

Update on ASI Loss of Control Reduction Efforts



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General Aviation Accident Statistics & Actions



-
- 40% of all fatal accidents result from Loss of Control (LOC)
 - 45% of all accidents occurring during Takeoffs / Landings / Go-Arounds
 - Accidents force change everywhere else in aviation - **BUT NOT IN GA**
 - TWA Flight 800 - Electrical spark elimination
 - US Air Flight 427 - Boeing spent \$500 million to retrofit all 2800 737's rudder systems
 - Colgan Air Flight 3407 – Sweeping changes for ATP requirements and pro-pilot training
 - It's time to look at alternatives to improve General Aviation safety and address the highest risk phase of flight and training improvements

Solutions – Reducing Loss of Control Accidents



- Two Parts: Technology and the Pilot
- Technology exists to reduce LoC accidents - HOWEVER
- Current regulations do not allow easy installation of low cost safety enhancing technologies in Part 23 aircraft
 - AoA systems being the exception
- The most immediate solution is to focus on reducing skill based errors - Training

May 3rd 2016- David Berube, Dana Parenteau and Benjamin Bridges



October 2015 NTSB LoC Forum



Training Has Not Evolved




- Pilot Training is Stuck in the 1970's
 - PPL PTS – AoA and Stabilized Approach each mentioned only 1 time in a 119 page document
 - AoA and Critical AoA are not concepts required to be taught
 - Box Pattern sets pilots up for failure.
 - Circular pattern as an alternative

Training For Safety – Accident Prevention Focus



1. Industry Supported Flight Review



The screenshot shows the AOPA Flight Review website. At the top left is the AOPA Air Safety Institute logo. To the right, a person is shown using a tablet displaying a flight review interface. Below the logo and image is the text "Flight Review" and a large orange button that says "Start Your Flight Review".

This eFRIC is open to all and may be taken by instructors renewing their flight instructor certificate or anyone interested in becoming a flight instructor. The first two questions must be completed by everyone taking the eFRIC. Asterisked (*) fields must be filled in correctly by all instructors taking the eFRIC to renew their instructor certificate.

We recommend using **Chrome**, **Safari**, or **Firefox** as the browser for this course. Please ensure that you have the latest version.

* Are you taking this FRIC to renew your flight instructor certificate? Yes No

* Would you prefer to complete and mail in a paper application for renewal (ST-15) rather than completing your application online? Yes No

* Certificate Number:

If you are taking this course to renew your flight instructor certificate, then your certificate number and expiration date are required. Be sure to answer this correctly before you enroll for the eFRIC, as the course will behave differently depending on your answer here. Answer no if you want to complete the online application (ACRA). Answer yes if you would prefer to mail in a paper ST-15 application.

2. Improving the HIGHEST RISK Phase of Flight (Landing Pattern)





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Industry-Supported Flight Review Training That Supports Accident Prevention



FAA Safety Team
FAASteam

Flight Review - Problem Statement



- Current Flight Review curricula needs to focus more on address accident prevention learning.
- Regulatory knowledge matters, but pilots also need to be taught the skills they need to avoid accidents
- Flight Reviews should focus on accident prevention and less on academic knowledge items

Regulatory Review Guide

Pilot	<p>Experience: Recent flight experience (61.57)</p> <p>Responsibility: Authority (61.3) ATC Instructions (61.123) Pre-flight action (61.103) Safety belts (61.107) Flight crew at station (61.105)</p> <p>Cautions: Careless or reckless operation (61.13) Dropping objects (61.15) Alcohol or drugs (61.17) Supplemental oxygen (61.211) Fitness for flight (AIM Chapter 8, Section 1)</p>
Aircraft	<p>Airworthiness: Basic (61.7) Flight manual, markings, placards (61.9) Certifications required (61.203) Instrument & equipment requirements (61.205) -ELT (61.207) -Position lights (61.209) -Transponder requirements (61.215) -Inoperative instruments and equipment (61.213)</p> <p>Maintenance: Responsibility (61.403) Maintenance required (61.405) Maintenance records (61.417) Operation after maintenance (61.407)</p> <p>Inspections: Annual, Airworthiness Directives, 100-Hour (61.409) VOR check (61.171) Transponder (61.413) ELT (61.207)</p>
environment	<p>Airports Markings (AIM Chapter 2, Section 3) Operations (AIM 4-3; 61.126, 61.125) Traffic Patterns (61.126)</p> <p>Airspace Altimeter Settings (61.121; AIM 7-2) Minimum Safe Altitudes (61.119, 61.177) Cruising Altitudes (61.159, 61.179; AIM 3-1-5) Speed Limits (61.117) Right of Way (61.113) Formation (61.111) Types of Airspace (AIM 3) -Controlled Airspace (AIM 3-2; 61.135, 61.131, 61.130, 61.129) -Class G Airspace (AIM 3-3) -Special Use (AIM 3-4; 61.133, 61.137, 61.141, 61.143, 61.145)</p> <p>Emergency Air Traffic Rules (61.139; AIM 5-6)</p> <p>Air Traffic Control & Procedures Services (4-1) Radio Communications (4-2 & Pilot/Controller Glossary) Clearances (4-4) Procedures (AIM 5)</p> <p>Weather Meteorology (AIM 7-1) Wake Turbulence (AIM 7-3)</p>
External pressures	<p>Personal Minimums Checklist Risk Management (3-P model) PTS Special Emphasis Items</p>

AC 61-98C

Flight Review – Concept for Solutions



- Nationwide, all-stakeholder effort to implement a standardized Flight Review (FR) program
- Flight Reviews focused on core areas that support accident prevention
- Create an industry-supported standard that CFIs and pilots are compelled to use. Supported with incentives (Industry, vendors, stakeholders etc.)
- A professionally administered FR is the best method to reach “high-risk” pilots



FAA Safety Team
FAASafetyTeam

Flight Review – Web Enabled Customization



- Common website to support Flight Review
 - Client “profile” and CFI matching/Scheduling
 - Provide the Client with an electronic menu
 - Choose electives and submit desired topics to the CFI
 - Based on Client input, provide a customized syllabus
 - Certificate upon completion
 - Industry supported incentives and discounts



Flight Review – Four Core Areas of Emphasis



-
- Loss of control (40% of GA Fatal Accidents)
 - Landings / Takeoffs / Go-Arounds (45% of All GA Accidents)
 - Fuel & Powerplant Management (20% of All GA Accidents)
 - Weather & CFIT (12% of all GA Accidents)

**Core Syllabus Items are Based on Historical GA Accident Data
Pilot Decision Making and Accident Prevention are Key Elements**

Flight Review – Topics within the Core Syllabus



1. Loss of control (40% of GA Fatal Accidents)

- AoA awareness and understanding
- Stalls / Slow flight / Recognition & Recovery
- How a loss of command precedes a loss of control
- Energy management
- Distraction / Startle response

- Vx / Vy airspeed control
- **Go Arouds**
- Proper Go-around techniques
- Startle/distraction response
- AoA awareness and understanding
- Energy management / Lift & Drag considerations
- Time & Configuration considerations (time settings etc.)

2.



- Non-awareness and understanding
- Circular pattern as an alternative to the box pattern
- Runway familiarization and performance planning
- Crosswind landings
- **Takeoffs**
- Performance planning including climb gradient, Wt&Bal & density altitude considerations
- Determining abort points and assessing takeoff performance

4. Weather & CFIT (12% of all GA Accidents)

- Establishing personal and family minimums
- VFR into IMC escape strategies
- PIREPs
- In Cockpit technology and limitations (Wx and Terrain)
- Buzz job / Reckless operations
- Radio comm – flight service and ATC flight following
- Effectively dealing with wx related emergencies
- ADM Considerations (preflight and in-flight)

Flight Review – Summary of Goals



-
- ✓ Create an GA/Industry/Pilot accepted standard for FR's
 - ✓ Provide high quality, standardized and individualized recurrent training for all GA pilots
 - ✓ Curriculum that emphasizes accident prevention
 - ✓ Website to provide Pilot / CFI resources, curriculum, and scheduling tools
 - ✓ Establish MOA's with an array of industry partners so the Certificate of Completion becomes a powerful tool that encourages participation.



The Circular Landing Pattern

“AN ALTERNATIVE TO THE TRADITIONAL BOX PATTERN “

A JOINT AOPA / UNIVERSITY OF NORTH DAKOTA (UND) STUDY

April 19th 2016 - Bay Bridge Airport



Safety Hypothesis – It's more than a Circular Pattern






- Achieve increased stabilization and reduce accidents by using three factors in conjunction with one another
 1. Reduced pilot workload
 - Constant: Angle of bank, rate of descent, and power settings
 - Configuration changes only performed wings level on the downwind
 2. Pattern discipline
 - Defined pattern checkpoints
 - Pre-established parameters with limits to assess errors
 3. Teaching pilots stabilized approach concepts, which includes:
 - AoA Awareness
 - Energy Awareness and Energy Management
 - Sterile Cockpit

Testing Alternatives – Circular Landing Pattern



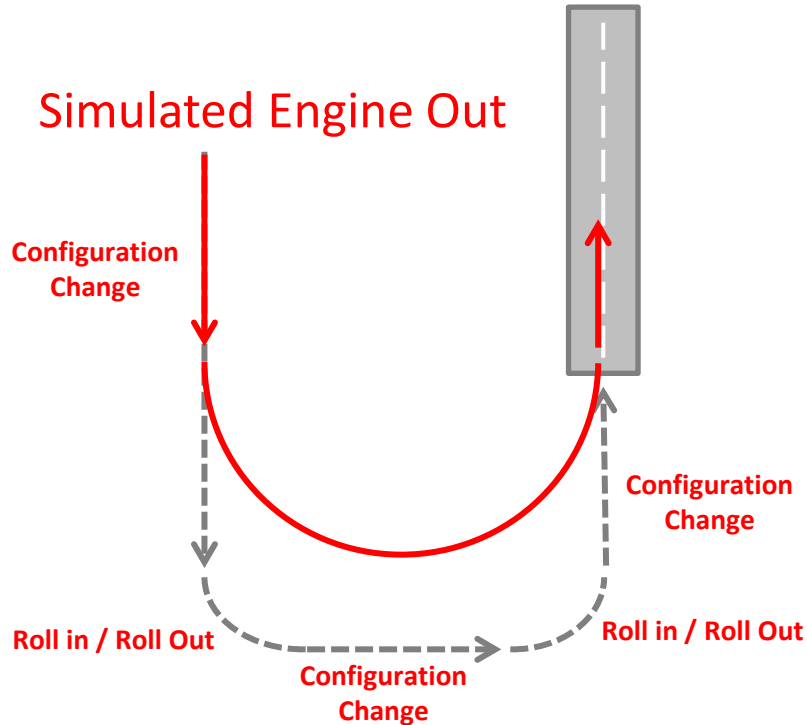
-
- UND and AOPA Air Safety Institute have partnered to validate the concept.

Three Phases

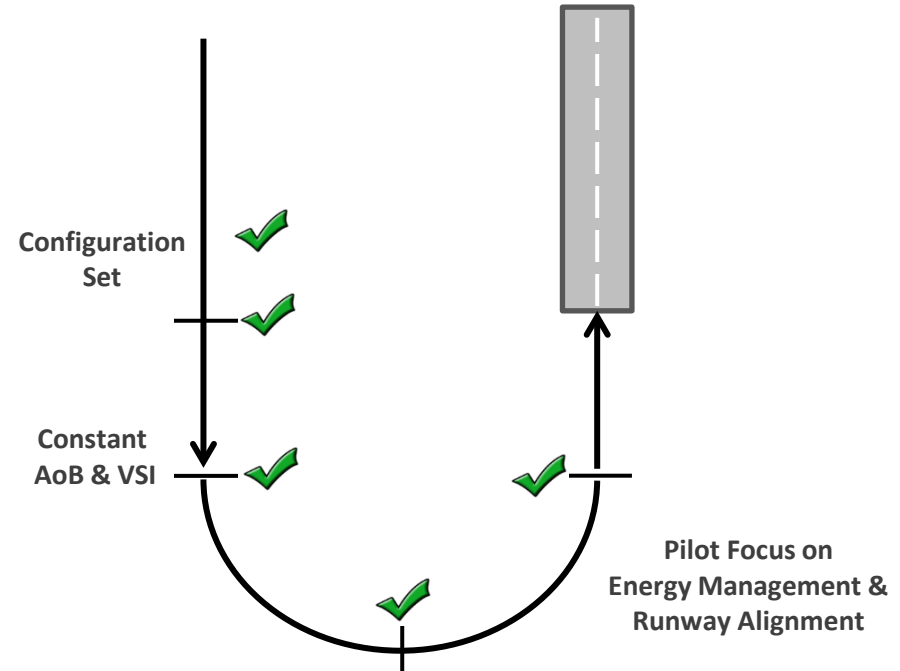
-  1. ASI constructed and validation circular pattern through testing and evaluation to ensure it would apply universally to all light GA aircraft
-  2. UND received ASI's work and has conducted preliminary flight test to revalidate and a thorough SMS review
-  3. UND plans to begin the study effort May 2016
 1. Flight parameter data-logging and eye-tracking software used to assess stability and workload vs a control group.

Testing Alternatives – Circular Landing Pattern

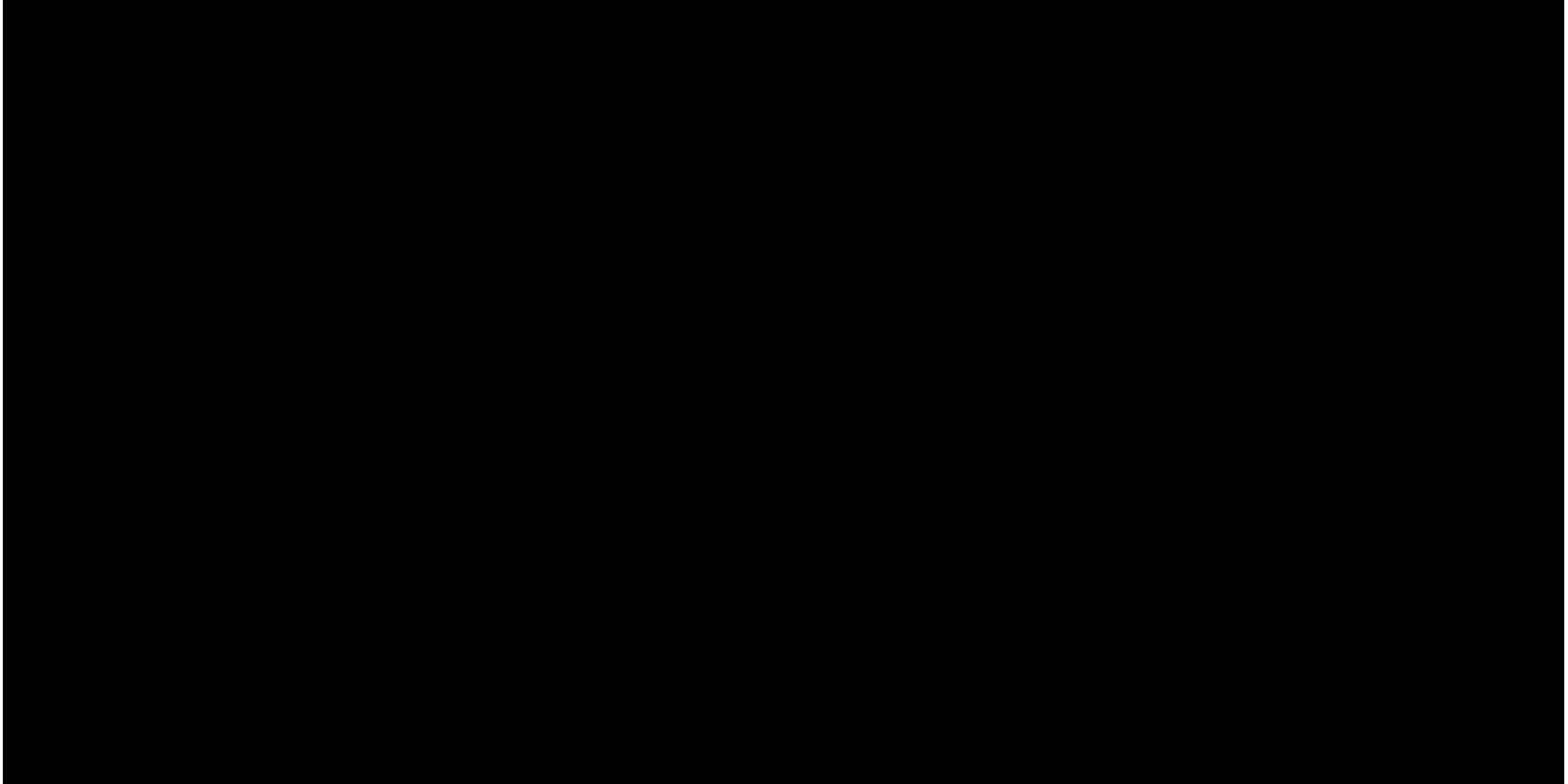
Traditional Rectangular Pattern



Circular Pattern



Circular Landing Pattern – Video Overview



Circular Landing Pattern – Long Term Goals

-
- ✓ Study validates increases in approach stability and safety
 - ✓ Engage with FAA to update AIM, PTS and AC 61-98
 - ✓ Work with universities and other flight training providers to broadly adopt
 - ✓ ASI builds training for existing GA pilots to use the circular pattern
 - ✓ Over time, the circular pattern becomes the GA standard



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Questions

Flight Review or Circular Pattern

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