



# Cobre Panama Project Profile

Client Name  
**First Quantum Minerals**

Sector  
**Mining & Minerals**

Project Manager  
**Brian Forrester**

# Project Benefits

**Benefit 1**

Mipac has helped position COBRE Panama as one of the world's most technologically advanced mineral processing plants.

**Benefit 2**

Drastically reduced inefficiencies and costs, increased production and safety with improved reliability and availability to deliver an optimised, world-class 24/7 operation.



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## Project Manager

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**Brian Forrester**  
Project Director

Brian has more than 25 years' experience with instrumentation and control systems engineering. Brian's expertise includes project management, design, configuration and commissioning of control systems in the mining, chemical, wastewater, food and beverage and cement industries.



**FIRST QUANTUM**  
MINERALS LTD.

## Project Overview

**Cobre Panama mine is a large copper deposit located approximately 120km west of Panama City. The Cobre Panama project consists of an open pit mine, facilities for ore crushing, conveying, stockpiling and processing, as well as ancillary plant including a port and 300MW power plant.**

## Project Background

Mipac was engaged by First Quantum Minerals to implement a plant-wide control system using PCS7, utilising the latest standards of ASM and alarm management at its Cobre operation in Panama.

Located on the Caribbean Coast, The Cobre Panama project is the second largest Investment in Panama with a \$5.5Bn complete greenfield site built in the jungle. The project included the construction of a 300 megawatt power station which is connected to the Panama power grid.

The entire project was to be delivered with an extremely fast ramp up time, using the local workforce and a modular approach to design and commissioning.

## Project Scope

Mipac was originally commissioned to deliver the following:

- ✓ Review of process, electrical and instrumentation design
- ✓ Review of vendor packages
- ✓ Integration of vendor packages and facilitation of design adherence
- ✓ Design of communication interfaces to drives and MV/HV equipment
- ✓ Design of smart instrument network and interfaces
- ✓ Review and testing of instrumentation and electrical panels and MCC designs
- ✓ Design of plant-wide control system and architecture
- ✓ Infrastructure design – virtualisation of control system servers, OSI PI and data visualisation/ analytics, expert system servers, vendor servers and simulation system
- ✓ Plant-wide network design including control system
- ✓ Functional description development accommodating multiple vendor control philosophies
- ✓ Development of control strategies
- ✓ Development of alarm philosophy to suit the site
- ✓ Development of configuration standards for PCS7 using ASM best practices
- ✓ Plant-wide control system configuration
- ✓ Factory acceptance testing of all plant PCS components
- ✓ Factory acceptance testing of positive displacement pumps in Germany
- ✓ Remote GMD vendor interface testing
- ✓ APC system interface testing
- ✓ Dynamic plant simulation
- ✓ Design of operator training platform using plant simulation system
- ✓ Procurement
- ✓ Commissioning
- ✓ Functional descriptions deployment on Mipac's cloud based functional description tool which allowed for:
  - Multiple reviewers and developers of the functional description
  - Sign-off and verification of all components in the functional description (written, diagrams, etc)
  - Factory acceptance sign-off
  - Completions tracking onsite
  - Live progress reporting during commissioning

## Project Challenges

Key challenges overcome by the project team included:

- The requirement for a rapid ramp up
- The facilitation of operational readiness with a largely unskilled workforce
- The fact that portions of the plant were in production whilst construction and commissioning activities were occurring in parallel
- Leveraging the latest technology whilst ensuring maximum reliability
- Working in a very large greenfields concentrator requiring multiple interfaces and skillsets
- Delivering a fully sequenced and automated plant focused on minimising operator interactions

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*First Quantum's proven Project Execution model aims to build and commission our own plants with the recent start-up and smooth ramp-up of the Cobre Panama project being our latest success. For this project, FQM engaged Mipac as the main automation contractor to provide Cobre Panama with a world class digital control infrastructure. Just as importantly however, it was the mineral processing, commissioning and plant optimisation knowledge that Mipac brought with them that was one of the various key enablers that allowed a successful ramp-up of the plant.*

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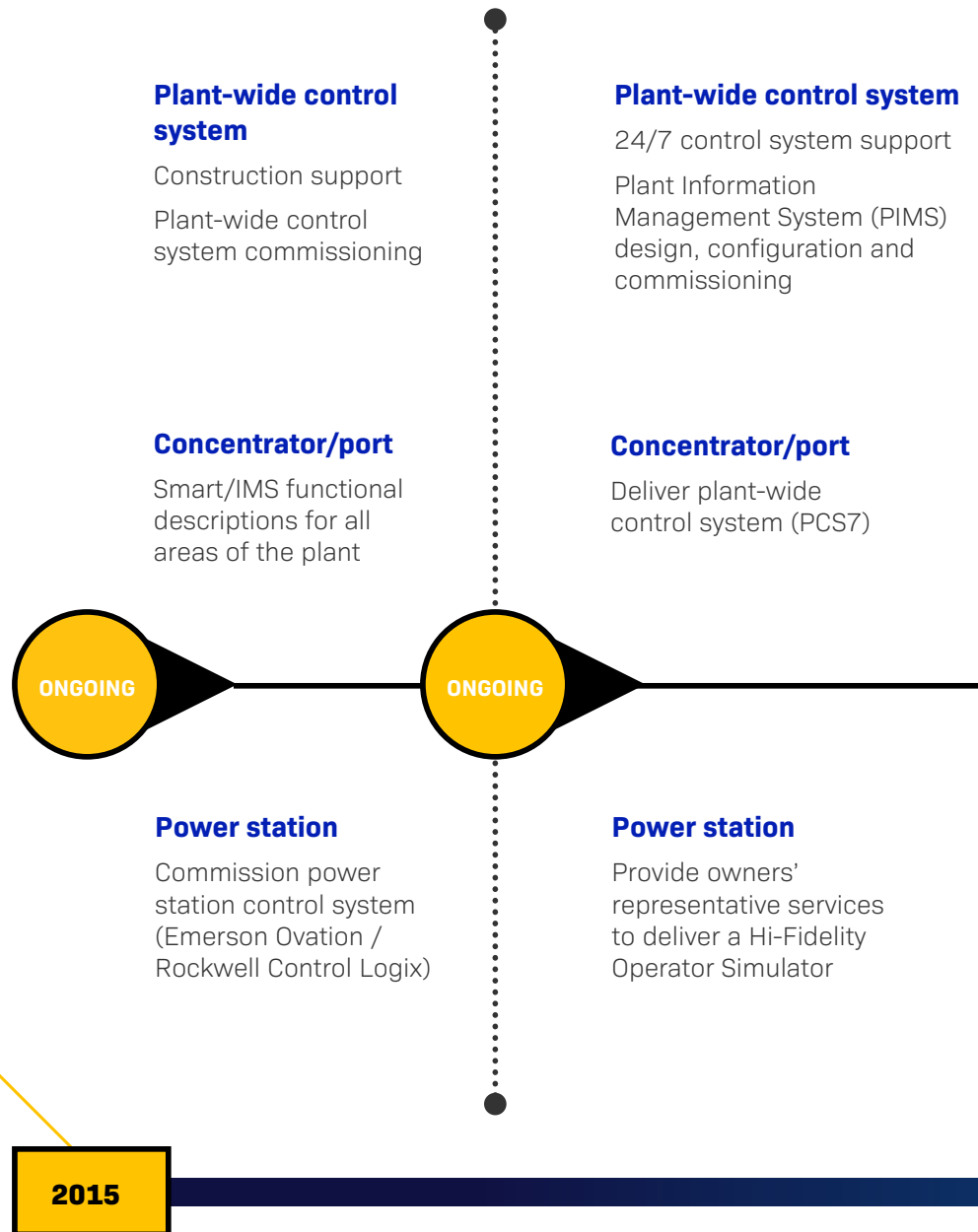
Zenon Wozniak. FQM Director, Projects



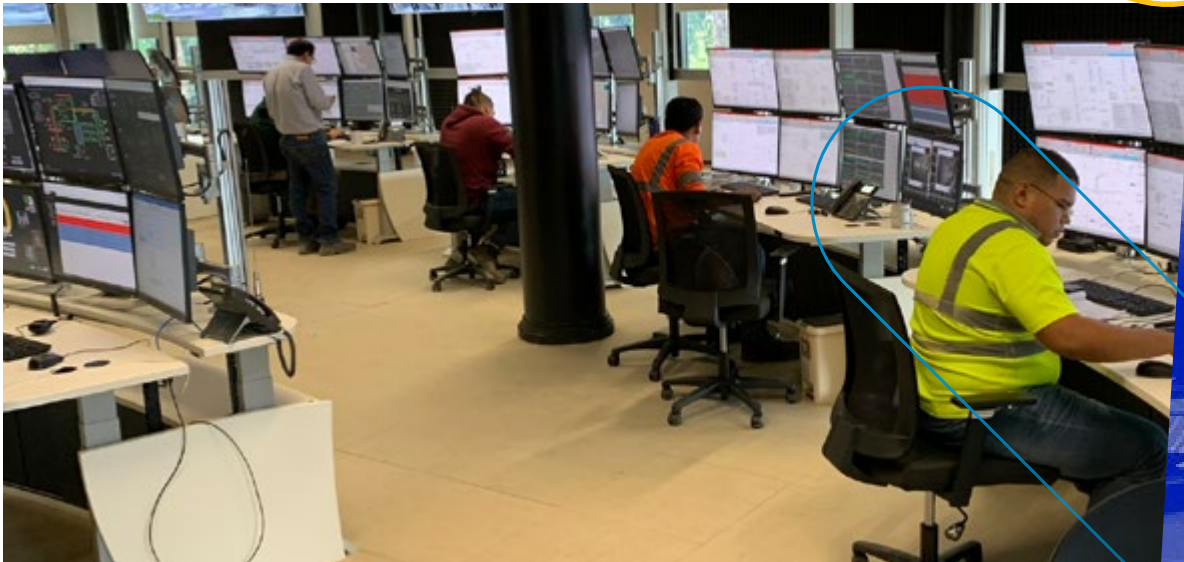
# Project Timelines

Mipac was first engaged to work on the Cobre Panama project in 2015. Over the duration of the project, Mipac's involvement with FQM increased to meet the evolving needs of the company's original design.

FQM understood the benefits of a complete plant-wide control system, giving a standard look and feel across the plant. Mipac were chosen as FQM's preferred partner following their successful implementation of a full plant-wide control system at FQM's Kansanshi copper smelter in 2014.







**Plant-wide control system**

Perform audit on OSIsoft PI infrastructure and assets  
 OSIsoft PI System server  
 Provide 24 x 7 service and engineering support for OSIsoft and RtDuet configuration and testing

**Concentrator/port**

Historian (OsiSoft PI)

**Plant-wide control system**

Define order of priority in collaboration with FQML plant personnel

**Concentrator/port**

Downtime monitoring (RT-DUET)

ONGOING

ONGOING

**Power station**

Provide control system rectification services as required

**Power station**

Power plant integration on site  
 Plant and power station start up  
 National grid synchronisation

# Project Results

As a result of this project, the Cobre Panama plant had a significant increase in productivity and was highly integrated, allowing reliable production at the highest possible throughputs.

State of the art technology and infrastructure were applied, using best practices and extensive industry expertise, to extract copper with world-class efficiency.

Reliability was achieved and the site has been future-proofed with the use of integrated control and data management solutions.



## Advanced technology and operations

The project has resulted in Cobre Panama being positioned as one of the world's most technologically advanced mineral processing plants.



## Optimised digital data insights and solutions

The site has been future-proofed as a result of integrated control and data management that maximises digital data solutions.



## Reduced inefficiencies and costs

The virtualised hardware solution has simplified the management of the plant and minimised future costs to upgrade.



## Global reliability and availability

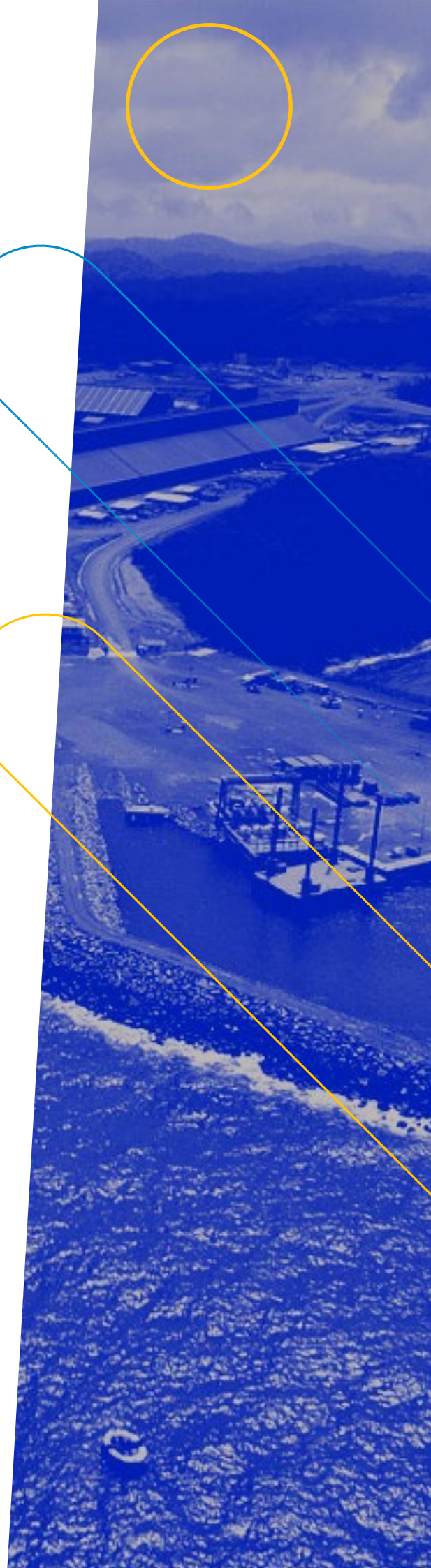
Delivered a robust, fully redundant and highly available control system that can seamlessly allow commissioning from across the globe.

## Project Highlights

Mipac's project team collaborated with multiple vendors, EPCMs and construction organisations to design and commission an integrated plant-wide control system.

Highlights of the project included:

- ✓ The design, commissioning and provision of ongoing remote support of the control system, virtual infrastructure, network and data systems for a 50,000 IO plant
- ✓ The multi-skilled Mipac team which successfully commissioned the plant-wide Siemens PCS7 and Ovation DCS for the power station
- ✓ The integration of all third-party systems (crushers, mill control, flotation, thickening, concentrate pumping) to ensure a unified control system interface and easy maintenance
- ✓ Creating a fully sequenced and automated plant to minimise operator requirements
- ✓ The advanced control strategies implemented in the main control system and the integration to advanced process control (APC) systems to allow for maximum operational flexibility
- ✓ Full plant optimisation and tuning
- ✓ A fully redundant OSI PI historian, AF instance allowing high availability access to analytics in PI Vision
- ✓ Built a PI-AF tree containing >8,000 elements
- ✓ Mipac's development of >3000 PI analyses
- ✓ Downtime tracking and asset management system
- ✓ The assistance provided in developing a production management and business intelligence system



## Testimonials

“Mipac have been none other than a trusted partner throughout our Cobre Panama project where they were engaged to provide around-the-clock support for the OSIsoft PI System, RtDuet and MPA. Not only did Mipac provide an easy-to-use service desk portal where we were able to log issues and simply find solutions to common problems through a library of rich how-to articles, they also offered a direct line in the need for emergency support.

The Mipac team has continuously demonstrated a high standard of excellence, providing Cobre Panama the best products, services and support. The attention to detail in designs and implementation is outstanding.

Mipac's genuine and dedicated engineers supported our team from inception of implementation of the PI system and new PI components (including a PI Integrator and Power BI reports), all the way through to concept development of a new architecture that helped boost performance and reliability and increased security to meet the growing demands and requirements for 24x7 support. Mipac has worked side by side with me and team on all challenges during and after implementation.

Not a milestone was missed through the course of the project due to the commitment Mipac demonstrated as a pivotal partner helping us achieve optimal results. Mipac has understood the requirements and demands of our site and have delivered equally as demanded.”

**Ravindran Pillay, Principal Engineer, First Quantum Minerals.**

“First Quantum Minerals considers Mipac a key partner in our projects and operation optimisation history and future.”

Gavin Ashley, Regional Manager,  
Projects and Operations, FQM



Get in touch and find out how we  
can improve your performance.

[sales@mipac.com.au](mailto:sales@mipac.com.au)

[mipac.com.au](http://mipac.com.au)

**mipac**