



PROJACS ACADEMY  
by @egis



# Electrical Diagrams, Calculation of Malfunctions and Documentation EMTP, ATP

الرسوم البيانية للمخططات الكهربائية وحساب الأعطال وتوثيقها

29 October – 02 November 2023

Cairo / Egypt

## Introduction

This Course is intended to promote the use of sound engineering principles in Electrical Diagrams. It is hoped that it will alert the electrical engineer or designer to the many problems that can be encountered in designing electrical systems

This course will provide the trainees the essential tools for the analysis, operation and design of electric power systems. The course will present the use of EMTP/ATP in the analysis of power system malfunction problems. The design of the switch gear system will be demonstrated, short circuit levels, selection of HV /LV switchboards, and relay coordination studies. Motors and their control systems will be investigated. The documentation of malfunctions will be presented as a tool of fault analysis.

## Who Should Attend?

The course is targeted to Senior Technicians and Engineers working in Electrical wiring Systems Design, Planning, Installation, Protection, Maintenance, and Performance Monitoring.

## Course Outline

### Day One

#### Elements of Electrical Diagrams

1. Utility
2. Bus
3. Transformer, 2-Winding
4. Transformer, 3- Winding
5. Cable
6. Transmission Line
7. Power Grid
8. Generator
9. Induction Machine
10. Lumped Load
11. Static Load
12. Capacitor
13. Ground Grid
14. Typical case study

### Day Two

#### Load Flow Analysis

1. Load Flow Toolbar
2. Study Case Editor
3. Display Options
4. Calculation Methods
5. Required Data
6. Output Reports
7. Typical case study

### Day Three

#### Malfunction Analysis

1. ANSI Short-Circuit
2. IEC Short-Circuit
3. Display Options
4. Calculation Methods
5. Output Reports
6. Relay coordination studies
7. Typical case study

## **Day Four**

### **Motor Starting Analysis**

1. Motor Starting Toolbar
2. Study Case Editor
3. Display Options
4. Calculation Methods
5. Output Reports
6. One-Line Diagram Displayed Results
7. Plots
8. HV /LV switchboards
9. Motor control centers
10. Typical case study

## **Day Five**

### **Generating Reports**

1. Report Generator
2. Understanding Results
3. Fault Analysis
4. Reliability Assessment
5. Data Exchange
6. Typical case study

## Training Method

- Pre-assessment
- Live group instruction
- Use of real-world examples, case studies and exercises
- Interactive participation and discussion
- Power point presentation, LCD and flip chart
- Group activities and tests
- Each participant receives a 7" Tablet containing a copy of the presentation, slides and handouts
- Post-assessment

## Program Support

This program is supported by interactive discussions, role-play, case studies and highlight the techniques available to the participants.

## Schedule

**The course agenda will be as follows:**

- |                     |                  |
|---------------------|------------------|
| • Technical Session | 08.30-10.00 am   |
| • Coffee Break      | 10.00-10.15 am   |
| • Technical Session | 10.15-12.15 noon |
| • Coffee Break      | 12.15-12.45 pm   |
| • Technical Session | 12.45-02.30 pm   |
| • Course Ends       | 02.30 pm         |

## Course Fees\*

- **3,200 USD**  
*\*VAT is Excluded If Applicable*



## المقدمة

يهدف هذا البرنامج إلى التشجيع على استخدام مبادئ الهندسة الصوتية في المخططات الكهربائية. ومن المؤمل أن ذلك سوف ينبه مهندسي الكهرباء والمصممين للعديد من المشاكل التي يمكن أن يواجهوها في تصميم الأنظمة الكهربائية.

هذا بالطبع سوف يتعرف المتدربين على الأدوات الأساسية لتحليل وتشغيل وتصميم أنظمة الطاقة الكهربائية. وسيتم التعرف على كيفية استخدام خاصية ATP / في تحليل مشاكل و أعطال نظام الطاقة و تصميم النظام، ومستويات الماس الكهربائي، واختيار توزيع الجهد العالي LV / وسيتم توثيق الأعطال كأداة للتحليل.

## الحضور

وتستهدف هذه الدورة التدريبية الفنيين والمهندسين العاملين في الأسلاك الكهربائية وأنظمة التصميم والتخطيط، والتركيب، والحماية، والصيانة، ومراقبة الأداء.