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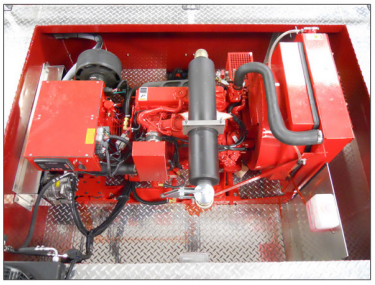
Case Study – Idling Reduction Technologies for Emergency Service Vehicles

Energy Systems Division

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Row 1, Left to Right: Photos 1 and 2, Vermont Department of Environmental Conservation; photo 3, United States Air Force

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Case Study – Idling Reduction Technologies for Emergency Service Vehicles

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Why Emergency Vehicle Fleets Idle

All emergency vehicles are not the same, and their reasons for idling differ. Below are descriptions of the primary reasons for idling associated with each emergency vehicle application.

Ambulance – These vehicles idle while personnel are picking up patients (at homes, nursing homes, businesses, etc.), dropping off patients at hospitals, completing paperwork, and waiting for the next call.

Electrified Parking Space

EPSs for emergency service vehicles are similar to those used in some shorepower-type truck stop electrification kiosks (also referred to as pedestals). All of the hardware and electrical service required to power the vehicle and provide conditioned air while it idles is installed in a fixed location. To use the system, drivers park next to the kiosk, connect the required power and HVAC equipment to the vehicle, and then turn the vehicle engine off. The EPS kiosk system is operational as long as the vehicle is connected. Figure 1 shows an example EPS kiosk. Figure 2 shows an ambulance connected to the system and using both HVAC and electrical power.

Figure 1: MediDock EPS Kiosk. Courtesy of Vermont Department of Environmental Conservation.

Figure 2: Ambulance connected to MediDock EPS Kiosk (HVAC and power). Courtesy of Vermont Department of Environmental Conservation.

Training for Drivers and Technicians

The relevant staff at hospitals participating in the Vermont DEC's EPS projects were trained when the kiosks were installed. Ambulance drivers who are unfamiliar with how to operate the system are instructed by other ambulance drivers, by hospital staff, or by viewing an online training video.

Idle Reduction Performance Results

Vermont Department of Environmental Conservation (Ambulance, Using EPS)

The Vermont DEC has had some data collection challenges. The EPS approach requires that data be collected on the infrastructure side. The MediDock EPS kiosk supplies conditioned air via an electrically powered HVAC system and electric power via the shorepower electrical connections. Each ambulance can use one or both of these services, depending on its needs. The HVAC system has an hour meter to track total HVAC usage, but the early-model kiosk used in these projects does not have a method for tracking usage of electrical power via the shorepower electrical connection. As a result, hospitals cannot accurately track total system use if only electrical power is used.* There is also no method for determining ambulance-hours of kiosk use vs. ambulance-hours of idling, so there is no method for quantifying the system utilization. Additionally, the operator avoidance factor must be considered. Avoidance occurs when an ambulance operator shuts down the engine to comply with the hospital's idling policy and determines that the use of the kiosk is not necessary at that time. Anecdotal information indicates that the kiosks are used frequently and that the EPSs are not capacity-constrained.

* ***Manufacturers Note: The redesigned MEDIDOCK'S hour meter records all power usage and is visible through a window for ease of recording the time information.***

Lessons Learned and Future Plans

Vermont Department of Environmental Conservation (Ambulance, Using EPS)

In general, the Vermont DEC has found that the seven MediDock kiosks installed through this program are sufficient for the ambulance services at those hospitals.

Conclusions

Electrified Parking Space

The EPS approach offers several pros and cons for ambulance applications. The benefits include the following: 1) Focused idling reduction/exhaust emissions reduction occurs at the hospital, where ambulance idling is most concentrated and can have the most serious impacts, 2) the kiosks can be used by all ambulances visiting a hospital, even if they do not regularly serve EPS-equipped hospitals, 3) there is no need to install a system on each ambulance to ensure the ability to eliminate idling (important for volunteer ambulance companies and towns with tight budgets), and 4) there is no downtime for the ambulance service providers for installing hardware. Challenges include the following: 1) system use is determined by the driver (personal preference, company anti-idling policies, etc.), and 2) driver compliance requires monitoring by hospital staff and/or ambulance company staff.

Supplemental Information

Vermont Department of Environmental Conservation (Ambulance, Using EPS)

The Vermont DEC investigated options for reducing ambulance idling emissions at hospitals. The organization considered APUs, but decided instead to fund the installation of shorepower-type electrification kiosks at the hospitals. Although an ambulance may idle while away from the hospital and additional air quality benefits could be provided by having an APU on the ambulance at all times, having an IRT kiosk at the hospital still provides protection to the sensitive population at the hospital, which is another goal of the grant-funded program. Additional factors that influenced Vermont DEC's technology selection included the following:

- A one-time installation and one piece of equipment to maintain;
- No need to make alterations to multiple ambulances, and no downtime for the ambulance service providers;
- Most hospitals have multiple ambulance service providers (some providers are volunteer organizations funded by towns and town budgets), and having the hospital install the IRT decreased the complexity of the project, especially when a cost match was required; and
- The kiosks can be used by all ambulances visiting a hospital, even if they do not regularly serve the EPS-equipped hospital.

The Vermont DEC funded the installation of seven EPS kiosks at three Vermont hospitals, listed below, between 2011 and 2013. The MediDock kiosk was selected because at the time of the projects, the product was suitable for hospitals, providing both HVAC and power.

- 2011 – Brattleboro Memorial Hospital (2 kiosks)
- 2012 – Porter Medical Center (2 kiosks)
- 2013 – Rutland Regional Medical Center (3 kiosks)

For the installations where data were available, the installed system cost ranged from $40,000 to $65,000 per project. This equates to approximately $14,000 to $19,000 per installed kiosk.

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