CAA Approved Helicopter Simultation at HFT

Helicopter Flight Training (HFT) at Ardmore has just received CAA Approval for their in-house developed Bell 206FX simulator. It's an impressive piece of work, utilising an actual Bell 206 cockpit in a dedicated room with wrap around visuals and realistic sound. Flying the sim is an immersive experience with more than a few candidates working up quite a sweat trying to deal with whatever difficult situation their Instructor has just placed them in.

PICTURE THIS: A pilot is completing the final approach to an off-shore oil rig and has just received the weather for the deck surface. The atmosphere in the cockpit is serious. Checks for wind direction and strength, available power, and a confirmation the pad was clear with lifting cranes locked and stowed away from approach and departure paths, all signalled to the pilot that he was cleared to land. Approaching the heli-deck – almost 200 feet above the ocean surface, the helicopter experienced wind buffeting off the superstructure. Control changes needed to be smooth to maintain a stable approach. Finally positioned over the deck he settled down on to the large 'H' and lowered the collective - a successful flight completed. The pilot relaxed and said to the 'back seater', "It certainly was easier this time; I could appreciate the power requirements and the constant angle approach, especially in the last part of the arrival."

In the 206FX Simulator at Helicopter Flight Training. CAA approved for 20hrs of instrument training towards an IFR qualification, the sim also provides a safe and efficient means of instilling good habits and training pilots to recover from difficult and high risk situations.

The 'back seater' was Jon Keller, HFT's lead Simulator Instructor. Jon is a B category Instructor with HFT and was a key part of the Bell 206FX simulator development programme. He led HFT's research into helicopter simulation worldwide over two years, visiting and testing several of the major European and USA manufacturers' offerings. CEO of HFT, Phill Maguire says that as they learned of the various packages available and how these could be matched to specific training roles, it did become apparent that much of the fidelity was possibly able to be improved on.

A decision was then made to develop an in-house simulator at HFT's Ardmore base, and a team started work to bring the best of the attributes they had seen on existing helicopter simulators, but with vastly improved visual and instrument reality. The Bell 206FX is the result of their endeavours and is fully IFR capable, with visual and audio environments that create 'real-time' task-driven scenarios.

The 206FX has been created to train helicopter pilots at various stages of their training. Through specially developed 'Vista-screen' technology, pilots can perfect a wide range of flying tasks and the simulator is now included in HFT's full range of training courses for PPL, CPL, Instrument ratings, Night ratings and initial Turbine Ratings. There is even a Night Vision Goggles (NVG) module.

"A simulator is perfect for developing skills and good habits." said Keller when KiwiFlyer visited. "Our international research showed that even at the PPL stage, students are able to capture critical learning events without ever leaving the ground". A host of environmental conditions can be adjusted by the Instructor to include weather, lighting variations, wind, and any combination thereof. Even the simplest of everyday occurrences adds realism to the experience, such as a fluttering windsock or a vehicle driving past the boundary fence at the Airport. "We can create thunderstorms, and when it has the thunderstorms, you can actually hear the thunder," Jon said. "You can see the lightning flashes and the approach of CBs."

Jon is a subject matter expert who actually helped in the design of the Bell 206FX simulator. Along with software from Lockheed-Martin, he has developed a photo-realistic model of HFT's base Airport, Ardmore. This entailed low level multiple high resolution photography from a helicopter that was then bundled into a visual platform. The results are impressive.

The experience goes beyond what the pilot or other crew member might see during the simulated flight. Air traffic control or Christchurch information can be simulated 'live', which raises pilot workload closer to reality. Jon says the helicopter can easily be configured to operate at max all up weight which is what trainee pilots need to experience in order to properly understand the characteristics and limitations of the aircraft.

He adds that "The simulator is good for a number of other reasons regarding safety, efficiency and flexibility. It eliminates the need to schedule an actual helicopter, saving on fuel and other operating costs, and it lessens many of the risks faced during real flights. Marginal or non-flyable weather outside does not affect the progression of training in the simulator and this can allow us to keep a pilot on track in the course without having to use blade time. The simulator allows for easy training on flights that would take much more planning and coordination otherwise."

Phill says that HFT is New Zealand's only Helicopter IFR pilot training organisation, explaining that an Instrument rating requires 40 hours instrument flying time and that HFT's simulator has CAA approval for up to 20 hours of instrument training towards the qualification.

Dan O'Reilly who is a captain with NEST on the S76 based in Whangarei, is an IFR Instructor on the Bell 206FX and created much of the syllabus and training profile 'foot-print' that is used by HFT during the instrument rating course. "This allows us to train on IFR tasks that we don't get a chance to do normally." Dan said, adding "We're able to do this more efficiently, with no ATC delays getting an Airways clearance, approach times or holding due to other traffic. We can quickly build a pilot's instrument flying scan and operating disciplines and we don't have to use blade time to do that. When compared to the costs of training in the actual helicopter, the simulator is only 20% of that".

Dan says he thinks the simulator is fantastic; "You'd be surprised how many similarities there are between this and the real helicopter. You can achieve so much over the various phases of the instrument rating and build confidence and competency with a pilot."

Night flying and the inherent risks involved for helicopter operations are well provided for in the night training program. Dan explains that "We introduce the basic instrument panel skills, then build on the importance of the various performance instruments. The night visuals are amazingly realistic - we can create various night skies and of course build in the odd passing rain shower to make things a little interesting."

HFT have made a significant investment in the 206FX and consider simulation training to be an important part of the helicopter aviation sector. It allows pilots to learn in a realistic environment, with high training values and is a cost effective solution to improving both their qualifications and their competencies. There is particular value for all pilots to experience simulated inadvertent flight into IMC and loss of visual reference. This high risk situation is one that many pilots have a poor ability to recover from should it ever happen. Simulation training is a safe way towards providing the basic skills for a pilot to carry out the correct actions and recover from the event.

Phill says that in most developed countries, use of NVG's also requires the pilot to hold an instrument rating, though NZCAA does not require this at present. Dan comments that "It would add a great deal to the capabilities of any operation where using NVG's is required to also hold the instrument rating". The 206FX provides full NVG scenario's and permits use of sophisticated terrain modules aimed at SAR, EMS and Police operations.

HFT expects that requirements for currency and associated simulator time will grow with the establishment and advancement of Safety Management Systems (SMS) and 'threat and error' protocols. The Bell 206FX certainly has the potential to contribute strongly towards the continuous improvement of training and safety standards that is expected in the emergency sector and in all training operations.

HFT welcomes any pilot considering either an Instrument rating, or wanting to simply experience a wide range of challenging helicopter scenarios as part of their career development, to contact them on 09 299 1157, email Phill directly at: gm@hft.school.nz or visit **www.hft.school.nz**

Helicopter Flight Training