
Departmental Seminar

Seminar Title	: Safe pillar extraction of thick coal seam using continuous miner below caved goaf and above the stowed goaf at higher depth
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Venue	: Seminar Hall, Department of Mining Engineering
Date and Time	: 19 Feb 2025 (12:15PM)
Abstract	: The extraction of coal pillars in thick coal seams under challenging geo-mining conditions is critical for improving underground mining efficiency and safety. This study focuses on the safe mechanised depillaring of a panel up to 6 m thickness along top section of 10 m (approx.) thick seam at Vakilpalli Mine, SCCL at higher depth. The panel was situated around 80 m below overlying barrier pillar of goaved-out panel and above limited thickness of parting (around 8 m) from the stowed goaf of lower seam. A combination of empirical methods, numerical modelling, and field studies was employed to assess behaviour of parting, underground structures and applied support system as per the existing geo-mining conditions of the panel. Results of numerical modelling revealed that softening of immediate roof of the working seam due to presence of stowed goaf in lower seam and accordingly roof bolts of 2.4 m was installed as general support system in place of 1.8 m length. Numerical and empirical approach-based design of underground structures and manner of pillar extraction found to be suitable, however, at the middle position of the panel, particularly below the overlying barrier pillar, instability in smaller size of fender (13 m width) and split gallery is observed due to considerable spalling during actual mining operation in the field. The field study revealed that modification in manner of extraction is required in order to increase stiffness of smaller size of fender to enhance support resistance near the working face and to protect the split gallery. The pillars situated below and near the vulnerable places are extracted with Split and Fender method in place of combination of Split & Fender and Fish-Bone method with safety and efficient recovery. Keywords: Thick Coal Seam; Mechanised Depillaring; Numerical Modelling; Spalling; Underground Structures; Applied Support