

Fuel Management

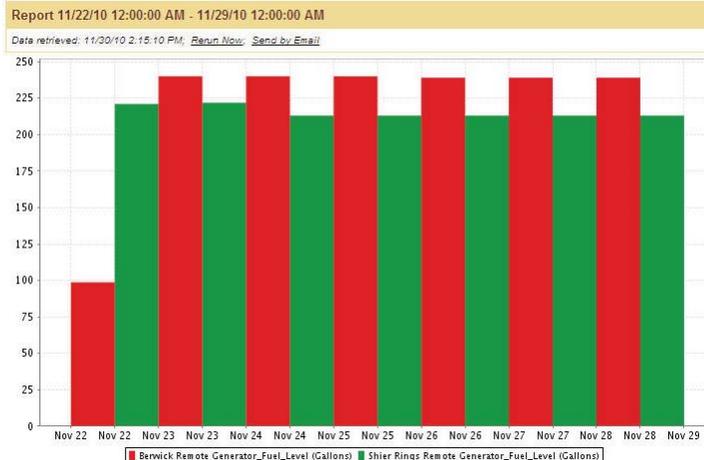
Understanding and managing fuel levels in generators is critical, especially during emergency situations such as natural disasters or when sites are located in remote or hard-to-reach locations. With the increasing cost of fuel, providers need to manage the operating expense both at individual sites and across the network. It is important to monitor fuel levels to facilitate timely refills, verify fuel deliveries, and know how much time remains while under load.

The comprehensive fuel management solution from Kentrox enables service providers to reduce the number of physical site visits by providing remote access capabilities to valuable information. Additionally, alarming and reporting capabilities provided help manage fuel effectively.

Fuel management reporting

Fuel is a critical component for running a generator. Kentrox supports both ultrasonic and pressure-based fuel sensors mounted either on top of or placed into a fuel tank. Kentrox can integrate with numerous existing fuel level sensors or interface directly to an intelligent controller to provide fuel level status.

Reports on fuel level, fuel consumption value, time until refill, and time remaining while under load can be performed on a cell site or on multiple sites throughout a network. Based on this information, service providers can schedule fuel delivery on an "as needed" basis instead of a defined period of time. This ensures there is enough fuel to run the generator in the current situation and proactively plan accordingly during stressed periods, such as natural disasters. Because the Remote and Optima products support one to many, multiple tanks of varying sizes and shapes can be managed in parallel.



Fuel level report



The Fuel Management solution from Kentrox provides:

- A complete view of fuel status across the network
- Alarm notifications based on user-definable parameters
- Proactive management of fuel status
- Improved network availability, especially important during natural disasters

Kentrox can provide historical fuel consumption reports that may be useful in determining whether a different generator model should be deployed in the future as a result of underperformance. By viewing detailed consumption reports across multiple cell sites, indicators may be found as to whether a generator should be replaced that is either operating under specification or unable to effectively manage the site load. By optimizing the generator size, energy consumption can be minimized.

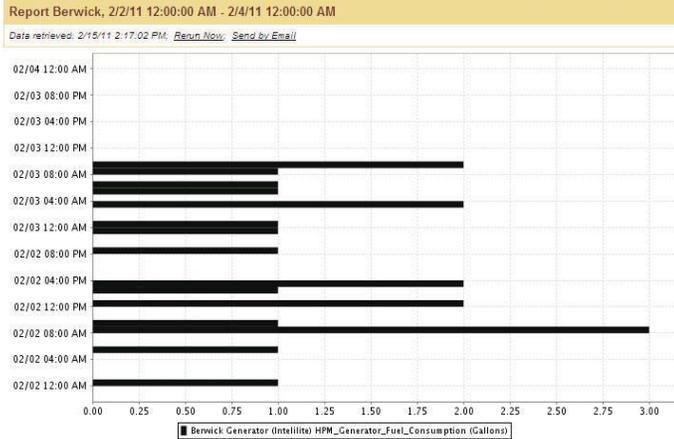
The following reports are available with the Kentrox solution:

- Fuel level
- Fuel consumption
- Estimated time until refuel
- Time remaining while under load

Alarms and notifications

To manage fuel effectively, thresholds should be user-definable for low fuel remaining, and once the low level is reached, automatic notification to the relevant personnel should be initiated. If fuel consumption is higher than the "normal" consumption rate (often caused by a leak or fuel

Solution Brief



Fuel consumption report



Estimated time until refuel report

theft), an alarm should be automatically generated. Alarms should also occur if a fuel cap is opened or if the fuel becomes contaminated.

Kentrox provides alarming for the following issues, and additional controller-specific alarms are also available:

- Abnormal fuel consumption (total consumption exceeds expected consumption)
- Refueling
- Fuel theft
- Low fuel level
- Very low fuel level
- Fuel cap open/closed
- Fuel contamination (water in fuel)

Manage fuel during stressed times

Managing fuel is extremely important when preparing for a storm or after an outage occurs. For example, if a hurricane causes a commercial power outage, providers should be able to utilize reports to quickly determine which sites have the highest priority for refueling based on fuel remaining and estimated time to refuel. The provider can dispatch resources based on valid data to minimize operating costs and network downtime.

Kentrox Solution for Fuel Management

Fuel management from Kentrox is a comprehensive solution that reduces the need for physical site visits and becomes a key solution in meeting compliance initiatives and avoiding costly fines. The solution uses critical technology innovations for monitoring fuel without a site visit, including the following products:

Remote - monitoring and control devices that provide IP management to sites and equipment. Remote provides site alarm monitoring, protocol conversion, and equipment connectivity and acts as an intelligent extension of your Operations Support Systems (OSS).

Optima - gives network operators a comprehensive view and control of network infrastructure sites. The management system provides preventative maintenance tools to help identify issues before they occur. It also provides performance reporting to enable operators to view trending and availability of their networks. Truck rolls can be significantly reduced because of the remote access, diagnostics, and control capabilities.

Kentrox Generator Management Solution

Batteries can only operate a site for a limited number of hours, therefore generators become the primary backup solution for commercial power outages to critical sites, often in remote locations. Commercial power fails for numerous reasons: infrastructure issues, malicious intent, contractor error, or adverse weather conditions. In all cases, power failures result in network downtime, lost revenue, safety issues, and potentially lost customers.

Kentrox offers a generator management solution that helps providers understand and manage generators to their maximum efficiency, substantially minimizing costs and easily providing information required to meet regulatory needs.

Kentrox Solution for Power Management

Power management from Kentrox is a comprehensive solution that reduces the need for physical site visits and becomes a key solution in meeting compliance initiatives and avoiding costly fines. The solution uses critical technology innovations for managing commercial and hybrid power without a site visit.

For more information, visit www.kentrox.com, email info@kentrox.com, or call 800-733-5511 (US), +1 614-798-2000 (outside US).