Responsible Ventilation: Significant Cost Reductions Reducing Environmental Impact

Electricity is generally the single largest cost to an underground mine with the auxiliary ventilation system usually being a mine's single greatest user of electricity (30% - 50%). Using PBE's Responsible Ventilation management system, fans can be controlled by personnel tracking and environmental monitoring, in addition to scheduled events and manual controls. The cost of these safety systems can be paid for by the saving in electricity, hence potentially no capital outlay. Additionally, the system reduces the carbon foot print which has an environmental as well as a social impact.
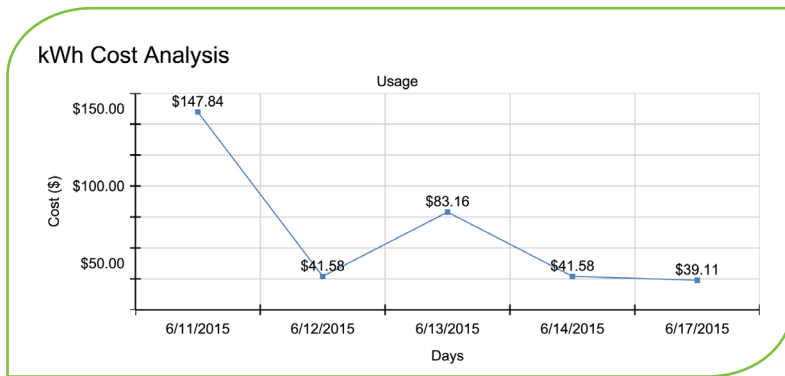
Detailed Cost Analysis
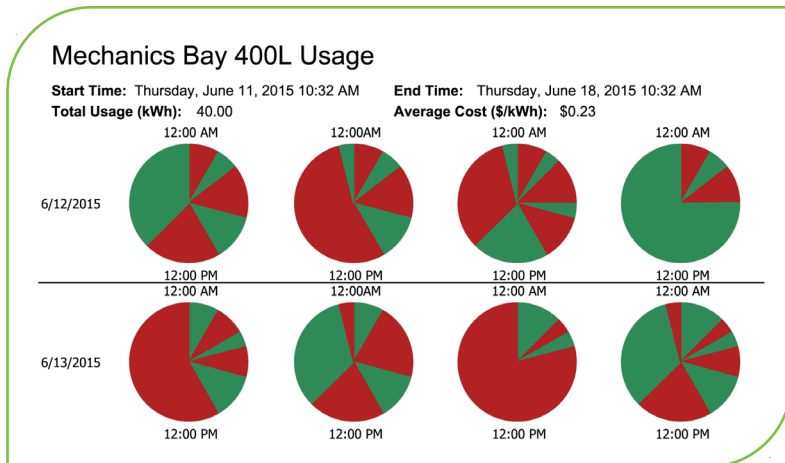
Extensive Reporting Including Usage, Cost Saving and

Day	Full Usage (kWh)	Zone Usage (kWh)	Savings (kWh)	Full Cost ($)	Zone Cost ($)	Savings ($)
6/11/2015	960.000	640.000	320.000	$221.76	$147.84	$73.92
6/12/2015	960.000	180.000	780.000	$221.76	$41.58	$180.18
6/13/2015	960.000	360.000	600.000	$221.76	$83.16	$138.60
6/14/2015	960.000	180.000	780.000	$221.76	$41.58	$180.18
6/17/2015	960.000	169.326	790.674	$221.76	$39.11	$182.65
Total			3,270.674			$755.53

Cost Saving Analysis

BENEFITS

- Dramatic operational cost reduction
- Extends life of ventilation equipment
- Comprehensive reporting package
- Configurable ventilation control
- Reduces environmental impact
- Scheduling module with manual override
- Licensing options allow a flexible pricing plan
- Improves safety through tracking of personnel and provision of environmental monitoring
- Security controlled with defined user privileges

CONTROL STRATEGIES

- *Tracking* – regulates ventilation in accordance with predetermined personnel and equipment location parameters
- *Environmental Monitoring* – gas concentrations reported by environmental monitoring devices activate fans to increase air flow and to help ensure safe levels
- *Scheduled Events* – events may be scheduled to control equipment, as a single occurrence or reoccurrence
- *Manual Override* – provides the user complete manual control

The Responsible Ventilation package is an available module within PBE Vantage. The monitoring, control and management software solution developed by the PBE Group. In addition to Responsible Ventilation, the software offers real time tracking of personnel and equipment, event playback, reporting and an electronic tag board. PBE Vantage is the complete facility safety and productivity system for use with all PBE equipment and has the ability to accommodate most other components outside the offering of PBE.

PBE VANTAGE SYSTEM REQUIREMENTS

FEATURES OF PBE VANTAGE

- *Real Time Tracking System* – visually monitor personnel and assets with interactive controls

- *Historical Playback* – replay events on selected maps using custom configured data and time ranges

- *Reporting* – access standard reports, graphs and charts, with multiple export features

- *Electronic Tag Board* – enhance or replace your existing tag board

- *Muck Manager* – view tag checkpoint data and assign muck manager objects

- *Responsible Ventilation Module* – customized zones, monitor and manage mine ventilation

- *3rd Party Compatibility* – tracking, diagnostic, communication, and control devices from third parties can be integrated into the PBE Vantage system

Minimum Server Requirements		Minimum Client Requirements	
Hardware		**Hardware**	
Processor Type	AMD Opteron, AMD Athlon 64, Intel Xeon with Intel EM64T support, Intel Pentium IV with EM64T support	**Processor Type**	AMD Opteron, AMD Athlon 64, Intel Xeon with Intel EM64T support, Intel Pentium IV with EM64T support
Processor Speed	1.4 GHz	**Processor Speed**	1.4 GHz
Memory	6.0 GB RAM	**Memory**	2.0 GB RAM
Hard Drive	25 GB	**Hard Drive**	10 GB
Software		**Software**	
SQL Server 2008 (Express or higher)		Microsoft .NET Framework 3.5 or higher	
Microsoft .NET Framework 3.5 or higher		Microsoft Silverlight 3.0 (or higher) Plug-in	
IIS Windows Component as well as IIS Server Roles		Browser capable of running Microsoft Silverlight 3.0 (or higher) Plug-in	
An email account on your local SMTP server			