## ICAO Loss of Control Symposium – Montreal 20 to 22 June

| Session 1. The aftermath of a LOC-I accident - The organizational impact of LOC acc. | | |
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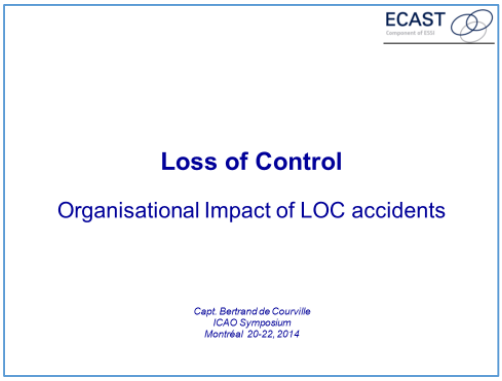



Some 15 years ago, I was part of a small team in charge of a safety seminar for top managers from flight ops, cabin, and maintenance and ground ops.
To get these managers prepared to participate actively, we did a little survey by sending this question to each of them:

"What are the 5 accident types we are the most exposed to?"

Among the different answers we received, nearly all referred to the scenario of the SR111 lost near Halifax because of a fire on board, a few weeks before this survey.

Some months later, another major European airlines told me they had also used a very similar survey published in their safety bulletin. And they obtained the same answers.

In 1999 and 2000, after the Halifax accident, the number of inflight diversions due to suspected on board fire more than tripled.

There are good and bad things there.

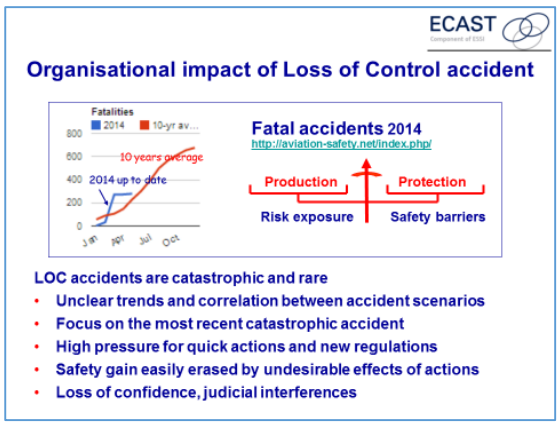
The good thing is that pilots, flight ops people and many others are well aware of catastrophic accidents. They keep themselves informed about the investigation progress and try to learn from it.
Regarding LOC, accidents such as AF447 or Colgan Air are powerful challenges to airlines and the whole aviation community.
Are we safe enough regarding this type of risk?
How could we prevent it to happen again?
These questions raise risk awareness at all level, give sense to operational procedures and training, and create opportunities for significant changes.

The "less good" thing there is the way our survey, about the exposure to accidents types, was answered in a subjective manner, not in a rational way. It was influenced for a great part by personal experience and opinions and by the most recent events. We were not really surprised as the objective of this seminar was precisely to work on this.

Today safety has improved. Not only in term of safety records, but also in term of method. Accident prevention is now more structured, documented and systematic. Safety policies and objectives appear now explicitly based on facts and trends. We could expect that a same question about potential accident would be answered in a more rational manner than 15 years ago.

But are we so sure?

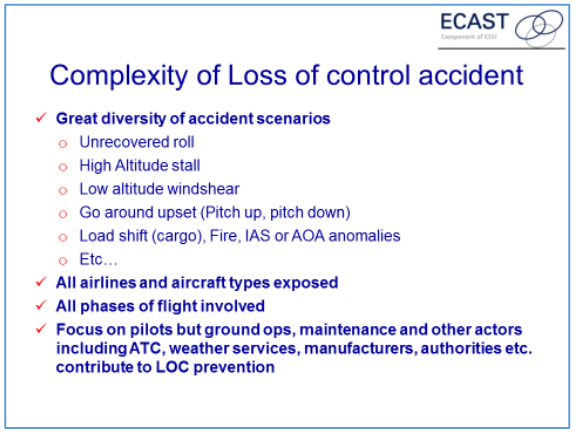
Bias and traps are numerous when addressing catastrophic accidents.
- Because these accidents are rare, we have very few relevant correlations and no trends to understand their real nature.
- Catastrophic accidents such as loss of control put the focus on the most recent ones for a significant time to a point that other scenarios and other accident risks may be neglected.
- The pressure is high to take immediate actions or to regulate. In responding to new regulatory requirements, airlines may often have to reallocate their limited resources. This may lead to simplistic and low level solutions while other deeper and more significant weaknesses are missed.
- LOC are N°1 in term of fatalities. But in term of number of events its rate remains very low. The safety gain we are aiming at today is very thin. Undesirable effects of safety actions that look intuitively good, even to highly professional and expert individuals, could quickly erase the safety gain we were expecting.




- As other catastrophic accidents, catastrophic LOC events could affect mutual trust between pilots, operators, manufacturers and authority. This not free from juidicial interferences. All this represents barriers to open questioning, analysis and improvements.

In the end, learning from accident is not only undesirable because of the loss of life they represent, it also might be inefficient. We tend generally to overestimate the value of the lessons. Advances in the collection and analysis of operational information sources are creating much more efficient and effective methods to learn about risks related to loss of control events.

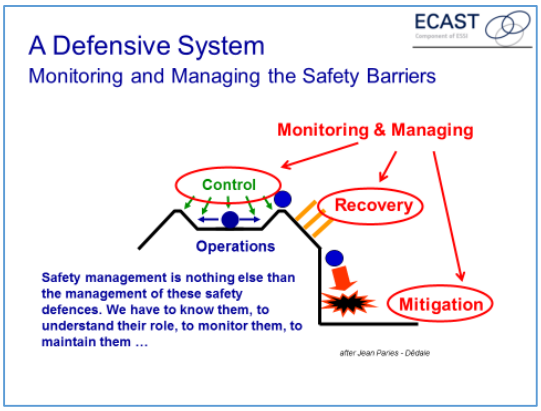
The Loss of control risk is complex, probably more difficult to manage than CFIT related risk. Events we may have in mind from the past 10 years such as Flash Airlines, AF447, Colgan Air, Kenya Airways accident are just some examples of what could happen. LOC scenarios are much more diverse.




All airlines are exposed. All aircraft types and all phase of flights are involved. We naturally tend to put the focus on pilots performance and training. They are key issues. But many other actors through their actions or inactions could contribute to LOC accidents.

Instead of focusing on what could cause LOC accidents, let's take another perspective and look at what makes our operations safe.

Per nature, the air transport safety system is a defensive system, made of three main types of “safety barriers” as illustrated here in this metaphor.




The ball in the bowl represents our daily operations. Errors, deviations, violations, unexpected failures could happen but procedures, equipment, training programs, good practices, professional culture contribute to keep these operations within a safe envelope, in other words to keep it "under control", even if things does not happen exactly the way we would like to. These are “Control barriers”.

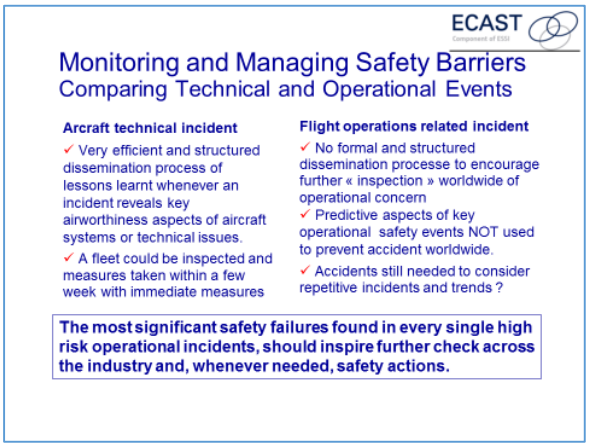
Sometimes things are going wrong further. The ball (our operations) moves out of the safe envelope. The “Recovery barriers” are there to get out from these unsafe situations. They are directly related to specific hazards and, beyond, to potential accident scenarios. We will not elaborate about the “Mitigation barriers” as they are very limited regarding LOC accidents.

Safety management is nothing else than the management of these safety defences. We have to know them, to understand their role, to monitor them, to maintain them …

So let’s go back to the organizational impact of LOC accidents from this perspective.
LOC accident investigations open windows into our safety system, we could say “access doors” to use the maintenance term. This gives useful but limited views, limited because we look at a single scenario only. If we consider LOC related events and data analysis, not accidents, we could cover a much wider range of information.
In a near continuous manner, we could see how far our “control barriers” and “recovery barriers” protect us or not, how they behave under various circumstances. Are they all effective, efficient? What are their failure modes? Where are their weaknesses?

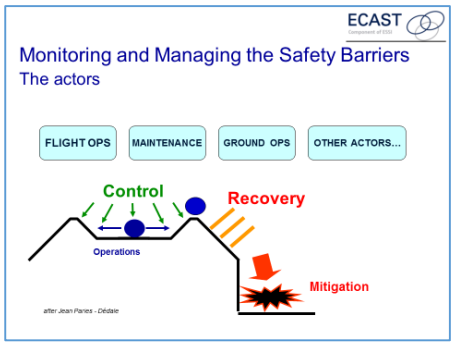
Basic safety assumptions could be challenged more easily. Some may remember the example of the TCAS RA which was assumed to be responded always the correct way until very few events detected through airlines reporting programs revealed that, under certain circumstances, TCAS Adjust Vertical Speed were responded the wrong way. The industry was able to assess this risk and to act to reduce it.

Other basic safety assumptions such as cockpit crew responses to “Bank angle” or “Windshear” alerts could be checked the same way. We have today enough events and monitoring tools to test these assumptions, in a non-destructive way unlike accident.




There is not always a need of massive data to initiate actions.
A single event revealing a high risk operational errors in a single airline could trigger large and costless “inspections” worldwide through FDM or other monitoring programs.
We have a good example with what maintenance, manufacturer and authorities do when they have discovered a single critical system malfunctions or structural failure. They do not wait for multiple events and trends before inspecting a whole fleet of aircraft.

Today in the operational field, policies, procedures, practices and training are becoming more standardized. Most of LOC related safety concerns detected and addressed in an airline are potentially an issue in other airlines. In other words operational failures around the world are becoming more « predictable ». Taking a better advantage of it is less expensive than the costs induced by catastrophic accidents.




As said before, pilots are not the only actors involved in LOC accident risk.
Flight ops, maintenance, ground ops, cargo and other actors are supporting or affecting the control, recovery or mitigation defences separately, or collectively. For example angle of attack probes damaged during ground operations or unsecured heavy load on cargo aircraft could results in a loss of control accident, with or without pilot errors.
Other examples could be found in the maintenance field. Weather services and ATC as well play a role regarding risks related to low level wind shear or wake vortices on departure or arrival. All these actors with different professional culture may have a different perception of their role, but they contribute to the same safety system. We should not forget about the value they add to our effort.

**To conclude,**

I would say that we have the ambition to erase LOC accidents from the statistics, worldwide.

But even without accident, the risks will remain anyway, on every flight.

We need to manage it more efficiently.
Our effort should focus on:
- supporting “threat and error” management at the front line. Training and Human Factors knowledge play a key role there, for pilot aspects but not only.
- supporting management to set long terms and more systemic actions.
- supporting global safety information process related to significant events to facilitate the monitoring and management of safety barriers

IATA’s holistic approach to identifying organizational and operational safety issues which includes: Improved technology, Regulatory harmonization, Training, Awareness.
IATA strategy is to work closely with industry stakeholders to ensure each of these pillars is leveraged to address each of its six-points safety strategies; and to prevent LOC-I accidents as part of its operational risk reduction strategy.

This symposium is a great opportunity to get synergy between all these actions.

It will be fully successful if we are able to organize one day a symposium of this type not because of accidents but because our operational information has identified global safety weaknesses that need to be addressed jointly.