

# NATIONAL METAL AND ENGINEERING CURRICULUM

**MODULE:** OPERATIONAL AWARENESS OF COOLING TOWERS AND EVAPORATIVE CONDENSERS (NR032)

**PURPOSE:** This module aims to provide instruction for persons employed in the operation of cooling towers for process cooling and evaporative condensers, and closed circuit water-cooled systems.

**NOMINAL DURATION:** Half module

*A full module is designed on the assumption that most of the students will achieve the competencies specified in 35 to 40 hours.  
The length of time taken to complete a module will vary, depending on factors such as teaching method used, knowledge and skills at entry and the individual student's ability.*

**PREREQUISITES:** Occupational Health and Safety (NBB02)

**LEARNING OUTCOMES:** On completion of this module the student will be able to:

1. Start and stop a cooling tower in accordance with safety and manufacturer's instructions.
2. Determine the correct operation of the cooling tower.
3. Identify responsibility under the legislation.
4. Maintain records.

**STUDENTS SHOULD BE MADE AWARE OF OCCUPATIONAL HEALTH AND SAFETY ISSUES IN ALL SITUATIONS AND BE EXPECTED TO DEMONSTRATE SAFE WORKING PRACTICES AT ALL TIMES.**

**OUTLINE OF CONTENT:**

**This module contains:**

1.
  - pre-cleaning of tower
  - emergency stop procedure
  - tower sequence and changeover
  - partial shut-down and ramification to the system operation
  - system operation
  - process cooling operation
  - system observation
  - safety controls (testing)
  - seasonal shut-down and start-up procedures
2.
  - determine water temperatures
  - air discharge and install
  - water discharge
  - water treatment monitoring
3.
  - health requirements under the Act and regulations, eg AS3666
  - protection clothing
  - disease and habitat
4.
  - records for council approval (aware dosing and testing of water)
  - maintenance program
  - sampling
  - various treatment systems

**ON-THE-JOB TRAINING:**

For consolidation the material in this module should be linked with and complemented by relevant on-the-job skill practice or other equivalent experience.

**PERFORMANCE CRITERIA:**

The criteria for each learning outcome should be:

**Learning Outcome 1**

**Assessment:** Simulated exercise

- Performance:**
- a. Observe safety precautions.
  - b. Start and stop a tower.
  - c. Safety controls test.
  - d. Partial shut-down of a multiple tower.
  - e. Seasonal shut-down.

**Learning Outcome 2**

**Assessment:** Simulated exercise

- Performance:**
- a. Observe safety requirements.
  - b. Test and record tower operating conditions.
  - c. Awareness of air movement and drift patterns from a tower.

**Learning Outcome 3**

**Assessment:** Short answer test

**Performance:** Analyse a system in terms of legislation.

**Learning Outcome 4**

**Assessment:** Short answer test

- Performance:**
- a. Council approval and regulation forms.
  - b. Data logging techniques (demonstration only).
  - c. Planned maintenance.
  - d. Monitoring conditions of the lower low on water treatment due to overflow.
  - e. Drift loss.