

Let's get started!



Day 4



Stretcher tag line lift



Single man lift



The San Diego Regional Fire and Rescue Helicopter Program Starts Off With Helicopter Hoist Training

by Michael R. Mitchell

Photos courtesy of Michael R. Mitchell

On June 23rd 2003, the San Diego Fire and Rescue Helicopter Program started operational hoist training, and on July 1 they went live. While they had the helicopter last year, 2003 marks the first year that the program had a rescue hoist capability. Captain Brian Fennessy, who worked for over six years to get the program to this point, was one of only two San Diego wildland firefighters qualified to operate the hoist. The start of the training was the culmination of over two years of communication and coordination between Brian and myself, Michael R. Mitchell, President of Zephyr International, in order to select the appropriate hoist and arrange the best suitable training program. This program is completely funded by private donations and supported by local industries.

The Kachina Bell 212 helicopter was outfitted with a Goodrich model 42305-3 rescue-hoist, provided by Goodrich under a special arrangement, specifically for this program. The hoist is internally mounted and can lift up to six hundred pounds of human payload and rotate them into the cabin. The rotation capability is a feature that is highly valued by a rescue crew conducting an external human load mission.

Prior to the actual operational hoist training, the Kachina facility maintenance crew, who had successfully completed the maintenance training provided by Zephyr International, installed the hoist in Boise, Idaho. The inclusion of the maintenance training demonstrates the importance the San Diego Regional Fire and Rescue Authority places on the proper operation and maintenance of this critical piece of equipment. The Zephyr maintenance training lasted three days. On day one, the technicians were trained on the inner workings of the 42305-3 hoist rescue system. Day two was spent installing the hoist and going through all the maintenance requirements which are essential at set up, for achieving optimal performance and safely and economically maintaining the equipment. Each person involved in the training program received hands-on

training on all the maintenance procedures. The third day was dedicated entirely to the construction and behavior of the hoist wire rope; which is the most important and critical component of the hoist system and about which there is much to learn. The details of its inspection and rejection criteria were thoroughly briefed to the technicians who are responsible for maintaining the rescue hoist along with the rest of the aircraft. At the end of the maintenance training, the technicians had a new awareness of the unique role and critical function that the rescue hoist and wire rope cable play in the total aircraft rescue system.

Following the maintenance training in Idaho, the Bell 212 was flown to San Diego for the hoist operations training which lasted seven days and was conducted by Helicopter Rescue Consult (HRC), Managing Director, Werner Greipl. Greipl is a mountain rescue expert, aeronautical engineer, helicopter pilot, and an experienced hoist training expert and practitioner. Hoist operations training began with two days of classroom education, in which HRC provided a complete operating philosophy and manual that was tailored to the customer's helicopter and hoist rescue system.

Day one covered basic hoist education, how the hoist works, and how it interfaces with the helicopter. They also examined the HRC hoist operation philosophy, which is to minimize time in the "dead-mans curve," if possible, and how to operate when it is not possible. Crew coordination and communication, static electricity discharge, and emergency operations were also discussed. The trainees for day one consisted of two crew chiefs and three pilots. Day two classroom training included weight and balance calculations, power availability and pressure altitude, the different types and placement of equipment depending on the mission, preflight planning, communications, and rescue equipment basics. In addition to day one trainees, the day two training included the firefighters and paramedics who would be the down wire rescuers.

Flight training began on day three. Each pilot and crew chief was required to fly basic hoist operations with a dummy load. The assignment was to try to put the load on a specific location. This develops the necessary skills needed for the hoist operators to perform various tasks in combination: talking the pilot in, running the hoist, and getting a feel for the hoist response, all while trying to minimize the amount of time in a hover. Thirty-five hoist cycles were performed on day three. During that day, the crews began to get the feel of the system and during the post flight briefing when the crews were shown the video from the hoist boom head it became clear that controlling the helicopter hoist system was not as easy as it looks on TV.

Day four was spent flying and practicing emergency procedures: wildly swinging loads, lost communications, and one engine inoperative hoist recovery. This was the most stressful day for the trainers and trainees. Each mission profile was thoroughly briefed beforehand and all participants had a say in the way the mission would be executed. At the end of the day, the hoist operators demonstrated the ability to control a swinging load, and continue



Going over the hoist details on ground



Getting the media's attention



Brian Fennessey addressing supporters of the program



San Diego Rescue 1 Trainees, from top down to the right: Julie, Harold, Brian, Wayne, Werner, Joe, Greg, Lyle, Unknown Victim, Spanky, Dennis, Bob, Bill, Derek, Mike not shown



the hoist mission after a communication drop out. The pilots and the hoist operators experienced the feeling of rapid altitude loss and flying away while the load was retracted and controlled as fast as possible. Twenty-one hoist cycles were performed on this day.

Day five was the start of the live lifts and all the firefighters and paramedics went through ground training on the procedures and equipment that would be used that day. The day's activities were to be single-person lifts, and later double-person lifts. We were able to complete twelve single-person lifts before one of the generators on the aircraft failed, forcing us to reconvene to the classroom; where the litter bag equipment, the operations using a tag-line, and the fly away method of litter hoisting were briefed. Later that afternoon the generator was repaired, enabling us to start flying again the next day.

Day six began where we left off the day before. Fourteen more single-person lifts, thirteen double-person lifts, and twelve stretcher operations were performed. At the end of the day all the trainees were demonstrating first-rate skills at their jobs.

Day seven activities included three simulated rescue missions. In each case a victim was flown into the surrounding hills and instructed on the nature of injury they were to simulate. The victim then was hoisted down in order to perform the simulation and the location was totally up to the victim to choose. In the mean-

time, the helicopter returned to base where the rescue crew waited for the simulated emergency call. The crew was tasked with executing the entire mission with minimal intervention by the trainers.

We then had the opportunity to fly two more rescue scenarios. I was to be the simulated victim on the next mission and my simulated injury was to be a spinal injury. Once hoisted down, I decided on a sunny spot on a hill between two trees and next to a large bush. A paramedic was hoisted down to ascertain my condition. Once he stabilized me, he requested the backboard and the litter. As the helicopter approached again, another paramedic was hoisted down with the backboard and the litterbag. I was strapped to the backboard and the paramedics discussed their options for hoisting me out. The helicopter returned and hoisted up the first paramedic, then orbited and returned to double hoist the paramedic and myself still inside the litterbag. Due to the position I was in and being at the bottom of a gully between two trees, a tag line hoist was not feasible. Soon after the helicopter got us off the ground, I realized we were hung up in the big bush just uphill from where I had fallen.

The helicopter quickly backed us out and all I could see was the cable out in front of my face and the helicopter above me. What I didn't know or feel was that we were already in forward flight and the litter was flying without rotation as a result of the

clean air we were in. I watched that cable carefully, every couple of seconds it would rotate very quickly and then stop as the twist was forced down the cable by the hoist action. Without a properly maintained hook bearing, that litter would have been spinning as a result of the cable twisting. I breathed a sigh of relief as the hoist began rotating into the cabin; the total hoisting time probably took less than two minutes. Once they secured me into the cabin, I realized we were already landing. The paramedics quickly lifted me out of the ship and while I looked up at the rotor blades off to my right, they opened the bag and I realized they had flown back to the base, a distance of at least three miles while they were completing the lift. Not only did they prevent the load from spinning, but they also minimized the total transport time. During the mission debriefing the point was made to try to move the victim away from obstacles whenever possible, such as the bush we encountered.

Finally the last mission was flown; it was a rock face pick-off using the triangle. The triangle looks like a diaper but is fast and easy to attach to a victim. The mission was a success and we then returned to the airport for a written test, which every trainee is required to complete at the end of the course. Everyone passed.

After each flight the hoist was given a thorough post flight inspection and the Kachina maintenance crew expertly maintained the helicopter. Each trainee received a certificate acknowledging that they had received the HRC Training Program and demonstrated proficiency in their roles.

For the San Diego Fire and Rescue Helicopter Program Team it was just the beginning of further training in order to be the best they can be, so that they will be prepared when the next real call for a helicopter hoist emergency mission comes in. **R**

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