FCB2 (Fast Carriage Boat 2)

Experimental FCB2

An update on the project so far…..

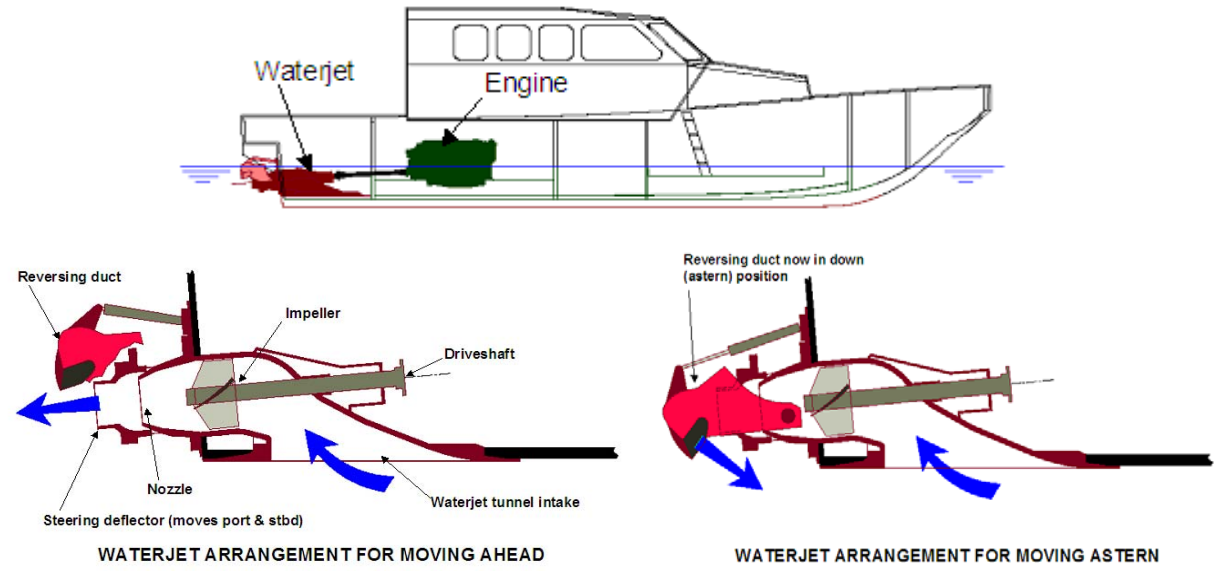
FCB2 is designed to replace the Mersey class which first came into service in 1989 and is now nearing the end of its planned 25-year life span. FCB2, like the Mersey, will be launched and recovered from a beach, but could also lie afloat if necessary. As with other all weather lifeboats she will be inherently self-righting in the event of capsize and must be able to cope with the roughest conditions to be found around our coasts. FCB2 will incorporate the latest SIMS (Systems and Information Management System) and after extensive trials will be the first modern generation RNLI all weather lifeboat to use waterjets in place of propellers.

WATERJETS

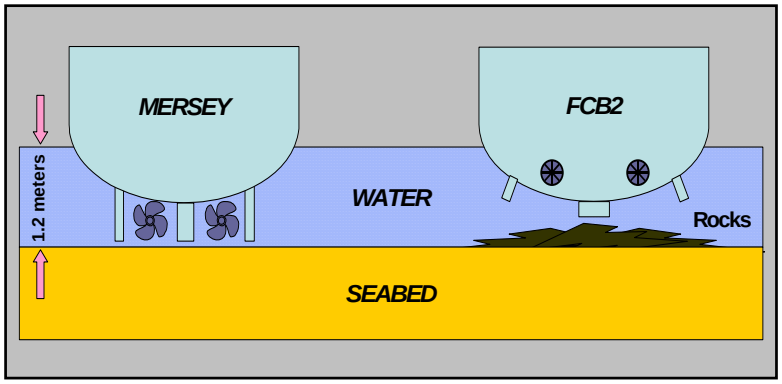
What are waterjets? Waterjets are an alternative propulsion method to propellers. They draw in water in from beneath the hull and expel it from the transom creating thrust to push the boat forward.

Why use waterjets? As a carriage boat FCB2 will operate in shallow waters and will be intentionally beached. Waterjets are extremely effective in both of these scenarios and the likelihood of damage occurring compared to a traditional propeller driven lifeboat is greatly reduced. If a 25 knot FCB2 with propellers and rudders were to be given the same level of protection there would be a significant drop in both manoeuvrability and performance. Apart from the issue of protection, waterjets will also give the Coxswain greater control when alongside other craft, in confined waters and in all sea conditions.

How do they work? The diagrams overleaf show how waterjets work. Water is drawn in under the boat, through the impeller and accelerated out of the nozzle at the stern of the boat, providing forward thrust. Turning the nozzles left or right controls boat direction. Astern motion is achieved by lowering the reversing duct, thus diverting the flow of water and propelling the boat backwards.



The rudders and propellers on the Mersey are susceptible to damage during launch and recovery and when in shallow waters. As a result they sometimes need replacing otherwise performance and speed will be reduced. As shown in the diagram, the hull of FCB2 will have no external appendages, apart from small bilge keels. This allows her to operate in depths that a traditionally driven propeller boat could not go.



If you fancy yourself as a bit of a coxswain, try completing the waterjet game: http://www.hamiltonjet.co.nz/jetboat_game
Find the game difficult? Don't despair; feedback from the FCB2 Project Team is that actual boat control is easier!

LAUNCH AND RECOVERY

There are currently 31 Mersey stations; 24 of these stations launch and recover the boat on the beach via a carriage. After extensive trials a new Supacat system has been chosen as the equipment most suited for FCB2.

How will FCB2 be launched and recovered? FCB2 will be launched from a carriage that can act as either a mobile slipway for launch close to the shore or as a platform that can be driven into deeper water from which FCB2 can then power herself off. The Supacat system provides sufficient flexibility to allow the method of launch and recovery to be tailored to the local beach conditions.

The launching mechanism on Supacat features a single release point at the bow, meaning the present system of Mersey launching using chains released by four crew members is no longer necessary. The new system is more user-friendly and removes the possibility of a foul up during launch because of incorrect chain release or the launching falls snagging on the propellers or rudders.

One of the main requirements when developing the launch and recovery system was to recover FCB2 bow first to the carriage. Mersey recovery requires the lifeboat to be pulled up the beach until enough space is available astern to position the carriage/tractor and then pull the Mersey backwards onto the carriage. This takes time to achieve and on some beaches the recovery may need delaying until the tidal conditions are more favourable. In fact at some locations Shorehelpers end up paddling when completing the recovery! Waterjets and a shallower draft enable the boat to get much closer to the shore before grounding, and in rough conditions coming ashore at speed allows the boat to clear the danger area and be recovered safely.

Prototype Supacat launch and recovery rig

Experimental FCB2 on Prototype Supacat launch and recovery rig

When FCB2 is safely on the carriage it is rotated by hydraulic power through 180° ready for the next launch. One of the many benefits of FCB2 launch and recovery is the saving on man (or woman!) power, especially during the recovery phase. To launch, only a Tractor Driver and Head Launcher are required, plus any Banksmen to ensure public safety. Recovery can be handled by smaller numbers too, as skids will not be needed in most cases.

FCB2 PROJECT & DEVELOPMENT

The Project: The FCB2 Project Team will design and build the first five FCB2s by 2015. This will include through life support, quality management, training, documentation and liaising with the relevant departments as required. The RNLI New Construction Section will then continue to build the remaining lifeboats in accordance with operational needs.

FCB2 must comply with all the requirements defined by the Operations Department. As with the new Tamar class, she will need to achieve 25 knots in good sea conditions, but will also be able to operate at 17 knots in sea conditions associated with a Beaufort Force 7. She must be inherently self-righting, have seating for 6 crew (including a doctor), 6 survivors, and enough fuel for 10 hours operation at full power in all weather conditions with a 10% reserve.

Experimental Lifeboat: The current hull is based on an existing commercial design. Unfortunately in rough seas severe slamming has been experienced, which on occasion has led to minor crew injuries (despite the installation of the new Tamar style seats). This problem means she would not be suitable as an operational lifeboat. The FCB2 Project has therefore been extended by three years while a new hull is sourced, fitted out and trialled. Although the delay is disappointing, ensuring our crews have a lifeboat that is effective and safe to operate in all sea conditions takes precedence.

Development: Although the current Experimental Lifeboat will not be developed any further, she will continue to be used for trials for various elements including electronics (SIMS), machinery (engines/waterjets) and wheelhouse design. Over the past 6 months the team have been researching other hull forms for FCB2. Most of this work has involved looking at, and trialling existing commercial hulls, however other new designs (including an in-house option) have also been developed. Eighth scale model testing will soon be conducted in both the open water and towing tanks. The new hull selection process should be completed by January 2009, after which the Prototype FCB2 will be built.

Coast Liaison: Input from the coast will be organised in the form of a FCB2 User Group. This group will consist of selected Coxswains, Mechanics and Crew. Their objective will be to provide comment (before, during and after build) to ensure that input from the coast is considered prior to finalising the design.

When will FCB2 be ready: It is planned that the prototype will be ready for sea trials in May 2011 with the first FCB2 being operational early in 2013. This may seem distant, but the complexity of RNLI lifeboats far exceeds that of other similar sized craft. Taking time now to get the design right will save time and money later and ultimately result in a better lifeboat.