

# Do You Know the Difference Between the Two Types of Risk Management in an Aviation Safety Management System?

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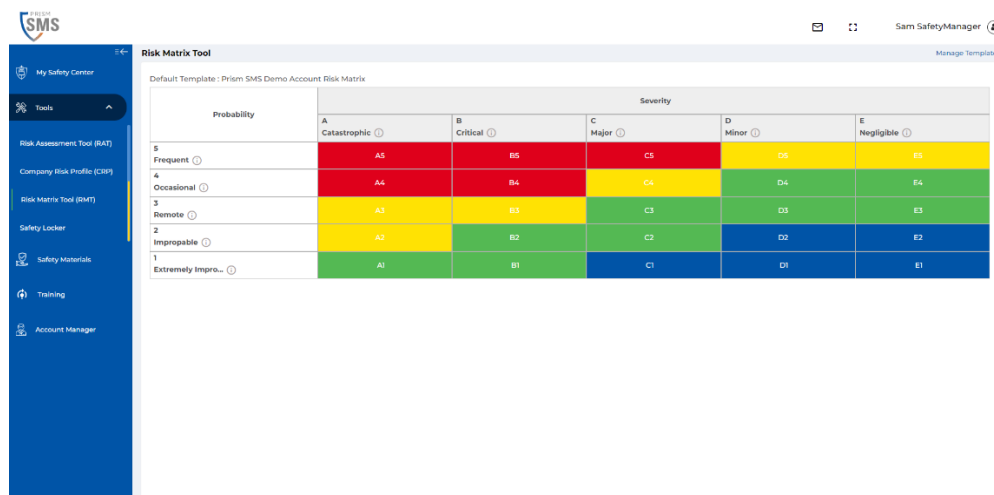
So your pilots and ground support personnel are filling out a Flight (FRAT) and/or Ground (GRAT) Risk Analysis form each day. That's great but do you know that is NOT sufficient to satisfy Element 2.2 (Safety Risk Assessment and Mitigation) of the ICAO and FAA Safety Management System (SMS) Framework? In fact, the ICAO and FAA SMS framework makes no mention at all of a Flight or Ground Risk Analysis. So what is going on here?

Essentially there are two “types” of Risk Management and their differences are not at all described by either ICAO or the FAA. For practical purposes in this article, we will name these two types of aviation Risk Management as “**Deliberate**” and “**Daily**”.

## Deliberate Risk Management:

This is a process with roughly five steps that uses a severity / probability risk matrix. It is not a fast process (hence the descriptor “deliberate”) and it should be performed / supported by a safety focus group such as your organization’s Safety Committee – typically chaired by your Safety Manager. This is what ICAO and FAA are looking for to satisfy Element 2.2 of the SMS Framework. The key words to remember for this type of Risk Management are “**uses a Risk Matrix**”

Here is what an example risk matrix looks like:



The screenshot shows a web-based interface for a Risk Matrix Tool. The main area displays a 5x5 matrix with 'Probability' on the vertical axis and 'Severity' on the horizontal axis. The severity levels are A (Catastrophic), B (Critical), C (Major), D (Minor), and E (Negligible). The probability levels are 5 (Frequent), 4 (Occasional), 3 (Remote), 2 (Improbable), and 1 (Extremely Improbable). The matrix cells are color-coded: A5, B5, C5 are red; A4, B4, C4, D4, E4 are yellow; A3, B3, C3, D3, E3 are green; A2, B2, C2, D2, E2 are blue; A1, B1, C1, D1, E1 are dark blue.

Probability	Severity				
	A Catastrophic	B Critical	C Major	D Minor	E Negligible
5 Frequent	A5	B5	C5	D5	E5
4 Occasional	A4	B4	C4	D4	E4
3 Remote	A3	B3	C3	D3	E3
2 Improbable	A2	B2	C2	D2	E2
1 Extremely Improbable	A1	B1	C1	D1	E1

**How the risk matrix works:** The user takes the severity and the probability of the identified cause(s) and follows those to an intersecting point on the risk matrix. The color of that intersection box determines the action required.

For example, a causal factor that has a severity of “Major” and a probability of “Occasional”, results in a yellow box labeled 4C. Yellow might mean that a senior level person in the organization has to approve that risk assessment and its controls.

The risk matrix gets used twice in the deliberate risk assessment and mitigation process – as depicted in these five steps:

1. Investigate and determine cause(s)
2. Assess INITIAL risk based on severity and probability using a risk matrix
3. Develop controls / mitigations using the “Hierarchy of Controls”.
4. Assess RESIDUAL risk (take into account the controls from step #3) based on severity and probability using a risk matrix
5. Implement / Communicate / Follow Up

Deliberate risk management helps organizations prioritize their resources and provide a clear answer to two questions: What is my organization’s risk exposure and what am I doing about it?

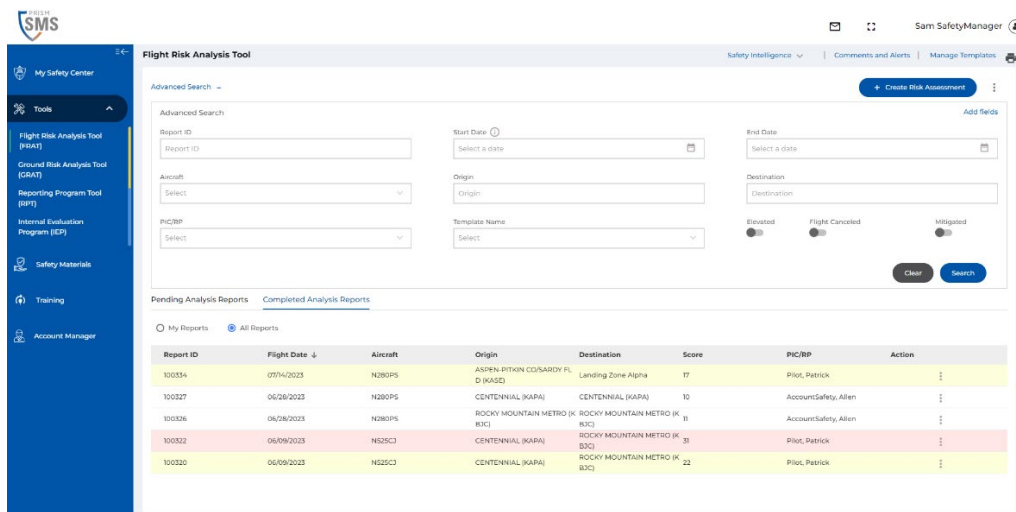
## Daily Risk Management:

This is basically an operational brief done at least once every day before any flight or ground support activities. A list of possible hazards are presented on a form, each with a preset score, and the user selects which ones apply for that day only. The score is added up and if a threshold is exceeded, higher authority review is required to determine if the activity should proceed. Daily risk management does NOT use a risk matrix so it **does not** satisfy the requirements of Element 2.2 in the ICAO and FAA SMS framework.

There is, however, a lot of utility in performing daily Flight and Ground Risk Analysis, so much so that most aviation certification standards either highly recommend or require it. Additionally, customers are increasingly requiring daily Flight and Ground Risk Analysis in the aviation operators that they hire. Many operators utilize an electronic Flight Risk Analysis Tool (FRAT) or Ground Risk Analysis Tool (GRAT) to fulfill this purpose.

It should be noted that the FAA **does** have a requirement for Pre-Flight Risk Analysis to be performed by Helicopter Air Ambulance operators, but that requirement is not in the SMS portion of the Code of Federal Regulations (14 CFR Part 5). Rather, the requirements is in 14 CFR Part 135.617, as part of their Charter Operator Certificate.

Here is what a sample Flight Risk Analysis Tool looks like:



The screenshot displays the Flight Risk Analysis Tool (FRAT) interface. The top navigation bar includes "My Safety Center", "Tools", "Safety Intelligence", "Comments and Alerts", and "Manage Templates". The main content area is titled "Flight Risk Analysis Tool" and features an "Advanced Search" section with the following fields:

- Report ID (text input)
- Start Date (calendar icon)
- End Date (calendar icon)
- Aircraft (dropdown menu)
- Origin (text input)
- Destination (text input)
- PIC/RP (dropdown menu)
- Template Name (dropdown menu)
- Estimated (radio button)
- Flight Canceled (radio button)
- Mitigated (radio button)

Below the search fields, there are tabs for "Pending Analysis Reports" and "Completed Analysis Reports". The "Completed Analysis Reports" tab is active, showing a table of reports:

Report ID	Flight Date	Aircraft	Origin	Destination	Score	PIC/RP	Action
100334	07/14/2023	N280PS	ASPEN-PITKIN COURSEY FL D (KASE)	Landing Zone Alpha	17	Pilot, Patrick	⋮
100327	06/28/2023	N280PS	CENTENNIAL (KAPA)	CENTENNIAL (KAPA)	10	AccountSafety, Allen	⋮
100326	06/28/2023	N280PS	ROCKY MOUNTAIN METRO (K BJC)	ROCKY MOUNTAIN METRO (K BJC)	11	AccountSafety, Allen	⋮
100322	06/09/2023	N525CJ	CENTENNIAL (KAPA)	ROCKY MOUNTAIN METRO (K BJC)	31	Pilot, Patrick	⋮
100320	06/09/2023	N525CJ	CENTENNIAL (KAPA)	ROCKY MOUNTAIN METRO (K BJC)	22	Pilot, Patrick	⋮

## For Further Information...

If your organization needs assistance in fulfilling the Risk Management activities of their SMS, please contact PRISM for information on Safety Management System training courses, SMS Health Checks, and SMS software tools for **both** types of Risk Management.