



A SOLUTION GUIDE FOR SAFER,
MORE RESILIENT PRODUCTION ENVIRONMENTS

Managing Weather Risk in Manufacturing

Contents

| | | |
|--|-----|----|
| Introduction | ... | 01 |
| Challenge 1: Protecting workers and assets | ... | 02 |
| Challenge 2: Reducing avoidable disruption | ... | 03 |
| Challenge 3: Limiting the impact of downtime | ... | 04 |
| Challenge 4: Meeting regulatory requirements | ... | 05 |
| Turning environmental intelligence into better decisions | ... | 06 |
| Related resources | ... | 07 |

Introduction

Manufacturing operations are built on control. But weather hazards can introduce uncertainty that affects worker safety, production schedules, asset protection, and regulatory exposure.

When conditions change, teams must decide quickly: Can work continue safely? Is the situation creating environmental risk? Should activities be adjusted or stopped? When is it safe to resume? And if those decisions are reviewed later, can they be justified against what was happening at the time?

This guide outlines how manufacturers can use environmental intelligence to protect people and assets, reduce unnecessary downtime, manage unavoidable disruptions, and support regulatory compliance with greater confidence.





Challenge 1: Protecting workers and assets

Understanding the challenge:

Outdoor and transitional work areas—such as yards, loading docks, storage areas, and transit paths—can expose workers and equipment to lightning, high winds, heat, and other hazards.

The challenge is knowing exactly when conditions make it unsafe to continue normal operations. Acting too late can increase exposure to serious hazards. Acting too soon can disrupt work unnecessarily.

What a solution looks like:

- 1 Site-specific conditions are continuously monitored 

- 2 Thresholds are aligned with facility-specific hazards and operations 

- 3 Alerts are triggered when conditions require action 

- 4 Workers are notified immediately to pause or adjust activity 

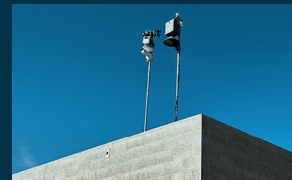
- 5 Alerts provide enough lead time for workers to reach safety 

How AEM does it:

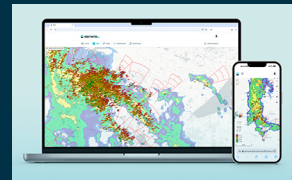
AEM delivers site-specific environmental intelligence for each facility, helping teams understand how changing conditions affect exposed workers, equipment, and operations.



Proprietary lightning detection network monitors lightning exposure



Weather stations monitor on-site hazards, including wind, rain, and heat



Proprietary software translates weather intelligence into decision support



Outdoor alerting systems provide visible strobes and audible horns



Mobile alerting sends notifications by text, email, and in-app message



Challenge 2: Reducing avoidable disruptions

Understanding the challenge:

Weather does not always require operations to stop. In some cases, shutdowns stem from bad information or false alarms. In other scenarios, teams can adjust how and where work is performed while other activities continue safely.

The challenge is seeing what is approaching early enough—and reliably enough—to shift people, equipment, and work plans before safe options narrow.

What a solution looks like:

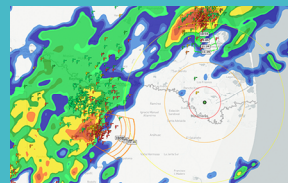
- 1 Conditions are monitored continuously across the facility 
- 2 Incoming and evolving weather systems are tracked 
- 3 Teams confidently assess which activities will be affected 
- 4 Decision-makers receive advance notice to adjust work plans 
- 5 Operations continue wherever conditions safely allow 

How AEM does it:

AEM provides reliable insight into what conditions are approaching and how they are likely to evolve. Hyperlocal weather data, validated lightning information, and forecasting give teams the advance notice needed to adjust work deliberately rather than defaulting to full shutdowns.



On-site and network-based monitoring supports reliable forecasting and alerting with low false-alarm rates



Multi-source forecasts support proactive planning and task reallocation



Automated alerting aligns with operational protocols



Software translates field data into centralized visibility for coordination



24/7 meteorological expertise helps anticipate complex, high-stakes weather impacts



Challenge 3: Limiting the impact of downtime

Understanding the challenge:

Some disruptions cannot be avoided. When they do occur, costs can add up quickly through lost production time, damaged materials, exposed equipment, or work left vulnerable in mid-process. The challenge is timing shutdowns and recoveries precisely.

Waiting too long to halt operations can force abrupt stops that leave equipment and raw materials exposed. Restarting too soon can create risk. Waiting too long to restart extends downtime unnecessarily.

What a solution looks like:

- 1 Dangerous weather is tracked before it arrives 

- 2 Dashboards connect conditions to operational needs 

- 3 Customized thresholds support consistent, timely decision-making 

- 4 Automated alerting enables fast, coordinated action 

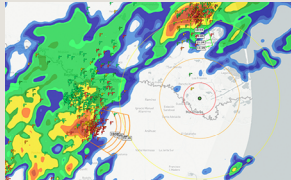
- 5 Site-specific monitoring shows when operations can resume 

How AEM does it:

AEM helps teams minimize the impact of disruptions that do occur, keeping shutdowns as short and orderly as possible to reduce downtime, equipment exposure, and material loss.



On-site and network-based monitoring tracks facility conditions and approaching weather in real time



Multi-source forecasts help anticipate disruptive conditions and duration



Automated alerting supports shutdown, protective action, and all-clear decisions



Software translates field data into situational awareness before, during, and after disruption



24/7 meteorological expertise provides guidance during complex, high-stakes weather events



Challenge 4: Meeting regulatory requirements

Understanding the challenge:

Manufacturers must adhere to a variety of regulatory requirements tied to environmental conditions, from OSHA safety requirements tied to heat stress and lightning exposure to EPA environmental impact regulations related to air and water pollution.

The challenge is doing the right thing while keeping records that prove it. Teams need to monitor relevant conditions, connect them to action thresholds, and maintain historical data that shows what conditions were present when decisions were made.

What a solution looks like:

- 1 On-site sensors and networked monitoring track regulated conditions 
- 2 Configurable thresholds define when action is required 
- 3 Alerts and notifications prompt consistent response 
- 4 Continuous data capture creates site-specific records over time 
- 5 Alerting history and historical observations support validation and defensibility 

How AEM does it:

AEM provides a continuous view of conditions that affect regulatory compliance. Threshold-based alerting supports consistent action, while historical data helps teams demonstrate what conditions were present at any given time.



On-site weather stations track hyperlocal weather conditions



Water level sensors monitor flooding, runoff, and containment risks



Proprietary weather and lightning detection networks capture up-to-the-minute observations



Software integrates field data into actionable dashboards and alerts



Alerting history and historical weather data help answer questions after the fact



Turning environmental intelligence into better decisions

From flooding and power outages to heat stress and lightning, weather hazards can directly threaten people and assets, cause downtime, and raise unwanted questions from regulatory bodies.

Across all of these challenges, decisions must be made in real time, often with incomplete information, and later justified against what was actually happening at the site. In each case, the difference between success and failure comes down to how well changing weather conditions can be anticipated and translated into appropriate action.

When real-time monitoring and forecasting are connected to defined thresholds for action and backed by reliable historical records, decision-making becomes more consistent and defensible. The result is safer working conditions, more resilient production, and stronger confidence in the decisions that keep both moving forward.



Next Step

Schedule a weather readiness consultation with AEM to assess your current risk exposure and identify opportunities to improve safety, uptime, and compliance across your manufacturing operations.

[Schedule a weather readiness consultation](#)

More Resources for Utilities



REPORT

How manufacturers can optimize operations with weather intelligence



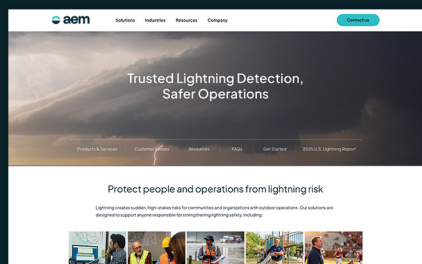
CASE STUDY

Fortune 500 mining company strengthens lightning safety, weather resilience, and compliance with services from AEM



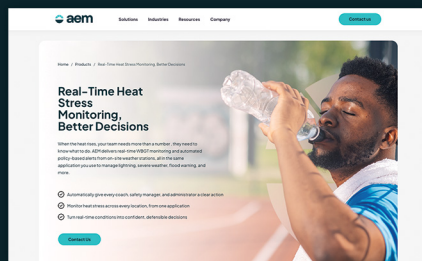
WEBINAR

How leading companies are winning against today's weather challenges



SOLUTION

Protect people and operations from lightning risk



SOLUTION

Real-time heat stress monitoring

ADDRESS

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[Talk to a manufacturing specialist](#)

