

COME HAIL OR HIGH WATER

**Don't let extreme weather
impact utility-solar production
and revenue**



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01

INTRODUCTION

Whether it's wildfires, hurricanes, or hail, natural disasters devastate solar power infrastructure. Particularly for asset owners of utility PV, extreme weather can cause significant downtime, repair costs, and revenue loss.

Last summer was the worst on record for natural [catastrophe claims](#), with far more damaging unmodeled extreme weather events. Hail losses in Texas alone last year caused about \$300 million in solar damage, nearly ten times the estimated losses from Hurricane Hanna in 2020. These weather events are causing some insurance firms to stop underwriting renewable projects, while others are increasing premiums to far higher levels.

When floods recede and winds die down, owners of solar assets need fast mobilization, plant recovery experience, and repowering expertise to get crucial assets back online rapidly.

DEPCOM Power has restored hundreds of megawatts of damaged plants. Our track record of project success combined with our one-source-solution approach ensures that you will experience the most efficient disaster recovery in the industry.

Key Takeaways

This guide offers a roadmap to natural disaster plant restoration, with actionable strategies to keep plant revenue loss under control. Our step-by-step approach details a refined process that:

- > **Balances** production with restoration
- > **Mitigates** component risks
- > **Manages** insurance claims
- > **Blends** original and new solar technologies
- > **Optimizes** plant performance post-recovery

**DON'T WAIT UNTIL
DISASTER STRIKES.
GET AHEAD WITH
A PREPAREDNESS
PLAN TO WEATHER
WHATEVER STORMS
MAY COME.**

02 | BEST PRACTICES FOR EFFICIENT RESTORATION

1

ASSESS AND DOCUMENT DAMAGE

First impressions can be misleading. What appears as minimal damage may conceal more significant issues. Document and take pictures of everything that may require attention. Note components that are obsolete and determine which OEMs will play significant roles moving forward.

Consider a high-resolution aerial scan to map the destruction, including infrared views to identify thermal problems. Insurance often covers this because they want to know what they're dealing with just as much as you do.

2

SAVE WITH SALVAGE

Before work begins, establish standards for testing damaged equipment and criteria for what warrants repair and what needs replacement. The right restoration partner will have the expertise required to implement these procedures.

Salvaging components requires flexibility. Maintain quality, but watch for opportunities to continue using viable parts. For instance, instead of replacing an entire inverter, explore options to re-energize the equipment. Successful salvage can save hundreds of thousands of dollars over replacement.

3

BALANCE PRODUCTION WITH RESTORATION

It's critical to get portions of the plant operational to restore revenue streams while restoration continues elsewhere on the site.

When possible, stagger the work to prioritize production; if one inverter is down simply because of a ground fault, but the rest of the array is in good shape, prioritize restoration there to get that section of the plant back online.

4

REPAIR AND REPLACE OLD WITH NEW

Ever-improving technology helps move the industry forward, but it also means that new equipment is not always backward compatible. It's tricky to blend legacy equipment that's no longer available with modern components. Creative engineering solutions that blend older units with state-of-the-art technologies can keep costs in check. Look for a partner with the expertise required to weave still-functional older parts in with newer PV technology.



5

MITIGATE EQUIPMENT SUPPLY RISKS

Today's 'perfect storm' of supply chain and inflation challenges exacerbates the complexity of extreme weather claims. A partner with EPC capabilities can streamline the wait for parts, ensuring availability through Tier 1 procurement agreements. Especially with today's supply constraints, you need experts with a deep supplier network and, ideally, an extensive inventory of spare parts on hand at regional warehouses.

6

MAKE INSURANCE A RECOVERY PARTNER

Insurance adjusters often are brought in too late. Instead, establish a relationship with your carrier early to ensure familiarity with PV best practices and align all stakeholders throughout the project.

Getting insurance up to speed from the project's genesis makes it easier to streamline the claims process and support fast, optimal insurance coverage. Select an experienced recovery partner that can help save valuable time by managing insurance claims.

7

GUARANTEEING PROFITABILITY AFTER THE CRISIS

Ensure strong post-recovery performance with in-house engineering teams, designers, construction management, and supply networks all under one umbrella. It's not enough to meet energy production guarantees after restoration. Partners with O&M capabilities bring additional plant operation solutions for long-term maintenance, repair, and energy optimization.

Repowering expertise can weed out unreliable equipment that diminish plant performance, while recertification programs can extend maintenance to salvage usable equipment and source parts faster than OEMs.

03 | WHAT TO LOOK FOR IN A RECOVERY PARTNER

It pays to bring a restoration expert on board early. Combating *force majeure* damage requires extensive experience to make swift decisions as well as skilled partner management to secure insurance and warranty support.



PROVEN RECOVERY KNOW-HOW

Recovery after an extreme weather event is complex, often more so than initial plant construction. Unlike new builds, restoration involves balancing current production needs against deconstruction and replacement demands. Screen partners for expertise in damage assessment, equipment salvage, and insurance claims management.



SOLAR CONSTRUCTION EXPERIENCE

Things rarely go exactly to plan. That's where PV experience is critical. Your partner should be able to troubleshoot and course-correct challenging construction issues before they metastasize. In-house capabilities and a capital equipment fleet can minimize risk and maximize safety, quality, and schedule control.



ADVANCED PV ENGINEERING

Close collaboration between construction and engineering teams can ensure project success. Demand detailed attention to permitting, civil and structural engineering, plant layout and design, energy modeling and analysis, inverter sizing, and substation size and layout.



PROCUREMENT STRENGTH

PV was not spared when the pandemic created supply chain challenges. While that squeeze is easing, the industry is still seeing solar module shortages and logistical constraints that increase supply risk. Look for EPCs with established partnerships with Tier 1 equipment manufacturers.



O&M AND REPOWERING EXPERTISE

Look for cost-effective solutions for short- and long-term maintenance, repair, and energy optimization. A partner with deep repowering expertise can help address diminished plant performance caused by unreliable equipment such as underperforming, damaged, or tough-to-source modules and inverters.



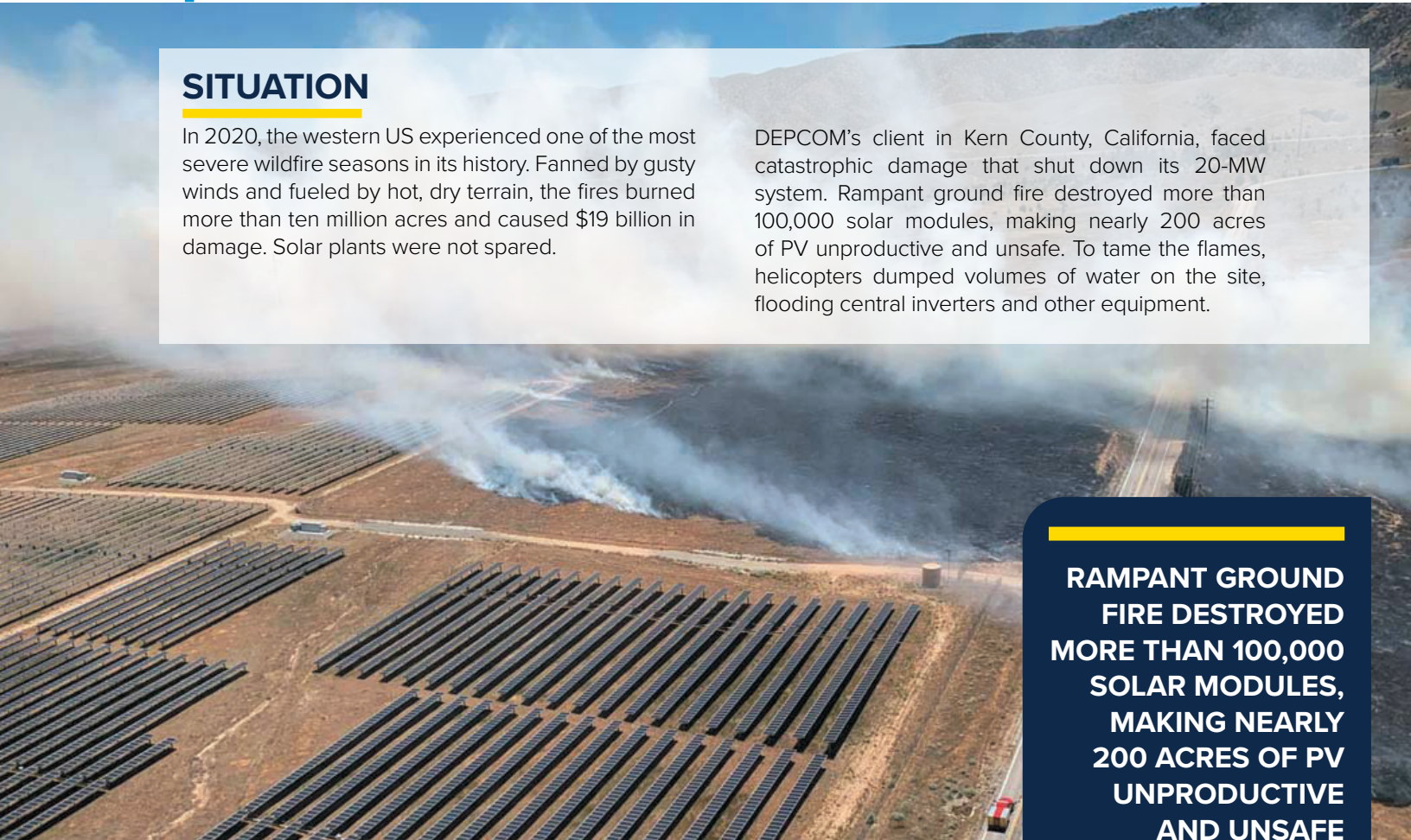
04 | RAISING PV PLANT FROM ASHES

EXPERT PLANT RECOVERY SAVES ASSET OWNER MORE THAN \$2.6 MILLION

SITUATION

In 2020, the western US experienced one of the most severe wildfire seasons in its history. Fanned by gusty winds and fueled by hot, dry terrain, the fires burned more than ten million acres and caused \$19 billion in damage. Solar plants were not spared.

DEPCOM's client in Kern County, California, faced catastrophic damage that shut down its 20-MW system. Rampant ground fire destroyed more than 100,000 solar modules, making nearly 200 acres of PV unproductive and unsafe. To tame the flames, helicopters dumped volumes of water on the site, flooding central inverters and other equipment.



RAMPANT GROUND FIRE DESTROYED MORE THAN 100,000 SOLAR MODULES, MAKING NEARLY 200 ACRES OF PV UNPRODUCTIVE AND UNSAFE

SOLUTION

DEPCOM quickly deployed its restoration team to assess the damage on-site, after months offline. With unique plant recovery expertise, DEPCOM surveyors thoroughly evaluated and documented rows of equipment and swiftly recommended a course of action to salvage, repair, and replace components.

DEPCOM worked alongside the asset owner and its insurers to prioritize getting a portion of the plant

back online quickly. It consolidated salvageable parts to restore segments of the facility while it procured new equipment to replace damaged parts. Unfortunately, the original bill of material and some of the equipment was no longer manufactured. As a result, DEPCOM had to source, engineer, permit, construct, and commission a hybrid system that wove in older equipment with state-of-the-art PV technologies.



RESULTS

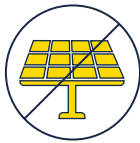
Performing this restoration during the COVID-19 pandemic required extra safety protocols to keep both DEPCOM and partners safe. DEPCOM leveraged its deep supply network to overcome pandemic-related supply delays.

DEPCOM merged in-house EPC capabilities with recovery expertise to balance production demands with deconstruction and replacement plans. This level of collaboration saved the asset owner a total of \$2.6 million in restoration and production losses.

DEPCOM's extensive restoration experience allowed it to work closely with insurers. The team streamlined the claims process by providing detailed documentation and cost explanations throughout the process, supporting rapid and optimal insurance coverage.

DEPCOM SAVED THE ASSET OWNER \$2.6M IN RESTORATION AND PRODUCTION LOSSES

DEPCOM outperformed alternative providers with advantages including:



Interruption savings:

\$1.2 million
in avoided lost revenue

Restoration cost savings:

\$1.4 million
in discounted labor and material costs

Restoration time:

60 calendar days
faster than competitive options

Total savings:

\$2.6 million saved
through expedited schedule and replacement efficiencies

Keeping everyone on the same page was critical. DEPCOM's proactive communication between the owner, the insurance providers, and partners wove the team together for an efficient collaboration.



05 | SALVAGING SOLAR FROM FLOOD

EXPERT PLANT RECOVERY SAVES \$6.5 MILLION FOR ASSET OWNER

SITUATION

Whipping winds, torrential downpours, power outages, and floods — hurricane season can be punishing. And with 2020’s Atlantic hurricane season ranking as the most active on record, owners of utility solar plants are bracing themselves for costly damages in the future.

When two hurricanes swept through the Southeast in 2018, one asset owner faced torrential rainfall and massive flooding at its 92-MW PV plant. The damage

was severe: Ten of 40 power conversion stations were inundated with 12 to 18 inches of water and remained flooded for several days.

The operator took all of the plant’s inverters offline before the hurricanes roared through, generating condensation inside all of them. Consequently, when the inverter manufacturer inspected for damage at the plant, it voided the warranty on all 40 inverters — instead of the 10 flooded units — abruptly denying responsibility for any of them.

**10 OF 40 POWER
CONVERSION
STATIONS WERE
FLOODED FOR
DAYS**

SOLUTION

DEPCOM’s restoration teams looked at all aspects of the project to keep costs and revenue loss to a minimum. From damage assessment and salvage planning to rapid restoration, they quickly assessed the situation: Condensation in the inverters was the long-term result of poor design and not negligent maintenance, as the OEM reported.

DEPCOM equipment specialists determined that the doors on the damaged units were not sealed

properly, allowing humid outside air to seep in, resulting in condensation.

With this expert documentation in hand, DEPCOM provided the critical proof that the units had pre-existing design issues, compelling the OEM to restore the warranty on the 30 inverters that had not flooded. Insurance covered the ten flooded inverters.



RESULTS

Facing significant production losses already, the plant owner and its insurance partner were on track to replace the flooded inverters. But DEPCOM’s specialists offered a different solution: Salvage and refurbish the units and save a whopping \$4 million in equipment replacement costs. The insurer approved the plan, but wanted to be sure the inverters were flood-proof. The most cost-effective solution? Elevate the concrete pads supporting the units by three feet for a fraction of the replacement cost.

One of DEPCOM’s unique strengths is prioritizing workflow to minimize revenue loss. In this case, it applied a strategic approach to move the restoration worksite to an area that would not hamper power production in other sections of the site.

As one of the country’s leading EPCs with more than 1.5 GWs of operational solar projects, DEPCOM can mobilize quickly. It deployed its 24/7 operational crews to the site to lift the pads in just six

weeks, far faster than the 22-week lead time required to install new inverters. This efficient solution minimized business interruption and got the flooded portion of the plant back online.

**EQUIPMENT
SALVAGING
AND RAPID
RESTORATION
SAVED \$6.5M
FOR THE ASSET
OWNER**



Interruption savings:	Restoration time:	Advantage:	Total savings:
<p>\$1.3 million Avoided production losses</p>	<p>152 days faster Than the competing solution</p>	<p>59% lower cost Faster than competitive options</p>	<p>\$2.5 million Through salvage and insurance support</p>

DEPCOM’s ability to rapidly return the plant to production resulted in \$400,000 to \$700,000 more revenue than waiting for delivery of new inverters. Combined with the \$1.8 million savings from salvaging the flooded units, DEPCOM’s fast restoration plan resulted in total savings of more than \$2.5 million for the asset owner.



06 RAISING PV PLANT FROM ASHES

EXPERT PLANT RECOVERY SAVES ASSET OWNER MORE THAN \$2.6 MILLION

SITUATION

When a rogue storm battered a PV power plant with winds up to 80 miles per hour, damaging 233 of the site's 1,600 trackers, it quickly became clear that consistent and thorough maintenance practices had not been observed prior to the damage. As a result, more than 15% of the plant's trackers weren't operational before the storm, making it impossible to stow them into a protective position to minimize damage.

Despite that failure, the asset owner initially relied on O&M personnel to assess the damage and file insurance claims. But four months after the storm, with huge swaths of the plant still not operating and finances beginning to sink into the red, restoration work had yet to begin. That's when DEPCOM's Repowering+ team was asked to step in.

**80 MPH WINDS
DAMAGED 15%
OF THE SITE'S
TRACKERS**

SOLUTION

As one of the country's leading EPCs with more than 1.5 GWs of operational solar projects, DEPCOM can mobilize quickly. Within four weeks, our recovery experts had a plan in place and were powering through the work.

Specialists deconstructed the damaged areas and conducted testing to determine what components could be salvaged and repaired versus what needed to be replaced altogether. Because of its deep supply network, DEPCOM was able to establish reliable and fast delivery for the required

replacement parts. Equipment also was readily available through DEPCOM's extensive inventory of spare parts on hand at regional warehouses.

Of equal importance was DEPCOM's early work with a key stakeholder too often brought in late in the process — the plant's insurance carrier. By establishing an ongoing dialogue with insurance adjusters, DEPCOM was able to keep the many moving parts in alignment while streamlining critical insurance payouts.



Ultimately, Repowering+ experts seamlessly married original, salvaged parts with new, modern equipment to bring the site completely back online without a significant (and costly) redesign. Such a complex accomplishment would not have been possible without our extensive restoration experience, which has allowed DEPCOM to consistently uphold every energy production guarantee after an extreme weather event. The flexible restoration plan minimized revenue loss while keeping much of the plant operational to maximize production throughout the repair process.

RESULTS

The final upshot: Savings of \$3.3 million over the initial forecasted budget. While the plant's owner had anticipated replacing roughly \$1.75 million worth of damaged components, DEPCOM was able to develop a salvage plan for the bulk of the modules that resulted in \$1.3 million in savings, recovering 70% more modules than anticipated in the original budget.

Recovery following an extreme weather event is complex, often even more so than initial plant construction. Unlike in new builds, recovery and restoration involve an intricate balancing act between current production needs and restoration demands. DEPCOM has found that balance time and again. In this case, additional savings came from reduced business interruption claims, a more efficient timeline than was originally forecasted, and a staggered workflow to prioritize production.

**DEPCOM'S
SALVAGE AND
RESTORATION
PLAN RESULTED
IN \$3.3 MILLION
IN SAVINGS**



Interruption savings:

\$381,000
in business interruption
damages



Restoration time:

126 days faster
than alternative



**Competitive
advantage:**

40% lower cost
than alternative



Total savings:

\$3.3 million

DEPCOM's restoration efforts resulted in additional savings from reduced business interruption claims, a more efficient timeline, and a staggered workflow to prioritize production.



07 REPOWERING INVERTERS AFTER SEVERE FIRE

SWIFT RECOVERY SAFEGUARDS REVENUE AND LIMITS COSTS

SITUATION

When a catastrophic inverter fire took down all production at a five-megawatt PV plant in Durham, North Carolina, there was no way to know how or why the fire ignited. Although it was clear that the flames had started inside the inverter cabinets, damage to both power conversion stations was so severe that it was impossible to determine the root cause.

Because the plant was commissioned in 2014, much of the original equipment is no longer made. The site

was designed around now-obsolete 1000-volt DC inverters, while today's plants are developed using 1500-volt DC systems.

Forced to work with a lump-sum payout from their insurers, the asset's owners needed a plan — and fast. Under the power purchase agreement with the local utility, there was a limited grace period allowed before production had to be restored. If that deadline was missed, the PPA could be voided entirely.

THE ASSET OWNER FACED EXTREME SCHEDULE PRESSURES TO RESTORE FOUR, 1,000-VOLT INVERTERS DESTROYED BY FIRE

SOLUTION

Unlike other contractors that quote a price at the outset and then modify it with change orders as issues stack up, DEPCOM's plant repowering expertise allows the EPC leader to cover the full scope of the project for a guaranteed price up front.

As the project started, DEPCOM's Repowering+ team determined that the four destroyed one-megawatt central inverters were no longer manufactured.

Instead, they devised a plan to reuse the existing skid base and consolidate the four old units into two new inverters with a higher power density — reducing the project's timeline and avoiding considerable construction costs.

DEPCOM's strategy simplified the overall system design, minimizing the balance-of-system materials required and reducing the AC bus work and



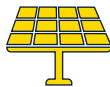
components needed, to create overall savings in installation costs. These savings offset the higher cost of manufacturing new 1000-volt inverters, which are now much more difficult to source and require components and materials no longer readily available.

Because the plant had to be partially redesigned, both local regulators and the contracting utility required that the facility meet all current standards and codes. This meant registering entirely new permits, updated testing, and a repeat approval process as if the plant were being commissioned for the first time.

RESULTS

DEPCOM Power brought in its repowering experts to mitigate the damage fast. Leveraging its EPC and O&M capabilities allowed DEPCOM to complete the permitting process efficiently, engineer and design the restoration rapidly, source new equipment, and remove damaged equipment. Timing was of the essence to complete the installation and fully test the new operation.

**DEPCOM
RECOVERED
PRODUCTION
BEFORE THE
PPA GRACE
PERIOD EXPIRED,
AND WITHIN
THE INSURER'S
BUDGET**



Expert Repowering	Ensured Production	Expedited Solution	Mitigated Losses
Designed, supplied, built, commissioned	Minimal PPA impact	Reduced project timeline	Optimized construction costs

Ultimately, DEPCOM was able to bring the plant back online before the PPA grace period expired, preserving the contract. Because work was completed within the budget set by the insurance company, the asset owner had no out-of-pocket expense beyond paying the deductible.

08

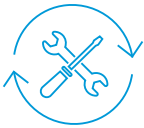
WHY MAKE DEPCOM YOUR NATURAL DISASTER PARTNER?

With expertise in damage assessment, salvage, insurance claim management, and rapid restoration, DEPCOM Power's combined EPC/O&M and recovery expertise helps limit the revenue impact of natural disasters.



INTEGRATED PARTNER

Our one-source solutions offer a comprehensive spectrum of services, including development support, solar engineering, procurement, construction, O&M, repowering, and energy storage.



TECHNICAL & OPERATIONAL EXPERIENCE

Our 5 GW solar portfolio with 1.7 GWs of assets under management ensures confidence. We offer best-in-class technical and service offerings backed by 99% fleet availability and a 100% energy capacity record.



ONGOING SUPPORT

Our plant operation solutions provide long-term maintenance, repair, and energy optimization. Repowering services correct plant performance issues, while recertification salvages usable equipment and sources parts faster than OEMs.



VALUE-DRIVEN

We strive to deliver superior value through our proprietary optimization and design expertise to maximize ROI. The outcome: Systems repaired to ensure strong post-recovery performance and lower cost of ownership.



CULTURE OF INTEGRITY

Our guiding principles and culture standards include hiring/supporting veterans, prioritizing American-made goods, putting safety first, and serving local communities. We complete every project with a less than 1% change order rate.



PROCUREMENT POWER

Leveraging a decade of supply relationships, our teams validate top-tier equipment and providers across a vast network of suppliers.



UNIQUELY BANKABLE

DEPCOM ensures project success through bankable leadership backed by Koch Engineered Solutions, a division of Koch Industries, the nation's second largest private company and a force in the energy generation sector.

DON'T WAIT FOR NATURAL DISASTERS TO STRIKE

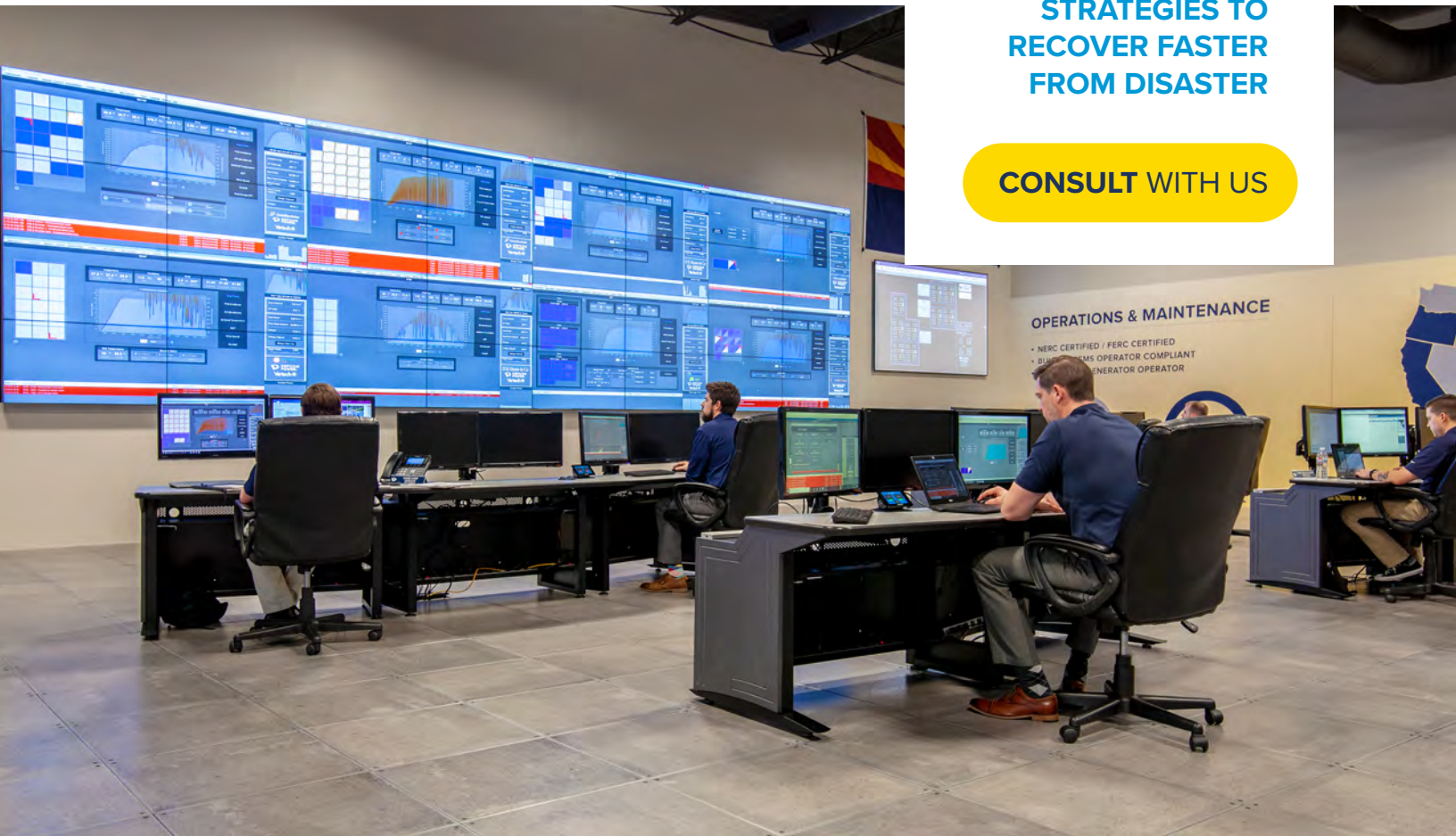
Site recovery takes more than cobbling pieces back together again after a disaster; it involves complex processes that demand unique skills and expertise beyond simple construction.

Planning ahead can make the difference between struggling to get back online and coming back at full strength. To weather whatever storms may come, plant owners should screen potential partners today and enlist their help to develop contingency plans for critical equipment and parts, safeguarding future profitability.

As a market leader in natural disaster management, DEPCOM's repowering team helps asset owners restore damaged solar assets for maximum profitability.

**GET ACTIONABLE
STRATEGIES TO
RECOVER FASTER
FROM DISASTER**

CONSULT WITH US





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Jamie Alexander is SVP Services at DEPCOM Power, which serves the solar and energy storage market by providing traditional O&M services, restoration of sites impacted by natural disasters, repowering of sites underperforming or experiencing catastrophic failures, and specialized services focused on inverter commissioning and repair. Jamie's 25 years of industry experience includes OEM equipment design and manufacture, project development, construction, and operations and maintenance. Having worked exclusively in the solar and energy storage sector for the past 12 years, Jamie has been involved in the deployment of almost 3 GWs of assets.

Consult with us about your next solar or energy storage project
info@depcompower.com | (480) 270-6910

ABOUT DEPCOM POWER

As a trusted energy solutions partner, DEPCOM Power brings nearly a decade of utility solar leadership. With a 5-GW project portfolio, including 1.7 GWs of PV assets under management, our end-to-end renewable energy capabilities span across the full value chain from development support, EPC, commissioning, energy storage, distributed energy, operations and maintenance, and repowering.

A Koch Engineered Solutions Company, DEPCOM delivers superior value, engineering solutions, technical leadership and unique bankability, as part of the largest private companies in the country.

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