

# CAN COMPETENCE ASSESSMENT BE USED TO UNDERSTAND NORMAL WORK?

Competence assessment is one method for checking that work-as-done accords with work-as-imagined. In reality, it is often the case that work-as-done is temporarily shifted to realign with work-as-imagined. **Anne-Mette Petri and Anthony Smoker** argue that changes to the competence model may be needed if we are to understand competence from a systems perspective in the context of work-as-done.

*"If a controller can produce a dull normal day, that should earn recognition and praise because the controller had to change to achieve that outcome."*  
(Weick, 1987)

Competence assessment has for many years been a routine feature of operational assurance within European ATM. Traditionally, the focus has been on monitoring and identifying non-standard performance due to errors in technique as well as procedural non-compliance. One problem with this approach is that it does not explain why and how ATC normally works well. Another concern is that an annual one or two-hour assessment of competence gives an artificial view of individual performance: a bit like setting up a one-day speed camera, once a year.

Understanding the 'why' and the 'how' of ordinary work cannot be attained by judging performance through a narrow normative lens where the operational task is exclusively defined by rules, procedures and the adherence to these. The scope of what is defined as competence needs to grow beyond the traditional ESARR 5 definition where competence is solely described as "the required level of knowledge, skills, experience and where required, proficiency in English, to permit the safe and efficient provision of ATM services." (ESARR 5, 2002, p.8). This definition is elusive and does not specify the various skills required to navigate normal work.

## KEY LEARNING POINTS

1. **Competence assessment is a routine task and its usefulness is rarely questioned.**
2. **A once a year snapshot of idealised work cannot capture ordinary day-to-day work.**
3. **There is a need for calibrating the traditional view of competence to encompass the new functions of normal work.**
4. **An alternative competence model is proposed, along with ideas for an evolved assessment approach.**

We believe that the competence of operational practice cannot be defined by procedural compliance alone. Weick implies this in the quote above. The reality of a controller's normal work involves expertise in changing strategies and adapting to the variations that naturally occur in the controlling world.

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This brings us to the challenge of a yearly dedicated check, which is perceived by operational staff as a temporary speed camera. A quite natural reaction when encountering a speed camera would be to revert automatically to a compliance-based simplification of work-as-imagined or

work-as-prescribed. This is problematic since it will not give us insight into the uncertainty and variability experienced in normal work. Controllers adapt to subtle variations in the traffic, trying to optimise efficiency, while keeping the sector safe as well as providing the best service possible.

A Safety-II or work-as-done perspective of competence would be an exploration of the messy details of an imperfect world, of flawed information and uncertainties, and how this shapes work. From this we can trace competence back to:

1. How a function or an organisation interacts with others.
2. How it uses its capabilities to sustain an effective and safe operation to ensure that things go right.

Today the scope of the competence assessment scheme is focused on the individual alone and hence does not embrace or recognise these competencies.

This was the starting point for an MSc research question, which essentially questioned if competence assessment of air traffic controllers can enable or facilitate a transition from Safety-I to Safety-II by recognising performance variability and adaptation (Hollnagel et al, 2013; Hollnagel, 2014).

A study was conducted in three European ANSPs. The three ATC units had different assessment philosophies and they applied different competence assessment methods. The aim was to examine the current practice of competence assessment of air traffic controllers, both as a concept and an operational process. The units were represented by a tower with 13 controllers, an approach unit with 50 controllers and an area control centre with 180 controllers. All 20 informants were directly or indirectly involved in the competence assessment scheme and were thus selected to represent air traffic controllers (ATCOs), competence assessors, managers and safety managers. Sixteen semi-structured interviews provided qualitative data for this research (four of these were conducted as small focus group interviews).

The study found a need for calibrating the traditional view of competence to encompass the many new functions of normal work. An enhanced six element competence model was derived from the research data to emphasise understanding of the daily activities of work. The six elements of the competence model are:

- Skill-based competence
- Knowledge-based competence
- Experience-based competence
- Adaptive competence
- Service-driven competence
- Social competence

The six-element competence model represents a synthesis of the ESARR 5 definition of competence and the data provided by the informants. The new model was adapted to include a view where work-as-imagined and work-as-done has relevance. The research has triggered a recognition that the scope of competence needs to broaden and recognise competencies



which otherwise will remain hidden or embedded in generic categories such as skill and experience.

In the current competence assessment scheme, emphasis is placed on work-as-imagined. The means of measurement are limited to skill-based competence during the practical part of the assessment. Knowledge-based competence is commonly assessed through theoretical examination in conjunction with the assessment. Both are assessed and measured against an imagined or prescribed view of work. Experience-based competence is not as tangible and is not measured or assessed per se. However, it is acknowledged that previous experience will provide you with a background to interpret and safely manage a given situation to ensure the best possible outcome.

The research found that working as an ATCO involves additional skills to those previously imagined. The new competence elements of adaptive competence and service-driven competence incorporate central aspects of Safety-II and are therefore placed in conjunction with work-as-done.

Adaptive competence comprises the need for flexibility and adaptability on an individual as well as a system level. These abilities were described by the participants as being core competencies and relate to the ATCO's 'discretionary space'. The introduction

of free route airspace was mentioned as a contributory factor in generating a stable condition of instability demanding both flexibility and adaptability of both the operator and the system.

Service-driven competence comprises trade-offs and the prerequisite of providing a high level of service, supporting flight efficiency or being able to work at a 'normal' speed. Being service-oriented – and providing a high and consistent level of service – appeared to be the driver for working efficiently and expeditiously. This again, is directly linked to social competence that embeds teamwork, cooperation, helpfulness and social skills.

Exploring these new key competencies is critical if we wish to gain a deeper understanding of what is 'normal' and what work really looks like when there is no speed camera.

**Let's focus on, and talk about, normal work!**

Is it then at all possible to measure adaptive, service-driven, social and experience-based competence? It could perhaps be feasible if we reduced these competencies down to specific behaviours, but it may not provide us with much understanding. It is, however, essential to find an appropriate method of exploring these new elements to understand work-as-done.

## Controllers are adept at changing or adapting plans and tactical strategies to manage their workload.

The operational environment is always changing, so people constantly have to adjust. Controllers are adept at changing or adapting plans and tactical strategies to manage their workload. This is one of the main reasons why the four bottom competencies in the model cannot be viewed through a ruleset; they have to be explored through talking to people. Although some of the elements might not be observed during the practical part of the assessment, they should still be explored using focus topics and scenario-type questions. The purpose is not to measure or evaluate performance, it is more to gain an understanding of how and why ATCOs adjust their performance on a day-to-day basis. This, however, does not exclude the traditional assessment of the two top competencies.

Setting the scene for obtaining this kind of information is crucial for the ATCO to feel comfortable in disclosing information on how the system is behaving. An appropriate setting would be a debrief based upon the six-stage competence model, as this includes the perspective of the messy details of the operational world that requires flexibility, adaptability, efficiency and teamwork. Considering that these are features of work-as-done, they should be appreciated and understood as significant constituents of competence.

What does all this mean in practice?

Competence in the future is more

than individual competence alone. The competence envelope has to expand to include how the system influences individual competence and how the individual contributes to the sustainability of the system.


### Today and tomorrow

The reality of operational competence is changing. The current tradition of assessing procedural compliance by the individual air traffic controller is challenged in a dynamic socio-technical system such as ATM.

As operational needs change, technology advances and human-system integration increases, the nature of work will change. New skill patterns and competencies will emerge and the assessment must include these. To anticipate and monitor change, organisations must explore and understand dynamic patterns of expertise and adaptive strategies. These are informal and yet effective solutions that frequently go unnoticed.

Today, competence assessment is not used to the full extent possible and the original philosophy of the ESARR 5 scheme is becoming outdated. This research has shown that there are additional technical and professional controlling skills, which are part of everyday work, and competence assessment should be extended to include this.

Developing a competence assessment scheme that can monitor the successes and failures of normal work, in addition to the constantly changing gaps between work-as-imagined and work-as-done, will improve the organisation's ability to succeed under varying conditions. Moving from an individual to a system perspective will help improve the effectiveness of the ATM system as a whole.

There is still great potential in including the dynamics of the ATM system and understanding how controllers are able to produce a dull normal day, even within the philosophy of competence assessment. Pragmatically, considering the ability of the industry to embrace such a change, there needs to be an evolutionary path and not a revolutionary one. 

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