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

TITLE OF PROPOSAL:
Corrections of Part 1 Section 4 Leaflet 96 leading to amendment of Leaflet 17

Stage of Amendment:	Draft

Def Stan 00-970 NPA Serial No:	*2013-001*	
Unsatisfactory Report Serial No:		
MAA Originator:	C2/Grade P Marshall	MAA-Cert-Structures4a

Affected Part: (including paragraphs)	Part 1 Section 4 Leaflet 96 Para 3.2
Cross-reference to other relevant amendment proposals or documents:	Part 1 Section 4 Leaflet 17 insert new paragraph 4.2
Proposed Issue Date	Jun 2013 (Issue 11)

Weblink of where this document can be accessed

ADS Point of Contact details		
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Part 1 (for issue to Regulated Community)
INTRODUCTION *(Not more than 250 words)*
The new text will be clearly identifiable within Annex A.
1. Leaflet 96 paragraph 3.2 has an incomplete sentence.
2. Leaflet 17 insert new paragraph 4.2.

SUMMARY OF PROPOSED AMENDMENT

Change: *See Annex A*

Impact Assessment:

Objective: Insert new wording

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 administrative changes will result in continuing misunderstanding of the requirement, leading to possible ambiguity of the requirement and lack of full compliance.

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 ambiguity within 00-970.It is highly likely that the additional detail will be complied with in full. Retrospective mandation is not considered necessary.

Preferred Course of Action. Amendment

Benefits and Costs:

1. ***Do nothing.*** There is little benefit of the do nothing option, which could result in increased non compliance with Def Stan 00-970.
2. ***Partial Amendment – No benefit****.*
3. ***Full Amendment****.* Full amendment will clarify Def Stan 00-970 Part 1 and will reduce ambiguity, possibly resulting in improved overall compliance with the document. The changes proposed here represent current practice and would have no or little economic impact.

Post Implementation Review: *Timing of post-implementation review.*

The author will establish the impact of the implementation of the change and consider lessons learned from this implementation.

Consultation period ends: 08 Mar 2013

The consultation period for this proposed amendment ends on the stated date. Please send your feedback via email to MAA-Cert-ADS group@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 mandation: 2 *
- Changes not requiring retrospective mandation but having an engineering impact: 1*
- Changes deemed as administrational only: C1 or Equivalent.

Approved by:

Signature	
Name	
Rank/Grade	
Post	
Date signed	
Date for amendment to be incorporated	
Date for NPA review to take place	

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

Document Part:	*ONE*	Sub-Part	***FOUR***

Unsatisfactory Report Reference		NPA Reference	***2013-001***

Originator		Date	

Amendment to be Incorporated on	

INTRODUCTION

AUTHORIZED AMENDMENT

FURTHER ACTION

APPROVAL

This Def Stan 00-970 NPA has been approved by the Head of Certification on behalf of DG MAA

INCORPORATION

The amendment will be incorporated in Def Stan 00-970 issue 11

Signed (IAW with part 2).

for DG MAA

Annex A.

Proposed change.

EXISTING TEXT

LEAFLET 96
REINFORCEMENT OF METALLIC STRUCTURES USING BONDED PATCHES

REINFORCEMENT DESIGN

3.2 For cracked components, the reinforcement should be designed so that the stress intensity factor range (ΔK) at the crack tip is reduced to a value which, will result in an acceptable rate of fatigue growth; i.e. the crack should be arrested. In the absence of detectable cracks, it should be assumed that the crack size (see Part 1, Section 3, Leaflet 36 for the definition of detectable crack size).

REPLACEMENT TEXT

LEAFLET 96
REINFORCEMENT OF METALLIC STRUCTURES USING BONDED PATCHES

REINFORCEMENT DESIGN

3.2 For cracked components, the reinforcement should be designed so that the stress intensity factor range (ΔK) at the crack tip is reduced to a value which, will result in an acceptable rate of fatigue growth; i.e. the crack should be arrested. In the absence of detectable cracks, it should be assumed that the crack size (see Part 1, Section 3, Leaflet 36 for the definition of detectable crack size) is at the detectable length and in the most critical location and orientation for the purpose of designing the reinforcement.

Proposed change.

EXISTING TEXT

LEAFLET 17 **PROCESSES AND WORKING OF MATERIALS** **ADHESIVE BONDING OF STRUCTURAL PARTS - RECOMMENDED DESIGN PRACTICE**
4 STRENGTHCONSIDERATIONS 4.1 In order to predict the failing strength of a bonded joint with an adhesive loaded in shear, it is advisable to perform a detailed load diffusion calculation taking into account the shear modulus of the adhesive and the stiffness of the components being joined. This calculation is to find the peak shears which occur at the extremes of the joint because they determine the ultimate strength. There are no simple rules to estimate these peak shears relative to the average stress in the joint. As a general guide to the allowable design values for these peak shears the results of single lap shear specimens, such as are used for process control purposes, can be used directly since the average failing shear on a short overlap specimen is almost equal to the peak shear, especially if there is some plasticity in the adhesive. In the case of large area plate to plate bonds, where ventilation holes cannot be provided, inwards migration of the adhesive can result in a thick glueline. Account should be taken of the reduction in strength and stiffness of the thicker layer. 4.2 Care should be taken in structures designed to buckle that such buckling does not lead to peel failure. 4.3 Soft tack rivets should not be regarded as contributing to the static strength of the joint.

REPLACEMENT TEXT

LEAFLET 17
PROCESSES AND WORKING OF MATERIALS
ADHESIVE BONDING OF STRUCTURAL PARTS - RECOMMENDED DESIGN PRACTICE

4 STRENGTHCONSIDERATIONS

4.1 In order to predict the failing strength of a bonded joint with an adhesive loaded in shear, it is advisable to perform a detailed load diffusion calculation taking into account the shear modulus of the adhesive and the stiffness of the components being joined. This calculation is to find the peak shears which occur at the extremes of the joint because they determine the ultimate strength. There are no simple rules to estimate these peak shears relative to the average stress in the joint. As a general guide to the allowable design values for these peak shears the results of single lap shear specimens, such as are used for process control purposes, can be used directly since the average failing shear on a short overlap specimen is almost equal to the peak shear, especially if there is some plasticity in the adhesive. In the case of large area plate to plate bonds, where ventilation holes cannot be provided, inwards migration of the adhesive can result in a thick glueline. Account should be taken of the reduction in strength and stiffness of the thicker layer.

4.2 For repairs Adhesive design data should be derived from the Thick Adherend Test as per ASTM D3983 and ASTM D5656-04**.** Repairs should not be designed using data derived from lap-shear strength tests.

4.3 Care should be taken in structures designed to buckle that such buckling does not lead to peel failure.

4.4 Soft tack rivets should not be regarded as contributing to the static strength of the joint.