THE MAIN DIFFERENCES BETWEEN THE TWO SYSTEMS

The table below shows the probability and severity of each risk and a given alphanumeric value.

Severity	*Meaning*	*Value*
Catastrophic	— Equipment destroyed — Multiple deaths	A
Hazardous	— A large reduction in safety margins, physical distress or a workload such that the operators cannot be relied upon to perform their tasks accurately or completely — Serious injury — Major equipment damage	B
Major	— A significant reduction in safety margins, a reduction in the ability of the operators to cope with adverse operating conditions as a result of an increase in workload or as a result of conditions impairing their efficiency — Serious incident — Injury to persons	C
Minor	— Nuisance — Operating limitations — Use of emergency procedures — Minor incident	D
Negligible	— Few consequences	E

Figure 1 – Severity Risk Table – ICAO Doc 9859, Safety Management Manual

The severity/probability combinations are then used to create a matrix. The risks are ranked according to their severity and likelihood.

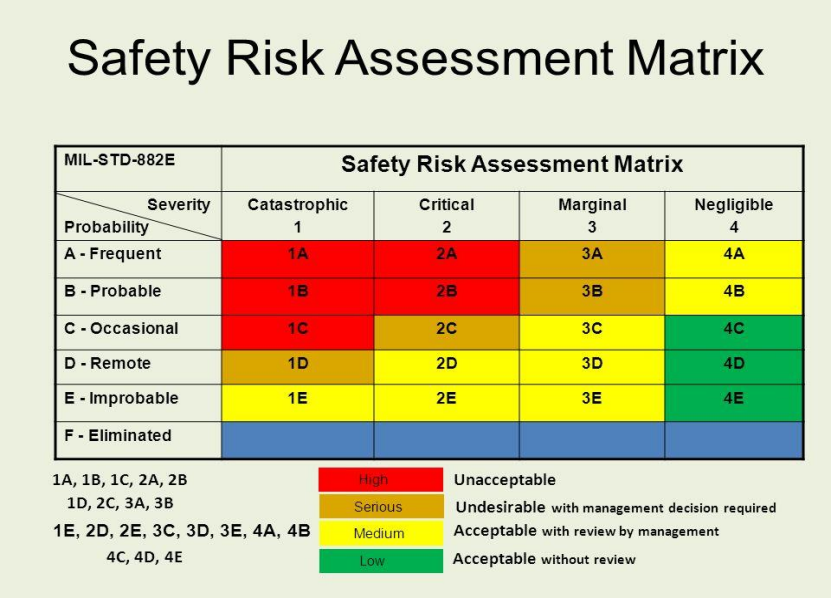


Figure 2 - Safety Risk Assessment Matrix

Most likely, the management will put a price tag for each risk in relation to the importance they give to each hazard. The objective is to evaluate the risks and eliminate the hazards. If this not possible, the objective will be to mitigate it.

The result will be in an acceptable level of safety whilst keeping operating costs within reason. We can call this a "Safety Space".

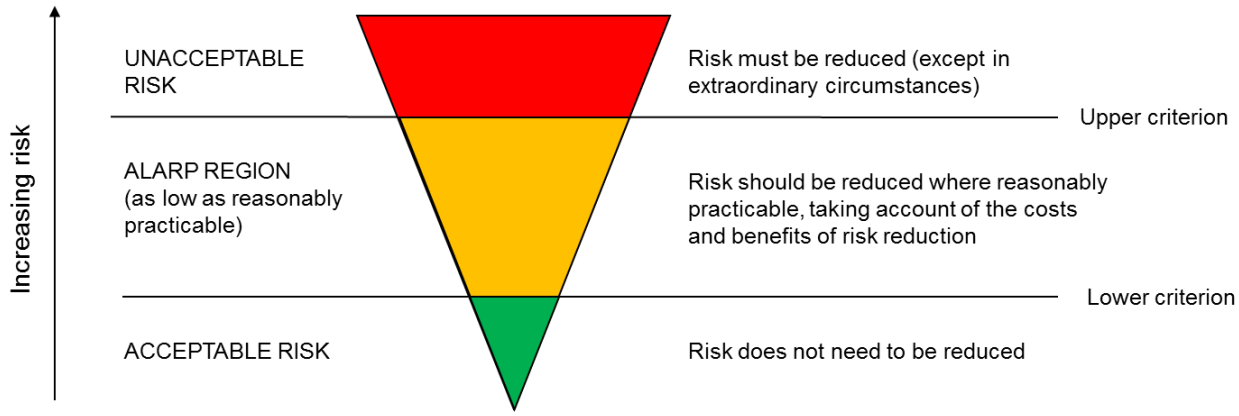
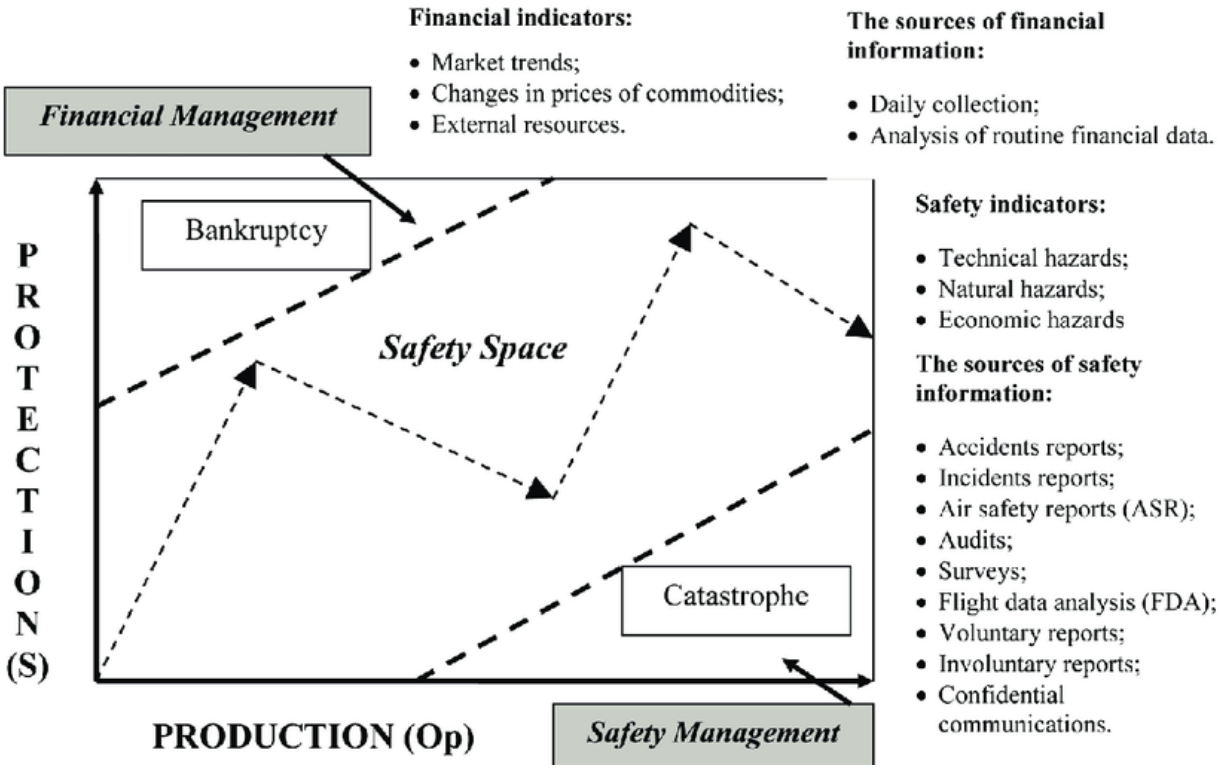


Figure 3 - "Safety Space"



In all business that involves high risk factors, the management should define acceptable levels of safety as well as its productivity goals. Management should actively eliminate risks and wherever this is not possible mitigate it.

> *"Pilot fatigue is a relevant problem in aviation operations, largely because of the unpredictable work hours, long duty periods, circadian disruptions, and insufficient sleep that are commonplace in both civilian and military flight operations. The full impact of fatigue is often underappreciated, but many of its deleterious effects have long been known. Compared to people who are well-rested, people who are sleep deprived think and move more slowly, make more mistakes, and have memory difficulties. These negative effects may and do lead to aviation errors and accidents."*[1]

An example of how an airline company can mitigate this issue is allocating resources to mitigate the result of increased working hours.

[1] Caldwell, John A.; Mallis, Melissa M.; Caldwell, J. Lynn; Paul, Michel A.; Miller, James C.; Neri, David F. *Aviation, Space, and Environmental Medicine,* Aerospace Medical Association, 2009.

Additional mitigation may be implemented by:

- Increasing automated tasks
- Training crew members to actively recognize fatigue conditions and how to tackle it
- Endorsing company policies that encourages fatigue reporting with zero impact in terms of liability measures

These measures need cash allocation. Figure 1-6 (above), has two axes, protection and production. In order to achieve a proper Safety Space, a good balance will be managing these two areas.

On the top left we have the Financial Management department that gives clear boundaries beyond which, costs in safety will lead to bankruptcy. On the lower right corner, we have the safety management department which will indicate levels under which it is not possible to go, as the result may lead to a catastrophe.

Boundaries are set by management. The airline systems and procedures should include continuous monitoring in order to operate in a Safety Space **at all times** and if needed, warn and alert the management shall these boundaries be approached so to implement corrective measures in a timely manner.

A continuous monitoring of risk in the long run leads to a decrease of accidents and incidents. A single accident, such as ground damage will result in costly repairs as the aircraft departure may be delayed or grounded with passengers needed to be redirected. In addition, a poor safety record may have a severe impact on sales or reputation as a consequence.

In this perspective, we can talk about a SMS also as a market mind approach to safety. The better balance between managing safety and risks and the understanding of acceptability of safe levels of risks will enable management to keep the proper balance between safety and revenue.

USEFUL VOCABULARY

To endorse

Heuristic tool

Hazard (definition)

Risk (definition)

Safety Space

SMS

Systematic

Proactive process