CIVIL AVIATION AUTHORITY

BRITISH HOVERCRAFT SAFETY REQUIREMENTS

HRC PAPER NO. 43

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SECTION B
TECHNICAL

MISCELLANEOUS AMENDMENTS TO SECTION B

(FOR ISSUE 5)

INTRODUCTION

The requirements and recommendations of this Paper have been agreed by the Hovercraft Requirements Committee and are made effective upon the advice of the Airworthiness Requirements Board.

TEXT OF AMENDMENTS

Material differences between current BHSR and those of this paper are shown with a marginal line.

ICE ACCRETION

A new para. 2.6 is added to Chapter B3-3 as follows:-

" 2.6 The Limitations and Approved Information shall be established for those craft which are intended to be operated in areas where ice accretion is likely to occur, (see B3-3, App. 2)".

A new para. 2 is added to Chapter B3-3, Appendix, as follows:-

"2 OPERATION IN AREAS WHERE ICE ACCRETION MAY OCCUR (see B3-3, 2.6)

2.1 The areas where craft are liable to suffer ice accretion are as follows:-

(a) The area North of latitude 65° 30'N between longitude 28°W and the West coast of Iceland: North of the North coast of Iceland; North of the rhumb line running from latitude 66°N, longitude 15°W to latitude 73 30'N, longitude 15°E, North of latitude 73°30'N between longitude 15°E and 35°E and East of longitude 35°E, as well as North of latitude 56°N in the Baltic Sea.

(b) All sea areas North of the North American Continent, West of the areas defined in (a) and (b) above.

(c) The Bering and Okhotsk Seas and the Tartary Strait during the icing season.

(d) South of latitude 60°S.

APPENDIX TO CHAPTER B4-2 LOADING CASES

The current B4-2 Appendix 1.1 and 1.2 is deleted and the following is inserted:-

"1 INTRODUCTION

1.1 An empirical method of predicting the acceleration and pressures resulting from water impact of flat-bottomed vehicles has been deveoped on the basis of early requirements and full scale measurements.

1.2 Pending further information this method, which includes an alleviation factor for the impact pressure due to the air cushion is considered to be an acceptable means of establishing compliance with the Water Impact Loads requirements of Chapter B4-2."

Para. 2.5 is amended as follows:-

"2.5 Local Pressure. The local pressure, taking into account a 50% reduction due to the presence of the air cushion, is given by the expression:-

$$p = 0.0162\ K_2\ \Delta_v\ V"$$

where p = pressure, lb. per sq. in.

K_2 = empirical hull station pressure weighing factor, see Fig.1. "

CHAPTER B5-1 GENERAL

A new para.4 to Chapter B5-1 is added as follows:-

"4 OPERATION IN EXTREME CLIMATES **Suitable provisions shall be made in the design and equipment of craft which are intended to be used in extreme climates."**

Proposals

A new para. 5 is added to Chapter B5, General, as follows:-

"5 HULL HYDRODYNAMIC DESIGN (See B5-1, App.)

5.1 The craft hull structure shall where appropriate be designed to provide hydrodynamic stabilising forces by means of planing surfaces following high speed contact with the water surface and by adequate buoyancy reactions for low speed contact with the water surface.

5.2 The peripheral hull structure shall be designed to avoid the entrapment of significant quantities of water following an impact with the water surface."

A new Appendix to Chapter B5-1 is added as follows:-

"APPENDIX TO CHAPTER B5-1

HULL HYDRODYNAMIC DESIGN (AMPHIBIOUS CRAFT)

1 INTRODUCTION Hovercraft, like all marine craft, must be considered to be capsizable even if in some cases the possibility appears to be remote. Usually a capsize is preceded by leading skirt Tuck-under and the requirements for the avoidance of this are contained in B5-10. However, unusual environmental conditions, damage or mis-handling may put any craft unexpectedly at risk. Hence on amphibious craft it is essential that the hull peripheral structure is designed to provide stablising forces and moments following contact with the water.

2 DESIGN FEATURES TO BE CONSIDERED The following design features should be considered.

2.1 A sloping bow structure to minimise the effects of a straight Plough-in from high forward speed.

2.2 Sloping side structure below the skirt outboard hinge line to provide adequate stabilising planing forces and moments during a high speed Plough-in beam-on.

NOTE: For craft with open plenums below the outboard skirt hinge an equivalent effect may be obtained as a result of the side skirt being flattened against the supporting structure for the peripheral boundary member. An adequate structure capable of supporting the skirt and the hydrodynamic planing loads should be provided in these cases.

2.3 Structures above the hinge line should slope outwards at an angle which ensures that the hydrodynamic normal force passes well above the craft CG. This is to provide adequate stabilising forces and moments during a high speed Plough-in beam-on and a buoyancy righting moment at low speed beam-on.

2.4 A sloping stern structure to minimise the effects of a Plough-in while travelling backwards.

NOTE: This applies particularly to small craft which do not have the benefit of variable pitch propellers.

3 UNACCEPTABLE DESIGN FEATURES The following design features will not in general be acceptable.

3.1 "Turtle back" side decks, particularly on small craft.

3.2 Open fronted appendages or structure which could trap water and/or create high drag loads during a Plough-in beam-on."