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A Business Case for SAFER One™:

or Why You Can't Afford Anything Less Than the Most Advanced Chemical Emergency Response Platform

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SAFER One™

ABSTRACT

PLAN. PREPARE. PROTECT.

Keeping people, property, and the environment safe in and around a chemical facility is a complex, never-ending process. Making this process even more challenging is the fact that organizations in the chemical industry must also comply with an ever-expanding set of regulations, standards, and processes.

Many facilities are leveraging new technologies to meet compliance and operational needs, but often these technological upgrades fail to solve all of the organizations' challenges — and in some cases, create new ones. As the amount of on-site technology at a chemical facility grows, for example, the costs and resources needed to manage these tools increase as well. Moreover, when chemical companies expand their infrastructure by deploying new hardware and software systems from various vendors, they often face new difficulties with integration. Their ability to monitor, analyze and act on their mission-critical data becomes dependent on maintaining the ever-expanding facility digital infrastructure.

This paper presents a business case for deploying a single integrated, cloud-based platform — SAFER One™ — that collects data from your weather and gas sensors as well as Internet based resources to provide a single real-time common operating picture. The included patented modeling algorithms and collaboration features help create a more efficient and cost-effective process for chemical-incident monitoring, plume modeling, and emergency response.

Michael Flavin

Director of Product and Marketing

EXECUTIVE SUMMARY

Implementing new digital technologies to improve chemical and refinery safety, uptime and decision making — while at the same time reducing costs — is a goal of every chemical organization.

But as a recent study from Siemens[1] found, about half of chemical-sector firms still haven't deployed connected sensors for their plants — which would provide anywhere access to real-time data, likely leading to improved efficiencies and reduced downtime. The same report shows that fewer than half of chemical firms have implemented cloud data storage — which would reduce IT costs, make the company's data safer and more readily accessible when needed, and allow its IT department to focus on more forward-looking initiatives.

COMMON ROAD BLOCKS TO INTEGRATEING NEW TECHNOLOGY IN THE CHEMICAL INDUSTRY

1. *Difficulty generating stakeholder alignment around a digitalization strategy.*
2. *Concern about investing the capital in upgrading all of their existing safety systems.*
3. *Reluctance to trust and embrace new technologies.*

Moreover, only 30% of chemical firms that do implement digital technologies even use the analytics capabilities the tools offer — meaning these businesses are missing out on many of the safety, efficiency and cost-saving benefits of the digital platforms they've deployed.

Common Road Blocks to Embracing New Technology

1. Difficulty generating stakeholder alignment around a digitalization strategy

Many chemical firms operate disparate systems for data collection and monitoring, data backup and archiving, reporting, chemical modeling, information sharing, compliance management, training for chemical-incident responses, etc. For such entities, corralling all of these disparate solutions and building a process to connect them all can seem like an overwhelming initiative. This is a legitimate concern.

What these organizations need is a single digital platform that seamlessly integrates their weather and gas detection data as well as the data — to enable simplified, real-time collaboration and decision support without adding yet another layer of technical complexity to their already cumbersome infrastructure.

2. Concern about investing capital in upgrading all of their existing safety systems

Another common obstacle for chemical organizations to migrate to modern digital safety-management solutions is the perceived cost of doing so. The Siemens report quotes Brian Clemons, Process Automation Manager for Dow Chemical, as saying, "If you have a plant that is, say, 40 years old sitting in the field, it's not cost effective to go change all your sensors and turn them all smart."

Mr. Clemons is of course correct in that upgrading each piece of detection hardware across a plant can seem daunting and cost-prohibitive, but there are other options available.

One of the major value propositions of a SaaS-based chemical safety management platform such as SAFER One is that the system works with many of the common gas sensors, meteorological stations, and other hardware typically found on refineries or chemical plants. This means that organizations implementing the cloud-based SAFER One platform are able to leverage their existing sensor network to move towards becoming the smart facilities of the future, requiring little to investment into additional gas detection hardware.

Indeed, the Siemens report points out that the chemical organizations that have deployed such modern digital technologies are indeed experiencing clear time and cost savings as a result. SAFER solutions integrate with optical remote sensing systems which boast the lowest cost per area monitored. Additionally, with a subscription based model organizations are able to grow gradually and incur the cost as an Operationial Expenditure rather than a Capital Expenditure, thereby simplifying the budgeting process .

3. Reluctance to trust and embrace new technologies

As Mark Rosenzweig, Editor-in-Chief of Chemical Processing Magazine, is quoted in the Siemens report, a company operating a chemical plant will "have to have a very high comfort level that a new technology is going to deliver improvement and not pose any additional hazards or risks."

This concern, too, is reasonable, given that many of the new digital platforms are being developed by firms that are new themselves — and have not yet battle-tested their solutions in the real world and developed a proven track record for quality and reliability.

SAFER One solves all of these concerns. The cloud-based platform creates a holistic common operating picture in and around the facility; while providing a single point of contact for all of your facility's monitoring, modeling, training, and hardware needs. The platform's developer, SAFER Systems, is an industry pioneer that has been helping keep facilities and their communities safe for more than 35 years.

Here's three ways that SAFER can help your facility integrate with much of the multiple gas and weather systems on your site:

1

Our solutions are solar-powered and wireless, and come with a Class-1 Division-2 rating (C1D1 optional if needed), making the detectors easy to deploy with very little, if any, infrastructure investment.

Additionally, SAFER has 900MHz and licensed UHF radio options to ensure the solution integrates seamlessly and interference free at your facility.

SAFER products support OPC, PI and Modbus communication protocols and come with a scalable wireless controller/PLC that can communicate with the SAFER One™ Platform as well as your existing process control network.

2

3

Seamlessly integrate Fixed-Point, Portable, and Open-Path sensors as well as next-gen technology to enhance safety. Case in point is SAFER's integration of Lightning Detection systems, which monitor actual strikes and the atmospheric electric potential. Providing the latest in lightning detection technologies on the same interface as the rest of the plant's sensors.

With that in mind, this paper will consider a business justification for SAFER One — going beyond numerical calculations and focusing on additional and sometimes intangible benefits that justify a financial investment.

WHY STAND-ALONE MONITORING AND MODELING SYSTEMS FOR CHEMICAL SAFETY MANAGEMENT ARE NO LONGER SUFFICIENT — AND WHAT TO DO ABOUT IT

The Problem

Many chemical companies have yet to deploy connected sensors, compatible digital systems, the latest in plume modeling and predictive analytics, and cloud-based data backup for their chemical-incident monitoring and management. As a result, these organizations' safety processes are more labor-intensive and costly than they need to be — and they may be at risk with a suboptimal chemical safety and compliance infrastructure.

Many chemical firms, agribusinesses and other organizations that maintain hazardous substances onsite track and store their gas- and meteorological-sensor data across several disconnected systems, using different data formats, and on software and hardware tools supplied by different vendors. As a result, accessing and sharing this data for regulatory, training or operational purposes can be a fractured and cumbersome process. In some cases, a business might not even be able to leverage all of its sensor and weather data in its decision-making because it can't pull all of the data together in a single format.

Accessing critical data on separate systems and screens slows down response times in case of emergency. Maintaining a real-time holistic operating picture in such conditions becomes difficult at best.

The Solution

The best practice in chemical process safety for today's organizations is a SaaS-based integrated solution that seamlessly ties together the disparate functions of chemical safety management: real-time data monitoring, record-keeping and reporting for compliance purposes, offsite data backup, incident modeling, training, etc. This solution should provide a clear operating picture to the organization at all times and make this mission-critical information accessible from anywhere through an intuitive, cloud-based platform.

THE SAFER DIFFERENCE

An ongoing commitment to the safety of our customers and their communities.

SAFER products support organizations' efforts to plan, prepare, and protect their communities and facilities in case of a chemical emergency. With a robust list of integrations SAFER One enables users to maintain an accurate real-time operating picture of their facility as well as the surrounding communities. The included patented modeling algorithms further expand the range of applications for SAFER One providing organizations the ability to monitor, model, and mitigate chemical emergencies all on a single intuitive interface.

Pre-Event Preparedness

- Facility sensor network is optimized using SAFER's patented modules.
- Real-time sensor integration provides accurate common operating picture.
- Model incident scenarios for risk management and emergency response planning.
- Live training drills.

Live-Event Response

- Dynamic plume modeling based on real-time weather and gas sensor data.
- Fenceline, process unit, and confined space monitoring with alarm tracking.
- Location of emission sources and release rate estimation.
- Enhanced collaboration with simple reporting and model sharing features.

Post-Event Analysis

- All sensor data is encrypted and archived providing historical data support for:
  - Litigation response
  - Compliance reporting
  - New hazard identification
  - Future training initiatives

EMBRACING

Industry 4.0

Many of the leading chemical companies are embracing Industry 4.0, the fourth industrial revolution (after water and steam power, then mass production, and most recently automation through IT and robotics).[2] Industry 4.0 introduces the concept of cyber-physical systems, enabling hardware to communicate with computer-based systems and allowing for analytics that drive greater efficiency and operating margins.

For chemical organizations — companies with the awesome responsibility of protecting people, property and communities from hazardous materials — creating a seamless digital environment where all hardware and software systems work reliably together is a necessity. Providing a single point of contact for real-time emission or incident data allows organizations to make critical decisions with confidence.

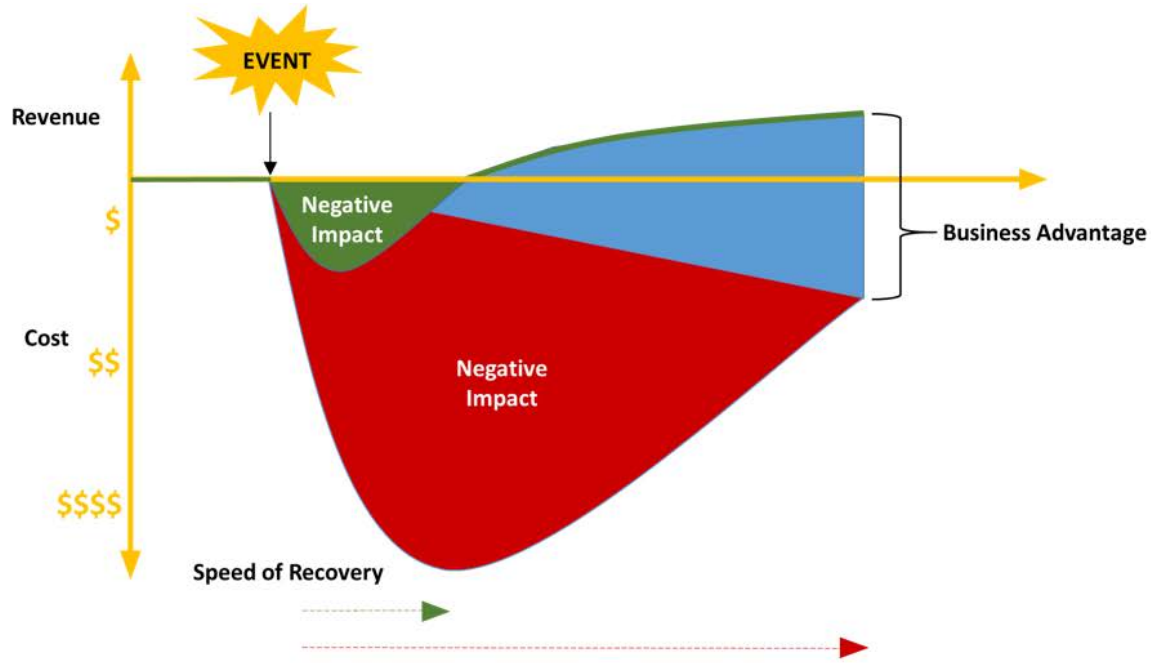
In fact, maybe the best way to understand the value of such a SaaS-based emergency-management platform is to review a real-world incident where the facility didn't have it.

PROTECTING AGAINST THE

MASSIVE COSTS

INCLUDING THE NON-MONETARY

OF A CHEMICAL INCIDENT



Perhaps the strongest business justification for deploying a SaaS-based solution such as **SAFER One** is this: The platform improves your organization's ability to monitor, train for, and model effective responses to a potential chemical incident.

And should your facility ever experience a real emergency, the platform lets you immediately access a wealth of *real-time* data — from gas sensors, weather stations, live map and traffic information, etc. — and pre-defined scenarios to coordinate your response with confidence.

Consider the Apex Case Study on the following pages - Here's why this is essential: Real-Time response capabilities for your facility directly affect plant's ability to mitigate losses.

The Apex Chemical Incident

A CASE STUDY

In October 2006, explosions at an Apex, North Carolina, facility operated by hazardous-waste company Environmental Quality Industrial Services (EQ) led local authorities to evacuate thousands of homes and businesses, fearing the release of toxic chemicals.

Federal investigators later determined the cause to be improper storage of oxygen generators, which were stacked beneath drums of chlorine-based pool chemicals.

As a local TV news report explained, hazardous waste companies were not legally required in 2006 to provide written information to first responders about the materials at their facilities. "We were 14 or 15 hours into the deal before we even knew what the constituency of the chemicals were," said Apex Town Manager Bruce Radford.[3]

This facility handled hazardous substances — and yet it had not even implement standard safety practices to protect them. Here's a breakdown of what the incident cost the company.

The initial explosion and plume (above) and a secondary explosion during fire operations (below).

Photos courtesy of the Apex Fire Department.

Regulatory violations: $553,225

The state's Division of Waste Management fined EQ for several compliance violations, including failure to report incidents involving chemical reactions and waste releases.[4]

Settlement with local residents: $7,8500,000

A lawsuit filed by residents ended in a settlement where EQ agreed to pay $750 for every home that was evacuated and up to $2,200 for businesses forced to shut down.[5]

Reimbursement costs to city for fire, police and other first responders: $200,000

The company also had to pay for the town's costs for emergency response, responding to the fire and coordinating the evacuations.[5]

Permanent loss of public trust and goodwill with the officials of the town of Apex?

Who can put a price on the widespread and negative media coverage EQ received after thousands of local residents and business owners were forced to flee the area — and later found out about the safety lapses at EQ which did not even communicate with emergency responders in the immediate aftermath of the explosions?

WHY YOU NEED

SAFER One

THE PLATFORM FOR CHEMICAL EMERGENCY MANAGEMENT.

Consider how much more serious the danger from the Apex chemical explosion became because the company responsible for maintaining the hazardous materials that leaked did not have the proper technology to detect the leak quickly enough — or to communicate vital information about it in real-time to emergency responders.

The hazardous waste company did not have the sensors in place to be alerted right away when the toxic chemicals began seeping into the atmosphere. Nor did they have a system for identifying the leak's specific chemical makeup and likely dispersion rate, so they could not effectively estimate the plume's trajectory or the time it would take to reach a populated area. All of which meant that local safety authorities went many hours without knowing exactly what substance was in the air, where or how fast it was traveling, and which residents to evacuate.

The fallout from this disaster was far more wide-reaching than the massive regulatory fines levied against the company and the multimillion-dollar settlement it was forced to pay. It created long-term, irreversible distrust of the business, not to mention making the local residents and business owners feel less safe in the area for years to come.

But much of the eventual fallout from this incident could have been avoided — or at least greatly mitigated — if the company had the right digital platform for chemical emergency management and response. If the firm had deployed such a system — like the SaaS-based platform SAFER One — they would have had all of their gas sensors, weather stations and other data seamlessly pulled together into a single interface, so their team would have been alerted right away to the leak. They then would have had the ability to leverage SAFER One's extensive library of advanced chemical-incident modeling algorithms — to begin estimating dispersion rates and likely directional paths of the dangerous chemicals, which they could then share in real-time with emergency responders.

The bottom line here is simple. With so much at stake — the safety of your staff and the surrounding communities, your organization's reputation and trust with local authorities, and, yes, your company's financial health — you can no longer afford to make due with a series of outdated and disconnected tools and processes for chemical emergency management. You need to deploy a modern, connected and seamless platform that pulls together all of your data and processes into a single point of contact — one you can trust. That platform is SAFER One.

ABOUT SAFER SYSTEMS

As the global leader in real-time integrated solutions for chemical organizations, SAFER Systems is uniquely positioned to help organizations implement digital tools to improve chemical safety. With more than 35 years of experience and dozens of strategic partnerships, SAFER Systems simplifies chemical process safety by delivering a single point of contact for all of a chemical organization's modeling, engineering, training, and hardware needs — providing organizations around the world with a peace of mind when it comes to chemical safety.

REFERENCES:

1. Siemens research report: Chemicals sector at a digitalization tipping point
2. Gartner: What is "Industrie 4.0" and what should CIOs do about It?
3. CBS News North Carolina: Apex chemical explosion 10 years later: How it changed hazmat site regulations
4. WRAL News: Apex residents pleased with EQ's fine
5. WRAL News: Apex chemical explosion settlement approved

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