

Attachment 7. JDA Assessment

DCA12MA020 Maintenance Factual Report

JDA Aviation Technology Solutions

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Mr. Lawrence J. Pietropaulo
Chief Executive Officer
Sundance Helicopters
5596 Haven St.
Las Vegas, NV 89119

Dear Larry,

Thank you for the opportunity to support your company. Attached please find JDA's report pertaining to the evaluation of Sundance Helicopters' maintenance policies and practices. The evaluation, which took place from July 27 to July 31, 2009, included a physical inspection of facilities, records, and observations of ongoing maintenance. Interviews were also conducted with maintenance management personnel and maintenance technicians during the same timeframe. Annotated in the report are our observations and recommendations for improving the maintenance organization and processes.

Please direct any questions that you may have regarding the report to Gary Gomes (806-577-3171) or Al Zito (412-657-6734) If we can be of further service to your organization please contact me or Al Zito.

Thank you again for the opportunity to provide services for your company. You are a valued customer and friend and we look forward to working with you again in the near future

Sincerely,


Michael F. Rioux
COO

Executive Summary
Sundance Helicopters, Inc.
Air Carrier Certificate KBMA477

Sundance Helicopters, Inc. is a certificated 14 CFR 135 on-demand air carrier and a certificated Commercial Air Tour Operator operating in compliance with 14 CFR Part 136. Sundance Helicopters, Inc., Operations Specification, D085 issued by the FAA on 12/09/2008, currently lists a fleet of fifteen Eurocopter AS 350 series and three EC-130 model helicopters.

The Sundance Helicopters operate from McCarran International Airport located at 815 Pilot Road, Las Vegas, Nevada. The operations facility where customers are prepared for their tour flights is orderly and well maintained. The maintenance facility hangar is small but adequate for the current size of the operation. The maintenance facility is cleaned regularly and maintained. However, it could be organized better for the type and volume of maintenance performed. The parts room and adjoining parts storage rooms are poorly organized and are not adequate for the size of the operation.

The Sundance Helicopters maintenance organization consists of a Director of Maintenance (DOM), Assistance Director of Maintenance, 13 maintenance technicians, a Parts Room Manager and two parts room personnel. Maintenance staffing is minimal and maintenance personnel frequently work overtime to meet operational demands resulting from the high aircraft utilization. Sundance Helicopters does not have a quality control program within the maintenance organization.

The aircraft are maintained in accordance with 14 CFR Part 135.411 (a) (1) and follow the manufacturer's inspection program. Sundance Helicopters is a high utilization operator flying in excess of 20,000 hours per year. Sundance Helicopters does not take advantage of any of the optional maintenance and inspections programs listed in 14 CFR Parts 135.419 or 135.411(a) (2) as allowed by paragraph 135.411(b).

Sundance Helicopters does not acquire or develop any reliability data to evaluate vendors, track the efficiency of maintenance practices or use that data to revise maintenance or inspection intervals.

The organization does not use any commercial software for tracking and scheduling maintenance and inspection requirements of their aircraft. They track maintenance requirements for the aircraft manually and individually and cannot determine the overall status of their fleet except by evaluating each set of aircraft records.

Sundance Helicopters has a General Operations Manual (GOM) with Section 7 devoted to maintenance. While the GOM has been accepted by the local FAA Certificate Holding District Office (CHDO), it is minimal in scope and detail and does not reflect the policies and procedures currently observed by the Sundance Maintenance Organization during the inspection and repair of company aircraft. *Tribal* knowledge is the basis for the accomplishment of many tasks and procedures. An evaluation of the aircraft revealed they are inspected according to the manufacturer's inspection schedule and receive adequate non-routine maintenance for discrepancies, which occur between inspections. While the aircraft receive periodic maintenance, they show signs of wear. The company would benefit by scheduling refurbishment to maintain their appearance.

Interviews with maintenance personnel indicated they like working for the company and believe it is a good organization. However, there is consensus among the maintenance personnel that operational commitments dictate the pace, which may influence the quality of maintenance allowing very little time to no time to repair cosmetic items and keep the aircraft looking fresh and presentable at all times.

Sundance Helicopters, Inc.
Air Carrier Certificate KBMA477F

During the week of July 27, 2009 an evaluation of maintenance operations was conducted at the Sundance Helicopters Inc, facility located at 815 Pilot Road, Las Vegas, Nevada. The evaluation included a physical inspection of facilities, records, and observations of ongoing maintenance. Interviews were conducted with maintenance management personnel and maintenance technicians. Results are documented below under broad headings, which allow for the presentation of observations and recommendations which are highlighted in ***bold Italics*** type.

Air Carrier Operating Certificate and Maintenance Operations Specifications

Sundance Helicopters, Inc. is a certificated 14 CFR 135 on-demand air carrier and a certificated Commercial Air Tour Operator operating in compliance with 14 CFR Part 136.

Sundance Helicopters, Inc was issued Operations Specifications (Ops Specs) paragraph D085, Aircraft Listing dated January 16, 2008, by the FAA Las Vegas Flight Standards District Office (LAS FSDO). The Ops Specs shows a total of fifteen Eurocopter AS350 series helicopters and three EC-130 model helicopters. The aircraft listed are identified by registration numbers and serial numbers. All aircraft listed were found eligible to operate in air carrier operations via 14 CFR Part 135 or in Air Tour Operations in accordance with 14 CFR Part 136.

Sundance Helicopters, Inc has been issued Operations Specification paragraph D102, additional maintenance requirements. This specification authorizes Sundance Helicopters, Inc to use the aircraft listed by make model and series provided they have met the additional maintenance requirements of 14 CFR Part 135.421(a)(1) for an aircraft with nine or less passenger seats. The aircraft are maintained using the manufacturer's maintenance and inspection program with fixed hourly intervals, which are very conservative. Sundance Helicopters, Inc., is a high-utilization operator, flying in excess of 20,000 hours per year and do not benefit from any of the optional maintenance and inspections programs under 14 CFR Parts 135.419 or 135.411(a)(2) as allowed by paragraph 135.411(b). Because of the high utilization, it is apparent that Sundance is literally wearing down the helicopters with the high frequency of routine inspections. ***Sundance should consider developing their own inspection programs based on their operating experience, which could be approved by the LAS FSDO.***

Also, Sundance Helicopters, Inc has been issued Operations Specification D095, Minimum Equipment List (MEL) Authorization. This authorization allows the deferral of inoperative items when listed on the company's FAA approved Fleet MEL for the

appropriate make and model helicopter. A review of the MELs showed that interfaces do not presently exist between the required MEL management program procedures and the Sundance Helicopters General Operations Manual (GOM) procedures for deferring inoperative items. Not all policies and procedures observed in the tracking and managing of MEL deferred items are presently documented in the GOM. ***Sundance should revise the GOM to include interfaces between the required MEL management program and the GOM.***

Sundance Helicopters, Inc has been issued Operations Specification A447, Airworthiness Directives (ADs), which provides for the notification of emergency ADs to the Director of Maintenance. The Director of Maintenance indicated there is an undocumented procedure in place to provide for a joint review of ADs with the Assistant Director of Maintenance to determine applicability and to schedule compliance. ***It is recommended that Sundance formalize the AD review process and include the process in the GOM.***

Facilities and Equipment

The Sundance helicopters operate from McCarran International with their main base located at 815 Pilot Road, Las Vegas Nevada. The building is a state of the art facility designed specifically to meet the needs of their air tour operations. The maintenance facility hangar, which is attached to main base facility, is minimally adequate for the present size of the maintenance operation. It is cleaned regularly and well maintained; however, it could be better organized for the type and volume of maintenance performed.

The parts room and adjoining parts storage rooms are not adequate for the amount of parts inventory and size of the operation. Parts removed from the aircraft and tagged as repairable are not stored to protect the parts. It appears many have been awaiting disposition/return to vendors for overhaul and repair for a period of time. Also, parts which have been condemned (red tagged) are not secured or quarantined. There are no written procedures or system in place for the destruction of life limited parts. There is; however, an undocumented informal process and a log to show compliance with the rule. ***Sundance should formalize their current process for managing and disposing of life limited parts and include the process in the GOM.***

There are no written procedures in the GOM for the issuance of parts and materials. Parts are issued and not controlled on an exchange basis and as a result of this practice worn/unserviceable parts are kept in the maintenance area and are not properly disposed in a timely manner. The parts room is not staffed with parts room personnel during the entire maintenance shift. Maintenance personnel have free access to parts when parts room personnel are not present resulting in difficulty with inventory control and maintaining the stock in proper locations. ***Sundance should establish a written procedure that delineates how parts are issued and controlled and include it in the GOM.***

There is consensus with maintenance personnel that the company has grown to the point where common usage of spare parts (servos, starter generators and batteries) are not stocked in sufficient numbers to facilitate maintenance without repeated cannibalization. Maintenance personnel have indicated much time is spent in repetitive cannibalization; thereby, wasting time that could have been devoted to maintenance activities. Sundance Helicopters, Inc does not presently have policies and procedures in the GOM for cannibalization of parts nor have limits been established for cannibalization. ***It is recommended that a policy and procedure be written for parts cannibalization and include it in the GOM.***

Sundance Helicopters, Inc. provides calibrated tools and precision measuring equipment to their maintenance personnel to accomplish maintenance on company aircraft. They manage calibrated company tools by memorandum and through the use of a calibrated tool list for company tools maintained by the Parts Manager. They observe a 12month calendar cycle for the calibration of company tools instead of a strict year-to-date interval, which has caused some concern with maintenance personnel. Sundance does not have a clear written policy on tool calibration requirements. They also allow maintenance personnel to use personal calibrated tools as long as the tools are properly calibrated. Sundance Helicopters requires personally owned tools requiring calibration to be calibrated before use on company aircraft and a copy of the calibration record to be kept on file. However, there are no written procedures in the GOM to identify who monitors and who is responsible for the oversight of the program. A review of the records of personally owned calibrated tools shows all of those tools to be out of calibration. ***Sundance should establish a policy and procedure for the use and management of calibrated tools including the use of personal tools that require calibration. The policy and procedure should be included in the GOM.***

Sundance Helicopters does not have all the basic tools necessary for the continued maintenance and repair of the EC-130 model helicopters. Maintenance personnel indicate that basic tools are borrowed from other operators when available or from the manufacture's service center. Maintenance delays have occurred because of non-availability. ***Sundance should consider purchasing the necessary tools for performing maintenance on the EC-130 model heicopter.***

Maintenance Personnel and Staffing

Sundance Helicopters Inc., maintenance organization consists of a Director of Maintenance (DOM), Assistance DOM, a staff of 13 maintenance technicians, a Parts Room Manager and two parts room personnel.

Sundance Helicopters does not employ any full time administrative personnel in the maintenance organization for the accomplishment of routine filing, data entry or other clerical work. They do use an individual to perform maintenance manual revisions on a

part time basis; however, much of the administrative work is done by the DOM and Assistant DOM.

An interview with the DOM showed that he obtained his maintenance experience in the military and working as a mechanic for Sundance Helicopters, Inc before being promoted to the DOM. He does not have experience with other types of maintenance and inspection programs, other than Sundance Helicopters, Inc., and indicated a willingness to explore other available options, such as, Approved Aircraft Inspection Programs (AAIP) and Continuous Airworthiness Maintenance Programs (CAMP). Interviews with maintenance personnel respect him and feel he provides the direction necessary to keep the aircraft properly maintained.

Sundance Helicopters, Inc. has two maintenance shifts running seven days per week, 12 hour days with seven days off for each shift. Sundance does not have a shift turnover procedure documented in their GOM. They do have a sheet used to transition between shifts but there is no formal exchange of work in progress status between shifts by shift leaders (face to face exchange). While not a regulatory requirement, it should be a systems safety consideration and documented in their manual. ***It is recommended that Sundance create a shift turnover procedure and include it in their GOM.***

Maintenance personnel all reported that they liked the current maintenance shift schedule and were resolute that the long shifts did not detract from the quality of work or have a negative impact on safety. However, they indicated there have been instances where maintenance personnel were required to work time beyond their 7 day shift to meet operational demands. While 14 CFR Part 135 does not have maintenance personnel duty time limitations similar to 14 CFR Part 121.377, consideration should be given to that standard. 14 CFR Part 121.377 states, in part, each certificate holder shall relieve each person performing maintenance or preventative maintenance from duty for a period of a least 24 consecutive hours during any seven consecutive days.

Some maintenance personnel believe staffing is short for the maintenance crews and others believe staffing is adequate with the caveat that some personnel are low performers which effects production the same as low staffing. Presently, Sundance Helicopters does not have performance standards for maintenance personnel and opinions vary on what performance standards are and expectations for the quantity of work to be accomplished. All are in agreement that maintenance should be performed to a high standard of quality and beyond the inspection schedule (when aircraft are scheduled in or out) have no standard for performance. ***Sundance Helicopters should research options for establishing maintenance personnel performance standards.***

Interviews with maintenance personnel indicated they like working for the company and believe it is a good organization. There is consensus that operational commitments dictate the pace of work and may influence the quality of maintenance, allowing little to no time for the repairing cosmetic items and keeping the aircraft looking marketing fresh and presentable.

Interviews with maintenance personnel revealed a consistent belief that the Company lacks an adequate Quality Control (QC) system with dedicated personnel that ensures adequate work quality. While not a regulatory requirement, there are no formal controls established to ensure the quality of work or act as an independent oversight entity outside of maintenance production. Reportedly Sundance had a QC person who performed QC work in the past; however, the position is currently vacant. The benefits of establishing a Quality Assurance (QA) position and associated procedures would pay great dividends for Sundance Helicopters. ***It is recommended that Sundance explore the creation of a QA position, responsibilities and procedures.***

Sundance Helicopters, Inc. does have a maintenance memo with a procedure which requires a second set of eyes when maintenance has been accomplished. While this is an excellent procedure, it is not documented as being accomplished and the company does not appear to be consistent in the application of this procedure. ***Sundance should benefit from formalizing this procedure as a systems safety best practice and include it in their GOM.***

The company performs self audits; however, the self audit program is not a part of the GOM and is a past practice leftover from the former Sundance repair station. Self audits are an element of systems safety and when properly accomplished can positively affect maintenance operations and improve safety. ***Sundance Helicopters should incorporate a self audit program into their GOM.***

A review of maintenance employees training records failed to show documentation that maintenance employees particularly parts room personnel have received hazardous materials (HAZ MAT) training. There was no indication of a HAZMAT training program. ***Sundance Helicopters should establish an e a HAZ MAT training program and document the training provided during company indoctrination training.***

General Operations Manual

Sundance Helicopters has a General Operations Manual (GOM) with Section 7 devoted to maintenance. While the GOM has been accepted by the local FAA Certificate Holding District Office (CHDO), it is minimal in scope and detail; however, it does reflect some policies and procedures currently observed by the Sundance Maintenance Organization during the inspection and repair of company aircraft. Tribal knowledge is the basis for the accomplishment of many tasks and procedures. Sundance observes many procedures containing systems safety attributes but lacks clear policies and procedures which would enhance the safety of operations and provide clear direction for their maintenance employees. ***Sundance should formalize all maintenance procedures and document them in the GOM and eliminate the use of individual practices/tribal knowledge procedures.***

Maintenance and Inspection Programs

Sundance Helicopters, Inc., operations specification, D085 issued by the FAA on 12/09/2008, currently lists a fleet of fifteen AS 350 series and three EC-130 model helicopters. These aircraft are maintained under 14 CFR Part 135.411 (a) (1), following the manufacturer's inspection program. Sundance Helicopters is a high utilization operator, flying in excess of 20,000 hours per year but does not benefit from any of the optional maintenance and inspections programs under 14 CFR Parts 135.419 or 135.411(a)(2) as allowed by paragraph 135.411(b). Essentially, the aircraft receive a huge amount of wear from the frequent disassembly required by the current inspection schedule.

Sundance Helicopters does not document or capture data with regard to the reliability of their maintenance practices or the reliability of their components serviceability. They do not have a Continuous Analysis and Surveillance System (CASS). ***Sundance could benefit greatly in the development of reliability data should they choose to modify their existing maintenance and inspection program intervals, using that data for justification in developing either an AAIP or CAMP program.***

An evaluation of aircraft and associated maintenance records denoted they are inspected according to the manufacturer's inspection schedule and receive adequate non-routine maintenance for discrepancies, which occur between inspections. While they receive periodic maintenance because of high utilization, the wear, without the benefit of scheduled refurbishment, has declined their appearance.

Sundance Helicopters does not use any commercial software for tracking and scheduling maintenance and inspection requirements of their aircraft. They track maintenance requirements for the aircraft manually/individually and cannot determine the overall status of their fleet except by evaluating each set of aircraft records. They are significantly behind most other operators in this area. ***Sundance should consider investing in a web-based maintenance tracking and scheduling software application for tracking aircraft maintenance and inspection.***

Summary and Opportunities for Improvement

Sundance Helicopters, Inc is a successful Air Tour Operator as well as a successful on demand 135 Operator operating airworthy aircraft with a relatively efficient organization. However, they could benefit from their service experience and ***petition the FAA for maintenance and inspection programs tailored specifically for their high utilization*** reducing the frequency of some inspections intervals and enhancing the safety of their operations and significantly reducing maintenance and inspection costs.

The company should expand or make more efficient use of their maintenance and parts storage facilities. The facilities today are minimally effective for the size of the operation any further expansion in operations would exceed the capability of the facility.

The Sundance Helicopters, Inc GOM does not contain adequate instructions, policies and procedures for the maintenance organization to function consistently. Tribal knowledge/undocumented policies and procedures serves as the basis for nearly all of the maintenance work performed today. There are no interfaces between the operations policies and procedures and maintenance policies and procedures. The present manual lacks controls to ensure compliance with critical processes such as recording and deferring mechanical irregularities. The GOM lacks clear direction, such as, who, what, when, where and how to accomplish necessary tasks to provide for the safety operations. ***The Company should expand their current maintenance section of the GOM or ideally separate the maintenance policy into a separate general maintenance manual (GMM) using system safety concepts as enumerated above.***

The DOM should expand his experience by networking with other successful operators who have more advanced maintenance and inspection programs. He should identify best practices by those operators and apply those to the company maintenance practices.

The recommendations in this report are based on industry best practices and would significantly improve the safety posture and performance of Sundance Helicopters, Inc.