

The Utilization of Time Domain EM Data for Shallow Subsurface Imaging in Indonesia Geothermal Field. Case Study: “XL” Field Sumatera Island of Indonesia

Riki Irfan¹, Ikko Suzuki¹, Yuris Ramadhan², Aditya Hernawan², and Haris Siagian¹

¹INPEX Geothermal Ltd., riki.irfan@inpex.co.jp

²Sarulla Operation Ltd., yuris.ramadhan@sarulla-geothermal.com

SUMMARY

The “XL” is in Sumatera Island of Indonesia, which most of thermal manifestations and permeability were controlled by major strike slip fault that relates with extensional regime along main Great Sumatra Fault (GSF). Many Geophysics methods has been applied to study the GSF Sumatera zone. There is also Time Domain Electromagnetic (TDEM) survey, which previously the data utilized only for MT static shift correction. The TDEM is an active geophysical EM method used to create subsurface model the value of electric and magnetic fields as a function of the time, distance, and depth. This active geophysical method injects an artificial electric current (5-20 Ampere) to the ground, and result to high resolution for shallow resistivity effective to image up to 500m depth. The authors use the available TDEM data in this field to create subsurface resistivity image, the results of this geophysical imaging support on determine the shallow cap rock layer distribution and give additional detail shallow subsurface information, thus help to support shallow hazard mitigation for future drilling.

Keywords: Time Domain Electromagnetic, Great Sumatra Fault, Shallow Resistivity, Cap Rock
