

# Safety Risk Management: Unplugged

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By now, it should come as no surprise that one of the most crucial elements of a safety management system (SMS) is safety risk management (SRM). SRM is a process by which an organization identifies hazards, assesses the risks associated with those hazards, and then mitigates those risks to as low as reasonably practicable (ALARP). Mitigation can range from eliminating the hazard in its entirety (and its associated risks), to accepting the hazard and putting in place controls to minimize the risks associated with it.

Effective SRM can keep an aviation organization out of trouble by reducing the likelihood of incidents and accidents. In turn, this makes the organization safer, with a corresponding increase in ROI and a reduction in potential litigation exposure. Although SRM is a process that is “in place” in many aviation organizations, many safety managers still struggle with the concept.

Let’s start with the basics of how the SRM process works (or should work). As an employee of XYZ Aviation Company, one of your SMS responsibilities is to submit safety issues into the voluntary (and non-punitive) company reporting system. These issues include safety hazards that you may identify in your daily activities.

It’s Monday morning and you just arrived for some company training and you notice that there is a power cord lying on the classroom floor, clearly in the path of where course attendees will be coming and going (see picture below).



As is often the case, few people take notice of the hazard, let alone think about addressing it. The reason for this is usually twofold: 1) that's the way things are around here and this is considered normal, and 2) there's probably some pluralistic ignorance in that everyone thinks "someone else will take care of it." But you, as the astute safety advocate that you are, take the smart step of engaging the issue. You submit a hazard report via your company's voluntary reporting system and hope that something gets done quickly about this problem. Here's what should happen next...

First, it's important to understand the following terms related to hazards and risks, as people tend to confuse these two terms:

- A hazard is not the consequence of a risk; rather-
- Risk is the consequence of a hazard

Example:

Birds near the airport are a **hazard**

FOD damage is a **risk** (consequence) of the hazard

Risk is measured in terms of **Probability** and **Severity**.

- **Probability-**

- How likely is \_\_\_\_ to happen?

- **Severity-**

- What would the consequences be if \_\_\_\_\_ did happen?

With those key terms and conditions understood, let's go back to our classroom example and go through the safety risk process-

**What is the hazard?** Electrical outlet box and wires on floor (which are powering portable floor fans).

**Can the hazard be eliminated?**

- **Yes:** All portable floor fans using the electrical box and extension cords can be removed. This will eliminate the hazard and associated risks. However, the room may become uncomfortable due to the temperature and humidity. We believe this is a good tradeoff in

terms of ensuring the safety of our course attendees. After removal, no further action would be required.

- **No:** We've decided the fans need to stay. Without them, the room is uncomfortable, and we feel that course attendees will enjoy the fresh breeze during their time in the classroom. This will, however, introduce risk.

INITIAL risk assessment:

For the following questions, refer to the risk matrix below.

**What are the risks?** The primary risk is that people can trip and fall, causing significant injury.

**What is the probability of this happening?** Frequent

**What would be the severity if it did happen?** Major

**What is the alpha-numeric score for the unmitigated risk?** 5C (Red-Unacceptable).

Immediate action required. Since the removal option has not been taken, we need to reduce the risk as much as possible with the portable floor fans remaining where they are.

Risk Probability	Risk Severity				
	Catastrophic A	Hazardous B	Major C	Minor D	Negligible E
5- Frequent	5A	5B	5C	5D	5E
4- Occasional	4A	4B	4C	4D	4E
3- Remote	3A	3B	3C	3D	3E
2- Improbable	2A	2B	2C	2D	2E
1- Extremely Improbable	1A	1B	1C	1D	1E

## How can the risk be mitigated?

1. Place trip-prevention molding or heavy tape over the wires.



2. Place caution floor signs around the electrical outlet box.



## Does this method get management approval?

- **Yes:** Management is willing to invest the small expense to reduce the risk. Management understands that although the risk is being significantly reduced, there will still be some residual risk. They are willing to live with the residual risk.
- **No:** Management says no to the idea because it costs money. Obviously, this is not a good decision. Your choices now might only be to remove the fans and eliminate the hazard—or—build a stronger case with management explaining why the small investment for safety is worthwhile.

With the assumption that management has answered Yes to the above, the next step is to assign the Issue to the person who will be responsible for implementing the risk controls (the molding and signs). An Issue closing date (i.e., 1 day) would also be assigned at this time.

Once the assigned person has completed the tasks, he/she will report back to the safety manager and advise that the tasks have been completed. The safety manager will then confirm the work is complete and conduct a closing risk assessment.

CLOSING risk assessment:

For the following questions, refer to the risk matrix below.

**What are the risks?** The primary risk is that people can trip and fall, causing significant injury.

**What is the probability of this happening?** Extremely Improbable

**What would be the severity if it did happen?** Major

**What is the alpha-numeric score for the unmitigated risk?** 1C (Green-Acceptable). Although the severity classification remains the same, we have lowered the likelihood of the trip and fall accident to the Extremely Improbable area. No further action needed.

The issue can now be closed.

Re-assessment should be conducted monthly to ensure the risk controls are still effective for the hazard.

Risk Probability	Risk Severity				
	Catastrophic A	Hazardous B	Major C	Minor D	Negligible E
5- Frequent	5A	5B	5C	5D	5E
4- Occasional	4A	4B	4C	4D	4E
3- Remote	3A	3B	3C	3D	3E
2- Improbable	2A	2B	2C	2D	2E
1- Extremely Improbable	1A	1B	1C	1D	1E

And that's all there is to it! This basic process works the same for any type of hazards and risks that may affect your aviation organization on a daily basis. The same applies to Management of Change (MOC) cases, although these might be more complex and time consuming.

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## About The Author

Dr. Bob Baron is the President and Chief Consultant of The Aviation Consulting Group, Inc. He conducts extensive training, research, and program implementation in Human Factors, SMS, CRM, and LOSA. He consults with, and provides training to, hundreds of aviation organizations on a worldwide basis.

Bob was an adjunct assistant professor at Embry-Riddle Aeronautical University from 2009-2012. He taught the Graduate Capstone Project and Research Methods for Aviation/Aerospace courses. He was also a full-time faculty member at Everglades University from 2004-2011, where he taught Safety Management and Human Factors courses at the Graduate and Undergraduate levels.

Bob has also served as a consulting editor for the FAA's International Journal of Applied Aviation Studies (IJAAS) and currently serves on the editorial board for the Journal of Airport Management (JAM) and the Journal of Aviation/Aerospace Education and Research (JAAER).

Bob is typed in Learjets (LRJET series) and Citations (CE500 series), and was a Part 135 contract Learjet captain and check airman for numerous operators in the south Florida area from 1996-2004. He was also a simulator and ground instructor for the Lear 35a at Pan Am Intl. Flight Academy in Miami and FlightSafety in West Palm Beach during that same period of time.

Dr. Baron's full bio can be viewed at [www.tacgworldwide.com/About-TACG/Bob-Baron-Bio](http://www.tacgworldwide.com/About-TACG/Bob-Baron-Bio)