Defence
Safety Authority

DSA02 DFSR – Defence Aerodrome Rescue & Fire Fighting (ARFF) Regulations

Defence Fire
Safety Regulator

DFSR

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►**Amendment Markings**◄ indicates new text

►◄ indicates deleted text

Amendment Record

Date:	Version:	Authority:	Comments
10 April 2019	1.0	DSA-DFSR-TL	Consultation document issued
16 Sept 2019	2.0	DSA-DFSR-TL	Initial Issue
18 May 2020	2.1	DSA-DFSR-TL	Correct a number of formatting and typing errors
►1 April 2022	3	DSA-DFSR-TL	First review and amendment of regulation. Updating references, remove and replace 0204 Annex A Table 1 with TRA outcomes. Introduce ICAO H Category '0'. Amend table to incorporate changes to rotary wing calculation methodology.◄

Foreword

The following message reinforces the ►Defence Fire Safety Regulator (DFSR)◄ Team Leaders commitment to improving safety across Defence and includes our responsibility to ARFF Services in providing assurance that the Services are contributing to aviation safety.

Defence Fire Safety Regulator Team Leaders Message

Whilst the regulations within this document are key to achieving this objective, I am personally committed to enhancing the safe delivery of Operational Capability and the continuous improvement of the Defence ARFF service; through focusing on improved Safety and Quality Management. Key to this is the continued development of a widespread engaged Safety Culture and greater sharing of information through effective Knowledge Management.

To enable the DFSR to be recognised as a first-class Fire Safety Regulator we must continue to engage with the Regulated Community (RC) and other regulatory bodies to ensure that our regulatory activity remains effective, relevant, and proportional.

Authority

The DSA Charter requires the Director General (DG) on behalf of the Secretary of State to "empower suitably qualified and experienced Crown servants to regulate safety and safety management. The authority of Defence Regulators derives from this Charter and extends wherever Defence activities are conducted including overseas (in which case the expectations of any host nation's relevant authorities are to be considered)". The DFSR Fire and Rescue (Oversight and Assurance) F&R (OA)) team shall regulate in a manner consistent with UK good practice and the regulators Code of Practice.

My goal is for the DFSR Fire and Rescue (Oversight and Assurance) F&R (OA)) team to be conducting full risk-based activity underpinned by evidence. To support this, we will continue to develop our people and support other assurance organisations within the RC. We will also improve the Knowledge Management across the community to enable increased transparency and a greater sharing of information.

Citation

This document will be referred to as the Defence Aerodrome Rescue & Fire-fighting (ARFF) Regulations.

Regulation and Policy

Each Regulation contains Rationale, Regulation, Acceptable Means of Compliance (AMC) and Guidance Material (GM).

►DFSR Fire & Rescue (Oversight Assurance) Regulatory Processes, Alternative Means of Compliance, Waivers, Exemptions (AWE) Applications and Appeals describes the processes that enable interaction between the Regulated Community and the DFSR amendment process. This document is to be used for submission/ratification of Alternative Acceptable Means of Compliance (AAMC) and the process for requesting Regulatory Change, Waivers and Exemptions or when appealing enforcement action.◄

Reference Material
Defence Publications:
Defence Strategic Direction 2016 (DSD 16)

►JSP 375 - Management of Health and Safet in Defence - Pt 1: Directive ◄
►JSP 418 - Management of Environmental Protection in Defence - Pt 1: Directive ◄
►JSP 418 - Management of Environmental Protection in Defence - Part 2 Guidance◄
JSP 441 - Managing Information in Defence
JSP 822 - Defence Direction and Guidance for Training and Education
►JSP 850 – Infrastructure and Estate Policy, Standards and Guidance◄
Military Aviation Authority (MAA) Publications and Regulatory Articles (RA):
►RA 1010 - Head of Establishment - Aviation Responsibilities◄
RA 1020 -►Aviation Duty Holder and Aviation Duty Holder Facing Organizations – Roles & Responsibilities◄
RA 1024 – Accountable Manager (Military Flying)
RA 1026 **-** ►Aerodrome operator and aerodrome supervisor (recreational flying) roles and responsibilities.◄
RA 1440 – Air Safety Training.
RA 1600 – Remotely Piloted Air Systems (RPAS).
RA 2307 – Rules of the Air.
RA 2335 - ►Flying Displays, Display Flying, Role Demonstrations and Flypasts.◄
RA 2415 – Civil Use of Government Aerodromes.
RA 3049 – Defence Contractor Flying Organization responsibilities for UK ►military◄ Air System Operating Locations.
RA 3261 (2) – Aerodrome Emergency Services.
RA 3263 – Aerodrome Classification.
RA 3267 – Aerodrome Vehicle Marking and Lighting Requirements.
RA 3311 – controller Emergency Actions
RA 3500 - Aerodrome Design and Safeguarding.
►RA 3530 – Helicopter Landing Site – Reference Information.◄
RA 3550 - Temporary Landing Zone►◄.
►RA 4808 – Equipment, Tools and Material (MRP 145.A.40)◄
Defence Aerodrome Manual (DAM).
►Aviation Safe Operating Environment Manual (ASOEM).◄
Manual of Military Air Traffic Management (MMATM)
North Atlantic Treaty Organisation (NATO) Standardised Agreements (STANAGS):

STANAG 3117 (Edition 9) Aircraft Marshalling Signals. (Edition A Version 1).
STANAG 3712 CFR (Edition ►9◄) - Aircraft Rescue and Fire-fighting (ARFF) Services Identification Categories.
STANAG 3896 CFR (Edition 6) - Aerospace Emergency Rescue and Mishap Response Information (Emergency Services).
►STANAG 7048 (Edition 4) - Crash, Firefighting and Rescue (CFR) Response Readiness◄
STANAG 7051 CFR (Edition 4) - Minimum Requirements for ►Crash Fire Rescue (CFR) ◄ Operations in Support of Home Station and Deployed Operations.
STANAG 7132 CFR (Edition 2) - Personal Protective and Fire-fighting Equipment Requirements for Fire and Emergency Operations.
STANAG 7145 ATM (Edition 5) - Minimum Core Competency Levels and Proficiency of Skills for Firefighters.
STANAG 7162 CFR (Edition 1) - Standardisation of Physical Fitness Maintenance Program for Firefighters.
STANAG 7179 CFR (Edition 1) – Planning Guidelines for Fire and Emergency Services Response to Major Fire and Emergency Incidents.
STANAG 7193 CFR (Edition 2) - Incident Command System for Fire and Emergency Services Responses to Incidents.
STANAG 7206 CFR (Edition 1) – Assessment Guides for the Provision of Fire Services During Deployed Operations.
European Aviation Safety Agency (EASA) Documents:
►◄
►◄
EASA Annex to Decision 2016/009/R Acceptable Means of Compliance (AMC) and Guidance Material (GM) to Authority, Organisation and Operations Requirements for Aerodromes – Amendment 1. ►[1]◄
International Civil Aviation Organisation (ICAO) Documents:
ICAO Annex 14 - Volume 1 Aerodromes - Aerodrome Design and Operations ►9th◄ Edition.
ICAO Annex 14 - Volume 2 Aerodromes - Heliports ►5th◄ Edition.
ICAO Airport Services Manual Part 1 - 4th Edition.
ICAO Heliports Manual - ►5th◄ Edition. Doc 9261
Civil Aviation Authority (CAA) Documents:
CAP 168 Licensing of Aerodromes ►12th Edition◄.
CAP 699 Framework for Competence of Rescue and Fire-fighting Service (RFFS) Personnel. ►3rd Edition◄
CAP 789 Requirements and Guidance Material for Operators ►2nd Edition◄.

[1] ►Adopted by CAA into UK law◄.

CAP 1150 Guidance on delivering an effective Airport Rescue and Fire-fighting Service (RFFS) Task Resource Analysis. ►2nd Edition◄.
CAP 1168 Guidance Material for Organisations, Operations and Design Requirements for Aerodromes
CAA Information Notice (IN-2016/052) – EASA ED Decision 2016/09/R Rescue and Fire-fighting Services – Remission Factor, Cargo Flights etc.
CAA Information Notice (IN-2017/031) - Aerodrome Rescue and Fire-fighting Service – Provision of Fire Extinguishing Agents.
CAA Initial Emergency Response Training Framework Document.
►Regulation (EU) No. 139/2014 as retained (and amended in UK domestic law) under the European Union (Withdrawal) Act 2018[2]◄
United Kingdom Emergency Service Publications:
Joint Emergency Services Interoperability Programme (JESIP).
National Operational Guidance (NOG).
Federal Aviation Administration (FAA) Publications:
►Federal Aviation Administration Title 14, Code of Federal Regulations, Part 139◄ (FAA 14 CFR Part 139)
National Fire Prevention Association (NFPA) Documents:
NFPA 403 Standard for Aircraft Rescue and Fire-fighting Services at Airports.

[2] ►All references to Regulations are to the UK law bearing that title or number, being EU retained law as retained (and amended by UK domestic law) pursuant to the European Union (Withdrawal) Act 2018.◄

DSA02 DFSR ARFF Regulations

Defence ARFF Regulation mirrors the layout used by the UK National Health and Safety Executive (HSE). A regulation is provided for each DFSR ARFF Regulatory Article (RA) in the following format:

Rationale:	The reason why the Defence Regulation is applied to the MOD, ideally with reference to National Legislation, British Standards Institute (BSI) or industry Codes of Practice.
Regulation:	**The Defence Regulation is reiterated in the relevant regulation to aid clarity and reinforce the relationship and precedence of the Regulation. Each Regulation may contain a number of Sub-Clauses that are pertinent to that Regulation (*more than one Regulation may be referenced*).**
Acceptable Means of Complaince	The Acceptable Means of Compliance (AMC) provides practical advice on how to comply with the Defence Regulation. If the AMC is followed, then this will be considered sufficient to demonstrate compliance. However, alternative approaches (Alternative Acceptable Means of Compliance (AAMC) may be utilised where this produces an outcome that can be demonstrated to be as good as that required by the ARFF Regulations.
Guidance Material:	Provides Guidance Material which, whilst not compulsory, may be considered ‘good practice’ to further support the Regulations.

Rationale:	*Military Aviation Authority (MAA) Regulatory Article (RA) 3261 (2):Stipulates that: 'Aerodrome Operators (AO) and Heads of Establishment (HoE) shall provide Emergency Services at aerodromes for which they are responsible.' This Defence Regulation has been aligned to:* a. *DSA Charter.* b. *NATO STANAG 3712 CFR (►9th◄ Edition) – Aircraft Rescue and Fire-fighting (ARFF) Services Identification Categories.* c. *►Regulation (EU) No. 139/2014 as retained (and amended in UK domestic law) ◄;* d. *ICAO Annex 14 Volume 1 Aerodromes - Aerodrome Design and Operations ►8th◄ Edition.* e. *ICAO Annex 14 - Volume 2 Aerodromes – Heliports ►5th◄ Edition.* f. *CAP 168 Licensing of Aerodromes Edition 11.* g. *CAP 699 Framework for competence of Rescue and Fire-fighting Service (RFFS) personnel ►3rd Edition◄; and* h. *CAP 789 Requirements and Guidance Material for Operators.* *and details the requirements and provisions relating to MOD ARFF Services. The purpose of this Regulation is to provide both direction and guidance to AO, ►AM(MF) ◄ and ARFF Service providers to establish an ARFF Service at Defence Aerodromes - ensuring minimum standards are achieved and are capable of meeting regulatory requirements.*

Contents:

Regulation: 0201

ARFF Service Levels of Protection

0201 Aviation Duty Holders (ADH), ADH-Facing (ADH-F) Organizations, Heads of Establishment (HoE), ►Aerodrome Operators (AO)◄ and Accountable Managers (Military Flying) (AM(MF)) **shall** task the ►Aerodrome Rescue Fire-fighting◄ (ARFF) Service Provider to provide ►ARFF◄ Services at aerodromes suitable to the appropriate ARFF category for which they are responsible, in accordance with (iaw) Front Line Command (FLC) and Industry[►3◄] requirements.

Acceptable Means of Compliance: 0201

ARFF Service Levels of Protection

1. ARFF Services **should** be provided to meet the ARFF category promulgated in the Unit Defence Aerodrome Manual[►4◄] (DAM)

2. The provision of ARFF services at MOD aerodromes aligns with the guidance used in NATO/ICAO/►◄/CAA. Within the MOD, ►15◄ aircraft categories are used to accommodate all variants of military aircraft types.

Table 1 below shows - Minimum useable amounts of extinguishing agents

ARFF Category	Foam meeting performance level B		Foam meeting performance level C		Complementary agents (Kg)	
	Water (Ltrs)	Discharge Rate Foam Solution (Lpm)	Water (Ltrs)	Discharge Rate Foam Solution (Lpm)	Minimum Dry Powder (Kg)	Discharge Rate (Kg/Sec)
Special	90	60	60	40	18	1.25
1	230	230	160	160	45	2.25
2	670	550	460	360	90	2.25
3	1200	900	820	630	135	2.25
4	2400	1800	1700	1100	135	2.25
5	5400	3000	3900	2200	180	2.25
6	7900	4000	5800	2900	225	2.25
7	12100	5300	8800	3800	225	2.25
8	18200	7200	12800	5100	450	4.5
9	24300	9000	17100	6300	450	4.5
10	32300	11200	22800	7900	450	4.5
►H0◄	►500◄	►250◄	►330◄	►165◄	►23◄	►2.25◄
H1	►800◄	►400◄	►540◄	►270◄	23	2.25
H2	►1200◄	►600◄	►800◄	►400◄	45	2.25
H3	1600	800	►1100◄	►550◄	90	2.25

[3] ►Refers to Contractor Flying Approved Organization Scheme (CFAOS) locations.◄

[4] ►The DAM is to be kept up to date with latest information and the UK Mil Aeronautical Information Publications (AIPs) **should** be updated following any change. Aeronautical Information published in national AIP must be identical to that published in the DAM. ◄

Notes:

1. The quantities of water shown in columns 2 and 4 of table 1 are based on the average overall length of aircraft in each category. ►Where the aircraft is larger than the average size in a given category, the quantities of water and discharge rates have been individually calculated in accordance with ICAO Airport Services Manual Part 1◄ and can be found in DFSR 01 Table 3.

2. At Category 1 and 2 Aerodromes up to 100% of the water may be substituted with complementary agents. At ►Permanent HLS[5]◄ up to 50% of the water may be substituted with complimentary agent. For substitution, the following equivalents should be applied when using performance level B foam:

   a. 1 kg of gaseous agent or dry powder = 0.66 litres of water.
   b. 2 kg of CO2 = 0.66 litres of water; and
   c. Where substitution of up to 100% of the water with complementary agent has occurred, the reserve supply of complementary agent should be increased to 200%.

3. ►The minimum discharge duration for ICAO H0-H3 is assumed to be two minutes. However, if the availability of back-up specialist fire services is remote from the heliport, consideration may need to be given to increasing the discharge duration from two minutes to three minutes.◄

4. At all aerodromes a quantity of gaseous agent or CO2 should be provided for use on small or hidden fires. A minimum extinguisher size is 5 kg for major and 2 kg for smaller vehicles.

5. 'H' aircraft category requirements are based on ►Permanent HLS◄ requirements. If operating from elevated heliports guidance should be sought from the ICAO Heliport Manual.

6. Where the main complementary agent is dry powder, an additional quantity of gaseous agent CO2 (18 kg) is required for effective intervention in cases of aircraft engine fire. Where the main complementary agent is gaseous, an additional quantity of dry powder (9 kg) is required to assist in dealing with a running fuel fire.

3. When non-UK MOD/NATO aircraft visit an aerodrome, the AO is to ensure that the appropriate ICAO aircraft category is provided utilising the information contained within Table 2[6].

Table 2 below lists ICAO Aerodrome Category for ARFF

Aerodrome category	Aircraft overall length	Maximum fuselage width
1	0 m up to but not including 9 m	2 m
2	9 m up to but not including 12 m	2 m
3	12 m up to but not including 18 m	3 m
4	18 m up to but not including 24 m	4 m
5	24 m up to but not including 28 m	4 m
6	28 m up to but not including 39 m	5 m
7	39 m up to but not including 49 m	5 m
8	49 m up to but not including 61 m	7 m
9	61 m up to but not including 76 m	7 m
10	76 m up to but not including 90 m	8 m

[5] ►A Permanent HLS also referred to as a "heliport" in MAA02, is a facility with a permanent rotary wing presence which is designated for operating, basing, servicing, and maintaining rotary wing aircraft. It may be either at home or overseas. It may be an entire aerodrome or a defined area within an aerodrome. It may contain one or more landing points.◄

[6] Details of the individual ICAO category for aircraft currently in use within UK Defence can be found at Table 3. Aircraft used within NATO can be found at Annex D.

Aerodrome category	Aircraft overall length	Maximum fuselage width
►H0	Up to but not including 8 m	1.5 m◄
H1	8 m up to but not including 12 m	2 m
H2	12 m up to but not including 16 m	2.5 m
H3	16 m up to but not including 20 m	3 m

Notes:

1. To ensure that the aerodrome operations cells provide the correct ICAO Aircraft category when booking in visiting aircraft, aircraft dimensions including length and width should be requested from the Aircraft Operating Authority (if the aircraft is not in Table 3 or Annex D).

2. The aircraft category for fixed wing aircraft is based on the aircraft overall length and width. If, after selecting the category appropriate to the length, the aircraft fuselage width is greater than the maximum width in column 3, for that category, then the category for that aircraft should be elevated to one category higher.

3. The aircraft category for ►Rotary Wing aircraft◄ is based on ►fuselage◄ length ►and width. The fuselage consists of the central portion of the rotary wing aircraft designed to accommodate the aircrew and the passengers and/or cargo. When calculating fuselage size, ICAO methodology allows a discretionary 10 per cent (%) tolerance applied to the upper limits quoted for fuselage length and fuselage width.◄ If, after selecting the category the aircraft fuselage ►length or◄ width is greater than the maximum ►permitted size, including 10% tolerance◄, for that category, then the category for that aircraft should be elevated to one category higher.

4. ►For Rotary Wing aircraft which exceed one or both of the dimensions for a category H3 heliport. It will be necessary to recalculate the level of protection using practical critical area assumptions, based on the actual fuselage length and the actual fuselage width of the Rotary Wing aircraft plus an additional width factor (W1) of 6 m.◄

4. The ARFF ►capability◄ **should** be ►commensurate with the appropriate category of the operating aircraft at that location[7]. The ARFF capability **should** be maintained for a period of not less than 15 minutes prior to, or following, flying operations.◄

5. The minimum number of ARFF vehicles provided at an aerodrome to effectively deliver and deploy the agents specified for the aerodrome category **should** not be less than that set out in DFSR 0203: ARFF Vehicle and Equipment Requirements.

6. Crewing levels **should** be determined in accordance with DFSR 0204: ARFF Personnel Requirements.

7. Table 3 lists the individual category for aircraft currently in service and planned to be in service with the MOD and associated agencies. It is emphasised that this is for individual aircraft categorisation and not for categorisation of aerodromes, which is a FLC and industry responsibility. The table lists the minimum quantity of water required for foam production (using performance Level B foam) to control the fire in the practical critical area and to maintain the control of, and/or extinguish the remaining fire using the ICAO

[7] ►FLC requirements may require aerodromes to operate at a higher category than the aircraft normally operating from the aerodrome. ◄

principles of calculation. The list of aircraft categories in Table 3 is compiled, maintained, and authorised by the sponsor, DFSR.

Table 3 below shows – Individual Aircraft Fire-fighting Media Requirements

	Water Calculation (Ltrs)	Aircraft Category	Min Water Required[8] (Ltrs)	Discharge Rate[9] (if different) to that provided in Table 1 (Lpm)
Atlas (A400M)	►14201◄	8	18200	
Avenger	1048	3	1200	
BAE 146 CC Mk2 (RJ 70)	5637	**Aircraft Type**	5637	3221
BAE 146 C Mk 3 (RJ 100)	7631	6	7900	
C130	8647	6	8647	4324
C17	18060	8	18200	
Cessna Caravan	728	2	728	574
Chipmunk	370	1	370	370
Dakota	2226	4	2400	
►Dassault Falcon FA 900 LX◄	►2265◄	►4◄	►2400◄	
Defender	891	3	120-0	
Hawk	937	3	1200	
Hunter	1075	3	1200	
Hurricane	615	2	670	
Islander	677	2	677	
Lancaster	2315	4	2400	
Lightning II	N/A	5	5400	
Pilatus PC-21	680	2	680	
Piper PA-31	639	2	670	
Prefect	411	1	411	411
Phenom	959	3	1200	
Poseidon	11203	7	12100	
Rivet Joint	11773	7	12100	
Robin DR 400[10]	332	1	332	332
Sea Fury	752	2	752	592
Sea Hawk	869	3	1200	
Sentinel R1	7267	6	7900	
Sentry E3D	13240	7	13240	5781
Shadow R1	1048	3	1200	
Spitfire	610	2	670	
Swordfish	658	2	670	
Texan	618	2	670	
Tutor	364	1	364	364
Typhoon	N/A	5	5400	
Voyager	19380	8	19380	7690
Wedgetail	8323	6	8332	4162

[8] Categories when using Level B Foam.
[9] In accordance with ICAO Annex 14 Volume 1 Aerodromes - Aerodrome Design and Operations ►9th Edition July 2022◄ Table 9.2.
[10] The DDH has confirmed that he is content for this aircraft to operate under category special aerodrome requirements.

Airbus EC 135 (Juno)	►625◄	H1	►800◄	
Airbus EC 145 (Jupiter)	►648◄	H1	►800◄	
Apache	►858◄	H2	►1200◄	
AW109	►708◄	H1	►800◄	
AW139	►949◄	H2	►1200◄	
AW189	►1052◄	►H2◄	►1200◄	
Bell 212	►1029◄	►H2◄	►1200◄	
Chinook	►1608◄	H3	►1608◄	►804◄
Dauphin	►772◄	►H1◄	►800◄	
Gazelle	►567◄	H1	►800◄	
Griffin	►915◄	►H2◄	►1200◄	
Merlin	►1460◄	H3	1600	
Puma	►1109◄	►H2◄	►1200◄	
Sea-King	►1076◄	►H2◄	►1200◄	
Sikorsky S-61N	►1269◄	►H3◄	►1600◄	
Wildcat	►786◄	►H2◄	►1200◄	

Notes:

1. In accordance with NATO STANAG 3712 CFR (Edition 8) – Aircraft Rescue and Fire-fighting (ARFF) Services Identification Categories, all Fast Jet aircraft have been classified as ICAO 5. Therefore, individual water requirements have not been calculated.

8. Flying, Gliding and Parachute Clubs[11] are recreational activities involving Service/Civilian personnel with various levels of experience. Where these clubs operate at MOD Aerodromes, the Flying, Gliding and Parachute activities **should** be Risk Assessed to determine the required ARFF services to be provided. The Risk Assessment **should** be recorded and the decision on the appropriate level of ARFF cover documented in the DAM. Suitably Qualified Experienced Personnel (SQEP) advice **should** be sought from the Defence ARFF Service Provider, to assist with informing the Risk Assessment (CAP 168 Licensing of Aerodromes: Chapter 8 Appendix 8C provides additional guidance).

Guidance Material:
0201

ARFF Service Levels of Protection

9. Reduced Hazard Profile Categories is the level of ARFF Response required for; cargo, refuelling,[12] mail, ferry, ►training, test,◄ positioning and end-of-life aircraft operations. Irrespective of the number of movements, the ARFF provision may be reduced in accordance with Table ►4◄. This is based on the need to protect only the area around the cockpit of an aircraft in the Critical Area concept.

10. When operating with reduced Hazard Profile categories, the aircraft is to be crewed by the minimum number of personnel necessary to safely achieve the aims of the sortie. Specifically, following consultation with the ADH chain and the Defence ARFF Service provider, the total number of personnel is to be detailed within Group Orders. It is to be noted that the number of personnel is to be limited to those that can be accommodated

[11] Refer to RA 2415 - Civil Use of Government Aerodromes
[12] Aircraft involved in refuelling operations are included in Reduced Hazard Profile categories where the only source of fuel is contained ►in◄ the aircrafts fuel tanks.

within close proximity to the aircraft crew entrance door (thus, reducing the size of the 'Hazard Area' that requires ARFF attention).

Table 4 below shows – Reduced Hazard Profile Categories

Aerodrome Category	ARFF Level of Protection Required
1	1
2	2
3	3
4	4
5	5
6	5
7	6
8	6
9	7
10	7

11. Remission is where the number of movements by the aircraft visiting the aerodrome (landing or take-off), performing passenger transportation in the highest category, is less than 700 in the busiest consecutive three months. In this instance, the level of protection provided in accordance with Table 1 may be reduced by no more than one category below that identified in Table 2.

12. Reduced Hazard Profile Categories and Remission are not to be applied without the explicit approval of the ADH chain responsible for the aircraft and are to be used independently.

13. Temporary Landing Zones as defined in MAA RA 3550 - Suitably Qualified Experienced Personnel (SQEP) advice can be sought from the Command/Group HQ/Defence ARFF Service Provider to assist with informing the Risk Assessment.

14. Helicopter Landing Sites (HLS), permanent, temporary, or austere exercise locations, are unlikely to have Rescue or Fire-fighting Services routinely. In order that ►◄ ADH and ►◄ ADH-F Organizations, or ►◄ AM(MF), meet their responsibilities, they must ensure that ARFF Services are considered when ►Rotary Wing aircraft◄ land away from base at either HLS or exercise locations. Therefore, ADHs/HoEs/►AOs◄/AM(MF)s are to conduct a Risk Assessment providing direction on the level of Rescue and Fire-fighting Services required, the Risk Assessment is to be recorded and the decision on the appropriate level of Rescue or Fire Fighting cover documented. Further guidance on the standards of fire cover required for the safe operation of rotary wing aircraft can be found at Annex B.

15. SQEP advice can be sought from the Command / Group HQ /Defence ARFF Service Provider to assist with informing the Risk Assessment.

16. Military Low Category (ICAO ARFF categories 1 and 2) Flying Training Schools (FTS) are to conduct a Risk Assessment to ascertain the level of ARFF protection required on the aerodrome. The Risk Assessment must be recorded and the decision on the appropriate level of ARFF cover documented in the DAM. SQEP advice can be sought from the Command / Group HQ / Defence ARFF Service Provider to assist with informing the Risk

Assessment, CAP 168 Licensing of Aerodromes Chapter 8 Appendix 8B provides guidance.

17. Where the ARFF services on ►Tier 1[13] Defence◄ Aerodromes ►operating at ARFF Category 'Special' IAW DSA 02 DFSR Defence Aerodrome Rescue Fire-fighting Regulations (R.0201.AMC.2).◄ Initial Emergency Responders (IER) may be used as an alternative to professional firefighters. IER shall be suitably equipped and trained to provide an immediate response during flying operations. IER personnel must receive initial and annual training. All training must be endorsed and assured by the Defence ARFF Service Provider SQEP (CAP 168 Licensing of Aerodromes Chapter 8 Appendix 8C provides additional guidance).

18. ARFF requirements during Deployed Operations►[14]◄ are subject to assessment by the Aircraft Operating Authority (AOA) and/or ADHs/AM(MF)s, and the operational Chain of Command. The assessment is to provide a balance between the operational requirements and the aerodrome operating requirement. For further guidance refer to Annex A: Requirements for Deployed Operations of Fixed and Rotary Wing Aircraft.

19. As deployed operating bases become established and circumstances permit, the complete ARFF capability should be provided and informed by conducting a Task Resource Analysis (TRA).

20. When operating aircraft to/from aerodromes, other than those regulated under MAA RA 3261 (2) Aerodrome Emergency Services, AOA need to satisfy themselves that the ARFF Service is appropriate for the aircraft type. Annex C provides a comparison table to assist AOAs with this requirement.

21. Annex D Table 1 lists the individual category for aircraft currently in service and planned to be in service within NATO.

[13] ►IAW MAA RA 1010 - Head of Establishment - Aviation Responsibilities◄
[14] ►DSA 01.2 Chap 12 1 The movement of troops or equipment to a place or deployed position to allow military activities to take place (e.g., Military operations, humanitarian missions, disaster relief).◄

Requirements for Deployed Operations of Fixed and Rotary Wing aircraft

A.1 Background

A.1.1 Defence Strategic Direction 2016[15] (DSD 16) identifies 2 concurrency sets:

a. Primary Concurrency is Warfighting at Scale (W@S); and

b. Secondary Concurrency set of 6 Niche, 5 Small and 1 Environmental Medium.

Only the Primary Concurrency set is force driving; however, Defence has yet to model W@S and therefore the Secondary Concurrency set is used to force model.

A.1.2. Niche and Small interventions are designed to be swift, short-term interventions, utilising identified numbers of personnel and equipment. Both W@S and the Environmental Medium are considered longer term activities which will be enduring.

A.2 Planning

A.2.1 Pre-planning for all interventions is essential due to the timescales involved in ensuring that the deployable force is in position within the given timescales. HQ Air A4 utilise the Logistical Functional Area Services (LOGFAS) to ensure that all required equipment is correctly identified. This ensures that, once stood up, all Force Elements at Readiness (FE@R) are swiftly transported to the identified deployed location.

A.2.2 The timeframes identified for Niche and Small interventions do not provide sufficient time for a ►Task Resource Analysis◄ (TRA) to be carried out. Therefore, minimum levels of response are identified within tables 1 and 2 of this annex providing the Aerodrome Operators (AO) and Delivery Duty Holders (DDH)/Accountable Manager (Military Flying) AM(MF)s with the assurance that ARFF provisions are at a suitable level to carry out effective fire-fighting operations.

A.3. Risk Assessment for Niche and Small Interventions

A.3.1 For Niche and Small interventions a Risk Assessment shall ascertain the required resources for crash Fire-fighting and Rescue Protection - based on the type and number of aircraft, combined with the anticipated number of sorties and the local resources available.

A.3.2 NATO STANAG 7206 CFR (Edition 1): Assessment Guides for The Provision of Fire Services During Deployed Operations, is used to determine the minimum number of firefighters and vehicles required to respond to an aircraft emergency. The minimum number of firefighters at the emergency is based on the minimum of three firefighters per vehicle (one driver and two firefighters to perform Hand Line Operations and facilitate self-rescue). Also, within this minimum number of firefighters, at least one fire fighter shall be trained as an Incident Commander. The number of firefighters required may vary and will be based on Risk Assessment.

[15] Refer to DSD 16 for further detailed requirements.

Table 1 below shows - Individual Fixed Wing Aircraft Fire-fighting Requirements

Aerodrome Crash Category										Recommended Firefighters	Recommended Minimum ARFF Vehicles
1	2	3	4	5	6	7	8	9	10		
Maximum Aircraft on the Ground											
1-12	1-12	1-12	1-12							4	1
13+	13+	13+	13+	1-12						6	2[16]
				13+	1-6					8	2
						1-6				10	2
						7+	1+	1-3		12	3
								4+		15	3

Table 2 below shows - Individual Rotary Wing Aircraft Fire-fighting Requirements

Aerodrome/Heliport Crash Category				Recommended Firefighters	Recommended Minimum ARFF Vehicles
H1	H2	H3			
Maximum ►Rotary Wing Aircraft◄ on the Ground					
1-12	1-12			4	1
13+	13+	1-12		6	1
		13+		►6◄	1

Notes

1. Fire fighter numbers should be doubled for 24-hour operations, to ensure a minimum of two operational crews available to adopt an appropriate shift system.

2. Minimum Extinguishing Agent quantities and Discharge Rates must be met.

3. Helicopter Landing Sites or Forward Area Re-arming and Refuelling point (FARPS) operations or similar locations are deemed out of scope and should be Risk Assessed. DFSR 0201: ARFF Service Levels of Protection (Paragraph 14) to this regulation refers.

A.3.4 When water supplies are limited►17◄, a water tanker and operating crew should be provided. This regulation does not consider structural or tented camps fire protection, therefore additional resources may be required. In addition, when operating at locations with more than one type of aircraft, the larger ARFF requirement applies.

A.4. ARFF Requirements for Enduring Operations

A.4.1 An Enduring Operation will generally follow on from either a Small Intervention or Environmental Medium as such there will be sufficient time to allow a full TRA to be carried out. This is to be carried out in accordance with DFSR Regulation 04: ARFF Personnel Requirements.

[16] The requirement for 2 ARFF vehicles may be reduced to 1 at aerodromes where there is no requirement to respond to structural type incidents.

[17] ►Senior ARFF personnel are to conduct a water assessment IAW R.0205.AMC.37◄

Guidance on the standards of Fire Cover required for the safe operation of Rotary Wing Aircraft.

B.1 Introduction

B.1.1 Front Line Commands (FLC) and Industry must ensure that Aerodrome Rescue Fire-fighting (ARFF) Services are considered when landing away from base. Assessment of a ►Tier 3[18] site◄ responsibility will enable the Aviation Duty Holder (ADH) or the Accountable Manager (Military Flying) (AM(MF)) to meet their responsibilities in accordance with RA 1020 – Roles and Responsibilities: Aviation Duty Holder (ADH) and, ADH-Facing Organizations and RA 1024 - Accountable Manager (Military Flying).

B.1.2 The Risk Assessment is an executive responsibility and owned by the risk owner (e.g., ADH, AM(MF)). The process may be delegated to ADH-Facing individuals (i.e., Aerodrome Operator or SATCO etc). Specialist advice may be sought through SQEP personnel including the Command/Group HQ or Defence ARFF Service Provider.

B.1.3 The mitigations are to be interpreted and applicable to the intensity of operations and be proportionate to the risk identified by the ADH or AM(MF).

B.2 Purposes of fire cover

B.2.1 The principal objective when responding to an ►aircraft◄ crash is to save life by creating and maintaining survivable conditions. Depending on the level of fire cover provided, additional tasks may include;

a. initiating rescue;

b. making safe special risks;

c. minimising damage to aircraft; and

d. reducing the effects on the environment and preserving evidence at the scene[19].

B.2.2 ARFF response should be positioned on the HLS to achieve response times in accordance with DSA02 DFSR 0202: ARFF Response.

B.2.3 The level of fire support must be addressed through Risk Assessment and be proportionate to the flying operations being conducted. Factors to be considered during this process are:

a. total number of planned movements in a 24hr period.

b. total number of ►rotary wing (RW) aircraft◄ in use at peak period including other operators.

c. Operating risks. Apart from the type of aircraft and the number of occupants, other operating factors to be taken into consideration include:

(1) presence of Dangerous Goods;

(2) fuel quantities;

(3) aircraft armaments;

[18] ►IAW MAA RA 1010◄
[19] These 'additional tasks' will only be provided by the employment of ARFF personnel.

(4) type of flying being conducted;

(5) time of day and weather considerations including Night Vision Device (NVD) sorties;

(6) response time of Civilian Emergency Services (CES) and their ability to provide adequate support[20];

(7) local topography; and

(8) Provision of fire cover for rotors running refuels[21].

d. The establishment of an Emergency Plan is the bare minimum requirement. This may be included within any Safe Operating Environment (SOE) documentation.

B.3 ►Tier 3 Site Assurance◄

B.3.1 RA 1026 - ►Tier 3[22] Site Assurance◄, stipulates that there is no requirement to establish an Aerodrome Operator (AO) at a ►Tier 3 Site◄, but the HoE and ADH and/or AM(MF) are not prevented from doing so if it is considered appropriate. ►The ADH, AM(MF) and / or HoE may consider the requirement to provide assurance of a ►Tier 3 site◄, by the creation and maintenance of an ASOEM.◄ The HoE must assess the suitability of ►Tier 3 sites used by Aircraft◄ for which they have responsibility for Risk to Life (RtL).

B.3.2 All Domestic HLS are to have an Emergency Plan in place. It is to include but is not limited to; emergency contact numbers, rendezvous points, emergency services[23] access, First Aid provision, water supplies available and actions in the event of fire.

B.4 Permanent HLS

B.4.1 A Permanent HLS (also referred to as a "heliport" in the MAA02 Master Glossary) is a facility with a permanent rotary wing presence which is designated for operating, basing, servicing and maintaining ►RW aircraft◄. It may be an entire aerodrome or a defined area within an aerodrome and may contain one or more landing points.

B.4.2 When ►RW aircraft◄ are permanently based at an ►Tier 3 Site◄ an assessment of the intensity of flying operations is to be carried out to confirm the level of ARFF Service provision required. Where this assessment identifies that the flying operations will be that of Standard Intensity, a Task Resource Analysis[24] (TRA) to confirm ARFF Service & crew numbers, is to be carried out at the earliest opportunity. Where this is not possible due to operational reasons, the guidance to be followed is provided in Annex A of DFSR01: ARFF Service Levels of Protection.

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[20] Where practicable the CES are to be offered the opportunity to undertake familiarisation of the aircraft, this may include provision of a copy of the relevant aircraft hazard datasheet.
[21] This activity should be subject to a separate Risk Assessment in accordance with DFSR 0206: ARFF Operations.
[22] ►IAW MAA RA 1010◄
[23] This could either be from internal or external emergency services.
[24] Facilitated by the Defence ARFF Service Provider on behalf of the ADH via the Aerodrome Operator (AO) if appointed.

►B.5 Temporary/Tactical HLS

B.7.1 A Temporary facility designated for the movement of passengers, crew, or cargo during times of tension, operations, training, or exercise. It may also be used for basing, servicing and/or maintaining ►RW aircraft◄. It may be located within the UK or overseas. It may be an entire aerodrome, a defined area within an aerodrome, or any other designated location. It may include one or more landing points.

B.7.2 ADH-facing Organizations must liaise with the relevant ADH/AM(MF) to ensure that there is an adequate level of ARFF services or fire provision required for the activity. ◄

B.6 Low Intensity Operations

B.5.1 Civilian publications (CAP 789)[►25◄] Requirements and Guidance Material for Operators and CAP 168 Licensing of Aerodromes) allow a greater latitude when ►RW aircraft◄ movements are deemed to be of a low intensity. The ADH/AM(MF) is to consider when conducting a Risk Assessment (which must be completed prior to the commencement of operations), the intensity of operations that are likely to take place during a 24-hour period. The definition of Low and Standard Intensity Operations is to be determined by the individual ADH chain, allowing a reduced level of ARFF response. Examples of fire provision for Low Intensity Operations can be found in (CAP 789).

B.7 ►◄Standard Intensity Operations

B.6.1 Where Standard Intensity Operations have been determined, the requirement to provide ARFF Services must be in accordance with DFSR 0201 – ARFF Service Levels of Protection.

B.8 Exercises

B.8.1 The provision and level of fire cover must be addressed at the Initial Planning phase for any exercise. Early engagement is key to ensure the fire cover is proportionate to the risk assessed. There is substantial lead time for any additional fire cover that may be identified.

B.9 Skills and Training

B.9.1 Skills and training are to be proportionate to the task expected of the personnel undertaking the fire-fighting responsibilities. Where practicable, the training of personnel required to use First Aid Fire Appliances (FAFA) is to include practical use of the FAFA in use at the location of flying operations. The training of SQEP ARFF Service personnel is to be in accordance with: DFSR 0208: ARFF Training Requirements.

B.10 Summary

B.10.1 The utility brought by ►RW aircraft◄ must not be constrained by overly prescriptive regulations with regards to providing fire cover. The latitude within the Risk Assessment process allows ADH/AM(MF) scope to adjust levels of cover dependent upon the ability to operate safely. Where doubt exists consult the Defence ARFF Service Provider or SQEP fire advice within FLC.

[25] ►Consultation with the CAA has confirmed this document is no longer supported by the CAA; however, it continues to be a source of good practice for unlicensed aerodromes. ◄

C.1 International and National Aerodrome Rescue Fire-fighting Service Standards

C.1.1 Across the World there are several different standards for ARFF[26] Service provision. e.g.

a. Civil Aviation Authority (United Kingdom) (CAA(UK));

b. European Union Aviation Safety Agency (EASA);

c. Federal Aviation Administration (FAA);

d. International Civil Aviation Organisation (ICAO);

e. North Atlantic Treaty Organization (NATO); and

f. National Fire Prevention Association (NFPA).

C.1.2 In order to assist Aircraft Operating Authorities (AOA) to understand these differing standards, Table 1 below provides comparison of the standards, identifying the maximum aircraft size that can be operated within each standard.

a. **Table 1 below shows – ARFF Category Comparisons:**

Airport Category:			Overall Length of Aircraft Up to but Not Including:	Maximum Exterior Fuselage Width Up to but Not Including:
NFPA/NATO	FAA►[27]◄	ICAO/EASA/CAA	Mtrs	Mtrs
1	A	1	9	2
2	A	2	12	2
3	A	3	18	3
4	A	4	24	4
5	A	5	28	4
6	B	6	39	5
7	C	7	49	5
8	D	8	61	7
9	E	9	76	7
10	E	10	90	8

Notes:

1. The FAA do not have an equivalent category for ICAO/EASA/CAA/NFPA/NATO aircraft categories 1-3. Therefore, the lowest FAA category will be category A.

2. Whilst it is accepted that each standard may have different fire-fighting media requirements, AOA need not concern themselves with these, concentrating solely on the maximum aircraft size that can be operated in each category.

[26] Also, referred to as Rescue Fire Fighting Service (RFFS) or Crash Fire Rescue (CFR) and is not to be confused with a Local Authority Fire and Rescue Service or other national equivalents.

[27] ►FAA Indexes do not utilise maximum exterior fuselage width.◄

Table 1: Individual Aircraft Fire-fighting Media Requirements for NATO Aircraft

D.1 The table lists the quantity of water required for foam production (using performance Level B foam) to control fires in the Practical Critical Area and to maintain control of, and/or extinguish, the remaining fire using the ICAO Principles of Calculation.

Aircraft Type	Water Calculation (Ltrs)	Aircraft Category	Min Water Required (Ltrs)	Discharge Rate[28] (if different) to that provided in Table 1 (Lpm)
A-10	N/A	5	5400	
A-37	454	1	454	454
A 310	15374	8	18200	
Aermacchi / Embraer AMX	N/A	5	5400	
Alpha Jet	927	3	1200	
AN-2 Colt	859	3	1200	
AN-12	8015	6	8015	4008
AN-26	2622	4	2622	
AN-30	2928	5	5400	
AN-32	2618	4	2618	
AN-124	24913	9	24913	9228
AN-225	31408	10	32300	
AV-8B Harrier II	N/A	5	5400	
B-1	13450	7	13450	5873
B-2	5400	5	5400	
B-52H	►12100◄	7	►12100◄	
B747 400 Series	25263	9	25263	9357
B767 200 Series	14279	7	14279	6236
Breguet Atlantique	7634	6	7900	
C-5	26322	9	26322	9749
C-23 Sherpa	1325	3	1325	1019
C-27J	2724	4	2724	1800
C-101 Aviojet	924	3	1200	
C-160	7904	6	7904	
C-212 Aviocar	1163	3	1200	
C-295M	5144	5	5400	
CL-41 Tutor	632	2	670	
CN-235	2444	4	2444	
DHC-6 Twin Otter	1179	3	1200	907
DO 28D / D-2 Skyservant	729	2	729	577
DO 228	1227	3	1227	944
E-2 Hawkeye	►1200◄	3	►1200◄	
EA-6 Prowler	N/A	5	5400	

[28] In accordance with ICAO Annex 14 Volume 1 Aerodromes - Aerodrome Design and Operations 7th Edition July 2016 Table 9.2.

EP-3E Aries II	8723	6	8723	4362
Falcon 20 / 200	1299	3	1299	999
F-4 Phantom II	N/A	5	5400	-
F-5 (All Variants)	N/A	5	5400	-
F-7 / J-7 Airguard	N/A	5	5400	-
F-15 (All Variants)	N/A	5	5400	-
F-16 (All Variants)	N/A	5	5400	-
F-18 (All Variants)	N/A	5	5400	-
F-22	N/A	5	5400	-
F-27 Enforcer	5214	5	5400	-
F-35	N/A	5	5400	-
F-117	N/A	5	5400	-
G-4 Super Galeb	730	2	730	575
G-222	2724	4	2724	-
IL-28 Beagle	►1200◄	3	1200	-
IL-76	13074	7	13074	5709
J-22 Orao	N/A	5	5400	-
Jaguar	N/A	5	5400	-
JAS 39 Gripen	N/A	5	5400	-
L-39	929	3	1200	-
KC-10A	18431	8	18431	7314
KC-135 Strato Tanker	11744	7	12100	-
M-346	740	2	740	583
MiG 17	N/A	5	5400	-
MiG 21	N/A	5	5400	-
MiG 23	N/A	5	5400	-
MiG 29	N/A	5	5400	-
Mirage 2000	N/A	5	5400	-
Mirage F1	N/A	5	5400	-
Mirage IV	N/A	5	5400	-
M.B. 339A	723	2	723	570
P-3 Orion	8740	6	8740	4370
PC-7 Turbo Trainer	592	2	670	-
PC-9	617	2	670	-
Rafale	N/A	5	5400	-
S-2 Tracker	►1200◄	3	►1200◄	-
SF 260	347	1	347	347
SU-17	N/A	5	5400	-
SU-20	N/A	5	5400	-
SU-22	N/A	5	5400	-
SU-25	N/A	5	5400	-
Super Etendard	N/A	5	5400	-
T-33	727	2	727	573
T-38	1055	3	1200	-
T-45A	765	2	765	602
TR-1	2093	4	2400	-

D1-2

206 Jet Ranger	►565◄	H1	►800◄	
AH-1 Cobra	►1200◄	H2	►1200◄	
AS 350 Ecureuil	►706◄	H1	►800◄	
CH-53	►1970◄	H3	►1970◄	►985◄
H-2 Sea Sprite	►1200◄	H2	►1200◄	
KA-25	►590◄	►H1◄	►800◄	
KA-27	►1209◄	►H3◄	►1600◄	
MD-500 Defender	►432◄	►H0◄	►250◄	►◄
Mi-8 / 14 / 17 Hip	►1300◄	H3	►1600◄	
Mi 24	►1059◄	►H3◄	►1600◄	
NH90	►1065◄	►H3◄	►1600◄	
SA 321G Super Frelon	►1332◄	►H3◄	►1600◄	
SA 332 Super Puma	►1181◄	►H2◄	►1200◄	
Tiger	►838◄	H2	►1200◄	
UH-60 Blackhawk	►1083◄	H2	►1200◄	
UH-70 Seahawk	►1083◄	H2	►1200◄	
UH-72	►648◄	H1	►800◄	
V-22 Osprey	1848	H3	1848	924

Notes.

1. In accordance with NATO STANAG 3712 CFR (Edition 8) - Aircraft Rescue and Fire-fighting (ARFF) Services Identification Categories, all ►Fighter◄ aircraft have been classified as ICAO 5. Therefore, individual water requirements have not been calculated.

D1-3

Regulation: 0202

Aerodrome Rescue Fire-fighting (ARFF) Response

0202 Aviation Duty Holders (ADH), ADH-Facing (ADH-F) Organizations, Heads of Establishment (HoE), ►Aerodrome Operators (AO)◄ and Accountable Managers (Military Flying) (AM(MF)) **shall** ensure that ►Aerodrome Rescue Fire-fighting (ARFF)◄ Services are organised, operated, and respond to all emergency incidents according to the defined principles in a timely manner.

Acceptable Means of Compliance: 0202

ARFF Response

1. The ARFF Service **should** be notified of all aircraft emergencies by ATC; operating in accordance with MAA ►Manual of Military Air Traffic Management (MMATM)◄.

2. ARFF services **should** be organised and operated in such a manner as to ensure their rapid deployment and the effective and efficient use of resources.

3. When aircraft are involved in incidents on or adjacent to aerodromes, the principle objectives of the ARFF service **should** be to:

   a. save life;

   b. create and maintain survivable conditions;

   c. initiate[29] the rescue of those occupants unable to make their escape without direct aid;

   d. make safe any special risks;

   e. minimise damage to aircraft and associated equipment;

   f. reduce or mitigate effects on the environment; and

   g. preserve evidence at incident location.

4. The operational objectives of the ARFF Service on aerodromes and ►Permanent HLS◄ are to:

   a. create and maintain survivable conditions;

   b. provide egress routes for occupants to escape unaided; and

   c. initiate the rescue of those occupants unable to make their escape.

5. At an aerodrome the ARFF Services **should** achieve the response times of two minutes (and not exceeding three minutes to any point of each operational runway, as well as to any other part of the movement area[30]), in optimum visibility and surface conditions[31].

[29] Oxford Concise English Dictionary definition is; *"Cause (a process or action) to begin."*

[30] MAA 02 defines movement areas as follows, "that part of an aerodrome intended for the surface movement of air systems, including the manoeuvring area and apron(s)."

[31] Optimum visibility and surface conditions are defined as daytime, good visibility, no precipitation, or strong wind with normal response route free of surface contamination e.g. water, ice, snow, and aircraft movement restrictions.

6. At a ►Permanent HLS◄, the ARFF Services **should** achieve response times not exceeding two minutes in optimum surface and visibility[32].

7. The ARFF Service **should** make safe progress (as quickly as conditions permit), to the accidents and/or incidents - to maximise the opportunity for saving life. Achieving the response times are dependent on; the size of aerodrome, location of fire station(s), disposition of vehicles, personnel, and weather conditions at any given time.

8. ARFF vehicles **should** normally be housed in a fire station to ensure that response times can be met. Their access from the fire station on to the runway area **should** be clear, direct, and requiring a minimum number of turns. The responding ARFF services **should** be capable of reaching the furthest point of the aerodrome boundary within the stipulated response time.

9. ►Tools and equipment[33] to effectively support ARFF services in the creation of survivable conditions and to initiate rescue **should** be available at the incident or accident scene within the required response time.◄

10. The ARFF Service Response Area **should** be identified within the Unit Emergency Orders – (Aerodrome Crash Plan).

11. If the aerodrome is located near water, a swampy area, or other difficult environment, or a significant portion of the approach/departure operations take place over these areas; the AO **should** coordinate[34] the availability of suitable rescue equipment and services. Where necessary, if not available from other Emergency Services,[35] the ARFF Service **should** be appropriately resourced with specialist rescue/fire-fighting vehicles, equipment, and training.

12. All ARFF vehicles **should** be equipped with Crash Maps and Ordnance Survey Maps in accordance with MAA RA 3261(2): Aerodrome Emergency Services.

13. A Response Safe System of Work includes a number of elements that must come together to deliver an effective and safe service. A comprehensive Hazard and Risk Analysis **should** be conducted over the Optimum Response Routes (within the aerodrome boundary) that ARFF vehicles are likely to use. The analysis and system of work **should** consider:

a. Standard Operating Procedures;

b. call handling;

c. alerting system;

d. position of the fire station or Standby Area;

[32] It is recognised that a two-minute response time for rotary wing aircraft may not always be achievable; particularly in training areas where ►rotary wing aircraft◄ movements are outside the aerodrome boundary.

[33] ►The management of tools and equipment should be IAW MAA RA 4808◄

[34] Refer to ICAO Airport Services Manual Part 1 Chapter 13 – Rescue Operations in Difficult Environments.

[35] CES in the UK or HN Support when on Deployed Operations.

e. position of training area where a response may be made from suitable access roads and routes;

f. visibility and surface conditions;

g. a clear route;

h. vehicle performance;

i. vehicle maintenance;

j. effective equipment;

k. competent staff;

l. communications;

m. an effective safety culture;

n. effective leadership and incident command;

o. Human Factors; and

p. monitoring and review (including records).

14. When assessing an effective response, the above points **should** be scrutinised and reviewed; however, when measuring effectiveness, each aspect need not be focused on in isolation.

15. A Response Area Risk Assessment (DFSR Form 01) **should** be completed by the Defence ARFF Service and endorsed by the AO. Once completed, the Risk Assessment **should** be included in the Unit DAM.

16. Assessment of the approach and departure areas within 1000m of the runway threshold, or suitable point(s) for rotary wing aircraft locations, **should** be carried out by the Defence ARFF Service present, to determine the options available for rescue. In considering the need for any specialist rescue and access routes, the environment of the Risk Area (in particular the topography and composition of the surface), **should** be considered.

17. To facilitate achieving minimum response times; Emergency Access Roads **should** be provided on an aerodrome where terrain conditions permit their construction. Particular attention **should** be given to the provision of ready access routes to approach areas up to 1000m from the threshold, or suitable point(s) for ►Rotary Wing aircraft◄ locations within the aerodrome boundary. Where a boundary fence offers obstruction to the responding ARFF services, appropriate arrangements **should** be in place to facilitate unobstructed access to outside areas for the largest ARFF vehicle.

18. The Aerodrome 1000m Assessment (DFSR Form 02) **should** be completed and included in the Unit DAM.

19. Defence ARFF Service providers **should** develop Safe Systems of Work for all incidents likely to be encountered on Defence aerodromes. Tactics, Techniques and Procedures (TTP) **should** be produced for all incidents likely to occur on all Unit-based and frequent visiting aircraft. Generic risks ►**should**◄ be reduced to As Low As

Reasonably Practicable (ALARP) and Tolerable by the introduction of these TTP.

20. The Duty Crew of the ARFF Service **should** be placed under the orders of the DATCO/ATCO IC who will be responsible for its deployment and state of readiness during aerodrome operating hours. The DATCO/ATCO IC **should** be responsible for immediately authorising the response of the ARFF service to attend all emergency incidents or accidents, on or near the aerodrome, if an aircraft is involved. The DATCO/ATCO IC **should** be responsible for disseminating the implications of the reduction of ARFF capability.

21. The Senior ARFF Officer present **should** retain Incident Command and Control of all deployed ARFF assets until the incident is handed over to an appropriate member of an Emergency Service[36], or until the incident Emergency Response Phase is terminated ►and handed over to the MOD Incident Officer◄.

22. ARFF crews **should** respond to all emergency incidents[37] within their areas of responsibility as a priority; when life may be at risk and/or an effective contribution to the incident can be made. Any consequent effect on aerodrome operations, through a reduction or loss of ARFF category, is to be considered secondary to the saving of life[38].

23. When an incident occurs off an aerodrome, the action to be taken depends on whether the exact location of the incident is known. When the location is known, the DATCO/ATCO IC (or other emergency coordinating body), **should** initiate emergency action in accordance with the Local Emergency Plan. If the location of the incident is unknown, ATC personnel or other emergency coordinating body will initiate search activity in accordance with MAA RA 3261 (2).

Guidance Material: 0202

ARFF Response

24. States of readiness for aircraft emergencies are defined as:

a. ►Emergency◄ State 1 - Aircraft Accident. ►A crash has occurred on the aerodrome or can be seen from the aerodrome◄.

b. ►Emergency◄ State 2 - Full Emergency. An incident on the aerodrome where doubt exists about the safety of the aircraft or its occupants, or to anticipate a State 1. The ARFF vehicles and emergency medical services are deployed to the incident or to pre-arranged positions on the aerodrome.

c. ►Emergency◄ State 3 - Local Standby: A precautionary measure to cater for a possible incident on the aerodrome, or when an aircraft has crashed off the aerodrome, but the position is unknown. ARFF vehicles are crewed with engines running at their normal locations.

[36] CES in the UK or HN Support when on Deployed Operations.

[37] In some instances, where ARFF capability is provided by a contracted Service Provider, where no provision has been made within the contract to provide a structural response capability. ARFF personnel will not be authorised or contracted to collate any pre-planning or structural risk information activities, which support Safe Systems of Working (SSoW). Where the situation exists, the aim being to limit the spread of fire to the compartment or building of origin.

[38] Refer to MAA RA 3261 (2): Aerodrome Emergency Services

d. ►Normal Standby. ARFF crews will be at normal response readiness to react to any incident◄.

e. ►ARFF Services Closed. No ARFF services available (the fire station closed or reduced to structural fire protection only).◄

25. Response time is considered to be the time between the initial call to the ARFF service, and the time when the first responding vehicle(s) is (are) in position to apply foam at a rate of at least 50 per cent of the discharge rate specified in Table 1 of DFSR Regulation 01 ARFF Service Levels of Protection.

26. Any vehicle(s), other than the first responding vehicle, required to achieve continuous agent application is (are) to arrive no more than one minute after the first responding vehicle(s).

27. When determining response time, the Aerodrome Operators need to consider:

a. providing direct access to the operational runway(s);

b. designating access routes to the response area;

c. the maintenance of roads and access routes;

d. eliminating the possibility of any vehicle blocking the progress of responding emergency vehicles;

e. accounting for the gross weight and maximum dimensions of the ARFF vehicle(s) expected to use the roads and access routes;

f. ensure roads are capable of being traversed in all conditions;

g. exit gates or frangible sections in the security fence are suitable to allow access of the largest ARFF vehicle utilised on the aerodrome;

h. exit points will need to be clearly identified. Reflective tape or markers will be of assistance where aerodrome may need to be accessible during the hours of darkness or in conditions of low visibility; and

i. providing sufficient vertical clearance from overhead obstructions for the largest vehicle.

28. ARFF vehicles will approach any aircraft incident by the quickest route commensurate with safety, although this might not necessarily be the shortest distance to the scene. Traversing through uneven or rough terrain areas can take longer than travelling a greater distance on paved surfaces. Therefore, a thorough knowledge of the topography of the aerodrome and its immediate vicinity is fundamental for ARFF personnel. The use of grid maps and careful selection of routes is essential for success in meeting the response objective.

29. It is highly likely that Air Transport Incidents will involve a multi-agency response, therefore it is important that the Defence ARFF Service provider ensures collaboration with civil emergency responders

forming the Pre-Determined Attendance (PDA) for incidents at individual aerodromes. To support Intraoperability and Interoperability it will be necessary to embed the basic principles of the JESIP into the Unit Emergency Orders (Aerodrome Crash Plan).

30. To ensure interoperability with Civil Emergency Services (CES) it will be necessary to ensure that tactics, techniques, and procedures (for dealing with all foreseen emergency incidents on aerodromes) reflect the information provided by the National Operational Guidance where relevant.

Regulation: 0203

DFSR 0203: ARFF Vehicle ►◄Equipment ►and Infrastructure◄ Requirements

0203 Aviation Duty Holders (ADH), ADH-Facing (ADH-F) Organizations, Heads of Establishment (HoE), Aerodrome Operators (AO) and Accountable Managers (Military Flying) (AM(MF)) **shall** provide Aerodrome Rescue Fire-fighting ►(ARFF)◄ Services with adequate numbers and types of vehicles and equipment at the aerodromes for which they are responsible.

Acceptable Means of Compliance: 0203

ARFF Vehicle, ►◄Equipment ►and Infrastructure◄ Requirements

1. The minimum number of ARFF vehicles provided at an aerodrome to effectively deliver and deploy the agents specified for the aerodrome category **should** not be less than that set out in Table 1.

Table 1 below shows – The minimum number of ARFF vehicles required at aerodromes.

Aerodrome Category	**Special**	1	2	3	4	5	6	7	8	9	10	►H0	H1	H2	H3
Minimum Number of ARFF vehicles	1	1	1	1	1	2[39]	2	2	3	3	3	1	1	1	1◄

2. The minimum performance specification for ARFF vehicles **should** be in accordance with the DSA02 DFSR ARFF Regulations and ICAO Airport Services Manual Part 1 - Rescue and Fire-fighting.

3. A system of preventative maintenance of ARFF vehicles **should** be employed to ensure effectiveness of the equipment and compliance with specified response time throughout the life of the vehicle.

4. Where a structural response capability is provided by the ARFF Service, the ability to deliver water jets would be desirable. Care **should** be taken in providing this additional capability to ensure that the primary role of the vehicle (aircraft fire-fighting) is not impaired.

5. Rescue equipment commensurate with the level of aircraft operations **should** be provided, taking into consideration:

a. the level of aircraft operations;

[39] The requirement for 2 ARFF vehicles may be reduced to 1 at aerodromes where there is no requirement to respond to structural type incidents.

b. a Task Needs Analysis (TNA);

c. the Task Resource Analysis (TRA) ►[40]◄; and

d. relevant Health and Safety legislation, e.g. Provision and Use of Work Equipment Regulations (PUWER), Personal Protective Equipment at Work Regulations (PPE) require that equipment is:

1) suitable for the intended use;

2) safe for use; maintained in a safe condition and, in certain circumstances, inspected to ensure this remains the case;

3) used only by personnel who have received adequate information, instruction, and training; and

4) accompanied by suitable safety measures(e.g., protective devices, markings, warnings).

e. a suitable Test and Inspection regime for which appropriate records **should** be maintained (for a minimum period of five years).

f. Records **should** include details of consequential action where an inspection has revealed a defect or deficiency.

6. ►Vehicle/Equipment **should** not be used outside of periodic test/inspection/maintenance date. ◄

7. ►Tools and equipment[41] to effectively support ARFF services in the creation of survivable conditions and to initiate rescue **should** be available at the incident or accident scene within the required response time.◄

8. If the aerodrome is located near a water/swampy area (or other difficult environment), or a significant portion of the approach/departure operations takes place over these areas, the AO **should** coordinate the availability of suitable rescue equipment and services. Where necessary, if not available from other Emergency Services[42], the ARFF Service **should** be appropriately resourced with specialist rescue/fire-fighting vehicles, equipment, and training.

9. All ARFF[43] personnel **should** be provided with Personal Protective Equipment (BS EN 469: ►2020◄) to enable them to perform their duties in a safe and effective manner.

10. ►**Communications.** ATC or Operations Rooms (Ops Rm) controlling aircraft movements **should** be connected by adequate ground communications to safety services and station

[40] ►As detailed within CAP 1150 TRA process◄

[41] ►The management of tools and equipment should be IAW MAA RA 4808◄

[42] Civil Emergency Services (CES) in the UK or Host Nation (HN) Support when on Deployed Operations.

[43] ►Immediate Emergency Responder◄ (IER) personnel are not to be considered as ARFF personnel. PPE for IER personnel is to be kept to the absolute minimum necessary to perform their duties. It is not expected for IER personnel to be provided with Fire Fighting PPE.

departments concerned with flying in accordance with MAA RA 3261(2)◄

11. A discrete communication system **should** be provided, linking the Fire Station with Air Traffic Control (ATC) ►or other Ops Rm controlling aircraft movements◄ and all ARFF vehicles.

12. ►A discrete communication system **should** be provided between ATC or other Ops Rm controlling aircraft movements and the ARFF crews in attendance at an aircraft accident/incident.◄

13. Communications equipment **should** be provided which will have an effective range such that it ensures reception within all the response areas that the ARFF Service may be required to operate in. The ARFF Service Response Area **should** be identified within the Unit Emergency Orders (Aerodrome Crash Plan).

14. Communication equipment **should** be provided to enable the ARFF Service to communicate with the responding CES.

15. Radio equipment **should** be provided to enable ARFF personnel to maintain communications with ATC when not in their vehicles.

16. A reliable method of summoning assistance from external emergency services **should** be provided[44].

17. ►The ARFF **should** be housed in a Fire Station[45] which consist of:

a. Vehicle Bays

b. Control/Watch Room

c. OIC Station Office

d. Administration Office

e. Drying Room

f. Changing/Locker Room

g. Ablutions

h. Dormitory (where applicable)

i. Kitchen/Rest Room

j. Training/Classroom

k. Storeroom

l. BA Servicing Room (and soundproof annex for Compressor)

m. Workshop

[44] Refer to MAA RA 3261 (2) Aerodrome Emergency Services.

[45] Through consultation with Defence Infrastructure Policy and Performance Standards JSP 850 Building Performance Standards

n. Cleaners Room◄

18. An alerting system for ARFF personnel, which is capable of being operated from that station, **should** be provided at the Fire Station and ATC.

19. ►The ARFF Service **should** be provided with a fire training area with suitable training resources:

a. that are commensurate with the type and scale of aerodrome operations and the size and complexity of the training and Maintenance of Competence Scheme (MOCS).

b. these may include: Live fire training facilities,

1) Aircraft simulator corresponding to the dominant risk profile of the aerodrome.

2) Drill Tower[46]

3) BA training complex◄

Guidance Material:

0203

ARFF Vehicle, Equipment and ►Infrastructure◄ Requirements

20. ►Consideration **should** be given to the provision of an additional vehicle(s) in order that the minimum requirements are maintained during periods when a vehicle is out of service.◄

21. In accordance with MAA RA 3267: Aerodrome Vehicle Marking and Lighting Requirements; ARFF vehicles utilised within the UK are to be Signal Red in colour.

22. Guidance on the rescue equipment to be provided at an aerodrome is given in both NATO STANAG 7132 CFR: Personal Protective and Fire-fighting Equipment Requirements for Fire and Emergency Operations, and ICAO Airport Services Manual Part 1.

23. At category 'Special', ICAO category 1 and 2 Aerodromes, any vehicle provided is to be mechanically reliable, fit for purpose, and capable of accommodating personnel. The vehicle is to be capable of conveying and delivering at least the minimum quantities of extinguishing agents as specified in DFSR Regulation 01 ARFF Service Levels of Protection Table 1.

24. Nonself-propelled appliances (trailers) are permissible, at category 'Special', 1 and 2 Aerodromes, but they are to be connected to a suitable towing vehicle during aircraft movements. Where soft or other difficult terrain is immediately adjacent to, or comprises part of the response area, a suitable all-wheel drive vehicle will be required to ensure an effective response. In other situations, the vehicle is to be suitable for the terrain at the specific aerodrome.

25. At category 'Special', 1 and 2 aerodromes following a TNA, a minimum quantity of ancillary equipment resource appropriate to

[46] Designed to meet the risk profile of the Station.

the sizes and types of the aircraft is to be provided. CAP 168 Chapter 8 Appendix 8B and 8C provides further details of equipment requirements for these aerodromes.

26. The management of information and record keeping including the disposal of records can be found in JSP 441: Managing Information in Defence.

27. At certain locations communication equipment may also include a requirement for ground-to-air[47] radio systems. Any requirement will be determined by HOE/AO.

28. In order that ARFF personnel can communicate with an aircraft captain, without the need for ground-to-air communications, it is acceptable for ARFF personnel to be supplied with a headset and microphone which can be connected to the aircraft once it has come to rest.

29. In accordance with MAA RA 2307 Rules of the Air, ARFF personnel are to utilise NATO Standardised Marshalling Signals as identified within NATO STANAG 3117 ►Ed 9◄ - Standard AFSP-2 ►Ed A Ver 1◄ Aircraft Marshalling Signals when operating in the vicinity of aircraft.

[47] The use of ground to air radio systems is limited to direct communications between the senior ARFF Officer present and pilot when the aircraft is on the ground and only within the period of a declared emergency.

Regulation: 0204

ARFF Personnel Requirements

0204 Aviation Duty Holders (ADH), ADH-Facing (ADH-F) Organizations, Heads of Establishment (HoE), Aerodrome Operators (AO) and Accountable Managers (Military Flying) (AM (MF)) **shall** provide Aerodrome Rescue Fire-fighting ►(ARFF)◄ Services with appropriate numbers of Suitably Trained and Competent Personnel (STCP) at the aerodromes for which they are responsible.

Acceptable Means of Compliance 0204

ARFF Personnel Requirements

1. The Defence ARFF Service Provider **should** ensure that:

a. during flight operations and at least 15 minutes after the departure of the last flight, an appropriate number of STCP are detailed and readily available to respond to an incident and operate the equipment at the maximum capacity;

b. all ARFF personnel required to act in aviation emergencies, demonstrate their medical fitness[48] to execute their role, taking into consideration the type of activity;

c. all personnel are deployed in a way that ensures the minimum response times can be achieved and continuous agent application at the appropriate rate can be fully maintained. Consideration **should** also be given to the use of hand lines, ladders and other rescue and fire-fighting equipment normally associated with aircraft rescue and fire-fighting operations; and

d. all responding ARFF[49] personnel are provided with ►personal◄ protective ►equipment◄ and respiratory equipment to enable them to perform their duties in an effective manner.

2. It is recognised that ARFF/►Immediate Emergency Responder◄ (IER) personnel may be engaged in duties other than those directly associated with the ARFF role. These 'extraneous' duties **should** be the subject of an Impact Assessment and are to be organised so as not to create conditions likely to compromise individual or crew performance or introduce additional hazards.

3. A Task Resource Analysis[50] (TRA) **should** determine the appropriate level of rescue and fire-fighting equipment, personnel, and supervisory grades. It **should** also identify training needs for personnel to deal with the Worst Credible Scenarios (for all ICAO ARFF categories promulgated within the Unit DAM).

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[48] Medical fitness assessments specific to ARFF Services should be conducted for pre-employment entry as a fire fighter as well as ongoing medical fitness assessments for existing staff.

[49] IER personnel are not to be considered as ARFF personnel. PPE for IER personnel is to be kept to the absolute minimum necessary to perform their duties. It is not expected for IER personnel to be provided with Fire Fighting PPE. This is to be confirmed by the 1* TRA following the Task Needs Analysis (TNA).

[50] Refer to ICAO Airport Services Manual Part 1 Paragraph 10.5 Task Resource Analysis and CAP 1150 Information Paper 04 Task Resource Analysis for further detail.

4. A TRA **should** be ►organised, managed and conducted◄ in consultation between the HoE/AO and Defence ARFF Service Provider by using a Qualitative Risk-Based approach which focuses upon Worst Credible Scenarios (WCS)[51]. ►This **should** be conducted through a series of table-top exercises and simulations.◄

5. During ►deployed◄ operations, ►where◄ no Civilian Emergency Services (CES) or Host Nation (HN) support is available, the provision of ARFF services **should** be scaled to ensure that all tasks associated with the WCS are effectively and safely dealt with by on-site arrangements.

6. The TRA process **should** commence by ascertaining the aerodrome category required by the Front-Line Command[52] (FLC) or Industry. This will allow the AO to confirm the minimum number of vehicles, minimum extinguishing agent requirements and discharge rates. This **should** also allow the Defence ARFF service provider to determine the appropriate number of personnel required to functionally operate the vehicles and equipment.

7. The outcome of the TRA **should** be agreed ►and endorsed by◄ the HoE/AO. ►It◄ is to be shared with the CES or Host Nation (HN) equivalent and Local Resilience Forums.

8. Independent assurance of the TRA **should** be ►determined and◄. provided by the DFSR F&R (OA) Team. Once completed, the TRA **should** be recorded in the Unit's Defence Aerodrome Manual (DAM).

9. The objective of providing the appropriate number of competent personnel **should** be based on the 'Safe Person Concept' to have available sufficient staff, at all responsibility levels, operating Safe Systems of Work (SSoW) to ensure that.

a. the ARFF Service can achieve the Operational objective;

b. all vehicles and equipment can be operated effectively and safely;

c. continuous agent application at the appropriate rate(s) can be maintained;

d. sufficient supervisory grades can initiate an Incident Command System;

e. ARFF personnel are able to assist in aircrew, passenger, and crew self-evacuation.

f. gain access to aircraft to carry out specific tasks if required (e.g. fire-fighting, create survivable conditions, initiate rescue[53], make safe any special risks).

[51] A TRA seeks to identify the most appropriate number of personnel required to undertake identified tasks in real time before supporting external services are able to effectively assist the ARFF service.

[52] For aerodromes operating under MAA CFAOS this will be set by the AM(MF)

[53] Oxford Concise English Dictionary definition is; "Cause (a process or action) to begin."

g. support and sustain the deployment of fire-fighting and rescue equipment;

h. support and sustain the delivery of supplementary water supplies, and

i. the ARFF elements of the Emergency Orders (Aerodrome Crash Plan) can be effectively achieved.

Note: The above list is not exhaustive, and all relevant tasks must be identified before proceeding through the TRA process. Each task may include numerous functional activities.

10. The AO **should** ensure that a TRA is carried out for each ICAO aircraft category promulgated within the Unit DAM. Other reasons requiring a TRA include, but are not limited to, the following:

a. where the aerodrome category published within the DAM has changed;

b. introduction of new ►Aircraft◄;

c. change of WCS;

d. change in flying operations (e.g. Defence Exercise, Air show etc, that requires the aerodrome to operate at a different ICAO aircraft category than promulgated within the Unit DAM).

e. change in type of ARFF vehicle(s) which introduce new technology;

f. change in the Pre-Determined Attendance (PDA) delivered by CES/HN Support;

g. adoption of new FRS Guidance where change impacts upon operational response;

h. where a ►Deployed Operation becomes◄ an Enduring Operation; and

i. continuous Improvement, following Lessons Identified (LI) from incidents, exercises reports (including DASORs etc).

11. At category 1 – 10/ ►H0◄– H3 aerodromes/►Permanent HLS◄, all personnel forming part of the appropriate staffing level **should** be qualified Aerodrome Rescue Firefighters who have maintained the competencies required to be considered STCP for the role in which employed.

12. ►Where the required level of ARFF services on Tier 1[54] Defence◄ Aerodromes ►operating at ARFF Category 'Special' IAW DSA 02 DFSR Defence Aerodrome Rescue Fire-fighting Regulations (R.0201.AMC.2).◄ The AO **should** promulgate clear and concise emergency procedures, including the use of IER personnel, as an alternative to professional firefighters. IER **should** be suitably equipped and trained to provide an immediate response during flying operations.

[54] ►IAW MAA RA 1010 - Head of Establishment - Aviation Responsibilities◄

13. An appropriate number of competent IER personnel **should** be detailed to operate the IER equipment.

14. Training of both ARFF and IER personnel **should** be carried out in accordance with DFSR Regulation 08: ARFF Training Requirements.

Guidance Material: 0204

ARFF Personnel Requirements

15. Medical standards for ARFF personnel are a single Service (sS) ►policy decision◄. However, guidance can be found in NATO STANAG 7162 ►Ed 1◄ Standardization of Physical Fitness Maintenance Program, for Firefighters on a Maintenance of Fitness programme.

16. ARFF/IER personnel designated as part of the appropriate level for response, who are engaged on extraneous duties, must be able to disengage safely to meet the response time objective.

17. ARFF/IER personnel designated as part of the appropriate level for response are not to be engaged on duties involving the handling of flammable liquids.

18. ►Annex A provides details and results of the TRAs conducted across Defence. Where aerodromes are required to operate at an ICAO category, that has not been subjected to a TRA, these tables provide information on resources required for each category.◄

►A.1 Task Resource Analysis Arrangements for Defence ARFF Services.

A.1.1 The results of TRAs conducted across Defence Aerodromes are contained in Table 1 for FW aircraft and Table 2 for rotary wing aircraft. The tables identify the different vehicle configurations and crewing models for each ICAO category assessed and provides the appropriate number of STCP to deal with aircraft incidents at each aerodrome ICAO category.

Table 1 – Fixed Wing Aircraft

ICAO CATEGORY	VEHICLE TYPE	CREWING MODEL		
1	1 x RRV[55]	3	CM	1
			FF	2
1	1 x MPRV	4	CM	1
			FF	3
2	1 x MPRV	4	CM	1
			FF	3
3	1 x MPRV	4	CM	1
			FF	3
4	1 x MPRV	4	CM	1
			FF	3
5	2 x MPRV or	6	WM	1
			CM	1
			FF	4
	1 x SUV 1 x MPRV 1 x HRET	6	WM	1
			CM	2
			FF	3
6	2 x MPRV or	6	WM	1
			CM	1
			FF	4
	1 x SUV 1 x MPRV 1 x HRET	6	WM	1
			CM	2
			FF	3
7	1 x SUV 1 x MPRV 1 x HRET	7	WM	1
			CM	2
			FF	4

[55] No structural firefighting commitment

ICAO CATEGORY	VEHICLE TYPE	CREWING MODEL		
8	1 x SUV 1 x MPRV 2 x HRET	10[56]	WM	1
			CM	3
			FF	6
		8[57]	WM	1
			CM	3
			FF	4
	2 x MPRV[58] 1 x HRET	8[3]	WM	1
			CM	2
			FF	5
	1 x MPRV 2 x HRET	8[3]	WM	1
			CM	2
			FF	5

Table 2 – Rotary Wing Aircraft

ICAO CATEGORY	VEHICLE TYPE	CREWING MODEL		
H1	1 x RRV or	4	CM	1
	1 x MPRV		FF	3
H2	1 x MPRV	4	CM	1
			FF	3
H3	1 x SUV 1 x MPRV or	5	WM	1
	1 x SUV 1 x HRET or		CM	1
	2 x MPRV or		FF	3◄
	1 x MPRV[59]			

[56] Passenger carrying aircraft with 2 aisles

[57] All ICAO 8 aircraft configurations when conducting cargo or air to air refuelling operations. All passenger carrying aircraft **shall** comply with footnote 2.

[58] Note: This vehicle set is unsuitable for Voyager aircraft

[59] MPRV with 5th seat fitted

Regulation 0205

ARFF Fire-fighting Media

0205 Aviation Duty Holders (ADH), ADH-Facing (ADH-F) Organizations, Heads of Establishment (HoE), Aerodrome Operators (AO) and Accountable Managers (Military Flying) (AM(MF)) **shall** provide Aerodrome Rescue Fire-fighting ►(ARFF)◄ Services with adequate quantities and properties of fire extinguishing agents at aerodromes for which they are responsible.

Acceptable Means of Compliance: 0205

ARFF Fire-fighting Media

1. The Defence ARFF Service providers **should** ensure that provision of fire-fighting media remains compliant with DFSR Regulation 01 ARFF Service Levels of Protection, Table 1.

2. Fire-fighting foams **should** be tested in accordance with ICAO Level B or Level C Performance Test Method as set out in: ICAO Airport Services Manual, Part 1, Rescue and Fire-fighting 4th Edition (2014), Chapter 8 (Doc 9137-AN/898 Part 1).

3. The foam produced by an ARFF vehicle, or other such appliance, **should** be of an acceptable quality. The delivery parameters (i.e. monitors, jet range and pattern), **should** be maintained and meet the appropriate operational requirement.

4. In order to ensure that the foam production by an ARFF vehicle or other such appliance is of an acceptable standard, a Foam Production Performance Test (i.e. an Acceptance Test) **should** be carried out when:

a. a vehicle is first acquired;►[60]◄ and

b. significant maintenance, refurbishment or component replacements have been undertaken on an ARFF vehicle that could affect a change in the foam quality or production performance of the foam-making system. This includes a change of foam-making branches, nozzles, or monitors. Only those parts of the system that could have been affected by the work undertaken or the component change need to be tested.

5. The Foam Production Performance Test **should** confirm the following:

a. the induction percentage for all foam making devices can be checked using water instead of foam (if the foam production system is fitted with an induction monitoring system, the test

[60] ►Acquisition may mean the new or second-hand purchase, leasing or hire of a Rescue, Fire Fighting (RFF) Vehicle◄

results obtained from analysis of the foam sample **should** correspond with those provided with the monitoring system);

b. the expansion ratio from all foam making devices;

c. the quarter draining time from all foam making devices;

d. the jet range of the main monitor; and

e. the spray pattern of the main monitor.

6. For vehicles equipped with foam monitors capable of producing foam on the move, the test **should** include an assessment of this capability.

7. Induction systems **should** induce within a tolerance of +/- 10% of the desired induction percentage at optimum working conditions. Pre-mixed foam systems **should** have a foam concentration introduced to within a tolerance of 1.0 to 1.1 times the manufacturer's desired induction rate.

8. ►The In-Service Test **should** be carried out in accordance with equipment manufacturers' instructions:

a. to ensure the on-going capability of the foam production system.

b. not exceeding (12) months. ◄

9. ►Once the Foam Production System has been fully tested as described in R.0205.AMC.4 to 7 and assuming no changes have been made, the In-Service Testing shall consist of periodic checks not exceeding (12) months to ensure induction accuracy.◄

10. ►The frequency of the In-Service Tests **should** be determined and conducted in conjunction with the vehicle maintenance provider.◄

11. Due to changes in environmental legislation and the Secretary of State ►for Defence◄ commitment to Environmental Protection, fire-fighting media **should** deliver a fire-fighting capability, whilst at the same time be sympathetic to the environment.

12. The foam solution **should** be acceptable to the local water utilities for discharge into the foul sewer. ►Where this is not possible, during training and testing of vehicles, the firefighting effluent **should** be captured to minimise◄ the impact on the environment and reducing the risk of enforcement action from an environmental release.

13. ►Fire and Rescue Service integrated risk management plans **should** consider environmental risk. They **should** identify and assess.

a. Potential pollution sources

1) The sensitivity and vulnerability of the local environment.

2) Factors to consider include impact on:

(a) Public and private water abstraction points

(b) Aquifers

(c) Bathing water, fisheries, and other recreational uses of water

(d) Nature conservation sites, such as SSSIs

(e) Other uses of water

(f) Pathways the pollutant will follow using drainage plans and control options, such as the type and location of pollution prevention systems

14. All reasonable steps **should** be taken to minimise pollution.

15. HoE **should** have systems in place to advise environment agencies when there is potential for pollution, or when pollution has occurred from ARFF Services activities.◄

16. The fire-fighting agents **should** be compliant with Persistent Organic Pollutant Regulations. The foam products **should** be free of any Perfluorotooctanesulfonic acid (PFOA), Perfluorooctane sulfonate (PFOS) and Perfluoroalkyl and Polyfluoroalkyl substances (PFAS), or any derivative that is persistent in the environment (there **should** be no acceptable lower limit or threshold).

17. ►In accordance with The Control of Substances Hazardous to Health Regulations (COSHH) where hazardous substances are present in the workplace, they are to be stored safely.◄

18. ►In pursuance of paragraph 0205.AMC.18 above, the responsible person **should** conduct a risk assessment with consideration of how substances are to be used and stored safely.◄

19. The complementary extinguishing agent **should** be a dry chemical powder suitable for extinguishing hydrocarbon fires (or any other alternative agent having equivalent fire-fighting capability).

20. The complementary agents **should** comply with the appropriate specifications of the International Organisation for Standardisation (ISO).

21. Where the main complementary agent is a gaseous agent, including CO2, a quantity of dry powder[61] **should** be provided to assist in dealing with a running fuel fire.

22. Systems **should** be capable of delivering the agent through equipment which will ensure its effective application.

23. The discharge rate of complementary agents **should** be selected for optimum effectiveness of the agent.

24. The required quantities of extinguishing agents **should** be in accordance with the aerodrome category, as identified within DFSR Regulation 01 ARFF Service Levels of Protection Table 1[62] and be available for immediate discharge from ARFF appliances.

25. For aerodrome categories Special, 1 and 2: hose line(s) of sufficient length(s) appropriate to dealing with fires involving the sizes and types of aircraft normally using the aerodrome, and which include a hand-controlled foam-making branch, **should** be provided.

26. For aerodrome categories 3-10, the discharge rates for foam **should** be met using vehicle mounted monitor(s).

27. Where different types of extinguishing agents are used on an Aerodrome, care **should** be taken to ensure that incompatible types are kept apart and stored in accordance with the manufacturer's guidance.

28. The quantity of foam concentrates separately provided on vehicles for foam production **should** be in proportion to the quantity of water provided; being sufficient to produce at least two full discharges of foam solution. The discharge rate of foam solution **should** not be less than the rates shown in DFSR Regulation 01 ARFF Service Levels of Protection Table 1.

29. It is essential that the foam produced by ARFF vehicles is of an acceptable quality and that delivery parameters are maintained to the appropriate operational requirements. To ensure that foam production is of an appropriate standard, foam production tests **should** be carried out, in accordance with manufacturer's instructions, and a record of the results of these tests maintained.

30. Vehicle foam tanks **should** be kept full at all times when the vehicle is in operational service.

[61] Refer to DFSR 01: ARFF Service Levels of Protection – Table 1

[62] The amounts of water specified for foam solution production are predicated on an application rate of 5.5 Ltrs/min/m² for foam meeting performance level B and 3.75 Ltrs/min/m² for foam meeting performance level C.

31. A reserve supply of foam concentrate, equivalent to 200% of the quantities required to produce at least two full discharges of foam solution for the aerodrome ICAO category as detailed in Tables 1 and 2 below, **should** be maintained on the aerodrome for vehicle replenishment purposes. Foam concentrate carried on fire vehicles that is above the quantity required to deliver two full discharges of foam solution can contribute to the reserve.

Table 1 below shows – ICAO Foam Requirements when using Performance Level B Foam.

	Foam to meet Water on Wheels Requirement (Ltr)		200% Foam Requirement (Ltr)	
Crash Category	3%	6%	3%	6%
1	14	28	28	56
2	40	80	80	160
3	72	144	144	288
4	144	288	288	576
5	324	648	648	1296
6	474	948	948	1896
7	726	1452	1452	2904
8	1092	2184	2184	4368
9	1458	2916	2916	5832
10	1938	3876	3876	7752
►H0◄	►30◄	►60◄	►60◄	►120◄
H1	►48◄	►96◄	►96◄	►192◄
H2	►72◄	►144◄	►144◄	►288◄
H3	96	192	192	384

Notes:

1. The amounts provided within this table are for when using Performance Level B foam with the reduced levels of water identified within DFSR Regulation 01 ARFF Service Levels of Protection Table 1
2. To calculate foam requirements for vehicle tanks - ICAO Water on Wheels Requirement x foam percentage / 100 x 2 = Vehicle Tank Requirement.
3. To calculate Reserve Foam requirements – Vehicle Tank Requirement x 2 = 200%.

Table 2 below shows – ICAO Foam Requirements when using Performance Level C Foam.

Crash Category	Foam to meet Water on Wheels Requirement (Ltr)		200% Foam Requirement (Ltr)	
	3%	6%	3%	6%
1	10	20	20	40
2	28	56	56	112
3	50	100	100	200
4	102	204	204	408
5	234	468	468	936
6	348	696	696	1392
7	528	1056	1056	2112
8	768	1536	1536	3072
9	1026	2052	2052	4104
10	1368	2736	2736	5472
►H0◄	►10◄	►20◄	►20◄	►40◄
H1	►20◄	►40◄	►40◄	►40◄
H2	►48◄	►96◄	►96◄	►192◄
H3	►66◄	►132◄	►132◄	►264◄

Notes:

1. The amounts provided within this table are for when using Performance Level C foam with the reduced levels of water identified within DFSR Regulation 01 ARFF Service Levels of Protection.
2. To calculate foam requirements for vehicle tanks - ICAO Water on Wheels Requirement x foam percentage / 100 x 2 = Vehicle Tank Requirement.
3. To calculate Reserve Foam requirements – Vehicle Tank Requirement x 2 = 200%.

32. A reserve supply of complementary extinguishing agents, equivalent to 100% of the quantities identified within DFSR Regulation 01 ARFF Service Levels of Protection Table 1, **should** be maintained on the aerodrome.

33. Reserve extinguishing agents **should** be available within agreed and acceptable timescales, as dictated by the establishments Emergency Orders (Aerodrome Crash Plan).

34. Additional water supplies **should** be provided for the expeditious replenishment of ARFF vehicles at the scene of an aircraft incident.

35. Additional water to replenish vehicles may be required in as little as five minutes after an incident. Therefore, the aerodrome ARFF Service **should** conduct an analysis to determine the extent to which it, and its associated storage and delivery facilities, are to be provided.

36. The aerodrome ARFF service **should** consider the following when assessing aerodrome water supplies:

a. size and type of aircraft using the aerodrome;

b. the capacities and discharge rates of ARFF vehicles;

c. the provision of hydrants;

d. the provision of static water supplies;

e. utilisation of existing natural water supplies;

f. vehicle response times;

g. historical data of water used during aircraft incidents;

h. the need and availability of supplementary pumping capacity;

i. the provision of additional vehicle-borne supplies;

j. the level of support provided by Civil Emergency Services;

k. the Pre-Determined Attendance (PDA) response of Civil Emergency Services; and

l. fixed pumps, where these may provide a rapid and less resource-intensive method of replenishment

37. A Water Assessment ►**should** be completed (DFSR Form 03) and◄, included in the Unit Defence Aerodrome Manual (DAM).

38. ►In pursuance of para R.0205.AMC 35, sufficient water supplies **should** be available. Where insufficient water supplies are identified, mitigation **should** be applied.◄

39. Where insufficient water supplies are identified, it **should** be ►documented,◄ in the Establishment Station Risk Register ►and◄ Aerodrome Operators Hazard Log (within the DAM). ►The AO **should** be notified◄ of the implications for the provision of the ARFF crash category.

Guidance Material:

0205

ARFF Fire-fighting Media

40. The objective of fire-fighting media is to extinguish/suppress a fire on which it is applied. Principal agents provide an air-excluding blanket which prevents volatile flammable vapours from mixing with air or oxygen and provides for permanent control, i.e. for a period of several minutes or longer. Complementary agents may provide rapid-fire suppression but generally only offer transitory control during application.

41. The ICAO Critical Area Concept is not intended to ensure extinguishment of the entire fire; it seeks to control the area of fire adjacent to the fuselage. The objective is to safeguard the

integrity of the fuselage and maintain tolerable conditions for its occupants.

42. ►Principal extinguishing agents include:

a. foam meeting the minimum performance level B;

b. foam meeting the minimum performance level C; or

c. a combination of these agents. ◄

43. Both principal and complementary agents are to be provided at a Defence Aerodrome ►giving consideration to compatibility◄.

44. Manufacturer standard test procedures and equipment requirements are to be detailed in; the ARFF Vehicle Army Equipment Support Publication (AESP), Technical Support Documents or ARFF Service Provider equivalent publication.

45. ►The most effective method of continually assuring the induction accuracy is for the vehicle to be fitted with a monitoring device which:

a. monitors the induction percentage.

b. records the dates and percentage inductions of foam concentrate.

c. has an alert if the induction rate goes outside set parameters.◄

46. ►The foam specimen for checking the induction percentage can be collected during normal procedural “spot” tests or training. The most common method of conducting such a test is by using a refractometer, however other methods e.g. closed loop computer controlled systems may be available.◄

47. A quantity of gaseous agent or CO_2 will need to be provided for use on aircraft engine fires.

48. Extinguishing agent quantities designated as reserve (including the stocks on the vehicle), are to be held in an appropriate manner which easily allows vehicles to be replenished promptly.

49. In addition to any statutory or legal requirements, ARFF Services are to ensure that they:

a. comply with manufacturers storage instructions;

b. complete regular inspection and testing;

c. maintain logbooks and records; and

d. comply with manufacturers recommended service and test intervals.

50. Training foams do not comply with any recognised national or international standards; however, they will be quality assured by the manufacturer. They may be formulated to mimic the operational foams for induction, drainage, and expansion

properties; however, their fire-fighting properties may be reduced. Personnel must understand this feature of training foams before they are used. Care is to be taken to prevent confusion between the storage and use of training foams with their operational counterparts.

51. Where the manufacturer can demonstrate that the training foam produces identical test results to those expected to be obtained by the operational fire-fighting foam, it may be used to conduct the foam production performance and 'in-service' tests. Training foam is to be managed in the same manner as operational foam.

52. The objective of providing additional water supplies at adequate pressure and flow is to ensure rapid replenishment of ARFF vehicles. This supports the principle of continuous application of extinguishing media to maintain survivable conditions at the scene of an aircraft incident for far longer than that provided for by the minimum amounts of water detailed in DFSR Regulation 01: ARFF Service Levels of Protection Table 1.

Regulation: 0206

ARFF Operations

0206 Aviation Duty Holders (ADH), ADH-Facing (ADH-F) Organizations, Heads of Establishment (HoE), Aerodrome Operators (AO) and Accountable Managers (Military Flying) (AM (MF)) **shall** ensure that Aerodrome Rescue Fire-fighting ►(ARFF)◄ Services are provided to cover all operations considered necessary at locations for which they are responsible.

Acceptable Means of Compliance: 0206

DFSR 0206: ARFF Operations

1. The ARFF capability **should** be commensurate with the appropriate category of the operating aircraft at that location[63]. The ARFF capability **should** be maintained for a period of not less than 15 minutes prior to, or following, flying operations.

2. The ARFF Service **should** respond as quickly as possible to accidents and/or incidents, to create maximum opportunity for saving life. Achievements of response times are dependent on the size of aerodrome, location of fire station(s), disposition of vehicles, personnel, and weather conditions at any given time.

3. At an aerodrome, the operational objective of the ARFF Service **should,** in optimum surface and visibility[64], achieve response times of two minutes (and not exceeding three minutes) to any point of each operational runway, as well as to any other part of the operating area.

4. At a ►Permanent HLS◄, the operational objective of the ARFF Services **should** be to achieve response times not exceeding two minutes in optimum surface and visibility.

5. It is recognised that a two-minute response time ►to◄ Rotary Wing aircraft, may not always be achievable; particularly in training areas where ►Rotary Wing aircraft◄ movements are outside the aerodrome boundary. In these cases, the ARFF Services **should** respond with due care and attention.

6. To achieve this operational objective, a response Safe System of Work **should** be produced, including Tactics, Techniques and Procedures (TTP) for dealing with all foreseen aircraft incidents, to achieve an effective and safe ARFF Service. This is to be achieved by carrying out a comprehensive Hazard and Risk Assessment in accordance with DFSR Regulation 02: ARFF Response.

7. During routine flying operations the ARFF Service **should** be at ►normal standby[65]◄, allowing personnel to carry out

[63] FLC requirements may require aerodromes to operate at a higher category than the aircraft normally operating from the aerodrome.
[64] ►Optimum visibility and surface conditions are defined as daytime, good visibility, no precipitation, or strong wind with normal response route free of surface contamination e.g. water, ice, snow, and aircraft movement restrictions◄.
[65] ►R.0202.GM.24.d◄

maintenance, training, and extraneous duties in accordance with DFSR Regulation 02: ARFF Response. However, there will be circumstances and operational tasks that require a pre-determined response from the ARFF Service.

8. The minimum operating category for aircraft carrying Dangerous Goods (DG) **should** be maintained. ARFF Services **should** be at ►Emergency◄ State 3 (in accordance with DFSR Regulation 02: ARFF Response) for air transport movements carrying DG 1.1, 1.2, 1.3 and 1.5. During unloading / loading of all UN class 1 (except 1.4) for optimum response a manned ARFF vehicle **should** be located near the operation.

9. Aero-med Flights may carry passengers who are not capable of evacuating an aircraft unaided in an emergency and this may necessitate additional assistance from the ARFF Service. The ARFF services **should** be at ►Emergency◄ State 3 (in accordance with DFSR Regulation 02: ARFF Response), during the aircraft movement, and in some circumstances, this may necessitate an ARFF vehicle following the aircraft to the parking or take-off point.

10. ARFF services **should** be of the category appropriate to the aircraft involved for Royal Flights. The ARFF services **should** be at ►Emergency◄ State 3 (in accordance with DFSR Regulation 02: ARFF Response), for the duration of the aircraft movement. In circumstances where the normal ARFF provisioning is inadequate, the parent Command HQ **should** seek the necessary augmentation. Where this is not possible, the aircraft operating authority **should** carry out a Risk Assessment in accordance with DFSR Regulation 07: ARFF Reductions in ARFF Cover.

11. The HoE/AM(MF) is responsible for specifying the level of ARFF cover after the cessation of flying operations. Advice **should** be obtained from the aerodrome Senior ARFF Officer present, with consideration given to higher risk aircraft operations such as:

a. ground runs (including APUs);

b. fuelling/de-fuelling operations;

c. Fuel flow testing;

d. hot work (heat producing) procedures being carried out on or adjacent to aircraft; and

e. loading and unloading of Dangerous Goods (DG).

12. Subject to a Risk Assessment, the aerodrome crash category provided may be maintained/lowered or removed as necessary. The HoE/AM(MF) **should** complete the Risk

Assessment (DFSR Form 04[66]/05)[67] confirming the decision regarding the level of ARFF cover to be provided, adding caveats as necessary. Once completed, the Risk Assessment **should** be placed in the Unit DAM.

Guidance Material:

0206

ARFF Operations

13. There is no requirement to increase the ARFF crash category for Armed Aircraft where the principle objectives contained within DFSR Regulation 02: ARFF Response are met with the available resources (as listed in DFSR Regulation 01: ARFF Service Levels of Protection Table 2).

14. A reduction in the ARFF services below that stated in DFSR Regulation 01: ARFF Service Levels of Protection Table 1 is not appropriate ircraft operating in an armed role.

15. The hazardous nature of rotors turning/engines running refuelling, requires a Risk Assessment to be undertaken by HoE/ADHs/AM(MF)s, with advice from the Senior ARFF Officer to identify appropriate levels of fire protection commensurate to the risk. Agreed procedures are to be published within Unit Orders.

16. Due to the dynamic nature of Aircraft Display Flying[68] the aerodrome may need to increase the ARFF service provision. Consequently, it is the responsibility of the HoE/AO, in consultation with the aerodrome ARFF service, to facilitate the necessary increase in ARFF provision.

17. Following a Risk Assessment[69], the agreed level of ARFF capability (including personnel levels confirmed by completion of a Task Resource Analysis (TRA) in accordance with DFSR Regulation 04: ARFF Personnel Requirements, and state of readiness for a flying display) will be recorded[70] and agreed by all stakeholders.

18. Remotely Piloted Air System (RPAS) ADHs/AM(MF)s are required to conduct a Risk Assessment to determine a level of ARFF service that is appropriate and proportionate to the risk and to record the findings. Hazard Data Sheets and Post-Crash Management Plans are to be kept up-to-date and Units are to pre-plan with all relevant Civilian Emergency Services in areas where RPAS may be operated[71].

19. Ground Instructional Aircraft (GIA) are used in the training of aircraft handlers and do not take-off or land. Typically these aircraft have reduced fuel loads, are unarmed, and operate at reduced power levels. Due to the reduced hazard profile and

[66] For all Defence Aerodromes.
[67] For Aerodromes operating under Contractor Flying Approved Organization Scheme (CFAOS).
[68] As defined within MAA RA 2335 flying displays, ►display flying, role demonstrations◄ and flypasts.
[69] Using DFSR 0204 for Defence and DFSR 0205 for AM(MF)
[70] DFSR Form 04 or DFSR 05 ►can◄ be used to record the outcome of the Risk Assessment.
[71] Refer to MAA RA1600 Remotely Piloted Air Systems.

kinetic movements of the GIAs, a Risk Assessment is to be undertaken by DH/AM(MF)s utilising the Senior ARFF Officer's SQEP advice to identify appropriate levels of fire protection commensurate to the risk. This Risk Assessment is to be recorded and details of actions to be taken published in Local Orders.

Regulation: 0207

ARFF Reductions in Cover

0207 Aviation Duty Holders (ADH), ADH-Facing (ADH-F) Organizations, Heads of Establishment (HoE), Aerodrome Operators (AO) and Accountable Managers (Military Flying) (AM(MF)) **shall** ensure that processes are in place for informing the Duty Holder(s) when there are reductions to the correct aircraft category at aerodromes for which they are responsible, or when aircraft are due to operate at aerodromes below the specific aircraft category.

Acceptable Means of Compliance: 0207

ARFF Reductions in Cover

1. The AO **should** confirm that the ARFF Service Provider has sufficient policy/procedures in place to notify the ADH/AM(MF) chain of any reductions in ARFF Services ensuring, through Risk Assessment, that flying operations either continue, are restricted, or cease.

2. The ARFF Service Provider **should** have policy/procedures in place to notify the ADH/►AM(MF) and AO◄ of the risks associated with operating aircraft at aerodromes ►and Permanent HLS◄ that are below the aircraft category for a specified aircraft.

3. ►The ARFF Service provider **should** notify the ADH/AM(MF) and AO of changes to staffing levels, that impact Safe Systems of Work (SSoW), as detailed in the Task Resource Analysis (TRA), for each affected ICAO category.◄

Guidance Material: 0207

ARFF Reductions in Cover

4. The ARFF services provided are to be appropriate to the aerodrome category, as detailed in DFSR Regulation 01: ARFF Service Levels of Protection. Exceptions include:

a. ‘Remission’ or

b. ‘Reduced Hazard Profile Categories’.

5. There is no requirement to increase the ARFF Crash Category for Armed Aircraft where the principle objectives contained within DFSR Regulation 02: ARFF Response are met with the available resources listed in DFSR Regulation 01: ARFF Service Levels of Protection Table 2.

6. In the event of an unexpected reduction in ARFF capability, e.g. unserviceability of a vehicle ►or◄ specialist equipment ►as identified in the equipment needs analysis◄,

the senior ARFF Officer on duty will initiate the Risk Assessment (DFSR Form 06[72]/07.[73]):

a. Complete the relevant section of the ARFF Risk Assessment Form;

b. Detail the nature of the reduction in ARFF capability;

c. State what ARFF capability remains; and

d. Provide an estimate of how long the reduced capability is expected to persist.

7. ►In the event of an unexpected reduction in ARFF capability, e.g. unplanned shortage of fire personnel, the senior ARFF Officer on duty will initiate the Risk Assessment (DFSR Form 04[74]/05.[75]):

a. Complete the relevant section of the ARFF Risk Assessment Form;

b. Detail the nature and implications of the reduction in ARFF personnel;

c. State any compensatory measures taken; and

d. Provide an estimate of how long the reduced capability is expected to persist.◄

8. Once completed by the Senior ARFF Officer present, the DFSR ►assessment◄ Form is to be sent to the ►AO to allow the ADH[76] to◄ determine what, if any, action will be taken concerning continuance of flying operations. The decision to stop, restrict or continue flying operations will depend on the nature of the reduction of ARFF capability. The HoE or AO is required to complete DFSR ►assessment◄ Form confirming the decision regarding the status of flying operations, adding caveats as necessary. Completed appendices constitute the formal audit trail of the Risk Assessment and are to be included within the Unit DAM.

9. When the ►Aircraft Operating Authority◄ (AOA)/ADH/AM(MF) are content to use an aerodrome at a lower than required ARFF category, the agreement of the receiving aerodromes HoE/AO is to be obtained before use. The HoE/AO of the receiving aerodrome will endeavour to meet the required ARFF category, but where this is not possible, ►they◄ may approve the use. Any decision not to support the below ARFF category movement is to be communicated to the relevant AOA/ADH/AM(MF). The Risk Assessment process detailed in Annex A is to be used to assist the ADH/HoE/AM(MF) decision.

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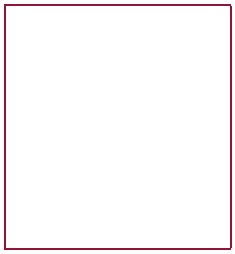
[72] For all Defence Aerodromes.

[73] For Aerodromes operating under Contractor Flying Approved Organization Scheme (CFAOS).

[74] For all Defence Aerodromes.

[75] For Aerodromes operating under Contractor Flying Approved Organization Scheme (CFAOS).

[76] AM(MF) operating iaw MAA RA 3049 Defence Contractor Flying Organization responsibilities for UK Military Air System Operating Locations will complete DFSR Form 07



It is permissible for the AOA to issue standing dispensation for regular activity.

10. When dealing with an in-flight aircraft emergency, the aircraft commander may elect to land at an aerodrome which will not meet the criteria set out in this document.

ARFF Risk Assessment guidance sheet

A.1. Introduction

A.1.1 Where circumstances dictate that flying is conducted to/from aerodromes with reduced levels of ARFF services, the ADHs/AM(MF)[77], in consultation with the Aerodrome Operator (AO), may approve such activity following a Risk Assessment informed by advice from the Defence ARFF Service Provider.

A.1.2 The Risk Assessment is conducted using DFSR Form 06[78]/07[79] which is to be archived within the Unit Defence Aerodrome Manual (DAM) once completed, providing an auditable record of the HoE/ADH's/AM(MF) decision. Aircraft Operating Authorities (AOA) are responsible for detailing (in Orders), who can make risk-based decisions and to the level of reduced ARFF category which will require elevation to the appropriate risk owner.

A.1.2.1 ►The Risk Assessment is conducted using DFSR Form 04[80]/05[81] which is to be archived within the Unit Defence Aerodrome Manual (DAM) once completed, providing an auditable record of the HoE/ADH's/AM(MF) decision. Aircraft Operating Authorities (AOA) are responsible for detailing (in Orders), who can make risk-based decisions and to the level of reduced ARFF category which will require elevation to the appropriate risk owner.◄

A.1.3 The Risk Assessment must consider the associated risks and potential outcomes prior to exposing not only aircraft, aircrew, passengers, and equipment, but also MOD resources and emergency services personnel to any increased exposure to potential hazards.

A.1.4 This guidance sheet is intended to assist in the formulation of a Risk Assessment, considering all factors prior to accepting a reduction in ARFF cover. The Risk Assessment, including any action taken to reduce identified hazards, is to be recorded.

A.2. Considerations

A.2.1 When compiling a Risk Assessment, the following factors are to be considered as a minimum:

Aircraft Type

a. does the a/c have ejection seats or other assisted escape systems?

b. does the a/c construction include large quantities of Composite Materials?

c. is the a/c carrying weapons/armaments and/or significant pyrotechnic stores?

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[77] It is acknowledged that in some cases the roles of ADH/AM(MF)/HoE and AO will be the same individual(s); equally that in some cases the HoE will NOT be an ADH or the AO. The requirement is that in order to operate from an aerodrome at a lesser ARFF state than normally required by the Air System, the platform RISK OWNER (or empowered representative) is the only person who can accept the lower ARFF state and continue with ops. AO are to be consulted but can only advise/inform the risk owner, notwithstanding that they can ultimately decline to accept the air system.

[78] For all Defence Aerodromes.

[79] For Aerodromes operating under Contractor Flying Approved Organization Scheme (CFAOS).

[80] For all Defence Aerodromes.

[81] For Aerodromes operating under Contractor Flying Approved Organization Scheme (CFAOS).

d. is the a/c carrying its full complement of crew/passengers?

e. would rescue of crew/passenger's entail firefighters entering a fuselage?

f. would rescue of crew/passenger's entail firefighters having to utilise additional rescue equipment e.g. ladders, hydraulic rescue equipment, etc? and

g. what is the a/c fuel load (Hydrazine/AVTUR/AVGAS)?

Aircraft Operations

a. the number of aircraft moves (low intensity, high intensity)

b. are paired/multiple take offs and landings being conducted?

c. are paired/multiple take offs and landings of training a/c with pilots under instruction being conducted?

d. are 'first solo flights' being conducted?

e. are aerobatic manoeuvres being performed?

f. is the a/c carrying Dangerous Air Cargo/Dangerous Goods?

g. is the a/c operating in an Aero-med role?

h. are rotors turning or engine running refuels being conducted? and

i. is the a/c operating in accordance with its release to service?

Location

a. are adequate water supplies for emergency purposes readily available?

b. does the terrain provide problems for access/egress of emergency service vehicles, e.g. marshy land, or watercourses?

c. are there other ground hazards in close proximity to the a/c operating area, e.g. fuel installations, armament/weapons stores, etc?

d. are emergency medical/ambulance services available to support rescue operations?

e. are the Civil Emergency Service (CES) capable of providing adequate support (e.g. back-up water supply) within an acceptable timeframe?

f. does the location afford good radio communications (e.g. no radio black spots)? and

g. are remaining firefighters able to be transported to the scene of operations by alternative means - to assist with initial fire-fighting operations?

►Personnel

a. What are the effects on Human performance in the following areas?

1) Environmental constraints

2) Workloads

3) Individual functions

4) Skills levels

5) Knowledge and experience

6) Organisational structure

7) Health and Safety aspects

8) Safe Systems of Work

b. Are there any pinch points created against the Worst Case Scenario (WCS) by the reduction personnel numbers?

c. What changes have occurred to the Tactic, Techniques and Procedures employed to deal with the WCS?

d. Can the principle objective of the ARFF Service be achieved? ◄

Regulation: 0208

ARFF Training Requirements

0208 Aviation Duty Holders (ADH), ADH-Facing (ADH-F) Organizations, Heads of Establishment (HoE), ►Aerodrome Operators (AO)◄ and Accountable Managers (Military Flying) (AM(MF)) **shall** ensure that Aerodrome Rescue Fire-fighting ►(ARFF)◄ Services are properly trained and qualified to operate at aerodromes for which they are responsible.

Acceptable Means of Compliance: 0208

ARFF Training Requirements

1. Personnel providing ARFF Services for aircraft operations are seldom called upon to deal with major aircraft fires/incidents. The maintenance of skills and core competencies required, are to be maintained by carefully following a planned and meticulous training programme. This assures that both personnel and equipment will be capable in dealing with an aircraft fire/incident and great emphasis **should** be placed upon the training of ARFF personnel.

2. The ADH, ADH-F Organizations, HoE, ►AO◄ and AM(MF) **should** ensure that:

a. all ARFF personnel required to act in aviation emergencies demonstrate their medical fitness to execute their function satisfactorily, taking in to account the type of activity;

b. all ARFF personnel are provided with training, including standardized aircraft rescue and fire-fighting information[82] allowing personnel to safely isolate aircraft systems and carry out rescue procedures from all station based and regular visiting aircraft;

c. all ARFF personnel have access to standardized ARFF specific technical information for all NATO aircraft;

d. all ARFF personnel are trained to carry out the role in which they are expected to perform operational ARFF duties;

e. all ARFF personnel maintain the required competencies through a Maintenance of Competence Scheme (MOCS) endorsed by the relevant Training Requirements Authority;

f. suitable facilities or means for conducting the required training are provided. This is to include the use of aircraft 'live' fire simulators corresponding to the dominant risk profile of the aerodrome ►and Permanent HLS◄; and

g. all ARFF personnel participate in 'live' fire drills commensurate with the types of aircraft and the type of rescue and fire-fighting equipment in use at the aerodrome ►and Permanent HLS◄.

[82] Training material is to be in accordance with NATO STANAG 3896 - Aerospace Emergency Rescue and Mishap Response Information (Emergency Services).

3. ‘Live’ fire training facilities **should** make provision for ARFF personnel to practice the tactics, techniques and procedures for the control and extinction of aviation fuel fires, including pressure fed fires. ‘Live’ fire frequencies are set in accordance with: NATO STANAG 7145 ATM – Minimum Core Competency Levels and Proficiency of Skills for Firefighters as follows:

a. Daytime - no less than once every 6 months; and

b. Darkness - no less than once per year[83].

4. ARFF training programmes **should** include Air Safety training[84] and training in Human ►Factors and Error Management◄, including team co-ordination.

5. The ADH, ADH-F Organizations, HoE, ►AO◄ and AM(MF) **should**:

a. ensure there are sufficient numbers of Suitably Qualified Experienced Personnel (SQEP) trainers and assessors, as per JSP 822 Defence Direction and Guidance for Training and Education, for the effective implementation of the MOCS at the aerodrome;

b. implement proficiency checks at adequate intervals to ensure continued competence of all ARFF personnel;

c. ensure assessment of the competency of the individual(s) determining, evaluating and conducting training is in accordance with JSP 822 Defence Direction and Guidance for Training and Education; and

d. ensure that all ARFF personnel maintain appropriate qualification, training, and proficiency check records to demonstrate compliance to this Regulation.

6. All ARFF training **should** meet the requirements of the individual Role Performance Statements (Role PS) endorsed by the relevant ►Training Requirements Authority [85].◄

7. ARFF training **should** include initial and recurring[86] familiarization of all station-based and regular visiting aircraft. Training **should** be in accordance with all aircraft engineering authorizations.

8. At category 1 and 2 aerodromes, ARFF training requirements **should** comply with at least those identified in CAP 168 Licensing of Aerodromes Chapter 8 – Appendix B.

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[83] Only required for ARFF Service personnel that are required to operate on an aerodrome that operates during the hours of darkness.
[84] Refer to MAA RA 1440 – Air Safety Training.
[85] The Task Resource Analysis process may identify training needs within individual aerodrome to deal with aircraft Worst Case Scenario's.
[86] Frequency is to be determined by a Task Needs Analysis ►initiated by the Training Requirements Authority.◄

9. At Category 'Special' ►Tier 1[87] Defence◄ aerodromes, operating ►IAW DSA 02 DFSR Defence Aerodrome Rescue Fire-fighting Regulations (R.0201.AMC.2).◄ Training requirements **should** comply with, at least those identified within: CAP 168 Licensing of Aerodromes Chapter 8 – Appendix C[88].

10. Proficiency checks **should** be carried out as agreed by the ►Training Requirements Authority◄ in accordance with JSP 822 Defence Direction and Guidance for Training and Education.

11. Qualification, training, and proficiency check records, endorsed by the ►Training Requirements Authority◄, **should** be maintained, and held for each individual in the ARFF Service ►to◄ the end of an individual's employment.

Guidance Material:

0208

ARFF Training Requirements

12. Physical fitness standards for ARFF personnel are a single Service (sS) ►policy decision◄. Guidance can be found in NATO STANAG 7162 ►Ed 1◄ CFR – Standardization of Physical Fitness Maintenance Program for fire-fighters.

13. Training of ARFF personnel employed within Defence is to utilise the Defence Systems Approach to Training (DSAT), in accordance with the authoritative policy as directed by Joint Service Publication (JSP) 822 Defence Direction and Guidance for Training and Education. This policy directs and guides Defence personnel to ensure that training and education are appropriate, efficient, effective, risk focussed and most importantly, safe.

14. AOC 22 Gp is the Training Requirements Authority for all Service training, this is delegated to the Battlespace Management Force Commander (BMFC) as the delegated 1 Star (1*) Joint ►Training Requirements Authority◄ for Shore-Side Professional Fire-fighting within Defence. 22 ►◄Gp Director Ground Training (DGT) has been identified as the 1* ►Training Requirements Authority◄ for ►Immediate Emergency Responder (IER)◄ personnel ►at Tier 1[89] Defence◄ Aerodromes ►operating at ARFF Category 'Special' IAW DSA 02 DFSR Defence Aerodrome Rescue Fire-fighting Regulations (R.0201.AMC.2).◄

15. In accordance with JSP 822: Defence Direction and Guidance for Training and Education - following a thorough Task Needs Analysis (TNA), Role Performance Statements (Role PS) are to be developed for each role required by ARFF Service providers. These Role PS provide the requirements that are

[87] ►IAW MAA RA 1010 - Head of Establishment - Aviation Responsibilities◄
[88] Greater detail of an IER Training Manual is contained within the CAA Initial Emergency Response Training Framework Document.
[89] ►IAW MAA RA 1010 - Head of Establishment - Aviation Responsibilities◄

needed for each role within the ARFF Service, as such all training is to be designed to meet the requirements of the Role PS.

16. At Category 1-10/►H0◄H3 aerodromes/►Permanent HLS◄ all ARFF personnel are to be at Training Performance Standard (TPS) following attendance at an ARFF Training Centre, prior to carrying out operational fire fighter duties.

17. At category 'Special' aerodromes IER personnel are to be provided with sufficient training, prior to carrying out their role.

18. A generic MOCS is to be utilised for all ARFF Service personnel. However, this can be individually tailored to ensure that it meets all requirements of each aerodrome. The aerodrome senior ARFF Officer is to ensure that all site-specific training requirements are covered by the generic MOCS. Any shortfalls identified are to be met by the introduction of local training packages endorsed by the TRA.

19. Training facilities are provided at each aerodrome allowing ARFF personnel to train (maintaining core competences and key skills), to ensure that all personnel remain SQEP.

20. Where training facilities are unavailable at the aerodrome, training can be achieved externally. Where a Unit elects to use an external training provider, it is important to ensure that ARFF personnel train with the types of vehicles and equipment that are used at the aerodrome at which they are employed.

21. The tactics, techniques and procedures used during training scenarios are to be compliant with the service providers operational policy and procedures.

22. Ideally, 'live fire' training will involve Class B liquid fires. However, considering the various environmental requirements and sources of guidance, the use of Liquefied Petroleum Gas (LPG) may be considered as a suitable alternative.

23. If LPG is used during live fire drills it is important that ARFF personnel are provided with suitable training to enable them to recognise the differing characteristics of LPG as opposed to Class B fires when used to simulate realistic fire training[90].

24. The training facilities are to enable ARFF personnel to periodically practice the application of multiple extinguishing agent application at the aerodrome.

25. The aircraft simulator is to make provision for ARFF personnel to practice:

a. Incident Command;

b. aircraft external fires;

[90] 1* TRA for Shore-side Professional fire-fighting within Defence has confirmed that "A small residual Trg gap exists for aerodromes with LPG only Trg facilities and this should be reflected in the Formal Trg Statement (FTS) as a Residual Trg Gap (RTG)"

c. aircraft internal fires;

d. gaining entry;

e. Search and Rescue; and

f. specialist equipment drills (e.g. High Reach Extendable Turret (HRET), aerial appliances, rescue/emergency stairs).

26. To meet this Regulation ARFF Service providers operating under: MAA RA 3049 – Defence Contractor Flying Organisation responsibilities for UK Military Air System Operating Locations, ►or similar organisations◄ may choose to utilise CAA CAP 699 - Framework for the competence of Rescue and Fire-Fighting Service (RFFS) personnel.