

## CREATING FLEXIBLE MOBILE FACILITIES

*How to create more energy efficient and flexible mobile facilities through the use of intelligent power*

A White Paper

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From natural disasters to pandemic outbreaks, today's emergency responders must be ready for anything. It is equally critical that they have facilities from which they can run operations that are as mobile and flexible as they are.

Enter intelligent power – generators that connect to form a single power grid and provide users with an energy efficient, mobile facility that can easily be reconfigured from one emergency to the next.

## Emergency Responders and the Need for Mobile Facilities

Recent events, such as the attacks on September 11, 2001, Hurricane Katrina and the 2009 H1N1 outbreak, have proven that mobile facilities allow emergency responders to bring operations directly to the scene and improve relief efforts.

Such disasters have also made it clear, however, that these facilities must be transportable, reliable, scalable and adaptable if they are to be truly effective.

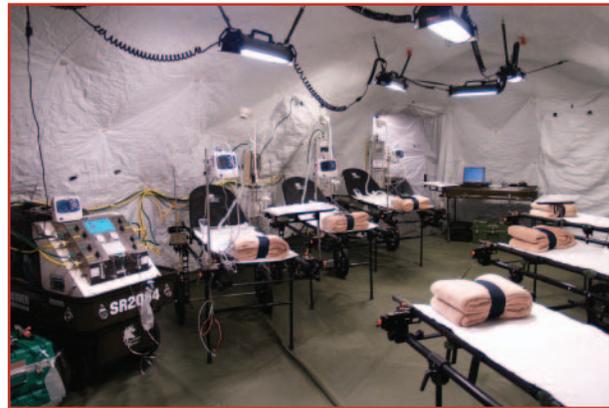
### Transportability

Whether called to support efforts at a remote incident site or to help control medical surge at a nearby hospital, emergency responders must be able to transport their workspace from one location to the next quickly and easily.

Often forced to bring operations into the field, it is also crucial that personnel be able to run their support equipment for extended periods of time without a steady, external fuel source close by.

### Reliability

Equally important as transportability, equipment should be able to run without the need for constant maintenance. This is especially crucial when responders are hard at work during an emergency situation.



### Scalability

Because responders may need to add or remove bedding, medical equipment, lighting, computers and other equipment as the severity of a disaster changes, personnel must be able to alter their facilities' overall size depending on the scale of an incident.

Additionally, a power supply unit should be in place that can handle sudden surges or lulls in power demand as equipment is added or removed should.

### Adaptability

From driving rain and strong winds to extreme temperatures and snow, responders can be faced with a wide range of environmental conditions while at the incident scene.

Personnel must be able to integrate generators, heaters and environmental control units into their facility. Such equipment allows users to maintain ambient interior conditions and continue their response efforts regardless of the surrounding environment.

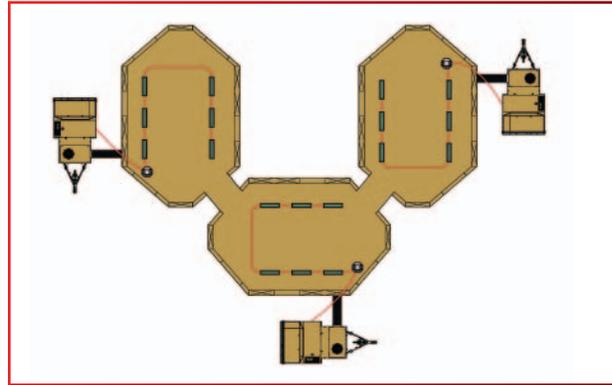
## Generators – The Problem

Though emergency responders are expected to complete a wide range of operations from the field, generators have long prevented personnel from achieving the flexibility they need.

Traditionally, generators used to power mobile facilities have been designed to run on “island mode” - operating independently of one another and almost always providing more power than as is required. These generators do not run based on the amount of power needed for a facility to operate, but rather are sized to run peak loads. Such power units continuously run on partial loads, require exorbitant amounts of fuel and produce power less efficiently.

This not only makes it difficult to operate for extended periods of time in remote locations far from an external fuel source, but causes maintenance issues as well. One such issue is wet-stacking, a common problem in which unburned fuel begins to clog the exhaust system due to running an engine on partial loads.

Many of these generators are also difficult to transport, providing users with little mobility and making the integration of additional generators to expand response efforts extremely burdensome.



Generators running on “island mode.” From a power perspective, the above field hospital is comprised of three separate facilities that each require its own generator and do not share any power lines. Even if one generator could satisfy the power needs of the entire hospital (example: at night when lights, medical equipment, etc. are turned off), all three must run at all times. This wastes fuel and creates unnecessary run-time hours.



## Smart Systems - The Answer

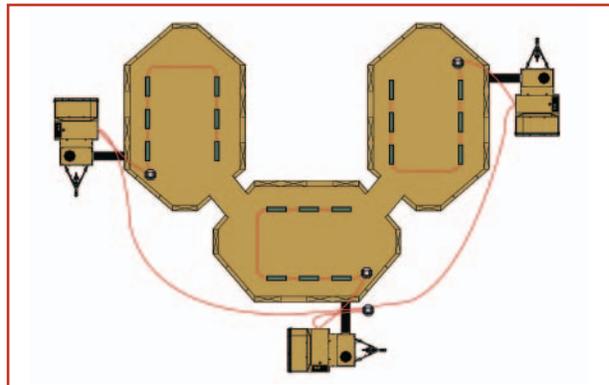
Generators featuring a digital smart system help reduce unnecessary fuel consumption and establish more efficient, flexible mobile facilities.

Digital smart systems allow users to parallel generators to operate as a single power grid that only supplies the power needed to meet a facility's immediate operational requirements. More simply put, smart systems allow users to connect multiple generators and turn off unneeded units to ensure that a facility will only use the amount of power it needs to operate - no more, no less.

The benefits of these generators include:

- **Fuel Efficiency.** Smart systems connect multiple generators to run together as a single power grid. Only the number of generators needed to run a facility at any given time will actually be used, reducing overall fuel consumption. Additionally, these generators are designed to run near full loads, often at close to 90 percent, to further achieve maximum fuel efficiency.
- **Reduced Maintenance.** By turning off unnecessary generators, smart systems minimize engine run-time hours and prevent issues commonly experienced in the field, such as wet-stacking, reducing the need for maintenance.
- **Flexibility.** Smart system generators can be interconnected, allowing users to integrate additional generators into a field facility as their power requirements change from operation to operation.

While many power technology companies are beginning to explore ways to build more efficient generators, one company, DHS Systems LLC, has introduced an entire line of Intelligent Power Technology™ (IPT) Trailers - trailers equipped with smart system generators for greater efficiency in the field.



Digital smart systems allow personnel to connect multiple generators to run together as a single power grid and reduce fuel consumption. In the above field hospital, all generators are working together to power the facility as one grid.

## Intelligent Power Technology (IPT) Trailers – An Energy Efficient Solution

Designed to meet users' unique power generation needs, Intelligent Power Technology™ (IPT) Trailers allow personnel to connect multiple generators to run together in parallel, not only helping to reduce current fuel consumption in mobile facilities, but reducing maintenance and providing users with greater flexibility as well.

Features of the trailer system include:

- **Power Management System** with automatic start/stop capabilities only runs the number of generators needed to meet immediate power requirements. Load sharing ensures that the demand for power will be equally distributed among generators left running.
- **Plug-and-Play** capabilities allow users to connect additional IPT Trailers as needed. Simple connectorized cabling eliminates the need for any hardwiring.
- **Load Shedding** turns off low-priority equipment to prevent brownouts during sudden peaks in demand.
- **Anti-Wet Stacking** prevents engine from being clogged with unburned fuel.



- Optional **Power Distribution Units (PDU)** distribute power to branch circuits, utility extension cords and lighting fixtures throughout the facility.
- **Military-Tested Trailers** allow for easy transport of generators through even the harshest terrain.

Additionally, IPT Trailers can be connected to insulated soft-walled shelters, such as DHS Systems' dual-walled Deployable Rapid Assembly Shelter (DRASH) to help reduce heating and cooling loads, and ultimately, overall fuel consumption.

In use with emergency responders across the country, DRASH shelters are available in 45 models ranging in size from 109-1,250 square feet. Unlike most soft-walled shelter systems, DRASH shelters are available with thermal insulation up to an R-Value of 3.5, helping to reduce fuel consumption by minimizing the amount of heating and cooling needed to maintain ambient temperatures within the field facility.

## Creating Flexible Facilities with IPT Trailers

On page 2 of this white paper, we discussed responders' need for facilities that are transportable, scalable and adaptable.

By providing greater energy efficiency, IPT Trailers allow personnel to establish mobile facilities that possess all of these qualities.

### Transportable and Reliable

During a disaster, responders must be able to easily and quickly transport their facilities from one location to the next. These facilities may also need to run for extended periods of time without a steady external fuel source close by, and without constant maintenance.

By allowing for parallel operations to create a single power grid that runs the optimal number of generators at any given time, IPT Trailers provide only enough power to meet the immediate needs of a mobile facility. This reduces unnecessary run-time hours, fuel consumption and, ultimately, the logistical burden of continuously transporting fuel to remote incident sites.

Reduced run-time hours, along with load shedding and anti-wet stacking, also minimize the need for maintenance.

Additionally, IPT Trailers have been designed and tested to travel through the harshest terrain, making the transport of generators from one location to the next an easy process.



### Scalable

Depending on the scope of an emergency, responders may need to integrate additional medical supplies, computers, lighting and other equipment into their facilities. As a result, they'll need generators that can handle sudden changes in demand for power.

Plug-and-play capabilities allow users to connect additional IPT Trailers as needed to power equipment. Load shedding prevents brown outs during sudden power surges, while optional power distribution units (PDU) ensure that power will reach equipment throughout the facility.

The trailers' power management system with auto start/stop features also ensures that unneeded generators will be turned off as equipment is removed and response efforts dwindle.

### Adaptable

Because responders may be faced with extreme environmental conditions, it is critical that personnel are able to easily add generators, heaters and environmental control units to their mobile facilities to maintain ambient conditions and continue operations.

IPT Trailers' plug-and-play capabilities allow for the integration of additional generators to power support equipment, such as heaters and environmental control units, as needed.

The trailers can also be combined with specially-insulated DRASH shelters that are designed to better maintain temperatures regardless of the surrounding environment.



## Conclusion

Expected to handle a wide range of emergency situations, responders need mobile facilities that are as flexible as they are. Intelligent power allows personnel to connect multiple generators to form a single power grid and create more efficient field facilities that can easily be reconfigured from one disaster to the next.

To learn more about IPT Trailers:

Visit  
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