worldskills

Technical Description

Aircraft Maintenance

WorldSkills International, by a resolution of the Competitions Committee and in accordance with the Constitution, the Standing Orders, and the Competition Rules, has adopted the following minimum requirements for this skill for the WorldSkills Competition.

The Technical Description consists of the following:

1 Introduction

1.1 Name and description of the skill competition

1.1.1 The name of the skill competition is

Aircraft Maintenance

1.1.2 Description of the associated work role(s) or occupation(s)

An aircraft maintenance technician works in the commercial, military, and public service sectors, performing a range of processes on aeronautical products. They have a critical responsibility to work professionally to ensure the safety of customers and operational personnel while maintaining the reputation of the team or organization.

The aircraft maintenance technician normally works in an aircraft hangar. However, there are times when working outdoors is required. They may work for large and small organizations and occasionally directly for individual customers. They will undertake a number of processes including inspection, servicing, modifying, troubleshooting, removal, installation, rigging, testing, and repairing. An aircraft maintenance technician may specialize by working on particular aeronautical products such as helicopters, airliners, UAVs (Unmanned Aeronautical Vehicles), or tilt wing aircraft. Key attributes required by all aircraft maintenance technicians wherever they work are efficient work organization, self-management, communication, interpersonal skills and problem-solving. They must have the ability to work safely and rigorously adhere to industry regulations and manufacturer's instructions. These universal traits are the benchmark of an outstanding aircraft maintenance technician.

In a mobile labour market, the aircraft maintenance technician may work in teams, or alone, or in both from time to time. Whatever the structure of the work, the trained and experienced aircraft maintenance technician takes on a high level of personal responsibility and autonomy. From safeguarding the safety of the customer through scrupulous attention to safe working, to undertaking complex repairs, every process matters and mistakes can be life threatening. The aircraft maintenance technician is one of the last lines of defence to ensure the safety of the aircraft before flight.

As a part of a global industry, the aircraft maintenance technician faces rapidly expanding opportunities and challenges such as maintaining drones or space vehicles. For the talented aircraft maintenance technician there are many commercial and international opportunities; however, these carry with them the need to understand and work with different regulations, cultures, and technological advancements. The diversity of skills associated with aircraft maintenance is therefore likely to expand.

1.1.3 Number of Competitors per team

Aircraft Maintenance is a single Competitor skill competition.

1.1.4 Age limit of Competitors

The Competitors must not be older than 25 years in the year of the Competition.

1.2 The relevance and significance of this document

This document contains information about the standards required to compete in this skill competition, and the assessment principles, methods, and procedures that govern the competition.

Every Expert and Competitor must know and understand this Technical Description.

In the event of any conflict within the different languages of the Technical Descriptions, the English version takes precedence.

1.3 Associated documents

Since this Technical Description contains only skill-specific information it must be used in association with the following:

- WSI – Code of Ethics and Conduct
- WSI – Competition Rules
- WSI – WorldSkills Occupational Standards framework
- WSI – WorldSkills Assessment Strategy
- WSI online resources as indicated in this document
- WorldSkills Health, Safety, and Environment Policy and Regulations
- WorldSkills Standards and Assessment Guide (skill-specific)

2 The WorldSkills Occupational Standards (WSOS)

2.1 General notes on the WSOS

The WSOS specifies the knowledge, understanding, skills, and capabilities that underpin international best practice in technical and vocational performance. These are both specific to an occupational role and also transversal. Together they should reflect a shared global understanding of what the associated work role(s) or occupation(s) represent for industry and business (www.worldskills.org/WSOS).

The skill competition is intended to reflect international best practice as described by the WSOS, to the extent that it can. The Standard 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 only be separate tests of knowledge and understanding where there is an overwhelming reason for these.

The Standard 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. This is often referred to as the “weighting”. The sum of all the percentage marks is 100. The weightings determine the distribution of marks within the Marking Scheme.

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

The Marking Scheme will follow the allocation of marks within the Standards to the extent practically possible. A variation of up to five percent is allowed, if this does not distort the weightings assigned by the Standards.

2.2 WorldSkills Occupational Standards

Section		Relative importance (%)
1	**Work Organization and Management**	**5**
	The individual needs to know and understand: • The Company Maintenance Policy Manual (MPM) • ATA chapters or equivalent • Health and safety legislation, obligations, and documentation • Approved manuals, data from manufacturers and government • Situations when personal protective equipment (PPE) must be used, to include safety footwear, eye and hearing protection, gloves, and respirators • Situations when electro-static dissipative equipment must be utilized to prevent system damage • The purposes, uses, care, maintenance and storage of hand, power, and machine tools/equipment together with their safety implications	

Section		Relative importance (%)
	• The purposes, uses, care and safe storage of materials • Principles of workflow and time management • The importance of researching, planning, accuracy, checking, and attention to detail in all working practices • The significance of certifying the completion of tasks to an international airworthy standard.	
	The individual shall be able to • 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 using the latest revision of approved manuals and data • Recognize the boundaries of own authority • Establish and consistently maintain high quality standards and working processes under pressure • Plan the workflow within a team environment to give the best chance for a safe, successful competition of the task within a given time • Organize and carry out a set of tasks within a team environment	
2	**Communication and Interpersonal skills**	**5**
	The individual needs to know and understand: • The importance of accurate written communication • 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 • The importance of swiftly resolving misunderstandings and conflicting demands • The principles of teamwork: ◦ The broader importance of working as teams ◦ Individual roles and responsibilities within team settings ◦ Interpersonal techniques of effective teamwork ◦ The importance of working within teams to accomplish tasks in a timely and economical manner	

Section		Relative importance (%)
	• Team values, imperatives, and contributions	
	The individual shall be able to: • Complete technical documentation accurately and legibly • Undertake investigative discussions e.g. to resolve technical problems • Reflect positively and respond constructively to feedback on own performance • Recognize and respond to the needs of support organizations e.g. logistical suppliers, engineering authorities, and manufacturers' technical support • Work within teams to accomplish tasks within a timely and economical manner • Contribute positively to teams e.g. in order to maintain safety and airworthiness.	
3	**Problem solving, innovation, and creativity**	**5**
	The individual needs to know and understand: • The common types of problem which can occur within the work process • Work methods and conduct to ensure an international airworthy standard is achieved • Diagnostic approaches to problem solving • The importance of following the latest revisions of manufacturers' maintenance manual and documentation during the problem-solving processes • Trends and developments in the industry including new materials, methods, and technology	
	The individual shall be able to: • Check work regularly to minimize problems at a later stage • Challenge incorrect information to prevent problems • Follow self-managed processes for identifying and resolving problems, using the latest revisions of manufacturers' maintenance manuals and documentation • Persist in resolving complex problems • Recognize and respond to opportunities to contribute ideas to improve the product and overall level of customer satisfaction • Take ideas forward to management • Try new methods and embrace change within approved practices • Exploit the potential of new technologies within approved practices • Interpret and apply information from maintenance publications • Encourage the checking and verification of one's own work, as well as co-workers working in a team environment, to an international airworthy standard	

Section		Relative importance (%)
4	**Sustainable Practice**	**5**
	The individual needs to know and understand: • Sustainability measures with respect to the use of environmentally friendly materials, minimization of waste, disposal of waste and recycling of materials. • Reducing paper consumption as a way to be environmentally friendly. • Trends and developments in the industry including the development of hydrogen propulsion, battery technologies, high-bypass-ration (HBPR) engines and Sustainable Aviation Fuel (SAF). • The importance of diversity and non-discrimination of workforce at the workplace	
	The individual shall be able to: • Comply with all regulatory requirements and relevant environmental standards • Use electronic documentation and task cards, thereby reducing carbon emission and accelerating the provision and transmission of information • Recognize the potential of digital technology to reduce fuel cost and carbon footprint within approved practices • Plan their work and to reduce material wastage • Embrace a workplace that encourages diversity and inclusivity • Operate Ground Support Equipment to reduce the usage of aircraft auxiliary power unit on the ground	
5	**Aircraft and System Inspection Line Maintenance**	**16**
	The individual needs to know and understand: • Visual inspection techniques • The purpose, structure, and contents of aeronautical maintenance publications i.e. ATA chapters, maintenance manuals, parts manuals, minimum equipment lists, company publications, inspection schedules, etc. • The purpose and use of documents to initiate aircraft maintenance, record defects/actions, and certify aircraft maintenance. i.e. Journey log, technical log, work order, task card etc. • Certifying staff responsibilities for documenting and certifying scheduled and unscheduled inspections	
	The individual shall be able to: • Apply visual inspection techniques • Interpret and carry out scheduled and unscheduled inspections • Identify and report any defects found	

Section		Relative importance (%)
	• Record and certify own work in accordance with relevant legislative, manufacturer and/or company requirements • Perform line maintenance servicing as per task cards • Identify problematic LRU and replace with serviceable unit	
6	**Airframe Powerplant Component Inspection Rectification**	**16**
	The individual needs to know and understand: • The purpose, structure, and contents of aeronautical maintenance publications, i.e. ATA chapters, maintenance manuals, parts manuals, minimum equipment lists, company publications, inspection schedules etc. • The purpose and use of documents to initiate aircraft maintenance, record defects/actions and certify aircraft maintenance. i.e. Journey log, technical log, work order, task card, etc. • Certifying staff responsibilities for documenting and certifying defect rectification • Troubleshooting techniques • System and component construction and operation • System and component publications • Recording and certification processes for troubleshooting	
	The individual shall be able to: • Interpret and apply information from system and component publications • Apply troubleshooting techniques • Rectify defects by carrying out actions such as: ◦ Replacing and servicing components ◦ Adjusting systems or components • Interpret defect and rectification reports including task cards or journey log entries by following maintenance manual procedures using the latest amendments • Record and certify own work in accordance with relevant legislative, manufacturer and/or company requirements	
7	**Aircraft Avionic System Inspection Rectification**	**16**
	The individual needs to know and understand: • The purpose, structure, and contents of aeronautical maintenance publications i.e. ATA chapters, maintenance manuals, parts manuals, minimum equipment lists, company publications, inspection schedules, manual and CASA AC21-99. • The purpose and use of documents to initiate aircraft maintenance, record defects/actions and certify aircraft maintenance. i.e. Journey log, technical log, work order, task card etc. • Aircraft electrical and avionics systems	

Section		Relative importance (%)
	• The certifying staff responsibilities for documenting and certifying defect rectification ◦ Troubleshooting techniques ◦ System and component construction and operation ◦ System and component publications ◦ Recording and certification processes for troubleshooting	
	The individual shall be able to: • Interpret and apply information from electrical wiring diagrams and related publications • Perform wire installation, routing and lacing and tying wire bundles • Apply troubleshooting techniques • Rectify defects by carrying out actions such as: ◦ Repair and/or Replace components ◦ Adjusting systems or components ◦ Lubrificating components ◦ Repairing components • Interpret defect and rectification reports, including task cards or journey log entries, by following maintenance manual procedures using the latest amendments • Record and certify own work in accordance with relevant legislative, manufacturers' and/or companies' requirement • Carry out instructions provided by an avionics technician	
8	**Aircraft Metal Structure Fabrication and or Repair**	**16**
	The individual needs to know and understand: • The purpose, structure, and contents of aeronautical maintenance publications, i.e. ATA chapters, maintenance manuals, parts manuals, minimum equipment lists, company publications, inspection schedules, structural repair manuals, AC43-13-1B, etc. • The purpose and use of documents to initiate aircraft maintenance, record defects/actions and certify aircraft maintenance. i.e. Journey log, technical log, work order, task card etc. • The certifying staff responsibilities for documenting and certifying defect rectification • Aircraft construction principles • Aircraft metal structure repair principles • Aircraft metal structure repair/fabrication techniques • Recording and certification processes	
	The individual shall be able to: • Apply aircraft metal structure repair principles and techniques • Interpret and apply information from aeronautical maintenance publications such as AC 43-13-1B and aircraft Structural Repair Manual	

Section		Relative importance (%)
	• Interpret defect and rectification reports, including task cards or journey log entries, by following maintenance manual procedures using the latest amendments • Record and certify own work in accordance with relevant legislative, manufacturers' and/or companies' requirements	
9	**Aircraft Composite Inspection Repair**	**16**
	The individual needs to know and understand: • The purpose, structure, and contents of aeronautical maintenance publications, i.e. ATA chapters, maintenance manuals, parts manuals, minimum equipment lists, company publications, inspection schedules, structural repair manual, AC43-13-1B and FAA-H-8083-31A-AMT-Airframe-Vol-1, chapter 7. • The purpose and use of documents to initiate aircraft maintenance, record defects/actions, and certify aircraft maintenance. i.e. Journey log, technical log, work order, task card etc. • The certifying staff responsibilities for documenting and certifying defect rectification • Aircraft construction principles • Aircraft composite structure repair principles • Aircraft composite powertrain repair techniques • Aircraft composite structure repair/fabrication techniques • Recording and certification processes	
	The individual shall be able to: • Apply aircraft composite structure repair principles and techniques • Interpret and apply information from structural repair publications such as AC 43-13-1B and aircraft Structural Repair Manual • Interpret defect and rectification reports including task cards or journey log entries by following maintenance manual procedures using the latest amendments • Record and certify own work in accordance with relevant legislative, manufacturer and/or company requirements	
	Total	**100**

3 The Assessment Strategy and Specification

3.1 General guidance

Assessment is governed by the WorldSkills Assessment Strategy. The Strategy establishes the principles and techniques to which WorldSkills assessment and marking must conform.

Expert assessment practice lies at the heart of the WorldSkills Competition. For this reason, it is the subject of continuing professional development and scrutiny. The growth of expertise in assessment will inform the future use and direction of the main assessment instruments used by the WorldSkills Competition: the Marking Scheme, Test Project, and Competition Information System (CIS).

Assessment at the WorldSkills Competition falls into two broad types: Measurement and Judgement. For both types of assessment, the use of explicit benchmarks against which to assess each Aspect is essential to guarantee quality.

The Marking Scheme must follow the weightings within the Standards. The Test Project is the assessment vehicle for the skill competition, and therefore also follows the Standards. The CIS enables the timely and accurate recording of marks; its capacity for scrutiny, support, and feedback is continuously expanding.

The Marking Scheme, in outline, will lead the process of Test Project design. After this, the Marking Scheme and Test Project will be designed, developed, and verified through an iterative process, to ensure that both together optimize their relationship with the Standards and the Assessment Strategy. They will be agreed by the Experts and submitted to WSI for approval together, to demonstrate their quality and conformity with the Standards.

Prior to submission for approval to WSI, the Marking Scheme and Test Project will liaise with the WSI Skill Advisors for quality assurance and to benefit from the capabilities of the CIS.

4 The Marking Scheme

4.1 General guidance

This section describes the role and place of the Marking Scheme, how the Experts will assess Competitors' work as demonstrated through the Test Project, and the procedures and requirements for marking.

The Marking Scheme is the pivotal instrument of the WorldSkills Competition, in that it ties assessment to the standard that represents each skill competition, which itself represents a global occupation. It is designed to allocate marks for each assessed aspect of performance in accordance with the weightings in the Standards.

By reflecting the weightings in the Standards, the Marking Scheme establishes the parameters for the design of the Test Project. Depending on the nature of the skill competition and its assessment needs, it may initially be appropriate to develop the Marking Scheme in more detail as a guide for Test Project design. Alternatively, initial Test Project design can be based on the outline Marking Scheme. From this point onwards the Marking Scheme and Test Project should be developed together.

Section 2.1 above indicates the extent to which the Marking Scheme and Test Project may diverge from the weightings given in the Standards, if there is no practicable alternative.

For integrity and fairness, the Marking Scheme and Test Project are increasingly designed and developed by one or more Independent Test Project Designer(s) with relevant expertise. In these instances, the Marking Scheme and Test Project are unseen by Experts until immediately before the start of the skill competition, or competition module. Where the detailed and final Marking Scheme and Test Project are designed by Experts, they must be approved by the whole Expert group prior to submission for independent validation and quality assurance. Please see the Competition Rules for further details.

Experts and Independent Test Project Designers are required to submit their Marking Schemes and Test Projects for review, verification, and validation well in advance of completion. They are also expected to work with their Skill Advisor, reviewers, and verifiers, throughout the design and development process, for quality assurance and in order to take full advantage of the CIS's features.

In all cases a draft Marking Scheme must be entered into the CIS at least eight weeks prior to the Competition. Skill Advisors actively facilitate this process.

4.2 Assessment Criteria

The main headings of the Marking Scheme are the Assessment Criteria. These headings are derived before, or in conjunction with, the Test Project. In some skill competitions the Assessment Criteria may be similar to the section headings in the Standards; in others they may be different. There will normally be between five and nine Assessment Criteria. Whether or not the headings match, the Marking Scheme as a whole must reflect the weightings in the Standards.

Assessment Criteria are created by the person or people developing the Marking Scheme, who are free to define the Criteria that they consider most suited to the assessment and marking of the Test Project. Each Assessment Criterion is defined by a letter (A-I). **The Assessment Criteria, the allocation of marks, and the assessment methods, should not be set out within this Technical Description. This is because the Criteria, allocation of marks, and assessment**

methods all depend on the nature of the Marking Scheme and Test Project, which is decided after this Technical Description is published.

The Mark Summary Form generated by the CIS will comprise a list of the Assessment Criteria and Sub Criteria.

The marks allocated to each Criterion will be calculated by the CIS. These will be the cumulative sum of marks given to each Aspect within that Assessment Criterion.

4.3 Sub Criteria

Each Assessment Criterion is divided into one or more Sub Criteria. Each Sub Criterion becomes the heading for a WorldSkills marking form. Each marking form (Sub Criterion) contains Aspects to be assessed and marked by Measurement or Judgement, or both Measurement and Judgement.

Each marking form (Sub Criterion) specifies both the day on which it will be marked, and the identity of the marking team.

4.4 Aspects

Each Aspect defines, in detail, a single item to be assessed and marked, together with the marks, and detailed descriptors or instructions as a guide to marking. Each Aspect is assessed either by Measurement or by Judgement.

The marking form lists, in detail, every Aspect to be marked together with the mark allocated to it. The sum of the marks allocated to each Aspect must fall within the range of marks specified for that section of the Standards. This will be displayed in the Mark Allocation Table of the CIS, in the following format, when the Marking Scheme is reviewed from C-8 weeks. (Section 4.1 refers.)

		CRITERIA								TOTAL MARKS PER SECTION	WSSS MARKS PER SECTION	VARIANCE
STANDARDS SPECIFICATION SECTION		A	B	C	D	E	F	G	H			
	1	5.00								5.00	5.00	0.00
	2		2.00					7.50		9.50	10.00	0.50
	3								11.00	11.00	10.00	1.00
	4			5.00						5.00	5.00	0.00
	5				10.00	10.00	10.00			30.00	30.00	0.00
	6		8.00	5.00				2.50	9.00	24.50	25.00	0.50
	7			10.00				5.00		15.00	15.00	0.00
TOTAL MARKS		5.00	10.00	20.00	10.00	10.00	10.00	15.00	20.00	100.00	100.00	2.00

4.5 Assessment and marking

There is to be one marking team for each Sub Criterion, whether it is assessed and marked by Judgement, Measurement, or both. The same marking team must assess and mark all Competitors. Where this is impracticable (for example where an action must be done by every Competitor simultaneously, and must be observed doing so), a second tier of assessment and marking will be put in place, with the approval of the Competitions Committee Management Team. The marking teams must be organized to ensure that there is no compatriot marking in any circumstances. (Section 4.6 refers.)

4.6 Assessment and marking using Judgement

Judgement uses a scale of 0-3. To apply the scale with rigour and consistency, Judgement must be conducted using:

- benchmarks (criteria) for detailed guidance for each Aspect (in words, images, artefacts, or separate guidance notes). This is documented in the Standards and Assessment Guide.
- the 0-3 scale to indicate:
  - 0: performance below industry standard
  - 1: performance meets industry standard
  - 2: performance meets and, in specific respects, exceeds industry standard
  - 3: performance wholly exceeds industry standard and is judged as excellent

Three Experts will judge each Aspect, normally simultaneously, and record their scores. A fourth Expert coordinates and supervises the scoring, and checks their validity. They also act as a judge when required to prevent compatriot marking.

4.7 Assessment and marking using Measurement

Normally three Experts will be used to assess each Aspect, with a fourth Expert supervising. In some circumstances the team may organize itself as two pairs, for dual marking. Unless otherwise stated, only the maximum mark or zero will be awarded. Where they are used, the benchmarks for awarding partial marks will be clearly defined within the Aspect. To avoid errors in calculation or transmission, the CIS provides a large number of automated calculation options, the use of which is mandated.

4.8 The use of Measurement and Judgement

Decisions regarding the choice of criteria and assessment methods will be made during the design of the competition through the Marking Scheme and Test Project.

4.9 Skill assessment strategy and procedures

WorldSkills is committed to continuous improvement including reviewing past limitations and building on good practice. The following skill assessment strategy and procedures for this skill competition take this into account and explain how the marking process will be managed.

Module A – Aircraft and System Inspection Line Maintenance

- Follow correct Aircraft inspection procedure;
- Follow Check List;
- Prepare Defect Report;
- Air Worthiness Directives and Service Bulletins;
- Teamwork;
- Task Cards;
- Use of all documents;
- Completion of reporting;
- Returning aircraft back to service;
- Area clean-up;
- Completion time;

Module B – Aircraft Metal Structure fabrication and/or Repair

- Proper use of PPE;

- All dimensions within tolerance;
- Grain direction;
- Bend radius;
- All edges smooth and nick free;
- All corners rounded to within tolerance;
- Fastener pitch;
- Edge distance;
- Fastener selection;
- Shop heads;
- Manufacturer heads;
- Surface finish/tooling damage;
- Repair carried out as per Standard Practices (AC 43-13);
- Area clean up;
- Completion time;

Module C – Aircraft Composite Inspection Repair

- All process steps have been followed satisfactorily;
- Accuracy of the written defects;
- Paperwork correctly completed;
- Proper use of Composite Repair Manual;
- Correct implementation of Manufacturer's instructions and drawings;
- Correct use of Visual and, Hammer Tap Test;
- Defect Reporting;
- Area clean up;
- Completion time;

Module D – Aircraft Avionic System Inspection Rectification

- Interpret flow charts, graphs and maintenance procedures for mechanical component systems.
- Interpreting Fault Codes;
- Use of Flow Charts;
- Correct procedure for removing and re-installing component;
- Correct "BITE" test;
- Correct use of approved documents;
- Defect reporting;
- Correct completion of document reports;
- Area clean up;
- Completion time;

Module E – Airframe Powerplant Component Inspection Rectification

- Interpreting Fault codes;
- Use of Flow Charts;
- Correct procedure for removing and re-installing component;
- Correct "BITE" Test;
- Correct use of troubleshooting processes and interpretation of results;
- Correct use of approved documents;
- Defect reporting;
- Correct completion of document reports;
- Area clean-up;
- Completion time;

This section summarizes advance information on, for example

- How assessment and marking will take their place in the Skill Management Plan
- The planned allocation of responsibilities across the Skill Management Team and Experts
- Plans for identifying Experts' capabilities for marking, and their allocation accordingly
- Any known special arrangements on account of the competition's size, structure, and other factors.
- The Chief Expert will divide the Experts into teams for purpose of marking and setting up marking schedules. Consideration is given to WorldSkills experience, language and culture;
- Each module/task/section to be completed on the assigned day so that progressive marking can take place;
- Marking is to be entered after each section has been completed, and a programme has been developed for computer calculation after time and task data has been entered;
- The Experts marking criteria and Competitor evaluation sheets for each of the modules are given to the Experts at the Competition.

5 The Test Project

5.1 General notes

Sections 3 and 4 govern the development of the Test Project. These notes are supplementary.

Whether it is a single entity, or a series of stand-alone or connected modules, the Test Project will enable the assessment of the applied knowledge, skills, and behaviours set out in each section of the WSOS.

The purpose of the Test Project is to provide full, balanced, and authentic opportunities for assessment and marking across the Standards, in conjunction with the Marking Scheme. The relationship between the Test Project, Marking Scheme, and Standards will be a key indicator of quality, as will be its relationship with actual work performance.

The Test Project will not cover areas outside the Standards or affect the balance of marks within the Standards other than in the circumstances indicated by Section 2. This Technical Description will note any issues that affect the Test Project's capacity to support the full range of assessment relative to the Standards. Section 2.1 refers.

The Test Project will enable knowledge and understanding to be assessed solely through their applications within practical work. The Test Project will not assess knowledge of WorldSkills rules and regulations.

Most Test Projects and Marking Schemes are now designed and developed independently of the Experts. They are designed and developed either by the Skill Competition Manager, or an Independent Test Project Designer, normally from C-12 months. They are subject to independent review, verification, and validation. (Section 4.1 refers.)

The information provided below will be subject to what is known at the time of completing this Technical Description, and the requirement for confidentiality.

Please refer to the current version of the Competition Rules for further details.

5.2 Format/structure of the Test Project

The Test Project is a series of five (5) standalone modules.

5.3 Test Project design requirements

Test Projects should reflect the purposes, structures, processes, and outcomes of the occupational role they are based on. They should aim to be a small-scale version of that role. Before focusing on practicalities, SMTs should show how the Test Project design will provide full, balanced, and authentic opportunities for assessment and marking across the Standards, as set out in Section 5.1.

Comply with current ICAO standards where applicable;

- Be modular;
- Be in accordance with the current Technical Description;
- Comply with WorldSkills requirements and numbering standard;
- Be accompanied by a marking scale that is finalized at the Competition;
- Be accompanied by documented proof of function/proof of construction/completion in the set time etc. as appropriate to this skill competition. This verification should be carried out by an industry subject matter expert with WorldSkills International competition experience.

5.4 Test Project coordination and development

The Test Project MUST be submitted using the templates provided by WorldSkills International (www.worldskills.org/expertcentre). Use the Word template for text documents and DWG template for drawings.

5.4.1 Test Project coordination (preparation for Competition)

Coordination of the Test Project/modules will be undertaken by the Skill Competition Manager.

5.4.2 Who develops the Test Project/modules

The Test Project/modules are developed by an Independent Test Project Designer (ITPD) in collaboration with the Skill Competition Manager.

5.4.3 When is the Test Project developed

The Test Project/modules are developed according to the following timeline:

Time	Activity
At the previous Competition	Experts can submit suggestions for possible Test Projects for the next competition through the Skill Competition Manager.
Ten (10) months prior to the Competition	The ITPD is identified and a Confidentiality Agreement between WSI and the ITPD is organized.
Three (3) months prior to the Competition	The Test Projects/modules are tested to ensure the Test Projects meet WSI standards and are certified fit for competition purpose by a WSI competition experienced industry expert.
No later than one (1) month prior to the Competition	The Test Project documents are sent to the WorldSkills International Skills Competitions Administration Manager.
At the Competition on C-4	The Test Projects/modules are presented to Experts.
At the Competition on the beginning of each module	The Test Project/modules are presented to Competitors.

5.5 Test Project initial review and verification

The purpose of a Test Project is to create a challenge for Competitors which authentically represents working life for an outstanding practitioner in an identified occupation. By doing this, the Test Project will apply the Marking Scheme and fully represent the WSOS. In this way it is unique in its context, purpose, activities, and expectations.

To support Test Project design and development, a rigorous quality assurance and design process is in place (Competition Rules sections 10.6-10.7 refer.) Once approved by WorldSkills, the Independent Test Project Designer (ITPD) is expected to identify one or more independent expert(s), and trusted individuals initially to review the Independent Test Project Designer's ideas and plans, and subsequently to verify the Test Project, prior to validation.

A Skill Advisor will ensure and coordinate this arrangement, to guarantee the timeliness and thoroughness of both initial review, and verification, based on the risk analysis that underpins Section 10.7 of the Competition Rules.

5.6 Test Project validation

The Skill Competition Manager coordinates the validation of the Test Project/modules and will ensure that it can be completed within the material, equipment, knowledge, and time constraints of Competitors.

At the Competition all Experts ensure that:

- The Test Project designs are accurate and complete;
- There are no installation requirements that cannot be completed;
- The tasks can be completed in the prescribed time of 15 to 22 hours;
- Proper function is achievable;
- The material/equipment list is accurate;

5.7 Test Project circulation

The Test Project/modules are not circulated prior to the Competition. The Test Project/modules are presented to Experts on C-4 and to Competitiors at the beginning of each module.

5.8 Test Project change

Due to the Test Project being developed by an Independent Test Project Designer (ITPD), there is no change required to be made to the Test Project/modules at the Competition. Exceptions are amendments to technical errors in the Test Project documents and according to infrastructure limitations.

5.9 Material or manufacturer specifications

Specific material and/or manufacturer specifications required to allow the Competitor to complete the Test Project will be supplied by the Competition Organizer and are available from www.worldskills.org/infrastructure located in the Expert Centre. However, note that in some cases details of specific materials and/or manufacturer specifications may remain secret and will not be released prior to the Competition. These items may include those for fault finding modules or modules not circulated.

6 Skill management and communication

6.1 Discussion Forum

Prior to the Competition, all discussion, communication, collaboration, and decision making regarding the skill competition must take place on the WorldSkills skill-specific Discussion Forum. (http://forums.worldskills.org). Skill related decisions and communication are only valid if they take place on the WorldSkills Discussion Forum. The Chief Expert (or an Expert Lead appointed by the Skill Management Team) will be the moderator for this Discussion Forum. Refer to the Competition Rules for the timeline of communication and competition development requirements.

6.2 Competitor information

All information for registered Competitors is available from the Competitor Centre (www.worldskills.org/competitorcentre).

This information includes:

- Competition Rules
- Technical Descriptions
- Mark Summary Form (where applicable)
- Test Projects (where applicable)
- Infrastructure List
- WorldSkills Health, Safety, and Environment Policy and Regulations
- Other Competition-related information

6.3 Test Projects and Marking Schemes

Circulated Test Projects will be available from www.worldskills.org/testprojects and the Competitor Centre (www.worldskills.org/competitorcentre).

6.4 Day-to-day management

The day-to-day management of the skill competition during the Competition is defined in the Skill Management Plan that is created by the Skill Management Team. The Skill Management Team comprises the Skill Competition Manager, Chief Expert, and the Expert Leads. The Skill Management Plan is progressively developed in the six (6) months prior to the Competition and finalized at the Competition. The Skill Management Plan can be viewed in the Expert Centre (www.worldskills.org/expertcentre).

6.5 General best practice procedures

General best practice procedures clearly delineate the difference between what is a best practice procedure and skill-specific rules (section 9). General best practice procedures are those where Experts and Competitors CANNOT be held accountable as a breach to the Competition Rules or skill-specific rules which would have a penalty applied as part of the Issue and Dispute Resolution procedure including the Code of Ethics and Conduct Penalty System. In some cases, general best practice procedures for Competitors may be reflected in the Marking Scheme.

Topic/task	Best practice procedure
Assessment	• All marking teams assigned by the Chief Expert will continue as a team throughout the competition. Refer to the Competition Rules for process for marking when a compatriot Competitor is being marked. The marking teams will only assess their assigned Test Projects. • All marking is completed electronically using the CIS on WorldSkills supplied tablets with a hardcopy backup. • Mandatory Assessment Training (MAT) is carried out by the Chief Expert on the morning of C-3. • The entire completed Test Project marking forms will only be available to all Experts on the evening of C4. • All required marking forms are issued in the morning of each competition day by the Chief Expert. • At the end of each day (C1 to C4) all completed marking forms shall be returned to the CIS for data entry by the Skill Assistant. • Any unsubmitted marking forms (at the end of each competition day) shall be investigated by the Chief Expert and reported to the Skill Competition Manager for further action if required.
Test Project design	• Competitor instructions are kept to a minimum of text, and that they do not exceed the available space permitted on the approved instruction sheet for any one module. • The 30% change of Test Projects modules is completed by an ITPD. • ITPD hard copies and/or electronic copies are available for translation and viewing by Competitors, Experts, and Interpreters on the morning of C-4.
Experts with Special Responsibilities (ESR)	• The Chief Expert can assign an Expert that has been at the competition two or more cycles and will assign them as the Health and Safety EL. • The Chief Expert can assign an Expert that has been at the competition two or more cycles and will assign them as the Sustainability EL. • The Chief Expert can assign an Expert that has been at the competition two or more cycles and will assign them as the Media EL. • These roles are assigned one month prior to competition by the Chief Expert on the WorldSkills Discussion Forum.
Miscellaneous	• The Competitor passport and/or identity card check is carried out by the Chief Expert on C-2. • The completed Marking Forms including the Mark Entry Acceptance Form is managed by the Chief Expert. • The Competitor assignment ballots for workstation rotation is managed by the Chief Expert. • On Familiarization Day each Competitor will receive the key to a locker in their change room. • When leaving the competition workshop, everyone must sign out and back in for any breaks during the competition days of C1, C2,

Topic/task	Best practice procedure
	C3, and C4. This includes Competitors, Experts, Chief Expert, Interpreters, Workshop Managers, and Skill Assistants. • All Experts shall make themselves available to organize and set-up their assigned workstations. • All new Experts and Interpreters must be available for a mandatory WSI orientation session on C-5.

7 Skill-specific safety requirements

7.1 Personal Protective Equipment

Refer to WorldSkills Health, Safety, and Environment Policy and Regulations for Host country or region regulations.

Task	Sturdy shoes with closed toe and heel	Safety glasses with side protection	General protective gloves	Safety shoes with protective cap	Hearing protection	Tight fitting work clothes (long trousers)	Bun cap
General PPE for safe areas	√				√ Optional		
Aircraft and System Inspection Line Maintenance		√	√	√	√ Optional	√	√
Aircraft Metal Structure fabrication and/or Repair		√	√*	√	√	√	
Aircraft Composite Inspection Repair		√	√	√	√	√	
Aircraft Avionic System Inspection Rectification		√	√ Optional	√		√	
Airframe Powerplant Component Inspection Rectification		√	√	√		√	

Task	Sturdy shoes with closed toe and heel	Safety glasses with side protection	General protective gloves	Safety shoes with protective cap	Hearing protection	Tight fitting work clothes (long trousers)	Bun cap
Certification and Return to Service Procedure				√			

** Protective gloves should not be worn when handling rotating handtools or machinery (eg hand drill).*

8 Materials and equipment

8.1 Infrastructure List

The Infrastructure List details all equipment, materials, and facilities provided by the Competition Organizer.

The Infrastructure List is available at www.worldskills.org/infrastructure.

The Infrastructure List specifies the items and quantities requested by the Skill Management Team for the next Competition. The Competition Organizer will progressively update the Infrastructure List specifying the actual quantity, type, brand, and model of the items. Note that in some cases details of specific materials and/or manufacturer specifications may remain secret and will not be released prior to the Competition. These items may include those for fault finding modules or modules not circulated.

At each Competition, the Skill Management Team must review and update the Infrastructure List in preparation for the next Competition. The Skill Competition Manager must advise the Director of Skills Competitions of any increases in space and/or equipment.

At each Competition, the Technical Observer must audit the Infrastructure List that was used at that Competition for the upcoming WorldSkills Competition.

The Infrastructure List does not include items that Competitors and/or Experts are required to bring and items that Competitors are not allowed to bring – they are specified below.

8.2 Competitors toolbox

Competitors are not allowed to send a toolbox to the Competition. All tools are provided by the Competition Organizer.

8.3 Materials, equipment, and tools supplied by Competitors

It is not applicable for Competitors to bring materials, equipment, and tools to the Competition.

However, Competitors are required to supply their own Personal Protective Equipment as specified in section 7 skill-specific safety requirements.

Furthermore, they may bring their flashlights/torches.

8.4 Materials, equipment, and tools supplied by Experts

Experts are required to supply their own Personal Protective Equipment as specified in section 7 skill-specific safety requirements.

Experts are responsible that Interpreters bring their PPE.

8.5 Materials and equipment prohibited in the skill area

Competitors and Experts are prohibited to bring any materials or equipment not listed in section 8.3 and section 8.4.

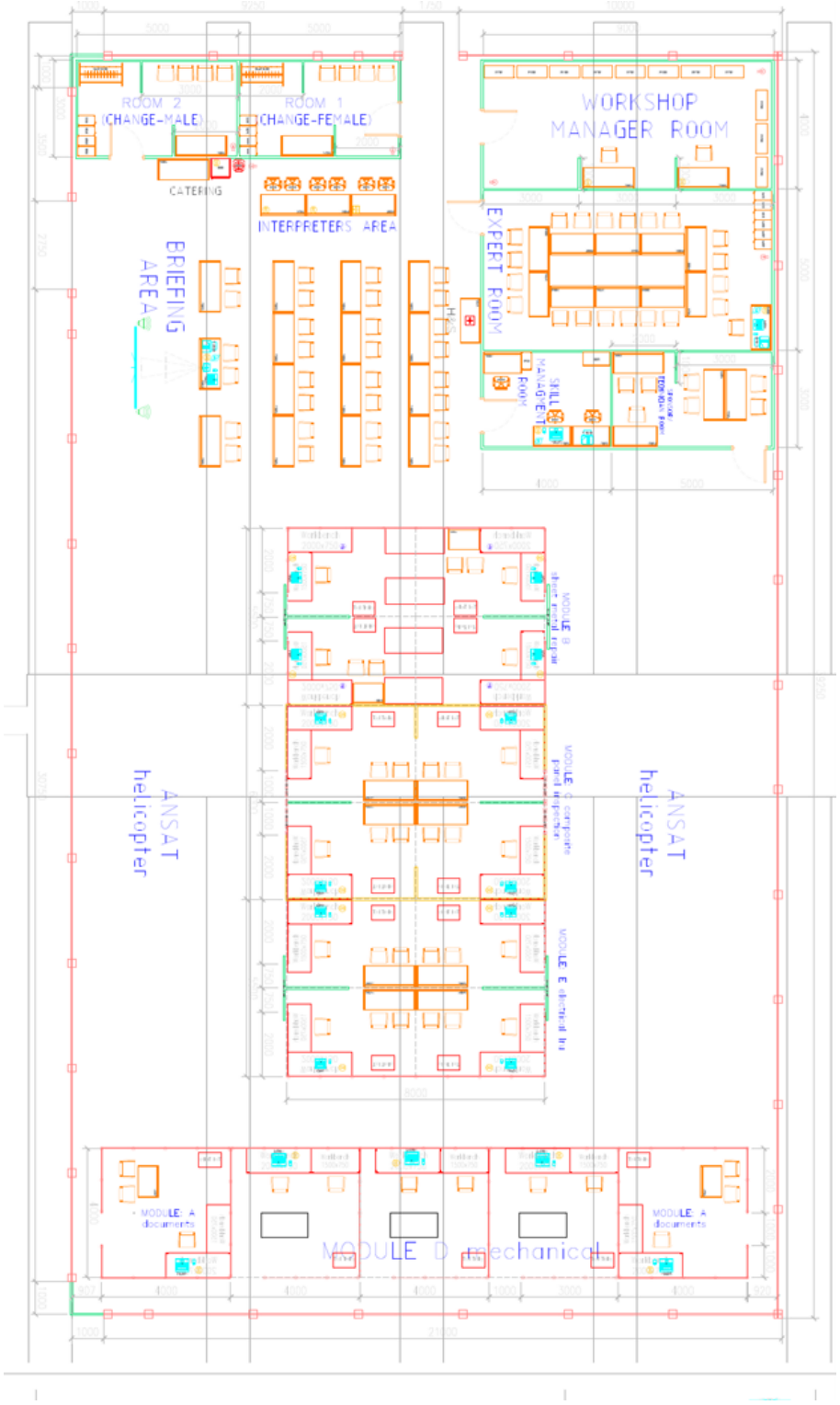
Furthermore it is forbidden to bring:

- Storage device;
- Programmable calculator;
- Any CD, floppy disk, flash memory, or any other recording equipment.

8.6 Proposed workshop and workstation layouts

Workshop layouts from previous competitions are available at www.worldskills.org/sitelayout.

Example workshop layout



9 Skill-specific rules

9.1 General notes

Skill-specific rules cannot contradict or take priority over the Competition Rules. They do provide specific details and clarity in areas that may vary from skill competition to skill competition. This includes but is not limited to personal IT equipment, data storage devices, Internet access, procedures and workflow, and documentation management and distribution. Breaches of these rules will be solved according to the Issue and Dispute Resolution procedure including the Code of Ethics and Conduct Penalty System.

9.2 Skill-specific rules

Topic/task	skill-specific rule
Use of technology – personal laptops, tablets mobile phones and electronic storage devices	• Skill Competition Manager, Chief Expert, Competitors, and Experts are not allowed to bring personal laptops, tablets, mobile phones, or electronic storage devices into the workshop from C-4 to C 4. The exception to this is a group photo opportunity in the workshop at the conclusion of competition on C4 with the permission of the Skill Competition Manager. • Interpreters are able to use their personal laptops for translation purposes only and are restricted to the Interpreters designated seating area. • If these items are brought into the workshop they must remain in the personal locker when not in use. These can only be removed at the end of each day. • Skill Competition Manager, Chief Expert, Competitors, and Experts are allowed to have their personal electric devices at lunchtime except when the Competitor and/or compatriot Expert are scheduled for a fault-finding module in the afternoon. • All personnel are allowed to take their personal devices home (at the end of the competition day) in the evening, however, there shall be no photographs or videos allowed of any competition areas when arriving or departing the workshop.
Use of technology – personal photo and video taking devices	• Skill Competition Manager, Chief Expert, Competitors, Experts, and Interpreters are only allowed to use personal photo and video taking devices in the workshop at the conclusion of the competition on C4. • Experts are allowed to use a dedicated camera and memory device provided by the Competition Organizer as required for the marking process. These must be approved by the Chief Expert.
Templates, aids, etc.	• Competitors are not allowed to bring templates and aids to the Competition nor are they allowed to fabricate templates or aids at the Competition that may give them an unfair advantage. This rule applies to C-1 until the end of C4.

Topic/task	skill-specific rule
Drawings, recording information	• Competitors are not allowed to bring any prepared drawings or documented information to the Competition from C-2 until C4.

10 Visitor and media engagement

10.1 Engagement methods

Following is a list of possible ways to maximize visitor and media engagement:

- Try-a-Skill;
- Display screens;
- Test Project descriptions;
- Enhanced understanding of Competitor activity;
- Competitor profiles;
- Career opportunities;
- Daily reporting of competition status – all results may be displayed in the Competition area as per previous Competitions. This is of the progressive marking for all sections of the Competition and will display the current total aggregate result per country/region.

11 Sustainability

11.1 Sustainable practices

This skill competition will focus on the sustainable practices below:

- Recycling;
- Use of “green” materials;
- Minimization of material wastage;
- Reducing paper consumption;
- Embrace a workplace that encourages diversity and inclusivity.

12 References for industry consultation

12.1 General notes

WorldSkills is committed to ensuring that the WorldSkills Occupational Standards fully reflect the dynamism of internationally recognized best practice in industry and business. To do this WorldSkills approaches a number of organizations across the world that can offer feedback on the draft Description of the Associated Role and WorldSkills Occupational Standards on a two-yearly cycle.

In parallel to this, WSI consults three international occupational classifications and databases:

- ISCO-08: (http://www.ilo.org/public/english/bureau/stat/isco/isco08/)
- ESCO: (https://ec.europa.eu/esco/portal/home)
- O*NET OnLine (www.onetonline.org/)

12.2 References

This occupation most closely relates to Aircraft maintenance technician:
http://data.europa.eu/esco/occupation/91373a70-79b6-47a2-aa50-07dfe20dd258.

and Aircraft Mechanics and Service Technicians:
https://www.onetonline.org/link/summary/49-3011.00 .

These links can be used to explore adjacent occupations.

ILO 7232

The following table indicates which organizations were approached and provided valuable feedback for the Description of the Associated Role and WorldSkills Occupational Standards in place for WorldSkills Lyon 2024.

Organization	Contact name
SAAB	Jonathan Björnermark, Maintenance production manager
STARS Air Rescue Service	Ryan Gillis, Aircraft Maintenance Engineer - Line

13 Appendix

13.1 Appendix information

Not applicable.