

**NATIONAL UNIVERSITY OF ENGINEERING
COLLEGE OF MECHANICAL ENGINEERING**



LABORATORY OF ENERGY

**Mechanical Engineering Program
Mechanical-Electrical Engineering Program
Mechatronics Engineering Program
Naval Engineering Program**

GENERAL SAFETY NORMS

Lima, Peru

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Laboratory of Energy

General Safety Norms

The safety of students, faculty and staff is the top priority regarding the operation and use of machines, equipment and tools at the laboratories of the College of Mechanical Engineering at National University of Engineering UNI.

All students, faculty and staff must comply and enforce the following general safety guidelines applicable to the Laboratory of Energy.

- Experimental work must be carried out under the supervision of a specialist faculty or laboratory staff.
- Wear closed hard shoes. Do not wear open-toed shoes or sandals in the shop.
- Do not move experimental setup without permission and guidance of laboratory staff.
- Check there is no fluid leakage or other types of chemical leakage in the laboratory. If it's the case, contact the laboratory supervisors or staff immediately.
- Guards must be placed on all pressurized setups. Keep distance while the experiment is in progress.
- Guards must always be placed on rotating machine parts and shafts in operation. Keep distance while the experiment is in progress.
- Check that equipment, components, fittings and hydraulic hoses, etc., are in good condition.
- Drip trays and skid proof mats must be used under and around setups in which oil spill may occur.
- In case of skin contact with hydraulic oil, wash the affected area with soap.
- Only instructed laboratory staff are permitted to make changes in experimental setups.
- When experimental setups are abandoned, they must be relieved of pressure and flow, and must always be placed in safe position

Ram Jet - Wind Tunnel

- Be sure there are not fixed or moving objects at tunnel inlet and outlet positions.
- Be sure there are not people at least 3 meters from the tunnel outlet.
- Check protective mesh at the input of the tunnel is clean and in good condition.
- Mandatory use ear protection when the wind generator is in operation. This applies to ALL who is working in the laboratory.
- Take data and observe phenomena in an orderly and spaced manner.
- Correctly apply the protocols for turning the air blower on and off.
- Pay attention to the location of emergency stops and electric breakers.

Steam Boiler

- Before operation, check pipelines and valves to be sure there is not water, steam or fuel leakages.
- Clearly understand the purpose and operation of every valve and switch.
- Pay attention to the location of emergency stops and breakers.
- Check gauge-glass and water-column connections are clean and readable.
- Double check water level before lighting a fire under a boiler.
- Correctly apply the protocols for turning the generator on and off.
- Do not open a valve under pressure quickly. Sudden pressure changes generate water hammer, and piping and valve failure.
- Be sure blow down valves are closed and proper vents, water-column valves, and pressure-gauge cock are open.
- Do not cut a boiler in on the line unless its pressure is within a few pounds of header pressure.
- Do not bring a boiler up to pressure without trying the safety valve.
- Lift the valve from its seat by the hand lever when the pressure reaches about three quarters of popping pressure.
- Do not tighten a nut, bolt, or pipe thread, nor strike any object under steam or air pressure.
- Do not change adjustments of safety valves.