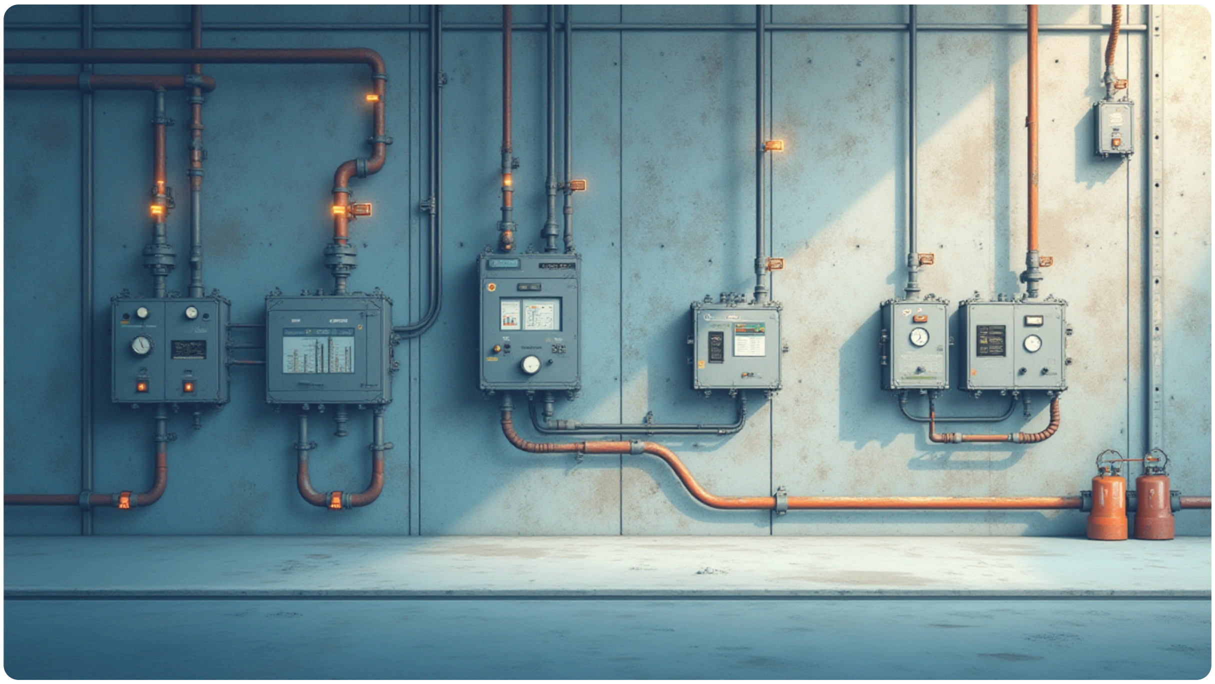
OPERATIONS RESILIENCE NEWSLETTER

When the Grid Goes Down: Planning for Operational Hardship

Moving beyond 'backup power' to deep systemic resilience.

operations management · risk mitigation · utility infrastructure · continuity planning

> The newsletter for operations leaders who prefer robust physical reality over comfortable digital assumption.



Issue Summary: The Illusion of Constant Power

Most manufacturing leaders treat electricity as a given—a utility that is simply always there, much like oxygen or floor space. This leads to a dangerous assumption about what happens when the grid flickers or fails. We often mistake "having power" for "having an operational plan." In reality, if your equipment isn't designed to handle a transition between power sources, you don’t have a backup; you just have a different way of failing.

The problem is that our current approach focuses almost entirely on the supply side: having enough generators and fuel to keep the lights on. But "uptime" doesn't mean your process remains in sync. If one part of the line stays running while another stops, or if an oven loses temperature for just five minutes before a generator kicks in, you aren’t maintaining production—you are creating a mess that your team will have to clean up later. We need to move away from simply "staying powered" and toward ensuring our processes remain stable through the transition.

Name the Failure: The Interdependency Blind Spot

The core failure here is what I call **The Interdependency Blind Spot**. It occurs when a plant treats power as an isolated utility rather than a fundamental component of the production sequence. When we don't account for how different machines interact during a power event, we aren't just risking a shutdown; we are risking "dirty" restarts that can damage equipment or ruin product.

I’ve seen this play out on several floors: a primary feed drops, the backup generator kicks in within seconds, and the lights stay on—but because the logic wasn't programmed for a transition, three different motors tried to start at the exact same moment. The resulting surge tripped the main breaker again, knocking the whole plant offline for hours. Or perhaps an extruder stopped just long enough that its internal temperature dropped below the safety threshold, requiring a full purge of the material before it could be restarted. In these cases, the "backup" worked perfectly as a piece of machinery, but it failed completely as a component of the manufacturing process. We aren't failing because we lack power; we are failing because we haven't mapped out how our machines behave when that power becomes inconsistent.

Why Resilience Fails (It’s Not Just Generators)

The reason most plants fail to handle grid instability isn't a lack of hardware. It is a failure of imagination regarding the "handshake" between your equipment and its environment. Simply having a generator in the yard doesn't mean you have an operational plan for when it actually starts spinning. You need to know exactly what stays on, what shuts down intentionally to save the motor, and how the system reconciles those differences once power is restored.

The Common Assumption	The Operational Reality
"The generator will keep us running."	A generator provides electricity; it does not provide a sequence for your PLC logic or mechanical clearances.
"We can restart quickly after a flicker."	An uncoordinated restart often leads to jammed conveyors, burnt-out motors, and ruined product batches.
"Our equipment is robust enough."	Unless the hardware specifically handles load shedding, it will simply try to do everything at once and fail.

A truly resilient plant understands that some items are not worth keeping powered during a transition. If an auxiliary conveyor doesn't need to be running for your primary furnace to stay hot, you should intentionally shed its load. This isn't about "less" power; it’s about smarter management of the energy you actually have available.

What It Really Costs: The Cost of False Preparedness

When we fail to plan for these transitions, the costs are rarely just measured in minutes of lost production time. Instead, they manifest as hidden costs that haunt your maintenance team and quality engineers for weeks after the event.

The first cost is **Sequence Damage**. If a conveyor stops halfway through a cycle but the upstream feeder keeps moving, you create a physical jam. When power returns, those motors will try to force their way through that obstruction, potentially stripping gears or burning out couplings. The second cost is **Material Waste**. In industries involving heated chambers or chemical mixing, even a three-minute drop in temperature can mean the difference between a usable batch and scrap metal. The third cost is **Recovery Labor**. If your team has to spend four hours manually clearing jammed lines, recalibrating sensors that were "shocked" by a power surge, or purging ruined material from the system, you aren't just losing time—you are spending valuable labor on damage control rather than production. We must stop pretending that any machine can be restarted instantly without a specific logic for how it handles an interrupted state.

The Resilience Playbook: Three Phases of Hardening

To move toward real resilience, we have to look past the generator and focus on the "operating system" of your plant floor. You need to harden the process in three distinct phases:

1. **Load Auditing:** Create a map of every piece of equipment that pulls from the main bus. Not all loads are equal. Identify which items are critical for safety, which are essential for product quality (like heat or pressure), and which are merely convenient (like certain auxiliary conveyors). You must know exactly what will be "tripped" by design during a power transition to prevent them from competing for limited resources.
2. **Decoupling:** Physically or logically separate your systems so that a failure in one area doesn't create a cascade. If the motor on a non-essential conveyor gets jammed, it shouldn't have the ability to trip the breaker for the main production line. This requires physical barriers and independent circuit protections that ensure an "unclean" stop in one zone stays contained there.
3. **Recovery Sequencing:** Develop a literal step-by-step checklist for what happens when power returns. Your PLC logic should be programmed to bring systems back online in a specific order—first the cooling fans, then the primary pumps, and finally the conveyor motors. This prevents "thundering herd" issues where every machine tries to draw peak current at the same moment, causing another drop or a fuse failure.

Practical Takeaways: Your Next 72 Hours Checklist

Don't wait for the next grid failure to start this work. Use your next three days to begin walking the floor with these specific goals in mind:

1. **Conduct a "Criticality Walk":** Walk your main production line and mark every piece of equipment as *Essential* (must stay on during transition), *Secondary* (can be off for up to 30 minutes), or *Non-Essential* (should be shut down immediately upon loss of primary power).

2. **Audit the "Restart" Logic:** Ask your maintenance team and PLC programmers: "If this specific machine loses power and then gets it back, what is its default behavior?" If the answer is "I'm not sure," you have a gap in your operational logic that needs to be addressed immediately.
3. **Verify Physical Clearances:** Identify any points where product would pile up or jam if a belt stopped unexpectedly. Ensure there are physical guards or clear zones so that an emergency stop doesn't create a manual "unsticking" task for the next shift.
4. **Review Your Emergency Call-Outs:** Ensure your team knows exactly who to call when a transition happens—not just to fix the power, but to begin the specific recovery sequence defined in your new playbook.

Call to Action

What is the single most fragile point in your operation that depends on external power? Share your thoughts with us or share this newsletter with another operations leader.

Newsletter replies: newsletter@sixsigmakaizen.com · X: @kaizen_6sigma

Stay curious, stay improving,

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References: The Energy Line: Why Your Plant Needs to Plan for Grid Collapse