DEF STAN 00-970 NOTICE OF PROPOSED AMENDMENT (Def Stan 00-970-NPA)

TITLE OF PROPOSAL: Emergency Lighting Requirements

Stage of Amendment:	Issue 2

Def Stan 00-970 NPA Serial No:	2012-003		
Unsatisfactory Report Serial No:	*N/A*		
MAA Originator:	C2	R A Bennett-Jones	MAA-Cert-ADS1a

Affected Part: (including paragraphs)	Part 13 Section 1.6 Clause 1.6.11.5 and Part 7 Leaflet 102 Para 4.
Cross-reference to other relevant amendment proposals or documents:	QinetiQ/AEG/AS/PRO110358 issue 1, Minor Task 34

ADS Point of Contact details		
Rank/Grade and Name:	As above	
Telephone Number mil/civ;	9679 35109	030 679 35109
Civilian Email address:	MAA-Cert-ADSGroup@mod.uk.	

Part 1 (for issue to User Community)
INTRODUCTION *(Not more than 250 words)*
Enter here a brief explanation of why NPA is being issued, i.e. what does the amendment hope to achieve, by when and how:
The requirements for emergency lighting within Def Stan 00-970 have been called into question by a rotorcraft PT. A comparison between the requirements for Rotorcraft and Fixed Wing was not possible due to different methods of measurement used to measure illuminance. This NPA is as a result of a report from QinetiQ
The new text will be clearly identifiable within Annex A.

SUMMARY OF PROPOSED AMENDMENT

Change: *See Annex A*

Impact Assessment:

Objective: Clarification of the requirements

Risk Assessment: The impact of not incorporating the recommended changes is the possibility of misinterpretation of the requirement

Courses of Action.

1. ***Do nothing.*** The option to do nothing is not desirable for the following reason. Not incorporating the changes will result in continuing confusion in compliance with the emergency lighting requirements.

2. ***Partial Amendment.*** Due to the minor nature of the change partial amendment is not considered.

3. ***Full Amendment.*** There is no reason that full implementation of all the changes should not be completely feasible. The changes will remove the confusion and the additional work required to comply with the 00-970 Clauses. Retrospective mandating is not considered necessary.

Preferred Course of Action. Full Amendment.

Costs and Benefits:

1. ***Do nothing.*** There is no benefit of the do nothing option, which could result in increased cost to the department in confirming compliance with a confusing requirement within Def Stan 00-970.

2. ***Partial Amendment.*** *No Benefit*

3. ***Full Amendment.*** Full amendment will clarify Def Stan 00-970 Part 7 and 13 requirements for emergency lighting and will reduce confusion, resulting in improved overall compliance with the requirement. The changes proposed here represent current practice and would have no or little economic impact.

Consultation period ends: 20/Jun/2014

The consultation period for this proposed amendment ends on the stated date. Please send your feedback via email to MAA-Cert-ADSGroup@mod.uk.

Part 2 (for MAA internal use)

Log of Comments: (to be completed once the consultation period has ended).

Comment reference	Date	From (name)	Post	Précis or Topic of Comment	MAA Response

Recap of Proposal: *A short summary of the proposal amendment including what changes were incorporated following the consultation period.*

Recommendation: *This section will be completed once all the comments have been received. The recommendation is for the relevant Head of Division to approve the proposal.*

Approval: *This section will detail exactly what has been approved and by whom, and confirm the date for the amendment to be incorporated as well as the date the NPA should be reviewed to determine what the effects of the amendment were in terms of meeting the objective of the change, if there were any unintended consequences and establishing whether the estimated costs were correct.*

Accepted changes will be authorised at the following levels:

- Changes requiring retrospective mandating: 2 *
- Changes not requiring retrospective mandating but having a significant engineering impact: 1* Head of Cert.
- Changes not requiring retrospective mandating but having a Minor engineering impact: OF 4 Deputy Head of Cert.
- Changes deemed as administrational only: Head of S and ADS.

Approved by:

Signature:	
Name:	
Rank/Grade:	
Post:	
Date signed:	
Date for amendment to be incorporated:	

Part 3 - NOTIFICATION OF AUTHORIZED AMENDMENT (Def Stan 00-970 NAA)

Document Part:	***13*** ***7***	Sub-Part:	***1.6.11.5*** ***Leaflet 102 Para 4***

Unsatisfactory Report Reference:		NPA Reference:	***2012-003***

Originator:		Date:	

Amendment to be Incorporated on	

APPROVAL

This Def Stan 00-970 NPA has been approved by ….. on behalf of DG MAA

INCORPORATION

The amendment will be incorporated in issue XX…

Signed (IAW with part 2).

for DG MAA

Annex A

Current Text Part 13

REQUIREMENT	COMPLIANCE	GUIDANCE
EMERGENCY ESCAPE/EVACUATION ILLUMINATION		
1.6.11.5. The following requirements shall apply in the design and location of power supplies, controls, lighting fixtures and associated equipment used to provide emergency escape illumination in aeroplanes: (a) Emergency escape illumination shall be designed so that no beam of light is directed into occupants' eyes in such a way as to compromise their ability to escape. (b) Emergency escape illumination shall be provided independent of normal electrical system power sources. (c) The emergency escape illumination shall be designed, installed and located in such a manner that will minimise damage to or loss of any portion of the emergency escape illumination as a result of ditching or an emergency landing. (d) Break-up of the fuselage shall not render any portion of the emergency escape illumination inoperative, except those lights directly destroyed by the break.		See ASCC Air Standard 61/113/09A (Was 10/66)

REQUIREMENT	COMPLIANCE	GUIDANCE
(e) Emergency escape illumination shall be continually lighted or automatically energised when an emergency occurs. (f) If an automatically energised system of emergency escape illumination is used, provision shall be made for alternate manual operation from a single location easily accessible to a flight crew member (see also 7.3.5). (g) The emergency escape lighting system shall provide not less than 0.22 LUX ambient illumination at all exits and in the centre of aisle ways leading to exits measured at seat arm rest height and in all aircrew stations and passenger compartments. (h) All exit signs, arrows and placards shall be electrically lighted or self- luminous and shall be no less than 0.10 cd/m2.		
1.6.11.6. Emergency escape illumination shall be provided independent of normal power sources.		(see Part 1 Section 4 Clause 4.23)

Proposed Text Part 13

REQUIREMENT	COMPLIANCE	GUIDANCE
EMERGENCY ESCAPE/EVACUATION ILLUMINATION		
1.6.11.5. The following requirements shall apply in the design and location of power supplies, controls, lighting fixtures and associated equipment used to provide emergency escape illumination in aeroplanes: (a) An emergency lighting system, independent of the main lighting system, must be installed. However, the sources of general cabin illumination may be common to both the emergency and the main lighting systems if the power supply to the emergency lighting system is independent of the power supply to the main lighting system. The emergency lighting system must include: (1) Illuminated emergency exit marking and locating signs, sources of general cabin illumination, interior lighting in emergency exit areas, and floor proximity escape path marking. (2) Exterior emergency lighting. (b) Emergency exit signs - For aeroplanes that have a passenger seating configuration, excluding pilot seats, of 9 seats or less, each emergency exit and external door in the passenger compartment must be internally marked with the word “exit” by a	See Def Stan 00-970 Pt 1 Section 7 clause 7.4 See Def Stan 00-970 Pt 13 Section 1.6	See ASCC Air Standard 61/113/09A (Was 10/66)

REQUIREMENT	COMPLIANCE	GUIDANCE
sign which has white letters 25 mm (1 in) high on a red background 51 mm (2 in) high, be self-illuminated or independently, internally-electrically illuminated, and have a minimum brightness of at least 0.51 cd/m2 (160 microlamberts). The colour may be reversed if the passenger compartment illumination is essentially the same. (c) General illumination in the passenger cabin must provide an average illumination of not less than 0.5 lux (0.05 foot-candle) and an illumination at any point of not less than 0.1 lux (0.01 foot-candle) when measured along the centre line of the main passenger aisle(s) and at the seat armrest height (d) Floor proximity emergency escape path marking must provide emergency evacuation guidance for the aeroplane occupants when all sources of illuminations more than 1.2 m (4 feet) above the cabin aisle floor are totally obscured. (e) When certification to the emergency exit provisions is requested, the following shall apply: (1) An emergency lighting system, independent of the main cabin lighting system, must be installed. However, the source of general cabin illumination may be common to both emergency and main lighting system if the power supply to the emergency lighting system is independent of		

REQUIREMENT	COMPLIANCE	GUIDANCE
the power supply to the main lighting system. (2) The lights must be operable manually from the flight crew station and from a point in the passenger compartment that is readily accessible to a normal cabin crew member seat. (3) There must be a flight crew warning light, which illuminates when power is on in the aeroplane and the emergency lighting control device is not armed. (4) The cockpit control device must have an 'on', 'off' and 'armed' position so that when armed in the cockpit or turned on at either the cockpit or cabin crew member station the lights will either light or remain lighted upon interruption (except an interruption caused by a transverse vertical separation of the fuselage during crash landing) of the aeroplane's normal electric power. There must be a means to safeguard against inadvertent operation of the control device from the 'armed' or 'on' positions. (5) There must be a crew warning light that illuminates in the cockpit when power is on in the aeroplane and the emergency lighting control device is not armed.		

REQUIREMENT	COMPLIANCE	GUIDANCE
(6) The emergency lights must be operable manually from the flightcrew station and be provided with automatic activation. The cockpit control device must have "on," "off," and "armed" positions so that, when armed in the cockpit, the lights will operate by automatic activation. (7) There must be a means to safeguard against inadvertent operation of the cockpit control device from the "armed" or "on" position. (f) The energy supply to each emergency lighting unit must provide the required level of illumination for at least 10 minutes at the critical ambient conditions after activation of the emergency landing system. (g) If rechargeable batteries are used as the energy supply for the emergency lighting system, they may be recharged from the main electrical power system of the aeroplane provided the charging circuit is designed to preclude inadvertent battery discharge into the charging circuit faults. If the emergency lighting system does not include a charging circuit, battery condition monitors are required. (h) Components of the emergency lighting system, including batteries, wiring relays, lamps, and switches must be capable of normal operation		

REQUIREMENT	COMPLIANCE	GUIDANCE
after having been subjected to the inertia forces resulting from the ultimate load factors prescribed in Part 1 Section 3 Clause 3.1 (i) The emergency lighting system must be designed so that after any single transverse vertical separation of the fuselage during crash landing – (1) At least 75 percent of all electrically illuminated emergency lights required by this paragraph remain operative; and (2) Each required electrically illuminated exit sign remains operative exclusive of those that are directly damaged by the separation~~.~~ (j) Emergency escape illumination shall be designed so that no beam of light is directed into occupants' eyes in such a way as to compromise their ability to escape. ~~(a) Emergency escape illumination shall be designed so that no beam of light is directed into occupants' eyes in such a way as to compromise their ability to escape.~~ ~~(b) Emergency escape illumination shall be provided independent of normal electrical system power sources.~~		

REQUIREMENT	COMPLIANCE	GUIDANCE
~~(c) The emergency escape illumination shall be designed, installed and located in such a manner that will minimise damage to or loss of any portion of the emergency escape illumination as a result of ditching or an emergency landing.~~ ~~(d) Break-up of the fuselage shall not render any portion of the emergency escape illumination inoperative, except those lights directly destroyed by the break.~~ ~~(e) Emergency escape illumination shall be continually lighted or automatically energised when an emergency occurs.~~ ~~(f) If an automatically energised system of emergency escape illumination is used, provision shall be made for alternate manual operation from a single location easily accessible to a flight crew member (see also 7.3.5).~~ ~~(g) The emergency escape lighting system shall provide not less than 0.22 LUX ambient illumination at all exits and in the centre of aisle ways leading to exits measured at seat arm rest height and in all aircrew stations and passenger compartments.~~ ~~(h) All exit signs, arrows and placards shall be electrically lighted or self- luminous and shall be no less than 0.10 cd/m2.~~		

REQUIREMENT	COMPLIANCE	GUIDANCE
1.6.11.6. Emergency escape illumination shall be provided independent of normal power sources.		(see Part 1 Section 4 Clause 4.23)

Current Text Part 7

4 EMERGENCY ESCAPE/EVACUATION ILLUMINATION[2]

4.1 The following requirements shall apply in the design and location of power supplies, controls, lighting fixtures and associated equipment used to provide emergency escape illumination in Rotorcraft.

(i) emergency escape illumination shall be designed so that no beam of light is directed into the occupant's eyes in such a way as to compromise their ability to escape.

(ii) emergency escape illumination shall be provided independent of normal electrical system power sources.

(iii) the emergency escape illumination shall be so designed, installed and located in such a manner that will minimise damage to or loss of any portion of the emergency escape illumination as a result of ditching or an emergency landing.

(iv) break-up of the fuselage shall not render any portion of the emergency escape illumination inoperative, except those lights directly destroyed by the break.

(v) emergency escape illumination shall be continuously lighted or automatically energised when an emergency occurs.

(vi) if any automatically energised system of emergency escape illumination is used, provision shall be made for alternate manual operation from a single location easily accessible to a flight crew member (see also Leaflet 103).

(vii) the emergency escape lighting system shall provide not less than 500 cd/m^2 ambient illumination at all exits and in the centre of aisle ways leading to exits measured at seat arm rest height and in all aircrew stations and paasenger compartments.

(viii) all exit signs, arrows and placards shall be electrically lighted or self-luminous and shall be no less than 500 cd/m^2.

2 – ASCC Air Standard 10/66

Proposed Text Part 7

4 EMERGENCY ESCAPE/EVACUATION ILLUMINATION[2]

4.1 The following requirements shall apply in the design and location of power supplies, controls, lighting fixtures and associated equipment used to provide emergency escape illumination in Rotorcraft.

(i) emergency escape illumination shall be designed so that no beam of light is directed into the occupant's eyes in such a way as to compromise their ability to escape.

~~(ii) emergency escape illumination shall be provided independent of normal electrical system power sources.~~

(ii) A source of light with its power supply independent of the main lighting system must be installed to:

(1) Illuminate each passenger emergency exit marking and locating sign; and

(2) Provide enough general lighting in the passenger cabin so that the average illumination, when measured at 1.02 m (40-inch) intervals at seat armrest height on the centre line of the main passenger aisle, is at least 0.5 lux (0.05 footcandle).

(iii) the emergency escape illumination shall be so designed, installed and located in such a manner that will minimise damage to or loss of any portion of the emergency escape illumination as a result of ditching or an emergency landing.

(iv) break-up of the fuselage shall not render any portion of the emergency escape illumination inoperative, except those lights directly destroyed by the break.

~~(v) emergency escape illumination shall be continuously lighted or automatically energised when an emergency occurs.~~

(v) exterior emergency lighting must be provided at each emergency exit. The illumination may not be less than 0.5 lux (0.05 foot-candle) (measured normal to the direction of incident light) for minimum width on the ground surface, with landing gear extended, equal to the width of the emergency exit where an evacuee is likely to make first contact with the ground outside the cabin. The exterior

emergency lighting may be provided by either interior or exterior sources with light intensity measurements made with the emergency exits open.

~~(vi) if any automatically energised system of emergency escape illumination is used, provision shall be made for alternate manual operation from a single location easily accessible to a flight crew member (see also Leaflet 103).~~

(vi) each light required by sub-paragraph (ii) or (v) must be operable manually from the cockpit station and from a point in the passenger compartment that is readily accessible.
The cockpit control device must have an 'on', 'off', and 'armed' position so that when turned on at the cockpit or passenger compartment station or when armed at the cockpit station, the emergency lights will either illuminate or remain illuminated upon interruption of the rotorcraft's normal electric power (see also Leaflet 103).

~~(vii) the emergency escape lighting system shall provide not less than 500 cd/m^2 ambient illumination at all exits and in the centre of aisle ways leading to exits measured at seat arm rest height and in all aircrew stations and paasenger compartments.~~

(vii) Any means required to assist the occupants in descending to the ground must be illuminated so that the erected assist means is visible from the rotorcraft.

(1) The assist means must be provided with an illumination of not less than 0.3 lux (0.03 foot-candle) (measured normal to the direction of the incident light) at the ground end of the erected assist means where an evacuee using the established escape route would normally make first contact with the ground, with the rotorcraft in each of the attitudes corresponding to the collapse of one or more legs of the landing gear.

(2) If the emergency lighting subsystem illuminating the assist means is independent of the rotorcraft's main emergency lighting system, it:

(a) Must automatically be activated when the assist means is erected;

(b) Must provide the illumination required by sub-paragraph (vii)(1); and

(c) May not be adversely affected by stowage.

~~(viii) all exit signs, arrows and placards shall be electrically lighted or self-luminous and shall be no less than 500 cd/m^2 .~~

(viii) the energy supply to each emergency lighting unit must provide the required level of illumination for at least 10 minutes at the critical ambient conditions after an emergency landing.

(ix) If storage batteries are used as the energy supply for the emergency lighting system, they may be recharged from the rotorcraft's main electrical power system provided the charging circuit is designed to preclude inadvertent battery discharge into charging circuit faults.

(x) each passenger emergency exit marking and each locating sign must have white letters 25 mm (1 inch) high on a red background 51 mm (2 inches) high, be self or electrically illuminated, and have a minimum luminescence (brightness) of at least 0.51 candela/m2 (160 microlamberts). The colours may be reversed if this will increase the emergency illumination of the passenger compartment.

2 – ASCC Air Standard 10/66