1 INTRODUCTION

The Niigata-ken Chuetsu earthquake occurred on October 23, 2004 at 17:56 on JST and it had a magnitude (Mj) of 6.8 on the magnitude scale of Japan Meteorological Agency. The earthquake caused the loss of more than 37 lives and injured more than 2500 people. The Kanetsu Expressway and Hokuriku Shinkansen Line, Joetsu railway line were heavily damaged and the Shinkansen train traveling at a speed of 200km/h was derailed, which was the first railway accident in the 40-years old history of the bullet train, Shinkansen.

   The earthquake had an unusual after-shock activity and at least 4 large after-shocks having a magnitude greater than 6 took place for this M6.8 earthquake.

   The most heavily damaged towns were Kawaguchi with an intensity of 7 on the intensity scale of Japan Meteorological Agency (JMA), Tokamachi and Ojiya City. Yamakoshi village was heavily damaged due to slope failures induced by the earthquake.

   The area with a total population of 300,000 people is less populated as compared other parts of Japan. The earthquake caused the collapse of old wooden houses with heavy roofs as also observed in the 1995 Kobe earthquake.

   There were no known active faults in the area on the active fault maps of Japan. However, the folding process was suggested to be actively proceeding.

   The author had a chance to visit the area from October 29 till November 1, 2004. Except Tokamachi and Yamakoshi village***, the author visited most part of the earthquake-inflicted area. This report covers both scientific and engineering aspects of the earthquake. The material presented in this report is the interpretation and compilation of the available materials and information released by mass media, various earthquake-related institutes in Japan and other countries as well as his own observations, measurements and computations.

*** The author was extremely annoyed by the restrictions imposed on academic earthquake investigators by the authorities during the site investigations of damage to various roadways and railways.