

PROJECT DESCRIPTION

Confidential Client

Siberia, Russia



The development and mining of a further, deeper situated coal seam in a coal mine, located in southern Siberia is planned. The annual production of the mine amounts to roughly 10.0 Mt high volatile coal. The geology consists of various alternations of coal seams, sandstones as well as fine- and medium grained siltstones. The different lithological layers are inclined by 2.5° in mining direction and 6.0° in longwall direction. It is planned to extract the coal via longwall mining with a 400 m coal face. A shield support will be installed in the face start-up road.

ITASCA'S ROLE

ITASCA Consultants GmbH (ITASCA) was asked to perform a geotechnical numerical simulation of the mining situation of the target seam. ITASCA's tasks were an analysis of the necessary support pressure and the maximum unsupported distance between shield and coal face. Also the stress state, the displacement field and the excavation damaged zone in the roof of the target seam where analyzed.

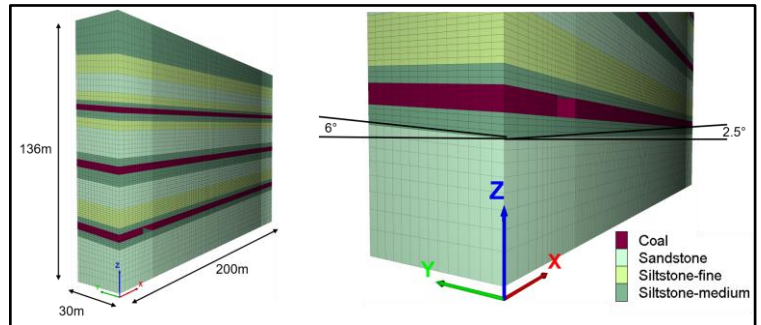


Figure 1. Geology of the model

PROJECT RESULTS

ITASCA identified 600 kPa as the necessary support pressure, with higher support pressures providing only disproportionately low increase in stability. Furthermore a maximum distance of 1.0 m between shield and coalface was determined to prevent the burst of rock mass from the roof in front of the shield. The Factor of Safety derived by shear strength reduction is 1.53.

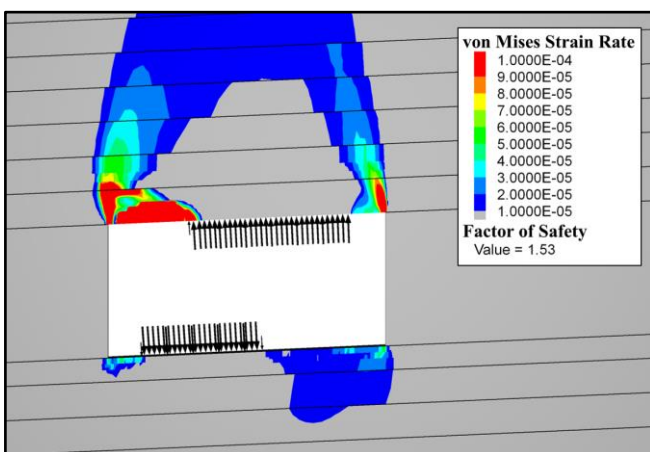


Figure 2. Von Mises Strain Rates, arrows indicate shield support pressure

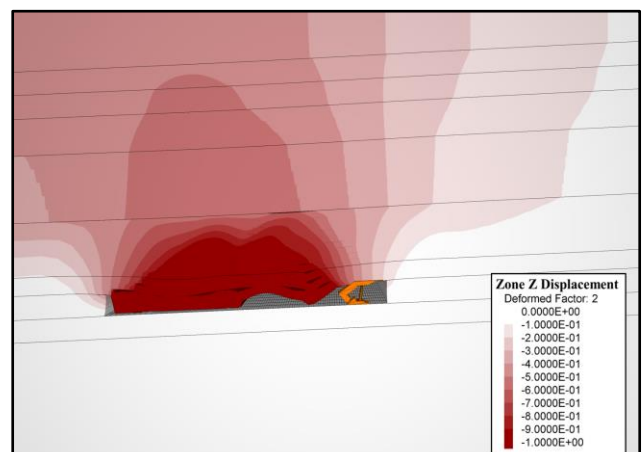


Figure 3. Z-Displacements as the shield moves down the coal seam