Change Management in ATM Operations

**Article Information**

**Description**

As the demands on airspace are ever increasing, the point is approaching whereby the delivery of additional capacity can only be achieved by introducing significant changes in the ATM operations. Many of the airspace structures in place today were designed at a time when noise and fuel burn were not priority concerns. During later periods of intense growth in air traffic, changes in airspace structures have often been brought about in order to accommodate air traffic demand. More recently however, greater emphasis has been placed on flight efficiency, which goes hand-in-hand with environmental issues. This means that there are a variety of pressures from both the ATM community and ‘society’, driving such change forward, as well as inhibiting such change.

In Europe, the [Single European Sky](https://skybrary.aero/index.php/Single_European_Sky_(SES)) (SES) legislative initiative has triggered a large process of change, integrated with the ATM modernisation project, [SESAR](https://skybrary.aero/index.php/SESAR). In United States, the [Federal Aviation Administration (FAA)](https://skybrary.aero/index.php/FAA) has launched NextGen, a programme to modernize the National Airspace System (NAS).

**Safety Assurance of Changes**

Safety assurance is one of the broader domains of ICAO [SARPS](https://skybrary.aero/index.php/Standards_and_Recommended_Practices_(SARPS)), SES and [ESARR3](https://skybrary.aero/index.php/ESARR3) safety management system ([SMS](https://skybrary.aero/index.php/Safety_Management_System)) frameworks which address management of change within the ATM Operations. It is one of the core activities of the SMS that aviation service providers shall implement in order to meet ICAO SARPS and regulatory requirements.

**ICAO**

ICAO Annex 11, in conjunction with ICAO Doc 9859 ([Safety Management Manual](https://skybrary.aero/index.php/ICAO_Safety_Management_Manual_Doc_9859)), provides a common safety assurance methodology based on a SMS that allows a consistent regulatory approach and, consequently, a common framework for [USOAP](https://skybrary.aero/node/23518) assessment and comparison. Safety management systems should also ensure that safety targets are defined (quantitative or qualitative), hazards are identified, remedial action planned (and taken) and that monitoring is used to verify that the safety levels are maintained. These processes aim to ensure that proposed changes to the ATM System will not jeopardise safety.

**EUROCONTROL**

EUROCONTROL [ESARR 4 Risk Assessment and Mitigation in ATM](https://skybrary.aero/index.php/ESARR4) is intended to support the implementation of a systematic assessment and control of the safety impact of ATM System changes. Within the overall objective of ensuring safety, the objective of ESARR 4 is to ensure that the risks associated with hazards in the ATM System are systematically and formally identified, assessed, and managed within safety levels which, as a minimum, meet those approved by the designated regulatory authority.

ESARR 4 was transposed into European Community law by Regulation 2096/2005 - Common Requirements for the Provision of Air Navigation Services and is supported by [Commission Implementing Regulation (EU) No 1035/2011 of 17 October 2011](https://skybrary.aero/bookshelf/books/1721.pdf) (which replaced Regulation 2096/2005).

**Drivers of Change in ATM Operations**

The drivers of change in ATM Operations can be split into two broad categories:

* stakeholder influence,
* technology, process and infrastructure.

The drivers of change are often interconnected. For example, a new process or technology will require stakeholder influence to bring about its introduction. However, the detail of a change, the way in which it is operationally implemented, is primarily driven either by a stakeholder influence, or by a new process or technology.

These broad categories can be further broken down as shown below:

* stakeholder influence
  + professional (e.g. organisation and ‘culture’; EUROCONTROL, etc)
  + society (e.g. local authorities)
* technology, process and structure
  + technology (e.g. equipment)
  + process (e.g. training)
  + infrastructure (e.g. airspace constraints)

Some changes may be driven by factors in a ‘top-down’ manner, for example the Single European Sky initiative driven by EUROCONTROL. Other changes may be driven in a ‘bottom-up’ manner, e.g. noise reductions at an airport, demanded by local residents. Whilst some changes can be brought about with quite a tight focus in one particular area (e.g. a change in a standing agreement between two adjacent ATC sectors), other changes such as the Single European Sky initiative, will have wide implications across many categories of change. These descriptions of categories are not designed to be either prescriptive or restrictive ways of thinking about change, but rather to help think about change in a systematic way. This means that important considerations are taken into account when trying to measure, understand and assess a change.

**Conditions before the Change**

Before implementing changes it is important to analyse the disposition and condition of the system before the change. Key descriptors of system’s disposition, may include:

* capacity constraints
* airspace structure
* environmental constraints
* cost-saving requirements
* societal pressurе

**Elements of Change**

The following key elements describe the mechanics behind the change in ATM operations. Each element is complemented with a set of questions which could be further expanded in order to provide the understanding of its details.

**Understanding the Need to Change**

* **Trigger**
  + What was the specific, first trigger of change?
  + Was there a problem to fix, or a need for improvement?
  + Would the change eventually have occurred (in one way or another) in any case, without this trigger?
* **Pressures**
  + What pressures were exerted to support the change? Against the change? Sources of such pressures? Which stakeholders? How is the pressure exerted?
* **Benefits**
  + Who benefits most from the change? Is there any quantitative evidence of benefit? Is the change accepted as a trade-off for some other benefit?
* **Public Interest**
  + Interface with public – what effect, if any, is expected from interaction with public? How does such interaction work? Is it filtered?
* **Approval**
  + What are the levels of approval required:
    - national / regulatory authority
    - local assessment (e.g. airport, local government)

**Implementing the Change**

* **Decision**
  + By whom was the final decision to adopt the change announced?
  + What decision-making process is required to adopt change?
  + Who will endorse the change?
* **Timing**
  + Timing of change compared with other changes?
  + Seen as lower / higher priority than would usually, due to other changes taking place / being discussed at same time.
  + How did such other change(s) (if any) improve or worsen attitude to the change in question? Staff motivation? Technical compatibility?
* **Consultation and facilitation**
  + For pilots and controllers - level of interest in change? Ownership? Personal responsibility?
  + Facilitation of change - same as those exerting pressure for change?
  + How well do those exerting pressure understand the process / are able to facilitate it?
  + Public consultation?
  + Level of enforcement?
* **Level of support**
  + supporting documentation / information
  + supporting training
  + supporting tools
  + Could procedure be adapted, e.g. with more, or less, autonomy of decision making, to allow greater compliance / fulfillment? Would greater, or lesser, degree of ‘systemisation’ help? Context of integration? Are there any local, national or environmental constraints?

**Alternative to Change**

Considering the specific ‘problem’ the change was trying to address, what alternative changes were formally considered, if any? (Alternatives include either completely different types of change, or different ways of carrying out the actual change adopted). Why were alternatives not adopted in end?

Still any scope for such alternatives?

Consequence of taking no action? Is the alternative acceptable/unacceptable? To whom?

Where are there any specific (anticipated) disadvantages of planned change?

Again considering the specific ‘problem’ the change was trying to address, to what extent was the adopted change the best way to address the ‘problem’?