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## **ÜTILITYSOURCE**

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First responders such as fire, EMS and police depend on reliable two-way radio communication when lives and property are at risk. That's not always an easy task in many buildings. In-building radio signals are often absorbed or blocked by structures that are larger, underground or constructed of concrete or metal. Additionally, building features designed to create more sustainable facilities such as low-E glass windows can attenuate the signal from public safety radio systems. When this occurs, weak or non-existent signals result in radio communication "dead zones" within commercial structures that can jeopardize coordination among and the safety of first responders during an emergency.

As a result, most fire codes now mandate the installation of Emergency Responder Communication Enhancement Systems (ERCES) for both new and existing commercial buildings. These advanced systems boost the signal inside the building, providing clear, two-way radio communication without dead spots.

"The challenge is that first responders operate on many different frequencies which vary significantly from city to city, so the ERCES equipment must be designed to amplify only the specific assigned channels," says Trevor Mathews, Wireless Division Manager at Cosco Fire Protection, a provider of business fire suppression and life safety systems for more than 60 years. The company has offered dedicated in-building radio communication system installation services for the past four years.

Mathews adds that this design usually involves tuning the ERCES to prevent signal interference with other frequencies and avoid running afoul of the FCC, which can levy significant fines when violations occur. In addition, companies often must install the entire system before the certificate of occupancy is issued. To meet



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the tight deadlines, installers rely on ERCES OEMs to quickly deliver the system components.

State-of-the-art ERCES are available that arrive "custom-tuned" by the OEM to the specific required UHF and/or VHF channel. The contractor can then further optimize the device onsite to the actual band frequencies with channel selective adjustments. The approach facilitates meeting all codes and requirements while reducing overall installation cost and complexity.

#### **Effective ERCES Equipment**

ERCES were first introduced in the 2009 International Building Code. The latest codes – such as IBC 2021 Section 916, IFC 2021 Section 510, 2019 NFPA 1221 Section 9.6, NFPA 1 2021 Section 11.10, and 2022 NFPA 1225 Chapter 18 – require all buildings to have an approved level of emergency communication coverage for first responders.

ERCES systems function by connecting through an over-the-air link that the installer optimizes to the public safety radio communications tower network, using a rooftop directional antenna. This antenna is then connected via coaxial cable to a bi-directional amplifier (BDA), which increases the signal level to provide sufficient coverage within the building, based on life safety standards. The BDA is connected to a distributed antenna system (DAS), a network of relatively small antennas installed throughout the building that serve as repeaters to improve the signal coverage in any isolated areas.

In larger buildings of 350,000 square feet or more, multiple amplifiers may be required to drive an adequate signal level across the system. Besides the building's square footage, other criteria can also affect the number of amplifiers required, such as the building design, type of construction materials used, and the density of construction.

In a recent application, Cosco Fire Protection was tasked with installing an ERCES along with a comprehensive fire and life safety system at a large distribution center in Washington. To meet municipal requirements, Cosco Fire needed to install an ERCES tuned to VHF 150-170 MHz for the fire department and UHF 450-512 for police. The building was due to receive its certificate of occupancy in several weeks, so installation needed to be completed quickly.



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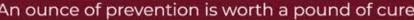


To streamline the process, Cosco Fire selected the Fiplex by Honeywell BDA and fiber DAS system, from a leading manufacturer of commercial building fire and life safety systems.

The compliant and certified system was developed to reliably provide superior RF amplification and coverage without noise, enhancing two-way radio signal strength inside buildings, tunnels and other structures. The system is specifically designed to meet NFPA and IBC/IFC code compliance with the UL2524

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According to Mathews, one vital aspect that sets the ERCES apart is the ability of the OEM to "tune" the device to the channels used before shipping. The contractor can then further optimize the BDA's RF tuning onsite to the precise frequency required with channel selective, software programmable or adjustable bandwidths. This eliminates the issue of wideband transmission in highly congested RF environments, which can otherwise cause outside interference and potentially lead to FCC fines.

Mathews points out another aspect that distinguishes Fiplex BDAs from other digital signal boosters: the availability of a dual-band option for dedicated UHF or VHF models.

"Combining the UHF and VHF amplifiers simplifies installation because you have one panel instead of two. It also reduces the necessary wall space, the power requirements, and potential points of failure. Annual testing is also easier," says Mathews.

With conventional ERCES systems, fire and life safety companies must often source third party components to supplement the OEM's package.



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For a previous application, Mathews found it "difficult to get conventional ERCES equipment to work. We ultimately had to turn to a third party for the [signal] filters needed because the OEM wouldn't provide them." Mathews also said the lead time to receive the equipment was several months when he needed it in weeks.

In contrast, the Fiplex by Honeywell equipment was delivered in only a few weeks.

"With other suppliers, it could take 8-14 weeks to receive an amplifier," explains Mathews. "Now we can get a custom tuned amplifier and install it with the DAS in 5-6 weeks. That is a game changer for contractors, particularly when there is a tight window for the installation," says Mathews.

For building developers, architects or engineering firms wondering if an ERCES will be required in a new or existing building, the first step is to consult with a fire protection/life safety company that can conduct an RF survey of the space.

The RF Survey is accomplished by measuring the downlink/uplink signal strengths in decibels-milliwatts (dBm) using special measuring devices. Results are submitted to the authority with jurisdiction to determine if an ERCES system is required or if a waiver is appropriate.

"Testing early is preferable to reduce cost, complexity and simplify installation if an ERCES is required. If the building fails an RF survey at any point in time, whether completed construction is at 50%, 80% or 100%, the ERCES system will have to be installed, so testing earlier is better before installation becomes more difficult," says Mathews.

He notes there can be additional challenges when conducting RF testing in structures like warehouses. An empty warehouse may not require an ERCES, but the signal strength can change dramatically in areas of the facility after racking and other equipment is installed, and merchandise is added. If a system is installed once a warehouse is already operational, the fire and life safety company must work around the existing infrastructure and any personnel.

"It is much harder to install ERCES components in an occupied building versus an empty warehouse. Installers may need to use lifts to reach the ceiling, fix cable or place antennas, which is difficult to do at in a fully operational structure," says Mathews.

If installation of the system interferes with the issuance of a certificate of occupancy, this bottleneck can significantly delay a project.

To avoid delays and technical challenges, commercial building developers, architects and engineering firms can benefit from an expert contractor's familiarity with the ERCES requirements.

With quick shipment of an advanced ERCES tuned by the OEM to the required RF channel, a skilled contractor can install and further optimize the device to the specific local band frequencies used with channel selective adjustments. The approach expedites the project and compliance, enhancing safety during an emergency.

For more information, contact Dawn Wotapka, Director of External Communications at Honeywell, 715 Peachtree Street, N.E., Atlanta, GA 30308; email: dawn.wotapka@honeywell.com.

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Elk River Fall Protection Harness: Keeping You Safe and OSHA Compliant

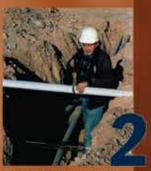
Falls are the leading cause of fatalities in the construction industry, the tower industry, and the industrial industry. The right fall protection gear, including fall protection harnesses & their associated hardware, prevents injuries & these tragic fatalities. It's critical that you understand the requirements and best practices of fall protection systems. Fall protection gear promotes safer working conditions and reduces the risk of injury or death. The proper OSHA-compliant personal protection gear is sure to help keep your team safe, and your business operating.

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What You Need To Know To Stay Safe & Legal As an employer, it's important you understand the risks of an unsafe workplace, not only for your employees but for the overall health of your company. Let's take a look at how you can ensure your operation is safe for all employees while also meeting all government regulations.

Why Is Fall Protection Important?

#### For Human Safety

Working with dangerous equipment in a fast-paced environment, it's no surprise that falls are the leading cause of fatalities in the construction industry. According to the CDC, falls accounted for one in three of the total number of fatalities in the industry during 2019. It's the responsibility and duty of the

employer to ensure safe working conditions for all employees.

Not only can a workplace injury have a devastating impact on the employee(s) involved, the costs associated with a workplace injury, including worker's compensation, can be devastating to an employer's bottom line. Not only is it imperative to be sure you are protecting your employees' health and well-being, but also your brand and bottom line as a whole.

#### Because it's Law

According to OHSA's Standard 1926.501 (Source), it is the duty of an employer to provide fall protection systems in certain work environments.

#### **OSHA**

OHSA, the Occupational Safety and Health Administration, has set forth guidelines and requirements to assist employers in creating a workplace that prevents employees from falling off platforms, elevated workstations, or into holes and ditches. Established in 1970, OSHA is a part of the federal Department of Labor. Its mission is to prevent workplace illness, injury, and death by providing guidelines and enforcing safety standards. Their number one goal is to create a better, safer working environment for all Americans.

#### Requirements:

Depending on the industry and application, OSHA has set forth specific height requirements: General industry applications require fall protection for workers located 4 or more feet above the ground.

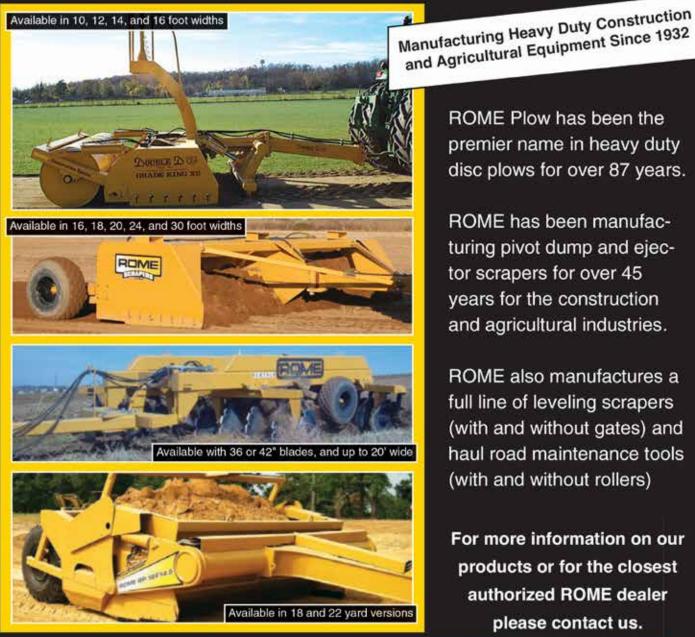
Shipyard applications require fall protection for any worker located at 5 or more feet above the ground.

The construction industry requires fall protection for workers located 6 or more feet above the ground.

Long shoring operations require fall protection for any worker located 8 or more feet above a below surface (including water).

It's important to note that there are times when personal protective gear is required though no height is involved. If an employee is working above dangerous equipment or machinery, or any hazard they could fall into, they must have personal fall protection or guardrails at all times.

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Fall protection can be in the form of a guardrail, though when that is not a viable option, personal protective equipment such as harnesses, lifelines, and lanyards are required by law.

#### Harnesses Lifelines Lanyards

Not only does OSHA provide height requirements depending on the industry, but they also offer general requirements for all workplace applications.

#### By law, OSHA requires employers to:

Provide working conditions free of known dangers. Keep floors in work areas clean and in a dry condition.

Provide required personal protective equipment at no cost to workers.

Conduct employee training by a competent person regarding job hazards in a language the employee can understand.

Failure to comply with these regulations may result in citations and hefty fines – ranging from \$14,000 to \$145,000 per violation for repeat offenders. Given these fines can be applied to each instance or citation, a charge of the sort can not only be devastating to your bottom line, but also to your reputation.

#### Guidelines to Help Employers

OSHA provides employers with specific guidelines to help address fall hazards. These include: Guardrails and handrails, personal fall arrest systems, and safety nets are recommended methods for any surface with an unprotected side or edge that's six feet or more above a lower level.

Guardrails and toe-boards are the recommended fall protection when an employee works over dangerous equipment or machinery, such as conveyor belts or vats of hazardous materials.

A railing and toe board (or a cover) can be used to cover exposed holes in the floor and open-sided platforms, floors, and runways, to prevent employees from falling.

Employers should have continuous training programs to educate workers on height-related hazards, notify them of the dangers posed by working at any height, and how to remain safe on the job.

In 1997, OSHA responded to a request for a reevaluation of Section 1926.501(b)(5) to ensure the standard properly addresses fall protection for pre-assembled rebar assemblies. This clarified rule states that fall protection is not required while an employee is in motion up to 24 feet, meaning fall protection is not necessary for employees climbing on or moving on built-in-place rebar assemblies at heights below 24 feet. Though, employers are required to provide safety equipment to employees working on rebar assemblies once those employees have reached their workstations or have moved to points at least 24 feet above a lower level.

#### Other Employer Resources

In partnership with the National Institute for Occupational Safety and Health (NIOSH) and National Occupational Research Agenda (NORA) – Construction Sector, OSHA has created a nationwide outreach campaign to raise awareness about common fall hazards in construction and how to prevent them. OSHA emphasizes that falls can be prevented through three important and highly effective steps:

- Plan ahead to get the job done safely
- Provide the correct equipment
- Train everyone to use the equipment safely and properly

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When it comes to falling in the workplace, you can never be too safe. No matter your industry, Elk River has quality fall protection equipment to keep you and your team safe. Contact us today to discuss your needs and what Elk River can do to keep your operation safe, legal, and effective. We are your source for all your fall protection needs – Elk River is your fall protection partner.

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## Unlikely Technology Combo KOs Large Suspended Solidsin Power Generation Industry

Automated scraper strainers paired with macerators eliminate high volumes of large, suspended solids from slurries for "set it and forget it" approach.

In the power industry, industrial strainers are utilized to separate unwanted suspended solids from liquids and slurries from boiler water slag or for filtering Bunker C fuel supplied to burners for power generation. However, conventional strainer methods can prove to be unreliable and lead to extensive maintenance, particularly in cases where the debris or solids are of substantial size and there is a significant amount of suspended solids present.

Fortunately, the utilization of a novel blend of industrial wastewater technologies now allows for the efficient removal of solids without the need for extensive manual labor, worker exposure to messy or potentially hazardous substances, or constant maintenance. Specifically, the design involves a one-two punch combination of a macerator, which breaks down large solids into smaller fragments, and an automated scraper strainer flexible enough to efficiently filter out larger debris along with tiny particles. This innovative solution can even accommodate high solids loading without clogging.

The combination of these two established technologies is already being applied to some of the toughest, dirtiest straining applications including wastewater debris, power plant boiler water slag, asphalt transloading, and meat processing waste streams.

#### **Overcoming Traditional Limitations**

Duplex strainers are often used in continuous flow processes that cannot be shut down for cleaning purposes. Duplex basket strainers employ two distinct chambers that function independently. When one chamber needs cleaning, the flow is seamlessly diverted to the alternate chamber, enabling the removal and cleaning of the first basket.

Cleaning is a messy, laborious process that involves equalizing pressure between the baskets, diverting



flow to the off-line chamber, opening the cover, manually removing the clogged basket, and cleaning it before refitting the basket, ensuring the seal, and tightening the fasteners.

If an operator fails to adequately clean the basket strainers for any reason, both strainers can become clogged at the same time. This compromises the filtration process, resulting in quality issues or unexpected downtime until the problem is resolved. For many processors, this can occur simply due to having insufficient personnel to keep basket strainers clean along with their other duties.

"As an alternative, a combination of established complimentary technologies such as a macerator and an automated scraper strainer can essentially 'knock out' even the toughest problems related to



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large solids and high solids loading in an automated way," says Robert Presser, Vice President of Acme Engineering Prod., Inc., a North American manufacturer of industrial self-cleaning strainers. The company is an ISO 9001:2015 certified manufacturer of environmental controls and systems with integrated mechanical, electrical, and electronic capabilities.

In this configuration, a macerator would be installed upstream to reduce large solids down to a manageable size. The capabilities of the automated strainer are crucial to the process as well, according to Presser.

"Although the macerator cuts up the biggest solids, the strainer must still be able to separate both relatively large pieces and tiny particles while handling high solids loading without becoming obstructed," explains Presser.

In the case of Acme, the OEM's automated scraper strainer is designed to continually remove both very large and very small suspended solids from liquids and slurries. Cleaning is accomplished by a spring-loaded blade and brush system, managed by a fully automatic control system.

Four scraper brushes rotate at 8 RPM, resulting in a cleaning rate of 32 strokes per minute. The scraper brushes get into wedge-wire slots and dislodge resistant particulates and solids. This approach enables the scraper strainers to resist clogging and fouling when faced with large solids and high solids concentration.

Blowdown typically occurs only at the end of the intermittent scraping cycle when a valve is opened for a few seconds to remove solids from the collector area. Liquid loss is well below 1% of total flow.

If additional pressure is required to clean the screen, Acme Engineering can add an inexpensive trash pump to the blowdown line to assist in removing the solids from the strainer sump.

"Since the solids are small, a little trash pump can pressurize the blowdown line to evacuate solids from the strainer. The combination provides quick ROI because operators no longer have to monitor and clean out heavily loaded basket strainers, resulting in substantially less labor and downtime," says Presser.



Alternatively, the sump can be replaced by a cylinder bracketed by two gate valves that open and close as needed to remove the solids waste.

"When you are ready to empty the cylinder, you close the top gate valve momentarily and open the bottom one by depressing a button to dump the accumulated solids into a receptacle like a dump truck or a conveyor bucket so there is no manual handling required," says Presser.

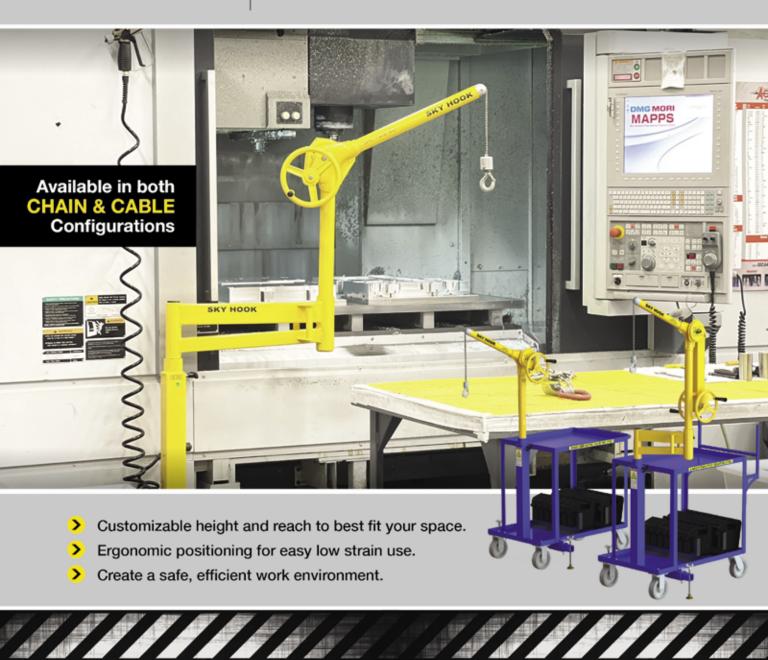
According to Presser, Acme has already worked with power plant operators and managers to implement a wide range of specialized straining systems for difficult applications with exceptionally large solids or very high solids loading.

One example is boiler water slag. Over time, boilers accumulate ash that forms slag deposits, which act as insulation on the boiler tubes. Consequently, more fuel is needed to achieve the desired temperature and output compared to a clean boiler. By removing slag deposits, boiler efficiency can be improved by 1 to 4 percent, leading to reduced emissions from power plants due to decreased fuel



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consumption.

For one power plant, Acme Engineering addressed the slag issue by employing large cylinders and gate valves to strain out slag from a waste slurry produced during boiler washouts. The size of the cylinders used exceeded typical dimensions, with the largest cylinder measuring six feet tall and 18 inches wide.

In another application, the OEM employed a strainer, cylinder, and gate valve configuration to eliminate solid impurities and debris from Bunker C fuel oil. Bunker C, a low-cost residual byproduct derived from the crude oil refinement process, is a viscous substance with a high asphalt content that includes concentrated trace minerals. In this scenario, Bunker C fuel was supplied to burners for power generation, necessitating the removal of any large clumps or oversized particles that could potentially obstruct the nozzles. Failure to do so could result in decreased production and unscheduled downtime for maintenance or repairs.

According to Presser, adapting strainers for the specialized filtration of uncommon liquids and slurries

requires not only expertise but also collaboration with the processor as well as some design iterations.

"For unusual applications, it may take a few attempts to get it right. You may have to adjust the timing and frequency of cleaning as well as adjust the screen slot size. There are quite a few variables involved," concludes Presser.

The power generation industry depends on the filtration of liquids or slurries to meet quality and regulatory standards. When the removal of large solids or managing excessive solids loading exceeds the feasibility of manual basket strainer cleaning, integrating a combination of highly effective technologies may be the best decision.

For more info, visit Acme Engineering Prod. Inc. at acmeprod.com or phone Robert Presser, Vice President at: 518-236-5659; fax: 518-236-6941; mail Acme at Trimex Building, Route 11, POB 460 PMB 10, Mooers, New York 12958. In Canada phone: 514-342-5656; fax: 514-342-3131; mail them at 5706 Royalmount Ave., Montreal, Quebec, H4P 1K5.

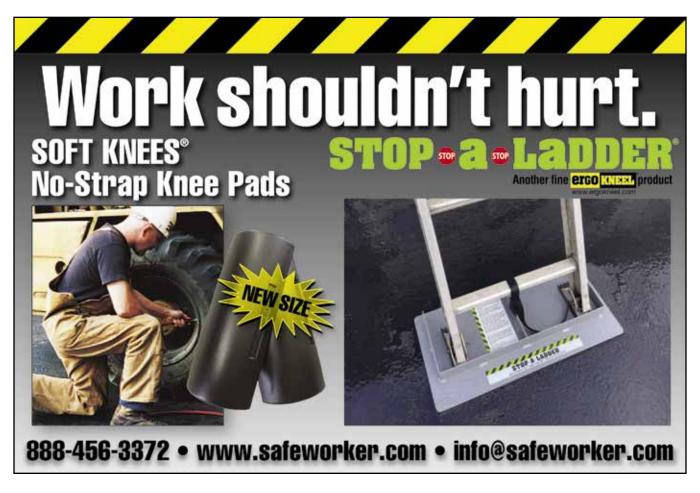
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