

IN THE NEWS

Q3 2019

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80 Years Of Technological Innovation In New Zealand

Noted.co.nz
13 August, 2019

Hamilton jet boat (1954)

Farmer and engineer **Charles William Feilden (Bill) Hamilton** wanted to explore the shallow rivers of the South Island, but the propellers of conventional outboard motors soon hit the stony riverbed. His solution was to do away with underwater appendages on motorboats, using a centrifugal-type pump to suck through the water to propel the boat forward. A trip up the Waitaki River in 1954 proved the concept, and further refinements at **Hamilton's** Irishman Creek workshop in Central Otago made the jetboat ready for commercial release in the 1960s. These days, jetboats race across shallow water all over the world and **Hamilton's** jet boats are still on sale.



Additive Manufacturing

3D Printing Industry
1 August 2019

Cox Powertrain, a propulsion system manufacturer based in West Sussex, UK, has selected Shropshire-based Grainger & Worrall (GW) to develop main engine castings using additive manufacturing for 300 horsepower diesel outboard motors. The CXO300 is a 4.4L, twin turbocharged V8 engine which provides improved fuel efficiency for commercial vessels, leisure and sea rescue. Due to the product's high demand, GW will leverage new technologies to produce 70 engine sets per week.

"Achieving any world-first requires the support of the best suppliers and all of Cox's suppliers are carefully evaluated on their abilities," said Duncan Green, Head of Procurement for Cox Powertrain. "It is important for Cox to partner with a supplier who can provide us with high quality, precision engine castings in the timescales and volumes required."

Grainger & Worrall and 3D printing

With 75 years of experience in automotive and marine casting, GW has ventured into digital manufacturing to accelerate the time to market of new products. Most recently, the company invested in a third, large scale CT scanner to ensure quality control of all its components. GW's total investment in CT technology so far is over £1.2 million.

According to Matthias Schoeffmann, business development manager at GW, the company's sand castings are made with the support of 3D printing. Earlier this year, GW used an S-max 3D printer from ExOne, to create large structural aluminum sand castings, accelerating the production of waterjet propulsion systems for [HamiltonJet](#).

GW also uses COSCAST, a process in which aluminum alloy is melted and stored in an electric furnace, then carried out with an electromagnetic pump transporting the liquid metal into the sand mold. COSCAST works in tandem with GW's digital process simulation, sand printing, rapid product validation and precision machining.

These methods will be implemented for the casts of the CXO300. Matthew Grainger, director of GW, stated, "The cylinder heads and both upper and lower crankcase will be produced by Grainger & Worrall as the first series production contract for the four significant engine castings."



3D sand casting

3D printed sand casts have been seen as an economical alternative for producing casting molds without the need for complex and expensive tools. As well as GW, ExOne's S-Max and newly released S-Max Pro have supported companies in various applications.

In May, PumpWorks Castings, LLC, an industrial pump manufacturer and foundry, utilised the S-Max system to reduce lead time for the production of two custom parts down from 17 weeks to 8.

Prior to this, ExOne collaborated with Catalysis Additive Tooling, an Ohio-based 3D print tooling and part manufacturer, to create a new 3D printed tooling process for low-to-medium volume production parts. This began with a sand mold produced on the S-Max, which is then processed with Catalysis' proprietary coatings. This creates a reusable tool to make a plastic, fiberglass, foam or other composite parts within traditional injection, vacuum formed or cast processes.

Ferry Fleets Getting More Efficient — And 'Green'

WorkBoat

August 7, 2019

Ferries continue to be a dynamic sector of the workboat industry, with steady passenger growth and innovative design — bigger, faster vessels for major metropolitan markets, and a new wave of hybrid propulsion.

Designers and builders are responding to demand for cleaner-operating vessels, pushed by California air-quality mandates and moves by Washington State Ferries toward developing hybrid and electric power. On the East Coast, ferry operators tend to stick to proven Tier 3 emissions-approved designs. But there's also interest in hybrid-electric drive for making new ferries good neighbors in densely populated waterfront neighborhoods.

The first U.S. passenger ferry with Tier 4 emissions controls went into service March 4 with the San Francisco Bay Ferry system. The \$23 million 445-passenger high speed Pyxis is the fifth new ferry built for the system service administered by the Water Emergency Transportation Authority (WETA) since the agency started acquiring its new Hydrus class in 2017.

"They operate on a longer route than the Hydrus boats. We're a one-hour trip," said Martin Robbins, general manager of the Bay Ferry's Vallejo division. "These are waterjet boats so they're designed for 34 knots. They will make 37 or 38 knots running light."

The first of three new 142.7'x39.4'x5.4', all-aluminum boats being delivered by Dakota Creek Industries, Anacortes, Wash., in 2019, the Pyxis serves the growing Vallejo route. It is the first new vessel on the northern bay since 1997, and very similar to earlier waterjet ferries by conceived by designers at Advanced Multihull Designs (AMD) of Australia.

"It's largely the same design, 2.6 meters (8.5') longer so we can get passenger capacity up from the mid-300s to 445," said Robbins. "We've seen steady (passenger) growth for five to six years. We slowed down a little bit, and that might have been because of our capacity limits. The parking lots are full and we've had to turn people away. Hopefully these new boats will help turn that around."

Two MTU 16V4000M65 engines rated at 3,433 hp each drive a pair of **HamiltonJet HT810 waterjets** through ZF 9055 gears. Propulsion integration by Pacific Power Group, Kent, Wash., includes the Tier 4 emissions control, a first for U.S. ferries. Earlier PPG supplied power packages and emissions controls for the Hydrus-class boats surpassed their nominal Tier 3 ratings, classing them two years ago as the cleanest U.S. passenger ferries.

San Francisco Bay operators were early pioneers in cleaner propulsion technology. The 320-passenger Solano, delivered by Dakota Creek in 2004, was equipped with an early, experimental selective catalytic reduction (SCR) emissions system that was not so efficient "but it proved very educational," said Robbins. "In the next 12 to 14 years the technology has become more advanced."



Kiwis Get To Show Off Extremes In Performance And Luxury At The Auckland On Water Boat Show

Livesaildie.com
1 October 2019

World-record breaking engines, four different brands of amphibious vessels, classic Riva boats, New Zealand made, hand-built performance RIBS and the largest selection of luxury boats ever seen in a New Zealand boat show, at this year's Auckland On Water Boat Show. We are PUMPED to see everything on display in one easy to get to location from the 3rd to 6th October 2019. That's this coming weekend!

The Auckland On Water Boat Show is New Zealand's largest on water boat show and kicks off on Thursday 3rd October bringing with it a host of super-sized displays, luxury yachts and sea trials to the heart of the Viaduct Harbour until 6th October, and just a stones throw away from the Emirates Team New Zealand base! Plus, the America's Cup will be on display!!!

Show highlights include:

A New Zealand-built jet which dwarfs people

This Christchurch-built HT1000 by New Zealand company **HamiltonJet** is destined for international markets and produces a whopping 7400HP. Much larger than a person, it will sit on Karanga Plaza and is being craned into place on the morning of Tuesday 1 October. HamiltonJet has produced 52 of these HT1000s since 2009 and will place it next to the smallest jet it produces.



Metal Shark Expands Into Peru

MarineLink
6 September 2019



A Metal Shark 45 Defiant patrol vessel, similar to the vessels being built for the Peruvian Navy at Metal Shark's Jeanerette, Louisiana USA production facility.

USA-based shipbuilder Metal Shark has announced its expansion into the country of Peru, with a new patrol boat order now in production, and a multiyear co-production agreement recently established with the state-operated Peruvian shipyard Servicios Industriales de la Marina (SIMA-PERU SA).

The first round of Peruvian Navy maritime interdiction vessels are now being built by Metal Shark in the United States. Under a co-production agreement with SIMA, Metal Shark plans to deliver multiple similar vessels to Peruvian interests through training and the transfer of designs, technological resources, and production methodologies to SIMA.

"This agreement represents a cooperative commitment by Metal Shark and SIMA, Peru's national shipyard, to dramatically expand Metal Shark's influence in Peru," said Metal Shark CEO Chris Allard. "This strategic move will further bolster Metal Shark's presence in Latin America while allowing Peruvian military and commercial operators expedited access to Metal Shark's engineering and technological resources, as well as our extensive portfolio of proven vessel designs."

Production of 45-foot Defiant-class patrol boats for the Peruvian Navy recently commenced at Metal Shark's Jeanerette, Louisiana production facility. Designed in-house by Metal Shark, the 45 Defiant is an increasingly popular platform, with vessels in service with multiple operators in the US, the Caribbean, and Asia.

The standardized 45 Defiant patrol craft platform has been customized to suit the Peruvian Navy's maritime interdiction mission requirements. Powered by twin inboard Cat Marine diesel engines coupled with **Hamilton water jets**, the vessel will reach speeds well in excess of 40 knots.

"Metal Shark is proud to add the Peruvian Navy to our growing list of international customers, which now totals over 50 military and commercial operators worldwide," said Henry Irizarry, Metal Shark's vice president of international business development. "This partnership with SIMA reflects Metal Shark's commitment to solidify its status as a leading vessel designer, builder, and innovator across the Americas and around the world."

New Turner Icení CTV Completes Sea Trials

OffshoreWIND.biz

8/7/2019



Turner Icení's new crew transfer vessel (CTV) Icení Revenge has completed its sea trials.

The UK company bought the vessel, then named Don Quixote, from Vroon at the beginning of the year with plans to have it undergo full refits.

Built in 2009, the 20m South Boat is re-engined with 1400hp MAN and **Hamilton 651 jets** which have the AVX control system and jet anchor.

The vessel has also been lengthened to 23m and has 25,000l of fuel onboard for refueling operations.

The work is carried out by Diverse Marine in Cowes, whose management was involved in the development and build of the vessel. In addition, the Diverse Marine team assisted Turner Icení in sourcing suitable craft and brokering the sale of the vessel.

'Ocean to Sky' coming to New Zealand Cinemas on October 31, 2019

Indiannewslink.co.nz
Auckland, October 5, 2019

In August 1977 a Shipping Corporation of India vessel unloaded three New Zealand jet boats at Haldia. At about the same time, an Air India plane landed in Kolkata carrying Sir Edmund Hillary and ten of his friends with 600 kgs of excess baggage.

Hillary's last major expedition, his 'Ocean to Sky journey' along India's Holy River Ganges from Ganga Sagar to the snowy peaks of the Devlok, was about to begin.

Millions watch their Hero

For the people of India, it was a pilgrimage led by a hero of almost God-like status and millions lined the river to watch.

"We roared in our jet boats into the great city of Kolkata, under the Howrah Bridge. And the crowds were absolutely mind-boggling. Three or four million people lining the banks, all of them waving, all there to get a glimpse of the amazing jet boats and my father, Ed Hillary." recalls Sir Edmund's son Peter.

"We departed upriver with the cheers of the crowd ringing in our ears. The warmth of our reception was incredible."

Healing Journey

For Sir Edmund and his 22-year-old son, it was a healing journey too, as they came to terms with the recent loss of Ed's beloved wife, Louise and daughter Belinda.

And for Sir Edmund's team of friends, it was a thrilling ride through the heart of India aboard three of New Zealand's iconic **Hamilton Jet Boats**.

Driven by the son and grandson of the inventor, and Sir Edmund's friend and Hindu Scholar Dr Jim Wilson, they navigated the Ganges' tiger-infested delta, crossed its vast, fertile flood plains and struggled up gorges guarded by fearsome rapids.

Then near Nandaprayag a waterfall stretching right across the river ended the jet boat stage of their journey. They continued their Ganga Tirtha on foot, sharing the sacred trails with other pilgrims, climbing via Kedarnath, Hemkund and Badrinath towards unclimbed peak.

Then, near the Ganges' snowy source the unthinkable happened. The first man to climb the world's highest mountain succumbed to altitude sickness and was rushed down in a desperate race to save his life.

Yet, to Sir Edmund, it always remained "the best journey of them all."

Revisiting India of 1970s

Revisit the India of the 1970s with majestic country boats under full sail, share the excitement of the crowds and get behind the myth to meet the "real" Sir Edmund Hillary as his friends recall the highs and lows, the laughter and the tears of this life-changing journey through a land they all loved.

'Hillary: Ocean to Sky' will be released in New Zealand cinemas on October 31, 2019.

Watch a trailer and read more about the film and the journey at www.michaeldillonfilms.com.au



The Best New Zealand Shore Excursions In 2019/20

CruisePassenger.com.au

27 September 2019

New Zealand remains one of Australia's top cruising destinations, beckoning cruisers with its stunning natural sights, rich culture and food. In the upcoming summer cruise season, lines have new, exclusive and classic shore excursion favourites lined up. We highlight 12 of the best.

Princess Cruises has expanded their 'Across the Ditch' Program with two industry-first overland excursions in New Zealand's North Island and over twenty exclusive shore tours.

All lines also offer plenty of options to explore the natural landscapes of New Zealand, from hiking through Kauri Forests with Princess Cruises, taking a train ride through the Southern Alps with Oceania Cruises, swim with the world's smallest and rarest dolphins with Norwegian Cruise Lines or just relaxing in the Manupirua Hot Springs with Royal Caribbean.

Guests of Seabourn can even explore the Fiordland National Park on a zodiac with expedition experts!

Celebrity Cruises is also courting adventure-seeking guests with a new picturesque hike to the Putangirua Pinnacles in Wellington. Both lines are also going to roll out Adventure Park Zip Lining in Lyttelton in the 2020/21 season.

Classic favourites such as visits to Akaroa's heritage sites and cruising the Bay of Islands are still in the program. Wine lovers will also be delighted with a Hawkes Bay Wine Trail with Oceania Cruises and guests can also taste Speight Brewery's 19th-century beer with Regent Seven Seas.

See what the lines are offering.

High Country 4WD and Jet Boat Adventure

Venture off the beaten track to visit the rugged hill country of the Southern Alps. Journey across the Canterbury Plains and Springfield to board a [Hamilton jet boat](#) at Waimakariri River Gorge. The jet boat adventure will take guests on a scenic ride deep into the heart of the Waimakariri Gorge, skimming over water at times only inches deep. Take breather with a buffet lunch at Rubicon Station before setting off on an off-road 4WD tour of Rubicon and Mt Torlesse Station and learn the history, geology and day-to-day farm of these areas.



Third Hukkelberg For Techno Dive

Maritime Journal
10 July 2019

Techno Dive AS, a diving company located in Haugesund, Norway, was handed its new diving vessel Katrine from Hukkelberg Boats in July.

The vessel is an HB 1411 LDC (Light Diving Craft), and is equipped to perform most subsea inspection, service and maintenance jobs in the Norwegian aquaculture industry.

The diving system aboard is designed and produced by Safe Air Diving, which has collaborated with Hukkelberg on the installation. The system is set up for two divers, and a large bottle bank with lightweight composite bottles. In addition to the logging system from Fathom, there is also a system for diving-suit heating, electronic monitoring of bailout pressure and a number of other functions to maintain safety and good working-conditions for both divers and diving supervisors.

The vessel is 14.9 metres long and almost 3.8 metres in beam. It is equipped with twin Yanmar 6LY440 engines driving HJ 322 waterjets from Hamilton, giving the vessel a top speed of around 33 knots fully loaded. It also has Hamilton's Blue Arrow manoeuvring system and Jet Anchor positioning system, making manoeuvring and handling of the vessel simple, as well as reducing fuel consumption and wear on the machinery.

In addition to generator, compressor, hydraulic aggregate and high pressure hose systems, the vessel is equipped with a deck crane to handle an ROV. It is also possible to drill rock bolts and hose underwater. A drying room and a workshop are located in front of the large aft deck, and in the spacious superstructure there is a toilet, pantry, resting benches and a saloon for the crew.

"We are proud to build Katrine, which has now become the third Hukkelberg vessel in Techno Dive's fleet. The vessel we have delivered today is a result of many years of experience in building special vessels to the diving industry, in combination with a good collaboration with Techno Dive", said Thomas Breivik, sales manager for Hukkelberg Boats.

Department manager for aquaculture at Techno Dive AS, Espen Odland Mörch, is also very pleased with the new vessel: "Exactly like a Swiss Army Knife, Katrine is a very versatile tool that fits perfect to our portfolio of services, and will help us perform services for our customers in a better and more efficient way."



Metal Shark Delivers Foil-Assisted Cat

MarineLog
16 September 2019

Jeanerette, La., headquartered shipbuilder Metal Shark has delivered a new excursion vessel to Southwest Florida tour and charter boat operator Pure Florida.

Sea Flight is a custom 40' x 14' welded aluminum foil-assisted catamaran designed and built to USCG Subchapter "T" standards and configured to carry up to 33 passengers.

Designed by Jutson Marine Design, the vessel features a highly efficient foil-assisted catamaran hull delivering performance, economy, and ride comfort.

Specially engineered forward and aft transverse hydrofoils elevate the hull at planing speeds to substantially reduce drag, resulting in significantly increased performance and fuel economy with modest power requirements.

Powered by twin 440-horsepower Yanmar 6LY440 diesel engines coupled to [Hamilton HJ292 water jets](#) via ZF Marine 280-1 transmissions, Sea Flight cruises at speeds in excess of 30 knots, and has a top speed of 40+ knots.

Sea Flight is the second Jutson-designed vessel of its type to be built by Metal Shark. Its layout has been optimized to accommodate a range of Pure Florida's eco tours, dolphin watching cruises, and offshore fishing trips.

Offering a safe, comfortable, and enjoyable passenger experience, the vessel is equipped with bench seating for up to 33 passengers beneath a large aluminum-skinned canopy with roll-up curtain package for weather protection. It is outfitted well-placed grab rails, rod holders, beverage holders, tackle storage, live wells, fish boxes, and coolers. White/red LED lighting is provided throughout for night trips, white/red LED lighting has been provided throughout.

The vessel is equipped with an enclosed head with fresh water sink.

A forward-positioned elevated helm station enclosed within a hybrid pilothouse offers full weather protection and a birds-eye view for the captain while still facilitating access to the passenger deck.

"Throughout the course of this project the enthusiasm of the Pure Florida team has been contagious and their desire to deliver the very best experience to their customers has been evident," said Dean Jones, Metal Shark's vice president of sales for law enforcement, fire rescue, and specialty projects. "We share in their enthusiasm and we're proud to deliver this advanced and efficient vessel to such a high profile and well respected operator."

"We recognize the need to fish further offshore, and our guests are telling us they want to fish deeper, faster," said Capt. Harry Julian, CEO of Pure Florida. "Sea Flight's cutting edge technology and capabilities can do just that. Bringing in this new vessel shows how heavily Pure Florida is investing in our customers' experience. The boat is ideal for half-day fishing excursions for the recreational angler and extreme long range charters for the avid angler. Sea Flight is a great option unlike any other currently available in Southwest Florida."

With locations in Naples and Fort Myers, Pure Florida offers a wide range of Sightseeing, river and sunset cruises, jet ski and boat rentals, jet boat thrill rides, fishing trips and charters, dolphin watch, eco and shelling tours, marine science educational field trips, and private family and corporate cruises.

The new Metal Shark vessel will be operated out of Pure Florida's Naples location at the historic Tin City boardwalk.



Vessel Review | Newbuild 19-Metre Catamaran For New Zealand's White Island Tours

Baird Maritime
July 3, 2019



The owners of New Zealand's White Island Tours, the Ngati Awa Group, approached local designer Teknicraft for the design of a vessel that could average 30 knots across to the island in most weather conditions, would have a shallow draught to enable bar crossings at any time, would be very stable when at rest, and highly manoeuvrable for the required bar crossing.

White Island is an active volcano, situated 28 nautical miles from the east coast of the North Island of New Zealand, in the Bay of Plenty. It is New Zealand's most active cone volcano, and has been built up by continuous volcanic activity over the past 150,000 years. The crossing is in mainly open, unprotected Pacific Ocean waters.

The design of Te Puia Whakaari is based on Teknicraft's latest technology, which includes the wave piercing hull, adjustable foil system, and an active ride control system.

The extended bow shape is very fine with low buoyancy. The purpose is to reduce pitching in waves when the vessel is operating in rougher seas. The reduced vertical accelerations not only significantly increase ride comfort, but also reduce drag associated with wave encountering.



The angle of attack of a wing or foil is directly related to the amount of lift it produces at a given speed. The ability to change the angle therefore allows the skipper to adjust the foil to suit the load and conditions in any particular scenario. In particular, when it gets rough and the vessel speed reduces to say 24 knots, the angle can be increased to provide more lift, which also ensures a softer ride.

The active ride control system is achieved using interceptors. With independent systems on the port and starboard hulls, any roll of the hull is eliminated. The pitch can also be controlled to remain stable which increases foil efficiency and fuel consumption.



White Island Tours' current vessels were very limited by the sea conditions they could operate in without passengers becoming unwell, and they had to operate at low speed. The newbuild enables them to operate on a far larger percentage of days in the year, and the high speed ensures that they can do more trips. During peak summer months, this could be three trips per day.

Due to operate over the very narrow and dangerous Whakatane sandbar, the boat is fitted with waterjets enabling trips to go ahead irrespective of tide. Whakatane's harbour is up a river, and the depth in the bar can get as low as one metre. Both harbour size and budget limited the size of the vessel to 18 metres hull length.

Te Puia Whakaari has full walk-around decks and large windows to enhance the experience when watching dolphins, whales and indeed the smoking island itself. The vessel carries 50 passengers to remain within the limit of certain regulations and crewing requirements.

The vessel is fitted with a modified version of Teknicraft's tender launch and retrieval system, similar to those fitted to its patrol boats. There is no pier or wharf at the island, so White Island Tours' passengers have to be transported between the boat and the shore using an inflatable boat. This needs to be done in the shortest possible time to maximize their time on the island. It is therefore important to have a reliable, safe and fast system to launch and retrieve the inflatable, numerous times every day.

The vessel is fitted with a 5.3-metre DSB RIB which can be launched in less than a minute without the use of any crane or other deck machinery. Retrieval is just as quick. A special boarding platform is built into the side of the vessel for passengers to safely step on and off the RIB whilst alongside.

In the engine room, twin 662kW engines drive **Hamilton 403 waterjets**. Waterjets enabled the designer to minimise the draught, whilst providing excellent manoeuvrability. Moreover it provides station keeping capability which is crucial whilst stationary at sea near the island.

The island trip takes passengers off the boat for an hour or more, during which time the boat awaits at sea. According to Teknicraft, station keeping is a far better solution than an anchor when weather is rough, especially whilst loading passengers on and off the vessel.

During sea trials the maximum, fully laden speed was 41 knots, with a 30 knot cruise speed achieved using only 72 per cent power.



ACC Champion Workplace Safety

CWF Hamilton & Co

THE HAMILTONJET parent company, CWF Hamilton & Co Ltd, was formed in 1939, centred on the workshop at Irishman Creek Station.

For the next 50 years, the company pursued a policy of planned diversification, a natural progression from the effective innovation and expertise initiated by the founder Sir William Hamilton.

Today, HamiltonJet employs over 350 staff in all aspects of waterjet design, production and service.

Along with the marine jet units, the company also produces

its own electronic and hydraulic control systems.

With over 60,000 waterjet units installed around the world, HamiltonJet represents the latest in waterjet propulsion technology. They are the preferred choice for the efficient propulsion of a wide range of high speed work and patrol boats, fast ferries, offshore crew boats, fire boats, fishing vessels, recreational and military craft.

The HamiltonJet waterjet is one of the most advanced and innovative marine propulsion systems in use today, and is at the forefront of waterjet propulsion

technology. Today we are consistently delivering vessel autonomy solutions in conjunction with our waterjet technologies.

HamiltonJet has been deeply immersed in this space for decades. Our first remote controlled vessel was commissioned in 1993. Since then we've worked in collaboration to equip a fleet of over 170 vessels with some form of autonomy or advanced skipper assistance across multiple regions, customers and applications.

Our waterjets are the perfect platform for skipper assistance

and autonomous technologies. They deliver end-to-end integration and interface simplicity, and our three electronic control systems each provide intuitive vessel control with options for dynamic positioning and autonomous integration.

Our mission is to continually optimise performance, efficiency and safety through innovation. With technology evolving at a rate of knots, we intend to exploit these advances to bring to markets, products and solutions that improve and enhance our customer's operations.



'Greening' port and riverine ops

The increasingly prolific Wight Shipyard Co. has added another string to its bow by giving first form to a hybrid-powered series of patrol/pilot boats. David Tinsley reports



The Chasewell 9m pilot cutter was conceived for minimised environmental impact at low-speed operation

A pairing of progressive UK companies from the specialised shipbuilding and technical consultancy sectors has yielded the first of a new generation of patrol and pilot boats employing a hybrid power installation. Constructed by Wight Shipyard Co. (WSC) and designed by naval architect Chartwell Marine, the Chasewell 9m pilot cutter was unveiled at the recent Seawork event in Southampton.

The project is the outcome of extensive R&D work carried out by the respective firms, and addresses the increasing challenges faced by operators as regards environmental standards as well as the fuel costs associated with fast craft and their typically widely varying duty cycles (see *Ship & Boat International* September/October 2018, pages 50-52).

With WSC having brought the UK shipbuilding industry back into the field of fast and lightweight ferry construction in recent years, the prototype hybrid patrol boat represents another strand of the yard's business development strategy, in terms of both newbuild type and

powering technology. "Building greener vessels has been an integral focus for some time now, so moving into hybrid options is the obvious next step forward," says WSC chief executive Peter Morton.

Minimised drag

The design and engineering of the new craft was conceived for minimised environmental impact at low-speed operation, with the possibility to rapidly switch to high speeds as and when required, and vice-versa. As well as reducing pollutant emissions, the ability to turn off the main engines and run in electric mode for prolonged periods promises significant savings in fuel costs and diesel maintenance.

Chartwell Marine's managing director Andy Page describes the vessel as having a unique hybrid system architecture and an innovative new hullform that minimises drag and resistance throughout the speed range. The hullform results from detailed investigations, applying computational fluid dynamics (CFD) techniques, into low-speed resistance, enabling efficient performance under both diesel and electrical propulsion. Chartwell's rationale for the specific technical approach has been that traditional hull designs, while appropriate for high-speed operation, may not be suitable when a vessel is being driven by electrical propulsion alone.

Switching between modes

The 9m craft is the first model in a series embracing designs of 11m, 14m, 15m and 18m, with the potential for further extensions to the range. The two main engines are Volvo Penta D3-series diesels, driving Hamilton

waterjets through reduction gears. The Chasewell powertrain features a hybrid system provided by the Kent company Marine & Industrial Transmissions (MIT) and its Italian manufacturing and technology partner Transfluid. MIT also undertook the role of integrator.

The Transfluid HM560 hybrid power module incorporated in the drive configuration delivers ratings of up to 164kW diesel power and 20kW electric power. Using rechargeable batteries and a battery management system, the unit actively manages power output and charge rate in accordance with battery status and condition. The control arrangements facilitate switching between operating modes, and the 'intelligent' software can integrate with other onboard systems for extended control and diagnostics.

Located in East Cowes on the Isle of Wight, off the southern coast of England, WSC started life as Shemara Refit in 2010 and took on its present name three years ago, since when the business has grown exponentially. UK domestic contracts for Thames Clippers, Red Funnel and Jacobite Cruises have been complemented by export work encompassing two 37m passenger catamarans for Mexico's largest ferry operator, Ultramar, and a recently delivered catamaran river ferry for Austria.

WSC also this year entered into an agreement with compatriot firm Arksen to develop and produce the latter's semi-autonomous hybrid explorer vessels (see *Ship & Boat International* May/June 2019, pages 59-60). **SBI**

Transfluid's HM560 hybrid power module actively manages power output and charge rate in accordance with battery status and condition



TECHNICAL PARTICULARS	
Chasewell 9m pilot/patrol vessel	
Length.....	9.6m (oa, incl Jet Guard), 8.7m (hull), 7.9m (wl)
Breadth.....	2.87m (oa)
Draught	0.74m
Main engines.....	2 x 147kW
Propulsion.....	2 x Hamilton waterjets
Hybrid power/electric motors.....	2 x 20kW
Energy storage/battery capacity	19.2kWh

ON THE WAYS

Dakota Creek delivers ferry with Tier 4 emission controls



New 445-passenger ferry is working in San Francisco Bay.

The first U.S. passenger ferry with Tier 4 emissions controls went into service with the San Francisco Bay Ferry system in March. The 445-passenger high speed *Pyxis* is the fifth new ferry built for the fleet since the Hydrus class started in 2017 and serves the growing 28-mile Vallejo route.

“They operate on a longer route than the Hydrus boats. We’re a one-hour trip,” said Martin Robbins, general manager of the ferry system’s Vallejo division. “These are waterjet boats, so they’re designed for 34 knots. They will make 37 or 38 knots running light.”

Delivered in February by **Dakota Creek Industries Inc.**, Anacortes, Wash., the 142.7’x40’x5.4’, all-aluminum *Pyxis* is the first new boat on the northern bay route since 1997, and the first of three to be delivered by the end of 2019. It is similar in design to the earlier waterjet ferries also conceived by designers at **Advanced Multihull Designs (AMD)** of Australia, sized up to accommodate steady demand growth on the route, said Robbins.

“It’s largely the same design, 2.6 meters (8.5’) longer so we can get passenger capacity up from the mid-300s to 445,” he said. “We’ve seen steady growth for five to six years. We slowed down a little bit, and that might have been because of our capacity limits. The parking lots are full and we’ve

had to turn people away. Hopefully these new boats will help turn that around.”

Power comes from two **MTU 16V4000M65** engines rated at 3,433 hp each, driving a pair of **HamiltonJet HT810** waterjets through **ZF 9055** gears. Propulsion integration by **Pacific Power Group**, Kent, Wash., includes the Tier 4 emissions controls — a first for U.S. ferries and an expensive endeavor that other operators have thus far avoided.

“We didn’t have any choice, it’s the law” under California state mandates, said Robbins. PPG supplied power packages and emissions controls for the Hydrus-class boats that surpassed its nominal Tier 3 ratings, classing them as the cleanest U.S. passenger ferries.

Operated by the **Water Emergency Transportation Authority (WETA)**, the bay ferry system has long been a pioneer in cleaner boats. The 320-passenger *Solano*, delivered by Dakota Creek in 2004, was equipped with an early, experimental selective catalytic reduction (SCR) emissions system that was not so efficient “but it proved very educational,” said Robbins. “In the next 12 to 14 years the technology has become more advanced.”

Sisterships *Lyra* and *Vela* are scheduled for delivery in June and December. WETA officials say the *Pyxis* was

Hamilton Jet signs major order with Taiwan Coastguard

HAMILTONJET HAS RECENTLY been awarded a significant project order from Jong Shyn Shipbuilding Group for the Taiwan Coastguard, which is the largest single project in the company's recent history.

HamiltonJet currently employs over 300 people in Christchurch and this order represents a substantial amount of business and considerable growth opportunity for the company and the Canterbury region.

HamiltonJet hosted the Taiwanese Shipbuilding and Coastguard delegation on May 8-9, 2019 at their Christchurch factory. The delegation included, amongst other delegates, the Vice-Chairman of Jong Shyn Shipbuilding Group, the Deputy Director of the Taiwan Coastguard and NZ Marine Executive Director Peter Busfield.

Over the next few years the Taiwan Coastguard will be installing Hamilton Jets in most of their 100-plus new Coastguard vessels, some over 60 metres in length.



L-R: Hamilton Jet Chief Financial Officer Vince Mortimer, Mr Wu of Taiwan Coastguard and the Vice-Chairman from Jong Shyn Shipbuilding Group.

Jet boat business remains buoyant

Russell Fredric

Gore-based jet boat manufacturer KeelowCraft Boats continues to build on its decades of success, based on a reputation which has attracted significant commercial clients.

Co-owner Paul Cross says forward orders over the next year are very strong on the back of another good year in 2018.

KeelowCraft's most popular recreational boat remains the popular Riverwild series from 4.2 metres to 4.8 metres long and are typically customised to suit clients' individual requirements, from the fit-out to engine preferences.

"We offer lots of different options, we also offer training for anyone that hasn't been jet boating before. We will build a boat to whatever specifications people require."

The most popular engines are Chevrolet V8 marine units, but anything from turbocharged four cylinder engines and upwards are available.

"The Chev engine in its small block and the later LS series is still very popular for its power to weight ratio and its reliability."

Last December, KeelowCraft delivered two jet boats to the internationally renowned tourist operator, Shotover Jet.

The company has a long-standing relationship with Shotover Jet and Dart River Safaris, owned by Ngai Tahu Tourism.

The latest boats, powered by twin 350 cubic inch V8 Chevrolet engines with twin Hamilton Jet units, are six metres in length and have a capacity to seat 14, excluding the driver.

Build time for each boat is 1000 hours, which equates to six months work for two staff.

Shotover Jet are trialling a different engine to what has been previously used in its boats.

"They are trialling, at the moment, a later model direct injected LS series; it's the new generation of the engine."

While the boats are supplied complete to Shotover Jet, they are built to a hull-only specification because a full sign-off to marine survey standards is required by Shotover Jet staff before they can be commissioned.

As well as manufacturing new boats, KeelowCraft also undertake repairs and maintenance, including on Ngai Tahu Tourism's fleet.

The high profile of Shotover Jet has been great for KeelowCraft's business, Paul says.

The company is presently building a Riverwild 480 for the Department of Conservation for use in South Westland. It will feature a removable back seat to allow equipment, including pest traps to be carried.

KeelowCraft's first order this year was also for a 480 Riverwild, for a client in Cambodia.

"It's for a businessman whose got two or three different businesses on a river.



KeelowCraft's most popular recreational boat remains the Riverwild series.

"The day we got back from [Christmas] holiday he was standing at the door; we gave him a demonstration and he signed the papers."

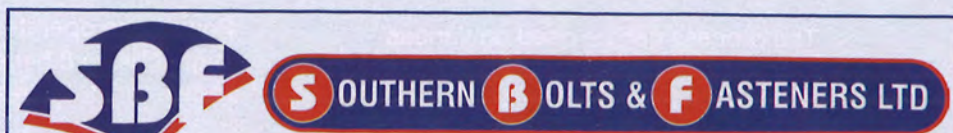
The client discovered KeelowCraft on its website and on Facebook after looking at options in Canada.

"He just liked our product and he was sold. It was a great coup for us. I think there will be a lot more interest once there are some of our boats in that part of the world."

Paul along with his wife and business partner Sarah recently marked their second year as the owners of KeelowCraft.

Paul says the company's reputation for producing

quality boats built by a highly skilled team, along with having good systems such as lean manufacturing processes, have been a real asset during the past two years.



Zealand, and will operate on Kitsap's current cross-sound ferry route between Bremerton and downtown Seattle.

The design of the new vessel was based upon the ultra-low-wake *Rich Passage I* (RP1), built by All American in 2011. AAM, the exclusive builder of Teknicraft hulls in North America, was tapped as the sole source to build this vessel. Teknicraft's patented hydrofoil-assisted hull design has a low-wake wash energy signature that will not degrade the sensitive shore lines of Rich Passage, shipyard officials said.

The *Reliance* was designed to carry 118 passengers and travel at a service speed of up to 36 knots. AAM constructed the hulls with high tensile strength 5383 aluminum alloy. The passenger cabin and deck were made from composites. The hydrofoil was molded in carbon fiber and automatically adjusts as the vessel transits Rich Passage.

Main propulsion will come from four Tier 3 **Caterpillar** C-18 diesel engines connected to **HamiltonJet 403** waterjets. The shipyard utilized lightweight aluminum honeycomb panel materials for finishing the interior spaces and applied high performance bottom paint to help meet speed and wake requirements.

In 2005, through a series of federally funded wake wash studies, it became evident that the wake signature of a Teknicraft standard hydrofoil-assisted catamaran produced the least amount of wake wash energy within its vessel class. Kitsap Transit contracted with **Pacific International Engineering**, Edmonds, Wash., to spearhead the ongoing research efforts in conjunction with All American and Teknicraft to further enhance and optimize the vessel's design.

Teknicraft's principal naval architect,

All American launches low wake, high speed ferry for Kitsap Transit

All American Marine Inc. (AAM) has launched the second of three low-wake, high-speed passenger vessels for **Kitsap Transit**.

The 77' *Reliance*, an aluminum catamaran with a composite superstructure, was launched in Bellingham, Wash., in March. The vessel was designed by **Teknicraft Design**, Auckland, New



New ferry will run between Bremerton, Wash., and downtown Seattle.



Heritage Trust Chatter



Heritage Trust Projects
By Tony Kean

There's nothing more satisfying than hearing about a classic jet boat being brought back to life. Dave Anderson's pretty keen on old jet boats, so it's only natural that as an employee of HamiltonJet NZ he would let some of that passion flow through to the workshop. Project Turbocraft is a combination of his and HamiltonJet's commitment to preserved history, so thanks for that!

Project Turbocraft



by HamiltonJet's Dave Anderson (DLK)

When it comes to old jet boats, there's no hiding my passion for what they represent. I've been around them all my life and for many years now I've had the pleasure of mixing my work with my pleasure at HamiltonJet NZ, building, maintaining and repairing jet boats. I really like early wooden and fibreglass/wooden boats and have bought a few over the years and restored them back to life. One of the latest, Guy Mannering's Jet,30 which is now owned by John Wicken.

One special old boat I acquired off John's brother Ed Wicken is a Jet 30 once owned by Eric Chapman who ran Hamiltons. It's one of the first 6 Jet 30's ever built. Right now though the project at hand is a 1961 Hamilton Turbocraft Jet 41 previously owned by Stu Trainer and seriously in need of significant work to bring it back to life.

That new life came in the form of five first year apprentices from HamiltonJet - three from the main works and two from the marine division who have been assigned two hours per week each to experience some of the old art of jet boat building, helping restore this boat. Thanks

to them and with help from the marine division management group, this old Jet 41 should make a full recovery!

The fibreglass hull had been restored by a previous owner and the old wooden deck has been removed and the timber framework repaired. A marine plywood deck and framework has now been fitted.

Sourcing period fittings and researching the history of the craft has been part and parcel of the project. The power plant is an unusual 3 stage Buehler jet unit which was manufactured under license by the Buehler Corporation at the then Indiana Gearworks in the USA. This is the company that built the jet boats that Jon Hamilton led the way up the Colorado river through the Grand Canyon. Powering this boat will be a Ford Zephyr straight 6.

All going well the Jet 41 project is expected to be completed prior to Christmas 2019. **JET**





Shepler's is building a new 210-passenger ferry that will work in Michigan. Pictured above is the 265-passenger *Capt. Shepler*, built in 1986.

in June. "The work being done here will support 40 local families and result in one of the finest vessels plying the straits today."

Instead of propellers, the new ferry will have four **HamiltonJet** HM461 waterjets connected to **Yanmar** AYEM-ET Tier 3 main engines, producing 803 hp at 1,800 rpm each, through **Twin Disc** MGX-5146SC marine gears with 1.33:1 reduction ratios. HamiltonJet will also take care of the boat's steering and controls needs.

The propulsion package will give the boat a running speed of 30 knots. The ferry will have an 8' draft.

The new boat will be the first fast-ferry application of waterjets from HamiltonJet in the U.S. Great Lakes, and the first application of its new advanced vessel control system in the U.S., according to Moran and Shepler's officials.

The new passenger vessel will be wheelchair accessible and have a big aft deck for luggage, bikes and strollers. It will also include enhanced air conditioning and heating capabilities to keep passengers comfortable in all weather conditions.

Construction will require some 13,000 man-hours on the

shop floor over the next several months. Capacities will include 900 gals. of fuel and a cargo deck that will measure 20'x18'. The electronics suite will include **Furuno** 1935 radar and GP33 GPS and **Sitex** Class A AIS.

This fall the 60-ton ferry will be trailered to Moran Iron's Port Calcite Collaborative, a deepwater port in nearby Rogers City, Mich. It will then launch in Lake Huron and be sailed in spring 2020 to Shepler's facility in Mackinaw City where it will be detailed in preparation for its inaugural run next summer.

Moran Iron has done routine repairs and extensive modifications on four Shepler vessels. The current newbuild is the second ferry it has built for the company.

Moran's first ferry for Shepler's was the \$3.8 million, 281-passenger vessel *Miss Margy*, launched in 2015. *Miss Margy* is Shepler's largest ferry.

— K. Hocke

WB

Moran Iron building 210-passenger ferry

Shepler's Mackinac Island Ferry, Mackinaw City, Mich., and **Moran Iron Works**, Onaway, Mich., are joining forces a second time to build a \$4 million 84'x20'3", 210-passenger aluminum ferry in northeast Michigan.

Designed by **Seacraft Design**, the ferry is scheduled to carry its first passengers in the summer of 2020.

"Moran Iron Works is all in on fulfilling Shepler's commitment to build in Michigan, by Michigan, for Michigan," Tom Moran, the shipyard's CEO and founder, said during a news conference

Big and Clean

As ferry transit grows, fleets get more efficient and 'green.'



The *Pyxis* is the first U.S. ferry with Tier 4 emission controls.

By Kirk Moore,
Contributing
Editor

Ferries continue to be a dynamic sector of the workboat industry, with steady passenger growth and innovative design — bigger, faster vessels for major metropolitan markets, and a new wave of hybrid propulsion.

Designers and builders are responding to demand for cleaner-operating vessels, pushed by California air-quality mandates and moves by **Washington State Ferries** toward developing hybrid and electric power. On the East Coast, ferry operators tend to stick to proven Tier 3 emissions-approved designs. But there's also interest in hybrid-electric drive for making new ferries good neighbors in densely populated waterfront neighborhoods.

The first U.S. passenger ferry with Tier 4 emissions controls went into service March 4 with the **San Francisco Bay Ferry** system. The \$23 million 445-passenger high speed *Pyxis* is the fifth new ferry built for the system administered by the Water Emergency Transportation Authority (WETA) since the agency started acquiring its new *Hydrus* class in 2017.

"They operate on a longer route than the *Hydrus* boats. We're a one-hour trip," said Martin Robbins, general manager of the Bay Ferry's Vallejo division. "These are waterjet boats so they're designed for 34 knots. They will make 37 or 38 knots running light."

The first of three new 142.7'x39.4'x5.4', all-

aluminum boats being delivered by **Dakota Creek Industries**, Anacortes, Wash., in 2019, the *Pyxis* serves the growing Vallejo route. It is the first new vessel on the northern bay since 1997, and very similar to earlier waterjet ferries conceived by designers at **Advanced Multihull Designs (AMD)** of Australia.

"It's largely the same design, 2.6 meters (8.5') longer so we can get passenger capacity up from the mid-300s to 445," said Robbins. "We've seen steady (passenger) growth for five to six years. We slowed down a little bit, and that might have been because of our capacity limits. The parking lots are full and we've had to turn people away. Hopefully these new boats will help turn that around."

Two **MTU 16V4000M65** engines rated at 3,433 hp each drive a pair of **HamiltonJet HT810** waterjets through **ZF 9055** gears. Propulsion integration by **Pacific Power Group**, Kent, Wash., includes the Tier 4 emissions control, a first for U.S. ferries. Earlier PPG supplied power packages and emissions controls for the *Hydrus*-class boats surpassed their nominal Tier 3 ratings, classing them two years ago as the cleanest U.S. passenger ferries.

San Francisco Bay operators were early pioneers in cleaner propulsion technology. The 320-passenger *Solano*, delivered by Dakota Creek in 2004, was equipped with an early, experimental selective catalytic reduction (SCR) emissions system that

WETA

Scarborough Dippers swam daily throughout July 2018 for Sumner Lifeboat



The 'blue ARROW' MouseBoat manoeuvring controller shown here to the left of the helm provides another option for governing the engine and steering controls

Each of Sumner Lifeboat's crafts are named after an organisation that has contributed to the purchase of the craft.

The 12.5m lifeboat Blue Arrow Rescue is named for its jet engine control system, 'blue ARROW'. This was supplied by **HamiltonJet**, Christchurch's own specialists in jetboat engine propulsion and control equipment, who also supplied the waterjet units. 'blue ARROW' is an electronic system that uses a hand-sized 'MouseBoat' manoeuvring controller that governs the engine throttle, gearbox and waterjet reverse and steering deflectors.

"It works just like the mouse we all use with our computer," explains Lifeboat Coxswain Blair Quane. "The skipper can steer, speed up and slow down the boat with one hand."

HamiltonJet recently fitted Blue Arrow Rescue with another amazing piece of technology – the JETAnchor system.

This system has a 'Station Keeping' or 'Virtual Anchor' mode that automatically holds vessel position more accurately than is possible using manual control. The station-keeping mode sets a single GPS point mooring and governs the jet units, which keep automatically adjusting for the wind, tide, swell and other influences, to make the boat stay in one spot. **HamiltonJet** has used Blue Arrow Rescue to demonstrate their technology, which has many applications especially with autonomic transport and self-drive boats becoming a reality.

Many thanks to **HamiltonJet**, who are generous with maintenance and are always there to help Sumner Lifeboat.

US

US gears up for offshore wind boom

The US Offshore Marine Service Association (OMSA) – which comprises 225 members, including 100 OSV owners and operators – has established a dedicated Wind Committee to pursue opportunities within the country's offshore renewables sector.

The association insists that all domestic offshore wind farm support boats must be built and maintained “in a Jones Act-compliant manner”. However, opportunities are ripe for international naval architects, as UK-headquartered BMT Specialised Ship Design has discovered. Wind energy major Ørsted and support services provider WindServe Marine recently contracted BMT to draw up the plans for two aluminium CTVs to service the US' nascent turbine farms. These will reportedly be the second and third such vessels constructed in the US, following the lead set by *Atlantic Pioneer*, which was built by Blount Boats in 2016 (see *Significant Small Ships of 2016*, pages 12-13). The state of New Jersey recently awarded Ørsted a contract to develop 1,100MW of wind energy off its coastline.

The first of the new duo will be built by US Workboats in North Carolina, and the second by Senseco Marine of Rhode Island. Each will measure 22.3m × 7m, draw 1.4m and accommodate four crewmen and 20 technicians. Each CTV will run on four Scania DI16 engines and four Hamilton HM461 waterjets, producing a top speed of 28knots.