ADAPTING TO SMALL CHANGES

Sometimes it is the little changes that, over time, tend to catch us out. **Julie Baltet** reports on changes in the context of learning and automatic behaviours, with some implications for management to help operational staff to adapt their routines.

KEY POINTS

- **Even a small change requires a learning process and creates new automatic behaviours.**
- **Errors due to these behaviours are difficult to detect.**
- **Stability, time and practice are necessary to integrate even small changes.**

When we think about 'change', we often think about big changes. If you are a controller, during your shift you probably face many small changes, perhaps to airspace, a new aircraft type, an airfield closure, or a new call sign. You adapt every day to small changes, without training. When you face a change, such as a new route map or new system implementation, you know that your routine will be mixed up.

Our routines include well-learned, automatic behaviours. These routines need little attention or conscious awareness. They are like familiar roads in the brain. But changes trigger the need for new roads. With practice, you will have a new road network.

When a new type of aircraft enters your airspace, you are forced to adapt:

- you analyse the data
- you try to understand the data
- you act
- you see the result, and
- you validate your action, or you adapt for next time.

That is a circle of learning. You do this circle many times, enough to create an automatic behavioural routine. In the end, you can predict how the aircraft will react in different situations without thinking much about it. This frees mental resources.

This 'resource-freeing' process that occurs during learning and practice ensures that performance is acceptably efficient, but in return we lose awareness of the process. This makes it difficult to detect problems, including mistakes. As a controller, you find your own ways to avoid and mitigate mistakes in order to work as safely as possible. For instance, particular aircraft may be difficult to monitor, and so you mark or highlight these aircraft. But these adaptations are not fully reliable, and small changes can disrupt our routines and adaptations.

> Small change by small change, you can face a complete reorganisation of your work, but it is not recognised as a complete reorganisation.

In Reims ACC, the procedure for Bern Arrivals has changed a lot in the last 10 years. Each time the descent profile changed, it was seen as a small change, so controllers received a briefing note to explain the change.

In this example, the old route was quite long and made a deviation. With the old route we usually had to provide separation with the slow climbing from Zurich departures. And we usually asked for a direct routeing to the Zurich West sector to help us in this crossing. Our rule became "If Bern Arrival, then ask a direct and send to Zurich West at FL150."

A final change occurred in 2018. We were sending these arrivals to Zurich ACC at FL150 but we now send them to Basel Approach. It did not look like a big change because the transfer level remained FL150 and the route was slightly displaced west. With only a briefing note, and no real explanation of the change for Basel approach and Zurich, we continued to descend Bern arrivals to FL 150 between HR and LUMEL.

In ten years, there were five minor changes.

Unfortunately, some hazardous coordinations occurred due to lack of understanding. We finally understood that the problem was that Basel Approach had to cross these arrivals with their own departures and then send Bern arrivals at FL90 to Bern Approach.

So a new circle of learning had to be launched. Now we have to descend Bern arrivals earlier, which means there is no problem with slow climbing from Zurich. But this means a new crossing in the upper sector. Bern arrivals now interact with Strasbourg and Basel descents from other Reims' sectors. We have to learn a new descent profile again. ▶▶

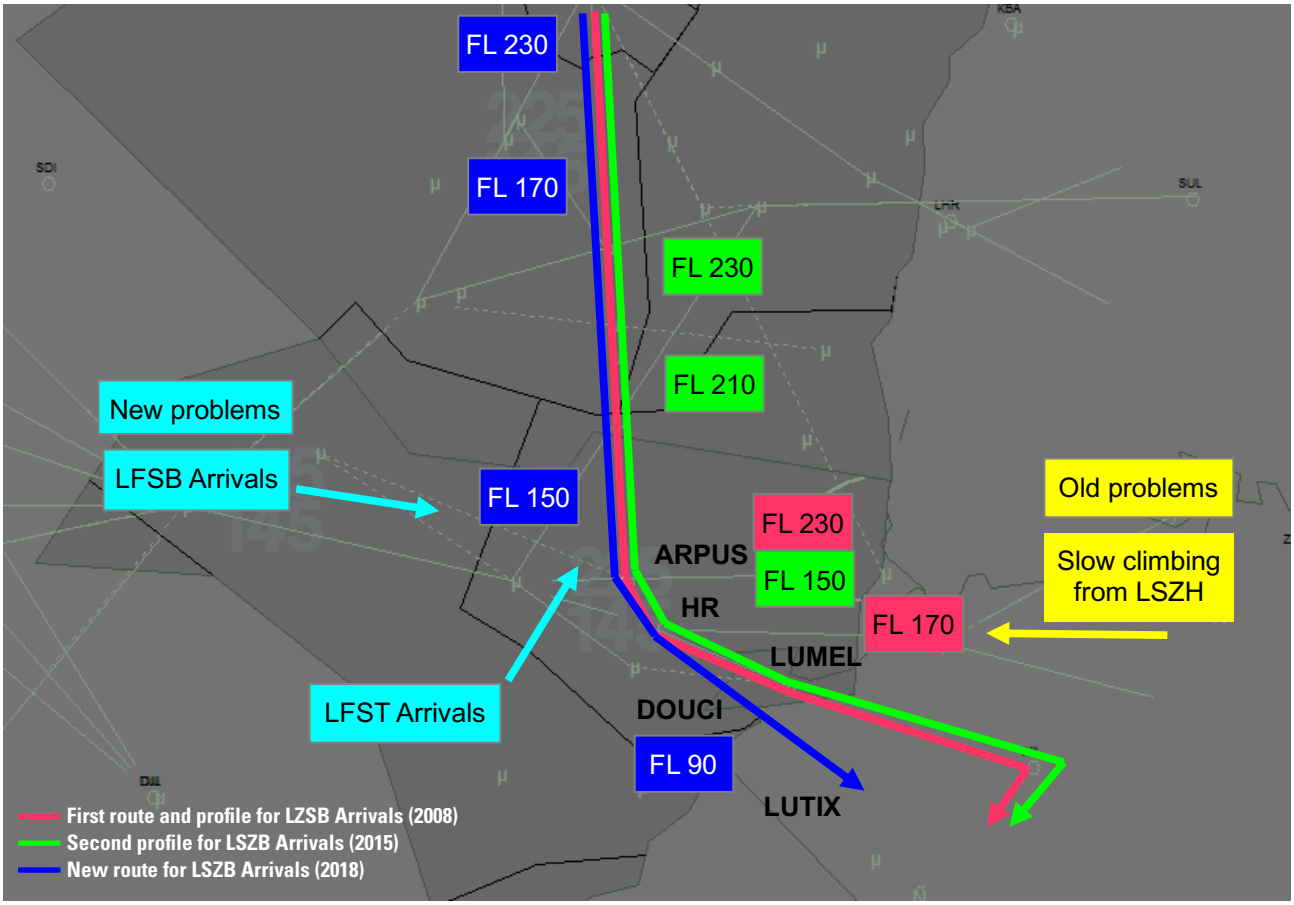

Figure 1: New route for LSZB arrivals

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A small change became a complete reorganisation in our list of rules created by descent profiles.

Not to be entangled by small changes requires awareness of the situation, but it is not as easy as it seems. We can easily drift with the flow of change and two things can happen: 1) old automatic routines can pop up again, without consciousness; 2) new routines become automatic, they are monitored less with practice, and so mistakes become harder to detect. For that you have to force yourself to take a step back and analyse the process. When you are a trainee, your instructor helps you through this process. Now as an ATCO, alone in front of your traffic, you have no time for that.

For the Bern arrivals example, Basel approach helped us to detect a problem: they complained to the SE sector because they needed Bern arrivals below their own arrivals, which made us understand the real change in skill adaptation and learning was for the upper sector.

ATCOs and other front-line staff have no choice but to deal with multiple changes. These changes occur almost every day and interact in our minds with preceding changes. Small change by small change, you can face a complete reorganisation of your work, but it is not recognised as a complete reorganisation. Therefore, management has to help operational staff to adapt their routines by:

- giving operational staff time to adapt, train and validate the adapted skills
- allowing them to express themselves, to observe and understand how they adapted
- allowing them to debate on job, the rules, the adaptations and open their minds to new solutions
- providing adequate continuation training to help them to find ways among adaptations
- providing simulator sessions to help create new routines.

Adapting to change is a fact of frontline staff. And recognising this, the more we have to adapt, the more management has to adapt.

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