Fire protection solutions for critical equipment enclosures

IT/Communication/Emergency Power Infrastructure
From a fire risk perspective, consider:

- High energy densities
- High air movement
- Combustible materials
- Friction from mechanical systems
- Flammable electrolytes, oils and carbon-based fuels
- Manufacturing defects, mechanical damage and component degradation and malfunctions

Consequently, fire protection is an essential element of risk mitigation and the concept should be comprehensive to ensure protection of life, assets and continuity of services.
Non-IT Related Outages

Statistically, fire is recognized as a significant contributor of non-IT related outages.

Source: Capitoline survey 2015: Causes of data centre failures
Regulatory codes address:

Life Safety
Critical Infrastructure Fire Protection Concept

Regulatory codes address:
- Life Safety

Performance standards & practices address:
- Protection of assets
- Value of equipment
- Value of services
- Maintenance of records
- Service Level Agreements
- Reputation
- Business continuity

Concept:
- Detect early
- Control
- Mitigate

Requires:
- Analysis of hazard
- Advanced technologies
- Expert application
- Appropriate settings
- Regular inspections and maintenance
Market Outlook: 2021-2023

MODULAR DATA CENTERS
- Market Size: US$ 46Bn by 2023
- CAGR: 28.90%

MICRO/EDGE DATA CENTERS
- Market Size: US$ 16Bn by 2023
- CAGR: 20.50%

EMERGENCY POWER SYSTEMS
- Market Size: US$ 22Bn by 2023
- CAGR: 5.00%
Autonomous infrastructure providing real-time processing of critical data for a wide array of industries

Fully enclosed and internally conditioned compartments housing IT/Communication equipment

Densely packed compartments with minimal room to house elements of fire protection

High heat densities + fuel sources = potential for fire events

Occusable dark autonomous spaces housing critical processing equipment

Fully enclosed self-contained environments isolated from building fire protection elements

Compact, densely packed spaces with minimal room to house elements of fire protection

High heat densities + fuel sources = potential for fire events

Need for advanced fire protection elements to automatically detect & suppress fires early before disruption
Emergency Power Infrastructure

Uninterruptable Power Modules

- Autonomous cabinets and walk-in-units or dedicated-use rooms or buildings
- High reliance on availability
- Typically house rectifier, batteries, inverter cooling and electrical switchgear
- Battery technologies include VRLA, Lead-acid and nickel-cadmium, Li-Ion evolving technology for use, particularly in UPS
- Potential of combustible hydrogen off-gassing

Backup Power Generators

- Autonomous walk-in-units or dedicated-use rooms or buildings
- Stationary standby diesel or natural gas powered generators
- Fuel supply in the form of onsite diesel tanks or network of natural gas pipelines
- Typically multiple generators to create redundancy
- Typically provided with electrical switchgear, fuel pumping and transfer

Need for advanced fire protection elements to automatically detect & suppress fires early to ensure availability
A risk-based performance solution, where design and implementation of advanced technologies come together to address the unique and dynamic infrastructure present, is essential for mitigating risk. An effective solution shall:

- Reliably detect potential events while in the incipient stages of fire development
- Notify personnel / initiate automated processes
- Rapidly extinguish at the right moment and prevent re-ignition, using agents safe for the environment and equipment present
- Prevent propagation
Since 1902

More than 70 fire protection businesses worldwide

Comprehensive in-house research, development and manufacturing capacities

Broad range of products and services

Represented on all continents

9300+ highly capable employees
Two state of the art research centers

R&D focus:
- Sprinkler / deluge systems
- Water mist and spark extinguishing systems
- Gas-based suppression systems
- Foam applications
- Fire detection and suppression control systems

Minimax boasts a fire research center spanning across 27,000 sq ft to test new fire protection solutions.
Practical Experience You Can Trust

Rely on us to deliver:

Unmatched Quality
Our reputation has been earned by focusing on continuous improvement in all elements of our business – from the products we manufacture and supply to the services we provide.

Product Breadth
The largest selection of fire protection products and services ensures single-point solutions for any fire protection challenge.

Converged Safety Solutions
Performance-based & code compliant safety solutions with full understanding of application protection challenges for solution perfection.
One-Stop Comprehensive Fire Protection Solutions

**FIRE ALARM**
- Conventional
- Addressable
- Control & Release Panels

**ALARM & CONTROL**

**DETECTION**
- Industrial Flame
- Industrial Heat
- Air Sampling
- Spot-Type
- Gas

**FLAME UV/IR**

**HEAT**

**AIR SAMPLING**

**SPOT-TYPE**

**GAS**

**EXTINGUISHMENT**
- Water Based
- Gaseous Suppression
- Special Hazards
- Portables

**WATER BASED**
- SPRINKLERS
- VALVES

**SPECIAL HAZARDS**
- GAS EXTINGUISHMENT
- FOAM
- PORTABLES

**I/O DEVICES**
- Audio Visual Alarm
- Strobes & Sounders
- Manual Stations

**NOTIFICATION APPLIANCES**

**PERIPHERAL DEVICES**

**CONVERGED SOLUTIONS**
- Prefabricated Kits
- Rackmount Active
- Packaged Extinguishment

**PRE-ENGINEERED**
- Prefabricated Kits
- OneU
- TotalPac
Network of Strategic Alliance partners

Over 60 locations Worldwide, 32 locations throughout the US

Viking SupplyNet's new "Rapid Delivery" mobile web app connects you instantly to the most common system components - available for immediate delivery to the job site

Viking's new virtual training platform includes cutting-edge VR experiences for a wide variety of fire protection concepts

Viking Integrated Safety and its certified contractor partners uniquely positions resources and capabilities to best serve the needs of our clients

- Installation & Commissioning
- Test & Inspections
- System Maintenance
- Repair Services
- Refill Services
- Warranty Services
Viking Integrated Safety for Critical Infrastructure

Critical Infrastructure Fire Protection Specialists

Pre-engineered kitted solutions tailored to meet demands of specific application
- Converged Solution
- Rapid Deployment
- Simplified Procurement
- Consistency
- Reduced Cost

Superior integrated performance-based safety solutions. Flexible, adaptable and compliant

Risk-based fire protection solutions
- Addresses unique dynamics of enclosed critical infrastructure
- Mitigates business disruption and impact to reputation

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**Viking Integrated Safety Pre-Engineered**

**Pre-Engineered Project Delivery**
- Tailored to meet specific needs
- Consistency across all projects
- Streamlined sourcing and delivery
- Rapid deployment
- Budgeting efficiency
- Cost savings as compared to traditional methods
- Reduced risk

**Traditional Project Delivery**
- Cost Determined

**33.5%**
- Less Time*

**10.6%**
- Cost Savings*

*On Average
Converged Performance Solution

System components

1. Air Sampling VEWFD smoke and gas detection system
2. Air sampling pipe network with sampling holes
3. Photoelectric spot-type smoke detection
4. Fire Detection and agent releasing panel
5. Abort, manual release, lockout switches
6. Notification appliances
7. Extinguishing agent
8. Extinguishing pipe network with nozzles
9. In-Rack smoke detection/extinguishing system
10. Over Pressure Vent (OPV)
Air Sampling Smoke Detectors (ASD) draws air from the environment through a series of sampling holes placed along a sampling pipe network, back to a centrally located specially designed detection chamber where the air is analyzed for presences of smoke.

These devices are suitable for detecting smoke early, while in the incipient stage of fire development.

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The Air Sampling Pipe Distribution Network extends from the ASD detector and covers the protected hazard with sampling holes strategically placed along the pipe network, spaced according to meet coverage density objectives for Very Early Warning Smoke Detection.

Sampling holes are sized in accordance with calculation software.

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Converged Performance Solution

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Photoelectric spot-type smoke detectors are placed at locations and spaced accordingly to meet early warning criteria for the hazard. Devices used are listed, fault tolerant technologies capable of early warning performance.
Converged Performance Solution

The Control Panel monitors the smoke detectors and manual release for an alarm condition, it activates the notification appliances and the extinguishing system. The panel also initiates control function like power shutdowns or air damper closures and monitors the critical devices condition. It provides communication to supervising station or to the fire department.

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Manual pull stations provide for a means to manually alarm the detection and extinguishment control panel, indicating a fire condition is present.

The manual release switch initiates the release of a suppression system. Its overrides any active abort switch.

The abort switch creates a delay of the suppression system release while the push button is held in. Release of the push button activates the suppression system, unless the control panel has been reset.

Devices used are listed and compatible with the control panel used.

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Notification appliances include horns, strobes, combination horn/strobes, bells, and warning signs.

These devices are intended to warn occupants of alarm conditions and status of extinguishment release sequences. Devices used are listed and compatible with the control panel used.
The extinguishment system releases the agent through an electrically activated cylinder valve and into a pipe system.

The extinguishing system is placed inside the hazard or may be located in a separate enclosure.

System components are listed and compatible with the control panel used.

**System components**

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4. Fire Detection and agent releasing panel
5. Abort, manual release, lockout switches
6. Notification appliances
7. **Extinguishing agent**
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10. Over Pressure Vent (OPV)

Connected nozzles distribute the agent within the enclosure to reach the design concentration suitable for the hazard.
Converged Performance Solution

Converged in-cabinet alarm, detection and suppression solution in a space saving 1U configuration. Ideally suited for fully enclosed equipment cabinets where asset protection is the objective.

Plug & Play convenience, featuring an integral power supply, back up battery, Very Early Warning aspirating smoke detection and Novec® 1230 suppression agent.

**System components**

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9. **In-Rack smoke detection/extinguishing system**
10. Over Pressure Vent (OPV)
In some cases, Over Pressure Venting (OPV) may be required to allow for pressure relief within a room during a discharge.

When required, it is important that correctly designed and engineered OPVs are fitted within enclosures protected by a gaseous suppression system. This is to prevent the possibility of the structural integrity of the area failing.

System components

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8. Notification Appliances
10. Over Pressure Vent
Function

- Incipient smoke develops
Function
- ASD Alert/Action levels reached
Function

- ASD Alert/Action levels reached
  - Flash the common alarm lamp and corresponding zone lamp on the control panel face
  - Display “Pre-Alarm” on the control panel LCD
  - Energize an audible signal at the control panel
  - Transfer auxiliary contacts which can perform auxiliary system functions, such as turning on extraction fan, transferring data, etc.
  - Transmit a signal to a normally attended station alerting a supervisory pre-alarm condition is present
Function

- Fire threat progresses
Function

- One detector in alarm (spot or ASD Fire 1), or activation of a manual pull station
Converged Performance Solution

**Function**

- One detector in alarm (spot or ASD Fire 1) or activation of a manual pull station
  - Flash the common alarm lamp and corresponding zone lamp on the control panel face
  - Display “Alarm” on the control panel LCD
  - Energize an alarm Agent horn device in coded fashion (1 sec on, 1 sec off) to indicate 1st stage alarm
  - Transfer auxiliary contacts which can perform auxiliary system functions, such as fan shutdown, etc.
  - Transmit a signal to a normally attended station alerting a fire condition is present
Function

- Two or more detectors in alarm (spot + spot or spot + ASD Fire 2)
**Converged Performance Solution**

**Function**

- Two or more detectors in alarm (spot + spot or spot + ASD Fire 2)
  - Flash the pre-discharge lamp on the control panel face
  - Display “pre-discharge” on the control panel LCD
  - Energize a pre-discharge agent horn device in a coded fashion (½ sec on, ½ sec off) to indicate 2\textsuperscript{nd} stage alarm
  - Activate strobe device in hazard
  - Shutdown HVAC system and/or close dampers
  - Start time-delay sequence (30 sec or depending on local requirements)
  - System abort sequence is enabled at this time. Activation shall extend the delay sequence
  - Transmit a signal to a normally attended station alerting a release sequence has been initiated
Function

- After completion of the time-delay sequence or at anytime the manual release station is activated, the following shall occur:
Function

- After completion of the time-delay sequence or at anytime the manual release station is activated, the following shall occur:
  - Illuminate the “discharge” lamp on the control panel face
  - Shutdown HVAC system and/or close dampers
  - Shutdown of all power to high-voltage equipment
  - Energize strobe-visual indicator(s) outside the hazard
  - Energize an “agent” horn-audible steady tone
  - Activate electric actuator
  - Release agent into the hazard
  - Suppress fire
Viking Clean Agent Systems are ideally suited for environments sensitive to water or foam-based suppressants, such as telecommunications facilities, computer and server rooms.

Available agents include Novec© 1230 (VSH-1230) and FM 200 (VSH-200)

Single- or multi-cylinder systems available in nominal fill sizes of 60, 140, 220, 280, 390, and 500 lbs.
**Extinguishing Agent Options**

**VSH-1230**
- Safe, proven, and dependable protection for high-value assets. Suitable for class A, B, C fires
- Provides an extra margin of safety for people, and leaves no residue, making it ideal for protection of sensitive assets
- Rapid total flooding extinguishing, exceedingly safe for occupied areas
- Compact and space saving design with low installation and maintenance costs
- World-wide recognized and approved extinguishing agent with lowest environmental impact, UL/FM approved
- Enhanced nozzle design is UL approved at increased design concentrations for heights up to 17’ 9”, eliminating the need for two levels of nozzles and pipe networks

**VSH-200**
- Extinguishes exceptionally fast, flooding the room in less than 10 seconds
- No extinguishing agent residues, neither corrosive nor electrically conductive
- Exceedingly safe for occupied areas
- Robust design with low installation and maintenance costs
- World-wide recognized extinguishing agent. UL/FM approved
- Enhanced nozzle design to generate high velocity spray patterns and effective agent discharge
Converged In-Cabinet Fire Protection Solutions

Plug & Play in-cabinet detection and suppression system for fully enclosed equipment cabinets

- Height equivalent to a 1U rack unit (44mm)
- Integrated aspirating smoke detector module
- Integrated Novec© 1230 extinguishing module
- Integrated power supply module, including emergency power
- Monitored control alarm devices
- Contacts for shutting down power circuits
- Display and operating panel
- Ethernet network capable

Detect • Extinguish • Control at the source
The FIREFLEX® DUAL is ideally suited for compact environments where both gas-based and water-based suppressants are desired to meet objectives for a particular hazard.

The system integrates a Viking pre-action sprinkler system, a Viking VSH-1230 clean agent suppression system and a fire control panel. Its available as single or double interlocked pre-action system.

The FIREFLEX® DUAL provides an integrated solution for:
- Telecommunication centers
- Server rooms and data storage
- Control rooms
- Emergency Power Supply Systems
Viking foam suppression systems are designed to limit fire damage in challenging and high-risk applications such as diesel fuel storage and emergency power generator rooms.

Viking foam suppression systems consists of components that are tested, approved and/or listed together.

Wide range of products available:

- Foam bladder tanks
- Proportioning devices
- Foam concentrate
- Discharge devices
Practical Experience You Can Trust

OVER

100 YEARS EXPERIENCE IN FIRE PROTECTION

Trusted above all

• **Count on us.** To provide best in class compliant protection solutions.

• **Achieve Consistency.** Every project, every time, through detailed engineering documentation, tailored to meet goals and expectations of the system.

• **Be Compliant.** Leverage our expertise of complex codes & standards.

• **One Call.** Leave the details to us to ensure qualified technicians execute on installation, commissioning and ongoing maintenance.

• **Save Time, Reduce Cost.** Eliminate cost associated with engineering of systems, risk of scope gap, cost of unexpected change orders. Our engineering services are intended to save you time and cost.
Developed with the needs of OEM clients in mind

A tailored program which simplifies the process in which fire protection products and solutions are sourced and installed through certified contractor partners, ensuring clients receive a fair price and a consistent application per their requirements and specifications.

Program Summary

- Single point of contact
- Negotiated discounts off published list prices
- Extended warranty
- Cost control management
- Needs assessment
- Project consultation & management
- Design review
- Installation and start-up review
- Commissioning review
- Final acceptance assessment
- Records archiving
- Staff training
- Service and maintenance support
- Global reach
While technology is important it is not the only key attribute when selecting a fire protection partner. Project delivery should be of equal importance consideration.
VISIT US ONLINE
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