



Rotorbreeze®

A Textron Company

July 2007 • Vol. 56 No. 2



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PATH TO PREMIER

Michael D. Blake

**Sr. Vice President
Commercial Business Unit
EVP Programs**

SAFETY

Recently, a Bell team attended the European Helicopter Operator's Conference in Budapest, Hungary where the theme was "Helicopter Safety – The Next Level." The event provided many venues for us to discuss helicopter safety, regulatory and operations issues. Fleet/Flight Data Management, Cockpit Noise/Vibrations, training, and relationship building with major offshore operators and customers, were also major discussion items throughout this safety conference. Safety is the offshore operator's number one priority, and improved training is recognized as a necessary means to achieve the International Helicopter Safety Team (IHST) goal of an 80% reduction in helicopter accidents over the next ten years.

COMMITMENT

Dick Millman spoke recently of the particular importance of Bell's opportunity for substantial growth, and how Bell is also a significant growth driver for all of Textron. His quote, "We must meet customer expectations and financial obligations; safely deliver quality products and services on time and within cost parameters; all the while living up to our values" is at the very heart of Bell's vision of rising to become *Premier*. Dick made another important point "... specifically achieving ... key objectives by keeping ... promises to our customers and to each other and doing it in a way that makes others successful." This idea must be the vanguard of everything we do to give best value to the customers who buy our products, Textron shareholders, and ultimately to Bell Helicopter and all our employees worldwide.



COMPLIANCE

This must be done by strict adherence to our proven processes, continuous improvement of processes and procedures to sustain our continued growth, and strenuous compliance with the laws and regulations that affect our individual jobs. Repeatable processes help make all our jobs easier and our products better. Lives depend on our compliance and ethical behavior! What happens at Bell in the next few years will dictate how easy or rough the road to *Premier* will be. Compliance and ethical behavior are the foundation of that journey.

As an example of cooperative compliance among a varied group of participants, on May 23, 2007, the Polar First Team was welcomed back to their launch position after completing a successful flight around the world, pole-to-pole, in a Bell 407 helicopter. Jennifer Murray and Colin Bodill flew their aircraft through 34 countries and covered more than 36,000 miles in 189 days. The Bell Helicopter network of Customer Service Representatives (CSRs), Customer Service Facilities (CSFs) and Bell Independent Representatives around the world were utilized to provide their world-renowned maintenance services to support the trip. We are grateful for the safe return of these two aviation pioneers and proud of the significant role our 407 played in this historic mission.

CUSTOMER SATISFACTION

In the near future, several pivotal events will occur that will help gauge how successful we have been in meeting customer expectations, both for our operators and the war effort. We have the 429 and 609 currently in flight test and evaluation,

and soon in the hands of our customers. We are also putting the V-22 into the fight for the Marines and the Air Force, the ARH-70A for the Army, the AH-1Z and UH-1Y for the Marines, and the VH-71 Presidential Helicopter.

Bell is constantly striving to become better at what we do. The professionalism and can-do attitude of Bell's workforce is exceptional. We know the job is getting tougher and our competition is fierce. We support a fleet of over 13,000 aircraft, with dwindling numbers of pilots to fly them. A listing of all the projects, in addition to the amount of investment and effort Bell and Textron are making to make our customers more successful, would be extensive. Our fill-rate for customer spares is up 6% in just over a year, for our Day 1 target. Delivery of commercial aircraft to contracted dates has improved substantially, and is getting better. Delivery of V-22 aircraft to the customer has met contractual deliveries now 2 years in a row. Deliveries of OH-58D SEP aircraft are routinely 4-6 weeks ahead of schedule.

Safety, Commitment, Compliance, Ethical Behavior and Customer Satisfaction are not just words in Webster's Dictionary or in the vocabulary of Bell employees... they are at the heart and soul of everything we do. Everyone knows that lives depend on the very meaning of these words!

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Telephone: (817) 280-8779

E-mail:

mdewey@bellhelicopter.textron.com

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EDITORIAL STAFF

Michael Dewey, *Editor*

ADVISORY COMMITTEE

Jack Denham

Ex. Director Product Support

Leslie Ferry

Business Development Marketing Mgr.

Mark Kocurek

Business Development Regional Manager; North America

Andy Kelley

Product Support Engineering

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V-22 OSPREY GETS ITS FLYING ORDERS

By Dave Montgomery, *Star-Telegram* Washington Bureau

WASHINGTON – The Bell-Boeing V-22 Osprey got its orders for combat on Friday and will be dispatched into Iraq in September for seven months for various missions, including transporting Marines and equipment.

The deployment was announced by Gen. James T. Conway, commandant of the Marine Corps, and Lt. Gen. John Castellaw, deputy commandant. Castellaw called it “a big day for the Marine Corps, and a big day for those Marines who are in harm’s way.” The V-22s will be based at the Al-Assad Marine Corps air station in the Anbar province in northeastern Iraq.

The first combat deployment of the controversial tiltrotor aircraft will fall to pilots of a hand-picked Marine Corps Squadron known as the Thunder Chickens.

Officially called Marine Medium Tiltrotor Squadron 263, or VMM 263, the unit is based at the New River Marine Corps Air Station, N.C., and has been in combat training for just over a year, even though its members were unsure of their ultimate destination until Friday.

Supporters of the aircraft hailed the announcement as a turning point in the oft-turbulent history of the V-22 and an opportunity to perform the missions for which it was designed. After the announcement, members of the news media were taken to Quantico, Va., for a test ride aboard an Osprey.

“This is one of the most important events in the history of the program,” Bell spokesman Bob Leder said. “We’re very enthusiastic.” The \$71-million-a-copy aircraft, co-produced by Bell Helicopter Textron of Fort Worth and Boeing Rotorcraft Systems in Ridley Township, Pa., takes off and lands like a helicopter and flies like an

airplane, reaching speeds and distances well beyond those of traditional helicopters.

But the aircraft program at times has struggled to survive and was grounded for 18 months after two fatal crashes in 2000. Critics continue to question its suitability for combat, but the Pentagon announcement on Friday constituted an unqualified endorsement of its air-worthiness after an extensive redesign and more than 19,000 hours of flight tests.

The squadron will have 10 aircraft and 171 officers and Marines, including 28 pilots.

As a replacement for Vietnam-era

women, all volunteered and were chosen by a Marine Corps selection board. The unit commander is Lt. Col. Paul J. Rock Jr., who goes by the call sign “Rocket” and has been flying V-22s since the late 1990s.

“They’re anxious to show the American public what this Osprey can do,” Cpl. Brandon Gale, the unit spokesman, said Thursday as the Thunder Chickens awaited news on where they would be deployed.

VMM 263 is only a year old, but it descends from the original Thunder Chickens helicopter squadron, the HMM 263, that dates back to the Korean War era. The predecessor squadron and its fleet of CH-46 “Sea Knight” helicopters were phased out last year to make way for the new tiltrotor unit, which was commissioned on March 3. Eventually all six CH-46 squadrons at New River will become tiltrotor units.

The colorful nickname was passed down from the predecessor squadron. According to unit lore, the squadron was initially called the Thunder Eagles, but the name got mis-translated in Vietnam and

the new moniker stuck.

The Thunder Chickens roster includes the first woman to pilot an MV-22 – Capt. Elizabeth Okoreeh-Baah, a seasoned CH-46 pilot who transferred from the decommissioned HMM 263 squadron. The squadron’s other woman aviator is First Lt. Sara Faibisoff, of Lake Havasu City, Ariz.

Thunder Chicken crews have worked with Marines troops at neighboring Camp Lejeune to simulate combat exercises. They also spent a stint at Yuma, Ariz., to prepare for combat in a desert environment.



helicopters, the V-22 – known as an MV-22 in the Marine Corps – is designed to ferry 24 Marines at a time or haul up to 20,000 pounds of cargo at up to 330 mph.

The aircraft is assembled at a Bell plant in Amarillo, with components from Bell plants in Fort Worth and the Boeing facility in the Philadelphia area. The Marines plan to buy 360 V-22s. The Navy is slated for 48 and the Air Force Special Operations Command will buy 50.

Flying an Osprey is considered an elite assignment. The Thunder Chickens’ 25 pilots, including two

ARH-70A CONTINUES DEVELOPMENT

The Armed Reconnaissance Helicopter (ARH) Program continues to accomplish critical events during the System Development and Demonstration (SDD) phase.

Commenting on the progress of the program, Bell President and CEO Dick Millman noted, "We recently completed two significant events in support of a Milestone C (Low Rate Initial Production) decision. These are critical paths to the successful fielding of the ARH-70A. The Bell and Army Teams have worked closely over the life of the ARH Program to bring it to this point. Overall the aircraft is performing well and receiving many positive comments from the Army/Bell test pilot team. I'm pleased to announce that the U.S. Army has notified us that Bell will continue the development and production of the Armed Reconnaissance Helicopter program. Last week the Army evaluated our proposal for the path forward for the ARH-70A. After review, Army officials believe that the ARH is the best aircraft for the war fighter. It is now our responsibility to deliver this important product to help our young men and women in harms way. We will do it!"

Recently completed events include a demonstration of the ARH digital battlefield capabilities to a representative from the Department of Defense. The demonstration was conducted from the ARH Mobile Systems Integration Laboratory (SIL) at the Bell XworX facility in Arlington, Texas.

The ARH SIL was connected over the tactical internet (Blue Force Tracker/L-band) with CH-47F, UH-60M, OH-58D platform SILs using the Force XXI Battle Command Brigade and Below (FBCB2) located in Huntsville, Ala.. The event confirmed that the ARH-70A meets the threshold criteria of the Army's Net Ready Key Performance Parameter (KPP).

The second Milestone C pre-requisite event, the Early User Test (EUT) was completed on April 25 at the Joint Reserve Base in Fort Worth, Texas. The Army's requirement is for an ARH-70A to be flight-ready within 15 minutes of arrival in a transport aircraft like the Air Force's C-130 Hercules or C-17 Globemaster III.

The event, conducted by the Army Test and Evaluation Command, evaluated an Army Load Team's ability to prepare two ARH-70As for transport, load them in a C-130, download and prepare for flight. Loading preparations include folding the blades and stowing the Target Acquisition Sensor Suite (TASS).

All timed trials were successful and the Army team achieved an exceptional "download flight-ready" time of less than 13, against the 15-minute requirement. This capability allows commanders to rapidly shift assets in theater. A third Milestone C prerequisite event, a Limited User Test (LUT), is tentatively set for late 2007.

ARH flight testing continues with system development and integration. To date, the ARH Program has completed nearly 600 flight test hours. System Design and Development (SDD) aircraft No. 1 leads with over 100 flight hours. It has reached a ceiling up to 14,000 feet and flight envelope expansion with external stores. The Honeywell HTS900-2 engine has successfully completed over 125 hours of flight testing and continues to demonstrate exceptional performance.



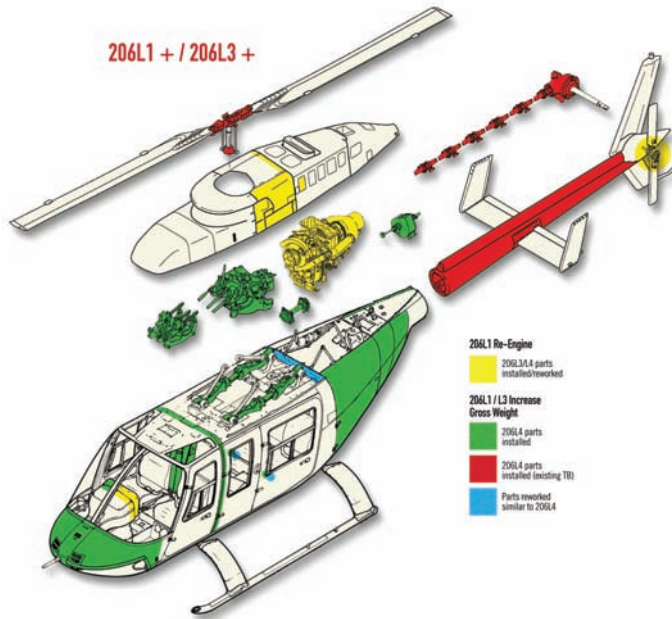
The 206L1 and 206L3 helicopters have been flying for more than 30 years, setting the performance standards for the single turbine light helicopters. Today, over 1,000 of these dependable Bell products are flying in over 60 countries around the world.

To meet the ever increasing demand for vertical lift aircraft, Bell Helicopter Textron Inc. has designed an Upgrade Program for the 206L1 and 206L3 helicopters to provide our customers with increased performance, improved reliability, and decreased operating costs.

The LongRanger Upgrade Program is based upon the proven 206L4 design, utilizing slightly modified 206L1 / 206L3 airframes and production parts from the current 206L4 program. Because every part of the Upgrade Kit is currently in production, this low risk development will assure our customers ready parts supply with many more years of continuous service.

206L Upgrade Program

By Mark Kocurek
Business Development Manager

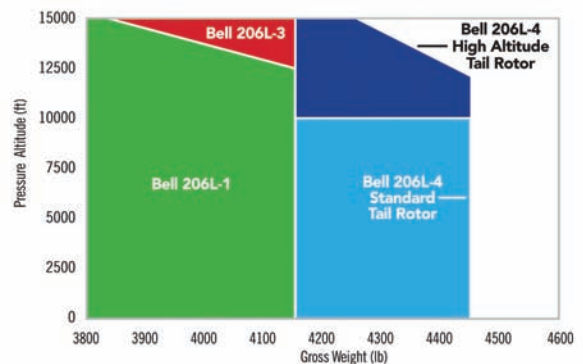


Reliability improvements introduced with this upgrade:

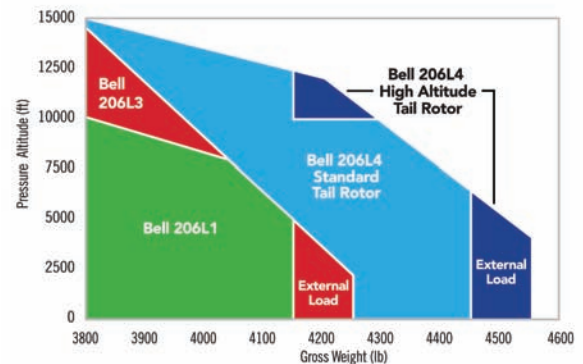
- Tail Rotor gearbox input seals
- Free wheel input seal
- Riveted, Segmented Tail Rotor Drive Shafts
- K-flex transmission to engine drive shaft
- Improved Mast Assembly and Swashplate Assembly
- Increased power rating of the 206L4 transmission without TBO penalties

Improved performance is achieved by upgrading the dynamic components to 206L4 configuration, strengthening critical airframe areas and on the 206L1s, replacing the Rolls Royce 250-C28 engine with the improved performance of the Rolls-Royce 250-C30P. These improvements provide a maximum gross weight of 4450 lb. (2018 kg.), an increased transmission take-off Power Rating to 490 shp (365 kw), and improved standard day hover performance.

IGE Hover Gross Weight Comparison
Standard Conditions



OGE Hover Gross Weight Comparison
Standard Conditions



- ENHANCED AIRCRAFT PERFORMANCE
 - Increased Gross Weight of 300 lb.
 - Replacement of Rolls Royce 250-C28 engine
 - Enable High Altitude Tail Rotor kit installation
- INCREASED OPERATIONAL EFFICIENCIES
 - Reduction of DOC
 - Standardized Fleet Configuration
 - Streamlined Supply of Spare Parts

(Continued on page 9)

RELY on Relays?

By Bierck Saxton II
Product Support Engineer
Armament, Electrical and Avionics

Almost every helicopter and aircraft configuration is fitted with electrical power interruption relays. At the flick of a switch, or in some cases automatically, electrical power relays open and close circuits to and from the electrical power generating unit, which can be anything from a fifty KVA three phase AC generator to a twelve-volt alternator. Relays also control current to many high amperage accessories such as the battery, starter, fans, lights, electrical actuators, hydraulic pumps and air conditioning units, to name just a few. When all is working fine, the engine starts, the lights turn on, landing gear extends and retracts, passengers are comfortable and pilots can see and be seen. Failure of these relays can cause any number of conditions ranging from delayed or cancelled flights, smoke in the cockpit or, in extreme cases, in-flight fires.

Most relays are electromechanically operated using a plunger type solenoid. When a "close" signal is applied to the relay close circuit, the plunger is pulled down with enough force to overcome the spring tension that holds the contacts in the open position and is held in the closed position by a magnetic latching circuit (*Figure 1*). The plunger movement pulls the moveable contacts to the stationary contacts, closing the circuit and actuating any auxiliary switches that are incorporated into the unit. Relays can have as few as one auxiliary switch to as many as ten or more. These low current switches can operate anything from the latching circuit to cockpit annunciator lights. The movable contacts assemblies in the relay are usually made up of a conductor, composed of solid copper or bronze, fitted with a silver alloy button on one side that makes contact with a stationary bus bar. This bus bar usually consists of a contact button surface at one end and a threaded stud on the other end for fastening securely to the power or load source.

Every time a relay opens or closes, an electrical arc is produced between the moveable and stationary silver alloy contacts, causing wear and pitting between the two contact mating surfaces. This continual opening and closing produces carbon and metal particles, which causes resistance between the contact surfaces. Because of this accumulation of carbon and metal particles, resistance builds at or near the contact mating surfaces, thereby creating heat. The hotter the contacts become, the more susceptible they are to arcing, ultimately leading to meltdown and failure (*Figure 2*). Damaged or shorted auxiliary switches, poor relay ground connection and loose or damaged terminal connections can also be reasons for replacement. Also, faulty components controlled by the relay, such as a shorted motor or starter generator, can draw more amps than the relay is rated for, causing premature failure. There can also be false indications of a failed relay such as an opened or shorted circuit, or component downstream such as frayed wire insulation, a shorted or open

circuit or even an inoperative cockpit annunciator panel light. As stated before, relay failures can cause many problems. For example: If a 28 volt helicopter turbine engine starter generator relay fails in the open position, the starter will not turn the engine. If it fails in the closed position (contacts fused together due to meltdown), the starter will turn as soon as the battery switch is turned on.

Worn and pitted contacts will create resistance in the circuit, producing lower voltage under load. Low voltage will cause the load component to require more amperage to accomplish the same task and in some cases, will overload the circuit or power source (battery or generator), melt wiring, or ultimately damage the component. The same is true for AC three-phase power relays and contactors, except in this case, one or more phases can be faulty due to high resistance or an open phase. If a three-phase component such as a fan, avionics component or even a de-icing system experiences an open phase during operation, failure of the system or component can occur.

Most of the problems described above are due to extended unit time/cycles. Not more than just a few years ago, most relay maintenance was on an "on condition" basis. but due to a number of recent incidents such as smoke in the cockpit, canceled flights, fires and burned out components, most major corporate fleets are re-evaluating relay maintenance procedures. One major airline conducted a survey whereas their maintenance department disassembled and inspected their entire fleet of aircraft power relays according to the component maintenance manual and found every one of the contacts, moveable and stationary, to be worn and pitted beyond useable limits. Due to the low cycles vs. flight hours, this airline hard timed their relays to six thousand hour TBOs. Helicopter operators and corporate flight departments flying shorter legs should hard time their relays proportionately because most contact pitting is due to cycles.

Without proper test equipment, alignment tools and up-to-date maintenance manuals, field maintenance is basically restricted to basic inspections and cleaning. With some relays, (*Figure 3*), the contact cover can be removed for visual inspection and carbon particle clean-out. Others are hermetically sealed and not intended for field maintenance. A good maintenance practice is to perform a millivolt drop test on mission-critical relays during the aircraft's annual or one-hundred-hour inspection. A quick glance at the recorded history of each relay should give you forewarning of imminent failure. So, to avoid delays at the hanger, cancelled trips or being stuck on an oil platform or somewhere in an austere environment, start a preventive maintenance program for the forgotten critical components of your aircraft.

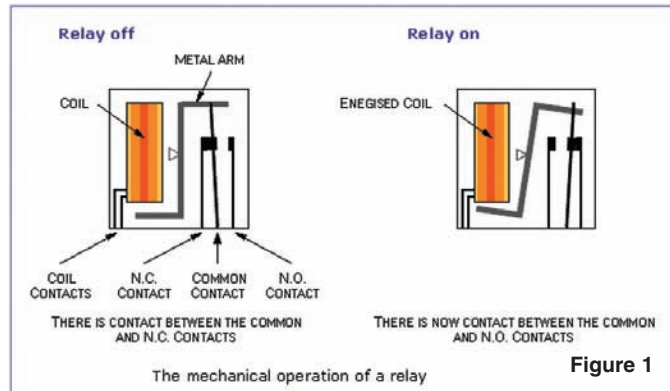


Figure 1



Figure 2

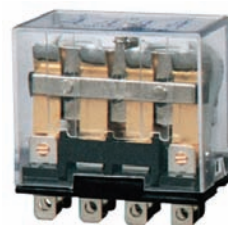


Figure 3

UH-1H – TOTAL SUPPORT SOLUTION

by James Tripp, Business Development Manager

As the Original Equipment Manufacturer (OEM), Bell Helicopter built the UH-1H product that many of you are flying today. We are committed to keeping it flying, regardless of whether a service life extension program has been incorporated. Bell has been supporting the UH-1H aircraft for over 40 years, and currently supports most public and foreign military customers through our existing commercial support channels – including spares, repair of repairables, publications, engineering and technical support.

A UH-1H operator that purchases Genuine Bell Spares through our worldwide network of Bell Supply Centers and Customer Service Facilities can expect Genuine Bell OEM Support, which means:

- Worldwide spares parts supply/distribution (Genuine Bell spare parts)
- Spare part warranty
- Factory and field technical support (24-7-365)
- Engineering services
- Aircraft refurbishments
- Component repair & overhaul
- Configuration management
- Publications (Due out summer '07)
- Pilot and maintenance training
- Teaming arrangement with engine OEM (Honeywell)

Recognizing the logistical challenges that UH-1H operators face worldwide, Bell has joined with Honeywell to offer the most comprehensive single source support solution available to the UH-1H operators. We offer access to the prime OEMs for the most reliable, timely and cost-effective total support package available. Bell Helicopter is dedicated to providing comprehensive real time total fleet management.



For more information, please contact your regional Business Development Manager:

Europe/Middle East/Africa

Dick Dodge
ddodge@bellhelicopter.textron.com
1-817-280-3542

Asia Pacific

Gary Wicks
Gwicks@bellhelicopter.textron.com
1-817-280-3360

Latin America

James Tripp
jtripp@bellhelicopter.textron.com
1-817-280-2236

Joaquin Alatorre
jalatorre@bellhelicopter.textron.com
1-817-280-2970

North America

Mark Kocurek
mkocurek@bellhelicopter.textron.com
1-817-280-3031



Bell Services – Bell Helicopter Can Supply Support Equipment

By Gary Wicks, Business Development Manager

In order to further expand the level of support and service our operators are accustomed to, we at Bell Helicopter are pleased to offer our assistance in equipping your workshop with quality tools and support equipment. We have teamed with some of the biggest names in the business to ensure only items of the finest quality are in the hands of your pilots and technicians. Along with hand tools and GSE, we are able to provide safety and test equipment, pneumatics, stands and work aids, electrical equipment and much more. We welcome the opportunity to provide a recommended list of tools and equipment tailored to your mission. For more information or to order equipment and tools, please contact your Business Development Manager.

Safety Harnesses

By Mark Medinger, CSR
Regional Manager

You may be surprised at what your Customer Support Representative is wearing the next time you ask him or her to climb up on an aircraft to look at something. The bright yellow harness is technically termed PPE for Personal Protective Equipment and is designed to arrest an accidental fall.

Bell Helicopter is leading the industry by setting the example for safe practices. We have equipped the CSR staff with full PPE harnesses. These bright yellow, fully adjustable harnesses incorporate both a front and rear attachment ring. A non-marring arrest lanyard secures the harness to a part of the rotor.

According to OSHA (Occupational Safety and Health Administration) data, "Falls are one of the leading causes of traumatic occupational death, accounting for eight percent of all occupational fatalities from trauma." Recently, these statistics became all too real when the CSR group lost one of its members due to complications related to a fall from the transmission deck of an aircraft. As an industry leader, BHT had the obligation to take the lead and show our customers by example that we are concerned about the safety of our valuable employees and customers.

Bell surveyed its customers through the CSR network and realized that few of our customers were using fall protection and fall arrest equipment when working on aircraft, so it was unlikely that this equipment would be available.

Other equipment such as properly designed stands and platforms are termed Fall Protection Devices. Stands and ladders offer some protection up to certain heights. Maintenance stands are a good safety enhancement and several ground support equipment manufacturers make well-designed, sturdy products.

In many cases, stands and ladders are not available, due to the location of the aircraft. This is when the PPE is most needed. A minor fall-related injury in a remote area could turn into a serious or fatal medical problem if immediate medical care is not available.

Often, loss of balance is a contributor to a fall. Faintness, or being light-headed immediately after standing upright is caused by a physiological phenomenon brought about by a sudden drop in blood pressure. A bit of unsteadiness combined with uneven footing surface could cause you to fall.

The old adage "it is not the fall that hurts you – it is the landing," is a rather simplistic view of the possible outcomes. Blunt trauma caused by falls from even modest heights of five to twelve feet have been known to be fatal.

Consider your own operation and the risks of someone falling. Your employees are your most valuable asset, and keeping them healthy is in the best interest of everyone. So after you have some fun teasing the CSR about the flashy addition to his wardrobe, consider the satisfaction of preventing a serious injury.



FlySmart™ Support *Takes Wing*

by Gil Morong, Director
Business Process & Technology

Bell Helicopter is investing in data-centric support technologies to ensure we maintain our lead in customer services for years to come. Beginning this year, Bell will extend its SAP data warehouse, currently supporting the V-22 fleet, to support multiple fielded models. Daily operational data will be collected and analyzed for use in management reporting, forecasting, and solution creation and insertion.

Better insight into customer daily operations will result in Bell having the right inventories when parts are needed. It will enable Bell to anticipate customer need and push services and data solutions to keep our fleets airborne.

As we roll out functionality to a broader user community, we will communicate in future issues of RotorBreeze to let you know what to expect, when. Bell is not resting on its 13 years as #1 in rotary wing support. FlySmart™ will offer new levels of support not possible today, and will continue our ongoing investment in our customers' success.

NEED HELP?

Need help with a technical question?

Here's how to contact Product Support Engineering:

Model 47, 206 or 407

Phone: 450.437.2862 or 800.363.8023

FAX: 450.433.0272

E-Mail: pselight@bellhelicopter.textron.com

Model 222/230, 427 or 430

Phone: 450.437.2077 or 800.436.3036

FAX: 450.433.0272

E-Mail: pseinter@bellhelicopter.textron.com

Model 204, 205, 212 or 412

Phone: 450.437.6201 or 800.363.8028

FAX: 450.433.0272

E-Mail: psemedium@bellhelicopter.textron.com

Model 214 or Surplus Military

Phone: 817.280.2481 (Model 214)

Phone: 817.280.8779 (Model OH-58A/C)

Phone: 817.280.7470 (Model UH-1 series military surplus)

Phone: 817.280.4074 (Huey II)

FAX: 817.280.2635

E-Mail: psemil214@bellhelicopter.textron.com

Q: Does Bell offer training for the model 47, 205A-1 and 214B?

A: Training for these models is conducted at Southern Illinois University Carbondale at the Department of Aviation Technologies. Their contact information is:

Department of Aviation Technologies
Southern Illinois University
635 Flightline Road, Mail Code 6816
Carbondale, Illinois 62901-6816
Email: Lowell Berentsen, Lberent@siu.edu
(618) 536-3371

Q: Are manuals available for the P/N 214-070-300 Internal Rescue Hoist Assembly?

A: Operation and maintenance manuals, which include an illustrated parts list, are available only from the hoist manufacturer, Goodrich Hoist and Winch (formerly TRW, Lucas Aerospace, Lucas-Western, Western Gear). Contact Goodrich Hoist and Winch Publications at telephone 909-569-0334 or fax 909-569-0382. P/N 214-070-300-001 (single-speed hoist) is covered by publication number 25-00-05 and P/N 214-070-300-101 (two-speed hoist) is covered by publication number 25-00-02.

Q: What is the part number of the electrical terminal cover for Droop Compensator actuator 205-060-762-103.

A: The (little) plastic cover part number is 6D1001.

Q: On the 407, how come there are no instructions in the Maintenance Manual for adjusting 4/rev vibration?

A: Four-per-rev (4/rev) vibration on the 407 is controlled by a FRAHM mounted on top of the main rotor. Instructions to adjust the FRAHM were introduced by means of TB 407-99-14. These instructions, along with damage limits to the FRAHM components, will be incorporated to the maintenance manual shortly.

Q: On the 407, starter-generator wear is noticeable after 300 hours of operation. The same generator, used on our 206L-3 fleet, makes it through 900 hours of operation. Why is the wear accelerated on the 407?

A: Starter generator 206-062-200-113, /-123 is used on the both the 206L-3 and the 407. We are not clear why wear appears more rapidly on the 407. However, some operators have commented that the wear on the rotor and brushes increases appreciatively after brush inspections. One theory suggests that disturbing the brushes alters the wear pattern and leads to premature wear of the rotor and brushes. Bell is aware that in one case an operator who did not disturb the brushes for 1,000 hours was able to reach TBO. Bell has defined a means to inspect for brush wear without the need to remove the brushes. This procedure is currently available from PSE on request. Plans are to add this procedure to the MM at a later date.

STC CERTIFICATION Given for **BELL 407** **Hi-Visibility™** Doors

Bell Helicopter, a Textron Inc. (NYSE: TXT) company, announced that its affiliate Aeronautical Accessories Inc. has received STC certification, STC number SR09376RC-D, for the Hi-Visibility™ modification on the 407 passenger and litter doors.

The Bell 407, the fastest-selling helicopter in its class, is used by many law enforcement agencies from the federal to the local level to accomplish their vital missions. The speed, reliability and now the visibility make the 407 an ideal platform for all types of law enforcement agencies.

Speaking about the new STC certification, Bell's Chief Executive Officer said, "Once again we have listened to the voice of our customer. In surveys and research we conducted, we received numerous favorable responses to the 407 Hi-Visibility™ doors from owners and operators, and we responded. Now that same enhanced visibility option can be added to all 407 owner/operator's passenger and litter doors."

Officials from Aeronautical Accessories added that in addition to law enforcement, the kit is ideal for tourism, corporate, and any other application where enhanced visibility is desirable. For more information contact: Aeronautical Accessories sales department: *Phone* (423) 538-5151, *Fax* (423) 538-8469, *e-mail* sales@aero-access.com.

Bell Helicopter is an industry-leading producer of commercial and military, manned and unmanned vertical lift aircraft and the pioneer of the revolutionary tilt-rotor aircraft. Globally recognized for world-class customer service, innovation and superior quality, Bell's global workforce serves customers flying Bell aircraft in more than 120 countries.



206L Upgrade Program (Continued from page 5)

The 206L1+ and 206L3+ will be modernized aircraft, made popular by the 206 LongRanger's renowned reliability and proven safety record. This upgrade provides increased payload capacity over preceding models, combined with the increased reliability of the 206L4 drive system components; all at a reduced cost of operation. Most importantly, this LongRanger Upgrade Program testifies to Bell Helicopter's commitment to exceptional customer support and leadership position in the commercial helicopter arena.

First Article for the 206L1 is scheduled for Q3 2007 and 206L3 for Q4 2007. Kits are expected to be available Q1 2008. For more information please contact:

Mark Kocurek

mkocurek@bellhelicopter.textron.com

817.280.3031



HANS WEICHSEL, A BELL HELICOPTER PIONEER, DIES

Hans Weichsel, who is known for sketching out a new version of the Huey on the back of a barf bag, died March 13 in San Antonio. Services are pending, with burial expected to take place in St. Louis.

Weichsel joined Bell in 1950 and retired in 1984 as a vice president/general manager. He worked closely with Larry Bell in the early days of Bell Aircraft Co.

Weichsel helped open the door to the use of helicopter in the Korean War, partly because of kindness to a little girl with a lollipop.

It was August, 1950, and the Korean War was in its early stages. Larry Bell, along with Weichsel and Joe Mashman, had flown to Army headquarters in Fort Monroe, Va., in a Bell 47 to convince the brass that the helicopter would be beneficial in Korea. Bell and Mashman, Bell's second helicopter pilot, went inside to try to talk with Army officials, while Weichsel, Bell's sales engineer, waited with the helicopter and polished it with a rag.

While Bell and Mashman were met with closed doors, a little girl of perhaps 7 or 8, and holding a lollipop, approached Weichsel – and, as children will do, began to explore the helicopter with her sticky fingers.

Weichsel patiently wiped down the helicopter after her. When the little girl finally asked for a ride, Weichsel, who privately wanted the child to leave, finally told her she could have a ride if her father came with her. Of course, Weichsel had no idea that the little girl's father was a general – and one who would open doors

for Bell. The company went on to work with the Army to come up with designs to meet customer requirements.

While trying to reconcile the nine-man design of the Huey with the 13-man requirement of the Army, Weichsel sketched a new version of the Huey on the back of an air sickness bag. Although that sketch wasn't the version finally adopted, it laid the foundation for the Huey that is recognized the world over for saving lives – and for transporting troops in and out of harm's way. He also was part of the group that came up with the initial design of the Model 201 – or Sioux Scout.

Mashman worked closely with Weichsel. He is quoted in *The Bell Helicopter Textron Story* as saying, "Back in those days, the military didn't know enough about helicopters to come up with a design spec. So it was Hans Weichsel's ingenuity, in figuring out what the military would be responsive to, that gave engineering an insight into what sort of design we needed or what to improve. And he was responsible for a lot of the designs – many of which were improvements on early production helicopters – some of which were based on my observations."



POLAR FIRST SETS WORLD RECORD

Returning to their original launch location, Jennifer Murray and Colin Bodill can now add another world record to their list of aviation accomplishments. The pair successfully completed

their flight around the world, pole to pole, in a Bell 407. The team began their historic trip, called Polar First, at the Bell Helicopter facility located at Alliance Airport in north Fort Worth, Texas, on December 5th of last year. They returned to a large crowd of well-wishers on May 23rd.

"We made it," Murray said after they landed, flashing a double thumbs up. The pair flew nearly 36,000 miles through 34 countries, spending more than 300 hours in the air.

Both Murray and Bodill mentioned their first attempt at this record three years ago, which ended when their helicopter crashed in whiteout conditions not far from the South Pole. Bodill, who suffered a broken back, insisted on finding a new helicopter almost immediately after coming out of surgery.

Landing again at the crash site was a moment that stood out for both of them. "I was moved to tears," Murray said. "It was a healing moment."

Textron, Bell Helicopter and other sponsors provided financial and logistical support for the journey that took Murray and Bodill 189 days. The Bell Helicopter network of Customer Service Representatives (CSRs) and Customer Service Facilities (CSFs) around the world were utilized to provide their renowned maintenance services to support the trip.

"To take that machine and circumnavigate the globe pole to pole is quite an accomplishment," Mike Blake, executive vice president for Customer Solutions, said during a reception at the Customer Center. "Bell Helicopter is grateful for the safe return of these two aviation pioneers and proud of the significant role our 407 helicopter played in this historic mission."

A major component of the Polar First mission was an educational outreach program in partnership with the Royal Geographical Society who worked with 28 key international schools in the countries visited during the journey. The "Educational Passport to the Poles" interactive project allowed children from around the world to work with each other to better understand the changing environment. The team also raised funds and awareness for the SOS Children's Villages. SOS Children's Villages cares for orphaned and abandoned children by giving them a mother, a family and a home until they are independent, in more than 430 custom-built villages in over 125 countries, with associated facilities providing education and health and social care for the wider community.

"I still can't quite believe that we've done it," Murray said. "It's a darn good feeling."



Over the last two years, there has been an increase in collaboration between Bell Helicopter and its Customer Service Facility (CSF) partners. This collaboration can be attributed in part to Bell's commitment to visit every CSF annually in order to have a two-way dialogue about ways to improve collective support for Bell operators around the world. While these conversations cover many topics such as spare parts, maintenance training, and technical support, there has been an unanticipated and consistent discussion about the importance of addressing Foreign Object Debris/Damage (FOD) in the maintenance environment.

FOD is any damage or malfunction attributable to a foreign object that may or may not degrade the product's required safety or performance characteristics. FOD is a major cause of aircraft damage and unscheduled maintenance. In severe cases, FOD can directly threaten the safety of flight crews and the integrity of an aircraft.

The financial impact of FOD is staggering. It is estimated that FOD costs the aerospace industry \$4 billion annually. Revenues are lost through interrupted manufacturing schedules, delays in flight schedules, additional and unscheduled maintenance, and reworking and scrapping of parts. FOD incidents can also cause loss of revenue through customer dissatisfaction and damaged reputations.

Many of the CSFs we visited have proactive FOD prevention measures and many more still want to get better. Of the best practices we've seen, it is clear that the most successful at FOD

prevention have to become part of the company's culture. A great example of this is at Bell's Repair & Overhaul Center where gearbox assemblers have created their own way to make sure tools don't become FOD. The assemblers recently implemented a best practice where they will each "own" a company-owned tool box. "By placing their name on the tool box, they have signed up to be accountable for all aspects of that tool box: the inventory, the open closed sheets, the drawer configuration, audits, all of it," said Tony Williams, Gearbox Assembly Team leader. "The best thing about this idea was that it came from the assemblers' own initiative and was not a management directive. Their contribution will help us with an even more robust tool control program."

Bell Helicopter is committed to sharing FOD best practices across the CSF Network so we can all ensure a safer, cleaner environment for all of our customers. As such, we offer a "FOD Prevention Start-Up Kit" on the CSF Portal. This information that we have collected from a variety of sources including other manufacturers, maintainers, and Bell Helicopter's own proven best practices, will

aid any CSF in starting an effective FOD prevention program that identifies and corrects potential problems, provides awareness and effective personnel training, and uses industry "lessons learned" for continued improvement.

In an industry where safety is paramount, can you really afford not to take Foreign Object Debris seriously? The answer is a resounding "No, you can't." Just F.O.D. for thought.



Rotor Adjustments made on the Ground due to *Blade Speed* Changes

By David C. Burch
Senior Customer Support Representative

There have been many improvements in rotor track and vibration data collection with the advent of new rotor tracking and balance equipment such as the RADS-AT and other units using advanced trackers. By using this available data, Bell Helicopter has revised the *Initial* Ground track and balance procedures after all adjustments have been "Zeroed" out due to a new rotor or blade installation or just starting over in working an existing rotor. This procedure decreases the amount of test flights required to work a rotor and helps provide a better flying aircraft.

This method rolls the blades into track with pitch change link adjustments at Idle rpm. Track is adjusted at 100% rpm (with a specified torque setting) with trim tabs. After track is within limits, the ground balance is adjusted at 100% rpm (with a specified torque setting) using balance weights. The RADS-AT will provide a complete solution. This solution is based on the increase in blade tip speed between idle rpm and 100% rpm being greater than the increase in blade tip speed between hover and VNE.

A blade that is climbing or diving with the increase in blade tip speed between idle and 100%, blade will act accordingly in flight. Tab adjustment/s on the ground based on the change in track from idle rpm to 100% rpm (with a specified torque setting) will reduce

the number of flights required to work the rotor and ultimately provide a better ride at all airspeeds. You should never go to the flight mode until all the Initial readings are *Within Manufacturer's Specified Limits!* (Note that this does not apply to the model 430 due to RADS software differences.)

NOTE: The torque used at 100% *must be repeatable* and is enough to load up the rotor and transmission. The 407 and 206 series have selected 35% torque as the best for the 100% rpm ground test states. The torque required is called out in the instructions for the RADS or states "Slight Torque." If it states "Slight Torque" it means you should increase the torque enough to stop ground bounce and use the same torque setting for all subsequent ground tests at 100% rpm. You do not want to use "Light on the skids!" as this does not give repeatable data.

For example: The difference in tip speed from idle (65% Nr) to 100% Nr on the ground for the model 407 is 180.62 mph. (156.94 kts) which is approximately 17 kts more than the increase from Hover to VNE at 140 Kts.

$$\text{Tip speed in mph} = [p \times D \times \text{rpm} \times 60] / 5280$$

$$\text{Tip speed in knots} = [p \times D \times \text{rpm} \times 60] / 5280 \times 0.8689$$

NEW FTDs for Bell Training Academy

By Scott Westbrook
Senior Media Specialist

The Bell Helicopter Customer Training Academy is currently constructing three new Flight Training Devices for our Customers – the 412EP/Huey II convertible FTD and the new 407 FTD. Both FTDs are scheduled for a June 2007 delivery.



Mechtronix 412EP FTD

The 412EP/Huey II convertible FTD is being constructed by Mechtronix Systems Inc. in Montreal, Quebec, Canada. This FTD features computer generated instrumentation allowing the switch between the 412 and the Huey II in less than one hour. By switching the instrument panel overlay out, replacing the overhead panel, swapping out pedestal components, and changing collectives, the conversion doubles our abilities to train on one single footprint.

The new 407 FTD is being constructed by Frasca International, in Urbana, Illinois. This FTD also features computer generated instrumentation, along with an advanced technology vibration base. This vibration base will be utilized to provide more flight cues, such as Effective Translational Lift, as well as provide abnormal vibrations for the aircraft, such as tail rotor malfunctions.



Frasca 407 FTD

CGI Instrumentation was utilized in anticipation of any future changes to the actual aircraft instrumentation configuration. Should that configuration be updated, the change to CGI eases the implementation, providing a secondary software load and allows the original configuration to be usable. The

device is to be certified to FAA Level 6 by year end.

Scheduled for July, 2008 delivery, the new 429 FTD is also being constructed by Frasca International. The FTD will have all the features of the 407 FTD, to include CGI instrumentation and vibration base. The project began in February of this year, running alongside the classroom material development. Delivery of both coincides with first Bell 429 Customer Aircraft delivery. The FTD will be certified to the highest level attainable at time of delivery, which currently is Level 6.

To register for Bell Training Academy courses or for more information on the Bell Training Academy, please visit www.bellhelicopter.com/training.

Bell Helicopter Training Academy

By Joe Schmaltz
Instructor Specialist

FIRST RESPONDER HELICOPTER SAFETY PROGRAM

The Bell Helicopter Training Academy (BTA) is completing the final stages of development of the First Responder Helicopter Safety Training program. This program is the first in a series of courses to be offered by the BTA and was specifically designed to provide First Responders with the knowledge necessary to safely and effectively perform their duties while working with helicopters. This program will receive the National Incident Management System (NIMS) / Incident Command System (ICS) certification of compliance from a certified NIMS/ICS instructor, as well as course certification with a Police Officer Standards and Testing (POST) board so that the program can be used for law enforcement training.



The program begins by giving the First Responders general knowledge of the helicopter's basic configuration and capabilities. After establishing a basic knowledge of helicopters, we continue by discussing the dangers, hazards, and safety precautions necessary to protect one's self, the helicopter crew, passengers, patients and

bystanders when working around helicopters. We also provide instruction on how to safely select, develop and manage a Helispot (landing zone) to included proper communication techniques. We then discuss helicopter hazards to ground personnel and conclude the program with safety recommendations and suggestions.

The First Responder Helicopter Safety Program will be offered in a standard DVD format. This format will afford those agencies who have limited budgets or equipment the opportunity to access and benefit from the training.

It is our mission to assist our First Responder community with the necessary skills to keep them safe as they perform their essential duties while working with and around helicopters. The bottom line of this program is simple:

First Responders - First Line Defense
- SAFETY FIRST -
Because Getting Home Matters!

For more information on this program, please contact Joe Schmaltz at JESchmaltz@bellhelicopter.textron.com or 817-280-8433.