

WORLD SKILLS STANDARD SPECIFICATION

Skill 14 Aircraft Maintenance





THE WORLDSKILLS STANDARDS SPECIFICATION (WSSS)

GENERAL NOTES ON THE WSSS

The WSSS specifies the knowledge, understanding, and specific skills that underpin international best practice in technical and vocational performance. It should reflect a shared global understanding of what the associated work role(s) or occupation(s) represent for industry and business (www.worldskills.org/WSSS).

The skill competition is intended to reflect international best practice as described by the WSSS, and to the extent that it is able to. The Standards Specification is therefore a guide to the required training and preparation for the skill competition.

In the skill competition the assessment of knowledge and understanding will take place through the assessment of performance. There will not be separate tests of knowledge and understanding.

The Standards Specification is divided into distinct sections with headings and reference numbers added.

Each section is assigned a percentage of the total marks to indicate its relative importance within the Standards Specification. The sum of all the percentage marks is 100.

The Marking Scheme and Test Project will assess only those skills that are set out in the Standards Specification. They will reflect the Standards Specification as comprehensively as possible within the constraints of the skill competition.

The Marking Scheme and Test Project will follow the allocation of marks within the Standards Specification to the extent practically possible. A variation of five percent is allowed, provided that this does not distort the weightings assigned by the Standards Specification.



WORLDSTILLS STANDARDS SPECIFICATION

SECTION		RELATIVE IMPORTANCE (%)
1	Work organization and management	5
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none">• ATA chapters or equivalent• Health and safety legislation, obligations and documentation• Approved manuals, data from manufacturers and government• The situations when personal protective equipment (PPE) must be used, to include: safety footwear, eye and hearing protection• The purposes, uses, care, maintenance and storage of hand, power and machine tools/equipment together with their safety implications• The purposes, uses, care and safe storage of materials• Sustainability measures applying to the use of 'green' materials and recycling• The ways in which working practices can minimize wastage and help to manage costs• The principles of work flow and measurement• The importance of planning, accuracy, checking and attention to detail in all working practices• The significance of 'signing off' a completed task to an international airworthy standard (I.A.W)• The role of the 'licensed practitioner' as the signing authority to release the aircraft for service	
	<p>The individual shall be able to:</p> <ul style="list-style-type: none">• Consistently and diligently follow health and safety standards, rules and regulations• Identify and use the appropriate personal protective equipment including safety footwear, ear and eye protection• Select, use, clean, maintain and store all tools and equipment safely• Select, use and store all materials safely• Plan the work area to maximize efficiency• Maintain the discipline of keeping the work area clean and tidy• Measure accurately and check regularly• Consistently and diligently follow regulated processes and procedures to an international airworthy standard (I.A.W) using approved manuals, at the latest 'Amended Issue' and data• Recognize boundaries of own authority• Work to the requirements of the industry 'Human Factors' qualifications regarding the recruitment/employment of technicians• Establish and consistently maintain high quality standards and working processes under pressure	



2	Communication and interpersonal skills	5
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none">• The significance of establishing and maintaining customer confidence• The roles and requirements of related colleagues• The value of building and maintaining productive working relationships• The importance of having/developing an Industry accepted attitude, aptitude and ability: "Triple A" success• Techniques of effective team work• The importance of swiftly resolving misunderstandings and conflicting demands	
	<p>The individual shall be able to:</p> <ul style="list-style-type: none">• Interpret customer requirements and manage customer expectations positively• Make recommendations which meet/exceed the customers' requirements and budget• Produce a cost and time estimate for customers• Contribute positively to a team e.g. in order to maintain safety• Undertake investigative discussions e.g. to resolve technical problems• Keep colleagues regularly informed/up-dated on planned maintenance procedures and negotiate timings to minimize negative impact on work/productivity levels• Reflect positively and constructively to feedback on own performance• Recognize the needs of support organizations e.g. logistical supplier, engineering authority	
3	Problem solving, innovation, and creativity	5
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none">• The common types of problem which can occur within the work process• Diagnostic approaches to problem solving• The importance of following the manufacturer's manual, at the latest 'Amended Issue'/industry problem solving processes to ensure an international airworthy standard (I.A.W.) is achieved• Trends and developments in the industry including new materials, methods and technology	



	<p>The individual shall be able to:</p> <ul style="list-style-type: none"> • Check work regularly to minimize problems at a later stage • Challenge incorrect information to prevent problems • Recognize and understand problems swiftly and follow a self-managed process for resolving them using manufacturer's manual, latest 'Amended Issue' • Undertake fault diagnosis discussions with pilots to determine the underlying causes of technical problems • Persist in resolving complex problems • Recognize opportunities to contribute ideas to improve the product and overall level of customer satisfaction • To take ideas forward to management • Demonstrate a willingness to try new methods and embrace change • Exploit the potential of new technologies • Interpret and apply maintenance procedures 	
4	Daily inspection	10
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> • ATA chapter(s) 05, 20, 51, 60 or equivalent • The maintenance manual • Airworthiness responsibilities 	
	<p>The individual shall be able to:</p> <ul style="list-style-type: none"> • Interpret the appropriate maintenance manual, latest "Amended Issue" and consistently use to support the inspection process • Accurately determine if an aircraft is safe for flight or if further inspection is required as per the Defect and Daily Inspection Checklists • Open and close a range of inspection panels • Accurately complete corresponding documentation to reflect the status of the completed Daily Inspection (D.I.) • Clearly and accurately document any defects and refer to the Controller for his/her attention 	
5	Sheet metal repair	10
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> • ATA chapter 51 or equivalent • Engineering drawings • Different types of metal and their characteristics • Formulae for calculating bends and rivet lengths • Types of rivet and their purposes • Precision measuring instruments • Repair/fabrication techniques 	



	<p>The individual shall be able to:</p> <ul style="list-style-type: none">• Recognize the need for a repair and obtain authority to carry out• Interpret manufacturer's engineering drawings for a range of complex repairs including: Top Hat, Lobster Back Bend, OGEE (curved bend), and Joggled• Accurately calculate the dimensions for flat layout• Form a complex section and channel and fit as required to make an assembly in accordance with Standard Practices (AC 43-13)• Bend sheet metal with a high degree of accuracy with corners rounded, smooth and nick free• Layout fastener, accurately determine the rivet length and install solid rivets in accordance with the supplied engineering drawings• Troubleshoot any defects found in repair and accurately report to a licensed engineer	
6	Composite repair	10
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none">• ATA chapter 51 or equivalent• Engineering drawings• Different types of composite materials and their characteristics• Health implications of repairs with composite and special precautions necessary including increased time allocation• Precision measuring instruments• Repair/fabrication techniques• How to use a Standard Composite Repair Manual	
	<p>The individual shall be able to:</p> <ul style="list-style-type: none">• Recognize the need for a repair and obtain authority to carry out• Interpret manufacturer's engineering drawings for a range of complex repairs including Rosette Insert install, Wet Layup practice (only) using a pre-fabricated a panel to repair using vacuum pack technique including panel edge potting of a Honeycomb panel using non-toxic potting material• Understand a complex section and as required to install an insert in accordance with Standard Practices (Standard Composite Repair Manual) including a vacuum pack repair• Troubleshoot any defects found in repair and accurately report to a licensed engineer	
7	Rig aircraft control systems	15
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none">• ATA chapter(s): Fixed Wing 10, 20, 27, 51; Helicopters 10, 20, 51, 67 or equivalent• The critical interaction of pilot requirements and systems constraints• The effect of atmospheric conditions on aircraft control systems• The effect of the computer hardware and software interaction with each other and the aircraft• The correct procedure for removing, inspecting installing and rigging all primary and secondary Flight Controls	



	<p>The individual shall be able to:</p> <ul style="list-style-type: none">• Interpret engineering drawings, graphs and maintenance manual procedures for mechanical/software control systems• Accurately set up complex aircraft control systems using charts supplied with tensiometer with the ailerons centred (using a rigging pin)• Accurately set all aircraft control travel limits by checking and adjusting as necessary• Check control movement, direction and sense of operation• Submit for independent inspection and safety of all aircraft hardware and travel stops	
8	Remove and install aircraft component	10
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none">• ATA chapter(s) 10, 11, 12, 20, 24, 27, 29 or equivalent• The impact of removing an aircraft component on the work of colleagues• The effect and consequences on the aircraft systems when a particular component is removed• Correct procedures of removing, inspecting and installing components	
	<p>The individual shall be able to:</p> <ul style="list-style-type: none">• Interpret engineering diagrams and follow maintenance manual procedures and use the latest 'Amendment Issue'• Ensure the aircraft is safe to work on• Remove access panels as required and store safely on racking• Remove system pressure hoses, if applicable, ensuring systems pressures have been dissipated• Ensure each attachment, bolt and nut are kept as a set to avoid• Misalignment of split pin holes on a refit• Remove wire locking, split pins, nuts and washers, maintaining awareness of potential loose articles• Clean, inspect and lubricate as required• Refit aircraft component ensuring correct orientation• Re-connect systems hoses, where disconnected and restore system pressure, making sure colleagues are aware• Carry out functionality test	
9	Gas turbine engine boroscope inspection	5
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none">• ATA chapter(s) 71, 72, 81 or equivalent• The airflow and dynamics through a gas turbine engine• Manufacturer's maintenance manual• Effects of metallurgy in very hot areas	



	<p>The individual shall be able to:</p> <ul style="list-style-type: none"> • Interpret engineering diagrams and follow maintenance manual procedures and ensure it is at the latest Amendment Issue • Use a fixed and flexible Boroscope to inspect and report defects found inside a Gas Turbine Engine without removing any components from the engine other than for access purposes • Accurately interpret the visual image to determine the level of any damage • Determine the limits, which have been established by the manufacturer and if a limit has been exceeded, what maintenance action(s) are required • Complete defect report accurately 	
10	Fabricate an aircraft electrical loom	10
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> • ATA chapter 24 or equivalent • Engineering/electrical diagrams • Different types of wire and their characteristics • Formulae for the bends in looms • Precision measuring instruments • Fabrication techniques as per standard wiring practices manual 	
	<p>The individual shall be able to:</p> <ul style="list-style-type: none"> • Install and terminate an aircraft wire loom as per aircraft wiring diagram • Check operational circuit • Correctly secure the loom to the aircraft structure • Use calibrated tools (i.e. multi-meter, mega meter, oscilloscope etc.) 	
11	Fault diagnose an aircraft electrical circuit	15
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> • ATA chapter 24 or equivalent • Standard wiring practices manual • The importance of discussion with the other trades as it affects them • how to use and interpret a multi meter 	
	<p>The individual shall be able to:</p> <ul style="list-style-type: none"> • Accurately identify and isolate faults in a wiring harness and correct • Report any defects found to a licensed engineer • Use calibrated tools e.g. multi-meter, mega meter, oscilloscope 	
	Total	100