

## Mud logging: its importance and potential for IODP future riser expeditions

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New IODP structure will start from October 2013 and D/V Chikyu operated by CDEX/JAMSTEC will continue to act important role as a riser drilling vessel for deeper scientific drilling (to ~6500+ mbsf) in IODP.

Mud logging is a conventional technique in petroleum industry to investigate well site geology, to search for oil/gas reservoirs and to carry out safety control. Three IODP riser expeditions were carried out with the Chikyu in 2009 and 2012, and mud logging operations were also included in the expeditions. Meanwhile mud logging as a new scientific measurement technique has been attempted on the Chikyu, continuous coring has also been a basic approach in shallower riserless scientific drilling (~2000 mbsf) by not only D/V JOIDES Resolution (JR) but also the Chikyu in IODP. However, since continuous coring generally takes great amount of operation time with high risks of hole instability; the deeper a hole becomes, the more it will be difficult to accomplish. Therefore, mud logging has been recognized as one of important scientific measurement techniques to investigate lithological, petrophysical and geochemical features of deep crust and upper mantle.

The Chikyu conducted two riser operations in JFY 2012 (Exps 337 and 338). Mud logging in these expeditions was carried out both for operational safety control (operation mud logging) and scientific cuttings/mud gas monitoring. Operation mud logging is mainly composed of lithological description of cuttings and real-time mud gas monitoring. Cuttings for lithological description are ordinarily sampled at every 5 m in depth. In mud gas monitoring, concentrations of hydrocarbons (C1 to C5), CO<sub>2</sub> and H<sub>2</sub>S gases are monitored in real-time.

In this presentation, results of operation mud logging in Exps 337 and 338 will be shown. In addition, potential of mud logging as a method of scientific measurement and issues for future expeditions will be discussed.

Keywords: Scientific drilling, IODP, Riser drilling, Mud logging, Core, Real-time gas monitoring