

ROLPHTON
NUCLEAR TRAINING CENTRE
COURSE 135

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NUCLEAR TRAINING COURSE

COURSE 135

- 1 - Level
- 3 - Equipment & System Principles
- 5 - ELECTRICAL SYSTEMS

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Electrical Systems - Course 135

COURSE OBJECTIVES

NOTE: Checkout Questions are based on Objectives and Assignment Questions.

135.01-1 Introduction to Symmetrical Components and Unbalanced Currents

On completion of the Lesson the student will be able to:

1. State the relationships between positive, negative and zero phase sequence currents when the following faults occur.
 - (a) 3 phase (L-L-L)
 - (b) line-to-ground (L-G)
 - (c) line to line (L-L)

2. State the condition(s) which give:
 - (a) only positive sequence currents
 - (b) zero sequence currents
 - (c) negative sequence currents.

135.02-1 Unbalanced Currents: Their Effects

On completion of the Lesson, the students will be able to:

1. Explain the effects produced by unbalanced currents in:
 - (a) generators
 - (b) induction motors
 - (c) transformers

2. Explain how negative phase sequence currents can damage:
 - (a) generators
 - (b) motors

given the relevant data, be able to calculate the time that a generator rotor can withstand:

- (a) a line to ground fault
- (b) a line to line fault

4. Explain how star/delta transformers affect the relationships between positive and negative phase sequence currents.

135.03-1 Further Examples of Protective Relays

On completion of the Lesson the student will be able to:

1. Explain the principle of:
- (a) simple differential protection
 - (b) 'T' circuit differential protection
 - (c) differential protection with load restraint features
 - (d) differential protection with harmonic restraint features
 - (e) transformer gas relays
 - (f) transformer winding temperature detectors
 - (g) temperature measurement using change in resistance

135.04-1 Composite Electrical Protective Schemes, Part I

On completion of the Lesson the student will:

1. Be able to state the four essential features for any electrical protective scheme.
2. Given the relevant diagram(s) be able to explain the ac and dc tripping and alarm circuits associated with
- (a) busbars
 - (b) transformers

135.05-1 Composite Electrical protective Schemes, Part II

On completion of the Lesson the student will:

- 1 Given the relevant diagram(s), be able to explain the ac and dc tripping and alarm circuits associated with a turbine-generator.

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