

# The National FAA Safety Team presents



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## Introduction to Safety Risk Management (SRM)

Salem Airport Terminal

Saturday, January 21, 2023



**Presented by Thomas Gorski and Beatrice Cameron**

**2022/03-15-246(I)PP** Original Author: John Steuernagle 03/15/2022; POC (Kevin Clover), National FAAS Team Operations Program Manager, Office 562-888-2020; revised by Beatrice Cameron and Thomas Gorski 12/11/2022 and 1/16/2023, FAAS Team Representatives.

**(Tom or Beatrice)**

**Good morning and welcome to the National FAA Safety Team' seminar. Today's topic, 'Introduction to Safety Risk Management' is brought to you by the General Aviation Joint Steering Committee, a work group part of the National FAA Safety Team dedicated to studying General Aviation mishaps.**

# Welcome

- Exits
- Restrooms
- Emergency Evacuation
- Breaks
- Set phones & pagers to silent or off



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**(Tom or Beatrice)**

**First things first, let's go over the venue logistics**

*Go over the bullets points*

**(Next Slide)**

# Overview

- **FAASTeam mission**
- **What is Safety Risk Management**
- **How do pilots use SRM**
- **Flight Risk Assessment Tools (FRAT)**
- **Questions**
- **Break**
- **Topic-focused jeopardy**



**(Beatrice)**

**In today's presentation, we will begin with presenting the FAASTeam and its mission in Aviation Safety.**

**We'll then talk about what is Safety Risk Management and how pilots use Safety Risk Management to fly safer and efficiently.**

**Then, we'll talk about Flight Risk Assessment Tools that can help pilots improve their risk management skills and we will use a flight scenario to understand how this tool works.**

**Then, we will explain how the WINGS program can help with risk management.**

**And then, we will have time for questions**

**And finally, there will be a 15 minute break followed by a topic focused jeopardy game.**

Now I'm going to pass it over to Tom who will present the FFAASTeam.

**(Next Slide)**



## Aviation Safety Seminars

**[www.faasafety.gov](http://www.faasafety.gov)**

the FAASafety Website



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**(Tom)**

**Activities of the FAASafety are organized and indexed through the Website  
FAASAFETY.GOV**

**Faasafety.gov is a portal between the FAA Safety Team and the aviation  
community.**

**FAASafety Representatives presenting aviation safety seminars (like us  
today) are volunteers with aviation background willing to help promote  
aviation safety through education.**

**(Next Slide)**



## Mission Statement

Improve the Nation's aviation accident rate  
by conveying safety principles and practices through  
training, outreach, and education;  
while establishing partnerships  
and encouraging the continual growth of a positive  
safety culture  
within the aviation community.



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**(Tom)**

**The mission of the FAASTeam is to:**

**Improve the Nation's aviation accident rate by conveying safety principles and practices through training, outreach, and education;  
while establishing partnerships and encouraging the continual growth of a positive safety culture within the aviation community.**

**(Next Slide)**



## Relationship With Aviation Community

Individuals who makes a conscious effort to promote aviation safety and become part of the shift in safety culture:

Pilots – participate in WINGS - Pilot Proficiency Program

Mechanics – participate in AMT Awards Program

Everyone who attends FAASafety Seminars

# Thank You!



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**(Tom)**

**A Safety Culture is made up of individuals making a conscious effort to promote aviation safety.**

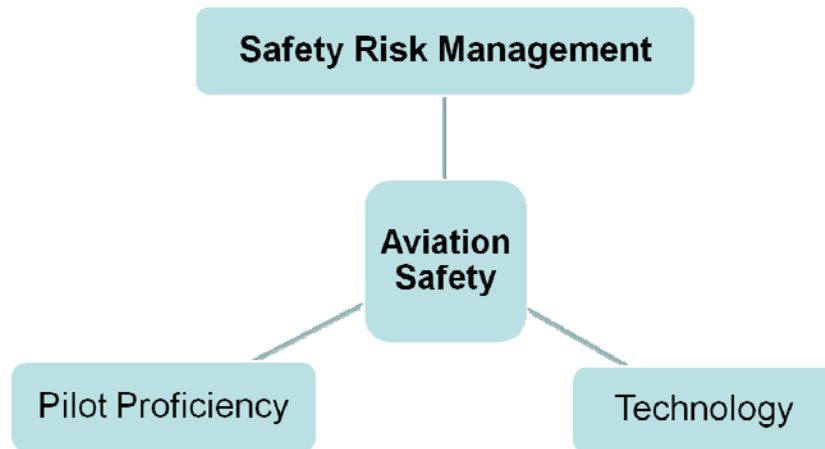
**By virtue of their conversations, those individuals share knowledge and experience, and serve to facilitate a shift in the way we think about safety. I am talking about Pilots who participate in the WINGS Pilot Proficiency Program, Mechanics who participate in the AMT awards program, and everyone who attends Safety Seminars.**

**On behalf of the FAA Safety Team I want to thank each and every one of you, for being here today. Thank you!**

*Now, I am going to pass it over to Beatrice who will talk about today's topic 'Safety Risk management'*

**(Next Slide)**

# What is Safety Risk Management (SRM)?



(Beatrice)

Today's topic is an 'introduction' to Safety Risk Management for General Aviation. The concept of Risk management is not new. It has been used by commercial aviation for a long time. What is new is that it is now included in the Airman Certification Standards and the FAA's Pilot's Handbook of Aeronautical Knowledge. Flight instructors are also encouraged to include Risk management in their flight lessons to train student pilots on the decision-making process: assessing risks before reaching a decision.

So, what is Safety Risk Management: (click)

Aviation Safety has 3 foundational elements:

- Safety Risk Management – hazard identification, risk assessment, and risk mitigation
- Pilot Proficiency – the skills to do the job,
- and Technology in aircraft operations.

These 3 elements work together to reduce aircraft accidents. While technology has made great progress in aircraft operations, we still have to maintain pilot proficiency and manage flight risks before, during and after every flight.

(Next Slide)

# Safety Risk Management (SRM)



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**(Beatrice)**

**Every flight has some level of risk. This is true for helicopters, airplanes, gliders, balloons and even drones. (Click)**

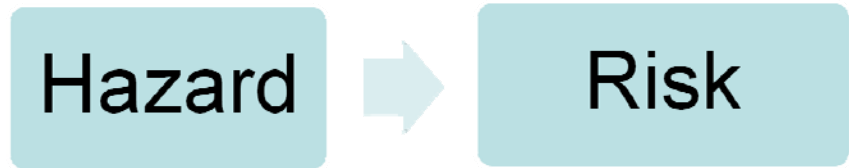
**It's a matter of balance. Our knowledge, skills, and technologies must be equal to the challenges we face in flight. But how do we know in advance that we'll be equal to the task?**

**That's when safety risk management comes in. It is a decision-making process we can use to understand flight challenges before we accept them.**

**But what is the concept of SRM?**

**(Next Slide)**

# Safety Risk Managing (SRM)



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(Beatrice)

**The concept of Safety Risk Management is based hazards and risks involved  
(Click)**

**A hazard is a condition, event, object or circumstance that could cause or contribute to an unwanted event such as an accident. It is a source of danger. If we fly into a thunderstorm, well, this is more then taking a high risk, this is ignoring the hazard. It's all about decision-making and good judgment.**

**Risk is the influence of hazards on safe operations. Risk is the possibility of something bad happening. Something uncertain that will have an effect on the safety of the flight.**

**If you recognize lightning and thunderstorm as a hazard, then choosing not to continue means you are managing the involved risk. Pilots should assess the risks before reaching a decision, this is also known as the go / no go decision.**

(Next Slide)

# Hazard and Risk



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**(Beatrice)**

**“if pilots do not recognize a hazard and choose to continue, the involved risk is not managed”.**

**But, is it that easy to identify hazards? Are the risks always so obvious?**

**In this picture, apparently not.**

**(Next Slide)**

# Examples of common aviation hazards

- A nick in the propeller blade
- Improper refueling of an aircraft
- Pilot fatigue
- Use of unapproved hardware on an aircraft



**(Beatrice)**

**It is quite impossible to make a list of all possible hazards that may impact a flight but here are some common aviation hazards.**

**(Next Slide)**

# Level of Risk

Accept?

Eliminate?

Mitigate?



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**(Beatrice)**

**In the ‘lightning and thunderstorm’ example (mentioned before) – let’s say we’ve identified this hazard and we’re pretty sure it will cause us some trouble. We now have three choices: (Click)**

**We can accept the risk – rarely a good idea but you never know until you try. You might just make it. (Click)**

**We can eliminate the risk – that way we don’t have to deal with it at all. (Click)**

**Or we can mitigate the risk to an acceptable level. Make it less likely that we’ll have a negative experience.**

**(Next Slide)**

# Level of Risk



**Marginal**



**Catastrophic**



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**(Beatrice)**

**For each hazard we must understand the level of risk. Because the level of risk is associated with the severity of consequences which can run from minor inconvenience (Click)**

**to catastrophic.**

**(Next Slide)**

[Risk-Based Aeronautical Decision Making  
in 57 Seconds - YouTube](#)



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(Beatrice)

Now, let's watch a 57-second video about risk management....

(Next Slide)

# SRM 3-step Process



**(Beatrice)**

**Poor risk management is a cause of many accidents**

**We can use Safety Risk Management as a 3-step process: (click)**

**-Step 1: identify hazards – what conditions could affect the safety of your flight? (click)**

**-Step 2: assess the risks - how likely are those hazards to cause a problem and how severe will the consequences be if they do? In other words, what will happen if you take the risk? (click)**

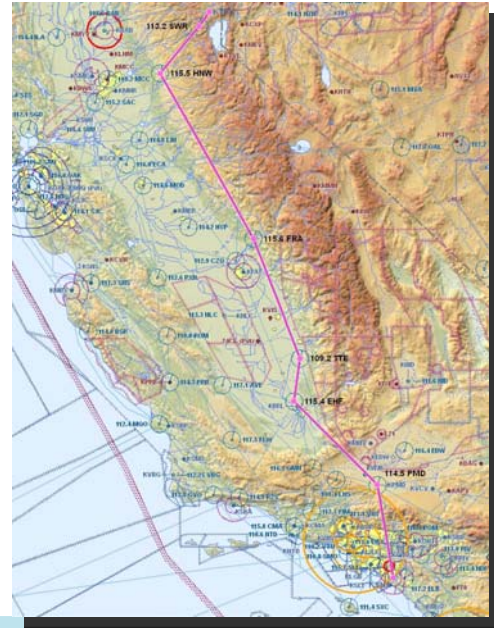
**-Step 3: mitigate the risks - What can be done to reduce the risks to acceptable levels, reduce the chances those hazards will cause an accident**

**Now let's look at a flight scenario as a practical example to show you how to use the Safety Risk Management process.**

**(Next Slide)**

# Flight Scenario Example

- **Mission – KSNA – KTRK**
  - 391 nm 3Hrs. 22 Min
  - Depart at 1800 Local Time
- P › **Pilot – Private, VFR**
  - 850 hrs. TT, 30 in last 6 months
  - Current medical, flight review, day/night currency
- A › **Aircraft – C-172-P**
  - 43 Gal Fuel, Day/Night VFR
- V › **Environment – DAY/Night/VFR**
  - Mountains.
- E › **External Pressure (s) – Family Reunion**



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(Beatrice)

In this example an 850 hour Private Pilot will be flying his family from Santa Ana, California to a reunion event in Lake Tahoe. The weather is forecast to be good along the route. The pilot will go straight to the airport after work and meet his family there. If all goes as planned, the flight will depart at or a little before six pm.

*-also recognize the PAVE checklist-*

So what hazards should be considered for this trip? Would you say the risks are acceptable? If not, what could the pilot do to mitigate them?

**Presentation note:** *Guide the audience in a discussion of hazards, risks, and mitigations. Some hazards include, VFR at night in mountainous terrain, possible fatigue due to departure after a full day at work, pressure to complete the flight in order to be present for the reunion, etc. Mitigations might include leaving work early in order to reduce fatigue and arrive in daylight or planning to leave early in the morning the following day. Make the point that going to this destination at night would be a particularly bad idea if the pilot were unfamiliar with the field.*

(Next Slide)

# Want an easier way to do it?

- Introducing the Flight Risk Assessment Tool for GA pilots:

*FRAT*



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(Beatrice)

Do you want and easier way to do it?

Introducing the FFAST FRAT; **(Click)**

an easy to use, basic Fight Risk Assessment Tool for general aviation pilots.

**(Next Slide)**

# FRAT

## PAVE checklist

**Pilot**  
**Aircraft**  
**enVironment**  
**External Pressures**

## FRAT

**Pilot**  
**Flight conditions**  
**Airport**  
**External Pressures**



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The FRAT is a tool designed for General Aviation Pilots based on the PAVE checklist.

The PAVE checklist is used during flight planning. It helps identify hazards. The FRAT will help calculate the level of risk

So why use FRAT? The goal is not to replace the PAVE checklist, the goal is to help identify and mitigate risks with a tool called FRAT Flight Risk Assessment Tool.

So, the FRAT is a tool that will calculate a level of risk based on the hazards identified in the PAVE checklist.

Now, let's take a closer look at the FRAT.

**(Next Slide)**


Pilot	Yes	Your Value
Less than 50 Hours in Aircraft or Avionics Type	<input type="checkbox"/>	0
Less than 15 hours in last 90 days	<input type="checkbox"/>	0
Flight will occur after work	<input type="checkbox"/>	0
Less than 8 hours sleep prior to flight	<input type="checkbox"/>	0
Dual Instruction Received in last 90 days	<input type="checkbox"/>	0
WINGS Phase Completion in last 6 months	<input type="checkbox"/>	0
Instrument Rating current and proficient	<input type="checkbox"/>	0


  

Flight Conditions	Yes	Your Value
Twilight or Night	<input type="checkbox"/>	0
Surface wind greater than 15 Knots	<input type="checkbox"/>	0
Cross wind greater than 7 Knots	<input type="checkbox"/>	0
Mountainous Terrain	<input type="checkbox"/>	0

Airport	Yes	Your Value
Non-towered Airport or tower closed at ETD or ETA	<input type="checkbox"/>	0
Runway length less than 3,000 Feet	<input type="checkbox"/>	0
Wet or soft field Runway	<input type="checkbox"/>	0




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(Beatrice)

-Switch screen view to show the FRAT-

The FRAT is a simple automated spread sheet that contains 20 condition statements for VFR pilots; 22 for IFR pilots.

The statements describe common general aviation flight liabilities and assets. Pilots simply click the “yes” box next to each statement that applies to their flight.

Each yes statement generates a risk value and those values are totaled on the sheet. So it adds up point values to get a final total.

(Next Slide)

## FRAT Matrix

Pilot	Time in Type	Low	Moderate	High
VFR	<100	5 to 15	15 to 20	>20
VFR	>100	15 to 20	20 to 25	>25
IFR	<100	20 to 25	25 to 30	>30
IFR	>100	25 to 30	30 to 35	>35

- **FRAT addresses factors common to GA accidents**



(Beatrice)

Total risk value obtained in the FRAT spreadsheet is then related to the risk Matrix chart to determine whether the flight risk is likely to be low, moderate or high.

No FRAT can cover all possible flight hazards but this one – though simple – does address some factors that are common to GA accidents. We hope its use will prompt pilots to learn more about Safety Risk Management.

(Next Slide)

## Let's practice the FRAT



*(Beatrice)*

**Let's go back to the flight scenario example and answer the questions in the FRAT spreadsheet**

**-switch screen view to show the FRAT spreadsheet-**

**(Next Slide)**

# FRAT in practice

	Yes	Your Value
<b>Pilot</b>		
Less than 50 Hours in Aircraft or Avionics Type	<input type="checkbox"/>	0
Less than 15 hours in last 90 days	<input type="checkbox"/>	0
Flight will occur after work	<input type="checkbox"/>	0
Less than 8 hours sleep prior to flight	<input type="checkbox"/>	0
Dual Instruction Received in last 90 days	<input type="checkbox"/>	0
WINGS Phase Completion in last 6 months	<input type="checkbox"/>	0
Instrument Rating current and proficient	<input type="checkbox"/>	0
<b>Flight Conditions</b>		
Twilight or Night	<input type="checkbox"/>	0
Surface wind greater than 15 Knots	<input type="checkbox"/>	0
Cross wind greater than 7 Knots	<input type="checkbox"/>	0
Mountainous Terrain	<input type="checkbox"/>	0
<b>Airport</b>		
Non-towered Airport or tower closed at ETD or ETA	<input type="checkbox"/>	0
Runway length less than 3,000 Feet	<input type="checkbox"/>	0
Wet or soft field Runway	<input type="checkbox"/>	0

## Mission – KSNA – KTRK

- 391 nm 3Hrs. 22 Min
- Depart at 1800 Local Time

## Pilot – Private, VFR

- 850 hrs. TT, 30 in last 6 months
- Current medical, flight review, day/night currency

## Aircraft – C-172-P

- 43 Gal Fuel, Day/Night VFR

## Environment – DAY/Night/VFR

- Mountains.

## External Pressure (s) – Family Reunion



(Beatrice)

We can work together to answer the questions on the FRAT spreadsheet and then see the results we get from the FRAT Matrix

Pilot questions

Flight Conditions questions

Airport questions

External Pressures questions

(Next Slide)

## FRAT Matrix

Pilot	Time in Type	Low	Moderate	High
VFR	<100	5 to 15	15 to 20	>20
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IFR	>100	25 to 30	30 to 35	>35



(Beatrice)

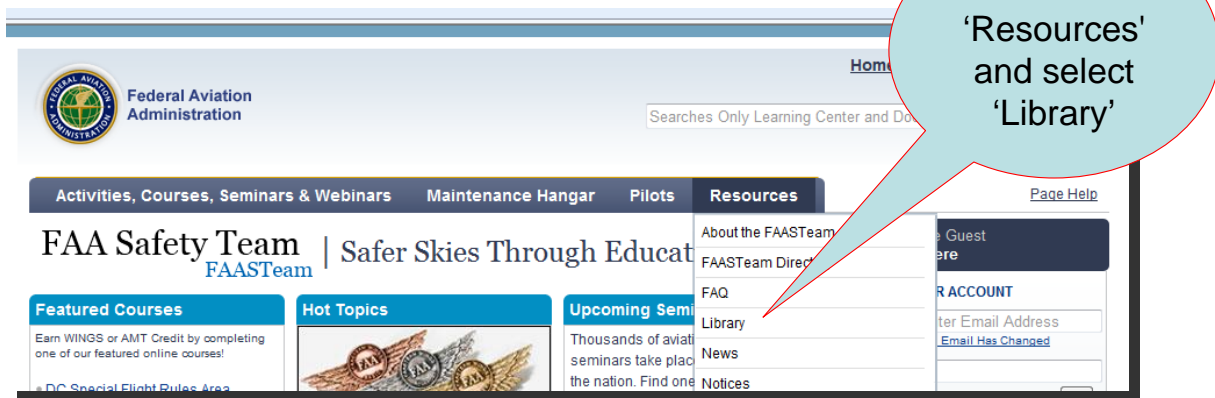
Looking at the Risk Matrix Chart we see that a Total Risk Value of 15 is between Low and Moderate for a VFR Pilot with fewer than 100 hours time in type,  
(Click)

but well within the low range for an IFR pilot with more than 100 hours time in type.

(Next Slide)

# Get your FRAT copy

- Go to [FAASafety.gov](http://FAASafety.gov)



(Beatrice)

Here's what to do to get your FRAT copy

Go to the FAA Safety Team website

Click on Resources, then click on Library.

(Next Slide)

# Get your FRAT copy



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### Search

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### Categories

## [Flight Risk Assessment Tool \(FAAST FRAT\)](#)

Risk Management Calculator

Scroll down  
to FAAST  
FRAT



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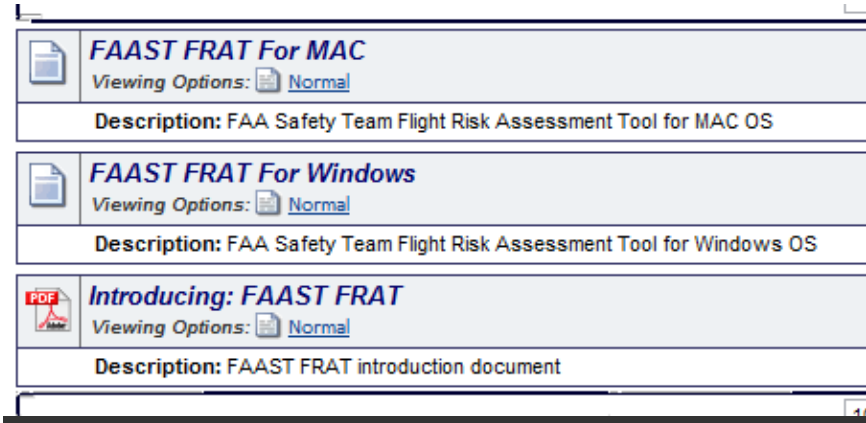
(Beatrice)

In the Resources screen, scroll down until you see the FRAT tool listed.

(Next Slide)

## Get your FRAT copy

- Download appropriate FRAT for your computer



(Beatrice)

Download the appropriate FRAT for your computer

Now, I'm going to pass it over to Tom who will explain why the WINGS program can help with Safety Risk Management and Risk mitigation.

(Next Slide)

Questions?



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**(Tom)**

*Time for questions.*

**(Next Slide)**

# Thank you for attending

- You are vital members of our GA safety community



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(Tom)

Your presence here shows that you are vital members of our General Aviation Safety Community. The high standards you keep and the examples you set are a great credit to you and to GA.

Thank you for attending.

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