MAIB SAFETY BULLETIN 4/2002

High Speed Craft (HSC)

Portsmouth Express

Wash Wave Incident

Issued November 2002

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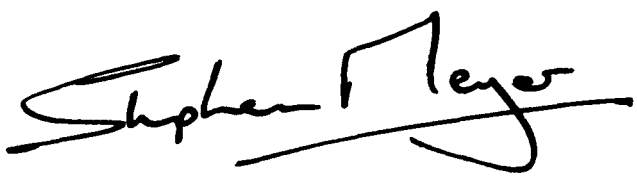
This document, containing safety recommendations, has been produced for marine safety purposes only. It is issued on the basis of information available to date.

The Merchant Shipping (Accident Reporting and Investigation) Regulations 1999 provide for the Chief Inspector of Marine Accidents to make recommendations at any time during the course of an investigation if, in his opinion, it is necessary or desirable to do so.

The Marine Accident Investigation Branch (MAIB) is carrying out an investigation into a wash wave incident, involving the high speed craft (HSC) *Portsmouth Express,* which resulted in several members of the public being injured. The MAIB will publish its report on completion of the investigation.

This Safety Bulletin is for the attention of all companies who operate HSC, and all port authorities with pilots who have to deal with HSC movements. The bulletin concerns Passage Plan Risk Assessments and training in relation to the wash produced by HSC.



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Background

Since HSC have been operating, a number of incidents have occurred as a result of the wash they have produced. The problems have been minimised by the careful study of the ferry routes involved, the introduction of Operational Criteria to the Permit to Operate HSC and the consequent modification of route and speed profile. The Maritime & Coastguard Agency (MCA) issues or checks the Permit to Operate HSC on routes to and from UK ports. From 20 January 2000, the MCA has required the compilation of a Passage Plan Risk Assessment, which identifies any likely areas of wash, and specifies the speeds/route to reduce it.

The accident

Portsmouth Express was operating close inshore while returning to Portsmouth after a period of repairs at Southampton. On board, the master, mate and pilot were unaware that the vessel was producing a hazardous wash. When the wash arrived onshore, a series of large breaking waves was produced, which rolled up the beach and went right over the sea wall, flooding the road and park beyond. It was high water at the time and the sea was calm.

Several members of the public sustained significant injuries, and one was washed out to sea. Had young children been on the beach, fatalities might well have resulted.

Comments

The physics of wash generation and propagation from HSC is complex, although a basic understanding of the subject can be obtained without too much difficulty. The main parameter is depth Froude number, which is a relationship between vessel speed and depth of water. The worst depth Froude number for producing wash is about 1; the associated speed is known as the critical speed. The vessel involved in this accident was travelling very close to the critical speed[1].

Passage Plan Risk Assessment

To receive a Permit to Operate, the operator must produce a Passage Plan Risk Assessment for the route on which the vessel operates. The purpose of the risk assessment is to ensure that wash does not create any significant problems on shorelines near to the track of the vessel. The vessel involved here was not operating on her normal route at the time of the accident. A Passage Plan Risk Assessment was not produced for this passage. The standard passage plan, which was compiled before the start of the voyage, did not consider the effect of wash.

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[1] [Depth Froude number (Fn_h) can be calculated by using the formula $Fn_h = V_s / \sqrt{(g \times h)}$, where V_s is vessel speed in metres/second, g is the acceleration due to gravity (9.81metres/second^2), and h is the depth of water in metres.]

Training

The master followed the Passage Plan Risk Assessment when operating the craft on her normal route, and the speeds and tracks specified were adhered to. Nevertheless, it is considered that he had insufficient understanding of the effects of wash to be able to operate safely at high speed in shallow water, when the craft was not on her usual route. Also, the competent harbour authority's pilot, who was on board at the time, appeared not to have received any significant training in the effects of wash from HSC.

Solutions

Passage Plan Risk Assessments, which comprise a detailed analysis of wash, should be carried out for all HSC voyages close to land above moderate speed. Had the vessel involved in this particular incident been proceeding at moderate speed, the hazardous wash would not have been produced[2].

Masters, mates and pilots who operate HSC should have an understanding of the wash produced by these vessels. The references below give further information[3].

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[2] If a vessel is operating at a depth Froude number of less than 0.80, it is operating at moderate speed.

[3] Marine Information Notes MIN 48 (M+F) and MIN 118(M+F), produced by the MCA and available free of charge, contain some useful research findings. The report into the accident involving the small vessel *Purdy* and an HSC can be obtained from the MAIB by calling 023 8039 5500. The Nautical Institute has also published guidance on the subject. There is an ongoing research study by PIANC (Permanent International Association of Navigation Congresses) which is endeavouring to establish an international standard for wash evaluation of HSC based on risk assessment.

Safety Recommendations:

To avoid similar problems in the future, the following recommendations are made:

HSC operating companies are recommended to:

1. Compile a Passage Plan Risk Assessment, comprising a detailed analysis of wash, for all voyages close to land and/or in shallow water, unless the HSC is operated at moderate speed.

2. Ensure that all masters and mates who operate HSC have an understanding of the problems of wash. Preferably, this should be obtained by attending an appropriate course but, as a minimum, it should include the reading of some relevant technical papers. They should also study their usual operating route Passage Plan Risk Assessment and apply the guidance on wash to other routes.

Harbour authorities employing pilots on HSC are recommended to:

3. Require a Passage Plan Risk Assessment, comprising a detailed analysis of wash, for all HSC movements. If this document is not available, the pilot should insist the vessel is run at moderate speed.

4. Ensure that all pilots employed on HSC have an understanding of the problems of wash. Preferably, this should be obtained by attending an appropriate course but, as a minimum, it should include the reading of some relevant technical papers.