



# AIR RESCUE REPORT

International Commission for Alpine Rescue

Kommission für Luftrettung/Commission pour le Sauvetage Aérien/Commission for Air Rescue

**October 6-9th, 2014 – South Lake Tahoe, Nevada – United States**

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## INTRODUCTION

This year's congress was hosted by the Mountain Rescue Association (MRA). The commission was chaired by Patrick Fauchère, of Air-Glaciers. The Air-Rescue Sub-commission met with members representing 13 countries. They were Austria, Canada, Croatia, Czech Republic, France, Italy, Norway, Poland, Scotland, Slovenia, Sweden, Switzerland and United States of America.

## FIELD DAY

A joint field day was organized by the Avalanche Air Rescue Commission focusing on mass casualties in the mountains. Heavenly Ski resort hosted the field day that included multiple stations where hands on training occurred.

## ACCIDENTS & INCIDENT REVIEWS FROM MEMBER COUNTRIES

### Switzerland

SA315B / Hover / white out, Air Glaciers- (Lama) During a hover step, crew member estimated that distance from skid to snow covered ground was 1 M, after step it ended up being much more. Crew member sustained back injuries in fall.

Two incidents of Injury to personnel from falling trees or objects as result of downwash.

EC 130 on route from Switzerland to France lost reference in fog and crashed. (This incident had just occurred and there have not been any reports about injuries/fatalities)

AW109SP / Descent flight

While in a descent flight, control was partially lost and the helicopter sustained an overlimit on the rotor.

### Scotland (Ben Nevis, Feb 2013)

A prepared statement on the incident was provided.

#### **Accident during a Helicopter Rescue on Ben Nevis, Scotland**

“As some of you may already know, an accident occurred during the helicopter rescue of a seriously injured climber from Ben Nevis in late February 2013. During the attempt to rescue him the casualty fell. He did not survive.

The Military Air Accident Investigation Branch of the Military Aviation Authority has been investigating the accident. No report has yet been published.

The Procurator Fiscal at Fort William is responsible for investigating sudden and unexplained deaths in that district. The Procurator Fiscal has directed police enquiries into this accident and is awaiting completion of the military investigation and other inputs before making a decision about the next stage.

In Scotland, sudden and unexplained deaths of certain categories are subject to an inquisitorial Sheriff court procedure called a Fatal Accident Inquiry or FAI. These inquiries are conducted in public. Deaths not in the proscribed categories may be subject to a FAI if it is thought to be in the public interest. Once all the other information is available, we can expect the Procurator Fiscal to consider whether a FAI should be conducted. “

30<sup>th</sup> September 2014

### Germany - (Hoist Accident)

BK117 training flight, night over water hoist training, loss of reference resulting in the aircraft crashing into the sea. Discussion about the aircraft capabilities and number of personnel needed for over water, deep water night hoisting.



### Norway

Hoist training in heavy seas, rescuer off the boat, because of sea state started hoisting commenced as boat was falling away result in shock load and the rescuer striking the boat resulting in injury to rescuer.

Hoist cable- During training in heavy seas the cable became entangled on boat. Cable separated and became entangled in rotor system. Pilots did not detect any abnormalities flew to landing area.

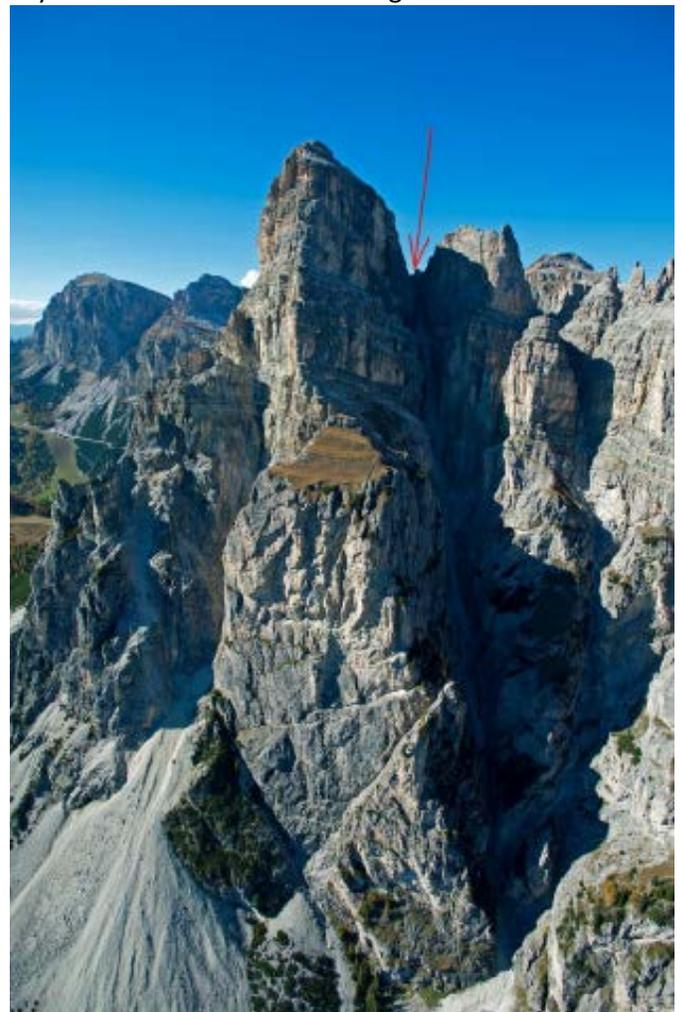
### Italy

Rotor strike (Pelikan 2)

Polish climber injured in fall. Pelikan 2 departed home base in Brixen. Pilot picked up a local mountain rescuer from landing site in Corvara and proceeded to the accident site. During insertion of the mountain rescuer there was main rotor blade contact with the mountain. With no place land the pilot returned to Corvara and landed uneventfully.

There was damage to all main rotor blades.

Long line mission (109) 90 M long line, 1 rescuer, 2 victims.



### **Norway - (HEMS Accident)**

Norwegian Air Ambulance HEMS Accident. On January 14, 2014 a Norwegian Air Ambulance EC135 was responding to an accident scene. During final approach the aircraft struck a series of electrical lines. Contact with the power lines resulted in loss of control of the aircraft and it landed Left side down. The pilot and doctor were fatally injured. The paramedic was critically injured but survived. Review of the incident included communications difficulties between the ground personnel and the aircraft, multiple sets of wires in the vicinity of the accident, power line poles that were obscured by trees and incomplete wire maps. Ground personnel identified the evolving threat but was unable to communicate to the crew because of radio infrastructure changes. This led to a discussion about standardized signals and recommendations for ground personnel that could be recommended by ICAR. Should include abort signals.

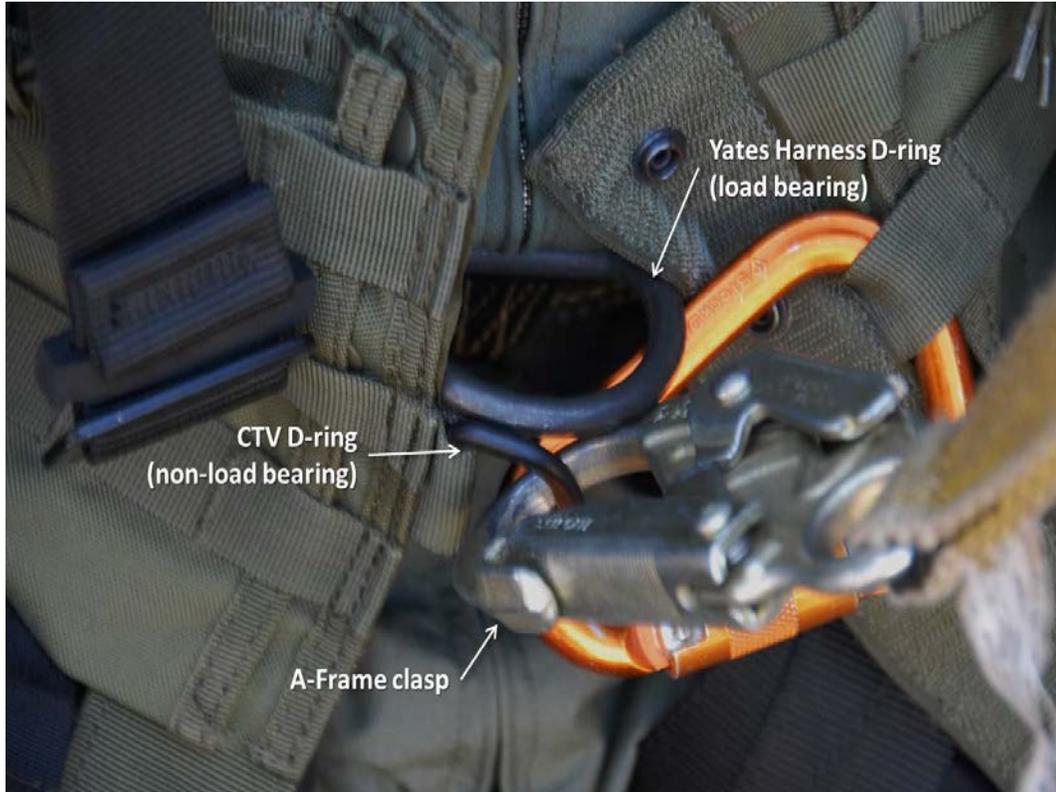
Next year a workshop on the subject “Air – Ground Collaboration” will be held with the goal of editing some key points to address to third persons on accident scene (Police forces, Firefighters, etc..)



### United States Air Rescue Report

Updates from 2013 United States Air Rescue Report -

California Air National Guard Hoist Accident- Accident report released. Victim attached hoist hook to non-load bearing plastic ring that was next to load bearing ring. Plastic ring failed short after the victim left the aircraft.



### United States - (Las Vegas) Metro Police Hoist Accident-

Final accident report still pending. While dynamic rollout has been a suspected cause in this accident, the hiker being rescued has reportedly stated "the rescuer was not attached to the hoist when the hoist commenced."

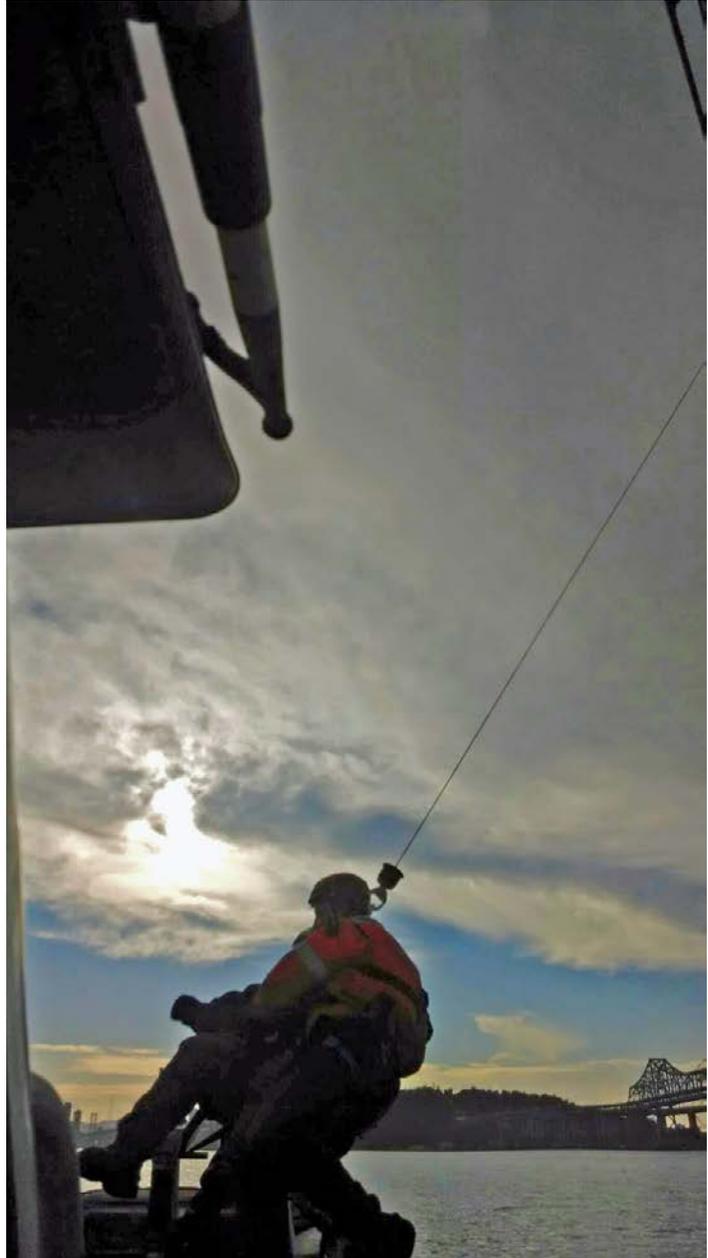
### United States - Metro Fire Department Hoist Incident (Sacramento, California)-

Sac Metro Fire Department Helicopter (UH-1) participating with a Homeland Security drill in the San Francisco Bay. During the scenario the aircraft was to extricate an injured party off a moving boat. In preparation the unit reviewed procedures and techniques used by other agencies performing similar missions including the United States Coast Guard.

**United States - Sacramento Metro Fire Department Hoist Incident (Sacramento, California) cont.-**

They practiced locally and determined the mission could be completed. Once onsite they evaluated the boat and removed some hazardous equipment. During the first hoist some issues were identified. Those were corrected and the second hoist commenced. During the extrication the rescuers harness became snagged on the bow of the boat. The helicopter and boat direction were no longer aligned resulting in significant downward pull being placed on the aircraft. The hoist operator was unable to deploy hoist cable and the aircraft was pulled downward and the Right. The emergency jettison switch was mounted on the hoist (internal). The hoist operator was attempting to reach the jettison button but aircraft movement impaired his ability to reach the button.

A second crew member in the cabin reached the jettison button as the aircraft was in close proximity to the water surface. Both pilots indicated that they could not activate the emergency jettison as they were fully engaged in trying to fly the aircraft. It appears that at almost the same time the rescuer's harness becomes free from the snag. The rescuer and victim are pulled off the boat and into the water. They are pulled through the water at significant speed for a short distance. The rescuer was injured during this sequence and needed the victim to activate his manually inflated flotation. They were removed by boat. The rescuer was off work for some time but there were no other injuries or damage.



After action review conducted by Sac Metro Fire Department identified

1. Practice cable cut for all crew positions
2. Position of the cable cut switch
3. Lack of clutch for rescue hoist
4. Nylon between rescuer and hoist ho

**United States - Classic Lifeguard Accident (Colorado)**

HEMS Bell 407 assisting local Sheriff's Office for search of missing skier in the San Juan Mountains. At ~10,000 feet MSL, 400 feet AGL the engine noise changed and vibration increased. Engine chip light illuminated along with FADEC degrade. The pilot initiated a precautionary landing. On final approach ~150 AGL the engine failed. During the short run on landing the aircraft rolled onto Left side. The crew was able to self-extricate without injuries.

The engine had recently been overhauled and was recently installed in the aircraft (<150 hours).



**United States - Maryland State Police Litter Spin (Maryland)**

Maryland State Police (AW139) requested to extricate an elderly female patient who was injured in a fall from horse. During extrication, the commercial hoist tagline device failed at ~50 feet. The hoist continued and resulted in significant litter spin. As the litter approached the aircraft, forward airspeed was initiated, which reduced the spin rate. The litter was brought in the aircraft and the patient was transported to the hospital. There were no injuries or damage to the aircraft.

The after action review conducted by Maryland State Police identified

1. Replaced weak link with another manufacture
2. Commence forward flight as soon as the litter is clear the obstacles



### **United States - HEMS Inadvertent instrument meteorological conditions (IIMC)**

HEMS aircraft (AS350) called to night scene response. En route the crew encountered a low ceiling with developing ground fog. They cancelled for weather and were returning to base. They were requested to rendezvous with ground ambulance at football field they had previously flown over. They landed at football field. While waiting for the ground ambulance, the weather at the site continued to deteriorate. The pilot stated he “was about to abort the rendezvous, when the ambulance arrived.” The patient packaging and loading delayed departure an additional 10 minutes. Upon departure the aircraft encountered IIMC conditions. The aircraft was equipped with Appareo cockpit video and aircraft recording system which allowed the IIMC encounter to be demonstrated for lessons learned.

### **Thailand - Royal Thai Police Hoist Accident**

Hoist rescue demonstration (Bell 412). The rescuer and litter were hoisted to the top of building. Police SWAT team members were at the hoist location and tasked with supporting the demonstration. The simulated victim was packaged in the litter and prepared for extrication. The tagline was packaged in a bag that was normally used for tactical rappel operations and the distal end was secured to the bag. The bag was attached to the harness and leg of the victim who was tasked with managing the tag line. The tag line was attached to the litter with a weak link of de-cored parachute cord.

The extrication commenced but as the litter approached the skid of the aircraft the hoist malfunctioned. Under normal circumstances, the litter would be brought into the aircraft and tag line removed by the rescuer. As the aircraft commenced forward flight the tag line attendant was pulled off the top of the building. The aircraft crew was unaware that the attendant was still attached to the litter through the tag line. The victim fell when the bag failed resulting in a fatal fall.

After action review conducted by authorities identified

1. Lack of air to ground/ground to air communications
2. No cutting devices at hoist location
3. Questionable Tactics
4. Hoist maintenance
5. Emergency procedure

### **Australia - Collision with terrain during a hoist incident (Queensland)**

Queensland EMS (Bell 412) requested to extricate a victim due to terrain and patient condition. The rescue site was in a river valley with a series of cascading waterfalls. The pilot elected to face the helicopter down the slope, to provide a greater power margin to be able to exit the area, without having to climb away. In this position, there were obstacles from the waterfall and higher ground behind the helicopter, and a clear area ahead. The crew also discussed the tag line, which attached to the corner of the stretcher to prevent it spinning around during winching. It was normally operated by the RCO on the ground, who would walk backwards to create an angle between himself and the stretcher, however this was not possible at this site due to a vertical drop behind the RCO. The pilot would be required to maneuver the helicopter rearwards to create the tag line angle.

The pilot then established the helicopter in a hover about 100 ft. above the ground, and reported that his reference point, used to maintain the helicopter's position in the hover, was a tree in about his 3 o'clock position and about 7 m from the helicopter. The ACO moved to the rear door, and took over the 'reference' of the helicopter. In this role, the ACO directed the pilot to maneuver the helicopter as required to perform the operation and remain clear of all obstacles.

As previously briefed, the doctor and RCO were winched down to the site together, and subsequently the paramedic was lowered. The pilot and ACO then departed the immediate vicinity in the helicopter and initial contact was established with the crew on the ground via UHF radio. After about 10 minutes, communication on the ground was again attempted, however due to a loud interference noise on the radio they were unable to communicate with the ground crew. They then returned and overflew the area to ascertain using hand signals, whether the ground crew were ready to be picked up. The RCO waved them away and the helicopter departed and conducted an orbit of the area. The ACO was then able to establish radio communication with the RCO who advised when they were ready. The sequence of recovery winches was confirmed between the ACO and RCO. On returning to the winching site, due to the interference noise on the radio affecting their ability to communicate with each other, the pilot and ACO deselected the radios.

The winch recovery of the doctor and stretcher commenced. During the initial recovery phase, the pilot stated that due to the 5 minute power limit, a circuit would be required before the final recovery of the RCO and paramedic. The ACO then directed the pilot to maneuver the helicopter backwards to set the tag line on the stretcher and winched up the doctor and the stretcher. During this winch, the helicopter had twice drifted to the left and the ACO directed the pilot to maneuver the helicopter right.

To maneuver the stretcher into the helicopter, the ACO directed the pilot to move forwards and to the right to provide a buffer at the tail of the helicopter, and then handed the visual reference over to the pilot, which was standard operating procedure for the organization, while the ACO's attention was focused on securing the stretcher inside the cabin.

About 1 minute later, the ACO returned to the door and observed that the helicopter had drifted back and left and he immediately directed the pilot to maneuver up and to the right, however the tail rotor collided with the foliage of a tree. The RCO attempted to alert the pilot to the proximity of vegetation to the tail of the helicopter over the radio but the radios in the helicopter were deselected. The pilot advised that he was again about 4 minutes into the 5 minute hover power limit and had to go around prior to picking up the RCO and paramedic. The ACO advised that the helicopter had collided with some light foliage and the pilot assumed it was the main rotor blades that had struck the vegetation.

The ACO pointed out to the pilot some vegetation similar to that which the helicopter had collided with. The pilot had not detected any strike, there were no abnormal indications or vibrations and the helicopter was operating normally.

The RCO and paramedic were then winched into the helicopter and the ACO returned to the front seat. The crew discussed whether it was necessary to divert to Townsville Airport, but elected to proceed to the hospital. The paramedic and doctor later stated that the tail had been close to the vegetation but the pilot reported that at that time, he had in his mind that it was the main rotor blades rather than the tail rotor blades that had struck the foliage.

After landing at the hospital, the pilot exited the helicopter and inspected the main rotor blades. The ACO then advised that it was the tail rotor not the main rotor that had struck the foliage and the pilot observed some ripples on the tail rotor blades and called the base engineer to inspect the helicopter

The engineering inspection revealed that the tail rotor blades required replacement and the tail rotor gear boxes and hub assembly required inspection.

#### **Korea – Coast Guard Accident**

Dauphin aircraft transporting divers from the Korean ferry disaster rapid descent and flight into urban area at high speed. Five fatalities.

#### **United States – Hoist Near Miss (New Mexico)**

New Mexico National Guard (UH60) requested to extricate victim remains due to difficult and hazardous terrain. During the risk assessment the high number of standing dead trees were identified. Ground personnel were moved away from the area. During hoisting operations a tree under the aircraft fell. As a result of the risk assessment there were no injuries or damage.

#### **United States – Rock Fall While Hoisting (Alaska)**

Alaska Air National Guard (UH60) was requested to perform a night hoist extrication of an injured hiker. During the hoist a rock was dislodged that resulted in the injury of a second member of the hiking party. The second victim was hoisted and both were transported to the hospital.

#### **United States – Rock Fall Near Miss During Hoisting (Location Unknown)**

During insertion of rescuer, a large rock was dislodged. It rolled down the hill narrowly missing the rescuer.

#### **Canada - Air Rescue Report- Canadian SAR Tech Hoist Hook Dynamic rollout**

The training scenario, near Bass River in Five Islands Provincial Park, Nova Scotia, involved insertion and extraction of two Search and Rescue Technicians (SAR Tech) and a rescue basket in a wooded confined area. Personnel and equipment were hoisted while the helicopter was in a 120 feet high hover. After the SAR Techs were lowered and practice maneuvers were conducted with the rescue basket, the first SAR Tech and the rescue basket were hoisted back on board the helicopter.

In preparation for being hoisted up, the second SAR Tech stowed the rescue basket guide rope and verified that the helicopter was directly overhead before he attached the hoist hook to his harness and signaled to the Flight Engineer (FE) that he was ready. The FE then took up the slack in the hoist cable and began to raise the SAR Tech.

Seconds later, the SAR Tech fell to the ground and landed flat on his back. The SAR Tech then stood up and indicated to the FE that he was not injured. The FE reeled in the hoist hook and then brought the SAR Tech up using the back-up hoist. After returning to a staging area, the entire crew then decided to terminate the training mission.



The investigation is focusing on technical causes, specifically a phenomena known as dynamic rollout, in which the rescue harness connecting D-ring can misalign with the hoist hook and allow the D-ring to disconnect. A Flight Safety *Flash* bulletin was immediately sent to all RCAF hoist users to identify this hazard.

Hoist Fall Recommendations- Conduct a workshop next year to address hoist/aircraft fall issues. They are too many losses and incidents around the world while hoisting. The goal of the workshop will be to address some key points for hoisting in order to avoid mishaps by increasing awareness of the crews.

## Presentations

### **United States – Washoe County Aviation**

Chief Pilot Doug Russell provided a presentation on the Washoe County Aviation program. Washoe County provides helicopter SAR services to the Lake Tahoe area. They were also provided an air rescue demonstration during the local night event.



### **Multiple Casualties in the Mountains**

Presentation on the comparison of mass casualty incidents in urban versus remote areas. Defining parameters are the availability of road access. The model presented the pilot workload in urban MCI is fairly low as the incident is managed by ground based resources that have easy access to the accident site. In remote areas the helicopter may be the first on scene and the pilot acts as an Operations Manager until additional personnel can arrive. Pilot workload can be quite high. Several examples were shown including the Riesending Cave rescue that included 725 mountain and cave rescuers. The incident required 10-15 helicopters that performed more than 100 winch cycles and more than 100 flight hours to support the incident.

### **Communications between Crew (Securite Civile)**

Presentation on the communications and human interaction required for a search and rescue aircraft.



### **AW169 Briefing**

AgustaWestland provided a briefing on the AW169.



### **Croatia Firefighter Evacuation**

Croatia Mountain Rescue presented a wild land fire fighter evacuation program that they developed after the tragedy at Kornat. 13 fire fighters were caught in a fire storm and 12 were tragically killed. The plan uses helicopter equipment that they already had including firefighting buckets to extricate fire fighters from hazardous situations.



## Discussion Topics

### Drones

Discussion about the use and integration of drones into the SAR environment. The technology is out pacing the regulatory and integration with manned aircraft. ICAR shall monitor the development in order to advise the members of the potential of such devices. Drones can be useful when the usage is appropriate but could be also dangerous when used without coordination with normal aircrews.



**Mountain Rescues in Nepal**

Update on the status of the ICAR Nepal partnership on mountain rescue. The focus of the project is to develop rescue capability from the world's highest mountains through on-site education and training that includes local resources and does not discriminate local population. Shuttle flights to and from base camps would be limited to those with medical justification.

Was instrumental during April 18, 2014 avalanche on Mount Everest.



### **Summary of missions 2009-2014**

- 3000 – 4000 Medevacs in 5 years
- 50% are faked (misuse of rescue)
- 1500 rescues for locals
- 40% did not survive after the rescue
- Since 2013 increase of 15% per year
- 80 rescues above base camps
- 50 Human Sling Operations (MERS)

### **PCDS**

This has been discussed at past ICAR Air Rescue Commission meetings. EASA requirement to ask for minor approval for all harnesses is not appropriate and will lead to either a chaos or a non-compliance from the user. With the number of harnesses being used and number of aircraft configurations this may be difficult to impossible to complete. ICAR has asked for alleviations: one for the patient and one for the rescuer in order to still have the possibility to work with on-site rescuer. In the last EASA proposal, the alleviations were inserted but ICAR has to closely monitor the final version.

### **Peter Kahrs (Norwegian Air Ambulance)**

Peter announced that this would be his last ICAR with his recent retirement. The Air Rescue Commission would like to thank Peter for his valuable contributions to Air Rescue. All members wish Peter the best in future endeavors and retirement.

### **60-65 age limit for pilots in EASA**

This has been discussed at past ICAR Air Rescue Commission meetings. EASA requirement that pilots in single pilot aircraft must stop flying at age 60. Within some European members the requirement is not well accepted and some alleviation are now on the table of the EASA.

### **2015 IKAR Topics Human Factors/Decision Making**

- Work shop
- Ground to Air Communications / HHO-HEC guideline

### **Combined Terrestrial, Air and Avalanche Committees**

Petzel Lezard- Petzel and the Gendarmarie presented the Lezard. The Lezard is in final approval process. It was presented to IKAR last year and has been in development at the request of the French Gendarmarie and Civile Security to address helicopter and mountain simultaneous attachment issues. In the event that the helicopter must immediately the Lezard will allow the anchor section to be jettisoned. Another presentation (small film) has been done on the last ICAR meeting by Air-Glaciers and Petzl concerning the usage of the lizard. This device shall prevent entanglement and when certified will be one solution to limit these entanglements. It will surely not be the only one but the system present some advantages.

Avalanche search in high risk areas- Norwegian Air Ambulance presented a program they developed that allows the search for victims post avalanche in high risk areas. The rescuers stay attached to the short haul line while searching. The pilot and crew member stay observant for any avalanche. In the event of

avalanche the rescuers are extricated by the helicopter. If a victim is located they are extricated by the aircraft with the rescuer.

#### Helicopter Search of Avalanche Areas

Please refer to Avalanche Commission meetings for information related to this topic.

The presentation done on Thursday on the topics were about the systematic search for avalanche victim from a helicopter with the usage of DVA antenna or Recco. The antenna needs a proper installation (according to the machine) in order to prevent all interferences. The crew shall have basic training about avalanche search to be efficient.

Another presentation of the Thursday demonstrated the reality versus the theory. We can apply all schemes but the terrain reality is always different and the success comes mostly from the adaptation of the crews.

**Next year's conference will be held from October 6<sup>th</sup>-11<sup>th</sup>, 2015 in Killarney, Ireland.**