



**FEDERAL AVIATION
ADMINISTRATION**

Annual Report

**FAA Modernization and Reform Act of 2012 (P.L. 112-95) –
Section 308
Inspection of Repair Stations Located Outside the United States**

February 20, 2014

FAA ANNUAL REPORT

REPAIR STATION SURVEILLANCE, STAFFING, TRAINING and INTERNATIONAL AGREEMENTS

This report is a response to Section 308 of the Federal Aviation Administration (FAA) Modernization and Reform Act of 2012 (Public Law 112-95) (the “Act”), dated February 14, 2012. Section 308 of the Act requires the FAA to publish an annual report on FAA’s oversight of part 145 repair stations and implementation of the safety assessment system required under Title 49 United States Code §44733, subsection (a). In this report the FAA describes the improvements in FAA’s ability to identify and track where part 121 air carrier repair work is performed; includes a staffing model of FAA aviation safety inspectors (ASI); describes the training provided to FAA ASIs; and contains an assessment of the quality of surveillance performed by FAA ASIs and inspectors from countries in which the FAA has a bilateral agreement.

(1) Describe in detail any improvements in the Administration’s ability to identify and track where part 121 air carrier repair work is performed;

The FAA uses a risk-based surveillance approach to identify and target resources towards areas of greater concern or criticality. FAA inspectors use the risk management tools and processes to analyze the identified hazards and risk posed by those hazards. This method allows for targeted surveillance, rather than scheduled surveillance, which focuses on providing overall safety oversight for a growing aviation industry. The FAA is developing the next generation of risk-based oversight system called Safety Assurance System (SAS) which is expected to begin deployment in fiscal year 2014.

FAA regulations authorize air carriers to make arrangements with other maintenance providers to perform its maintenance¹. It requires specifically that maintenance performed by either an air carrier or by another person(s), must be performed in accordance with the air carrier’s required maintenance manual. Further, the air carrier remains primarily responsible for the airworthiness of its aircraft. The air carrier is required to document in its maintenance manual a listing of maintenance providers with whom it contracts maintenance and a general description of the work to be performed. This information is used by the FAA to plan surveillance of an air carrier’s maintenance program and determine that each contract maintenance provider is performing their work according to the air carriers’ maintenance manual. The FAA has found that these lists are not always kept up to date and/or in a standard format that is readily useful for FAA oversight and analysis purposes. Without accurate and complete information on the work being performed for air carriers, the FAA risk assessment tool cannot adequately target its inspection resources for surveillance.

To improve FAA’s oversight of air carrier’s contract maintenance, FAA published a notice of proposed rulemaking (NPRM) ². When published as a final rule, it would

¹Unless otherwise indicated, when we refer to “maintenance,” the term is meant to include “maintenance, preventive maintenance, and alteration.”

² The NPRM was published in the Federal Register on November 13, 2012, docket number FAA-2011-1136, titled Air Carrier Contract Maintenance Provider.

require air carriers to develop policies and procedures for performing contract maintenance acceptable to the FAA and to list the contract maintenance providers in their maintenance manual. This would ensure the ability to maintain a particular standard with minimal variation to the arrangement between air carriers and their contract maintenance provider, but still maintain the goal of guaranteeing that the air carrier provides their contract maintenance provider with adequate guidance and instructions to perform maintenance tasks.

The proposed rule also requires air carriers to maintain a current list in a format acceptable to the FAA. It would include the name and address of each contract maintenance provider it uses and a description of the type of maintenance that would be performed. Air carriers who make changes to this list would be required to provide a copy to the FAA by the last day of each calendar month. The information would reside in a single database providing the FAA useful data for planning and targeting of surveillance activities of each air carrier's contract maintenance provider and the kind of work being performed.

We believe the proposed rule, when published, will provide standardized contract maintenance provider requirements. It will assist the FAA in its oversight responsibilities and provide a framework for the FAA to identify when and where air carrier maintenance work is performed. Using this information, we will more effectively target our inspections and increase the efficiency of FAA surveillance.

(2) Include a staffing model to determine the best placement of inspectors and the number of inspectors needed;

The AVS Staffing Tool and Reporting System (ASTARS) is the FAA's forecasting tool to determine how many inspectors and other employees are needed to provide adequate levels of safety oversight in the National Airspace System and where they are needed. It uses internal and external data sources to forecast probable levels of work activity required based on the configuration of each certificate holder assigned to the office. This generates what is called Predicted Annual Work Hours (PAWH) for each certificate holder. These hours are converted into fractions of a full time equivalent (FTE). The latest ASTARS forecast says the FAA needs the following FTEs for repair station oversight, by region:

| Region | Avionics | Maintenance | Grand Total |
|--------------------|--------------|--------------|----------------|
| Alaska | 5.0 | 8.9 | 13.9 |
| Central | 35.8 | 49.1 | 84.9 |
| Eastern | 79.2 | 124.8 | 204.1 |
| Great Lakes | 48.8 | 68.7 | 117.5 |
| Northwest Mountain | 33.8 | 48.3 | 82.1 |
| Southern | 80.7 | 126.9 | 207.6 |
| Southwest | 72.3 | 105.2 | 177.5 |
| Western Pacific | 90.3 | 131.7 | 221.9 |
| Grand Total | 445.9 | 663.6 | 1,109.5 |

(Totals may not add up due to rounding. Totals as of 10/30/2013.)

Notes on the data:

1. Maintenance and avionics inspectors who are assigned safety oversight responsibilities over repair stations are generally assigned to more than one repair station and/or additional operators certificated under other 14 CFR parts, such as part 135.
2. The current version of ASTARS is an initial application, and was intended to be refined as the project matured. The DOT Office of the Inspector General (OIG) has audited ASTARS. That audit, together with FAA's own reviews, has identified actions necessary for the FAA to improve forecast capabilities within the ASTARS Model. The FAA is in the process of analyzing and initiating model changes to improve the accuracy of model forecast.
3. The FAA is also expanding its efforts to improve future model forecasts through increased data quality reviews, simplifying databases for easier data collection, and improving guidance for keeping databases as current and accurate as possible.
4. The ASTARS model identifies resources to mitigate risk, but it is not the sole determinant for the number and location of inspectors. The FAA uses ASTARS for macro-level resource guidance, which is further refined with expertise and judgment from field managers, division managers, executive management, and subject matter experts to finalize staffing decisions. While the current model has known forecast limitations for required resources, it has been useful in identifying existing inspector resource locations and work specialties.

(3) Describe the training provided to inspectors; and

A newly hired airworthiness Aviation Safety Inspector (ASI) is trained under two aviation specialties Air Carrier Airworthiness (AC A/W) and General Aviation Airworthiness (GA A/W). Each has a specialized curriculum which utilizes a blended approach by providing prerequisite regulatory guidance as web-based training (WBT). This is then reinforced in the classroom training which utilizes hands on practical scenarios that reinforce the application of regulations in real life situations.

Once the formal training is completed, an AC A/W ASI will have completed 123 hours of WBT and 49 ½ days of classroom training while the GA A/W ASI will have received 104 hours of WBT and 46 ½ days of classroom training. This training includes material pertinent to part 145 repair stations as well as 5 days of classroom training dedicated solely to the part 145 repair stations.

Formal training occurs in six phases within the first year of employment. The WBT is held at the employee's worksite and the classroom courses are completed at the FAA Mike Monroney Aeronautical Center Training Academy in Oklahoma City, OK.

| | AC A/W ASI | | GA A/W ASI | |
|------------------|--|-------------------------------|--|-------------------------------|
| Phase I | WBT – 26 Hours of regulatory content preparing the ASI for job functions expected to be accomplished in the first 180 days. | | WBT – 26 Hours of regulatory content preparing the ASI for job functions expected to be accomplished in the first 180 days. | |
| Phase II | Classroom – 19 days formalized practical application designed to reinforce the regulatory guidance and provide job function application to include safety management and international aviation. | | Classroom – 19 days formalized practical application designed to reinforce the regulatory guidance and provide job function application to include safety management and international aviation. | |
| Phase III | WBT – 38 hours of primarily AC specific job function training including maintenance/inspection programs and a variety of specialized functions. | | WBT - 40 hours of primarily GA specific job function training including maintenance/inspection/programs and maintenance facilities/providers | |
| Phase IV | Classroom - 19 days of hands-on practical application specific to assigned job functions to include maintenance organizations. | | Classroom – 13 days of hands-on specific to job functions to include airworthiness technical core and a practical application workshop | |
| Phase V | WBT – 59 hours of advanced AC specialized topics based on job function | | WBT – 38 hours of advanced GA specialized topics based on job function | |
| Phase VI | Classroom – 11 ½ days including 5 days of Certification and Surveillance of part 145 Repair Stations | | Classroom – 14 ½ days including 5 days of Certification and Surveillance of part 145 Repair Stations | |
| Total | WBT 123 hours | Classroom 49 ½ days | WBT 104 hours | Classroom 46 ½ days |

On the job training (OJT) is an ongoing formalized program the Flight Standards Service uses to continually expand ASI proficiency in their specialty. OJT must be accomplished through 3 levels. In level 1 the employee must demonstrate the knowledge required for the task. In level 2 the employee must demonstrate an understanding of that knowledge, and in level 3 the employee must successfully perform the specific job task.

An airworthiness ASI who is assigned oversight of a part 145 repair station receives targeted OJT prior to accomplishing any associated job tasks. Proficiency must be successfully demonstrated in the following skills prior to any assignment of duty:

- Inspect a 14 CFR Part 145 Repair Station and Quality Control Manual(s) Revision

- Inspect a 14 CFR Part 145 Repair Station/Satellite Located outside the U.S. and its Territories
- Inspect a 14 CFR Part 145 Repair Station's Personnel Records
- Evaluate a 14 CFR Part 145 Operator's SFAR 36 Authorization
- Evaluate a 14 CFR Part 145 Repair Station/Applicant's Facilities and Equipment
- Evaluate a 14 CFR Part 145 Repair Station and Quality Control Manual(s) Revision
- Certificate a 14 CFR Part 145 Repair Station/Satellite Located Outside the U.S. and its Territories

The successful completion of the formalized WBT, classroom courses, and OJT enable the ASI to be competent in the performance of assigned job functions. To maintain currency, the ASI is required to attend recurrent training every 5 years and advanced training as needed based on job assignment.

(4) Include an assessment of the quality of monitoring and surveillance by the Administration of work performed by its inspectors and the inspectors of foreign authorities operating under a maintenance safety or maintenance implementation agreement.

The FAA will inspect over 4,800 repair stations in 2014. There are approximately 4,100 domestic and 700 foreign FAA certificated repair stations. That number varies from year to year based on new repair station certifications and repair stations that go out of business, merge, move, or are acquired by other companies. Part of the repair station inspection requirements are established from the FAA Order 1800.56N, National Work Program Guidelines, which creates the baseline surveillance program for the inspection areas that should be evaluated on a scheduled basis, such as facilities, maintenance processes, technical data and training programs.

Every FAA-certificated repair station, regardless of the location, is subject to certain calendar based risk inspections annually. In addition to the calendar based risk inspections, the FAA uses an automated repair station assessment tool (RSAT) in targeting areas of a repair station that present an elevated risk. This tool assists the inspector in prioritizing inspection efforts in areas that require focused attention. It also assists the inspector in future work program planning.

Whenever our risk analysis determines an increased level of risk and a corresponding decrease in the safety margin, the FAA increases its level and intensity of surveillance. For example, when an operator is under financial stress (such as bankruptcy) or experiences labor issues, the FAA will increase overall surveillance to ensure the maintenance and other safety related tasks are being properly done.

On average, inspectors may conduct as many as 16 inspection elements per year at a domestic repair station, or 15 inspection elements at a foreign repair station. The elements are based on the regulatory requirements of 14 CFR Part 145 "Repair Stations". The comprehensive inspection requirements for a repair station are broken down into 16

possible elements, depending on various factors (primarily based on risk assessment), including, but not limited to, maintenance performed for a Part 121 air carrier. Typically, an inspector will conduct surveillance activities for several of these elements on the same day. Larger and more complex repair stations, require the use of inspector resources on a more frequent basis, whereas, the smaller repair stations with fewer employees and less complex maintenance activities, generally don't consume the inspector resources the larger repair stations do.

An FAA inspector is not required to give notice prior to an inspection. However, an inspector may notify the repair station to ensure appropriate personnel are available and coordination is accomplished between the repair station and remote facilities or contractors subject to the inspection. In the case of repair stations located outside of the U.S., it's often necessary for the FAA to coordinate inspections with the approved maintenance organization (AMO) and its Aviation Authority (AA).

FAA inspectors review paperwork and inspect the maintenance being performed on aircraft or component parts of aircraft within the repair stations ratings. Inspectors assigned to repair station surveillance ensure the facility has the proper manuals and paperwork of the air carriers it services, required equipment, and trained technicians to perform the job. Inspectors assigned to a certificated management office (CMO) for an air carrier whose aircraft is having maintenance performed at a repair station may also conduct inspections of that repair station.

Inspections resulting in less than satisfactory results may be handled using the risk management process (RMP). This tool is part of the inspector's available resources and used to identify and mitigate an identified risk. It affords the inspector the ability to target those inspection elements that do not meet the minimum regulatory standards and focus their resources on those areas in gaining compliance. On occasion, a repair station may be in violation of the FAA Federal Aviation Regulations (FAR) or demonstrate a non-compliant attitude. In these instances an investigation ensues and if warranted, a repair station may be issued an administrative enforcement action, such as a warning notice or a letter of correction. The repair station may be fined (civil penalty), have its certificate suspended for a predetermined number of days pending compliance with the FAR, or have their certificate revoked.

Repair Stations Outside the U.S.

In order to apply for FAA certification, a repair station located outside the U.S. must provide evidence that it will provide maintenance for U.S. registered N-numbered aircraft. The N-numbered aircraft may be used in general aviation or in large operations with U.S. air carriers. If the repair station applicant does not have a need to work on U.S. registered aircraft, then there is no reason for the FAA to invest resources towards its certification or surveillance activities. The FAA calls this "demonstrating the need" for certification. In order to meet customer needs, many original equipment manufacturers (OEMs) have repair stations located outside the U.S.

Once certification is complete, a repair station outside the U.S. is visited at least once a year by the repair station's principal inspector or assistant. The repair station must be either inspected annually or undergo a renewal of certification (every 12-24 months). Also, the inspector may perform a follow-up inspection if risk indicators display a potential decrease in the safety margin. The risk management process detailed above, for the mitigation of identified risks, would be employed for systemic non-compliant elements.

FAA certificated repair stations outside the U.S. pay fees for certification under 14 CFR part 187.

Bilateral Agreements and the European Aviation Safety Agency

For those repair stations in countries which the U.S. has a Bilateral Aviation Safety Agreement (BASA) with Maintenance Implementation Procedures (commonly called BASA/MIP), the host authority will audit the repair stations on behalf of the FAA. The same process is used by FAA to perform audits for those countries that have repair stations located in the U.S.

In June 2008, the U.S. signed a bilateral agreement with the European Union (EU).^{*} The agreement entered into force in May 2011, and provided 24 months to complete the transitions and transfers which were completed on May 3, 2013.

The Agreement allows the FAA and EASA to rely on each other's surveillance systems, minimize the duplication of efforts, increase efficiency, and conserve resources to the greatest extent possible. The Agreement calls for successful completion of regularly scheduled FAA inspections. The FAA uses risk based concepts to target specific areas of elevated risk. The FAA and EASA have on-going discussions for harmonization of risk based oversight. The FAA and EASA must be satisfied that repair stations located in the U.S. and EU-based Approved Maintenance Organizations (AMO) meet the conditions of Annex 2.

Annex 2 of the Agreement allows EASA and the FAA to accept each other's standards, systems, and approvals relating to repair stations located in the U.S. and EU-based AMOs that maintain civil aviation products. Annex 2 also explains how to establish points of communication and cooperation when urgent or unusual situations develop.

This new agreement covers 18 of the 27 European Union (EU) member countries. Before entering into the bilateral agreement, the U.S. evaluated the aviation systems of the each country and determined which ones were equivalent to the FAA. The 18 countries included in the agreement are:

^{*} The BASA with EASA was signed on June 30, 2008. The FAA delayed implementation of the agreement until FAA reauthorization was complete. In accordance with Article 19 of the agreement, the BASA and its annexes will enter into force on the first day of the second month following the date on which the U.S. and the E.C. have exchanged diplomatic notes confirming completion of their respective procedures for entry into force.

- 1 Austria
- 2 Belgium
- 3 Czech Republic
- 4 Denmark
- 5 Finland
- 6 France
- 7 Germany
- 8 Italy
- 9 Luxemburg
- 10 Malta
- 11 Netherlands
- 12 Poland
- 13 Portugal
- 14 Romania
- 15 Spain
- 16 Sweden
- 17 Ireland
- 18 United Kingdom

As mentioned previously, aviation authorities in those countries inspect U.S. FAA certificated repair stations on behalf of the U.S. The FAA performs the same function here in the U.S. for EASA certificated repair stations. Inspections of the EASA repair stations are done using the EASA regulations and the special conditions agreed upon with the U.S. The special conditions address areas where the FAA and EASA have not harmonized. One example of this is human factors (HF) training. EASA requires specific HF training, while the FAA does not. Another example of a special condition relates to air carrier maintenance manual requirements. The FAA requires an organizational management chart and more specific procedures while EASA does not.

To ensure both FAA and EASA are maintaining the quality of their inspections and reviewing the special conditions, FAA participates in sampling inspections. The FAA inspectors participate as an observer in EASA Sampling Inspection System (SIS) team inspections of an EU-based approved maintenance organizations and the national aviation authority to ensure their compliance. EASA inspectors do the same with sampling inspections conducted in the U.S. The SIS visits have yielded findings in the areas of tools and calibration, human factors training, quality assurance system, segregation of tools, and failure to follow procedures outlined in the repair station and quality control manuals (RSM/QCM).

The FAA agreement with the EU provides benefits for repair stations located within the U.S. Approximately 1,300 of 4,100 of FAA certificated repair stations located within the U.S. hold an EASA certification as well. Thus, an FAA inspection on behalf of EASA saves the U.S.-based repair station additional inspection and certification fees.