Feadship Centinela IV Repowers

To date, this is the most technically difficult, complex, and stressful re-power MER has done. The M/Y Centinela IV is an immaculate, 30 year old Feadship. Recommended by Radke Marine, Captain Daniel Anderson came to us for two new generators. In our first conversation, he told us this would be “...the nicest thing you’ve ever built”. He was right.

The boat had twin, sound enclosed, CAT 4.4, 100 kW gen-sets. We would be replacing them with John Deere 6068TFMs and Marathon Mariner generators with PMGs. That’s simple enough. It was the one-off skids and sound enclosures Dan specified that would be the real design challenge. He wanted the best- 90% vibration isolation and 65 dB @ 5 feet. That kind of performance would require massive 1200 pound skids, perfectly balanced and positioned compound mounts, and very sophisticated sound enclosures; with sealed connection points, high performance sound foam and air plenums. We went so far as to design water jacketed dry exhaust thimbles, with custom 5-ply flex sections, so we could create an air tight seal where the exhaust exited the enclosure.

Further complicating matters, Dan wanted the entire R&R done dockside in La Paz Mexico. Not going to a yard would save tens of thousands of dollars, but it meant we had very limited resources. Cutting holes in the boat wasn’t an option, so everything had to be designed as precision-fit, bolt-together pieces to get it into the ER. To keep the install simple, everything was fully modeled in our 3D CAD program. The skids were tailor fit to the vessel’s engine beds, and the fuel, oil, exhaust, electrical and plumbing locations in the skids placed to match up with the boat’s.

Expectations were high, so the initial start-up was stressful. The real proof that we had done okay came from Dan himself. He said they were the quietest 100 kW gen-sets he had ever heard, and far exceeded his expectations. Vibration isolation was better than 98%, and they were so quiet you couldn’t hear them running over the ambient engine room noise. It was an exhaustive build, but rewarding for everyone in the end.

On The Blog

The MER Technical Support Blog is online, providing hard to find information for mariners, aiding our customers in keeping their equipment running safely and efficiently. We are especially strong on how-to resources.

Some of our recent additions are:
• Oil regeneration systems and how they work
• Marine dry exhaust plumbing do’s and don’ts
• Diesel engine coolant explained

The Blog is also loaded with as many high resolution images as we can fit, as a picture always does a better job of explaining than we do!

Check out our blog at: www.merequipment.com/blog
Featured Products

MER S.C.O.R. Filter System

SCOR stands for SeaChange Oil Refrigeration. It is our lube oil polishing, drying and additive replenishing system for marine diesel engines. In reality, oil doesn’t wear out, it just gets dirty. The SCOR system continually cleans and rejuvenates it to new condition. Oil is diverted from the block, routed through the filter and drier, and back to the pan to recirculate through the engine. The drier is a heater element that removes moisture from the oil and the filter is impregnated with a time released additive package which keeps your oil tip top. Oil leaves the filter cleaner than it does coming out of the barrel. The long and the short of it is, you don’t have to change your oil any more (though we stop short of that recommendation). There are lugs running the system, with over 20,000 hours since their last oil change. The savings pay for the system in less than a year’s time. With regular oil analysis as part of the system you are assured the lubrication qualities are as good or better than new oil.

MER SeaFire Alpha IIP, LED Projection Light

LEDs are an increasingly popular choice for marine lighting solutions. It makes sense, as they use 10-20% of the energy, last much longer, and are not subject to the failures common with halogen and HID lights (low/ high pressure sodium and metal halide). Suppliers, MER included, see the benefits and everybody is jumping on the bandwagon. With all the choices available, it’s hard to figure out what is worth buying and what is garbage. That said, the SeaFire LED lights are a cut above. LED chips keep getting brighter, and so do our lights. The SeaFire Alpha IIP at 44,000 lumens and only 400 watts, sets the bar pretty high. All other metrics aside, it’s about as bright as 4 or 5 - 1000W halogen or quartz lights. It also runs on 80-440 volts, has a 5 year warranty, is waterproof, instant on and off, and is priced about the same as lights that are only half as bright.

LEDs are very different from traditional light sources, and have a bit of a learning curve. If you have any questions, or are interested in becoming a dealer, give MER a shout.

MER Training Classes

MER is known as the place to call for over-the-phone troubleshooting and diagnostic help. A few years ago, we realized a need was not being met. Our customers were expressing interest in learning about preventive maintenance servicing, and marine diesel diagnostics. Resources are very limited for anyone looking to learn more about their boat’s engine and auxiliary systems. Since there was not really anyone doing it we thought “why not us?”. Response has been positive, so we’ve continued to add topics. Class subjects can range from engine cooling to voltmeter use and electrical troubleshooting, marine power generation, power trains, fuel injector pop testing coolant testing and oil analysis, to name a few. They are geared toward beginners, DIYers, and professional maintenance staff. To ensure participants receive maximum benefit from the class, lessons are tailored to the skill level of the students and focus on the engines they are using. Whatever the aptitude of the student, they leave better informed, and with invaluable knowledge of how to better maintain equipment and prevent failures aboard ship.

Boat Owner’s Tool Box

Diesel Coolant Basics and Testing Equipment

Coolant is a necessary evil. It may keep your engine from overheating, but running water through an iron block creates its own set of problems. If coolant isn’t properly maintained, it can cause some of the problems it’s supposed to prevent. This is especially true in newer diesels, with EGR systems and higher operating temps. Stray current can quickly deplete coolant additives which protect against cavitation. Left unchecked coolant can freeze and crack your block, boil and cause your engine to overheat, become corrosive and eat away at components and seals, cause rust, deposit scale which diminishes heat transfer, fuel electrolysis between dissimilar metals, and cause cavitation which will erode cylinder liners and water pump impellers. This is all easily avoided with some basic coolant knowledge and simple, periodic monitoring.

As far as diesels go, there are really only two kinds to consider; fully formulated conventional or an extended life coolant. Both are a mixture of glycol (either propylene or ethylene) and water, with an additive package. Fully formulated conventional coolant uses a Supplemental Coolant Additive package, or “SCA”, to mitigate all the detrimental effects mentioned earlier. Brands vary, but different SCAs usually contain nitrate to protect iron and steel, tolytriazole to protect copper and brass, borate or phosphate to buffer acids (formed as glycol breaks down), silicate to protect aluminum, nitrite (sometimes accompanied by molybdate) to form a cavitation-resistant barrier on sleeves. Extended life coolants take a different approach and use Organic Acid Technology, or “OAT” in place of an SCA. The neutralized organic acids protect engine components by forming a thin protective barrier on the inside of the engine. The key to good coolant maintenance is picking a coolant and sticking with it, then following the manufacturer’s maintenance and replacement guidelines. It’s usually good practice not to mix different coolants.

Fully formulated coolants work well, but are only good for two years, need to be tested every six months, and must have their SCA topped off as the additive package becomes depleted by use. Extended life coolants are good for six years, or 6,000 hours, and the organic acids last the life of the coolant. Some OAT coolants do use nitrates to provide extra cavitation protection (called NOATS), and must have an “extender” added at the three-year mark to maintain the nitrite level.

Either way, coolants should be tested periodically for dilution, contamination, additive depletion, and acidity. Every boat owner’s toolbox should have test strips, and a refractometer. Test strips can be used to test freeze/boling point, nitrite levels, and pH level. Because different coolants use different SCA packages, it’s important to use test strips formulated for that coolant. Coolant freezing and boiling points are determined by checking the specific gravity of the coolant. Test strips can be inaccurate if the glycol content is over 60%. We recommend using a refractometer over a hydrometer. While hydrometers are accurate to +/- 10 degrees, refractometers are usually accurate within 1 degree. They can also be used to check battery electrolyte as well.

Instructions vary on test strips, but they all work like litmus paper. Coolant is absorbed by the small paper strip, which then changes color to reflect a value. The color is then compared to the provided color chart to determine the condition of whatever the strip is testing for. A good kit will contain three kinds of strips, one for coolant concentrate, one for nitrate (or whatever additive is being used to protect against cavitation) and one for pH.

Refractometers are not as common as hydrometers and cost a little more, but they are easy to use and don’t require batteries. In addition, they do not wear out and are self-calibrating. Unlike hydrometers, results aren’t effected by coolant temperature.

Coolant monitoring is as important as oil analysis. With a couple of simple tools, and basic understanding of how coolant works, it’s quick and easy.
The Right And Wrong Ways To Get The Most Out Of A Generator

President Bob Allen discusses generators, electrical heat, 480 VAC wiring and transformers.

In my 35 years as a commercial fisherman I was always looking for ways to catch more fish, or cut my operating expenses to maximize the bottom line. I’ve experimented with all sorts of gadgets and methods. Some worked, some didn’t, but coming up with a better mouse trap was never far from my mind.

In our other business, MER, our passion for continual improvement is the same. We’re always trying to figure out how to build a better generator, one that’s easier to maintain, with greater fuel and electrical efficiency. There are a lot of good engines on the market, some more fuel efficient than others, but the best of the best are pretty close in gallons per HP. There are engine makes out there not even in the fuel savings ballpark.

Choosing engines that most efficiently convert fuel to horsepower is a given. That being said, choosing a generator end that converts engine horsepower most efficiently to electricity is just as important. Alternators generate heat, and heat equals electrical resistance. As the temp goes up the electrical resistance increases along with it, making it harder to push the same amount of current through the generator. Simply put, the more current (Amps) a given generator is pushing through a conductor of a given size the less efficiently it’s doing it.

There are limits to how much heat is allowable and ratings of 80°C to 150°C temperature rise across the generator windings are common. The thing that is important to remember though is that the temperature ratings are in place not for the sake of efficiency, but for the sake of the insulation on the windings. Melt the insulation, and you’ve got a dead short.

The Right And Wrong Ways To Get The Most Out Of A Generator

There is a way to have your cake and eat it too, and that’s in how you wire your generator. There are a lot of boats out there running on 208, but switching to 480 volt generator wiring is an effective way to actually boost efficiency and get by on a smaller generator. 480V generators have up to a 60% increase in motor starting efficiency, which means you don’t need as big a generator wired for 480 as you would wired for 208. Additionally, they run cooler at the equivalent KW and so make more KW per gallon of fuel burned. (See the chart above.) The same generator running at the same temperature makes almost 10% more electricity at 480V than it does at 208V. The great thing is any 12 wire generator wired at 208 can be connected to produce 480 by switching a couple terminals. You might remember the relationship between Line to Line voltage and Line to Neutral voltage in a three phase system is the square root of three, V3. Multiply your L-N voltage by 1.73 (V3) to get your L-L voltage, so 120V x 1.73 = 208V. It’s also important to note, just about any electric motor running on 208 will also run (more efficiently) on 480, so there’s no need for new motors.

So at 480, a generator requires less fuel to make the same amount of power as one wired at 208, and can start a much bigger motor. It also cuts the costs of boat wiring in half. If you have purchased any wire for your boat lately you know that $5.00 for wire doesn’t go as far as it used to. Wire size and breaker size are a function of how much current or how many Amps they can carry. More amps equals more copper, which explains why starter cables are so big and so expensive. Watts/Volts = Amps, which

(3) to get your L-L voltage.

Upcoming

Pacific Marine Expo

LED Demos

MER Training
Classes are catered to the make and model of the attendees. Inquire with Brian for scheduling. We currently have an engine training class set for December 7th.

Seattle Boat Show
January 27-Feb 03, 2013, CenturyLink Field Event Center & South Lake Union

New Products
• Marine Radiators
• Equipment Enclosures
• LED Fixtures
• Air inlet Silencers

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The Right And Wrong Ways To Get The Most Out Of A Generator (continued)

From The Founder
The End of Traps & Beginning of a New Era in Kodiak Fisheries

Ivan Fox remembers the years of debate, the eventual abolition of trap fishing and the changes to the industry that followed. It was a time of upheaval and growth for the processing plants, the fisherman, and their communities.

Much has been said about the impact fish traps had on salmon runs, commercial salmon fishing, and their eventual demise in Kodiak and throughout Alaska. Part of the drive for statehood was the desire of Alaskans to wrest control of fishing regulations away from the Federal government and outside interests, so traps could be banned. Since the first trap pike was driven in 1906, natives, local fisherman and pioneers had been waging an increasingly heated fight to ban them. Ratified in 1956, so fervent was the want to be rid of traps, the Alaska constitution contained a provision banning them. Alaska did not become a state for another three years, on January 3, 1959, but traps were abolished a few short months after the territory passed into statehood. In 1958, 243 traps participated in the Alaskan Commercial Salmon Harvest. In 1959 there were 11 native traps, and by 1963, only two remained.

The fisheries were changing. Ivan began working for the San Juan Fishing and Packing Co. in ’43 as a deck hand on the fish tender San Antonio. By the time traps were banned in 1959, he’d been running the Uganik plant for three years. When he arrived in Kodiak, there were 11 salmon packing companies on the island, operating 13 packing plants. Of those 13 plants, five had traps that year: San Juan Fishing and Packing operated four traps out of its Uganik plant. Kodiak Fisheries operated four-five traps from its Port Bailey facility off of Kupreanof Strait, and two more from its Sheanwater Bay plant on the east side of the island. On the south end, Pacific American Fisheries operated three-four traps in the Attiaq area. Kodiak Salmon Packers had a canneroy at Larson Bay with three more traps. Uganik Fisheries, would have been the sixth, but wasn’t in operation that summer. Purchased by San Juan in 1945 and known as Uganik Bay Herring Plant, Uganik Fisheries had three trap sites later used by San Juan, giving them a total of seven.

Trap fish accounted for 50% of San Juan’s total pack. Whether by legislation or attrition, Ivan felt the traps’ days were numbered. Seiner vessels were becoming bigger and more efficient, and traps were incredibly expensive and time-consuming. They had to be removed every fall and reinstated the following spring. In addition, seiners only had to stay 300 feet or more away from a trap, and became very effective at corking them.

Banning the traps lead to a boom in the fishing fleet. To keep the catch up, San Juan took a three-pronged approach. They built up the company fleet, and put the word out they would finance new boats for fishermen. There was already a boat-building boom going on in the NW, much of which was a legacy of the war effort. Dave LeClerq, among others, were building boats like mad for the Bristol Bay fleet, which had been allowed to switch from sail and oars to motor boats in 1951.

The third tactic was to finance set-net operations where all the traps had been, and get people fishing for them. They got a lot of response, and people started snatching up the trap sites.

“The set net operation got to be quite an operation. I’ll always look back at that operation of the set-netters as the settlement of Uganik Bay. There was nobody around Uganik Bay, cabins or anything. But once we started this, the people that we put on and financed, were young, ambitious people and hard working. They played hard too. They came in and put up tents and tent frames. In a few years you go back and look at them-they had cabins. They had wall to wall canning, hot and cold running water, refrigeration. It just was a marvel. It kind of shows you how I guess the early days were for settlers, how people built up.”

It is estimated that banning traps, and the efficiency they had, directly created 6,000 fishing jobs, and generated untold number in the industries supporting the fleet. The seine fleet quickly grew by some 45% following the ban. The smaller boats and skiffs which had been the mainstay were quickly replaced by larger vessels that could pack more fish and take heavier weather.

The increase in number and size of the boats, in part fueled by packing company financing, helped the fleet grow and develop the island’s crab and shrimp fisheries... people started bringing in boats from CA. Sardine boats. Sardine business was falling on its face down there, so this gave the sardine fisherman a chance to either get into crab or get rid of their boats. As I recall one of the first ones was Lloyd Cannon, he picked up the Oceanic. It had been a sardine boat. So there was a lot changing right in

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From The Founder (continued)

that time. Crabbing, crabbing was hot and heavy there in the late ’50s. We got involved, San Juan. We had an operation, joint venture with Kadiak Fisheries in Kodiak called Alaska King Crab Company. But eventually the crab played out. I always thought it was overfished, but I’m kinda convinced now by one of my friends that was on the board of directors; he said he was convinced from the research the reason the crab left was because the water temperature around Kodiak went up, I think three to four degrees. He said one degree temperature would be about six degrees to us. It warmed up and the crab moved back out into deeper water. So crabbing was over, and they closed the season, and shrimp, shrimp the same. It just disappeared."

That theory, now known as Regime Change, states that as water temperatures shift, so do the fish populations. That change, which negatively impacted shrimp and crab, may have also propelled the rise of halibut and pollock stocks. Similarly, the shifting political climate in Alaska was the catalyst which fueled both the rise and fall of trap fishing, and provided the fertile ground for the rise of other gear types. Ivan has watched over 70 years of change in the Alaskan fish stocks, fisheries management, and harvesting and processing models. Who knows what the future will bring… here’s to hoping the next 70 are as engaging, and as bountiful!

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