Protection de l’industrie minière dans Les Andes

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ABSTRACT: Minera Los Pelambres (http://www.pelambres.cl/) is a copper (Cu) mining company situated high in the Andean Mountain Range, in a country of South America so called Chile, where it is exposed to fierce snow storms and avalanches. The risks generated by the winter weather conditions need to be kept under control.

1 THE PURSUED OBJECTIVES ARE:

- Prevent accidents resulting in injury
- Protect the health of workers
- Prevent damage to equipment and facilities
- Ensure the continuity of operations
- Prevent environmental accidents

2 GEOGRAPHY OF THE AREA:
Maximum elevation of mining operations: 3,900 MASL
Maximum annual precipitation: 724 cm
Annual mean precipitation (in 23 years): 325 cm
Minimum dimension of avalanche area: 2,200 MASL

3 AVALANCHE PROTECTION, ARTIFICIAL RELEASE AND MITIGATION STRATEGIES

The risk is kept in check, by applying a directive called Winter Operation Regulation, which applies to company workers and contractors, authorities, visitors, suppliers, etc.

4 STAFF PREPARATION:

- In the beginning of, the Winter Operation Regulation is delivered to all staff that enter to work at the mine, which highlights the Alerts with the activities and responsibilities of each management office.
- A daily weather forecast is distributed in the morning and in the afternoon by email and by recording through a telephone number; weekly every Monday and Thursday, and every
month a three month prognosis is delivered.

- A weekly meeting with the mine operations staff in which the check list for preparation for inclement weather is reviewed.
- A monthly meeting between March and September with the staff of the Concentrator Plant and Services, or when there is an inclement weather announcement.
- Delivery of information in all meetings, Intranet Portal, closed circuit TV videos, in the Mine Magazine and wall posters.

4 WHO LEADS AND MANAGES THE AVALANCHE RISKS.

- The Winter Operation Manager decrees and cancels weather Alerts, restrictions on access to exposed areas and the closure of roads.
- Alerts are communicated throughout the entire organization through email, and by radio inside mine. The Superintendent of Mine Operations, or whoever replaces him, coordinates with the Winter Operation Manager to determine the sectors that can continue to operate safely, keeps a stock of low grade material close to the crusher in case of closer of areas exposed to avalanches.
- Safety and Occupational Health Manager is kept informed of the

- Checking the backup electrical generators.
- Preparation of the electrical emergency brigades.
- Check list of supplies of consumables.
- Status of tailings the transportation channels.
- Review of landfills, ponds, secondary roads, etc.
- Ensure the installation of signs on the roads.
- Organize and maintain operational of the Emergency Rescue Brigade for operating in mountains, motor vehicle accident, hazardous materials, etc.
- Keep all meteorological stations 100% operational.
- Keep all radio communication systems operating, maintain channel 3 for the exclusive use of Winter Operations.
- Review of backup UPS power systems.
- Fixed and portable Radio communications equipment must be inspected and certified with a special seal.
situation and at the same time maintains constant communication with his superiors. During weekends this communication extends to the Resident Manager.

5 FACILITIES / EQUIPMENTS

- Every worker takes a device of victims’ search of avalanche RECCO.
- 2 refuges with provisions for 10 days and a center with a capacity that there allow a normal operation of the mine.
- A control of avalanches with canon Locat, Gaz-ex-, facilities of nets and of barriers.
- An exclusive contract for machines of cleanliness of the snow.
- A contract of exclusive personnel for the control of ways, gunners, nivologues and meteorologists.
- 3 machine snow cat for the transport active.
- Defenses paravalanchas to the means of nets and of barriers.

6 OPERATIONAL RESULTS:
Zero personal injuries
Zero stoppage of the crushers due to snow storms
Zero stoppage of the grinders due to lack of material during the snow storms