U.S. Department
of Transportation
**Federal Aviation
Administration**

Office of the Administrator

800 Independence Ave., S.W.
Washington, DC 20591

August 15, 2022

The Honorable Maria Cantwell
Chair
Committee on Commerce,
Science, and Transportation
United States Senate
Washington, DC 20510

Dear Chair Cantwell:

Enclosed is the Federal Aviation Administration (FAA) Annual Safety Incident Report. This report is the FAA's second submission under Section 325 of the FAA Reauthorization Act of 2018 (Public Law 115-254).

Section 325(a) directs the FAA to submit an annual report to Congress regarding 14 CFR part 121 airline safety oversight. The report includes:

- A description of the FAA's primary safety oversight process, known as the Safety Assurance System, which is used to ensure the safety of the traveling public.
- A description of how the FAA applies risk-based oversight methods, such as the Interim Certificate Holder Priority Index and the Service Difficulty Reporting, to ensure aviation safety.
- Information about how the FAA monitors part 121 air carriers and how those carriers undergo recurrent reviews based on the performance of their safety programs.

Please note that the reporting requirement under Section 315 of the FAA Modernization and Reform Act of 2012 (Public Law 112-95), which required the FAA to submit a report on the Flight Standards Evaluation Program annually, falls within and is subsumed by this report.

A similar letter has been sent to the Ranking Member of the Senate Committee on Commerce, Science and Transportation and the Chair and Ranking Member of the House Committee on Transportation and Infrastructure.

Sincerely,

Billy Nolen
Acting Administrator

Enclosure

U.S. Department
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**Federal Aviation
Administration**

Office of the Administrator

800 Independence Ave., S.W.
Washington, DC 20591

August 15, 2022

The Honorable Roger Wicker
Ranking Member
Committee on Commerce,
Science, and Transportation
United States Senate
Washington, DC 20510

Dear Ranking Member Wicker:

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800 Independence Ave., S.W.
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August 15, 2022

The Honorable Peter A. DeFazio
Chair
Committee on Transportation
and Infrastructure
U.S. House of Representatives
Washington, DC 20515

Dear Chair DeFazio:

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U.S. Department
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Office of the Administrator

800 Independence Ave., S.W.
Washington, DC 20591

August 15, 2022

The Honorable Sam Graves
Ranking Member
Committee on Transportation
and Infrastructure
U.S. House of Representatives
Washington, DC 20515

Dear Ranking Member Graves:

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Acting Administrator

Enclosure

FAA
Aviation Safety

REPORT TO CONGRESS:

Annual Safety Incident Report

Second Annual Submission

FAA Reauthorization Act of 2018 (Pub. L. 115-254) – Section 325

Executive Summary

This is the Federal Aviation Administration's (FAA) second report to Congress regarding Title 14 *Code of Federal Regulations* (14 CFR) part 121 airline safety oversight under Section 325 of the FAA Reauthorization Act of 2018(the Act).[1] This report, which covers Fiscal Year (FY) 2020,[2] describes the FAA's primary safety oversight process, known as the Safety Assurance System (SAS), which is used to monitor the safety of the National Airspace System (NAS). SAS applies official policy by delivering safety controls through regulations and practical applications to businesses and individuals subject to FAA statutes and regulations.

This report also includes detailed information on how the FAA utilizes risk-based decision-making (RBDM) to build on current safety management principles and proactively address emerging safety risks. RBDM requires tools to data-mine all facets of information available. Tools mentioned in this report include the Interim Certificate Holder Priority Index (ICPI), Service Difficulty Reporting (SDR), the Emergency Operations Network (EON), the Voluntary Disclosure Reporting Program (VDRP), the Program Tracking and Reporting Subsystem (PTRS), Pilot Deviation (PD) data, enforcement and compliance actions, and the QMS. These tools provide a comprehensive data package that covers various aspects of oversight of operations under
14 CFR part 121, such as:

- Monitoring organizational trends and maintenance issues.
- Tracking accidents and incidents in near real-time.
- Supporting voluntary reporting.
- Identifying the need for additional inspection items covered by existing regulations.

FAA aviation safety inspectors (ASI) monitor part 121 air carriers on a continuous basis. Each air carrier is subject to recurrent reviews of the performance of its safety programs. During the period covered in this report, the FAA's planned inspection results did not warrant any cases where the timelines for recurrent reviews were advanced.

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[1] Public Law 115-254

[2] October 1, 2019 – September 30, 2020

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Legislative Mandate

Section 325 of the Act requires:

(a) IN GENERAL.—Not later than 1 year after the date of enactment of this Act, and annually thereafter for 5 years, the Administrator, shall submit to the appropriate committees of Congress a report regarding part 121 airline safety oversight.

(b) CONTENTS.—The annual report shall include—

(1) a description of the Federal Aviation Administration's safety oversight process to ensure the safety of the traveling public;
(2) a description of risk-based oversight methods applied to ensure aviation safety, including to specific issues addressed in the year preceding the report that in the determination of the Administrator address safety risk; and
(3) in the instance of specific reviews of air carrier performance to safety regulations, a description of cases where the timelines for recurrent reviews are advanced.

The content of this report fulfills the requirements of Section 325. Additionally, the reporting requirement under Section 315 of the FAA Modernization and Reform Act of 2012,[3] which required the FAA annually to submit a report on the Flight Standards Evaluation Program (FSEP), falls within and is subsumed by this report. Thus, the content previously provided in accordance with the FSEP reporting requirement will now be provided through this Section 325 report.

Safety Oversight Process

The FAA's primary oversight system is the Safety Assurance System (SAS). SAS is an oversight tool used to perform certification and surveillance and to ensure continued operational safety inspections for all commercial operations. SAS includes policy, processes, and associated software that aids the Agency in resource and oversight planning. SAS does not represent a separate safety standard and does not impose additional requirements on certificate holders.

The FAA implemented SAS to standardize the oversight of certificate holders or applicants under 14 CFR parts 121, 135, and 145. SAS is based on system safety principles, safety attributes, and risk management to identify hazards and prevent loss of life and the loss of equipment and other property. The design of SAS is based on the following three roles:

[3] Public Law 112-95 (Feb. 14, 2012)

1. **Initial Certification -** The role of Initial Certification is to assess whether applicants can conduct business in compliance with the applicable regulations.
2. **Continued Operational Safety (COS)** - The role of COS includes the functions of routine surveillance and certificate management. The purpose of this function is to assess a certificate holder's ongoing compliance with regulatory standards and management of risk.
3. **Assurance Support** - The role of Assurance Support is to keep the SAS program current and complete, which includes maintaining Data Collection Tools (DCT), automation version control, and feedback.

Air carriers have a statutory duty to provide service with the highest degree of safety in the public interest. SAS is a means by which the FAA determines whether air carriers fulfill that duty. SAS supports the implementation of official policies designed to ensure that air carriers, other business organizations, and individuals comply with regulations and other safety controls that apply to them.

The FAA uses SAS to meet five primary responsibilities to ensure safety.

1. Verify that an applicant seeking certification from the FAA can operate safely and comply with the regulations and standards before issuing a certificate and approving or accepting programs.[4]
2. Conduct periodic reviews to verify that a certificate holder continues to meet regulatory requirements when the operating environment changes.
3. Validate the performance of a certificate holder's approved and accepted programs for the purpose of COS.
4. Identify regulatory noncompliance or safety issues and correct them as effectively, quickly, and efficiently as possible.
5. If a noncompliance or safety issue exists, use the most effective means to return an individual or entity that holds an FAA certificate, approval, authorization, or license to full compliance and to prevent a recurrence.

These responsibilities, as well as information on SAS policy, concepts, and principles, are outlined in 8900.1, Volume 10 of the Flight Standards Information Management System.[5]

[4] Approval is granted by letter, by a stamp of approval, by the issuance of OpSpecs/MSpecs/TSpecs/LOA, or by some other official means of conveying approval. Acceptance of an operator's proposal may be accomplished by various means, including a letter, or by taking no action, which indicates there is no FAA objection to the proposal. available at https://fsims.faa.gov/PICDetail.aspx?docId=8900.1,Vol.3,Ch1,Sec1

[5] Flight Standards Information Management System- Volume 10: Safety Assurance System Policy and Procedure, Chapter 1, September 18, 2020 *available at* https://fsims.faa.gov/PICResults.aspx?mode=EBookContents&restricttocategory=all~menu

Risk-Based Oversight Methods

The FAA has adopted several strategic goals under Risk-Based Decision-Making (RBDM) to ensure safety in the NAS.[6] These goals build on current safety management principles and proactively address emerging safety risks. The FAA is taking advantage of the growing availability of safety data and the development of powerful analytical tools that will integrate safety risk into decision-making processes. Specifically, the FAA is developing policies, procedures, and systems to collect safety-related data in a consistent way across the Agency and throughout the aerospace industry. Additionally, the FAA is leveraging the industry's use of safety management principles and exchanging lessons learned and best practices using this data to make informed, proactive safety decisions based on identified risks. The FAA will continue to evolve the oversight model to target resources to the highest level of risk, improve standardization and data access, and incorporate risk model interoperability to enhance decision-making across the Agency.

Integrated Oversight Philosophy

The FAA Integrated Oversight Philosophy identifies principles for evolving the safety oversight systems to better position the FAA to meet the challenges of a rapidly evolving U.S. aerospace system. The policy supports RBDM by leveraging the use of consistent, data-informed approaches to enable the FAA to make smarter, system-level, risk-based decisions. RBDM emphasizes the review of safety data to integrate risk into decision-making processes and enable informed decision-making by oversight personnel.

Integrated Oversight Philosophy applies to the safety oversight programs of all FAA organizations that have regulatory oversight responsibilities. The policy embraces many interdependent principles, including; RBDM, Safety Management Systems, the FAA Compliance Program, and voluntary safety reporting programs. The FAA recognizes that safety oversight programs are an integral part of the safety culture. Evolving those programs and the FAA's oversight model supports the movement toward a safety management framework that collectively helps to define the safety culture.

Addressing Safety Risk with RBDM

The FAA continues to maintain the Interim Certificate Holder Priority Index (ICPI), a safety performance and risk factor analysis model. The ICPI is a methodology that evaluates certificate

[6] FAA Strategic Plan, FY 2019-2022, *available at* https://www.faa.gov/sites/faa.gov/files/about/plans_reports/FAA_Strategic_Plan_Final_FY2019-2022.pdf

holder safety performance and risk factors to help prioritize parts 121, 135, and 145 certificate holders for oversight planning and resource allocation purposes.

The FAA created a centralized website with more than 1,000 reports and analytical products to serve as a "one-stop-shop" resource to assist internal stakeholders with the information needed to support RBDM and certificate oversight efforts. The FAA Flight Standards analytical community provides in-depth analytical products upon request to internal stakeholders across the Agency. To date, information systems and categories analyzed have included SAS, SDR, EON, VDRP, PTRS, PD data, enforcement and compliance actions, and Quality Management System (QMS) data.

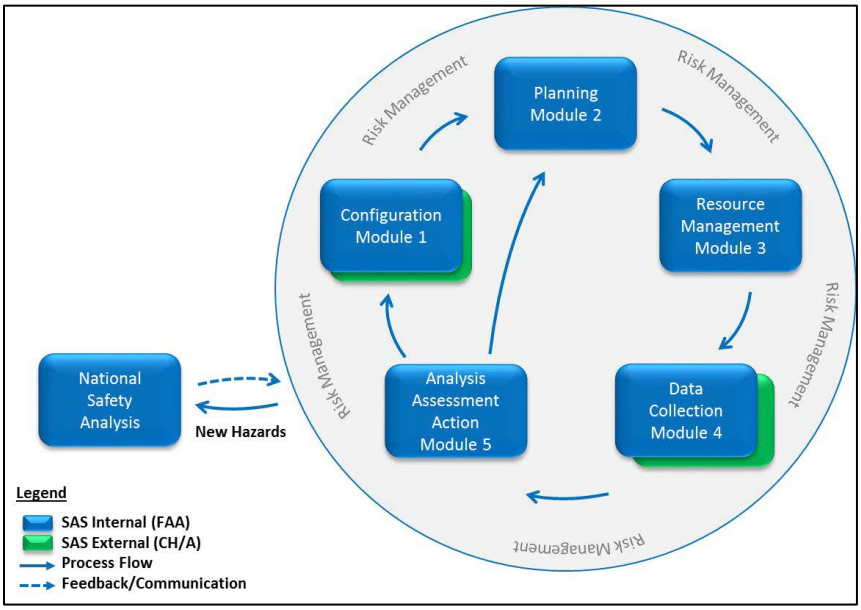
Certificate Holder Evaluation Process (CHEP)

The CHEP is used at the national, divisional, and office levels to evaluate 14 CFR parts 121, 135, and 145 certificate holders. This process may also be used to evaluate 14 CFR parts 141, 142, and 147 certificate holders at the divisional and office levels. The CHEP provides Flight Standards with standard policies and procedures to evaluate parts 121, 135, and 145 certificate holders. The CHEP is conducted in accordance with FAA Order 8900.1 and is administered through the Certification and Evaluation Program Office (CEPO) of the Safety Analysis and Program Division. The CHEP provides an in-depth look at the certificate holder's systems and has three primary goals:

1. Verify that the certificate holder's systems and subsystems comply with applicable requirements.
2. Evaluate whether the certificate holder is operating at the highest possible degree of safety in the public interest in accordance with Title 49 *United States Code* § 44701(d).
3. Identify hazards and mitigate associated risks.

Using the SAS Oversight Model, presented in Figure 1, the National CHEP team validates regulatory compliance and records the results in the SAS database. Analysis and assessment results are based on the data collected and recorded in Module 4, Data Collection. In Module 5, Analysis Assessment Action, the Certificate Management Team (CMT) works with the FAA's Office of the Chief Counsel to initiate action relative to the certificate holder by adding actions in the Action Item Tracking Tool (AITT).

Figure 1: SAS Oversight Model



With the increased availability of data for RBDM, the National CHEP Team has the option to modify the review schedule to evaluate high-risk certificate holders in accordance with RBDM. The CEPO reviews various databases when scheduling evaluations for National CHEPs. The databases reviewed by CEPO include facts concerning accidents and incidents, enforcement activities, pilot deviations, past assessments, financial conditions, and other information. This review might flag certificate holders deemed to be 'higher risk' and could cause the National CHEP Team to alter its scheduling priority.

The National CHEP Team provides the FAA with the following:

- Consistent application of regulations or policy across all certificate-holding district offices.
- An independent evaluation of air carrier compliance.
- Standardization of the oversight process.
- Alerts for a system malfunction.
- Identification of potential regulatory inconsistencies.
- Data on Element Design Assessment (EDA) and Element Performance Assessment (EPA) results that can be trended.

National CHEP Team Assessments and Accomplishments

Eight teams of ASIs accomplish CHEP assessments. In FY 2020, the FAA conducted six CHEP assessments. Due to the COVID-19 pandemic, the CHEP assessments for the 3rd and 4th

quarters of FY 2020 were limited to design assessments only. Also, during FY 2020, the CHEP schedule changed as certificate holders ceased operations due to the COVID-19 pandemic's impact on the aviation industry.

Assessment Determination Value (ADV) Scoring Process

An outcome of the SAS business process is the ADV score. To generate an ADV score, the FAA uses SAS Analysis, Assessment and Action (AAA) procedures and tools to make a bottom-line assessment to determine whether the certificate holder's system design meets the standards for acceptance (for EDAs) and to determine whether the certificate holder's system performs in a way that it controls hazards (for EPAs).

The AAA process uses data collected by the ASI to determine whether the certificate holder's or applicant's systems are designed and perform in a manner that results in regulatory compliance by the certificate holder or applicant and whether safety risk is being managed to an acceptable level. The principal inspector (PI), Training Center Program Manager (TCPM), or certification project manager (CPM) may use data from other sources to help make the assessment. The AAA process requires the PI/TCPM/CPM to determine and document the appropriate course of action based on the result of the analysis and assessment.

Per FAA Order 8900.1 Volume 10, the PI uses the AAA process to analyze data, evaluate the design and performance of the certificate holder's system, and assess whether to approve, accept, or reject a certificate holder's or applicant's programs. The PI documents this determination and any associated PI action.

If no unfavorable responses exist, the automation defaults to an assessment determination of "0G." The PI may add comments in the justification field. If unfavorable responses exist, the PI considers the safety impact, likelihood, regulatory compliance, and justification. Safety impact is based on the PI's estimation of the worst reasonable outcome that may result from the unfavorable findings. The likelihood is determined based on the PI's estimate of how frequently failures similar to those identified during data collection will recur. The PI determines whether any of the findings involve regulatory noncompliance.

The PI determines if action is required, including action to address regulatory noncompliance.

The PI closes the assessment and approves or accepts the program if determined that the certificate holder's performance or design meets the guidelines and regulatory requirements. If the PI determines the certificate holder's performance or design does not meet the requirements, then the PI may plan future EPAs, EDAs, or Custom Data Collection Tools (DCT) prior to approving the program.

If the action is a compliance action, the PI conducts a root cause analysis in accordance with Flight Standards Service Compliance Action Decision Procedures. The results of the root cause analysis and the PI's knowledge of the certificate holder's compliance attitude, safety culture, and ability to enact effective corrective actions are used to determine the corrective action(s) required to mitigate the identified risk.

If the appropriate action is not a compliance action, the PI may: adjust the priority order of the Safety Performance Analysis (SPA); add an EPA or EDA; add a Custom DCT; notify the Certificate Holder; initiate enforcement action per FAA Order 2150.3,[7] FAA Compliance and Enforcement Program, as amended; amend or remove an Operations Specification (OpSpec); convene a System Analysis Team (SAT); identify a new hazard (Request National Safety Analysis (NSA) Support); or initiate the Risk Management Process.

For an EDA or EPA, once the bottom-line assessment is complete, the assessment is accepted or rejected and assigned a numerical ADV score from 0 to 7, as indicated in the PA and DA determination tables (Table 1 and Table 2). These tables were created to assist PIs/CPMs with identifying assessment determination options and affirmation status, safety impact, and likelihood descriptions, and determining whether action is required. The difference between the PA and DA determination options is that a moderate safety impact with remote likelihood results in an assessment determination of four yellow (4Y) for PAs and four orange (4O) for DAs. The FAA conducts the planning of corrective actions under the standards of an SAS business module. Table 3 shows the ADV scores assigned in CHEP assessments in FY 2020.

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[7] FAA Order 2150.3C FAA Compliance and Enforcement Program, September 18, 2018 *available at* https://www.faa.gov/regulations_policies/orders_notices/index.cfm/go/document.information/documentid/1034329

Table 1: Performance Assessment Determination Value Scores (FY2020)

PA Determination Value	Regulatory/ Nonregulatory	Performance Affirmation Status	Description	Action Required?
7R (Seven Red)	Nonregulatory	Performance Not Affirmed	Discrepancies observed which had a significant safety impact and are likely to recur frequently.*	Yes
7R (Seven Red)	Regulatory			
6O (Six Orange)	Nonregulatory	Performance Not Affirmed	Discrepancies observed which had a moderate safety impact and are likely to recur frequently* or which had a significant safety impact and are likely to recur occasionally.*	Yes
6O (Six Orange)	Regulatory			
5O (Five Orange)	Nonregulatory	Performance Not Affirmed	Discrepancies observed which had a moderate safety impact and are likely to recur occasionally* or which had a significant safety impact and have a remote likelihood of recurring.	Yes
5O (Five Orange)	Regulatory			
4Y (Four Yellow)	Nonregulatory	Performance Affirmed with Mitigation	Discrepancies observed which had a moderate safety impact and have a remote likelihood of recurring.	Yes
4Y (Four Yellow)	Regulatory			
3Y (Three Yellow)	Nonregulatory	Performance Affirmed with Mitigation	Discrepancies observed which had a minor safety impact and are likely to recur frequently.*	Yes
3Y (Three Yellow)	Regulatory			
2Y (Two Yellow)	Nonregulatory	Performance Affirmed with Mitigation	Discrepancies observed which had a minor safety impact and are likely to recur occasionally.*	Yes
2Y (Two Yellow)	Regulatory			
1G (One Green)	Nonregulatory	Performance Affirmed with Mitigation	Discrepancies observed which had a minor safety impact and have a remote likelihood of recurring.	Yes
1G (One Green)	Regulatory			
0G (No Findings)	Nonregulatory	Performance Affirmed	No Discrepancy Observed	No

Table 2: Design Assessment Determination Value Scores (FY2020)

Design Assessment Determination Value	Regulatory Compliance	Design Affirmation Status	Description	Action Required?
7R (Seven Red)	Nonregulatory	Design Not Accepted/Approved	Discrepancies observed which had a significant safety impact and are likely to recur frequently.*	Yes
7R (Seven Red)	Regulatory			
6O (Six Orange)	Nonregulatory	Design Not Accepted/Approved	Discrepancies observed which had a moderate safety impact and are likely to recur frequently* or which had a significant safety impact and are likely to recur occasionally.*	Yes
6O (Six Orange)	Regulatory			
5O (Five Orange)	Nonregulatory	Design Not Accepted/Approved	Discrepancies observed which had a moderate safety impact and are likely to recur occasionally* or which had a significant safety impact and have a remote likelihood of recurring.	Yes
5O (Five Orange)	Regulatory			
4O (Four Orange)	Nonregulatory	Design Not Accepted/Approved	Discrepancies observed which had a moderate safety impact and have a remote likelihood of recurring.	Yes
4O (Four Orange)	Regulatory			
3Y (Three Yellow)	Nonregulatory	Design Accepted/Approved	Discrepancies observed which had a minor safety impact and are likely to recur frequently.*	Yes
3Y (Three Yellow)	Regulatory	Design Not Accepted/Approved		
2Y (Two Yellow)	Nonregulatory	Design Accepted/Approved	Discrepancies observed which had a minor safety impact and are likely to recur occasionally.*	Yes
2Y (Two Yellow)	Regulatory	Design Not Accepted/Approved		
1G(One Green)	Nonregulatory	Design Accepted/Approved	Discrepancies observed which had a minor safety impact and have a remote likelihood of recurring.	Yes
1G (One Green)	Regulatory	Design Not Accepted/Approved		
0G (No Findings)	Nonregulatory	Design Accepted/Approved	No Discrepancy Observed	No

* "Frequent" or "Occasional" likelihoods may indicate a systemic hazard. Design assessment determination is based on the potential impact the design discrepancies could have on performance.

Table 3: ADV Scores Assigned in FY 2020 CHEP Assessments[8]

ADV Score	Element Design Assessments (EDA)		Custom Design Assessments (CDA)	
	Number of Elements	Percent of EDAs	Number of Elements	Percent of Customs
0 Green	22	27.5%	1	16.67%
1 Green	5	6.25%	0	0%
2 Yellow	4	5%	3	50%
3 Yellow	1	1.25%	0	0%
4 Orange	20	25%	1	16.67%
5 Orange	23	28.75%	1	16.67%
6 Orange	4	5%	0	0%
7 Red	1	1.25%	0	0%
Total	**80**	**100%**	**6**	**100%**

ADV Score	Performance Assessments		System / Subsystem Assessments	
	Number of Elements	Percent of EPAs	Number of Elements	Percent of Customs
0 Green	6	14.63%	0	0%
1 Green	3	7.32%	0	0%
2 Yellow	2	4.88%	0	0%
3 Yellow	4	9.76%	0	0%
4 Yellow	3	7.32%	0	0%
5 Orange	17	41.46%	0	0%
6 Orange	3	7.32%	0	0%
7 Red	3	7.32%	0	0%
Total	**41**	**100%**	**0**	**0%**

[8] Figures on Table 3 are rounded to the nearest hundredth.

Actions Taken as a Result of CHEP Findings

The FAA addresses any CHEP element scored 1 through 7 and ensures any associated risk is mitigated to an acceptable level. Listed below are some possible compliance and enforcement actions in general order of most serious to less serious:

- Initiation of Legal Enforcement Action: A legal enforcement action may be initiated if a certificate holder has conducted or is conducting operations contrary to applicable FAA regulations, and the criteria in Order 2150.3[9] , as amended, indicates that legal enforcement action is required or warranted. Legal enforcement action may result in a suspension or revocation of a certificate, or a civil penalty action, depending on the circumstances.
- Administrative Action: An administrative action is used to address regulatory noncompliance when compliance action will not remediate noncompliance and ensure future compliance, and legal enforcement action is not required under Order 2150. 3[10], as amended. An example of administrative action is a Letter of Correction, which memorializes a specific agreement between the FAA and the regulated entity of corrective action to be taken by the entity.
- Compliance Action: A compliance action is a non-enforcement response to regulatory noncompliance. A compliance action is taken when the entity is both willing and able to regain compliance and when legal enforcement or administrative action is not required or warranted. An example of a compliance action includes changes to an operator's procedural manuals.

Listed below are some additional actions taken, continuing in general order of most serious to less serious:

- Custom DCT: A Custom DCT allows data collection activities to be requested by principal inspectors to evaluate and collect data on specific areas of immediate concern outside of the normal assessment schedule. There were 39 Custom DCTs that were initiated as a result of CHEP findings.
- Planning of Additional EPA, EDA, or SPA (System/Subsystem Performance Assessment): Inspection activities not previously scheduled can be added to the CMT work plan to provide additional surveillance of particular areas of concern.

[9] FAA Order 2150.3C FAA Compliance and Enforcement Program, September 18, 2018 *available at* https://www.faa.gov/regulations_policies/orders_notices/index.cfm/go/document.information/documentid/1034329
[10] Ibid

- Notification to Certificate Holder: Particular findings of the assessment process can be formally transmitted to the certificate holder. There were 80 notifications to certificate holders that were initiated as a result of CHEP findings.

The FAA continues to find CHEP assessments to be a valuable addition to the part 121 air carrier oversight program. The CHEP program provides additional technical expertise to identify issues that were difficult to recognize at the local office level and provides information and training to managers and inspectors to increase their knowledge and skill set. The CHEP program provides senior FAA management with an additional oversight tool to identify regional and national trends.

Analytical Support Functions

The Flight Standards analytical community provides safety intelligence to support risk-based decisions, actions, priorities, and the assessment of system performance of the FAA. This also includes industry product and service providers for which Flight Standards has oversight responsibility. The Flight Standards analyst community's work provides the data necessary for making informed policy decisions that support strategic and everyday decision-making functions.

Analytical support includes data reporting, data analysis, data modeling, and the development of automated data displays to improve RBDM. In addition, Safety Performance Analysis System (SPAS) is an application that provides Flight Standards inspectors, managers, and analysts with access to more than two dozen safety databases, enabling stakeholders to evaluate data under routine as well as non-routine scenarios and make informed decisions.

National Safety Analysis

The FAA established the National Safety Analysis (NSA) to conduct investigative analysis and risk assessment associated with new hazards reported from the field through the SAS. The NSA is a foundational component of the SAS. As such, the NSA provides analytical support and coordinates risk management efforts for new hazards or safety issues identified within the aviation community overseen by Flight Standards. A new hazard is one where the associated risk is not controlled adequately by current directives, or safety risk controls do not exist to mitigate risk effectively. The hazard may be associated with a systemic or a potentially systemic system safety issue that may apply to multiple certificate holders. Within SAS, PIs/CPMs have the ability to identify and record a new hazard as a "Request National Level Hazard Analysis," which engages the analytical community and subject matter experts within the Agency for a review of the new hazard.

SAS New Hazard Analysis and Risk Assessments

In accordance with processes established within SAS, analysts provide coordinated hazard analysis and risk assessment services to CMT PIs and other officials who identify a potential new hazard when conducting oversight. In FY 2020, the Safety Analysis Program Office (SAPO) reviewed approximately 188 suspected new hazards that were entered into the SAS automation through the formal SAS NSA process. Since the inception of SAS, SAPO has reviewed over 1,344 hazards in the SAS database using the NSA function.

Interim Certificate Holder Priority Index (ICPI)

Flight Standards maintains a safety performance and risk factor analysis methodology known as the ICPI. The ICPI methodology analyzes certificate holder safety performance levels and risk factors for oversight planning and resource allocation purposes. In FY 2019, the FAA introduced the ICPI in phases within the air carrier and general aviation communities.

The ICPI provides a standardized, objective capability for evaluating and prioritizing parts 121, 135, and 145 certificate holders based on their safety performance levels and risk factor exposure. It replaces the capabilities of the SPAS Trend Monitoring Index, Surveillance Priority Index, and Repair Station Analysis Model, which have become obsolete and unusable for certificate 'holders' prioritization following the implementation of SAS. The ICPI evaluates data in four-component subject areas:

- Safety Performance History (Accidents/Incidents/Occurrences/Pilot Deviations/Enforcements).
- Negative Surveillance (AAA Results in SAS).
- Certificate Holder Assessment Tool (CHAT) Risk Indicators (Risk indicators selected by PIs in SAS CHAT).
- "Uncertainty" (Lack of recent surveillance, PI changes, age of Certificate).

The ICPI algorithm simulates the logical thought processes that an inspector, analyst, or other safety officials would apply when evaluating certificate holder safety performance levels, surveillance results, and other risk factors to prioritize certificate holders for surveillance.

Through continuous improvement, the ICPI has provided additional features and improvements. In FY 2020, the ICPI has added:

- Certificate holders' negative conditions
- Certificate holders' fleet history
- Updates for SAS v3.0 AAAs
- Updates for SAS v3.0 CHAT Risk Indicators.

Safety Data and Analysis Team (SDAT)

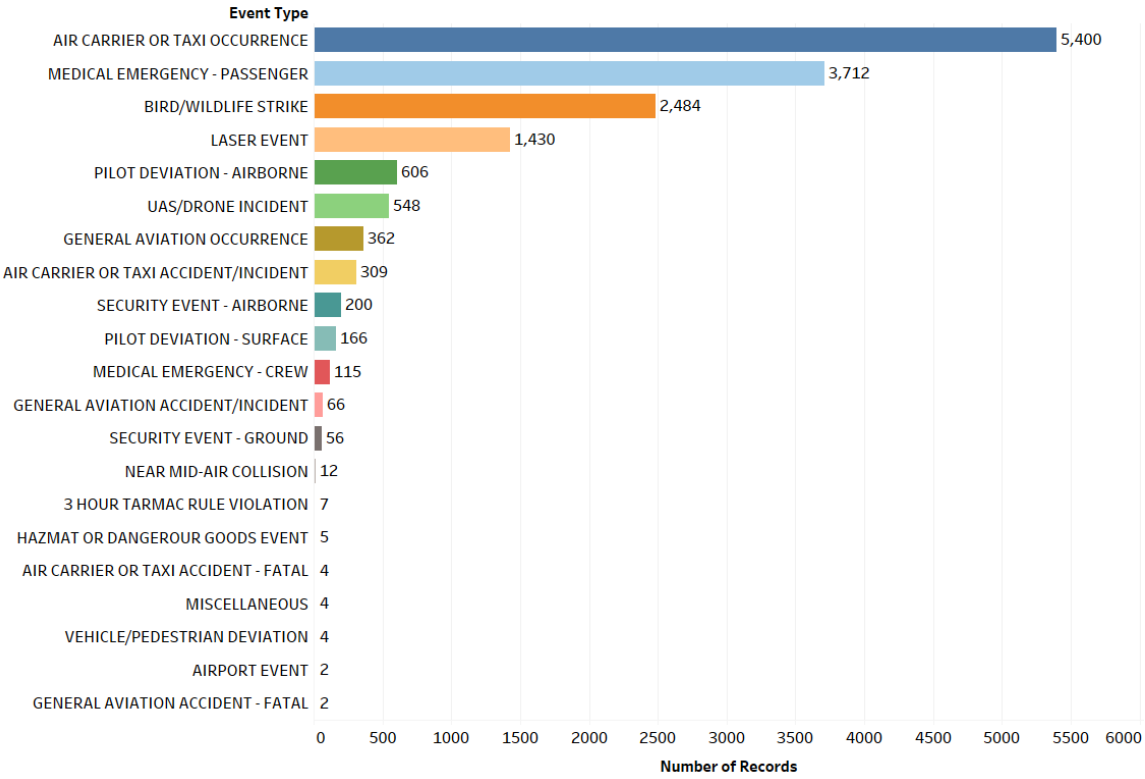
The SDAT is a cross-Agency team that focuses on improving the quality and efficiency of data analysis across the FAA. A sub-team of the SDAT is working on the development of a Hazard Wiki Library for hazards that affect operations that occur under 14 CFR part 121. The library is a searchable list of classified hazards allowing for tracking and analysis of changes to system safety. The FAA draft Hazard Taxonomy is used as a means of organizing hazard types. Some of the current hazard types include single-engine failure; wake turbulence; wind shear and environmental turbulence; conflict of taxiway or apron; runway incursion; icing; loss of control in flight or inappropriate aircraft handling; flight crew incapacitation; and flight control system failure.

Continuous Monitoring and Trend Analysis of Operational Safety Events

The FAA's Regional Operations Centers receive reports of approximately 3,200 aviation safety events each month. Flight Standards has initiated a proactive, continuous monitoring program, which reviews and analyzes operational safety events reported through the EON Daily Report Application on a regularly scheduled basis. This continuous monitoring and analysis program provides early identification of emerging performance patterns so that Flight Standards can identify and correct conditions causing any unsafe performance pattern.

Figure 2 provides information on the total number of EONs events categorically. The events shown include only those events reported through the EONs; it does not provide a tally of all events that may have occurred in the NAS. This data is current as of September 30, 2020.

Figure 2: EONs Events for FY 2020



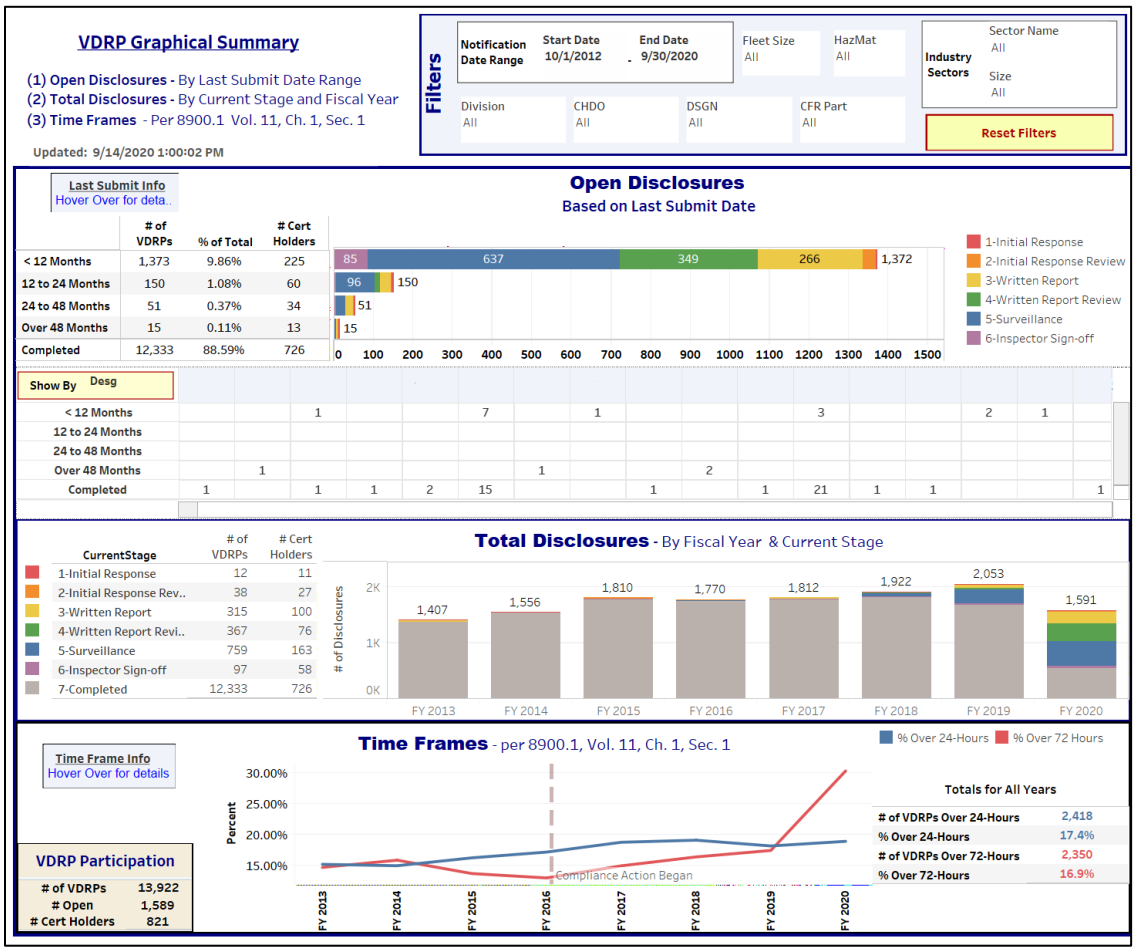
Monitoring of the Voluntary Disclosure Reporting Program (VDRP)

The primary purpose of the VDRP is to identify and correct issues of noncompliance or safety. Certificate holders are not required to participate in the VDRP. Initiation of VDRP is indicative of the participant's willingness to identify instances of regulatory noncompliance. In the case that regulatory noncompliance is identified, participants are expected to correct their own issues and develop long-term comprehensive fixes. Ultimately, the FAA intends for this program to foster safe operating practices and encourage a positive safety culture.

The FAA created a VDRP analysis tool to help analyze data at the national and CMT level. Figure 3 presents an example of the output of the VDRP analysis tool. The tool is used to:

- Provide Flight Standards users with a standardized interactive method for analyzing VDRP.
- Visualize and understand data patterns within VDRP.
- Support CMTs' ability to include VDRP data in their oversight plans.

Figure 3: Example VDRP Graphical Summary



SAS Analysis, Assessment & Action (AAA) Summary & Monitor Report

SAS incorporates five business process modules for the initial certification and continued operational safety of certificate holders or applicants. PIs use the analysis and assessment process to make informed decisions about a certificate holder's operating system. Within the SAS AAA, PIs have numeric scoring options to capture a bottom-line assessment of certificate holder performance, based on the data collected from DCTs and other available information.

Flight Standards has created two dashboards for each of the SAS Peer Groups that average the AAA results across the certificate holders, peer groups, and other parameters. The dashboards allow decision-makers to focus quickly on deteriorating areas and determine whether an action plan is required. Thus, the decision-makers or PIs can save available time and resources by closely examining surveillance records associated with the highest assessment scores. Figure 4 shows one example of a SAS Peer Group Dashboard.

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Figure 4: Example SAS Peer Group Dashboard

AAA Summary Peer Group A (14 CFR Part 121)

mlf_label	mlf_name	criticality	FY 2020 Q3	FY 2020 Q4
1.1	Safety and Performance Monitoring	H	1.301	1.100
1.1.2	(OP) Safety Program (Ground and Flight)	H	1.625	1.077
1.1.3	(AW) Continuous Analysis and Surveillance System (CASS)	H	1.553	1.273
1.1.4	(AW) Reliability Program	H	1.000	1.857
1.1.6	(AW) Safety Program	H	1.000	1.750
1.2	Operations Management	L	1.500	1.556
1.2.1	(AXH) HM Manual Management	L	3.000	1.000
	(OP) Required Personnel	L	1.000	1.000
1.2.2	(OP) Manual Management	L	1.086	1.216
1.2.3	(OP) Computer-Based Recordkeeping System	L	1.667	1.200
1.3	Airworthiness Management	L	3.167	1.333
1.3.1	(AW) Required Personnel	L	1.750	1.222
1.3.2	(AW) Manual Management	L	1.182	1.385
1.3.3	(AW) Coordinating Agencies for	L		

Reviews of Air Carrier Performance to Safety Regulations

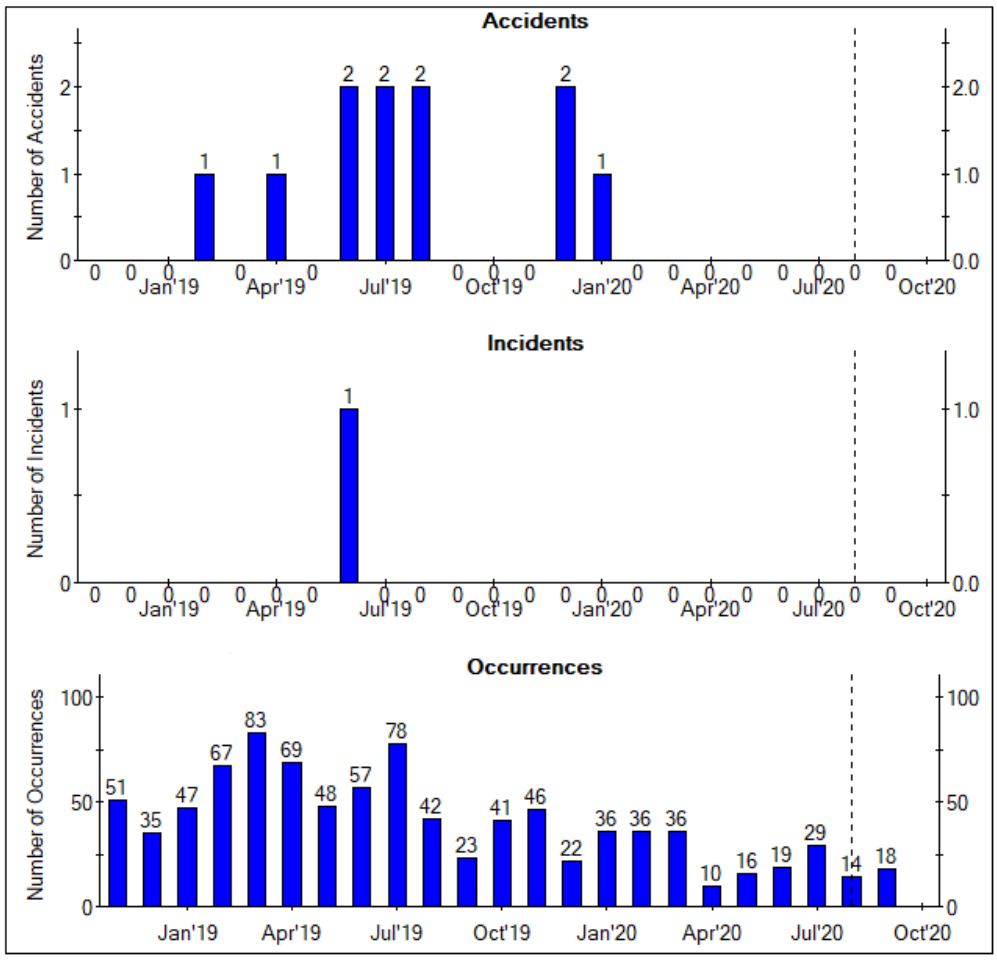
Flight Standards compiled and analyzed selected sets of safety data from FAA data sources regarding various certificate holders and developed a report. The purpose of these analyses and the subsequent report is not to provide a comprehensive safety assessment of a particular certificate holder but rather to provide information that may assist the CMT in working with the certificate holder to optimize their safety management practices.

These reports provide insight from an objective examination of available data to support CMTs' and the certificate holders' ongoing efforts to maximize the effectiveness of each certificate holder's safety programs at all levels of the operation. The report reviews information from the SAS, CHAT, SDR, EON, VDRP, and PTRS to provide a broad overview of safety performance.

Figure 5 shows an example of how a typical report on any particular air carrier is derived from the data. The FAA reviewed several data sources with very few obvious trends standing out, but an increase in accidents beginning in February 2019 and continuing to the present is a concern. The increase in the occurrence rate in the months prior to February 2019 has prompted the FAA to examine certain areas of safety management closely. Also noted is how each certificate holder

followed up on each relevant event and whether mitigation strategies put in place were performing as expected. Beginning in 2020, the number of events decreased.

Figure 5: Example of Safety Performance Review Data Analysis



The FAA is continuously supporting the safe introduction of new technologies and programs as the NAS environment evolves.

Conclusion

SAS expands the FAA's oversight beyond regulatory compliance. SAS supports the implementation of official policies designed to ensure that part 121 air carriers operate at the highest level of safety, thus ensuring the safety of the traveling public. Some of the enhancements to SAS during FY 2020 are outlined below.

The AAA process in SAS allows for the identification of regulatory noncompliance, and the AITT selections identify those issues that Flight Standards addressed with compliance action.

This aids in the ability to review an entity's compliance history. It also contributes to the ability of Flight Standards to measure the adoption, utilization, and proficiency of the Compliance Program.

The new Assessment Determination risk matrix was released in SAS automation in February 2020. During SAS Phase 3, Flight Standards Service will be enhancing SAS automation with a new risk profile to assist the PI, CPM, and management with RBDM. The first step towards implementing the new risk profile is the integration of a risk matrix in the "Assessment Determination." The Assessment Determination risk matrix was developed based on the severity descriptions and likelihood thresholds described in FAA Order 8040.4, Safety Risk Management Policy.[11]

The FAA remains committed to developing programs and systems that embrace increased sharing of safety data among FAA organizations, industry, and international partners to help us identify better hazards relating to aviation and mitigate associated safety risks.

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[11] Safety Risk Management Policy, May 02, 2017 *available at* https://www.faa.gov/regulations_policies/orders_notices/index.cfm/go/document.current/documentNumber/8040.4