

EN477

Steam Practicum (3rd Class Power Engineering)

6 Credits

Instructor: Daniel Jantzen
780 871 5486

Original Developer: Daniel Jantzen

Current Developer: Daniel Jantzen

Reviewer: Kevin Ma

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2602 - 59 Avenue, Lloydminster, Alberta, Canada T9V 3N7. Ph: 780 871 5700
5707 College Drive, Vermilion, Alberta, Canada T9X 1K5. Ph: 780 853 8400
Toll-free in Canada: 1 800 661 6490



EN477 Version: 1



Steam Practicum (3rd Class Power Engineering)

Calendar Description

This course is 480 hours of controlled practicum for 2nd year Heavy Oil Power Engineering students. This is an industry placement by the college in a minimum 3rd class Power plant.

Rationale

This course provides students with the real life application of the theory and lab learned during school year. Students must pass this course to get qualification time towards their 3rd class power engineer licenses.

Prerequisites

1. The student must have passed all courses in HOOT or first HOPE. The student must hold a 4th class Power Engineer certificate.
2. Qualifications: The practicum host may have qualifications that must be met before a student is accepted. These may include a criminal records check, immunization records, pre-employment medical screening including drug and alcohol testing. Students must become familiar with the host's company rules and abide by them. Contravention of the rules may result in practicum disqualification.
3. The host site will have personal protective equipment requirements. These could include but not limited to: hard hat, safety glasses, safety toed boots, Fire Retardant outerwear.
4. Course fees must be paid to student services before the student is enrolled in EN-477. This will be separate from the other 2nd year HOPE tuition.
5. International students must have a student visa and a work visa to participate in EN477.

Co-Requisites

None

Course Learning Outcomes

Upon successful completion of this course, students will be able to

1. perform work in a plant environment on a regular shift of both dayshift and nightshift.
2. perform job functions of the shift engineer at the specific plant practicum placement.

3. complete daily logs and basic operation of fired equipment specific to the host plant.
4. explain the process flow of the plant from the raw fuel or material entering the plant to the saleable product leaving the plant

Resource Materials

Required Text(s):

None

Reference Text(s):

None

Conduct of Course

The 480 hours of controlled practicum is an industry placement by the college in a minimum 3rd class Power plant. Under the direction of the shift engineer the student participates in the operation of the power plant. The college provides Workmen's Compensation and Insurance coverage for the duration of the practicum. Unpaid practicum agreements are signed by the student, practicum coordinator and the practicum host.

Or:

The student is hired by a company for temporary employment in a minimum 3rd class plant. Under the direction of the shift engineer the student participates in the operation of the power plant. The student is covered by the company's Workman's compensation and insurance. Paid practicum agreements are signed by the student, practicum coordinator and the practicum host. A minimum 480 hours of steam time must be worked.

The student is expected to work as would be required of an entry level employee.

The student must show 480 hours of steam time. Transportation to the work site is the responsibility of the student.

The usual time period to complete this course is immediately after completion of first year HOPE but the student has up to 5 years from the start of the HOPE program to complete this course.

Evaluation Procedures

This is a pass (P) or fail (F) course.

Assignment: The student must complete an assignment as part of the course. The assignment consists of Process flow drawings of the practicum facility and a daily log of activities the student participated in as part of the practicum. An events log of significant events at the site

will be entered in the log book. A background and company information report must be submitted

Documentation:

1. Task check-off list of pertinent task relating to the Lakeland program
2. A detailed timesheet signed by the host Chief Steam Engineer
3. A student work evaluation filled out and signed by the host Chief Steam Engineer
4. An ABSA or TSASK Steam Experience form signed by the host Chief Steam Engineer (AB-66) or (TSK-2021)
5. Students completing practicum in Saskatchewan must also complete ABSA “Out of Province Transfer” form (AB-130)

Grade Equivalents and Course Pass Requirements

This is a pass (P) or fail (F) course. No other grade is assigned.

Attendance

480 hours minimum of practicum time must be completed in the course allotted time period.

Course Units/Topics

Topics will vary depending on the work placement

Raw Water System		
	Raw water source	Filters and piping
	Raw water pumps	Backwash system
	Piping and valves to clarifier	Clarified water pumps
	Control valves and bypass	Control valves and bypasses
	Flow control system	Timers
	Flow recorders	Flow controller to clarifier
	Clarifier chemicals used	Flow controller to filters
	Agitator and drive	Flow controller to backwash
Treated Water System		
	Chemicals and tanks	Zeolite regeneration chemicals
	Valves and bypasses	Control valves
	Instruments or loops	Automatic timing or sequencing
	Zeolite system ion exchange	Water quality tests
	Demineralization system	

Deaerator & Heat Recovery		
Treated water piping to deaerator		Temperature and pressure control system
Blowout heat exchanger		Valves and bypasses
Treated water pumps to deaerator		Overflow and the control system
Condensate pumps to deaerator		Vent, vent condenser and valve
Treated water Valves and bypasses		Treated and cooling water to condenser
Deaerator level control		Condensate return system
Level control floats and transducers		Chemical treatment to deaerator
Temperature recorder		Deaerator water feed pumps
Boiler Feedwater System		
Feedwater pumps		Control valves and bypasses
Feedwater recirculation system		One, two, three element drum level control
Feedwater lines to boiler or economizer		Transducers, recorders, controllers for drum level
Mass and Continuous Blowdown		
Drum and header drain valves		Adjustable CBD valve
Piping system to blowdown tank		Heat exchanger
Blowdown tank		Valves and bypasses
Continuous blowdown Line from steam drum		CBD Line from heat exchanger sewer
Combustion Air System		
Forced Draft		Induced Draft
Air inlet filter		Fan type, single or double inlet
Fan type, single or double inlet		Damper type, inlet or outlet
Damper type, single or outlet		Type of impeller blades
Type of impeller blades		Draft tap at fan, inlet or outlet
Ducting to primary and secondary wind-boxes		Horsepower, voltage, amperage
Primary and secondary air flow orifices		Drive coupling type
Pressure taps from FD fan		Furnace pressure tap
Primary or secondary wind-box orifices		Furnace pressure
Transducers and pressure lines		Air pre-heater ductwork
Drive horsepower, voltage, amperage		
Drive coupling type		

Boiler Steam and Combustion Control System	
Steam Pressure Control	Combustion Control
Main steam pressure transducer	Fuel controller
Boiler plant master	Primary and secondary air controllers
Fuel recorder	Oxygen trim control
Primary and secondary air recorder	Primary and secondary Air damper actuators
Fuel-air proportional relay	Oxygen recorder
Auxiliary Plant Systems & Alarms	
Auxiliary Systems Under the Care of the Chief Engineer	Alarm Systems
1. _____	1. _____
2. _____	2. _____
3. _____	3. _____
4. _____	4. _____



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