



## **IKAR 2000 Air Rescue Sub-Commission**

**Report of the 52<sup>nd</sup> Meeting of IKAR-CISA  
International Commission for Alpine Rescue  
November 8-11, 2000 Dorf-Tirol, Italy**

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### **INTRODUCTION:**

The proceedings of this year's Air Rescue sub-commission meetings were directed by the new chairman, Mr. Gilbert Habringer (OAMTC-Austria), who takes over from the retiring Silvio Refondini (Rega-Switzerland).

These Air Sub-Commission meetings were attended by twenty-eight persons representing fourteen nations, including: Andorra, Austria, Bulgaria, Canada, Croatia, Czechia, France, Germany, Italy, Norway, Poland, Sweden, Switzerland and the USA.

### **Field Trip - Augusta Westland Helicopters**

For the third consecutive year, members of the Air Rescue Sub-Commission arrived at IKAR a day early in order to combine their annual technical/field meeting with the regular general assembly of the IKAR. Members assembled at noon Wednesday, November 8. The remainder of the day was dedicated to commission meetings. On Thursday, the commission members was taken by bus to Milan where we were hosted to a tour of one of the plants of Augusta Westland helicopters. Participants toured the main assembly line of the Augusta fleet, where the new Augusta 109 Power was among the helicopters being manufactured. The 109 Power is the latest model by Augusta that is aimed at the EMS and mountain rescue markets. Several pilots on the sub-commission were able to test-drive the Power before bad weather shut down flying for the afternoon.

The merger of Augusta and Westland Helicopters Ltd created the second largest helicopter manufacturer in the world with plants in Italy, Great Britain and Holland. In addition this company is engaged in joint ventures with Bell helicopters ( assembly of the Bell 412 for the European market, and building the Bell 609 tilt rotor turbo- prop) and with Eurocopter (the NH90).

Members of the sub-commission appreciate the generous hospitality of Augusta Westland as well as the efforts of our chairman, Gilbert Habringer, who made the arrangements for this visit. This is the second year in which Gilbert has organized a commission trip to the principal facility of one of the leading manufacturers of rescue helicopter models. This is a sign of the connections being made between the IKAR Air Commission and the manufacturers of the vital hardware of our trade, connections for which Mr. Habringer can take significant credit.

### **ACCIDENTS/INCIDENTS FROM MEMBER COUNTRIES :**

Understandably and regrettably, an important part of these meetings is devoted to a review of incidents and accidents that happened during air-rescue operations. Obviously, the aim is to improve our understanding of the dangers of this business. Switzerland was hit particularly hard by accidents this season.

**Engine Failure - Switzerland:** The first accident report involved an Allouette Lama rescue helicopter which was grounded overnight at 3000m on a glacier during an intense snow storm. The pilot was able to walk out from the landing site for the night. Prior to leaving the site, he put snow covers on the machine but this was not before it had been exposed to blowing snow for a period of time. The pilot returned in the morning. It is known for certain that he started up the engine and ran it for about 10 minutes on the ground, then held the machine in a low hover to test the engine performance before taking off. The pilot then took off and descended rapidly to the valley. Observers on the ground said that as the helicopter approached the ground, the pilot began a high turn at about 30-40m elevation. Suddenly the helicopter lost RPM and fell out of the sky. The pilot was killed.

One possible explanation was that the pilot may not have realized that the engine had quit during the descent, the theory being that the high rate of descent kept the rotor RPM up until the pilot slowed down above the landing, at which point he was too high to complete a safe autorotation. The pilot had 5000 hours experience.

**Mid-air Collision B Switzerland:** Three weeks later, an Allouette III and Bell 206 collided and crashed. Both helicopters were approaching a landing when the Allouette III overtook and smashed into the rear port side of the Jet Ranger. One person in the 206 was killed. The Allouette rolled over in the air and crashed from a height of 30m killing all 5 persons on board. This was the worst helicopter accident in Swiss history. The most likely cause of this tragedy was that the direction of flight on the final approach to the landing was directly into bright sunlight which blinded the pilots.

**Engine out - Switzerland:** In another accident in the same region, a rescue helicopter removing a patient from the site of an avalanche accident experienced an engine out. The pilot was able to land safely. No further details available on this.

**Roll-over - Switzerland:** In the Engadine, an Astar rolled over in white out conditions. The pilot was killed but four passengers survived with only minor injuries. Sorry, no further details.

**High bank turn/crash- Italy:** This incident involved a BK117 and thankfully resulted in no injuries. The helicopter, flying through a pass, initiated a high banked right turn (60E) at low speed (60 - 70kts) when the pilot ran out of pedal, and hit the ground. The tail was severed by the main rotor. One of the other delegates commented there is a warning in the BK flight manual about loss of rudder control in slow speed turns to the right, and that a similar incident was reported earlier in Slovenia.

**Dynamic roll-over - Switzerland:** While this accident occurred during a photography mission (i.e. not a rescue flight), the crew was made up of a pilot and engineer who routinely perform rescue work. An Astar with pilot and four passengers was on close final for landing at a flat site at 3800m. The pilot was surprised by white-out due to loose snow while hovering at 1 metre. The result was the helicopter experienced a dynamic roll-over. The pilot was killed by the main blade hitting the cabin. The 4 others were spared.

**Photo flight - Canada:** This accident also involved an experienced rescue pilot who happened to be engaged in commercial film making in the mountains of northwestern British Columbia. The aim of the mission was to obtain footage of the helicopter flying low over an icefall. The 206L had made several passes toward the camera in a way that made it appear as if the machine was rising out of the ice. Each time the pilot repeated the shot he was encouraged to approach from a lower angle. On the final pass, the rotor clipped the ice, crashed into a deep crevasse and incinerated. All 4 on board were killed.

**Cable Strike - Germany:** The German Air Force provides helicopter support for public mountain rescue services in southern Germany. This incident however took place while on United Nations work in Kosovo. A UH 1 (Huey) with 5 persons aboard hit a main power line suspended across river, and managed to land safely! In fact, the helicopter struck all three of the power lines. All were severed by the cable cutters mounted on the helicopter. This is an extraordinary example of a successful outcome involving the sometimes controversial cable cutters

**Lack of Mountain Experience - Sweden:** This accident happened in the mountains in northern Sweden. During a rescue that began as a ground based evacuation, a Super Puma from the Swedish army was dispatched to complete the transport of a seriously injured patient. The helicopter was flying up a large wall to reach a ridge when it struck the face. It crashed 80 m into a boulder field and exploded, killing the pilot and winch operator. The accident took place in good visibility during late evening sunlight with what was described as Amiles of space around@.

**Helicopter Tips Over - France:** A French police Allouette III was in the process of shutting down during a landing in the Pyrenees when a wheel slipped off a rock, causing the helicopter to tumble about 20m downhill. The machine was totalled but luckily there were no serious injuries.

## **DISCUSSIONS**

The atmosphere of the Air Rescue Sub-commission promotes free discussion on any matter. This section contains notes on some of the general discussions and comments that arose this year, partly as a result of the accident reports

### **Cable Hazard:**

As usual, there were a number of cable strikes in Europe again this year (only one of them is mentioned in the accidents listed above). In response to a question by the visiting representative from Eurocopter to the commission members, "What do you think of cable cutters"?

- "Cutters should be on every machine, and anti-crash seats for that matter!"
- "The Allouette III cannot mount cutters" (The frame not strong enough)
- "It would be preferable to have a good cable warning system...the problem right now however is cost"
- Eurocopter responded "The demand in the market so far for the new system is low, consequently the price is high but it is offered as an option to accommodate both richer and poorer markets."
- "One problem with new instrument systems is they make pilots look at the instruments rather than out the window"!

There was much interest expressed by the delegates in the cable warning systems that are being developed. As a result of this interest, the sub-commission drafted Recommendation 3/2000 (See the Recommendations section)

### **Twin vs. Single Engine:**

This is one of the more frequently discussed topics of this group of experts. Here is a sampling of some of the comments this year:

- "In Europe, single engine helicopters are rapidly becoming a thing of the past."
- "But having a second engine is not automatically better!"
- "Don't forget that among the advantages of twin helicopters are their use for night flying and flying over congested areas. More and more, regulations require twin engines for specific circumstances."
- "Private companies can't afford to switch to twins the way larger agencies can."
- "In the Sud Tirol twin engines are required by regulations for all landings at hospitals."
- "Twins do not always have enough power on a single engine to complete the mission."
- "The Slovenian government is buying twin helicopters for rescue work. It is the law!"
- "Public opinion is making it more likely twin engines will become the law. For flying over built up areas, governments are recognizing this and saying they can't disregard public pressure".
- "Switzerland does not have any regulations requiring twin engines for anything" (ie. Yet?).
- "The USA is different". (this goes for North America - ed.) This comment refers to the amount of rescue work being done by private carriers who may not be able to justify twin engine helicopters where the machine is not dedicated to SAR/EMS tasking).

### **Helicopter Photo Work and the Media:**

The accident listed above describing a crash during filming for a movie triggered a strong reaction from some of the pilots on the commission. The general message was that all felt that film work is one of the more dangerous jobs a pilot can undertake: One senior pilot went so far as to say it is so bad that A...it is like a camera man is licensed to kill@. This topic evolved into a lengthy discussion about a related subject; that of problems created by helicopters chartered by media entering areas of emergency flight operations. Some of the remarks:

- AMedia in helis go into areas ...to get the shot - you have to watch out!@
- ADuring rescues, film teams will go after you to be right on board@
- A...three helicopters on the avalanche accident and suddenly the press heli is in your midst@
- Aln most countries, temporary closures of airspace can be established by issuance of a NOTAM (Notice to Airmen), however this may take too long. Something immediate is needed.”
- Aln Austria during an incident a NOTAM was used but there were several intrusions before it was officially arranged ...it took 2 days to implement properly@
- ARCC-s (Rescue Coordination Centres) can announce NOTAMS over the air to all pilots.@
- Aln Germany we have set up a treaty between the media and the civil aviation authority which seems to work. It has power that the media respect. If they don't cooperate, they will lose the privilege. They must contact the police to obtain permission to fly into the area.@  
(See Recommendation 1/2000 resulting from this discussion)

### **Standardized Radio Frequencies in SAR**

There was discussion about adoption of common frequencies for SAR helicopter operations. The problem in Europe is that it is very difficult to coordinate frequencies due to nation specific designations. Everyone has invested so much in the equipment, based on their own local or national standards, that an international standard is Ajust a dream@at this point.

For example, Austria has incompatible systems in the east and west parts of the country, where until this year different agencies provided emergency helicopter services. They are planning to install special brackets that will hold whichever radio is required for the flight area. In Germany, the helicopters and rescue personnel are on different band-widths. One commission member described the current system as Astone age@. The best answer for the present seemed to be to employ the IKAR 123.1 frequency for on site operations.

### **Safety During Heli Rescue Training**

The commission discussed the number of accidents that have occurred during rescue training sessions involving helicopters. Recall the two recent accidents in Slovenia\* and Spain\*. The comment was made that considering practices usually happen in optimum conditions, when there is time to plan, and accidents still happen, maybe we should rethink the amount of training we do. Following their disastrous accident, the Slovenians analysed the circumstances and have decided to at least limit the size of the team directly involved in air assisted operations.

It was agreed that it is important to understand the purpose of each training exercise, and to regard the potential risks involved. It may be wise to have an extra officer assigned to watch out for hazards, and to follow up on problems that are discovered. One member cautioned to be particularly vigilant when TV cameras are present...people tend to make mistakes under these circumstances (not only in practices). (\* Slovenia – IKAR 97 report, Spain – 99)

A proposal was made to develop some standards for training sessions. These might include for example: a plan for each session, supervision by experienced personnel at each key station of the training mission, etc. A standard checklist may be useful. The members agreed to exchange ideas on this via the internet site this year.

## **DEMONSTRATION**

The host agency provided a helicopter rescue demonstration using the BK 117 from the nearby Bolzano hospital base. This winch equipped helicopter is used for routine EMS as well as mountain rescue services in the northern Dolomites.



The BK T117 winching a rescuer with a patient in the stretcher.

Rescuer from the South Tirol suspended on the winch cable in a combination seat and chest harness which provides good upright position.



A custom pocket system fastened to the back of the copilots seat provides storage for all the map coverage for the area serviced by this helicopter.

## **PRESENTATIONS**

This year, delegates were asked to bring presentations on subjects of interest from their area. Here is a brief summary of some the presentations given.

### **Austria - Pilot Training**

In the Austrian Army, mountain flight training is the highest achievement for helicopter pilots. Pilots carry out their basic mountain training in the Jet Ranger. They then move to the Allouette

III, where they focus on outside landings (defined as natural terrain above 2000 m), high landings and winch operations. This training is spread over 2 years and takes approximately 50 hours of flight time in both summer and winter conditions. The course also includes extensive ground survival training.

This Austrian mountain course is also subscribed to by forces from other (NATO) nations including the US and Sweden. On completion of the training, the pilots are certified for "high mountain work". In the Austrian army helicopter corps, approximately one half of the work is civil (fire, rescue etc.). Altogether it takes about 3-3 1/2 years to become a full mountain rescue pilot. There are pilot examinations at each stage of this training.

**Germany - Pilot Training - Military**

In Germany, the army provides support for civilian mountain rescue. Helicopter training for the German air force begins at Fort Drucker, USA. This basic training takes 7 months in the US and involves about 120 hours flight time. Following this the pilot returns to Germany and continues training which includes Europeanization and tactical or military operations training.

They then begin basic mountain training, which is conducted in Bavaria. Much of this involves slinging cargos which, for the purposes of training, are weighted to force the students to cope with the limitations of altitude and mountain conditions. In the end, military pilots who have completed mountain SAR training have received nearly 800 hours flight training. They use the Bell 212 (UH-1). The standard SAR crew in Germany is: 1 Pilot, 1 Engineer (who operates the winch), plus rescue crew, who are normally from the local Bergwacht/Red Cross organization.

**Switzerland - Pilot Standards - Training**

In this presentation, the Swiss described that their pilots are required by national regulation, to pass a mountain course for any flying above 1100 m. This becomes an official government endorsement of the pilot's licence. In the course, under the heading Theory, pilots receive training in Weather, 'Legalities', and Behaviour Tactics. In the Practical component, they cover General (mountain flying), Winds, and Circuits. The practical test involves 20 landings and involves an average 25 hours flight time. The Swiss national standard for mountain flying includes understanding detailed formulae for Performance Evaluation Calculations, as well as a logic chart for mountain landing reconnaissance.

The chairman of the commission commented that the JAROPS has nothing like the Swiss Standard, and that he felt the Swiss regulations were way ahead in this regard.

**Swiss Heli Accident Analysis 1968 - 2000**

A paper was presented providing, among other things, the following statistics from Switzerland:

Total (serious) Accidents 1968 - 2000	314
Total Accidents involving fatalities	57
Average number of fatalities/year.	1.8

<u>Operation Type</u>	<u># Accidents</u>	<u>#Fatalities</u>	<u>% Fatals/Accident</u>
Passenger and Training flights	214	38	17%
Cargo flights	57	9	23%
Rescue flights	23	8	34% (!!)

<b><u>Pilot Experience</u></b>		
< 200 hours	73	
< 1000 hours	70	
>1000 hours	142	
<b><u>Basic Cause:</u></b>		
Skill	23	
Wire Strike	14	
Hit Mast (?)	3	
Technical (?)	6	
White-out	1	
Mechanical	7 (eg. engine)	
<b><u>Rescue Accidents:</u></b>		
Sling or Hoisting	6	
Mechanical	1	
Wire Strikes	3	
Unknown	10	

### **Canada - Pilot Testing**

This presentation described procedures to select and test pilots specifically for mountain rescue by the Canadian Parks Service in Western Canada. The helicopter services used by Parks Canada are provided by civilian air carriers. For economic reasons, fixed rope slinging is used rather than winches. Two interesting aspects of this test are the emphasis on personal suitability (judgement) in pilot selection and the inclusion of experienced rescue-men alongside the test pilot on the examining team. The number of pilots tested is limited to the number required to service each area.

Pilots must have a minimum of 2500 hours flight time prior to being tested. The test is mainly practical and consists of three components which examine:

- 1) General mountain flying ability
- 2) Slings capability
- 3) Special SAR conditions (high altitude, problematic conditions, tactics)

The entire test, which usually takes about 2 days, uses a Bell Jet Ranger.

### **Bulgaria – Helicopter Rescue**

This presentation provided an overview of helicopter rescue in Bulgaria. Bulgaria is roughly 300X400K and has mountains up to 3000M. There are two bases in Bulgaria from which helicopters are dispatched in the event of mountain rescues. One is a military base while the other is a civilian emergency base in the capital Sophia. Both employ Sokil MI-8 and MI-17 helicopters, which are mostly used to transport rescuers and for load-and-go of patients.

The Bulgarian presenter said that the Sokils can be used to rappel and sling fixed line, but that they try not to do this sort of mission in the mountains. He said their machines are getting old and are ready to be retired. As a result of this and the fact that often they cannot rely on helicopters being available, ground rescue is important. There are several hundred trained volunteer rescuers in Bulgaria, some of whom are certified to work with the helicopters.

The military considers rescue work training and provides its helicopters without charge. Civilian helicopters are hired by the Ministry of Health. Rescue services are free for tourists and citizens, so far, in Bulgaria.

### **OTHER NATIONAL PRESENTATIONS THIS YEAR**

The following are the brief highlights of the national reports for the other member states this year:

**Andorra** – Showed a video of a gondola evacuation practice using a winch equipped Astar. The rescue team consisted primarily of firemen.

**Austria** - Until this year, helicopter emergency services (HEMS) in Austria were provided by two different agencies: The Austrian Automobile Club (OAMTC) in the western half of the country (including the greater part of mountainous Austria), and in the east, by a government operated air service. In 2000, the new Minister of the Interior privatized the government air service and rolled it into the OAMTC contract. In January 2001 the OAMTC took over 8 more emergency helicopter stations, 40 more pilots, and 18 aircraft! The plans call for major renovation of the related infrastructure as well as purchase of 11 more EC135's.

**Bavaria** – Heli service used to be exclusively by army. Now they are required to use several agencies including Police helicopters. Therefore they have updated their regulations. Some of these include: all sling or winch operations must be done with trained Bergwacht personnel; they require formal briefings before each mission; mountain rescue leaders decide on utilization of heli service (ie. not the coordination centre); regs emphasise the use of experienced personnel on helicopter operations.

**Czech Republic** – The national police provide helicopter support for mountain rescue from two stations in Prague and East Bohemia, which employ 17 pilots and 68 trained rescuers (trained for helicopter missions).

**Croatia** – Military and Police helicopters are used in Croatia. They use MI 8 and Bell 206's. So far the pilots are not specially trained for mountain or rescue flying.

**Slovenia** – Has an on-call heli rescue team, including pilot, one rescuer, and a doctor, located in one base for weekends only but are pushing for full time coverage. They will be getting a winch with 76m cable. Til then they have a static rope system.

**France** – Presented a special video on the mountain rescue flight training conducted by the French Police mountain rescue service (PGHM), which happened to also highlight the work of Jean Louvet, who is retiring this year after a long, respected career as senior flight instructor at the Briancon mountain flight training centre.

**Poland** – Rescue services covered by two groups: GOPR with about 1000 volunteers and 56 professionals in seven sub-groups; and TOPR, in the Tatras organized in one group. Rescue services are provided free by the government. Sokils and MI 2's are used. Poland will be getting new Sokil helicopters soon.

**Sweden** – Sweden is about 1000k in length. There are 500 civilian mountain rescuers. Ground rescuers are organized into 10 person mobile groups. Mountain rescue is coordinated by the Swedish Police. Rescue helicopters are provided by the military.

## **EUROCOPTER INFORMATION**

These notes cover the information presented by the representative from Eurocopter who was a visiting guest at the commission proceedings this year. In point form:

- Revisions/redesign of the BK117 (EC145) are nearing completion. They feel they have solved the computer related problems. Certification in Germany however is taking a long time. They are working on certification for the new noise mitigation and autopilot technologies. Delivery of the first 30 copies of the new model is scheduled for Nov 2001 to the French Gendarmerie.

- Eurocopter feels the Fenestron technology is the future for tail rotors in the helicopter industry. They are considering Fenestron for the Squirrel either as a modification, or an entirely new model based on the Squirrel. As to why they have not adopted Fenestron for the new EC145, they explained that it was decided not to change the tail rotor design because the present tail rotor system on the 145 is already so high (and therefore safer) at this point.

## **AUGUSTA UPDATE**

For more detailed notes on the A109 Power, please see this year's IKAR Terrestrial Commission report.

## **AIR RESCUE COMMISSION RECOMMENDATIONS 2000**

### **Recommendation 1 / 2000 Restricted Air Space**

For the safety of emergency personnel, IKAR recommends that all appropriate authorities adopt firm measures to provide the immediate restriction of airspace to control air operations over emergency operation sites.

### **Recommendation 2 / 2000 Noise Abatement**

IKAR recommends to strongly focus on noise abatement solutions when designing helicopter types in order to protect the environment.

### **Recommendation 3 / 2000 Cable Detection**

In order to improve helicopter flight safety, IKAR strongly recommends that the helicopter industry adopts as a standard the implementation of active cable detection systems combined with heads-up warning devices on all helicopters.

### **Recommendation 4 / 2000 Number of Pilots / HEMS Crew Members**

IKAR recommends the deployment of a minimum number of three pilots and HEMS crew members for HEMS bases providing year-round, twenty-four hour per day service. A minimum of two pilots and HEMS crew members is necessary for day-service only situations.