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D2.2

Model for Skills Intelligence Skills Mapping

Occupations in the Low voltage DC workforce

ISSO

Occupation:	Electrical engineer	EQF Level:	7	ULOS (Units of Learning Outcomes)		
Tasks and responsibilities:		**Level of competence:**		**Knowledge**	**Skills**	**Attitude**
(a) The electrical engineer advises on, designs *and set up low voltage DC, microgrids,* power stations and systems which generate, transmit, and distribute electrical power.		4,5		The electrical engineer can advise[4] on power stations and systems which generate, transmit and distribute electrical power. *The electrical engineer can explain and interpret a solid understanding of low voltage DC, electrical grid and systems.*	The electrical engineer can design[5] power stations and systems which generate, transmit and distribute electrical power. *The electrical engineer can set up low voltage DC and microgrid in buildings or the grid.*	
(b) The electrical engineer supervises, controls, and monitors the operation of electrical generation, transmission, and distribution systems.		2, 3		The electrical engineer can monitor[2] the operation of electrical generation, transmission and distribution systems	The electrical engineer can supervise[3] and manage[3] the operation of electrical generation, transmission and distribution systems	
(c) The electrical engineer advises on and designs systems for *storage systems*, electrical traction, and other equipment, or electrical domestic appliances.		4,5		The electrical engineer can advise[4] on systems for electrical motors, electrical traction and other equipment, or electrical domestic appliances. *The electrical engineer can explain the concept of energy generation, transmission, distribution, storage systems, and consumption.*	The electrical engineer can design[5] systems for electrical motors, electrical traction and other equipment, or electrical domestic appliances	
(d) The electrical engineer specifies *the design,* the electrical installation and application in industrial and other buildings and objects, *while inspects the work.*		3		The electrical engineer can specify[3] *the design,* electrical installation and application in industrial and other buildings and objects	*The electrical engineer can assess electrical installations and applications in industrial and other buildings and objects.*	
(e) The electrical engineer establishes the *maintenance methods,* control standards and procedures to monitor performance and safety of electrical generating and distribution systems, motors, and equipment.		5		The electrical engineer can *create the maintenance methods,* control standards and procedures to monitor performance and safety of electrical generating and distribution systems, motors and equipment		
(f) The electrical engineer determines manufacturing methods for electrical systems, as well as maintenance and repair of existing electrical systems, motors, and equipment.		4		The electrical engineer can establish[4] manufacturing methods for electrical systems, as well as maintenance and repair of existing electrical systems, motors and equipment		

(g)	The electrical engineer **connects and adjusts** *digital communication protocols, for seamless operation of DC power networks*, ensuring interoperability between electrical components and control systems. They also use simulations to optimize and test LVDC network designs.	3	The electrical engineer **specifies** *the characteristics and functions of digital communication protocols in DC power networks* to ensure interoperability between electrical components and control systems.	The electrical engineer **connects and adjusts** *communication protocols in DC power networks* to enable interoperability between electrical components and control systems. The electrical engineer **conducts** *simulation and modeling techniques* to measure the behavior of LVDC networks, guide design choices, and explore system resilience under varying loads and operational conditions.	The electrical engineer **promotes** *compliance with communication protocol standards* to guarantee seamless operation of DC power networks.
(h)	The electrical engineer **installs and connects** *software-driven electrical systems for real-time monitoring of low voltage DC systems*, ensuring seamless operation of power electronics, energy storage systems, and smart grid infrastructure through embedded programming and system integration.	3	The electrical engineer **specifies** *key software-driven electrical systems used for real-time monitoring of low voltage DC systems* to ensure seamless operation of systems, through embedded programming and system integration	The electrical engineer **installs and connects** *software-driven electrical systems used for real-time monitoring of low voltage DC systems* to ensure seamless operation of power electronics, energy storage systems, and smart grid infrastructure through embedded programming and system integration.	The electrical engineer **promotes** *continuous improvement and technological innovation in software-driven electrical system monitoring* to ensure seamless operation of systems, through embedded programming and system integration.
(i)	The electrical engineer **designs and integrates** *low voltage DC systems, including renewable energy systems,* ensuring compatibility with AC systems and optimizing efficiency.	5	The electrical engineer **explains** *the principles of low voltage DC systems, including renewable energy systems*, and their integration with AC systems to optimize efficiency.	The electrical engineer **designs and integrates** *low voltage DC systems*, selecting appropriate components for renewable energy systems.	The electrical engineer **follows** *industry best practices and standards* when integrating low voltage DC systems with AC networks.
(j)	The electrical engineer **designs** *advanced control and protection strategies for low voltage DC systems*, addressing issues such as fault detection, arc flash safety, and fault current protection, in compliance with industry standards.	5	The electrical engineer **conceptualizes** *advanced control and protection strategies for low voltage DC systems*, including fault detection, arc flash safety, and fault current protection.	The electrical engineer **designs** *advanced control and protection strategies*, configuring systems to detect and mitigate faults in compliance with industry standards.	The electrical engineer **ensures** *adherence to safety regulations and best practices* in designing protection strategies for low voltage DC systems.
(k)	The electrical engineer **ensures** *system-level integration of Low Voltage DC components, including power conversion, automation, and industrial control systems*, optimizing performance and efficiency for industrial and commercial applications.	4	The electrical engineer **explains** *the principles of system-level integration of Low Voltage DC components*, including power conversion, automation, and industrial control systems to optimize system performance.	The electrical engineer **applies** *techniques to optimize the performance and efficiency* of industrial and commercial LVDC applications.	The electrical engineer **demonstrates** *a commitment to ensuring seamless integration of LVDC components* for enhanced system performance.
(l)	The electrical engineer **ensures** *the design of low voltage DC systems, selecting appropriate components, and performing detailed calculations* to ensure the correct sizing of cables, converters, and protection devices.	4	The electrical engineer **evaluates and specifies** *the correct sizing of cables, converters, and protection devices in low voltage DC systems* to support efficiency and reliability.	The electrical engineer **assesses** *appropriate components and revises system design* by updating detailed calculations.	The electrical engineer **combines** *precision and analytical thinking in optimizing low voltage DC system design*.
(m)	The electrical engineer **oversees** *the commissioning process for low voltage DC systems*, ensuring that all systems are properly tested, calibrated, and compliant with regulations before going live. They also troubleshoot issues related to DC systems' performance and integration	4	The electrical engineer **explains** *the commissioning process of low voltage DC systems*, including testing, calibration, and regulatory compliance.	The electrical engineer **oversees** *system commissioning, testing, and troubleshooting* to ensure the correct operation of low voltage DC systems.	The electrical engineer **takes** *responsibility for ensuring low voltage DC systems meet performance and compliance requirements* before operation.

(n)	The electrical engineer **ensures** *all low voltage DC systems are designed and installed according to applicable electrical safety codes, regulations (e.g., IEC, NEC), and industry best practices,* with a particular focus on DC-specific concerns.	4	The electrical engineer **evaluates** *electrical safety codes, regulations (e.g., IEC, NEC), and industry best practices* relevant to low voltage DC systems.	The electrical engineer **verifies** *the compliance of low voltage DC systems* with applicable safety standards.	The electrical engineer **promotes** *a safety-conscious approach* when designing and installing low voltage DC systems.
(o)	The electrical engineer **prepares** *detailed estimates of quantities and costs of materials*, according to the specifications given.	4	The electrical engineer **assess** *detailed estimates of quantities and costs of materials and labor required* for manufacture and installation of LVCD.	The electrical engineer **calculates** *the quantities and costs of LVDC materials and labor* according to project specifications.	The electrical engineer **ensures** *accuracy and transparency in cost estimation* to support informed decision-making.
(p)	The electrical engineer **coordinates** *with IT and cybersecurity specialists to implement secure system architectures*, protecting LVDC networks from cyber threats, unauthorized access, and data breaches.	3	The electrical engineer **analyses** *key cybersecurity risks and protective measures* for LVDC networks.	The electrical engineer **coordinates** *with IT and cybersecurity specialists to constructs secure system architectures* that safeguard LVDC networks.	The electrical engineer **promotes** *cybersecurity best practices to limit threats and ensure data protection* in LVDC networks.
(q)	The electrical engineer **evaluates** *project requirements and determines the feasibility of implementing LVDC systems* based on factors such as energy sources, loads, and regulatory constraints.	4	The electrical engineer **explains** *the criteria for evaluating the feasibility of LVDC system implementation* based on energy sources, loads, and regulations.	The electrical engineer **assesses** *project requirements and determines the suitability of LVDC systems* for specific applications.	The electrical engineer **demonstrates** *analytical thinking in evaluating project constraints and feasibility* for LVDC systems.

Occupation:	**Electrical engineering technician**	**EQF Level:**	**5**	**ULOS (Units of Learning Outcomes)**		
Tasks and responsibilities:		**Level of competence:**		**Knowledge**	**Skills**	**Attitude**
a) The electrical engineering technician *supply* technical assistance in research on and development of electrical equipment and facilities or tests prototypes		2			The electrical engineering technician can *supply* technical assistance in research on and development of electrical equipment and facilities, or testing prototypes	
b) The electrical engineering technician designs and prepares blueprints of electrical installations and circuitry according to the specifications given and *the complexity of the installation.*		5,3			The electrical engineering technician can design[5] blueprints of electrical installations and circuitry according to the specifications given *and the complexity of the installation.*	The electrical engineering technician can prepare[3] blueprints of electrical installations and circuitry according to the specifications given *and the complexity of the installation.*
c) The electrical engineering technician prepares detailed estimates of quantities and costs of materials and labor required for manufacture and installation, according to the specifications given		3				The electrical engineering technician can prepare[3] detailed estimates of quantities and costs of materials and labour required for manufacture and installation, according to the specifications given
d) The electrical engineering technician monitors technical aspects of the manufacture, installation, utilization, maintenance, and repair of electrical systems and equipment to ensure satisfactory performance and compliance with specifications, regulations, *and level of detail depending of the situation.*		2		The electrical engineering technician can monitor[2] technical aspects of the manufacture, installation, utilization, maintenance and repair of electrical systems and equipment to ensure satisfactory performance and compliance with specifications and regulations, *and level of detail depending of the situation.*		
e) The electrical engineering technician plans installation methods, checks completed installations for safety and controls, or undertakes the initial running of new electrical equipment or systems.		5		The electrical engineering technician can plan[5] installation methods, checking completed installations for safety and controls or undertaking the initial running of the new electrical equipment or systems		
f) The electrical engineering technician *make sure being done assembles, installs, tests, calibrates, modifies, and repairs* electrical equipment and installations to conform with regulations and safety requirements.		2,4,3			The electrical engineering technician can assemble[2] ,install[3] ,test[2] ,calibrate[3] ,and repair[2] electrical equipment and installations to conform with regulations and safety requirements	The electrical engineering technician can modify[4] electrical equipment and installations to conform with regulations and safety requirements
g) The electrical engineering technician **participates** *in integrating communication into DC systems,* ensuring smooth operation of real-time control, monitoring, and optimization of system performance.		3		The electrical engineering technician **explains** *the role of communication protocols in real-time control, monitoring, and optimization* of low voltage DC systems.	The electrical engineering technician **participates** *in connecting and calibrating communication protocols in low voltage DC systems* to ensure seamless operation.	The electrical engineering technician **cooperates** *with engineers and technical teams to ensure effective communication protocols* between components of Low voltage DC systems.

h)	The electrical engineering technician **installs and commissions** *low voltage DC systems*, ensuring all connections, protections, safety systems, and operational settings are properly implemented.	3	The electrical engineering technician **explains** *the installation and commissioning process of low voltage DC systems*, including the implementation of operational settings.	The electrical engineering technician **installs and commissions** *low voltage DC systems,* ensuring proper implementation of connections, protections, safety systems, and system settings.	The electrical engineering technician **follows** *safety procedures and best practices* when installing and commissioning low voltage DC systems, including the accurate implementation of system settings
i)	The electrical engineering technician **conducts** *rigorous factory and on-site testing of low voltage DC circuits*, ensuring all components (e.g., converters, chargers) are functioning according to specifications. They also troubleshoot faults and failures, ensuring that the system meets safety and operational standards.	3	The electrical engineering technician **identifies** *factory and on-site testing procedures for low voltage DC circuits* to verify the correct operation of components such as converters and chargers.	The electrical engineering technician **conducts** *factory and on-site testing and troubleshooting of low voltage DC circuits*, diagnosing faults and ensuring compliance with safety and operational standards.	The electrical engineering technician **ensures** *accuracy and thoroughness* in factory and on-site testing and troubleshooting low voltage DC circuits.
j)	The electrical engineering technician **performs** *preventive maintenance, diagnostics*, and **repair** *on low voltage DC systems and components*, to maintain optimal performance and is able to effectively communicate preventive maintenance.	4	The electrical engineering technician **describes and communicates** *preventive maintenance procedures and diagnostic methods* for low voltage DC systems and components.	The electrical engineering technician **performs** *preventive maintenance, diagnoses faults, and repairs low voltage DC systems to maintain optimal performance*, while also communicating preventive maintenance.	The electrical engineering technician **takes** *responsibility for maintaining system reliability and minimizing downtime* through preventive maintenance and is able to effectively communicate preventive maintenance.
k)	The electrical engineering technician **ensures** *that all low voltage DC systems are installed, maintained, and operated* according to established safety protocols, including measures to prevent arc flash incidents, electrical shocks, and fire hazards.	4	The electrical engineering technician **interprets** *safety protocols and regulations for low voltage DC systems,* including measures to prevent arc flash incidents, electrical shocks, and fire hazards.	The electrical engineering technician **verifies** *compliance with safety protocols* when installing, maintaining, and operating low voltage DC systems.	The electrical engineering technician **promotes** *a safety-first culture by adhering to safety protocols and educating team members on best practices*, when installing, maintaining, and operating low voltage DC systems.
l)	The electrical engineering technician **provides** *recommendations on selecting appropriate LVDC components*, including breakers, fuses, relays, and switching devices, ensuring compatibility with project specifications.	1	The electrical engineering technician **identifies** *the functions and specifications of LVDC components* such as breakers, fuses, relays, and switching devices.	The electrical engineering technician **selects** *LVDC components that meet project specifications* and ensure system compatibility.	The electrical engineering technician **ensures** *due diligence in recommending LVDC components* for safe and efficient system operation.
m)	The electrical engineering technician, in coordination with the engineer **updates** *existing low voltage DC systems*, modifying installations to improve performance, expand capacity, or integrate new components such as additional battery storage or new renewable energy sources.	4	The electrical engineering technician **identifies** *methods for updating low voltage DC systems* in coordination with the engineer, including modifying installations to improve performance, expand capacity, and integrate new components.	The electrical engineering technician, in coordination with the engineer, **updates** *low voltage DC systems* by modifying installations, integrating additional battery storage, and incorporating new renewable energy sources.	The electrical engineering technician **adopts** *a proactive approach to improve low voltage DC systems performance*, ensuring future scalability.