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# UNDERSTANDING SHIP FIN STABILIZER AND ITS OPERATION

**Madan Kanagaraj** - GME.,

The function of a fin stabilizer, found at the bottom part of the ship's hull, is to provide resistance to the excess rolling of ship in either direction. Many seafarers have not seen a real fin stabilizer until the ship goes to dry dock for hull inspection and surveys. This does not rule out the knowledge that every on board engineer and officer must possess regarding the components and functioning of fin stabilizer system.

Let's take a look at the main components of fin stabiliz

## Components

**1. Two fins** forming part of the hull structure of the ship, one port and one starboard.

These fins are connected to fin stabilizer room on port and starboard sides of the ship from where they are operated/ controlled

Each stabilizer consists of a fin box, which houses a fin and supports the fin actuating machinery. Each stabilizer machinery unit provides the support and the means by which the fin may be rigged in or out, locked and tilted up to +/-25 degrees.

**2. Two hydraulic power units** located in the stabilizer room PS and SB, power the fin tilting and rigging motions

**3. Bridge Control Panel (BCP)** provides control and indicators for remote operation from bridge. The panel is installed in the BMCC.

**4. Two local control units (LCU)** are located in each stabilizer room. These panels are providing local indication and control of the fin.

**5. Main Control Unit (MCU) –** This panel can control fins from ECR with the same features as bridge control unit. LCU display for starboard and port are present in MCU.

**6. Roll Motion Sensor Unit (RMSU)** measures ship's roll acceleration and provides the control signal for the roll control algorithm and interfaces to the Main Control Unit (MCU).

The RMSU comprises of a solid state sensor and signal conditioning electronics. Sensor is located in MCU.

**7. Fin Angle Feedback Transmitter** provides the fin angle position signal for the servo controller. A fin angle indicator mechanically coupled to the tilt cylinder piston rod and the fin angle transmitter shows the fin tilt angle.

**8. The Stroke Control Unit (SCU)** is mounted on the variable delivery pump. It provides drive and feedback of the position of the pump's control spindle.

## Operation

A Hydraulic Power Unit (HPU) powers the fin tilting and rigging motions. Built into the HPU is a high power electric motor driving a variable delivery piston pump with a tandem vane pump for control pressure. A second vane pump for fin rigging and pump replenishment is driven from the other end of the main motor

A variable delivery piston pump controls fin tilting. The flow rate of this pump is controlled by a rotary valve that is positioned by the Stroke Control Unit

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The SCU consists of a servo motor and gears with an integral resolver, mounted within rectangular cast box. The LCU contains circuitry to provide microprocessor based control of the SCU, and hence the direction and rate of flow from the pump. The fin's rotational velocity is proportional to the pump flow rate

Fin rigging is controlled by solenoid actuated valves. The HPU also provides the means for stowage of the fin under emergency power. A second electric motor (of lower power) is connected to a constant delivery gear pump. This pump is connected to an auxiliary set of solenoid controlled valves that can be used to tilt the fin to zero angles and rig it in.

The operation can be controlled from bridge or ECR. A selector switch located on the MCU control panel allows the MCU to become the active control station if the BCP or communi - cation to the BCP becomes defective

**Following preparation must be done before operating the fin stabilizer:**

Before starting the Gyro fin Stabilizer System, the Engine Room should confirm:

1. There are no obstructions to the moving parts of the Stabilizer Machinery.
2. Cooling water is flowing through the Hydraulic Power Unit heat exchanger.
3. All local power isolation switches to controls and pumps are turned ON.

***Courtesy: Marine Insight***

# 10 IMPORTANT TESTS FOR MAJOR OVERHAULING OF SHIPS

**Vinay Kumar** - GME.,

## Generator

D'Carb or major overhauling of ship's generator is an important and complicated task requiring professional skills, knowledge, and experience. Generators being the lifeline of the ships require periodic maintenance which include both routine and major overhauling procedures.

As an engineer on board ships, you will be required to carry out the generator overhauling during routine maintenance or in case of an emergency situation. Thorough knowledge of the generator d'carb procedure is, therefore, a must for engineers of all levels working on ships.

Before and during the overhauling process, a variety of tests are performed on various tools and parts of the generator. Mentioned below are 10 important tests that are performed during major overhauling of the ship's generator.

**1. Hydraulic jack test:** During overhauling, a variety of hydraulic jack tools are used for opening generator's cylinder head, bottom end bolts, main bearing bolts etc.

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In order to ensure a smooth d'carb process, proper testing of hydraulic jacks and pumps is done before using them for the overhauling procedure.

**2. Cylinder head test:** The cylinder heads on board ships are overhauled and reused. Even the head supplied from shore is most of the time reconditioned. Hence it is important to test the heads for any leakage by means of pressure testing.Pressure testing of the generator cylinder head is done by means of water and air.

**3. Bearing cap test:** The serration provided in the bearing housing holds the two caps against each other along with the con-rod bolts. Hence any damage to bolts will also result in damage to the bearing cap.

The bearing caps serrations are checked for cracks by using Die Penetrant test kit.

**4. Con-Rod bolts test:** The bottom cap holds the con-rod bearing by means of bottom end bolts which are subjected to reversal stresses. Crack test of Con-rod bolts is also to be done during every overhauling by using die penetrant test kit.

**5. Connecting Rod Bend Test:** The connecting rod is subjected to extreme pressures. When overhauling the generator, the con-rod is checked for straightness by inserting a brass rod in the oil hole of the con-rod having slightly less diameter than the oil bore. If the con-rod is slightly bent (which cannot be seen with the naked eye), the brass rod will not pass through the bore.

**6. Fuel Injector Test:** Fuel injectors are generally re-used after overhauling. With timely use of the injector, its internal parts, which have very fine clearances, are subjected to wear and tear. Increase in clearance leads to dripping or other injection problem, eventually resulting in improper pressure injection.

Hence all the fuel injectors are pressure tested i.e. checking for correct opening pressure in the injector testing stand before using them in the generator.

**7. Starting air valve testing:** Like fuel injectors, air starting valves are also overhauled and reused. Hence to check the proper operation of the same, all starting air valves are tested by using service air for any leakage before installing into the cylinder head.

**8. Relief valve test:** The relief valve of the cylinder head is pressure tested to check proper functioning. It is an important part which prevents explosion of the head or damage to the combustion chamber because of overpressure. Pressure testing is carried out on a bench mounted test rig consisting of high-pressure air, pressure control valve, and calibrated gauges. The relief valve is bolted to the accumulator flange and the air pressure is increased until the valve lifts. Settings are done accordingly.

**9. The current test:** This is an important test which is done before trying out the generator with fuel after the completion of d'carb procedure. Once the d'carb is finished, the turning gear is engaged and with indicator cock open, the engine is turned. The current is continuously monitored. Any fluctuation or increase in the current value indicates obstruction or some problem in the rotating shaft.

**10. Alarm and Trips test:** The alarm and trips of the generator are electrical systems with wiring and contacts. To check their correct operation, testing of all the alarms and trips of the prime mover including lube oil trip, cooling water high-temperature trip, over speed trip etc. are done.

D'carb or major overhauling of a ship's generator is a very tedious task for marine engineers on board. Following a step-by-step procedure backed by systematic planning is the base for a successful generator overhauling procedure.

***Courtesy: Marine Insight***

# OFFSHORE ENERGY EXHIBITION & CONFERENCE 2023 EXPANDS WITH ADDITIONAL EXHIBITION HALL

**Karthick Raj** - GME.,

Europe's premier offshore energy event to feature an integrated conference area, Offshore Energy Pavilion, and more.

Offshore Energy Exhibition & Conference 2022 at RAI Amsterdam; Photo: Navingo BV


**Offshore Energy Exhibition & Conference (OEEC) 2023, the highly anticipated event for the offshore energy industry, is proud to announce the addition of an extra exhibition hall. The annual event, scheduled in 2023 for the 28th and 29th of November in Amsterdam, remains the leading platform for the entire offshore energy sector in Europe.**

The additional exhibition hall will help better showcase the whole set-up of OEEC 2023 and provide more exhibition possibilities for interested companies. Among these are already **TotalEnergies, bp, SSE, Van Oord, Damen** and **Huisman**. The set-up of OEEC 2023 will be such that visitors and exhibitors can expect, on the exhibition floor itself, a spacious conference area, state-of-the-art bookable meeting rooms, an exclusive business lounge and an Offshore Energy Pavilion.

In line with the event's theme, *Changing Currents*, the 2023 edition places, besides the Dutch companies active in the offshore energy sector, emphasis oninnovation and internatio -nalization. OEEC firmly believes that fostering innovation requires the presence and convergence of companies, universities, graduate schools and start-ups active across the various verticals (market segments), including offshore wind, marine energy, hydrogen, green marine, fossil fuels and clean fuels.

As the global net-zero objective necessitates cross-market collaboration to achieve climate targets, OEEC continues to attract diverse businesses from offshore energy and related industries. The event serves as a catalyst for forging strategic partnerships that can help in changing the energy mix.

Expanding the exhibition floor, also means OEEC 2023, is already making significant and increased interest as the sector, together with all of its moving parts, is working towards reaching the global net-zero goals.

The event is backed by the Government of the Netherland (RVO), who consider OEEC the flagship event when it comes to the energy sector. This year, the Netherlands Enterprise Agency will again have a large presence during Offshore Energy Exhibition & Conference.

Join us at Offshore Energy Exhibition & Conference 2023 to be part of transformative conversations and ground breaking initiatives that are shaping the future of the offshore energy industry.

*This is a press release issued by Navingo BV, organiser of the Offshore Energy Exhibition & Conference and owner of offshoreWIND.biz, Offshore Energy, Dredging Today, and Naval Today news sites.*

***Courtesy:World Maritime Day(Off Shore Energy)***

# RAPID DEVELOPMENTS IN OFFSHORE MARKET REQUIRE NEW PRODUCTION METHODS FOR FAST CREW SUPPLIERS

Valli Kumar Alagan - GME.,

**"Damen Song Cam Shipyard in Vietnam is gearing up to begin rapid series production of Damen's Fast Crew Supplier 2710. This is to meet the projected rapid growth in demand for wind farm support vessels due to the expansion in offshore wind development across South-East Asia that is already underway."**

Damen Song Cam Shipyard (DSCS) is well positioned geographically to meet the needs of the region's wind farm operators, and it also has experience in the large-scale, series production of workboats.In 2015 it became the first tugboat factory in the world and to this day it continues to produce high quality tugs for stock, enabling rapid delivery at economical prices, along with other work boats.

The manufacturing techniques for the series production of work boats have similarities to those used in the automotive sector when it comes to efficiency and teamwork. These shared techniques mean that DSCS can achieve short delivery times while also being able to deliver vessels tailored to meet the specific needs of each client. Over 50 equipment and performance options are maintained in stock, ready to be installed.

The need for fast delivery in South-East Asia is due not just to the rapid growth in offshore sustainable energy, but also because contracts for supply in the local industry are typically awarded less than 12 months ahead of the start date.

Damen Fast Crew Supplier 2710 Serial production of the 27-metre Fast Crew Supplier (FCS) will start once the new production hall is built and fitted out. This vessel together with its predecessor FCS 2610, have already proved themselves as an efficient and popular wind farm support vessel with over 70 sold since its introduction in 2012, mostly into Europe.

Over that time the design has had many updates and modifications based on customer feedback in line with Damen's commitment to operational excellence. The production lines are designed to have ten in build at any one time, with the same number to be delivered over the next two and a half years. However, this can be rapidly scaled up.

The entire supply chain for the offshore wind sector is under pressure given the demand for the products and services that are needed to install and maintain the wind turbines. Introducing the new capacity at DSCS, Damen will continue to build Fast Crew Suppliers at its shipyard in Antalya, Turkey, for the European and other markets.

"By ensuring that advanced, proven, Fast Crew Suppliers are available to our clients in South-East Asia when they need them, we aim to make the FCS 2710 the go-to wind farm support vessel for local operators, the same as it is in Europe," says DSCS Managing Director Joris van Tienen. "At DSCS we have the experience and the capability to make that a reality."

Customers looking for vessels for immediate deployment can also contact Damen Marine Services which maintains a fleet of Damen work boats for charter or sale.

***Courtesy: World Maritime News (Off Shore Energy)***

# GOING WITH THE FLOW – DAMEN CONCEPT AIMS TO TACKLE THE NEXT GENERATION OF OFFSHORE WIND

**Nirdesh** - G P Rating

Driven by ambitious targets and the drive for energy self-sufficiency, the offshore wind industry is gathering pace. As it grows, the developing sector faces challenges. Amongst these are the installation of turbines in deeper waters.


Many areas planning offshore wind developments do not have the relativelyshallow waters encountered in the North Sea region, where most projects have been carried out to date. Even there, with so much installation in recent years, developers are looking to construct wind farms farther from shore in deeper waters

The solution is floating wind turbines. However, these come with their own unique challenges. For one thing, conventional installation using a jack-up vessel is not an option. A new generation of wind turbine installation vessels is required.

**Meeting the challenge head on** Damen Shipyards Group, headquartered in the Netherlands, is taking the challenge head on. Damen has reached out to industry stakeholders including vessel operators, wind farm developers and equipment manufacturers to get their input on the vessel of the future. From this, the shipbuilder has developed an exciting new concept – the Damen Floating Offshore Wind Support Vessel (FLOW-SV)-, a vessel that aims to build bigger, faster and with increased efficiency.

The vessel's primary function is the transportation and pre-lay of mooring spreads. Additionally, it can perform tow-outs and hook ups, meaning the entire process can be carried out with a single vessel.

**Efficiency gains**: The concept's arrival is timely; there are plans in place to install many floating turbines in coming years.

"There are expected to be thousands of floating turbine installations in the coming years, including 1,800 in 2030," says Wijtze van der Leij, Damen Sales Manager Offshore Wind. "A recent test case demonstrated that installation of a single turbine takes some 34 vessel days. Even with a generous allowance for efficiency gain, this is not likely to reduce below 11 vessel days. This means more than 100 vessels will be needed to install the turbines planned for 2030 alone."

Certainly, current capacity does not allow for this. The vessels most suited to the job – large anchor handling tug suppliers (AHTS) – are largely already committed to projects in a resurgent oil and gas market. Besides, the capacity of such vessels is sufficient to handle just one mooring spread per voyage.

"The planned installations will require some 3.6 million metres of rope and chain, as well as 5,400 anchors. Plus, the chain required for a floating turbine spread is significantly larger than that used in the oil and gas sectors," explains Wijtze. "Most vessels from the current AHTS fleet would be required to return to shore each time it had installed a single spread."

**Increased capacity :** To increase efficiency, Damen's FLOW-SV concept features significantly increased capacity, including a deck area of 1,600m$^2$ and 3,000m$^3$ chain locker space. With this, the vessel can transport three floater mooring systems in a single voyage.

The FLOW-SV does not stop there in its bid for increased efficiency, however.

**Relieving the tension :** "The traditional way to proof load mooring lines is to use the vessel's bollard pull. The FLOW-SV offers more than 400 tonnes of bollard pull, which is significantly higher than most AHTS vessels, but with floating turbine spreads we are talking about proof loading lines up to 1,000 tonnes. Typically, the solution would be to use a tensioner, but this is a time consuming process. We heard from industry stakeholders that there is a lot of interest in an alternative method for proof loading."

Damen came up with an innovative approach to tackle this. The process begins with the vessel anchoring itself at the bow. Following this, the turbine anchor is released over the transom. The vessel then combines its bollard pull and forward winch pull to embed the anchor and apply the proof load forces necessary to secure the line for the forces it is required to handle.

To facilitate this novel approach, the vessel features a unique propulsion arrangement. In

addition to its twin azimuth thrusters for normal operations, DP and reaction anchor embedment, the FLOW-SV has two booster lines to ensure its ability to reach maximum bollard pull.

**Green vessel for a clean sector :** The development of the FLOW-SV is a logical step for a company committed to becoming the most sustainable shipbuilder. Damen is keen to support the offshore wind industry in reaching its full potential.

This goal of increased sustainability runs through the concept. It features, for instance, battery-hybrid power for peak shaving and spinning reserve, reducing emissions during DP operations. Furthermore, the vessel has been prepared ready to operate on carbon neutral methanol fuel in the future.

**Looking ahead:** The concept, as advanced as it is, does not represent the final word on the matter, however, as Wijtze explains.

"We started the process by reaching out to stakeholders and aim to continue in this way. We are reaching out to the industry, looking for partners who can help us to take this to the next stage. What we see today is just the beginning of a new generation in offshore wind."

**Damen Shipyards Group – Oceans of Possibilities** Damen Shipyards Group has been in operation for over ninety years and offers maritime solutions worldwide, through design, construction, conversion and repair of ships and ship components. By integrating systems we create innovative, high quality platforms, which provide our customers with maximum added value.
Our core values are fellowship, craftsmanship, entrepreneurship and stewardship. Our goal is to become the world's most sustainable shipbuilder, via digitalisation, standardisation and serial construction of our vessels.

Damen operates 35 shipyards and 20 other companies in 20 countries, supported by a worldwide sales and service network. Damen Shipyards Group offers direct employment to more than 12,000 people.

***Courtesy: The opinions, beliefs, and viewpoints expressed in this article do not necessarily reflect the opinions of Offshore-Energy.biz***

# BRIGHT FUTURE FOR MARITIME EDUCATION.


**MR.ASHOKADVANI, PLACEMENT ADVISOR, ADDRESSES THE GATHERING DURING THE ORIENTATION PROGRAMME OF G.P RATING HELD ON 12-07-2023.**

Maritime education is more profitable. During the Orientation programme of first year GP Rating in RL Institute of Nautical Sciences it was mentioned that there are good placement opportunities for maritime education. Our president Dr. R. Lakshmipathy presided over the function and said that students should follow discipline and have integrity. Joint Secretary Dr. L. Ramasubbu and Management Executive Mr. Ramkumar took part and graced the function. Mr. Ashok Advani, Placement Advisor, Mumbai said that maritime education is lucrative and more candidates are required in the field of GP Rating. Mr. GnanaEdison , Principal, RLINS welcomed the gathering. Dr.Kumarasamy, Vice-Principal extended vote of thanks. All the faculty members and students attended the function.

# 60 TH BIRTH DAY CELEBRATION OF SHRI. ADIMOOLAM - SOW.SUDHA

The 60 th birth day celebration of shri. Adimoolam, Dinamalar Publisher, Coimbatore edition and Secretary ,RLINS was held in his residence at T.Nagar, Chennai on 16/06/2023, 17/06/2023 and 18/06/2023.In continuation of this function, the Shasti Abdha Poorthi was held on 19/06/2023at AVM Mahal from 10 am to 12 noon.

In this function, Mr.Balasubramanian Adityan, President, Dhinathanthi; Mr.Murali,Krishna Sweets; Mr.Rajan I Sekar; Mr.Rajan; Ms.P.Susheela ,Playback Singer; Ms.Vanitha Mohan ,Industrialist, Coimbatore; Mr.Sakthivel, Industialist, Thirupur took part in it.


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