IKAR/CISA 2002
MALBUN - LIECHTENSTEIN
Kommission für Luftrettung
Commission pour le Sauvetage Aerien
Commission for Air Rescue

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INTRODUCTION:

The air-Rescue Sub-commission met with 33 people representing 12 countries. They were Austria, Canada, Sweden, United States of America, Croatia, Italy, Norway, Slovenia, France, Switzerland, Germany, and the Czech Republic. The proceedings held on October 17-19, 2002, were directed by the Chairman, Mr. Gilbert Habringer of Austria.

ACCIDENTS/INCIDENTS FROM MEMBER COUNTRIES:

A number of serious accidents with fatalities occurred this year. Our condolences are extended to the families of the victims, rescuers and the rescue organisations affected by these incidents.

FADEC/GOVERNOR FAILURE, AUSTRIA:

Accident involved Schenk-Air a commercial operator in Austria. During a training exercise on October 14th at a ski area, where the air temperature was sub-freezing, a single rescuer was suspended on a 20 meter fixed rope system. The aircraft, an Agusta Koala 119 (single engine), experienced a malfunction related to the Fadec and governor. The pilot reverted to manual controls but was unable to throttle the engine down manually. With heavy low cloud cover that precluded climbing and with the engine running at full throttle, the pilot was left with

Schenk Air Augusta Koala- Internet Photo

little option but to increase the airspeed. The helicopter was flying at over 100 knots for about 30 minutes while an emergency strategy was devised. It was decided that the best course of action was to release the rescuer in a lake while flying forward and then shut the engine down and autorotate the aircraft at a nearby airport. Rescue crews were waiting nearby at the lake to pick up the rescuer, once he was released. The subject was laying face down in the water with an air bubble in his anorak keeping him afloat. Unfortunately as a rescue crewman on a hoist rolled the subject over to secure him, the subject sank out of sight. Divers later recovered his body and it appears that his neck was broken by the impact with the water at the high forward speed. The helicopter was autorotated successfully with minimal damage, laying down 120 meters of skid-marks on the concrete. A number of points were discussed. First, there are varying opinions on emergency procedures while doing long line and hoisting operations. Given the variety of aircraft types and operating procedures, this is not surprising. However, it is intended that next year the various countries will present their emergency procedures for such operations. The intent is to try and come up with recommendations for this type of in-flight emergency. Second, the rescuer-crew member did not have any radio communications with the pilot. Reliable radio communication is considered essential. Although, it may not have made any difference on the outcome, it would at least have allowed the crewmember to be part of the decision process on how to handle this emergency.

CRASH, SWITZERLAND

Accident involving an Allouette III of Air Glaciers in Switzerland. In the region of the Jungfraujoch, a rescuer and doctor were dropped off in bad weather at an avalanche rescue site at about 3500 meters. Due to the weather the pilot opted to fly back down to the valley to find a place to land. A Few minutes later while trying to land, he lost reference. The tail rotor hit the snow; the machine begun to spin and finally the main rotor struck the snow. Shortly following the crash, the weather improved slightly and the pilot was rescued. He sustained minor injuries. Twenty minutes later, the weather turned back to very poor and stayed that way for two days. The rest of the rescue crew was rescued by snowmachine. The victim died in the avalanche.

Air Glaciers Allouette III- Internet Photo

HELICOPTER RESCUE ACCIDENTSNEAR-MISS REVIEW- UNITED STATES

-Presentation conducted by Ken Phillips

MOUNT HOOD, OREGON

Shortly before 9 a.m. on May 30, 2002, several roped teams of climbers were ascending a 45-degree snow slope above the Palmer Glacier at approximately 11,000 feet on Mount Hood's popular south Side route. This location is a short distance from the 11,240-foot summit of Mount Hood. Near the top of the slope, one member of a four-member team slipped. Unable to arrest the jolting fall, the whole team slid down the slope, gathering speed, and snared two more climbers about 50 feet below them. The six continued sliding in a tangled mess and crashed into another group of six near the bottom of the slope. Nine of the climbers fell into a deep bergschrund at the head of the glacier, plunging as far as 250 feet into the crevasse. William G. Ward, 49, and Richard T. Read, 48, both of Forest Grove, Oregon, and John A. Biggs, 62, of Windsor, California, died in the fall.

The State OEM (Office of Emergency Management) began response coordination and contacted the AFRCC who directed them to use “state resources”. The 1042nd Army Air National Guard with two Blackhawk helicopters then was dispatched to the scene. Meanwhile 304th RQS Air National Guard (USAF) received a “call” about the operation and later responded with two Sikorsky HH-60G Pavehawk helicopters. The Incident Command Post was established with a helispot at Timberline Lodge at 6,000 feet. The USAF arrived when the second critical patient was being evacuated by Air National Guard. There was a considerable delay in the Air National Guard and US Air Force aircraft being able to communicate with one another due to lack of a common frequency . Initially the plan was to have the Army Blackhawk complete the extractions from the scene, since they were configured lighter. When the Army helicopter became low on fuel, a change was made to have the Pavehawk perform a patient extraction.

The USAF crew calculated they had to dump 1200 pounds of fuel in order to operate safely at the accident site. The Pavehawk flew to the accident site and hoisted down one PJ (Pararescue Jumper) with a Stokes Litter pulling only 78% torque. The Pavehawk later returned to complete the extraction of the PJ with the subject. While in hover, the aircraft experienced an increased demand for power that exceeded the capabilities of its engines, resulting in a droop in the RPM. As soon as the flight engineer realized that the aircraft was settling, he reached across the cabin and actuated the severing of the hoist cable. This action likely saved the life of the patient. While being maneuvered in an attempt to recover RPM to the normal operating range, the helicopter impacted the southwest flank of Mount Hood, at approximately 10,700 feet. Immediately after impact, the helicopter rolled seven and one half times down the mountain before coming to rest on relatively flat terrain

approximately 200 ft below the area of impact. The pilot, the copilot, the combat rescue officer, and one of the pararescue jumpers egressed the helicopter with minor injuries. However the flight engineer, and one of the pararescue jumpers, who were tethered to the aircraft by harnesses that were attached to the helicopter floor, were ejected from and rolled over by the helicopter as the aircraft rolled down the side of Mount Hood. One of them sustained non-life threatening internal injuries and a fractured ankle. The other suffered soft tissue injuries and a cervical strain. The aircraft was severely damaged. The main rotor blades were damaged on impact. The main rotor blades, tail rotor blades and fuel probe were damaged and either wholly or partially broke off during the roll sequence. The aircraft shell sustained relatively minor damage. (source USAF Accident Investigation Board).

It appears that the accident is related to pilot inexperience in mountain flying and the power capabilities of the helicopter becoming exceeded. It also appears that human factors were a consideration with the two military organisations responding to the one incident.

MOUNT RAINER NATIONAL PARK, WASHINGTON

On June 25, 2002 a Bell 206 B3 Jet Ranger crashed into Mount Rainier's Carbon Glacier at 8,800 feet while supporting a rescue operation for 19-year-old Jesse Whitcomb, who had been injured by rockfall at 9,400 feet on the *Liberty Ridge.* The summit of Mount Rainer lies at 14,411 feet. The helicopter had been hired by the National Park Service from Aero-Rotors, Seattle, WA to perform crew insertions of rescuers on the mountain. Neither the pilot nor the two rescuers aboard -- climbing guide Dave Hahn and NPS ranger Chris Olson -- were injured. Whitcomb, his climbing partners, and the rescuers were airlifted to safety later that evening by a military helicopter. Investigators determined the load calculation prepared for the mission was in error. The aircraft was over-gross for landing OGE (out of ground effect) at the intended helispot.

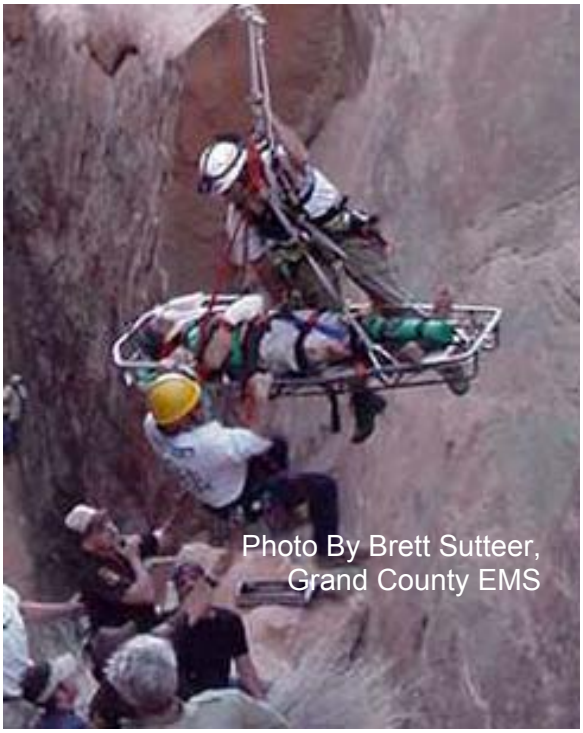
YOSEMITE NATIONAL PARK, CALIFORNIA

On June 13th Richard Zucatto, 43, hit the ground from 70 feet up while rope-soloing on Higher Cathedral Spire in Yosemite National Park. The National Park Service Super Huey 205 had inserted rescuers to the scene, but was unable to perform a short haul

extraction because the helicopter yoke band had been out of the park for modifications. A Navy Twin Huey helicopter from Lemoore Naval Air Station (CA) was called in to perform a hoist rescue of the injured climber. The Huey was hoisting a still-conscious Zucatto in a Stokes litter along with a Navy corpsman, when the aircraft began settling with power. The Pilot took control of the aircraft from the co-pilot, and she immediately steered the helicopter down the side canyon toward Yosemite Valley in an effort to escape. Zucatto and the rescuer struck two sets of treetops with the litter. During one of the impacts, the helicopter hoist cable broke, but the litter was caught was caught by a secondary belay line. The hoist cable snapped upward and struck the main rotor system. The belay line was managed with a sticht plate inside the helicopter. The shock force of the two-person load was too much to manually control and the rope began running through the device for 100 feet. A snarl in the rope then caught the load. The pilot was able to successfully land the helicopter in El Cap Meadow. Amazingly, the Navy corpsman survived with minor injuries, but Zucatto was pronounced dead at the scene.

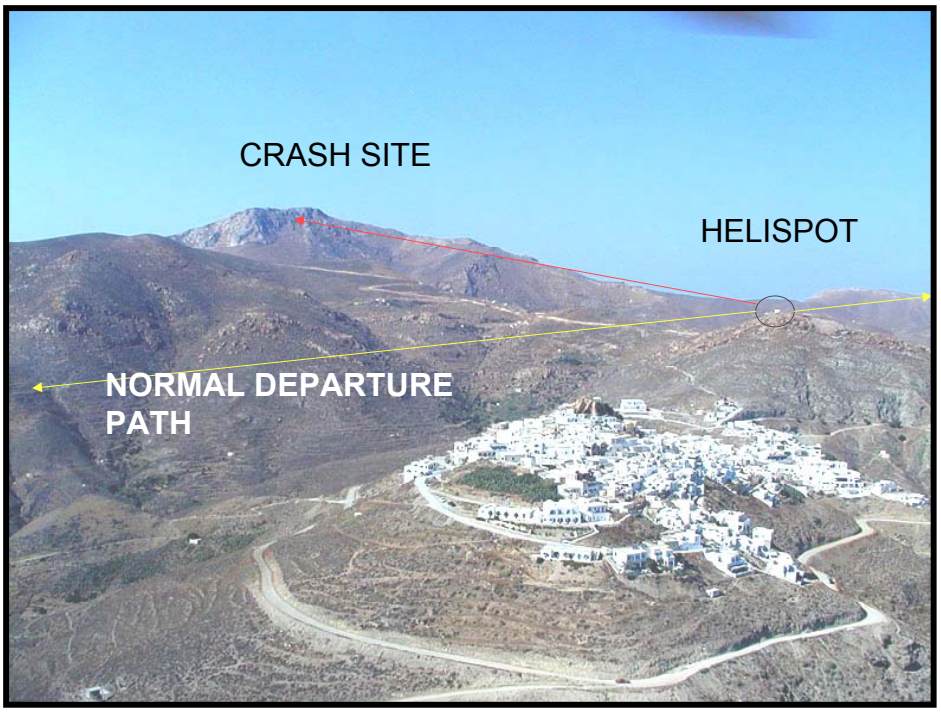
MOAB, UTAH

On March 30, 2002, during *Jeep Safari Week* just outside of Moab, a sport utility vehicle flipped and rolled backwards during a “hill climb” on a steep sandstone formation. The vehicle fell 60 feet down into a narrow side canyon with three occupants. Grand County (UT) SAR Team was called upon to extricate the three injured subjects. The decision was made to perform a helicopter short haul rescue. A local commercial operator was called upon with a Bell 206 B3 Jet Ranger for the mission. The first two short haul extractions were completed successfully. During the third and final evolution, the patient was packaged in a Stokes litter and being prepared for an extraction with a rescuer attendant. A short haul rescuer, who had attended on the previous evolution, had been returned to the accident scene. As rescuer #2 was assisting with the connection of the short haul line to the last patient, his attachment straps, which were dangling from his harness, had become unknowingly entangled in the Stokes Litter beneath him on the ground. This was not realised until the helicopter began lifting the litter into the air. The pilot was not able to set the load back on the ground, due to exposure, and had to proceed with the mission. Three persons were extracted suspended beneath the Jet Ranger, which contained a pilot and spotter. Fortunately no injuries were sustained during this near-miss. This incident provides an important lesson to all rescuers on how quickly an entanglement situation can occur during a helicopter rescue.

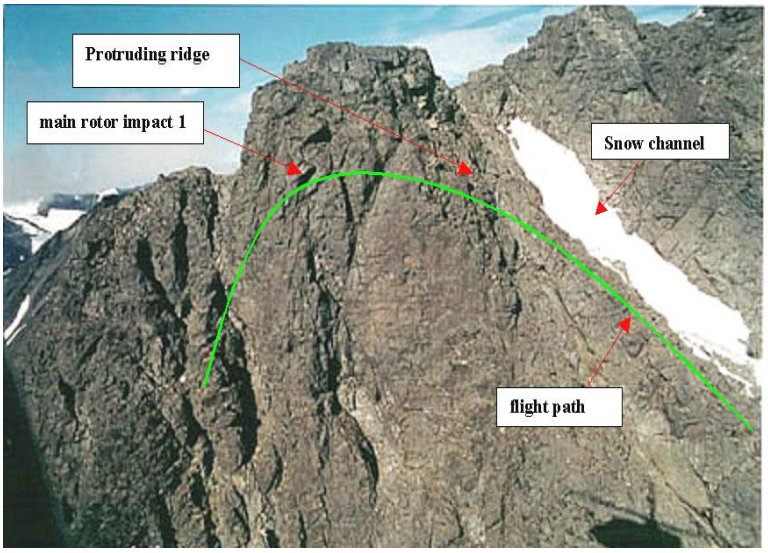


PATIENT FELL FROM RESCUE STROP, GERMANY: While hoisting an unconscious woman with a strop (horse collar), the patient fell through the collar. She was killed in the fall. The German military doesn't normally perform rescue operations, since there are numerous civilian rescue helicopters available. However this incident involved a large emergency response to a flood situation. This type of patient personnel carrying device is used in a number of operations, and it requires the person to have the strength to not allow their shoulders to slump through the collar. It is preferable to use a three-point diaper arrangement for uninjured patients.

NIGHT FLIGHT-CRASH INTO TERRAIN, GREECE: Following a routine night-time, evacuation from a heliport on the Greek island of Analfi, an Agusta 109K2 crashed into a hillside, 1 minute and 40 seconds after takeoff, killing all of the occupants on board including pilots, crew members and patient. After picking up the patient at the heliport, the pilot took off on a northerly departure and impacted a hillside shortly afterwards. The established departures from this heliport were Southwest or Northeast to avoid terrain. The landing gear, which should have been retracted within 20 seconds after take-off, was down at the time of impact. The rate of climb at the time of impact was only 700 ft/min. Normally this rate should have been 1500 feet/min. At the time of impact, the helicopter initiated a right turn with a 30-degree bank angle. Weather conditions were not a factor. There are many unanswered questions, however, it appears that one of the contributing factors to this accident may have been related to language and cultural barriers between the two pilots. The Greek government requires IFR procedures for night flights operations, however the pilot had not filed a flight plan for the mission. The pilot in command spoke Greek, while the co-pilot spoke English. Most of the radio traffic was conducted in Greek, which precluded the co-pilot from participating in the decision making. In this case, it seems that having two pilots did not increase the overall safety.



NIGHT FLIGHT- CRASH INTO TERRAIN, SWEDEN: On August 11, 2000 following an extended search for some missing climbers on Mount Kaskasapakte (2,043 meters), an Armed Forces Eurocopter Super Puma experienced a main rotor strike on a mountain side resulting in the crash of the aircraft. The helicopter exploded on impact and then caught on fire. All three crewmembers on board the aircraft were killed in the crash. A ground rescue team on the mountain had located the missing climbers. One of the victims, an 81 years old male, was unable to descend and required helicopter evacuation. Rock surfaces were covered with clear ice, creating treacherous walking conditions. The pilot initially refused a request at midnight to perform the extraction due to the severe weather conditions. When pressed again later to fly, the pilot re-evaluated and went ahead with the mission. The helicopter was dispatched to the site to hoist the rescue party and victims. With searchlights on, the helicopter climbed up the cliff face following a snow gully for reference. Once near the ridge elevation, where the party was located, the aircraft began to traverse across the face towards the visible ridge. The August night sky in Scandinavia was not completely dark, with the sun seven degrees below the horizon, but the cliff face was in shade. The pilot, looking into the light of early dawn, apparently did not see a bulge in the terrain as he traversed the face. The main rotor struck the cliff face 25 meters away from the individuals on the mountain. The helicopter crashed down the mountainside and a cloud of fuel vapour ignited into a large fireball.



Inexperience in mountain flying and overestimation of the crew in each other's skills as well as "target fascination" and fatigue appear to be contributing factors in the accident. A night helicopter rescue dramatically increases operational risks. The survivability of a subject to make it thought the night till morning should be carefully considered for safety. In the end the subject and rescue team were hoisted from the mountain by a Norwegian rescue helicopter that arrived much later in the day (0740 hours).

The investigation report for this accident is available at:
http://www.havkom.se/rapportSammandrag/rm2002_01e.pdf

DISCUSSIONS:

There was considerable discussion on **JAR OPS 3** and **JAR OPS 4** and what mechanism should be used to influence changes there. [Note: The JAA (Joint Aviation Authority) is developing the JAR (Joint Aviation Requirements) for European member countries with emphasis on harmonising aviation regulations with the FAA (USA). Source: JAA Website; http://www.jaa.nl/whatisthejaa/jaainfo.html] One of the problems is that there is a lack of uniformity in definitions and interpretation for HEC (Helicopter External Cargo), HEMS (Helicopter EMS), SAR, Air Ambulance, Medevac etc. Various countries interpret and apply these terms differently. Given the various structures in the different countries for rescue work, it is unlikely that uniformity will be achieved soon. This led to discussion on the ability of the IKAR Air Rescue Commission's ability to affect regulatory changes.

Discussions led by Patrick Fauchere of Switzerland followed concerning the **International Federation of Airline Pilot's Association** (IFALPA). This strong Association includes a helicopter committee, but until Mr. Fauchere's recent attendance, they were not familiar with the IKAR Air Rescue Commission. This Association apparently has considerable influence on regulatory bodies. It was felt that continuing to follow the business of this Association was worthwhile. More information on IFALPA can be found at http://www.ifalpa.org/

Norway is beginning to see an increase in base jumping accidents on the big walls. This is presenting new challenges for both ground and air rescue crews. Currently, ground crews using very long ropes effect most rescues. Hazards such as rockfall and the risk of entanglement of the parachute (similar to parapentes and powerlines) will present challenges for helicopter rescue evacuations for these incidents.

There was a discussion on the subject of human factors in accidents. It appears that regardless of the improvements in technology, that the percentage of accidents that can be attributed to human factors has not changed much over the years. Some studies indicate that over the last 30 years, 80% of accidents are a result of human factors. The question of whether a two pilot operation versus a single pilot with experienced crewmember is safer or not ensued. The Air Rescue Commission will devote one day next year prior to the annual meetings for a workshop on human factors.

PRESENTATIONS:

EUROCOPTER EC145: During the first two days Phillippe Marx and Markus Speicher of Eurocopter brought in a EC145 demonstrator. All of the pilots on the Air Rescue Commission had the opportunity to fly this aircraft. A number of rescue organisations are presently in negotiations for acquisition of the helicopter including the Gendarmerie Nationale and Sécurité Civile of France and Rega in Switzerland that includes up to forty aircraft for fleet replacement which reportedly would tie up the next two years of aircraft production.

Many thanks to Patrick Fauchere of Air Glaciers for arranging this.

The EC 145 can be configured for a multitude of missions such as passenger transport (up to 9 passengers), SAR and EMS missions, law enforcement service operations. Easy access to cockpit and cabin via the large side doors as well as easy straight-in loading of patients or equipment through the large rear clamshell doors. It has a twin engine design that incorporates two Turbomeca Arriel 1E2 turbine engines. The EC 145 is an upgrade of the pre-existing BK-117 design, which does not currently have Fenestron tail rotor design, although several European IKAR members stated they have personal knowledge of a possible future design modification.

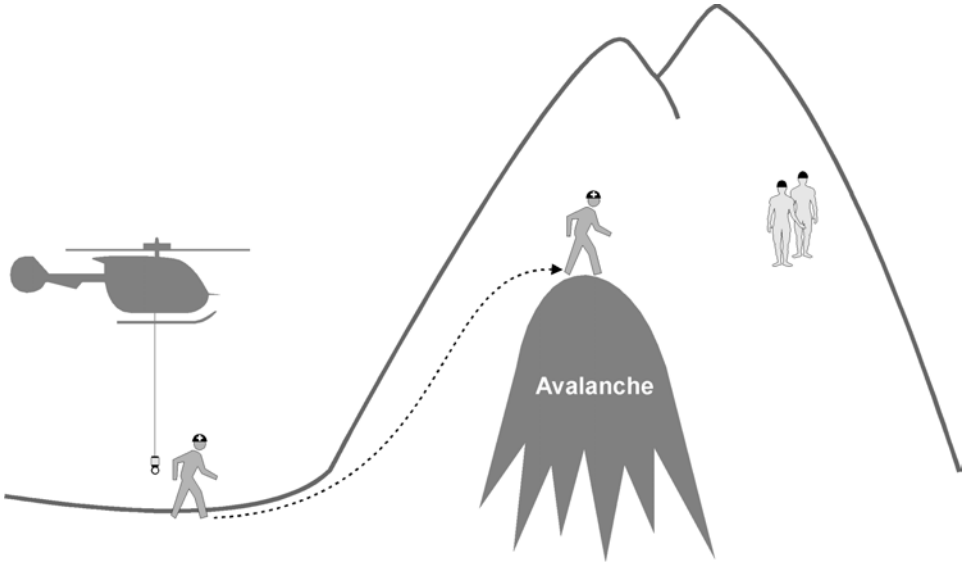
For more information on the EC145; http://www.eurocopter.com/ec145/

GRAND CANYON MISSION BRIEFING: Following a detailed presentation on the accidents over the past year in the United States (see above), Ken Phillips presented the briefing and debriefing formats used by the National Park Service Search and Rescue program at Grand Canyon National Park. In recognition, of the frequent human factors present in many accidents during rescue operations, they have adopted this format to ensure that all crewmembers are properly briefed and to maximise input into decision making. The mission briefing and hot debriefing format is shown below.

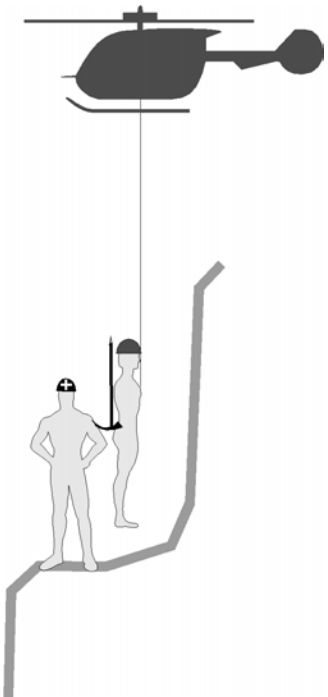
PGHM ACCIDENT CASE ANALYSIS:
The Peloton de Gendarmerie de Haute Montagne (PGHM) of Chamonix presented a new training tool intended to reduce repeat accidents or incidents. It is based on writing down details from rescuers following "close calls" during rescue operations. Since documenting this type of information is potentially sensitive and difficult to elicit from rescuers, it is done without using names. The intent is not to generate criticism but rather provide case studies that can be examined by new rescuers or rescuers not present at the time. The PGHM has also generously offered to make this information available to other rescue organisations. They have compiled 31 cases of "near-misses" since 1997. They also welcome cases that may be of interest from other rescue organisations.

To illustrate this the PGHM shared three examples of near-misses encountered in their organisation during rescue operations;

The first example involved reaching two climbers in distress on a snow-covered mountain. A helicopter rescue was begun, but due to cloudy conditions the helicopter could not reach the climbers. A rescuer was lowered by hoist from the helicopter at a lower elevation, where they then began climbing to reach the distressed party. While attempting to traverse over to the climbers, the rescuer triggered a small avalanche and was buried. Although he was alone (which is not normally done), he was able to alert the helicopter crew by radio from beneath the snow. He was recovered alive by his teammates.

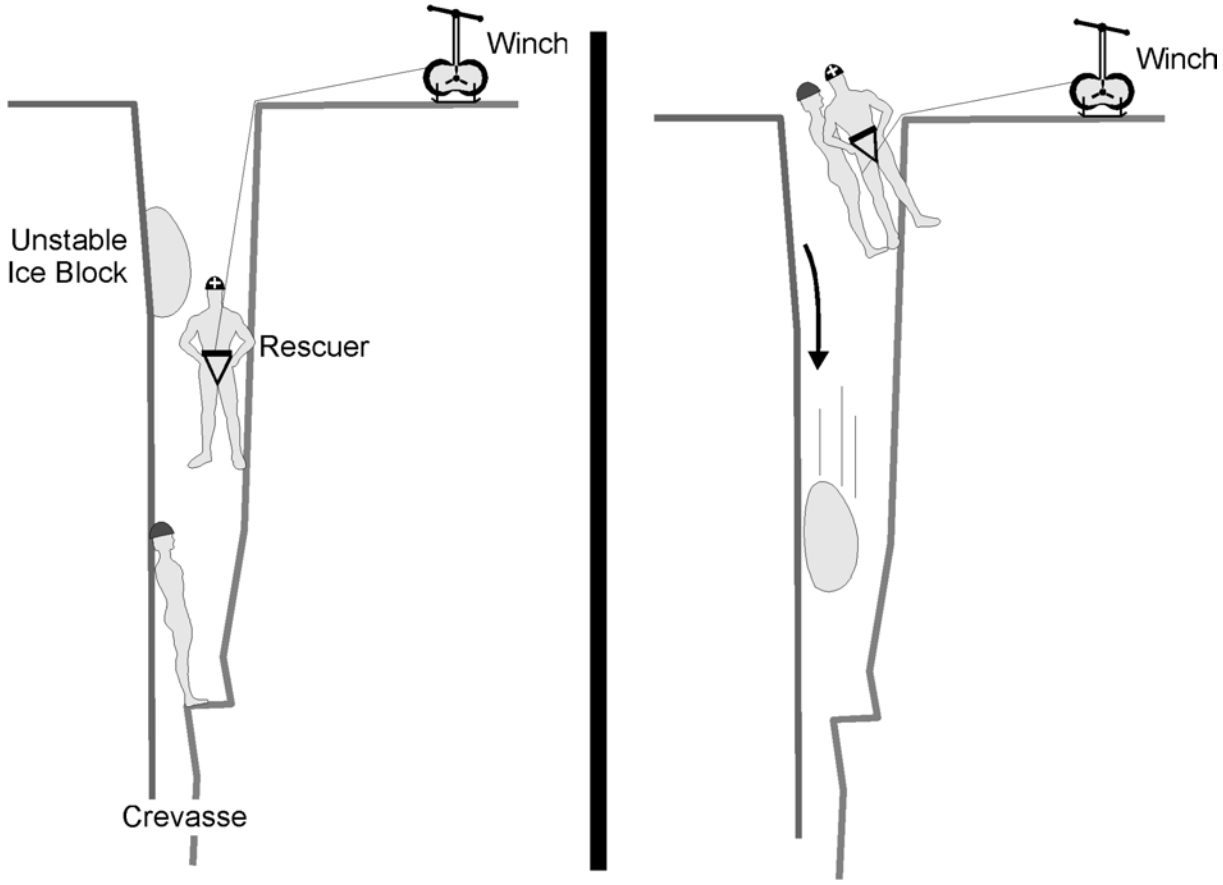


The second accident was not a near miss but was presented nonetheless. It involved a hoist rescue extraction operation on a steep exposed cliff. A rescuer had been lowered to an injured climber. The



victim, who had an ice axe on the outside of their pack, was being hoisted in an upright position without an attendant. During the hoist extraction the subject's ice axe snagged the rescuer on the ground and pulled him off the cliff. He fell to his death. This was an experienced rescuer certified as a mountain guide who chose to go the scene site alone. The decision was based on the relatively benign nature of the terrain. It highlights the "snagging" dangers inherent with hoisting or long line operations.

The final example involved the rescue of a subject who had fallen into a crevasse. Prior to going down, the rescuer noted a large unstable ice block in the crevasse. This was a significant hazard to the victim and rescuer. During the raise the rescuer and subject were above the unstable ice when it came loose and fell along the path that the rescuer had taken. Although protocol is to go to the victim, in this case, it may have been safer to lower the cable to the victim since he was uninjured.



QUALITY MANAGEMENT IN AIR RESCUE, SWITZERLAND: Enrico Ragoni of Switzerland gave a presentation on the manufacturing, testing and subsequent certification of equipment components used for air-rescue work in Switzerland. A number of approvals have been received for various equipment such as ropes, personnel carrying devices etc. This was an interesting presentation since there is wide variety of approval processes depending on the country and whether the air rescue work is done with civil or military aircraft.

SWISS CONCEPT ON HEC (*Human External Cargo*): Gerold Biner of Switzerland presented existing and draft regulations for Switzerland concerning the minimum requirements for pilots engaged in air-rescue work. A number of concerns were raised about whether these regulations were realistic and there was discussion as to whether this was sustainable in Switzerland. A number of operators in Switzerland are currently in discussions with the regulatory body to ensure that a workable document is finalised. It is important that any regulations concerning guidelines of certification of rescue pilots take into account the economic and helicopter industry realities of the country they are written for.

HELICOPTER RESCUE IN ITALY: Oscar Piazza of Italy gave an excellent presentation on the situation in Italy with regards to mountain rescue. His presentation included a helicopter demonstration of a hoist extraction of a climber on overhanging limestone using an Eurocopter SA 365 N3 (Dauphin). The technique requires rescuers to access the climber on the cliff and then lower him out from an anchor above the overhanging section. The victim is then lowered so that he is plumb with the overhang. The victim and rescuer can then be picked up with a hoist. Once secured with the hoist, they can be released from the lowering system on the face.

CHRISTOPHORUS VARIABLE FIXED ROPE SHORT HAUL TECHNIQUE, AUSTRIA

The Christophorus Rescue Helicopter Program associated with the Austrian Auto Club (OAMTC) uses a fixed rope (short haul) system that replaces the steel cable previously employed by their program. They employ a 12mm diameter rope, which is commercially available through Mammut. It comes pre-rigged from the manufacturer and employs stitched terminations rather than tied knots. Their retirement policy is after two years or 100 cycles, which ever occurs first. The maximum load they employ on a single line is <u>four persons</u>.

For canyoneering and other special circumstances they utilise a “variable rope technique”, which permits the introduction of an additional 80 meters of rope into the system. The rescuer can then rappel from the end of the fixed rope controlling their descent into a narrow gorge. They utilise the *Anthron Double Stop* descender, which is manufactured in Slovenia. To go the lever must be pulled out and held in one position. Pulling the handle too far or squeezing the handle into the device will both cause the device to jam on the rope and stop the user. Letting go of the device will also stop the user.

Anthron Double Stop

NATIONAL STANDARDS FOR HELICOPTER "RESCUE CREWMAN"- NORWAY
For applications involving air ambulance, rescue helicopters and offshore SAR work a national standard has been established in Norway for rescue-crewman positions. This standard includes the following elements:

- Formal medical education and two years of pre-hospital care experience.
- Physical fitness tests; 3000 meters running, 1000 meters swimming, pull-ups, push-ups and sit-ups.
- Rescue technician education, includes; hoist land and sea, fixed rope and alpine rescue, including rope and avalanche.
- Radio communication training (radio operator's certificate).
- License to operate emergency vehicles (In the event the helicopter can not fly).
- Operational aviation knowledge- private pilot license, simulator training, technical training, company training and quality assurance.

SLOVENIA POLICE HELICOPTER RESCUE- SLOVENIA
Mihael Avbelj of the Slovenian Police Helicopter Unit gave an overview of operations within that organisation. Although Slovenian Police helicopters perform the majority of mountain rescues in the country in conjunction with ground mountain rescue teams, there is joint also common training with military helicopters. Their fleet includes Augusta Bell 412 and 212 helicopters. The crew configuration is a pilot, co-pilot, hoist operator, physician, rescue-man and also depending upon the mission a policeman.

They have experienced massive training efforts since the Slovenian mountain rescue community suffered a very tragic helicopter rescue accident on June 10,1997, which claimed the lives of five rescuers. During a hoist rescue training exercise on a cliff face the common safety line for the rescuers became entangled with the helirescue-bag and the helicopter hoist lifted everyone off the cliff. They fell 600 feet to the ground when the safety line failed.

Both hand and voice communication are now required prior to an extraction or insertion being conducted. They also promote the following factors relating to helicopter operations communications;

1. Communication is required.
2. Communication incorporates clarity.
3. Communication is disciplined.

Hoist operator training is now progressive and more formalised than prior to the accident. Training sites are now selected to be more forgiving in the event of error with less fatal exposure. Formalised pre-planning in training has been incorporated to highlight that in the event of entanglement during a hoist operation, the planned immediate action is for everyone including the aircraft to immediately call for "Stop!"