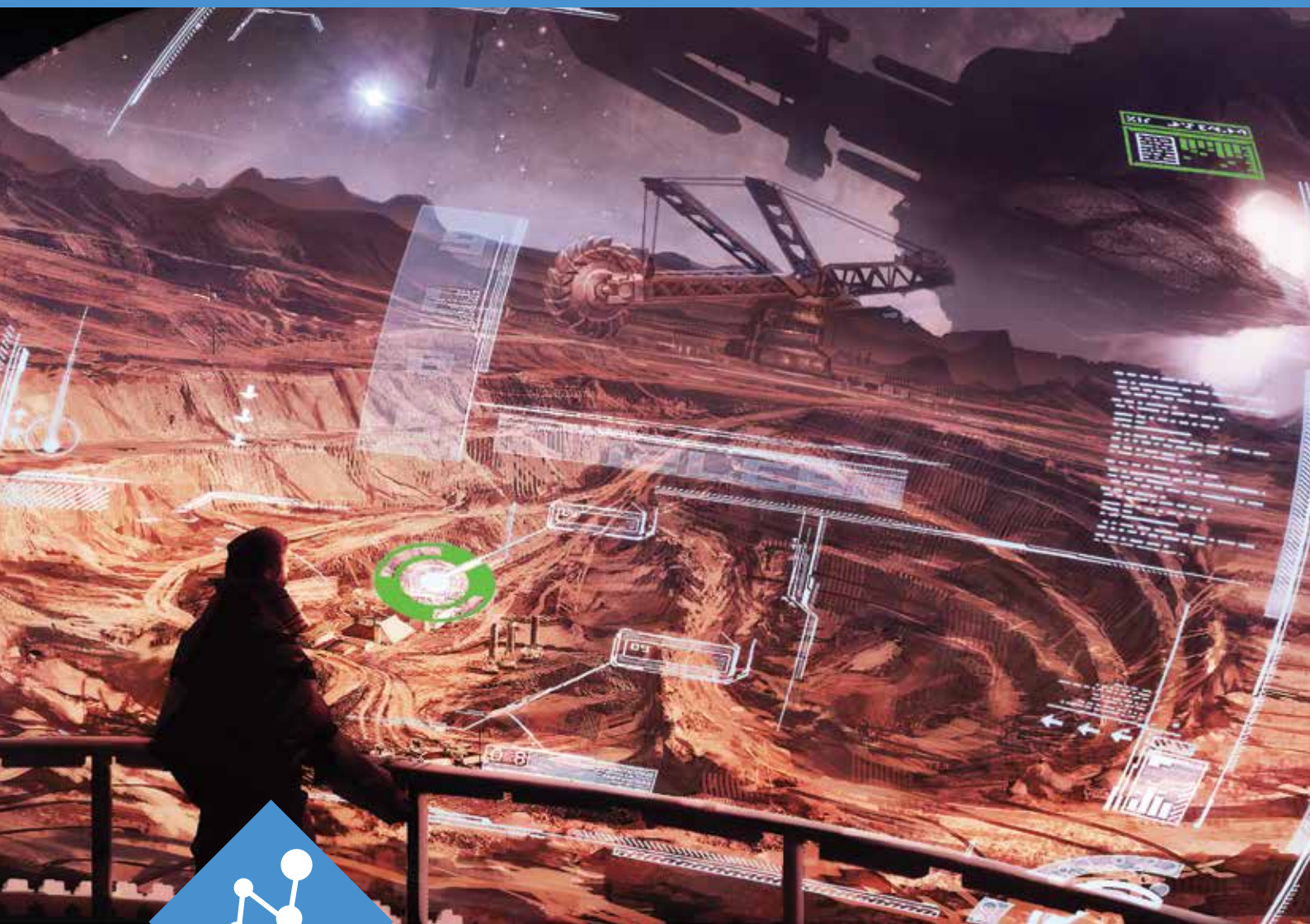




DATA, POWER & SAFETY SOLUTIONS FOR THE MINING INDUSTRY





PBE Data & Communications Infrastructure

PBE Group designs, engineers and manufactures Internet of Things ("IoT") networks to improve safety and increase productivity in mines globally.

PBE offers various communication solutions and data infrastructure to enable reliable voice and data to be transported to the surface and be displayed on PBE's proprietary control & monitoring solution 'Vantage'. These systems can be deployed as a combination of different technologies to meet customer requirements.

The network infrastructure provided is used by PBE's own extensive suite of safety and productivity products as well as 3rd party applications and devices for data backhaul. ♦



Real time data to improve safety and increase productivity

Vantage - Monitoring & Control System

Vantage is PBE's proprietary centralised web-based monitoring and control system used to maximise safety and increase productivity in underground environments.

The Vantage software platform provides a user-friendly navigation interface allowing intelligent control, monitoring and reporting facilities. This enables an integrated safety system to be deployed from a single IoT platform.

Features of the Vantage system include:

- Network wide control and monitoring
- Historic playback of all events
- Suitable for PBE's complete product portfolio and integration of 3rd party systems
- Customisable reporting
- Integration of system maps

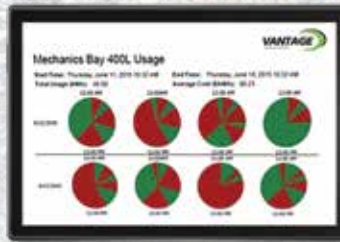
Example of some Vantage applications



Tracking Network



Environmental Monitoring



Responsible Ventilation



Proximity Detection System

Network infrastructure includes:

Leaky Feeder / Radiating Cable Voice and Data Networks

Leaky Feeder systems offer clear two-way radio communication and high-speed data transfer capabilities throughout the mine.

PBE provides a wide range of leaky feeder system options including conventional leaky feeder system, CMTS high speed data systems, permanent radiating cable infrastructure and hybrid networks.

SCADA / Telemetry Networks

PBE offers a wide spectrum of systems that provide reliable, scalable and inherently flexible solutions to meet increasingly complex mandates.

The modular SCADA based hardware can interface with Ethernet and RF networks ensuring seamless connectivity to existing infrastructure.



State of the art leaky feeder infrastructure

Fibre Backbone

PBE is a fibre network provider that has delivered a vast array of integrated tunnelling projects globally and offers custom solutions that are reliable, robust and easy to use. Rebroadcasting systems (LTE, FM, TETRA, P25, etc.), video monitoring and other real time control systems can demand high bandwidth and require low latency for operation.

PBE offers a wide range of fibre-based solutions, providing Ethernet over Fibre (EoF) and RF over Fibre (RoF) systems.

LTE Networks

PBE offer a private LTE network providing a gateway for Smart Mining and IoT Infrastructure. This secure and reliable wireless solution is optimum for critical mining operations. Complete end-to-end private LTE networks provide unified infrastructure for underground applications with varying QoS, bandwidth and latency requirements. ♦





SAFETY

PBE Safety Solutions

PBE Group designs, engineers and manufactures a suite of proprietary products for safety, data infrastructure and communications equipment that create an integrated IoT solution for harsh mining environments.

PBE's products are sophisticated and reliable, with over 50 years of ensuring safer environments in challenging working conditions.

Manufacturer of over 70 proprietary products, meeting all global mining regulations, PBE Group are supported and serviced by its 18 global sales and support offices and a vast network of distribution partners, enabling the provision of timely service and engineering. ◆



Real time data to improve safety

Proximity Alert System (PAS)

PAS is a complete Proximity Detection and Collision Avoidance solution that allows seamless operation above and below ground, giving operators and pedestrians visual and audible warnings of impending interactions and provides remote real time monitoring.



Units are available in a compact, ruggedized, explosion proof models and via a tablet-based radar type display. ♦

Responsible Ventilation

PBE's Responsible Ventilation (RV) platform provides significant cost saving and reduced environmental impact through control of auxiliary booster fans in a mining environment.

The RV management system controls these fans, operational only when required. These conditions can be triggered by environmental events such as unsafe gas levels and temperature, vehicles or personnel entering the area (mine tracking) or through specified scheduling. ♦



Tagging & Tracking

PBE's electronic tagging system is used for the tracking of personnel, vehicles and assets in mining environments.

This solution uses multiple technologies, increases situational awareness, minimising accident response times whilst promoting an overall safer workplace. The system can be used in conjunction with the Proximity Alert System and also provides entry/exit functionality. ♦



Emergency Alerting Stations

An emergency alert response system is essential in a harsh construction environment. Alerting stations can provide audible and visual alerts in the case of emergency.

The PBE Evacuation and Alarming system consists of operator software and remote stations. The system can be configured to individual client operational requirements and can operate either autonomously or through dispatcher interaction. ♦



Environmental Monitoring

PBE's Environmental Monitoring systems provide monitoring and concentration information for all common gasses in all mines types.

The system is monitored using PBE's own control and monitoring software, 'Vantage' allowing instantaneous alerts and providing a complete historical database. The system can be combined with air velocity, tracking and temperature information and can form part of PBE's Responsible Ventilation solution. ♦

Fleet Management Solutions

PBE's Fleet Management System (FMS) extracts, records and presents crucial operational data for the monitoring and management of a mining fleet. This enables all levels of the



mining operation to have the knowledge to support quick and effective decisions. The FMS is a suite of specialised software modules running on a rugged Nexis computing platform, which is installed on-board the mining fleet with GPS and wireless mesh capabilities.

Nexis links on-board vehicle systems back to the office for real-time management of your fleet. Operators engage through the in-cab screens with the system being integrated to PBE's 'PAS' Proximity Detection and Collision Avoidance solution. ♦





PBE Power Solutions

PBE designs, integrates, installs and services temporary and permanent high voltage equipment and infrastructure for the mining industry on a sale or rental basis.

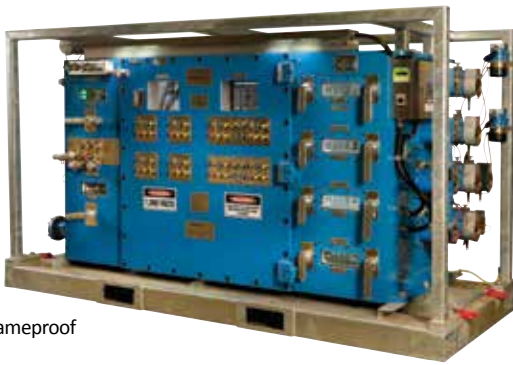
PBE Power manufactures and installs electrical power distribution equipment such as substations, switchrooms, distribution boards, HV cables, transformers etc.

PBE Group has invested in a fleet of power electrical equipment to provide our customers with hire options for their operations and projects and maintains a fleet of 1,200+ rental assets across global locations.

PBE has a Power Projects team that specialises in permanent mining infrastructure projects encompassing design, construction and commissioning of high voltage systems. ◆



Ready available power assets for hire or sale



VCS Flameproof

PBE Power Projects

PBE Power Projects specialises in delivering full turnkey high voltage permanent infrastructure projects encompassing design, construction and commissioning of high voltage infrastructure including substations, switchyards and reticulation systems, construction of high voltage overhead power lines and the installation of underground cables.



11kV Type Tested
Circuit Breaker

Hiring of Power Equipment

In addition to the design and supply of new power infrastructure, PBE provides customised solutions to meet temporary electrical power needs, providing a cost effective and minimal risk solution. Our comprehensive range of specialised electrical equipment is designed to quickly and efficiently power up operations and projects.

Our large global hire fleet is supported by our sales and service capabilities. From building custom engineered substations to providing plug and play power cabling systems, our team understands the specific mining requirements.

PBE Mine Services

PBE Mine Services provide a vast range of cables and couplers for sale and hire. Our workshops have extensive experience in repairing high and low tension cables, control cables, data cables, communication cables and electrical reeling and



Cable and manufactured coupler

trailing cables globally. The repair workshops can provide cable repairs, fault finding and testing, plug and coupler maintenance and fitting, terminations, low and high voltage splicing, site cable audits and statistical reporting.

PBE are specialists in providing plug and play cable packages that are ready to install on your project or operation. High voltage cables can be fitted to a wide range of coupler or junction box sizes to suit your load and voltages ranging from 3.3kV - 24kV couplers up to 800A.

PBE also provides reliable and robust medium voltage cable connections suitable for mining applications. Ease of fitting and maintenance has been incorporated into our coupler design.

Specialist Mining Equipment

PBE have developed a versatile range of electrical equipment to provide solutions for all types of mining environments including flameproof and non-flameproof solutions such as substations, distribution control boards, pump starters, enclosed circuit breakers, auxiliary fans and 11kV type tested circuit breakers.

Australia's standards for underground mining equipment are some of the most stringent in the world and our experience in meeting these standards allows us to confidently provide equipment to meet the required standards around the globe. ♦



Auxiliary fan



PBE Group Company Overview

PBE Group ("PBE") provide an adaptive and flexible integrated solution where a reliance on safety and productivity is essential.

PBE is a true global systems provider for the mining, tunnelling, construction and associated markets. Our specialised engineering team integrates our industry specific manufactured products and best in class 3rd party products to ensure a sophisticated, robust and commercially viable solution.

Our growth in international markets is based on the key verticals of Technology, Power and Service Delivery – fundamental in any industrial project. Our experience in confined space and underground construction has enabled PBE to complete over 850 projects in more than 60 countries with 320 staff and 18 regional offices. ◆

PBE Technology

PBE Technology offers a suite of proprietary safety, data and communication products and systems that create an integrated Internet of Things (IoT) solution for use in harsh environments.

PBE manufactures over 70 proprietary products, meeting global regulations in the mining, tunnelling and construction industries. Solutions include data and voice communications infrastructure, environmental monitoring, vehicle collision avoidance and proximity detection, tracking, emergency alerting systems, ventilation on demand and fleet management.

PBE Power

PBE Power designs, integrates, installs and services temporary and permanent high voltage equipment and infrastructure to the tunnelling and construction industries on a sale or rental basis. In addition, PBE Power (Projects) provides permanent power infrastructure for mines.

PBE's electrical power distribution equipment for construction projects include substations, switchrooms, distribution boards, HV cables, transformers etc. PBE Power also maintains a fleet of 1,200+ rental assets across global locations.

PBE Mine Services

PBE Mine Services is an electrical services business for the Australian mining industry, including the design and manufacture, testing, repair and refurbishment of low to high voltage electrical cables and couplers offered on a sale or rental basis.

In addition, PBE Mine Services offers for hire and sale flameproof and non-flameproof equipment such as substations, switchrooms, distribution control boards, auxiliary fans etc. for the Australian coal and hard rock markets.

Our growth...

in international markets is based on 3 key verticals which are fundamental in any industrial project:



Data & Communications Solutions



Safety Products



Power Solutions

Contact Us

For further information please contact:

LATIN AMERICA

sales.lam@pbegrp.com
T: +56 9 9022 9607

UNITED STATES

sales.usa@pbegrp.com
T: +1 276 988 5505

EUROPE

sales.europe@pbegrp.com
T: +44 203 943 5185

ASIA

sales.asia@pbegrp.com
T: +65 6661 6888

OCEANIA

sales.aus@pbegrp.com
T: +61 2 4961 9619

CANADA

sales.usa@pbegrp.com
T: +1 705 222 0020

SOUTH AFRICA

sales.sa@pbegrp.com
T: +27 12 379 9497

Disclaimer

Copyright © 2019 PBE Group Ltd. All rights reserved. This document is protected by copyright belonging to PBE Group Ltd and may not be reproduced in any form republished in whole or part without the prior written consent of PBE Group Ltd. While every precaution has been taken in the preparation of this literature, PBE Group Ltd assumes no liability for errors or omissions, or from any damages resulting from the use of this information. The contents and product specifications within it are subject to revision due to ongoing product improvements and may change without notice.



PBE INNOVATING SAFETY.
POWERING PRODUCTIVITY.

pbegrp.com

