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**POWER
ELECTRONICS
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BRIJ SHARMA,
FOUNDER, PRESIDENT,
AND CEO

**INTRODUCING NEXT-GEN
TRANSFORMER
TECHNOLOGY**

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INTRODUCING NEXT-GEN TRANSFORMER TECHNOLOGY


 OUR FACILITIES COMBINE
 STATE-OF-THE-ART
 MANUFACTURING RESOURCES
 WITH THE INTUITIVENESS OF
 OUR ENGINEERS TO DEVELOP
 SOME OF THE BEST LINEAR
 POWER TRANSFORMERS AND
 LINEAR DC POWER SUPPLIES



By Laura Davis

Ever looked at offshore oil drilling platforms and wondered how they weather severe storms? Well, their stability depends on how well the platforms are anchored to the seabed using metal or concrete structures. These undersea structures descend thousands of meters, making them as tall as some of the most ambitious skyscrapers. Needless to point out, the metal structures require regular maintenance, including welding of the metal parts to prevent degradation or cracking from extreme underwater conditions or turbulent storms.

However, underwater welding is no easy task. It requires specially manufactured power supply components (including

welding transformers) that can withstand the extreme pressure, underwater temperature, and salinity of seawater so as to prevent welding equipment failure.

An industry-leading welding equipment manufacturer faced a similar challenge when supplying welding products to its customers for the construction and repair of oil drilling rigs around the world. Although their welding equipment was top-notch, the transformers used for power conversion did not perform up to the mark in extreme underwater conditions. They needed better, purpose-built transformers that could sustain such conditions while also providing superior performance and longer lifecycles. Fortunately, they found

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**OUR TRANSFORMERS
 ARE ALSO KNOWN
 FOR THEIR SUPERIOR
 PERFORMANCE
 AND HIGH ENERGY
 EFFICIENCY**



the perfect solution to their problem with PowerVolt—an industry-leading manufacturer of power transformers and provider of power supply solutions.

PowerVolt began its collaboration by conducting an initial assessment of the environment in which the transformers would be used. Based on the analysis, the company then designed

compact, encapsulated transformers capable of performing seamlessly amid seawater extremities. The company also conducted several tests by mimicking the field environment to prove the new transformer’s reliability before delivering it to the client.

Impressively, PowerVolt’s transformers performed beyond the client’s expectations, and this secured PowerVolt’s place as the exclusive transformer supplier to the welding equipment manufacturer. This instance only stands to show PowerVolt’s deep-rooted focus on quality and customer satisfaction. In the same vein, it also shows PowerVolt’s power transformer expertise in niche domains like underwater welding. The company’s product portfolio, however, is not limited to welding transformers alone. In fact, its leading-edge transformer products are leveraged by some of the biggest OEMs across multiple industry verticals, including medical

device companies, automotive producers, equipment manufacturers, and so on. Even in the HVAC space, PowerVolt’s transformers are dominant for use in heating, ventilation, and refrigeration equipment.

What makes PowerVolt’s power systems stand out is the fact that these transformers are significantly improved versions of everything that is currently available in the market, especially when it comes to safety, quality, and performance. The live connections within the transformer, for instance, are encased in ‘finger safe’ casings, which not only prevent short circuits but also ensure safety during maintenance services. “Our transformers are also known for their superior performance and high energy efficiency,” says Brij Sharma, founder, president and CEO of PowerVolt. In fact, the company’s transformers deliver an efficiency level greater than 83 percent, enabling clients to save costs and earn their coveted energy ratings.

The Roots of Engineering Excellence

The inception of PowerVolt can be traced back to the early 80s when Brij Sharma was a budding electrical engineer. Growing up, he had a passion for drawing experimental designs of electrical components, and this passion turned toward transformer technology when he joined a transformer manufacturing company after completing his engineering program. While working, he noticed several shortcomings in existing transformer designs and found room for improvement, especially when it came to safety, quality, and performance. Each day after work, he would pursue his passion and come up with new—potentially better—transformer designs.

Eventually, he decided to take a leap of faith by quitting his job and buying a small power component supplying company, which he rebranded to PowerVolt and leveraged its capabilities to develop superior transformer products based on his designs. Despite several ups and downs during the growth phase, Sharma’s company kept expanding its client base through the sheer superiority of its offerings. To augment its manufacturing capabilities, PowerVolt also acquired several established power system manufacturers—namely Wabash Transformer and Ensign Corporation—which further ended up bolstering the company’s requisite R&D.

Today, these subsidiaries function under the wing of PowerVolt. They support PowerVolt’s mission of supplying the most cost-effective transformers and power supplies while maintaining the highest quality and safety standards. Notably, PowerVolt and its subsidiaries have design and manufacturing facilities in the Midwest (Illinois and Iowa), along with offshore facilities in China and



Mexico. These facilities are powered by the company’s highly skilled engineering teams with more than 180 years of cumulative power transformer design experience. “Our facilities combine state-of-the-art manufacturing resources with the intuitiveness of our engineers to develop some of the best linear DC power supplies and power transformers,” says Sharma. Their product portfolio includes class 1, class 2, control, and power transformers with traditional steel cores optimized for 50 Hz to 500 Hz operation and ferrite and toroid cores for frequencies greater than 500Hz (up to 100KHz). The company’s linear power transformers, especially, are preferred for industrial control applications, including controlling power for temperature, speed of motors, heating, air conditioning, refrigeration systems, showrooms, and even residential lighting. It is also interesting to note that, when developing these transformers, PowerVolt leverages domestic as well as international partnerships to augment its supply chain of raw materials, which helps in further enhancing design and reducing costs for its clients.

The Epitome of High-Quality Manufacturing Standards

While PowerVolt’s product portfolio remains exceptional in the market, what really sets it apart is the company’s ability to stay at the cutting-edge of technological evolution. Especially during the COVID-19 pandemic, when even some of the biggest companies were facing the challenges of labor shortage, PowerVolt was able to maintain business continuity by complementing its workforce with state-of-the-art automation.

Even now, PowerVolt’s facilities are augmented with computerized transformer design capabilities and automation-enabled engineering labs to facilitate rapid prototyping and assembly of transformer units. Bringing automation into its manufacturing facilities has enabled PowerVolt to ramp up production from a rate of 300 parts/day to over 3000 parts/day. Where once it required around 30 minutes to manufacture a transformer part, PowerVolt can now do it in just four minutes. Along with shortening the lead times, automation allows the

company to maintain the quality of the manufactured parts.

PowerVolt is also consistently modernizing its supply chain workflow by incorporating analytics and forecasting capabilities to deal with the rising material shortage. By analyzing historical data, PowerVolt predicts demand from its potential clients and based on the forecasts, it orders the required raw materials in bulk from its supply chain partners to achieve quicker product delivery times for clients.

Moreover, all PowerVolt's facilities are equipped with robust testing capabilities to implement stringent control over the quality and performance of its final products. Whether it is vibration testing or temperature testing, they ensure the transformers can sustain even the most extreme conditions without failure. This commitment to quality and safety is further testified by PowerVolt's certifications from authorities, such as the Underwriters Laboratories (UL) and Canadian Standards Association (CSA), TUV, VDE etc. Besides, PowerVolt is an

ISO 9001:2015 registered company with CE certifications for all its products. These certifications only stand to show the company's adherence to regulatory requirements and dedication to quality standards.

Ushering Clients to the Future of Power Conversion

These quality standards have even garnered the company clients from highly regulated industries such as medical equipment, which require extremely reliable components. A case in point is when a medical equipment supplier needed to design a custom, purpose-built transformer. The medical supplier was already working on a low-temperature freezer for the armed forces to store and transport critical medicine, vaccines, and injections during the COVID-19 pandemic. However, they could not find any off-the-shelf transformer that was compact enough to easily fit in the freezers and also have high power conversion capability. That's when they turned to PowerVolt. It did not take long for PowerVolt to design a transformer

exactly to the specifications. Impressed by the performance of the transformers and PowerVolt's customer support, the client decided to extend the contract. Today, with PowerVolt supplying the crucial transformer components, the medical equipment manufacturer is seamlessly delivering freezers to the armed forces and laboratories without delay.

This success story substantiates PowerVolt's ability to quickly design and deliver even the most complex transformer units under short notice. Such capabilities are further complemented by the dedication of its workforce. The company's employees uphold Sharma's inherent principles of hard work and commitment, aspiring to take PowerVolt to the pinnacle of the transformer manufacturing industry through constant innovation.

While this culture will remain a foundational pillar in the company's growth, PowerVolt also aims to bring further upgrades in its manufacturing capabilities. It is already trying to reduce offshore supply chains and create more facilities in the U.S. to boost the local economy and streamline lead times. More notably, from the technological viewpoint, PowerVolt is in the process of developing a combined unit with the capabilities of both control transformers as well as heating/ventilation transformers. This will not only reduce the installation space and assembly time but also minimize the need for repair and maintenance. At the same time, the company is also working on 'smart transformers,' which will potentially push transformer technology into its next generation. On that front, PowerVolt aims to incorporate self-monitoring capabilities into all its future products, allowing users to troubleshoot more easily. "Our aim is to take power transformer technology to the next level and align it with the digitalized and evolving world," concludes Sharma with conviction. 

