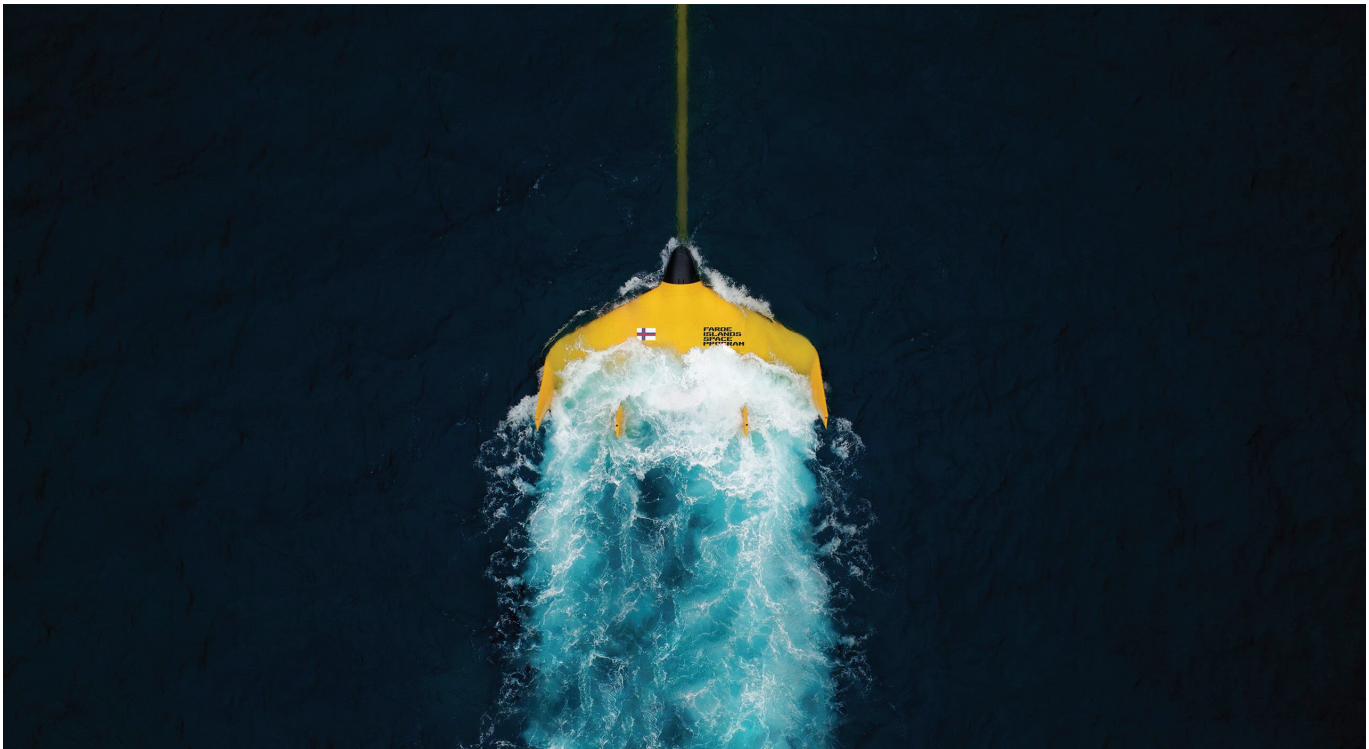
Harnessing the Power of the Moon: SKF's Role in the Faroe Islands Space Program

As the world accelerates its transition toward renewable energy, innovative collaborations are reshaping how we think about power generation. One such groundbreaking initiative is the Faroe Islands Space Program—an Earth-bound venture that leverages the Moon's gravitational pull to generate clean electricity through tidal forces. At the heart of this project is the Dragon 12 (LUNA), an advanced tidal kite developed by ocean energy company Minesto, with critical support from global bearing and technology leader SKF. By integrating smart bearing systems, real-time monitoring sensors, and sustainability-focused software tools, SKF is helping optimize the kite's performance while minimizing its environmental footprint.

To learn more about the cutting-edge technology and sustainable impact behind this pioneering effort, we spoke with Annika Ölme, Chief Technology Officer and Senior Vice President of Technology Development at SKF. In this conversation, she shares insights on SKF's role in the project, the future of tidal energy, and how cross-industry collaboration is unlocking new pathways to cleaner, more reliable power solutions.



SKF has developed cutting-edge bearing and sensor technologies for the Dragon 12 tidal kite—can you elaborate on the most challenging technical innovations involved in adapting these components for underwater use?

Since the Dragon 12 tidal kites operate deep down in the Atlantic Ocean, there were great challenges we needed to tackle from a parts perspective. The kites fly at speeds of up to 16 knots at a depth of 60 meters. During operation the turns are smooth, but the system must also be able to handle acceleration. So, designing the right bearings and seals to endure these conditions was critical. That involved not just choosing the most suitable bearing type but also dimensioning the bearing to be robust and reliable, while at the same time optimizing bearing arrangement for minimal friction. In terms of the sealing arrangement, we faced challenges related to shaft deflection, water pressure, and low friction. In combination with the design, a sealing material with good friction properties is needed in an environment with limited lubrication and high wear resistance to avoid being worn down by particles present in seawater. All of these factors were considered as we developed the bearings installed in the applications within the kite including the rudders and turbine, as well as the sealing system.

How does SKF's SimPro Quick software enhance the efficiency and durability of tidal energy systems like LUNA? Can you give examples of its impact in this project?

Our SimPro Quick software evaluates and optimizes bearing arrangements, which allows SKF and Minesto to perform detailed performance evaluations of the bearing arrangements within the Dragon 12 tidal kites based on specific requirements and conditions. With this project taking place in the depths of the Atlantic Ocean, we have to account for various marine conditions like salinity, water temperature and water pressure. Being able to analyze bearing performance in real time

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is critical so that we can adjust and improve, ensuring the kites are operating with the least amount of friction possible.

Real-time monitoring seems to be a key feature of this system. How do SKF's vibration and temperature sensors contribute to preventive maintenance and operational reliability in such a harsh marine environment?

Since this project is focused on harnessing energy and fueling the villages of the Faroe Islands, preventing downtime is imperative. SKF's sensors, which are installed on the turbine in the Dragon 12 kites, measure vibrations and temperature during operation to monitor the turbine and detect abnormal frequencies. This enables planned maintenance and avoids bearing damage and unplanned downtime.

SKF emphasizes sustainability in its approach. How does your Product Select tool support customers in reducing CO_2 emissions through better bearing choices?

Our product select software tool calculates bearing rating life and estimates CO_2 emissions, among other attributes, so that different solutions can be compared not only from a technical standpoint but also through the lens of sustainability. Providing this level of support when it comes to decision-making for our customers reinforces our mission to drive innovation in renewable energy.

How do you measure and verify the environmental impact reductions achieved through SKF's technologies in the Dragon 12 project?

Research shows 20% of all energy consumed globally is used to overcome friction, and this is particularly important when producing energy as you want all production to go to the electrical grid and not disappear as friction. Our bearings and seals are designed to reduce the amount of friction produced, which is also monitored through SKF sensors mounted in the kites. By measuring the operational data, we get a good basis for optimizing the system so that the kites can perform more efficiently.

What has the collaboration with Minesto taught SKF about cross-industry innovation, and how might it shape future projects?

This project has truly underscored the critical role of cross-industry collaboration and knowledge-sharing in accelerating innovation, advancing the shift to renewables, and shaping a more sustainable energy future. It takes trust, courage and creativity to embark on a daring, yet "down-to-earth" project like the Faroe Islands Space Program. All of us – SKF, Minesto and Sev – were aligned on our goals from the start and that propelled us forward together. We believe that our program serves as a blueprint for broader cooperation across sectors.

In what ways is the partnership with Sev and the Faroe Islands helping demonstrate a model for tidal power adoption in other remote or coastal regions?

Through the Faroe Islands Space Project, we're showing the world that there are untapped renewable energy sources still to be explored. Sev and the Faroe Islands share the same vision as SKF of a clean, responsible, net-zero future. Ocean energy currently is a small part of the renewable energy mix. But Minesto estimates there are at least 3,000 more "Faroe Islands" out there qualifying for our space program. Our program demonstrates that harnessing the energy of the moon is possible and coastal regions can start exploring this avenue for sustainability today.

Do you see SKF's technologies being adapted for other ocean energy projects beyond tidal kites—such as wave energy converters or offshore wind installations?

The Faroe Islands Space Project is one of a few that SKF is involved in regarding ocean energy. We believe it's an energy of the future and are eager to explore different avenues