Web GIS Operations Dashboard for Equipment Monitoring to Ensure Productivity

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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](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
- Inclinometer
- 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
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

Showing equipment status & position only, no statistics information
Supporting Informations for Dashboard

- Daily Pit Situation: daily
- Ore & Overburden: daily
- PI System: Conveyor System, 5 minutes
- Dispatch System: 5 minutes
- Prism: 15 minutes
- IBIS Radar: 6 hours

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

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.
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Grasberg Operation Ops Dashboard - Map

- Mill oreflow system status
- Equipment position & status
Grasberg Operations Dashboard - Statistics

- Crusher related summary
- Equipments status summary
- Legend
- Truck related summary
Multi Views Operations Dashboard - Snapshots by time
Overlayed with Available Informations

IBIS Radar monitoring
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