CASE STUDY

ENHANCEMENT OF QUALITY ASSURANCE AND QUALITY CONTROL (QA/QC) IN DRILLING AND BLASTING PROCESSES USING BLASTIQ™

PT KALIMANTAN PRIMA PERSADA (KPP) – JOBSITE INDEXIM COALINDO, INDONESIA

SITE PROFILE

PT Kalimantan Prima Persada (KPP) at the Jobsite Indexim Coalindo is in the Kaliorang area, East Kutai, East Kalimantan Province, Indonesia. KPP has two cluster areas, namely Cluster 1 (T2 and T3) and Cluster 2 (T4 and T6), with a planned OB blast volume of 88.6 million BCM, or 76% of the total OB volume in 2025.

THE SITUATION

Orica supplies explosive products and services through Total Load Services to customers KPP. KPP conducts the drilling process independently, using drilling units without GPS support systems for their production holes and still relies on manual spotting. GPS support for drilling and blasting activities at the KPP site is only utilised once the boreholes are formed and are about to be detonated. The data collected is then used for blast material inventory purposes.

The Orica-KPP material volume calculation relies on an empirical formula, but the internal KPP volume itself uses area data measured by a survey for loader inventory purposes. Comparing these two data sets shows a deviation of 10.7% in December 2024 and 8% in January 2025, with the empirical formula volume being larger due to a lack of monitoring improvements. This results in changes to the geometry of the production holes in the field. Additionally, the assignment of hole IDs remains inconsistent for each production hole, leading to reports of production hole data without known IDs. This complicates tracing the actual depth and PF per hole when validating hard material issues.

TECHNICAL SOLUTIONS

BlastIQ™ is designed to support Quality Assurance and Quality Control (QA/QC) activities for drilling and blasting operations. It utilises tablet devices to facilitate design and administrative reporting. This system is supported by a digital format that connects to a server, making information accessible to multiple users. This capability is particularly valuable for real-time monitoring of loading activities, simplifying the process of analysis and evaluation.

Figure 1. BlastIQ™ tablet usage activities in the field

THE RESULT

The introduction of BlastIQ™ has received strong support from KPP of Jobsite Indexim Coalindo. The key benefits provided to the customer are as follows:

- Evaluation and enhancement of the accuracy of actual production hole coordinates and hole loading.
- Improved oversight of drilling and blasting activities.
- Increased hole accuracy.
- Prevention of undercharging or overcharging of blast holes that deviate from the original plan.

Despite these advancements, the compliance score for production hole accuracy from January to June 2025 was notably low, consistently reflecting a range of 1.3% to 4.1%. This inadequate level of accuracy served as a critical impetus for the customer operations team to pursue improvements. Consequently, by July 2025, the accuracy achievement for XY hole samples rose to 71.6% compared to the originally planned figures.

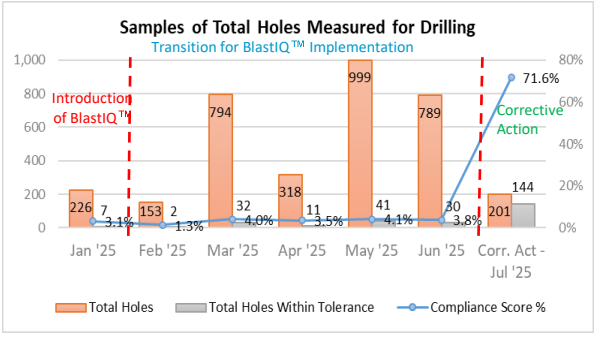

Figure 2. Graph of production hole sampling quantity for drilling data in the BlastIQ™ application and the compliance score

This measurement is directly proportional to the average deviation of the actual distance of the hole from its planned specifications. Initially, the range was between 3.14 meters and 4.99 meters from January to June. However, a notable reduction in deviation has occurred, resulting in an average deviation of 0.43 meters per hole.

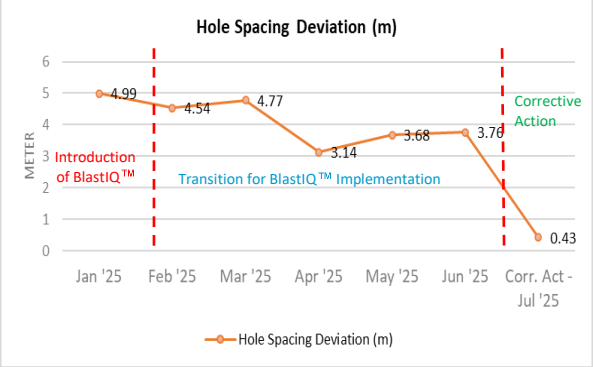

Figure 3. Graph of average hole deviation distance (m/hole)

During the period from January to June 2025, the compliance score for explosive loading per hole exhibited a positive trend. The score increased from 69.3% in January to consistently surpass 85% from February through June.

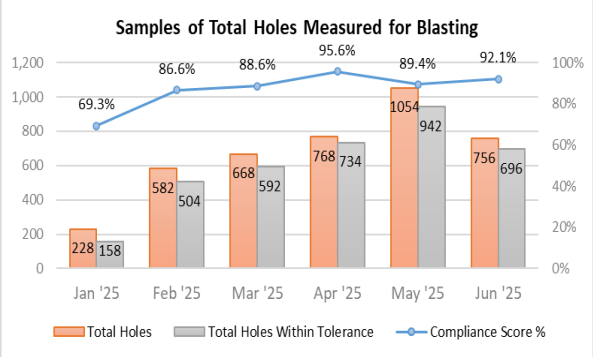

Figure 4. Graph of the number of production hole samplings for blasting data in the BlastIQ™ application and the compliance score

The trend indicating a decrease in explosive loading deviation per hole is positive. In January, the recorded overcharge deviation was 5kg per hole, which then consistently declined to approximately 3kg per hole by June.

The occurrence of undercharge and overcharge conditions in the field is influenced by various factors. A primary factor is the identification of different lithologies, which can necessitate modifications to the initial blasting plan (PF plan). Consequently, these conditions can be monitored and assessed daily by the user to support ongoing improvements.

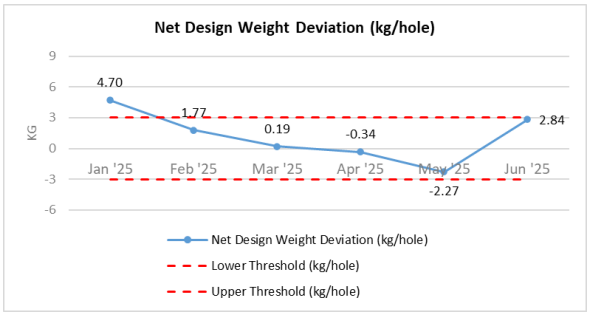

Figure 5. Graph of explosive material filling deviation per hole (kg/hole) with a tolerance limit of ±3 kg/hole

TESTIMONIAL

"We are pleased with the BlastIQ technology. It provides a new digital approach to the improvement process in the KPP – Indexim environment."

Khairul Anhar, Dept. Head Drill & Blast
PT Kalimantan Prima Persada (KPP)

ACKNOWLEDGEMENTS

Orica is grateful for the collaboration with PT Kalimantan Prima Persada (KPP), especially Drill & Blast team, for giving us the opportunity to jointly find improvements for your operation through our technologies, while complying with safety standards, maintaining positive interaction with communities and preserving the environment.

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Date: **25 July 2025**

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