

RotorBreeze

Q1 • 2009

**SDFD 412
Ready For
Action -
You Can Bank
On It!**

Bell Helicopter® FLY SMART. FLY BELL.
A Textron Company

Photo Courtesy of Sheldon Cohen



A Message from Danny Maldonado

- Sr. VP Customer Support & Chief Service Officer

Thank you for your continuous support and business throughout the years. We look forward to the industry challenges ahead and to improving our customer service capabilities accordingly.

Given the state of the global economy, we expect a leveling, and perhaps a slowdown, in overall flight hour activity over the next 12 months. We are beginning to see a slight reduction in spares order backlog, which should relieve some pressure on the supply chain. Having said that, we believe that any potential decline will be short-lived. Long-term, there is considerable demand for new products and for the support and services that are applicable to the existing fleet.

There are several trends affecting commercial support, which include the propagation of Integrated Vehicle Health Management (IVHM) and sophisticated diagnostics/prognostics technologies, the prominence of the European Aviation Safety Agency (EASA), the expectations of the International Helicopter Safety Team, the growing interest in procurement of non-OEM parts, and the development of new technology and regulatory requirements.

Generally speaking, customers are demanding more OEM involvement with operations and support. OEMs will need to develop the capability to effectively manage an operator's aircraft maintenance and logistics activities and guarantee high levels of aircraft availability. In other words, OEMs must transition from

selling parts to selling readiness. The vision for Bell Customer Support & Services (CSS) is to become the leading provider of fleet management (performance-based) services for new-production aircraft and the installed base. The goal over the last few years has been to leverage our considerable support foundation to drive this forward. Acquiring market-priced, industry-leading, aftermarket service providers such as Edwards & Associates, US Helicopter, and McTurbine are important steps along this path.

At Bell, we have all the capabilities for a one-stop shop. We just need to manage those capabilities in a way that ensures customer-defined operational and mission-availability requirements are consistently met or exceeded. This defines our mindset going forward... let's talk about some specifics in this regard.

A key piece to this strategy is continuous access to operator fleet usage data. For this reason, Bell acquired the company SkyBOOKS and is now delivering all new-production aircraft with an analyst-supported, Web-based, electronic logbook service.

Utilizing a more stringent auditing process, Bell's Achievement Ranking System (BARS), we have challenged our worldwide Customer Service Facility (CSF) network to achieve higher levels of service quality. The network has risen to meet the challenge and Bell will recognize the pre-eminent CSF players this year.

Bell will focus heavily on out-of-production aircraft spares and technical support. A dedicated department to manage the supply chain for these aircraft will be in place by the second quarter 2009. Integral to this effort, Bell is focusing on more cost-effective spares support and is looking at various options, including the potential licensing of third-party providers to manufacture and source spares. This effort includes the Model 47. No Bell model will be left behind, especially the one that launched this industry.

The current backlog for new helicopters will ensure that older, existing aircraft remain in demand and continue to "carry the load." This reality reinforces the need for helicopter upgrades. Bell has already invested in retrofit, modification and upgrade (RMU) programs that recognize the value and continuing demand for legacy products. These programs include the 206L1/L3 to L3+ upgrade, the 412SP to HP upgrade and the UH-1H to Huey II upgrade. Bell will continue to develop

and execute on these particular programs while it keeps an eye out for similar improvements to its other products.

We fully expect to be able to maintain a 92% average spares order fill rate throughout 2009. In addition, Bell will introduce a new Aircraft-on-Ground (AOG) order policy this year to better control the prioritization of spares ordering.

It is no secret that continuing cost pressures have forced Bell to raise spares pricing for 2009. Although we have managed to cap the price increase in advance for 2010 (at 3-5%), Bell recognizes that OEMs are under pressure to provide cost-effective genuine spare parts to compete effectively with non-OEM sources. One specific area that Bell will focus on in this regard is the fixed-rate parts plans, under which operators have the option of paying by flight hour rather than by part usage. This service offering takes the cyclical nature of maintenance expenditures out of the picture and replaces it with known, regular flight-hour billings. This type of offering guarantees maintenance costs, reduces maintenance infrastructure costs, and compels OEMs to manage internal costs effectively. The key for OEMs is to invest in stocking the necessary rotatable components (supplier-owned exchange pool). Look to the new Model 429 for Bell's next step in parts plans. We have conducted considerable competitor and customer analysis to develop this new product and will offer it on all Bell production models.

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Where There's Smoke . . . **There's the San Diego Fire Department**

By Gary Wicks, CSS Development Manager



In 1997, the San Diego Fire Department (SDFD) began development of a dedicated, full-service fire and rescue helicopter program to meet the ever increasing demand for enhanced helicopter emergency service delivery. SDFD became operational in 2002 when they began contracting a Bell 212 for the fire seasons with funds raised primarily through donations. The tipping point for SDFD came with the wild fires of 2003, which solidified the need for a robust, full-time operation. Finally, in July 2005, SDFD took delivery of "Copter One," a Bell 212HP retrofitted by

the Bell Customer Service Facility Eagle Copters of Calgary, Alberta.

In September 2008, SDFD and Copter One more than doubled their operational abilities with the delivery of their new Bell 412EP. "This is a major milestone in our efforts to ensure that residents have access to immediate and continuous aerial fire suppression, rescue, and emergency medical services and has been a top priority for the Fire-Rescue Department since the Cedar Fires," said Deputy Fire Chief Brian Fennessy.

Due to its range, payload, versatility, and reliability, the Model 412 remains a popular choice across many market segments. This particular multi-role work horse is outfitted by Edwards & Associates, Inc. with over 60 individual customizing and mission equipment options geared to enhance their missions of firefighting, search and rescue, emergency medical services, law enforcement and much more throughout San Diego County. The Simplex Model 304 Fire Attack Belly Tank and Bambi Bucket provisions enable accomplishment of the primary mission of firefighting.

The Aeronautical Accessories Inc. external hoist allows for extraction of stranded or endangered persons when landing is not an option while the FLIR Ultra 8500 XRT Dual Sensor Camera, Spectrolab XS-16 IFCO Nightsun, NVG-compatible cockpit/cabin, and fully interfaced avionics suite combine to make the SDFD 412EP a true round-the-clock performer.

To help guarantee service costs and eliminate unknowns from the budgeting process, the new aircraft is enrolled in Bell's FLYSMART™ GOLD PLAN as well as Pratt & Whitney's Eagle Service Plan™. These plans provide spares for scheduled and unscheduled maintenance at a fixed hourly rate.

SDFD, and others like them, provide a most valuable service to our communities; for that, we can all be grateful. Bell Helicopter and its growing family of affiliates give thanks and stand ready to provide exceptional support for many years to come.





A Message from Danny Maldonado

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Bell Training Academy Instructor Named HAI Flight Instructor of Year



Senior Flight Instructor Kevin C. Brandt at the Bell Training Academy has been named the HAI 2009 Outstanding Certified Flight Instructor. Kevin has been with the Academy since 1996. His specialty is transition and recurrent training for standard flight maneuvers and emergency procedures. "In addition to flight proficiency, Kevin fosters an attitude of safety during each flight, and in all aspects of flying," HAI said in naming him as recipient of this year's award. "His students complete their training as more competent and safer pilots. As testimony to this, Brandt was

awarded an HAI Pilot Safety Award upon logging 5,000 consecutive accident and violation-free helicopter flight hours."

Kevin is continually expanding his knowledge of equipment and teaching techniques. As a licensed A&P mechanic, he incorporates knowledge from that perspective into his flight instruction by teaching students about the entire aircraft. He currently has more than 10,000 accident- and violation-free flight hours and over 4,450 hours of flight instruction with more than 2,000 students. He has more than 70,000 touchdown autorotations with no accidents, specializing in day and night touchdown and precision autorotations. He also has more than 15 years of aeromedical and five years of offshore flying experience, and was acknowledged for his humanitarian efforts during the 2005 Hurricane Katrina relief operation.

Kevin's rapport with students make him one of the most requested instructors for recurrent training at the Academy. Kevin's abilities as a helicopter flight instructor, his sense of humor and quick wit, and his genuine concern for students have earned him the widespread respect of students and peers alike. The Academy and HAI congratulate Kevin for his contributions to the helicopter industry.

Kevin will be recognized at Heli-Expo 2009's annual "Salute to Excellence" Awards Banquet on February 23, 2009 at 8:00 p.m. in Anaheim, Calif.

Bell is continuing to invest in the R&D related to onboard health and usage monitoring and condition-based maintenance (CBM). In fact, Bell won a research contract with the U.S. Army to develop advanced, on-board diagnostic/prognostic sensor technologies. The adoption of a CBM philosophy will allow the customer to better manage the health and serviceability of their aircraft. Bell plans to couple CBM technologies with its fleet management processes to enable a scalable support solution ranging from transactional spare parts support right up to a comprehensive ("tip to tail"), performance-based, fleet management contract.

Bell will continue to participate in the International Helicopter Safety Team (IHST) initiative to reduce accidents by 80% by 2016. The Bell Training Academy developed the Professional Pilot Program (P3) to provide advanced pilot training and we continue to offer the NVG pilot training course. Bell will remain in lockstep with this team as it moves forward with its important work. Additionally, in 2008 Bell expanded its distribution of the HELIPROPS (Helicopter Professional Pilots Safety Program) newsletter from 6,000 to 106,000 readers to educate the pilot community and maintain a focus on safety-related issues.

Bell will continue to invest in its repair and overhaul capabilities. Significant capital investments are in work at the repair and overhaul facility, which supports our military customer as well as our commercial customer. Bell is also investing in our affiliates, which perform a significant portion of our commercial R&O. Bell is looking to capitalize on the strengths of each affiliate and leverage them to create a value experience for R&O.

Bell has made progress over the past year, but there is still more work ahead. Bell believes the right strategy is in place and that the stage is set. We will hit our marks in 2009. We look forward to another prosperous and energetic year. Thanks again for your business.

Bell Hires Its First Female CSR



Bell Helicopter's newest customer support representative (CSR), Erin McMahon, represents a number of firsts. She is Bell's first female CSR and the first second-generation CSR. Erin joins the CSR group after three years in Mirabel as a product support engineer with the Light Helicopter group.

Erin grew up in an aviation household. Her father, Pat McMahon, has been a Bell CSR since 1980. As an engineer with one of Canada's largest privately owned helicopter companies, VIH Aerospace Inc., Erin gained the hands-on field experience supporting oil and gas exploration in northeastern British Columbia. After working in the field, she was ready for a change and joined Bell's Product Support Engineering Group. In the three years working there, she learned an incredible amount from a talented group of individuals.

Erin will cover the areas of British Columbia and the Yukon. You can reach her at 604-619-4733 or emcmahon@bellhelicopter.textron.com.

Fly Smart. Fly Bell.

Direct Maintenance Cost Projections for 2009

By Warren Moseley, CSS Development Manager

One of the first things you will notice after looking at the published Direct Maintenance Cost (DMC) estimates for 2009 is the absence of several Bell Helicopter models. In an effort to concentrate on the highdemand product offerings, Bell Helicopter has sunset three of the models that appeared in last year's estimates. Production of the Model 206B3, 427, and 430 has been phased out (or will be) and will no longer be presented as part of our published DMC estimates.

Bell's 2009 annual price increase for spare parts used on in-production aircraft established a weighted increase of about 9%. Within the DMC calculations, this increase mainly effects the costs associated with life-limited parts, parts estimated for overhaul of components, and on-condition components. Overall, the parts price increase added only 7% to the Model 206L4 and 412EP and 8%

to the Model 407. The labor estimate was increased from \$75.00 per hour in 2008 to \$80.00 per hour for our 2009 estimates. This resulted in a 6% increase in the amount estimated for labor for the Model 206L4 and 407 and a 10% increase from last year on the Model 412EP.

Over the course of a year, Bell receives a large amount of requests for cost estimates with different labor rates or fuel costs from those that are published. In an effort to more accurately predict the DMC for a particular region, Bell will in the future publish estimates that exclude actual fuel-per-gallon costs and labor-per-hour rates. What will be presented is the maintenance-manhour-perflight-hour estimates and the actual gallons-per-hour fuel-burn rate for the particular model. It will be the operators' choice to provide their own costs for these two variables and establish a more customized estimate of their DMCs.



Bell Helicopter Textron Inc. 2009 Direct Maintenance Cost Estimates ⁽³⁾

	<u>206L4</u>	<u>407</u>	<u>412</u>
Fuel and Lubricants			
Fuel (1)	114.00	138.00	339.00
Lubricants (3% of fuel costs)	3.42	4.14	10.17
Fuel & Lubr. Sub Total	<u>\$117.42</u>	<u>\$142.14</u>	<u>\$349.17</u>
Labor (2)			
Inspection	26.46	13.17	38.08
Overhaul	7.21	9.63	8.08
Unscheduled and On-Condition	27.90	66.25	47.29
Labor Sub Total	<u>\$61.57</u>	<u>\$89.05</u>	<u>\$93.45</u>
MMH/FH	0.77	1.12	1.18
Parts			
Inspection	1.48	4.02	11.59
Retirement Parts	65.59	70.63	119.08
Overhaul	29.00	58.09	52.08
Unscheduled and On-Condition	71.88	78.61	207.05
Part Sub Total	<u>\$167.95</u>	<u>\$211.35</u>	<u>\$389.80</u>
Airframe Sub Total	<u>\$346.94</u>	<u>\$442.54</u>	<u>\$832.42</u>
Powerplant Direct Maintenance			
Direct Maintenance Costs (4)	65.34	79.51	260.32
Line Maintenance Labor	4.98	4.98	26.54
Powerplant Sub Total	<u>\$70.32</u>	<u>\$84.49</u>	<u>\$286.86</u>
Total Average Cost per FH	<u>\$417.26</u>	<u>\$527.03</u>	<u>\$1,119.28</u>

Notes: (1) Fuel costs calculated at US\$3.00 per Gallon

(2) Labor costs calculated at \$80 per maintenance man-hour.

(3) Basic VFR helicopter.

(4) Engine DMC represents total costs of maintenance including overhauls, accessory maintenance, unscheduled maintenance, and accruals for scheduled maintenance and life limited parts.



For information purposes, Bell's average replenishment lead time is more than eight months, but can extend to 36 months for very complex assemblies! Our customer's obvious question is "OK fine, but what is my lead time?" Generally speaking, your parts are shipped off the shelf in 24 to 72 hours on items actively stocked by Bell (some 48,000 part numbers). About 90% of the time you order a part, it is delivered from our shelf stock. Naturally the spread of time stated is dependent on the priority you express when you order the part. It is our intent to have every actively stocked part sitting on the shelf at the time your order is received. For a myriad of reasons, this may not happen. These can range from variability of demand to a vendor having a fire or flood. The more complex the part, the longer the supply chain, and the more opportunity for a shortage. Think in terms of a main rotor blade that may contain over a hundred parts and therefore a hundred opportunities for something to go wrong!

There is one final area to discuss that likely needs clarification: Special Order parts. These are parts that are not normally stocked by Bell. Our decision to stock or not stock a part is based on our projection of the future demand substantiated by historical usage. If we have a regular pattern of orders (generally a sale of one piece a year) over a given period that supports a speculative forecast, we will stock the part on a routine basis. Otherwise, it becomes special order. We build or procure these parts upon receipt of your order. It is likely this is the area where most confusion arises as it relates to "When am I going to get the part?" The vast majority of these parts are structural parts, but can also be parts that are non-standard to the basic configuration of the aircraft. While we actively stock thousands of these items, there are many that don't sell often enough to warrant maintaining an inventory. It is not uncommon for these parts to sell no more than once in five or more years. In answering the question about availability, the issue of the parts lead time usually surfaces. These items, being no different than items we actively stock, also have a lead time. In this instance, lead time should be regarded as a "worst case" scenario. Does it take full lead time to acquire these parts? The answer is "almost never." The reason being is that lead time, as described above, is stated in routine terms. That is, it presumes that all activities will flow through normal channels without human intervention.

The lead time on a special order part can be reduced by many things: expediting the process (human intervention); the availability of excess material in other Bell facilities; the availability of raw material, etc. The list goes on and on. Remember that normal lead time presumes you start from zero at the system's pace. It is not unusual, therefore, to reduce a lead time by more than half or even more. Theoretically, it can be reduced to days or weeks rather than months depending on availability of material and the priority of the order. Can we do this every time? Obviously not, but it will not be from lack of effort. We take urgent requirements for items that are not available very seriously, whether they are normally stocked or special order. In summary, you may hear manufacturing/procurement lead time quoted from time to time, but it should be regarded as the starting point rather than the final answer. It would be most helpful if our customers would notify us of their real "need" date when ordering a special order part. This would do much to assist us in timing the various actions and priorities.

Lead Time Defined

By Dennis Green (Ret.) and Gordon Harveson,
Director - Spares and Inventory Management

One of the more frequently misunderstood terms in the materiel world is lead time. Let's begin with a rather academic review of the term, then move on to practical application.

Webster defines lead time as "the time interval between the placing of an order and delivery." While this is an accurate statement, it is limited in scope. Properly defined, lead time starts when the first action is taken and ends when the part is properly placed in the end user's stockroom or in his hands. This may seem a minor distinction, but it is not. For example, if you count only the time it takes to acquire an item and overlooks such things as approvals to purchase, funding allocations, in-transit time, customs clearance, receiving/inspection, etc., you could grossly underestimate the time required to get a part. From a stock replenishment point of view, this could be disastrous. In summary, all elements of the procurement cycle must be included, starting with the recognition of a need and ending with item being properly accounted for in the system that receives it.

From a more practical view, let's discuss lead time as it relates to Bell Helicopter. Being in the materiel world, it is an issue we face daily and its importance cannot be overstated. As indicated above, our stock replenishment activity hinges on the accuracy of our lead times. Every item has a usage projection and a lead time in our CO-OP order system. The combination of these two figures represents a calculation that generates for us a *reorder point*. It should be the same in your system. Classic inventory management rules apply. A previous *RotorBreeze* article discussed this rather in detail, but as a review: if you use four widgets a week and it takes 12 weeks' lead time to receive a replenishment of widgets, then you would have to reorder when your asset position is equal to 48. (Usage x Lead Time = Reorder Point).



A Little MSG is Good . . . With Your Bell 429

By Francois Magnan, Manager – Product Support Engineering



In previous issues of *RotorBreeze*, we shared with you the successful efforts of the Bell 429 Customer Maintenance Advisory Panel. By working with launch customers of that new light twin, Bell has developed a much improved inspection schedule intended to reduce maintenance costs and direct operating costs while increasing aircraft availability for the Bell 429. What we have not explained is the methodology used to develop this inspection schedule. This is where a little “MSG” comes in.

First a little history. With the advent of commercial airline jet service in the late 1950s, it quickly became clear that, for the airlines to stay profitable, the prevailing maintenance philosophy of “hard time” overhauls would have to evolve. The level of maintenance it called required too much downtime, was too expensive and was even creating failures as a result of disassembling components too often. The Air Transport Association (ATA) decided to create a Maintenance Steering Group whose mandate was to look for opportunities to increase aircraft availability and reduce maintenance costs without compromising safety. It produced the MSG-1 recommendations in 1968, which were first applied to Boeing’s 747. The process led to a second set, MSG-2, for the next generation of airliners, and MSG-3 recommendations, which were published in 1980 and revised most recently in 2007. To keep it simple, the MSG-3 introduced reliability-centered maintenance (RCM), a task-oriented approach that analyzes a system from the top down to determine which failure modes may cause a functional failure and develop maintenance tasks to prevent that.

“So what do airliner inspection methods have to do with my EMS-configured Bell 429?” you might ask. A lot, especially if you consider availability and reliability important to your operation. During the Customer Maintenance Advisory Panel meetings, the team analyzed every aircraft system, including airframe structure and wiring installations, to determine failure modes, their criticality, the ease of detection, the level of inspection required to find those failure modes and the ideal recurrence of those inspections. This is where the varied experience of the team came in to play. AME/A&P experts applied their many years of experience in aircraft operations and engineers provided input as to the system’s detailed functions. **From this analysis resulted a maintenance schedule that should require up to 35% fewer maintenance man-hours versus a comparable aircraft.**

So why have you not heard of this before in the helicopter industry? Simply because Bell is the first OEM to use this method in the creation of a maintenance schedule for a commercial helicopter. Aviation authorities, mainly Transport Canada, the Federal Aviation Administration, and the European Aviation Safety Agency, have all supported Bell in pioneering this approach. They have also indicated that, although MSG-3 and RCM are not mandated at this time, this type of analysis may be required in the future. We have tried to adapt it to rotorcraft as much as possible, but a lot of work remains. We will eventually work with our peers in the rotorcraft industry to slightly modify the approach so it is better suited to our aircraft.

Destroyed Aircraft

The following Bell Helicopter aircraft identification data plates have been returned to Bell, and were subsequently destroyed and documented as such. The serial numbers have been retired. Additionally, Bell has recommended to the certificate offices of the FAA and Transport Canada that the aircraft serial numbers be removed from the applicable type certificate data sheets.

MODEL	SERIAL NUMBER
212	30890, 31133
UH-1D/H . . .	4032, 4077, 5310, 5341, 5704, 5801, 8955, 9113, 10790
UH-1N.	31070

The following Bell Helicopter aircraft were reported by official investigation authorities as “destroyed.” Based upon that finding, Bell has recommended to the certification offices of the FAA and Transport Canada that the aircraft serial numbers be removed from the applicable type certificate data sheets.

MODEL	SERIAL NUMBER
206B	1060, 1695, 2971

Bell furnishes listings of destroyed aircraft and destroyed data plates as a service to our customers, the FAA and Transport Canada. Bell does not represent that these lists constitute all of the aircraft or data plates that have been destroyed. Listed are only those aircraft on which Bell has recently received final reports from official accident investigation authorities describing them as destroyed or for which Bell has destroyed the aircraft identification plate as requested by others.

My 407 Main Rotor Will Not Smooth Out – Why?

By Dave Burch, Sr., Customer Support Representative

What to do and check if your 407 main rotor will not smooth out using the RADS-AT (or other vibration analyzers) in 1-3 flights.



The following information will give you troubleshooting suggestions to help when a 407 rotor is not responding to adjustments provided by your test equipment. Often when a rotor does not respond, there are one or more problems that are preventing you from obtaining a smooth ride.

Normally three flights are all that is required to bring the vibration levels to acceptable limits. If you suspect the rotor is not responding, stop and perform a detailed check of the following items. Your local Bell customer service representative (CSR) can provide you with more detailed help if required, although they will probably ask you if you have checked the items below.

Ensure the test equipment is properly installed

Cables that are not routed to the proper channels and accelerometers that aren't orientated in the proper direction will totally confuse both you and test equipment. Improper color codes in the main rotor cause adjustments to be made to the wrong blades, so make sure the coding agrees with the maintenance manual. If the black paint on the outboard ends of the blades is worn off or uneven, this will give the tracker erroneous track measurements. The paint applied should wrap around the leading edge by 0.250 to 0.375 inch. On occasion, air conditioning systems and GPS units have adversely affected the test equipment. Try leaving this equipment off when taking measurements.

Inspect your aircraft

Take the time to disconnect the pitch links to check for looseness and roughness in rod-end bearings and universal joints. With the collective at mid-travel, check the swash plate assembly for excessive play. Slight side-to-side movement of the cyclic stick can help identify looseness in the swash plate area. Check the swash plate friction and purge lubricate the swash plate bearing while turning the rotor.

Engage the rotor brake if installed or have someone help hold the rotor from turning. Have one person slowly lift the blade over the nose from the down stop to past the mid-travel point of cone up. While the blade is being moved up, move the pitch horn in an up-and-down motion while observing the shear-restraint bearing. Pay particular attention to ensure full rotation of the bearing from the inner race to the outer race across the elastomer. Non-rotation may indicate a failure of the bearing. Also note if there is any axial movement of the shaft at the center of the bearing as you raise and lower the blade, which

may indicate a failure of the bearing. While the blade is being moved up, also move it fore and aft to check the lead-lag bearings. Pay particular attention to the elastomer for gaps or bulges indicating possible deterioration of the unit. Check for movement of the bearing assembly between the upper and lower plates or loose studs. Repeat this test for each blade.

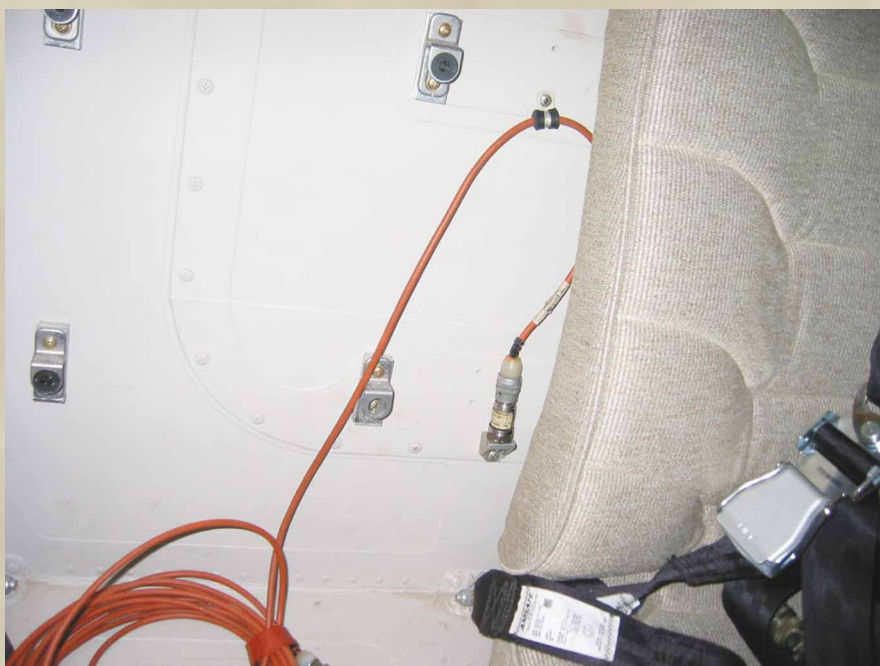
Inspect the springs and center bearings of the Frahm damper (if installed). Perform a detailed inspection of the corner mounts per the maintenance manual. Inspect the transmission fore and aft restraints for loose bearings. A swollen or extruded elastomer or one that is cracked or sheared could indicate deterioration of the restraint. Ensure proper color coding for location and adjustment of the restraints. Look for loose or worn attachment hardware, including the bolts and bushings. Lift the whole helicopter either by the mast nut, straps or jacks to inspect the landing gear for full contact on the aft cap assemblies when the aircraft is lifted. The cross tubes should contact the aft caps with no load on the landing gear.

Reinstall all removed/ disconnected components per the maintenance manual before operation

Inspect the main rotor blades for loss of filler, excessive paint erosion, or missing sealant at product weight pockets (which can lead to water intrusion). Check the fuselage for loose equipment that could be vibrating in sympathy with the rotor, such as searchlights, instrument panels, radio racks, or displays.



Correct cable/accelerometer installation



Hints for Working the Rotor

When using the Initial Program after starting a rotor from scratch, do not go to Flight Program until the RADS-AT states: "All measurements are within Manufacturer's Specified Limits"! You will be wasting your time. If you have two or four main rotor blades with Product Balance Adjustment capability, use it. Technical Bulletin 407-04-55 has detailed information on using these adjustments. This is the best chance to get the blades to fly together. Remember that the "limits" in the flight programs of the RADS-AT are the vibration limits for a new aircraft. Trying to get all the vibration levels down to the RADS-AT limits on an aircraft in the field with anything less than new parts may require an excessive amount of flight time or be impossible. Be sure to correct the indicated airspeed for true airspeed to match the RADS-AT

test states, particularly at high density altitudes. Use your E6-B flight computer or get a chart from your local CSR. Use the cold weather (Suitable Operating Range for M407 Rotor Work) chart to determine maximum airspeed for working the rotor. You can obtain one from your CSR if you don't have one. Keep the fuel load within 200 pounds of the normal operating weight while working the rotor.

These suggestions should help you be more effective at rotor smoothing using the shortest amount of time and flights. Do not hesitate to ask for help from your local CSR or PSE. If you can download the diagnostic data from the test equipment and electronically transmit the data, we can provide suggested adjustments when the test equipment is not providing adjustments leading to improved ride quality.

As an aircraft maintenance manager, you are responsible for a multitude of activities that contribute to the overall operation of your aircraft. These responsibilities extend from regulatory compliance to operational availability and cost control.



Maintenance Management and Cost Control - A Factor of "What Ifs"

By Warren Moseley, *CSS Development Manager* and
John Willis, *COO SkyBOOKS*

What if you as the maintenance manager could monitor, manage and make decisions based on accurate up-to-date operational fleet information at any single point? What if, at that single point, you could determine which aircraft are operational, which are getting close to a maintenance event or requirement and which are delayed for dispatch because work is due now? What if you could determine that one of your pilot's Biennial Flight Review was due and he would not be able to fly the mission you just scheduled for the following week?

Bell Helicopter is now delivering new aircraft with a tool that can help you do just that. Each new Bell aircraft now comes with *SkyBOOKS* free of charge for two years. *SkyBOOKS* is more than just an electronic logbook. - It can help the maintenance manager control many of the "what ifs."

SkyBOOKS provides tools for both flight operations and maintenance management that will assist in the regulatory compliance process, improve aircraft availability, reduce risk, and better manage costs. Operators will now have the tools necessary to easily verify each individual aircraft's airworthiness at all times and be able to verify dispatch ability for each flight.

Aircraft maintenance events that have multiple compliance requirements are automated and displayed in simplified color coded alerts. This color coded dashboard, or status page, provides a real-time look at your aircraft fleet's operational capability. The system RED light indicators will ensure you do not inadvertently operate a crew member or aircraft that is not in compliance. All of the aircraft and aircraft personnel requirements are loaded (and updated by *SkyBOOKS* personnel) into a template for each aircraft. With *SkyBOOKS* personnel updating these templates, you as a Maintenance Manager are assured of performing

maintenance at the most current manual revision with incorporation of all applicable AD's, SB's and ASB's affecting your aircraft. With *SkyBOOKS* loading all applicable documents into the individual aircraft templates, your maintenance technicians are able to concentrate on what they do best and leave the documentation research drudgery behind. The *SkyBOOKS* team will be working as your outside QA department and document control center. Your assigned *SkyBOOKS* analyst will become part of your quality control department helping you maintain regulatory compliance and assisting when complex questions arise.

Have you ever removed a battery from an aircraft and thought to yourself "seems like I just changed this last year?" When making the appropriate log book entries like this, *SkyBOOKS* can clearly illustrate the warranty period and or expiration date at the component level. With *SkyBOOKS*, situations like this make warranty cost recovery a managed reality.

Posting aircraft updates are the first order of business every day to make sure your records are always current and accurately posted. Updating your aircraft records are as easy as sending (via email, fax or mail) a copy of the Return To Service information and any additional supporting documentation following a maintenance event to *SkyBOOKS*. Your analyst will update all records, attach documents to components and load pertinent information into structured archive folders for future search and retrieval needs.

AOG or away from home support is directly aided by *SkyBOOKS* reducing non-productive activity due to the fact that all historical data and modified aircraft wiring or system diagrams are available on-line to all authorized support personnel. Having historical information and modification diagrams improves trouble shooting processes and reduces downtime immensely.

SkyBOOKS may not eliminate all of the "What if's", but it can go a long way in providing the Maintenance Manager with some very valuable information to gain better control over aircraft operations and costs.

For more information on the tool, please contact *SkyBOOKS* at 866.929.8700.





2008 was quite a year for Bell Helicopter Customer Service Facility Support. I want to thank our CSFs who so graciously welcomed me into the CSF Support organization. While I've been with Bell for over seven years, Customer Support was an entirely new role for me. I have thoroughly enjoyed getting to know our valued CSFs throughout the world and look forward to visiting each of them over the next few years.

As many of you know, Trey Wade, who led CSF Support as director of strategic partnering, was promoted to director of the Bell Training Academy this past October. We certainly appreciate all Trey has done for the CSF network and wish him well as he transitions to his new role.

In 2007, Bell Helicopter modified the annual Customer Service Facility audit process and implemented the Bell Achievement Ranking System (BARS) process. This process measures and scores each CSF on multiple factors, identifies areas for improvement, and recognizes excellence. While the BARS process has evolved since its inception, the overall goal remains the same - improve the customer service experience.

The BARS process was quickly embraced by our CSFs and is already driving improvements within the network. CSFs identified by the BARS process as providing superior service are designated Platinum-level CSFs. This designation not only recognizes the CSFs' achievement, but identifies these outstanding facilities to our customers. Beginning with the release of the 2009 Customer Support and Services Directory, Platinum CSFs will be identified by a special symbol on their respective directory page.

So what does it mean to the Bell customer? Simply put, you are receiving the best service possible within the Bell CSF network. All CSFs have a large selection of Bell-approved services; an organized, clean, and safe environment for their employees and customers; a broad inventory of Bell spare parts; insurance coverage for your aircraft while it is being serviced, and an extensively trained staff. A Platinum-level CSF greatly exceeds the minimum CSF requirements.

Throughout 2009 in *RotorBreeze*, we will highlight our Platinum CSFs. Please do your part supporting these outstanding CSFs and thank them for their dedication.



Service Bulletins for T53 Engines

McTurbine, Inc. recently received new Honeywell Service Bulletins (SB) T53-0158 (military engines) and (SB) T53-0159 (commercial engines). The SBs address the outer shield of the power turbine (PT) bearing housing on T53 engines.

The PT bearing housing P/N 1-140-590-09 has an outer shield manufactured from Hastalloy X material. The 1-140-590-04 and -07 PT bearing housing outer shields are manufactured of low-carbon steel and are subject to heat distress causing repetitive repairs of the housing.



P/N#
1-140-590-07
as removed from engine (low carbon steel)



New P/N#
1-140-590-09
(Hastalloy X material)

This service bulletin introduces a PT bearing housing P/N 1-140-590R10, which incorporates the Hastalloy X heat shield currently used on the PT bearing housing P/N 1-140-590-09.

These SBs addresses engine durability and product improvement. McTurbine and Honeywell recommend that these service bulletins be implemented at the next repair of the PT bearing housing.

For details regarding performance of these or other T53 service bulletins during overhaul or in the field, contact International Marketing Manager Fernando Millia at fernando.millia@mcturbine.com or Domestic Marketing Manager James Zahn at james.zahn@mcturbine.com.

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Did You Know...

You can access the latest Alert Service Bulletins, Technical Bulletins, Operations Safety Notices, Information Letters and other data through the Bell Helicopter website at www.bellhelicopter.com. (From the homepage, click on the "Support" link, then "Product Support" and "Service Directives.")

Alert Service Bulletins and Operations Safety Notices for all models issued after March 1st 1999 are posted, as well as several high demand Technical Bulletins and Information Letters. All Technical Bulletins and Information Letters issued after September 1st, 1999 will also be available on the website. Prior distribution of earlier Service Directives, in combination with required compliance dates, eliminates the need to post previous bulletins. If required, copies of previous documents may be obtained through the Commercial Publications Distribution Center by e-mailing publications@bellhelicopter.textron.com or by sending a fax to (817) 280-6466.



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