March 17, 2023

Brandon Roberts
Executive Director, Office of Rulemaking, ARM-1
Federal Aviation Administration
800 Independence Avenue, SW
Washington, DC 20591

Re: Recommendation Report – Training Standardization Working Group (TSWG) – Standardized Curriculum

Dear Mr. Roberts,

On behalf of the Aviation Rulemaking Advisory Committee (ARAC), I am pleased to submit the enclosed Recommendation Report from the Training Standardization working group (TSWG).

At the March 16, 2023, ARAC meeting at FAA's Washington, DC headquarters, Mr. Brian Koester presented an overview of the report which recommends a standardized curriculum concept.

ARAC members who attended the meeting, in-person and virtually, accepted the report, as presented. With that, I would welcome the agency's timely review, acceptance, and implementation of the working group's recommendations.

I thank the members of TSWG for their thorough work. I am hopeful that, once put into practice, the use of standardized curriculum will enhance both training and checking while also promoting safer operational practices through a common and consistent methodology for training and evaluating – ultimately improving the safety of part 135 flight operations.

Sincerely,

David Oord
ARAC Chair

Enclosure: Recommendation Report – Training Standardization Working Group (TSWG) – Standardized Curriculum

FAA Aviation Rulemaking Advisory Committee

Training Standardization Working Group (TSWG)
March 2023 Recommendation Report

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1 Executive Summary

1.1 Summary

The Standardized Curriculum Concept supports the overarching goals to enhance training and checking and promote safer operational practices in part 135 operations through a common and consistent methodology for training and evaluating. This supports the National Transportation Safety Board Most Wanted List initiative to improve the safety of part 135 flight operations.

The TSWG is comprised of representatives from the aviation industry, including training centers, aircraft manufacturers, operators and industry organizations, serving as members of the group and report to ARAC. This recommendation report includes the results of the following TSWG actions:

- Identified the components of Adaptive Recurrent standardized curricula, which incorporate the maneuvers, procedures and functions to be performed during training and checking.

- Recommended revision to Federal Aviation Administration (FAA) guidance to facilitate the execution of the standardized curricula.

2 Background

2.1 The Task and Tasking

The FAA established the Air Carrier Training Aviation Rulemaking Committee (ACT ARC) in 2014 to provide a forum for the U.S. aviation community to discuss, prioritize, and provide recommendations to the FAA about operations conducted under parts 121, 135, and 142, addressing air carrier training.

The ACT ARC produced several part 135-specific recommendations it believed would achieve standardization (where appropriate) and significant administrative efficiency in check pilot qualification, flight instructor qualification, and part 135 air carrier training curricula delivered by part 142 training centers. The ACT ARC also recommended the FAA establish a Standardized Curriculum Concept for part 135 training provided by part 142 training centers.

On March 19, 2020, the FAA assigned this task to the Aviation Rulemaking Advisory Committee (ARAC), who established a new Training Standardization Working Group (TSWG) for this purpose. The TSWG tasking for standardization includes addressing inefficiencies that exist between part 135 and part 142, such as:

1. *Training, Testing, and Checking: Operators may not receive training that matches its operational environment; instructors and check pilots may focus on multiple operational methods, which decreases the quality of training, and checking.*

2. *Lack of curriculum uniformity and improvements.*

3. *Complicated Approval Process: Multiple Principal Operations Inspectors (POIs) are currently required to review technical elements of the same curriculum.*

4. *Administrative Inefficiencies: Supplemental training for training center instructors and check pilots is required, with individual letters of approvals for each, which leaves an administrative gap with no easy means to verify qualifications. Additionally, part 135 operators must develop their own aircraft-specific fleet curriculum and must reproduce a physical copy of each as part of their training program records.*

Standardized curricula will provide a common method for quality training accessible to any operator that obtains approval to use the curriculum in its FAA-approved training program. The Standardized Curriculum Concept aims to provide an efficient means to approve training curricula offered by part 142 training centers while increasing the consistency of training, testing, and checking delivered to part 135 operators. The use of standardized curricula is strictly voluntary and is one means to comply with the applicable regulatory requirements of parts 135 and 142. The standardized curriculum does not modify existing regulatory requirements for pilot training or qualification.

The Aircraft-Specific Part 135 Standardized Curriculum Model will enhance operator/training center safety programs and create a feedback loop that allows part 135 operators and part 142 training centers to partner in an effort to systematically use safety information to continually review and improve the standardized curriculum, as well as target areas of emphasis to enhance the quality of training provided. This "train as you fly, fly as you train" approach harmonizes with safety management principles, industry best practices, and risk mitigation, raising the level of safety competencies, threat awareness, and feedback for continual evaluation.

This improvement feedback mechanism forms the basis for revising the standardized curriculum, conducting training and administering checking. These three components then work together to allow the part 135 operator to spotlight the quality of the training program rather than the administration of the training program. Likewise, it also allows the part 142 training center to deliver a standardized and consistent training product that has the capability for continual improvement on a national level.

The TSWG will provide advice and recommendations to the ARAC on the most effective ways to standardize part 135 air carrier curricula delivered by training centers. The group is formally tasked with the following:

1. *Recommend a detailed master schedule for the development of part 135 standardized curricula for each aircraft or series of aircraft.*
2. *Develop and recommend a standardized curriculum to qualify training center instructors and evaluators (check pilots) to provide part 135 training, testing, and checking.*
3. *Develop and recommend part 135 standardized curricula for each aircraft or series of aircraft, which includes the maneuvers, procedures, and functions to be performed during training and checking.*
4. *Recommend continuous improvements to each part 135 standardized curriculum for a specific aircraft or series of aircraft.*

5. *Develop reports that contain recommendations for standardized curricula and results of the tasks listed. The group should review relevant materials to assist in achieving their objective, including FAA Advisory Circular 142-1, Standardized Curricula Delivered by Part 142 Training Centers.*

Under the Standardized Curriculum concept, the TSWG uses formalized stakeholder input to develop and recommend to the ARAC standardized curricula for each aircraft fleet. The ARAC uses the work of the TSWG to make recommendations to the FAA. The FAA reviews the recommendations and, if acceptable, makes draft standardized curricula available for public comment through published notices in the Federal Register. The FAA may task the ARAC, through the TSWG, to use the public comments to refine its recommendations to ARAC. The FAA reviews the recommendations and, if acceptable, publishes the standardized curricula at a national level.

2.2 Participants in the Training Standardization Working Group (TSWG)

Name	**Organization**
TSWG Members	
Brian Koester, Chair	National Business Aviation Association
Thomas Benvenuto	Solairus Aviation
Stephen Bragg	Executive Jet Management
Greg Brown	Helicopter Association International
Doug Carr	National Business Aviation Association
Fabiano Cypel	Embraer
Jon Dodd	Coalition of Airline Pilots Associations
Steve Hall	FlightSafety International
Aimee Hein	CAE, Inc.
Jens Hennig	General Aviation Manufacturers Association
Todd Lisak	Air Line Pilots Association
Steve Maloney	Sun Air Jets
Allan Mann	Wheels Up, LLC
John McGraw	National Air Transportation Association
Brian Neuhoff	Airbus Helicopters
Janine Schwahn	Summit Aviation, Inc.
Annmarie Stasi	Northwell
Daniel Von Bargen	Pilot
Mike Walton	Textron
FAA, Other Advisory, and Support Staff	
Josh Tarkington, Project Lead	Training and Simulation Group, AFS-280
Paul Preidecker, Facilitator	Training and Simulation Group, AFS-280
Jim Sapoznik, Subject Matter Expert	Training and Simulation Group, AFS-280

Shannon Salinsky, Change Practitioner	Training and Simulation Group, AFS-260
Kristin Tullius, Program Specialist	Training and Simulation Group, AFS-280

2.3 Working Group Activity

The TSWG members agreed to form subgroup teams to research and analyze:

- Curriculum, which includes published guidance, regulations, reference materials, data sources, and airframes practical for standardization.
- Qualifications, to include instructors, pilots, and safety-implications.
- Continuous Improvement methods, which includes data-driven metrics and recommendations.

The TSWG must comply with the procedures adopted by the ARAC as follows:

- Conduct a review and analysis of the assigned tasks and any other related materials or documents.
- Draft and submit a work plan for completion of the task, which includes the rationale to support the plan, for consideration by ARAC.
- Provide a status report at each ARAC meeting.
- Draft and submit the recommendation report based on the review and analysis of the assigned tasks.
- Present the recommendation report at the ARAC meeting.

TSWG was able to comply with the schedule and deadlines as outlined in the FAA Tasking Notice:

> *June 2021 – Deadline to submit the initial recommendation report, which includes the proposed master schedule for standardized curriculum development to ARAC. The deadline to submit the interim report to the FAA is June 30, 2021.*
>
> *December 2021 – Deadline to submit the addendum recommendation report, which includes a standardized curriculum to qualify training center instructors and check pilots to provide part 135 training, testing, and checking to ARAC. The deadline to submit the interim report to the FAA is December 31, 2021.*

The TSWG will submit ad hoc recommendation reports, which includes type-specific standardized curricula packages (SCPs) and continuous improvements to the standardized curricula, via ARAC to the FAA for review and consideration at any time.

3 Historical Information

3.1 Overview

The concept of the standardized curriculum was recommended by industry through the Air Carrier Training Aviation Rulemaking Committee to remedy inefficiencies in the current dynamic between part 135 and part 142. The new standardized curriculum is expected to

improve the efficiency of approval processes and increase the consistency of training, testing, and checking delivered to part 135 operators.

FAA Advisory Circular 142-1, Standardized Curricula Delivered by Part 142 Training Centers, provides the framework for implementation of the Standardized Curriculum Concept. Under the concept, the FAA accepts an aircraft-specific standardized curriculum at a national level. A part 142 training center may deliver the nationally accepted standardized curriculum to any part 135 operator that obtains approval to use it.

The part 135 operator's POI reviews the curriculum and grants approval for use of the aircraft-specific part 135 standardized curriculum, without changes, as part of the operator's training program. In discussions with the operator, the POI determines whether use of the aircraft-specific standardized curriculum (which comes with a cadre of qualified instructors and check pilots, along with use of the standardized curriculum) is appropriate for that operator based on the published guidance, rather than reviewing the specific content of individual modules in the aircraft-specific curriculum and the accompanying training center instructor/evaluator documentation. Introducing an aircraft-specific part 135 standardized curriculum for operators, coupled with guidance that enables part 142 training centers to develop a curriculum that would qualify part 142 training center instructors and evaluators to conduct training/checking under that aircraft-specific part 135 standardized curriculum, would address a number of inefficiencies in the current system.

3.2 Defining the Problem

Part 142 training centers generally have clients operating under a variety of 14 CFR parts and develop a core curriculum to meet the needs of their stakeholders. Currently, these core curriculums cannot be used by part 135 operators. Instead, each part 135 operator must have its own training program approved by the operator's POI. The training program can be based on the part 142 training center's core curriculum; however, the operator or POI may require changes so that the resulting curriculum meets all part 135 regulatory requirements. Because some of these curricula were not originally designed for part 135 operators, many adjustments and improvements may be necessary, which results in a lack of curriculum uniformity.

These changes, combined with the time it takes for each POI to conduct an in-depth review of each operator's curriculum, creates strain on the POI, the operator, and the training center. The operator is required to obtain POI approval of the "contract check pilot" to conduct checks under the operator's training curriculum, generally through the center's Training Center Evaluators (TCE).

The framework for the aircraft-specific part 135 standardized curriculum model, which also addresses the inefficiencies involved with each operator having approved instructors/contract check pilots, should include a manner by which training center instructors/evaluators can be qualified as instructors/check pilots under part 135. Specific guidance can be developed that would assist training centers to develop a standard non-aircraft-specific training curriculum that satisfies the requirements of § 135.329, 135.345, 135.293, and 135.297 in a manner consistent with the size, scope, and complexity of the operator (in this case, a part 142 training center) and

can be approved under part 142. The training center would use this special curriculum to train and qualify its instructors/evaluators to conduct training, testing, and checking under standardized curriculums for part 135 operators.

3.3 Resolution and Benefits

The standardized curriculum may be valuable to the industry due to the expectation it will enhance safety and increase administrative benefits. Within the industry, this curriculum will be especially advantageous to part 142 training centers, part 135 operators that use a part 142 training center, training personnel who develop and deliver training under parts 135 and 142, as well as individual contract pilots.

Enhanced Training, Testing, and Checking.

The use of a common set of Standard Operating Procedures (SOPs) eliminates the situation in which part 142 training center personnel deliver training and checking to numerous part 135 operators with widely varying objectives, standards, and procedures. This approach allows instructors and check pilots to focus on one operational method, which increases their ability to evaluate comprehensively the pilots they are checking.

Leveraging Expertise.

An industry-led group composed of subject matter experts (SMEs) that represent manufacturers, part 135 operators, part 142 training centers, and industry trade organizations develops the standardized curriculum. Any stakeholder can recommend improvement at any time. This means that as risks are identified (i.e., NTSB safety recs), the curriculum can be updated at a global level, with those improvements drilled down to all the operators using the curriculum.

Streamlined Approval Process.

The FAA approves and publishes the standardized curriculum at a national level. This eliminates the need for multiple POIs to review technical elements of the same curriculum. Instead, POIs evaluate if the curriculum (and associated standards and procedures) fit the needs of the part 135 operator.

Administrative Efficiency.

A part 142 training center qualifies its personnel as instructors and check pilots for the part 135 standardized curriculum. This eliminates the need for individually issued check pilot letters of approval for each part 135 operator. Also, a part 135 standardized curriculum listed in a training center's Training Specifications (TSpecs) may be referenced in the part 135 operator's training program as an FAA-published curriculum in accordance with § 135.341, without the need to reproduce a physical copy of the curriculum.

3.4 The Scope of a Standardized Curriculum

An aircraft-specific standardized curriculum is only one segment of the training required to serve as a pilot in part 135 operations. It will not provide part 135 operators with a complete training program, and is only a segment of training in accordance with § 135.324(b). See Figure 2-1 Standardized Curriculum Elements below:

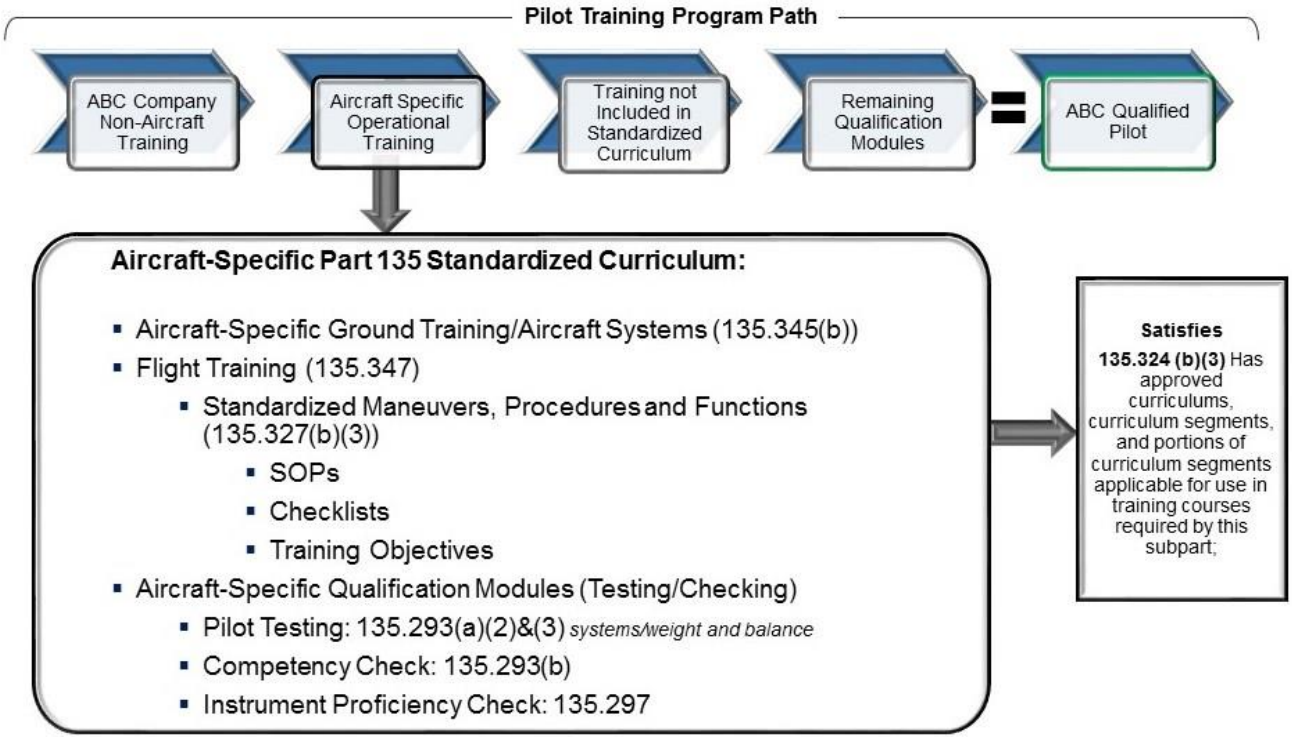

Figure 2-1 Standardized Curriculum Elements

As required for any training conducted in accordance with § 135.324(b), the part 142 training center must qualify its personnel to provide part 135 training, testing, and checking as outlined in AC 142-1 in order to deliver the standardized curriculum. The image above, Figure 2-1, Standardized Curriculum Training Elements, illustrates "the box" in which training, testing, and checking is included in the standardized curriculum. Figure 2-1 also illustrates where the standardized curriculum resides in the path to part 135 pilot qualification. The expanded area, "Aircraft-Specific Operational Training portion of the Pilot Training Program Path", defines the elements within the box of the standardized curriculum, and represents what the ACT ARC recommended.

The Standardized Curriculum Package (SCP) is a package comprised of the training curricula and the supporting courseware, equipment, records, personnel, and facilities necessary to deliver a curriculum or group of curricula for part 135 training. The part 142 training center qualifies its personnel to deliver the part 135 training.

A part 142 training center may deliver the nationally accepted standardized curriculum to any part 135 operator that obtains approval for its use. It is one, voluntary way to comply with existing regulations as well as a way to simplify the approval process for an air carrier's training program.

4 Task Group Assignments and Activities

4.1 Defining the Subgroups and Tasking

The TSWG reviewed the assigned tasking from the original ARAC tasking statement, and created these primary categories to develop a standardized curriculum:

- Curriculum, which includes published guidance, reference materials, data sources, and airframes.
- Qualifications, to include instructors, pilots, and safety-implications.
- Continuous Improvement, which includes data-driven metrics and recommendations related to the multiple standardized curricula that will be developed.

Each category was discussed in detail and aligned with task assignments that were directly supportive of the TSWG's objectives and assigned a number:

TWSG Task Detail Table	
1	Develop TSWG meeting schedule.
2	Identify activities that require SME action-teams/sub-groups.
3	Conduct a targeted review of published FAA guidance, data sources, and other reference materials relevant to the design, development and proposals to support the standardized curricula. Examples for review: ARAC Tasking Notice; FAA Advisory Circular 142-1; FAA Order 8900.1 Inspector Guidance (TCPM and POI); Standardized Curricula Delivered by Part 142 Training Centers; Flight Standardization Board Report (FSBR); relevant supporting data sources; etc.
4	Identify systematic development methodology (i.e., Instructional Systems Design (ISD), etc.).
5	Identify list of aircraft types and variants practical for standardized curriculum development.
6	Prioritize standardized curriculum development based on aircraft types.
7	Identify the 'flagship' (first) aircraft type standardized curriculum.
8	Conduct focused review and analysis of existing qualification training curricula for applicable aircraft types under part 135 operations.
9	Develop Instructor and Check Pilot Qualification Curriculum.
10	Identify sub-curricula for each standardized curricula aircraft type (e.g., CQ, Re-Qual; as needed for future development).
11	Identify supporting data and resources.
12	Conduct a regulatory GAP analysis to include parts 135 and 142, along with the proposed standardized curriculum.
13	Identify methodology for ongoing standardized curriculum maintenance and development (who, how, when/triggers for revisions).
14	Determine data-driven methods and element criteria to identify program effectiveness to make recommendations for continuous improvement.
15	Determine the maximum extent to which standardized curriculum programs can be standardized across aircraft types, based on regulatory analysis, safety implications, and manufacturer (OEM) input.

4.2 Subgroup Action Teams

The working group determined these tasks would be achievable through the formation of specialized breakout groups (Action Teams). Many of these tasks were addressed in the TSWG's initial recommendation report presented to ARAC in June 2021. The remaining tasks are addressed by new Action Teams. Each of these new Action Teams are responsible for research, analysis, and execution of the assigned tasking for their team's respective subject categories:

Instructional System Design (ISD) Action Team	Tasking 3, 4, 10, 15
Standard Operating Procedures (SOP) Action Team	Tasking 15
Gulfstream G-V Action Team	Recommend G-V SCP
Adaptive Recurrent Action Team	Recommend AR SCP

The Action Teams met weekly or as scheduled. Each Action Team provided updates to the broader TSWG's meetings.

4.2.1 Review and Analysis Results of the Adaptive Recurrent Action Team

In support of developing an initial training curriculum for the Adaptive Recurrent, the TSWG assembled a type-specific action team comprised of Adaptive Recurrent subject matter experts from the manufacturer, operators, training centers, and the FAA.

Adaptive Recurrent Action Team Subject Matter Experts	
Aimee Hein, CAE	John Vetter, FlightSafety International
Allan Mann, Wheels Up LLC	John McGraw, NATA
Gene Copeland, Jet Aviation	Kevin Hancock, FAA
Kevin Comstock, ALPA	Brian Small, FlightSafety International
Todd Lisak, ALPA	Stephen Bragg, Executive Jet Management
Steve Dennis, CAE	Timothy Schoenauer, CAE

After reviewing the initial ARAC tasking, the work of the ISD Action Team and the SOP Action Team, the TSWG assigned the Adaptive Recurrent Action Team the following tasks:

TWSG Type Specific Action Team Tasking Table	
1	Identify pre-requisites for fixed wing and rotor wing pilots.
2	Determine ground school learning objectives.
3	Determine checking requirements: • Feasibility of no jeopardy checking (incomplete vs. unsat) • Initial observation
4	Determine simulator learning objectives: • Grading criteria • Flight profiles • Maneuvers, procedures, and functions to be performed

	• How to incorporate TEM
5	Determine the planned ground school training hours.
6	Determine simulator planned hours.
7	Determine how to incorporate special emphasis training elements.
8	Determine suggested record-keeping requirements, specifically PRD requirements.
9	Determine remedial 'Other Training' requirements for after a pilot fails to pass course three.
10	Draft and submit the recommendation report based on the assigned tasks.
11	Present the recommendation report at the TSWG meeting.
12	Provide continuous improvement for the standardized curriculum based on recommendations from the TSWG.

The Adaptive Recurrent Action Team held a two-day in-person meeting during November 2022 where they discussed the framework for the Adaptive Recurrent. Discussions regarding type-specific action teams and what they will base their curricula on also took place. A subsequent in-person meeting was held during the first week of December 2022 to further develop this framework. Weekly meetings were also held throughout January and February 2023 to ensure the above outlined tasking requirements were met. The Adaptive Recurrent Action team set a March 2023 deadline for the ARAC submission.

4.2.2 Grading.

As the Adaptive Recurrent Action Team discussed the details of adaptive recurrent training, it became apparent that a grading system that only captures the outcome of training in a 4-point scale or captures the outcome of checking and testing as satisfactory/unsatisfactory will not capture the true essence of the pilot's performance. The root cause factors that underly and differentiate between standard performance and one that exceeds the standards or falls below the expected standard will be missing, and continuous improvement of standardized curriculum will be limited.

To enhance and continuously track the efficacy of part 135 training, industry partners need a robust grading policy and a system standardized across training centers that can capture the root causes of unexpected pilot performance and allow that data to be analyzed for insights that can improve the training program and enhance safety performance on the line.

4.2.3 Circling Approaches.

The objective for simulator training is to deliver the most realistic and effective training, checking, and testing possible to ensure pilot proficiency and competency for all flight operations. Level D Flight Simulation Training Devices (FSTD have proven to be the most effectual means to accomplish this goal for air carrier operations. The creation and application of the FAA Order 8900.1 guidance defining the current requirements for approving Simulator Circling Approaches precludes simulator approval and training for the majority of the most utilized circling approach procedures in service in our industry.

The NTSB repeatedly makes the recommendation to "*Require programs for flight crewmembers with performance deficiencies or failures during training and administer additional oversight and training to correct performance deficiencies"* but currently a critical portion of circling approaches scenarios are prohibited for simulation. The approach to landing and maneuvering phases of circling approaches contribute to a high-risk environment in aviation where realistic training is needed to mitigate risk and comply with safety recommendations. It is imperative that additional circling approach procedures be included in simulation flight training to identify and mitigate common pilot performance risks for circling approaches.

The core problem with the current guidance in FAA Order 8900.1 for approving simulator circling approaches to support approved training programs is that the guidance inappropriately extrapolates the standard established for the qualification of a FSTD into the training approval process contrary to the current Airman Certification Standards (ACS) and the needs of standardized training and checking for 135 Operators.

5 Recommendations

5.1 Recommendation on Adaptive Recurrent Training

> The TSWG recommends the FAA develop guidance for industry stakeholders (135 operators and 142 training centers), with accompanying guidance for FAA personnel (e.g., Principal Operations Inspectors (POI) and Training Center Program Managers (TCPM)) allowing 135 operators to incorporate adaptive recurrent training and checking in a part 135 certificate holder's training program/Aircraft-Specific 135 Standardized Curriculum.

The TSWG recommends the FAA develop guidance in accordance with the guidelines and recommendations contained in Appendix A to allow part 135 certificate holders to receive and part 142 certificate holders to provide adaptive recurrent training. Due to the nature of part 142 training centers, the guidance must clearly indicate they are able to provide this type of training for clients.

This recommendation is based on ACT ARC Recommendation 16-1: Scenario Enhanced Recurrent Training and Checking for 135 Operators. However, because many training centers and operators already use some element of scenarios in their training, the TSWG renamed the program adaptive recurrent training.

Adaptive recurrent training is intended to maximize efficiency by starting with a checking event that allows pilots to demonstrate proficiency in normal operations. This eliminates the need to train items that the pilot performs in the course of their normal flying. The time saved can be used to address areas that may require additional time to reach proficiency or to practice additional maneuvers. Additional maneuvers, in the form of special emphasis items, may be determined by the TSWG or type specific experts.

Adaptive recurrent training improves safety by attempting to maximize the extent to which the training environment matches the operating environment. Training centers will design curriculum using scenarios that mimic normal operations. Further, because the training environment will replicate the operating environment, assessing the skill level on each event will result in valuable data that can be used to further improve and enhance the Standardized Curriculum.

Future recommendations will include aircraft-specific training and checking information developed by groups of experts on each aircraft type.

5.2 Recommendation on Training Circling Approaches

> The TSWG recommends the FAA revise Order 8900.1 guidance to correct simulator circling approach approval guidance to coincide with the ACS proposed for regulatory Incorporation by Reference (IBR) and support realistic standardized training and checking so that any published Circling Approach may be approved for simulator circling approach training for circle to land on a runway less than 90-degrees offset from the final approach course provided the simulator circling approach used by an applicant during a check or test makes at least 90-degrees of total heading change per ACS.

Current FAA policy requiring landing on a runway with an orientation at least 90° degrees from the instrument approach course arbitrarily prohibits half of all circling approaches for simulator circling approach approval and training credit. This policy unnecessarily restricts training due to geometry regardless of safety and training practicality. This prohibition for simulator training includes several circling approach procedures that should be trained for known circumstances that are a risk to flight operations and should be trained for proficiency even if not ACS compliant for evaluation. This group of circling approaches needing simulator training includes airport crossover circling approaches where direct airport visual contact is not 100% but airport environment visual contact is 100%, as well as those nearly aligned circling minimums when either the normal rate of descent or the runway alignment factor exceeds 30 degrees (15 degrees for GPS IAPs).

The current generation simulator performance, handling, and visual systems operate at a level of fidelity that make the current 90° course to runway FSTD Qualification standard arbitrary and obstructive to simulator training's ability to address safety risks known for specific circling approach procedures. Given the capability of modern FSTD-FFS it is improvident to prohibit simulator circling approach procedure training necessary to address existing safety recommendations. Modern FSTD-FFS's support simulation capability representative of in-aircraft flight operation to the extent that any circling approach at a modeled airport should be eligible for simulator flight training the same as it would be in-aircraft not withstanding ACS evaluation requirements.

14 CFR part 60 Appendix A, 11. Qualification Requirements (60.15), w. and part 60.15(g)(6) circling approaches may be excluded from FSTD Qualification and requires a Specific

Authorization to be included therefore continued authorization of circling approaches for training delivery in simulators is necessary.

14 CFR part 60 Appendix A, Attachment 3, 2. Discussion, e. states:

> ***Simulators*** *demonstrating a* ***satisfactory*** *circling approach* ***will be qualified*** *for the circling approach maneuver and may be approved for such use by the TPAA in the sponsor's FAA-approved flight training program.* ***To be considered satisfactory****, the circling approach will be flown at maximum gross weight for landing, with minimum visibility for the airplane approach category, and must allow proper alignment with a landing runway at least 90° different from the instrument approach course while allowing the pilot to keep an identifiable portion of the airport in sight throughout the maneuver (reference - 14 CFR 91.175(e))* [emphasis added].

This regulation distinguishes between "satisfactory" for "qualification" and Training Program Approval Authority (TPAA) approval of simulator circling approach approval for flight training program approval therefore the extrapolation of the simulator qualification criteria to training approval is not required and contrary to ACS evaluation standards proposed for IBR and specific task effective SER training.[1]

This recommendation addresses and compliments the long-term component of the ACT ARC AC&CT WG Scope of Work: Recommend innovative strategies to integrate evidence and scenario-based approaches into the training, checking, and qualification modules of operator training programs.

The ACT ARC recommended the FAA develop guidance for industry stakeholders (part 135 operators and part 142 training centers) describing the methodology to develop and integrate scenario enhanced recurrent training and checking scenarios into part 135 certificate holders' training programs. The ARC recommended the guidance include analysis of airports used by part 135 operators and the criteria associated with added complexity in certain airfield operating environments in order to ensure 14 CFR part 60 approved full flight simulator (FFS) modeling is available.

The ACT ARC also recommended the FAA develop accompanying inspector handbook guidance for FAA personnel (i.e. Training Standards Board, part 135 POIs, part 142 TCPMs) with appropriate job aids to evaluate the use of recurrent training and checking as a component of the Aircraft-Specific part 135 Standardized Curriculum, or as a component of a part 135 operator Custom Training Program.

The TSWG recommends that this change be incorporated into 14 CFR part 142 training and checking programs for the same safety and risk assessment concerns.

This recommendation can be accomplished by revising the simulator circling approach approval guidance in the following paragraphs of FAA Order 8900.1 to allow for all valid circling

[1] 87 FR 75955, Dec.12,2022, ACS & PTS for Airmen; IBR

approaches to be approved for adaptive recurrent training tasks and to agree with the standard for circling approach evaluation set forth in the ACS as proposed for IBR:[2]

Volume 3, Chapter 54, Section 6; Paragraph 3-4435 Flight Training Equipment (FTE), (C) Evaluating and Approving FFSs (Page 7-8)

Volume 3, Chapter 19, Section 6, Table 3-61. Part 121 PIC/SIC Initial New-Hire, Initial Equipment, Transition, Conversion & Upgrade Flight Training, Transport and Commuter Category Airplanes, footnote 12, (Page 30)

Volume 3, Chapter 19, Section 7, Figure 3-80. Part 121 Pilot Proficiency Check, footnote 15, (Page 14)

Volume 5, Chapter 2, Section 10, Paragraph 5-472 Instrument Proficiency Flight Check Job Aid, C. Circling Approaches (Page 5)

Volume 5, Chapter 3, Section 2, Paragraph 5-832, C. Circling Approach Maneuver (Page 9-10)

Volume 5, Chapter 3, Section 5, Paragraph 5-911, C. Circling Approach Maneuver (Page 5)

5.3 Recommendation on Grouping Approaches

> The Training Standardization Working Group recommends the FAA revise FAA Order 8900.1 Volume 3, Chapter 19, Section 6 to facilitate grouping instrument approaches similar to the groupings permitted under part 121.

Today, guidance permits grouping approaches for operator training under 14 CFR parts 61 and 121. However, operators training under part 135 are required to train on every type of approach for which they have authorization to perform. Because many approaches require the same skill set to fly, this becomes a repetitive process without enhancing safety. Permitting approach grouping under part 135 will maintain the same level of safety as part 121 while increasing efficiency. The increases in efficiency will lead to more operators using the standardized curriculum. Additionally, the time saved can be used to train scenarios and data driven special emphasis leading to further improvements in safety.

The TSWG recommends the FAA align the Approaches and Missed Approaches Training Events in Table 3-63. Part 135 PIC/SIC Initial New-Hire and Initial Equipment Flight Training—Transport and Commuter Category Airplanes with those listed in Table 3-61. Part 121 PIC/SIC Initial New-Hire, Initial Equipment, Transition, Conversion, and Upgrade Flight Training—Transport and Commuter Category Airplanes. Table 3-61 is depicted below for reference.

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[2] 71 FR 63414, Oct.30,2006, Statement of Qualification; FAA Response
67 FR 60355, Sep.25,2002, Begin Information, e.
Docket number FAA–2002–12461, attachments G

Table 3-61. Part 121 PIC/SIC Initial New-Hire, Initial Equipment, Transition, Conversion, and Upgrade Flight Training—Transport and Commuter Category Airplanes

		FSTD								
FLIGHT PHASE	TRAINING EVENT	LEVEL OF FTD				LEVEL OF FFS				ACFT
		4	5	6	7	A	B	C	D	
APPROACHES	VFR Procedures Visual Approach#	-	-	-	-	-	-	X	X	X
	Normal Instrument Landing System (ILS)	-	-	-	-	-	-	H	H	X
	Manually Controlled ILS with Simulated Powerplant Failure[1] H* Applies to initial. X* Applies to transition, conversion, and upgrade only.	-	-	-	-	X*	X*	X*, H*	X*, H*	X
	Nonprecision (OpSpec) Non-Directional Radio Homing Beacon (NDB) (OpSpec) Very High Frequency Omni-Directional Range (VOR) (OpSpec) LOC Backcourse (OpSpec) Simplified Direction Finding (SDF)/ Localizer-Type Directional Aid (LDA) (OpSpec) Airport Surveillance Radar (ASR) (OpSpec) Area Navigation (RNAV) A*/X* Applies to initial and transition only. At least one nonprecision approach must be accomplished in an FFS or the aircraft.	-	A*	X*	-	X	X	X	X	X

		FSTD								
FLIGHT PHASE	**TRAINING EVENT**	**LEVEL OF FTD**				**LEVEL OF FFS**				**ACFT**
		4	**5**	**6**	**7**	**A**	**B**	**C**	**D**	
	Nonprecision with Simulated Powerplant Failure #	-	A	X	-	X	X	X	X	X
	(OpSpec) Precision Approach Radar (PAR)	-	-	-	-	X	X	X	X	X
	Circling[2]	-	-	-	-	-	-	H	H	X
	No-Flap or Partial Flap H* Applies to initial and conversion only. X* Applies to transition and upgrade only.[3]	-	-	-	-	X*	X*	X*, H*	X*, H*	X
MISSED APPROACHES	Missed Approach From ILS	-	-	-	-	X	X	X	X	X
	Other Missed Approaches	-	A	X	-	X	X	X	X	X
	Missed Approach with Complete Missed Approach Procedure		A	X		X	X	X	X	X
	With a Simulated Powerplant Failure	-	-	-	-	X	X	X	X	X
	From Nonprecision Approach #	-	A	X	-	X	X	X	X	X

[1] The simulated powerplant failure must occur before initiating the final approach course and continue to touchdown or through the missed approach.

[2] Circling approaches and circling approaches to landing are only required if the certificate holder is authorized by OpSpec C075 to conduct circling approaches below a 1000-foot ceiling and 3 miles visibility. The circling approach must be made to the authorized minimum circling approach altitude followed by a change in heading and the necessary maneuvering by visual reference to maintain a flightpath that permits a normal landing on a runway at least 90 degrees from the final approach course. The circling approach must be performed without excessive maneuvering, and without exceeding the normal operating limits of the airplane. The angle of bank should not exceed 30 degrees.

[3] POIs should review the FSB Report for the airplane type to determine whether no-flap or partial flap is required.

5.4 Recommendation on Grading

> For all courses contained in the 135 Standardized Curriculum, the Training Standardization Working Group (TSWG) recommends that the standardized four-point grading system recommended in ACT ARC 16-1 Recommendation (g), Data Collection be implemented across all participating training providers and utilized for scoring training events. The four-point grading scale should reference a standardized rubric detailed in Appendix B.
>
> The TSWG further recommends that checking events be recording on a binary scale of "Satisfactory" or "Unsatisfactory" in reference to the current Airline Transport Pilot (ATP) and Type Rating ACS.
>
> In addition to a standardized 4-point grading scale and rubric for training events, and a standardized binary grading scale for checking and testing events, the TSWG recommends standardized curriculum adopt a mechanism by which instructors can record supplemental information on the root cause of pilot performance that falls below or above expected performance at any point during training or checking.

This recommendation improves upon the Recommendation on Grading Criteria submitted to the ARAC in September 2022. Recording the root causes of unexpected pilot performance during training and checking will provide insights beyond what is available by simply gathering numerical scores. These insights will enable a feedback loop that allows part 135 operators, part 142 training centers, and the FAA to partner to systematically analyze meaningful data which improves the standardized curriculum, as well as targeting areas of emphasis to enhance the quality of training provided and ultimately improve the aviation systems safety performance.

Deidentified root cause data information should be provided to the TSWG for review as part of the change management process for revising/updating and continuously improving the standardized curriculum.

It remains critical for the improvement of the program that the FAA establish a mechanism to collect, deidentify, and aggregate supplemental grading information.

5.5 Recommendation on the Standardized Curriculum Aircraft/Simulator Training Matrix

> The Training Standardization Working Group recommends the FAA revise Standardized Curriculum Aircraft/Simulator Training Matrix to explain the training requirements for a pilot that starts but does not finish a recurrent training program.

In the September 2022 recommendation to ARAC, the TSWG report included a table in Appendix A, G-V Standardized Curriculum, section 5.1.8 Standardized Curriculum Aircraft/Simulator Training Matrix. The TSWG and G-V action team developed the table to help certificate holders determine which course is most appropriate for a pilot that needs training.

The TSWG recommends adding additional information to the training matrix that address situations in which a pilot becomes unqualified for reasons other than it has been more than 12 calendar months since the training event.

The additions in rows 4 and 4a describe training requirements for a pilot that started, but did not finish recurrent training. This information will help inspectors and operators understand the training requirements for a pilot in this situation.

	Pilot is:	AIRCRAFT GROUND TRAINING SEGMENT	AIRCRAFT FLIGHT TRAINING SEGMENT	AIRCRAFT QUALIFICATION SEGMENT	Minimum Course Footprint
1	**SC 135 current in type and duty position.**	**No additional training required**	**No additional training required**	**No additional training required**	No additional SC training required*
2	**SC 135 current in type and duty position and is upgrading from SIC to PIC duty position.**	All recurrent ground training elements. 16 training hours.	All recurrent Flight training elements. 12 training hours plus qualification segment.	135.293a2 & b 135.297* *PIC only	2
3	**Non-SC 135 current in type and duty position, OR 61.58 current in type and duty position.**	All recurrent ground training elements. 16 training hours.	All recurrent Flight training elements. 12 training hours plus qualification segment.	135.293a2 & b 135.297* *PIC only	2
4	**Pilot has become unqualified during an SC recurrent, OR was previously qualified in SC and is outside of eligibility period for recurrent, OR is changing duty position from PIC to SIC and is:**				
4a	Less than 12 calendar months past due month	All recurrent ground training elements not accomplished when due.	All recurrent flight training events not accomplished when due.	The modules not accomplished in the eligibility period, as applicable to duty position: KT, IPC, CC, LC or special.	As required based on most recent 8410**
4b	12 to 35 months past due month	All recurrent ground training elements. 16 training hours.	All recurrent Flight training elements. 12 training hours plus qualification segment.	135.293a2 & b 135.297* *PIC only	2

4c	> 35 months past due month	– SAME AS INITIAL EQUIPMENT TRAINING AND QUALIFICATION	1
5	**Other**	– SAME AS INITIAL EQUIPMENT TRAINING AND QUALIFICATION	1

*Operator specific training may be required
**The intent is to identify the pilot's needs for qualification and determine the proper course of actions based on an operator's risk assessment

5.6 Recommendation to Improve the G-V Curriculum

The Training Standardization Working Group recommends the FAA revise Standardized Curriculum Aircraft/Simulator Training Matrix with the following technical corrections and improvements to the G-V Standardized Curriculum.

The TSWG recommended a standardized curriculum to ARAC in September 2022. By February 2023, the FAA published a final version of the G-V Standardized Curriculum to the Dynamic Regulatory System. As the TSWG reviewed the final document, the working group recognized areas for improvement and areas that need technical amendment due to errors in the recommendation report.

The TSWG recommends the following adjustments.

3.5 A. Recurrent Training.
…
Each year's training should challenge the pilots to respond to a malfunction from each group.

The Recommendation report misstated the intent of the malfunction equivalency groups. The malfunction equivalency groups are intended to inform the training center curriculum development experts and the TSWG. This information can be used to determine how malfunctions will challenge pilots. As the standardized curriculum develops training data identifies opportunities to improve the curriculum, the TSWG will use the malfunction equivalency information to recommend training scenarios that address those opportunities.

The TSWG recommends replacing "Each year's training should challenge the pilots to respond to a malfunction from each group" with "Over time, the continuous improvement group will recommend which groups of malfunctions contain procedures that can address pilot needs based on a large volume of training data in the fleet."

8.3 Systems Integration Training. Table 17. Task Expectation Rating (Ground Training)

The Task Expectation Rating is used to determine the level of proficiency expected of a pilot during training. As a pilot begins training, the pilot is not expected to perform tasks to the

standards established in the ATP and Type Rating ACS. However, as training progresses, the pilot is expected to improve. By the time training is complete, the pilot must demonstrate the ability to meet the standards established by ATP and Type Rating ACS.

The pilot will only conduct checking tasks during the flight simulator portion of the evaluation. Consequently, the bottom row of Table 17 was included in error.

Additionally, task expectation ratings are used to measure performance for skill learning objectives, which are primarily taught during systems integration training and flight training. Consequently, the ground training specification should be changed to systems integration training.

The TSWG recommends removing the bottom row of Table 17, so that it matches the table below.

Table 17. Task Expectation Rating (Systems Integration Training)

Task Expectation Rating	Description
Low	Trainee may require a significant level of instructor intervention (e.g., demonstrations, explanations, repetitions). Applicable to the first introduction of a task, maneuver or procedure, or where a task is a "train only" item.
Medium	The trainee may require a moderate level of instructor intervention or input. Some limited assistance is required. (e.g. coaching, instructing, prompting) to correct errors or improve task performance.
High	Minor instructional inputs, coaching or prompting is sometimes required to enhance task performance. Applicable where the trainee should be able to demonstrate the expected level of task maneuver or procedure proficiency with minimal or no instructor input.

5.7 Recommendation on Part 135 Checking Modules – Airplanes

> The Training Standardization Working Group recommends the FAA revise Order 8900.1, Volume 3, Chapter 19, Section 7, Paragraph 3-1283, to align module and task naming conventions, grouping, and requirements with FAA Airline Transport Pilot and Type Rating for Airplane Airman Certification Standards.

At present, Order 8900.1 guidance regarding part 135 basic checking module requirements for demonstration of competency or proficiency does not adequately reflect tasks required for evaluation. In some cases, the modules presented in Table 3-70 conflict with current Airman Certification Standards and Areas of Operation defined in 14 CFR part §61.157(e) which respectively will become rule through incorporation by reference and undergo revision in

accordance NPRM docket number FAA-2022-1463. This disparity impacts safety and standardization when a Training Center Evaluator employed by a contract training provider issues an Airline Transport Pilot certificate and/or aircraft type rating in accordance with 14 CFR § part 61.157(f).

The TSWG specifically recommends the FAA amend Table 3-70 Part 135 Checking Modules – Airplanes and table notes to ensure standardized capture of all certification standard tasks respective of airplane class and powerplant configuration. Proposed revision to Table 3-70 is depicted in Appendix D.

5.8 Recommendation to Improve the Instructor and Check Pilot Qualification Master Curriculum

The Training Standardization Working Group recommends the FAA revise Standardized Curriculum Instructor and Check Pilot Qualification Master Curriculum with the following technical corrections and improvements.

The TSWG recommended a standardized curriculum for instructors and check pilots to ARAC in June 2021. In February 2023, the FAA published a final version of the Instructor and Check Pilot Qualification Master Curriculum. As the TSWG reviewed the final document, the working group recognized sections of the curriculum that require technical amendment or improvement, which are listed below.

Page & Para	Reviewer's Comment and Rationale	Reviewer's Recommendation
Pg. 5. 1.2 B. Training.	This section requires bifurcation between flight instructor/check pilot (aircraft) and flight instructor/check pilot (simulator). The purpose of standardized curriculum is for part 142 training center to deliver training to part 135 certificate holders' pilots; thus, the focus should be on simulator Instructor/Check Pilot qualification.	The TSWG recommends amending this paragraph to the following: To satisfy the regulatory requirements of §§ 135.337(c)(2-3), (f), and 135.338(c)(2-3), (f), the proposed training must be completed in a flight simulator that replicates the same aircraft type that the instructor or check pilot seeks to become qualified in to provide training and checking. In addition, §§ 135.337(f) and 135.338(f) requires that the check pilot or flight instructor fly in the "type, class, or category aircraft" for which they seek to gain qualification to serve as a flight instructor or check pilot or complete an approved line-observation program.
Pg. 5. 1.3.B. Applicable Requirements	Making a statement including the word "must" without clear definition as to what is required and how compliance is evaluated should not be included.	The TSWG recommends deleting paragraph 1.3.B.

Page & Para	Reviewer's Comment and Rationale	Reviewer's Recommendation
Pg. 6. 2.1.B. Note.	The sentence in the note should be removed. "Should" is subjective but will be interpreted as mandatory.	The TSWG recommends amending this paragraph as follows: NOTE: Basic Indoctrination is for pilots who have not operated under part 135. ~~Also, it should be considered for those pilots who have previous experience but have not operated under Part 135 in the past 36 months.~~ The goal is to provide instructors and check pilots a basic understanding of part 135 operations.
Pg. 10. Table 2. 1. Basic Indoctrination Training. 46 hours initial planned hours.	The 46 planned hours for initial indoctrination training is excessive and does not demonstrate a basis in guidance or regulation. The FAA Order 8900.1, Vol. 3, Chap. 19. Section 3 contains "direction and guidance to POIs" regarding Basic Indoc hours. For a line pilot this would be 32 hours for Transport category and 24 hours for IFR Multi-engine. Given the fact that the contract training provider is given limited scope of authorizations, any planned hours in excess of the established norms has no added value. Planned hours for exposure to 135 basic indoc elements should match up with training time for only those subjects/elements having direct value.	The TSWG recommends amending 46 to 24 hours, which is the threshold listed in the Order 8900.1.

Page & Para	Reviewer's Comment and Rationale	Reviewer's Recommendation
Pg. 10. Table 2. 2. Initial Instructor/Check Pilot Fundamentals. Initial ground training.	The 10 planned hours for initial ground training is excessive and does not demonstrate a basis in guidance or regulation. Fundamentals training should not exceed 4.0 hours for Initial or transition A	The TSWG recommends changing 10 hours to 4.
Pg. 10 and 11. Table 2. 4, 5, and 6. Qualification Event. 2.5 hours.	It is not necessary to establish a minimum number of planned hours for qualification events. The duration of qualification events is determined by the number of items that need checked and the time required to accomplish them.	The TSWG recommends deleting the planned hours for qualification events.
Pg. 12. 4.4.A General Part 135 Operations Training.	For simplicity and to avoid duplication, please do not include planned hours references in these paragraphs. Please only include total planned hours in the main table.	The TSWG recommends amending the last sentence as follows. This training is ~~planned for 8.5 hours and is~~ designed to provide one acceptable means to satisfy §§ 135.329(a)(1)(i)-(a)(1)(iii). Reference Table 3: General Part 135 Operations Training.
Pg. 14. 4.4.B. Airman-Specific Training.	For simplicity and to avoid duplication, please do not include planned hours references in these paragraphs. Please only include total planned hours in the main table.	The TSWG recommends amending the last sentence as follows. This training is ~~planned for 23.5 hours and~~ designed to provide one acceptable means to satisfy §§ 135.345(a)(1)-(a)(7). See Table 4: Airman-Specific Training.

Page & Para	Reviewer's Comment and Rationale	Reviewer's Recommendation
Pg. 14. Table 4. Airman-Specific Training	If the plan is to remove 135.293(a)(3) authority from contract training and checking then there is no need for weight and balance training, as it is already completed under part 142	The TSWG recommends removing section 2. Principles of Weight and Balance (W&B) §135.345(a)(2) from Table 4.
Pg. 15. Table 4. 4. Airspace and Air Traffic Control (ATC) systems, procedures, and phraseology (§ 135.345 (a)(4)):	Airspace is not included in (§ 135.345(a)(4). Additionally, wake turbulence, as it relates to air traffic control, is referenced in Order 7110.65 2-1-20. In regards to wake turbulence training requirements, because the module is focused on ATC, the reference should be Order 7110.65 2-1-20 and subsequent referenced paragraphs with AC90-23 (current edition) being secondary. Simplification to "Wake Turbulence" rather than citing specific operational procedure information is preferred.	The TSWG recommends removing airspace from the Airman-Specific Training modules listed in table 4 to accurately reflect the scope of the regulatory reference. 4. ~~Airspace and~~ Air Traffic Control (ATC) systems, procedures, and phraseology (§ 135.345(a)(4)): • Definitions (precision approaches, airways, automated terminal information service (ATIS), etc.) • ~~Description of airspace~~ • Navigation performance and separation standards • Controller and pilot responsibilities • ATC communications • Wake turbulence ~~recognition and avoidance (Aeronautical Information Manual (AIM) Chapter 7, Section 4; AC 90-23 (current edition)~~ • NextGen concepts (ADS-B, data link communications, Network Enabled Weather (NNEW), NAS voice switch (NVS), etc.)

Page & Para	Reviewer's Comment and Rationale	Reviewer's Recommendation
Pg. 17. Table 5. 1. Reporting Emergency Situation Training. Reporting incidents and accidents.	Reporting incidents and accidents is trained under Table 3 in the module on NTSB section 830.	The TSWG recommends removing the requirement to train on reporting incidents and accidents from section 1 of Table 5. ~~Reporting incidents and accidents.~~
Pg. 28. Paragraph 6.3 Qualification Standards.	This paragraph was included in error, as ground instructor qualification standards are included at the end of paragraph 6.1. Please remove paragraph 6.3.	The TSWG recommends removing section 6.3 Qualification Standards. ~~6.3. Qualification Standards. Upon completion of the basic indoctrination training, the candidate should be capable of completing a written examination with a passing score of at least 80 percent (corrected to 100 percent), failure of which will result in remedial training and the administration of a new written examination.~~

Appendix A. Adaptive Recurrent Training

Course 3 – Adaptive Recurrent Training

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Adaptive Recurrent Training.

Adaptive Recurrent Training is FAA approved recurrent pilot training and checking that focuses on day-to-day operationally-based scenarios that are developed, regularly evaluated, and updated by the SC Continuous Improvement Team. The scenarios focus on tasks that will improve safety in critical areas, which may not be covered in a traditional task-based recurrent pilot training event. ART meets the §§135.293 and 135.297 requirements through the use of consecutive checking.

Purpose.

Per ACT ARC Recommendation 16-1 and TSWG recommendation 6.1(c)(3), the objective of the adaptive recurrent curriculum concept is to improve the overall quality of the pilot's training experience and allow the check airman to evaluate the crewmember's skills in a realistic operating environment. Each training event should adapt to the needs of the pilots.

Adaptive recurrent training moves away from a train-train-check footprint and training that relies on rote memorization. The adaptive recurrent training program uses multi-day scenarios so the pilots "fly as they train and train as they fly" so assessing the skill level on each event will result in valuable data that can be used to further improve and enhance the Standardized Curriculum. For operators certificated under 14 CFR part 135 with a custom training program, the ability to incorporate scenarios the pilot will deal with in an operational environment will significantly improve the quality of training. This value-added approach incorporates threat and error management (TEM) and is consistent with safety management system (SMS) principles and industry best practices.

Definitions.

Term	Definition
Adaptive Recurrent Training (ART)	**FAA approved recurrent pilot training and checking that focuses on day-to-day operationally-based scenarios that are developed, regularly evaluated, and updated by the SC Continuous Improvement Team. The scenarios focus on tasks that will improve safety in critical areas, which may not be covered in a traditional task-based recurrent pilot *training event*. ART meets the §§135.293 and 135.297 requirements through the use of *consecutive checking*.**

Consecutive checking	**Consecutive checking is the practice of evaluating pilot knowledge and proficiency using the certification standard appropriate to the certificate and/or rating held over multiple sessions concurrently with an approved training program. Training sessions are provided following or in sequential order with checking sessions without obligation to train a task before checking that task. Consecutive Checking is not permitted in cases where the check results in airman certification.**
Training Event	**The complete set of proficiency objectives defines the end result of training: the task activities the crew must be able to perform, the set of conditions under which they must be able to perform them, the performance standards that must be met, and the evaluation strategy that will be used to evaluate proficiency.**
Event set	**A relatively independent segment of a scenario made up of several events, including an event trigger, possible distracters, and supporting events**
Initial observation	**Evaluation of Airman Certification Standard (ACS) tasks during *consecutive checking* that occurs before any training has been conducted. Initial Observation tasks include those tasks used frequently in daily operation and evaluated to determine retention of pilot proficiency. Checking tasks not performed to ACS standards during the initial observation may be trained to proficiency and rechecked. All checking tasks performed to ACS standards during the initial observation are considered complete and no further training or checking of those tasks is required.**
Operator specific training	***Modules* of Operator specific training and/or checking that fall outside the scope of a normal 293/297 recurrent training event, such as special training like Aspen, steep approach, CAT II, etc.**
Other Training	**Training required by a pilot after an unsatisfactory test, check, or performance during recurrent training based on Airman Certification Standards (ACS).**
Scenario	**The framework of ART consecutive training and checking event in which emphasis is placed on creating a learning environment that closely replicates the operational environment in which a flight deck crew performs their duties.**
Simulator event	**A portion of a training curriculum designated to be in a Flight Simulation Training Device qualified for that training.**
Special emphasis items	**ACS and FSB items determined by the Authority to require focused training and/or checking**

Prerequisites and SC enrollment.

This category of training is for a flightcrew member who has been trained and qualified under part 135 in the aircraft for the operator, who will continue to serve in the same duty position and aircraft type, and who must receive recurring training and/or checking within an appropriate eligibility period. Pilots that are not within the eligibility period for recurrent require a requalification curriculum.

The pilot must have familiarity with the crew resource management (CRM) concepts in 14 CFR 135.330.

The pilot must have a current 135.293(a)(1), and (3)-(8) for the certificate holder.

The pilot is within 135.293 currency.

Ground School.

Adaptive recurrent training includes a ground school segment to cover the items in 14 CFR 135.351(b)(2). The objective of the adaptive recurrent ground curriculum segment is to achieve the published learning objectives, which shall be defined by a combined effort of industry, training providers, the FAA, and the manufacturer experts through the TSWG's type specific action teams. Achieving these learning objectives will prepare the trainee for the flight training curriculum segment and qualification segment. Training providers may accomplish the learning objectives in adaptive recurrent ground training through traditional means if they wish. However, they are encouraged to pursue innovations that will provide a more modern experience and a better learning outcome than traditional lecture.

The FAA, operators, and training providers recognize that there is an opportunity to improve the traditional practice of publishing planned hours for ground training in the recurrent category through modern training methods and technologies. Hours spent in a classroom do not necessarily equate to learning achieved. Ground school training should be sufficiently long to meet all learning objectives. Given various aircraft types, technology, and sophistication, actual ground training hours are best assessed by type specific experts based on individual aircraft type and learning objectives.

In accordance with 14 CFR 135.351, recurrent training must include certain subjects annually; low-altitude windshear training and training on operating during ground icing conditions as prescribed in § 135.341 and described in § 135.345, crew resource management training as prescribed in § 135.330, and emergency training as prescribed in § 135.331. Regulations do not require that each element of initial training be repeated during each period of recurrent training. Rather, pertinent subject areas must be taught often enough to ensure that flightcrew members remain competent in the performance of their assigned duties. This means training centers can teach learning objectives on a rotating basis. Additionally, some learning may occur outside of the classroom, via computer based training or other mechanisms.

Note, this recommendation would not change qualification requirements of 135.293(a). Regardless of methodology used to deliver the ground curriculum, pilots must be able to demonstrate proficiency on all learning objectives established by type specific experts by passing

a written or oral test. The qualification segment remains critical to ensure that pilots have a baseline level of knowledge.

135.293(a) Evaluation.

The adaptive recurrent action team recommends developing policy that the written or oral evaluation required by 14 CFR 135.293(a)(2) be completed in phases corresponding with the applicable flight checking. This will mean that the evaluation is begun prior to the first simulator-based check and training session and completed in a subsequent simulator-based check and training session. This will allow for an assessment of the pilot's understanding of the aircraft systems relative to the inter-related practical application of aircraft/flight operations.

Such a policy should permit finishing the oral portion of the evaluation after the flight segment begins. FAA Order 8900.1 states there is no formal division between the knowledge portion and FSTD portion of a practical test and that oral questioning is conducted throughout the testing process. We agree. Consequently, it should not be required that the ground portion precede the practical portion of the practical test. Therefore, evaluators should be able to complete the requirements of 14 CFR part135.293(a)(2) after beginning initial observation, because it will lead to additional efficiency gains.

We recommend the FAA develop new guidance for the standardized curriculum that supports completing the ground portion over multiple days. Today, policy requires a pilot to demonstrate proficiency in all flight check items prior to finishing the qualification segment, even if they do so across multiple days. In the same way, the pilot should be able to complete the ground evaluation segment across multiple days. It is more important that the pilot demonstrate knowledge in all required areas before completing recurrent testing than the order in which demonstration is accomplished.

While policy requiring completion of the ground portion of the evaluation prior to beginning the flight portion of the evaluation may have originated to protect inspectors from getting in an aircraft with an incompetent pilot, these protections are not necessary in a flight simulator. Any residual risk will be outweighed by scheduling and efficiency gains. Furthermore, the adaptive recurrent is limited to pilots who meet a minimum experience threshold and is not available to pilots seeking certification.

Briefing.

In order to make each flight leg in the scenario as realistic as possible, the pilots should receive a Trip Sheet/Scenario Briefing prior to beginning simulator training that provides information about the flight legs included in the scenario. This is designed to replicate the how pilots receive a trip sheet (or equivalent information) from the operator prior to departing for a multi-day trip.

The preflight briefing will incorporate TEM/TPC principles.

During the course of each designated flight leg throughout the consecutive check, the check airman will evaluate any required events. At the conclusion of each day, the check airman will conduct a thorough debrief with the pilots to ensure each pilot understands whether each event was performed satisfactorily or unsatisfactorily.

Consecutive Checking.

Consecutive checking is the practice of evaluating pilot knowledge and proficiency using the certification standard appropriate to the certificate and/or rating held over multiple sessions concurrently with an approved training program. Training sessions are provided following or in sequential order with checking sessions without obligation to train a task before checking that task. Consecutive Checking is not permitted in cases where the check is intended to result in airman certification.

Simulator events consist of consecutive training and checking. Simulator events must be constructed using multi-day scenarios to ensure that both pilots complete all required events. Scenarios should be scaled to the complexity of the aircraft and the operating environment. Each scenario will include any required training elements in the curriculum (i.e., special emphasis items added by the Training Standardization Working Group) and the opportunity for retraining or re-checking any events that were unsatisfactory. Any time not spent checking will focus on training scenarios that include Abnormal and Emergency Procedures that may not be scheduled to be checked, such as: TCAS, EGPWS, Operations in Icing Conditions, Smoke Removal, Emergency Descent, etc.

There are three benefits to consecutive checking. By allowing a current, type rated and experienced pilot to check on required tasks without the requirement to train tasks prior, valuable simulator time can be reallocated to more relevant training that will improve the safety performance of the aviation system, versus spending that time simply rehearsing a list of tasks to be subsequently repeated and checked. By spreading a checking event over more than one simulator session, numerous checking tasks can be accomplished in an operational, realistic, uncompressed, scenario-based point to point flight, versus subjecting crews to an unrealistic series of back-to-back approaches and continuous malfunctions.

As aircraft have become more capable and more complex, additional checking tasks have been added to FSBR, resulting in an unreasonably arduous challenge when two pilots are expected to complete a check in a single session of simulator time. By accomplishing a significant number of basic checking module tasks immediately, the TSWG will gather valuable data on pilot's proficiency in normal line operations which will in turn design/improve the curriculum learning objectives. Additionally, ample time remains for operationally-based, realistic and reasonable training of more complex tasks, followed by checking of those more complex tasks, and where needed, training to proficiency in accordance with FAA Order 8900.1 V3 Ch54 Sec1 par. 3-4333 or "other training" in accordance with FAA Order 8900.1 V3 Ch19 Sec11 par. 3-1364

After initial observation, a pilot receiving consecutive checking may elect to receive training prior to checking on any tasks they wish, and should align their expectations for the event with the check pilot prior to commencing the session as part of the preflight briefing. If a pilot wants training prior to any checking, the pilot will need to work with the certificate holder to enroll in course two.

As with any checking event, the applicant must always know if they are being trained or checked. Consecutive checking is not applicable to pilots seeking certification.

An applicant not demonstrating proficiency in a maneuver or procedure during a first attempt will be trained to proficiency and provided an opportunity for a subsequent recheck, per FAA Order 8900.1. Volume 3, Chapter 19, Section 7, Paragraph 3-1285(b), as outlined in the section of this recommendation on Other Training.

Adaptive recurrent training allows pilots to display proficiency and competency throughout the consecutive checking process. During the course of the consecutive check, the check pilot will grade all required events as the flights progress each simulator session. The consecutive check is administered against the Airman Certification Standards and no training may occur during checking events. The crewmembers will conduct structured briefings at the beginning of each simulator session and detailed debriefings at the end of each simulator session to make sure each crewmember is fully aware of the events successfully completed.

During a consecutive check, the crewmember will receive credit for and must complete all proficiency and competency check requirements under 135.293(a)(2) & (b) and 135.297, as applicable to the duty position. Exact checking requirements will be determined by type specific action teams. All necessary checks will be complete by the end of the multiple-day scenario and the result will be reported to the crewmember or certificate holder as satisfactory or unsatisfactory.

Initial Observation.

During adaptive recurrent training the first simulator training event will include “initial observation.” Initial observation is the evaluation of ACS tasks during consecutive checking that occurs before any training has been conducted. Initial observation tasks include those tasks which are used frequently in daily operation and evaluated to determine retention of pilot proficiency. Checking tasks not performed to ACS standards during the initial observation may be trained to proficiency and rechecked. All checking tasks performed to ACS standards during the initial observation are considered complete and no further training or checking of those tasks is required.

Initial observation is a check during which a check pilot focuses on normal operations, but may include some abnormalities as time permits. Initial observation will be conducted by a check airman. All items conducted to ATP and Type Rating ACS standards will be recorded on the FAA Form 8410 as satisfactory. Any tasks that do not meet ATP and Type Rating ACS standard will be recorded on the FAA Form 8410 and must be retrained and rechecked. All checking items will be graded as satisfactory or unsatisfactory. However, an additional data collection process will incorporate a supplemental granular four-point grading scale that will be used to improve the curriculum, as described below.

Initial observation should include a system malfunction resulting in an abnormal condition which validates proficiency in recognizing abnormal conditions in normal flight operations and the ability to manage the situation through checklists and CRM. A single system malfunction may not satisfy the entirety of the requirements in the FAA Form 8410. Rather, the majority of the

systems related items may be addressed during subsequent checking events, thus completing the requirement.

Initial observation will include the following items, at a minimum:

NORMAL PROCEDURES:
(may include some abnormal)

GROUND OPERATIONS
Preflight inspection
Start procedures
Taxiing/runway operations
Pretakeoff checks

TAKEOFF AND DEPARTURES
Normal
Crosswind
Instrument
Area departure

INSTRUMENT PROCEDURES
Normal ILS approach
Coupled approach
Nonprecision approach
Missed approach from an ILS

LANDINGS AND APPROACHES TO LANDINGS
Normal
Crosswind

NON-NORMAL AND EMERGENCY PROCEDURES
System malfunction

After Landing
Shut-down Procedures
(Other items as time permits)

Initial observation performance scores will be combined with those of other participants to establish the effectiveness of the training program itself and identify areas for further improvement. Events will receive a supplemental grade on the four-point scale, and the granular grading information will be aggregated, deidentified, and provided to the TSWG for the purpose of improving the curriculum.

After completing the initial observation, the remaining time on day one can be used for training. Training should focus on the elements that remain to be checked.

Flight Profiles, Maneuvers, Procedures, and Functions to Be Performed.

Every multi-day checking event will be developed as a single scenario, consisting of multiple flight legs, that incorporate all objectives. Once all checking elements required by 14 CFR 135.293(a)(2)&(b) and 135.297 (PIC only) have been satisfactorily completed, the training provider and operator may complete additional scenarios developed to meet the operator's requests based on equipment capabilities, time available, and other focus items pertinent to the certificate holder's operations.

After initial observation, the multi-day scenario must include training that is sufficient to prepare the pilots for the remaining checking elements. Each multi-day scenario must also contain the opportunity for retraining and re-checking any events that were unsatisfactory and meet any learning objectives associated with special emphasis items. Any remaining time will focus on training for Abnormal and Emergency Procedures that may not be scheduled to be checked, such as: TCAS, EGPWS, Operations in Icing Conditions, Smoke Removal, Emergency Descent, etc.

Through the use of a risk analysis in the continuous improvement process, the TSWG will identify threats and errors to be incorporated in ground school and flight training, as well as tasks for special purpose operational training (SPOT). Special emphasis items may be type specific or industry wide. The type specific and industry wide items may be similar or identical. The TSWG will identify special emphasis items based on real-world data gathered from flight operations and historical events.

The certificate holder's training program manager may provide additional input and special emphasis items to ensure the scenarios reflect the certificate holder's operating environment. Scenarios should be scaled to the complexity of the aircraft and the operating environment. Additional training items are outside the scope of the adaptive recurrent qualification event and may be conducted before or after completion of course 3.

The TSWG will review and recommend special emphasis items on an annual basis. After the TSWG recommends new special emphasis items to ARAC, the training providers will need to revise training scenarios to incorporate the new special emphasis items.

The FAA, operators, and training providers recognize that given various aircraft types, technology, and sophistication, actual flight profiles, maneuvers, procedures, and functions to be performed during flight training are best determined by type specific experts. The flight profiles and procedures should remain the same as those recommended by the type specific experts for course two. Maneuvers will be determined by the training provider and must encompass learning objectives and special emphasis items recommended by the TSWG.

Following initial observation, and after a training opportunity, additional consecutive checking scenarios must include the following checking tasks:

TAKEOFF AND DEPARTURES
With powerplant failure
Rejected takeoff

Short field

IN-FLIGHT MANEUVERS
Steep turns
Stall prevention (approaches to stalls)
Powerplant failure
Two-engine-inoperative approach

INSTRUMENT PROCEDURES
Holding
Engine-out ILS
Second nonprecision approach
Second missed approach
Area arrival
Circling approach
EFVS approach

LANDINGS AND APPROACHES TO LANDINGS
Landing from an ILS
Landing with engine out
Circling approach
Rejected landing
Two-engine-inoperative landing
Short field landing
No-flap approach
EFVS landing

NON-NORMAL AND EMERGENCY PROCEDURES
System malfunction
NVG malfunction
Maneuver by partial panel
Unusual attitude recovery
Emergency landing
Use of external lighting
Instrument approach

Note: The final simulator session should be used for retraining and rechecking any items that were not yet performed to the ATP and Type Rating ACS. If the pilot performed no maneuvers or few maneuvers unsatisfactorily throughout the training event, extra time may remain during the final simulator session. This time may be used to train special emphasis items requested by the pilot or operator.

Outcome.

All necessary checks will be complete by the end of the multiple-day scenario and the result will be reported to the crewmember or certificate holder as satisfactory or unsatisfactory.

The PIC Curriculum leads to a PIC 135.293 and PIC 135.297 Proficiency Check.
The SIC Curriculum leads to a IFR SIC 135.293 Competency Check.

Successful completion of adaptive recurrent will be achieved by meeting applicable ACS standards for checking elements and completing all required training elements.

The 8410 shall not be issued until after completion of all training and checking elements in the approved adaptive recurrent curriculum.

Other Training.

In accordance with 135.301(b), "if the pilot being checked is unable to demonstrate satisfactory performance to the person conducting the check, the certificate holder may not use the pilot, nor may the pilot serve, as a flight crewmember in operations under this part until the pilot has satisfactorily completed the check."

A flightcrew member who fails a required check must receive remedial training in accordance with FAA Order 8900.1 V3, Ch19, S11. Training may consist of as little as a detailed debriefing, or it may need to be very extensive flight training. Additional training should be given to strengthen the flightcrew member's overall performance. Other Training requirements will be determined by the operator in coordination with the training provider.

The evaluator must record when a pilot does not perform a checking item to the ACS standards. The operator and training provider must also document Other Training in the crewmember's records. The documentation should include the unsatisfactory result of the check, retraining and rechecking.

Adaptive Recurrent training allows pilots to display competency throughout the checking event. A clear determination of when the pilot is undergoing training or checking must be made prior to beginning any maneuver. The following guidelines shall be used for determining whether the outcome of the continuous check is satisfactory or unsatisfactory:

- If in the judgment of the check pilot, the crewmember does not meet the ACS standards for any checking item, that element is unsatisfactory.
- If the consecutive check becomes unsatisfactory per adaptive definitions, the crewmember will be transitioned from Adaptive Recurrent training and checking to Other Training, in accordance with FAA Order 8900.1 V3, Ch19, S11.
- In accordance with § 135.301(b), the check will be recorded as unsatisfactory on the 8410, and the pilot will be held from line service until the maneuver-based recurrent training and checking is completed satisfactorily.
- The reasons for the disqualification and the training given must be entered in the flightcrew member's records.

- Once the event is assessed as unsatisfactory by the check pilot, the crewmember will not be checked on the event again until he or she has completed retraining at which time the event can be re-checked.
- Training may consist of as little as a detailed debriefing, or it may need to be very extensive.
- Each event can be checked one additional time by the end of the multi-day scenario, after retraining occurs. However, a maximum of three events total can be retrained/re-checked during the course of the multi-day scenario.

    The TSWG recognizes that current part 142 policy limits each check to re-checking two events. The initial observation creates a checking environment without any prior training, potentially creating a scenario for a pilot to not perform to standard while adjusting to the simulator. The TSWG believes the extra flexibility is merited due to the value of the data and efficiency derived from the initial observation. It should be further noted that there is no limit on the number of items that can be retrained and rechecked in part 135 regulations.

- The TSWG may add one or more critical events to the Aircraft-Specific Part 135 Standardized Curriculum. Failure of a defined critical event may result in an immediate unsatisfactory result on the consecutive check.

Change Management Process.

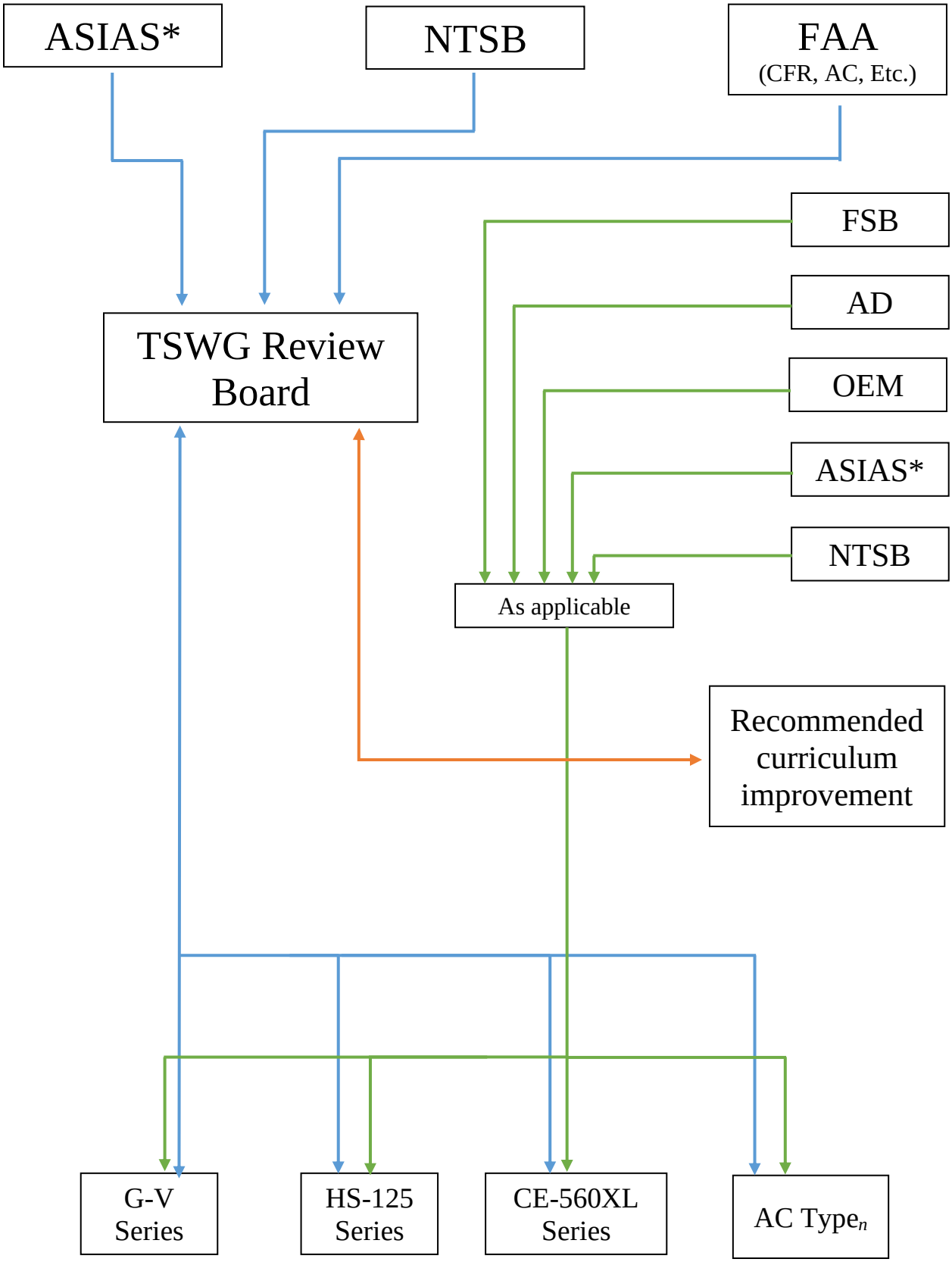
In accordance with their tasking, the TSWG will implement a process to continuously improve the adaptive recurrent program based on data, industry trends, new technology, and changing regulations. To improve course 3, the TSWG and type specific experts will review the training program, flight operations data, and supplemental training information at least once every 12-months.

The TSWG may also initiate changes to the curriculum at shorter intervals if new safety information becomes available or new training requirements are implemented. For example, the TSWG or type specific experts may initiate a change if safety or training information is made available by the NTSB, FAA, manufacturer, or part 142 training center. New information may be made available by the NTSB in the form of a recommendation or accident report. The FAA may make new information or mandates may be provided via regulations, Information for Operators message, Safety Alert for Operators, Advisory Circular, Flight Safety Board Report, or FAA Order 8900.1. The manufacturer may trigger a change by revising the aircraft flight manual, quick reference handbook, or equipment changes. A training center may initiate a change if simulator operational quality assurance or other data indicates a training may be improved by altering the training program.

When new information, guidance, or requirements become available, the TSWG will analyze the information to determine which, if any, curricula should change. The TSWG will apply global

changes to all standardized curricula, and aircraft-specific changes will apply to only those aircraft. Type specific experts may also use the annual data review or trigger to determine any additional emphasis items that should be applicable to either the aircraft specific curriculum. The image below depicts the flow of information and changes.

When the TSWG determines a revision to the curriculum is necessary, whether for improvement or compliance, the TSWG will recommend the revision to the ARAC in accordance with their tasking. Recommendations will be made at the next feasible ARAC meeting. While ARAC meetings occur each quarter, situations may exist in which a modification to a curriculum may be necessary in a shorter timeframe, such as for an emergency Airworthiness Directive. When the FAA determines that a modification is required prior to receiving an recommendation, they will be able to make those modifications at their discretion.



*Data collected will address Global (all training/operations) trends and filtered to identify aircraft-specific (training/operations) trends.

Before any new or revised curriculum is activated, the curriculum objectives and training procedures will be reviewed by the TSWG SMEs using the FAA SMS Safety Matrix to complete a hazard identification analysis and risk assessment, and design mitigating strategies, including curriculum revision, if necessary, when hazards are identified and mitigation strategies cannot lower the likelihood and/or severity factors to acceptable levels.

When operators elect to add additional training and/or checking objectives beyond the scope of the TSWG Adaptive Recurrent program curriculum objectives, it will be incumbent on the individual operator to have completed and maintain its own hazard-risk analysis for those additional elements.

Supplemental Grading Criteria.

Checking events will be recorded on the binary scale of "Satisfactory" or "Unsatisfactory" in reference to the current ATP and Type Rating ACS.

For all courses contained in the 135 Standardized Curriculum, instructors will grade pilot performance in accordance with the supplement four-point grading system recommended in ACT ARC 16-1 Recommendation (g), Data Collection. In addition to a standardized 4-point grading scale and rubric for training events, instructors may record supplemental information on the root cause of pilot performance that falls below or above expected performance at any point during training or checking. These observations will be made in the form of observable behaviors. Instructors will use the supplemental grading and observable behaviors during initial observation as well as throughout the event. Information derived from aggregated and deidentified granular grading data provided to the TSWG will facilitate continuous improvement of the training program.

As is the case today, only Satisfactory or Unsatisfactory scores are recorded in the FAA Form 8410 and kept with the pilot's record.

Record Keeping Requirements.

As is the case today, only Satisfactory or Unsatisfactory scores should be recorded in the FAA Form 8410 and kept with the pilot's record. All checking items performed to the standards prescribed in the ATP and Type Rating ACS will be recorded on the FAA Form 8410 as satisfactory.

As is the case today, operators and training centers should also document unsatisfactory checking results, retraining and rechecking. In accordance with the section on Other Training, a training center evaluator must also document if a pilot does not perform a maneuver to the ATP and Type Rating ACS Standard. The operator and training provider must also document subsequent Other Training and results from the reevaluation in the crewmember's records. Today, this is commonly documented in the FAA Form 8410.

Training centers will need to record supplemental grading information, including supplemental scores on a four-point scale and observable behaviors. Training centers will submit the supplemental scores to the FAA. While the TSWG envisions a program similar to ASIAS, the manner for recording and submitting scores will be determined by the FAA. The ensuing information will be used to improve the training program. Because this supplemental information is not documented to understand the pilot's

performance, but is instead intended for improving the training program, the TSWG assumes the FAA will not require the supplemental information to be recorded in the pilot records database.

The TSWG recommends the training centers develop a mechanism to capture supplemental grading information and observable behaviors in addition to tradition information required for the FAA Form 8410. While the TSWG assumes training centers will develop unique software to capture the information, Appendix C contains one example of a modified form that can be used to track supplemental grading information, as well as traditional checking information.

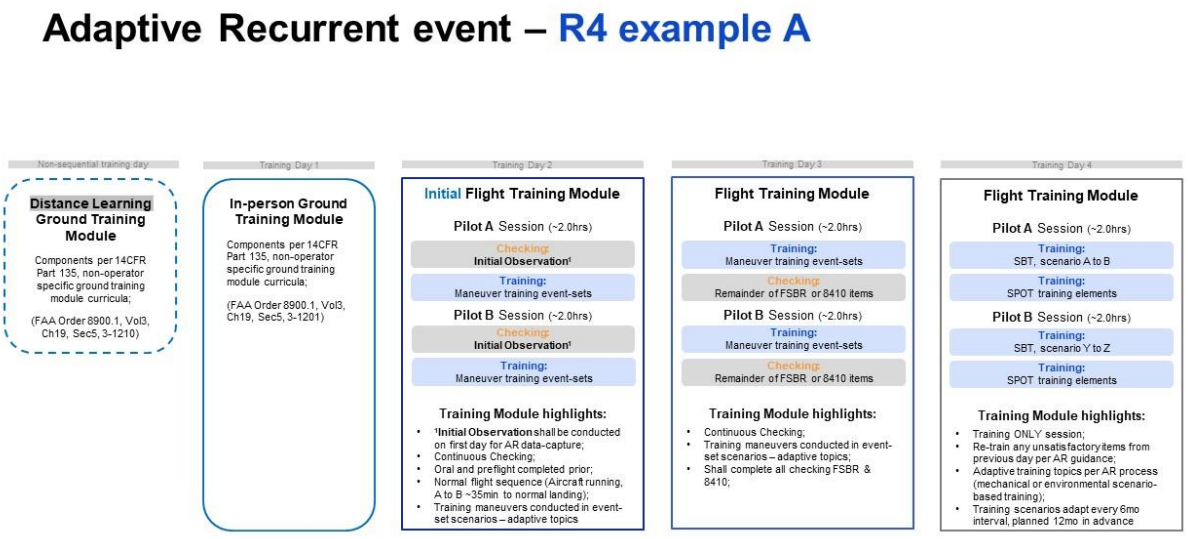
The TSWG recommends the FAA update AC 120-68J – Pilot Records Database and Pilot Records Improvement Act to indicate which records, if any, from adaptive recurrent must be included in the PRD.

Course Outline.

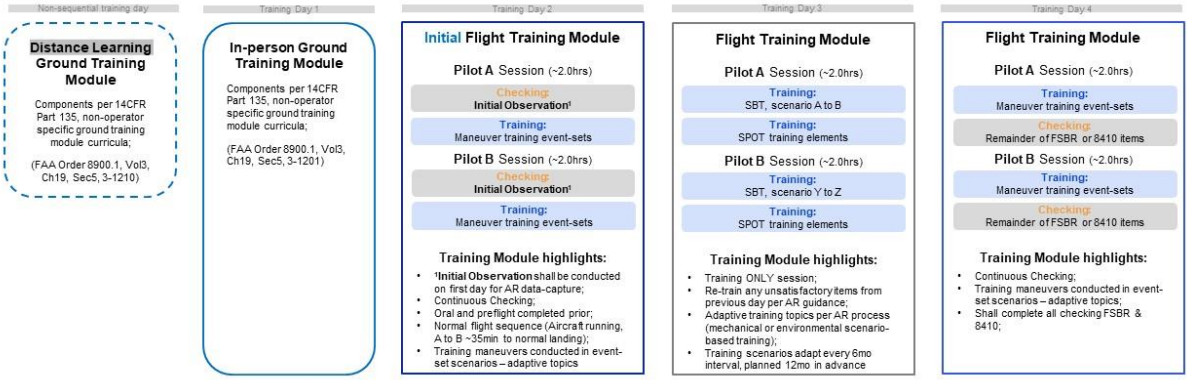
As mentioned above, type specific experts will determine the ground and flight learning objectives for each aircraft type. These will come in the form of recommendations for Course 3.

The format for Course 3 may vary. Type specific experts will recommend learning objectives, flight profiles, maneuvers, procedures, and functions to be performed. The type specific experts may not recommend the order in which each objective must be accomplished, thereby allowing the training center to determine the best order to accomplish the objectives. Training centers may use this flexibility to take advantage of remote learning opportunities. This added flexibility leads to options for the manner in which a pilot will accomplish course 3.

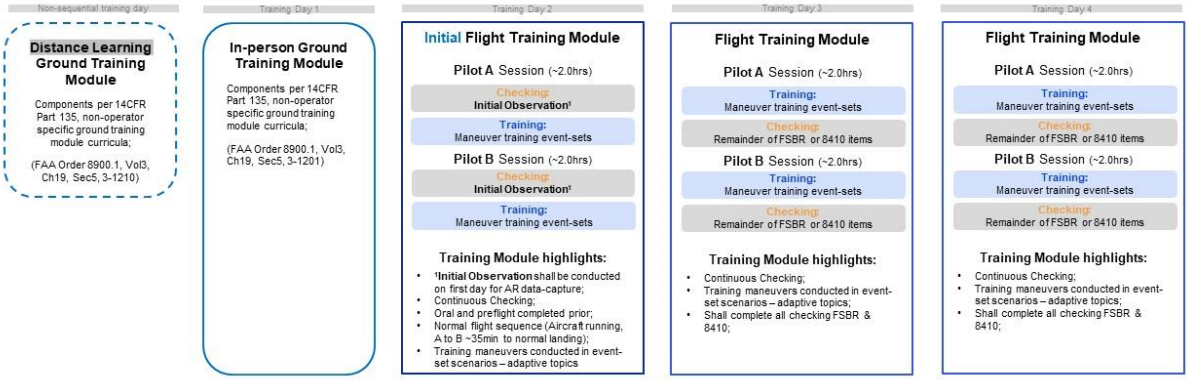
Several options, but not all options, for executing Course 3, are listed below.



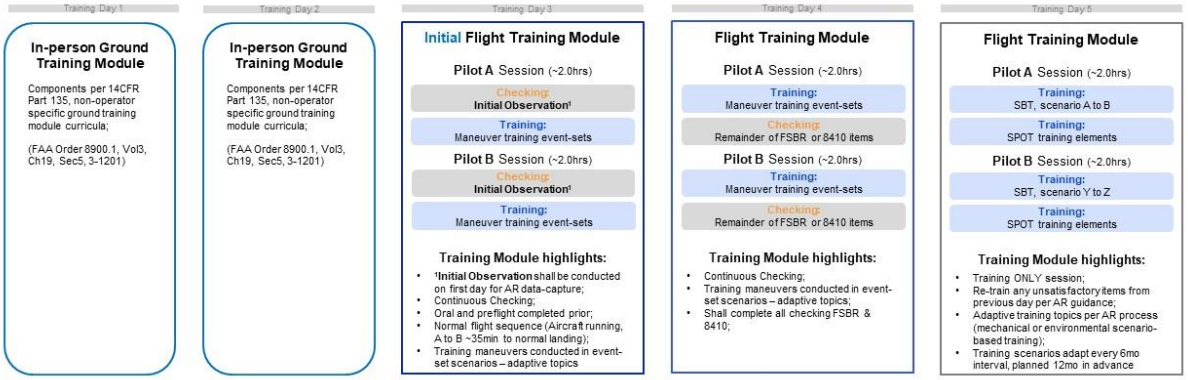
Adaptive Recurrent event – R4 example B



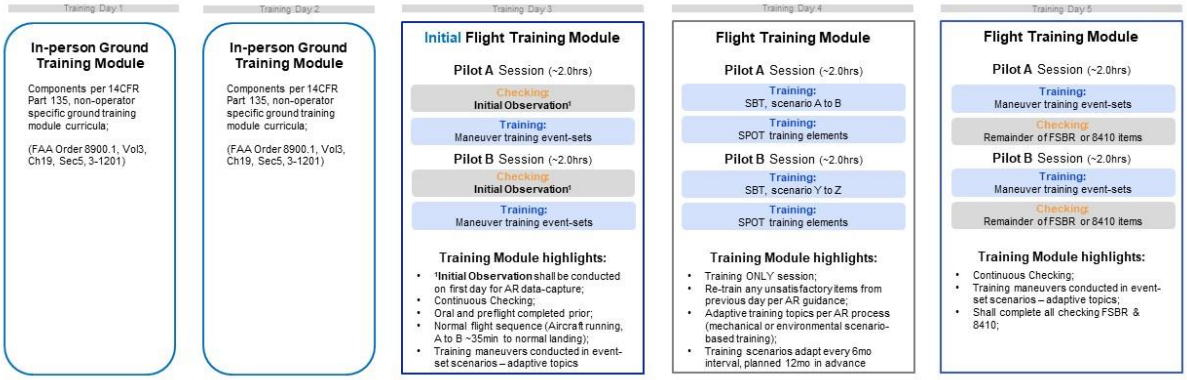
Adaptive Recurrent event – R4 example C



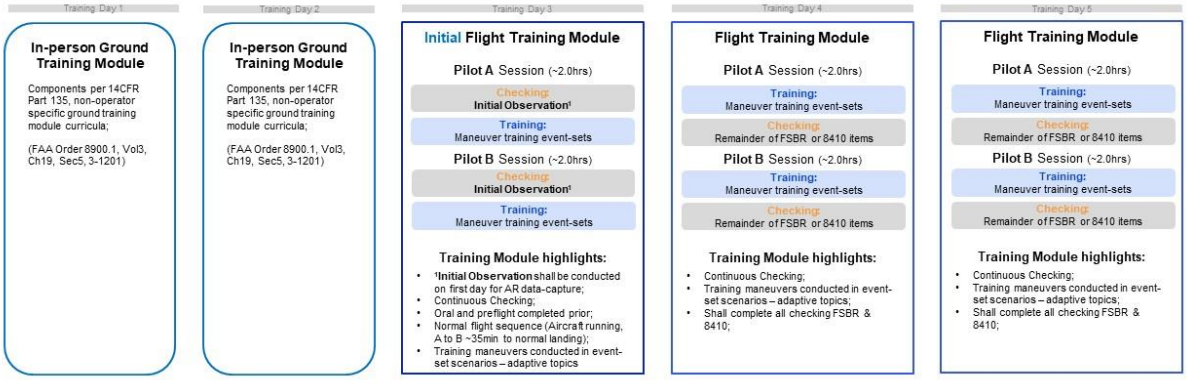
Adaptive Recurrent event – R5 option D



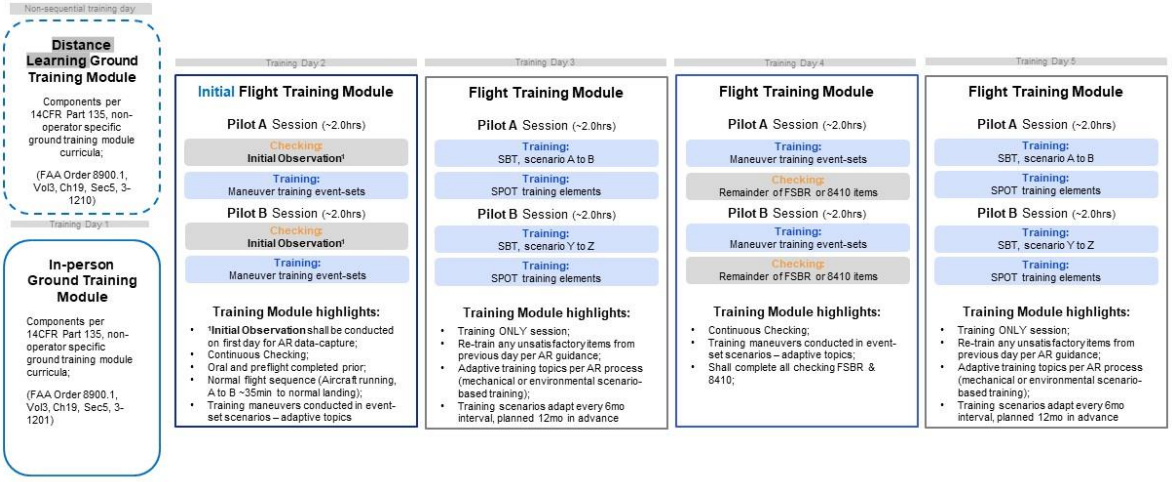
Adaptive Recurrent event – R5 option E



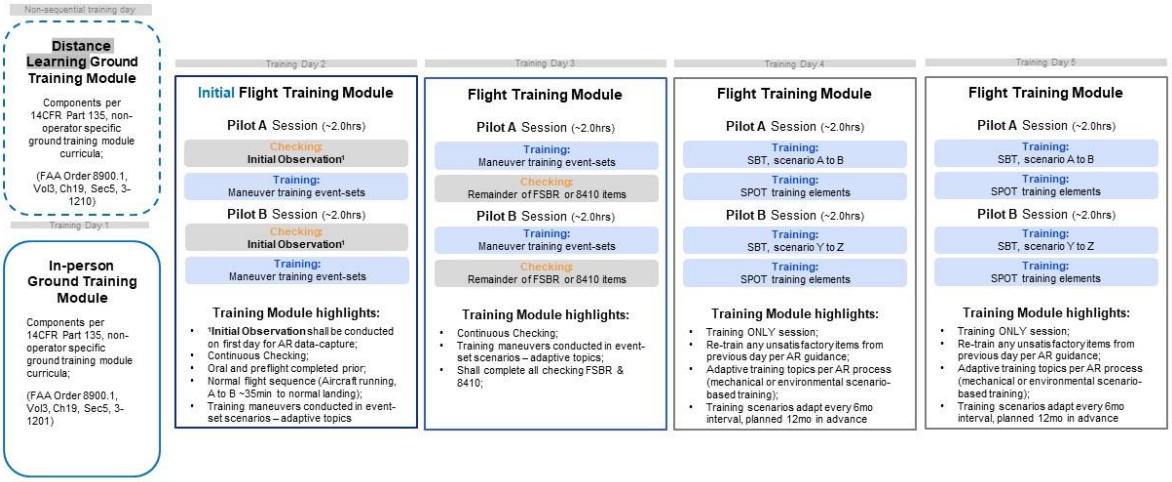
Adaptive Recurrent event – R5 option F



Adaptive Recurrent event – R5 example G



Adaptive Recurrent event – R5 example H



Appendix B. Grading Criteria

This standardized curriculum grading system is designed to help instructors and students achieve their goals by capturing both technical and non-technical skills. The proposed grading scheme emphasizes threat and error management and aligns with the ICAO airplane pilot competency framework which enable the gathering of critical data by which adaptive recurrent training scenarios can be tailored to the data driven needs of a particular fleet.

Grading Matrix During Training Events.

The first time a pilot performs a task or maneuver, the training center instructor or evaluator should rate the performance on the grading scale outlined below. The training center instructor or evaluator should assess a score for check or training events, the first time the pilot performs the task. This information will be aggregated and deidentified to determine the areas that pilots best retain skills between training events. This information can be used to improve the training program.

Score	**Rubric**
Best Score	a) The task is completed to the standard error-free the first time performed. b) Crew Resource Management (CRM) / Single Pilot Resource (SRM) skills and behaviors meet standard throughout the task. c) Threats are quickly identified, and individual response is appropriate. d) The individual can demonstrate error-free mastery of the aircraft, with the successful outcome of each task is never in doubt.
Second Best Score	a) Individual is proficient and performs efficiently and skillfully throughout the task. b) CRM/SRM skills and behaviors meet standards throughout the task. c) Threats are identified and individual response is appropriate. d) Errors are recognized and self-corrected immediately. (Minor, non-critical deviations may occur infrequently.) e) The individual can demonstrate mastery of the aircraft, with the successful outcome of each task never in doubt.
Third Best Score	a) Individual does not demonstrate proficiency in the task. b) CRM/SRM skills and behaviors are ineffective at any point during the task. c) Threats are slow to be identified and/or individual response is not appropriate. d) Critical errors are not recognized in a timely manner or resolved by the individual. e) Verbal instructor/evaluator intervention was needed. f) The instructor/evaluator is of the opinion that additional training will enable the individual to meet the applicable completion standards.
Fourth Best Score	a) Individual does not demonstrate proficiency in the task. b) CRM/SRM skills and behaviors are ineffective throughout the task. c) Threats are not identified, or individual response is not appropriate. d) Critical errors are not recognized or resolved by the individual.

	e) Instructor/evaluator intervention was necessary to prevent excessive deviation from the standard. f) The individual's performance is clearly unsatisfactory due to basic deficiencies, such as lack of skill, knowledge, or ability, and/or because of improper attitude with respect to successfully performing a task.

Task Expectation Rating.

During the early stages of training curriculums, Instructors can expect that trainees will require active coaching and teaching. However, as the trainee progresses towards the final competency standard and gains more confidence in performing independently, the instructor takes on a more passive role and may only give occasional advice on how to improve efficiency or intervene in instances where safety may be compromised.

For all FSTD training lessons, the curriculum will assign a level of acceptable proficiency that is to be achieved for each element (task, maneuver, or procedure), expressed as a Task Expectation Rating (TER), in accordance with the following table:

TASK RATING (TER)	MEANING
LOW	• Applicable to the first introduction of a task, maneuver, or procedure, or where a task is a "Train only" item. • The trainee may require significant level of instructor intervention and support (e.g., demonstrations, explanations, repetitions). • Applicable Teaching Styles: Explain (Tell), Demonstrate (Show)
MEDIUM	• The trainee may require a moderate level of instructor intervention and support • Some limited assistance is required (coaching, instruction, prompting) to correct errors and/or improve task performance. • Applicable Teaching Style: Discover with Assistance
HIGH	• Applicable where the trainee should be able to demonstrate the expected level of task proficiency with minimal or no instructor support • Minor instructional inputs, coaching or prompting may be provided to further enhance task performance beyond expectations. • Applicable Teach Styles: Facilitation, Discover without Assistance

Monitoring Trainee Progress

It is important any grading system can be used to highlight when a student is not progressing as expected so that a meaningful intervention can be made, and the student receives the support required to succeed. Furthermore, properly monitoring student progress allows instructors to assist the student by identifying the root cause of their performance issue in terms of Knowledge, Skills or Attitude and thus target the appropriate support or remedial training.

Expected grades and the expected amount of instructor support should be clearly identified in the training program and thus will provide a benchmark of both expected pilot proficiency for a given task at that point in the training, and the expected amount of instructor support at that point in the training. As the course progresses the student scores may be measured against the benchmark. An example would be when an exercise is first attempted: The target score may be "third best score", and the task expectation rating may be "Low" meaning that the pilot is expected to perform close to standards but not quite and should require a lot of instructor support at that point in the course. Approaching the test or check, a "second best" or above would be required, and the task expectation rating would be "High" meaning little to no instructor support was required. Tracking against a target score could be presented as a traffic light system (in effect a relative grading) such that a candidate would know if they were progressing in line with expectations. To be considered as "ready for testing or checking" by the end of training, all scores must be second best or above and all task expectation ratings must be met.

Whenever a task is executed below the expected score or TER, the instructor should provide appropriate training during the lesson to improve trainee performance to the expected level within the time available. If insufficient time remains in the training sessions to achieve the expected score and TER, that task should be carried forward to the next lesson. If insufficient time is available in the next lesson to complete all carry over tasks to the expected score and TER, then additional training sessions should be scheduled.

Grading Matrix During Checking and Testing.

Score	**Rubric**
Satisfactory	Meets ATP and Type Rating ACS
Unsatisfactory	Does not meet ATP and Type Rating ACS

Supplemental Data.

For both training or checking, instructors will record supplemental information as to the reason(s) for unexpected performance. This supplemental information will be in the form of the ICAO/IATA observable behaviors below.

Application of Knowledge Competency	
KNO 0.1	Demonstrates practical and applicable knowledge of limitations and systems and their interaction
KNO 0.2	Demonstrates required knowledge of published operating instructions
KNO 0.3	Demonstrates knowledge of the physical environment, the air traffic environment including routings, weather, airports, and the operational infrastructure
KNO 0.4	Demonstrates appropriate knowledge of applicable legislation
KNO 0.5	Knows where to source required information
KNO 0.6	Demonstrates a positive interest in acquiring knowledge
KNO 0.7	Is able to apply knowledge effectively

Application of Procedures Competency	
PRO 1.1	Identifies where to find procedures and regulations
PRO 1.2	Applies relevant operating instructions, procedures, and techniques in a timely manner
PRO 1.3	Follows SOPs unless a higher degree of safety dictates an appropriate deviation
PRO 1.4	Operates aircraft systems and associated equipment correctly
PRO 1.5	Monitors aircraft systems status
PRO 1.6	Complies with applicable regulations
PRO 1.7	Applies relevant procedural knowledge
Communication Competency	
COM 2.1	Determines that the recipient is ready and able to receive information
COM 2.2	Selects appropriately what, when, how and with whom to communicate
COM 2.3	Conveys messages clearly, accurately, and concisely
COM 2.4	Confirms that the recipient demonstrates understanding of important information
COM 2.5	Listens actively and demonstrates understanding when receiving information
COM 2.6	Asks relevant and effective questions
COM 2.7	Uses appropriate escalation in communication to resolve identified deviations
COM 2.8	Uses and interprets non-verbal communication in a manner appropriate to the organizational and social culture
COM 2.9	Adheres to standard radiotelephone phraseology and procedures
COM 2.10	Accurately reads, interprets, constructs, and responds to datalink messages in English
Flight Path Management Using Automation Competency	
FPM-A 3.1	Uses appropriate flight management, guidance systems and automation, as installed and applicable to the conditions
FPM-A 3.2	Monitors and detects deviations from the intended flight path and takes appropriate action
FPM-A 3.3	Manages the flight path safely to achieve optimum operational performance
FPM-A 3.4	Maintains the intended flight path during flight using automation while managing other tasks and distractions
FPM-A 3.5	Selects appropriate level and mode of automation in a timely manner considering phase of flight and workload
FPM-A 3.6	Effectively monitors automation, including engagement and automatic mode transitions
Flight Path Management Manual Control	
FPM-M 4.1	Controls the aircraft manually with accuracy and smoothness as appropriate to the situation

FPM-M 4.2	Monitors and detects deviations from the intended flight path and takes appropriate action
FPM-M 4.3	Manually controls the aircraft using the relationship between aircraft attitude, speed and thrust, and navigation signals or visual information
FPM-M 4.4	Manages the flight path safely to achieve optimum operational performance
FPM-M 4.5	Maintains the intended flight path during manual flight while managing other tasks and distractions
FPM-M 4.6	Uses appropriate flight management and guidance systems, as installed and applicable to the conditions
FPM-M 4.7	Effectively monitors flight guidance systems including engagement and automatic mode transitions

Leadership and Teamwork	
LTW 5.1	Encourages team participation and open communication
LTW 5.2	Demonstrates initiative and provides direction when required
LTW 5.3	Engages others in planning
LTW 5.4	Considers inputs from others
LTW 5.5	Gives and receives feedback constructively
LTW 5.6	Addresses and resolves conflicts and disagreements in a constructive manner
LTW 5.7	Exercises decisive leadership when required
LTW 5.8	Accepts responsibility for decisions and actions
LTW 5.9	Carries out instructions when directed
LTW 5.10	Applies effective intervention strategies to resolve identified deviations
LTW 5.11	Manages cultural and language challenges, as applicable
Problem Solving and Decision Making	
PSD 6.1	Identifies, assesses, and manages threats and errors in a timely manner
PSD 6.2	Seeks accurate and adequate information from appropriate sources
PSD 6.3	Identifies and verifies what and why things have gone wrong, if appropriate
PSD 6.4	Perseveres in working through problems while prioritizing safety
PSD 6.5	Identifies and considers appropriate options
PSD 6.6	Applies appropriate and timely decision-making techniques
PSD 6.7	Monitors, reviews, and adapts decisions as required
PSD 6.8	Adapts when faced with situations where no guidance or procedure exists
PSD 6.9	Demonstrates resilience when encountering an unexpected event
Situational Awareness	
SAW 7.1	Monitors and assesses the state of the aircraft and its systems
SAW 7.2	Monitors and assesses the aircraft's energy state, and its anticipated flight path
SAW 7.3	Monitors and assesses the general environment as it may affect the operation

SAW 7.4	Validates the accuracy of information and checks for gross errors
SAW 7.5	Maintains awareness of the people involved in or affected by the operation and their capacity to perform as expected
SAW 7.6	Develops effective contingency plans based upon potential risks associated with threats and errors
SAW 7.7	Responds to indications of reduced situational awareness
Workload Management	
WLM 8.1	Exercises self-control in all situations
WLM 8.2	Plans, prioritizes, and schedules appropriate tasks effectively
WLM 8.3	Manages time efficiently when carrying out tasks
WLM 8.4	Offers and gives assistance
WLM 8.5	Delegates tasks
WLM 8.6	Seeks and accepts assistance, when appropriate
WLM 8.7	Monitors, reviews, and cross-checks actions conscientiously
WLM 8.8	Verifies that tasks are completed to the expected outcome
WLM 8.9	Manages and recovers from interruptions, distractions, variations, and failures effectively while performing tasks

Adopting this worldwide standard of root cause data collection will ensure individual pilots receive more accurate assessment of their own performance and opportunities to improve, as well as enable a universal data set with which the entire training program can be improved. Any time a training, checking, or testing task is scored above or below the expected score and/or TER, the relevant observable behavior or behaviors shall be recorded. As an example, perhaps both pilot A and B we're off altitude and slightly outside the expected control of airspeed during a steep turn, but the reasons are very different. Simply collecting scores will prevent the industry from identifying and attacking root causes of potential future incidents and accidents.

Simulator Session #1

Task: Steep Turns **Expected Score:** Third Best **TER:** Medium

Pilot A:
Task: Steep Turns **Actual Score:** Fourth Best **TER:** Low **Obs:** FPM 4.1 and FPM 4.3

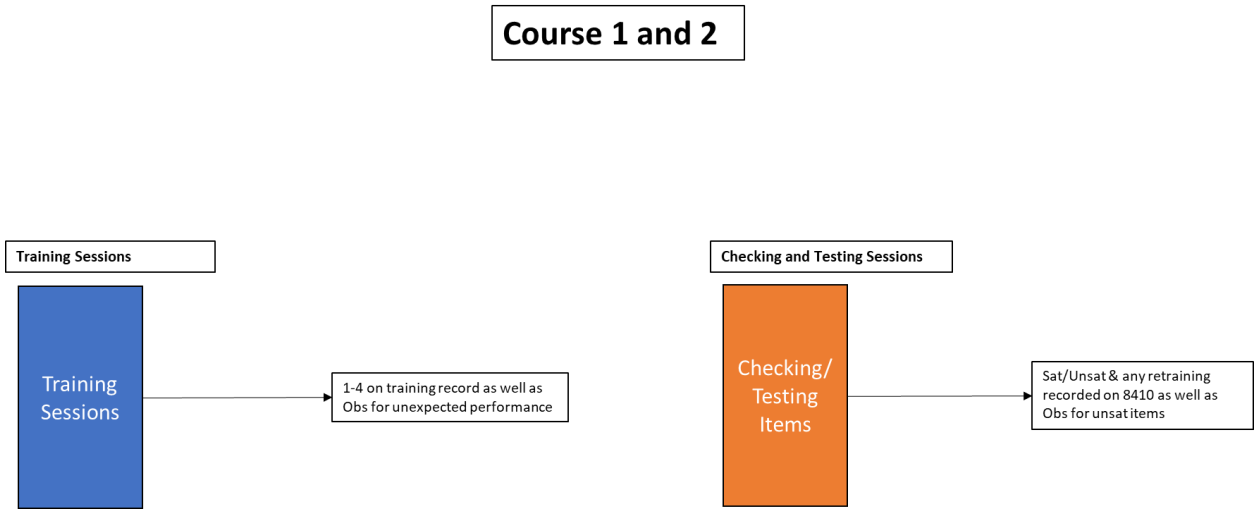
Pilot B:
Task: Steep Turns **Actual Score:** Fourth Best **TER:** Low **Obs:** FPM 4.5 and PSD 6.3

By recording the supplemental observable behavior data, each pilot can be debriefed more accurately on what they must improve, and a standardized data set for the entire pilot community is being built which can inform the selection of scenarios in adaptive recurrent or modifications to other courses in response to quantifiable needs of that pilot demographic. Gathering the same supplemental data on performance that exceeds expectations is equally valuable, as it may help identify best practices in one area of the industry that should be expanded to other operators. For example, pilot C exceeded performance expectations on simulator session #1. This pilot will benefit from being made aware of

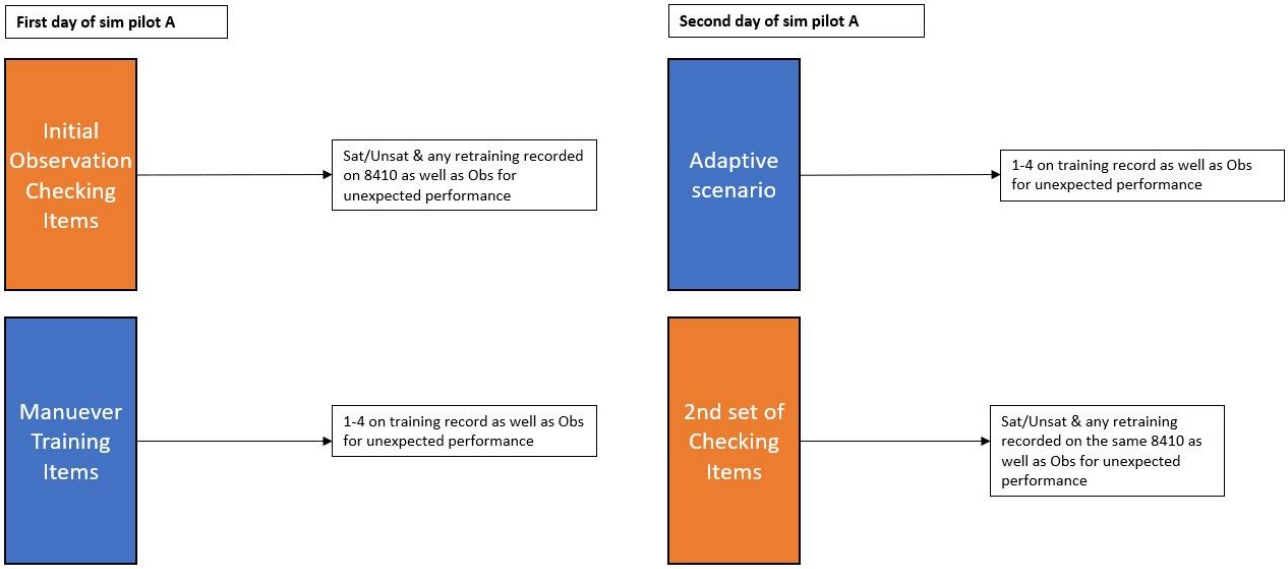
their exceptional performance, and a larger data set may emerge over time with insights as to certain operators' best practices, or certain demographics of pilots. Air carriers may find this information useful in identifying pilots that are good candidates for other duties within their organizations.

Pilot B:
Task: Steep Turns **Actual Score:** First Best **TER:** High **Obs:** FPM 4.1 and FPM 4.3

Visualization of Grading Data



Course 3


First day of sim pilot A
Initial Observation Checking Items
Sat/Unsat & any retraining recorded on 8410 as well as Obs for unexpected performance
Manuever Training Items
1-4 on training record as well as Obs for unexpected performance
Second day of sim pilot A
Adaptive scenario
1-4 on training record as well as Obs for unexpected performance
2nd set of Checking Items
Sat/Unsat & any retraining recorded on the same 8410 as well as Obs for unexpected performance

Appendix C. Sample Supplemental Grading Form

AIRMAN COMPETENCY/PROFICIENCY - GRADING/CHECK FORM	AIR CARRIER:	AIR CARRIER CERTIFICATE NUMBER:
TRAINING CENTER LOCATION:	DATES OF CHECK:	DURATION OF CHECK
PILOT NAME (last, first, middle initial):	TYPE OF TEST/CHECK: INH- (___) REC___ TRA- (___) REQ ___ ☐ 135.293(a)(2-3) & b ☐ 135.297 Only ☐ 135.293(a)(2-3) & b & 135.297	
PILOT CERTIFICATION INFORMATION: Grade: Number:	AIRCRAFT *(Make/Model/Series)*:	SIMULATOR *(FAA ID)*:

FLIGHT MANEUVERS GRADE *(1&2=Satisfactory, 3&4=Unsatisfactory – Retraining/Rechecking Required, N/A=Not Applicable)*

Maneuver (* = SIC Requirement)	Grade	Grade	Final Grade
PREFLIGHT PREPARATION			
1. Operation of Systems			
2. Performance and Limitations			
PREFLIGHT PROCEDURES			
3. Preflight Assessment*			
4. Powerplant Start – Normal*			
5. Powerplant Start – Abnormal			
6. Taxiing*			
7. Before Takeoff Checks*			
TAKEOFFS AND LANDINGS			
8. Normal Takeoff and Climb*			
9. Normal Approach and Landing*			
10. Crosswind Takeoff*			
11. Crosswind Landing*			
12. Rejected Takeoff			
13. Go-Around/Rejected Landing			
14. EFVS Landing*			
INFLIGHT MANEUVERS			
15. Steep Turns			
16. Recovery from Unusual Flight Attitudes/Nose High*			
17. Recovery from Unusual Flight Attitudes/Nose Low*			
STALL PREVENTION			
18. Partial Flap Config Stall Prevention			
19. Clean Config Stall Prevention			
20. Landing Config Stall Prevention			
INSTRUMENT PROCEDURES			
21. Instrument Takeoff			
22. Departure Procedures			
23. Arrival Procedures			
24. Nonprecision Approach*			
25. Nonprecision Approach (Manually Flown) With Course Reversal			

Maneuver (* = SIC Requirement)	Grade	Grade	Final Grade
INSTRUMENT PROCEDURES (Cont.)			
26. Approach, Backup Instrumentation*			
27. Precision Appr, Manually Flown			
28. Precision Appr*			
29. Landing from a Precision Appr			
30. Circling Appr			
31. Landing from a Circling Appr			
32. Missed Appr (from a Precision Appr)			
33. Missed Appr (with OEI)			
34. Published Missed Appr			
35. Holding Procedures			
36. GPS/RNAV			
37. EFVS Approach*			
EMERGENCY OPERATIONS			
38. Emergency Procedures			
39. Powerplant Failure during Takeoff*			
40. Inflight Powerplant Failure and Restart*			
41. Appr and Landing - Powerplant Failure*			
42. Precision Appr (Manually Flown) Powerplant Failure			
43. Landing from a No Flap or Nonstandard Flap Appr			
POSTFLIGHT PROCEDURES			
44. After Landing			
45. Parking and Securing			
REMARKS			
FSB REQUIRED QUALIFICATION EVENTS: DIFFERENCES:			

NAME & SIGNATURE OF EVALUATOR:		RESULT OF CHECK: ☐ SATISFACTORY
NAME & SIGNATURE OF EVALUATOR:		☐ UNSATISFACTORY
FAA OBSERVATION *(if appropriate)*:		SIGNATURE OF FAA INSPECTOR:

This Optional Section for Air Carrier Use Only		
PROFICIENCY/COMPETENCY DEMONSTRATED	**Base Month-Next Due**	**Air Carrier Certifying Official**
Pilot Competency -		
Instrument Proficiency - 135.297		
Use of Autopilot without SIC - 135.297(g)		
MEDICAL INFO - DOB: Exam Date: Class:		

Appendix D. Recommended Revisions to Table 3-70

As indicated in Recommendation 5.7, the Training Standardization Working Group recommends the FAA revise Order 8900.1, Volume 3, Chapter 19, Section 7, Paragraph 3-1283, to align module and task naming conventions, grouping, and requirements with FAA Airline Transport Pilot and Type Rating for Airplane Airman Certification Standards.

The proposed revision to Table 3-70 is depicted below:

Table 3-70. Part 135 Checking Modules—Airplanes

EVENTS	VFR COMP.	IFR COMP.	INST. PROF.	NVG TASKS	NOTES
Preflight Preparation (Oral)	B	B	P	B	
14 CFR part 135, § 135.297			P		
§ 135.293	B	B		B	
PREFLIGHT PROCEDURES					
Preflight inspection	B[(c)]	B	P	B	1
Powerplant start procedures	B[(c)]	B	P	B	1
Taxiing/runway operations	B[(c)]	B	P	B	1
Before takeoff checks	B[(c)]	B	P	B	1
TAKEOFF AND LANDING					
Normal takeoff and climb	B[(c)]	B	P	B[(d)]	
Crosswind takeoff	B[(c)]	B	P	B[(d)]	2
Powerplant failure during takeoff	B	B	P	B[(d)]	ME Only
Rejected takeoff	P[(c)]	P	P	B[(d)]	2, ME Only
Short field takeoff	P	P	P[(b)]	B[(d)]	SE Only
Normal approach and landing	B[(c)]	B	P	B[(d)]	2
Crosswind landing	B[(c)]	B	P	B[(d)]	2
Short field landing	P	P	P	B[(d)]	SE Only
Landing with two-engines-inoperative	P[(c)]	P	P	B[(d)]	3- and 4-Engine Airplanes
Landing from a precision approach			P		

Approach and landing with a powerplant failure	B	B	P	B[d]	ME Only
Two-engine-inoperative approach and landing	P[c]	P	P		3- and 4-Engine Airplanes
Landing from a circling approach			P		7
Landing from no-flap or nonstandard flap approach	P[c]	P	P	B	2, 9
EFVS landing		B			8
Go-around/Rejected landing			P	B	
IN-FLIGHT MANEUVERS AND STALL PREVENTION					
Steep turns	P[b]	P[b]	P[b]	B	
Stall prevention – partial flap configuration	B[c]	P	P	B	2
Stall prevention – clean configuration	B[c]	P	P	B	2
Stall prevention – landing configuration	B[c]	P	P	B	2
Recovery from unusual flight attitudes – nose high/nose low	B[c]	B	P	B	
INSTRUMENT PROCEDURES					
Instrument takeoff		P	P		2
Departure procedures			P[a]		
Arrival procedures			P[a]		

EVENTS	VFR COMP.	IFR COMP.	INST. PROF.	NVG TASKS	NOTES
Holding procedures			P(b)		
Precision approach		B	P		3, 2
Precision approach – one engine inoperative – manually flown		P	P		3, 2, ME Only
AP Coupled approach		P	P		3, 2
Nonprecision approach		B	P		6
Nonprecision approach – backup instrumentation			P		6
Nonprecision approach – manually flown – with course reversal			P		6
Missed approach from a precision approach			P		
Published missed approach			P		
Missed approach – one engine inoperative			P		2, ME Only
Circling approach			P		7
EFVS approach		B			8
SEA & SKI OPERATIONS (if applicable)					
Step turns	P(b)	P(b)	P(b)		
Glassy water takeoff and climb	P(b)	P(b)	P(b)		
Rough water takeoff and climb	P(b)	P(b)	P(b)		
Confined area takeoff and max performance climb	P(b)	P(b)	P(b)		
Taxiing and Sailing	P(b)	P(b)	P(b)		
Glassy water approach and landing	P(b)	P(b)	P(b)		
Rough water approach and landing	P(b)	P(b)	P(b)		
Confined area approach and landing	P(b)	P(b)	P(b)		
Docking	P(b)	P(b)	P(b)		

EVENTS	VFR COMP.	IFR COMP.	INST. PROF.	NVG TASKS	NOTES
NON-NORMAL AND EMERGENCY OPERATIONS					
Emergency procedures	B(c)	B	P	B	1
Powerplant failure	P	P	P	B	SE Only
Power-Off 180° accuracy approach and landing	B	B	P	B	SE Only
Inflight Powerplant Failure and Restart	P(c)	P(c)	P(c)	B	ME Only
NVG malfunction				B	
Instrument Approach	B(c)				4
POSTFLIGHT PROCEDURES					
After landing procedures	B	B	P	B	1
Parking and securing	B	B	P	B	1

NOTES TO TABLE 3-70, PART 135 CHECKING MODULES—AIRPLANES

P Pilot in command (PIC).
B Both the PIC and second in command (SIC).
ME Multiengine.
SE Single-engine.
(a) May be waived at the discretion of the Principal Operations Inspector (POI) and the check pilot when the check is not simultaneously conducted for certification. (See Volume 5, Chapter 3, Section 2.)
(b) May be waived at the discretion of the POI and the check pilot when the check is not conducted in conjunction with initial new-hire or initial equipment training.
(c) Accomplishment Unaided may be combined at the discretion of the POI or the check pilot when conducting a night vision goggle (NVG) competency concurrent with a visual flight rules (VFR) competency check.
(d) Only required if the certificate holder is authorized to conduct takeoff and landing Airplane Night Vision Goggle (ANVG) operations on operations specification (OpSpec) A051.
1 Both PIC and SIC may be evaluated performing their assigned duties in these events simultaneously when the check pilot is not seated at the controls.
2 See Volume 5, Chapter 3, Section 2.
3 The applicant must demonstrate the ability to use all installed equipment including

autopilots and flight directors (FD). A minimum of two precision approaches are required. If equipped with autopilot couplers, at least one coupled autopilot precision approach must be flown. In multiengine airplanes, a precision approach – one engine inoperative (manually flown) may be substituted for one the precision approaches. One precision approach should be flown with reference to backup or partial panel instrumentation at the option of the check pilot.

4 POIs must ensure applicants accomplish this event in an aircraft the certificate holder uses (FSTD)). The event should reflect a realistic course of action the pilot might take to escape from an encounter with inadvertent instrument meteorological conditions (IIMC). POIs should approve methods appropriate to the aircraft, equipment, and facilities available. When the pilot is authorized to operate an appropriately equipped aircraft and the check is conducted at a location where an ILS is operational, demonstrate an ILS approach. POIs may also approve a letdown on partial panel when this would be an appropriate course of action.

~~**5** Airplanes not having standby instrumentation.~~

6 See Volume 5, Chapter 3, Section 2. Any two Nonprecision Approaches (NPA) authorized by the OpSpecs may be accomplished at the discretion of the inspector or check pilot conducting the check. In airplanes equipped with an approach approved RNAV (GPS) system, the pilot must demonstrate approach proficiency using that system. Either the Nonprecision approach – backup instrumentation or Nonprecision approach manually flown with course reversal may be substituted for the Nonprecision approach

7 A pilot need not be evaluated in circling approaches when the certificate holder's procedures restrict that pilot (PIC or SIC) from conducting this event in revenue service.

8 If the certificate holder is authorized to conduct enhanced flight vision system (EFVS) operations to touchdown and rollout, at least one instrument approach to a landing must be made using an EFVS, including the use of enhanced flight vision from 100 feet above the touchdown zone elevation (TDZE) to touchdown and rollout. If the certificate holder is authorized to conduct EFVS operations to 100 feet above the TDZE, at least one instrument approach to a landing must be made using an EFVS, including the transition from enhanced flight vision to natural vision at 100 feet above the TDZE.

9 Required only for transport, commuter, turboprop, and Special Federal Aviation Regulations (SFAR) aircraft families as described in Volume 3, Chapter 19, Section 1.