



4

Possible units of a mobility pass



Lifelong Learning Programme

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Introduction

As remarked in the report on WP3, is it preferable but not really realistic that a learner acquires the LO of a whole unit in the host institution due to the short time of standard mobility periods. So the contents of the units (cp. WP2) were subsumed to mobility units (MU) which are integrated parts of the respective unit.

The meetings with the stakeholders related to this work package were focusing on 2 functions:

- 1.) The structure of the mobility passes
- 2.) A meaningful denomination of the MU

In summary led the remarks and additions to the following conclusions:

- The MU must be seen as single steps within the context of the whole unit of LO; there should be no formal crediting of the isolated MU.
- It is especially but not only in the field of maintenance not possible to list all potential MU, there should be space to add additional MU.
- Learning must be seen as a development of competence, single units (MU or LU) are not necessarily learnt from “0 to 100”.
- To achieve a sustainable learning outcome single MU must be performed several times, especially central skills like “drilling” or “rivetting” need several periods of training before they can be performed according to the sectoral quality demands.
- The relative relevance as well as the concrete LO are depending on the type of aircraft.
- The additional work load for teachers/trainers should be as small as possible.
- The matrices should be reduced as far as possible.
- Performing a MU independently is a necessary but not sufficient precondition for the awarding of a whole unit of learning outcomes.

These results were considered in the development of the mobility passes by

- describing only the headline of the unit and the denomination of the MU in the passes and only attaching the holistic description of the unit,
- reducing the amount of space per matrix to 2 pages, only 1 if possible,
- following the skills (cp. WP2) for the denomination of the single MU and clarifying by the attached unit and by listing the KSC for chosen MU that the denomination is meant holistic,
- adding the row “remarks” to open spaces for additional aspects, f. e. the type of airplane or the operated automated system,

- opening the possibility to document the reached level of autonomy for each learner on a 4-level, performance-oriented frame,
- establishing the possibility to add additional MU to each unit,
- clarifying that the last row (performing the MU above in context) **cannot** be assessed in a qualitative-performance-oriented manner.

The recognition of LO with the proposed instruments follows a 2-step approach. The teachers or trainers who are responsible for the single MU (independent of the place where the student is learning) are assessing the level of autonomy reached by the candidate on the 4 levels of our scheme. To inform other responsibilities about the concrete environment additional information like the place and the date is provided. So it might become obvious, that the only learning activities of a candidate related to a chosen MU were month ago and need refreshment. Functional represent the MU in our approach a kind of transcript of learning outcomes, but there is no simple additive handling foreseen: The use of the matrices as a kind of route card (in the meaning of: all signatures collected => LO of the whole unit acquired) is not possible. When the respective responsible teachers or trainers (independent of the place where the student is learning) judge that a candidate has acquired most of the relevant MU in a sufficient manner, than is it possible to acquire the whole unit. As the handling of the passes the assessment too should not lead to a lot of additional work for the teachers respective trainers. The assessment follows the guidelines developed by SEMTA for the English units: The candidate should work autonomously on a work order that is characteristic for the chosen unit. The processes as well as the product are part of the assessment. An example for unit 14 is the passing of bunched circuits by the candidate by combing the MU. Do the local trainers/teachers confirm that the LO were reached than this is certified. This certification – with respect to national regulations – can be used in fragmented systems like the British one as approval of the LO – f. e. units 12 & 13 correspond to SEMTA-Unit 87 „Producing Aircraft Electrical Sub-Assemblies, Cableforms and Looms“. In systems, which do not refer to the assessment of units, modules or something similar two actual added values are foreseen: Firstly, the certificate documents that additional teaching on this issue is not needed and secondly as equivalent to parts of formative assessment like interim demonstrations. Another possibly even more important case is the one when the LO of an unit are part of the (national) work tasks in the respective sector but not of the national curricula: The added value for the candidate in case of job application in his home country would be the confirmation of LO, that are wanted, but usually not acquirable in the home system.

Units

Unit 1:							
Production of metallic components for aircraft or ground support equipment							
Remarks							
Mobility unit	Assessment				Place	Date	Signature
	observed/ supported	under instruction	under surveil- lance	independ- ently			
Preparing wrought material							
Handling presses							
Using different moulds							
Knowledge of different characteristics of the presses							
Rigging and shutting down the presses							
Assessing the need for one or two work cycles for the respective workpiece							
Cooperating with the colleagues, asking for advice when needed							
Preparing workpiece for transport to the next workplace							
Demoulding work pieces							
Checking for damages, Rectification works (f. e. deburring)							
Production of metallic components for aircraft or ground support equipment							

Unit 2:							
Production of components of plastics or composite materials for aircraft or ground support equipment							
Remarks							
Mobility unit	Assessment				Place	Date	Signature
	observed/ supported	under instruction	under surveil- lance	independ- ently			
Preparing wrought material, vacuum equipment							
Run autoclave							
Knowledge of the appropriate pressure and heat							
Choosing the parameters for the process							
Knowledge of the characteristics of the different fibre composites							
Controlling the process							
Cooperating with the colleagues, asking for advice when needed							
Respecting safety regulations							
Demoulding work pieces							
Checking for damages, Rectification works (f. e. deburring)							
Production of components of plastics or composite materials							

Unit 3:							
Operating and monitoring of automated systems in the aircraft production							
Remarks							
Mobility unit	Assessment				Place	Date	Signature
	observed/ supported	under instruction	under surveil- lance	independ- ently			
Equipping the respective auto- mated system							
Setting and start- ing the respective automated system							
Running the re- spective auto- mated system and controlling the production							
Recognising dam- ages, assessing the quality of the products							
Knowledge of the quality standards							
Checking the results of the processes							
Cooperating with the colleagues from the quality department							
Performing additional tests							
Analysing the protocols of the production proc- ess							
Communicating results and/or possible im- provements							
Maintaining the respective auto- mated system							
<i>Operating and monitoring of automated sys- tems in the air- craft production</i>							

Unit 4:

Joining and dissolving of structural components and aircraft airframes

Remarks

Mobility unit	Assessment				Place	Date	Signature
	observed/ supported	under instruction	under surveil- lance	independ- ently			
Preparing struc- tural components for joining							
Choosing driller with respect to the material and drill- ing with the ap- propriate rota- tional speed							
Knowledge about the properties of drillers and drilling machines							
Ability to work accurate							
In case of drilling fibre glasses: Respect the especial health haz- ards							
(Even blind) communi- cation and cooperation with the colleagues							
Self-critical control of the results							
Documentation of concessions							
Delivering the airframe to the next cycle							
Joining and lock- ing parts or as- semblies by rivet- ting, screwing or bonding							
Mounting assem- blies							
Orienting and calibrating as- semblies or struc- tural components by reference points, lines or levels							
Checking conces- sions, visual in- spections							

<i>Joining of structural components and aircraft airframes</i>					
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Unit 5:							
Assembly and disassembly of equipment and systems in/at the aircraft airframe							
Remarks							
Mobility unit	Assessment				Place	Date	Signature
	observed/ supported	under instruction	under surveil- lance	independ- ently			
Assembling pas- senger and emer- gency doors							
Assembling air- condition unit							
Assembling Belly Fairing							
Assembling floors							
Clarify fitting with the quality department							
Checking work order and drawings							
Checking parts for defilements							
Knowledge about the tools							
Cooperating at assem- bly of the frames							
Inserting and screwing floor tiles							
Self-critical control of the results							
Documentation of concessions							
Assembling hy- draulic equipment, preparing and performing hy- draulic test							
Mounting cesspit and fresh water tank							
Assembling rota- tion shaft system for the flaps							
Mounting cargo- loading system							

Assembling fuel lines							
Connecting hoses							
Setting ground connections conforming to standards							
Assembling bleed air tubes							
Assembling plastic tubes							
<i>Assembly and disassembly of equipment and systems in/at the aircraft airframe</i>							

Unit 6:							
Functional checks and tuning at the aircraft							
Remarks							
Mobility unit	Assessment				Place	Date	Signature
	observed/ supported	under instruction	under surveil- lance	independ- ently			
Testing Aircraft Hydraulic Systems							
Setting and Test- ing Aircraft Pneu- matic Systems							
Testing and/or replacing Aircraft Electric and Elek- tro-Pneumatic Systems							
Obtaining and using the correct issue of aircraft manuals and maintenance docu- mentation							
Checking work order and drawings							
Respecting safety regulation, f. e. ensur- ing that the system is safely isolated							
Knowledge about the tools, expected values and possible error sources							
Performing the test by cooperating with the colleagues from safety department							
Analyzing and self- critical control of the results							
Documentation of the results and possible modifications							
Carrying Out Maintenance of safety systems esp. of Oxygen Masks							
Running and han- dling of auxiliary power units							
Performing "Weight and Bal- ance"							

Maintaining ground equipment, tools and inspection equipment								
Testing and controlling components of aircraft systems								
Orienting and calibrating assemblies or structural components by reference points, lines or levels								
Functional checks and tuning at the aircraft								

Unit 7:							
Maintenance and inspection of the aircraft							
Remarks							
Mobility unit	Assessment				Place	Date	Signature
	observed/ supported	under instruction	under surveil- lance	independ- ently			
Removing en- gines, ailerons, flaps, speed brakes and differ- ent head covers							
Washing and de- painting the air- craft							
Determining com- pliance status of the structure, the body etc.							
Removing landing gear and cylinders							
Obtaining and using the correct issue of aircraft manuals and maintenance docu- mentation							
Checking work order and drawings							
Respecting safety regulation							
Knowledge about the tools, possible techni- cal difficulties and standard settings							
Cooperating and com- municating with the colleagues							
Using approved re- moval and fitting tech- niques and procedures							
Marking parts and documentation of the work process							
Detecting flaws by magnetic or eddy- current tests							
Repairing simple malfunctions							
Adjusting repaired components							

Performing functional checks							
Performing tightness checks, replacing seals when necessary							
<i>Maintenance and inspection of the aircraft</i>							

Unit 8:							
Analysis and recondition of malfunctions at system components							
Remarks							
Mobility unit	Assessment				Place	Date	Signature
	observed/ supported	under instruction	under surveil- lance	independ- ently			
Analysing mal- functions at pneumatic or hy- draulic parts, components or systems							
Exchanging or reconditioning pneumatic parts, components or systems by using special tools							
Exchanging or reconditioning hydraulic parts, components or systems by using special tools							
Connecting and disconnecting bunched circuits							
Reading & understand- ing work order							
Work resource-saving							
Knowledge of different characteristics of the connectors							
Providing & preparing the material							
Checking the circuits for corrosion and distortion							
Crimping, connecting							
Cooperating with the colleagues, asking for advice when needed							
Approving work order							
Detecting flaws by magnetic or eddy- current tests							
Setting control systems							
Testing repaired components and documenting con- cessions							

<i>Analysis and recondition of malfunctions at system components</i>							

Unit 9:

Analysis and recondition of malfunctions at system components

Remarks

Mobility unit	Assessment				Place	Date	Signature
	observed/ supported	under instruction	under surveil- lance	independ- ently			
Analysing by visual inspection and reconditioning damages of body, steering gear or wings							
Carrying out maintenance of landing gear							
Detecting flaws by magnetic or eddy-current tests							
Rivetting aluminium-Patches							
Knowledge about the properties of drillers and rivets and the manuals							
Removing damaged part with respect to structural integrity							
In case of drilling fibre glasses: Respect the especial health hazards							
(Even blind) communication and cooperation with the colleagues							
Working conforming to standards							
Cooperating with the quality department when confirming							
Documentation of concessions							
Sealing repaired damages							
Recognising delaminations							
Running ultra-sonic systems							

Laminating fibre-composite-patches							
Repairing sandwich components							
Documentation of concessions							
<i>Analysis and reconditioning of damage on structure components</i>							

Unit 10:							
Reconditioning of accessory equipment							
Remarks							
Mobility unit	Assessment				Place	Date	Signature
	observed/ supported	under instruction	under surveil- lance	independ- ently			
Differentiating and using connectors for engines							
Maintaining mechanical accessory equipment							
Production or reconditioning of hydraulic, pneumatic or electrical accessory equipment							
Assembling and disassembling components, boxes, turbines and electrical engine systems							
Clarify fitting with the quality department							
Checking work order and drawings							
Checking parts for defilements							
Knowledge about the tools							
Cooperating at assembly of the components							
Respecting the health hazards when working with high-voltage current							
Self-critical control of the results							
Documentation of the work and possible modifications							
Equipping and removing engine systems, documentation of concessions							
Mounting brackets and seals							

<i>Reconditioning of accessory equipment</i>							

Unit 11:

Independent quality inspections

Remarks

Mobility unit	Assessment				Place	Date	Signature
	observed/ supported	under instruction	under surveil- lance	independ- ently			
Choosing and preparing of test control units and test control circuits to measure the function of assemblies, sub-assemblies and devices							
Measuring the function of assemblies, sub-assemblies and devices							
Documenting and interpreting the results of the measurement							
Orienting and calibrating assemblies or structural components by reference points, lines or levels							
Performing quality assurance measurements on assemblies, sub-assemblies and devices with respect to the manual							
Knowledge about the relevant chapters of the quality control manual							
Choosing the right control units							
Respecting the health hazards when working with high-voltage current							
Communicating and cooperating with the colleagues from the safety department							
Working conforming to standards							
Documentation of measurements and results							

Performing visual and non-destructive material testing of new and repaired components							
Performing and recording of the final quality control							
<i>Performing independent quality inspections</i>							

Unit 11:							
Independent quality inspections							
Remarks							
Mobility unit	Assessment				Place	Date	Signature
	observed/ supported	under instruction	under surveil- lance	independ- ently			
Choosing and preparing of test control units and test control circuits to measure the function of assemblies, sub-assemblies and devices							
Measuring the function of assemblies, sub-assemblies and devices							
Documenting and interpreting the results of the measurement							
Orienting and calibrating assemblies or structural components by reference points, lines or levels							
Performing quality assurance measurements on assemblies, sub-assemblies and devices with respect to the manual							
Knowledge about the relevant chapters of the quality control manual							
Choosing the right control units							
Respecting the health hazards when working with high-voltage current							

Communicating and cooperating with the colleagues from the safety department							
Working conforming to standards							
Documentation of measurements and results							
Performing visual and non-destructive material testing of new and repaired components							
Performing and recording of the final quality control							
<i>Performing independent quality inspections</i>							

Unit 12:							
Production of bunched circuits							
Remarks							
Mobility unit	Assessment				Place	Date	Signature
	observed/ supported	under instruction	under surveil- lance	independ- ently			
Production of copper bunched circuits							
Production of fibre glass bunched circuits							
Reading & understanding work order							
Work resource-saving							
Providing & preparing the material							
Knowledge about material property							
Cutting cables, crimping							
Cooperating with the colleagues, asking for advice when needed							
Testing and preparing the circuit for transport to the next workplace							
Production of aluminum bunched circuits							
Production of bunched circuits							

Unit 13:							
Production or modification of electric devices							
Remarks							
Mobility unit	Assessment				Place	Date	Signature
	observed/ supported	under instruction	under surveil- lance	independ- ently			
Producing or modifying bunched circuits following the manuals							
Producing electric devices of differ- ent elements fol- lowing the manu- als							
Modifying and/or upgrading electric devices following the manuals and/or the work- orders							
Working in modi- fied or updated technical dia- grams on assem- blies or devices							
Clarifying work order with the engineering							
Checking drawings							
Checking assemblies for modification							
Knowledge about the technical drawings							
Working following the diagrams							
Respecting the health hazards when working with high-voltage current							
Self-critical control of the results							
Documentation of the modifications							

Testing and ad-justing assemblies and devices to put them into operation							
<i>Production or modification of electric devices</i>							

Unit 14:							
Passing bunched circuits in aircraft systems							
Remarks							
Mobility unit	Assessment				Place	Date	Signature
	observed/ supported	under instruction	under surveil- lance	independ- ently			
Mounting brackets and splitters							
Setting ground points							
Mounting race- ways							
Passing bunched circuits							
Setting of connec- tors							
Reading & understand- ing work order							
Work resource-saving							
Knowledge of different characteristics of the connectors							
Providing & preparing the material							
Crimping, connecting							
Cooperating with the colleagues, asking for advice when needed							
Approving work order							

Applying test equipment and voltage							
Testing of connectivity & grounding							
<i>Passing bunched circuits by performing the MU above in context</i>							

Unit 15:							
Assembly and disassembly of subsystems and devices at aircraft systems							
Remarks							
Mobility unit	Assessment				Place	Date	Signature
	observed/ supported	under instruction	under surveil- lance	independ- ently			
Checking the devices or sub-systems to be disassembled for zero-potential							
Disassembling electrical devices or subsystems							
Assembling devices or subsystems following the manuals							
Installing and adjusting electrical devices or sub-systems							
Checking drawings & work order							
Checking devices or subsystems							
Knowledge about the right setting							
Adjusting following the diagrams							
Respecting the health hazards when working with high-voltage current							
Cooperating with the colleagues							
Self-critical control of the results							
Documentation of the settings							

Assembling and connecting electrical drives and hydraulic or pneumatic connections							
Testing the assembled devices or subsystems following the documentations, repairing malfunctions and documenting modifications							
Assembly and disassembly of subsystems and devices at aircraft systems							

Unit 16:							
Modification of aircraft systems							
Remarks							
Mobility unit	Assessment				Place	Date	Signature
	observed/ supported	under instruction	under surveil- lance	independ- ently			
Connecting and assembling sub-systems of digital technologies for sending and receiving							
Connecting, assembling and adjusting sub-systems of digital technologies for drive and control							
Testing assembly and installation following the documentations, repairing malfunctions and documenting modifications							
Clarifying settings with the engineering/colleagues							
Checking drawings and documentations							
Testing assemblies for modification							
Knowledge about the nominal values							
Repairing malfunctions							
Respecting the health hazards when working with high-voltage current							
Control of the results in cooperation with the safety department							
Documentation of the modifications							
Updating software							

Documenting modified and updated diagrams, settings and versions							
Modification of aircraft systems							

Unit 17:							
Functional checks and system audit of supply units and control systems							
Remarks							
Mobility unit	Assessment				Place	Date	Signature
	observed/ supported	under instruction	under surveil- lance	independ- ently			
Installing, testing and operating power-supply units							
Installing and adjusting electrical devices or sub- systems							
Installing, testing and operating warning, hydrau- lic, pneumatic, fuel, engine and cabin air systems							
Selecting and configuring meas- urement equip- ment and test circuits for check- ing functions of assemblies and devices							
Clarifying work order with engineer- ing/colleagues							
Selecting equipment and test circuits							
Configuring test cir- cuits							
Knowledge about the nominal values							
Performing pre-tests							
Respecting the health hazards when working with high-voltage current							
Critical control of the results							
Documentation of the work steps							

Checking func- tions of digital and analog assem- blies and devices							
Checking and configuring elec- tromechanical assemblies							
Checking and configuring drive and control de- vices							
<i>Performing func- tional checks and system audit of supply units and control sys- tems</i>							

Unit 18:							
Functional checks and system audit of information and communication systems							
Remarks							
Mobility unit	Assessment				Place	Date	Signature
	observed/ supported	under instruction	under surveil- lance	independ- ently			
Checking and measuring electrical values in aerial systems							
Measuring and configuring sensors and transformers for non-electric values							
Checking information devices							
Checking and configuring warning systems							
Checking the functional relations and technical solutions of communication and information systems on ground and at the aircraft referring the manuals							
Clarifying work order with engineering/colleagues							
Reading and referring to the manual							
Checking functional relations and technical solutions							
Knowledge about the nominal values							
Working following the diagrams							

Respecting the health hazards when working with high-voltage current							
Critical control of the results							
Documentation of the test-results							
Modifying and operating sub-assemblies for information- and communication technology							
Checking, measuring and setting of analogue and digital signals							
Updating software							
Functional checks and system audit of information and communication systems							

Unit 19:							
Analysis and repair of malfunctions at bunched circuits in aircraft systems							
Remarks							
Mobility unit	Assessment				Place	Date	Signature
	observed/ supported	under instruction	under surveil- lance	independ- ently			
Repairing power- supply units by analysing and operating							
Repairing sub- assemblies and devices							
Operating with automated diag- nostic systems							
Selecting and configuring meas- urement equip- ment and test circuits for check- ing functions of circuits and de- vices							
Checking, meas- uring and setting of analogue and digital signals							
Clarifying work order with engineer- ing/colleagues							
Choosing the right instruments (digi- tal/analogue)							
Checking settings							
Knowledge about the nominal values							
Working following the diagrams							

Respecting the health hazards when working with high-voltage current Critical control of the results Documentation of the measured values							
Checking and setting of electro-mechanical sub-assemblies							
Modifying drawings							
Documenting and analyzing measured values							
<i>Analysis and repair of malfunctions at bunched circuits in aircraft systems</i>							

Unit 20:							
Analysis and repair of malfunctions at supply units and control systems							
Remarks							
Mobility unit	Assessment				Place	Date	Signature
	observed/ supported	under instruction	under surveil- lance	independ- ently			
Repairing warn- ing, hydraulic, pneumatic, fuel, engine and cabin air systems							
Analysing and repairing units for measurement and control en							
Checking and configuring elec- tromechanical assemblies							
Clarifying work order with the engineering							
Checking drawings							
Checking assemblies for modification							
Knowledge about the technical drawings							
Working following the diagrams							
Respecting the health hazards when working with high-voltage current							
Self-critical control of the results							
Documentation of the modifications							
Measuring and configuring sen- sors and trans- formers for non- electric values							
Measuring, testing and adjusting analogue and digital input and output signals							

Documenting and analysing results of measurement, modifying technical drawings							
<i>Analysis and repair of malfunctions at supply units and control systems</i>							

Unit 21:							
Analysis and repair of malfunctions at information and communication systems							
Remarks							
Mobility unit	Assessment				Place	Date	Signature
	observed/ supported	under instruction	under surveil- lance	independ- ently			
Checking func- tions of analogue and digital devices and assemblies							
Measuring, testing and adjusting analogue and digital input and output signals							
Checking and measuring electri- cal values in aerial systems							
Testing and ad- justing functional units for meas- urement and con- trol							
Modifying techni- cal drawings							
Clarifying work order with the engineering							
Checking drawings							
Knowledge about the technical drawings							
Working following the diagrams							
Self-critical control of the results							
Documentation of the modifications							
Verifying modifications with engineering							

Documenting and analysing the results of tests and measurements							
Modifying and starting radio and IT- assemblies and devices							
Checking functional relations and technical solutions on ground and at the aircraft of IT- and communication systems following the technical documents							
Updating software							
Checking and starting alert systems							
Analysis and repair of malfunctions at information and communication systems							

Unit 22:							
Maintenance and inspection of aircraft systems							
Remarks							
Mobility unit	Assessment				Place	Date	Signature
	observed/ supported	under instruction	under surveil- lance	independ- ently			
Checking func- tions of analogue and digital devices and assemblies							
Measuring, testing and adjusting analogue and digital input and output signals							
Checking and adjusting electro- mechanical as- semblies							
Checking and measuring electri- cal values in aerial systems							
Testing, measur- ing and adjusting sensors and con- verters of non- electrical quanti- ties							
Testing and ad- justing functional units for meas- urement and con- trol							
Clarifying work order with the engineering							
Checking drawings							
Checking functional units							
Knowledge about the technical drawings							

Working following the diagrams						
Respecting the health hazards when working with high-voltage current						
Self-critical control of the results						
Documentation of the results						
Checking and adjusting functional units of power electronics following the technical documentations						
Documenting and interpreting the results of the measurement						
Maintenance and inspection of aircraft systems						