AVALHEX: new « gas-mix-explosive » system for avalanche triggering

Statement after two seasons of use in Savoie, France

AVALHEX system is based upon a gas-mix-explosive blast (hydrogen – oxygen) above snow. It is the result of development driven by CEMAGREF, CEA/CENG and ITS.

In France, the Regional Government of Savoy has installed 20 AVALHEX exploders for protection of 6 km of road in danger of avalanche burst. Selection of AVALHEX system has been made because of its capability to install “self contained” equipment (free of any external buried hose), requiring lightweight infrastructure (allowing capability to shift equipment in case of wrong installation), and reduced costs regarding other exploder technologies.

AVALHEX performances are evaluated by human observations, and by a system which provides an acoustic detection of blasts and avalanches (ARFANG). More than 160 shots have been made.

The AVALHEX has highlighted some residual failures during the 2000-2001 winter: micro leakage against hydrogen hose fitting and, mainly, tearing of flexible envelope used for the mix explosive containment before blasting. The micro leakage has been totally solved in 2001. The problem of flexible envelope has been solved by design of a new material successfully tested during the 2001-2002 winter.

The AVALHEX efficiency for avalanche triggering has been well demonstrated during 2001-2002 winter. Some important avalanches have been released, some of the cracks having more than 2.5 m thickness.

Works are continuing in order to improve the exploder reliability and installation improvement to obtain a better efficiency.

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