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STATUS OF ROADWAY INSTABILITY AT UNDERGROUND COAL MINE IN THE QUANGNINH COAL BASIN OF VIETNAM - CAUSES AND ORIENTATION OF BEHAVIORAL SOLUTIONS

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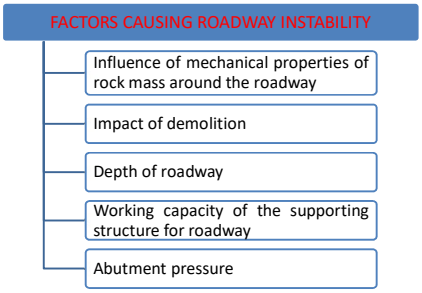
The total length of new driven roadways each year at underground coal mines in the Quangninh coal basin amounts to 300,000m. In which, the proportion of repaired and re-supported of roadway accounts for 25÷30% or over 50% at some underground coal mines, and tends to increase year by year. The main reason is due to complicated geological conditions, many faults, water, great mining depth, roadways in the bottom coal seam with gob as roof in the close-spaced multi-seam coal mining, and so on, that directly caused higher mining stresses. Besides, the surrounding coal and rock of the roadway is weakened, unstable, increased range of displacement, pressure on the structure of support, cause deformation, narrow the cross-section, for details see Figure 1



Basic factors causing roadway line instability include: (1) Influence of mechanical properties of rock mass around the roadway; (2) Impact of demolition; (3) Depth of roadway; (4) Working capacity of the supporting structure for roadway; (5) Abutment pressure. Most roadways are simultaneously affected by many adverse factors. For details on the level of influence causing roadway instability according to the combination of factors, see Figure 2.

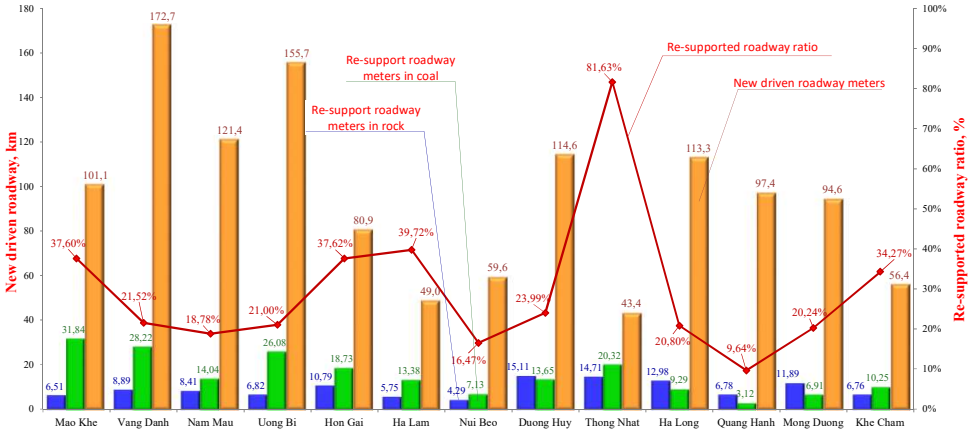


Figure 1: Chart of the total volume of driven roadway meters in the period from 2018 ÷ 2022 at underground coal mines in Quang Ninh region

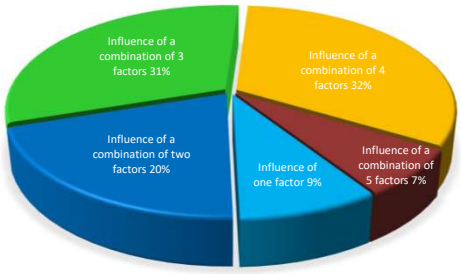
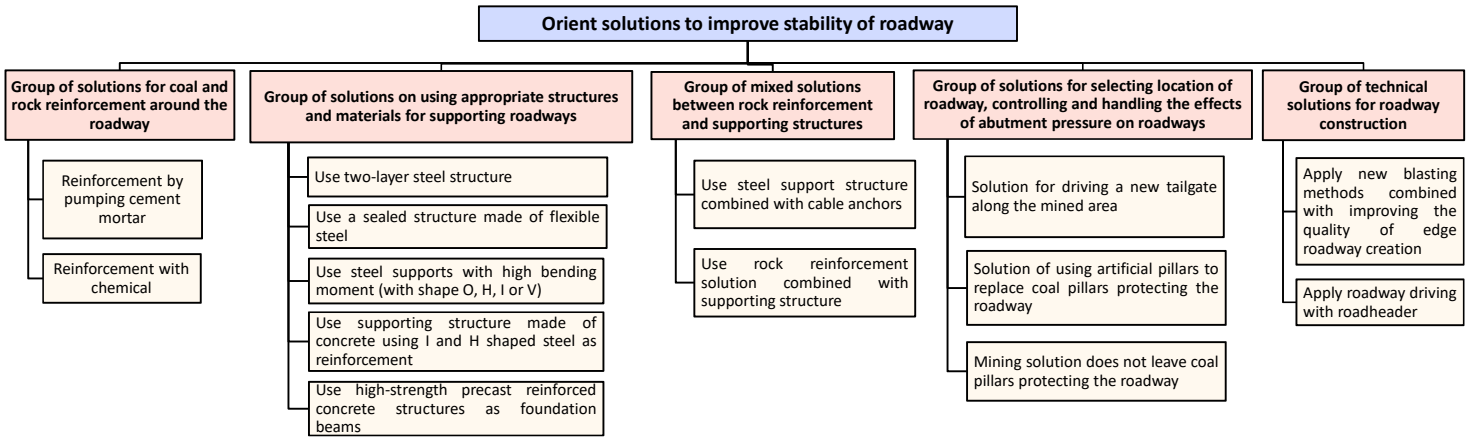


Figure 2: Chart classifying the rate of unstable roadway classified according to a combination of adverse influencing factors



Research and implementation of technical and technological solutions to improve roadway stability in Vietnam's mining industry are highly emphasized. Many research results have been implemented and brought positive results.

However, in reality, due to the difficult and complicated geological conditions of the mine, the level of mining science and domestic research facilities are still limited, so the problem of reducing the rate and cost of the re-supported and repaired roadway is basically target has not been achieved yet. Therefore, the Vietnamese side always wants to cooperate with research units and mining scientists around the world to research, evaluate and come up with appropriate solutions to effectively handle the problem of roadway instability in underground coal mines in Quang Ninh region.