

SolTec

Towards a European Qualification for Service and Maintenance in the Solar Energy-Sector 503219-Leonardo-2009-LLP -2009-2181

General knowledge

- Factual and theoretical knowledge of/ about
 - o solar-energy
 - electric systems, on-grid-connection, off-grid-system and variants of electric storage
- Knowledge of/ about
 - facts and principles of technical drawings
 - the practical steps for the installation
 - environmental and safety protection
 - mathematics
 - PV installation plans
- Basic knowledge of
 - structural mechanics
 - electronics, automation and mechanics
 - physics
 - Astronomy

Skills

- To read and interpret the work plans of technical projects
- To always take into account health and safety measures

Competences

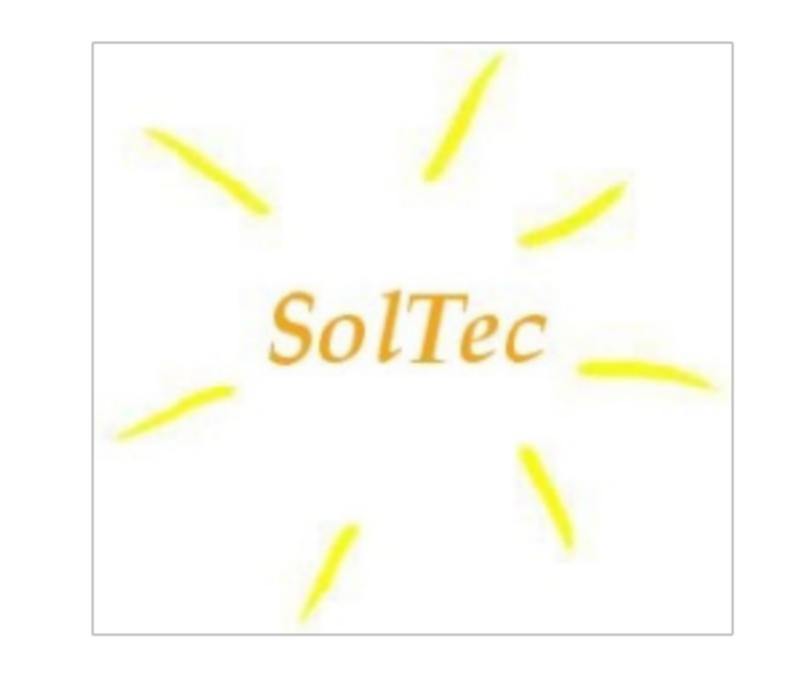
- Analytic competences
- To plan work processes and supervise other persons
- To be aware of the need for precise and accurate work
- Good Communication with other workers (and for small projects with the clients)
- Competences in Self-Management and Self-organisation
- To act reliable regarding the safety and environmental rules











I Installation

Competence Unit Assignments	Tasks Sub-Assignments	Knowledge	Skills 	Competences	NQF	EQF
		Knowledge of/ about	To be able to	To be competent at		
Planning						
Analyses of needs and context	- To assess the needs of the users and determine the solar potential of an area	 Knowledge about optimisation of energy consumption Knowledge about the relevant criteria for needs analyses 	 to be able to analyze and calculate the monthly and annual irradiation considering orientation, shadowing, etc. to be able to classify, quantify, analyze and optimize the energy needs of different types of users to be able to analyze the needed connection to the grid or storage system 	 being aware of the importance of calculations and forecasts being competent at advising the customers according to their real needs 		
Planning of the PV-concept according to the needs analyses	 To define the characteristics of the PV-installation according to the user needs and the solar potential of an area To select the equipment and necessary elements with their specifications 	characteristic of the equipment and technical elements of the PV-system - Knowledge about to-	(possibly together with the designer) the best configuration of the PV-system	narrow collaboration with the designers		4











Competence Unit	Tasks	Knowledge	Skills	Competences	NQF	EQF
Assignments	Sub-Assignments					
		Knowledge of/ about	To be able to	To be competent at		
			system	signers) - Seeing the linkages in a system and thinking and acting in a holistic		
Legal, formal and technical obligations	 To prepare the documents for the legal authorizations and possible subsidies To apply for grid connection (if necessary) 	islation on PV-system-		way		3
Planning of the execution (for small installations)	 To plan the work stages for the installation To develop detailed work and time tables for the installation To plan a monitoring strategy for the installation process (review) To plan the logistic process 	ject and process management - Knowledge about environment and work safety - Knowledge about different delivery regulations, storage possibili-	perts/ workers from the	 Thinking abstractive and planning proactive Taking responsibility for the planning and the supervision of the involved experts/workers Taking decisions concerning the procurement and delivery process 		4











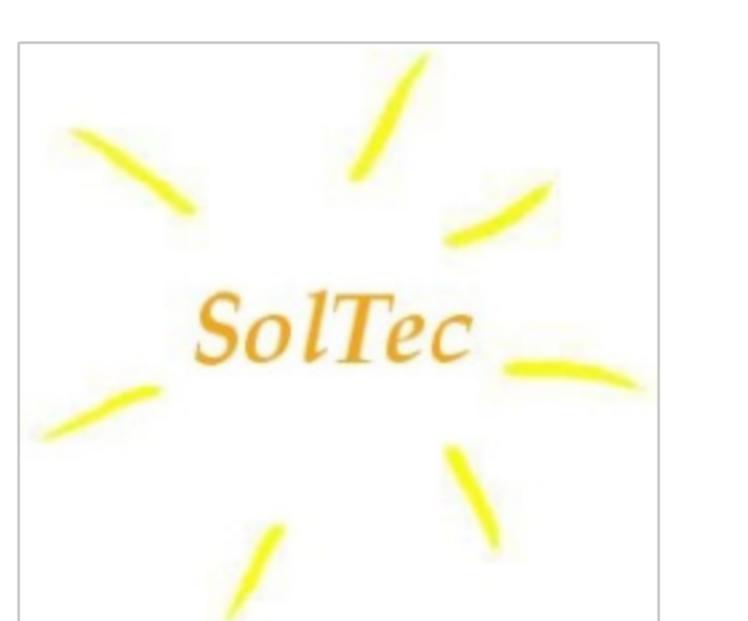
Competence Unit Assignments	Tasks Sub-Assignments	Knowledge	Skills	Competences	NQF	EQF
		Knowledge of/ about	To be able to - To select material, tools, suppliers and other technical resources and order them	To be competent at		
Safety and Environmental Protection	 To create a health and safety plan for the installation process To accomplish the safety measures according to the plan To control the implementation of the health and safety plan To define the necessary environmental protection measures 	safety regulations - Knowledge about individual work safety equipment - Knowledge about environmental protection legislation and concepts (e. g. recycling	minimize the consequences of possible accidents - To know how to undertake the risk assessment - To know how to act in	 Being responsible that the work is carried out according to the safety plans Making the team observe the safety rules 		3-4











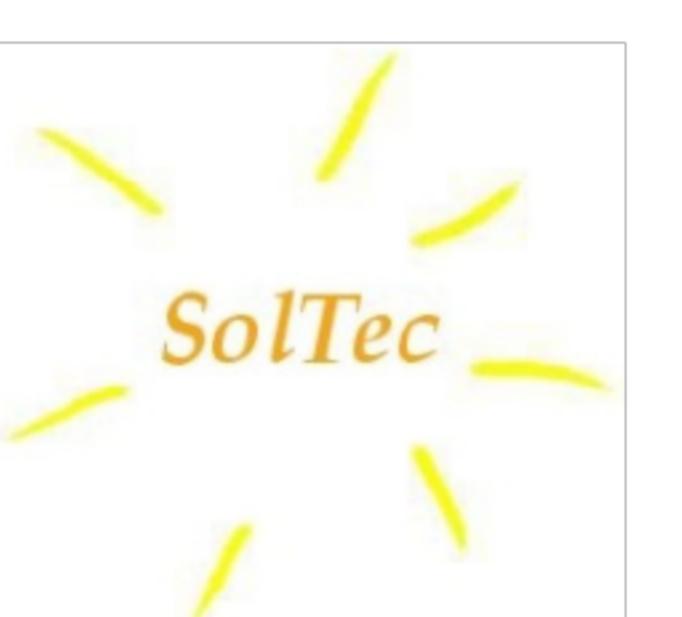
Competence Unit Assignments	Tasks Sub-Assignments	Knowledge Knowledge of/ about	Skills To be able to	Competences To be competent at	NQF	EQF
		Killowieuge Oi/ about	prevent and minimize risks	TO DE COMPETENT AL		
Execution						
Preparation of the installation	 To analyze the installation plan and define the installation process To prepare and organize the installation 	ferent materials, tools and equipment used	- To identify the equip- ment needed, also considering the safety rules and the physical conditions being re-	is prepared - Being responsible to promote a good collaboration process with		4
Practical Execution	 To install the system with regard to all safety rules To commission and operate the test 	•	techniques to install all the equipment according to the state of the art To be able to choose and use the personal	 Being self-responsible for the own physical and psychological conditions for undertaking the practical execution Maintaining a high quality and helping colleagues to meet the standards 		4











Competence Unit Assignments	Tasks Sub-Assignments	Knowledge	Skills	Competences	NQF	EQF
		Knowledge of/ about	To be able to	To be competent at		
		tems	prevent and minimize risks - To be able to selfevaluate the quality - To assess the efficiency and test the system	- Working honesty and accuracy and to declare any mistakes and unexpected problems which can compromise the functionality and efficiency of the system		
Documentation	- To develop the operational and maintenance manual	 Knowledge about the minimum requirements for the manual (all documentations of installed components, report of the first commission and test, users guide) Knowledge about technical standards on PV-components 	documentation and technical standards	 Having the sensibility to focus the important points for the manual Working honesty and accuracy in the documentation process Writing in an understandable and correct way 		3











II Service and Maintenance

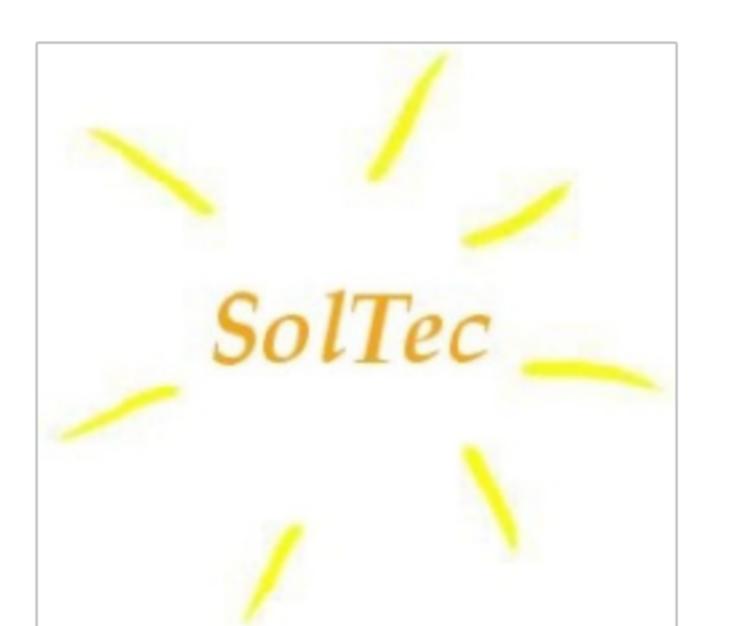
activity e	To identify tools and equipment required for maintaining and trouble-shooting To identify maintenance needs on site	 Knowledge about measurement equipment and working tools Knowledge about typical maintenance needs and activities related to the different types of installation Knowledge on work planning and organisation of maintenance work 	periodical maintenance plan for that kind of plant and select the typical needed equip- ments and tools - To analyse the techni- cal documentation of PV installations, de- termining the activities	for the planning - Seeing the linkages in a system and think and act in a holistic way	4
activity e	equipment required for maintaining and trouble-shooting To identify mainte-	measurement equipment and working tools - Knowledge about typical maintenance needs and activities related to the different types of installation - Knowledge on work planning and organisation of maintenance	periodical maintenance plan for that kind of plant and select the typical needed equip- ments and tools - To analyse the techni- cal documentation of PV installations, de- termining the activities and resources, to plan the maintenance proc-	for the planning - Seeing the linkages in a system and think and act in a holistic way	4
			 To read and understand the operational and maintenance manual made by the installer To analyse the past production report and fault reports To know about possible ways to increase the performance of the PV-system 		
mental Protection with	e in the installation, th special attention to ectrical hazards		- To use the mainte-	- Having the ability to	











Competence Unit	Tasks	Knowledge	Skills	Competences	NQF	EQF
Assignments	Sub-Assignments					
	procedures - To perform diagnostic procedures and interpret results - To identify performance and safety issues and implement corrective measures - Test the systems after the maintenance measures	of undertaking tests and diagnoses	techniques of the PV- system To use the appropriate measurement tech- niques To make the tests of the performance of the system To analyse the performance and define the problems of the PV-system	and taking the right measures (information, communication, influence-taking, etc.) for a successful maintenance process - Having a "problem-solving-attitude"		
Maintenance documenta- tion	 To demonstrate complete functionality and performance of the system To document of work process 	forms of documenta- tion - Knowledge about	technical report taking into account all imple-	mentation process - Writing in an under- standable and correct way		3











Competence Unit	Tasks	Knowledge	Skills	Competences	NQF	EQF
Assignments	Sub-Assignments					
Repairing						
Planning of repair activities	- To diagnose the anomalies in the PV-system - To organise the process of repairing	 Knowledge about manufacturer warranties Knowledge about ways of undertaking tests and diagnoses Knowledge about error records Knowledge about quality standards required for the executed products Knowledge about new technologies and their compatibility with old technologies Knowledge about safety and environmental rules (e. g. systems of recycling old components) Knowledge on ICT, communication protocols and monitoring systems 	"old" or not complete documents and find alternative ways of assessment To check manufacturer warranty details before exchange of components To read and understand the production and error records and select a proper troubleshooting procedures To calculate the costs adequately To select and involve the eventually needed experts To negotiate and order new components, taking into account the	ity to regain and keep the performance of the system in the future - Taking the responsibil- ity of use the appropri- ate repair techniques in accordance with all environmental and safety procedures - Taking the responsibil- ity for the supervision of the work carried out by other people in-		4











Competence Unit	Tasks	Knowledge	Skills	Competences	NQF	EQF
Safety and Environ- mental Protection	See in the installation, with special attention to electrical hazards		appropriate methods and other equipment to prevent and minimize risks			
Execution and verification		pair techniques of PV-	the damaged equipment To use (computerassisted) tools and equipment To be able to choose and use the personal safety and environmental equipment and appropriate methods	in accordance with all environmental and safety procedures		4











Competence Unit Assignments	Tasks Sub-Assignments	Knowledge	Skills	Competences	NQF	EQF
Documentation	- To document the repair	 Knowledge about the forms of documentation Knowledge about documentation procedures and tools 	technical report taking into account all imple-	accuracy in the docu- mentation process - Writing in an under- standable, structured and correct way		3