

SAFE OPERATION PROCEDURE (SOP)

Machine Laboratory, Department of EEE, BUET

1. Purpose

This SOP ensures safe operation of electrical machines and associated equipment during undergraduate laboratory experiments involving AC/DC supplies, motors, generators, transformers, and measuring instruments.

2. Scope

Applicable to all students, instructors, lab engineers, and authorized personnel conducting experiments using: - 3-phase supply system - Fixed and variable AC/DC supplies (up to 240 V) - Induction, synchronous, and DC motors/generators - Single-phase transformers - Electrodynamometer and other electrical measuring instruments

3. Authorization & Supervision

- Entry and operation are permitted **only under supervision** of the course teacher/lab engineer.
- Students must perform **only the assigned experiment**.
- Unauthorized modification of wiring or settings is strictly prohibited.

4. General Safety Rules

- Wear proper attire: **closed shoes**, no loose clothing, jewelry, or dangling items.
- Ensure **dry hands and floor**; liquids are not allowed near equipment.
- Do not touch live terminals or rotating parts.
- Maintain a safe distance from rotating machines and exposed shafts.
- Know the location of **main isolator, emergency stop, and fire extinguisher**.

5. Pre-Operation Checklist

Before energizing any setup: - Verify circuit connections with the instructor/lab staff. - Ensure all **MCBs/CBs are OFF** and supply is isolated during wiring. - Set variac/variable supply to **zero output**. - Check proper earthing of machines and metallic frames. - Confirm rated voltage, current, and speed of machines. - Ensure mechanical coupling and load conditions are secure.

6. Operating Procedure

- Energize the circuit **only after approval** from the supervisor.
- Increase voltage/current **gradually** using the variac.
- Do not exceed rated values of voltage, current, speed, or torque.
- Never change connections or meter ranges while the circuit is energized.
- Monitor abnormal signs: excessive noise, vibration, smell, or overheating.

7. During Abnormal Conditions

- Immediately **switch OFF supply** if any abnormality is observed.
- Inform the instructor/lab engineer at once.

- Do not attempt troubleshooting without permission.

8. Post-Operation Procedure

- Reduce variac output to **zero** before switching OFF supply.
- Turn OFF all switches and isolate the main supply.
- Allow machines to come to a complete stop before touching.
- Restore connections to original condition if instructed.
- Keep the workbench clean and organized.

9. Emergency Guidelines

- In case of electric shock: **disconnect supply immediately** and seek help.
- In case of fire: use **CO₂ or dry powder extinguisher only**.
- Report all incidents, even minor ones, to lab authorities.

10. Compliance

Failure to comply with this SOP may result in **cancellation of the experiment** and disciplinary action as per university rules.

Note: Safety is a shared responsibility. When in doubt, always ask before switching ON.