

## Setting up HEMS in Saudi Arabia

FEEDBACK SAUDI ARABIA

In Issue Three's Ask the Experts section, Nidzam Norwani of National Air Services (NAS) asked how to set up a non-commercial helicopter air ambulance service in Saudi Arabia. Dr Michael Weinlich of Eurami and Patrick Fauchère from Air-Glacières respond

**Question:** We are in the midst of a research and feasibility study with regards to establishing a non-commercial air ambulance service in Saudi Arabia. The aim is to provide assistance for road traffic accidents, and we plan to establish helicopter bases in strategic places to offer such a service. Would you be able to advise us on a range of information, data, and material relevant to this project?  
**Nidzam Norwani, National Air Services**

**Michael Weinlich, Eurami**

I am more than delighted to answer the questions raised by Nidzam Norwani of NAS as I have been involved in an assessment for a proper HEMS operation in Saudi Arabia for the last three years. To better understand the necessities of HEMS operation in Saudi Arabia and the adequate configuration, we should go back in time and look at the history of air rescue in this large country. HEMS

operation in Saudi Arabia is divided into three entities. The first is the military HEMS operation, another is civil defence and the third is coming

up at the moment, the non-commercial HEMS operation. Each partner in the HEMS operation has its own task and types of helicopters. All entities closely work together with the ground ambulance forces of the Saudi Red Crescent Society (SRCA).

The military medevac forces operate Black Hawk UH 60 helicopters, and the interior is designed to pick up several trauma patients from the scene simultaneously and is not intended to fly ventilated intensive care patients from hospital to hospital. These helicopters are usually used for civilian operation in case of a mass casualty event in the desert or on the highways, such as bus accidents. As these events do not happen that often, the helicopters on a given airfield are usually called upon only every other month for such a civilian operation.

A long time ago, the civil defence department bought Kawasaki CH 47 double-rotor helicopters. These helicopters are intended for mass casualty situations, as well as extracting patients by rope. These helicopters have their

own hangars and are located close to the major cities of Saudi Arabia.

Both the Blackhawk as well the Kawasaki CH 47 have a high weight at more than 12 tons. They cannot be used within cities or in an uneven territory, such as the southwest mountain area of Saudi Arabia. As Saudi Arabia suffers from a high rate of car accidents, the guarantor, the Saudi Ministry of Health, pointed out the necessity to start a HEMS project with a commercial HEMS operation to drastically reduce the time from the scene of the accident to the hospital, which can in some cases last as long as five hours.

Three years ago, Abdul Latif Jameel Co. Ltd. (ALJ), the Toyota importer, financed two BO 105 LS A3 HEMS-configured helicopters in Jeddah. In Saudi Arabia, aviation is being formed under the rules of the Federal Aviation Administration (FAA) regulations, but there are so far no clear regulations for HEMS operations services in Saudi Arabia. At that time, it was very difficult to receive approvals from the civil aviation authorities (GACA).

Due to this and several other factors, HEMS operation in Jeddah could not get in line with the initial idea: to help trauma patients on the scene of the accident.

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Instead, the helicopters transferred patients from one hospital to the other. Finally, the initial HEMS operation provider had to give up.

At that time, EURAMI was asked by its member Dr Tarek Al-Arnous, medical director of the ambulance forces in Saudi Arabia at the Ministry of Health, to audit the HEMS operation in Jeddah and to give advice on how to improve or restart a well organised and functional HEMS service. The audit clearly showed that the major problems were a lack of adequate training for helicopter crews, maintenance staff and the medical team to perform proper HEMS missions according to international standards. The major advice to the Ministry of Health was to use state-of-the-art helicopters to cope with the heat and the large distances (typically about 10 times the distance in central Europe) and to implement adequate training for all parts of the HEMS operation. This advice was not followed; when a local aviation company took over the HEMS missions, this ended in a tragic accident with all three HEMS crew members dead.

After H.R.H. Prince Faisal Bin Abdullah Al Saud became president of the Saudi Red Crescent Society, he highlighted the necessity for his country to continue the



implementation of an adequate HEMS system in Saudi Arabia and to learn from the previous situations and mistakes. The presidents of the Saudi Red Crescent Society and EURAMI signed a memorandum of understanding during a meeting in Saudi Arabia in the middle of 2007. In alignment with the statutes of EURAMI, the Saudi Red Crescent Society was supported in their activities with a detailed assessment that showed which kind of HEMS operation is useful in Saudi Arabia and how it can be implemented into the existing rescue forces infrastructure.

The outcome was quite promising after an assessment in the Asir region. Plenty of well trained military helicopter pilots, mostly trained in the US, are available in Saudi Arabia. Maintenance infrastructures for helicopters are steadily improving to allow safe and continuous HEMS missions. In the medical field, standardised courses like ATLS and ACLS are common and provide a good basis for adequate and fast treatment of patients.

Concerning the type of helicopters recommended, it should clearly be a midsize helicopter in the range of 3.5 tons with dual engines. These helicopters can land at designated landing sites within a city, as it is not useful to land them on the inner city streets, as the public is not yet prepared for and aware of this new situation – the landing of a HEMS helicopter. As the distances are very far and the centres of



excellence are usually located within the major cities, intensive care transportation should be included into the HEMS



André Kanweith

BO105 in service for DRF

system. Therefore, adequate medical equipment, including an intensive care respirator, has to be implemented as standard. We found that EURAMI HEMS standards adequately fit the local situation and should be considered as a guide line for the development of further activities. Due to the special situation in Saudi Arabia, with a sandy environment, and in coastal areas with a high amount of salt in the air, maintenance costs will clearly be high if compared to a typical American or European location. We estimated the initial costs to be about €10 million for the first year, including the purchase of the helicopter. For each planned station in Saudi Arabia, a local audit and assessment has to be performed to be sure about the adequate make and model of aircraft for the specific region and a location / base for the helicopter, for instance at an airport with a hangar or a hospital with the adequate environment for the helicopter, has to be evaluated and located before announcing a recommendation accordingly. In addition, all people involved in HEMS operations have to be thoroughly trained, including

all of the ground rescue forces, on how to deal with a helicopter – or better said how to handle a HEMS mission from A to Z. Finally, the hospitals and the emergency room staff need training to ensure that they do not waste time performing the final therapy (of the HEMS mission) for the patient. A major conclusion of our assessment for the implementation of HEMS operation in Saudi Arabia was the clear benefit for any severely injured or sick patient in more remote areas. As we know from a study by Clark et al, the mortality of trauma patients increases by 1 per cent every three minutes. One can easily calculate a time benefit of about one hour for trauma patients in Saudi Arabia. This large improvement and survival

maintenance costs will clearly be high if compared to a typical American or European location

rate with HEMS operations can be explained by the lack of ground ambulance in remote desert areas between the cities or on the highways.

### Patrick Fauchère, Air-Glaciers SA

Finance is the most important element. Every decision will depend on finance, from the type and number of machines, to the number of crew and personnel, facilities, etc; look for the management courses at the HAI for strategies and management. What personnel are required to operate a HEMS service depends on the size of the company. For a small company, a pilot, HEMS

crew member, doctor, paramedic, engineer, base manager, accountable manager, and secretary may be enough. For a larger company, or with more bases, more personnel may be needed to fulfil National Aviation Authorities (NAA) requirements, such as a flight operations manager, safety officer, quality manager, ground operations manager, maintenance chief, crew trainer, etc.

All flight-related personnel can be trained in different courses from worldwide providers, like the Helicopter Association International (HAI), International Flight Services Association (IFSA), or appropriate flight schools. The organisational structure you opt for will depend on the number of bases and helicopters you operate. Essential medical equipment to kit out a helicopter as an

ambulance includes an oxygen system, an oxymeter, a ventilator

unit, a monitoring system for resuscitation, a defibrillator, an ECG monitor (with Spo2, ETC02, etc.), a suction unit such as those provided by Laerdal, and an IV push pressure infusor. Communication equipment is essential, and I would suggest asking your local partner what kind of frequency they use in order to co-ordinate your buy. At Air-Glaciers, we have FM radios and direct contact with the hospital through FM. Also we have direct FM contact with the police and firefighters on other frequencies. An aeronautical communication specialist will be able to provide more information and prices.

## WAYPOINTS

### Aeromedical helicopters

helped to rescue over 150 patients affected by Hurricanes Gustav and Ike in the US, utilising more than 60 helicopters and fixed-wing aircraft, although it was noted that there remain areas for improvement in terms of co-ordinating care.

### The Australian Capital

Territory government has signed an agreement with its New South Wales counterpart to keep the SouthCare rescue helicopter in action. The deal will keep the service running for the next five years.

### Exxon Mobil has donated

\$500,000 to St Mary's CareFlight programme to help the hospital expand its landing pad and aircraft hangar. The critical care organisation serves western Colorado and eastern Utah, US.

### Luxembourg Air Rescue gained

3,000 members in the first six months of the year, bringing the total number of members to 175,000.

### Northwest Texas Hospital

has conducted a ceremony to introduce Lifestar's new EC135 helicopter, the second chopper the hospital operates. The US hospital also recently celebrated its 15-year anniversary of Lifestar.

### Helicopter Specialities, Inc.

is to provide completions of two Eurocopter EC145 helicopters to the Milwaukee Regional Medical Centre Flight for Life transport system, US. The new choppers add to the existing pair of two BK117s.

### Canada's Alberta Shock

Trauma Air Society (STARS) has purchased two new AW139 helicopters, and has taken delivery of the first one. The chopper has also been fitted with a hoist.

### A lawsuit filed against the

University of Michigan, US by the former operator of its Survival Flight aircraft has been settled, although neither side was willing to disclose details of the settlement.



Dr Michael Weinlich is a general surgeon and a chief emergency physician in Germany. He has been in the rescue field for over a decade and was flight physician for a helicopter rescue service based in Stuttgart, Germany. Since 2000, he has been president of EURAMI (European Aeromedical Institute), which has successfully implemented a worldwide accreditation standard in air rescue.



Patrick Fauchère is pilot and flight safety officer for Air-Glaciers SA in Sion, Switzerland with around 8,500 helicopter flight hours in mountain environments. He is chairman of the International Committee for Alpine Rescue's Air Rescue Commission, a Swiss delegate at the European Helicopter Safety Analysis Team and the European Helicopter Association, and a member of various working groups within the Swiss Helicopter Association.