

DRIVEN BY VALUE



PT FREEPORT INDONESIA

Affiliate of Freeport-McMoRan

Web GIS Operations Dashboard for Equipment Monitoring to Ensure Productivity

Heri Setiono
Firman Setiabudi

PT Freeport Indonesia Overview

PT Freeport Indonesia is an affiliate of Freeport-McMoRan, a major international mining company with headquarter in Phoenix, Arizona, United States.

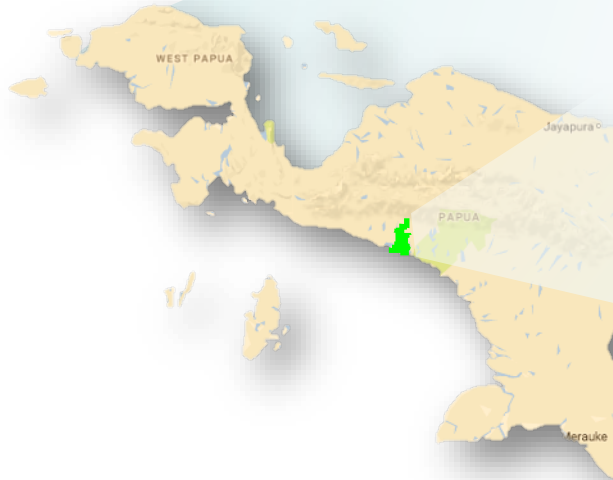
PT Freeport Indonesia explore, mining and processing ore containing copper, gold and silver in the highland areas of Mimika District, Papua Province, Indonesia.

Grasberg mine is one of the largest single copper and gold producers in the world, and contains the world's largest retrievable copper reserves, also the world's largest single gold reserves.

Right now PT Freeport Indonesia applies two mining techniques, open-pit or surface mine at Grasberg and underground mine at Deep Ore Zone (DOZ).

PTFI website : <http://ptfi.co.id/en>

PT Freeport Indonesia's Project Area



Grasberg Open-Pit Mine Landscape



Photo by Paul Warren

Grasberg Open-Pit Mine

The open-pit method is used in mining the Grasberg ore body, as this method is suitable for Grasberg, where the ore body occurs near the highland surface (Grasberg).

Equipments operated on Grasberg open pit mine:



116 trucks



15 shovels



7 loaders

PT Freeport Indonesia use Dispatch System to assign trucks into specific shovels or dump area automatically.

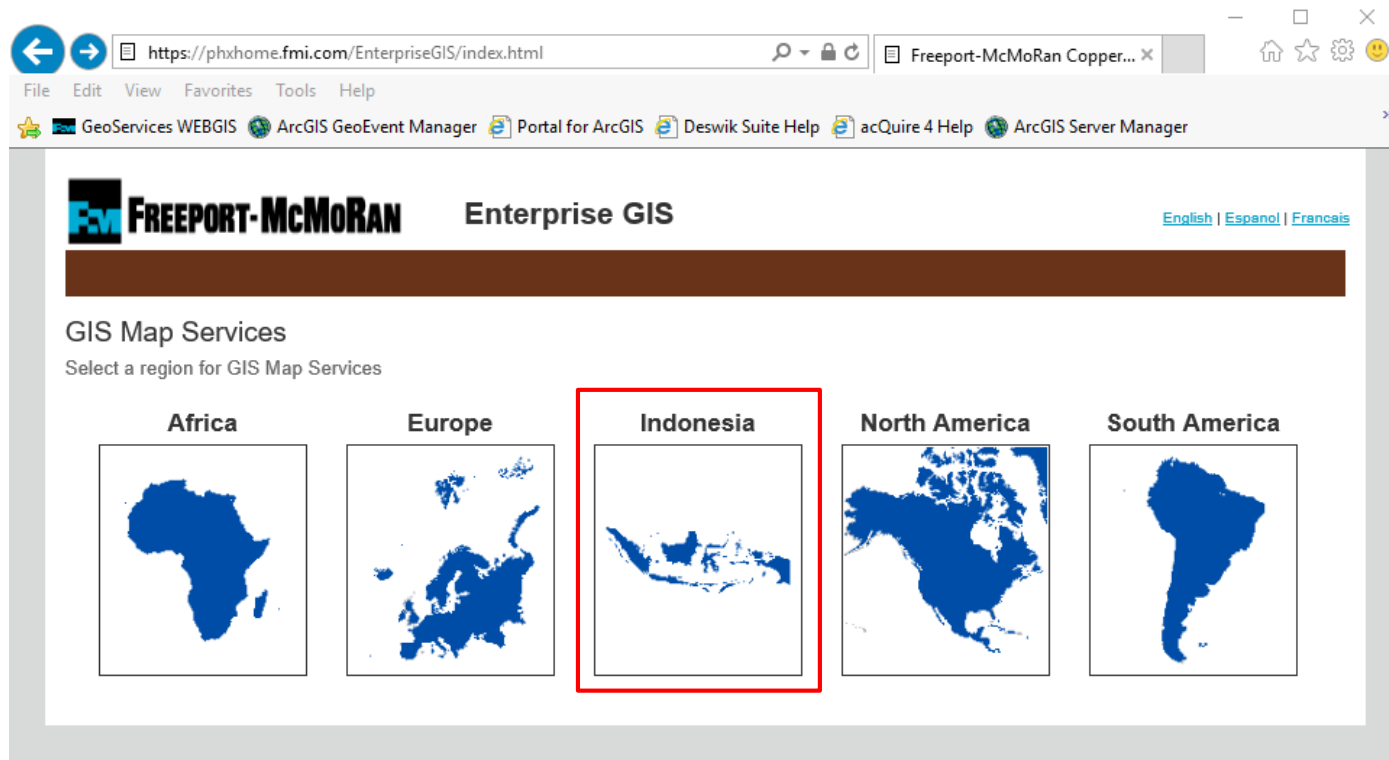
Grasberg Slope Monitoring Devices

To monitor hazard on Grasberg's open pit mine, PT Freeport Indonesia use following slope monitoring devices:

- SSRXT Radar
- IBIS Radar
- RTS & Prism
- GPS
- Wireline Extensometer
- Inclinator
- TDR
- Standpipes Piezometer
- White Seismograph
- Rainfall Station

Currently **IBIS Radar, RTS & Prism, GPS and Rainfall Station** data can be displayed on Web GIS as a near real time information

GIS Implementation in PTFI



Implementation GIS in PT Freeport Indonesia is part of Enterprise GIS global implementation on Freeport-McMoRan corporate.

Currently there's 64 REST map services consist of 1878 data layers established to support PT Freeport Indonesia daily operation, consumed by Web GIS for both Flex and Portal.

Surface Mine Monitoring on Web GIS Flex Version

The screenshot displays the PTFI GIS Portal interface for 'Operation Risk Management : Grasberg'. The main map area shows a 3D perspective view of a large open-pit mine with various equipment icons (shovels and trucks) scattered across the site. Two pop-up windows are visible: one for 'Truck T331F (Active Live Data)' and another for 'Shovel S11 (Active Live Data)'. The truck pop-up provides detailed information such as date, time, status, location, destination, shovel status, material, production, and fleet. The shovel pop-up includes a photo of the shovel and a 'Zoom to' button. On the right side, there is a 'Layer List' panel with 'Operation Information' checked, and a 'Legend' panel showing equipment status icons (Down, Standby, Ready, Delay) for both Shovel and Truck. The top of the interface includes a search bar, navigation icons, and a 'Return to Upper Menu' button. The bottom left corner shows a scale bar and coordinates.

Truck T331F (Active Live Data)

- Date : 30-MAY-17 D
- Time : 09:45:01
- Status : Ready
- Location : Q1-2
- Destination : S09
- Shovel Locked : S09
- Material : Empty
- Last HR Production : 0
- Cum. Shift Prod : 420
- Fleet : Cat 793B U

Data Source : Dispatch System

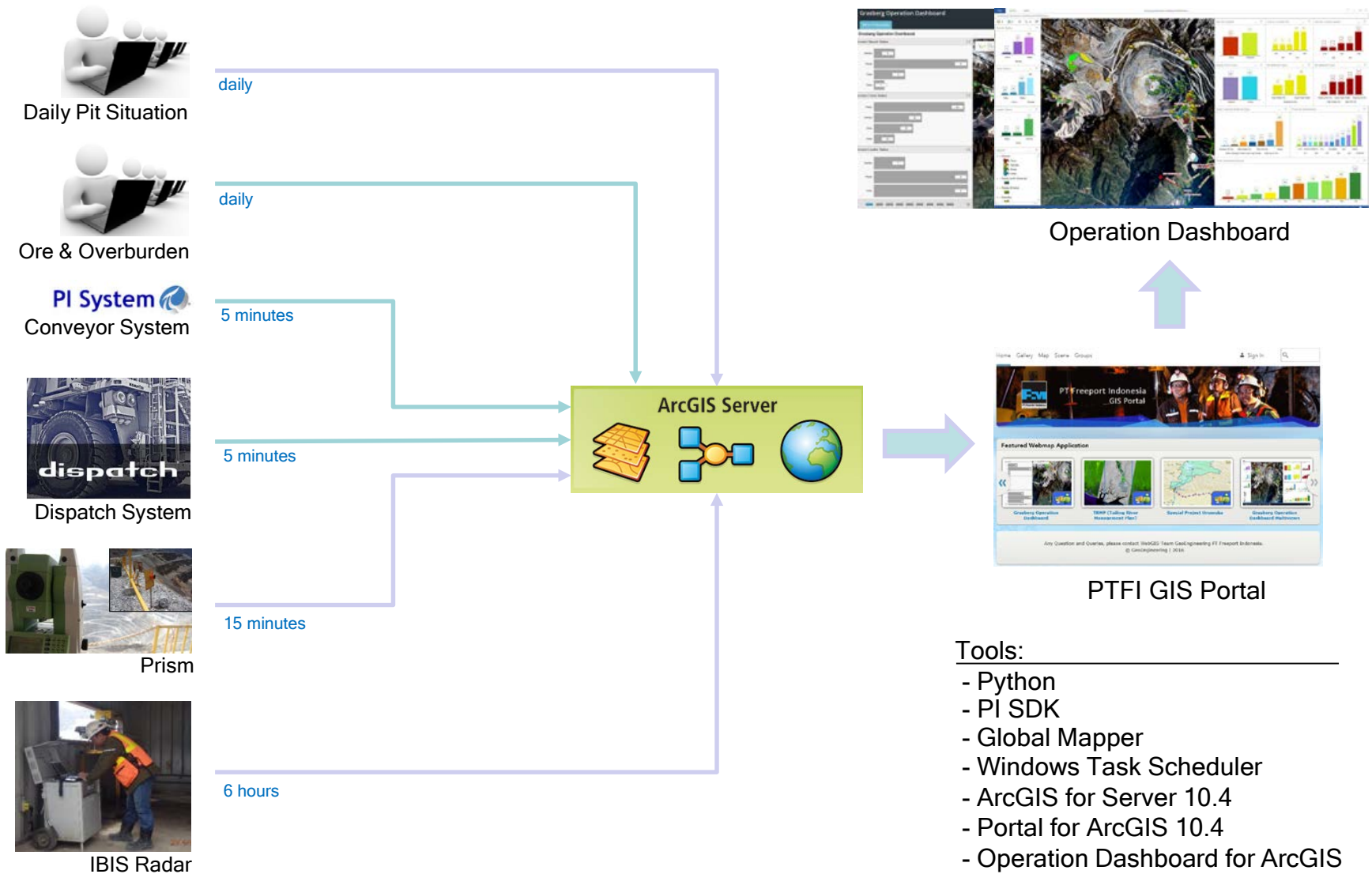
Shovel S11 (Active Live Data)

Click Image For Larger Photo

Zoom to

Showing equipment status & position only, no statistics information

Supporting Informations for Dashboard




Tools:


- Python
- PI SDK
- Global Mapper
- Windows Task Scheduler
- ArcGIS for Server 10.4
- Portal for ArcGIS 10.4
- Operation Dashboard for ArcGIS

PTFI GIS Portal

Home Gallery Map Scene Groups Sign In




Featured Webmap Application




Grasberg Operation Dashboard



TRMP (Tailing River Management Plan)



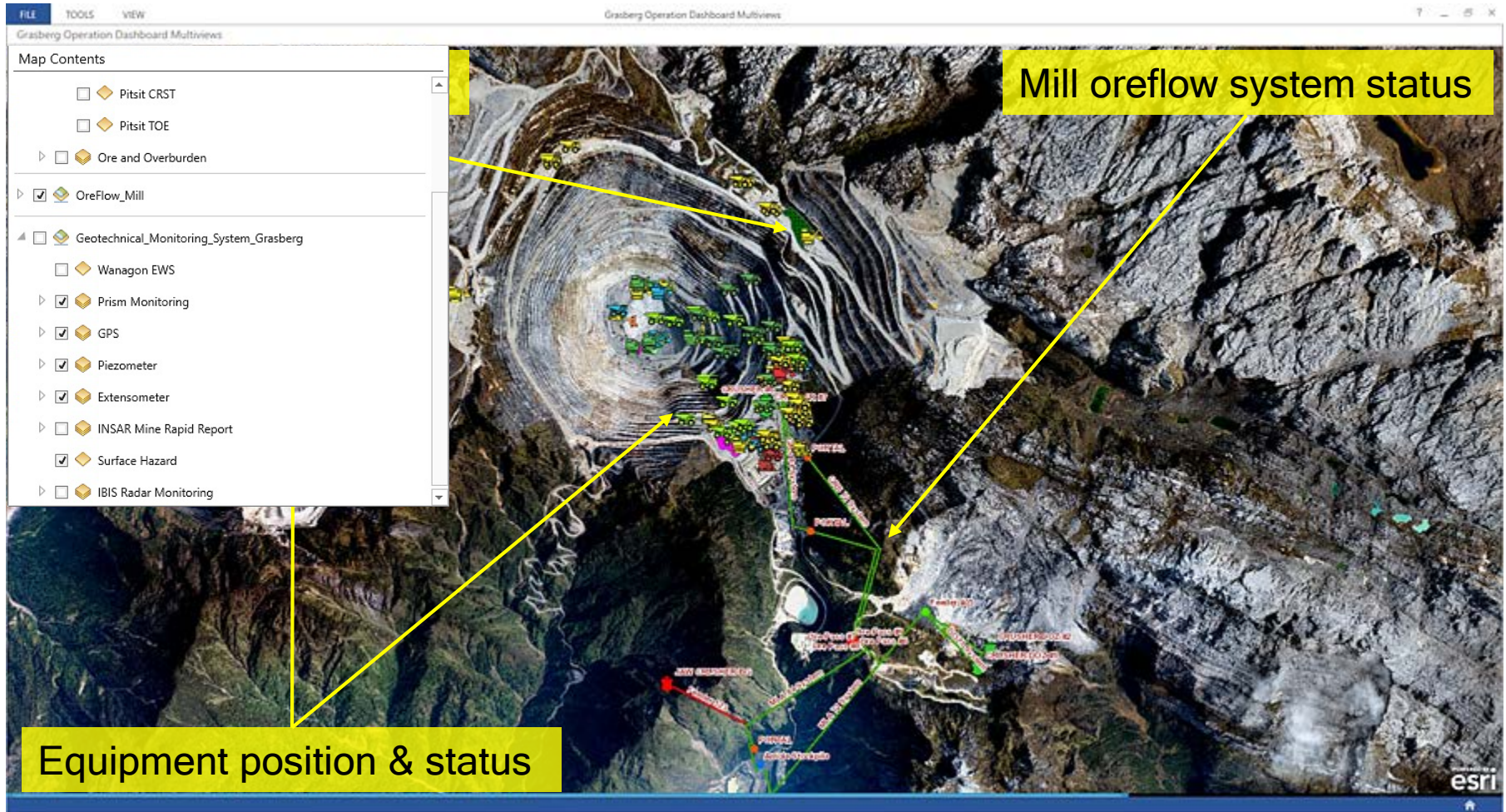
Special Project Urumuka



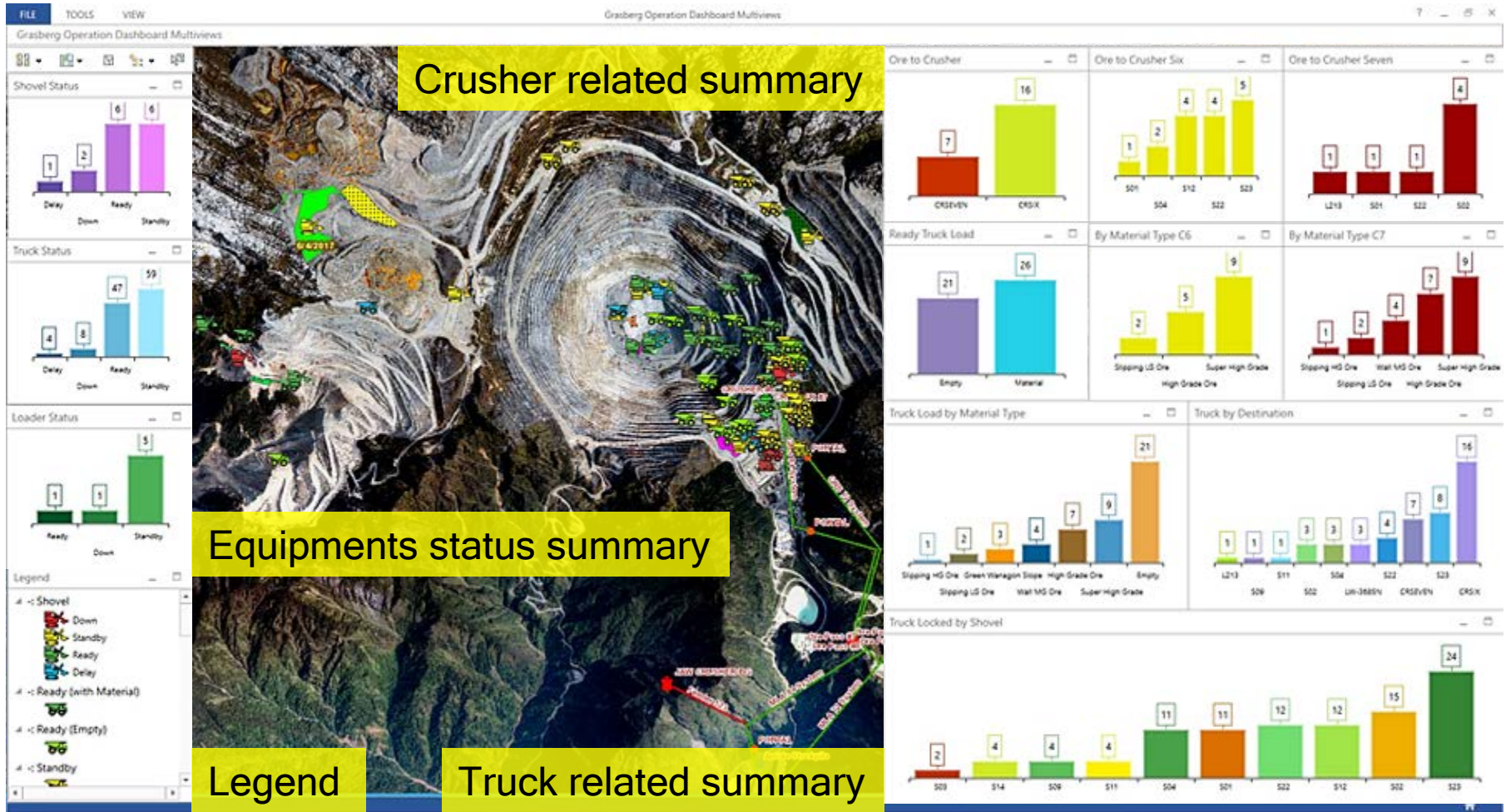
Grasberg Operation Dashboard Multiviews

Any Question and Queries, please contact WebGIS-Team GeoEngineering PT Freeport Indonesia.
© GeoEngineering | 2016

Grasberg Operation Ops Dashboard - Map



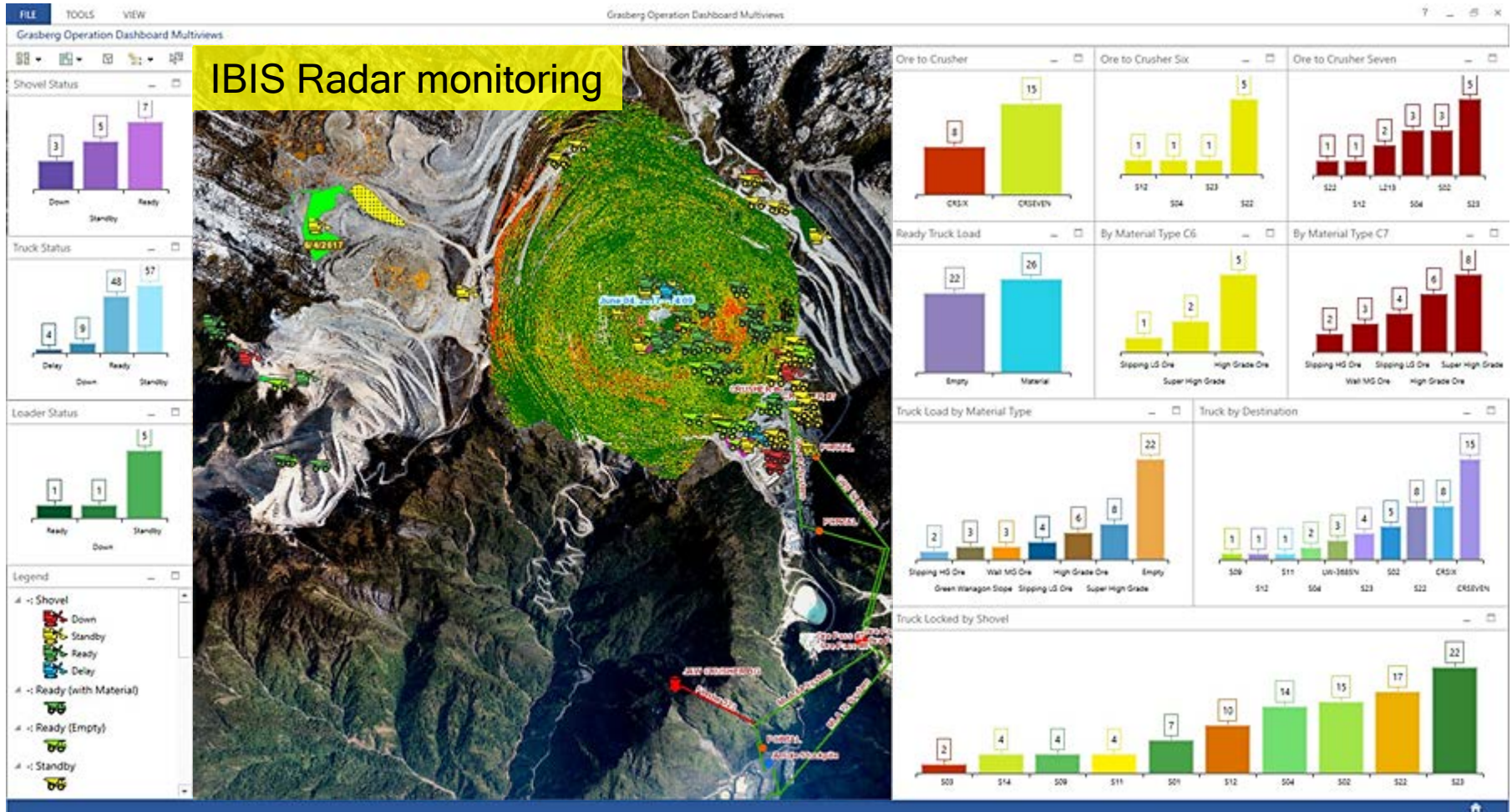
Grasberg Operations Dashboard - Statistics



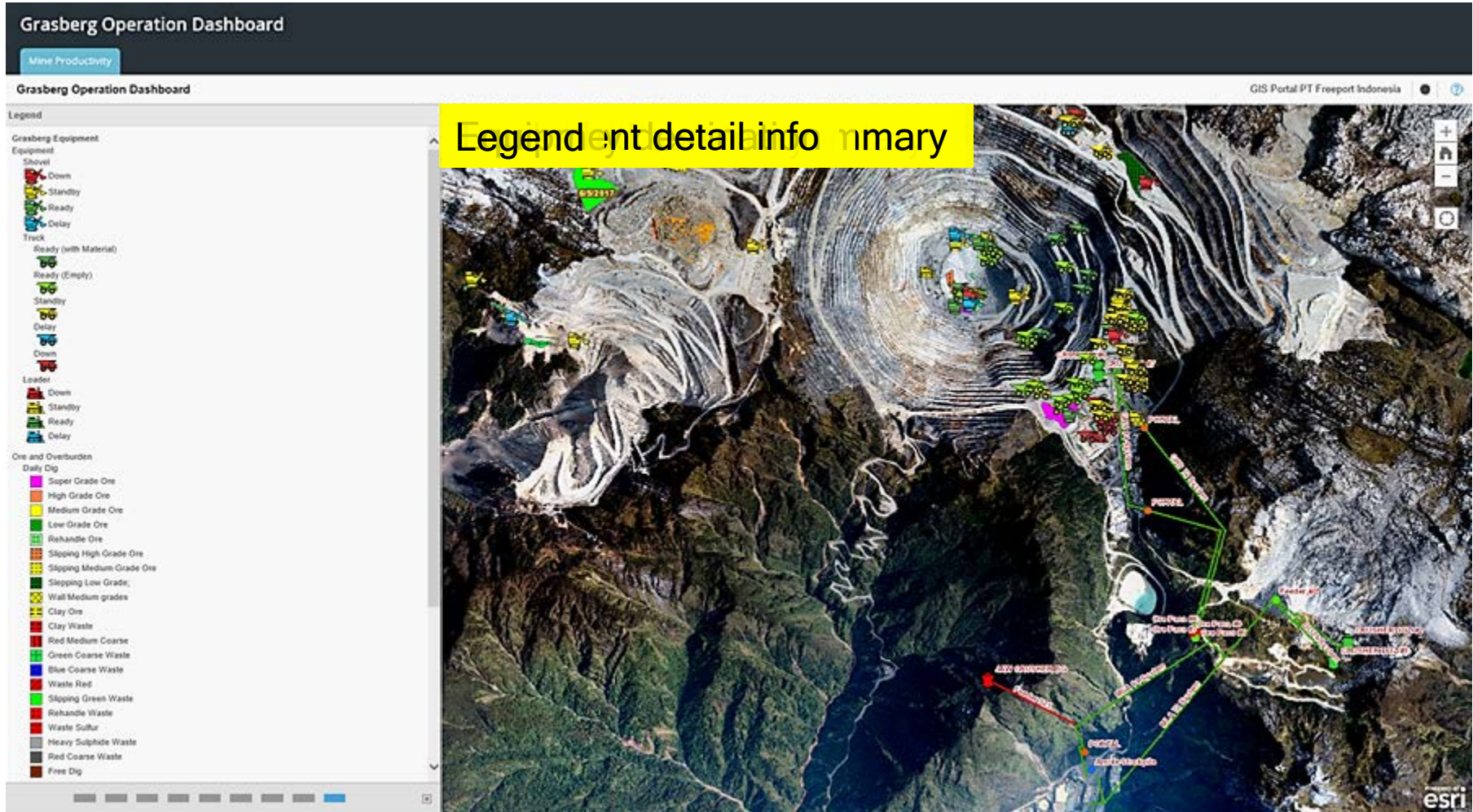
Multi Views Operations Dashboard - Snapshots by time



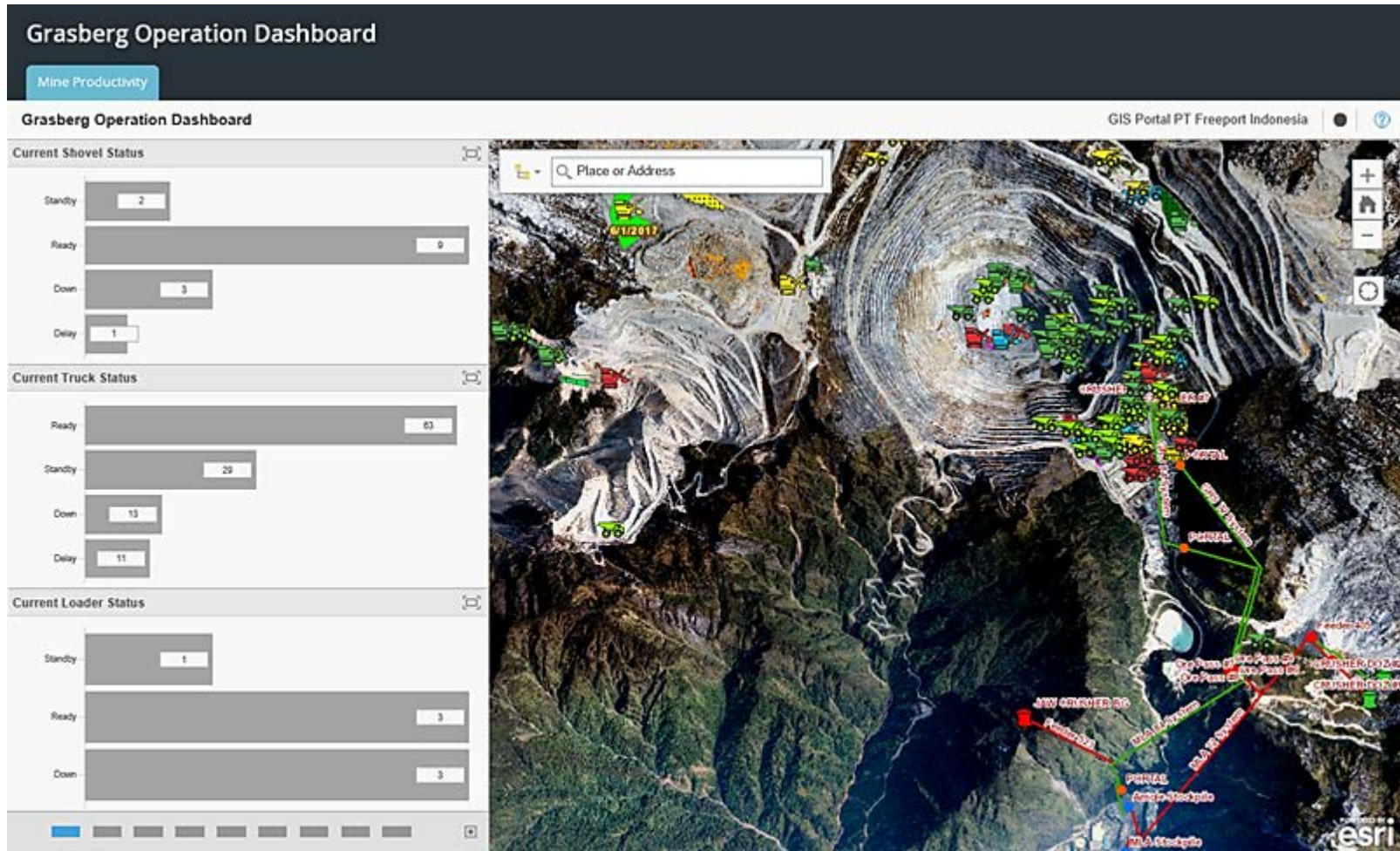
Overlaid with Available Informations



Grasberg Operation Dashboard - Single View (Browser)



Single View Operations Dashboard - Snapshots by time



Strength, Benefit, and Challenge



Integrate various information related to Grasberg open-pit mine daily operation (equipment position & status, ore & overburden map, ore flow system status, geotechnical monitoring devices) in a dashboard.



Monitor and assess equipment's daily operations in Grasberg open-pit mine.



Thanks to the integrate spatial information on map with interactive charts contains comprehensive information to support operational decision making.



Huge datasets and extremes field condition need more effort to ensure all field-sensor to work properly during operations.

Thank you

DRIVEN BY VALUE



PT FREEPORT INDONESIA
Affiliate of Freeport-McMoRan