

stance.

- The depth of cover was 700 feet or greater in 77 percent of the fatalities.
- The mining height exceeded 7 feet in every instance but one.
- Other conditions that have contributed to rib fall fatalities include slickensides in the coal and unstable pillar corners.

Safety Tips

- Rib bolts provide the best protection against rib falls and are most effective when installed on cycle and in a consistent pattern.
- Operators of mines where conditions create rib fall hazards are strongly encouraged to employ inside-control, walk-through roof bolting machines with rib bolting capability.
- In some limited situations where rib bolting is not available, other techniques such as roof-to-floor standing support, roof-rib brackets, or pillar wrapping can be helpful.

2011 Preventive Roof/Rib Outreach Program (PROP)



U.S. Department of Labor
Mine Safety and Health Administration
Coal Mine Safety and Health

Coal Mine Rib Control for Mine Operators



Did You Know?

Accident Trends

- Roof fall fatalities have been reduced by about 62 percent since the 1990s, while the incidence of rib fall fatalities has remained approximately constant.
- Since 1995, there have been 22 rib fall fatalities (excluding coal burst incidents).
- Approximately 75 percent of rib fall fatality victims were roof bolting machine operators or continuous mining machine operators.
- Four of the fatalities occurred during construction activities, such as: installation of belt drives, overcast construction, and track grading. In each of these cases, an area was created where the mining height was considerably greater than normal, but no rib support had been installed.
- At least three of the fatalities occurred in multiple seam environments; two occurred near pillar recovery operations; and one took place in a longwall headgate adjacent to the stageloader.
- Out of the 22 cases, only two had any rib support installed at all.
- In 2010, the number of fatal rib falls in U.S. underground coal mines exceeded fatal roof falls for the first time ever.

- During 2010, three coal miners were killed by rib falls.
- The 2010 rib fatality victims were a roof bolting machine operator on a mining machine with integral bolters, a section foreman, and a continuous mining machine operator.
- In addition to the fatalities, approximately 100 miners are injured by rib falls every year.
- During the past three years, rib fall injuries accounted for approximately 20 percent of all ground fall injuries in U.S. underground coal mines.
- Rib fall injury rates increase substantially as mining height increases.

Mining Conditions

- The NIOSH (2010) report to Congress on deep cover pillar recovery found that for the period 2006-2008, nearly 25 percent of all rib fall injuries occurred in the small group of deep cover pillar recovery mines that accounted for less than 10 percent of all hours worked underground. At these mines, the rib fall rate was approximately three times as great as it was for other room and pillar mines.
- Fatal rib falls have occurred in every type of coal seam, from strong and blocky to weak and friable.
- Rock partings (rock layers contained within the coal seam) or rock brows (rock layers above the coal seam) were present in almost every in-