

PERTAMINA BALONGAN REFINERY DATA CAPTURE

Emesent Hovermap technology helps Pertamina safely survey a bulk oil storage tank at the Balongan refinery.

BACKGROUND

Indonesian national energy company Pertamina produces and processes oil and gas for the domestic and export markets. Situated 200 kilometres east of Jakarta, the company's Balongan crude oil refinery is being upgraded as part of a national strategy to double the country's fuel output.

THE CHALLENGE: SAFELY CAPTURE DATA TO PRODUCE A BULK OIL STORAGE TANK AS-BUILT

As part of the upgrade program, Pertamina is seeking to improve the efficiency and rigour of its Engineering, Procurement and Construction (EPC) maintenance activities at Balongan.

The refinery features a number of aging assets including OGT Balongan Tank 4, a crude oil storage tank with a capacity of 37,000m³, constructed in 1972 and currently not in use. Blueprints and schematics for the tank were not available so Pertamina sought to obtain an accurate as-built, prior to developing a remedial maintenance schedule.

Historically, this would have necessitated setting up a total station to carry out terrestrial surveys of the tank's exterior and interior. The exercise would have been time consuming and costly and the possible presence of trapped gases inside the tank would have posed a significant risk to the personnel performing the surveys.



The Halo Robotics team conducted two 10-minute walking scans, inside and outside the 37,000m³ tank, and a six-minute flight around its perimeter and overtop.

Pertamina management sought a means of obtaining the required data without compromising the safety of Pertamina employees or contractors.

THE SOLUTION: SEND IN HOVERMAP

In July 2020, Emesent partner Halo Robotics, an Indonesian remote sensing specialist, was contracted to deliver schematics and structural data for the tank's roof, shell and support structures, based on 3D scans.

Halo Robotics spent one hour onsite, conducting two 10-minute walking scans, inside and out the tank, and a six-minute flight around its perimeter and overtop, using Hovermap mounted to a DJI M210 drone.

"The results that have been obtained with this drone technology actually exceeded our previous expectations. These types of drone operations will really support preventative maintenance operations, helping us locate specific defects, provide the correct type of maintenance and ultimately achieve significant increases in speed and accuracy."

Almuyat Librata, Oil and Gas Transportation Manager, Pertamina EP

DELIVERABLES

Halo Robotics processed the LiDAR data offsite. Data was cleansed, scans were aligned and merged. The LiDAR data was then processed to extract, and label, as-builts of the roof, shell, and support structures that updated the site's schematic data and also informed the Close Visual Inspection (CVI) flight planning. Outputs were delivered to the Balongan maintenance team in CAD-ready file formats.

KEY ACHIEVEMENTS



Reduced safety risk for Pertamina personnel and contractors



Cost effective collection of data to inform maintenance planning



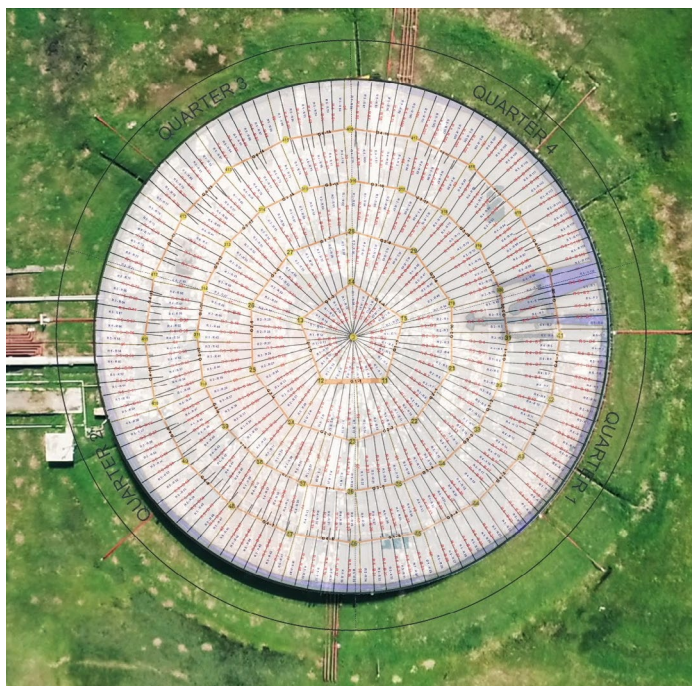
Accurate as-built of an undocumented asset delivered within a day

USING ACCURATE DATA TO INFORM A LONG-TERM MAINTENANCE SCHEDULE

Using Hovermap to scan Balongan Tank 4 enabled Pertamina to obtain an accurate 3D representation of an aging asset quickly and cost effectively, with minimal risk to human safety.

The data was used to inform a maintenance program to recommission the tank to global storage safety standards.

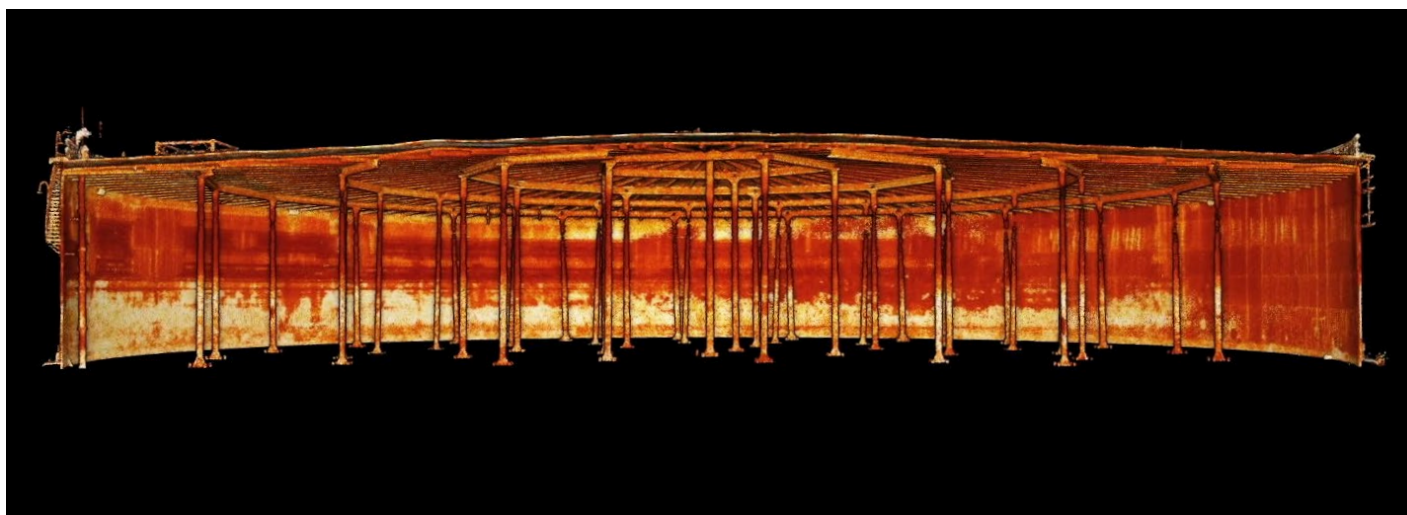
As Indonesia's biggest company and a leader in upstream exploration and production operations, Pertamina intends to continue using LIDAR scanning technology to update its as-built drawings and develop digital twin projects, as part of its efforts in continuous improvement in asset integrity management.



Halo Robotics extracted, and labeled, as-built schematics of the roof, shell, and support structures for CVI flight planning.

“This project addressed a major challenge for large scale upstream Oil and Gas companies in maintenance of high value brownfield assets, given the common mis-match between old as-built drawings and a real world situation that has changed – sometimes dramatically – over the years. Using the Hovermap allowed us to safely and quickly scan the entire structure – inside and out – to produce an accurate, high resolution as-built without a single minute of non-productive time, and we are certain that this will continue to be the case as adoption increases throughout the energy industry.”

Eli Moselle, CEO Halo Robotics



LiDAR scans, colorized by intensity, produced an accurate and up-to-date as-built model.