Assessment of the RNLI Review of the Location of New 'Shannon' class ALB

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Between 2016 – 2017, the RNLI reviewed the replacement of the Mersey class all-weather lifeboats (ALB) stationed in Cardigan Bay with the new Shannon class ALB. Following this review, the RNLI Trustees Board have decided to locate the new Shannon class boat in Barmouth and replace the current all-weather lifeboat (ALB) stationed in New Quay with a 'B' class Atlantic 85 inshore lifeboat (ILB).

Despite the assertion of RNLI Chief Executive that

> 'the Atlantic 85 is much faster than both the Mersey and the Shannon Class ALBs; it can reach casualties more quickly and it also has a better shallow-water capability'[1]

the B-class Atlantic 85 cannot be used in daylight sea conditions of Beaufort Force 7 and above, or during the hours of darkness above Beaufort Force 6. Added to this, the B-class cannot be used in casualty situations involving fire. The B-class' suggested capabilities of speed and shallow-water capability are therefore severely compromised. Cognisance appears to be lacking regarding the casualty potential of passenger vessels operating in the New Quay/ Aberaeron/ Aberystwyth area with some of the individual vessels plying this trade having a carrying capacity of 72 persons (B-class ILB carrying capacity is limited to 20 persons) and the possibility of approximately 200 passengers being on the sea in various vessels at any time.

The primary function of a lifeboat is to save lives (RNLI mission statement: 'save lives at sea') and to achieve this, lifeboats must reach a casualty in the most expeditious manner, i.e., minimum time with due regard to the safety of the lifeboat crew.

The RNLI report, *New Quay Lifeboat Station – Data Analysis*, includes summary statistics of lifeboat launches (ALB/ILB) for New Quay for the period 2011 to 2015, with 2016 also included. Although only this 'six year period' is plotted as a 'Return of Service (RoS)' graph, the report claims

> 'the RoS data contained within the ALB strategy model covered a 7 year period between the 1st January 2008 and the 31st December 2014.' [2]

The report also notes that

> 'data contained within the Deaths, Rescues and Injuries (DRI) model covered an 8 year period between the 1st January 2008 and the 31st December 2015.'[3]

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[1] Letter from RNLI Chief Executive Paul Bossier to Ceredigion County Council Chief Executive Bronwen Morgan, 13 July 2017

[2] *New Quay Lifeboat Station – Data Analysis*, pp.13-14

[3] *New Quay Lifeboat Station – Data Analysis*, p.13

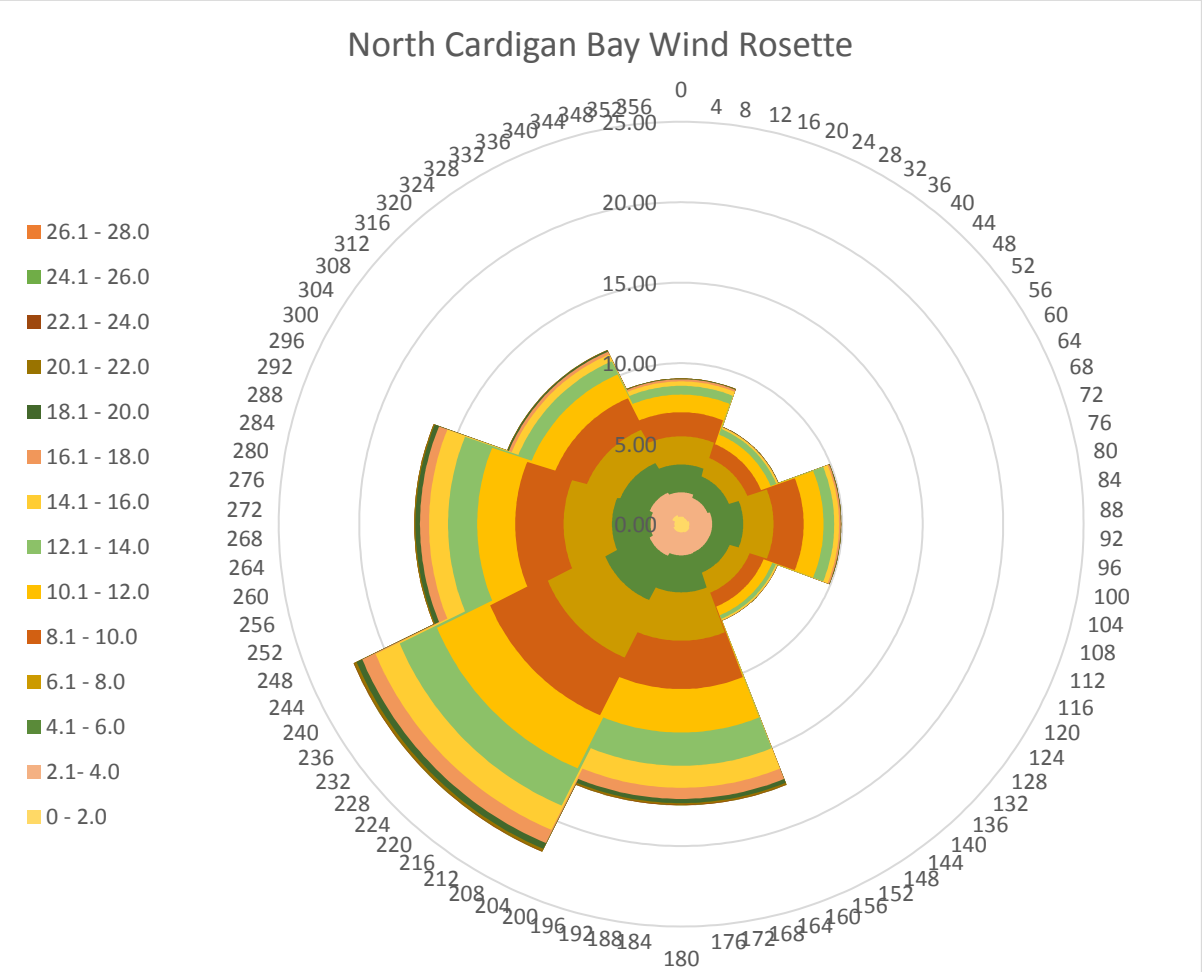
Further, although this report states that

> 'an operational risk report was produced for Cardigan Bay […] to provide the analytical supporting evidence that helped inform the decision process regarding the long term future and disposition of ALB assets in Cardigan Bay, based upon current knowledge and concept of operations (Con-Ops)[4]

there is no evidence anywhere in the report of a quantitative risk analysis having been undertaken to inform decision making.

A preliminary risk analysis has been undertaken (independently of the RNLI) which demonstrates that a Shannon class ALB stationed at New Quay will reach casualties located near Aberdyfi, and all the way down the coast to Fishguard and beyond, faster than an identical Shannon class ALB stationed in Barmouth.

This risk analysis is based upon the following wind data from the UK METOFFICE model for the period 2000 to 2008:



[4] *New Quay Lifeboat Station – Data Analysis*, p.12

The Wind Rosette for North Cardigan Bay demonstrates that the significant prevailing winds in the South/Westerly directions directly expose any lifeboat launches or boat recovery from the Barmouth area.

Onshore winds adversely affect the operational capabilities of the Barmouth lifeboat approximately 68% of the time, over a 12 month period.

The Barmouth lifeboat station it is situated near the mouth of the Mawddach river which gives shifting sand bars and extreme breaking wave conditions due to its exposure to the prevailing South Westerly wind conditions.

Despite the navigational hazards of Barmouth, and the challenges of Barmouth lifeboat station's particular geographical location, the RNLI report *New Quay Lifeboat Station – Data Analysis* concluded that

> 'Due to Barmouth boathouse being able to accommodate a Shannon class ALB, only a one day visit was required.'[5]

This suggests that it was the dimensions of the 'boathouse' alone which were considered.

[5] *New Quay Lifeboat Station – Data Analysis*, p.12

Figure 1, Barmouth and New Quay with respect to Prevailing Winds and Cardinal Marks (below), shows the location of the reefs Sarn y Bwch, Sarn Badrig/Causeway and the Patches.

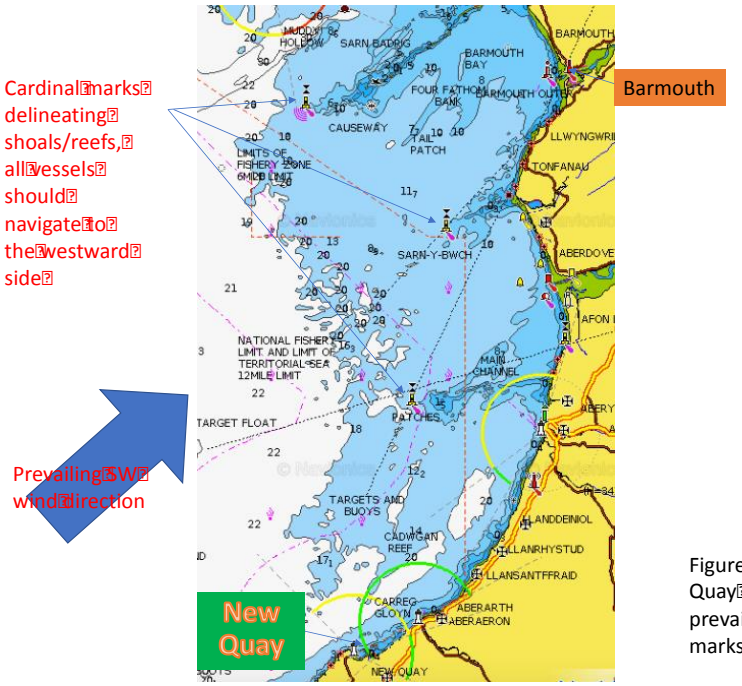


Figure 1: Barmouth and New Quay with respect to prevailing winds and cardinal marks

Figure 1 (above) shows how prevailing winds and navigational obstructions compromise the 'all weather' capability and passage/casualty response times of an ALB stationed at Barmouth.

Table 1.0 (below) gives the differences in passage hours duration for a Shannon ALB located at New Quay and Barmouth reaching a casualty at various locations on the coast.

Limitations on the transit speed with respect to sea-state of the ALB were based on 'Seakeeping Analysis of a High-Speed Search and Rescue Craft by Linear Potential Theory'[6]. This paper covers analyses the longer hull length Trent class ALB, which should have superior or equivalent motion characteristics to the shorter hull form of the Shannon class ALB.

Positive values indicate that the ALB from New Quay reaches the casualty before the Barmouth ALB.

[6] 'Seakeeping Analysis of a High-Speed Search and Rescue Craft by Linear Potential Theory', Prini F., Benson S., Birmingham R. W., Sheppard P.J., Phillips H. J., Mediavilla-Varas J., *International Conference on Lightweight Design of Marine Structure* (Glasgow, 2015)

			TIME DIFFERENCE(HR)		
BEAUFORT FORCE	Aberystwyth	Aberporth	Cardigan	Aberaeron	Aberdyfi
0	0.52	1.22	1.16	1.04	-0.20
4	0.52	1.22	1.16	1.04	-0.20
7	1.05	1.95	1.97	1.60	0.12
9	2.29	4.02	4.13	3.26	0.53
10	4.72	7.82	8.16	6.27	1.58

Table 1.0 - Casualty Response Time Differences for Shannon Class based in New Quay versus Barmouth stationed (positive number indicates faster response of New Quay based ALB)

Figure 2.0 (below), Comparison of New Quay and Barmouth ALB Areal Coverage, shows the significantly larger sea area which can be accessed in much shorter passage times from a Shannon class ALB stationed at New Quay, thus saving lives.

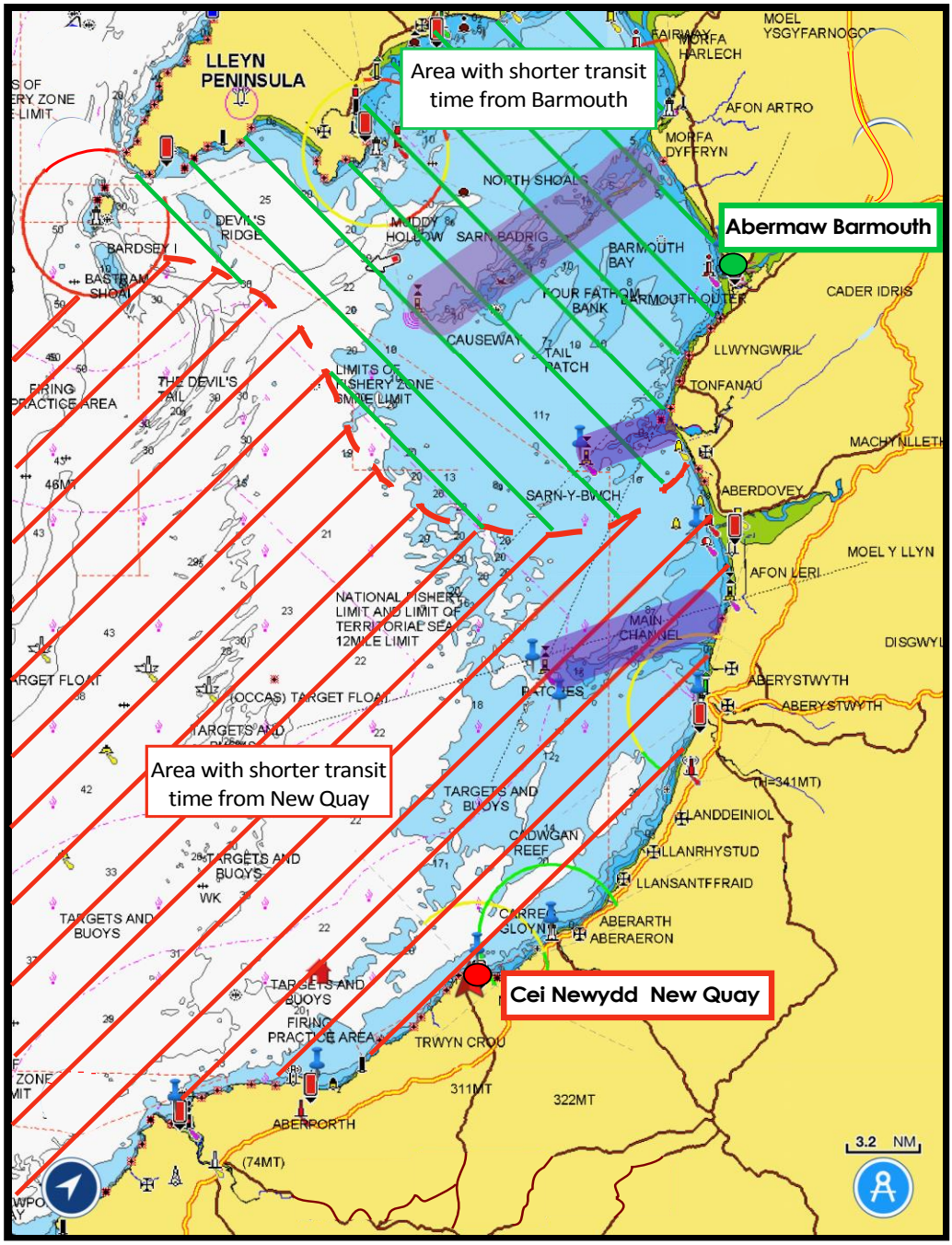


Figure 2.0 - Comparison of New Quay and Barmouth ALB Areal Coverage

Bibliography

New Quay Lifeboat Station – Data Analysis
(RNLI produced document which appears to be a redacted extract)

Prini F., Benson S., Birmingham R. W., Sheppard P.J., Phillips H. J., Mediavilla-Varas J., 'Seakeeping Analysis of a High-Speed Search and Rescue Craft by Linear Potential Theory', *International Conference on Lightweight Design of Marine Structure* (Glasgow, 2015)