

INTERMEDIATE-DEPTH CORE DRILLING AT MIZUHO STATION, ANTARCTICA BY JARE-25 (ABSTRACT)

Kunio KAWADA¹, Yoshiyuki FUJII², Minoru YOSHIDA^{3*},
Shin'ichi MATSUMOTO⁴ and Hideki NARITA⁴

¹*Faculty of Science, Toyama University, 3190, Gofuku, Toyama 930*

²*National Institute of Polar Research, 9-10, Kaga 1-chome, Itabashi-ku, Tokyo 173*

³*Water Research Institute, Nagoya University, Furo-cho, Chikusa-ku, Nagoya 464*

⁴*Institute of Low Temperature Science, Hokkaido University,
Kita-19, Nishi-8, Kita-ku, Sapporo 060*

The 25th Japanese Antarctic Research Expedition (JARE-25) resumed the intermediate-depth core drilling operation at Mizuho Station, Antarctica which was begun by the JARE-24 with a hole measuring 700 m in depth.

The thermal drill equipment, a winch with a 700-m armored cable and the controllers of the same type as those used by the JARE-24, was improved to a considerable extent.

The JARE-25 used the tentative diameter gauge to measure the diameter of the borehole drilled by the JARE-24. This equipment was effective to know the contraction of the borehole diameter. The diameter measurements of the borehole drilled by the JARE-24 were carried out on three occasions, in January, March, and May 1984. In May 1984, the JARE-25 drilling team could not go beyond the depth of 120 m with the drilling equipment they had on hand. The JARE-25 drilling team failed in their attempt to ream the previous borehole even after employing various methods. Therefore, the team began to drill a new hole to a depth deeper than 140 m in June 1984.

Using the results of diameter measurements of the JARE-24 borehole, the strain rate of the borehole diameter was calculated and the borehole closure was estimated at the depth in question. The deeper the hole, the greater became the borehole closure rate.

By considering the total time needed to drill, the diameter of the borehole for drilling, and the closure rate, the drilling operation was planned. According to this plan, the working time required to reach a depth of 700 m was 15 hours a day. Six men of the wintering party at Mizuho Station were divided into two drilling parties and they worked continuously until completion. Intermediate-depth core drilling at Mizuho Station was completed on August 1, 1984 after successfully reaching a depth of 700 m.

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* Present address: Hakusan Industry Co., Ltd., 1-18, Musashidai, Fuchu-shi, Tokyo 183.