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CABLES FOR WIND-POWER COLLECTION SYSTEMS

PROFILE

Barr Engineering Co.

JULY 2023
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CONTENTS

12

THE COVER SHUTTERSTOCK

SECTIONS

July 2023 VOLUME 14 ◤ NUMBER 7

◤ THE FUTURE OF WIND

TAILWINDS

THE BUSINESS OF WIND

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FROM THE EDITOR

Wind stronger than ever

Wind energy isn't going anywhere. To all who have spent years developing ways to harness power from the wind, that statement seems more than obvious.

Still, there are some doubters out there.

Which makes it all the more interesting when I hear news like this: federal data showed that wind and solar produced more electricity through May than coal for the first time, according to an article from *Scientific American*.

All-in-all, wind and solar generated 252 TW/h during the first five months of the year.

Some of that shift in power production was due to the closing of several coal plants, but it also means that many are realizing that coal can't compete with green initiatives that are growing exponentially across the U.S.

Great news for wind and all renewables. That steady growth in renewables also means that the products and services needed to get those turbines built and spinning are more important than ever.

In our July issue, we take a closer look at two of these topics: wires and cables and turbine safety.

Our lead inFocus article from American Wire Group's Michael Joseph takes a deep dive into using medium voltage cables for wind-power collection systems and how MV underground distribution cable allows for the low-loss transport of electric power generated by wind-collector arrays.

Building a turbine comes with a host of safety needs. An article from Online Safety Trainer runs down 10 tips for employers on how to protect workers from variety of possible hazards when dealing with wind-turbine construction.

And speaking of turbine construction, make sure you check out our company profile highlighting Barr Engineering Co. Its crucial engineering and environmental capabilities are a much-needed service when it comes to designing and building wind assets.

You'll discover that and much more in this issue. I hope you find it informative, and please feel free to send me any feedback about what you'd like to see in future issues. I'm always looking for contributors and good article ideas.

Thanks for reading!

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Giving Wind Direction
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Green hydrogen plan incentivizes 'first movers'

From American Clean Power

The American Clean Power Association (ACP) recently released a proposed framework to support the development of a new green-hydrogen industry in the United States. Hydrogen made with clean power — green hydrogen — is the most promising solution for decarbonizing heavy industrial manufacturing and chemical processes that are essential to the U.S. economy.

The Inflation Reduction Act provides significant incentives to make green hydrogen cost competitive with more carbon-intensive forms of hydrogen production. There is active debate over the appropriate structure of the hydrogen tax incentives in the early years for this new industry.

After significant internal deliberation and engagement with external stakeholders and members, ACP is proposing an implementation roadmap that will create a viable green hydrogen industry while accelerating clean-power deployment and reducing emissions. The new proposal includes recommendations on several emissions safeguards advanced by environmental leaders.

ACP proposes the government limit green-hydrogen production incentives to companies demonstrating they are relying on new, additional sources of clean electricity to power hydrogen production. Green hydrogen facilities must also ensure there is a degree of alignment in time between when clean energy is generated and the time when a green hydrogen facility is operated. To ensure these environmental safeguards, ACP proposes companies must embrace rigorous constraints on where and when clean-energy credits can be produced.

These constraints will ensure the emissions integrity of the increased power demand on the grid from green-hydrogen production. The strict timing requirements under the proposal, which align with the EU's green hydrogen standards, will take effect after a limited phase-in period. Under ACP's approach, "first mover" projects that start construction before the end of 2028 receive greater flexibility on the timing of when clean-energy credits can be produced. This early flexibility will ensure the green-hydrogen industry reaches commercial viability and can support decarbonization.

AMERICAN CLEAN POWER

American Clean Power is the voice of companies from across the clean-power sector that are powering America's future. For more information, go to www.cleanpower.org

DIRECTION

THE FUTURE OF WIND

Equinor has awarded DORIS an Owner's Engineering framework for offshore wind and low-carbon projects. (Courtesy: Equinor)

Equinor selects DORIS for offshore wind, low-carbon projects

Equinor has selected DORIS to provide owner's engineering services under a master services framework agreement for offshore wind and low-carbon projects. Across the five-year agreement, DORIS will provide its expertise in those energy industries to Equinor across its project portfolio.

DORIS will deliver services to Equinor across three central scopes: the provision of personnel through secondments; the completion of studies, reviews, and verifications; and the completion of engineering scopes such as design and detailed engineering, procurement, and project management.

Across its support to Equinor's fixed and floating offshore wind projects, DORIS will draw on its substantial owner's engineering track record, which is in excess of 6 GW and includes projects in the U.K., Korea and the U.S. In addition, the wider DORIS Group will use its 60 years of offshore experience to scale up low-carbon energy production solutions for Equinor.

"DORIS is pleased to be awarded the framework agreement by Equinor," said Andrew Baker, DORIS' executive vice president of renewables. "With our established capability in owner's engineering services and depth of experience in offshore wind and low-carbon energies, we look forward to enabling a net-zero future with Equinor."

MORE INFO www.equinor.com

American Clean Power names new chief policy officer

Frank Macchiarola will join the American Clean Power Association (ACP) as the organization's chief policy officer.

Macchiarola now serves as senior vice president of policy, economics and regulatory affairs at the American Petroleum Institute. In his new role at ACP, he will lead a policy team working to develop the regulatory and legislative framework necessary to efficiently deploy the full suite of advanced clean energy technologies.

Frank Macchiarola will join the American Clean Power Association. (Courtesy: American Petroleum Institute)

Macchiarola joins an executive team that includes Chief Advocacy Officer JC Sandberg; Chief Communications Officer and Sr. Counselor to the CEO Rosanna Maietta; and Chief Strategy Officer Jason Clark.

"The clean energy sector is at a pivotal moment, and growing our team to embrace the opportunities before us will ensure this industry has the bench strength in place in order to match the moment," said Jason Grumet, ACP's chief executive officer. "Frank is uniquely qualified to understand the speed and scale we need to move the organization forward and will partner with our dynamic team to make that happen.

"I have no doubt that together, we will bring both sides of the aisle, and different constituencies and communities, together to meet our common goal, which is an America powered by clean, domestic energy."

"The energy industry is going through a generational change; an entire sector of the global economy is being transformed," Macchiarola said. "I have spent my career working on energy policy, and I am eager to get to work to advance ACP's commitment to secure, affordable and clean domestic energy. I am excited to join the team at ACP and be a part of the next phase of the American energy revolution."

MORE INFO cleanpower.org

ACWA Power signs deal with Kazakhstan energy ministry

ACWA Power, a leading Saudi developer, investor, and operator of power generation, water desalination and green hydrogen plants worldwide, recently announced the signing of the Roadmap Agreement with the Ministry of Energy of Kazakhstan and Samruk-Kazyna, Kazakhstan's Investment Development Fund and sovereign wealth fund, for the 1-GW wind energy and battery storage project within the Central Asian country. This significant milestone provides a clear direction for processes and paves the way for construction.

"The signing exemplifies the progress of the 1-GW wind and battery storage project, setting the stage for Kazakhstan's stride toward its clean energy ambitions," said Marco Arcelli, ACWA Power CEO. "The transformative project will have a profound impact on the country's socioeconomic landscape. Our appreciation goes to the Kazakhstani government and the visionary leadership of HRH Prince Abdulaziz bin Salman Al Saud, Minister of Energy of the Kingdom of Saudi Arabia, for their unwavering support, invaluable guidance, and unparalleled commitment."

The 1-GW wind project represents ACWA Power's entry into Kazakhstan, and with an investment tag of $1.5 billion, marks the biggest Saudi investment in Kazakhstan's power sector. The project aims to support national climate action, and promote sustainable development through innovation and technology integration. With completion scheduled for 2027, the development will play a crucial role in decarbonizing fossil fuel-based power generation.

Central Asia is ACWA Power's second-largest market in terms of investments, underscoring the company's

The agreement was signed by H.E. Almassadam Satkaliyev, Kazakhstan's minister of energy; Nurlan Zhakupov, Samruk-Kazyna CEO; Basil Yernat Duisenbekuly, Zhetysu region deputy governor; and Marco Arcelli, CEO of ACWA Power. The ceremony also had the honor of the presence of HRH Prince Abdulaziz bin Salman Al Saud, Saudi Arabia's minister of energy. (Courtesy: ACWA Power)

long-standing commitment to the region. This endeavor seeks to unlock new value. It also capitalizes on missions abatement and energy-transition opportunities through wind turbines and battery storage.

MORE INFO acwapower.com/en

Siemens Gamesa approves capital reduction

Siemens Gamesa minority shareholders on June 13 approved a capital reduction for the remaining 2.21 percent of shares not held by Siemens Energy in the Extraordinary General Meeting of Shareholders, paving the way for a full integration of both companies.

The capital reduction was approved by 98.21 percent of the minority shareholders attending in person or by proxy (38.88 percent). Approval was contingent on a presence of at least 25 percent of the minority shareholders with an approval rate of at least two-thirds. As a result of the capital reduction, the shares of the minority shareholders are redeemed. For that, the shareholders will receive compensation of 18.05 euros per Siemens Gamesa share, the same price that was offered in the original tender offer by Siemens Energy in 2022. "This is an important step in preparing for full integration," said Christian Bruch, CEO and president of Siemens Energy, and Siemens Gamesa chairman. "Besides, the turnaround program at Siemens Gamesa, Mistral, needs further rigorous execution, even though we see first moves in the right direction."

"I am pleased that our minority shareholders are supporting our effort to fully integrate Siemens Gamesa into Siemens Energy," said Jochen Eickholt,

The approval paves the way for a full integration of Siemens Gamesa and Siemens Energy. (Courtesy: Siemens Gamesa)

Siemens Gamesa CEO. "We can now further streamline our structures so that we can focus 100 percent on improving our performance and achieving profitability."

Siemens Energy announced the tender offer to acquire all remaining shares of Siemens Gamesa in May 2022. The tender offer concluded in December 2022, and following a sustained purchase order, Siemens Energy held about 98 percent of Siemens Gamesa shares.

Siemens Gamesa ceased trading on February 14, 2023. Upon completion of the transaction, Siemens Energy will have spent a total of 4.05 billion euros to acquire all shares not previously owned. In line with the target to maintain a solid investment grade rating, the transaction has mostly been financed with equity.

MORE INFO www.siemens-energy.com/us/en.html

MEDIUM VOLTAGE CABLES FOR WIND-POWER COLLECTION SYSTEMS

PowerGuard medium voltage reels. MV power cables unlock the potential of wind-collector arrays. (Courtesy: AWG)

Medium-voltage underground distribution cable allows for the low-loss transport of electric power generated by wind-collector arrays.

By MICHAEL JOSEPH

Extruded-dielectric medium voltage (MV) power cables make up the backbone of underground power distribution systems. The construction of MV underground distribution cable provides for a safe, reliable, and economical method of moving electricity where the use of overhead lines is not practical. Transporting power from collector arrays on a wind site is no different. Long-term reliability of wind-site cable systems connected with MV cables relies on quality materials and good installation practices.

MV power cables unlock the potential of wind-collector arrays. Power generation at the individual turbines produces a couple hundred volts of electromotive force, which translate to unacceptable energy losses transporting this voltage across an installation due to the high currents and the resistance losses in the power cables. It is a widely known principle in physics that transporting electricity over long distances only becomes economical in the kilovolt (kV) range, with current and subsequently losses decreasing as voltage is increased. Transformers within the turbines step up the generation-voltage to distribution-voltage range for transport across the electrical system. However, as this "transport" voltage is increased, the electrical insulation of the underground cable must become larger and more expensive. The design and use of medium-voltage (5 kV-46 kV) cable strive to strike an economical balance between electrical system losses and cost of materials.

BREAKING DOWN THE LAYERS

At the core of MV cables is the conductor, which moves the electricity from point A to B across the system. The conductor is made from either copper or electrical-grade aluminum, with aluminum being the predominant conductor type on wind sites. Although aluminum is not as conductive as copper (approximately 2/3 the conductivity of copper), it is much lighter and less costly. Since the typical direct burial of MV cables are not restricted on space, large aluminum conductor sizes upwards of 1,250 kcmil and 1,500 kcmil are possible to achieve a higher ampacity. MV underground cable conductors can be solid or stranded. Usually, conductors 1/0 AWG and larger are stranded to maintain flexibility for installation and handling.

Surrounding the conductor is a triple-layer insulation

Good installation practices of accessories play as important of a role in long-term cable reliability. (Courtesy: AWG)

PowerGuard medium voltage cable. (Courtesy: AWG)

system consisting of an inner semiconductive layer called the conductor shield, the primary insulating layer, and a thin outer semiconducting layer called the insulation shield. The primary function of the insulation system is to keep the electricity within the conductor. Within the system, the conductor shield provides for a smooth circular interface between the conductor and insulation. The conductor shield also works in tandem with the insulation shield to provide for a uniform electric field within the insulation layer. The insulation layer, made from extruded polymer, is typically made from either cross-linked polyethylene with water-free retardant additives (TR-XLPE), or ethylene propylene diene monomers (EPDM, sometimes referred to as ethylene propylene rubbers or EPR). Both insulation types are not only good electrical insulators, but the process of cross-linking makes them into thermosetting compounds. Thermosetting compounds, once set, do not melt and re-flow, giving the insulation good thermal stability adequate for the 90°C and 105°C conductor-operating temperature ratings.

The two remaining layers surrounding the cable core are the metallic shield and jacket. The metallic shield is in intimate contact with the insulation shield and functions as a neutral cable. The metallic shield is made from copper with very little exception and comes in several different configurations depending on application. The outer jacket is an environmental protection layer and does not carry any voltage rating. There are several different materials that jackets can be made from, with linear low density, medium density, high density, and even cross-linked polyethylene (LLDPE, MDPE, HDPE, and XLPE), being the most common in wind-site applications.

Medium-voltage underground distribution cable allows for the low-loss transport of electric power generated by wind-collector arrays. (Courtesy: AWG)

The quality of the insulation system is the most critical part of long-term reliability and long-life performance. The insulation of a properly manufactured cable with quality materials can be considered a homogenous system. The breakdown strength at any point within the system should be similar and even indistinguishable from any other points within the system. Issues in manufacturing, such as contaminations or voids within the insulation, or damage from installation that compromise the integrity of the insulation shield pose significant risks to performance. In all cases, the exposure of trapped gasses within voids and defect boundaries or the exposure of free air to the high voltage electric field creates localized electric breakdowns that do not immediately cause the entire cable to fail. The phenomenon is known as partial discharge (PD). When PD occurs within a cable, these discharges erode the surrounding insulation and form carbon structures called electrical trees. These electrical trees grow within the cable, bringing the high-voltage potential from the conductor and the ground plane from the insulation shield closer together over time. Eventually, this distance becomes small enough that the increased electric field strength exceeds the breakdown strength of the bulk insulation, and a full cable failure occurs.

MV CABLE INSTALLATION

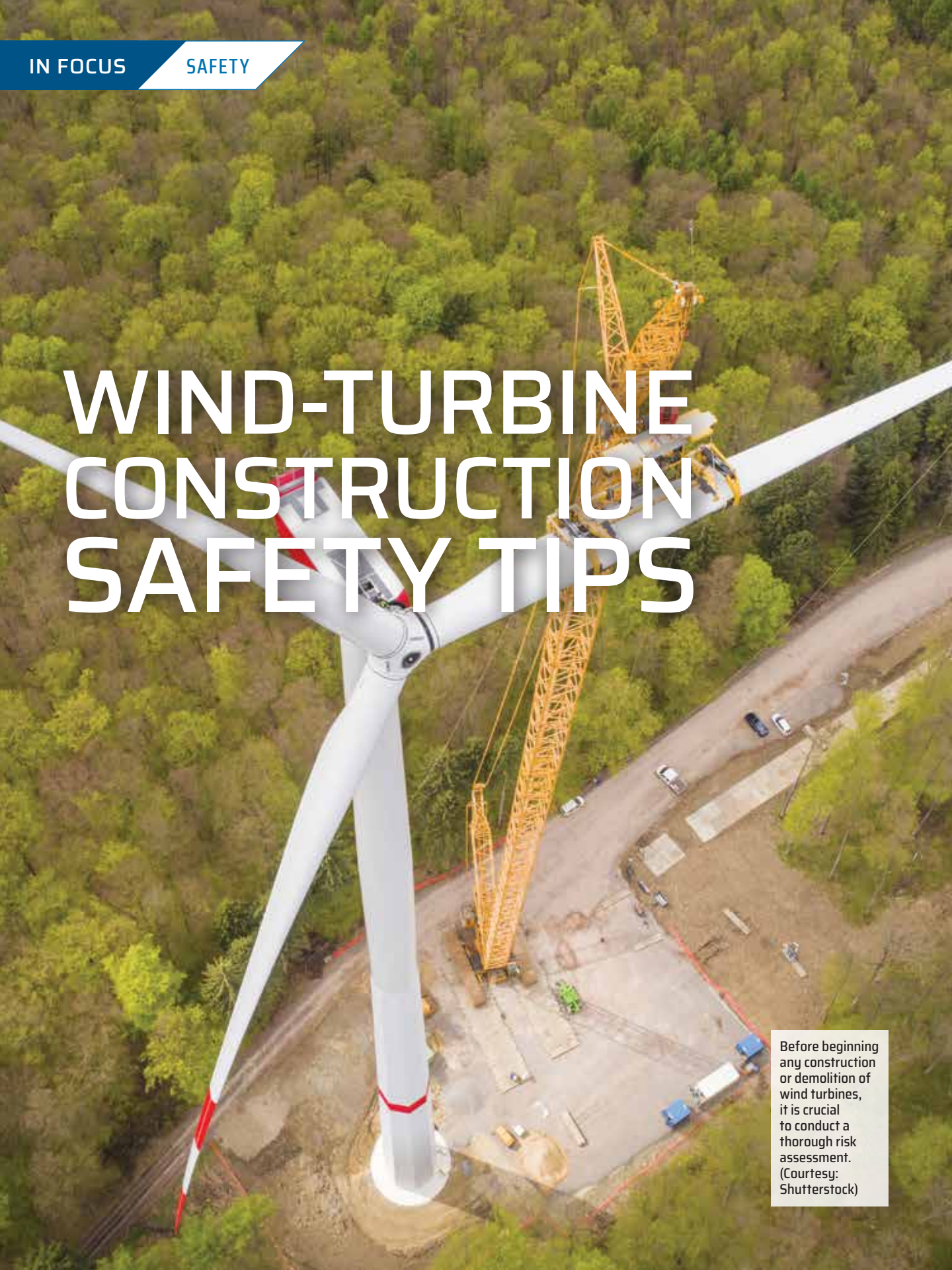
Good installation practices of accessories play as important of a role in long-term cable reliability. When a cable is prepared for a termination or splice, the metallic shield and insulation shield are stripped away from the end of the cable. The termination or splice accessory will "rebuild" these layers, but great care must be taken to ensure the interface between the exposed cable insulation and the inner layer of the accessories are defect-free. Preparation damage, moisture, and trapped air will all result in PD activity similar to that of cable insulation defects and damage, significantly reducing cable life performance. Using accessory manufacturer instructions, proper tools, and commissioning (ideally with power frequency PD testing similar to the manufacturing requirements), cable preparations with correct dimensions, smooth radial insulation shield cutbacks, proper void filler application, and defect-free interfaces can be assured for expected long-term performance.

Medium-voltage underground distribution cable allows for the low-loss transport of electric power generated by wind-collector arrays. The high-quality extruded polymer insulation systems are suitable for the direct burial applications ubiquitous throughout the wind industry. Both cable manufacturers and cable installers have their parts to perform in the assurance of long-term cable performance. Good manufacturing and quality control practices help guarantee that MV power cables are produced defect-free and able to withstand the rated electric-field potential. Cable installers are then responsible for applying the cable accessories in a manner that does not introduce defects at the interfaces between the cable insulation and splices or terminations.

ABOUT THE AUTHOR

Michael Joseph is engineering director for American Wire Group.

WIND-TURBINE CONSTRUCTION SAFETY TIPS



Before beginning any construction or demolition of wind turbines, it is crucial to conduct a thorough risk assessment. (Courtesy: Shutterstock)

10 ways employers can help protect workers from a variety of hazards and reduce the risk of accidents and injuries on the job.

By ONLINE SAFETY TRAINER

Wind-turbine construction and demolition can be dangerous if proper safety measures are not taken. There are many hazards to be aware of, such as falls, electrical hazards, and heavy machinery operation, and steps that can be taken to ensure the safety of all involved. According to the Occupational Safety and Health Administration (OSHA), wind-turbine construction and demolition is a high-risk industry that requires strict adherence to safety standards.

To protect yourself and your employees from the potential hazards of wind-turbine construction and demolition, it is crucial to conduct a thorough risk assessment, train workers on the hazards, implement fall protection, properly maintain equipment, implement electrical safety measures, establish clear communication protocols, and have emergency procedures in place.

1 CONDUCT A THOROUGH RISK ASSESSMENT

Before beginning any construction or demolition of wind turbines, it is crucial to conduct a thorough risk assessment. Identify the potential hazards, such as falls, electrical hazards, and heavy machinery operation, and determine the likelihood and severity of injury or harm. This will help to prioritize the risks and inform the development of a safety plan. A risk assessment will enable you to identify the hazards and assess the risks associated with the project. By identifying the hazards, you can take steps to eliminate or control them, which will help to ensure the safety of workers. It's also essential to make sure the risk assessment is kept up to date, so that new hazards can be identified and addressed as soon as possible.

2 TRAIN WORKERS ON THE HAZARDS

All workers involved in wind-turbine construction and demolition should be trained on the specific hazards of the job, including fall protection, electrical safety, and heavy-machinery operation. This training should be ongoing to ensure that workers are up-to-date on the latest safety guidelines and procedures. By providing training, employers can ensure workers have the knowledge and skills to work safely, and that they understand the risks associated with their work. This can help to reduce the likelihood of accidents and injuries.

3 IMPLEMENT FALL PROTECTION

Falls are a leading cause of injury in the wind-energy industry. To prevent falls, workers should be provided with proper fall protection equipment, such as harnesses and lanyards, and be trained on how to use it properly. Additionally, guardrails, safety nets, and other fall protection systems should be installed at heights where falls are a risk. Fall protection is crucial because falls are one of the leading causes of injuries and fatalities in the construction industry. By implementing proper fall protection, employers can help to keep workers safe and reduce the risk of injury.

4 PROPERLY MAINTAIN EQUIPMENT

Heavy machinery is a common hazard in wind-turbine construction and demolition, which is why it is important to ensure all equipment is properly maintained. Regular inspections, testing, and maintenance of equipment can help to identify and fix any issues before they become a problem. This will also help to ensure equipment is functioning correctly and safely. Employers should also establish procedures for the safe operation and maintenance of equipment and ensure workers are trained on these procedures. By properly

Workers should be trained on how to properly use and maintain PPE. (Courtesy: Shutterstock)

Personal protective equipment (PPE) is essential for protecting workers from a variety of hazards, including falls, falling objects, electrical hazards, and more. (Courtesy: Shutterstock)

maintaining equipment, employers can reduce the risk of equipment failure, which can lead to serious accidents and injuries.

5 IMPLEMENT ELECTRICAL SAFETY MEASURES

Electricity is another major hazard in wind-turbine construction and demolition. To protect workers from electrical hazards, employers should ensure all electrical equipment is properly grounded, and electrical panels, switches, and wiring are in good working condition. They should also implement lockout/tagout procedures to prevent accidental start-up of machinery during maintenance or repair. Additionally, workers should be trained on electrical-safety procedures and the proper use of electrical equipment. By implementing electrical-safety measures, employers can help reduce the risk of electrocution and electrical fires.

6 ESTABLISH CLEAR COMMUNICATION PROTOCOLS

Clear communication is essential for safety on any construction site, especially when working with heavy machinery. Employers should establish clear communication protocols, such as hand signals, to ensure workers can communicate effectively with each other and with equipment operators. This will help to prevent accidents and injuries caused by miscommunication. Additionally, employers should establish procedures for emergency communication, such as an emergency alarm system, to ensure workers can be quickly and effectively alerted in case of an emergency.

7 HAVE EMERGENCY PROCEDURES IN PLACE

Emergencies can happen at any time, and it is important for employers to have emergency procedures in place to protect workers in case of an emergency. This should include emergency evacuation plans, procedures for shutting down equipment, and emergency response teams. Employers should also conduct regular emergency drills to ensure workers are familiar with emergency procedures and know how to respond in case of an emergency. This will help to ensure workers are prepared and can respond quickly and effectively in case of an emergency.

8 PROVIDE ADEQUATE PPE

Personal protective equipment (PPE) is essential for protecting workers from a variety of hazards, including falls, falling objects, electrical hazards, and more. Employers should ensure workers are provided with adequate PPE, such as hard hats, safety goggles, harnesses, and fall protection equipment. Workers should also be trained on how to properly use and maintain PPE. By providing adequate PPE and training workers on its use, employers can help to reduce the risk of accidents and injuries on the job.

Safety procedures should be regularly reviewed and updated to ensure they are effective in protecting workers. (Courtesy: Shutterstock)

9 TRAIN WORKERS ON FALL PROTECTION

Falls are one of the leading causes of injuries and fatalities in the construction industry, and they are especially hazardous in wind-turbine construction and demolition. Employers should provide workers with fall protection equipment and train them on how to properly use it. They should also establish procedures for working at heights and have a fall-protection plan in place. Additionally, employers should conduct regular inspections of fall-protection equipment to ensure it is in good working condition. By training workers on fall protection and implementing fall protection measures, employers can help to reduce the risk of falls and fall-related injuries.

10 REGULARLY REVIEW SAFETY PROCEDURES

Safety procedures should be regularly reviewed and updated to ensure they are effective in protecting workers. Employers should conduct regular safety audits, incident investigations, and safety meetings to identify hazards, review procedures, and make any necessary changes. By regularly reviewing and updating safety procedures, employers can help identify and eliminate hazards and ensure workers are protected from harm.

In conclusion, wind-turbine construction and demolition are inherently hazardous operations that require a high level of safety and caution. By following these 10 tips, employers can help to protect workers from a variety of hazards and reduce the risk of accidents and injuries on the job. These tips include conducting regular safety audits, providing training on fall protection, establishing emergency procedures, and providing adequate PPE. By implementing these safety measures, employers can create a safer and more secure working environment for their workers.

It is crucial to remember that safety is a shared responsibility between employers and employees. Employers must provide the necessary resources and training, while employees must be willing to work safely, use the provided resources, and follow established procedures.

Together, employers and employees can work toward a common goal of maintaining a safe work environment and ensuring the well-being of all workers. By taking a proactive approach to safety, employers can help ensure wind-turbine construction and demolition projects are completed safely and efficiently.

ABOUT THE AUTHOR

Online Safety Trainer has been involved in the business of safety training for more than 25 years, providing both live training courses, safety training videos, and online safety training. This article is printed with permission of Online Safety Trainer (www.onlinesafetytrainer.com/10-wind-turbine-construction-safety-tips/) For more information, go to www.onlinesafetytrainer.com.

PROFILE

BARR ENGINEERING CO.

INTEGRATING ENGINEERING AND ENVIRONMENTAL EXPERTISE

Barr is an engineering company that moved into turbine foundation design in the 1990s and 2000s. (Courtesy: Barr Engineering Co.)

Barr Engineering Co. provides crucial engineering and environmental capabilities as well as civil, electrical, and permitting capabilities to its clients in the wind-energy sector, as well as other renewables.

By KENNETH CARTER ◤ Wind Systems editor

Expert engineering is paramount when installing a wind turbine, especially when it comes to designing the asset's foundation.

With its long history of geotechnical engineering and environmental review, Barr Engineering Co. has evolved to assume a leadership position in the world of wind energy.

"Our wind team has taken on thousands of projects across North America and around the world," said Nick Palatiello, power market lead for Barr. "We've designed foundations for nearly half the installed onshore megawatts of wind in North America and have assisted with environmental review and permitting at numerous sites."

MOVING INTO WIND

And that means Barr has been a relied-on engineering company of record for much of the installed wind in North America as the company moved into turbine foundation design in the 1990s and 2000s, according to Palatiello. And as turbines begin to age out, Barr is finding additional projects in repowering older assets.

"As sites need repowering, our clients are coming back to ask us to look at structural health, to assess whether their foundations are still in good condition and can support the larger turbines and blades — everything that needs to be done to make them structurally sound for those upgrades," he said.

There are several ways in which older foundations might be modified to support new turbines, according to Palatiello, ranging from reinforcing, repairing, or enlarging the bases to moving them to new locations.

EEC ACQUISITION

To continue expanding its footprint into the wind-energy and other renewables sectors, Barr recently brought on board the employees of Exponential Engineering Company (EEC) to bolster its electrical engineering capabilities, primarily those involving substations, transmission lines, interconnections, and battery storage, according to Palatiello.

"We've been working with EEC for a number of years, so it means continuity for our clients and our project teams," he said. "EEC brings some unique capabilities both for owners and developers, particularly with interconnection studies and design, which is increasingly needed with projects. EEC also strengthens our ability to address both the engineering and environmental requirements and challenges for wind and solar projects. It also allows us to more confidently say that we have a fully integrated team to help from the beginning to the end of a wind project."

MORE THAN A GEOTECHNICAL FIRM

Even though in the wind arena Barr is mostly known as a structural and geotechnical firm, Palatiello stressed the company is much more than that.

"We've increased our engineering and environmental capabilities; we have civil capabilities, electrical capabilities, permitting capabilities — we're a full-service firm," he said. "High Energy Inc. joined Barr in 2019, which expanded our electrical, structural, and civil engineering services for substations, overhead and underground transmission lines, and distribution lines. We really have been investing in that

Barr is a full-service team with engineering and environmental capabilities, civil capabilities, electrical capabilities, and permitting capabilities. (Courtesy: Barr Engineering Co.)

To continue expanding its footprint into the wind-energy and other renewables sectors, Barr recently brought on board the employees of Exponential Engineering Company (EEC) to bolster its electrical engineering capabilities, primarily those involving substations, transmission lines, interconnections, and battery storage. (Courtesy: Barr Engineering Co.)

power-delivery aspect for the wind market, but we've also invested in site layout, site permitting, and those other disciplines I think some folks don't know Barr provides."

Projects that come to Barr may all have unique variables, but Palatiello said the company starts all projects the same way — in the shoes of its clients.

"We really work to understand the challenges and goals for each project and each site," he said. "From our experience over the decades, we have a deep understanding of the challenges and opportunities presented with each project, but we also know that each of them is unique in terms of the location and the project itself. We work with our clients to understand their challenges and their goals. We also have a unique culture; we build our teams to bring in the experts to address what's needed for the client. Really, it's oftentimes bringing in experts to work across disciplines to deliver the right technical expertise to the client."

CHALLENGES WELCOME

Barr thrives on complex challenges, said Palatiello.

"Our experience demonstrates this," he said. "We've worked at complex site locations, including ones with faults, fractures, and karst formations, and we've also been helping establish turbine foundations on mountaintops and former mining sites, which are now incentivized by the Inflation Reduction Act."

As sites need repowering, Barr's clients need to know whether their foundations are still in good condition and can support larger turbines and blades. (Courtesy: Barr Engineering Co.)

The IRA has opened up particular avenues for Barr in the repurposing of mining sites for renewable energy, according to Palatiello.

"There's just an increase in interest in learning if there are feasible locations to be able to take advantage of those incentives," he said.

Throughout its decades-long history — Barr was founded in Minneapolis, Minnesota, in the 1960s — the company has focused on helping clients use natural resources responsibly and practically. As that relates to wind foundations, the com-

pany began providing turbine-foundation designs to M.A. Mortenson in the 1990s, according to Palatiello.

"We've continued to serve not only Mortenson, but much of the wind industry, since then," he said.

LEAD FOUNDATION DESIGNER

For all that time, Palatiello said Barr has been proud of being one of the lead designers for wind-turbine foundations in the U.S. and North America, developing long-term client relationships.

"Our clients have trusted us with their most challenging projects for many years now, and many of those clients have brought their relationship with Barr along with them as they've changed jobs and moved around the industry," he said. "It's really those long-term client relationships and the value in them that we're most proud of."

Palatiello expects those relationships in wind and other renewable sectors to keep growing. "We see continued large demand and growth, particularly with onshore wind, for Barr," he said. "We see, with the Inflation Reduction Act, a little bit more stability in the wind market, and we see us continuing to support the industry moving forward. Wind is one of the foundational clean-energy generation sources. With many of the low-carbon goals of our investor-owned utilities and other utilities, wind is really going to be part of the portfolio for the next 10 years and more."

MORE DEVELOPMENTS

Along with the power created directly from wind, Palatiello said Barr will also be involved in satellite developments that can go with it, such as battery storage and production of green hydrogen.

"We anticipate greater development of storage to go along with wind to help with load balancing; it's also clear that we need and can anticipate a greater buildout of the transmission infrastructure in North America, particularly in the mid-continent region, to deliver this energy from wind," he said.

"We also see — with both wind and solar — the bolstering of green-hydrogen developments."

Palatiello added that Barr already is moving to take advantage of wind and solar being used for green-hydrogen production.

"We're excited for the future," he said. "Renewables is a great space to be in. It's one that we've enjoyed serving and being in for the last several decades, and we really — as shown by bringing EEC on board — continue to believe this market is going to be really strong.

So, we are happy to be engaged, happy that we have long-term clients, and we look forward to continuing to serve them."

MORE INFO www.barr.com

Matt Roberts

Director, business development, renewable energy technologies ◤ Emerson

"Our customers are striving for ownership and access to their assets; they want to be able to see all of the data that's being generated."

◤ What does Emerson do for wind and other renewables?

Emerson has a long and proud history of serving the traditional power sector for over a century, and we've been supporting a lot of the major utilities in that space. As more and more power producers have been moving into the renewable space, we've been moving with them. We cover renewables in nearly every space—hydropower, solar and battery storage, hydrogen and wind power.

Emerson acquired Mita-Teknik in December 2021. They've been a great addition to helping us bring solutions to our existing customers in the space of wind turbine controls and asset management, and even some specific equipment controls like pitch retrofits and condition monitoring. Our focus is providing access to data that either we generate or pull out of existing equipment.

◤ What is a turbine retrofit and how is Emerson involved in making this happen?

There's a lot of equipment within the turbine, and we are focused in two main areas. I'll start with the most general one first, the controls retrofit. The turbine controller is the piece of equipment that is the brains behind the turbine. It's controlling when they're starting, when they're stopping, what the load is, which direction they're pointing, how they're into the wind-blade pitch, and how fast they're running.

We provide both OEM solutions and retrofit solutions that are independent from the equipment OEMs. What we often hear from our customers is either due to reliability, or a lack of access to data, they want to own the operational data generated by their assets. They want to go in and be able to control the assets they own. Consider the traditional power industry—they are used to owning their assets' data. They're used to having full control, full access to data, and they expect that same control in the renewables space. That's what we can provide to them. By bringing in an open-control platform, they have access to all the information they need. They can change and modify any of the control algorithms. It's completely open and available for them.

To enable this control, we have specific control retrofits for specific wind-turbine models. There are over 350 specific wind-turbine models that we have off-the-shelf retrofits for, designed to be plug and play. You disconnect the wires; you pull out the controller; you put in the new controller; you re-land the pigtails. We can generally do a full-term retrofit in one to two days.

◤ What is Ovation Green and what does it mean for wind?

As I mentioned before, we have this tremendous history in the traditional power space, and the Ovation Green portfolio is the expansion of that with renewables-focused solutions. It allows us to meet two critical needs at the same time: we have both a purpose-built renewables solution and all the benefits of integrating it into the larger ecosystem. We're hearing customers say things like, "I want standardization; I want my engineers and operators going from my coal plant to my gas plant to my hydro plant to my wind turbine to my solar sites." These customers benefit when their personnel are all familiar with the same platform and with broader innovation. We can do that. Within Ovation Green specifically, we have solutions that we're bringing in and ones we're further developing that are built for renewable projects, not originally built for fossil projects.

◤ Since you acquired Mita-Teknik last year, how has that helped you advance where you need to go?

We've been involved in the renewables space for quite some time. Some of our earliest projects were with solar in the U.S. and globally for the past 10 years or more. We had wind projects before the acquisition of Mita-Teknik, but our customers were asking us to expand our solutions. They wanted our

deep power generation expertise and the cutting-edge wind technologies in a format that would help them optimize their renewables operations. And Mita-Teknik brought that solution. They were a leader in wind-turbine controls. They developed some of the first controls in the '80s, and they've been a large supplier to OEMs in the European market and in the Asian markets, but not as much in the U.S. We're able to bring that expertise to our customers here. We're seeing a tremendous connection between the pains and the challenges they're having and our solutions.

Are you developing any new software for wind clients?

Yes. Most of our development has been around energy management and asset management. On the energy-management side, you're seeing a lot of the grid and connection requirements changing. You're seeing a little bit on the battery integration and hybrid sector, and even more on the solar side. Our customers want more integrated controls between asset types. Energy management at the park level or at the fleet level is an area of focus for us.

Similarly, asset management brings in a single-purpose-built SCADA and asset-management platform that allows seamless integration between wind sites, solar sites, battery sites, and other asset types. We can also layer additional industrial software solutions on top of that. For example, we've partnered with AspenTech, who we now have 55 percent ownership of, and they have a lot of digital twin simulation technology, AI, and machine learning technology, which integrates with our existing machine-learning advancements from our Ovation platform. We are applying that knowhow to the specific needs of wind.

Emerson's wind involvement is still relatively new, correct?

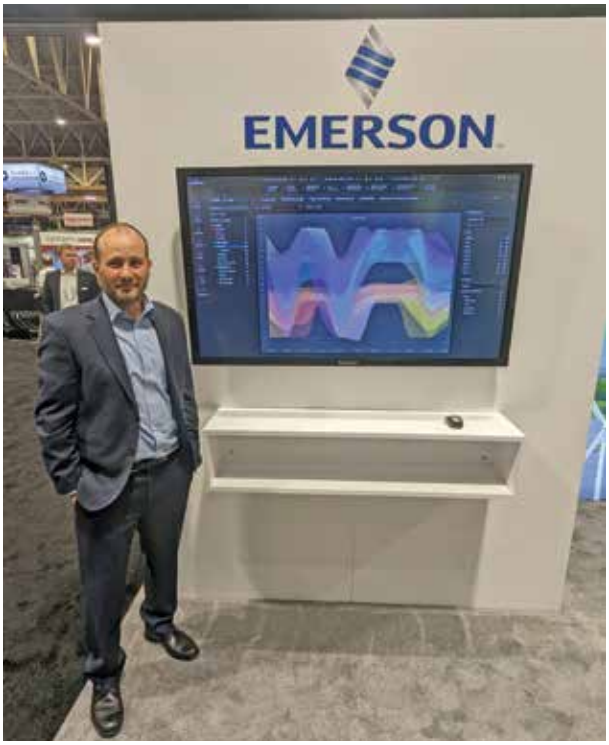
It depends how you look at it. Mita-Teknik was formed in the '60s, and they've been delivering turbine controls since 1969. The integration of our renewable energy technologies team is going tremendously well, and the Denmark team is an integral part of our development cycles now with the solutions and support we're offering to customers.

Prior to the acquisition, Emerson and Mita-Teknik were working with a lot of the same customers. So, while Emerson's involvement in wind may be a little newer, the relationships to the customers and the challenges are not.

What's been the market response to what you are offering the wind industry?

It's been very, very positive. We're doing this for a handful of reasons. One is that it's just being asked for. Our customers are saying, "We have these pains; can you help us? We've acquired these wind sites. I want you to do for us here what you've done for us there."

Our customers are striving for ownership and access to their assets. They want to be able to see all of the data that's being generated. They want to know the condition of the equipment that they have. A lot of times, new turbines are going in with service agreements where they don't have access to what's going on. I heard a story from a customer recently where they have condition monitoring equipment



Matt Roberts demonstrates Emerson's Ovation Green software at CLEANPOWER23 in New Orleans. (Courtesy: Emerson)

on the units, but they don't know the data; they don't even know what the alarm thresholds are. They just know whether there's a problem or not. And when the equipment gets turned over to them in 10 years, they won't know the history of it.

Being able to provide open access to data — either through our equipment or through our compatible protocols that we've developed that allow us to go in and access data directly from the OEM's controllers and bring it into our SCADA solutions — has been the biggest challenge.

Our Ovation Green SCADA solution to that challenge is really exciting. There are a few layers to it: the data collection, the data aggregation, and then the user interface and the intelligence behind it. All of those are addressing specific challenges we're hearing from our customers. In many cases, there's a controller there, and it's putting 20 data points out to a server and the user can access the server, but they know there's a wealth of knowledge beyond those 20 points that's cut off.

We can access that wealth of knowledge. We can take a controller and go from 20 data points to 2,000, and we can do that across all different asset types, either different turbine types, or even assets outside of wind. And then we start aggregating that — generalizing the data, aggregating it and making it manageable and making it make sense, and then feed that up into a very quickly scalable piece of software that's built for purpose. It is a solution that's built specifically and only for renewable asset management.

MORE INFO www.Emerson.com/Ovation-green

SMC personnel climbing an offshore wind turbine. (Courtesy: Specialist Marine Consultants)

CONSTRUCTION

SMC contracted for Sofia wind farm

Specialist Marine Consultants (SMC) was recently awarded a contract from RWE's Sofia Offshore Wind Farm to deliver offshore resources and services for the duration of the project's offshore construction, commencing in 2023.

The turnkey package of works includes a range of services, such as an above-water offshore balance of plant works that includes statutory inspection and general maintenance of the TP, marine coordination resourcing, delivery of vessel inspections, project PPE management, specialist offshore construction resourcing, project consultancy support, and all associated project management.

"We are extremely proud to win the Sofia construction services contract," said Ian Coates, SMC managing director. "It is a major achievement for the company and testament to the entire SMC team who work onshore and offshore. SMC, following on from the success of the Triton Knoll project, where SMC undertook similar works on behalf of RWE, have taken great care to ensure we continued to develop our offering and to cement our position as a 'best in class' supplier of our respective services."

"Our recent achievements in this area, with solutions delivered to a range of clients globally, have allowed SMC to build and retain a strong team of specialists, focusing on local content and personnel development, something we know to have been a key priority for Sofia," he said.

Rob McLauchlin, Sofia's general site manager (offshore), said he is pleased to have a respected and experienced service provider join the Sofia team as it nears its next key phase of activity, offshore construction.

The 1,400-MW Sofia offshore wind farm is 195 kilometers from the U.K.'s coast on Dogger Bank in the central North Sea and is one of the largest single offshore wind farms in the world, as well as one of the farthest from shore.

It will comprise 100 14-MW turbines across a 593 square-kilometer site, which is roughly the same size as the Isle of Man.

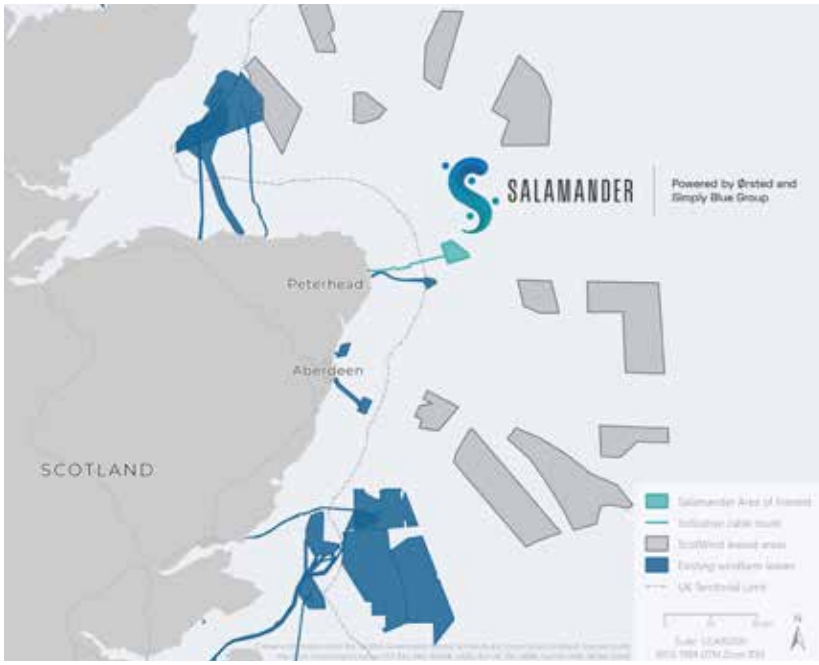
MORE INFO www.sofiawindfarm.com

CONSTRUCTION

Salamander sets wind-farm consultations

The Salamander offshore wind joint venture is holding consultations allowing people to speak with the project team. The consultations were available virtually on the Salamander website until June 23. Salamander is a joint venture between Ørsted, Simply Blue Group, and Subsea7 that will support the local supply chain and create jobs.

Salamander, to be developed 35 kilometers off the coast of Peterhead, will generate enough green energy to power 100,000 Scottish homes. The joint venture aims to begin construction in 2026. "We're holding these consultation events so that local residents



Salamander, to be developed 35 kilometers off the coast of Peterhead, will generate enough green energy to power 100,000 Scottish homes. (Courtesy: Salamander Floating Wind)

can learn more about this innovative development taking place on their doorsteps and be proud to be part of it," said Huw Bell, Salamander project director. "We also want to hear any ideas or concerns from the community so that we can take these into account at an early stage."

"Salamander presents an exciting opportunity for the Scottish energy sector and will serve a crucial role in the progression towards our decarbonization goals," he said.

The project is a stepping-stone to the large-scale floating offshore wind projects coming to Scotland in the near future. It has been designed to give Scottish companies the opportunity to roll out new technologies at a smaller scale, as they prepare to expand their operations.

This means local companies will be best placed to compete for contracts and create sustainable, long-term jobs. Salamander will also help deliver the Scottish government's target of 11 GW of offshore wind by 2030 and the U.K. government's target of 5 GW of operational floating offshore wind by the same date.

The virtual and in-person public exhibitions were designed to give the public an opportunity to complete a feedback form where comments and questions on the proposal, as well as any requests for further information, can be submitted directly to the project team.

MORE INFO www.salamanderfloatingwind.com

CONSTRUCTION

JDR to supply test cables for floating wind project

JDR Cable Systems, the global subsea cable and umbilical supplier, part of the TFK Group, recently announced it has been awarded the contract to supply, test, and terminate the 66kV dynamic inter array cables (IAC) for independent renewable energy producer Qair's floating offshore wind Eolmed pre-commercial 30-MW project.

Located in the south of France, the Eolmed project will be connected to the French Electricity Transmission Network (RTE), providing about 100 million kWh per year of power – equivalent to the electrical consumption of 50,000 inhabitants.

JDR will design and manufacture the 66kV dynamic cables, with the cable cores being produced at TFK's Bydgoszcz plant in Poland.

The assets will be transported for final assembly and testing at the business's facility in Hartlepool, U.K.

The manufacture and delivery will be completed in the second half of 2024.

MORE INFO www.jdrcables.com

Funding will support ONYX Insight expanding its predictive maintenance solutions from the drivetrain to the blades. (Courtesy: ONYX Insight)

INNOVATION

ONYX Insight wins grant to boost blade-sensing technologies

ONYX Insight recently secured a grant that will supercharge the adoption of blade-sensing technologies for the wind industry in a bid to reduce downtime for wind operators across their turbine fleets.

The Nottingham-based company has been awarded the funding by the U.K.'s Offshore Wind Growth Partnership (OWGP), part of the Offshore Renewable Energy Catapult.

The funding will support a project over the next 18 months that will see ONYX Insight expand its predictive maintenance solutions from the drivetrain into the blades. The project will build on the success of ONYX's wind-turbine drivetrain condition monitoring product, ecoCMS.

"The funding from OWGP provides us with a welcome grant to accelerate the development of advanced sensing for the blades," said Bruce Hall, ONYX Insight CEO. "It also acknowledges the work we have been doing to develop holistic approaches to CMS that provide ever more detailed and wide-ranging data insights for our customers."

As a provider of condition monitoring services (CMS) to the wind industry, ONYX Insight uses advanced sensing technology and data analytics to support wind-farm operators in identifying potential faults and planning maintenance. The company collects data directly from more than 14,000 turbines across 30 countries.

Catastrophic blade failure in onshore settings can cost upwards of 300,000 pounds in materials, equipment, labor, and unscheduled downtime, and can be much higher in an offshore setting. However, if this same fault is predicted and remedied when it is less severe, repairs can be significantly less.

It is anticipated that the adoption of blade-monitoring technologies will increase over the coming years, delivering significant financial and time savings for wind operators, with blade

failure being one of the leading contributors to offshore and onshore asset downtime after gearbox faults.

MORE INFO onyxinsight.com

INNOVATION

Edinburgh researchers win grant for wind-turbine recycling

Engineering researchers have won a 125,000 pounds grant from renewables investor Greencoat UK Wind to develop their wind-turbine recycling process.

The researchers, from the University of Edinburgh, are developing a technique to turn old wind-turbine blades into powders that could be used to protect engineering and structural components, including new wind-turbine blades.

Wind energy is a critical part of the renewable energy mix being harnessed in the U.K.'s drive to net-zero carbon, but the question of how to recycle wind-turbine blades at the end of their 20-25 year lifespan continues to pose an engineering and environmental challenge.

Wind-turbine blades are usually huge structures, made from a complex composite of materials bonded together by a strong adhesive known as epoxy, and reinforced with fibers, making them difficult and expensive to separate and recycle.

Professor Vasileios Koutsos and Dr. Dipa Roy, from the University of Edinburgh's School of Engineering, have devised a method to turn decommissioned blade materials into powders that could be used in surface coatings to protect engineering and structural components from corrosion and erosion by the elements.

Greencoat UK Wind, an investment trust specializing in renewable energy infrastructure, provided funding for a 12-month research project to develop the process.

The coating produced would help protect new wind-turbine blades from erosion caused by raindrops and other particulates. It could also be used in the built environment, for example, to prevent corrosion on the cables of suspension bridges.

The project is being supported by the University of Edinburgh's commercialization service, Edinburgh Innovations, who helped secure the funding.

MORE INFO edinburgh-innovations.ed.ac.uk

MAINTENANCE

Rope Partner acquires Gladiators Cleaning

Rope Partner, the premier provider of rope access and blade services for wind turbines, has acquired Gladiators Cleaning, an industrial cleaning company.

The acquisition will allow Rope Partner to expand its offering to include cost-effective and low-environmental impact cleaning solutions for internal and external towers as well as nacelles and blades.

Rope Partner has been serving the wind-power industry since 2001 and has experience in at-height maintenance, inspection, and performance enhancing aftermarket services that require specialized access approaches. The company's extensive experience has helped clients across the globe with blade repair and improvements, tower mechanical and inspection scopes, reducing down time and maximizing output.

"Since partnering with Gladiators in 2019, our clients have capitalized on our offering of internal and external tower cleanings, including blades and nacelles with much success," said Eric Stanfield, CEO of Rope Partner. "Acquiring Gladiators furthers our

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ability to better amortize technician mobilizations and reduce standby by offering the ability to complete more work scopes in a single site visit.

We are very focused on being the 'Tip of the Spear,' bringing new products and services to our customers and this patented solution is yet another value add that we will offer our customers."

The acquisition of Gladiators, the leader in wind-turbine power-washing, will help keep cleaning projects on schedule no matter how dirty the wind turbine.

This patented cleaning tool uses citrus-based cleaners and microbes to eliminate hydrocarbons, along with extensive wastewater removal measures.

MORE INFO www.ropepartner.com

MAINTENANCE

B&K Vibro names new CEO

Brüel & Kjær Vibro (B&K Vibro), one of the leading worldwide independent suppliers of condition monitoring solutions for rotating machinery, recently named Ingo Anders as its new CEO.

Anders, who will be based at B&K Vibro's headquarters in Darmstadt, Germany, will lead the global organization in growth and operational management. With more than 25 years of experience in service operations, Anders most recently served as vice president of Operations in the vacuum technique business unit, at Atlas Copco. He previously spent 14 years as the Head of Service Operations at Schaeffler.

"I am looking forward to collaborating with our expert team to strengthen our customer relationships and expand B&K Vibro's reach into many industries, including oil and gas, renewables, pulp and paper, and steel," Anders said. "Our company aims to make doing business into the field of condition monitoring and machine protection as 'easy as a click.'" B&K Vibro delivers actionable insights that help its customers to fix faults faster. This is made possible by harnessing the company's expertise in remote monitoring and by implementing value-added monitoring solutions, such as DDAU III for wind turbines, and VCM-3 for the industrial field monitoring market. These offerings have expanded with the launch of BKV Beyond, a new platform that extends condition monitoring from edge to enterprise.

MORE INFO www.bkvibro.com

MAINTENANCE

North Star completes Grampian Tyme crew

North Star, a U.K. vessel infrastructure

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We are stronger together by using our collective voice, resources, and influence to drive our industry forward. **ACP is proud to lead utility-scale clean power technologies of all types**, across the value chain and country, into this decade of opportunity.

support operator, has crewed up the first of its offshore wind fleet with 42 experienced seafarers, 60 percent of which have moved across from its existing North Sea workforce, transitioning core skills and company culture into the new vessel and its operations.

This completes the crew for the firm's new hybrid-electric service operations vessel (SOV), the Grampian Tyne, alongside the catering specialist team from Aramark.

The new North Star ship is the first of four that will support ongoing operations and maintenance work at the Dogger Bank Wind Farm over the next decade for joint development partners Equinor, SSE Renewables and Vårgrønn. The new SOV was unveiled at its naming ceremony at Equinor's O&M base at the Port of Tyne on June 7.The 135-year-old business, which has been supporting the oil and gas sector for the past 40 years, has a workforce of about 1,300 crew and onshore personnel across its locations in Lowestoft, Newcastle, and Aberdeen. The business has a fleet of 42 emergency support vessels providing uninterrupted critical safety services to more than 50 U.K. Continental Shelf installations every day. It has never left a post unattended.

The company has also completed further investment in its Lowestoft workshop to enhance its quayside support with regular SOV and associated daughter craft maintenance. Katy Willis has joined the local team as tender manager to assist with further business growth, and Ben Gardner has been appointed as vessel manager to aid operations in Port of Tyne.

"Our successful expansion into the offshore wind market has opened up many exciting new opportunities for existing crew members and has also allowed us to attract new talent into the business," said Robert Catchpole, North Star COO. "Those transitioning across from our emergency response and rescue vessels have in some cases successfully upgraded their certification with our support to allow them to diversify into manning our offshore wind fleet of vessels in support of The Dogger Bank Wind Farm."

"Being able to leverage our existing fleet's skill pool is a unique capability for North Star, and it gives us a real edge in terms of the safety culture and standards onboard," he said. "When we complement this knowledge and seamanship with external experience, we find ourselves very well positioned for successful operations moving forward."

MORE INFO www.northstarshipping.co.uk

MANUFACTURING

North Star, Alicat team for offshore wind daughter craft

North Star, specialist vessel operator for offshore infrastructure support, has awarded a new contract to Alicat Workboats Ltd, a leading Great Yarmouth-based shipbuilding firm, for the construction of two new offshore wind daughter craft. The hybrid-propulsion workboats 5 & 6, designed by Chartwell Marine, a U.K. pioneer of next-generation vessel design for the offshore wind sector, will be integrated into North Star's renewable fleet. They will complement the two new SPS 120 CSOVs under construction with Vard.

The latest additions to the fleet bolster the ongoing partnership between North Star and Chartwell, following the procurement of four daughter craft vessels between 2021 and 2024 for four contracted SOVs. Combining diesel and electric outboard propulsion and efficient hull design, the crafts respond to the demand in the offshore wind support market for low-emissions, high-performance vessels that can thrive in turbulent sea- and weather-states.

North Star delivered its inaugural service operations vessel (SOV) designed specifically for offshore wind operations and maintenance (O&M) support on Dogger Bank. The first of four SOVs bound for the development, the firm's distinct design, is powered by hybrid technology and provides wind-farm technicians with V1:C1 cruise liner standard comfort and accommodation while working in the field for extended periods.

Daughter crafts 5 & 6 will play a critical role in ensuring quick and safe operation offshore on the next series of vessels in North Star's renewables growth, transferring technicians from CSOV to turbine on a regular basis in a challenging offshore environment.

Alicat Workboats Ltd will build the two vessels based on the Chartwell Daughter Craft design specification, offering enhanced flexibility in the field for personnel development and logistics. The designs will integrate green technologies and futureproof for further technological advancements to come, facilitating the integration of low-emission fuels.

"We are thrilled to collaborate once again with North Star and Alicat, and excited to be able to apply our expertise on such a monumental offshore wind project — not just in the U.K., but globally," said Andy Page, Chartwell Marine director and naval architect. "The next-generation technologies and design philosophy of daughter craft 5 & 6 further solidify our shared vision for a green future in the maritime industry.

With the workboats playing a pivotal role in the further offshore sites serviced by North Star's Walk-2-Work fleet, providing a safe means of transfer for technicians, these vessels will prove essential in maintaining the momentum of the project's progression."

"Through our close collaborations with Chartwell and Alicat, we've witnessed their remarkable expertise and craftsmanship first-hand, so they were the natural choice for our next sequence of daughter crafts," said Andrew Duncan, North Star's renewables director.

"Their impressive track record has instilled in us the utmost confidence that they can reliably deliver on time in the fields of design and construction, helping us continue to provide essential services offshore."

MORE INFO www.chartwellmarine.com

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Located in the heart of America's offshore energy industry, New Orleans will host 2024 IPF just as the Gulf of Mexico begins developing its offshore wind market. Gulf companies are already hard at work building America's next energy industry and moving to integrate new technologies like green hydrogen into offshore wind. Embracing its offshore energy past and embracing the future of offshore wind, New Orleans and the state of Louisiana are emerging as a center of experience, expertise, innovation, and heart of this new industry.

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EMBRACING THE TRANSITION

According to Louisiana Gov. John Bel Edwards, energy transition isn't something that will happen overnight, even for a state like his that has been producing energy for more than a century. (Courtesy: Shutterstock)

Louisiana Gov. John Bel Edwards discusses the strides his state has made to combat climate change while improving Louisiana's economy.

By KENNETH CARTER ◤ Wind Systems editor

When one thinks of U.S offshore wind, the state of Louisiana may not immediately spring to mind; however, the southern state is making some bold advancements in pushing Louisiana toward a net-zero carbon future.

At CLEANPOWER 2023 in New Orleans in May, Louisiana Gov. John Bel Edwards spoke to a large crowd about what his state is doing for the renewables sector and how those moves could resonate into other parts of the U.S.

Before introducing the governor, Mary Landrieu, a former Louisiana senator who is now with Van Ness Feldman, LLP, revealed Louisiana has more industry per capita than almost any other state and, as a result, will be difficult to decarbonize.

It's a solid challenge, but Louisiana leadership is not backing down while looking at a range of possibilities to guide the state to success, according to Gov. Edwards.

"Today, there is a focus on bipartisanship," he said. "And the truth is, those things really sum up what we've been trying to do here in Louisiana. And I believe that we have had success. Louisiana is an energy state. Period. And it's exactly for that reason that we are taking an all-of-the-above approach to the energy transition."

A BALANCING ACT

Balance is the key, according to Edwards, because energy transition isn't something that will happen overnight, even for a state that has been producing energy for more than a century.

"We're going to have to embrace the transition to the maximum extent possible but do it in a balanced way," he said. "Not just balanced among all the various clean-energy initiatives, but balanced with the oil-and-gas industry as well. Because it is a transition that's going to play out over a number of years and probably over several decades, so we embrace what's happening."

Despite the need for a balancing act among industries, Edwards was quick to point out that change is needed, and needed quickly.

"Here in Louisiana, the need is even more urgent," he said. "And, quite frankly, it's visible. Our state has again more adversity affected by climate change than any other state in the nation. As you probably are aware, storms are getting stronger. They're also getting more frequent. And in fact, the two strongest storms to ever hit our state, hurricanes Lauren and Ida, actually happened in 2020 and 2021."

Along with more frequent deadly storms comes sea-level rise and coastal erosion, which play a huge hand in destroying Louisiana's ecosystems and well as its cultural traditions, according to Edwards.

"In Louisiana, unfortunately, we lose a football field's worth of land every hour and a half," he said. "So, climate change is real. In Louisiana, it's not really an academic discussion. It affects other people. It's not a mythical talking point you hear about on TV. It is at our door. And we recognize the need to take action not just to protect our eroding coast, but to address the root cause of the climate change. In particular, carbon emissions."

CO_2 SOURCES

Part of the challenge in Louisiana is the source of the carbon dioxide, according to Edwards.

"We're a little different here," he said. "We're the only state in the nation where more than 50 percent of our CO_2 emissions don't come from power generation. They come from chemical manufacturing and refining."

In order to tackle those massive emissions, Louisiana will need to electrify much of those industrial processes, according to Edwards.

"As much as that electricity needs to be renewable as possible," he said. "But this is also a climate issue. We're landing tens of billions of dollars' worth of investment projects precisely because we were saying yes when some of our neighbors are saying, 'Not so fast.' And in fact, the *Houston Chronicle* recently published a story about how Louisiana is claiming clean-energy projects while Texas resists. Everyone, including the most ardent climate deniers, understand economic development, investment, and job creation."

Successfully implementing a net-zero-carbon plan means private companies will have to do their part as well, according to Edwards.

"It helps that the oil-and-gas companies doing business here in Louisiana, but also our chemical manufacturers, all have their own internal goals around decarbonizing the future," he said. "And, of course, we brought government actors to the table, and we all worked together on that climate-action plan. But I really believe that there is a growing consensus in Louisiana climate change that we have to do something to address it, but also that, if we want to be an energy state, if we want to retain those jobs, if we want to retain that role, as important it is for the country and quite frankly, for the world, this is something we're going to have to participate in and really lead the way in. And I think it's working."

ECONOMIC BENEFITS

Edwards said he was a bit surprised at the support for his state's climate initiatives until he realized the economic factors involved.

"There has been a lot more support for our initiatives, quite frankly, than I thought when we set out," he said. "There may be some people who aren't so sure about whether climate change is real, or if it's real, if human behavior is influencing that. But everybody understands economic

Louisiana Gov. John Bel Edwards speaks about his state's renewable-energy initiatives at CLEANPOWER 2023 in New Orleans. (Courtesy: Wind Systems)

development, investment, and job creation. And so, given the climate-investment decisions that have been made and other projects that have been announced, they've added to the tens of billions of dollars."

And all that investment translates into thousands of construction jobs and tens of thousands of permanent jobs, according to Edwards.

"Everybody understands that," he said. "That has really helped us. But we also know if clean energy isn't available in Louisiana so the companies can't meet their own internal goals here, those investment dollars are going to go somewhere else. We want them here in Louisiana because we have so many other advantages. We have the best workforce in the country, and of course I'm biased about that. For example, the density of pipelines in the state is unmatched anywhere else. And for all of those reasons, it really does work. Not to say it hasn't been challenging. But we've been successful to a very large degree thus far because we're doing it in a way that we position ourselves in the middle and not on either extreme."

CHALLENGING ISSUES

Permitting issues, as well as other concerns, not just in Louisiana, but in many states will be a factor in getting projects off the ground quickly, and Edwards said working with other governors is key to that success.

"Governors get along really well — y'all should know that," he said. "And that happens irrespective of party. Because, quite frankly, we don't have the ability to simply say, 'Well, that's somebody else's job to make work.' Every state only has one governor, and you get credit for things that you shouldn't, and blamed for things you shouldn't be blamed for because there's only one person there to make it happen. So, we do get along, and the party labels really don't matter that much.

We borrow from one another. Quite frankly, there's a lot more collegiality there than you might think. We readily share experiences and what we think is the best practice or painful lesson learned with other governors."

Addressing issues that can expedite or, in turn, delay a project are paramount, according to Edwards, which has let Edwards and other governors to discuss potential challenges with permitting with the White House.

"I think that there are permitting steps that can be taken simultaneously as opposed to sequentially," he said. "There are so many things that we can do, especially around clean energy. Because the whole thing with energy is about the environment. We have a different issue here. We're trying to restore our ecosystems, and we're still having to go through inordinate delays because, in truth, our restoration efforts (are being treated) as if we're trying to build some commercial facility."

AD INDEX

Oil-and-gas companies in Louisiana have their own internal goals about decarbonizing the future. (Courtesy: Shutterstock)

LOUISIANA WIND

Without permitting issues being quickly resolved, projects could stall, according to Edwards.

"We're going to talk, I hope, about wind energy," he said. "If you put a wind platform in the Gulf and you don't connect it to the grid, you've done absolutely nothing."

As part of moving Louisiana to clean-energy alternatives, wind is a crucial part, according to Edwards.

"Wind is critically important for us," he said. "I just told you the single most important thing we have to do to realize our climate action plan goals is to electrify our industrial processes, and that has to be renewable electric to the maximum extent possible. Solar is certainly a part of that, but wind is, too, especially with us being a Gulf state."

As part of that wind goal, Edwards said Louisiana has already passed statutes to set rules for how to invest in wind energy in state waters. Three companies already have expressed significant interest due to those initiatives.

That goes to show the symbiotic nature of the government and private sectors working together toward a common goal, according to Edwards.

"People think they always have to be in conflict — the traditional oil-and-gas industries vs. clean energy," he said.

But recent history has shown that to not be the case at all, according to Edwards. For example, when the nation's first offshore wind project was brought in, there were Louisiana companies participating in that, which bodes well for that same cooperation closer to home.

"Wind is critically important to us," he said. "Having oil-and-gas and wind-energy companies operating in the same parts of our state at the same time really will facilitate the development of wind energy because they don't have to bear all of those costs of the infrastructure — all the efforts — by themselves. So, it's incredibly important, and we are very excited about the interest we are seeing in Louisiana in wind energy."

INFRASTRUCTURE IN PLACE

That existing infrastructure from oil-and-gas, in terms of industries, is a natural fit for wind, according to Edwards.

"If you've been making vessels to install and service oil-and-gas platforms, with modifications, those vessels can install and service wind platforms," he said. "We have some of the best vessel manufacturers anywhere in the world right here in Louisiana, so this is not just something that is theoretical.

I wish you could go to some of these shipyards in south Louisiana and see the vessels that they're building right now and the hundreds and hundreds of skilled workers who are employed building those vessels. This is exciting to us, but it's evidence on the ground that embracing the transition is right for Louisiana."

A number of industries and companies are already helping make these goals a reality, as well as looking to future goals such as the creation of green hydrogen, according to Edwards, but more work will be needed — both now and in the future.

"Nobody wants to be cold and in the dark, and we're asking people to make decisions today that — for this benefit today — the biggest benefit comes in the next generation," he said. "The American people, I suspect, are not quite that generous and forward-looking, and so, we want their continued support for this transition — for clean power. We're going to have to do this in a balanced approach and understand that it is a transition. That doesn't mean that we don't move as fast as we reasonably can, because there is a sense of urgency, too. But to try to get all of that right, I think is critically important."

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