, safety goggles, nose mask, ear plug/muff             | Yes   |
|  |                                     |  |  | Use good quality ear plugs/muffs. Take rest in between the job. Do not expose yourself to continuous noise.   | Safety shoes, hand gloves ,safety helmet, safety goggles, nose mask, ear plug/muff             | Yes   |
|  | Body injury (Slip/trip)             |  |  | Have a 360 degree vision and be alert about the area of work. Use proper and healthy tools.   | Safety shoes, hand gloves ,safety helmet, safety goggles, nose mask, ear plug/muff             | Yes   |
|  | Body eye conact/ hand injury        |  |  | Engage inline experienced work person, Use healthy and tested Tools.Use safety goggles to avoid any foreign material to go inside your eye.                       | Safety shoes, hand gloves ,safety helmet, safety goggles, nose mask, ear plug/muff             | Yes   |
|  | Falling of Object from height       |  |  | Proper supervision to be done, restrict unauthorized entry to the workplace, ensuring height work permit.   | Safety shoes, hand gloves ,safety helmet, safety goggles, nose mask, ear plug/muff             | Yes   |
|  | Fall of ladder/platform             |  | Ensure that the ladder/platform should be placed on a flat and rigid surface | Ensure healthiness of ladder and its rungs before work. The ladder/platform should be placed on a flat and rigid surface.   | Safety shoes, hand gloves ,safety helmet, safety goggles, nose mask, ear plug/muff             | Yes   |
|  | Fire hazard                         |  |  | Remove any combustibile subastance from the fabrication yard. keep fire extinguisher and water &sand bucket at site.Ensure hot work permit before starting of job | Safety shoes, hand gloves ,safety helmet, safety goggles, nose mask, ear plug/muff             | Yes   |
| Dismantling & Fixing of GCI and colour coated sheets | Electrocution                       |  |  | Ensure the insulation of grinding and steel cutting machine and its cable. Ensure that the power source is from a 30mA sensitive RCCB.                            | Safety shoes, hand gloves ,safety helmet, safety goggles, nose mask, ear plug/muff             | Yes   |
|  | Noise from drill machine            |  |  | Use good quality ear plugs/muffs. Take rest in between the job. Do not expose yourself to continuous noise.   | Safety shoes, hand gloves ,safety helmet, safety goggles, nose mask, ear plug/muff             | Yes   |

| SEQUENCE OF BASIC STEPS  | SAFETY, HEALTH & ENVIROMENT HAZARDS  | SAFE JOB STEPS / HAZARD CONTROL MEASURES  |   |  |  | Are control Measures adequate to mitigate the risk (Yes/No) |
|--|--------------------------------------|---|---|--|--|---|
|  |                                      | Elimination/ Substitution   | Engineering   | Administrative   | PPE  |   |
|  | Fall of ladder/platform              |   | Ensure that the ladder/platform should be placed on a flat and rigid surface  | Ensure healthiness of ladder and its rungs before work. The ladder/platform should be placed on a flat and rigid surface.  | Safety shoes, hand gloves ,safety helmet, safety goggles, nose mask, ear plug/muff | Yes   |
|  | Falling of Object/ tools from height |   |   | Proper supervision to be done, restrict unauthorized entry to the workplace, ensuring height work permit.  | Safety shoes, hand gloves ,safety helmet, safety goggles, nose mask, ear plug/muff | Yes   |
|  | Falling of workmen from height'      |   | Ensure that the ladder/platform should be placed on a flat and rigid surface. | Use A-type FRP Ladder and one person must be holding the ladder at the time of climbing/decending. Have a firm grip on the ladder/platform and maintain a 3-point contact while climbing/decending on the ladder/platform. In case of platforms, ensure that top rail and midrails are healthy and strong. | Safety shoes, hand gloves ,safety helmet, safety goggles, nose mask, ear plug/muff | Yes   |
| Tractor loading and unloading for shifting of materials at site.                                   | Body injury (Slip/trip)              |   |   | Have a 360 degree vision and be alert about the area of work. Use proper and healthy tools.  | Safety shoes, hand gloves ,safety helmet, safety goggles, nose mask, ear plug/muff | Yes   |
|  | Body eye conact/ hand injury         |   |   | Engage inline experienced work person, Use healthy and tested Tools.Use safety goggles to avoid any foreign material to go inside your eye.  | Safety shoes, hand gloves ,safety helmet, safety goggles, nose mask, ear plug/muff | Yes   |
|  | Dust/Ash/fumes                       |   |   | Keep dust/fume mask with you. Use wherever needed.Check, whether the filters of the mask are clean before using. Use clean masks.  | Safety shoes, hand gloves ,safety helmet, safety goggles, nose mask, ear plug/muff | Yes   |
|  | Falling of Object from height        |   |   | Proper supervision to be done, restrict unauthorized entry to the workplace.   | Safety shoes, hand gloves ,safety helmet, safety goggles, nose mask, ear plug/muff | Yes   |
|  | Poor Posture                         |   |   | Take Rest in between the job. Do not overstretch your body. Keep in mind about your body limits.   | Safety shoes, hand gloves ,safety helmet, safety goggles, nose mask, ear plug/muff | Yes   |
| Emergency Safety Measures ( Rescue/Fire Brigade etc):  |                                      | Emergency Contacts-Main Control Room- 222, 233,244, Fire- 777, 222257, Ambulance- 248/337, Hospital-666 |   |  |  |   |
| Overall Job Risk Category-   | HIGH                                 |   |   |  |  |   |
| JSA Review during PJB:   |                                      |   |   |  |  |   |
| Pre Job Briefing (PJB) is applicable to all persons involved with the task.                        |                                      |   |   |  |  |   |
| Pre Job Briefing (PJB) Acknowledgement: I undertake that the JSA is communicated to me effectively |                                      |   |   |  |  |   |
| Name   | Agency's name                        | Signature   |   |  |  |   |
|  |                                      |   |   |  |  |   |
|  |                                      |   |   |  |  |   |
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