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ROOT CAUSE ANALYSIS – THE FIVE WHYS

After an occurrence, some operators ‘fix’ what they see as the most obvious cause of a failure. And they’re perplexed when the failure happens again, because they ‘fixed’ it, didn’t they? But the real cause could be buried deep inside the operation, ready to trigger another unpleasant surprise.



Let’s say a pilot of a small cargo operation has an occurrence. The internal investigation finds pilot error to be the cause and the pilot receives extra training.

Then another pilot in the same operation does something similar. There’s obviously something going on other than pilots making decisions that led to occurrences.

An investigation that asked ‘why’ the first pilot made the decision they did might have found they were fatigued. Asking why they were fatigued might have found they were overworked. Asking why they were overworked may have found there was a seasonal influx of work and too few pilots to meet the demand.

And asking why that had happened may have identified poor personnel management practices at the operation – employing just the adequate number of pilots to meet the requirements of low season work, but not employing extra personnel to cover high season needs.

Diving deep like this into the possible cause of an occurrence is called root cause analysis and the method described here is called the five whys.

It’s used by CAA’s safety investigators.

“We ask, ‘is it training that caused this?’” says CAA Safety Investigator Colin Grounsell, “Or is it the ergonomics of the aircraft – have the manufacturers made the landing gear selector handle look similar to the flap lever and have them in close proximity to each other?”

“Could it be poor maintenance practice, or is the maintenance manual deficient?”

“Or is it the way the company is organised?”

Fellow CAA Safety Investigator Dan Foley says it’s easy to blame human error.

“Blame is the enemy of safety,” he says. “Phrases like ‘he ought’, ‘she should’ – those are ‘blame words’ and using them often veils the true cause of an issue.

“They’re part of a faulty set of conclusions called ‘hindsight bias’. This prejudice arises when someone not involved in an incident looks at all the factors involved laid out in front of them and thinks, ‘well it’s obvious to me what happened; they should have seen it too’.

“Whereas, when you’re in the decision-making environment itself and things are unfolding and you cannot necessarily see what is going to happen next, all the factors that led to the occurrence are not obvious at all,” says Dan.

“It’s very rare that a pilot or engineer does something deliberately foolish. So you have to put yourself in their position and think, ‘right, they were flying along, or in the workshop, and they made these decisions and those decisions made sense to them at the time.

“Now why is that’, why didn’t they do the things that seem so obvious to us?”

Colin Grounsell says most organisations do a good job of investigating an occurrence.

“But what can be really difficult is when the investigation leads you down into the culture of the organisation. It’s like throwing rocks inside your own glasshouse, and may not be taken very well.

“So you can understand internal investigators’ reluctance to start asking the harder questions of the CEO.”

But Dan Foley says the real value comes from asking those difficult questions.

“It’s a mark of the organisation’s maturity – and its resourcing – to be able to do it. But an organisation will sometimes struggle if one or two people are wearing multiple hats. In that situation, contracting an outside investigator can be a good move.”

Colin says the ‘five’ in five whys should not be taken literally.

“You could go on to 11 whys if needed. Or you might find the cause in three.”

An Australian quality system consultant, Mike Sondalini, says at each stage of the five whys, investigators must have concrete evidence that they’re on the right track.

“[Otherwise] they end up fixing problems that did not cause the failure incident ... it is never certain that you have found the root cause unless there is real evidence to confirm it.”¹

He says if physical evidence is truly impossible to get, clear logic can also be used to map the path from cause to occurrence.

“Impeccable logic that withstands scientific scrutiny can also be used to identify the failure path,” he says.

“It is evidence and clear logic that decides the path to take, not someone’s opinion.”

Dan Foley says if some issue along the way is found to have contributed to the incident, even if it isn’t the root cause, identifying it gives an opportunity to fix it.

“Let’s say someone slips in a pool of water. That’s traced to a leaking air conditioner. That’s tracked back to a seal that’s been faulty for some time, and the ‘why’ of the long-term faulty seal leads back to a poor reporting culture.”

“While the poor reporting culture is the root cause of the incident, identifying the faulty seal clearly gives the opportunity to fix it.”

An internal investigation also needs to question why its safety management system didn’t identify the potential risk, or if it had, why the risk escalated to a fully formed occurrence.

“Following an investigation,” says CAA Safety Management System Specialist Charlotte Brogan, “operators should review their risk controls to ensure those they’ve documented and have in place actually worked.

“Or if the controls they had in place weren’t effective in stopping the occurrence happening, operators should look at what controls will be effective.

“And if the occurrence was something unrecognised as a potential risk, it now needs to be captured within the risk register.”

Colin Grounsell says anyone struggling with an internal investigation can contact the Safety Investigation Unit at the CAA and ask for help.

“We’re happy to help, and it’s free of charge,” he says. ➡

¹ Web article: *Understanding How to Use The 5-Whys for Root Cause Analysis*, Lifetime Reliability Solutions.

Five whys analysis example

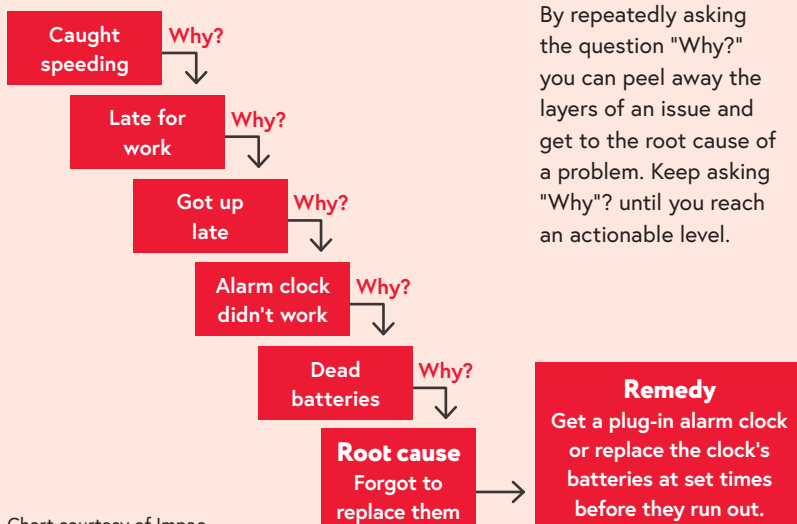


Chart courtesy of Impac.

// OCCURRENCE INVESTIGATION WORKSHOP

Colin and Dan are presenting a new CAA workshop on occurrence investigation.

See the back cover for dates and places where the workshop will be held.

Email publications@caa.govt.nz for your free copy of the updated booklet, *How to report occurrences*.

TAKING DRONE SAFETY SERIOUSLY

The chief executive officer of NZ Drones may be only 19 years old, but he's taken on his responsibilities regarding safety like someone who's grown wise with years of experience and close calls.



At 16, when most are considered to be way off adulthood, Jack Scott established his own drone photography company. It brought together a lifelong fascination with model aircraft and enthusiasm for videography.

Since then, NZ Drones has become Part 102-certificated, with Jack leading the development of the company exposition. He's attended numerous UAV operating and aviation safety courses, completed a drone night rating course and is working towards his PPL to improve his aviation knowledge.

Jack's incorporated SMS principles into the NZ Drones ops manual, even though Part 102 organisations are not required to.

"I've got a really strong attitude towards safety," he says.

"I regard drones as I do manned aircraft: if you're flying over people and property, or in the same airspace as manned aircraft, and you lose control of the C2 link¹, the result could be catastrophic."

To the disgruntlement of an early client, he turned down a well-paying job of operating a drone over a street parade – on safety grounds.

And another client, a real estate agent, wanted a view of the property he was selling, that would have required Jack to fly into the confines of the airport, and potentially into conflict with manned aviation.

Again, he refused to undertake the assignment because he felt there was "really no safe way to do it".

As noted in his nomination for the CAA's inaugural Young Aviation Professional Award in 2019 (he was one

of three finalists), "It is an exceptionally hard thing for a young man who owns a business to turn down income. But this simply demonstrates Jack's maturity, and his ongoing commitment to safety".

Constantly building safety

The NZ Drones' exposition is a living document, according to Jack.

"We don't say, 'okay, we have an exposition, now we're safe'. We're always amending it to make sure it's current, and to make it more easily understood. That makes it easy for staff and contract pilots to comply with it."

NZ Drones has also made it convenient for anyone to report an incident. Jack has developed a writable PDF, which means staff and contractors can fill out a report on their tablet, then upload it to the company's server.

"We meet regularly to review reports," says Jack, "and talk about whether something needs changing, or if we can do something better. We brainstorm a whole lot of ideas, write them down, and consider implementing them if they're appropriate."

Jack has also hired staff whose attitudes reflect his own. His safety manager Mick Turner plays a big part in the operations of NZ Drones.

"Mick is always there to give me new ideas on how to improve safety," says Jack.

Many of the company's clients have little understanding of drone operation safety, and Jack finds himself often patiently explaining what he will, or will not, do because of safety considerations.

¹ The C2 link is the radio frequency connection between the control unit and the drone itself.

// Drones are not toys – despite being easily purchased. //



// Jack Scott, CEO NZ Drones.

“Sometimes they think it’s okay to just go with the lowest price operator, because to begin with, they think it’s just about price. But most clients do come to understand that you can’t put safety in jeopardy just to get a low price.

“We show clients our operating procedures and maintenance checklist, what we do to train our pilots, and our preflight procedures: it all helps to convince them of the advantage of going with a safety-conscious company.”

Part of Jack’s commitment to safety includes selecting the best equipment for the job. He says that in Wellington particularly, many of the commercial off-the-shelf drones are not up to operating in high winds.

“But I’ve managed to get access to military grade drones,” Jack says, “which are capable of flying in the rain and in wind gusts of up to 90 kilometres per hour.

“These are not cheap options, but they do ensure the operation is as safe as possible.”

As one would expect, NZ Drones requests NOTAMs are issued for most of its operations. This helps notify other aviators that a UAV is operating in the designated location, which potentially prevents a near miss or incursion from manned aviation.

“We do have the occasional problem with manned aircraft,” Jack says. “And frequent problems with hobby drone operators. When they first unbox their aircraft, some of them regard the rules as ‘terms and conditions’ – that is, they ignore them and just want to get the drone in the air.

“But these drones are not toys – despite being easily purchased.”

The number of drone user breaches of airspace and rules has prompted Jack to begin writing drone operation training courses. He wants NZ Drones to become a Part 141 training organisation, and through that, to become more influential in the field of aviation safety.

“There’s a lack of education. Children and teenagers, even adults, sometimes find the rules a bit difficult to understand. There’s also those people who think they can buy a drone and just go out and do commercial work and they have no idea of the rules. They fly over people without consent, they fly over property without consent, and they fly within controlled airspace without any training.”

With his PPL, Jack will become one of a small number of drone operators who are also conventional pilots.

“I think it’s good for each sector to have people who do both. It gives you insight into the things each type of pilot faces.”

What would he say to other drone operators about staying well clear of manned aircraft?

“I don’t think people flying drones, particularly as a hobby, actually understand pilot workload. They’re doing their checks and they’re listening out for other manned aircraft and they’re listening out for instructions from air traffic control. The workload is massive.

“People need to understand what that’s like for a pilot. They don’t get why pilots get so agitated by drones flying around airports and by people not doing the right thing with UAVs.

“But they need to realise it will take only one disaster to disrupt the whole drone industry.” ➤

ENGAGEMENT AND TOP-DOWN COMMITMENT

A finalist in the CAA's new safety award outlines the work that triggered the nomination.

For Josh Haslemore – one of three finalists in the CAA's inaugural Young Aviation Professional Award – modernising a safety culture starts with engagement.

Josh's nomination was for his work in updating the standard operating procedures of the Auckland Coastguard Air Patrol – of which he is chairperson – and for establishing a robust safety management system for the organisation.

All in his own time

As well as his up to 10 hours a week volunteer commitment to the air patrol committee, and – during summer – more weekly hours as an operational inflight co-ordinator, he has a full-time day job as a senior safety specialist with Air New Zealand.

As part of establishing an SMS, the 27-year-old – the youngest coastguard committee chair in the country – led work in improving hazard identification and risk evaluation, introducing processes of continual improvement, and digitising procedures and records.

It's been, and continues to be, a big job that began by engaging with air patrol volunteers and with the wider Coastguard service.

"It's been challenging," says Josh. "We have a range of ages, new recruits and veterans, differing degrees of flying experience and therefore differing appetites for risk.

"When you have a seemingly safe flying culture, it's testing for some long-serving members of an organisation to accept there's an even better way of doing it.

"But we put in place robust and appropriate procedures and training so that our volunteers – whatever their experience and appetite for risk – operate to the same standard."

Josh says that, nevertheless, all volunteers know that if they're uncertain about a mission, the lines of communication are well and truly open.

"If need be, pilots are able to call our chief pilot for further advice should they have any uncertainty about operating on the day. Not being able to fly is at times a reality of the operation and, although we're a vital asset in saving lives, our crew's safety is at the forefront of what we do."

Slow and steady

Josh says that given the breadth of changes made to improve safety, the committee took things slowly.

"I can't stress enough the importance of doing this gradually, to avoid alienating those whose buy-in we need the most.

"We try to keep safety and risk management simple. Overloading staff and volunteers with safety information just for the sake of compliance is ineffective and it ends up doing more harm than good."

Josh also reshaped the relationship between the four-person air patrol committee and its 27 volunteers.

"Relatively speaking, we are a very young committee and we see our role as supporting the volunteers and their work, rather than the committee occupying the upper strata of a two-level hierarchy."

That approach has led to increased reporting, and more volunteers turning up to training nights.

"They're increasingly engaged, which is actually measurable though a constant stream of feedback to the committee.

"Without this engagement, the safety system just wouldn't work."



// Josh Haslemore

A wider alliance

In the past, the Northland and Auckland Coastguard Air Patrols operated pretty independently of each other, despite coming under the one umbrella of Coastguard Northern Region (CNR).

So Josh reached out to his counterparts in Northland, Willy Morton and Murray Miskelly, and they've since shared the work of improving standard operating procedures and ensuring those SOPs are fit for the purpose of conducting maritime search ops.

"We used to be very separate entities," says Josh, "but now we're collaborating a lot more, linking in remotely to see what each other is up to."

Josh says another 'must' was top-down commitment to putting safety at the heart of everything the patrols do.

"That applies to any organisation: whether its aim is to make money, or save lives at sea, working with those at the helm, showing them how safety aligns with the goals of the organisation, is vital to success.

"I really appreciate Willy and Murray joining me on this challenging road," he says.


"Without buy-in at the top, implementing an effective safety management system just isn't possible.

// I can't stress enough the importance of doing this gradually, to avoid alienating those whose buy-in we need the most. //

"The CEO of Coastguard Northern Region, Callum Gillespie, and CNR board member Roy Savage, have been invaluable parties in supporting change within the air patrols. They, too, don't see compliance as an end goal. They don't see safety as something you 'achieve' then put in a box. They see it ever-evolving."

To illustrate continual improvement, Josh says the patrol's newly created risk register is reviewed every month, together with a re-evaluation of how risk controls are working.

"We might also decide a risk needs to be re-evaluated, or there might be an emerging risk we need to start looking at or focussing on a bit more.

"This stuff is never static." 



WHO 'DOES' SMS AT YOUR PLACE?

The safety manager may be the initial go-to of a safety management system, but everyone needs to be responsible for its success.



“**T**o be honest, it was a bit overwhelming.” That was Alex Turnbull’s first reaction when he began coming to terms with safety management systems.

Alex is one of six pilots at Air Milford, and the company’s safety manager.

Fortunately his sense that there was just too much to establishing an SMS didn’t last long.

“After studying the ‘how to do an SMS’ stuff for a while, I realised we were doing most of it already.”

Although Air Milford is an SMS Group One operation, it’s more like a Group Two organisation in size. Specialising in scenic trips around the Milford and Queenstown regions, the Part 125 organisation has 12 employees and five aircraft.

“Being smaller, and already having a robust QA system in place, definitely made the move to SMS easier,” says Alex.

Initially it was Alex who was tasked with drafting what he thought was needed.

“I took that to management, and importantly, could show them from a practical point of view, how straightforward I believed the transition to SMS would be.

“Up until then, it would be fair to say, they didn’t relish the idea of SMS, but once they realised it was basically what we were doing already, they bought into it.”

British SMS specialist Neil Richardson says the development of a safety management system must begin at the top.

“Management needs to lead the way, to ‘show willing’ so a genuine safety culture develops – that means across the entire organisation and includes external stakeholders.

“If the safety manager is the only one advocating the safety message and trying to make decisions, then it is less likely to succeed.”

With management and senior staff on board, Alex then brought in the wider staff.

“It was important that I could reassure them that SMS wasn’t going to be that unfamiliar to them.

“Because we’re such a small operation, everyone has multiple roles – the accountant can sometimes be out on the apron loading and unloading planes – so everyone could have input into what our SMS would ultimately look like.”

In some ways, Alex says, SMS is almost not on Air Milford’s conscious radar.

“It’s so much a part of our day-to-day activity, we don’t always think about it explicitly. It’s not something that’s special or put on top of what we do ‘for safety.’”

Neil Richardson says the role of safety manager should be that of trusted advisor, not sole operational decision-maker.

“It’s senior leaders who need to satisfy themselves that ‘risk owners’ are making sound decisions about lowering that risk to as low as reasonably practicable.

“And other staff, who sometimes know what the real issues are, or who are best placed to help, should also have a place at the SMS table.

“It’s not always just the safety manager and leadership with the bright ideas.”

Alex says the biggest difference between the previous QA system and SMS is that safety decisions are discussed, communicated and documented in a more structured way.

“Although even a very minor incident would never go unexamined, we wouldn’t always formally document how we were going to stop it happening again.

“Now, that’s written down so everyone has access to it.”

Alex has also devised an ‘operations notice system’ – a board for written messages and the initials of each pilot, accompanied by a coloured tag.

“When I, or the chief pilot, issue a new message, the tags next to each pilot’s initials are turned to red. That way, the pilots know there’s a new message they must read.

“When they’ve read it, they sign the board and turn their tag over to green, and I can see the message has been read.”

Alex has also made more use of internal emails.

“I know there’s a bit of pushback these days about email messages. But if you use them sparingly and only for really important messages, they’re a good way of getting a message out while you think of it and are maybe short of time; and unlike a paper note, they can’t get lost.”

An added advantage with email messages, of course, is that the sender can also set up an auto-confirmation message, so they know the recipient has received the email.

// It’s not always just the safety manager and leadership with the bright ideas. //

Alex is also improving the way staff can report concerns.

“If you give someone a pen and paper and ask them to write it down, they groan. If they can do it electronically they’re much more likely to comply.”

Alex is therefore working on a fillable electronic document to make it quicker and easier to report.

“SMS encourages you to look at the procedures in your manuals from a practical viewpoint and question, ‘in reality, does this actually work for us?’ Our reporting system was a good example of that.”

Alex also says SMS is never going to be perfection. “You’ve got to keep examining what you’ve put in place and ask, ‘does that still work for us?’”

That’s why Alex chose not to use an outside consultant to draw up an SMS plan for Air Milford.

“I needed someone with an intimate knowledge of how the operation works,” he says.

Air Milford has various kinds of safety meetings.

“We have formal, dedicated, documented safety meetings, with minutes. We have casual, almost spontaneous ‘cup of tea’ meetings, particularly with the pilots. Sometimes we start out like that but actually they become more formal because a good decision is reached and that decision needs to be documented.”

Alex tries to call formal safety meetings when most staff are present.

“It’s not always easy. We’re a seven-day operation and there’s always someone having a day off.

“But I bribe them with a good cup of coffee to come in for just an hour, to take part. That seems to work well,” he laughs. ➤

HAZARD, RISK, AND SMS



If you're struggling with the difference between hazard and risk, and what to do about each, this is for you.

A 'hazard' is anything with the potential to cause harm. The 'risk' associated with that hazard is assessed by looking at the probability of that harm happening, together with the severity of the consequences if it did happen.

Think of an uncapped bottle of bleach left out on the kitchen bench during the school holidays. It's an obvious hazard, and the probability of it causing harm is high because it's opened and within reach of small hands. The consequences are also severe – eyes being splashed with it, for instance, should the worst occur. So it is high-risk.

But if that same bottle of bleach is now firmly capped, on a high shelf, and in a locked cupboard, the risk is much lowered because – while the consequences of a child getting hold of it are still very undesirable – the probability of them doing so are almost nil.

The placing of the bleach high in a locked cupboard is the 'control', reducing the risk to as low as reasonably practicable.

And that, in a nutshell, is a risk management process – one of the fundamentals of a safety management system (SMS).

Let's look at an aviation example. A maintenance engineer using an adjustable spanner may be a hazard. The risk of them doing that will be a combination of how probable it is, and its consequences for the airworthiness of the aircraft they're maintaining.

In a workshop lacking robust tool control, or appropriate tooling, the probability might be quite high.

But the following are all controls against the worst happening, aiming to lower the risk to as low as reasonably practicable:

- robust maintenance procedures, including strict tool control
- a positive safety culture throughout the organisation
- properly trained engineers who understand the significance of using appropriate tools
 - who are supervised, and
 - whose work is checked off by a superior.

First, the hazard

It all starts with identifying the hazard. CAA safety management systems specialist Trevor Jellie offers the following advice to operators struggling with that first step.

“Hazards will be identified from ‘walkaround’ hazard surveys, occurrence reporting, internal audits, safety investigations, change management, and management reviews.

“One of the most valuable sources of information is frontline staff who’re actually ‘doing the job’. For instance, the flight followers who identified weak points in a company’s emergency response plan. And the ground crewman who identified on-site hazards with farmers before a spray job.”

Trevor says experience has shown a staff get-together to brainstorm ideas is most effective if it's not attached to any other activity, like the monthly staff meeting where other agenda items are up for consideration. “In other words have a staff meeting *dedicated* to hazard brainstorming.”

Too small a group of people identifying the hazards in an organisation can lead to a narrow focus on one area. For instance, those of the ‘slips, bumps, and falls’ worksite variety. Trevor advocates for as wide an approach as possible.

The benefit of casting a broad net for information is illustrated by a story from Brian Dravitzki, Senior Base Engineer of Helicopters (NZ), in New Plymouth.

“An offshore operator had an inflight event where a shop rag was left accidentally in a tail rotor drive train area during maintenance and the rag became entangled with the driveshaft causing considerable damage to the driveshaft and tail boom wiring.

“The heightened awareness and the possibility of that happening to us meant rags quickly became an identified hazard. We assessed the risk of FOD (foreign object debris) such as these causing issues in the future and immediately came up with a process to control the use and storage of rags, the same as our tool control process.”

Trevor Jellie says a well-constructed register of hazards will include those associated with each type of operational activity. In heli ops, for instance, lifting, spraying, and passenger transport.

“There are also hazards related to ground activities, such as refuelling and loading of cargo. There are organisational hazards such as potential loss of key staff, and business hazards such as loss of insurance cover.” »

Trevor offers these ideas for effective hazard identification:

- Consider the complete cycle of each type of operation conducted. What hazards there could be from the beginning of the day when the pilot and aircraft are preparing to fly (pilot fatigue, improper fuelling) through all the activities of the day (poor weather decisions, time pressures) to the end of the day when pilot and helicopter are put to bed (rushed postflight check). The CAA’s SMS team call this the ‘day in the life’ approach.
- Brainstorm the collective knowledge in the organisation for ‘what has bitten us in the past?’ and ‘what gave us a fright?’
- Consider that what’s happened to other operators ‘could happen to us’.
- Break down each organisational exercise to human, human-machine interface, and procedural tasks, and look for the hazards associated with each.
- Undertake a trend analysis on what safety data has been collected. The amount of information might be small at the beginning of establishing an SMS but it could still be useful. A steady increase in occurrences will indicate, for instance, that a control is either weak or missing.

Trevor also says to successfully identify all the hazards in an organisation everyone needs to think beyond the obvious.

“Look for the more subtle dangers. For example, poor maintenance is obvious, but an overrun of a lifed component because the maintenance controller was overloaded by concurrent Part 145 commitments is not so obvious.

“Likewise, bad weather is an obvious hazard but pushing on through bad weather to get home at the end of a long, tough day indicates a hazard exists in pilot decision-making.”

Recording the hazard

Trevor Jellie says recording hazards must be simple, and every member of the organisation needs to be able to do it easily.

“One of the best hazard registers I’ve seen is a battered, well-used tablet carted everywhere by an operations manager. It has tabs for each type of operation, the base, and all the organisational stuff.”

That operations manager is Jason ‘JD’ Diedrichs, of Amalgamated Helicopters in Wairarapa.

“We went online to give staff easy access to hazard identification,” says JD. “We started out with general hazards then got more specific according to the task. If a pilot is going to a spray job, they can click on the appropriate tab and see each hazard, its associated risk, and the controls, for that job.

“We did have a paper hazard register but it was unwieldy, and it was hard getting staff to participate. This way is much easier and the staff are more forthcoming.

“We have all this information in hard copy document form as well, so if we lose connectivity for whatever reason, we have backup.”

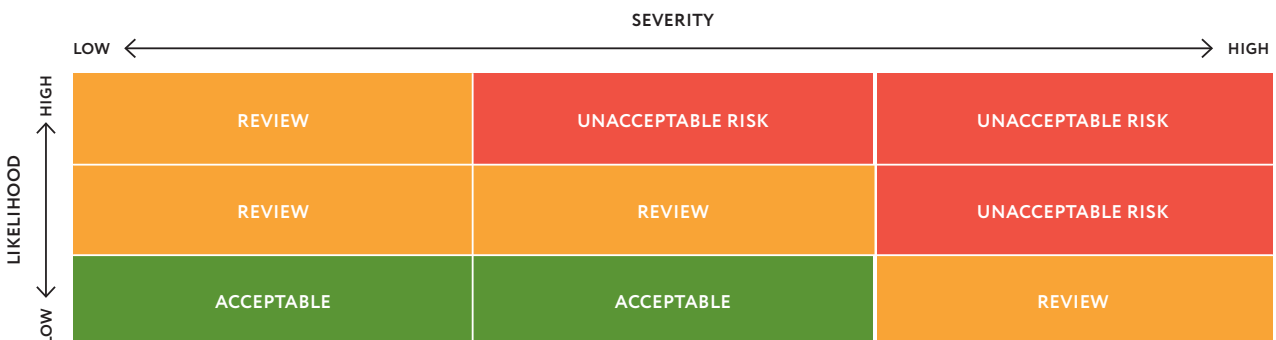
Then, the risk

Noting a hazard and its associated risk in a folder or spreadsheet somewhere does not equate to controlling the impact of that risk.

“Some organisations I’ve seen pile their identified hazards into a register like it’s a ‘bucket,’” says CAA safety management system specialist Simon Carter.

“And then they rarely review the risks and stated controls. No one is monitoring properly what happens next.

“The risk associated with a hazard has to be assessed; then ranked (say, from intolerable to acceptable); controls to minimise the risk identified and put in place; and the effectiveness of those controls assessed.”



// There are many ways an organisation can assess risk. Here is one: a simple risk matrix. Each organisation, however, should do what works for them.



// A controlled burn in rural Wairarapa.

JD says all his staff were involved in an initial brainstorming session to identify hazards, and they were also involved in the process of assigning risk.

“There were multiple benefits. We got some different ideas about just how much risk a hazard presented, but also, everyone was involved in improving safety.

“With some of the younger employees, they can disengage when it comes to talking about safety and SMS and hazards and risk, so the more we can involve them, make them responsible for a particular area of SMS, the more connected they’ll be to what we’re trying to do.”

Having established the risk associated with a hazard, the next step is to nominate someone to be responsible (the ‘owner’ of the risk) for ensuring that controls are identified, developed, applied, and assessed. That person should not always be the safety manager.

A safety manager should make sure risk owners are managing their area of responsibility, Simon Carter believes, but the safety manager is not Ms or Mr Fixit for every risk in the organisation.

“They can’t necessarily be the owner of an operational risk, or a risk in the maintenance area – both may be completely out of their area of expertise.”

Once someone is identified as the owner of the risk, they need to follow through with identifying and developing controls against that risk.

“They are expected to see through the lowering of the risk to as low as reasonably practicable, but in some organisations some risk owners are not actually doing that,” says Simon.

“If it’s out of their area of expertise, they need to escalate it up the line to someone who can manage or reduce the risk. That needs to be done formally so it doesn’t fall through the cracks.”

That ties in with appropriate people being nominated as the owner of each risk in the first place.

“The person who’s accountable for accepting the stated risk controls must be someone who knows something about it, and who has the appropriate authority and resources to implement controls,” says Simon.

Now, the controls

The controls stated in the risk register have to be specific, robust, and their effectiveness measurable. A control against using an adjustable spanner has to be something more than ‘engineer awareness’.

Simon Carter believes the most effective thing an organisation can do is to establish a formal risk and control review programme.

“A formal meeting can be set at regular intervals, or in smaller organisations it could be just a ‘let’s get around the table’.

“Such a review looks at each risk with a really critical eye – the less tolerable the risk, the more closely it, and the effectiveness of its controls, is looked at.

“But a low risk should be examined carefully too. You need to consider, ‘is this rating still really appropriate? If not, could reality bite me?’” ➤

HOW TO BUILD A GREAT REPORTING CULTURE



As part of establishing their Safety Management System, the Canterbury Aero Club built a robust reporting culture in 18 months. Here, they – and other operators – explain what’s important to encourage reporting.



How do you persuade pilots – who’re perhaps reluctant to report a mistake and expose themselves to ridicule – to report an occurrence?

Jeremy Ford, the CEO of Canterbury Aero Club, says you start with yourself.

“Leading from the front means you have to have the right mentality yourself. Only then can you instil the culture needed to deliver the level of safety you’re looking for.”

Jeremy built on the work of the previous chief executive in transforming the reporting culture at Canterbury, knowing that to have an effective Safety Management System (SMS), he had to encourage reporting.

“We wanted to change the attitude that occurrences were something you just tried to forget had happened, to things that were opportunities to learn, to contribute to future safety.

“We emphasised that reporting would help us fix the system that had allowed the occurrence to happen in the first place.”

Jeremy says members of the aero club, and students at the club’s international aviation academy, were assured any reports could be done with complete anonymity.

“I have no idea who has submitted a report. Sometimes I’ll put the word out that I’d like to talk to the ‘reporter’ and sometimes they will come and have a chat. Sometimes they won’t – and we honour that. We don’t push.”

Words matter

Jeremy and his safety systems manager, Stephanie Schwabe, also reassured hesitant aero club members and academy students their occurrence would not be treated as a ‘breach’ of anything.

“Words are important, so we renamed the ‘Problem Report’ the ‘Occurrence and Improvement Report’ reflecting the emphasis on improving safety.”

Such encouragement of reporting can, at the start, lead to an embarrassment of riches.

Stephanie says as the reporting culture takes hold, there can be some fairly trivial ones.

“Nevertheless, people who report have to see their occurrence is being investigated and they want to know what happens as a result.

“The first time you don’t bother to examine an event is the point at which you lose their engagement.

“Once things settle down, people get a better idea of what is reportable. You start to get some really good data.” »

// BUILDING REPORTING

- Make it easy to report.
- Apply just culture principles.
- Encourage open reporting (with the option of anonymity to reassure reluctant reporters).
- Investigate every report.
- Keep the emphasis on what can be learned.
- Make it clear what happened as a result of the report.

Stephanie says the 18-month period in which it took to improve reporting reflects the longest course the academy provides.

“So the students were taking on the reporting culture, the instructors were taking on the reporting culture, and they were taking that next door to the aero club.

“The turnover in staff in that 18 months also contributed, because we had an intake of new employees who’d only ever experienced a strong reporting culture.”

The role of just culture

Shaun Seddon, the deputy SMS manager at the International Commercial Pilot Academy in Whanganui, describes what happened when students came face-to-face with a just culture.

“Student representatives attend our regular safety meetings. At one, they told us about an occurrence that sounded pretty hair-raising, that hadn’t been reported formally. They’d just heard about it from other students.

“We called a students’ meeting and said there’d be no flying until a formal report had been logged.

“But we also said no one would be in trouble; we just had to get the details on what happened so we could make sure it didn’t happen again. We talked a lot about ‘just culture’ principles.

“The next day, the formal report was logged – and so were a few others. They didn’t get in trouble, as we promised. We went from about five reports a month to about 30.

“As it turned out, the original story had become embellished as it had gone round the students. When we investigated the circumstances described in the formal report, we realised there was no real risk at all.

“The more important thing was that it gave us an opportunity to reassure the students they would not be in hot water if they reported.”

Shaun says there’s another reason for the increased rate of reporting.

“The students are keen to see trends in occurrences. We were able to explain the direct link between reporting and being able to identify trends.

“So they were keen to be a part of that as well.”

Pearce Bennett, Chief Pilot of Skydiving Kiwis in Ashburton, believes the younger generation of participants may be more at home with regular reporting than the older generation.

“I think the introduction of just culture principles, recognising that humans will make mistakes, has meant a change in attitude,” Pearce says.

// JUST CULTURE PRINCIPLES

- Workers are encouraged, even rewarded, for providing essential safety-related information.
- Disciplining human error is inappropriate and counter-productive to reporting.
- Safety failures and incidents are used as lessons to avoid more serious events.
- Workers are clear about where the line is drawn between blameless mistakes, and negligent, reckless, repeated, and/or intentionally wilful unsafe acts.

“These days, everyone is far more interested in information-gathering and education, than in penalising someone for a mistake anyone could make.”

It’s generally accepted that leading up to a major occurrence there are about 400 minor ones.

“So you deal with those minor ones so they don’t get a chance to become the major one,” says Pearce.

As an example, he describes a recent report from a tandem master.

“He opened his parachute and found one of the brake lines wasn’t correctly stowed; it came loose after the parachute was deployed.

“So he reported it, no big deal, and it was just, ‘oh sweet, we can deal with that’. We were training a new packer so we just gave them a bit more guidance, particularly about maintaining vigilance, and now it’s all good.”

Involving the staff

Miriam Stevenson, CEO of Skywork Helicopters in north Auckland, says having the reporter involved in developing the solution has also been successful in building a healthy reporting system.

“It’s great if the reporter, not management, comes up with the solution. If they’re experienced, they know what better option they could have taken. If they’re inexperienced, it might take a bit of help to come to a viable solution.

“It’s important they don’t feel like they report, then go about their business, and management will decide what to do.”

Miriam says reported incidents and near misses are also treated as learning opportunities for everyone, and solutions are often generated through a team approach.

“That approach means everyone gets the one message, and it helps them feel like they ‘own’ the issue, the answer, and the responsibility to act, so it doesn’t crop up again.

“We have a very co-operative organisation – no management versus workers thing – and everybody gets involved in safety and the reporting process.

“It varies between people as to how much they report. But we have built an environment where reporting is done more and more.

“That’s not to say nothing is ever disciplined. If someone is indicating they don’t care what they could have done to themselves or others, or what they cost the company, then yes, that’s disciplined.

“But usually we have the ‘good conversation’ first – before it ever gets to that point.”

Reporting to the CAA

Some participants who’ve reported to the CAA in the past have complained they never know what happens to their report.

The managers of Intelligence, Safety and Risk Analysis (ISRA), and Safety Investigation both look at every report – all 8000-odd of them, every year!

In the March/April 2017 issue of *Vector*, ISRA’s manager, Jack Stanton, said this:

“We really appreciate that reporting is increasing. Eighty percent of our intelligence work is based on reports, and good descriptions are essential to making sense of those reports.”

The CAA’s analysts pore over the data to identify spikes in types of accidents, say, at a certain time of year, or trends over time.

“I’m aware that some people think their report has fallen in a black hole, because they don’t hear much back,” says Jack. “But I can assure them every report is looked at, and those that are part of a trend will be valuable to our assessment of risk and safety.”

CAA analyst Joe Dewar liaises with the helicopter and adventure aviation sectors to improve the awareness of participants about where risk is concentrated. That work is based on participants’ reporting.

Reporting underpins the quarterly and six-monthly safety reports (caa.govt.nz, “Aviation Info > Safety Info > Safety Reports”) summarising occurrences in each sector.

The analysts also produce ‘mini’ safety reports for each sector, improving the understanding of each of the CAA’s operational units of where best to concentrate resources.

Reporting enables safety investigators to analyse what contributed and led up to occurrences, combining that information with other safety data, to identify any ‘themes’ in the occurrences and what they might have in common.

All this valuable information begins with participants’ reports. 

// REPORTING MYTH

Here’s an excerpt from the May/June 2016 *Vector* article, “Just Culture and Reporting”, in which the Director described the CAA’s attitude to reporting.

“If an incident has resulted from human error, it’s pointless to punish the person involved. It’s human to make mistakes, we all do it. So the CAA’s approach is to support the person, learn from the information provided, improve the system if we can, and move on.”

Graeme Harris is aware there’s an ‘urban myth’ behind much of the failure to self-report: that reporting an occurrence means the person involved will likely end up in court.

“The stats, however, don’t bear that out. Over the last five years, the CAA has received about 32,500 reports and complaints, from the public, from industry, from CAA personnel. In that time there have been just 79 prosecutions.

“I don’t believe there is any rational basis for a pilot, for instance, to worry about sanction if they report an incident they caused.

“I cannot recall any prosecution taken over an incident during the last five years, where the CAA learned about it only through a report by the person involved.

“If anyone knows from personal experience of such a case, I invite them to email me.”

In the two years since that article was published, Graeme has never received such an email.

The easiest way to report an occurrence to the CAA is online, www.caa.govt.nz/report.

Look up Part 1 of the Civil Aviation Rules to read definitions of an accident, serious incident, and incident.

The *How to Report Occurrences* booklet is available free by emailing info@caa.govt.nz.



Just the **two** of us

Two-people certificated operations are required to establish a Safety Management System, just as much as the largest airline. Here, three operators talk about implementing their SMS plan.

With SMS implementation plans for all Group 2 participants now submitted, the time has arrived to put them into action.

Austin Healey, of the CAA's Safety Management System implementation team, is saying to small operators that they should keep on keeping it simple.

"Sometimes an operator – and not just small operators – will design a perfectly acceptable, simple, appropriate plan. But then, in putting it into practice, they do a virtual cut and paste from somebody else's manual, or of something off the internet. And all they've done is make it complicated.

"I say to operators, 'think about your manual, your exposition, as being like a contract. You sign the contract, and we've accepted the contract, so you don't want to put any extra stuff in the manual that you can't do, because then you're in breach of your contract'."

SMS specialist with the CAA Penny Stevenson advises operators to be methodical as they work through their plan.

"You've put a huge amount of work into the plan, so now just follow the plan.

"Go over it regularly with staff, make sure the tasks are being done. There will inevitably be more tasks as you go along, and you will find places where you realise a certain idea is crazy and it won't work. It's fine to change it to something else simpler and more appropriate. And call us if you need reassurance about changing stuff."

Winkie Sisson, who – together with her partner, Marc Mangan – owns Central Ag Air in Otago, believes there's nothing too scary once the plan is complete.

"I'm just going to do it the way it works best for us," says Winkie, who is going to get more training on implementing her plan.

"I've worked out how long things are going to take me, and I've set them out in the order that seems to work for us. I've got a board set up with my timeline and what things I have to do first myself, and what things I can work on together with Marc."

Winkie's top tip to other operators is to make use of the resources of the Safety Management International Collaboration Group or SMICG (see 'Resources').

"They're fantastic. Even though they don't give you everything in an exact format, they offer really sensible solutions for small organisations."



Kelly Cullen – safety manager at Campbell Copters in Whangarei – says her plan will also be put into practice systematically.

“Everything is going into our diaries. We all have tasks and goals for each month, we all have diary reminders, and we’ll all be constantly aware of where we’re supposed to be.”

Charlotte Mills, SMS specialist with the CAA, says that’s really important during the implementation period.

“Implementation involves monitoring how the plan is going, and reassessing resources and timeframes if you start falling behind.”

Trevor Jellie, of the CAA’s heli and ag operations unit, says the key for the smallest operators is being on the lookout for the forward-looking and proactive elements of their SMS, particularly if their plan changes as they put it into practice.

“From an operating perspective, they need to be able to recognise how activities such as investigations, internal audits, management of change, and reporting all feed into a central bucket of risk management.”

Trevor says the best plans he has seen have identified gaps, not just in the manual, but also in the day-to-day procedures of the operation.

“Stay focussed on those. Fixing gaps in manuals alone won’t give you an SMS.

“Sometimes it’s hard for two- or three-people organisations to look at their operation critically, which is a good reason to get further training, or ask for guidance from the SMS team.”

Charlotte Mills advises operators that, if they haven’t already done so, they should start getting buy-in from staff now.

“A huge part of managing change is keeping staff informed and ‘with’ the change. Then when your SMS implementation date comes around, the transition should be seamless.”

Certainly, the first step for Nigel Griffith from Patchett Ag Air in Blenheim has been staff engagement.

“We only have four staff and we work in pilot-and-loader driver pairs, and remotely from each other. So it’s important the guys take on board what SMS is about. I can’t be there with all of them all the time.”

Nigel, who has a spreadsheet with the steps he needs to implement SMS and the months he needs to implement them, is using a free application he downloaded from the internet which he says is a “really good hazard identification and incident reporting tool”.

“The guys just fill out the details on their phone and it comes alive on mine. I’m having to still prompt them about reporting; that will take a while but reporting has increased a bit. That’s good because they are beginning to realise its significance.”

Kelly Cullen agrees, saying the five full-timers and one part-timer at Campbell Copters “have an absolute role to play” in SMS, especially with reporting.

“That’s where we want them giving us feedback on what’s going to make their day better – how they can work smarter rather than harder, and how we can support them to work as safely as they can.

“The staff will become engaged, dependent on how we (Kelly, and the owners, Mal and Neil Campbell) put it across. But I think all staff like to be involved and they all like to be informed.”

Kelly’s top tip is “don’t pause”.

“Just because we’ve got our implementation plan in, we’re still moving it along. Otherwise it’ll be certification day and we won’t be ready.” ■

Resources

Visit www.caa.govt.nz/sms for links to:

- » Guidance for Part 137 operators (useful for other small operators too)
- » Booklet seven from CASA
- » SMICG, for small operators
- » EHASt, for rotary operations.

For help, email sms@caa.govt.nz.

SMS for Part 135s

How do you establish and maintain a robust reporting system? How do you engage staff? *Vector* asked three organisations – two already SMS-certificated, and one well along the way.

For Richard Rayward of Tekapo-based Air Safaris, leading from the top in SMS is crucial.

Richard has taken his own advice seriously, formally reporting his own occurrence of momentarily being caught out by a snow-created illusion, despite being in very familiar territory.

“Pukaki aerodrome, in the Mackenzie Basin, has a full length taxiway, parallel to the main runway. The snow was in patchy lines and I briefly lined up with the taxiway instead of the runway when turning finals.

“The value in that report was not so much what I said,” says Richard, “than the fact I said it at all. It showed I was willing to report which would encourage others to do as well.

“If you want commitment from the whole staff, you must lead from the top.”

In a small operation it’s comparatively easy to report and deal with issues.

“At some point of almost every day, we’re in the same room, so it’s not hard to bring up issues, discuss and resolve them, and monitor the outcomes.”

As to documentation, the company has a simple paper-based reporting form that includes space for follow-up preventive action. The safety officer normally takes responsibility for documenting that.

While the paper-based system at Air Safaris is sufficient for the 12-employee company, at Blenheim-based Sounds Air an online system was introduced about 18 months ago.

The safety officer at Sounds Air, Craig Anderson, says the online system has increased reports by “quite literally, about a thousand percent.

“We have a predominantly younger crew and they think in an online way. With the paper-based system, we might have had 20 reported occurrences a year, whereas now we’re getting 25 a month. I think that tells me staff wanted to do the right thing – management just had to give them a simple way of doing it.”

Massey Lynch, fixed wing operations manager with Philips Search and Rescue Trust, says his organisation introduced a computer program, meeting many of its training and operational needs, including occurrence reporting.

“All staff can file reports and see the hazard register easily and quickly, including on their cellphone. It does make everything more accessible, and especially suits our younger generation of employees.



"When a report or suggestion has been made, all the assigned personnel can view the investigation progress and add further comments, actions and suggestions – contributing to the direction of the investigation until it's been closed. That makes for an open and collaborative process which often results in much more effective outcomes than were perhaps previously able to be realised.

"The computer programme is a significant cost, but we see it as an investment."

Craig Anderson says Sounds Air staff know they'll always get an email or call from the part-time occurrence investigator for details of whatever incident they reported.

"People lose interest if they don't see things changing, so the investigator's sole job is dealing with occurrences, and follow-up with outside organisations, if necessary, like Airways, BP or the CAA."

Craig says the company making their SMS as practical as possible has also smoothed the way for staff engagement.

"We didn't make changes unless they were going to make things better, for instance, the current obsession with high-vis vests anywhere outside. These days, if you don't wear a high-vis vest you are more likely to stand out! So we made wearing one a requirement only in areas where it genuinely added to safety.

"So, practical, simple, and couched in plain language. Otherwise it won't work, especially in a small operation, because people don't have the time or resources for anything else."

Craig says the biggest change for Sounds Air under SMS was recording safety actions.

"We were actually doing quite a bit informally, but the resolution to an issue might have just been a conversation, and there was, I guess, the danger that everyone would eventually forget.

"So that required a change in thinking but you can be quite inventive. For instance, we had an email exchange about an issue, including how it was to be resolved. I took a screenshot of that exchange, and that was our documentation."

Richard Rayward says much of what's required by SMS should already be in a good QA system. But complacency is always a trap.

"After 50 years in business, it doesn't seem like there are many unknown hazards, as you can imagine! But things do change and there are variations in opinions about what constitutes a major hazard.

"We have a practice, on quieter days, of holding brainstorming sessions about hazards, everyone understanding we expect them to be alert to anything potentially dangerous. Sometimes we can get a bit too much reporting! But staff know we will always consider what they've said, and their suggestion won't be ridiculed or treated unfairly.

"While we do get some reports of things that don't really pose a safety hazard, you accept those as part of an open and robust reporting system. You don't dismiss them because you think they're too small. Besides, everyone has a slightly different idea of what constitutes an issue.

"At the other end of the spectrum, you have to be a wee bit careful that people don't start to question the value of a safety intervention, because nothing ever happens.

"For instance, in our very early days, we used to have multiple occurrences of people taking off with seat belts hanging outside the doors, or fuel caps left off or dipsticks still left on the aircraft. So we introduced a very formal walkaround to check those things. Since we introduced that, we've had no recurrence, so we need to keep newer staff members aware of why we do it."

Craig Anderson says one of the benefits of establishing an SMS is that management gets to know its business better.

"Often we discover that it's not so much that someone individually stuffed up, as that we have structured things in such a way that allows mistakes to happen.

"There've been quite a few cases where we've sat back, and said, 'hey, we need to do things a bit differently,' or 'gee, we never thought of that in the past, but perhaps we'd better'.

"That's why it's so important to involve your staff from the start. While someone has to drive SMS, it's the staff who have the ideas, which are often great – simple and sensible. We might have been about to put some complex decision in place, and they will come up with something brilliantly practical.

Continued over >>

"Air Wanganui's journey to SMS implementation began in September 2015, when Part 100 was in its draft form. We thought we'd get ahead of the game and, somewhat naively, rushed together an implementation plan for approval. Reality hit home when the business had its first plan returned in February 2016..."

"So, using the CAA SMS resource kit, we started again. Since then our focus has been on weaving SMS through our management systems, health and safety procedures, quality management processes, and most importantly, embedding it in our daily operations.

"We now have a very good understanding across the whole business, of the shift required regarding our approach to safety, and, critically, we have buy-in across the whole business organisation from the board down."

Dean Martin, CEO, Air Wanganui.



» Continued from previous page

"They help to drive – and they know they help to drive – decisions about safety."

Massey Lynch says SMS is an opportunity for an operator to tailor their safety processes to suit their own organisational culture.

"It compares well with the more inflexible Quality Assurance system, which was one size fits all.

"That makes it a lot easier to have a positive approach, 'hey, we're going to come up with something that works for us'. Anyone will become engaged when they see it directly benefitting the organisation, rather than being something they were forced to do because everyone else was doing it exactly the same way."

Massey views SMS not as an added burden, but a way of working smarter.

"It's tying a whole lot of individual safety elements together that perhaps already existed but weren't necessarily together before.

"It encourages and enables that overall coordination of safety processes which makes actions easier to track and monitor, which must be the ultimate positive safety outcome." ■

Themes regarding risk emerging from the Part 135 Sector Risk Profile (SRP) are at www.caa.govt.nz/srp.

These risk themes were identified by sector participants at four SRP workshops and will help Part 135 participants focus on their particular hazards and risks, as they begin the process to become SMS-certificated.

Photo: iStock.com/jollo

SMS Safety Summit

An industry-led summit on 9 May 2018 brought industry together to collaborate on safety management.

More than 150 industry participants gathered in Auckland in May for a day dedicated to safety management systems (SMS).

The summit, hosted by Oceania Aviation with the support of the CAA, aimed to facilitate communication, cooperation, and collaboration on safety within industry. The summit provided an opportunity for industry players to learn more about safety management, and to find out how it's being incorporated by others within the sector.

There were 16 speakers, representing different subsectors, including MetService, airlines, airports, adventure aviation, helicopter operations, and maintenance. They spoke about their experiences with SMS, providing real-life insights and practical advice. Topics ranged from understanding and implementing SMS, to engaging staff, and fostering positive and proactive safety cultures.

Neil Richardson of international aviation consultancy Baines Simmons opened the summit with Oceania's Don McCracken, and led a dedicated CEOs forum.

The summit was well-received by participants, with overwhelmingly positive feedback, and encouragement for similar events in the future.

Pip Ives from Heli Maintenance Ltd said the summit was "a very collaborative and informative day, and it was encouraging to hear examples of how others have implemented SMS".

For Mark Law from Frontier Helicopters, the practical tips shared by presenters and attendees were a highlight.

"Industry stood up to explain how they approached SMS, and what they did in their businesses. You could see how you could implement it, and what it could look like."

For more information on the summit, including access to the presentations and a safety forum, visit www.safetysummit.co.nz. ■



SMS... Taking the Plunge!

While the aviation sector is relatively new to Safety Management Systems, a range of industries have been using them for some time now. What can we learn from those industries, and just how important has leadership been?

If the aviation business is all about keeping people comfortable and secure at height, the opposite could be said of bungee jumping.

Despite the inherent risks of throwing people off high things, AJ Hackett Bungee is renowned for the safety record they've built over 30 years.

So good is their record, the Code of Practice they created has become an industry standard in New Zealand and Australia, and is used as a guideline throughout the world.

AJ Hackett Bungee Health and Safety Officer, Malika Rose, knows the value of embedding a safety culture throughout an organisation. So much so, her email signature reads 'Safety... Did it, done it, doing it tomorrow!'

"Safety does have to come from the top down, but it also comes from every angle," says Malika.

"Our Board embraces it and wants everybody to be proactive. We've also got a strong health and safety committee, which is empowered to do good things."

Not only is the health and safety committee empowered, but it is also given the resources and funds to make good ideas happen.

"A couple of our supervisors went out and researched mental health, and ended up running a presentation through the whole business. Their training was adopted across the company, and everybody was able to see the positive results," says Malika.

New staff inductions include a strong health and safety component from day one, which is then repeated 30 days into the role. After 60 days new staff have to give the induction back to the person who inducted them.

AJ Hackett also encourages a strong reporting culture, making it easy for crew to report occurrences through an online interface.

"We talk to the crew and reinforce that reporting is key, rewarding good culture."

"We really push the reporting of near misses, and we investigate them and smaller occurrences. We look for patterns, and regularly give feedback to the crew."

Just Culture is a key tenet of any good Safety Management System, and AJ Hackett are believers. While swift and decisive action is important, so too is fair and just treatment.

"Somebody having a near miss will be drug and alcohol tested, stood down, and retrained if necessary. There's no stigma around that, as long as people have followed process," says Malika.

"If people aren't sticking to procedure, we also question whether the procedure is still correct."

And that's another key to implementing a good SMS. Constantly seeking to improve, and measure success. It's hard to measure accidents that aren't happening, but there are other things you can look at.

"We try and measure our adherence to procedures, and audit how our people are working. We observe them doing their job, and talk to them."

"Last year we went through a gap analysis, from the café to bungee making. We asked, 'what do we do that could hurt people?'"

Watching Generational Change

The local maritime industry, too, has been using Safety Management Systems for more than two decades. Maritime New Zealand's National Compliance Manager, Bruce McLaren, says he's seen real generational change.

"It's really interesting to see a second and third generation in the fishing sector taking SMS on board, without question, while their fathers may have resisted it. There is far less tolerance for risk today, and they're far more open to doing something about it."

"Rather than say, with arms crossed, 'I'm safe all the time', which is what their fathers may have said, the new generation is saying 'I'm as safe as I can be in this high-risk environment, here is the evidence to prove it, and we're constantly looking at ways to improve on this.'"

In 2014, Safe Ship Management (SSM) was replaced by the Maritime Operator Safety Systems (MOSS) – each a mandatory form of Safety Management System. More than 1500 commercial operators are currently in MOSS, and must satisfy Maritime New Zealand that they're meeting its requirements.

"People are often enthusiastic to begin with, and things are put in place, including policies, procedures, training, and supervision. But, a lot of systems fall over at that point. That's as far as they go," says Bruce.

"To close that loop, you must have monitoring, implement an audit process, or ensure there are checks to make sure the people who are meant to be doing things are actually doing them. The lessons learned from those internal checks must be assessed and applied within the SMS."

Bruce stresses the need for strong leadership.

"Chief executives and boards not only have to buy into the SMS, they have to lead it, communicating to the rest of the organisation, 'Hey, we are serious about our Safety Management System and we expect you to be too.'

"The introduction of 'Officer' duties in the new Health and Safety at Work Act 2015 has really helped reinforce this key principle."

The Importance of Leadership

Francois Barton, executive director of the Business Leaders' Health and Safety Forum, says the advantages of embracing SMS are far-reaching.

"Many CEOs take safety walks around their company to signal to their people that safety is a priority – which is great. But increasingly, many business leaders are doing it to actually

learn, not just as a signalling exercise – doing it as a genuine commitment to learn something.

"Take a deep breath and listen to your people. You will learn a lot about your business – what's helping and what's hindering performance... not *just* health and safety."

Compliance is only one reason why health and safety is important.

"Compliance is a reality, but if it's your only goal, you could easily waste time and money – chasing compliance by looking at compliance *only* can be a mirage," he says.

"The legislation is quite deliberately not prescriptive. People think there are a bunch of boxes to check and a bunch of accreditation labels to possess, and therefore that equals safety. A phone book of paper is not going to keep people safe," says Francois.

"It's critical there's buy-in from the top. Leadership drives culture and culture drives performance. What interests the boss fascinates the team.

"But make sure leadership focus is on people and managing the risks to keep them safe - don't just tick a box." ■



Photo courtesy of AJ Hackert Bungy.

The Changing Role of the Senior Person

Some characteristics sought by the CAA in a Senior Person remain constant – experience, knowledge, and integrity among them. SMS means a Senior Person will also need to demonstrate a proactive and energetic approach to safety.

There's a new Senior Person role – that with special responsibility for Safety Management Systems.

The role will incorporate some of those associated with the era of internal quality assurance, such as overseeing an audit programme and management reviews. But the focus of the position will be overseeing the organisation's Safety Management System, including proactively identifying hazards and ensuring their associated risks are controlled.

"The sort of person we're looking for," says Mark Hughes, CAA's Deputy Director Air Transport and Airworthiness, "will have a sound understanding of safety management, including finding aviation safety hazards, mitigating risks, safety performance, and monitoring and measurement.

"It differs from quality assurance in that with QA, one person was the go-to for safety, and the various line managers would say, 'You assess my part of the organisation, you tell me what's wrong and how to fix it'."

But, Mark says, a fundamental of SMS is that everyone is responsible for applying it in their particular area.

"In a Part 119 air operation, for instance, you have a chief executive, then a Senior Person for flight and ground operations, a Senior Person for training and competency assessment, one for security, and one for investigating occurrences.

"All those Senior Persons have to have knowledge of SMS, and promote associated safety behaviours within their area. The Senior Person responsible for Safety Management Systems then makes sure the overall SMS 'machinery' is working."

Resourcing

In assessing the suitability of a candidate to be a Senior Person, of any hue, the CAA examines the time the individual will have available for the role.

"People often hold multiple roles within an organisation, or multiple roles within industry," says Mark. "With SMS now an integral part of the Senior Person role, the CAA needs to be convinced they will have enough time to be effective in all those roles.

"For instance, will they spend enough time on site? Will they dedicate enough time to the job? We need confidence that not only is the candidate capable, but they're actually going to be dedicating sufficient time to their responsibilities.

"The chief executive, of course, is responsible for providing sufficient people, resources and facilities so their employees can carry out their work effectively.

"But a candidate for Senior Person should also be assessing whether they have the time to do the job they've been employed or contracted to do.

"If the answer is 'no', they should be having a talk with their chief executive before their application gets to the CAA."

Mark says in a smaller organisation, a part time role may be appropriate, but in a larger one the Senior Person may need to be full time.

"Senior Persons don't have to be on site all the time. In the Skype and mobile phone era, a certain amount of time can be spent away from the base of operations. But if they're in a supervisory role, it's very hard to promote change, and to monitor the organisation completely, from afar.

"Vague commitments of, 'Oh well, I'll be monitoring my phone' do not demonstrate the hands-on supervision needed, nor give the CAA confidence that the Senior Person applicant can be effective in their important safety role."

Use or Lose It

Mark says the CAA is always interested in the ongoing ability of the Senior Person to do their job.

"For instance, what they are doing in terms of professional development. Are they keeping themselves updated? Are they attending user group meetings, are they up to play with rule changes, are they totally across exposition changes in their company? So all those things they need to do to keep themselves ahead of the game, that's part of the role too.

"They should never think, 'Hey, I've got through the gate, now my job is done'. Continuing to meet the fit and proper person requirements is an ongoing obligation. It's definitely not just 'once every five years, I tick a box'."

"Genuine Commitment"

The CAA also assesses the approach to safety of a candidate for Senior Person. This is especially important to achieve the benefits of SMS. Is there a genuine commitment to safety for its own sake, or is the bar they're shooting for, minimum compliance?

Mark Hughes says that's critical for him.

"An attitude is demonstrated in behaviour, so we're looking for behaviours that would illustrate they've got a positive, proactive and constructive approach to safety.

"We're also keen to assess their level of communication, with us, the regulator, and with their own people.

"Is it open and two-way? What is their attitude to employees reporting errors? To their employees offering quality improvement suggestions? To reporting occurrences to the CAA?"

"In an interview, I might ask something like, 'If you had a serious occurrence or deficiency at your organisation, who would you talk to about that?'"

"Given the critical nature of these supervisory roles in fostering a safety culture, it's important the candidate is prepared to go beyond simple compliance with the rules, and describe how they intend to raise the bar at their organisation."

The Basics

While knowledge of SMS, and a willingness to work with it, is new to the Senior Person interview, the longstanding fundamentals of a successful application remain the same.

"They have to do their research before applying," says Mark.

"They're accountable to the Director, so they need to know their way around the Act and the rules. They need to know their organisation well, its exposition, and its particular hazards and risks, and how they are to be managed.

"And of course the foundation of expertise, knowledge, experience and character remain the same if someone wants to be a Senior Person."

Read More

See the various sections on personnel requirements in Part 119 *Air Operator – Certification*. For further guidance, read AC 119-1 *Air Operator Certification*.

Go to www.caa.govt.nz, "Quick Links > Forms > Fit and Proper Person Process" for guidance on the role.

To read other Senior Persons articles published by *Vector* in Nov/Dec 2006; Jan/Feb 2012, and Mar/Apr 2012, go to www.caa.govt.nz, "Quick Links > Publications > Vector". ■

Andrew Crawford, Senior Person, Sounds Air

"Once I changed my mindset from a QA-based approach to one based on the principles of Safety Management Systems, it was relatively straightforward to pass on to staff.

"They learn more willingly and effectively from the people they know and trust. Yes, it takes time and perseverance, but it was crucial that adoption of SMS was done from the inside of our organisation.

"We are already seeing a quantum shift in thinking, and people taking genuine responsibility for SMS."

Image courtesy of Sounds Air.

SMS Certification for Chief Executives

Some companies become certificated in Safety Management Systems with seemingly little trouble. What do the CEs of those companies have in common?

A robust safety management system should flow through an entire operation in a positive way, influencing the safety-linked behaviour and values of each employee.

But it is the attitude of just one person – the chief executive – who largely drives whether the actual *process* of becoming SMS certificated is filled with hooks and hiccups, or is smooth and straightforward.

And it's apparent to the CAA that the companies which have become SMS certificated on their first attempt have chief executives who share a similar approach.

"They're already trying to build as strong a safety culture as possible," says Adrian Duncan, a CAA safety management systems technical specialist. "They have this goal of their business operating smoothly and safely, and their bottom line untroubled by the potential expense of having to deal with an accident.

"Then, before they do anything else, they've come to a thorough understanding of what SMS is all about. They've read AC100-1, researched credible sources on the internet, and consulted other operators. They've checked out the CAA's sector risk profiles, and they've attended a CAA safety management system workshop.

"None of this stuff is rocket science. They've taken the time to learn the fundamentals, and they've led the organisation through the introduction of their SMS.

"In learning those basics," Adrian says, "the CEs have realised that SMS is not just Quality Assurance. Nor is it occupational health and safety at the exclusion of operational safety. Organisations that typically fail in SMS have put all their energy into ensuring their workplace is safe, but haven't given due consideration to the management of their operational risks, which is the primary purpose of an SMS.

"And a safety management system is not just documentation either. The key word here is 'system'. There are 13 elements to an SMS, and 'the manual' is just one of those. Those CEs recognised that 'producing a manual' on its own and submitting it to the CAA wouldn't make much of a difference to safety, and therefore wouldn't be enough to meet SMS certification requirements."

British safety management systems specialist, Neil Richardson, who led a Wellington

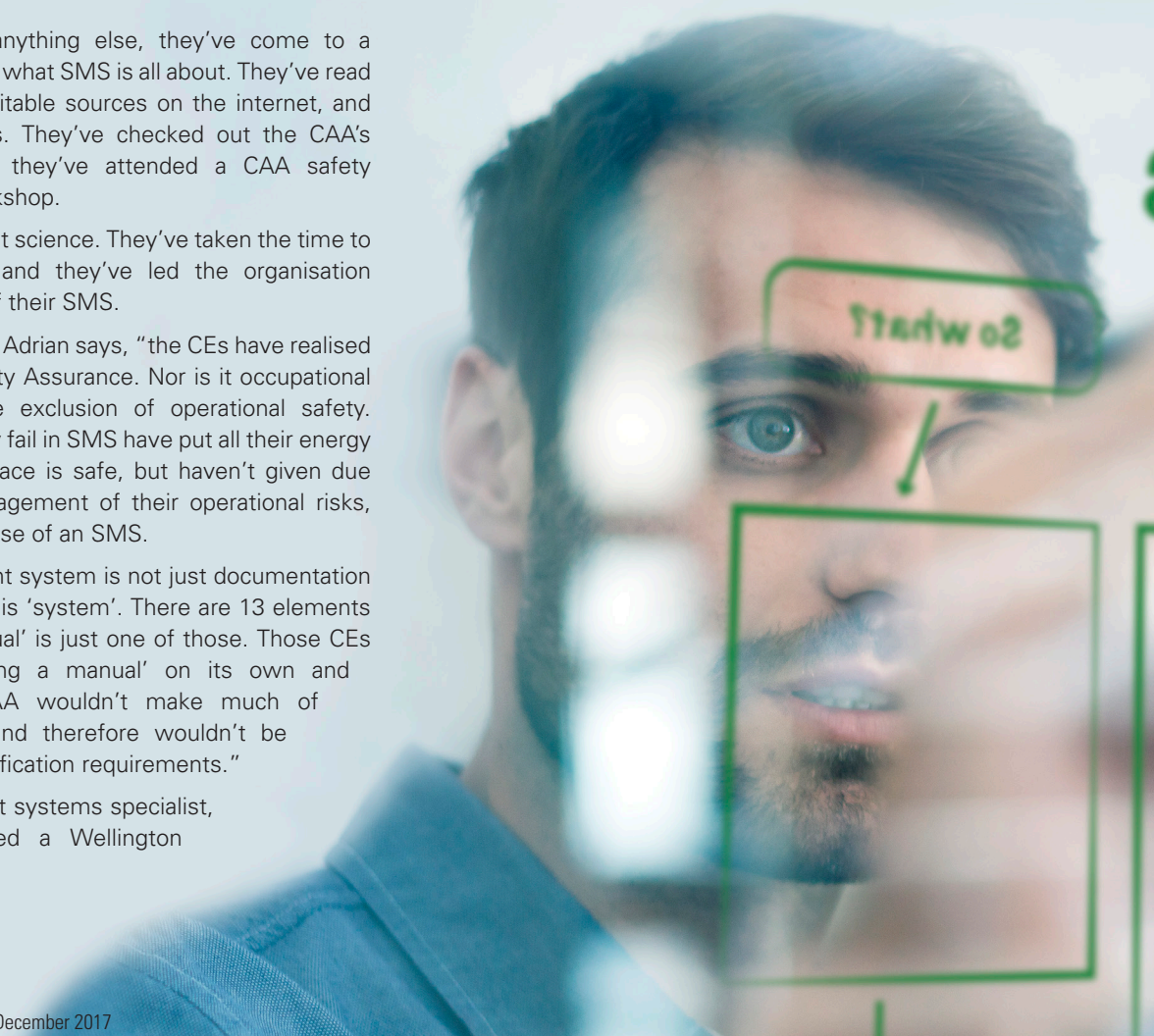
workshop for CEOs in April 2017, agrees SMS is more than just paperwork.

"The reality of 'doing safety' must extend beyond the manual, matrices and risk registers, and play out in the decision making and behaviour of people throughout the organisation on an hour-by-hour basis.

"Safety is fundamentally behavioural."

Only when those CEs fully understood what SMS was, why it's a requirement of ICAO, and what it meant for their business, in both obligations and benefits, did they begin to put something concrete in place.

"That first task," says Don McCracken, CEO of Oceania Aviation, "is to appoint a good safety officer who understands what SMS is, what it entails, and why it's beneficial to the organisation.



"Then the leadership needs to support the safety manager's decisions as they put risk reduction systems in place, and provide them with the resources to do that."

Adrian Duncan says that the CAA has no problem with chief executives getting in external consultants to assist in the design of an organisation's SMS. But, he says, some of those organisations fail in their first attempt to become SMS certificated, because the consultant has used almost a generic 'template', which proves to be a poor fit for that particular operation.

"CEs who've hired a consultant and said to them 'build me an SMS, don't take up my time with it, just get it done and into the CAA' were disappointed when their application invariably failed."

"The chief executives who got the most out of their consultant's fees worked closely with that person to make sure that what they came up with made sense to the CE, and would work well for their operation. This is the concept of 'scalability', where the system corresponds to the size of the organisation, the nature and complexity of the activities the organisation undertakes, and the hazards and associated risks inherent to those activities."

Neil Richardson agrees that each SMS should be tailored for individual operations.

"Keep it pragmatic," he says. "Make it work for you."

A constant refrain from those who've become certificated is that preparing for SMS implementation is more straightforward than it first looks.

Don McCracken admits that the hardest part was "slowly coming to the realisation of how simple it could be".

"Some people with practical intelligence might regard the SMS concept as obscure and difficult to put into place. But in fact, they are already practising safe behaviour to a high level every day. SMS is really just about formalising that practice."

Neil Richardson agrees about keeping it simple.

"SMS can be surrounded by mystery and clouded by jargon, but once you grasp its intent of reducing and controlling safety risks, it makes perfect sense."

But what does all that mean in a practical sense?

"Tool box meetings," says Don McCracken. "Daily updates on projects can identify opportunities for improvement and possible future risk."

"Everyone should be involved in reviewing existing known hazards, identifying new ones, and trying to imagine the future to determine what may be up ahead."

"Writing down any possible outcomes, preparing for the unknown event, creating a Plan B, and mitigating what can be mitigated."

That sort of commitment by every employee is led and modelled by the chief executive, not just to achieve certification, but also because there are benefits to SMS other than those surrounding safety.

"It gives CEs a really clear understanding of the way their business works," says Adrian, "and where the holes are. Weaknesses that maybe, weren't obvious before SMS, suddenly became apparent, and can then be addressed."

"Creating and sustaining the sort of culture that makes SMS part of daily business takes leadership," says Neil Richardson.

"But if fully embraced, the wider business benefits of 'being safe' can be realised through improved harm protection."

"Who wouldn't want that?"

The Director of Civil Aviation, Graeme Harris, regards the introduction of SMS as a potential solution to the very poor safety performance, in international terms, of elements of commercial general aviation in New Zealand.

"For many years, the prescriptive civil aviation safety regulatory system applied around the world has lagged behind the more demanding performance-based approach taken in the occupational health and safety field in many countries."

Continued over >>



"The ICAO mandate for the introduction of SMS recognises the need for a significant improvement in safety performance.

"That means a move from minimum standards in the form of civil aviation rules, to what is close to a 'best practice' standard required to manage risks to an 'all reasonably practicable steps' standard."

Graeme notes that assessing what is 'reasonably practicable' must be done in the context of international practice – not simply what is done in New Zealand.

"I see safety management systems as offering the opportunity to improve GA's relatively poor safety performance. I encourage operators to engage early with the CAA during the SMS certification process and to take every opportunity to learn from their colleagues who are already certificated.

"Those colleagues will be able to provide valuable advice on how best to develop the robust risk reduction strategies needed for SMS certification."

Some Tips

'Group 2' participants should be working on and submitting their implementation plans now. The cut-off date for getting those plans into the CAA is 30 July 2018.

There's a wealth of information on the internet, and particularly on the Skybrary – Safety Management International Collaboration Group – site, which puts out plenty of readable material, good for organisations of all sizes.

Check out the Sector Risk Profile of Parts 135 and 137 at www.caa.govt.nz, "Aviation Info > Safety Info > Safety Reports". Compare what the profile says about risk with what your organisation is already doing about that risk.

If you decide to get in a consultant, ask around first. Who did other, successfully certificated, organisations use?

The CAA web site has a range of resources to help with SMS implementation. Go to www.caa.govt.nz/sms.

There's also good material at www.zeroharm.org.nz/ and at www.deloitte.com/nz/healthandsafety/.

If you want to email the CAA's SMS team, it's sms@caa.govt.nz.

Applications need to be with the CAA no later than 60 days **prior** to the organisation's implementation date (refer AC100-1). The application needs to include:

- » An appropriate certificate-type application form, eg, 24119/01, 24137/01
- » Amended exposition/SMS manual and associated matrices
- » Completed form 24100/02 Evaluation Tool
- » Senior Person FPP application(s).

Part of assessing whether an organisation has sufficiently robust risk reduction strategies to become SMS certificated includes an onsite visit by the CAA. That includes an interview with the nominated safety manager, the chief executive, and discussions with staff at all levels.

The CAA team will test that the 'elements' of the SMS are in place and are suitable for the organisation, but what's also important are discussions with people throughout the organisation. The team will be testing their understanding of that organisation's SMS, and their involvement in it. It's finding out about the culture and the leadership, and the buy-in of every employee. ■



Photo: iStock.com/kasto80

SMS – Advice from Heli Operators

The first two helicopter operators to become SMS-certificated give their top tips for implementing SMS in any operation.

Taranaki-based Ice Aviation, and Rotor Force in the Hawkes Bay are two 'early adopters' of a Safety Management System. Both 'Group 2' organisations*, they are the first two helicopter operations to become SMS-certificated.

Here, Jim Finlayson from Ice Aviation, and Tracey Campbell, the SMS Manager for Rotor Force, give their top tips for SMS certification success.

It's Not That Hard

Tracey: It really isn't that difficult, particularly if you already have a good QA system. Don't reinvent the wheel. Use what you already have, just upgrade it to match what's needed.

Jim: Don't be daunted. It's not that onerous. Break it down into little segments, review what you already have and then look at what you need to add.

Where to Start

Tracey: Do the gap analysis first. That will identify what you already have, and what you need to meet the new requirements. Focus first on your critical operational risks, the high consequence events.

Jim: Most companies with a robust QA system will already be identifying hazards and managing risk and conducting safety investigations. Assess that first. You could find that all that needs to happen is for it to be properly written down. In today's world, you need to have something concrete for the auditor to assess.

Staff

Tracey: One person cannot do this alone. Joe Faram (CEO of Rotor Force) called all his contract pilots in for a day to explain what SMS was about and how they would be involved.

The system is only as good as the organisation's safety leadership and culture. Joe is really proactive in this area. His contractors respect him and if he believes in it, and walks the talk, they will too.

It would be a waste of time if somebody in leadership treats it as a box tick.

Jim: I have only one staff member – me. That made composing the implementation plan more difficult. I had to tailor guidance, obviously aimed at larger organisations, to my tiny business. That was the biggest challenge for me.

Now What?

Tracey: We'll be continually reassessing and improving Rotor Force's SMS, establishing and reviewing key safety performance indicators, making changes where required, and identifying trends by looking for reoccurring types of events, common causes or risks.

Jim: You have to keep at it. SMS is not about 'the manual'. It's not about certification. It's about on the ground, day-to-day, ongoing safety measures. There's only me in my operation, but to get a fresh eye, I have a safety manager who's a very experienced helicopter pilot and who has a background in safety management. My flight examiner is the safety manager for another heli company. So both are very focused on safety and neither is hesitant to tell me when they think I need to do something differently.

"Focus first on your critical operational risks, the high consequence events."

Where to Get Help

Tracey: Joe brought me in to prepare an implementation plan because I have a background in system creation and management, as well as in workplace health and safety.

If you can't do it yourself, get someone in to do it for you. Ask other operators who they got in, what that person's background is and their experience, and what the operator thought of the implementation plan.

Jim: I was convalescing after a shoulder operation so could put the time into the implementation plan, myself. It took me about two weeks, full time.

But if you can't do it yourself, and you can't afford anyone else to do it, you can ask me, or people like me, for low cost – or, depending on the circumstances, even no cost – mentoring. I already have three participant operators that I'm advising. And Aviation New Zealand has put a call out to SMS-certificated operators to do something similar.

* To find out more about your obligations as a Group 2 organisation, go to www.caa.govt.nz/sms.



Photo courtesy of Rotor Force.

Special Tip

Tracey: If you're not sure what's required, my suggestion would be for someone from your organisation to go to a CAA workshop. I have a background in putting systems together but I still found the workshop useful. And it's free!

Jim: After I'd drafted the plan, I tested one part out, to make sure it was useful. Your emergency response plan for instance: a little desktop exercise might uncover that in reality, it wouldn't work, or wouldn't be useful. It will also show the auditors when they come to assess you at the beginning that you know for sure the system you have designed does work.

Final Words

Adrian Duncan (CAA Team Leader Airworthiness, Helicopter and Agricultural): The SMS certification of Rotor Force was relatively straightforward, because management had taken responsibility for the development of SMS from the start. They had also tailored the system to fit the size of their organisation and the specific nature of the activities it undertakes.

Joe Faram: Embrace SMS, don't resist it. View your safety management system as a tool to improve not just the safety, but the quality and control of your business. It will create efficiency, effectiveness, and profitability. With SMS you'll be constantly in tune with your business and that of your clients. ■

Summary

- » Don't be daunted.
- » Don't reinvent the wheel.
- » Do the gap analysis first.
- » The system is only as good as the organisation's safety leadership and culture.
- » SMS is about on the ground, day-to-day, ongoing safety measures. It's not about 'the manual'.
- » If you can't do it yourself, get someone (who knows what they're doing) to do it for you. Or contact Aviation New Zealand for SMS-certificated operators willing to mentor.
- » Go to a CAA workshop, even if you think you know what to do.
- » Test one part of your plan to see if, in reality, it works.
- » Embrace SMS. It will improve not just the safety, but the quality and control of your business, its efficiency, effectiveness and profitability.

SMS – Your Deadline, Your Responsibility



A number of organisations are approaching the deadline for certification of their Safety Management System (SMS) and it's critical they stick to it.

Organisations have begun submitting their SMS implementation plans, which tell the CAA what they're going to do and *when* they're going to be ready for certification.

The plans that have been approved will include a date for implementation approved by the Director. This is the date that an organisation's SMS must be certified by.

Chris Lamain, the CAA's SMS Implementation Lead, says individual organisations nominated a date when they would be ready to fully implement their SMS.

"Their plans told us how they are going to get there, the gaps that needed addressing, the timeline, and the resource required to do it," says Chris.

"We've looked at the plan, its feasibility – the tasks, proposed resource, and timeline to implement – and the CAA's ability to certify the organisation at the proposed date for implementation. Based on this information, the Director has approved a date for implementation for each organisation."

He says there is a practical reason for that.

"We don't have the capacity to process and certify all organisations at once on the final date for certification required by the rules."

While the rules set a final date for certification, organisations should not make the mistake of thinking they have leeway if they nominated an earlier date.

"We can't give extensions to all of these participants. There's a regulatory date here – the date approved by the Director," says Chris.

"We've never regulated this way before – normally it's a fixed date. This time we said 'you tell us how you are going to do it'. The CAA gave them some latitude."

There is a regulatory process for managing participants who don't meet their deadline.

For more information about SMS, including where to send questions, go to the CAA web site, www.caa.govt.nz/sms. ■

SMS Implementation

Implementation plans are flowing into the CAA for approval. If you're still unsure how to go about yours, here's some advice from two companies whose plans have been approved.

Getting Started

"This was the most difficult part," says David Norris, Quality Assurance Manager for the Hamilton-based Kiwi Balloon Company. "But using the structure of Revision 1 of AC100-1 really helped. It breaks down the components of SMS and provides explanations. Setting up a table using the template from Annex D created a means of making a structured start to building the gap analysis."

Assessing Risk

Tim Rayward, Manager of Flight Operations at Air Safaris, in the Mackenzie Country, says most aviation operations would have been assessing and managing risk for years.

"There's no need to reinvent the wheel. We just looked at what we already had in our exposition, our SOPs, our training manuals, checklists and so on. It was almost all there already."

"The challenge for us was in documenting it in a coherent way, so anyone coming in from outside can quickly see what we are doing."

David Norris kick-started his company's process by looking at its existing health and safety hazard assessments which, in part, incorporated risks.

"I then added in risk scores for all stages. That included a risk rate for the hazard or risk, then a second risk rate, once controls have been put in place. I used the risk matrix from CAA SMS Booklet 4."

The company also updated its safety policy to incorporate SMS. That has the added benefits of bringing up to date any documentation, for both the new health and safety legislation and SMS.

"Updating the policy also shows a commitment by the company to SMS," David says.

Tailoring it for Your Company

David says using the gap analysis template, he worked through the Kiwi Balloon Company exposition to see what matched.

"Most of the body of SMS exists within the exposition. Start with the operational aspects because getting those into place and working gets the system nominally operational."

"Then I was able to assess where the shortfall was, what action or task was required and briefly summarise that, assigning staff members to those tasks."

Tim believes rather than companies starting with the SMS documentation and looking at how they already comply, they should do it in reverse.

"You could lose your way a bit starting with SMS requirements. It's better to look first at what you have in play, then match it to the SMS material."

"For instance, to comply with the rules, we have fuel management policies to manage the risk of running out of fuel. So that's all in place. Really, it's not like we need to do anything more."

Working With the CAA

David Norris says he enjoyed working with the CAA staff on the implementation plan.

"I think we're all learning and everyone needs to share knowledge and experience."

"It's far better for people in the aviation industry to see CAA as a facilitator rather than a regulator policing the rules. Too many people regard ignorance of what SMS entails as a defence."

Other Bits

Both companies made use of the evaluation tool, which provides key indicators and means of compliance acceptable to the CAA.



Plans – Top Tips

David Norris advises that companies really take their time working through the evaluation tool. "You cannot take shortcuts with this. The CAA will be looking for the detail of 'Element 0' which is in the evaluation tool, to appear in your application with the gap analysis."

The evaluation tool (CAA form 24100/2) is at www.caa.govt.nz, "Forms".

David says one set of risks every operator needs to think about is 'what if I cannot run the business or fly the aircraft?'

"The risk that needs to be considered in an SMS is what action will be taken if, say, a pilot leaves during the peak of the business operation. SMS is also about sustaining the business."

David says the SMS implementation plan should include how long the company estimates it will take for each SMS task to be completed. He also says included in the thinking about SMS should be the consideration of the cost to move to a Safety Management System.

Up and Running

David says once the operational side of SMS is in place, he'll concentrate on the management aspects, including monitoring.

"SMS cannot be put on a shelf to gather dust. Whether or not the SMS hazard and risk documentation has been part of an internal review will be a key part of any CAA audit. The documentation may not need to be changed, but it does need to be reviewed."

Building a Culture

Tim Rayward says apart from the nitty gritty of keeping documentation and procedures updated, there is a 'big picture' approach that will keep SMS fresh.

"You can have a Safety Management System sourced in your exposition and other safety documentation, and there is nothing wrong with that," he says.

"But you can go further and make your SMS your safety 'umbrella', and take it into every aspect of your operation. For instance, with active staff involvement, with regular round table staff meetings about safety, with a robust reporting system, with the QA pilot and manager talking about safety every single day."

"At Air Safaris, risk and safety is not something 'added on' to our business-as-usual. It forms the basis of our business-as-usual."

"For us, SMS will be a way of thinking, not just compliance."

The Assessment

The CAA says the Kiwi Ballooning Company clearly identified the current state of the organisation, where it wanted to be and therefore where the gaps were.

"David identified what was needed under SMS," says CAA's SMS team member Adrian Duncan. "He looked at what the company needed to meet those requirements. And crucially, he documented everything."

"Then he took the information he'd gathered about the 'gaps', assigned time and resources and people to them, and that showed a clear plan of how the company was going to get there."

SMS team member Austin Healey says Air Safaris' implementation plan was impressive in that it provided an overall picture of how they intended to proceed, supported by a clear and logical timetable of activities, risk management and governance.

"It was just what we were looking for to give us confidence that the plan could succeed," he says.

For more information about SMS, go to www.caa.govt.nz/sms.

To keep up to date with developments in SMS, subscribe to our email notifications at,

www.caa.govt.nz/subscribe

For free booklets on implementing a Safety Management System, email sms@caa.govt.nz. ■

Tim Rayward, "SMS will be a way of thinking, not just compliance."
Photo courtesy of Air Safaris.

Risk – Where to Begin

Implementing a Safety Management System for your organisation is now a rule requirement for most organisations. For some of you, there's not much more than 16 weeks to have SMS plans in to the CAA for approval.*

What's in it for you?

Establishing a Safety Management System (SMS) provides a simple and co-ordinated approach to preventing undesirable events, including accidents.

No 'undesirable event' is without cost, so a robust SMS leads to a more profitable business. There's an old saying, "If you think safety is expensive, try having an accident."

A good safety record enhances the reputation of your organisation, and a safe working environment helps to minimise staff turnover, which is another cost saving.

Start by Identifying Hazards

Hazards are objects or conditions that could cause injuries to staff, damage to equipment or structure, loss of material, or a reduction in the ability to perform a function.

Hazards are as varied as fatigued pilots, inadequately completed tech logs, and insufficient staff chasing tight deadlines.

Under SMS, staff *proactively* identify hazards, rather than only dealing with their effects after the event. That can be done by analysing occurrence data for instance, or surveying all employees, or holding a brainstorming session with key staff.

Mike Groome, the Chief Executive Officer of the Taupo Airport Authority advises organisations still developing their SMS that it's critical all possible stakeholders are engaged in the process.

"This isn't necessarily only those directly involved in your operation, but anyone who is affected, or affects safe outcomes. Get them all in a room and talk!"

Managing Risk

Risk management is not the same as hazard identification. A hazard is something that can cause harm, and risk is the potential outcome of that hazard. For example, an uneven runway surface would be considered a hazard, but the risk comes from operating on that runway.

Risk is the likelihood of something happening, combined with the severity of the consequences if it does. One way of assessing risk is to design a matrix, such as that on page 9.

A matrix doesn't need to be drawn up for all organisations however. Smaller scale operators might just rank their risks according to what they believe is the highest.

Not all risk can be completely eliminated, but it can be managed by ensuring it remains at an acceptable level. That involves reducing the likelihood of it occurring, or the impact of the consequences if it does.

Continued over »



Never assume that the absence of accidents indicates an organisation has robust 'safety health'.

When anyone asks me how I can best describe my experience in nearly 40 years at sea, I merely say uneventful... I have never been in an accident of any sort worth speaking about... I never saw a wreck and have never been wrecked, nor was I ever in any predicament that threatened to end in disaster of any sort.

Captain Edward John Smith, RMS *Titanic*

Doing something about it

"I visited an operator recently," says Steve Backhurst, a CAA Airworthiness Inspector, "and as we entered the hangar office, my host said 'oh, mind the step' indicating a step up into that area. They'd obviously identified that step as a hazard, but had done nothing about it, other than to tell people to 'watch out' for it."

Once a hazard has been identified, it needs to be eliminated, or the degree of risk it presents minimised. In the case of the step, that could be done by building a ramp over the top of it, or by erecting a large and obvious sign next to it, or by the front edge being painted a bright colour.

"A Safety Management System is only as good as the degree to which hazards are dealt with," says Mark Hughes, CAA's General Manager of Air Transport and Airworthiness.

"If there's little follow-up, everyone's relying for safety on something that does not actually exist. They think everything must be okay because hazards have been identified."

"The SMS can even be nicely written down, but if it's not enforced and practised, the end result is the same as if there was no SMS."

"In fact, it's worse than knowing that you don't have any kind of SMS, and need one."

Dependence on Good Reporting

"A strong Safety Management System relies on data," says Mark Hughes. "And that data comes from staff not just reporting the large incidents, but also the small things, like poor lighting in the maintenance area, constant disruption to tasks by having to answer the phone, or a pilot's regular rushed fuel handling at the pump."

"Good reporting helps to identify weaknesses in the system. Conversely, someone who doesn't report is depriving the organisation of the opportunity to prevent an accident. Everyone has an obligation to report."

At Air New Zealand, reporting was made easier by the introduction of the Korusafe online database. All staff use the system for submitting safety reports.

Reports are then collectively reviewed by the safety team, receive an operational risk classification, and actions are tracked to completion through the same system.

It's also possible for the submitting staff to see the progression of their report through the database.

Encouraging Reporting

Staff are not going to report any genuine mistakes, or events arising from them, if senior management humiliate or penalise them for it.

A management culture recognising that human errors occur, and that lessons can be learned from them, will encourage staff to report.

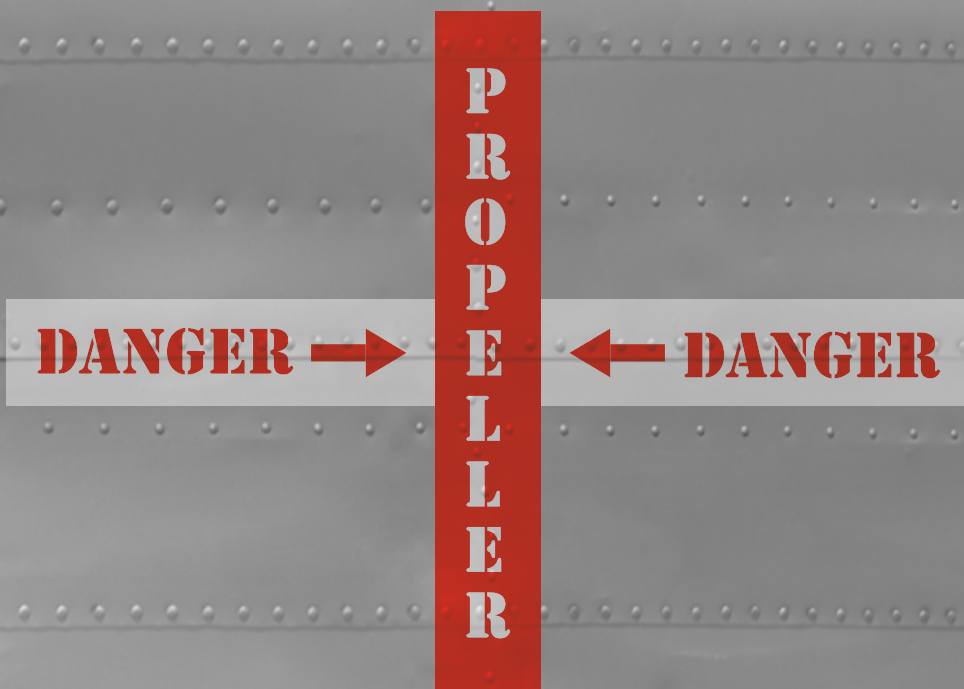
As Mark Hughes says, "In the same way that employees have an obligation to report, it's the responsibility of management to create the right atmosphere for reporting."

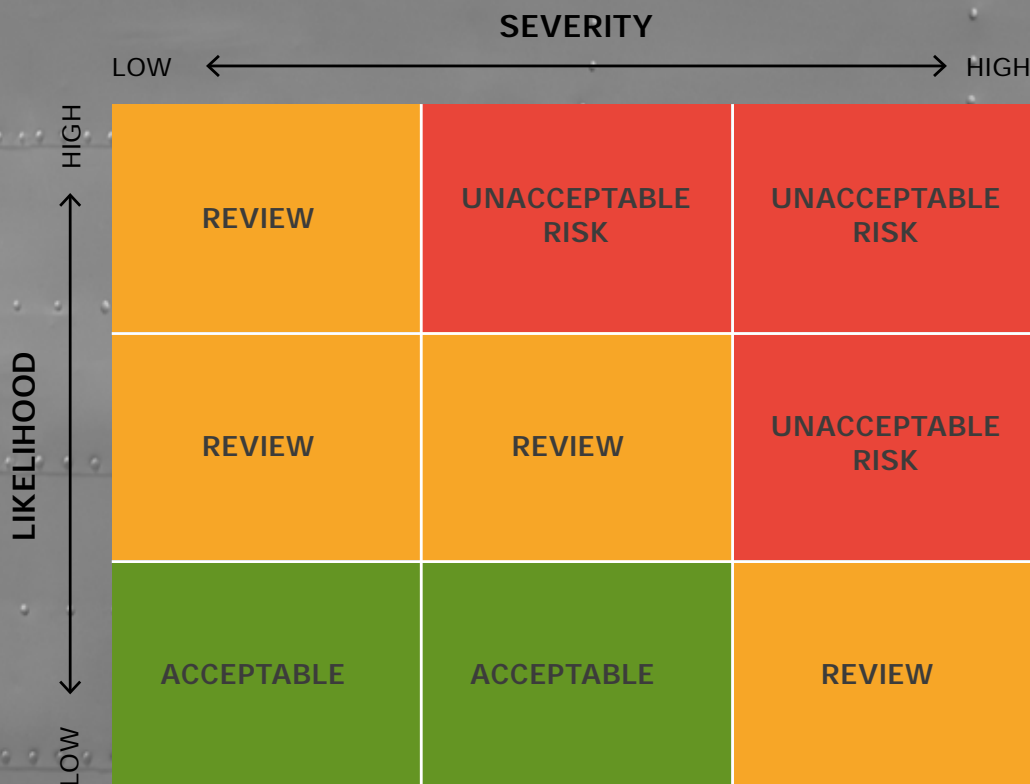
Risk is Dynamic

Identifying *today's* hazards, and assessing and dealing with *today's* risk, is not the end of the process.

Risk ebbs and flows, depending on the working environment: staff numbers fluctuate; an operation carrying little risk in summer might carry more in winter; the introduction of new technology presents higher risk if staff are not properly trained to use it. All such factors influence the nature, and degree, of risk to an operation.

Undertaking regular reviews of risk, as well as at high-risk times, will keep an SMS robust. Times of higher risk would include periods of major expansion, or major staff changes.





This type of risk matrix combines the likelihood of an event happening with the severity of the consequences if it does. Those potential events that score high on both are the ones that pose an intolerable risk. Those that score low on both can probably be lived with. Some that are high on one, and low on the other, or that are middling on both, should be reviewed regularly to ensure the risk they pose has not changed.

Similarly, an ongoing exchange of safety information between management and employees will help everyone understand the state of safety in the organisation, and their role in maintaining it.

One way Massey School of Aviation has ensured that it is continually improving safety is through using an external analyst to identify and measure any 'gaps' in the school's SMS.

That has provided the school with a prioritised list of what needs to be improved, and the use of someone outside the organisation has given it a more objective result.

Put someone in charge ... but don't leave them to it

Someone – appropriately qualified – needs to have oversight of the whole SMS. That doesn't mean, however, only one person has responsibility for hazard identification, reporting, and risk assessment.

That obligation falls on all employees, from the CEO to the maintenance shop junior.

Ideally, it becomes part of the everyday routine of each employee. It does not stand apart from everything else, but is woven into the fabric of the company. For instance, regularly challenging staff about their understanding of the risks associated with the job they're about to do, or incorporating risks and hazards discussions into regular meetings will help to make SMS part of business as usual.

South Island-based Air Safaris, with 12 staff, has developed a company 'safety culture', led from the top.

"We have regular, formal safety meetings. But with a small close-knit team, we also use the opportunity to discuss, over our daily cuppa in the crew room, safety considerations and any new issues," says CEO, Richard Rayward.

"Safety is embedded in the company ethos. It's not just the pre-winter and pre-summer briefing, day-to-day safety practices are front and centre of every employee's mind."

Nil Desperandum

Paul Kearney, the Quality Assurance Manager for the Massey School of Aviation says operators should take heart that developing an SMS is easier than it looks.

"A lot of organisations may worry that there is an insurmountable amount of work in implementing an SMS. However, for those with Quality Management Systems already, it's mostly done."

And Stephen Burrows, Oceania Aviation's former Group Quality Manager, says to keep it simple.

"Try to reduce the number of systems, processes and tools so you aren't making things so complex, they're unsustainable. Look around for what's already out there that works and then tailor this for your use."

Richard Rayward of Air Safaris agrees.

"SMS might at first look daunting but keeping it simple and practical for *your* company means staff will understand it and support it." ■

Your SMS is Yours and Yours Alone

Your SMS needs to be tailored specifically to your operation to manage your risks and build a safety culture that works for you.

No two aviation organisations are quite the same. You might run a similar operation to your neighbour, but your staff, aircraft, premises, hazards, and associated risks may be totally different. That's why your SMS needs to be tailored to your business.

"You can't just pick up a template and insert your name and be done," says Chris Lamain from the CAA's SMS team.

Developing an SMS plan is different from the ordinary process of writing an exposition.

Some organisations may make use of a consultant to develop their implementation plan (as part of the broader SMS implementation process) – and that's fine, providing they really understand your business.

Most experienced consultants deal with safety across a range of codes of practice and legislation.

"Consultants can be very valuable to your business but they need to spend time on site and talk with your staff. If they don't, how can they best understand your business?" says Chris.

One consultant who works with several organisations on their SMS implementation is Heather Andrews. Understanding the organisation is her first priority.

"I need to thoroughly understand the organisation, including its goals and objectives," says Heather. "What the company structure looks like; what certificates it has, and any codes of practice that may be relevant to the organisation.

"Once I understand that, I do a 'gap analysis' against the relevant standard based on the organisation's exposition. This helps the organisation identify the best way to close those gaps. From there, a work plan can be implemented with accountabilities."

Heather says that the most important part of any SMS is commitment from senior management.

"There should be regular involvement of senior management, including the CEO, through attendance at safety committee meetings and training sessions," says Heather.

"Cultural changes are difficult to achieve, so an effective implementation plan needs to provide plenty of time for training sessions and for people to become comfortable with the new processes.

"If staff see senior management interested in safety then they also will have more commitment to the SMS."

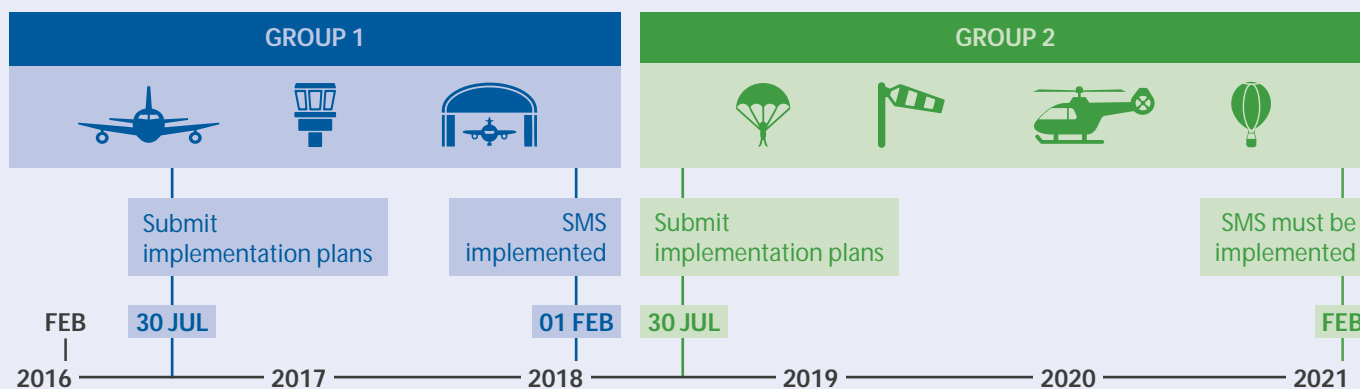
Heather says that time management is another major advantage in using an external consultant.

"Planning SMS implementation takes time. Sometimes these projects get left to the last minute and may not get completed to a standard that reflects the organisation. Using an external consultant can mean these projects get addressed in a timely manner."

Chris Lamain adds, "Your consultant needs to actively work with you, not just for you, to ensure your SMS truly is yours and yours alone – your ownership is vital to building and fostering a robust safety culture."

Further Information

For more information refer to the CAA web site, www.caa.govt.nz, "Safety Management Systems (SMS)". You can also check out the articles "SMS – What it Means for You" and "Risk – Where to Begin", in the March/April 2016 edition of *Vector*. ■



SMS – What it Means for You

The rules mandating Safety Management Systems became effective on 1 February 2016. That means most organisations have to have a CAA-approved set of procedures and processes to identify hazards and deal with their associated risks.

“There’s no doubt that the introduction of SMS is one of the biggest improvements to safety in civil aviation, possibly since the Civil Aviation Act in 1990,” says Mark Hughes, CAA’s General Manager of Air Transport and Airworthiness.

“While compliance to rules has worked well in the past, things like an increasingly diverse mix, higher density of air traffic, and the complexity of some of the automation, is increasing risk in the sector. So if we just stay with compliance to rules, our safety record will get worse.”

So what is a Safety Management System and what do you do next?

“SMS is about asking ‘what are the hazards that could affect our operation? How can we manage their associated risks?’ It’s about reducing the risk of harm to people and property to as low as is practicable,” says Mark.

Many organisations will have elements of an SMS in place because it builds on an already-established Quality Management System.

For instance, does your organisation have a written-down, widely-communicated and well-maintained safety policy?

Before you start any new activity, do you identify safety hazards, and evaluate the risks that are involved?

If you say ‘yes’ to those questions, you already have the basics of an SMS in place.

“Otherwise, you could start by having a staff brainstorming session,” says Mark Hughes. “Get everyone to identify the hazards they’re aware of, because of where they work and what they do. Then consider the risk to safety that these hazards pose to the operation.

“Pull together all the data you have on occurrences in your operation. That will be one indicator of where you need to concentrate your time and energy. If you don’t have much of that sort of data, go to other operators and ask them about the hazards they’ve identified.”

The CAA has a series of booklets on building a Safety Management System, email info@caa.govt.nz for

a free kit. CASA in Australia also has guidance – go to www.casa.gov.au/sms.

For more information about SMS, including Advisory Circulars, where to send questions, how to receive email updates, and training, go to our web site, www.caa.govt.nz/sms.

Who and When?

Existing participants under Parts 121, 125, 145 (those supporting 121 and 125 operators), 139 (those supporting international operations), and the 170 series are required to have their SMS Implementation Plans in to the CAA by 30 July 2016.

Each of these operators will then propose a date they will be ready to fully implement their SMS. The final date they can propose is 1 February, 2018.

The CAA will then review the Implementation Plan and the proposed date. A confirmed date for implementation will then be set by the CAA, taking into account:

- » the date proposed by the organisation
- » the date the organisation’s certificate is to be renewed
- » the capability and complexity of the organisation
- » the risks inherent in its activities
- » the workload of the CAA and the organisation.

Existing participants under Parts 115, 135, 137, 141, 145 (those supporting other than 121 and 125 operators), 139 (those not serving international operations), 146, 147, and 148 are required to have their Implementation Plans in to the CAA by 30 July 2018, and their SMS up and running by 1 February, 2021.

The same process applies to this group, in terms of getting a date approved for implementation, as to the first.

Applicants for a new organisational certificate submitted after 1 February 2016 should refer to Annex F, AC100-1 (Rev 1) for the options available to them.

For more about managing risk as part of a Safety Management System, go to page 7. ■



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