Technical Note

Project Title:	Gourock Dunoon Ferry Study
MVA Project Number:	101988
Subject:	Vessel Reliability & Specification
Note Number:	3 Version: 2
Author(s):	[redacted]
Reviewer(s):	[redacted]
Date:	12 February 2013

1 Introduction

1.1 This note contains the definitive analysis of weather related vessel reliability issues for this study. These data sets the benchmark for specifying foot-passenger and passenger and vehicle ferry services on the route in terms of this key parameter.

1.2 It also contains a discussion of sea conditions on the Firth of Clyde, and the implications of this for vessel design.

2 Reliability Data

2.1 Argyll Ferries provide detailed data relating to the CalMac / Cowal ferries service over the period 01/01/2001 to 29/06/2011, a total of over 128,000 individual sailings.

Table 1 Vessel Reliability Rates (2001-2011 inclusive)

Vessel	Cancelled – All Reasons (%)	Late (%)	On Time / Early (%)	Cancellations – Weather (%)	Total Scheduled Sailings
Ali-Cat	5.0	0.2	94.8	**3.0**	13,952
Juno	1.9	8.3	89.7	0.4	18,684
Jupiter	1.3	9.0	89.6	0.5	57,320
Saturn	1.4	11.4	87.1	0.6	33,434
All Streakers	*1.4*	*9.6*	*88.9*	***0.5***	*109,438*

2.2 It can therefore be seen that over this 10.5 year period the Streaker vessels were cancelled due to weather on 0.5% of scheduled sailings, and the figures for the three individual vessels were very similar. The equivalent figure for the Ali Cat is much higher at 3.0%.

2.3 The trend over time for the Streakers is shown in Figure 1 below.

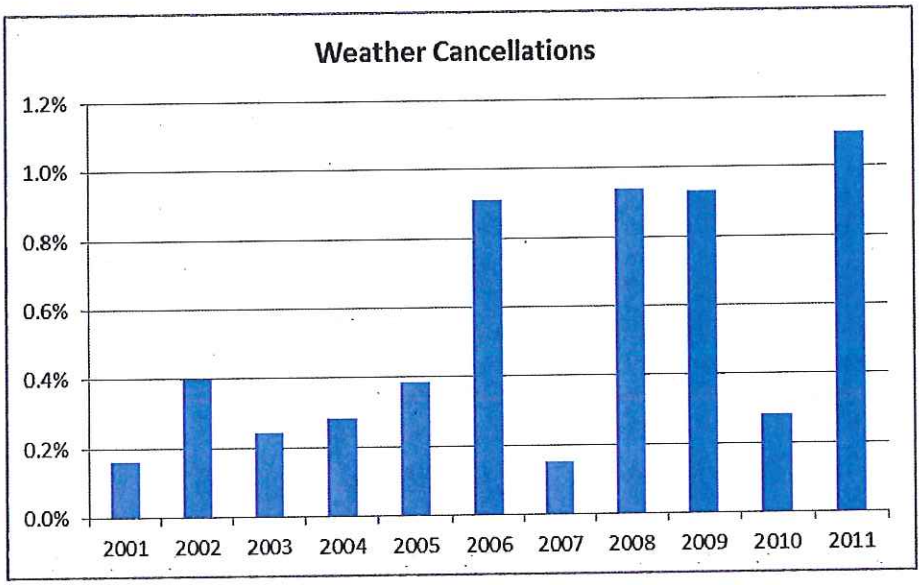

Figure 1: Streaker Weather related Cancellations

2.4 It can be seen that there have been four years (2006, 2008, 2009 and 2011) when the weather related cancellation rate has been much higher, presumably reflecting more severe winter weather. Otherwise the cancellation rate is in the 0.3-0.4% range.

3 Conclusion

3.1 The last 10.5 years represents a good time series of data on which to base a vessel specification. It is therefore proposed that the foot-passenger and vehicle and passenger ferries specified for this route should have seekeeping characteristics which enable them to achieve 99.5% weather related reliability.

4 Vessel Specification (TMG)

4.1 Speed limits for the routes are not contained in any bye-laws. However Clyde Ports' H&S regulations call for a speed limit of 12knots above Cloch Point and 19kts to the seaward limit. This is by concusses with the yachting fraternity, fishermen and the Royal Navy. The routes between Gourock and Dunoon and McInroy's Point and Hunter's Quay are restricted to 12 knots.

4.2 The Master's of vessels report that significant wave height very seldom gets above 1.25 metres and this is borne out by our weather study of the area (see below). However there is no wave rider buoy situated in the area of the service to confirm these reports. Some difficulty in berthing in NE'ly winds in Gourock and S to SW'ly winds (the predominant wind) in Dunoon. The old Dunoon Pier aligns N/S and this made berthing easy in the prevailing wind. The breakwater

was built to shelter the demolition of the old Dunoon Pier; however the pier was declared a listed building and will now remain.

4.3 Western Ferries claim 100% reliability. Crews of 4, having 4 crews per vessel. Most crews members and employees are based in Dunoon and environs.

4.4 Residents and the indigenous population of Dunoon and environs were overwhelming in their criticism of the ***Argyll Flyer*** and ***Alicat*** and service provided by Argyll Ferries. In particular they were concerned at the motion of the craft and access to board and disembark. However they also criticized Western Ferries for high charges, lack of foot passenger facilities and the service being 2 miles out of Dunoon and 1 mile from Gourock.

4.5 CMAL advised that the linkspan at Gourock is in poor shape and need of refurbishment, though by no means unsafe. Designs for pontoons to service the passenger only route at both Dunoon and Gourock had largely been discounted, however they would wait for the completion of the study before any final decisions were made

4.6 The MCA confirmed that the Gourock to Dunoon route crosses the Category D/C weather restrictions between a vessel trading as a Class V or Class iV passenger ship. A dispensation has been granted for the Class iV classification regarding the need to carry a High Speed Rescue Craft (HSRC), though this has placed weather limitations on the operation of the service.

4.7 TMG have looked at aspects of both a passenger only vessels and RoPax for the route.

Weather

4.8 The enclosed nature of the Firth of Clyde with its characteristic narrow fjords has a dampening effect which limits the wave field effecting the coastline of this area. Wave climate modelling by Wallingford (1996) indicate that the majority of the waves in the region come from the southwest and west. Significant wave height in the off shore zone rarely exceeds 1.6m in height whilst in the inshore zone they rarely exceed 1.2m in height. The Firth of Clyde is therefore not greatly affected by swell waves since they rarely extend into the area from the Irish Sea. The fjord coastline within the Firth of Clyde has inherently low wave magnitudes due to the shelter afforded by the surrounding landscape. Shelter will in effect reduce wind speed that in turn lessens wave fetch resulting in a marked reduction in wave energy in comparison to more open areas of the Scottish coastline outside the Firth of Clyde[1].

4.9 The highest significant wave recorded in the Upper Clyde is about 2.5 metres. A Beaufort Force 7 (near gale) produces a 1.54 metre significant wave height off Cloch Point. Gales occur at Greenock (the nearest weather station to the route) about 14 days per year (stats over a 21 year period) with most of these occurring in January, February and March.

4.10 The predominant wind is S thru SW though gales can usually be expected from SW through to W but are known from all quarters. The average duration of a gale depends on exposure and may last between 5 and 7 hours in exposed places. Gales from S and SE are usually short lived. Storm force winds (force 10 and above) in the Clyde area are very infrequent and are only 2-3% of all winds above Force 7. Wind speeds in the Upper Clyde may vary greatly within very short distance due to the different degrees of shelter and the distance from a leeward shore.

[1] Admiralty Sailing Directions NP 65 and Imray Clyde Cruising Club Sailing Directions.

Thus a SSW Force 7 may affect berthing at Dunoon but be relatively sheltered in Gourock. Conversely a NE gale will affect berthing in both Dunoon and Gourock.

4.11 The area (both Cat C & D) is designated as a 1.5 significant wave area by the MCA for issuance of certificates. The Cat C area is between Cloch Point and the Dunoon Pier northwards, thus making the Dunoon Linkspan just in Cat D waters. This line however moves southwards in Summer between March and November allowing the vessels to trade as Class V vessels. Both existing vessels are Class IV and Class V designation, though the Class IV vessel operates with a dispensation from carrying a HSRC and operate with a crew of 3 (instead of 4?). The Master has had a weather restriction placed on him and can only proceed to sea in favourable weather, taken to mean "fine, clear, settled weather, such that as to cause only moderate rolling and pitching". The reason for this is that the vessel itself will have to act as a rescue craft should a "man-over board" situation occur, there being no HSRC. Presumably CalMac have decided that the cost of cutting the extra crew member out, far outweighs the cost of having to put a HSRC aboard, maintain it and train an operator, plus the number of sailing cancelled because of the weather.

4.12 Fog occurs in Greenock 8 days a year (stats over a 21 year period), mainly in December.

4.13 Tidal range is 3 metres, not excess, but significant when looking at embarkation / disembarkation. Tidal flow seldom reaches more than 1 knot at just before HWS in both directions, generally flowing up or down the line of the Firth. The stream does however split 1 nm north of Cloch Point, one stream following the river and the other flowing into Loch Long.

4.14 TMG do not think the GT (Gross Tonnage) figure plays a significant part in what constitutes an ideal vessel for the route (but it does affect port dues), the length, breadth and draft are more important with sea keeping qualities. To find a vessel that will give a similar performance to the "Streakers" of a weather down-time of 0.5% or better we feel a vessel is needed of:

- LOA 40-50 metres, beam 11 to 15 metres and a draft of 2 metres. Service speed to be 14-15 knots and be capable of operating with a crew of 4. Passengers 200 to 250. The GT should be as low as possible. The vessel will need to be highly manoeuvrable to allow quick turn rounds in port