Applying Line Operations Safety Audits (LOSA) and Flight Data Management (FDM) technologies to general aviation flight training

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What is LOSA?

- Traditionally a human observer
- Used by exclusively by airlines (Klinect)
- “Fly on the wall” documenting “real world”
- Incorporates Threat Error Management (TEM)
  - Threats – External (Weather, aircraft, ATC, etc.)
  - Errors – Those committed by flight crew
- LOSA documents how a flight crew handles threats and errors that might not be recorded via ASRS, ASAP or other reporting system
- Why? Threats and errors can lead to incidents and accidents
Threat & Error Management Model

Threats

Threat continues

Threat Expires

Yes

No

Threat Detected?

Yes

No

Threat managed correctly?

Yes

Crew Error

No

Incident Accident

Consequence?

Yes

No

Undesired aircraft state

Error Continues

Consequence?

Yes

Error Detected?

Yes

Normal Ops

No

Error Corrected?

Yes

Error Expires

No

UAS Detected?

Yes

UAS Corrected?

Yes

No

Yes

No

Crew Error?
LOSA Characteristics

- Voluntary
- Non-punitive (Just Culture)
- Identities protected
- Informed consent
Identify threats and errors prior to incidents and accidents

Capture improved procedures/processes for threats/errors (catch them doing something good!)

Identify most prevalent threats/errors and develop training/mitigation plans

Information available should an incident or accident occur

Encourage use of safety reporting system
What’s different about this project?

- Eliminates the human observer
- Simultaneous digital recording of FDR, voice, and video
- Use of general aviation aircraft in a flight training environment
- Ability to:
  - Review flights repeatedly or by other authorized/trained observers
    - Student/CFI?
  - Gather data on solo flights
Appareo Systems GAU 2000

the GAU 2000 captures roll, pitch, yaw, latitude, longitude and altitude. Additionally, the GAU 2000 records acceleration, rotation rates and magnetic field strength along the roll, pitch and yaw axis. Only requires aircraft power. Option for pitot and static inputs.
The Equipment

Reflight PK100 Recording System

• Digitally captures cockpit video and internal/external communications for playback
Data handling

- Threats/errors/UAS collected from FDR/audio/video
  - Inadvertent error? Not reported, FDR/audio/video deleted
  - Drugs/alcohol/intentional deviations? Reported to chief instructor only for internal review/action. FDR/audio/video deleted after review/action.
  - NTSB reportable accident/incident? FDR/audio/video retained per NTSB regulations
  - Aircraft exceedance? Maintenance review of FDR data containing exceedance.

- Collected data for study deidentified
Aircraft flight video, audio, and flight data

Trained analysts analyze data

- Intentional, negligent deviation(s)?
- Deviation(s) involves drugs/alcohol?
- NTSB 830 accident/incident?

Deidentified threat, error, UAS and resolution data extracted

Audio/video/flight data retained if required by regulation

Analyst refers to Flight training director or chief flight instructor for appropriate action

Results of referral not used for study

Audio/video deleted. Flight data to maintenance if aircraft parameters exceeded

Deidentified data used for study

YES

NO
Example of GA–LOS A

- One GA pilot routinely conducts a self LOSA
- Uses video of instrument panel/ATC audio to record flight
- No FDR
- Makes in flight comments
- Insights posted on video
- Videos available on the web
  - [http://keith.tristesse.com/page/lancair_360](http://keith.tristesse.com/page/lancair_360)