

Operator performance in Air Traffic Control



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“KEEPING THE CONTROLLER IN THE LOOP”

Air traffic control is established through a coordinated network of controllers who are each responsible for a certain segment of airspace or airport. It is based upon a strong but vulnerable conjunction of human performance, procedures, and supporting systems coping with a dynamic environment to deliver a safe and efficient flow of traffic.

Air traffic control is challenged by ever increasing numbers of traffic and amounts of available data. Meanwhile, some recent incidents have directed the attention towards fatigue in ATC.





"...AVOID OVERLOADING THE CONTROLLER WITH INFORMATION"

Operator Performance in processes of change

At NLR Operator Performance is considered key in developing safe and efficient concepts of operations and therefore it is integrated in the processes of development and validation. Our knowledge of the human operator is applied to assess and where possible increase overall system performance, in processes of change towards improved:

1. Controller support tools

New automation should search an optimum between reducing workload, meanwhile keeping the controller in the loop.

2. Procedures and working methods

Changes of procedures and working methods are often driven by a need to increase efficiency and/or capacity of air transport. The resulting controller workload and situation awareness are important indicators of the safety of such new procedures.

3. Staffing and role distribution

We have experience in personnel licensing in ATM. Based on the particular operations we can help to choose suitable license types, associated ratings and rule-making. Additionally, NLR has been consulted to assess ATC tower role distributions in operational environments and through simulations. Furthermore, we use the recent momentum in research on fatigue to help improve working hour schemes for around-the-clock operations.

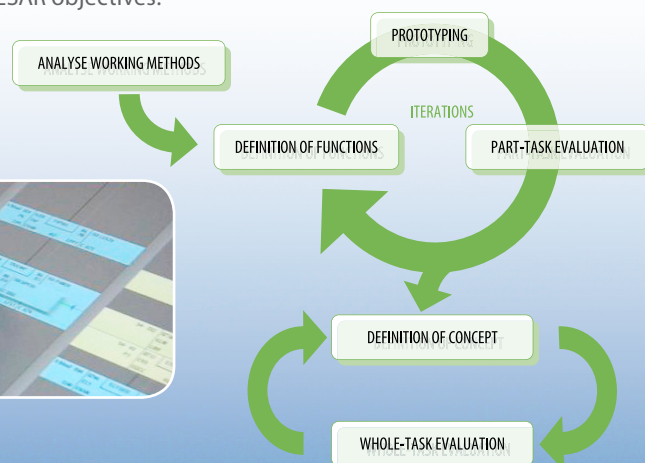
Depending on the questions to be answered the following activities can be performed:

1. Identifying Operator performance issues in current or future concept of operations;
2. Facilitate or contribute to human-centered design approaches;
3. Validating new concepts of operations in comparison to current working methods;

Additionally, through innovative research projects we maintain and expand our knowledge of operator performance in the field of ATC.

NLR has the availability of Air Traffic Control simulators for simulating tower control as well as radar control. NLR has a track record of projects for international customers in the field of operator performance.

With our knowledge and experience we can support in processes of change compliant with methodologies such as the Human Factors Case methodology, the European Operational Concept Validation Methodology (E-OCVM) and support in the validation of SESAR objectives.



Electronic Flight Strips

A typical example of a project for the ANSP in the Netherlands implied the prototyping of electronic strips for use in the tower. The goal of this project was to assess user requirements for such a system.

In this project, NLR worked together with operational experts (controllers). First, current working methods with paper strips were analysed. An iterative prototyping process followed with intermediate part-task evaluations. The final prototype was evaluated in a whole-task evaluation facilitated by NLR's Tower Simulator, against a baseline condition using paper strips.

