



ADVANCED DIPLOMA OF ELECTRICAL AND INSTRUMENTATION (E&I) ENGINEERING FOR OIL AND GAS FACILITIES

MODULE DETAILS

MODULE 8: Power System Protection and Co-ordination

Nominal duration: 3 weeks (24 hours total time commitment)

This time commitment includes the preparation reading, attendance at each webinar (1 hour plus 15-30 minutes for discussion), and the time necessary to complete the assignments and further study.

MODULE PURPOSE

This module has been designed to give plant operators, electricians, field technicians and engineers a better appreciation of the role played by power protection systems. An understanding of power systems along with correct management will increase your plant efficiency and performance as well as increasing safety for all concerned. The module is designed to provide excellent understanding on both a theoretical and practical level. Starting at a basic level and then moving onto more detailed applications, it examines the need for protection, fault types and their effects, simple calculations of short circuit currents, and system earthing. The module includes some practical work, simple fault calculations, relay settings and the checking of a current transformer magnetization curve.

PRE-REQUISITE MODULES/UNIT(S)

Module 4: Power Distribution

Module 5: Power Transformers

Module 6: Switchgear for Power Distribution

Module 7: Cables and Wires – Maintenance and Installation Practice

ASSESSMENT STRATEGY

To evaluate the achievement of the learning outcomes; written assignments, group projects and practical exercises are set.

SUMMARY OF LEARNING OUTCOMES

1. Examine the fundamentals of protection [8.1]
2. Describe the characteristics and application of fuses, relays and batteries [8.2]
3. Discuss the various protection types [8.3]



**ADVANCED DIPLOMA OF ELECTRICAL AND INSTRUMENTATION (E&I)
ENGINEERING FOR OIL AND GAS FACILITIES**

Learning Outcome 1	Examine the fundamentals of protection	[8.1]
Assessment Criteria	<ol style="list-style-type: none">1. Explain the need for protection [8.1.1]2. Discuss issues related to system earthing/grounding [8.1.2]3. Discuss fuses as protection system components [8.1.3]4. Discuss the instrument transformers in terms of (a) attributes, and (b) application [8.1.4]5. Discuss circuit breakers in terms of (a) purpose, (b) fault clearance time, (c) types and (d) applications [8.1.5]	
Learning Outcome 2	Describe the characteristics and application of fuses, relays and batteries	[8.2]
Assessment Criteria	<ol style="list-style-type: none">1. Examine and discuss the various fuse-contactor combinations [8.2.1]2. Describe the (a) attributes and (b) application of control and tripping batteries [8.2.2]3. Discuss the (a) construction of, and (b) settings of the different relay types [8.2.3]	
Learning Outcome 3	Discuss the various protection types	[8.3]
Assessment Criteria	<ol style="list-style-type: none">1. Explain the basic principles of unit protection [8.3.1]2. Explain the fundamentals of the following types of protection:<ol style="list-style-type: none">(a) Feeder protection [8.3.2.a](b) Transformer protection [8.3.2.b](c) Switchgear (bus bar) protection [8.3.2.c](d) Motor protection [8.3.2.d](e) Generator protection [8.3.2.e](f) Overhead line protection [8.3.2.f]3. Discuss procedures for the management of protection systems [8.3.3]	



ADVANCED DIPLOMA OF ELECTRICAL AND INSTRUMENTATION (E&I) ENGINEERING FOR OIL AND GAS FACILITIES

Delivery Mode

A combination of asynchronous and synchronous e-learning delivery comprising a judicious mix of interactive online web conferencing, simulation (virtual labs) software, remote online labs, online videos, Power Points, notes, reading and study materials (in pdf, html and word format) accessed through the Moodle Learning Management System (LMS).