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EUROCONTROL

Safety Intelligence for ATM CEOs
A White Paper - May 2013

DNM Safety

"The critical common element is an unwavering commitment to safety at the top of an organization: the CEO and board of directors must create the culture and establish the conditions under which everyone in a company shares responsibility for maintaining a relentless focus on preventing accidents."

President's Report on the BP Deepwater Horizon Accident 2010 (p.218)

http://www.oilspillcommission.gov/sites/default/files/documents/FinalReportPartIII.pdf

FOREWORD

CEOs and the Directors of ANSPs must manage aircraft flights safely, balancing safety with other Key Performance Areas such as Cost, Environment, Capacity and Efficiency. So far this 'balancing act' has done well, with not a single ATM-induced fatal accident in civil aviation in Europe in the past decade. As an industry in continuous change, whether such change relates to economic pressures, regulatory framework changes, or changes to practices (FABs) or infrastructure (SESAR), it is useful to reflect on best practices that have helped keep the industry safe. This White Paper is based on insights gained from over sixty Senior Executives in Europe and North America from a dozen ANSPs, who were asked how they managed safety, what they focused on, and how they led safety in their organisations. The insights have been gathered together under an umbrella term called **Safety Intelligence**.

Safety Intelligence concerns safety decision-making and safety leadership at the top of an ANSP. The insights in this White Paper primarily relate to the Chief Executive Officer (CEO), though they are also relevant to any Executive Board Member or Director (or Senior Executive, Vice President, etc.), or other Senior Manager.

Safety within the ANSP's jurisdiction is the responsibility of the CEO and Board. In the tragic event of an ATM accident, whilst initial focus will fall on the controllers and pilots involved, later on it is the Senior Executives who are likely to be called to account for any decisions that may have affected the likelihood of the accident's occurrence or its severity. Questions will arise from accident investigators, staff, media and even the public, particularly on whether the accident that happened was a known risk, and if so what was being done about it, and if the right processes and practices were in place to maximise safety. The degree to which Senior Executives can answer such questions is an indication of their 'safety intelligence'. The first aspect of safety intelligence is **safety knowledge**: knowing your ANSP's safety risks, and its safety strengths and weaknesses.

ANSPs manage safety by having the right processes in place, continuously monitoring and reacting to safety data from a range of sources. But sometimes the safety 'picture' emerging from such analyses is not clear: perhaps there is a problem, perhaps not. This is where the second aspect of safety intelligence comes in – **problem-solving**. An issue may be raised at Board level, and the Management Team led by the CEO must decide what to do. Resources are not infinite, so judgement and weighing of evidence, and balancing against other KPAs, is crucial.

The last aspect of safety intelligence is **social competence**. It is about perception of others and their goals and needs, it is also about persuasion, and it is about leadership. This aspect focuses on the CEO as the leader of the Management Team, as the CEO's 'style' will affect how the Board operates. Social competence affects the way problems will be raised and resolved at Board level, and it influences the safety culture of the entire organisation. However, there is plenty of scope for different 'styles' of social competence – not every CEO needs to be a 'safety superman' or, for example, spend a good deal of time talking with controllers in the Ops Room. What is needed, however, is a level of commitment to safety that is 'authentic' for that CEO, and communication via a range of media that, again, suits that CEO's particular style.

Safety Intelligence is about how to stay sharp on safety while growing the business. This document expands on the three components of Safety Intelligence, using quotes from Senior Executives in Europe and North America to emphasise key points.

INTRODUCTION

Senior Executives in ANSPs – the CEO and Directors – share a legal responsibility for safety. Because ATM-induced accidents are thankfully very rare in Europe, most focus is on serious safety-related incidents (near misses), whether these are for example losses of separation, or runway or taxiway incursions. Many ANSPs have their incidents classified in levels of severity, and try to have zero serious incidents, and as few as possible of the less severe categories. At a high level this is how safety is monitored. But there are other indicators of safety such as results of safety cases, safety process audits or safety surveys (including safety culture surveys), as well as 'weak signals' such as concerns from controllers or others that could indicate an underlying safety problem. The difficulty for the CEO and other Senior Executives is to stay 'on top' of such information (which may be heavily 'filtered' before it reaches them), remaining aware of their ANSPs critical safety strengths and weaknesses.

A key component of Safety Intelligence is asking the right questions. To begin with, therefore, here is a 'Safety IQ test' focusing on the first component of safety intelligence, which is safety knowledge. However, this is not 'static' knowledge about safety processes or theories; this is knowledge about the state of safety in your own ANSP.

What is your Safety IQ?

Here is a 'Safety Intelligence Quiz', designed for CEOs. It can be done individually, or with the Safety Director, or with the entire Board:

1. What are the top five safety risks for your organization?
2. What is being done about each of them?
3. Do you have an internally-published Just Culture Policy in your ANSP?
4. How often do you give a safety message to staff?
5. Is Safety a standing item on the Board Agenda
6. Can you name three safety culture strengths and three safety culture weaknesses for your ANSP?
7. What is currently the most significant operational safety threat for your ANSP as evidenced by quarterly incident trend information?
8. What are the top three Human Factors areas your organisation needs to focus on to assure safe operational performance?
9. Which are your two best operational units (e.g. towers, ACCs, or individual sectors) in terms of safety performance? Which are the two most vulnerable?
10. Name two learning points from incidents or safety studies which have been translated into operational practice in your ANSP
11. Is Safety represented at Director level?
12. Do your discussions with other ANSPs (especially FAB partners) include Safety?

SAFETY INTELLIGENCE

What is safety intelligence?

The above test focuses mainly on one aspect of Safety Intelligence – knowledge – but that is only one of three aspects of Safety Intelligence, as shown in Figure 1. Safety knowledge is key – think of the stock market and knowing not just how it works, but what matters: which stocks and shares are moving up or down, which are 'rock-solid', which are vulnerable. The CEO does not need to have a deep understanding of safety – that is the Safety Director's role. But the CEO needs to know how safety works (and can fail), and where his or her ANSP's safety strengths and weaknesses lie.

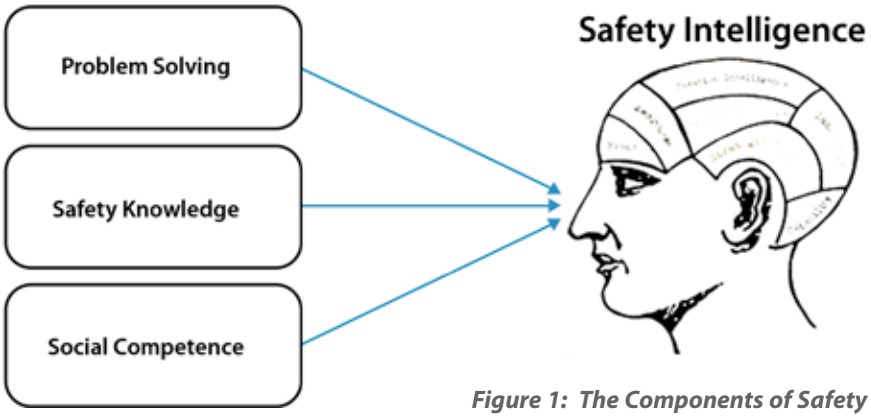


Figure 1: The Components of Safety Intelligence

Once the knowledge component is there, problem-solving is required to decide whether action needs to be taken or not, and if so, what action. Using the stock market metaphor again, this amounts to deciding whether to invest in certain shares or companies, or to sell stocks, etc. Safety information often presents itself in the form of complex and sometimes 'messy' issues, and the CEO and Board must decide if there is a real safety problem or not, and if so how to deal with it. The CEO is unlikely to be involved in determining how to fix a problem – rather, their skill is often in considering the problem, and reformulating it. This is discussed in more detail later in the context of real scenarios presented to a number of CEOs, and idealised solutions (as well as less-ideal solutions) generated.

The problem-solving activity requires working with the Management Team and understanding how each relevant Director understands the problem presented. It involves knowing what the problem 'means' to them, in terms of their roles, motivation and agendas. For example, if the Safety Director raises a safety issue linked to controller fatigue in busy traffic periods, then the Director of Operations will obviously have an interest, as will Directors of Finance and Human Resources as there may be staffing implications. Social Competence concerns the ability to recognise people's motivations and needs, as well as their styles of inter-personal interaction, and to work with them to reach good solutions. Such 'soft skills' are particularly important at the top of an organisation, so that balanced decisions are made.

Outside Board Meetings, social competence is linked to safety culture via safety leadership. If the CEO and other Board Members are seen as committed to safety via their words and actions, this can have a large positive impact on the company's safety culture. However, such outward safety leadership needs to be authentic or it will not work. Furthermore, there is room for different styles of 'safety leadership', both for those more 'outgoing' CEOs who are happy to spend time talking to controllers in the Ops Room, as well as those CEOs who are happier working closely with their direct Management Team and external stakeholders.

SAFETY INTELLIGENCE I
SAFETY KNOWLEDGE

In ATM, safety ultimately means avoiding serious incidents and accidents such as midair collisions, runway and taxiway collisions, etc. ATM is a mature industry with many safety rules and practices. This means it is well-defended, and incidents and accidents do not happen easily – there are many barriers which have to be penetrated before an accident will occur. Figure 2 shows some of the 'process factors' that keep ATM systems safe – there have to be a lot of 'holes' for an accident to happen. Such factors are considered in the Safety Management System (SMS) along with identification and prioritisation of risks and their management, so that all credible causes of incidents and accidents are considered and, in some cases (e.g. for an ATM Unit safety case) quantified to ensure that risks are lower than a threshold value (e.g. 1.55 accidents per hundred million flight hours).

The CEO and other senior managers can therefore inspect such processes to see if they are working correctly, have sufficient resources, etc.

In many cases however, the first indication of a problem somewhere in this 'performance chain' will be an incident, e.g. a loss of separation or a runway incursion, or perhaps a trend of events with a similar profile or occurring in the same location or set of circumstances.

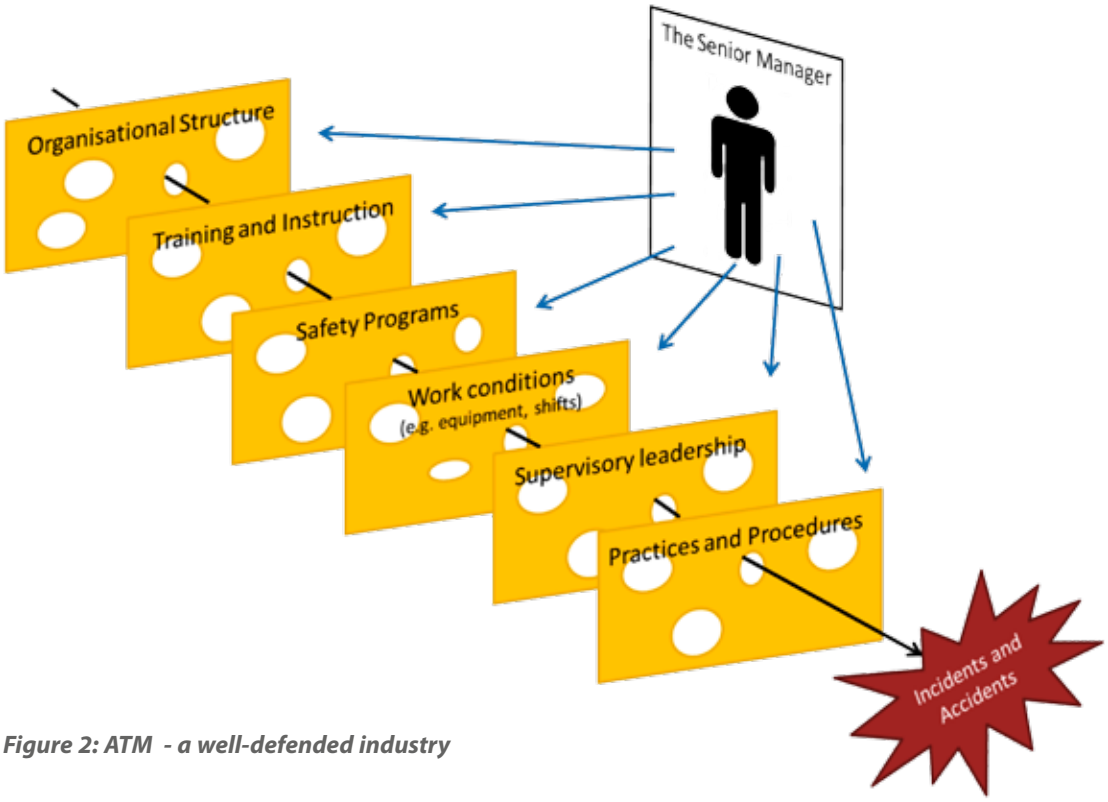
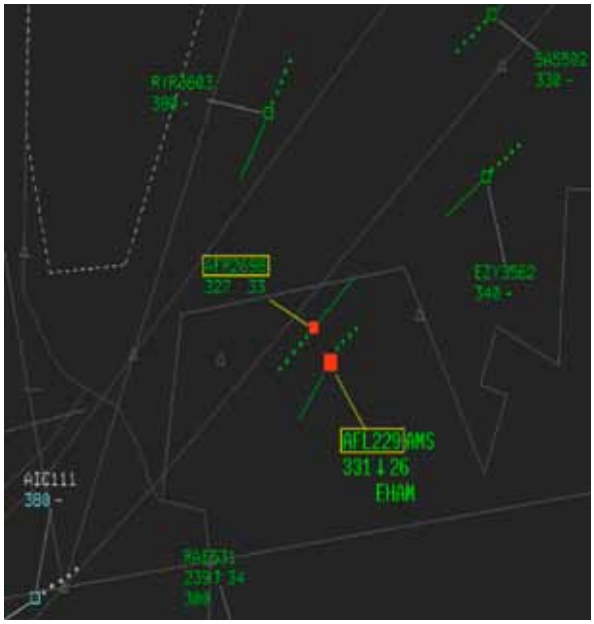


Figure 2: ATM - a well-defended industry

Incident investigation is there to distinguish between a developing threat that could lead to an accident (a signal) from more general random events (noise) that will occur from time to time, and also to ensure that the 'noise' itself stays well below the safety threshold. The Safety Director / Manager should be presenting trend analyses to the Board regularly (e.g. monthly or quarterly), as well as safety survey results (e.g. safety maturity or safety culture or safety audit results, or the results of Human Factors studies), highlighting potential concerns and issues. The Board members will then consider the evidence and decide if and where action is required, bringing other KPAs into the decision-making context.



A Near Miss – signal or noise?

At the top of the list will be the incident –is it a random fluctuation or indicative of a trend that could recur and develop into a full-blown accident? Is it a real 'signal' or random noise? Sometimes 'weak' signals contain critical but easily overlooked information on what is happening to safety.

Another way to look at safety – which is closer to the way accidents are investigated – is to consider the safety nets that failed in order for the accident or incident to occur. Figure 3 shows the typical final safety nets: TCAS and STCA in particular for En Route safety. From a safety point of view, the further 'upstream' you are (away from STCA and TCAS) the better. Therefore an obvious question to ask is how often does your ANSP have to rely on TCAS rather than STCA to resolve a loss of separation? Also, ANSPs will have a way of measuring the severity of incidents such as losses of separation (e.g. using the Risk Analysis Tool), and the Safety Director / Manager should be presenting a digest of information that enables the board to see if safety is getting better, or worse, or remaining stable.

The Contributory Factors on the left hand side of Figure 3 are also related to Board Level Safety Knowledge. An ANSP's incident investigation system should be classifying such factors. The CEO would not be expected to know the classification system, but if there was a developing incident trend of concern, he or she should be advised as to the principal contributory factors, e.g, fatigue coupled with low workload, etc. Often these are 'Human Factors', and part of Safety Knowledge is knowing which Human Factors are current issues for your ANSP, whether through the analysis of safety incidents or via your Human Factors specialists. Although Human Factors may sometimes seem to be vague, they are always evident in ATM (and other industry) accidents, and should never be ignored (separate guidance exists in this area)[1].

[1] *http://www.eurocontrol.int/sites/default/files/content/documents/nm/safety/hp_white_paper_2010_low.pdf*

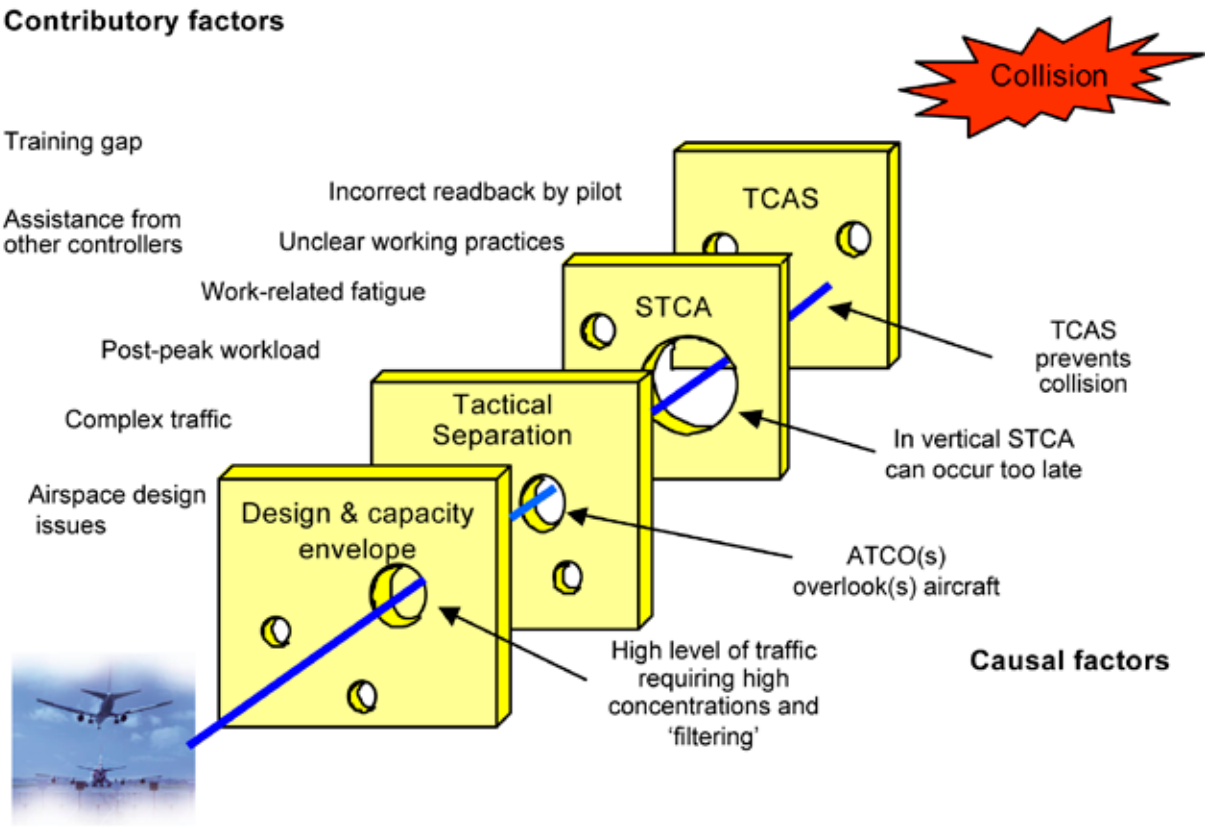


Figure 3 – Incident Pattern Analysis with Human Contributory Factors

The relevance of some of the questions in the Safety IQ test should now be clearer. Safety Intelligence at this level means the following:

- understanding how safety works
- understanding how incidents happen and safety can fail
- being 'on top' of the safety information in your ANSP
- asking the right questions concerning the available safety data
- knowing whether safety is being maintained sufficiently or not (are you 'ahead of the game' or slipping behind?)
- where the possible threats lie.

If CEOs and their Boards have the right information and ask the right questions, there should be no nasty surprises.

One thing this all hinges on is the availability of the right data in the first place – for example detecting when there has been a loss of separation (whether by controller self-reporting or via an Automatic Safety Monitoring Tool [ASMT]), and getting honest information about its causes and contributory factors. This requires a non-punitive working environment, one of trust between management and the workforce where both are working for safety as a common goal. In particular it requires a 'just culture', and this is best made explicit as a jointly prepared policy (between management and controller representatives / unions) in an ANSP, signed by the CEO. If there is a non-trusting environment, this will stem the data flow, and the CEO and Board will be to an extent operating 'blind'. In such a case, should an accident occur (and it will be more likely to occur), in the media aftermath it will be found out that the controllers knew it was 'an accident waiting to happen', but the Senior Management did not know about it. In such a case, ignorance will not be a sound defence.

Typical sources of safety knowledge are shown below:

Five of these sources are internal to the ANSP, whereas the last (International Collaboration) implies learning from other European ANSPs via groups such as the Safety Team and its sub-groups and work programmes, such as the Safety Improvement Sub-Group (SISG), which is a group of safety investigators who 'compare notes' on observed threats or trends, and who raise 'safety alerts' for all ANSPs. EVAIR confidentially collects incident data from ANSPs and matches it with airline data, allowing safety lessons to be learned across the European Network. SKYBRARY is a 'safety Wikipedia', a comprehensive and comprehensible source of information on a large range of safety and Human Factors areas, and the SHP sub-group of the Safety Team works on pan-European Human Performance issues such as controller fatigue.

"Do we have the right competencies and attitudes?
The Correct risk picture? Do we know all the vulnerabilities of our system?"

Knut Skaar, ex-CEO AVINOR

Statements from other European Senior Executives:

"Well, the manager will definitely need to have a risk picture, which is as correct as possible in order to make good decisions and priorities.
And to get that he needs reports, he needs that people tell him (or her)."

"So what we are trying to do and what I try to do as leadership is to reinforce an open reporting culture, that if everything gets reported, we have a chance. We can demonstrate this way that we are listening, and that there is a record of ideas, and people are not being ignored."

"And I think that just the understanding of human error will go a long way to helping people and safety leadership.,"

"And not only reports. We need a well-functioning safety knowledge system, gaining feedback from surveys and safety processes as well as incidents."

SAFETY INTELLIGENCE II
PROBLEM SOLVING

Problem Solving includes *Understanding a Problem* and *Idea Generation*. Understanding the problem means to determine, based on data and information, what the actual problem is. This involves looking at the problem from many viewpoints, and the ability to identify and use information sources related to the issue at hand. Such sources may be informal as well as the more usual 'objective data'. The ability to integrate and weigh the evidence from both types of information can be critical in solving complex safety problems. Idea generation involves identifying promising possibilities, alternatives or options for a solution, and knowing where to find them.

You are the CEO of a European ANSP, and the following issue has been brought to your attention.

Recently controllers in your ANSP complain more about fatigue and you also have noticed that mistakes during clearance have occured more often. Furthermore, recently more reliance on short term conflict alerts and a higher rate of TCAS alerts has been reported. Informally, controllers are concerned that they are pushing the envelope too far, though quarterly reports indicate that incident rates have remained the same.

Twoof the low-cost airlines have complained about ATC induced delays and 'inflexibility' when responding to pilot requests.

So – what do you think is going on? What would you do or recommend?

As noted earlier, *Problem Solving* has been found to be one of the key elements of Safety Intelligence. In fact from the CEO perspective it is not always so much solving the problem, as seeing it in its full context, re-formulating it, and so being able to make a judgment about whether action is needed or not. Idea generation usually works best as a team effort (more heads are better than one) with the Board. In particular, for safety issues in ATM, often the solutions are not completely technical or engineering solutions, and so what is needed is the generation of 'cultural' ideas or 'soft' solutions. Often, however, problems are not 'clear-cut'. For example, consider the problem described in the box to the left.

ANSWER A

"The TCAS alerts got my attention, it might be that we are seeing a trend that hasn't yet shown up in the incident rates. That, coupled with the increased reliance on STCAs and controller concern, suggests to me there is something going on, probably due to some change in traffic level or complexity, either something we did, or something external. I would want to know where this is happening, e.g. in a particular sector or across our airspace, and if any other KPIs are showing a change, e.g. overloads, workload in peak hours, etc. I would first make sure it is not just reflecting seasonal demand or problems with new rules or equipment, and want to be sure it is not linked to some kind of motivational issue, e.g. negotiations with staff or unions, industrial action, etc., or staff absences due to sickness etc. If it is not one of these 'usual suspects', then we need to look closer at what is happening in the Ops room, and what is happening in our airspace."

ANSWER B

"TCAS alerts can be due to false alarms, and the controllers are usually complaining about something. Often these things arise and then disappear – they appear related but they are not. I would wait until clear evidence arises in the incident reports. I might ask my Director of Ops to have a talk with some trusted controllers to see what is going on."

ANSWER C

"There are probably three things I would look at. Is the fatigue issue causing more mistakes with clearances and making them feel they are pushing the envelope? Have we changed something in the rostering system, or are people working longer hours, something that could affect fatigue? When are the mistakes occurring, near the end of the shift, or after a busy period? Second, I would of course want to know which airlines are complaining, low-cost or national carriers? But the main thing is to focus on the increased reliance on STCAs and TCAS – are these TCAS events because they slipped through our nets? How much have STCAs gone up? Is it across all sectors? I need to know what is going on here."

There is no 'perfect answer', but you may find your own assessment gravitating towards one of the three above. Here are some further examples of real safety issues which are not clear cut, but for which a way forward must be found:

- Following a serious near-miss due to controller workload and poor coordination, a restriction has been in place for 5 months which has reduced capacity, and stopped incidents. The CEO of an affected airline asks you when you will remove the restriction.

- You are moving from two old ACCs to a single new ACC. Staff and unions have expressed concerns about contingencies and social impacts.

- You are developing a 3rd Runway. Pressure groups are telling the media there are safety as well as environmental issues.

These and other issues are not simple. They involve 'social' and/or Human Factors aspects, and so may require a more 'cultural approach'.

The 'Cultural' Approach to Problem-Solving

The 'cultural' approach focuses on dealing with the social/human aspect of problems or issues (particularly where these are long-standing issues) and knowing how to find or work towards solutions. Such approaches are often called 'soft skills', and can be crucial in problem resolution. The main approaches identified across the ANSP sample include the following:

1. Utilise Face-to-face meetings with those affected/involved (ATCOs, pilots, airlines, etc.), whether with individuals, or groups, or chiefs, or other group leaders. Let the controllers know they are not being blamed for anything.

2. Weigh up all the evidence, including comments and complaints as well as the more objective data. See behind the symptoms and the statistics to the underlying causes.

3. Internal relations: let the controllers know that it is being taken seriously, that their issues are being considered.

4. Throughout discussions, maintain safe performance as the business imperative, before capacity and demands from external stakeholders, because without safety there will be no business. Make this clear to everyone.

5. Customer relations: keep the peace with external stakeholders, without 'folding' to external pressure – let them know that the issue is being investigated and addressed. This can prevent an increase in external pressure and a subsequent degradation of performance.

6. Transparency: explain the questions you are going to ask, and the questions you are going to answer once you have the evidence.

7. Set up a task force to look at the issue(s), or ask an existing panel to investigate, involving some of those affected. Let people know it is happening and that the panel will report to the Board as well as back to staff.

8. Consider short-term actions to relax the situation (e.g. 'flash' notices to controllers on the issue, what is known about it and what is being done; additional staff; turn the traffic down; etc.). These of course have to be followed by longer term solutions.

9. Use Human Factors expertise and/or organisational psychologists to explore what is really going on.

10. Communicate with frequent, regular updates. Communication can take the 'heat' out of situations.

HUMAN FACTORS & 'CULTURAL ISSUES'

Human Factors concerns the people aspects of your ANSP's operations, from the controllers and maintenance crews to support staff and management. Many ANSPs do not have Human Factors expertise, which is a mistake given the industry's dependence on human performance. Human Factors can help unravel more complex incident patterns and their causes, and help derive more sustainable and people-sensitive counter-measures. The ideal is to have your own HF expertise in-house, but if not there are plenty of reputable consultancies and university departments who can help. Most other industries take advantage of this resource, ATM by comparison is a little slow to recognise it (there are major exceptions such as NATS which has a very large HF capability), and EUROCONTROL has recently set up a Safety Human Performance sub-group of its Safety Team to help ANSPs work smarter in this area. As a CEO, having a HF capability can be an important asset particularly when faced with more 'cultural' issues.

Human Factors can help with problem resolution by:

- Understanding 'people/cultural' issues by dissecting complex or 'difficult' problems into their elements and more manageable 'chunks'
- Determining the relative importance of HF aspects of problems, e.g. whether an issue is really to do with a new interface or procedure, or has a deeper cause linked to working conditions
- Identifying practical solutions – even if only partial solutions to begin with – to move the problem forward and regain system performance
- De-personalising long-standing issues by taking a systematic, analytical and psychological approach

"What's really behind this problem?"

"What can we do about it in practical terms?"

"Where do we start?"

"How do we get things moving?"

"It's not personal!
How do we get the heat taken out of these discussions?"

What does good problem-solving from a CEO or Senior Executive look like?

A good problem-solver:

1. Does not jump to conclusions:
2. Considers many possible issues that might be contributors
3. Knows the risk of complacency leading to standard answers as to why issues occur and controllers 'complain'
4. Explores a new problem with a fresh look, but still builds on experience
5. Considers all sources of data and information that could help him or her in finding out what is going on
6. Takes several data sources into account, to view the problem from many angles
7. Identifies a need for more data and information
8. Critically examines the issues and the reasons that are behind the situation
9. Considers each of the issues on its own, but also considers connections between the issues

SAFETY INTELLIGENCE III
SOCIAL COMPETENCE

A key component of social competence is the expression of safety commitment through safety leadership. Studies on safety and safety culture have shown that senior managers' commitment to safety has a large effect on the rest of the company's commitment to safety, and hence the whole organisation's safety performance. Roughly speaking, we are all motivated by the opinions of our peers and our bosses. If the chief executive seems to really care about safety, then that will ripple down through the organisation and lead to safer behaviour. We will value safety. This is the essence of safety leadership.

But is has to be authentic. People can detect a false message, one which is often called 'lip service', a message put out as a 'show' rather than reality. Often in safety culture surveys we hear from the controllers that the management says safety is first, "but everyone knows capacity (movement of traffic) is first." Perhaps you agree? This is an easy one to solve, and remain 'authentic', by for example putting out a more realistic message to staff that "We aim to meet or surpass our performance targets, but we also cannot afford an accident, no ANSP can, so we must stay safe." This shows safety intelligence. It also signals to the organisation that such **critical goal conflicts are handled by the top of the organisation**, i.e. the CEO and the Board.

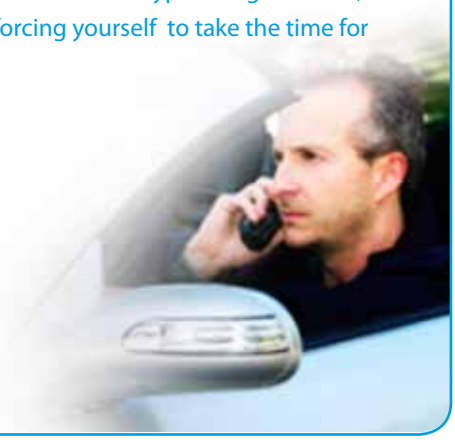
Social competence is about how we interact with others. We all vary in this naturally as a function of our personality, upbringing and experiences. Some people are naturally more outgoing, gregarious, or great listeners. Others are more introverted, less happy in a crowd, etc. Whichever you are, it doesn't matter. Even for less extravert CEOs who maybe feel their place is at the company's helm running the operation rather than walking the Ops Room floor chatting to controllers, there are ways to send the right messages of safety commitment to the workforce.

If you really are not committed to safety, well, that is a risk. If there is an ATM-induced accident that may well change your mind. If you believe that safety is the province of your Safety Director and not your concern, that will also send a message to the other Directors, including Directors of Operations, Engineering, Finance and Human Resources, who may also adopt the same attitude, and over time this can lead to a marginalisation of safety and its degradation.

"You can't fake being committed to safety. You either are or you are not."

"Senior Executive accountability and decision-making – making the tough calls – bring safety leadership and commitment to life

"In a very busy schedule like most senior executives have in this type of organisation, it is about forcing yourself to take the time for safety."



Safety Commitment & Leadership [what is wrong with this picture?]

On the other hand, being committed to safety does not mean that at every Board meeting safety 'wins' every argument. That would be no way to run a competitive organisation. Safety must still make its case cogently and persuasively, and must convince the entire Board (or enough of it) rather than simply 'playing the safety card'. This is a crucial part of safety competence for the CEO, managing the Board discussions on safety-related issues, ensuring what is called a 'level playing field', hearing out all the relevant parties, and then making a decision based on all relevant KPAs.

Here are twenty different ways to show commitment to safety and hence safety leadership:

1. Have an active **Safety Strategy** to drive your ANSP's vision of safety, and an annual summary that reviews safety progress against specified targets for safety improvement and investment. Enlist people in this vision.

2. Have a twice-yearly or yearly '**Safety Day**', where managers and staff can gather to discuss safety issues. As CEO, you will be present, as will your directors.

3. Send out a **monthly safety message** – either a status of your ANSP's safety performance (safety statistics, recent incidents, etc.), or a motivational message about safety. Use whatever media suits your style (from formal memo to 'blog')

4. **Visit** an ACC or tower once a quarter.

5. Have safety as the first item on the regular **Board Agenda**. [At any rate, have it as a standing item, and definitely not last on the Agenda, as that sends a poor message.]

6. Have your Safety Director/Manager present (concisely) the quarterly incident rates, how your ANSP is doing, any potential threats or trends or safety issues, progress on safety surveys and safety culture, etc. [your ANSP's '**safety health**']

7. Meet regularly with your **Safety Director**/Manager (e.g. weekly). Treat the Safety Director as you would Dir. Ops, Dir. Finance, etc.

8. Ensure your Safety Director / Manager works well with all the other Directors and keeps them up to date – it is not good for anyone to have '**surprises'** at Board meetings.

9. Occasionally ask **other Directors** about safety – how they are doing on relevant aspects of the SMS, or simply if they have any concerns or ideas on safety.

10. Have an independent **safety culture survey** of your ANSP, support it and encourage all staff to participate, endorse its findings, and enact some or all of the recommendations.

11. Consider **safety at the start of projects**, rather than at the end, so that safety is 'built in' during the design and development stages rather than 'rubber-stamped' at the final approval stage.

12. Set up **feedback channels** (safety groups) so you get relatively unfiltered bottom-up feedback.

13. **Challenge your Directors**, ask them "How do we know we are safe? Where is the evidence? If I go down to the Ops room or into Engineering will they agree we are safe?"

14. Ensure your **Safety Director is up to date** with safety approaches and standards in other ANSPs. Meetings such as the EUROCONTROL Safety Team, and CANSO Safety meetings, are useful networking opportunities to see what other ANSPs are doing, and also what is working and what is not.

15. Talk to the **unions** about safety. Tell them it is something you should work together on with a common vision, rather than it being used as a bargaining chip by either side.

16. Bring up safety issues or questions with **external partners**, including other ANSPs, airports and the airlines. Ask them what they are doing on safety.

17. Pick a safety case and ask your Safety Director to lead you through it. Make sure (s)he explains it until you understand and are confident in its results.

18. Have at least one 'safety investment project' where new equipment/procedures or training are being implemented to improve safety. Have some current controllers involved in this project from the start. Ensure they feed back to their colleagues.

19. [Advanced] Develop a 'safety dashboard' based on safety performance indicators and progress on the top 3 or 5rrisks that is reviewed at each Board meeting. Ensure that some of the indicators include the more 'qualitative' issues related to safety maturity, safety culture and Human Factors.

20. [Advanced] Run an 'accident' simulation exercise, wherein the Board spends a day led by specialised consultants experiencing what would happen if your ANSP had an ATM-induced accident (i.e. the ensuing interactions with lawyers, police, media, ministries, etc.), and how to manage it. EUROCONTROL can advise on how to do this.

The Table below gives examples of aspects of the skills discussed so far, that will be relevant for the senior management team as a group, and the CEO and Safety Director/Manager in particular.

	Other Directors	CEO	Safety Director
Problem Solving	Listen to the individuals with the expertise in the team	Balance safety with other KPAs, but the bottom business line is that it has to stay safe	Retrieve and understand relevant information
	Challenge assumptions	Make decisions after consultation	Propose solutions
	Explore issues from various angles	See interconnections & interdependencies	Focus on safety processes as well as outcomes
Safety Knowledge	Evidence-based management, base decisions on facts and information	Know the SMS and how it works in your ANSP	Understand goal conflicts
	Balanced approach towards objective data (e.g. statistics) and subjective data (e.g. reports from controllers)	Understand how safety culture is built, and your ANSP's strengths and weaknesses in this area	Know the controllers' and engineers' safety concerns
		Know the key risks and their human factors contributions	Understand operational risks and human factors
Social Competence	Allow individuals to speak up and express their concerns	Have good contact with all levels of the organisation	Understand other points of view, keep your Board colleagues informed
	Openly discuss safety issues	Operate an open door policy	Be able to drive a discussion
	Listen to each other	Be a good listener	Disseminate information clearly, without safety jargon

Table 1: Safety Intelligence & Board Roles

Social Competence and Safety Leadership

The fact that not all CEOs are outgoing has already been mentioned, but site visits can be a small price to pay for a large gain in transmitting safety commitment. National cultures differ, and so in some corners of Europe such visits may be more formal, but they can nevertheless have a major impact on safety culture.

"Are managers realising what a big effect they have on their people? And getting feedback about whether they are having the effect they expect to have on their people?"

(Statement from a European Senior Executive)

They are generally seen as an opportunity for senior managers to interact directly with the workforce, to demonstrate their interest in the issues that concern the workforce and to subscribe the workforce to the senior management's safety goals.

"You can't do that by just speaking to people on the phone, you have to meet people to be able to look them in to the eye and persuade them and get the message through."

Site visits help CEOs become sensitive towards issues on the 'shop floor'. Shakespeare was aware of this, when he wrote of King Henry V disguising himself and walking amongst his troops the night before a large battle, to know if his troops were committed to his leadership and ready for battle.

"It [site visits] is just a way of me to say: I wonder what it feels like for you on the frontline then. I want to go and see what these guys really think. By the time it gets to me it has been through about seven filters. So some things I just want to un-filter. Just tell me what is going on."

(Statement from a European COO)

Senior Executives need to reflect on the ways in which they can influence safety by motivating others. As with any motivational goal, it is the reward for positive behaviours that will lead to long term change in attitudes and values, rather than punishment. Ideally, all the Directors and the CEO, but especially the Safety Director, should lead by example. Of course, this is not always easy to do, but sometimes small things mean more to people, and can send a stronger message that safety really matters:

"Some people will say safety is not having an accident. But actually I think safety is things that people do every day. Like, if you are driving to work, you don't speed or you put your lights on and you don't talk on your mobile phone and you wear your seatbelt. And you do all these little things that add up to prevent an accident. And so one of the things that I am trying to do is give people a lot of positive feedback for all the little things and keep showing them how all these little things add up and trying to make a difference"

Persuasion, or the ability to change others' behaviours and attitudes, can be especially relevant for senior managers' work on safety. Safety is a goal that is abstract, not tangible and difficult to measure. Accordingly, it is different from many other goals that an organisation will strive for (e.g. growth, return on investment, profit margins), making it a challenging motivational goal.

"And it is not strange to me in any business that people will tend to go after things like financial targets, because it is tangible. But things like safety scare them. So what they do is they try to not get themselves on the hook for anything. So they don't really take accountability when it comes to safety."

This is where having a clear SMS, a 'Safety Dashboard', and engaging other Directors in safety is advantageous. In this way safety becomes a management team responsibility, and this mentality can cascade down through the ranks so that ultimately all staff feel safety is their responsibility, and not just the controllers and the safety department. Then your ANSP will have the foundations for a strong safety culture.

CONCLUDING REMARKS

The CEO and the Directors, more than other group in an ANSP, crucially inform and shape their organisation's safety and its safety culture. They set the tone in their organisation and determine how safety is viewed and treated by its members. This central role of Senior Executives for organisational safety stems from their influence on many aspects and characteristics of the organisation through the decisions and policies they make as well as their attitudes, values and behaviours.

This document hopefully has given some practical insight into how CEOs and other Senior Executives can exhibit safety intelligence and improve safety in their ANSPs, through safety knowledge, problem-solving, and social competence. The final word, however, is given overleaf to some of the CEOs and Directors interviewed in this study. As with safety culture, although it may be difficult to define precisely what safety intelligence is, people nevertheless understand what it means for them, and how it can impact their ANSPs.

CEOs' Opinions on Managing Safety in their Organisations

"As CEO I want two things: a complete risk picture of my ANSP, and to know that people come to work wanting to be safe."

"You have to think about what to do while you are planning the project, what you are going to do ensure that we address the quality and safety issues for that project from the very start."

"You have a clear vision about it, you know, you are kind of painting a picture of the future, and then you are enrolling people in that vision."

"So there is nothing too small, and there is nothing too big when you are dealing with safety."

"I don't agree that the Safety Director is responsible for safety. He alone is not responsible for safety: the Ops guy, the line manager, the engineer is responsible for safety. You have to be careful you don't park safety and say "sorry, actually it doesn't have anything to do with me, because that is the safety management system". You have to 'mainstream' safety. That is my responsibility as CEO, to make sure safety is mainstreamed."

"But further to that, safety is in each of my Directors' goals, and my front line managers' too."

"So what I decided to do was have my Safety Director set up this register and we have a safety rep on each team, and these are the members of the unit safety management committee."

"We also give safety feedback to the engineers, to keep them involved."

"Our operations have to be safe. Any change that is implemented must not jeopardise safety. This is rule no 1."

"Safety is not something that belongs only to us, to me, but the way how to spread some safety duties to all the employees.

FURTHER INFORMATION

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For further information on EUROCONTROL Safety and Human Performance Activities in Network Management please view SKYBRARY at the following URL address: http://www.skybrary.aero/index.php/Main_Page

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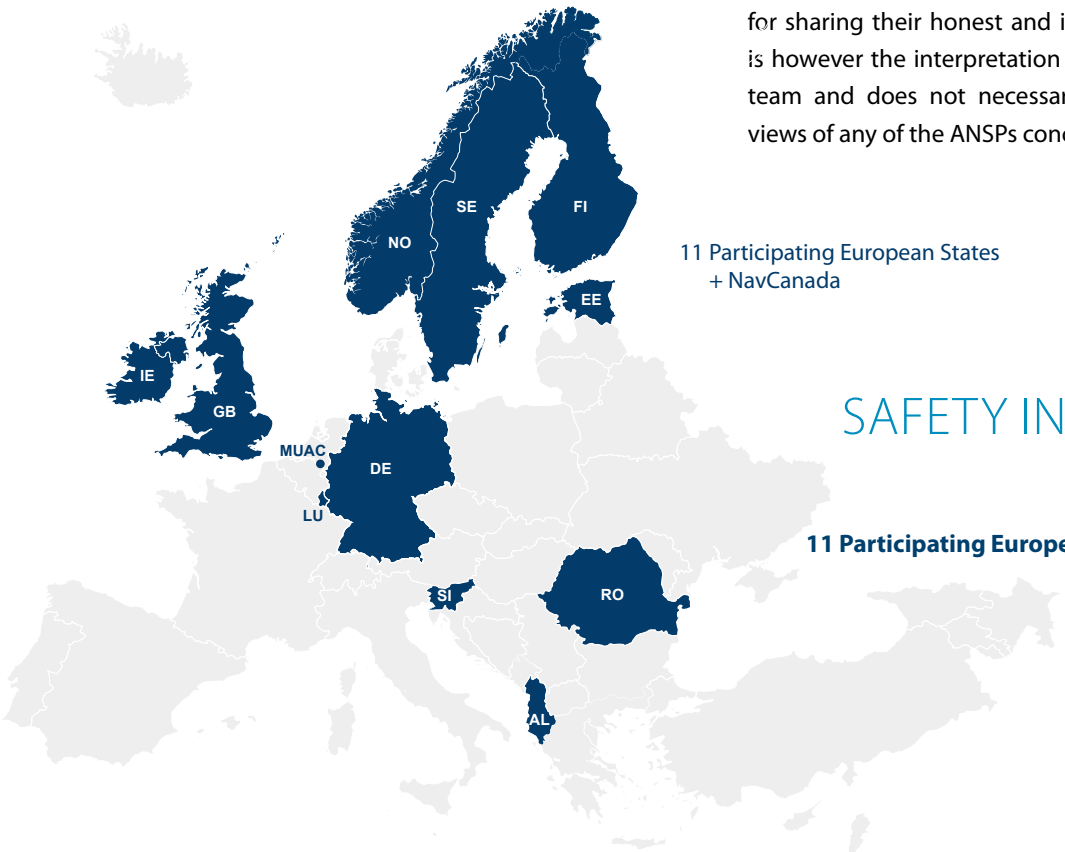

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