

EUROPASS DIPLOMA SUPPLEMENT

TITLE OF THE DIPLOMA

Técnico Superior en Centrales Eléctricas

TRANSLATED TITLE OF THE DIPLOMA (EN)⁽¹⁾

Higher Technician in Power Plants

(1) This translation has no legal status

DIPLOMA DESCRIPTION

The holder of this diploma will have acquired the general competence with regard to:

Managing, coordinating and controlling operation tasks, supporting the monitoring of the production process and carrying out first level maintenance in power plants and electricity substations, ensuring their optimal running from the point of view of reliability and energy efficiency and complying with established requirements on quality and safety regarding individuals, environment and installations.

Within this framework, the PROFESSIONAL MODULES and their respective LEARNING OUTCOMES acquired by the holder are listed below.

"Electrical Systems at Plants"

The holder:

- Establishes the characteristics of electrical systems, interpreting schemes and identifying their application.
- Classifies electric and magnetic materials, recognising their properties and characteristics.
- Calculates circuits in single and three-phase electrical installations used in power plants, using configuration tables and techniques.
- Distinguishes the characteristics of static and rotating electric machines, specifying their constitution and values.
- Recognises the characteristics of switchgear and control gear and electrical protections in power plants and electrical substations, describing their constitution and operation, and interpreting basic magnitudes.
- Configures secondary back-up systems (safe voltage or direct current, amongst others), distinguishing installations and interpreting schemes.
- Carries out electrical measures, using the appropriate equipment and interpreting the results obtained.
- Characterises quality parameters for electric power, applying national and international current regulations and relating them to feed and supply systems.

"Electricity Substations"

The holder:

- Identifies the characteristics of electricity substations, recognising different configurations.
- Interprets projects of substations, identifying the characteristics and the function of their parts.
- Plans assembly processes of electricity substations, recognising assembly elements and characteristics.
- Programs supply plans for the building of electricity substations, specifying their stages and organising logistics.
- Plans control and monitoring operations for assembly and commissioning, identifying specific techniques for systems and elements.
- Sets out electricity substations elements and civil works, identifying their use and characteristics.
- Plans the maintenance of electricity substations, recognising critical points and drafting the safety plan.
- Carries out first level corrective maintenance operations in electricity substations, interpreting technical documentation and applying set procedures.
- Carries out basic operations of the equipment and the instruments in electricity substations systems, applying specific techniques.

"Remote Control and Automatism"

The holder:

- Characterises instrumentation, control and measuring elements used in electric power generation installations, selecting elements and assessing parameters.

- Assembles the driving devices used in electric power generation installations, recognising their operation and using technical documentation.
- Controls electric and electronic equipment, setting and adjusting their parameters.
- Determines control electric and electronic equipment in power plants, setting and adjusting their control systems.
- Configures automated installations to be applied in processes, recognising elements and adjusting parameters.
- Characterises transmission and communication systems for processes remote control, recognising their components and signals.
- Uses automatic monitoring applications with SCADA software, simulating controls and recognising system adjustments.
- Verifies access surveillance and control networks, operating and setting up elements and systems.

“Electric Risk Prevention”

The holder:

- Identifies the physiological effects of electric current, depending on the degree of exposure to it.
- Assesses the risks of working in the vicinity of voltage, applying set procedures.
- Applies the safety protocol to remove voltage from an installation and restoring it afterwards, following the set procedure.
- Classifies safety and protection equipment used to prevent an electrical risk, identifying its characteristics and use.
- Applies the safety protocol when working in the vicinity of voltage, simulating the safe action.
- Tests action techniques in case of high-voltage related emergencies, applying safety and first aid procedures.

"Electric Power Production Plants"

The holder:

- Identifies the different types of electric power production plants, analysing their characteristics and overall operation.
- Calculates parameters of circuits and thermal installations in thermal power plants, applying heat production and transmission fundamentals.
- Identifies equipment and parts in thermal and fluid processes, analysing their operation in power plants.
- Identifies the specific systems and parts used in hydroelectric power plants, selecting their elements and recognising their function.
- Distinguishes specific systems and parts of conventional thermal power plants, identifying their parts and assessing their parameters.
- Distinguishes specific systems and parts of combined cycle plant, recognising their parts and identifying their operation.
- Specifies electric power generation installations with internal combustion engines, relating them to other systems and distinguishing their elements.

“Operation in Power Plants”

The holder:

- Characterises the management of the operation in power plants, identifying processes and defining manoeuvres.
- Differentiates the parameters of stable regime power plants, assessing and establishing optimal operation ranges.
- Recognises operation manoeuvres (starting and stop, amongst others) in conventional thermal, cogeneration or hydropower plants, applying standard manoeuvres and operations to each type of plant.
- Characterises the behaviour of a power plant in case of abnormal operation situations occurs, carrying out verifications and determining specific action procedures.
- Carries out manoeuvre and dysfunction-monitoring operations in a power plant, using simulating equipment or systems.
- Determines the manoeuvres to be performed to temporary disqualify or discharge the equipment in plants, following the procedures established by the equipment and systems.
- Recognises the actions to be performed in case of emergencies or accidents, applying procedures and devices.

“Power Plants Maintenance”

The holder:

- Plans equipment installation and maintenance in power plants, deciding the stages and establishing resources.

- Carries out the maintenance of the equipment and electric installations, using instrumentation and carrying out tests and verifications.
- Carries out the maintenance of the mechanical equipment, defining procedures and carrying out measures and tests.
- Defines the necessary maintenance tasks, recognising the conditions of the job position and applying regulations.
- Prepares the technical documentation related to maintenance, according to the using regulations and procedures established in the maintenance plan.
- Plans the actions for a major shutdown in a power plant, observing the stages and following the instructions from the electricity network managers.
- Complies with the rules on labour risk prevention and environmental protection, identifying the associated risks and measures and the equipment to prevent them.

"Human Resources Coordination"

The holder:

- Recognises the team's organisation and job positions, classifying and assessing tasks and functions.
- Prepares specific training plans specific to the plant, assessing and recognising the positions and their workload.
- Applies communication techniques in industrial processes (operation events, staff reports and work instructions), defining processes and identifying the addressees.
- Applies staff management techniques and coordinates the work of the human resources under his/her responsibility, applying problem solving techniques.
- Applies quality management processes to different services (maintenance, operation, safety and environment, amongst others), taking into account integrate management systems.
- Prepares the monitoring plan to be applied to outsourced companies, carrying out inspections and defining tests.

"Project on Power Plants"

The holder:

- Identifies the needs of the production, relating such needs to similar projects which may fulfil them.
- Designs projects related to the competences referred in the diploma, including and developing its various stages.
- Plans the implementation of the project, determining the intervention plan and all related documents.
- Defines the procedures for monitoring and controlling the implementation of the project, justifying the selection of the variables and the instruments used.

"Professional Training and Guidance"

The holder:

- Selects job opportunities, identifying the different possibilities of labour integration, and the alternatives of lifelong learning.
- Applies teamwork strategies, assessing their effectiveness and efficiency on the achievement of the company's goals.
- Exercises rights and complies with the duties derived from labour relationships, recognising them in the different job contracts.
- Determines the protective action of the Spanish Health Service in view of the different covered eventualities, identifying the different types of assistance.
- Assesses the risks derived from his/her activity, analysing the job conditions and the risk factors present in his/her labour setting.
- Participates in the development of a risk prevention plan for a small enterprise, identifying the responsibilities of all the agents involved.
- Applies protection and prevention measures, analysing the risk situations in the labour setting of the higher technician in power plants

"Business and Entrepreneurial Initiative"

The holder:

- Recognises the skills related to entrepreneurial initiative, analysing the requirements derived from job positions and business activities.
- Defines the opportunity of creating a small enterprise, assessing the impact on the sphere of action and incorporating ethic values.
- Carries out the activities for the setting-up and implementation of a company, choosing its legal structure and identifying the associated legal obligations.

- Carries out basic administrative and financial management activities of an SME, identifying the main accounting and tax obligations and filling in documentation.

“On the Job Training”

The holder:

- Identifies the company’s structure and organization relating both to electric power production and marketing.
- Applies labour and ethic habits in his/her professional activity according to the characteristics of the job position and the procedures established by the company.
- Analyses the characteristics of power plants on the basis of a draft or given conditions, applying relevant regulations.
- Plans the assembly of electricity substations, establishing stages and allocating the resources on the basis of the project’s technical documentation.
- Monitors operations in power plants, cooperating in their processes and observing safety and quality protocols set by the company.
- Carries out the setting-up or commissioning of power plants and electricity substations, monitoring and cooperating with the implementation, following set procedures.
- Controls first level maintenance operations in power plants and/or electricity substations, cooperating in their implementation, verifying that the established objectives are fulfilled and optimising the available resources.
- Monitors the repair of breakdowns and dysfunctions in equipment and installations, cooperating in their implementation and verifying that corrective maintenance techniques and procedures are applied.

RANGE OF OCCUPATIONS ACESIBLE TO THE HOLDER OF THE DIPLOMA

The Higher Technician in Power Plants works in companies related to electricity generation by means of thermal power plants (coal, gas, diesel, biomass and other fuels, comprising solar thermal electricity generation installations and cogeneration installations) and hydro power plants. Besides, he/she can work in companies having high voltage installations, as well as in industrial companies which perform assembly and maintenance works at power plants and electricity substations, reporting functionally to a superior and being able to have his/her own staff.

The most relevant occupations or jobs are the following:

- Operation technical assistant at thermal power stations.
- Technician in charge of operation and maintenance of cogeneration systems.
- Plant operator at thermal power stations.
- Control operator at thermal power stations.
- Operation and maintenance technician at hydro power plants.
- Control centre operator at hydro power plants.
- Plant operator at hydro power plants.
- Electricity substations assembly manager.
- Maintenance manager at electricity substations.
- Operator-maintainer at electricity substations.

AWARD, ACCREDITATION AND LEVEL OF THE DIPLOMA

Name of the body awarding the diploma on behalf of the King of Spain: Spanish Ministry of Education or the different Autonomous Communities according to their areas of competence. The title has academic and professional validity throughout Spain.

Official duration of the education/ training leading to the diploma: 2000 hours.

Level of the diploma (national or international)

- NATIONAL: Non-University Higher Education
- INTERNATIONAL:
 - Level 5b of the International Standard Classification of Education (ISCED5b)
 - Level 5 of the European Qualifications Framework (EQF5).

Entry requirements: Holding the Certificate in Post-Compulsory Secondary Education (Bachillerato) or holding the corresponding access test.

Access to next level of education/training: This diploma provides access to University studies

Legal basis: Basic regulation according to which the diploma is established:

- Minimum teaching requirements established by the State: Royal Decree 258/2011, of 28 February, according to which the diploma of Higher Technician in Power Plants and its corresponding minimum teaching requirements are established.

Explanatory note: This document is designed to provide additional information about the specified diploma and does not have any legal status in itself.

COURSE STRUCTURE OF THE OFFICIALLY RECOGNISED DIPLOMA

PROFESSIONAL MODULES IN THE DIPLOMA ROYAL DECREE	CREDITS ECTS
Electrical Systems at Plants	10
Electricity Substations	11
Remote Control and Automatism	11
Electric Risk Prevention	4
Electric Power Production Plants	15
Operation at Power Plants	15
Power Plants Maintenance	14
Human Resources Coordination	4
Project on Power Plants	5
Professional Training and Guidance	5
Business and Entrepreneurial Initiative	4
On the Job Training	22
	TOTAL CREDITS
	120
OFFICIAL DURATION (HOURS)	2000

* The minimum teaching requirements shown in the table above comprise 55% official credit points valid throughout Spain. The remaining 45% corresponds to each Autonomous Community and can be described in the **Annex I** of this supplement.

INFORMATION ON THE EDUCATION SYSTEM

