Key Skills and Competences for Defence

EDA contract reference: 14.CPS.OP.030

Annex D

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The work described in this report was carried out under EDA contract. Responsibility for the contents resides with the organisation that prepared it.

RAND Europe

RR-1226/3-EDA
10 March 2015

Annex D - Taxonomy of Key Skills and Competences

This Annex accompanies Chapter 2 and Chapter 4 and provides detailed information on the literature search process which led to the identification of appropriate sources for the development of taxonomies for each defence domain. It then contains a full taxonomy for each defence domain, namely:

- Air
- Land
- Naval
- Complex Weapons
- Cyber C4ISTAR
- Space

It also provides the detailed assessment of what skills and competences are specialist for defence.

Lastly, it provides a graphical representation of key skills and competences relevant for the current and future EDA Priority Areas.

1.1. Details on the literature review process underpinning the development of taxonomies

The literature review process was conducted at the start of the taxonomy development as follows:

- We did not impose any timeframe limitations when searching for relevant sources
- We reviewed top 100 results by database relevance criterion
- We did not assess publications by quality
- We did not limit the scope to any particular geographic region
- We excluded duplicates

The following sections first lists the search strings used during literature review to identify appropriate sources for development of taxonomy. Next, we provide a set of summary tables depicting the number of relevant hits within key databases searched in the literature review process, that is: Military Collection (ProQuest); DTIC (Defense Technical Information Center) and Web of Science.

To conduct the search through the databases identified, we used the following search strings of terms to generate hits/identify appropriate sources for review.

Defence

Generic

1. ((“military” OR “defence”) AND (“taxonomy” OR “skill* tree” OR ”skill* family”))

Management

2. ((“military” OR “defence”) AND (“management”) AND (“taxonomy” OR “skill* tree” OR ”skill* family”))

R&D and T&E

3. ((“military” OR “defence”) AND (“R&D” OR “research” OR “development” OR “design” OR “test” OR “evaluation”) AND (“taxonomy” OR “skill* tree” OR ”skill* family”))

Manufacture

4. ((“military” OR “defence”) AND (“manufacture” OR “construction”) AND (“taxonomy” OR “skill* tree” OR ”skill* family”))

Maintenance

5. ((“military” OR “defence”) AND (“maintenance”) AND (“taxonomy” OR “skill* tree” OR ”skill* family”))

Disposal

6. ((“military” OR “defence”) AND (“disposal”) AND (“taxonomy” OR “skill* tree” OR ”skill* family”))

Air

Generic

1. (((“military” OR “defence”) AND (“air force” OR “aerial warfare”)) AND (“taxonomy” OR “skill* tree” OR ”skill* family”))

Management

2. (((“military” OR “defence”) AND (“air force” OR “aerial warfare”)) AND (“management”) AND (“taxonomy” OR “skill* tree” OR ”skill* family”))

R&D and T&E

3. (((“military” OR “defence”) AND (“air force” OR “aerial warfare”)) AND (“R&D” OR “research” OR “development” OR “design” OR “test” OR “evaluation”) AND (“taxonomy” OR “skill* tree” OR ”skill* family”))

Manufacture

4. (((“military” OR “defence”) AND (“air force” OR “aerial warfare”)) AND (“manufacture” OR “construction”) AND (“taxonomy” OR “skill* tree” OR ”skill* family”))

Maintenance

5. (((“military” OR “defence”) AND (“air force” OR “aerial warfare”)) AND (“maintenance”) AND (“taxonomy” OR “skill* tree” OR ”skill* family”))

Disposal

6. (((“military” OR “defence”) AND (“air force” OR “aerial warfare”)) AND (“disposal”) AND (“taxonomy” OR “skill* tree” OR ”skill* family”))

Land

Generic

1. (((“military” OR “defence”) AND (“army”)) AND (“taxonomy” OR “skill* tree” OR ”skill* family”))

Management

2. (((“military” OR “defence”) AND (“army”)) AND (“management”) AND (“taxonomy” OR “skill* tree” OR ”skill* family”))

R&D and T&E

3. (((“military” OR “defence”) AND (“army”)) AND (“R&D” OR “research” OR “development” OR “design” OR “test” OR “evaluation”) AND (“taxonomy” OR “skill* tree” OR ”skill* family”))

Manufacture

4. (((“military” OR “defence”) AND (“army”)) AND (“manufacture” OR “construction”) AND (“taxonomy” OR “skill* tree” OR ”skill* family”))

Maintenance

5. (((“military” OR “defence”) AND (“army”)) AND (“maintenance”) AND (“taxonomy” OR “skill* tree” OR ”skill* family”))

Disposal

6. (((“military” OR “defence”) AND (“army”)) AND (“disposal”) AND (“taxonomy” OR “skill* tree” OR ”skill* family”))

Maritime

Generic

1. (((“military” OR “defence”) AND (“navy” OR “naval capability*”)) AND (“taxonomy” OR “skill* tree” OR ”skill* family”)

Management

2. (((“military” OR “defence”) AND (“navy” OR “naval capability*”)) AND (“management”) AND (“taxonomy” OR “skill* tree” OR ”skill* family”))

R&D and T&E

3. (((“military” OR “defence”) AND (“navy” OR “naval capability*”)) AND (“R&D” OR “research” OR “development” OR “design” OR “test” OR “evaluation”) AND (“taxonomy” OR “skill* tree” OR ”skill* family”))

Manufacture

4. (((“military” OR “defence”) AND (“navy” OR “naval capability*”)) AND (“manufacture” OR “construction”) AND (“taxonomy” OR “skill* tree” OR ”skill* family”))

Maintenance

5. (((“military” OR “defence”) AND (“navy” OR “naval capability*”)) AND (“maintenance”) AND (“taxonomy” OR “skill* tree” OR ”skill* family”))

Disposal

6. (((“military” OR “defence”) AND (“navy” OR “naval capability*”)) AND (“disposal”) AND (“taxonomy” OR “skill* tree” OR ”skill* family”))

C4ISTAR

Generic

1. (((“military” OR “defence”) AND (“communications” OR “surveillance” OR “reconnaissance”)) AND (“taxonomy” OR “skill* tree” OR ”skill* family”))

Management

2. (((“military” OR “defence”) AND (“communications” OR “surveillance” OR “reconnaissance”)) AND (“management”) AND (“taxonomy” OR “skill* tree” OR ”skill* family”))

R&D and T&E

3. (((“military” OR “defence”) AND (“communications” OR “surveillance” OR “reconnaissance”)) AND (“R&D” OR “research” OR “development” OR “design” OR “test” OR “evaluation”) AND (“taxonomy” OR “skill* tree” OR ”skill* family”))

Manufacture

4. (((“military” OR “defence”) AND (“communications” OR “surveillance” OR “reconnaissance”)) AND (“manufacture” OR “construction”) AND (“taxonomy” OR “skill* tree” OR ”skill* family”))

Maintenance

5. (((“military” OR “defence”) AND (“communications” OR “surveillance” OR “reconnaissance”)) AND (“maintenance”) AND (“taxonomy” OR “skill* tree” OR ”skill* family”))

Disposal

6. (((“military” OR “defence”) AND (“communications” OR “surveillance” OR “reconnaissance”)) AND (“disposal”) AND (“taxonomy” OR “skill* tree” OR ”skill* family”))

Complex weapons systems

Generic

1. (((“military” OR “defence”) AND (“guided” AND “weapon*”)) AND (“taxonomy” OR “skill* tree” OR ”skill* family”))

Management

2. (((“military” OR “defence”) AND (“guided” AND “weapon*”)) AND (“management”) AND (“taxonomy” OR “skill* tree” OR ”skill* family”))

R&D and T&E

3. (((“military” OR “defence”) AND (“guided” AND “weapon*”)) AND (“R&D” OR “research” OR “development” OR “design” OR “test” OR “evaluation”) AND (“taxonomy” OR “skill* tree” OR ”skill* family”))

Manufacture

4. (((“military” OR “defence”) AND (“guided” AND “weapon*”)) AND (“manufacture” OR “construction”) AND (“taxonomy” OR “skill* tree” OR ”skill* family”))

Maintenance

5. (((“military” OR “defence”) AND (“guided” AND “weapon*”)) AND (“maintenance”) AND (“taxonomy” OR “skill* tree” OR ”skill* family”))

Disposal

6. (((“military” OR “defence”) AND (“guided” AND “weapon*”)) AND (“disposal”) AND (“taxonomy” OR “skill* tree” OR ”skill* family”))

1.2. Domain-specific taxonomies

The next section contains the detailed taxonomies by defence domain, structured along four descending layers: The taxonomies have been structured into four descending layers:

- **Lifecycle** – the stage at which a skill or competence is used in the development and maturation of a defence capability;
- **Functional competence group** – the overarching skills groups comprising each lifecycle;
- **Occupation** – the technological and engineering occupations which make up each functional competence group;
- **Skills coverage** – an indicative breakdown of the typical coverage comprising each occupation.

In Table D.1 we present the taxonomy structure by platform and a set of illustrative examples of specific equipment types.

Table D.1. Taxonomy structure by defence with illustrative equipment examples

Defence domain	Platform	Examples
Air	Air defence fighters	F-16, MiG-29, Rafale, Typhoon
	Interdiction aircraft	Rafale, Typhoon, Gripen, Panavia Tornado
	Air support	Su-22, AMX A-11 Ghibli
	Air to air refuelling	Airbus A330 MRTT, Boeing KC-767
	Tactical and strategic lift	A400M, C27J Spartan, CASA/IPTN CN-235, C17 Globemaster, C-130E/J Hercules
	Airborne early warning	E3D Sentry, Raptor
	Rotary	NH90, AW101, Merlin, Puma/ Super Puma, Eurocopter 232, Sikorsky CH-53G
Land	A Vehicle (armoured/combat vehicles)	Challenger II, Leopard 2 A4-A6M, AMX-30B, Leclerc, T-72, AMX10, VAB, Panhard VCR, BVS10 Viking, FV512 Warrior Armoured Repair Vehicle
	B Vehicle (logistics vehicles)	AHSVS 8x8 Truck, Panther CLV 4x4 utility vehicle, PVP armoured utility vehicle, TILOS VTL armoured logistics vehicle, Leyland DROPS, MAN support vehicle
	C Vehicle (engineering/plant vehicles)	M300 crane, JCB 390 Forklift, Unimog 416 Tractor
	Support weapons / Small arms / Artillery	L85A2 Assault Rifle, Bereta ARX-160, FN2000, L118 light gun

	Personal systems	Osprey body armour, M7 helmet, SPECTRA Helmet, FELIN load carrying equipment, Aramid helmet
Naval	Carriers	Queen Elizabeth class, Cavour, Charles de Gaulle, Garibaldi, Principle de Asturias
	Cruisers / Destroyers	Type 45 Daring
	Frigates	T23 Duke class, T26 Global Combat Ship, Thetis Class, FREMM European Multi-mission Frigate , Artigliere, Cassard, De Zeven Provincien, F100 Alvaro de Bazan, F122 Bremen
	Offshore patrol vessels	Buques de Acción Marítima Class Patrol Vessels, Commandante Class Patrol Ships, Holland Class Offshore Patrol Vessels, L'Adroit Offshore Patrol Vessel, Orkan Class Fast Attack Craft
	Coastal patrol vessels	River, Minerva Class Corvette, K130 Braunschweig Class Corvette
	Amphibious / Landing craft	Albion Class LPD, Foudre , Mistral, Juan Carlos, Rotterdam
	Auxiliary	Galacia, Wave Knight, Bay Class, Absalon, Berlin, CB90, Durance, Echo, Etna, Jason
	Nuclear submarine	Vanguard, Trafalgar
	Non-nuclear submarine	Agosta, Scorpene, Gotland, Walrus, U212 / U214, S-80
Complex Weapons	Guided precision weapons	Storm Shadow, Meteor (BVRAAM), NG LGB (Griffin 3)
C4ISTAR	Cyber-C4ISTAR	M600, AMASCOS, Maigret 580, SERO 14
Space	Space	Skynet V, Helios 2, Syracuse 3B, SICRAL-2

1.3. Identification of specialist skills for defence

When assessing the degree of **specialisation to the defence** sector of the skills/competences in the taxonomy, the expert group used the following scale:

Low – Commonly available and used in defence; this is a skill/competence that is widely used in the defence and other sectors; it is fully transferable

Medium – Widely used by defence; this is a skill/competence that is used widely in defence and to an extent in the civil sector

Medium / High – Specialised for defence; this is a skill/competence that is used in the defence sector and requires an extensive background in defence engineering

High – Unique to defence; this is a skill/competence that is only used in the defence sector

In the following pages, we present a ranking of defence relevance of skills within each defence domain. These ranking are averages of the rankings provided by the expert reviewers and have been informed by the assessment presented by industry on the criticality of skills. In the following tables, we present an overall ranking of skills by their uniqueness to defence. Occupations which are likely to experience skills gaps (referred to in Chapter 3, Table 3.2) are highlighted in **dark blue**.

Air - Air defence

Table D.2. Air – Air defence. Lifecycle stage: Management

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Programme management	Project manager	Performance management, cost management, risk management, contract management, requirements management, technical management, supply chain management	Low
	Planning and production support engineer	Strategic planning, work flow management	Low
	Cost estimator	Cost modelling, learner rates, three point estimating	Low
	Procurement officer	Market research, market assessment, financial management	Medium

Table D.3. Air – Air defence. Lifecycle stage: Design, Engineering and Manufacture

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Design	Design engineer	Concept design, requirements engineering, interoperability	Med/high
	Detail and installation designer	Components, sub-assemblies, installation	Med/high
	Draughtsman and CAD designer	Electrical and control, mechanical, simulation	Medium
Systems engineering and design	Air vehicle flight systems – electrical engineer	Electrical (generation and distribution), conversion, utilities control system, digital electronics	Med/high
	Air vehicle systems – mechanical engineer	Propulsion and secondary power, flight control, hydraulic, pneumatic, conditioning and fuel, landing gear, life support, aircrew equipment, crew escape, utilities control system, flight sensors and displays	Med/high
	Air vehicle avionics systems engineer	Avionics architecture and integration, navigation, autopilot, flight management, displays and controls, communications	Med/high

	Electromagnetic compatibility engineer	Design configuration, electromagnetic spectrum management	Med/high
	Mission systems engineer	Defensive aids, electronic support measures, attack and identification, communications, sensor data fusion, data security, mission support/planning systems, networking and battlespace management, signal processing, payload data processing, payload data processing	High
	Low-observability engineer	Signature measurement, stealth engineering, vulnerability, susceptibility, detectability	High
	Software designer	Software requirements definition, design, evaluation and integration, algorithms, prognostics, diagnostics, structural modelling, information assurance, network defence	Medium
	Interoperability engineer	System technical capabilities and interfaces	Med/high
	Design validation engineer	Performance analysis, threat analysis, test validation planning, scenario validation, design verification[1]	Med/high
	Whole systems integration engineer	Tracking and systems evaluation, engineering management, configuration management, integration of systems, systems architecture, human factors engineering, risk management, optimisation, reliability, systems security	Med/high
Platform engineering	Aerostructures engineer	Materials technology, structural design, strength, fatigue, mass, aeroelasticity, stealth materials	Med/high
	Air vehicle dynamics engineer	Aerodynamics, stability and control, stores release and jettison, performance, stealth shaping, wind tunnel testing	Med/high
Powerplant engineering	Structure engineer	Casing, rotors, stator, strength, fatigue, rotor dynamics, shafts, transmissions, intakes, exhaust	Med/high
	Fluid dynamics and combustion engineer	Airflows, rotor/stator blade design, combustion system, reheat system, thrust/weight ratio	Med/high

[1] Within the defence sector, design validation and verification tend to be regarded as two distinct processes ensuring respectively that the correct systems/capabilities are being designed and that the systems/capabilities are being designed in the correct manner.

	Materials engineer	High temperatures, stealth, nickel and titanium alloys, composites	Med/high
	Electrical systems engineer	Architecture, generation, conversion, distribution and storage	Medium
	Mechanical systems engineer	Friction reduction, thermal efficiency, air flows	Medium
	Control systems engineer	Full Authority Digital Engine Control, accessories and services	Medium
Unmanned air system (UAS) engineering	Autonomy engineer	Digital decision-making, imagery analysis	Med/high
	Operational governance engineer	Flight certification	Med/high
Manufacture	Production engineer	Manufacturing technology	Medium
	Jig and tool designer	Tooling design	Medium
	Composite fabrication engineer	Composite details, assemblies	Medium
	Electrical installation engineer	Engineering, construction, control systems	Medium
	Specialist manufacture and machining engineer	Precision mechanical, heavy machining, technical data	Medium
Integrated test, evaluation and acceptance	Platform test engineer	Structural test and laboratories, rig testing, system quality testing, platform pre-flight and production build testing, structural integrity, test equipment	Med/high
	Systems test engineer	Technical scheduling, collation, analysis	Med/high

Table D.4. Air – Air defence. Lifecycle stage: In-service Support

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Synthetic environment	Synthetic environments engineer	Flight simulation, operational evaluation, modelling	Med/high
Logistics and service management	Safety and governance manager	System safety engineering, operational worthiness, standards implementation, safe and suitable for service testing, flight certification	Med/high
	Fleet services manager	Through-life fleet/capability management	Medium
	Support services manager	Inventory, supply chain and obsolescence management, support cost optimisation, technical publications	Medium
	Sustainability manager	Reliability, ability to test, ability to maintain, interoperability	Medium
Operations	Flight operations manager	Management, planning, flying, air-to-air refuelling	High
	Airfield operations manager	Service provision airfield operation	Medium
Field support	Training design and delivery manager	Aircrew, maintainer and operational training, tools, manuals, aids, training systems	Medium
	Maintenance engineer	Maintenance Approved Organisation Scheme equivalence, avionics, mechanical, propulsion and weapons technicians, diagnostics	Med/high

Table D.5. Air – Air defence. Lifecycle stage: Disposal

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Disposal	Compliance officer	Environmental compliance, regulatory, reuse/recycling	Medium
	Make-safe engineer	Removal of sensitive components/sub-systems	Med/high
	Decommissioning officer	Demilitarisation	High

Air - Interdiction

Table D.6. Air – Interdiction. Lifecycle stage: Management

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Programme management	Project manager	Performance management, cost management, risk management, contract management, requirements management, technical management, supply chain management	Low
	Planning and production support engineer	Strategic planning, work flow management	Low
	Cost estimator	Cost modelling, learner rates, three point estimating	Low
	Procurement officer	Market research, market assessment, financial management	Medium

Table D.7. Air – Interdiction. Lifecycle stage: Design, Engineering and Manufacture

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Design	Design engineer	Concept design, requirements engineering, interoperability	Med/high
	Detail and installation designer	Components, sub-assemblies, installation	Med/high
	Draughtsman and CAD designer	Electrical and control, mechanical, simulation	Medium
Systems engineering and design	Air vehicle flight systems – electrical engineer	Electrical (generation and distribution), conversion, utilities control system, digital electronics	Med/high
	Air vehicle systems – mechanical engineer	Propulsion and secondary power, flight control, hydraulic, pneumatic, conditioning and fuel, landing gear, life support, aircrew equipment, crew escape, utilities control system, flight sensors and displays	Med/high
	Air vehicle avionics	Avionics architecture and integration, navigation,	Med/high

	systems engineer	autopilot, flight management, displays and controls, communications	
	Electromagnetic compatibility engineer	Design configuration, electromagnetic spectrum management	Med/high
	Mission systems engineer	Defensive aids, electronic support measures, attack and identification, communications, sensor data fusion, data security, mission support/planning systems, networking and battlespace management, signal processing, payload data processing	High
	Low-observability engineer	Signature measurement, stealth engineering, vulnerability, susceptibility, detectability	High
	Software designer	Software requirements definition, design, evaluation and integration, algorithms, prognostics, diagnostics, structural modelling, information assurance, network defence	Medium
	Interoperability engineer	System technical capabilities and interfaces	Med/high
	Design validation engineer	Performance analysis, threat analysis, test validation planning, scenario validation, design verification	Med/high
	Whole systems integration engineer	Tracking and systems evaluation, engineering management, configuration management, integration of systems, systems architecture, human factors engineering, risk management, optimisation, reliability, systems security	Med/high
Platform engineering	Aerostructures engineer	Materials technology, structural design, strength, fatigue, mass, aeroelasticity, stealth materials	Med/high
	Air vehicle dynamics engineer	Aerodynamics, stability and control, stores release and jettison, performance, stealth shaping, wind tunnel testing	Med/high
Powerplant engineering	Structure engineer	Casing, rotors, stator, strength, fatigue, rotor dynamics, shafts, transmissions, intakes, exhaust	Med/high
	Fluid dynamics and combustion engineer	Airflows, rotor/stator blade design, combustion system, reheat system, thrust/weight ratio	Med/high
	Materials engineer	High temperatures, stealth, nickel and titanium alloys, composites	Med/high

	Electrical systems engineer	Architecture, generation, conversion, distribution and storage	Medium
	Mechanical systems engineer	Friction reduction, thermal efficiency, air flows	Medium
	Control systems engineer	Full Authority Digital Engine Control, accessories and services	Medium
Unmanned air system (UAS) engineering	Autonomy engineer	Digital decision-making, imagery analysis	Med/high
	Operational governance engineer	Flight certification	Med/high
Manufacture	Production engineer	Manufacturing technology	Medium
	Jig and tool designer	Tooling design	Medium
	Composite fabrication engineer	Composite details, assemblies	Medium
	Electrical installation engineer	Engineering, construction, control systems	Medium
	Specialist manufacture and machining engineer	Precision mechanical, heavy machining, technical data	Medium
Integrated test, evaluation and acceptance	Platform test engineer	Structural test and laboratories, rig testing, system quality testing, platform pre-flight and production build testing, structural integrity, test equipment	Med/high
	Systems test engineer	Technical scheduling, collation, analysis	Med/high

Table D.8. Air – Interdiction. Lifecycle stage: In-service Support

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Synthetic environment	Synthetic environments engineer	Flight simulation, operational evaluation, modelling	Med/high
Logistics and service management	Safety and governance manager	System safety engineering, operational worthiness, standards implementation, safe and suitable for service testing, flight certification	Med/high
	Fleet services manager	Through-life fleet/capability management	Medium
	Support services manager	Inventory, supply chain and obsolescence management, support cost optimisation, technical publications	Medium
	Sustainability manager	Reliability, ability to test, ability to maintain, interoperability	Medium
Operations	Flight operations manager	Management, planning, flying, air-to-air refuelling	High
	Airfield operations manager	Service provision airfield operation	Medium
Field support	Training design and delivery manager	Aircrew, maintainer and operational training, tools, manuals, aids, training systems	Medium
	Maintenance engineer	Maintenance Approved Organisation Scheme equivalence, avionics, mechanical, propulsion and weapons technicians, diagnostics	Med/high

Table D.9. Air – Interdiction. Lifecycle stage: Disposal

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Disposal	Compliance officer	Environmental compliance, regulatory, reuse/recycling	Medium
	Make-safe engineer	Removal of sensitive components/sub-systems	Med/high
	Decommissioning officer	Demilitarisation	High

Air – Close Air Support Jet Aircraft

Table D.10. Air – Close Air Support Jet Aircraft. Lifecycle stage: Management

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Programme management	Project manager	Performance management, cost management, risk management, contract management, requirements management, technical management, supply chain management	Medium
	Planning and production support engineer	Strategic planning, work flow management	Low
	Cost estimator	Cost modelling, learner rates, three point estimating	Low
	Procurement officer	Market research, market assessment, financial management	Medium

Table D.11. Air – Close Air Support Jet Aircraft. Lifecycle stage: Design, Engineering and Manufacture

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Design	Design engineer	Concept design, requirements engineering, interoperability	Med/high
	Detail and installation designer	Components, sub-assemblies, installation	Medium
	Draughtsman and CAD designer	Electrical and control, mechanical, simulation	Low
Systems engineering and design	Air vehicle flight systems – electrical engineer	Electrical (generation and distribution), conversion, utilities control system, digital electronics	Medium
	Air vehicle systems – mechanical engineer	Propulsion and secondary power, flight control, hydraulic, pneumatic, conditioning and fuel, landing gear, life support, aircrew equipment, crew escape, utilities control system, flight sensors and displays	Medium
	Air vehicle avionics	Avionics architecture and integration, navigation, autopilot, flight management, displays and	Medium

	systems engineer	controls, communications	
	Electromagnetic compatibility engineer	Design configuration, electromagnetic spectrum management	Medium
	Mission systems engineer	Defensive aids, electronic support measures, attack and identification, communications, sensor data fusion, data security, mission support/planning systems, networking and battlespace management, signal processing, payload data processing	Med/high
	Low-observability engineer	Signature measurement, stealth engineering, vulnerability, susceptibility, detectability	High
	Software designer	Software requirements definition, design, evaluation and integration, algorithms, prognostics, diagnostics, structural modelling, information assurance, network defence	Medium
	Interoperability engineer	System technical capabilities and interfaces	Med/high
	Design validation engineer	Performance analysis, threat analysis, test validation planning, scenario validation, design verification	Medium
	Whole systems integration engineer	Tracking and systems evaluation, engineering management, configuration management, integration of systems, systems architecture, human factors engineering, risk management, optimisation, reliability, systems security	Medium
Platform engineering	Aerostructures engineer	Materials technology, structural design, strength, fatigue, mass, aeroelasticity, stealth materials	Med/high
	Air vehicle dynamics engineer	Aerodynamics, stability and control, stores release and jettison, performance, stealth shaping, wind tunnel testing	Med/high
Powerplant engineering	Structure engineer	Casing, rotors, stator, strength, fatigue, rotor dynamics, shafts, transmissions, intakes, exhaust	Medium
	Fluid dynamics and combustion engineer	Airflows, rotor/stator blade design, combustion system, reheat system, thrust/weight ratio	Med/high
	Materials engineer	High temperatures, nickel and titanium alloys, composites	Low
	Electrical systems	Architecture, generation, conversion, distribution	Medium

	engineer	and storage	
	Mechanical systems engineer	Friction reduction, seals, thermal efficiency, air flows	Low
	Control systems engineer	Full Authority Digital Engine Control, accessories and services	Low
Unmanned air system (UAS) engineering	Autonomy engineer	Digital decision-making, imagery analysis	Med/high
	Operational governance engineer	Flight certification	Med/high
Manufacture	Production engineer	Manufacturing technology	Low
	Jig and tool designer	Tooling design	Low
	Composite fabrication engineer	Composite details, assemblies	Low
	Electrical installation engineer	Engineering, construction, control systems	Low
	Specialist manufacture and machining engineer	Precision mechanical, heavy machining, technical data	Low
Integrated test, evaluation and acceptance	Platform test engineer	Structural test and laboratories, rig testing, system quality testing, platform pre-flight and production build testing, structural integrity, test equipment	Low
	Systems test engineer	Technical scheduling, collation, analysis	Medium

Table D.12. Air – Close Air Support Jet Aircraft. Lifecycle stage: In-service Support

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Synthetic environment	Synthetic environments engineer	Flight simulation, operational evaluation, modelling	Medium
Logistics and service management	Safety and governance manager	System safety engineering, operational worthiness, standards implementation, safe and suitable for service testing, flight certification	Medium
	Fleet services manager	Through-life fleet/capability management	Medium
	Support services manager	Inventory, supply chain and obsolescence management, support cost optimisation, technical publications	Low
	Sustainability manager	Reliability, ability to test, ability to maintain, interoperability	Low
Operations	Flight operations manager	Management, planning, flying, air-to-air refuelling	Med/high
	Airfield operations manager	Service provision airfield operation	Medium
Field support	Training design and delivery manager	Aircrew, maintainer and operational training, tools, manuals, aids, training systems	Medium
	Maintenance engineer	Maintenance Approved Organisation Scheme equivalence, avionics, mechanical, propulsion and weapons technicians, diagnostics	Low

Table D.13. Air – Close Air Support Jet Aircraft. Lifecycle stage: Disposal

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Disposal	Compliance officer	Environmental compliance, regulatory, reuse/recycling	Low
	Make-safe engineer	Removal of sensitive components/sub-systems	Med/high
	Decommissioning officer	Demilitarisation	Med/high

Air – Air-to-Air Refuelling

Table D.14. Air – Air-to-Air Refuelling. Lifecycle stage: Management

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Programme management	Project manager	Performance management, cost management, risk management, contract management, requirements management, technical management, supply chain management	Medium
	Planning and production support engineer	Strategic planning, work flow management	Low
	Cost estimator	Cost modelling, learner rates, three point estimating	Low
	Procurement officer	Market research, market assessment, financial management	Medium

Table D.15. Air – Air-to-Air Refueling. Lifecycle stage: Design, Engineering and Manufacture

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Design	Design engineer	Concept design, requirements engineering	Med/high
	Detail and installation designer	Components, sub-assemblies, installation	Medium
	Draughtsman and CAD designer	Electrical and control, mechanical, simulation	Low
Systems engineering and design	Air vehicle flight systems – electrical engineer	Electrical (generation and distribution), conversion, utilities control system, digital electronics	Medium
	Air vehicle systems – mechanical engineer	Propulsion and secondary power, flight control, hydraulic, pneumatic, conditioning and fuel, landing gear, life support, aircrew equipment, crew escape, utilities control system, flight sensors and displays	Medium
	Air vehicle avionics systems engineer	Avionics architecture and integration, navigation, autopilot, flight management, displays and controls, communications	Medium
	Electromagnetic	Design configuration, electromagnetic spectrum	Medium

	compatibility engineer	management	
	Mission systems engineer	Defensive aids, electronic support measures, attack and identification, communications, sensor data fusion, data security, mission support/planning systems, networking and battlespace management, signal processing, payload data processing	Med/high
	Low-observability engineer	Signature measurement, stealth engineering, vulnerability, susceptibility, detectability	High
	Software designer	Software requirements definition, design, evaluation and integration, algorithms, prognostics, diagnostics, structural modelling, information assurance, network defence	Medium
	Interoperability engineer	System technical capabilities and interfaces	Med/high
	Design validation engineer	Performance analysis, threat analysis, test validation planning, scenario validation, design verification	Medium
	Whole systems integration engineer	Tracking and systems evaluation, engineering management, configuration management, integration of systems, systems architecture, human factors engineering, risk management, optimisation, reliability, systems security	Medium
Platform engineering	Aerostructures engineer	Materials technology, structural design, strength, fatigue, mass, aeroelasticity, stealth materials	Med/high
	Air vehicle dynamics engineer	Aerodynamics, stability and control, stores release and jettison, performance, stealth shaping, wind tunnel testing	Med/high
Powerplant engineering	Structure engineer	Casing, rotors, stator, strength, fatigue, rotor dynamics, shafts, transmissions, intakes, exhaust	Medium
	Fluid dynamics and combustion engineer	Airflows, rotor/stator blade design, combustion system, reheat system, thrust/weight ratio	Med/high
	Materials engineer	High temperatures, stealth, nickel and titanium alloys, composites	Low
	Electrical systems engineer	Architecture, generation, conversion, distribution and storage	Medium
	Mechanical systems	Friction reduction, seals, thermal efficiency, air	Low

	engineer	flows	
	Control systems engineer	Full Authority Digital Engine Control, accessories and services	Low
Unmanned air system (UAS) engineering	Autonomy engineer	Digital decision-making, imagery analysis	Med/high
	Operational governance engineer	Flight certification	Med/high
Manufacture	Production engineer	Manufacturing technology	Low
	Jig and tool designer	Tooling design	Low
	Composite fabrication engineer	Composite details, assemblies	Low
	Electrical installation engineer	Engineering, construction, control systems	Low
	Specialist manufacture and machining engineer	Precision mechanical, heavy machining, technical data	Low
Integrated test, evaluation and acceptance	Platform test engineer	Structural test and laboratories, rig testing, system quality testing, platform pre-flight and production build testing, structural integrity, test equipment	Low
	Systems test engineer	Technical scheduling, collation, analysis	Medium

Table D.16. Air – Air-to-Air Refueling. Lifecycle stage: In-service Support

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Synthetic environment	Synthetic environments engineer	Flight simulation, operational evaluation, modelling	Medium
Logistics and service management	Safety and governance engineer	System safety engineering, operational worthiness, standards implementation, safe and suitable for service testing, flight certification	Medium
	Fleet services manager	Through-life fleet/capability management	Medium
	Support services manager	Inventory, supply chain and obsolescence management, support cost optimisation, technical publications	Low
	Sustainability manager	Reliability, ability to test, ability to maintain, interoperability	Low
Operations	Flight operations manager	Management, planning, flying, air-to-air refuelling	Med/high
	Airfield operations manager	Service provision airfield operation	Medium
Field support	Training design and delivery manager	Aircrew, maintainer and operational training, tools, manuals, aids, training systems	Medium
	Maintenance engineer	Maintenance Approved Organisation Scheme equivalence, avionics, mechanical, propulsion and weapons technicians, diagnostics	Medium

Table D.17. Air – Air-to-Air Refueling. Lifecycle stage: Disposal

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Disposal	Compliance officer	Environmental compliance, regulatory, reuse/recycling	Low
	Make-safe engineer	Removal of sensitive components/sub-systems	Med/high
	Decommissioning officer	Demilitarisation	Med/high

Air – Tactical and Strategic Lift

Table D.18. Air – Tactical and Strategic Lift. Lifecycle stage: Management

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Programme management	Project manager	Performance management, cost management, risk management, contract management, requirements management, technical management, supply chain management	Medium
	Planning and production support engineer	Strategic planning, work flow management	Low
	Cost estimator	Cost modelling, learner rates, three point estimating	Low
	Procurement officer	Market research, market assessment, financial management	Medium

Table D.19. Air – Tactical and Strategic Lift. Lifecycle stage: Design, Engineering and Manufacture

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Design	Design engineer	Concept design, requirements engineering, interoperability	Med/high
	Detail and installation designer	Components, sub-assemblies, installation	Medium
	Draughtsman and CAD designer	Electrical and control, mechanical, simulation	Low
Systems engineering and design	Air vehicle flight systems – electrical engineer	Electrical (generation and distribution), conversion, utilities control system	Medium
	Air vehicle systems – mechanical engineer	Propulsion and secondary power, flight control, hydraulic, pneumatic, conditioning and fuel, landing gear, life support, aircrew equipment, crew escape, utilities control system, flight sensors and displays	Medium
	Air vehicle avionics	Avionics architecture and integration, navigation, autopilot, flight management, displays and	Medium

	systems engineer	controls, communications	
	Electromagnetic compatibility engineer	Design configuration, electromagnetic spectrum management	Medium
	Mission systems engineer	Defensive aids, electronic support measures, attack and identification, communications, sensor data fusion, data security, mission support/planning systems, networking and battlespace management, signal processing, payload data processing	Med/high
	Low-observability engineer	Signature measurement, stealth engineering, vulnerability, susceptibility, detectability	High
	Software designer	Software requirements definition, design, evaluation and integration, algorithms, prognostics, diagnostics, structural modelling, information assurance, network defence	Medium
	Interoperability engineer	System technical capabilities and interfaces	Low
	Design validation engineer	Performance analysis, threat analysis, test validation planning, scenario validation, design verification	Medium
	Whole systems integration engineer	Tracking and systems evaluation, engineering management, configuration management, integration of systems, systems architecture, human factors engineering, risk management, optimisation, reliability, systems security	Medium
Platform engineering	Aerostructures engineer	Materials technology, structural design, strength, fatigue, mass, aeroelasticity, stealth materials	Med/high
	Air vehicle dynamics engineer	Aerodynamics, stability and control, stores release and jettison, performance, stealth shaping, wind tunnel testing	Med/high
Powerplant engineering	Structure engineer	Casing, rotors, stator, strength, fatigue, rotor dynamics, shafts, transmissions, intakes, exhaust	Medium
	Fluid dynamics and combustion engineer	Airflows, rotor/stator blade design, combustion system, thrust/weight ratio	Medium
	Materials engineer	High temperatures, nickel and titanium alloys, composites	Low
	Electrical systems	Architecture, generation, conversion, distribution	Medium

	engineer	and storage	
	Mechanical systems engineer	Friction reduction, seals, thermal efficiency, air flows	Low
	Control systems engineer	Full Authority Digital Engine Control, accessories and services	Low
Unmanned air system (UAS) engineering	Autonomy engineer	Digital decision-making, imagery analysis	Med/high
	Operational governance engineer	Flight certification	Med/high
Manufacture	Production engineer	Manufacturing technology	Low
	Jig and tool designer	Tooling design	Low
	Composite fabrication engineer	Composite details, assemblies	Low
	Electrical installation engineer	Engineering, construction, control systems	Low
	Specialist manufacture and machining engineer	Precision mechanical, heavy machining, technical data	Low
Integrated test, evaluation and acceptance	Platform test engineer	Structural test and laboratories, rig testing, system quality testing, platform pre-flight and production build testing, structural integrity, test equipment	Low
	Systems test engineer	Technical scheduling, collation, analysis	Medium

Table D.20. Air – Tactical and Strategic Lift. Lifecycle stage: In-service Support

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Synthetic environment	Synthetic environments engineer	Flight simulation, operational evaluation, modelling	Medium
Logistics and service	Safety and governance	System safety engineering, operational worthiness, standards implementation, safe and	Medium

management	manager	suitable for service testing, flight certification	
	Fleet services manager	Through-life fleet/capability management	Medium
	Support services manager	Inventory, supply chain and obsolescence management, support cost optimisation, technical publications	Low
	Sustainability manager	Reliability, ability to test, ability to maintain, interoperability	Low
Operations	Flight operations manager	Management, planning, flying, air-to-air refuelling	Med/high
	Airfield operations manager	Service provision airfield operation	Medium
Field support	Training design and delivery manager	Aircrew, maintainer and operational training, tools, manuals, aids, training systems	Medium
	Maintenance engineer	Maintenance Approved Organisation Scheme equivalence, avionics, mechanical, propulsion and weapons technicians, diagnostics	Medium

Table D.21. Air – Tactical and Strategic Lift. Lifecycle stage: Disposal

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Disposal	Compliance officer	Environmental compliance, regulatory, reuse/recycling	Low
	Make-safe engineer	Removal of sensitive components/sub-systems	Med/high
	Decommissioning officer	Demilitarisation	Med/high

Air – Airborne Early Warning

Table D.22. Air – Airborne Early Warning. Lifecycle stage: Management

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Programme management	Project manager	Performance management, cost management, risk management, contract management, requirements management, technical management, supply chain management	Low
	Planning and production support engineer	Strategic planning, work flow management	Low
	Cost estimator	Cost modelling, learner rates, three point estimating	Low
	Procurement officer	Market research, market assessment, financial management	Medium

Table D.23. Air – Airborne Early Warning. Lifecycle stage: Design, Engineering and Manufacture

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Design	Design engineer	Concept design, requirements engineering, interoperability	Med/high
	Detail and installation designer	Components, sub-assemblies, installation	Med/high
	Draughtsman and CAD designer	Electrical and control, mechanical, simulation	Low
Systems engineering and design	Air vehicle flight systems – electrical engineer	Electrical (generation and distribution), conversion, utilities control system, digital electronics	Medium
	Air vehicle systems – mechanical engineer	Propulsion and secondary power, flight control, hydraulic, pneumatic, conditioning and fuel, landing gear, life support, aircrew equipment, crew escape, utilities control system, flight sensors and displays	Medium
	Air vehicle avionics	Avionics architecture and integration, navigation,	Medium

	systems engineer	autopilot, flight management, displays and controls, communications	
	Electromagnetic compatibility engineer	Design configuration, electromagnetic spectrum management	Med/high
	Mission systems engineer	Defensive aids, electronic support measures, attack and identification, communications, sensor data fusion, data security, mission support/planning systems, networking and battlespace management, signal processing, payload data processing	Med/high
	Low-observability engineer	Signature measurement, stealth engineering, vulnerability, susceptibility, detectability	High
	Software designer	Software requirements definition, design, evaluation and integration, algorithms, prognostics, diagnostics, structural modelling, information assurance, network defence	Medium
	Interoperability engineer	System technical capabilities and interfaces	Med/high
	Design validation engineer	Performance analysis, threat analysis, test validation planning, scenario validation, design verification	Medium
	Whole systems integration engineer	Tracking and systems evaluation, engineering management, configuration management, integration of systems, systems architecture, human factors engineering, risk management, optimisation, reliability, systems security	Med/high
Platform engineering	Aerostructures engineer	Materials technology, structural design, strength, fatigue, mass, aeroelasticity, stealth materials	Medium
	Air vehicle dynamics engineer	Aerodynamics, stability and control, stores release and jettison, performance, stealth shaping, wind tunnel testing	Med/high
Powerplant engineering	Structure engineer	Casing, rotors, stator, strength, fatigue, rotor dynamics, shafts, transmissions, intakes, exhaust	Low
	Fluid dynamics and combustion engineer	Airflows, rotor/stator blade design, combustion system, thrust/weight ratio	Low
	Materials engineer	High temperatures, stealth, nickel and titanium alloys, composites	Low

	Electrical systems engineer	Architecture, generation, conversion, distribution and storage	Medium
	Mechanical systems engineer	Friction reduction, seals, thermal efficiency, air flows	Low
	Control systems engineer	Full Authority Digital Engine Control, accessories and services	Low
Unmanned air system (UAS) engineering	Autonomy engineer	Digital decision-making, imagery analysis	Medium
	Operational governance engineer	Flight certification	Medium
Manufacture	Production engineer	Manufacturing technology	Low
	Jig and tool designer	Tooling design	Low
	Composite fabrication engineer	Composite details, assemblies	Low
	Electrical installation engineer	Engineering, construction, control systems	Medium
	Specialist manufacture and machining engineer	Precision mechanical, heavy machining, technical data	Low
Integrated test, evaluation and acceptance	Platform test engineer	Structural test and laboratories, rig testing, system quality testing, platform pre-flight and production build testing, structural integrity, test equipment	Medium
	Systems test engineer	Technical scheduling, collation, analysis	Medium

Table D.24. Air – Airborne Early Warning. Lifecycle stage: In-service Support

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Synthetic environment	Synthetic environments engineer	Flight simulation, operational evaluation, modelling	Medium
Logistics and service management	Safety and governance manager	System safety engineering, operational worthiness, standards implementation, safe and suitable for service testing, flight certification	Medium
	Fleet services manager	Through-life fleet/capability management	Low
	Support services manager	Inventory, supply chain and obsolescence management, support cost optimisation, technical publications	Low
	Sustainability manager	Reliability, ability to test, ability to maintain, interoperability	Low
Operations	Flight operations manager	Management, planning, flying, air-to-air refuelling	Medium
	Airfield operations manager	Service provision airfield operation	Low
Field support	Training design and delivery manager	Aircrew, maintainer and operational training, tools, manuals, aids, training systems	Medium
	Maintenance engineer	Maintenance Approved Organisation Scheme equivalence, avionics, mechanical, propulsion and weapons technicians, diagnostics	Medium

Table D.25. Air – Airborne Early Warning. Lifecycle stage: Disposal

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Disposal	Compliance officer	Environmental compliance, regulatory, reuse/recycling	Medium
	Make-safe engineer	Removal of sensitive components/sub-systems	Med/high
	Decommissioning officer	Demilitarisation	Med/high

Air – Rotary

Table D.26. Air – Rotary. Lifecycle stage: Management

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Programme management	Project manager	Performance management, cost management, risk management, contract management, requirements management, technical management, supply chain management	Medium
	Planning and production support engineer	Strategic planning, work flow management	Low
	Cost estimator	Cost modelling, learner rates, three point estimating	Medium
	Procurement officer	Market research, market assessment, financial management	Medium

Table D.27. Air – Rotary. Lifecycle stage: Design, Engineering and Manufacture

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Design	Design engineer	Concept design, requirements engineering, interoperability	Med/high
	Detail and installation designer	Components, sub-assemblies, installation	Medium
	Draughtsman and CAD designer	Electrical and control, mechanical, simulation	Low
Systems engineering and design	Air vehicle flight systems – electrical engineer	Electrical (generation and distribution), conversion, utilities control system, digital electronics	Medium
	Air vehicle systems – mechanical engineer	Propulsion and secondary power, flight control, hydraulic, pneumatic, conditioning and fuel, landing gear, life support, aircrew equipment, crew escape, utilities control system, flight sensors and displays	Medium
	Air vehicle avionics	Avionics architecture and integration, navigation,	Medium

	systems engineer	autopilot, flight management, displays and controls, communications	
	Electromagnetic compatibility engineer	Design configuration, electromagnetic spectrum management	Med/high
	Mission systems engineer	Defensive aids, electronic support measures, attack and identification, communications, sensor data fusion, data security, mission support/planning systems, networking and battlespace management, signal processing, payload data processing	High
	Low-observability engineer	Signature measurement, stealth engineering, vulnerability, susceptibility, detectability	High
	Software designer	Software requirements definition, design, evaluation and integration, algorithms, prognostics, diagnostics, structural modelling, information assurance, network defence	Low
	Interoperability engineer	System technical capabilities and interfaces	Med/high
	Design validation engineer	Performance analysis, threat analysis, test validation planning, scenario validation, design verification	Medium
	Whole systems integration engineer	Tracking and systems evaluation, engineering management, configuration management, integration of systems, systems architecture, human factors engineering, risk management, optimisation, reliability, systems security	Medium
Platform engineering	Aerostructures engineer	Materials technology, structural design, strength, fatigue, mass, aeroelasticity, stealth materials	Med/high
	Air vehicle dynamics engineer	Aerodynamics, stability and control, stores release and jettison, performance, stealth shaping, wind tunnel testing	Medium
Powerplant engineering	Structure engineer	Casing, rotors, stator, strength, fatigue, rotor dynamics, shafts, transmissions, intakes, exhaust	Low
	Fluid dynamics and combustion engineer	Airflows, rotor/stator blade design, combustion system, thrust/weight ratio	Low
	Materials engineer	High temperatures, stealth, nickel and titanium alloys, composites	Med/high

	Electrical systems engineer	Architecture, generation, conversion, distribution and storage	Low
	Mechanical systems engineer	Friction reduction, seals, thermal efficiency, air flows	Low
	Control systems engineer	Full Authority Digital Engine Control, accessories and services	Low
Unmanned air system (UAS) engineering	Autonomy engineer	Digital decision-making, imagery analysis	Medium
	Operational governance engineer	Flight certification	Medium
Rotor systems	Transmission engineer	Gearing reduction, autorotation	Low
	Vibration management engineer	Rotor blade integrity, vibration minimisation, mechanical condition monitoring	Medium
Manufacture	Production engineer	Manufacturing technology	Low
	Jig and tool designer	Tooling design	Low
	Composite fabrication engineer	Composite details, assemblies	Low
	Electrical installation engineer	Engineering, construction, control systems	Medium
	Specialist manufacture and machining engineer	Precision mechanical, heavy machining, technical data	Low
Integrated test, evaluation and acceptance	Platform test engineer	Structural test and laboratories, rig testing, system quality testing, platform pre-flight ad production build testing, structural integrity, test equipment	Low
	Systems test engineer	Technical scheduling, collation, analysis	Medium

Table D.28. Air – Rotary. Lifecycle stage: In-service Support

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Synthetic environment	Synthetic environments engineer	Flight simulation, operational evaluation, modelling	Medium
Logistics and service management	Safety and governance manager	System safety engineering, operational worthiness, standards implementation, safe and suitable for service testing, flight certification	Medium
	Fleet services manager	Through-life fleet/capability management	Low
	Support services manager	Inventory, supply chain and obsolescence management, support cost optimisation, technical publications	Low
	Sustainability manager	Reliability, ability to test, ability to maintain, interoperability	Low
Operations	Flight operations manager	Management, planning, flying	Medium
	Airfield operations manager	Service provision airfield operation	Low
Field support	Training design and delivery manager	Aircrew, maintainer and operational training, tools, manuals, aids, training systems	Medium
	Maintenance engineer	Maintenance Approved Organisation Scheme equivalence, avionics, mechanical, propulsion and weapons technicians, diagnostics	Med/high

Table D.29. Air – Rotary. Lifecycle stage: Disposal

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Disposal	Compliance officer	Environmental compliance, regulatory, reuse/recycling	Medium
	Make-safe engineer	Removal of sensitive components/sub-systems	Med/high
	Decommissioning officer	Demilitarisation	Med/high

Land – A Vehicle

Table D.30. Land – A Vehicle. Lifecycle stage: Management

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Programme management	Project manager	Performance management, cost management, risk management, contract management, requirements management, technical management, supply chain management	Medium
	Planning and production support engineer	Strategic planning, work flow management	Low
	Cost estimator	Cost modelling, learner rates, three point estimating, cost engineering	Medium
	Procurement officer	Market research, market assessment, financial management	Medium

Table D.31. Land – A Vehicle. Lifecycle stage: Design, Engineering and Manufacture

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Design	Design engineer	Concept design, requirements engineering, vehicle architecture, interoperability	Med/high
	Detail and installation designer	Components, sub-assemblies, installation	Medium
	Draughtsman and CAD designer	Electrical and control, mechanical, simulation	Medium
Systems engineering and design	Vehicle electrical systems engineer	Electrical (generation and distribution), conversion, utilities control system, architecture, storage, electronic support measures, digital electronics	Medium
	Vehicle mechanical engineering systems engineer	Propulsion and secondary power, hydraulics, transmission, architecture	Medium
	Vehicle electronics/ navigational systems engineer	Navigation, displays and controls, communications, GPS, target position	Medium

	Electromagnetic compatibility engineer	Design configuration, electromagnetic spectrum management	Medium
	Mission systems engineer	Defensive aids, electronic support measures, attack and identification, communications, sensor data fusion, data security, mission support/planning systems, networking and battlespace management, signal processing, payload data processing	Med/high
	Low-observability engineer	Signature measurement, vulnerability, susceptibility, detectability, decoy device control, screening device control, armour, active protection, reactive protection	HIgh
	Software designer	Software requirements definition, design, evaluation and integration, algorithms, prognostics, diagnostics, structural modelling, information assurance, network defence	Medium
	Interoperability engineer	System technical capabilities and interfaces	Medium
	Design validation engineer	Performance analysis, threat analysis, test validation planning, scenario validation, design verification	Medium
	Whole systems integration engineer	Tracking and systems evaluation, engineering management, configuration management, integration of systems, systems architecture, human factors engineering, risk management, optimisation, reliability, systems modelling, systems security	Med/high
Platform engineering	Framework / chassis engineer	Turret design, hull design, suspension, track, structural design	Med/high
Powerplant engineering	Structure engineer	Casing, stator, strength, fatigue, shafts, transmissions, intakes, exhaust, gearbox	Low
	Combustion engineer	Airflows, combustion system, injection system, governor	Low
	Materials engineer	High temperatures, signature, alloys	Low
	Electrical systems engineer	Architecture, generation, conversion, distribution and storage	Low
	Mechanical systems engineer	Friction reduction, seals, thermal efficiency, air flows	Low

	Control systems engineer	Full authority digital engine control, accessories and services	Low
Unmanned land vehicle engineering	Autonomy engineer	Digital decision-making, imagery analysis, terrain negotiation, obstacle avoidance, pattern recognition	Medium
	Operational governance engineer	Certification	Medium
	Control applications engineer	High-performance sensors	Medium
Manufacture	Production engineer	Manufacturing technology	Low
	Jig and tool designer	Tooling design	Low
	Composite fabrication engineer	Composite details, assemblies	Medium
	Electrical installation engineer	Engineering, construction, control systems	Medium
Integrated test, evaluation and acceptance	Platform test engineer	Structural test and laboratories, system quality testing, platform and production build testing, structural integrity, test equipment	Medium
	Systems test engineer	Technical scheduling, collation, analysis	Medium

Table D.32. Land – A Vehicle. Lifecycle stage: In-service Support

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Synthetic environment	Synthetic environments engineer	Operational evaluation, modelling	Medium
Logistics and service management	Safety and roadworthiness governance manager	System safety engineering, operational worthiness, standards implementation, safe and suitable for service testing	Med/high
	Fleet services manager	Through-life fleet/capability management	Medium
	Support services manager	Inventory, supply chain and obsolescence management, support cost optimisation	Medium
	Sustainability manager	Reliability, ability to test, ability to maintain, interoperability	Medium
Operations	Land operations manager	Management, planning, driving	Med/high
	Depot operations manager	Service provision base operation	Low
Field support	Training design and delivery manager	Maintainer and operational training, tools, manuals, aids, training systems	Medium
	Maintenance engineer	Maintenance Approved Organisation Scheme equivalence, electronics, mechanical, propulsion and weapons technicians, diagnostics	Medium

Table D.33. Land – A Vehicle. Lifecycle stage: Disposal

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Disposal	Compliance officer	Environmental compliance, regulatory, reuse/recycling	Medium
	Make-safe engineer	Removal of sensitive components/sub-systems	Med/high
	Decommissioning officer	Demilitarisation	High

Land – B Vehicle

Table D.34. Land – B Vehicle. Lifecycle stage: Management

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Programme management	Project manager	Performance management, cost management, risk management, contract management, requirements management, technical management, supply chain management	Medium
	Planning and production support engineer	Strategic planning, work flow management	Low
	Cost estimator	Cost modelling, learner rates, three point estimating, cost engineering	Low
	Procurement officer	Market research, market assessment, financial management	Medium

Table D.35. Land – B Vehicle. Lifecycle stage: Design, Engineering and Manufacture

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Design	Design engineer	Concept design, requirements engineering, vehicle architecture, interoperability	Medium
	Detail and installation designer	Components, sub-assemblies, installation	Low
	Draughtsman and CAD designer	Electrical and control, mechanical, simulation	Low
Systems engineering and design	Vehicle electrical systems engineer	Electrical (generation and distribution), conversion, utilities control system, architecture, storage, electronic support measures, digital electronics	Medium
	Vehicle mechanical engineering systems engineer	Propulsion and secondary power, hydraulics, transmission, architecture	Low
	Vehicle electronics/ navigational systems engineer	Navigation, displays and controls, communications, GPS, target position	Medium
	Electromagnetic	Design configuration, electromagnetic spectrum	Medium

	compatibility engineer	management	
	Mission systems engineer	Defensive aids, electronic support measures, attack and identification, communications, sensor data fusion, data security, mission support/planning systems, networking and battlespace management, signal processing, payload data processing	Med/high
	Software designer	Software requirements definition, design, evaluation and integration, algorithms, prognostics, diagnostics, structural modelling, information assurance, network defence	Low
	Interoperability engineer	System technical capabilities and interfaces	Medium
	Design validation engineer	Performance analysis, threat analysis, test validation planning, scenario validation, design verification	Medium
	Whole systems integration engineer	Tracking and systems evaluation, engineering management, configuration management, integration of systems, systems architecture, human factors engineering, risk management, optimisation, reliability, systems modelling, systems security	Medium
Platform engineering	Framework / chassis engineer	Turret design, hull design, suspension, track structural design	Medium
Powerplant engineering	Structure engineer	Casing, stator, strength, fatigue, shafts, transmissions, intakes, exhaust, gearbox	Low
	Combustion engineer	Airflows, combustion system, injection system, governor	Low
	Materials engineer	High temperatures, signature, alloys	Low
	Electrical systems engineer	Architecture, generation, conversion, distribution and storage	Low
	Mechanical systems engineer	Friction reduction, seals, thermal efficiency, air flows	Low
	Control systems engineer	Full authority digital engine control, accessories and services	Low
Unmanned land vehicle engineering	Autonomy engineer	Digital decision-making, imagery analysis, terrain negotiation, obstacle avoidance, pattern recognition	Medium

	Operational governance engineer	Certification	Medium
	Control applications engineer	High-performance sensors	Medium
Manufacture	Production engineer	Manufacturing technology	Low
	Jig and tool designer	Tooling design	Low
	Composite fabrication engineer	Composite details, assemblies	Low
	Electrical installation engineer	Engineering, construction, control systems	Low
Integrated test, evaluation and acceptance	Platform test engineer	Structural test and laboratories, system quality testing, platform and production build testing, structural integrity, test equipment	Medium
	Systems test engineer	Technical scheduling, collation, analysis	Medium

Table D.36. Land – B Vehicle. Lifecycle stage: In-service Support

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Synthetic environment	Synthetic environments engineer	Operational evaluation, modelling	Medium
Logistics and service management	Safety and roadworthiness governance manager	System safety engineering, operational worthiness, standards implementation, safe and suitable for service testing	Medium
	Fleet services manager	Through-life fleet/capability management	Low
	Support services manager	Inventory, supply chain and obsolescence management, support cost optimisation, technical publications	Low
	Sustainability manager	Reliability, ability to test, ability to maintain, interoperability	Medium
Operations	Land operations manager	Management, planning, driving	Medium
	Depot operations manager	Service provision base operation	Low
Field support	Training design and delivery manager	Maintainer and operational training, tools, manuals, aids, training systems	Low
	Maintenance engineer	Maintenance Approved Organisation Scheme equivalence	Medium

Table D.37. Land – B Vehicle. Lifecycle stage: Disposal

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Disposal	Compliance officer	Environmental compliance, regulatory, reuse/recycling	Medium
	Make-safe engineer	Removal of sensitive components/sub-systems	Med/high
	Decommissioning officer	Demilitarisation	High

Land – C Vehicle

Table D.38. Land – C Vehicle. Lifecycle stage: Management

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Programme management	Project manager	Performance management, cost management, risk management, contract management, requirements management, technical management, supply chain management	Medium
	Planning and production support engineer	Strategic planning, work flow management	Low
	Cost estimator	Cost modelling, learner rates, three point estimating, cost engineering	Low
	Procurement officer	Market research, market assessment, financial management	Medium

Table D.39. Land – C Vehicle. Lifecycle stage: Design, Engineering and Manufacture

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Design	Design engineer	Concept design, requirements engineering, vehicle architecture, interoperability	Medium
	Detail and installation designer	Components, sub-assemblies, installation	Low
	Draughtsman and CAD designer	Electrical and control, mechanical, simulation	Low
Systems engineering and design	Vehicle electrical systems engineer	Electrical (generation and distribution), conversion, utilities control system, architecture, storage, electronic support measures, digital electronics	Low
	Vehicle mechanical engineering systems engineer	Propulsion and secondary power, hydraulics, transmission, architecture	Low
	Vehicle electronics/ navigational systems engineer	Navigation, displays and controls, communications, GPS, target position	Medium
	Electromagnetic	Design configuration, electromagnetic spectrum	Medium

	compatibility engineer	management	
	Software designer	Software requirements definition, design, evaluation and integration, algorithms, prognostics, diagnostics, structural modelling, information assurance, network defence	Low
	Interoperability engineer	System technical capabilities and interfaces	Medium
	Design validation engineer	Performance analysis, threat analysis, test validation planning, scenario validation, design verification	Medium
	Whole systems integration engineer	Tracking and systems evaluation, engineering management, configuration management, integration of systems, systems architecture, human factors engineering, risk management, optimisation, reliability, systems modelling, systems security	Medium
Platform engineering	Framework / chassis engineer	Turret design, hull design, suspension, track structural design	Medium
Powerplant engineering	Structure engineer	Casing, stator, strength, fatigue, shafts, transmissions, intakes, exhaust, gearbox	Low
	Combustion engineer	Airflows, combustion system, injection system, governor	Low
	Materials engineer	High temperatures, signature, alloys	Low
	Electrical systems engineer	Architecture, generation, conversion, distribution and storage	Low
	Mechanical systems engineer	Friction reduction, seals, thermal efficiency, air flows	Low
	Control systems engineer	Full authority digital engine control, accessories and services	Low
Unmanned land vehicle engineering	Autonomy engineer	Digital decision-making, imagery analysis, terrain negotiation, obstacle avoidance, pattern recognition	Medium
	Operational governance engineer	Certification	Medium
	Control applications engineer	High-performance sensors	Medium

Manufacture	Production engineer	Manufacturing technology	Low
	Jig and tool designer	Tooling design	Low
	Composite fabrication engineer	Composite details, assemblies	Low
	Electrical installation engineer	Engineering, construction, control systems	Low
Integrated test, evaluation and acceptance	Platform test engineer	Structural test and laboratories, system quality testing, platform and production build testing, structural integrity, test equipment	Medium
	Systems test engineer	Technical scheduling, collation, analysis	Medium

Table D.40. Land – C Vehicle. Lifecycle stage: In-service Support

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Synthetic environment	Synthetic environments engineer	Operational evaluation, modelling	Medium
Logistics and service management	Safety and roadworthiness governance manager	System safety engineering, operational worthiness, standards implementation, safe and suitable for service testing	Medium
	Fleet services manager	Through-life fleet/capability management	Low
	Support services manager	Inventory, supply chain and obsolescence management, support cost optimisation, technical publications	Low
	Sustainability manager	Reliability, ability to test, ability to maintain, interoperability	Medium
Operations	Land operations manager	Management, planning, driving	Medium
	Depot operations manager	Service provision base operation	Low
Field support	Training design and delivery manager	Maintainer and operational training, tools, manuals, aids, training systems	Low
	Maintenance engineer	Maintenance Approved Organisation Scheme equivalence	Medium

Table D.41. Land – C Vehicle. Lifecycle stage: Disposal

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Disposal	Compliance officer	Environmental compliance, regulatory, reuse/recycling	Medium
	Make-safe engineer	Removal of sensitive components/sub-systems	Med/high
	Decommissioning officer	Demilitarisation	High

Land – Support Weapons/Small Arms/Artillery

Table D.42. Land – Support Weapons/Small Arms/Artillery. Lifecycle stage: Management

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Programme management	Project manager	Performance management, cost management, risk management, contract management, requirements management, technical management, supply chain management	Low
	Planning and production support engineer	Strategic planning, work flow management	Low
	Cost estimator	Cost modelling, learner rates, three point estimating	Low
	Procurement officer	Market research, market assessment, financial management	Medium

Table D.43. Land – Support Weapons/Small Arms/Artillery. Lifecycle stage: Design, Engineering and Manufacture

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Design	Design engineer	Concept design, requirements engineering, interoperability	Med/high
	Draughtsman and CAD designer	Electrical and control, mechanical, simulation	Low
Systems engineering and design	Detail and installation designer	Components, sub-assemblies, installation	Medium
	Mechanical engineering systems engineer	Propulsion, structural design	Medium
	Low-observability engineer	Signature measurement, vulnerability, susceptibility, detectability, decoy device control, sighting systems	High
	Software designer	Software requirements definition, design, evaluation and integration, algorithms, prognostics, diagnostics, structural modelling, information assurance, network defence	Low

	Design validation engineer	Performance analysis, threat analysis, test validation planning, scenario validation, design verification	Medium
	Electromagnetic compatibility engineer	Design configuration, electromagnetic spectrum management	Medium
	Whole systems integration engineer	Tracking and systems evaluation, engineering management, configuration management, integration of systems, mission systems architecture, human factors engineering, risk management, optimisation, reliability, systems modelling, systems security	Med/high
	Interoperability engineer	System technical capabilities and interfaces	Low
Weapons systems	Weapons designer	Lethality, fuze design, identification systems	High
	Ballistics engineer	Internal ballistics, exterior ballistics, terminal ballistics and short time dynamics, explosives	High
Manufacture	Production engineer	Manufacturing technology	Medium
	Jig and tool designer	Tooling design	Medium
	Composite fabrication engineer	Composite details, assemblies	Medium
	Electrical installation engineer	Engineering, construction, control systems, digital electronics	Medium
Integrated test, evaluation and acceptance	Platform test engineer	Structural test and laboratories, system quality testing, platform and production build testing; wind tunnel testing; high G testing, test equipment	Med/high
	Systems test engineer	Technical scheduling, collation, analysis; safety and arming devices	Med/high

Table D.44. Land – Support Weapons/Small Arms/Artillery. Lifecycle stage: In-service Support

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Synthetic environment	Synthetic environments engineer	Operational simulation, operational evaluation, modelling	Medium
Logistics and service management	Safety and governance manager	System safety engineering, operational worthiness, standards implementation, safe and suitable for service testing	Med/high
	Asset manager	Through-life asset/capability management	Medium
	Support manager	Inventory, supply chain and obsolescence management, support cost optimisation, technical publications	Medium
	Sustainability manager	Reliability, ability to test, ability to maintain, interoperability	Low
Operations	Land operations manager	Management, planning	Medium
	Depot operations manager	Service provision base operation	Medium
Field support	Training design and delivery manager	Maintainer and operational training, tools, manuals, aids, training systems	Medium
	Maintenance engineer	Maintenance Approved Organisation Scheme equivalence, electronics, mechanical, propulsion and weapons technicians, diagnostics	Med/high

Table D.45. Land – Support Weapons/Small Arms/Artillery. Lifecycle stage: Disposal

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Disposal	Compliance officer	Environmental compliance, regulatory, reuse/recycling	Med/high
	Make-safe engineer	Removal of sensitive components/sub-systems	Med/high
	Decommissioning officer	Demilitarisation	High

Land – Personal Systems and Protection Equipment

Table D.46. Land – Personal Systems and Protection Equipment. Lifecycle stage: Management

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Programme management	Project manager	Performance management, cost management, risk management, contract management, requirements management, technical management, supply chain management	Low
	Planning and production support engineer	Strategic planning, work flow management	Low
	Cost estimator	Cost modelling, learner rates, three point estimating	Medium
	Procurement officer	Market research, market assessment, financial management	Medium

Table D.47. Land – Personal Systems and Protection Equipment. Lifecycle stage: Design, Engineering and Manufacture

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Design	Design engineer	Concept design, requirements engineering, interoperability	Medium
	Draughtsman and CAD designer	Electrical and control, mechanical, simulation	Low
	Detail and installation designer	Components, sub-assemblies, installation	Medium
Systems engineering and design	Low-observability engineer	Vulnerability, susceptibility, detectability, decoy device control, screening device control	Med/high
	Sustainability manager	Logistics	Medium
	Design validation engineer	Performance analysis, threat analysis, test validation planning, scenario validation, design verification	Medium
	Electromagnetic compatibility engineer	Design configuration, electromagnetic spectrum management	Medium

	Whole systems integration engineer	Tracking and systems evaluation, engineering management, configuration management, integration of systems, mission systems architecture, human factors engineering, risk management, optimisation, reliability, systems modelling, systems security	High
	Interoperability engineer	System technical capabilities and interfaces	Medium
Manufacture	Production engineer	Manufacturing technology	Low
	Jig and tool designer	Tooling design	Low
	Composite fabrication engineer	Composite details, assemblies	Low
	Electrical installation engineer	Engineering, construction, control systems, digital electronics	Low
Integrated test, evaluation and acceptance	Systems test engineer	Technical scheduling, collation, analysis, test equipment	Medium

Table D.48. Land – Personal Systems and Protection Equipment. Lifecycle stage: In-service Support

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Logistics and service management	Safety and governance manager	System safety engineering, operational worthiness, standards implementation, safe and suitable for service testing	Medium
	Asset manager	Through-life asset/capability management	Low
	Sustainability manager	Reliability, ability to test, ability to maintain, interoperability	Medium
Field support	Training design and delivery manager	Maintainer and operational training, tools, manuals, aids, training systems	Medium
	Maintenance engineer	Maintenance Approved Organisation Scheme equivalence, electronics, mechanical, propulsion and weapons technicians, diagnostics	Medium

Table D.49. Land – Personal Systems and Protection Equipment. Lifecycle stage: Disposal

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Disposal	Compliance officer	Environmental compliance, regulatory, reuse/recycling	Low
	Make-safe engineer	Removal of sensitive components/sub-systems	Med/high
	Decommissioning officer	Demilitarisation	High

Naval[2] – Aircraft Carriers

Table D.50. Naval – Aircraft Carriers. Lifecycle stage: Management

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Programme management	Project manager	Performance management, cost management, risk management, contract management, requirements management, technical management, supply chain management	Medium
	Planning and production support engineer	Strategic planning, work flow management	Low
	Cost estimator	Cost modelling, learner rates, three point estimating	Medium
	Procurement officer	Market research, market assessment, financial management	Medium

Table D.51. Naval – Aircraft Carriers. Lifecycle stage: Design, Engineering and Manufacture

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Design	Design engineer	Concept design, systems integration, requirements engineering, interoperability	Med/high
	Detail and installation designer	Components, sub-assemblies, installation	Medium
	Draughtsman and CAD designer	Electrical and control, mechanical (including piping, heating, ventilating, and air conditioning), hull/structural/ arrangements, simulation	Medium
	Electrical and control designer	Electrical system component, electrical analysis, electrical design, conversion, utilities control system, digital electronics	Medium
	Mechanical/ fluids designer	Mechanical system; mechanical design; piping design; heating, ventilation and air	Medium

[2] Please note the structure of the taxonomy within the Design, Engineering and Manufacture lifecycle stage takes into account specific expert input which suggested this would more accurately reflect the processes within the lifecycle of a naval project.

		conditioning (HVAC); fluid system design; hydraulic system design	
	Vessel electronics/navigational systems designer	NAVAIDS, electronic chart display and information systems, autopilot, instruments, metoc equipment	Med/high
	Electromagnetic compatibility designer	Design configuration, electromagnetic spectrum management	Med/high
	Mission systems designer	Defensive aids, electronic support measures, attack and identification, communications, sensor data fusion, data security, mission support/planning systems, networking and battlespace management, signal processing, payload data processing	High
	Low-observability designer	Signature measurement, vulnerability, susceptibility, detectability	High
	Software designer	Software requirements definition, design, evaluation and integration, algorithms, prognostics, diagnostics, structural modelling, information assurance, network defence	Medium
	Design validation engineer	Performance analysis, threat analysis, test validation planning, scenario validation, design verification	Med/high
	Interoperability design	System technical capabilities and interfaces	Medium
Engineering	Acoustics/signatures/ dynamics engineer	Signature analysis, noise and vibration	Med/high
	Electrical and control engineer	Electrical system component, electrical analysis, electrical design, power generation	Low
	Mechanical/fluids engineer	Mechanical component, mechanical system, mechanical design, piping, HVAC, fluid system, hydraulics	Medium
	Naval architecture/marine engineer	Naval architecture, marine engineering, weights analysis, standards	Med/high
	Planning and production support manager	Scheduling, purchasing support, component support	Low
	Hull/structural/ arrangements engineer	Structural engineering, structural arrangement	Medium
	Propulsion /combustion and fluid dynamics	Airflows, rotor/stator blade design, combustion system, reheat system,	Medium

	engineer	thrust/weight ratio, propeller	
	Systems engineer	Tracking and systems evaluation, engineering management, configuration management, integration of systems, mission systems architecture, human factors engineering, risk management, optimisation, reliability, systems security	Med/high
	Unmanned naval system engineer	Autonomy, digital decision-making, imagery analysis	Medium
	Operational governance manager	Certification	Med/high
Manufacture	Outfitting engineer	Calibration, hull insulation, mechanical fitting, caulking, pipe welding, piping/machinery insulation, sheet metal	Low
	Structure engineer	Steelwork, plating, structure welding, shipfitting	Low
	Direct support manager	Quality assurance/control, stores, material control, rigging, crane and lorry operation	Low
Integrated test, evaluation and acceptance	Platform test engineer	Structural test and laboratories, rig testing, system quality testing, platform pre-sail and production build testing, structural integrity, test equipment	Med/high
	Systems test engineer	Technical scheduling, collation, analysis, quality assurance/control	Med/high

Table D.52. Naval – Aircraft Carriers. Lifecycle stage: In-service Support

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Synthetic environment	Synthetic environments engineer	Simulation, operational evaluation, modelling	Medium
Logistics and service management	Safety and governance manager	System safety engineering, operational worthiness, standards implementation, safe and suitable for service testing	Medium
	Fleet services manager	Through-life fleet/capability management	Medium
	Support services manager	Inventory, supply chain and obsolescence management, support cost optimisation, technical publications	Low
	Sustainability manager	Reliability, ability to test, ability to maintain, interoperability	Medium
Operations	At sea operations manager	Management, planning, sailing	Med/high
	Port operations manager	Service provision port operation	Medium
Field support	Training design and delivery manager	Crew, maintainer and operational training, tools, manuals, aids, training systems	Medium
	Maintenance engineer	Maintenance Approved Organisation Scheme equivalence, electronics, mechanical, propulsion and weapons technicians, diagnostics	Medium

Table D.53. Naval – Aircraft Carriers. Lifecycle stage: Disposal

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Disposal	Compliance officer	Environmental compliance, regulatory, reuse/recycling	Medium
	Make-safe engineer	Removal of sensitive components/sub-systems	Med/high
	Decommissioning officer	Demilitarisation	High

Naval – Cruisers / Destroyers

Table D.54. Naval – Cruisers / Destroyers. Lifecycle stage: Management

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Programme management	Project manager	Performance management, cost management, risk management, contract management, requirements management, technical management, supply chain management	Medium
	Planning and production support engineer	Strategic planning, work flow management	Medium
	Cost estimator	Cost modelling, learner rates, three point estimating	Low
	Procurement officer	Market research, market assessment, financial management	Medium

Table D.55. Naval – Cruisers / Destroyers. Lifecycle stage: Design, Engineering and Manufacture

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Design	Design engineer	Concept design, systems integration, requirements engineering, interoperability	Med/high
	Draughtsman and CAD designer	Electrical and control, mechanical (including piping, heating, ventilation and air conditioning), hull/structural/arrangements, simulation	Low
	Detail and installation designer	Components, sub-assemblies, installation	Med/high
	Electrical and control designer	Electrical system component, electrical analysis, electrical design, conversion, utilities control system, digital electronics	Low
	Mechanical/fluids designer	Mechanical system; mechanical design; piping design; heating, ventilation and air conditioning (HVAC); fluid system design; hydraulic system design	Medium
	Vessel electronics/ navigational systems designer	NAVAIDS, electronic chart display and information systems, autopilot, instruments, metoc equipment	Med/high

	Electromagnetic compatibility designer	Design configuration, electromagnetic spectrum management	Medium
	Mission systems designer	Defensive aids, electronic support measures, attack and identification, communications, sensor data fusion, data security, mission support/planning systems, networking and battlespace management, signal processing, payload data processing	High
	Low-observability designer	Signature measurement, vulnerability, susceptibility, detectability	High
	Software designer	Software requirements definition, design, evaluation and integration, algorithms, prognostics, diagnostics, structural modelling, information assurance, network defence	Low
	Design validation engineer	Performance analysis, threat analysis, test validation planning, scenario validation, design verification	Med/high
	Interoperability designer	System technical capabilities and interfaces	Med/high
Engineering	Acoustics/signatures/ dynamics engineer	Signature analysis, noise and vibration	Med/high
	Electrical and control engineer	Electrical system component, electrical analysis, electrical design, power generation	Medium
	Mechanical/ fluids engineer	Mechanical component, mechanical system, mechanical design, piping, HVAC, fluid system, hydraulics	Low
	Naval architecture/marine engineer	Naval architecture, marine engineering, weights analysis, standards	Med/high
	Planning and production support manager	Scheduling, Purchasing support, component support	Low
	Hull/structural/ arrangements engineer	Structural engineering, structural arrangement	Medium
	Propulsion /combustion and fluid dynamics engineer	Airflows, rotor/stator blade design, combustion system, reheat system, thrust/weight ratio, propeller	Medium
	Systems engineer	Tracking and systems evaluation, engineering management, configuration management, integration of systems, mission systems architecture, human factors engineering, risk management, optimisation, reliability, systems	Med/high

		security	
	Unmanned naval system engineer	Autonomy, digital decision-making, imagery analysis	Medium
	Operational governance manager	Certification	Medium
Manufacture	Outfitting engineer	Calibration, hull insulation, mechanical fitting, caulking, pipe welding, piping/machinery insulation, sheet metal,	Low
	Structure engineer	Steelwork, plating, structure welding, shipfitting,	Low
	Direct support manager	Quality assurance/control, stores, material control, rigging, crane and lorry operation	Low
Integrated test, evaluation and acceptance	Platform test engineer	Structural test and laboratories, rig testing, system quality testing, platform pre-sail and production build testing, structural integrity, test equipment	Med/high
	Systems test engineer	Technical scheduling, collation, analysis, quality assurance/control	Med/high

Table D.56. Naval – Cruisers / Destroyers. Lifecycle stage: In-service Support

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Synthetic environment	Synthetic environments engineer	Simulation, operational evaluation, modelling	Medium
Logistics and service management	Safety governance manager	System safety engineering, operational worthiness, standards implementation, safe and suitable for service testing	Medium
	Fleet services manager	Through-life fleet/capability management	Medium
	Support services manager	Inventory, supply chain and obsolescence management, support cost optimisation, technical publications	Low
	Sustainability manager	Reliability, ability to test, ability to maintain, interoperability	Medium
Operations	At sea operations manager	Management, planning, sailing	Med/high
	Port operations manager	Service provision port operation	Low
Field support	Training design and delivery manager	Crew, maintainer and operational training, tools, manuals, aids, training systems	Medium
	Maintenance engineer	Maintenance Approved Organisation Scheme equivalence, electronics, mechanical, propulsion and weapons technicians, diagnostics	Medium

Table D.57. Naval – Cruisers / Destroyers. Lifecycle stage: Disposal

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Disposal	Compliance officer	Environmental compliance, regulatory, reuse/recycling	Low
	Make-safe engineer	Removal of sensitive components/sub-systems	Med/high
	Decommissioning officer	Demilitarisation	High

Naval – Frigates

Table D.58. Naval – Frigates. Lifecycle stage: Management

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Programme management	Project manager	Performance management, cost management, risk management, contract management, requirements management, technical management, supply chain management	Medium
	Planning and production support engineer	Strategic planning, work flow management	Medium
	Cost estimator	Cost modelling, learner rates, three point estimating	Low
	Procurement officer	Market research, market assessment, financial management	Medium

Table D.59. Naval – Frigates. Lifecycle stage: Design, Engineering and Manufacture

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Design	Design engineer	Concept design, systems integration, requirements engineering, interoperability	Med/high
	Draughtsman and CAD designer	Electrical and control, mechanical (including piping, heating, ventilation and air conditioning), hull/structural/arrangements, simulation	Low
	Detail and installation designer	Components, sub-assemblies, installation	Med/high
	Electrical and control designer	Electrical system component, electrical analysis, electrical design, conversion, utilities control system, digital electronics	Low
	Mechanical/fluids designer	Mechanical system; mechanical design; piping design; heating, ventilation and air conditioning (HVAC); fluid system design; hydraulic system design	Medium
	Vessel electronics/ navigational systems designer	NAVAIDS, electronic chart display and information systems, autopilot, instruments, metoc equipment	Med/high

	Electromagnetic compatibility designer	Design configuration, electromagnetic spectrum management	Medium
	Mission systems designer	Defensive aids, electronic support measures, attack and identification, communications, sensor data fusion, data security, mission support/planning systems, networking and battlespace management, signal processing, payload data processing	High
	Low-observability designer	Signature measurement, vulnerability, susceptibility, detectability	High
	Software designer	Software requirements definition, design, evaluation and integration, algorithms, prognostics, diagnostics, structural modelling, information assurance, network defence	Low
	Design validation engineer	Performance analysis, threat analysis, test validation planning, scenario validation, design verification	Med/high
	Interoperability designer	System technical capabilities and interfaces	Med/high
Engineering	Acoustics/signatures/ dynamics engineer	Signature analysis, noise and vibration	Med/high
	Electrical and control engineer	Electrical system component, electrical analysis, electrical design, power generation	Medium
	Mechanical/ fluids engineer	Mechanical component, mechanical system, mechanical design, piping, HVAC, fluid system, hydraulics	Low
	Naval architecture/marine engineer	Naval architecture, marine engineering, weights analysis, standards	Med/high
	Planning and production support engineer	Scheduling, Purchasing support, component support	Low
	Hull/structural/ arrangements engineer	Structural engineering, structural arrangement	Medium
	Propulsion /combustion and fluid dynamics engineer	Airflows, rotor/stator blade design, combustion system, reheat system, thrust/weight ratio, propeller	Medium
	Systems engineer	Tracking and systems evaluation, engineering management, configuration management, integration of systems, mission systems architecture, human factors engineering, risk management, optimisation, reliability, systems	Med/high

		security	
	Unmanned naval system engineer	Autonomy, digital decision-making, imagery analysis	Medium
	Operational governance manager	Certification	Medium
Manufacture	Outfitting engineer	Calibration, hull insulation, mechanical fitting, caulking, pipe welding, piping/machinery insulation, sheet metal,	Low
	Structure engineer	Steelwork, plating, structure welding, shipfitting,	Low
	Direct support manager	Quality assurance/control, stores, material control, rigging, crane and lorry operation	Low
Integrated test, evaluation and acceptance	Platform test engineer	Structural test and laboratories, rig testing, system quality testing, platform pre-sail and production build testing, structural integrity, test equipment	Med/high
	Systems test engineer	Technical scheduling, collation, analysis, quality assurance/control	Med/high

Table D.60. Naval – Frigates. Lifecycle stage: In-service Support

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Synthetic environment	Synthetic environments engineer	Simulation, operational evaluation, modelling	Medium
Logistics and service management	Safety governance manager	System safety engineering, operational worthiness, standards implementation, safe and suitable for service testing	Medium
	Fleet services manager	Through-life fleet/capability management	Medium
	Support services manager	Inventory, supply chain and obsolescence management, support cost optimisation, technical publications	Low
	Sustainability manager	Reliability, ability to test, ability to maintain, interoperability	Medium
Operations	At sea operations manager	Management, planning, sailing	Med/high
	Port operations manager	Service provision port operation	Low
Field support	Training design and delivery manager	Crew, maintainer and operational training, tools, manuals, aids, training systems	Medium
	Maintenance engineer	Maintenance Approved Organisation Scheme equivalence, electronics, mechanical, propulsion and weapons technicians, diagnostics	Medium

Table D.61. Naval – Frigates. Lifecycle stage: Disposal

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Disposal	Compliance officer	Environmental compliance, regulatory, reuse/recycling	Low
	Make-safe engineer	Removal of sensitive components/sub-systems	Med/high
	Decommission officer	Demilitarisation	High

Naval – Offshore Patrol Vessels

Table D.62. Naval – Offshore Patrol Vessels. Lifecycle stage: Management

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Programme management	Project manager	Performance management, cost management, risk management, contract management, requirements management, technical management, supply chain management	Medium
	Planning and production support engineer	Strategic planning, work flow management	Medium
	Cost estimator	Cost modelling, learner rates, three point estimating	Low
	Procurement officer	Market research, market assessment, financial management	Medium

Table D.63. Naval – Offshore Patrol Vessels. Lifecycle stage: Design, Engineering and Manufacture

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Design	Design engineer	Concept design, systems integration, requirements engineering, interoperability	Med/high
	Draughtsman and CAD designer	Electrical and control, mechanical (including piping, HVAC), hull/structural/arrangements, simulation	Low
	Detail and installation designer	Components, sub-assemblies, installation	Med/high
	Electrical and control designer	Electrical system component, electrical analysis, electrical design, conversion, utilities control system, digital electronics	Low
	Mechanical/fluids designer	Mechanical system; mechanical design; piping design; heating, ventilation and air conditioning (HVAC); fluid system design; hydraulic system design	Medium
	Vessel electronics/navigational	NAVAIDS, electronic chart display and information systems, autopilot, instruments,	Med/high

	systems designer	metoc equipment	
	Electromagnetic compatibility designer	Design configuration, electromagnetic spectrum management	Medium
	Mission systems designer	Defensive aids, electronic support measures, attack and identification, communications, sensor data fusion, data security, mission support/planning systems, networking and battlespace management, signal processing, payload data processing	High
	Low-observability designer	Signature measurement, vulnerability, susceptibility, detectability	High
	Software designer	Software requirements definition, design, evaluation and integration, algorithms, prognostics, diagnostics, structural modelling, information assurance, network defence	Low
	Design validation engineer	Performance analysis, threat analysis, test validation planning, scenario validation, design verification	Med/high
	Interoperability designer	System technical capabilities and interfaces	Med/high
Engineering	Acoustics/signatures/ dynamics engineer	Signature analysis, noise and vibration	Med/high
	Electrical and control engineer	Electrical system component, electrical analysis, electrical design, power generation	Medium
	Mechanical/fluids engineer	Mechanical component, mechanical system, mechanical design, piping, HVAC, fluid system, hydraulics	Low
	Naval architecture/marine engineer	Naval architecture, marine engineering, weights analysis, standards	Med/high
	Planning and production support manager	Scheduling, purchasing support, component support	Low
	Hull/structural/ arrangements engineer	Structural engineering, structural arrangement	Medium
	Propulsion /combustion and fluid dynamics engineer	Airflows, rotor/stator blade design, combustion system, reheat system, thrust/weight ratio, propeller	Medium
	Systems engineer	Tracking and systems evaluation, engineering management, configuration management, integration of systems, mission systems	Med/high

		architecture, human factors engineering, risk management, optimisation, reliability, systems security	
	Unmanned naval system engineer	Autonomy, digital decision-making, imagery analysis	Medium
	Operational governance manager	Certification	Medium
Manufacture	Outfitting engineer	Calibration, hull insulation, mechanical fitting, caulking, pipe welding, piping/machinery insulation, sheet metal	Low
	Structure engineer	Steelwork, plating, structure welding, shipfitting	Low
	Direct support manager	Quality assurance/control, stores, material control, rigging, crane and lorry operation	Low
Integrated test, evaluation and acceptance	Platform test engineer	Structural test and laboratories, rig testing, system quality testing, platform pre-sail and production build testing, structural integrity, test equipment	Med/high
	Systems test engineer	Technical scheduling, collation, analysis, quality assurance/control	Med/high

Table D.64. Naval – Offshore Patrol Vessels. Lifecycle stage: In-service Support

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Synthetic environment	Synthetic environments engineer	Simulation, operational evaluation, modelling	Medium
Logistics and service management	Safety governance manager	System safety engineering, operational worthiness, standards implementation, safe and suitable for service testing	Medium
	Fleet services manager	Through-life fleet/capability management	Medium
	Support services manager	Inventory, supply chain and obsolescence management, support cost optimisation, technical publications	Low
	Sustainability manager	Reliability, ability to test, ability to maintain, interoperability	Medium
Operations	At sea operations manager	Management, planning, sailing	Med/high
	Port operations manager	Service provision port operation	Low
Field support	Training design and delivery manager	Crew, maintainer and operational training, tools, manuals, aids, training systems	Medium
	Maintenance engineer	Maintenance Approved Organisation Scheme equivalence, electronics, mechanical, propulsion and weapons technicians, diagnostics	Medium

Table D.65. Naval – Offshore Patrol Vessels. Lifecycle stage: Disposal

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Disposal	Compliance officer	Environmental compliance, regulatory, reuse/recycling	Low
	Make-safe engineer	Removal of sensitive components/sub-systems	Med/high
	Decommissioning officer	Demilitarisation	High

Naval – Coastal Patrol Vessels

Table D.66. Naval – Coastal Patrol Vessels. Lifecycle stage: Management

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Programme management	Project manager	Performance management, cost management, risk management, contract management, requirements management, technical management, supply chain management	Medium
	Planning and production support engineer	Strategic planning, work flow management	Medium
	Cost estimator	Cost modelling, learner rates, three point estimating	Low
	Procurement officer	Market research, market assessment, financial management	Medium

Table D.67. Naval – Coastal Patrol Vessels. Lifecycle stage: Design, Engineering and Manufacture

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Design	Design engineer	Concept design, systems integration, requirements engineering, interoperability	Med/high
	Draughtsman and CAD designer	Electrical and control, mechanical (including piping, HVAC), hull/structural/arrangements, simulation	Low
	Detail and installation designer	Components, sub-assemblies, installation	Med/high
	Electrical and control designer	Electrical system component, electrical analysis, electrical design, conversion, utilities control system, digital electronics	Low
	Mechanical/fluids designer	Mechanical system; mechanical design; piping design; heating, ventilation and air conditioning (HVAC); fluid system design; hydraulic system design	Medium
	Vessel electronics/navigational	NAVAIDS, electronic chart display and information systems, autopilot, instruments,	Med/high

	systems designer	metoc equipment	
	Electromagnetic compatibility designer	Design configuration, electromagnetic spectrum management	Medium
	Mission systems designer	Defensive aids, electronic support measures, attack and identification, communications, sensor data fusion, data security, mission support/planning systems, networking and battlespace management, signal processing, payload data processing	High
	Low-observability designer	Signature measurement, vulnerability, susceptibility, detectability	High
	Software designer	Software requirements definition, design, evaluation and integration, algorithms, prognostics, diagnostics, structural modelling, information assurance, network defence	Low
	Design validation engineer	Performance analysis, threat analysis, test validation planning, scenario validation, design verification	Med/high
	Interoperability designer	System technical capabilities and interfaces	Med/high
Engineering	Acoustics/signatures/ dynamics engineer	Signature analysis, noise and vibration	Med/high
	Electrical and control engineer	Electrical system component, electrical analysis, electrical design, power generation	Medium
	Mechanical/fluids engineer	Mechanical component, mechanical system, mechanical design, piping, HVAC, fluid system, hydraulics	Low
	Naval architecture/marine engineer	Naval architecture, marine engineering, weights analysis, standards	Med/high
	Planning and production support manager	Scheduling, purchasing support, component support	Low
	Hull/structural/ arrangements engineer	Structural engineering, structural arrangement	Medium
	Propulsion /combustion and fluid dynamics engineer	Airflows, rotor/stator blade design, combustion system, reheat system, thrust/weight ratio, propeller	Medium
	Systems engineer	Tracking and systems evaluation, engineering management, configuration management, integration of systems, mission systems	Med/high

		architecture, human factors engineering, risk management, optimisation, reliability, systems security	
	Unmanned naval system engineer	Autonomy, digital decision-making, imagery analysis	Medium
	Operational governance manager	Certification	Medium
Manufacture	Outfitting engineer	Calibration, hull insulation, mechanical fitting, caulking, pipe welding, piping/machinery insulation, sheet metal	Low
	Structure engineer	Steelwork, plating, structure welding, shipfitting	Low
	Direct support manager	Quality assurance/control, stores, material control, rigging, crane and lorry operation	Low
Integrated test, evaluation and acceptance	Platform test engineer	Structural test and laboratories, rig testing, system quality testing, platform pre-sail and production build testing, structural integrity, test equipment	Med/high
	Systems test engineer	Technical scheduling, collation, analysis, quality assurance/control	Med/high

Table D.68. Naval – Coastal Patrol Vessels. Lifecycle stage: In-service Support

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Synthetic environment	Synthetic environments engineer	Simulation, operational evaluation, modelling	Medium
Logistics and service management	Safety governance manager	System safety engineering, operational worthiness, standards implementation, safe and suitable for service testing	Medium
	Fleet services manager	Through-life fleet/capability management	Medium
	Support services manager	Inventory, supply chain and obsolescence management, support cost optimisation, technical publications	Low
	Sustainability manager	Reliability, ability to test, ability to maintain, interoperability	Medium
Operations	At-sea operations manager	Management, planning, sailing	Med/high
	Port operations manager	Service provision port operation	Low
Field support	Training design and delivery manager	Crew, maintainer and operational training, tools, manuals, aids, training systems	Medium
	Maintenance engineer	Maintenance Approved Organisation Scheme equivalence, electronics, mechanical, propulsion and weapons technicians, diagnostics	Medium

Table D.69. Naval – Coastal Patrol Vessels. Lifecycle stage: Disposal

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Disposal	Compliance officer	Environmental compliance, regulatory, reuse/recycling	Low
	Make-safe engineer	Removal of sensitive components/sub-systems	Med/high
	Decommissioning officer	Demilitarisation	High

Naval – Amphibious / Landing Ships

Table D.70. Naval – Amphibious / Landing Ships. Lifecycle stage: Management

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Programme management	Project manager	Performance management, cost management, risk management, contract management, requirements management, technical management, supply chain management	Medium
	Planning and production support engineer	Strategic planning, work flow management	Low
	Cost estimator	Cost modelling, learner rates, three point estimating	Medium
	Procurement officer	Market research, market assessment, financial management	Medium

Table D.71. Naval – Amphibious / Landing Ships. Lifecycle stage: Design, Engineering and Manufacture

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Design	Design engineer	Concept design, systems integration, requirements engineering, interoperability	Med/high
	Draughtsman and CAD designer	Electrical and control, mechanical (including piping, HVAC), hull/structural/arrangements, simulation	Medium
	Detail and installation designer	Components, sub-assemblies, installation	Medium
	Electrical and control designer	Electrical system component, electrical analysis, electrical design, conversion, utilities control system, digital electronics	Medium
	Mechanical/fluids designer	Mechanical system; mechanical design; piping design; heating, ventilation and air conditioning (HVAC); fluid system design; hydraulic system design	Medium
	Vessel electronics/navigational	NAVAIDS, electronic chart display and information systems, autopilot, instruments,	Med/high

	systems designer	metoc equipment	
	Electromagnetic compatibility designer	Design configuration, electromagnetic spectrum management	Medium
	Mission systems designer	Defensive aids, electronic support measures, attack and identification, communications, sensor data fusion, data security, mission support/planning systems, networking and battlespace management, signal processing, payload data processing	High
	Low-observability designer	Signature measurement, vulnerability, susceptibility, detectability	High
	Software designer	Software requirements definition, design, evaluation and integration, algorithms, prognostics, diagnostics, structural modelling, information assurance, network defence	Medium
	Design validation engineer	Performance analysis, threat analysis, test validation planning, scenario validation, design verification	Med/high
	Interoperability designer	System technical capabilities and interfaces	Medium
Engineering	Acoustics/signatures/ dynamics engineer	Signature analysis, noise and vibration	Medium
	Electrical and control engineer	Electrical system component, electrical analysis, electrical design, power generation	Low
	Mechanical/fluids engineer	Mechanical component, mechanical system, mechanical design, piping, HVAC, fluid system, hydraulics	Low
	Naval architecture/marine engineer	Naval architecture, marine engineering, weights analysis, standards	Med/high
	Planning and production support engineer	Scheduling, purchasing support, component support	Low
	Hull/structural/ arrangements engineer	Structural engineering, structural arrangement	Medium
	Propulsion /combustion and fluid dynamics engineer	Airflows, rotor/stator blade design, combustion system, reheat system, thrust/weight ratio, propeller	Medium
	Systems engineer	Tracking and systems evaluation, engineering management, configuration management, integration of systems, mission systems	Medium

		architecture, human factors engineering, risk management, optimisation, reliability, systems security	
	Unmanned naval system engineer	Autonomy, digital decision-making, imagery analysis	Medium
	Operational governance manager	Certification	Med/high
Manufacture	Outfitting engineer	Calibration, hull insulation, mechanical fitting, caulking, pipe welding, piping/machinery insulation, sheet metal	Low
	Structure engineer	Steelwork, plating, structure welding, shipfitting	Low
	Direct support manager	Quality assurance/control, stores, material control, rigging, crane and lorry operation	Low
Integrated test, evaluation and acceptance	Platform test engineer	Structural test and laboratories, rig testing, system quality testing, platform pre-sail and production build testing, structural integrity, test equipment	Med/high
	Systems test engineer	Technical scheduling, collation, analysis, quality assurance/control	Med/high

Table D.72. Naval – Amphibious / Landing Ships. Lifecycle stage: In-service Support

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Synthetic environment	Synthetic environments engineer	Simulation, operational evaluation, modelling	Medium
Logistics and service management	Safety governance manager	System safety engineering, operational worthiness, standards implementation, safe and suitable for service testing	Medium
	Fleet services manager	Through-life fleet/capability management	Medium
	Support services manager	Inventory, supply chain and obsolescence management, support cost optimisation, technical publications	Low
	Sustainability manager	Reliability, ability to test, ability to maintain, interoperability	Medium
Operations	At-sea operations manager	Management, planning, sailing	Med/high
	Port operations manager	Service provision port operation	Low
Field support	Training design and delivery manager	Crew, maintainer and operational training, tools, manuals, aids, training systems	Medium
	Maintenance engineer	Maintenance Approved Organisation Scheme equivalence, electronics, mechanical, propulsion and weapons technicians, diagnostics	Medium

Table D.73. Naval – Amphibious / Landing Ships. Lifecycle stage: Disposal

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Disposal	Compliance officer	Environmental compliance, regulatory, reuse/recycling	Medium
	Make-safe engineer	Removal of sensitive components/sub-systems	Med/high
	Decommissioning officer	Demilitarisation	High

Naval – Auxiliary Ships

Table D.74. Naval – Auxiliary Ships. Lifecycle stage: Management

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Programme management	Project manager	Performance management, cost management, risk management, contract management, requirements management, technical management, supply chain management	Low
	Planning and production support engineer	Strategic planning, work flow management	Low
	Cost estimator	Cost modelling, learner rates, three point estimating	Low
	Procurement officer	Market research, market assessment, financial management	Low

Table D.75. Naval – Auxiliary Ships. Lifecycle stage: Design, Engineering and Manufacture

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Design	Design engineer	Concept design, systems integration, requirements engineering, interoperability	Medium
	Draughtsman and CAD designer	Electrical and control, mechanical (including piping, HVAC), hull/structural/arrangements, simulation	Low
	Detail and installation designer	Components, sub-assemblies, installation	Medium
	Electrical and control designer	Electrical system component, electrical analysis, electrical design, conversion, utilities control system, digital electronics	Low
	Mechanical/fluids designer	Mechanical system; mechanical design; piping design; heating, ventilation and air conditioning (HVAC); fluid system design; hydraulic system design	Low
	Vessel electronics/navigational systems designer	NAVAIDS, electronic chart display and information systems, autopilot, instruments, metoc equipment	Low

	Electromagnetic compatibility designer	Design configuration, electromagnetic spectrum management	Low
	Mission systems designer	Defensive aids, electronic support measures, attack and identification, communications, sensor data fusion, data security, mission support/planning systems, networking and battlespace management, signal processing, payload data processing	Med/high
	Low-observability designer	Signature measurement, vulnerability, susceptibility, detectability	Med/high
	Software designer	Software requirements definition, design, evaluation and integration, algorithms, prognostics, diagnostics, structural modelling, information assurance, network defence	Low
	Design validation engineer	Performance analysis, threat analysis, test validation planning, scenario validation, design verification	Medium
	Interoperability designer	System technical capabilities and interfaces	Low
Engineering	Acoustics/signatures/ dynamics engineer	Signature analysis, noise and vibration	Low
	Electrical and control engineer	Electrical system component, electrical analysis, electrical design, power generation	Low
	Mechanical/fluids engineer	Mechanical component, mechanical system, mechanical design, piping, HVAC, fluid system, hydraulics	Low
	Naval architecture/marine engineer	Naval architecture, marine engineering, weights analysis, standards	Medium
	Planning and production support engineer	Scheduling, purchasing support, component support	Medium
	Hull/structural/ arrangements engineer	Structural engineering, structural arrangement	Low
	Propulsion /combustion and fluid dynamics engineer	Airflows, rotor/stator blade design, combustion system, reheat system, thrust/weight ratio, propeller	Low
	Systems engineer	Tracking and systems evaluation, engineering management, configuration management, integration of systems, mission systems architecture, human factors engineering, risk management, optimisation, reliability, systems	Medium

		security	
	Unmanned naval system engineer	Autonomy, digital decision-making, imagery analysis	Medium
	Operational governance manager	Certification	Medium
Manufacture	Outfitting engineer	Calibration, hull insulation, mechanical fitting, caulking, pipe welding, piping/machinery insulation, sheet metal	Low
	Structure engineer	Steelwork, plating, structure welding, shipfitting	Low
	Direct support manager	Quality assurance/control, stores, material control, rigging, crane and lorry operation	Low
Integrated test, evaluation and acceptance	Platform test engineer	Structural test and laboratories, rig testing, system quality testing, platform pre-sail and production build testing, structural integrity, test equipment	Medium
	Systems test engineer	Technical scheduling, collation, analysis, quality assurance/control	Medium

Table D.76. Naval – Auxiliary Ships. Lifecycle stage: In-service Support

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Synthetic environment	Synthetic environments engineer	Simulation, operational evaluation, modelling	Low
Logistics and service management	Safety governance manager	System safety engineering, operational worthiness, standards implementation, safe and suitable for service testing	Medium
	Fleet services manager	Through-life fleet/capability management	Medium
	Support services manager	Inventory, supply chain and obsolescence management, support cost optimisation, technical publications	Low
	Sustainability manager	Reliability, ability to test, ability to maintain, interoperability	Low
Operations	At-sea operations manager	Management, planning, sailing	Low
	Port operations manager	Service provision port operation	Low
Field support	Training design and delivery manager	Crew, maintainer and operational training, tools, manuals, aids, training systems	Low
	Maintenance engineer	Maintenance Approved Organisation Scheme equivalence, electronics, mechanical, propulsion and weapons technicians, diagnostics	Low

Table D.77. Naval – Auxiliary Ships. Lifecycle stage: Disposal

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Disposal	Compliance officer	Environmental compliance, regulatory, reuse/recycling	Low
	Make-safe engineer	Removal of sensitive components/sub-systems	Medium
	Decommissioning officer	Demilitarisation	Medium

Naval – Nuclear Submarines

Table D.78. Naval – Nuclear Submarines. Lifecycle stage: Management

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Programme management	Project manager	Performance management, cost management, risk management, contract management, requirements management, technical management, supply chain management	Medium
	Planning and production support engineer	Strategic planning, work flow management	Med/high
	Cost estimator	Cost modelling, learner rates, three point estimating	Med/high
	Procurement officer	Market research, market assessment, financial management	Medium

Table D.79. Naval – Nuclear Submarines. Lifecycle stage: Design, Engineering and Manufacture

Functional competence group	Officer	Skills coverage	Specialisation to defence
Design	Design engineer	Concept design, systems integration, requirements engineering, interoperability	Med/high
	Draughtsman and CAD designer	Electrical and control, mechanical (including piping, HVAC), hull/structural/ arrangements, simulation	Medium
	Detail and installation designer	Components, sub-assemblies, installation	Med/high
	Electrical and control designer	Electrical system component, electrical analysis, electrical design, conversion, utilities control system, digital electronics	Med/high
	Electromagnetic compatibility designer	Design configuration, electromagnetic spectrum management	Med/high
	Mechanical/fluids designer	Mechanical system; mechanical design; piping design; heating, ventilation and air conditioning (HVAC); fluid system design; hydraulic system design	Med/high
	Vessel	NAVAIDS, electronic chart display and	High

	electronics/navigational systems designer	information systems, autopilot, instruments, metoc equipment	
	Mission systems designer	Defensive aids, electronic support measures, attack and identification, communications, sensor data fusion, data security, mission support/planning systems, networking and battlespace management, signal processing, payload data processing	High
	Low-observability designer	Signature measurement, vulnerability, susceptibility, detectability	High
	Software designer	Software requirements definition, design, evaluation and integration, algorithms, prognostics, diagnostics, structural modelling, information assurance, network defence	Medium
	Nuclear-specific design engineer	Radiation physics and shielding	High
	Design validation engineer	Performance analysis, threat analysis, test validation planning, scenario validation, design verification	High
	Interoperability designer	System technical capabilities and interfaces	Med/high
Engineering	Acoustics/signatures/ dynamics engineer	Signature analysis, noise and vibration	High
	Electrical and control engineer	Electrical system component, electrical analysis, electrical design, power generation	High
	Mechanical/fluids engineer	Mechanical component, mechanical system, mechanical design, piping, HVAC, fluid system, hydraulics	Med/high
	Naval architecture/marine engineer	Naval architecture, marine engineering, weights analysis, standards	High
	Planning and production support manager	Scheduling, purchasing support, component support	Medium
	Hull/structural/ arrangements engineer	structural engineering, structural arrangement	High
	Propulsion /combustion and fluid dynamics engineer	Airflows, rotor/stator blade design, combustion system, reheat system, thrust/weight ratio, propeller	High
	Nuclear propulsion engineer	Reactor plant design, turbine engineering,	High

	Systems engineer	Tracking and systems evaluation, engineering management, configuration management, integration of systems, mission systems architecture, human factors engineering, risk management, optimisation, reliability, systems security	High
	Operational governance manager	Certification	High
Manufacture	Outfitting engineer	Calibration, hull insulation, mechanical fitting, caulking, pipe welding, piping/machinery insulation, sheet metal	High
	Structure engineer	Steelwork, plating, structure welding, shipfitting	High
	Direct support manager	Quality assurance/control, stores, material control, rigging, crane and lorry operation	Medium
Integrated test, evaluation and acceptance	Platform test engineer	Structural test and laboratories, rig testing, system quality testing, platform pre-sail and production build testing, structural integrity, test equipment	High
	Systems test engineer	Technical scheduling, collation, analysis, quality assurance/control	High

Table D.80. Naval – Nuclear Submarines. Lifecycle stage: In-service Support

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Synthetic environment	Synthetic environments engineer	Simulation, operational evaluation, modelling	Med/high
Logistics and service management	Safety governance manager	System safety engineering, operational worthiness, standards implementation, safe and suitable for service testing, nuclear safety systems	High
	Fleet services manager	Through-life fleet/capability management	Med/high
	Support services manager	Inventory, supply chain and obsolescence management, support cost optimisation, technical publications	Medium
	Sustainability manager	Reliability, ability to test, ability to maintain, interoperability	Med/high
Operations	At-sea operations manager	Management, planning, sailing	High
	Port operations manager	Service provision port operation	Med/high
Field support	Training design and delivery manager	Crew, maintainer and operational training, tools, manuals, aids, training systems	High
	Maintenance engineer	Maintenance Approved Organisation Scheme equivalence, electronics, mechanical, propulsion and weapons technicians, diagnostics	High

Table D.81. Naval – Nuclear Submarines. Lifecycle stage: Disposal

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Disposal	Compliance officer	Environmental compliance	High
	Make-safe engineer	Removal of sensitive components/sub-systems	High
	Nuclear decontamination engineer	Decontamination	Med/high
	Decommissioning officer	Demilitarisation	High

Naval – Non-nuclear Submarines

Table D.82. Naval – Non-nuclear Submarines. Lifecycle stage: Management

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Programme management	Project manager	Performance management, cost management, risk management, contract management, requirements management, technical management, supply chain management	Medium
	Planning and production support engineer	Strategic planning, work flow management	Med/high
	Cost estimator	Cost modelling, learner rates, three point estimating	Med/high
	Procurement officer	Market research, market assessment, financial management	Medium

Table D.83. Naval – Non-nuclear Submarines. Lifecycle stage: Design, Engineering and Manufacture

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Design	Design engineer	Concept design, systems integration, requirements engineering, interoperability	Med/high
	Draughtsman and CAD designer	Electrical and control, mechanical (including piping, HVAC), hull/structural/ arrangements, simulation	Medium
	Detail and installation designer	Components, sub-assemblies, installation	Med/high
	Electrical and control designer	Electrical system component, electrical analysis, electrical design, conversion, utilities control system, digital electronics	Med/high
	Mechanical/fluids designer	Mechanical system; mechanical design; piping design; heating, ventilation and air conditioning (HVAC); fluid system design; hydraulic system design	Medium
	Vessel electronics/navigational systems designer	NAVAIDS, electronic chart display and information systems, autopilot,	Med/high

		instruments, metoc equipment	
	Electromagnetic compatibility designer	Design configuration, electromagnetic spectrum management	Med/high
	Mission systems designer	Defensive aids, electronic support measures, attack and identification, communications, sensor data fusion, data security, mission support/planning systems, networking and battlespace management, signal processing, payload data processing	High
	Low-observability designer	Signature measurement, vulnerability, susceptibility, detectability	High
	Software designer	Software requirements definition, design, evaluation and integration, algorithms, prognostics, diagnostics, structural modelling, information assurance, network defence	Medium
	Design validation engineer	Performance analysis, threat analysis, test validation planning, scenario validation, design verification	High
	Interoperability designer	System technical capabilities and interfaces	Med/high
Engineering	Acoustics/signatures/dynamics engineer	Signature analysis, noise and vibration	High
	Electrical and control engineer	Electrical system component, electrical analysis, electrical design, power generation	Med/high
	Mechanical/fluids engineer	Mechanical component, mechanical system, mechanical design, piping, HVAC, fluid system, hydraulics	Med/high
	Naval architecture/marine engineer	Naval architecture, marine engineering, weights analysis, standards	High
	Planning and production support manager	Scheduling, purchasing support, component support	Medium
	Hull/structural/arrangements engineer	structural engineering, structural arrangement	Med/high
	Propulsion /combustion and fluid dynamics	Airflows, rotor/stator blade design, combustion system, reheat system, thrust/weight ratio, propeller	Med/high

	Propulsion engineer	Plant design, turbine engineering	Med/high
	Systems engineer	Tracking and systems evaluation, engineering management, configuration management, integration of systems, mission systems architecture, human factors engineering, risk management, optimisation, reliability, systems security	Med/high
	Unmanned naval system engineer	Autonomy, digital decision-making, imagery analysis	Med/high
	Operational governance manager	Certification	Med/high
Manufacture	Outfitting engineer	Calibration, hull insulation, mechanical fitting, caulking, pipe welding, piping/machinery insulation, sheet metal	High
	Structure engineer	Steelwork, plating, structure welding, shipfitting	High
	Direct support manager	Quality assurance/control, stores, material control, rigging, crane and lorry operation	Medium
Integrated test, evaluation and acceptance	Platform test engineer	Structural test and laboratories, rig testing, system quality testing, platform pre-sail and production build testing, structural integrity, test equipment	High
	Systems test engineer	Technical scheduling, collation, analysis, quality assurance/control	Med/high

Table D.84. Naval – Non-nuclear Submarines. Lifecycle stage: In-service Support

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Synthetic environment	Synthetic environments engineer	Simulation, operational evaluation, modelling	Medium
Logistics and service management	Safety governance manager	System safety engineering, operational worthiness, standards implementation, safe and suitable for service testing	High
	Fleet services manager	Through-life fleet/capability management	Med/high
	Support services manager	Inventory, supply chain and obsolescence management, support cost optimisation, technical publications	Medium
	Sustainability manager	Reliability, ability to test, ability to maintain, interoperability	Med/high
Operations	At-sea operations manager	Management, planning, sailing	High
	Port operations manager	Service provision port operation	Med/high
Field support	Training design and delivery manager	Crew, maintainer and operational training, tools, manuals, aids, training systems	Med/high
	Maintenance engineer	Maintenance Approved Organisation Scheme equivalence, electronics, mechanical, propulsion and weapons technicians, diagnostics	Med/high

Table D.85. Naval – Non-nuclear Submarines. Lifecycle stage: Disposal

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Disposal	Compliance officer	Environmental compliance, regulatory, reuse/recycling	Med/high
	Make-safe engineer	Removal of sensitive components/sub-systems	High
	Decommissioning officer	Demilitarisation	Med/high

Complex Weapons – Guided Precision Weapons

Table D.86. Complex Weapons – Guided Precision Weapons. Lifecycle stage: Management

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Programme management	Project and technical manager	Performance management, cost management, risk management, contract management, requirements management, technical management, supply chain management	Medium
	Project and system control manager	Strategic planning, work flow management	Low
	Cost estimator	Cost modelling, learner rates, three point estimating	Medium
	Procurement officer	Market research, market assessment, financial management	Medium
Synthetic environment[3]	Synthetic environments engineer	Simulation, experimentation, operational evaluation, modelling	Medium

Table D.87. Complex Weapons – Guided Precision Weapons. Lifecycle stage: Design, Engineering and Manufacture

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Design	Design engineer	Concept design, platform integration, modularity, interoperability	Med/high
	Draughtsman and CAD designer	Electrical and control, mechanical, rapid prototyping, simulation	Low
	Production engineer	Manufacturing technology	Med/high
Systems engineering and design	Concept engineer	Requirements engineering, concept of operations development	Med/high
	Electromagnetic compatibility engineer	Design configuration, electromagnetic spectrum management	Medium

[3] Synthetic Environments has been included as a Functional Competence Group at the Management Lifecycle Stage to reflect specific industry feedback; for all other domains it is included at the In-Service Support stage.

	Technology insertion engineer	Technology readiness, system architectures, interface compatibility, programme scheduling	Med/high
	Propulsion engineer	Launch systems, flight control, conditioning, materials, structures, actuation	Medium
	Operational governance manager	Operational certification	High
	Low-observability engineer	Stealth engineering, detectability, counter-counter measures, image processing	High
	Software designer	Software requirements definition, design, evaluation and integration, algorithms, prognostics, diagnostics, high-integrity software, InfoSec engineering	Medium
	Design validation engineer	Performance analysis, threat analysis, test validation planning, scenario validation, design verification	Med/high
	Interoperability engineer	System technical capabilities and interfaces	Med/high
	Systems integration engineer	Tracking and systems evaluation, engineering management, configuration management, integration of systems, weapon systems architecture, human factors engineering, risk management, optimisation, reliability	Med/high
	Command and control engineer	Comms and data links, system sensors, missile data links, telemetry, signal processing	High
Missile engineering	Air frames and structures engineer	Materials technology, structural design, strength, fatigue, mass, aeroelasticity, stealth materials, signature control	High
	Aerodynamics engineer	Stability and control, performance, wind tunnel testing	High
Missile systems	Missile designer	Fuze, detonation, interfaces, safety and arming units	High
	Lethality engineer	Warheads, energetics and explosives	High
	Mechanical engineer	Component engineering, friction reduction, thermal efficiency, air flows	High
	Electronic engineer	Radiation hardening, component engineering, conversion, electrical distribution and storage, digital electronics	High

Guidance, control and navigation	Autonomy engineer	Digital decision-making, imagery analysis	Medium
	Navigation engineer	Integrated navigation, sensors, GPS, datalink, RF seekers, IR seekers	Medium
	Guidance and control engineer	Target acquisition and engagement, autopilot, counter-counter measures, algorithms	High
Manufacture	Composite fabrication engineer	Composite details, assemblies, tooling design	Medium
	Electrical installation engineer	Engineering, construction, control systems	Low
	Specialist manufacture and machining engineer	Precision mechanical, heavy machining, technical data	Medium
	Detail and installation designer	Components, sub-assemblies, installation	Medium
Integrated test, evaluation and acceptance	Test specialist	Structural test and laboratories, system quality testing, technical scheduling, collation, analysis, environmental engineering, test equipment	High

Table D.88. Complex Weapons – Guided Precision Weapons. Lifecycle stage: In-service Support

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Logistics and service management	Safety engineering and governance manager	System safety engineering, operational worthiness, standards implementation, safe and suitable for service testing	High
	Fleet services manager	Through-life capability management	Med/high
	Support services manager	Inventory, supply chain and obsolescence management, support cost optimisation, technical publications	Medium
	Sustainability manager	Reliability, ability to test, ability to maintain, interoperability	Med/high
Operations	Launch operations manager	Management, planning, launch	High
	Support operations manager	Service provision	Med/high
Field support	Training design and delivery manager	Maintainer and operational training, tools, manuals, aids, training systems	High
	Maintenance engineer	Electronics, mechanical, propulsion technicians, diagnostics	Med/high

Table D.89. Complex Weapons – Guided Precision Weapons. Lifecycle stage: Disposal

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Disposal	Compliance officer	Environmental compliance, regulatory, reuse/recycle	Medium
	Decommissioning officer	Demilitarisation	High
	Make-safe engineer	Removal of sensitive components/sub-systems	High

C4ISTAR – Cyber C4ISTAR

Table D.90. C4ISTAR – Cyber C4ISTAR. Lifecycle stage: Management

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Programme management	Project manager	Performance management, cost management, risk management, contract management, requirements management, technical management, supply chain management	Medium
	Planning and production support engineer	Strategic planning, work flow management	Low
	Cost estimator	Cost modelling, learner rates, three point estimating	Low
	Procurement officer	Market research, market assessment, financial management	Medium

Table D.91. C4ISTAR – Cyber C4ISTAR. Lifecycle stage: Design, Engineering and Manufacture

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Design	Design engineer	Concept design, interoperability, requirements engineering, interoperability	Medium
	Design validation engineer	Performance analysis, threat analysis, test validation planning, scenario validation, simulation, design verification	Medium
Systems engineering and design	Whole systems integration engineer	Tracking and systems evaluation, engineering management, configuration management, integration of systems, systems architecture, human factors engineering, risk management, optimisation, reliability	Medium
	Technology insertion engineer	Technology readiness, system architectures, interface compatibility, programme scheduling	Medium
	Electronic warfare systems engineer	Electronic counter-measures, jamming, radar counter-measures, threat warning systems, electronic support measures, decoys	High
	System designer	Modelling	Medium
	Electromagnetic	Design configuration, electromagnetic spectrum	High

	compatibility engineer	management	
	Algorithms engineer	Sensor processing, information analytics and fusion, big data analytics and optimisation, decision aid algorithm, waveform design, cryptography	Medium
	Communication systems engineer	Technologies for telephony, mobility technologies, networks, communications protocols, telecommunications, cyber security, communications systems, image communication, communication switching	Med/high
	Information architect	Sonar, image processing, multiplexing, network topology	Med/high
	Systems engineer	Whole systems integration, systems modelling, tracking and systems evaluation, engineering management, configuration management, integration of systems, systems architecture, human factors engineering, risk management, optimisation, reliability, systems security	Medium
Hardware and sensors engineering	Acoustics technologies engineer	Acoustic systems and devices	Med/high
	Analogue interfaces engineer	Analogue/digital and digital/analogue conversion	Medium
	CBRN technologies engineer		Med/high
	Communication switching engineer	Code division multiplexing, electronic switching systems, frame relay, handover, packet switching	Medium
	Digital electronics engineer	Digital printed circuit board, application-specific integrated circuit, field-programmable gate array	Medium
	Materials engineer	Semiconductors growth and process, ceramic and composite materials fabrication	Med/high
	Mechanical and thermal engineer	Servomechanics, machining, coating technologies, aerodynamics and flight mechanics, thermal management, material behaviours, environment constaints	Med/high
	Optics and electrooptics engineer	Electrooptics architecture, displays, optical detectors, optical sources, lasers, optics components	Med/high

	Power supply and generation engineer	Power supply	Medium
	RF and microwave engineer	RF/HF architecture, low power RF/HF, high power RF/HF, tubes, monolithic microwave integrated circuits, antennas, radar (conventional/SAR/MTI), ESM	Med/high
Software engineering	Data and information processing engineer	Algorithm implementation, artificial intelligence, simulation software, software security, data mining	Medium
	HMI and GIS engineer	Human machine interaction software technologies and frameworks	Medium
	Infrastructure and technology services engineer	Databases, enterprise service bus technologies, WEB technologies and portals, equipment interfacing, drivers, software security infrastructure, data storage, back up, recovery plan	Medium
	Operating systems engineer		Medium
	Computing platforms engineer	Field-programmable gate array , parallel processing, data centres and cloud	Medium
	Programming language engineer		Medium
	Software architect	Distributed and constrained, web IS/IT, embedded and real-time	Medium
Integrated test, evaluation and acceptance	Test specialist	Structural test and laboratories, system quality testing, production build testing, test equipment	Low

Table D.92. C4ISTAR – Cyber C4ISTAR. Lifecycle stage: In-service Support

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Synthetic environment	Synthetic environments engineer	Simulation, operational evaluation, modelling	Medium
Logistics and service management	Asset manager	Through-life capability management, capability maintenance	Medium
	Safety and governance manager	System safety engineering, operational worthiness, standards implementation, safe and suitable for service testing	Medium
	Support manager	Inventory, supply chain and obsolescence management, support cost optimisation, technical publication	Medium
	Sustainability manager	Reliability, ability to test, ability to maintain, interoperability	Medium
Operations	Operations manager	Management, planning	Med/high
Support	Training design and delivery manager	Maintainer and operational training, tools, manuals, aids, training systems	Medium
	Maintenance engineer	Electronics, mechanical, computing technicians, diagnostics	Medium

Table D.93. C4ISTAR – Cyber C4ISTAR. Lifecycle stage: Disposal

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Disposal	Compliance officer	Environmental compliance, regulatory, reuse/recycling	Medium
	Make-safe engineer	Removal of sensitive components/sub-systems	Med/high
	Decommissioning officer	Demilitarisation	Med/high

Space[4]

Table D.94. Space. Lifecycle stage: Management

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Programme management	Project manager	Performance management, cost management, risk management, contract management, requirements management, technical management, supply chain management	Medium
	Planning and production support engineer	Strategic planning, work flow management	Low
	Cost estimator	Cost modelling, learner rates, three point estimating	Low
	Procurement officer	Market research, market assessment, financial management	Medium

Table D.95. Space. Lifecycle stage: Design, Engineering and Manufacture

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Systems design and engineering	System design and validation engineer	Mission and system specification, collaborative and concurrent engineering, system analysis and design, system verification, simulation, interoperability, design verification	Medium
	Whole systems integration engineer	Tracking and systems evaluation, engineering management, configuration management, integration of systems, mission systems architecture, risk management, optimisation, reliability, systems security	Medium
	Electromagnetic compatibility engineer	Design configuration, electromagnetic spectrum management	Med/high
	Spacecraft environments and effects engineer	Space environment, environment effects, space weather	Med/high

[4] Please note the structure of the Space taxonomy reflects the sources identified as part of the project team's literature review.

	Mission operation and ground data systems engineer	Advanced system concepts, mission operations, ground data systems	Medium
	Space debris engineer	Ground- and space-based debris and meteoroid measurements, modelling and risk analysis, debris mitigation, debris environment remediation and protection	Medium
	Ground station system and networks engineer	Ground station system, ground communication networks	Medium
	Automation, telepresence and robotics engineer	Applications and concepts, automatic and robotics systems, automation and robotics components and technologies	Medium
	Mechanisms engineer	Mechanism core technologies, non-explosive release technologies, exploration tool technologies, control electronics technologies, MEMS technologies, tribology technologies, mechanism engineering, pyrotechnic technologies	Medium
	Propulsion engineer	Chemical propulsion technologies, electric propulsion technologies, advanced propulsion, supporting propulsion technologies and tools	Medium
	Structures engineer	Structural design and verification methods and tools, high-stability and high-precision S/C structures, inflatable and deployable structures, hot structures, active/adaptive structures, damage tolerance and health monitoring, launchers, reentry vehicles, planetary vehicles, meteoroid and debris shield design and analysis, advanced structural concepts and materials	Medium
	Thermal engineer	Heat transport technology, cryogenics and refrigeration, thermal protection, heat storage and rejection, thermal analysis tools	Medium
	Materials and processes engineer	Novel materials and materials technology, materials processes, cleanliness and sterilisation, space environmental effects on materials and processes, modelling of materials behaviour and properties, non-destructive inspection, materials and process obsolescence, materials for electronic assembly	Medium
Software engineering	Onboard data	Payload data processing, onboard data	Medium

	systems engineer	management, microelectronics for digital and analogue applications	
	Space system software engineer	Advanced software technologies, space segment software, ground segment software, ground data processing, earth observation payload data exploitation, information assurance, network defence	Med/high
	Flight dynamics and GNSS engineer	Flight dynamics, global navigation satellite system high-precision data processing	Medium
Hardware engineering	Spacecraft electrical power engineer	Power system architecture, power generation technologies, energy storage technologies, power conditioning and distribution including regulation, control and distribution, digital electronics	Med/high
	Space system control engineer	Control systems engineering, control systems innovative technologies, control techniques and tools, AOCS (Attitude and Orbit Control System) /Guidance and Navigation Control sensors and actuators	Med/high
	RF systems, payloads and technologies engineer	Telecommunication systems/subsystems, radio navigation systems/subsystems, TT&C (telemetry, tracking, and commanding) and payload data modulator (PDM) systems/subsystems, RF payloads, RF technologies and equipment	Medium
	Electromagnetic technologies and techniques engineer	Antennas, wave interaction and propagation, EMC/RFC/ESD	Medium
	Optics engineer	Optical system engineering, optical component technology and materials, optical equipment and instrument technology	Med/high
	Optoelectrics engineer	Laser technologies, detector technologies, photonics	Med/high
	Aerothermodynamics engineer	Numerical methods, sensors and measurement techniques, flight databases	Med/high
Integrated test, evaluation and acceptance	Test specialist	Structural test and laboratories, system quality testing, production build testing, test equipment	Medium

Table D.96. Space. Lifecycle stage: In-service Support

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Synthetic environment	Synthetic environments engineer	Simulation, operational evaluation, modelling	Medium
Logistics and service management	Asset manager	Through-life capability management, capability maintenance	Medium
	Safety and governance manager	System safety engineering, certification, standards implementation, safe and suitable for service testing,	Medium
	Support manager	Inventory, supply chain and obsolescence management, support cost optimisation, technical publication	Medium
	Sustainability manager	Reliability, ability to test, ability to maintain, interoperability	Medium
Operations	Operations manager	Management, planning	Medium
Support	Training design and delivery manager	Maintainer and operational training, tools, manuals, aids, training systems	Medium
	Maintenance engineer	Electronics, mechanical, computing technicians, diagnostics	Medium

Table D.97. Space. Lifecycle stage: Disposal

Functional competence group	Occupation	Skills coverage	Specialisation to defence
Disposal	Compliance officer	Environmental compliance, regulatory, reuse/recycling	Medium
	Make-safe engineer	Removal of sensitive components/sub-systems	Med/high
	Decommissioning officer	Demilitarisation	Med/high

1.4. Graphical representations of EDA Priority Areas

The following images provide a graphical representation of the EDA Priority Areas.

The current Priority Areas include:

(1) Air-to-Air refuelling
(2) Remotely piloted aircraft systems (RPAS)
(3) Cyber defence
(4) Satellite communications (SATCOM)

The future Priority Areas include:

(1) Maritime capabilities (multirole logistic ships)
(2) Space observation
(3) Precision guided munition and logistic support

The structure of our taxonomies presented above does not include a specific taxonomy for skills related to remotely piloted systems. Such skills are included as part of the Air Defence Fighter and Interdiction Aircraft taxonomies. As such, it was not possible to generate the same kind of graphical representation of skills for RPAS.

The skills taxonomies relevant for the remaining Priority Areas are:

(1) Air-to-Air refuelling
(2) C4ISTAR (Cyber defence)
(3) Space (Satellite communications (SATCOM) and Space observation)
(4) Auxiliary Ships (Maritime capabilities)
(5) Complex Weapons (Precision guided munition)

The skills within each wheel image are colour-coded as per the key below:

Figure D.1. Colour-coding key for taxonomies' graphical representation

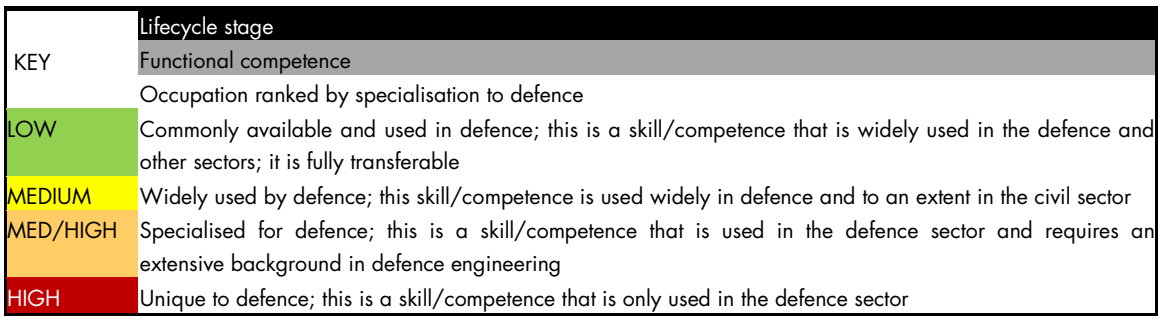
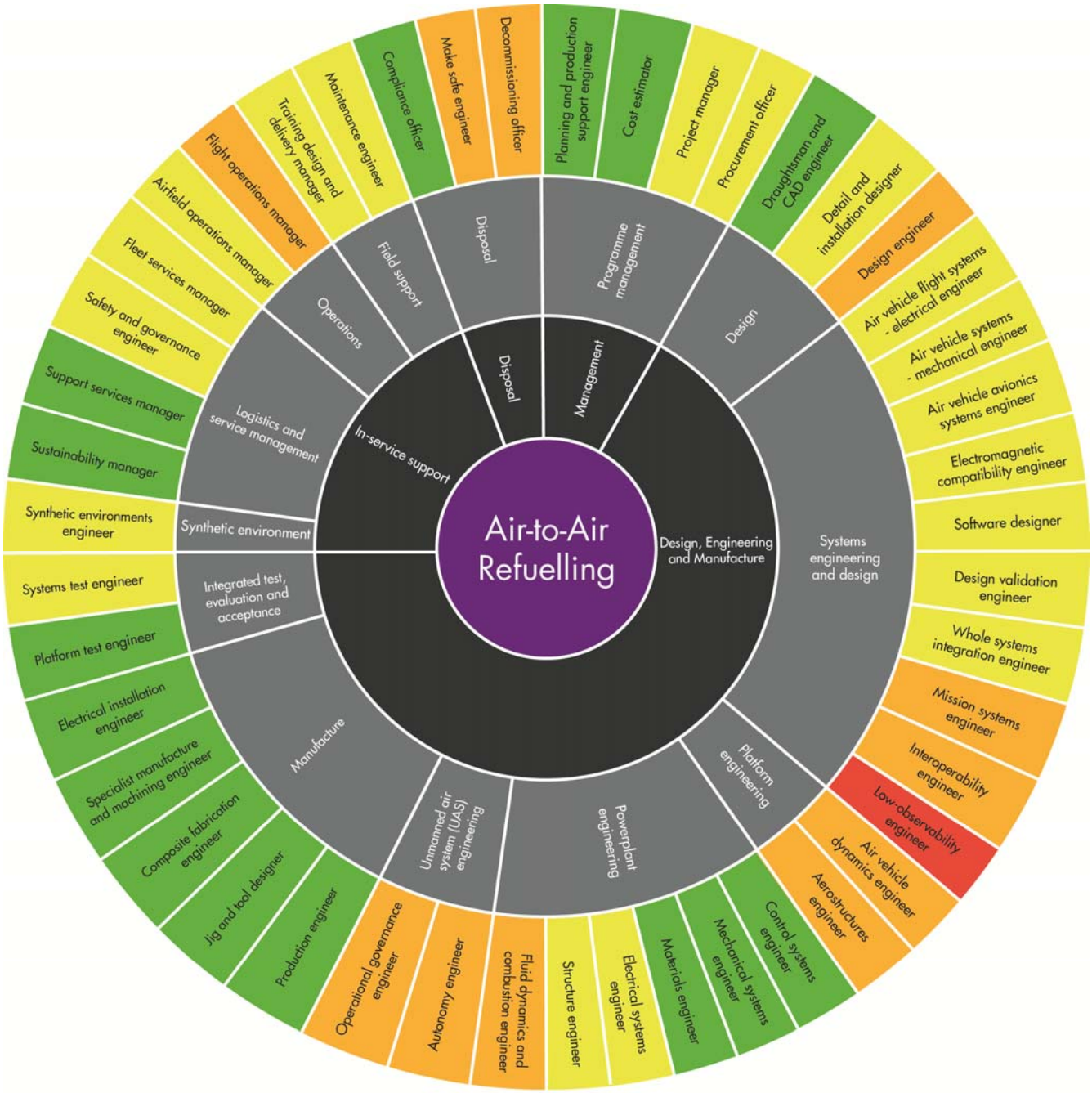
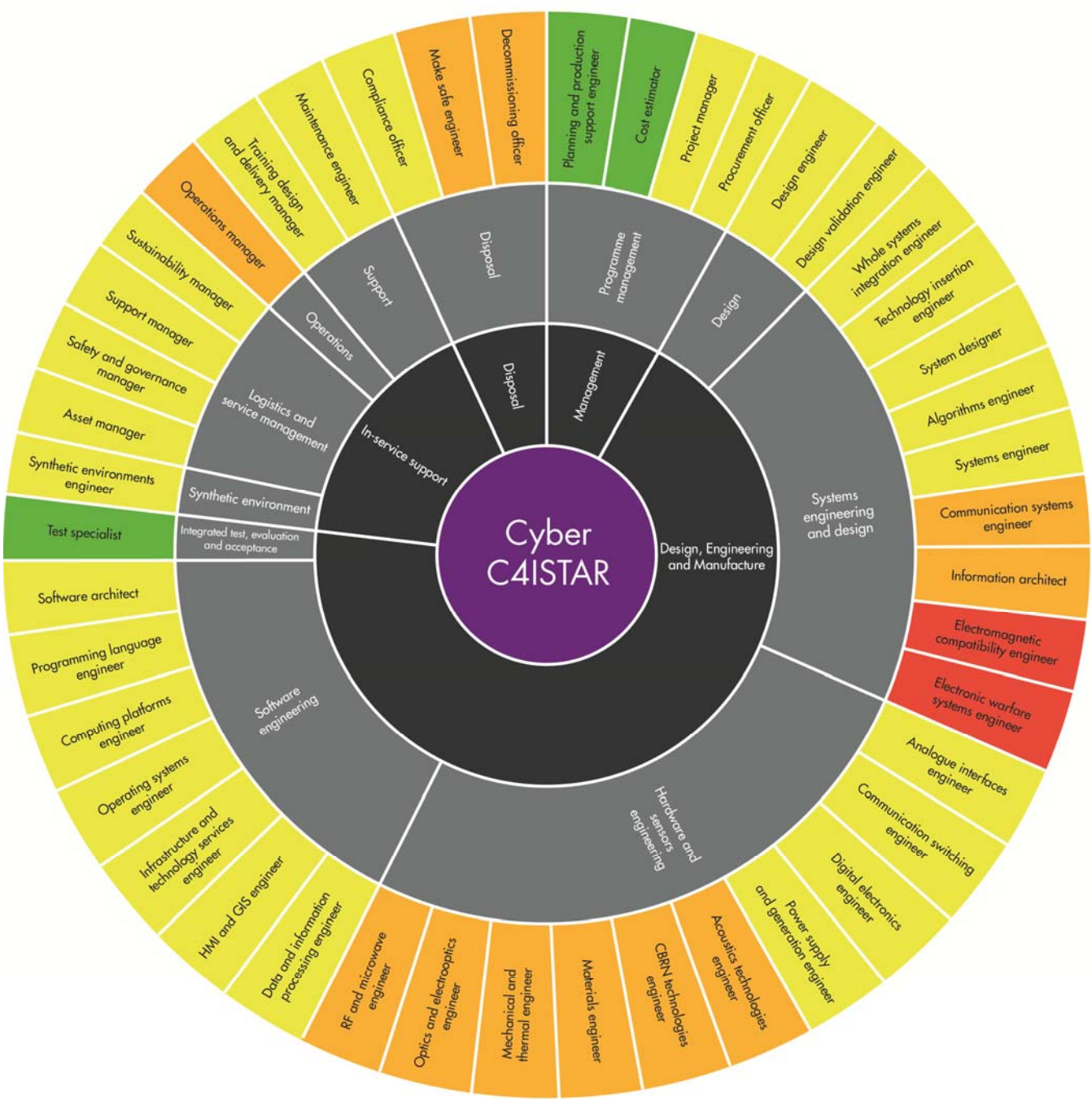


Figure D.2. Air-to-Air Refuelling Taxonomy



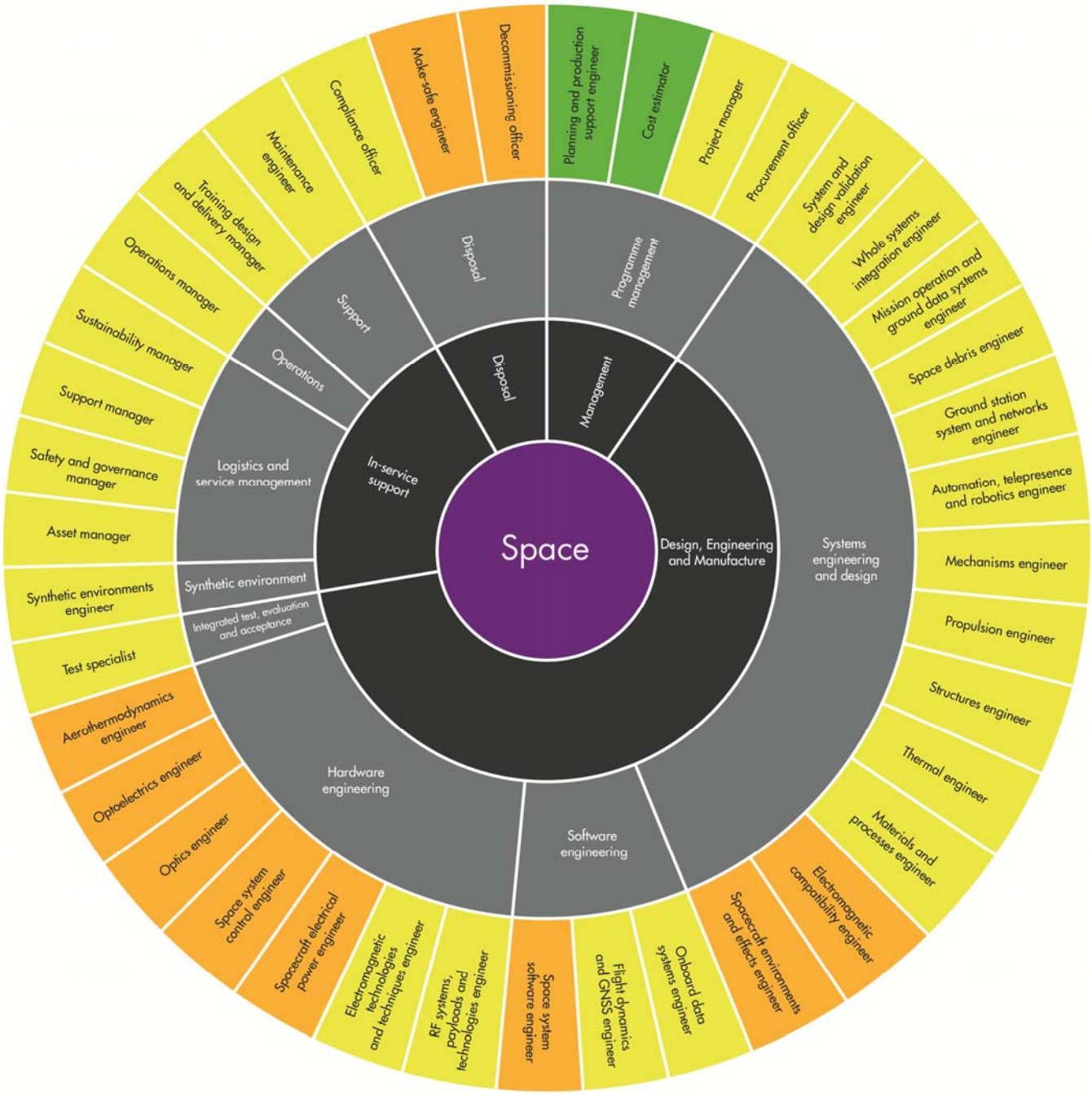
Note: the full taxonomies (see above) contain an extra level of detail describing skills coverage. This detailed breakdown of occupations is not included in the diagram to ensure its readability.

Figure D.3. Cyber Defence (C4ISTAR) Taxonomy



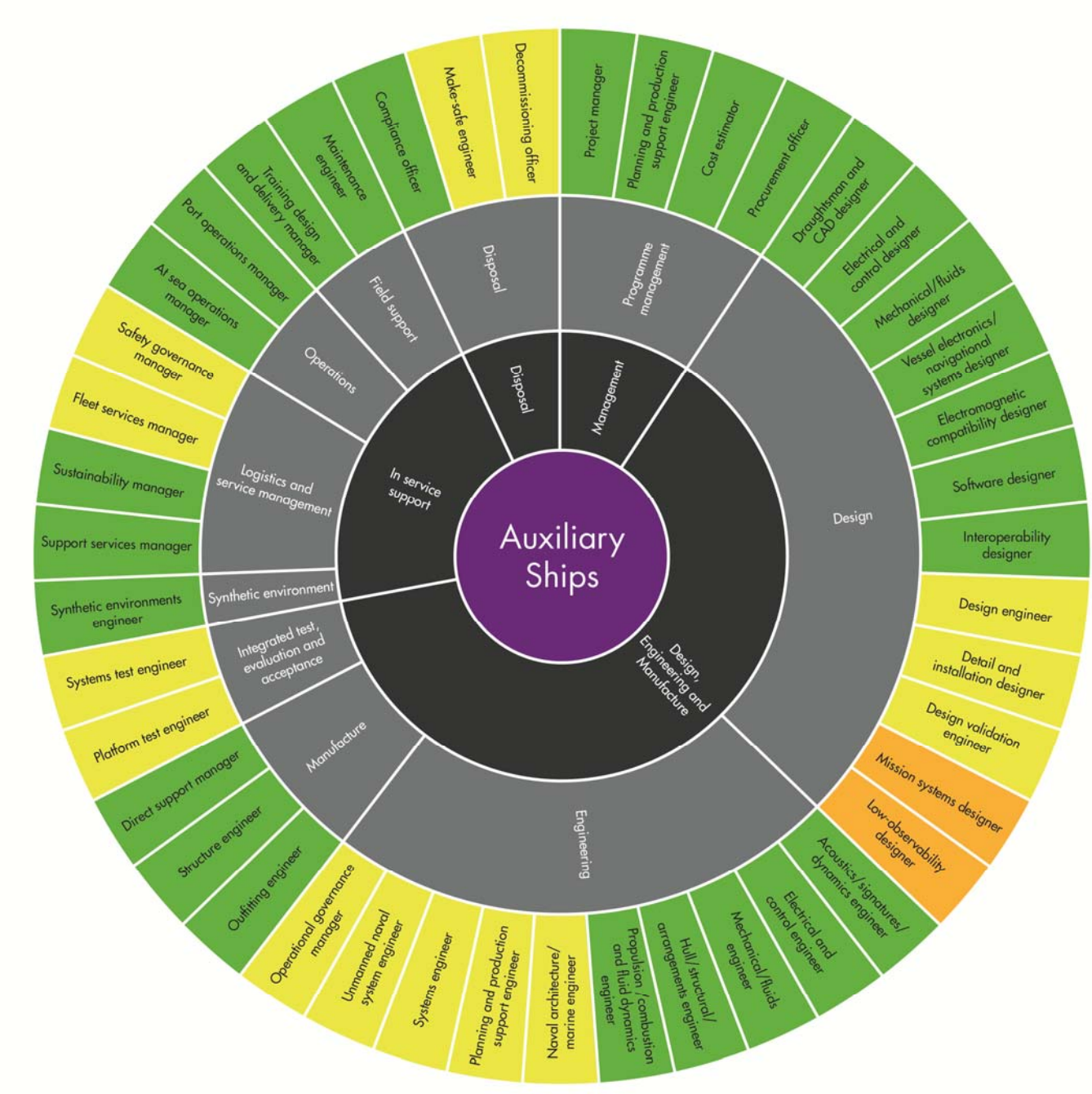
Note: the full taxonomies (see above) contain an extra level of detail describing skills coverage. This detailed breakdown of occupations is not included in the diagram to ensure its readability.

Figure D.4. SATCOM and Space observation (Space) Taxonomy



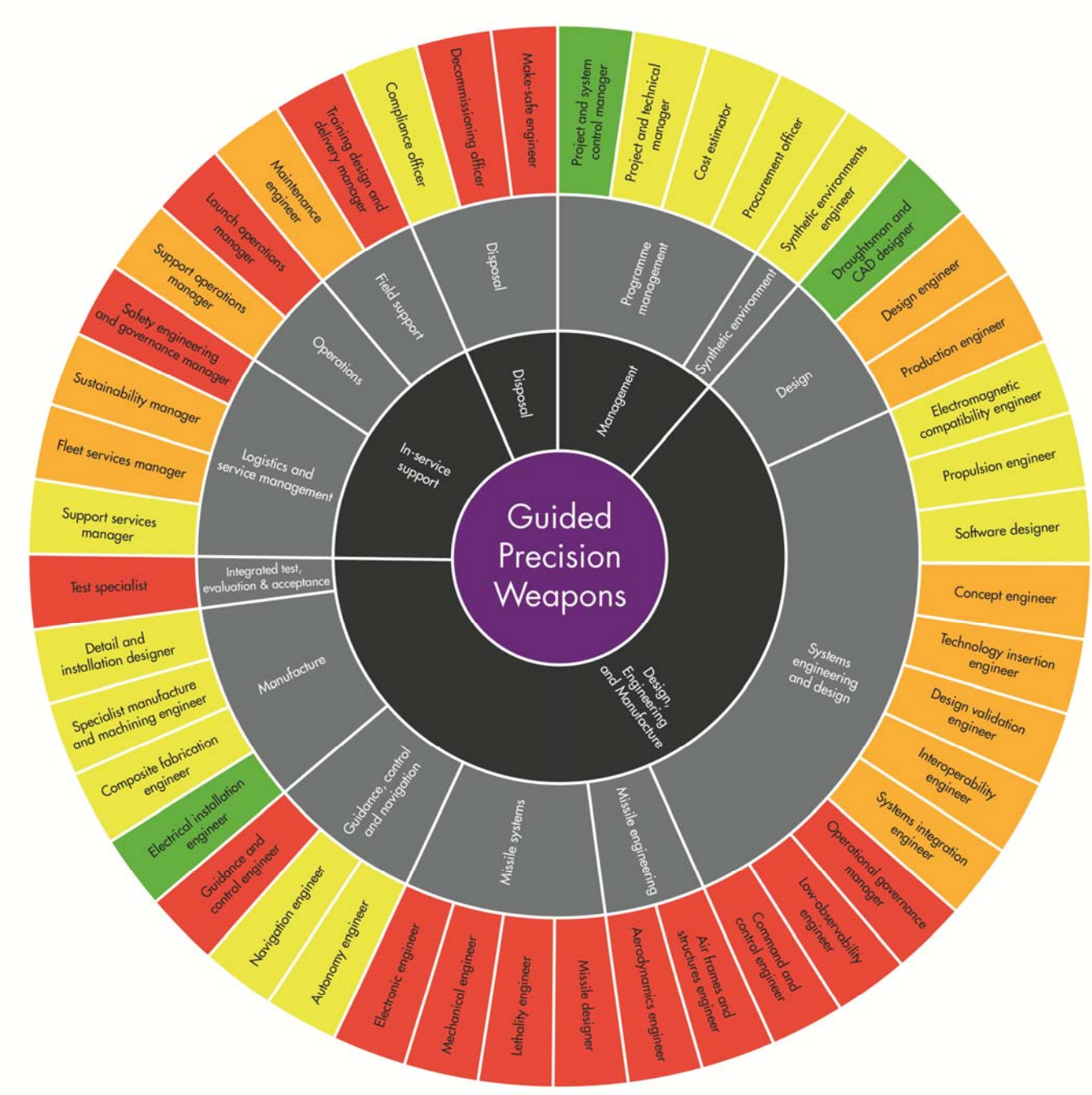
Note: the full taxonomies (see above) contain an extra level of detail describing skills coverage. This detailed breakdown of occupations is not included in the diagram to ensure its readability.

Figure D.5. Maritime capability (Auxiliary Ships) Taxonomy



Note: the full taxonomies (see above) contain an extra level of detail describing skills coverage. This detailed breakdown of occupations is not included in the diagram to ensure its readability.

Figure D.6. Guided Precision Weapons (Complex Weapons) Taxonomy



Note: the full taxonomies (see above) contain an extra level of detail describing skills coverage. This detailed breakdown of occupations is not included in the diagram to ensure its readability.