

Nuclear Training Course 235
TIMS Ref. 23005

Electrical Systems

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NUCLEAR TRAINING COURSE 235

ELECTRICAL SYSTEMS

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ABSTRACT OF CURRENT REVISION

July 1992 ⇔

Complete revision to update course to reflect operator job family requirements. Added abstract of current revision.

- Old module 235.01-1 Transmission Equipment deleted.
- Old modules 235.02-1 and 235.02-2 complete revision, separated contents and renumbered the modules. Fuse selection reference material removed from course (not relevant to operator job function).
- Deleted objectives from old module 235.04-1 and added them to the 230.2 Electrical Equipment course objectives (230.25-3 module had the same content, but it had different objectives).
- Combined old modules 235.05-1 and 235.06-1 with minor revisions and clarifications only.

Module 0

INTRODUCTION TO THE COURSE

AUDIENCE AND PREREQUISITES

This course is for Authorized Nuclear Operators in Training (ANOITs) and Shift Supervisors in Training (SSITs) taking the conventional general part of their authorization training.

The prerequisites include:

1. For ANOITs: 484 Electrical Protection, 426 Electricity, 335 Electrical Systems,
For SSITs: 484 Electrical Protection, 426 Electricity, PI30.2 Electrical Equipment, PI35 Electrical Systems.
2. This course requires some of the information from the 230.2 Electrical Equipment course. The 230.2 course should either be taught prior to, or at the same time as this course. (The candidates must have the prerequisites for 230.2)

COURSE CONTENTS

This course covers the major electrical systems in a CANDU plant, namely the electrical distribution system and electrical protection of motors, transformers and the generator. A list of the major topics covered by the course is provided in the table of contents at the beginning of the course notes.

Good understanding and thorough technical knowledge of these systems by you, a future shift supervisor or ANO, is crucial to ensure safe, reliable and efficient operation of our stations. This course will help you achieve it by providing you with relevant technical information. Discussion of these general operational concepts and concerns in this course will prepare you for the station specific part of the authorization training during which you will learn specific indications, alarms, annunciations, actions and procedures.

Being part of the general phase of the authorization training, this course does not favour any particular CANDU station. Only the most typical equipment and operating practices that apply to most stations are discussed. A consequence of this approach is that some information presented in this course may not apply to your station.

NOTES & REFERENCES

These instances, however, are not frequent. In the few cases where different terminology is used at different stations, the most typical name is used in the course, while the other names may also be listed.

COURSE STRUCTURE

The course is made up of 9 self-contained units of instruction called “modules”, and are listed in the table of contents at the beginning of the course notes. Except for this module, the remaining 8 modules are made up of three major parts:

1. Objectives.

- The objectives are placed at the front of each module. They serve two purposes. First, they specify the contents of the module so, when you read them, you will get a pretty good idea of what you will learn from the module. Second, they define the scope of the test that you will be subjected to under closed-book conditions to demonstrate that you have attained the required knowledge by meeting or exceeding the pass mark.

At the end of some objectives or their individual parts, you will find a number enclosed in brackets. This number specifies how many points you should list, state, describe or explain in order to meet the requirements of the objective.

To help you find the instructional text which addresses each objective, the pages where this text is located are specified in the outer margin right beside each objective.

It is worth emphasizing that these objectives have been reviewed by a panel of authorized nuclear operators, shift operating supervisors and shift supervisors at Bruce A & B, Darlington and Pickering A & B to ensure that they are relevant to your future job.

2. Instructional text.

The instructional text is placed right after the objectives and contains all the information that you will need to learn in order to meet them. The text is also cross-referenced back to the objectives in the outer margin. These marks indicate the beginning of the text which covers the specified objective.

In the instructional text, new terms and key concepts are highlighted to stand out from the rest of the text and thus attract your attention. They are again reinforced in a summary at the end of the module. In the case of larger modules, several summaries are used, and will be distributed throughout the text so that it is broken into smaller parts (for easier learning).

NOTES & REFERENCES

Occasionally, the instructional text is supplemented with a footnote. Usually, these footnotes specify references to other sections of the same module, other modules or other courses or provide supporting information for the concept discussed. This will help you integrate individual modules and courses in one logical set and/or help you understand the main concepts. You are not required to remember any information included in the footnotes.

3. Assignment.

The assignment is placed at the module end and consists of several questions that address the objectives. The purpose of the assignment is to give you an opportunity to practice the acquired knowledge and to check for yourself how well you understand and remember the presented material. To determine your retention, it is important that you not refer to the text or summaries when you are working on the assignment. If you do not feel confident about your knowledge of the subject matter, it is better to study it again, or discuss your doubts with the instructor or your classmates, rather than to do the assignment prematurely.

In longer modules, instructions are placed following summary sections to guide you to specific assignment questions. This will break the module and assignment into smaller parts (for easier learning).

No answers are provided to the assignment questions. This is because all the information that you will need to answer them is given twice: first, it is presented in the instructional text and second, it is condensed in the summaries of the key concepts. Thus, you should be able to check your answer easily by referring to the relevant parts of the instructional text and summaries.

Because all the assignment questions are combined at the module end, you can easily separate them from the rest of the module if the instructor wants to mark them, or if you want to submit them for instructor's evaluation.