

PACDEFF 2012

Kitem presentum. Mwella Kith.

That is a little bit of the language spoken by the locals on St Barts, a small island in the Caribbean. The language is a curious Norman dialect with French influence.

If you were planning to go on a scuba diving weekend to St Barts, being **aware** of the language spoken there would allow you to at least purchase the correct phrase book from your local bookshop.

If you were going to spend a couple of weeks on St Barts, it would be useful to **know** some words and phrases. The first phrase you might learn is “kicotay lavatory?” – Where is the toilet? You need to know this because the arrival at St Barts International can be exciting.

Video: Overrun at St Barts

That strip is okay for length. It is the hill on short finals that is the problem.

Image: Low flying aircraft

If you were cool with the landing, another useful phrase might be: “Mwen ta le ji bee” – I’d like a beer.

With a little bit of **knowledge** and some body language, you would probably get by reasonably well.

However, if your boss said: “Bloggs, I want you to set up our operation on St Barts. Plan on being there for a couple of years. Then you would need to be able to **use** the language. This is not just a matter of learning more words and phrases, but also about understanding how the language works. You could study the grammar, word order in a sentence, pronunciation and so on. So for example, you would learn to leave out “is” and “am”. Where John? I sick.

To form a plural, you would add “dem” to the noun: De boy – one boy. De boy dem – several boys.

There is no “th” sound. You would say authority rather than authority.

And so on. By learning how the language is put together, you would become proficient in using the language.

Why am I telling you this? The reason is I want to highlight the differences between **awareness**, **knowledge** and **skill**.

Awareness is when you are conscious of something. So, you are aware that a French dialect is spoken on St Barts.

Knowledge is when you know some information or facts. For example, you know the phrase “Mwen ta vle ji bye” means I’d like a beer.

Skill is when you are proficient in **doing** something. You have a skill if you can effectively communicate with the locals in their language.

So what has this got to do with human factors training? Well, awareness, knowledge and skill are the three levels of achievement that your training program should deliver.

Nearly all training delivers on the first two: awareness and knowledge.

For example, these are the Situational Awareness outcomes for one of Australia’s large operators:

Image: Situational Awareness topics

Now this is all fine for awareness and knowledge, but being able to recognise, list or identify does not help you remain situationally aware. It does not improve your skill.

It is this third element, skill, that I want to concentrate on today. Now it sounds like a simple task - devise some training techniques that will help develop skills. There is nothing simple about designing a training program for skill development. You may recall Ian Banks (CASA) saying yesterday that individuals tend to be given the knowledge and left on their own to work out how to turn this knowledge into skill. He also noted that skill development was the area in most need of attention in many of training programs.

Consider the single skill of learning to read. Here are the first of several hundred techniques you could use.

Image: Learning to read

These strategies have been worked out since the Phoenicians invented the alphabet about three and a half thousand years ago.

Human factors in aviation hasn't been around that long: maybe a century as airmanship since Wilbur and Orville's time, maybe thirty years as CRM since Tenerife, or maybe twelve months as CASA mandated training. The point is, these are early days. There is no proven right or wrong way to do this.

Let's look at one way you might attack it.

In developing a skill, the first task is to precisely identify that skill. One of the best ways to do this is to start with an incident in **your** operations. There are two advantages of this:

- a) The fact that the incident has occurred clearly shows that one, or several, skills are deficient.
- b) By linking your training to incidents in your operations, the interest and understanding of your staff will be greatly enhanced, which means your training program is going to be much more effective.

So let's look at an incident so that we can see how this works. This footage was taken at Moorabin in December last year. Keep an eye on the taxiway just beyond the threshold.

Video: Runway incursion

The taxiing aircraft was cleared by the tower to taxi back to base across runway 13R, but to hold short of that runway.

Image: Airport diagram

The holding point was appropriately marked, but as you just saw, the aircraft failed to stop.

This is a classic case of loss of situational awareness.

Now, there are many separate skills that combine to produce **good** situational awareness.

As most of you would be aware, maintaining situational awareness is the result of correctly perceiving information, effectively analysing that information, and successfully projecting what will happen on the basis of that analysis.

If you fail in the first instance to correctly **perceive** the information, as happened here, then the whole process is doomed. The instructor and the student pilot in the taxiing aircraft have failed to perceive the holding point.

Why might a person might fail to perceive information? Research indicates that it is because either:

- a) The information wasn't available.
- b) The information was available but difficult to detect.
- c) The information was simply missed.

It is not a or b: the holding point was clearly marked and there were no obstructions in the way. The information was simply missed. This is what happens in the vast majority of cases.

The next step is to work out **why** it was missed. It is usually due to either distraction, boredom, overload or fixation.

The ATSB report on this incident states that the instructor reported being **distracted** by discussions with his student at the time of the incident.

So for this particular skill, the strategies we need to develop should help minimise distractions. We want a way of repeatedly, correctly practising minimising distractions. Here are some methods to try:

Rigidly practise eliminating irrelevant chat during important activities. Make it your standard procedure. On the flight deck, this would involve implementing a sterile cockpit during critical phases of flight. This strategy would have obviously been effective in this incident.

However, you can't always control distractions. I am sure many of you have experienced particularly noisy cockpits. So you need to practise concentrating on one activity in a noisy environment. For example, practising reading a book in front of the television is a good way to train your brain to focus on the task.

Practise using a physical means of blocking distractions. For example, if you are unable to remove the distraction, such as a noisy piece of ground equipment adjacent to your walk around path, find some ear protection to help you focus on the inspection.

Practise issuing instructions to others to prevent them from distracting you. This may be as simple as issuing a "Not now" command. Away from the job, you can try this one out on the kids in the back seat.

Notice that with all of these strategies the verb "practise" is mentioned. This is the fundamental pillar of improving performance: repeated, correct, practice. I can't stress that enough.

Being **aware** of distractions and having **knowledge** of distractions will give you limited performance increases. But this alone is not enough. Actually **doing** distraction minimising exercises and then incorporating this into your day to day routine is how dramatic improvements in performance can be achieved. How skill can be polished.

If you want to improve your performance in a physical activity, say golf, you could watch the Australian Open, read Golf Monthly, talk to Adam Scott, or play nine holes. Repeatedly practising swinging a golf club over nine holes is the best way to increase your skill.

If you want to improve your performance in a cognitive activity, say minimising distractions, then you should repeatedly practise distraction minimising exercises. How good would it be if, every time your crew presented for work, they implemented a sterile cockpit, they focussed effectively,

they had a number of physical strategies to block distractions, and they were confident in instructing others about minimising distractions.

Let's have a look at another example. This incident occurred at Ayers Rock airport in March 2010.

Image: Aircraft loading

Six crew and 91 passengers had boarded the aircraft and the pilot in command instructed the cabin crew to close the aircraft doors.

The ground crew runner onboard the aircraft confirmed with the cabin crew that they were ready to close the aircraft doors.

The runner descended the portable stairs and stated 'doors closed' to the movement controller over a two-way radio.

The stair operator, located at the foot of the stairs, and the marshaller, located at the base of the stairs under the fuselage, reported hearing the runner say 'doors closed'.

The cabin crew member assigned to the left forward door experienced difficulties unlatching the door from the fuselage.

A second cabin crew member came to assist. She placed one foot outside the aircraft onto the stairs. At the same time, the stair operator released the brakes and commenced moving the stairs away from the aircraft. The marshaller, who could not see the aircraft door from his location, also assisted in moving the stairs.

When the stairs commenced moving, the assisting cabin crew member, who still had a foot on the stairs, fell through the open door onto the apron.

She sustained serious injuries in the fall.

There are a number of players in this incident: the two ground crew who moved the steps, the "runner" who declared "Doors closed", and the cabin attendant who stepped out of the aircraft. Let's just consider the runner, who incidentally, was employed by a contracted ground handling agent from another operator.

What went wrong here? You could identify poor communication, incorrect decision making, lack of teamwork, or loss of situational awareness. As with many incidents, it could be a combination of several of these. For the purpose of this exercise, I want to look at lack of teamwork.

Now in this instance the runner may have had a good understanding of how he operated within his team, however he didn't appear to have an adequate appreciation of how his role interacted with other teams. This can be difficult to appreciate, because your team might work together every day for a year, whereas the larger team in this example, will only be a team for the period of the turnaround.

So how can we help build this employee's ability to view their role as part of a bigger team? Some practical strategies may include holding a toolbox meeting where staff list who they work with and discuss how they think their role interacts with that person. This may highlight a clear lack of understanding of what cabin crew do. You may want to organise some industry awareness training. Ask the operator if new ground staff can jump on a few sectors to see it from the other side.

Let's think outside the box here, maybe you might like to get a junior staff member to organise the next social BBQ. How will this help, you may ask? OK, it's a bit abstract, but by getting that person to organise a team event, they will start to see that their actions affect people not directly involved

in the immediate task, they may also learn to communicate more effectively with a wider group of people and hopefully they will get a certain buzz from a successful team activity which will encourage them to view themselves more as an integral part of dynamic team.

Now, practising how to be a better team member may seem a bit excessive to the requirements of your job. Just keep in mind, this cabin attendant could easily have died because of the shortcoming in this skill.

In this final example, you have to do the thinking.

Image: Airport diagram

Essentially what happened was the pilot of aircraft A wanted to enter runway 32 from runway 05, and backtrack to the downwind threshold. Pilot B was inbound to runway 32. A waited for B to land and clear the 05 intersection before entering the runway and backtracking to the departure threshold.

He reported that he did not sight aircraft B when he lined up on runway 32. As the tower was not open, he broadcast the intention to commence the takeoff on CTAF, as per the procedure, and as an extra precaution, twice queried whether aircraft B was clear of runway 32. After completing take-off checks, he put his heels to the floor, power on, and was rolling. He later recalled that he heard no response from the pilot of aircraft B.

When passing a speed of about 70 kts, (at foxtrot) A observed aircraft B backtracking to the runway 32/05 intersection. Both aircraft diverted to their left and fortunately a collision was avoided.

So your job is to tell me which human factors element was absent (on screen): communication, decision making, leadership, teamwork, situational awareness, workload management?

Okay, let me have some explanations. I digress for a moment. This is typical adult education. If you were all six year olds, most of you would be busting to give me an answer. Some of you would be correct, some of you would have a semi plausible explanation, some of you would be on another planet, and a small number of you would want to tell me your dog died last year. Adults are different. We are self conscious, especially amongst our peers. So we need a little incentive: this McClaren Vale Shiraz is for the person with the best explanation of what happened here.

(Discussion)

In this case, the particular communication skill that appears to be lacking was the active engagement of both parties. Simply launching the words out into the ether is not enough. To effectively share your information, you need to get the other person's attention, convey the information and then check that they have understood you.

The really difficult part of the exercise is coming up with some strategies that you can practise which will improve communication skills. This is a time consuming activity so I will leave it to you to ponder an answer. My guess is that you will find this exceedingly difficult, and this might help explain why CASA is seeing limited skills training in hf training programs. It is not easy.

Okay, that's a quick look at one way of designing training strategies to improve actual performance rather than just improving knowledge. What you now need to know is, having spent time, money and effort developing and implementing a training program, does it work? You will want to ensure you are getting the maximum return. You also need to be able to demonstrate to the regulator that your program is effective.

If you want to measure awareness, you can conduct a survey. If you want to measure knowledge, you can utilise a quiz or a test. If you want to measure a skill, you can observe the trainee in their normal work role. This will allow you to see how they actually perform; to see if they have transferred their learning to their job. That is the whole purpose of the training: to be better at your job.

Several of the airlines we provide training to carry out on the job observations every six months. They use a simple behavioural marker system with a five point score sheet for each of the six key skills areas: decision making, communication, teamwork, leadership, workload management and situational awareness. This is a sample score sheet for Decision Making:

Image: Scoresheet

You get the idea. Essentially a 1 is you are in the wrong job, 2 is not good enough, 3 is just okay, 4 is good and 5 is excellent.

What is crucial is that all of the observations are consistent. Different observers must be trained to rate a given performance identically. They must also rate the same performance at a later time identically. By achieving this, you can measure if a person is improving, identify areas of most need, and provide input into the design of recurrent training.

A complete look at assessment will be the topic for another day.

I just want to finish with this:

I was fascinated to hear Sidney Dekker say this morning: "After writing about human factors for fifteen years, I found that on a dark and stormy night flight, I was unable to be assertive with a crusty old captain." Lots of knowledge, not enough skill.

You could purchase the 1648 page book, "How to land the A380". You could give this to a student pilot to study and memorise. He or she could pass the quiz at the end of every chapter, pass the major exam at the end of the book, pass a panel assessment and a one on one knowledge test with the chief pilot. But land the aircraft at their first attempt – not a hope. Again, lots of knowledge, no skill. You wouldn't dream of letting the student get anywhere near the controls. Ditto human factors. You could have an enormous amount of knowledge about, say, how to make a decision, but unless you repeatedly, correctly practise actually making decisions, your skill will not improve.

As I said at the beginning: nearly all training delivers awareness and knowledge. Developing skill is the jackpot.