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## Drilling and survey technology for controlled drilling-Development of drilling technology and its application-

Takayuki Sunaga<sup>1\*</sup>, Kenzo Kiho<sup>1</sup>, Kimio Miyakawa<sup>1</sup>, Yasushi Komoda<sup>2</sup>, Kazunori Hase<sup>2</sup>, Masato Nakadai<sup>3</sup>

<sup>1</sup>CRIEPI, <sup>2</sup>Sumiko Consultants Co.,Ltd, <sup>3</sup>Geophysical Surveying Co.,Ltd

### Abstract

Central Research Institute of Electric Power Industry (CRIEPI) has been conducting the research and development for the controlled drilling and survey system enabling the efficient survey during the selection of area for detailed investigation for the final repository of High Level Radioactive Waste (HLW).

The controlled drilling system has its significant characteristics which there is less bore hole collapse and borehole accident, since the non rotated casing rod can case the bore hole wall refrain from collapsing, and the down hole motor located at the end of casing rod can drill the bore hole. In addition, the system makes it possible to investigate the geological condition more efficiently than before due to the continuous control of the drilling azimuth and inclination by the vent housing installed in the down hole motor and MWD (Measurement While Drilling).

CRIEPI began to drill the bore hole at the Hokushin area of Horonobe site in Hokkaido to examine its applicability for the tertiary diatomaceous mud stone (Koetoi formation) and hard shale (Wakkanai formation) in 2003. In 2005 we moved to the Kami-horonobe area to check the applicability for the fault in the tertiary sedimentary rock. The Omagari fault whose strike is NNW-SSE and located at the Kami-horonobe area was decided as a target for the controlled drilling. After conducting reflection survey for the Omagari fault to check the fault profile, the drilling site and borehole trace was decided in 2005. Considering the planned trace, the bore hole was drilled to the 900m long and its core recovery was 99.8% as of FY. 2009. Using borehole logging / measurement/survey, the geological, hydrological, geo-mechanical, geophysical and geochemical data were collected and the Omagari fault was characterized.

This study was done under contracts awarded from METI (Ministry of Economy, Trade and Industry) and in-situ drilling and survey was conducted as a collaboration work with the Horonobe Underground Research Center of JAEA (Japan Atomic Energy Agency).

Keywords: Geological disposal, Controlled drilling, Down hole motor, Horizontal long drilling