ROUTINE MAINTENANCE AND ROUTINE OPERATIONS: **IT TAKES TWO TO TANGO**

Front-line operators such as controllers and supervisors also have an imagination of the work of others, including the work of technicians. But technical systems are increasingly complex, and technicians have less time to understand and maintain them.
As **Maria Kovacova** explains, communication, coordination and checklists can help to ensure that things go right.

KEY LEARNING POINTS

1. **Routine maintenance doesn't always go as imagined. Technical specialists work under pressure**
2. **Timely coordination, clear communication and checklists between technical experts and supervisors can help to ensure that things go right.**
3. **When things do go wrong, just culture should apply to technicians as well as controllers.**

Routine maintenance is not what it used to be. Gone are the days when technical experts could run maintenance during night shifts with almost no traffic. Also, technical systems and solutions used by air navigation service providers are now much more complex. Systems are hard to understand even for technical experts.

So imagine now that you are an ATC supervisor. And imagine that your technical colleague comes to you and asks for permission to maintain certain equipment. They say that they will not touch the main system and ATCOs will not even realise that the required equipment is under maintenance. Would you, as a supervisor, trust your engineering colleague?

Why not, when they promise 'no impact' on current performance of technical systems…? Why not, when they are very well trained and skilled specialists on that technical system…? Why not, when they say that the main system has independent set A and set B and in case of failure ATCOs have a backup system almost equivalent to the main system, and this backup system has internally independent set A and set B…?

And what makes you think thos console wasn't wired properly?

Statistically, a total loss of service, like radar or voice communication, is extremely unlikely.

You are not a specialist in this area at all. Your tasks are completely different, such as: opening and closing of sectors based on traffic demand, weather, number of ATCOs available, MIL activities; coordination of all necessary activities with adjacent units; solving unexpected and emergency situations, and so on. So you think…maintenance is under control and the technical experts reassure you about fall-back modes and contingency procedures.

> Even in routine maintenance, things don't always go as imagined

But even in routine maintenance, things don't always go as imagined. Here are some real-life examples that are not so old.

One day, between 0900–1000 two sectors were opened to provide services during low traffic density, with a prediction of high density traffic, which was usually expected during lunch time. During the annual maintenance of the telephone communication system, an external company performed regular testing of telephones under the supervision of an internal ANSP technical expert. At the end of the maintenance, the external company tried to re-arrange cables in an organised way and started to strip some cables at the back of the console of the ATCO working position to help provide easy access to the relevant equipment for the future. During this cable management work, the external technician accidentally unplugged the situation display of one ATCO, who lost the entire display. The ATCO immediately announced this system failure to the supervisor and started to provide services on the backup system, which was fully independent from the main ATM system. At that time, the technical coordination cell was not able to define the cause(s) of failure because the display of the ATM system itself was, at that time, not under monitoring supervision of the technical coordination centre. After 10 minutes, technical experts finally understood the failure and plugged the ATM system display back into the electricity network, and declared that the ATM system was operational without any restrictions.

Another situation occurred during a summer period, one hour before lunch, which meant high traffic load for controllers. Five sectors were opened and the supervisor received a phone call from the technical coordination cell with notification that technical experts will do regular routine maintenance of the radar message conversion and distribution unit (RMCDU A), while RMCDU B will be still operational. This meant that the RMCDE (radar message conversion and distribution equipment) would be running without any change to the ATCO position. RMCDE contains RMCDU A and RMCDU B, while radar information from different radar sensors is brought into RMCDU A or RMCDU B via an automatic line switch (ALS). During this maintenance, a technician switched the ALS from routing data into RMCDU A to RMCDU B. The RMCDU A was ready for maintenance and could be safely switched off. But the technician accidentally switched off the RMCDU B, which was at that time in use for real operation. Suddenly, the ATCOs started to see stars instead of aircraft plots and immediately announced this technical failure to the supervisor. Due to the very quick reaction and notification to the technical coordination cell, technicians switched ALS back to RMCDU A. So the ATCOs had 'only' three minutes of technical failure of the ATM system.

We may wish to have equipment with almost no maintenance during the whole lifecycle, but there is a need for regular maintenance to assure the availability of the technical service. To wait for a period of time with low traffic density is very demanding. Technical experts sometimes have a feeling that ATCOs are not so busy and maintenance could be done as needed, but the view of the supervisor can be completely different: one moment it can be quiet but in next 10 minutes heavy traffic is predicted or weather is going to change radically. Can the technical expert ensure that everything will go right?

In real life there are thousands of scenarios such as those above, but technical failures are not widely known between ANSPs. Increasingly, it is very important to understand the position of each player: supervisor, controller and technician. This means trying to put yourself into the shoes of your colleagues, and ensuring proper and timely communication. Effective communication between technical experts and supervisors is needed in order to be prepared for an operational worst case scenario. Usually in routine maintenance, everything goes right, but we must be sensitive to the possibility of failure (Hollnagel et al, 2013). One good practice is to use checklists on both sides. This helps to ensure a common language and understanding.

Now there is increasing pressure on technical experts to run maintenance faster and more efficiently, and they are forced to improvise in real operation with various pieces of equipment of various ages. As 'frontline' actors under time pressure, they are forced into a situation where errors are more likely. When mistakes do happen, how should we judge technical experts? Remember that just culture principles apply to technicians as well.

Maria Kovacova is an aviation safety enthusiast actively contributing to safety areas such as just culture, safety management gap analysis and proposals for safety improvements, introducing practical and efficient safety methods and tools to air traffic control. After her graduation in aviation engineering, she continued her mission to improve safety processes in air navigation services, supporting just culture within the Slovak Republic and providing training for different aviation stakeholders.

Reference

Hollnagel, E., Leonhardt, J., Licu, T., & Shorrock. S. (2013). *From Safety-I to Safety-II. A white paper*. Brussels: EUROCONTROL Network Manager.