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Bridging the Gap Between Response Agencies Through the Use of Interoperable Systems

A White Paper

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In any emergency communication is crucial to faster and more effective response. In the case of a life-threatening emergency, communication between the various departments involved is critical. Government agencies, fire rescue, emergency medical and police responding to the scene all need to know what is going on and where it's happening, fast. When every second counts, responders must be able to communicate with each other no matter what agency they work for. If any of this is compromised, delays, caused by questions involving control of the communications system or by perceived barriers to action can ultimately affect the ultimate outcome of the event.

Enter interoperable communications systems – equipment which allows responders from all agencies, regardless of hardware, to communicate effectively during an emergency event.

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What is Interoperability?

The Merriam-Webster dictionary defines interoperability as the ability of a system to work with or use the parts or equipment of another system. In terms of an emergency, this means that rescue workers on a scene can easily connect to law enforcement officials, who in turn, can easily connect to emergency medical technicians who can be in touch with their local government responders as well.

In short, now that everyone's talking, rescue operations can happen much faster — saving time, resources, and ultimately lives.

This has not always been the case. Traditionally, agencies could not exchange information because they operated widely disparate hardware that was incompatible. As a result, agencies functioned largely in isolated "information islands."

However, because interoperability is an important issue for first responders and public health and safety departments, the U.S. government is making a concerted effort to overcome the country's lack of public safety interoperability, pursuing programs that are designed to help agencies work together.

Something everyone can achieve

Whether an event is small or large, every community can benefit from interoperability. Daily applications may include road closures, traffic accidents, sporting events or VIP visits.

Larger applications may include natural or man-made disasters, such as hurricanes, tornadoes, floods, fires, terrorist attacks, etc. Just because a major disaster does not happen every day, does not mean that you need to ignore the fact that interoperable communication is necessary.

Benefits to Interoperability in Emergency Situations

- Consolidates communications operations across departments
- Allows departments to share intelligence and coordinate plans for successful joint operations.
- Saves costs through allowing multiple agencies investing in one system to enhance communications with each other.

A Note About Federal Grants

A number of Federal Grants support the use of radio bridging devices, which allow the user to take different radios with different frequencies, such as UHF and VHF and connect them to a single unit. This allows multiple agencies to speak with each other, or the user can choose which agencies need to be connected at a time.

Constructing a Communications Interoperability Plan

In order to properly execute an interoperability plan, solutions must be implemented, roles and responsibilities must be learned and delegated and the plan must be put into practice. To do this, it is best to follow these practices:

- **Keep It Alive:** Ensure all parties understand the plan. Document the plan and hold regular meetings to periodically review the plan and ensure that ongoing needs are being met. The plan must flow with your organization's moment by moment needs.

- **Implement Technology Solutions:** Purchase or upgrade equipment necessary to execute the plan. (See "Different Levels of Interoperability Technology Choices" on next page.)

- **Put It Into Action:** Ensure thorough training and ongoing practice drills so that everyone knows how to implement the plan in an emergency.

Different Levels of Interoperability Technology Choices

In order to make the best choice for your department, interoperability options need to be weighed and measured against the department's individual needs. Whether you need a solution that will cover events of any scale; small or large scale events; small or moderate scale events; or simply small scale events, will remain largely up to the unique function of your department or organization's role within the emergency response process.

Different events, however, do require different equipment needs and may influence your future purchasing decisions. Equipment needs can be divided into three different categories – local, regional and global.

Local

A local interoperability solution would cover small to large scale events during which all or some agencies need to communicate with each other on site regardless of equipment. In this scenario, different radio frequencies can be bridged to allow for interoperable communications. In this scenario, multiple departments, such as Fire, EMS, Police or National Guard can communicate with each other regardless of hardware.

Regional

A regional interoperability solution would be best for teams of personnel that need to cover regional events during which more bandwidth is needed. Fire, EMS, the National Guard, smaller state agencies, towns, counties and municipalities would benefit best from this type of solution.

Global

A global interoperability solution would be needed in case of large scale events during which support is needed for a large number of personnel over a wide geographical area.

Determining Your Interoperability Solution Structure

Determining which type of structure to use to house your interoperability solution will largely depend on which type of solution you choose.

There are a few common denominators however that need to be considered in choosing an emergency incident command post.

- First, the command post must be mobile. Without mobility, you lose the flexibility to travel right to the scene of the incident.
- Second, it needs a solid structure to keep off the elements, such as wind, rain, snow, etc. while protecting the communications equipment and personnel inside.
- Third, the command post needs to have the ability to keep an ambient temperature no matter how high or low the temperature is on the outside. There are two reasons for this. One, a steady ambient temperature keeps electronic equipment running optimally. Second, personnel working on the incident scene will function more efficiently in a more comfortable temperature.
- Fourth, the command post needs to take up a small footprint at the emergency scene. Large, bulky vehicles that take up a lot of space may work in some cases, however, as each incident is different and allows for a very large or very small space in order to set up operations, a small footprint is crucial to allowing the incident commander to have optimal flexibility in determining where to set up the system.

What Others Are Doing

Because interoperability is an important issue for first responders and public health and safety departments, the U.S. government is making a concerted effort to overcome the country's lack of public safety interoperability, pursuing several programs, which are designed to help agencies work together.

Some states are even making a concerted effort to enhance interoperability within their jurisdictions.

For instance, the **Utah Highway Patrol** and other departments in Utah have created a statewide data-sharing network using technology from a company based in Bountiful, Utah, FATPOL Technologies.

The **State of Maryland** signed an executive order in June 2008 to establish a statewide communications system that would allow law enforcement and public safety personnel from different state, county and municipal agencies to use one emergency radio system. The order was signed due to a determination that incompatible radios from different city and county emergency responders hampered rescue attempts after 9/11.

Other organizations, such as **DHS Technologies**, have teamed with communications companies to not only provide an interoperable communications equipment solution for emergency responders, but also to supply all of the necessary equipment for command post set up as well.

The system is called the Reeves (ICP) Incident Command Post Trailer, and contains a fully managed, end-to-end interoperability communications solution that is secure, cost effective, and fast and easy to implement. The command post is comprised of a military-grade shelter that attaches to a lightweight trailer that can be towed by any vehicle with a towing capability of over 3,000 pounds. The shelter provides a large, protected space within a small footprint, while the trailer houses and stores the generator, fuel systems, battery power, air conditioning unit and communications equipment. Recently purchased by the City of New Orleans, the Reeves ICP Trailer fills all the requirements of providing Local, Regional and Global solutions while allowing for an optimal command post structure.

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The Reeves ICP Trailer – An Interoperability and Command Post Package Solution

In order to take advantage of local, regional and global interoperability solutions and provide a solid incident command post structure, a few organizations, such as the City of New Orleans, have opted to use the Reeves Incident Command Post (ICP) Trailer.

The Reeves ICP Trailer is a unique trailer and shelter combination that allows the incident commander to mobilize a fully operational interoperable incident command post through which to communicate with other agencies during an emergency.

The interoperability of the system allows different emergency departments, such as police, fire and public health to communicate with each other regardless of disparity in equipment or hardware. The trailer and shelter provide the structure for the command post.

Reeves ICP Trailer Overall Features

- A complete lightweight, transportable command solution to mobilizing a fully operational interoperable incident command post quickly and efficiently.
- Specialized trailer and shelter combination allows for navigation in varying terrain and extreme environmental conditions.
- Double-wall military-grade shelter is deployed with minimal personnel in minutes.
- Interoperable communications equipment includes satellite communications, Internet access and an integrated command and control system — all within a manageable footprint.

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The Reeves ICP Shelter and Trailer – A Unique Command Post Structure that Works

On Page 5 of this White Paper, we determined that mobility, a solid structure, temperature control and a small foot print were important to choosing a command post structure as selecting the right equipment to provide an interoperability solution. The Reeves ICP fulfills these requirements in the following ways:

The command post must be mobile. Without mobility, you lose the flexibility to travel right to the scene of the incident.
With a starting weight of less than 3,000 pounds, and a foot and a half of ground clearance, the ICP's lightweight, aerodynamic design allows it to be easily towed behind most vehicles, allowing for travel anywhere, even off road, and better gas mileage than bulky command trailers.

The command post needs a solid structure to keep off the elements, such as wind, rain, snow, etc. while protecting the communications equipment and personnel inside.
The ICP Shelter design uses the same materials as the Deployable Rapid Assembly Shelter, or DRASH System, that has been used extensively by the military as tactical operations centers, medical facilities, aircraft maintenance facilities and forward operating bases for more than 20 years. It is lightweight, portable, rugged, reliable and, most importantly, user friendly. There are no loose parts to misplace, and it deploys in less than ten minutes. Shelter features include a ground cover, floor, windlines and a weather-tight seal between the shelter and trailer. The shelter's durable structure has been tested to withstand gusts of wind up to 65 mph and to withstand free falling and blowing rain without intrusion of water.

The command post needs to have the ability to keep an ambient temperature no matter how high or low the temperature is on the outside.
With an air conditioning unit mounted on the roof, double layer shelter design and insulated interior, keeping an ambient temperature inside the Reeves ICP is not only feasible, but easy. With the help of an ECU, the shelter has been tested to maintain ambient temperatures between +40˚F and +87˚F when subjected to extreme high and low temperature ranges of -50˚F to +131˚F.

The command post needs to take up a small footprint at the emergency scene.
With the smallest footprint taking up no more than 12.8' x 23.2' and the largest only 12.8' x 32.9' the Reeves ICP Trailer functions optimally in a smaller space than larger, bulky command vehicles.

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The Reeves ICP Communications Packages – Providing Varying Levels of Interoperability in a Compact Structure

As different departments and events require different equipment needs, the Reeves ICP provides four interoperability packages that can be geared to each individual customer's needs. All packages include a Reeves ICP trailer and heavy-duty shelter with a 6.5 kW generator, heavy duty axle, off road tires and roof-mounted ECU. All packages also include a command cabinet to hold communications gear and equipment storage, and include communications equipment that meets federal standards for interoperability.

- The **Basic** package is a platform on which users can build their own solution, or install communication equipment they already have. It provides no pre-installed communications equipment.

- The **Local** package is designed to allow bridging of different radio frequencies for local incident management. That way, different departments can easily communicate regardless of hardware. It also includes a cellular connection box to give voice, fax and internet access via the cellular network.

- The **Regional** package includes the Local radio bridging and cellular access, but also adds a satellite phone and BGAN satellite internet access for additional, redundant communications capabilities that covers a larger region.

- The **Global** package is based upon a VSAT satellite dish terminal, and gives broadband internet access anytime, anywhere. This gives broadband internet connection, and multiple VoIP phone lines. It also includes a radio bridge and set of radios. Satellite dish equipment is Mil-Spec.

	Basic	Local	Regional	Global
Radio (UHF, VHF, 800MHz)	-	Yes	Yes	Yes
Radio Bridging	-	Yes	Yes	Yes
Bridge Radio to Phone Call	-	-	Yes	Yes
Text Email	-	Yes	Redundant	Yes
Picture Email	-	Yes	Redundant	Broadband
Download Weather and News	-	Yes	Redundant	Broadband
Stream Video	-	Low Res	Low Res	High Res
Voice (phone) line	-	Yes	Redundant	Multiple Lines

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