# Lift (Elevator) Safety Procedure

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| Rev 00 | First release | R&P Subcommittee | D Kamath | Vijay Chourey |
| Rev 01 | Standardization of procedure | Arnav Mukherjee (Head - EMD & IMD Haldia) | Navendra Singh (Group Head – P & CB; Corp Safety.) | Vijay Chourey (Chief – Corp Safety) |
| Rev 02 | Periodic revision | Navendra Singh Head- Safety (T&D) Corp safety | Rajesh Sharma Head- Safety (Generation) Corp safety | Suresh Khetwani Chief - Corporate Safety & Environment |

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## 1. OBJECTIVE:

Objective of this procedure is to provide minimum requirements for safe operation of Lifts (Elevators) and to establish mandatory requirements and practices to protect personnel & property from hazards associated with Lift related maintenance and servicing jobs.

## 2. SCOPE:

This procedure applies to all operating and project sites of Tata Power Group companies including JVs/Subsidiaries.

## 3. EXPECTED RESULTS:

3.1. Manage jobs related to Lifts being done under Permit-to-Work safely.
3.2. Control of incidents related to lift operation and maintenance.
3.3. Compliance to Regulatory requirements related to Lifts.

## 4. ACCOUNTABILITY & RESPONSIBILITY:

4.1. **ACCOUNTABILITY**: Concerned Division's Heads/Assets Custodian.
4.2. **RESPONSIBILITY**: Site Engineers and Site Supervisors.

## 5. GLOSSARY/ DEFINITIONS:

**Approver:** Location Manager in charge of plant/dept. authorized shall be as per the permit to work procedure.

**Competent Person :** One who, by possession of a recognized degree, certificate, or professional standing and certified by government authority.

**Hazard Identification & Risk Assessment:** Hazard Identification & Risk Assessment is to identify and evaluate the hazards, Risk and put controls measures for safe execution of activities.

**Hazard:** Source or situation with potential for harm, something that can cause body injury / occupational illness, damage property.

**HIRA :** Hazard Identification and Risk Assessment

**Job:** A piece of physical work defined by time or other limits and that has a clear start and end point.

**Job Safety Analysis:** Job Safety Analysis (JSA) is a procedure which helps integrate accepted safety and health principles and practices into a particular task or job. In a JSA, for each basic step of the job, it is to identify potential hazards and to recommend the safest way to do the job.

**JSA :** Job Safety Analysis

**LOTO :** Lock out Tag out

**OEM:** Original Equipment Manufacture

**Non Routine Job / Task:** Where an SOP / SMP is not available or the conditions of the SOP / SMP have changed

**Periodic Inspection :** Detailed safety and maintenance inspection performed by a qualified person to verify compliance with the provisions of legal requirements.

**PPE :** Personal Protective Equipment

**PTW:** Permit to Work

**Risk:** Effect of uncertainty, Risk is a combination of the consequences of an event and the associated "likelihood" of occurrence

**Risk Assessment:** A systematic and structured process whereby hazards present in a workplace, or arising from workplace activity, are identified, risks assessed / evaluated, and decisions prioritized in order to reduce risks to acceptable levels.

**Shall:** Mandatory requirement

**Shall:** Optional requirement

**SHE:** Safety, Health and Environment

**Severity:** The level of consequence / harm of an event that could occur due to exposure to the hazard present

**Task / Activity:** A sequence of steps taken to conduct a job. A task/activity is a sub element of a Job.

**U/D:** Up/Down

## 6. PROCEDURES:

6.1. **Safety Guidelines for Servicing, Maintenance and Use of Lifts:** These guidelines are applicable to Installation, commissioning, examination, maintenance, repair, or demolition of Lift or any associated equipment or machinery of a lift. These guidelines include, but not limited to develop safe maintenance system for lift maintenance.

6.1.1. Contract for installation, commissioning, examination, maintenance, repair, alteration or demolition of any lift shall be given to

a. Original Equipment Manufacturer (OEM), or

b. A Contractor Authorized by OEM

6.1.2. Only trained, qualified and skilled persons shall be allowed to carry out lift maintenance (as lift technician).

6.1.3. The Tata Power Permit to Work procedure shall be followed when lift maintenance work will be carried out.

6.1.4. Prior to carrying out any lift maintenance works, proper risk assessment shall be conducted by OEM /maintenance contractor. A check list is attached to help in Risk assessment as Annexure 1: Checklist to Risk Assessment before Lift maintenance work.

6.1.5. For Risk assessment (HIRA /JSA) and lift maintenance , person including lift technician & engineers involved in lift works shall refer to the installation, operation and maintenance manuals, drawings, schematic diagrams, process flow charts,

method statements, working procedures and checklists provided by or drawn up based on recommendations of the manufacturer of the lift.

6.1.6. The specific safety practices and recommendations made by manufacturer of the lift must be included and strictly adhered in (HIRA /JSA).

6.1.7. Contractor involved in Lift maintenance shall provide necessary instructions to the technician / workers in the form of written method statement and through tool box talk.

6.1.8. Work tasks shall only be commenced when all the safety precautions are in place. The status of the works and the effectiveness of the safety precautions shall be closely monitored and regularly reviewed.

6.1.9. During any lift maintenance works, no passengers will be allowed to stay in the lift.

6.1.10. The door(s) of the lift car is always kept in the closed position, except in occasions where the particular tasks require the lift technician to stay in the carrier.

6.1.11. Adequate lighting for the works shall be provided to workers working in a lift shaft.

6.1.12. Emergency lighting or a battery torch shall be provided or made available to workers for use in the event of power failure or sudden failure of the normal lighting.

6.1.13. It is required to attend to the failure of any emergency device of a lift within 4 hours from the time when it has knowledge of the failure. Till that time power of the lift must be switched off and it must be kept out of operation.

6.1.14. A guideline for Safe lift operation and Use should be provided inside the lift cabin /car help the users.

6.1.15. All lifts shall be inspected and certified by Lift Inspector and competent persons under the Inspector of Factories Act and relevant State Rules as per the defined frequency.

6.1.16. Periodic inspection of lift shall be done by competent persons as per Manufacturer guidelines.

6.1.17. Following Safety Accessories should be provided and maintained inside a lift cabin /car

a. Telephone for Emergency call
b. Emergency Light
c. Telephone Numbers to contact during emergency
d. Certificate provided by Lift Inspector /factory Inspector
e. Carrying capacity in KGs / No. of Passenger

6.1.18. Safe Operating Procedure (SOP) as per Annexure- 3 shall be followed for taking control of lift (elevator) before accessing Car (lift cage) Top & before exiting from Car (lift cage) Top.

6.1.19. Safe Operating Procedure (SOP) as per Annexure- 4 shall be followed for taking control of lift (elevator) before entering and exiting the pit.

**7. Records:**

7.1. Checklist to Risk Assessment before Lift Maintenance Work – Three years

7.2. Lift Inspection Checklist/Form filled by Lift Inspector/ competent person as per State Lift Rules- Five years

**8. Training & Communication:**

8.1. Training of Lift Safety procedure shall be carried out to cover for following-

a) Site Engineer/ Site Supervisor
b) Lift Operator (if any)
c) Maintenance personnel (Tata Power, Associates, OEM)

8.2. 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 Lift procedure audit, field safety visit and site inspections.

**10. Exceptions:** Any Exception to this procedure shall only be done as per Document Control .Procedure (TPSMS/GSP/DOC/014)**.**

**11. REFERENCES**

- Indian Factory Act 1948 and State Factory Rules
- State Lift & Escalators Acts and Rules
- Tata Power Permit-To-Work Procedure - (TPSMS/CSP/PTW/008)
- Tata Power Job Safety Analysis (JSA) Procedure - (TPSMS/CSP/JSA/009)
- Tata Power Hazard Identification & Risk Assessment (HIRA) Procedure - (TPSMS/GSP/HIRA/005)

**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. ATTACHMENTS/APPENDIX :**

13.1. Annexure - 1: Check list to Risk Assessment before Lift Maintenance Work (TPSMS/GSP/LIFT/FORM/001)

13.2. Annexure - 2 : Guideline for Safe Lift operation and Use

13.3. Annexure – 3: Safe Operating Procedure (SOP) for taking control of lift (elevator) before accessing Car (lift cage) Top & before exiting from Car (lift cage) Top

13.4. Annexure – 4: Safe Operating Procedure (SOP) for taking control of lift (elevator) before entering and exiting the pit.

**Annexure-1**

**TPSMS/GSP/LIFT/FORM/001**

## Check List to Risk Assessment before Lift Maintenance Work

| SL No. | Description | Status (Yes / No/ NA) | | | Remarks |
|---|---|---|---|---|---|
| **A** | **General** | **Yes** | **No** | **N/A** | |
| 1. | Mechanic aware of standard repair process? | | | | |
| 2. | Mechanic certified to conduct the process? | | | | |
| 3. | All process related PPE's are available? | | | | |
| 4. | Proper and special tools are available. | | | | |
| 5. | Mechanics not working at different levels? | | | | |
| 6. | Certified hoisting tools are used in process? | | | | |
| **B** | **Machine Room** | | | | |
| 1. | Access to machine Room is safe and well lit? | | | | |
| 2. | Lighting / illumination is adequate? | | | | |
| 3. | LOTO is provided on main electrical power supply? | | | | |
| 4. | Floor is free of oil /lubricant or l tripping hazard? | | | | |
| 5. | Oil and other lubricant are kept in spill proof containers? | | | | |

| SL No. | Description | Status (Yes / No/ NA) | | | Remarks |
|---|---|---|---|---|---|
| | | | | | |
| 6. | Barriers/covers are provided to prevent accidental contact with electrical circuit? | | | | |
| 7. | All moving equipment, machinery and rotating parts are guarded? | | | | |
| 8. | Speed governor functional? | | | | |
| 9. | Safe Means of hoisting (Capacity, Hook locking etc.) is available? | | | | |
| **C** | **Car & Counter Weight (CWT)** | | | | |
| 1. | Emergency Stop switch easily accessible and identified? | | | | |
| 2. | Emergency Stop switch is working? | | | | |
| 3. | TOCI installed and functional properly? | | | | |
| 4. | Light /bulb externally guarded? | | | | |
| 5. | Light /Bulb is not creating Fire hazard (due to storage of oil / lubricant ) | | | | |
| 6. | Illumination is proper on car top and hoist way? | | | | |
| 7. | Car Top guardrail provided? | | | | |
| 8. | Warning signs are in place | | | | |
| | All moving parts /rotating parts are | | | | |

| SL No. | Description | Status (Yes / No/ NA) | | | Remarks |
|---|---|---|---|---|---|
| 9. | guarded? | | | | |
| 10. | Car top wiring is safe? | | | | |
| 11. | Tools and material required for maintenance activity are kept safely on car top and secured? | | | | |
| 12. | Mechanical safety equipment is functional? | | | | |
| **D** | **Hoist Way** | | | | |
| 1. | Illumination is proper on car top and hoist way? | | | | |
| 2. | All covers /fascia installed? | | | | |
| 3. | Hoist way screening protection up to man height | | | | |
| **E** | **PIT** | | | | |
| 1. | No one is in cabin to operate the lift in normal mode? | | | | |
| 2. | Emergency stop switch is installed, accessible and identified? | | | | |
| 3. | Emergency Stop switch is working? | | | | |
| 4. | Illumination is proper? | | | | |
| 5. | Pit ladder installed and easily accessible? | | | | |
| 6. | CWT screen guard and level below CWT buffer top? | | | | |
| | Floor must be free of oil, water and material | | | | |

| SL No. | Description | Status (Yes / No/ NA) | | | Remarks |
|---|---|---|---|---|---|
| 7. | causing tripping hazard? | | | | |
| F | **Remarks** | | | | |
| | | | | | |

**Checked By**:

Name &Sign of Engineer/Supervisor

**Annexure-2**

## Guideline for Safe Lift operation and Use

Follow these simple guidelines to prevent injuries and enhance safety.

### Approaching Lifts:

1. Push the Lift call button once. (Up or Down)
2. Look or listen for the signal announcing car's arrival.
3. Stand aside for exiting passengers. Wait for the next car if the arriving Lift is full.
4. Don't try to stop closing doors with anything, including hands, feet, canes, etc. Wait for the next Lift.
5. Use the stair case in any emergency that could lead to a disruption in electrical service.

### Entering and exiting Lift / elevators:

1. Enter and exit carefully. Passengers nearest the doors shall move first.
2. Move to the back of the car to make room for other passengers.
3. When all passengers are on board, and then only press the button.
4. Stand clear of the doors; keep clothes and other belongings away from the opening.
5. Push and hold the DOOR OPEN button if doors need to be held open, or ask someone to push the button for you.

### Riding on Lift / elevators:

1. Stand back from the doors.
2. Hold the handrail, if available.
3. Pay attention to the floor indicators and be prepared to exit at your destination.

4. If the doors do not open when the Lift stops, push the DOOR OPEN button. If the doors still don't open, ring the ALARM button and/or use the telephone or intercom. Wait until qualified people can assist you.

**If the Lift / elevator stop between floors:**

1. Push or pull the ALARM button to call for assistance.
2. Phone for help, if a phone is available. An intercom or alarm may be available. Follow the instructions for their use.
3. Do not force to open the Lift door. Do not attempt to leave the Lift.
4. Be patient - help is on the way. You are safe and there is plenty of air. So relax and wait for help

**Annexure – 3**

**SAFE OPERATING PROCEDURE FOR TAKING CONTROL OF LIFT (ELEVATOR) BEFORE ACCESSING CAR TOP & BEFORE EXITING FROM CAR TOP:**

1) Obtain Approved Permit-To – Work with HIRA/JSA for the job.
2) Inform Operation / Concern Departments about Lift shutdown. Place stickers or posters to make general public aware of Lift maintenance activity.
3) Caution: Before commencing of work update workmen during tool box talk about probable hazards in the job and various corrective measures against hazards. Also indicate necessary and required PPEs for the job.
4) It is mandatory to use 24 Volts hand lamp during work.
5) Confirm the normal functioning of hall call buttons by registering one down and one up call. Lift to operate as per calls.
6) Check the normal functioning of Door Safety Circuit using Door Key.
7) When the car reaches the landing and the doors open, register at least two car calls on the car operating panel in the down direction, preferably for a floor just below and two floors below.
8) As the car commences its downward travel, open the door using prescribed landing door key. Ascertain the car is in a position where it is possible to go on car top (in level with landing sill or at the most 30 centimeters above). Close the door and allow the car to run if necessary and open the door again, so the car top is at the desired level. This is to avoid any tripping hazard that might result from the difference between the levels of the two surfaces.
9) If the Lift stops at the opening of door, it is an indication that door safety circuit is operational.
10) Locate the car top inspection box. If the inspection is beyond 750 mm from landing and not easily accessible then it is necessary to use door blocking device to hold the car doors from closing.
11) Use correct posture while accessing TOCI switches on car top.
12) Holding the doors open put the STOP switch to STOP on the top of the car inspection box.
13) Close the landing doors and register hall call. Wait for 10 seconds to check whether the car is responding the hall call. If the car does not move it is the indication that STOP switch is functioning properly.
14) Open the doors again and put the INSPECTION Switch to Inspection (INS) position. Turn the STOP switch to RUN position. Please maintain correct posture while accessing TOCI switches.
15) Close the landing doors and register hall call. Wait for 10 seconds to check whether the car is responding the hall call. If the car does not move it is the indication that INSPECTION switch is functioning properly.

16) All the above checks are necessary for independent verification of door safety, STOP switch and INSPECTION switch. Any failure must be immediately reported to OTIS/Supervisor and any further operations carried out only when instructed.
17) Open the door, put the STOP switch to STOP position.
18) Turn ON the car top light.
19) Having gained the full control of the car as above, again visually ensure that STOP switch is in STOP position and INSPECTION switch is in INS mode.
20) Switch OFF electric power to lift at machine room and on service switchgear.
21) Perform LOTO operation & place Release Tags.
22) Enter to the car top for the required job.
23) If the car is to be moved up or down then following procedure is necessary.
24) Position yourself in a safe location on the car top. In most cases space behind the crosshead is generally safe. It is strongly advised that positioning in front of cross head is to be avoided unless the space in front is substantially large (more than 600 mm) and is not crowded with car top equipment. If the space in front of crosshead is less and there are projection in hoist way (such as door header, landing sill projections etc.), positioning in front of crosshead is prohibited while moving the car.
25) While moving from front of the crosshead to the back side, standing on the cross head is strictly prohibited. Even if crosshead is high, cross over from one side to other only in sitting position.
26) Put the STOP switch to RUN position after ensuring Inspection switch is in INS position.
27) Test the inspection run in DOWN & UP direction using UP/Down (U/D) and Call (C) buttons on inspection box. Move the car six inches down and then six inches up and establish that both U/C and D/C combinations are functional.
28) As soon as car is positioned to the location where it is required to work first put the STOP switch to STOP position.
29) Complete your work as necessary.
30) On completion of work, follow following procedure to exit from car top.
31) It is recommended that the exit be through the same landing that was used and verified for accessing the car top.
32) Put the STOP switch to RUN position and move the car to the same landing.
33) Put the STOP switch to STOP position.
34) Open the landing door and exit from the car top and position yourself safe on the landing.
35) Holding landing doors open, put LIGHT Switch off.
36) Put INSPECTION switch to normal position.
37) Put STOP switch to RUN position.
38) Close landing door.
39) Give a hall call and ensure that the Lift is running normally.

40) Sometimes it may be necessary for you to exit from the top of car to a landing other than one where you entered on car top. In that situation following additional steps must be executed to ensure that the door safety of that specific landing is operational.
    a. Position the car top aligned to the landing sill on the desired floor.
    b. Put the STOP switch to STOP position.
    c. Open the landing door.
    d. Block the landing door by using Door Blocking Device.
    e. This shall preferably be done from the car top. However, if car top is small and putting door blocks are very difficult; doing it from landing is allowed.
    f. Position yourself in a safe location on car top and put the STOP switch to RUN.
    g. Attempt to run the Lift by pressing U/C and D/C Button on Inspection Box.
    h. If the Lift does not move, it ensures that the door safety circuit is operational and it is safe to exit at this landing.
41) Caution: before exiting clear the car top check for any loose material, tools etc.
42) Clear the release and restore power by switching ON all breakers at machine room and at service switchgears.
43) Check Lift operation by giving up or down call.
44) Keep all tools, special tools and devices at appropriate places.

Annexure – 4

**SAFE OPERATING PROCEDURE FOR TAKING CONTROL OF LIFT (ELEVATOR) BEFORE ENTERING AND EXITING THE PIT:**

1) Obtain Approved Permit-To – Work with HIRA/JSA for the job.
2) Inform Operation / Concern Department about Lift shutdown. Place stickers or posters to make general public aware of Lift maintenance activity.
3) Confirm the normal functioning of hall call buttons by registering one up and one down call. Lift is to operate as per calls.
4) Check the normal functioning of Door Safety Circuit using Door Key.
5) Checking of Door Safety Circuit can be confirmed by opening landing door on upward travel of Lift, Lift must stop.
6) Send the car to first floor. After car reaches first floor open doors of ground floor by using Door Key.
7) With doors open, block the door using Door Blocking Device.
8) Caution: Door blocking must not be done using foot or any body part.
9) Caution: Use correct body posture for fixing Door Blocking Device.
10) Actuate Upper Pit Switch to STOP position.
11) Caution: Use correct body posture and proper body bracing to actuate Upper Pit Switch.
12) Check functioning of Upper Pit Switch. Remove Door Blocking Device, close the landing door and register hall call. Wait for 10 seconds to check whether the Lift is responding to call. If Lift does not move, it is an indication of correct functioning of Upper Pit Switch.
13) Open the landing door and block it with the help of Door Block Device.
14) Put the pit light ON by using pit light switch.
15) Use the pit ladder to climb down the pit and put Lower Pit Switch to STOP position.
16) Climb up to the landing. Put the Upper Pit Switch to RUN position from landing.
17) Check functioning of Lower Pit Switch. Close the landing door and register hall call. Wait for 10 seconds to check whether the Lift is responding to call. If Lift does not move, it is an indication of correct functioning of Lower Pit Switch.
18) Caution: If door safety and two pit switches test fail, entry to pit is prohibited.
19) This shall be brought to the notice of Manufacturer/Service provider immediately.
20) Open the landing door and block with Door Blocking Device.
21) Put Upper Pit Stop Switch to STOP position.
22) In this position working person has full control of Lift and can enter the pit for the activity in pit or on open landing door.
23) Establish that landing doors are adequately protected by barricading etc.
24) Establish again that two pit switches are in STOP position.

25) Place second Door Blocking Device at the rear end of door to maintain gap of 75 mm between the doors. This ensures doors themselves act as barricades to prevent any unauthorized entry causing accident and ensures ventilation.
26) Switch OFF electric power to lift at machine room and on service switchgear.
27) Perform LOTO operation & place Release Tags.
28) Perform the task in the pit for which entry was intended.
29) Caution: Before commencing of work update workmen during tool box talk about probable hazards in the job and various corrective measures against hazards. Also indicate necessary and required PPEs for the job.
30) It is advised to use supply air fan in case of work is of longer duration inside pit.
31) It is mandatory to use 24 Volts hand lamp during work.
32) On completion of work follow the entire procedure in reverse order to exit the pit.
33) Remove the second Door Blocking Device at the rear end of door. Adjust first Door Blocking Device in such a way that doors are full open.
34) Remove all materials, tools, lighting fixtures from pit. Maintain housekeeping of Lift pit before exiting pit.
35) Put the Lower Pit Switch to RUN position.
36) Use pit ladder to climb out of pit to landing.
37) From landing switch off light and put Upper Pit Switch to RUN position.
38) Close landing doors. Clear the release on the Lift and remove the lock placed at various places.
39) Remove all stickers and barricades placed for the job.
40) Restore power by switching ON all breakers at machine room and at service switchgears.
41) Check Lift operation by giving up or down call.
42) Keep all tools, special tools and devices at appropriate places.
43) Please note that emergency speed governor system functions at 40% above rated speed.