Study on Options to Improve ATM Service Continuity in the Event of Strikes – Final Report

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Guidance on notification period and minimum service level EU harmonisation in the event of air traffic management strikes

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Executive summary

On behalf of the European Commission (DG MOVE), Ricardo Energy & Environment and York Aviation have performed a study of the impact of strikes in the air traffic management (ATM) sector on the performance of ATM in the European Union. The purpose of the study was to recommend options for best practices that could mitigate the impact of strike events on the network as a whole and on users of air transport services.

The study investigated good practice relating to the implementation of minimum notification periods (in advance of a strike) and minimum levels of service (during a strike). It should be emphasised that consideration of any restrictions on the rights of employees to take industrial action (including strikes) was not part of this study. This document forms the final report on the study.

The Commission's Aviation Strategy of December 2015 noted that:

> *'Aviation is a strong driver of economic growth, jobs, trade and mobility for the European Union. It plays a crucial role in the EU economy and reinforces its global leadership position. An Aviation Strategy is needed to ensure that the European aviation sector remains competitive and reaps the benefits of a fast-changing and developing global economy..'*
>
> *'In order to allow for continuity of air traffic management, a minimum level of service in managing European airspace should be ensured, allowing at least for the movement of overflights (flights crossing the airspace of an affected state or area) causing the least amount of disruption to the network. In this respect, the Commission will promote the exchange of best practices between Member States".*

The European Commission emphasised the important contribution of the Single European Sky Project (SES) towards reducing the costs stemming from inefficiencies (delays, and longer flight routes, etc.) contributing to a reduction in CO_2 emissions of 50 million tonnes by 2020. It also recognised the importance of the continuity of provision of air navigation services to the achievement of the environmental benefits of the SES.

However, the achievement of the performance targets of the SES is being adversely affected by industrial action events in a few air navigation service providers (ANSPs). For the SES to deliver its intended benefits in full, all elements of the European ATM system must continue to operate at all times. **Disruption to one part of the airspace can cause knock-on effects in other regions through cancellations, delays and re-routing**.

There are multiple reasons for disruption including air traffic control (ATC) capacity, airspace design and staffing-related constraints. Industrial action, including strikes, is one of the issues that affects the performance of the network and the achievement of those objectives.

The study included the analysis of a large body of historic flight delay and efficiency data, provided by the Network Manager, with the aim of identifying the impacts of industrial action on the European ATM system. The analyses sought to identify the impacts of strikes in different countries on delays, cancellations and re-routings. These analyses identified that:

- **there were 379 days on which strikes impacted the European ATM system between 01 January 2004 and 31 December 2016, causing over nine million minutes of additional delays;**
- **over this period, 15 out of the EU 28 Member States were not affected by strike action of national air traffic controllers;**
- **the remaining 13 Member States experienced national strike actions, albeit 6 out of them were impacted by two strike days or less;**
- **strikes in France were responsible for a large proportion of the strike days and delays; the other countries with significant impacts (though very much lower than France) due to ATM strikes were Greece and Italy.**

There was less certainty in the identification of flight cancellations from the data provided by the Network Manager; nonetheless, significant numbers of cancellations due to the effects of strikes were identified. **On average, the number of cancellations per strike day was higher in Greece, Italy and Spain than in France**.

To provide further understanding of existing practices related to strikes in European ANSPs, a survey was distributed to the ANSP and the Civil Aviation Authority (CAA) in all EU Member States and the other countries that have committed to implementing the SES. In addition, interviews were held with a selection of organisations. This was to gain deeper insight into how their legal situation and practices contribute to the prevalence of strikes and the management of ATM services during those strikes. The interviews were also used to seek to understand the interviewees' views on the potential for reductions in the impact of strikes on ATM services from harmonised minimum notification periods and minimum levels of service. European organisations of air traffic controllers decided not to contribute to the study. The countries and organisations interviewed included:

Country	Organisations
Denmark	ANSP and CAA
France	ANSP and Airline
Germany	Airline
Ireland	ANSP, CAA and Airline
Italy	ANSP
Greece	ANSP
Portugal	CAA
Spain	ANSP and CAA
UK	ANSP and Airlines (two)

The results of the survey and interviews led to the definition of multiple 'models' of strike management in place in different European countries:

Denmark/Ireland/UK

These countries place a strong emphasis on the maintenance of a high level of social dialogue with the aim of avoiding disputes escalating to the point of a strike being called. This has largely been successful in avoiding strikes during the period covered by the study. The successful measures to avoid strikes are based on local agreements between the ANSP and the Unions that define the principles of social dialogue. These are often accompanied by procedures for resolving disputes, with conciliation and arbitration as the last steps in the process. These agreements typically isolate the ANSP from broader national labour disputes (solidarity strikes).

Italy/Greece

Both of these Member States have experienced a number of strikes in ATM in recent years. Although there have been negotiations to avert strikes, the level of social dialogue has been insufficient to avoid them occurring.

To reduce the impact of strikes on the wider ATM network, **both countries have minimum service levels that ensure that all overflights will be served**, although there is no guarantee that there will not be consequential delays dependent on the workforce available on the day. **The strikes in these two countries tend to be limited in duration to four or eight hours and, in the case of Italy, outside of peak periods.** Most flights to or from the countries concerned are cancelled, subject to provisions for long haul arrivals and socially vital connections to islands in the case of Italy. The clarity regarding flights that will be able to operate provides a more certain regime which the airlines can plan around to a large degree.

Spain

Spain has achieved generally good relations between the ANSP and the unions. As a result, there has only been a single strike over the last few years.

The minimum notification period for a strike in Spain is 10 days. This provides sufficient time for the ANSP (and those managing surrounding airspace) to implement contingency plans. It also allows time for the airlines to begin planning how they are going to manage flights during the strike.

The key aspect of the approach for managing a strike in Spain that sets it apart from other Member States is that the minimum level of service to be provided is decided on a case-by-case basis. This decision takes account of the level of demand at the time, which is highly seasonally dependent for Spain.

France

France has made efforts to foster a good social dialogue, and there is evidence of progress in that direction. However, it has been subject to a considerable number of strikes, many of which have been related to national public service labour disputes (solidarity strikes).

France has a **minimum notification period of five days** and a **minimum level of service that requires that at least 50 % of overflights will be served**. It also ensures that a number of airports remain open with the aim of serving a relatively high proportion of the normal daily traffic. Although this approach reduces the number of flight cancellations, there is no system for specifying which 50 % of overflights can be handled. As a result, demand levels remain high. This leads to a greater number of flights seeking to use the airspace, or sectors within it, than can be handled by the available workforce without giving rise to excessive delays. As a result, **there are more significant consequential effects on the day (delays and cancellations) than in countries that serve 100 % of overflights** but cancel most flights operating to or from the country concerned.

The benefits of avoiding strikes through good social dialogue, as opposed to mitigating the effects through minimum levels of service, were emphasised in the interviews with some countries.

A key issue identified by the study is that there are many 'solidarity' strikes, particularly in France, in support of national (generally public service) labour disputes. Although the ATM unions and their members are able to decide whether or not to participate in such strikes, the large number of such strikes and their duration leads to a considerable impact on the European network when controllers opt to participate.

It was also identified that **a lack of certainty in advance as to which sectors will operate and at what capacity during the strike, particularly in France, can lead to further disruption** as airlines make late decisions regarding which flights to operate as a result of the uncertainty.

The interviews with the airlines provided insight into the manner in which they anticipate and then react to the effects of a strike and the consequential impacts on their passengers. They also provided understanding of the potential benefits from changes that might be made to the approach taken to manage strikes in some countries.

The study defined a range of best practices for managing strikes in ANSPs, covering measures that are likely to reduce the frequency of strikes and measures that would reduce the impact of such strikes on the ATM network. They do not focus on a narrow interpretation of the notion of minimum levels of service. Rather, they address the issue from a wide perspective and contribute to the identification of all options to improve ATM service continuity.

In relation to social dialogue, it is clear that a good level of social dialogue can contribute to reducing the number of strikes. **The measures contained in the CANSO/ATCEUC/ETF Toolbox have been identified as examples of good practice that could be adopted by all Member States**.

It is also considered good practice for the ANSP to be a structurally separate entity from the rest of the Member State's public service, to reduce the probability that the ANSP employees would participate in wider public service strikes which have little, or no, relevance to the employees themselves.

For notice periods in advance of a strike, the study identified the following activities as best practice:

- Greater than 14 days prior to strike – initial notification from unions of an issue that may lead to a strike. Rapid notification of the potential strike by the ANSP to the Network Manager and the other European ANSPs to allow them to begin planning the implementation of their contingency plans.

- 5 to 7 days prior to strike - confirmation that strike action is planned, triggering the start of contingency planning. Negotiations to avert the strike may continue.
- 2 to 3 days prior to strike – specific notification of the expectation of the sectors that will be affected and the flow rates that may be achieved. To enable this, best practice includes notification by the union members as to whether they will participate in the strike or not.

For the minimum levels of service provided during a strike, the study identified the following as best practice:

- Setting maximum durations for any strike (e.g. four or eight hours) and ensuring that strikes can only take place outside defined peak periods (as in Italy). This would serve to mitigate a major part of the impact of strikes on airlines as they could plan their operations around the strike periods.
- Ensuring that all overflights can be served with a defined maximum level of delay during the strike. This would significantly reduce the impact of the strikes on the wider network and reduce the time for network operations to recover following the strike.
- If flights to/from and within the Member State are permitted during the strike, the ANSP should provide certainty as to how much traffic can be handled, through requiring a definitive percentage reduction or other defined priorities, e.g. flights serving outlying regions or islands, long haul flights etc. The definition of this permitted volume should also take account of a defined maximum level of delay requirement.

These best practices, if supported, should be implemented by different actors, including the European Commission, Member States, ANSPs and unions. The recommendations for the implementation of these best practices are:

Recommendation 1: We recommend that the Commission communicates the best practices outlined in this report to the Member States for their consideration and encourages all actors to participate in the implementation of best practices.

Recommendation 2: We recommend that the Commission works with CANSO, ATCEUC and ETF to promote a high quality social dialogue between individual ANSPs and their employees.

Recommendation 3: We recommend that the Commission considers measures to designate upper airspace as a 'common resource', in line with the provisions of the Single European Sky, to reduce the impact of strikes in individual Member States on users of that resource (i.e. overflights).

Recommendation 4: It is recommended that, when developing the SES Performance Scheme, the Commission considers including penalties for ANSPs (and compensation to airlines) when strikes occur or, at least, removes the provisions of the current traffic risk sharing mechanisms when strikes occur.

Recommendation 5: Member States should consider whether legislation regarding the provision of minimum notification periods and, in particular, minimum levels of service in ATM is appropriate for them. They should also consider whether efforts to maintain and enhance social dialogue would be more likely to achieve the aims of minimising the impacts of strikes on the performance of the European ATM network.

Recommendation 6: It is recommended that, the minimum level of service should ideally include guarantees to serve all overflights during a strike, although local requirements may reduce the provision slightly below 100 %.

Recommendation 7: To reduce the impact of strikes related to wider labour disputes on ATM services, Member States should consider structurally separating the functions of the ANSP from the CAA, by creating the ANSP as a separate legal entity.

Recommendation 8: ANSPs should take the lead in establishing a regular social dialogue with the relevant Trade Unions with a view to agreeing local terms and conditions, resolving disputes before they result in strike action and agreeing measures to mitigate the impact of strikes.

Recommendation 9: If the Member State decides that it is not appropriate for it to pass legislation related to minimum notification periods or minimum levels of service, it is

recommended that the ANSPs aim to reach agreement with the unions regarding such measures. The minimum notification periods and minimum levels of service agreed should be consistent with those described in Section 7 of this report.

Recommendation 10: When the ANSP becomes aware that a strike is likely (i.e. following an initial notification by the union), it should take action to inform the Network Manager and the other ANSPs (particularly those in neighbouring Member States) with no delay (certainly less than 48 hours after being informed that a strike will take place). It should also inform the airlines that it serves. This approach will ensure that all organisations likely to be impacted by the effects of the strike have sufficient notification to put contingency plans into action and make maximum provision to mitigate the effects of the strike.

Recommendation 11: In advance of a strike, the ANSP should inform airspace users, airlines and other ANSPs of the level of service that it will be able to deliver with as much accuracy as possible.

Recommendation 12: ANSPs should consider the potential to mitigate the impacts of a strike by allowing some cross-border management of airspace.

Recommendation 13: The unions are recommended to participate in negotiations with the ANSP to reach agreements on minimum notification periods and minimum levels of service, along the lines of those described in this report**,** and to ensure that their members cooperate with the requirements during periods of industrial action.

Recommendation 14: It is recommended that the Network Manager should take a more proactive role in working with the affected ANSP in advance of the strike to plan and manage the available capacity. During strikes, the Network Manager should continue to work proactively with the ANSP to reduce the effect of cumulative regulations and hence reduce the overall delays.

Recommendation 15: It is recommended that the Network Manager extend their data collection to include further information on flight cancellations and actual strike durations.

Recommendation 16: We recommend that the Public authorities, ANSPs and staff concerned should reflect about the above best practices and related recommendations and recognise the need for change.

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1 Introduction

On behalf of the European Commission (DG MOVE), Ricardo Energy & Environment and York Aviation have performed a study of the impact of strikes in the air traffic management (ATM) sector on the performance of ATM in the European Union. The purpose of the study was to draw up guidance on best practices that could mitigate the impact of strike events on the network as a whole and on users of air transport services. In line with our terms of reference, we investigated good practice relating to the implementation of minimum notification periods (in advance of a strike) and minimum levels of service (during a strike). It is important to note that consideration of any restrictions on the rights of employees to take industrial action (including strikes) was not part of this study. This document forms the final report on the study.

This report presents the background to the study, an analysis of the historical impacts of strikes in European ATM and a review of the outcomes of stakeholder consultations performed to understand possible options for reducing the impacts of strikes. It concludes by presenting recommendations for best practices that could be implemented by the European Commission, Member States, air navigation service providers, unions and the Network Manager to improve the situation.

2 Background

2.1 The Commission's Aviation Strategy

The Commission's Aviation Strategy of December 2015 makes clear that:

> *'Aviation is a strong driver of economic growth, jobs, trade and mobility for the European Union. It plays a crucial role in the EU economy and reinforces its global leadership position. An Aviation Strategy is needed to ensure that the European aviation sector remains competitive and reaps the benefits of a fast-changing and developing global economy.'*

Three priority areas for action are identified, including 'Tackling limits to growth in the air and on the ground, by reducing capacity constraints and improving efficiency and connectivity'. Ultimately, this action area is intended to ensure that the air transport industry can deliver the required services to support economic growth and that the functioning of the ATM network does not give rise to any undue impediments to achieving that overarching objective.

Within this context, the European Commission emphasised the important contribution that the Single European Sky Project (SES) could have in reducing the costs stemming from inefficiencies (delays, and longer routes etc.) contributing to a reduction in CO_2 emissions of 50 million tonnes by 2020. The same document also recognises the importance of the continuity of provision of air navigation services to the achievement of the environmental benefits of the SES:

> *'In order to allow for continuity of air traffic management, a minimum level of service in managing European airspace should be ensured, allowing at least for the movement of overflights (flights crossing the airspace of an affected state or area) causing the least amount of disruption to the network. In this respect, the Commission will promote the exchange of best practices between Member States".*

Ensuring that disruption to airspace management through industrial action can be mitigated is therefore an important element in achieving an efficient and effective management of the SES and improving its performance. Hence, in Section 6.1, the Aviation Strategy identified that it was important that sufficient notice be given of strike events to allow proper planning of mitigating actions.

It went on to suggest that, in order to allow for continuity of air traffic management, it would be highly desirable to promote a minimum level of service in managing European airspace, providing at least for the movement of overflights (flights crossing the airspace of an affected state or area). The aim would be to give rise to the least amount of disruption to the network. In this respect, the Commission indicated that it would promote the exchange of best practices between Member States.

The Aviation Strategy also recognised the role of social dialogue in seeking to avoid the incidence of strikes in the first place.

The Single European Sky legislation itself entered force in 2004. This first package of legislation defined the SES as a key initiative to reform the organisation of European airspace to provide improvements in safety, capacity, efficiency and environmental impacts. The management of air traffic within Europe relies on the national air navigation service providers (ANSPs) working cooperatively using common systems.

The second package of SES legislation (2009), known as SES 2, introduced a Performance Scheme setting down EU-wide and local targets for the SES, as well as performance monitoring and corrective actions. In this context, key performance indicators and respective targets have been identified in relation to the safety, capacity, efficiency and environmental aspects for two reference periods (2012-2014 and 2015-2019). Capacity and cost-efficiency indicators, such as en-route Air Traffic Flow Management (ATFM) delay per flight and average European Union-wide determined unit rate for en-route air navigation services are particularly relevant in the context of this study.

However, the achievement of these performance targets is being adversely affected by industrial action events in the ANSPs. For the SES to deliver its intended benefits in full, all elements of the European ATM system must continue to operate at all times. Disruption to one part of the airspace can cause knock-on effects in other regions through cancellations, delays and re-routing.

There are multiple reasons for disruption including air traffic control (ATC) capacity, airspace design and staffing-related constraints. Industrial action, including strikes, is one of the issues that affects the performance of the network and the achievement of those objectives.

2.2 Further context for the study

This study is tasked with providing information and analysis on the effect of industrial action on service continuity in the ATM Network. It is further tasked with advising on the feasibility of harmonising minimum notification periods and minimum levels of service in the event of industrial action to inform the planned preparation by the Commission of guidelines on the matter during 2016/17.

2.2.1 Causes of strikes

At the outset, it is important to recognise that industrial action in ATM can have multiple causes and, to some extent, these impact on the feasibility of harmonising notice periods and defining minimum levels of service as well as impacting on the scope for action to address the causes of strikes. Two principal causes of strikes affecting ATM can be identified:

- ATM related causes such as pay disputes, changes to working conditions, rostering, technical modernisation; or change management etc. and which are specific to the ANSP;
- participation in general/public service strikes covering terms and conditions of employment, pensions etc. (‘solidarity strikes’).

In the former case, these strikes may be related to the process of modernising and improving the ATM service so, whilst there negative effects of the strike are damaging, the outcome may result in an improved ATM service in the future.

In the latter case, strikes are often unrelated to specific issues within the ANSP and typically relate to national issues affecting all public sector workers. In these cases, the ANSP has much less influence over the conduct and timing of the strikes and limited, if any, control on the process by which such issues are resolved.

2.2.2 Impacts on airlines

A further impetus to this study is provided by the concerns expressed by airlines regarding the disruption and costs to them and to passengers due to strike events. This is best evidenced by the position of Airlines for Europe (A4E) and its ‘Call for Action’ and in the setting up of the Network Management Board Task Force to address the problem and related issues. A4E has published a study from Price Waterhouse Coopers (PwC) on the economic costs of strikes and the findings from that study have been taken into account in the present work.

2.2.3 Industrial relations

It has been recognised that social dialogue and improved industrial relations can have a positive role in reducing the occurrence of industrial action in ATM. The European Commission is aiming to address some of these issues through the Specific Sectoral Dialogue Committee on Civil Aviation and

on Air Traffic Management, which includes key organisations such as the Air Traffic Controllers European Unions Coordination (ATCEUC), the European Transport Workers Federation – Air Traffic Management (ETF-ATM) and the Civil Air Navigation Services Organisation (CANSO).

2.2.4 Mitigation of strike impacts

At the same time, however, improvements in the ability to mitigate the effects of such strikes, when they occur, are also particularly relevant, including two potential measures:

- adoption of minimum levels of service for ATMs during strike action allowing at least for the movement of critical flights and overflights;
- ensuring greater forward visibility of strikes through minimum harmonised notification periods to allow better mitigation planning by surrounding ANSPs.

The expectation is that the promotion of such measures across the EU could help to reduce the impact of strikes, when they happen, and reduce the costs for all users of air space and for passengers. In the medium- to long-term, such improvements can contribute to strengthening the competitiveness of the aviation sector.

3 Methodology – Data sources

To analyse the impact of strikes on the European ATM network and to inform the development of the proposals for best practice guidance, data and information have been obtained from a variety of sources. These data are described briefly in the following sections.

3.1 The 2013 strike repository

In 2013, the EU Network Manager for ATM conducted a survey of 31 Member States and collated the information received in a 'strike repository' spreadsheet. This repository includes information on the right to strike in the Member State, whether there are conditions associated with that right (specific to ATM or otherwise), ATM operations during a strike, airport operations during a strike and contingency plans.

The information in the repository formed the starting point for our study and we used the information contained therein to build understanding of the position of Member States; this was used as input to a further survey of ANSPs and CAAs conducted as part of this study.

3.2 Data from Network Manager database

In response to a request from the study team, the Network Manager provided data extracted from the historic database of European ATM performance. In general, the data covered each day in the period 01/01/2004 to 31/12/2016 and included the following parameters:

- total traffic (number of flights entering the NM area);
- total air traffic flow management (ATFM) delay;
- total ATFM delay directly attributed to strikes;
- total delays attributed to 'other' reasons;
- total delays attributed to 'other' reasons with 'Industrial Action' mentioned in the regulation remarks;
- total distance flown (km);
- total great circle (GC) distance;
- flight efficiency parameter (calculated as the percentage increase over the GC distance represented by the actual distance flown.

These data were analysed to identify the dates on which strikes occurred and their impact on the airspace traffic. Although there are some uncertainties in the results, the analyses provide understanding of the overall impact of strikes on the performance of European ATM and allow the identification of the relative impact and frequencies of strikes in different Member States.

As part of this analysis, presented later in this report, the need for further data giving the number of flights that entered the airspace of each Member State (in which a strike occurred) was identified. These additional data were provided by the Network Manager and used in the preparation of Figure 4-3.

3.3 Survey of ANSPs and CAAs

Survey questionnaires were distributed to the air navigation service providers (ANSPs) and Civil Aviation Authorities (CAA) or National Supervisory Authorities (NSAs) of the European Union Member States and of other States participating in the network functions[1]. These questionnaires requested updated information on the situation regarding strikes (similar to the 2013 survey by Network Manager) and requested opinions on the potential for achieving harmonised minimum notification periods and minimum service levels. The survey documents were partially completed using the data from the 2013 strike repository and other sources (creating 'country fiches', presented in Annex A.1) before being sent and the recipients were requested to confirm, complete or amend the information.

In total, responses were received from ANSPs or CAAs (in some cases both) from 24 EU Member States and from nine other states. The information supplied has been used to understand the situation in each Member State and to identify existing practices (such as minimum notification periods and minimum levels of service). The assessment of these existing practices, and the comparisons with the impacts of strikes in the Member States, has been used to identify the 'best practices' described in Section 10.

The responses from the different Member States have been collated into in fiches per country presented in Annex 1.

3.4 Interviews of ANSPs and CAAs

To improve understanding of the situation in different Member States and to clarify mitigation measures that have been implemented, a number of ANSPs and CAAs have been interviewed, either face-to-face or as a telephone conference. In some cases, both the ANSP and CAA were represented in the same interview. The interviews also included discussion of the potential for implementing harmonised minimum notification periods and minimum levels of service.

The organisations interviewed are listed in Table 3-1; significant information from the interviews is presented in Section 5.

[1] The primary focus of the study was on EU Member States and other States who have committed to implementing the SES. However, for completeness, the survey was also distributed to EUROCONTROL Member States who have not yet made such a commitment: Armenia Turkey, Ukraine

Table 3-1 List of ANSPs and CAAs interviewed during the course of the study

Member State	Organisation	Face-to-face or telephone?
ANSPs		
Denmark	NAVIAIR	Face-to-face
France	DSNA	Telephone
Ireland	IAA	Face-to-face
Italy	ENAV	Telephone
Greece	Hellenic Civil Aviation Authority	Telephone
Spain	ENAIRE	Face-to-face
UK	NATS	Telephone
N/A	Maastricht Upper Area Control (MUAC)	Telephone
CAAs		
Denmark	Danish Transport and Construction Agency	Face-to-face
Ireland	IAA	Face-to-face
Portugal	ANAC	Telephone
Spain	General Directorate of Civil Aviation of Spain	Face-to-face

3.5 Interviews with airlines

In addition to the ANSPs and CAAs, five airlines were interviewed to assist in understanding the impacts of strikes and the measures that airlines take to mitigate the impact on passengers during a strike. The interviews sought to identify the benefits to them of different notification periods and different levels of service during a strike (both in the nature of the definition of the minimum level of service and the value(s) assigned to that defined level of service).

The airlines interviewed during the study are listed in Table 3-2; significant information from the interviews is presented in Annex 2.

Table 3-2 List of airlines interviewed during the course of the study

Member State	Organisation
Airlines	
United Kingdom	British Airways
United Kingdom	easyJet
Germany	Lufthansa
Ireland	Ryanair
France	Air France

3.6 Interviews with Trade Unions

As well as the ANSPs/CAAs and airlines, it was intended that the study would include interviews with, and inputs from union representatives in key Member States. Approaches were made to the Air Traffic Controllers European Unions Coordination (ATCEUC) and the European Transport Workers Federation (ETF) to initiate such discussions. However, the organisations were concerned regarding the topic areas of the study (the minimum notification period and minimum level of service), even though it was explained that there was no intention to challenge the right to strike. On 25 July 2016, the two organisations informed the EU study team that they would not participate in the study and subsequent attempts to contact some individual unions resulted in confirmation that they were following the recommendations of ATCEUC and ETF.

A union representative did participate in one of the interviews (Denmark) and an informal discussion was held with a union representative from Greece. Although not presenting an official union position, the information and comments provided were beneficial in forming the conclusions and recommendations from the study.

The study team also attended a workshop on minimum service levels in ATM, organised by the Commission under the auspices of the Expert Group on the Social Dimension (EGSD). The workshop was also attended by representatives from the International Federation of Aeronautical Information Management Associations (IFAIMA), the International Federation of Air Traffic Safety Electronics Associations (IFATSEA) and the International Federation of Air Traffic Controllers Association (IFATCA), representing the positions of the unions on the subject. At this workshop, feedback was received on the potential success of best practices on minimum notification periods and minimum service levels and, in particular, on the importance of good social dialogue in reducing the number of strikes. This feedback has informed the formulation of the recommendations presented in Section 10.

3.7 Network Manager Board Task Force on Minimum Service Levels

During the study period, the study team attended five meetings of the Network Management Board (NMB) Task Force on Minimum Service Levels. This Task Force was made up of a sample of representatives from ANSPs and airspace users as well as the Network Manager and the Commission. These meetings provided the opportunity for the study team to present progress and to receive guidance and feedback as well as further information and clarifications. This extra information has been taken into account when formulating the best practices recommended later in this report.

4 Analysis of the impacts of strikes on ATM in Europe

4.1 Introduction

The current study is focused on the impact of strikes by air traffic control officers (ATCOs) on disruption to the air traffic management system in Europe.

According to data presented in the EUROCONTROL report 'ATM Cost Effectiveness (ACR) 2014 Benchmarking Report with 2015-2019 outlook'[2], in 2014, **there were approximately 17 500 ATCOs working in operations in Europe** (almost 14 000 in EU Member States). A further 2 470 (1 810 in EU Member States) ATCOs were employed on other duties. As described later in this report, **only a relatively small number of ATCOs (in just a few countries) have participated in strikes in recent years**. However, the impacts on the European economy, in the form of delays, flight cancellations and costs to airlines and passengers, can be significant.

The status of the ANSP, and hence the ATCOs working for it, varies between different countries. In some countries, the ANSP is part of the CAA and its employees are public servants, with many belonging to wider public service unions. In other countries, the ANSP is a private organisation and its

[2] https://www.eurocontrol.int/sites/default/files/content/documents/single-sky/pru/publications/ace/ACE-2014-Benchmarking-Report.pdf

employees are not public servants. **The likelihood of ATCOs striking in support of a national public service strike (solidarity strike) is much greater in the former case.**

Although ATCOs in Europe may have a different status, depending on the ANSP that they work for, they are all subject to standard regulations regarding, for example, licencing and certification[3].

The disruption caused by strikes can take a number of different forms, particularly in the way that it affects individual flights:

- **Delays** – Delays to the departure of flights can be due to the regulation of airspace. The reduced capacity of the airspace managed by the ANSP in which the strike occurs can affect flights which depart from the same Member State or a different one (but which is planned to pass through the regulated airspace). Additional flights may also be delayed if neighbouring airspace receives an increased level of traffic and, as a result, is regulated to manage that additional traffic.
- **Consequential delays** – Delays to the departure of flights which, although not directly affected by the strike, are affected by (for example) the late arrival of an incoming flight which has been directly or indirectly affected by the strike.
- **Cancellations** – If the strike causes airports to be closed (or their capacity to serve flights is restricted) then flights departing or arriving at those airports may be cancelled. Additional flights may also be cancelled if the delays in the en-route airspace make it impractical to operate the flight (due to arrival beyond curfew, aircraft being out of position or flight crew going beyond flight time limitations).
- **Flight efficiency** – The restricted capacity of airspace may cause airlines to fly alternative and extended routes to reach their destination. Although this may allow the flight to operate (or to operate with less delay than waiting for a slot to transit the affected airspace), the extended flight distance leads to a longer flight time (giving delays to the arrival), increased fuel consumption (causing increased costs for the airline) and increased environmental impacts.

In addition to formal strikes by ATCOs, similar levels of disruption may be caused by less formal forms of industrial action ('work to rule' or, for example, coordinated sick leave for multiple controllers). Strikes by other categories of staff, such as technicians, may also lead to an inability of the air traffic control centre (ACC) to perform its function and cause hence disruption to the ATM network. These events are recorded differently and are not identifiable in the data that were obtained from the Network Manager; however, they can give rise to similar impacts when they occur.

4.2 Historic data analysis

To provide an analysis of the historical impact of strikes on the European ATM system, data were obtained from the Network Manager (NM). These data provide definitions of the delays in the European ATM network for every day from 01 January 2004 until 31 December 2016, including those delays that have been recorded as being due to industrial action.

The data include, for every day since 01 January 2004:

- total traffic (number of flights entering the NM area);
- total air traffic flow management (ATFM) delay;
- total ATFM delay directly attributed to strikes;
- total delays attributed to 'other' reasons;
- total delays attributed to 'other' reasons with 'Industrial Action' mentioned in the regulation remarks;
- total distance flown (km);
- total great circle (GC) distance;
- flight efficiency parameter (calculated as the percentage increase over the GC distance represented by the actual distance flown.

[3] Commission regulation (EU) 2015/340, see http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2015:063:FULL&from=EN

The data related to flight efficiency (i.e. total distance flown, total GC distance and efficiency parameter) are only available for dates since 01 January 2014. Furthermore, prior to 2012, the data relating to 'other' reason delay did not always record whether this was due to 'Industrial Action', limiting the conclusions that could be drawn from such data.

A further set of data obtained included the breakdown of the delay data by Member State, including the allocation of the delay attributed to the strikes to an individual Member State (i.e. the Member State in which the strike occurred). This data set includes, for each day since 01 January 2004 and for each Member State in which delays are recorded on that date:

- total air traffic flow management (ATFM) delay;
- total ATFM delay directly attributed to strikes;
- total delays attributed to 'other' reasons;
- total delays attributed to 'other' reasons with 'Industrial Action' mentioned in the regulation remarks;

In these data, the 'Member State' field also includes Maastricht Upper Area Control Centre (MUAC) as an entity in which delays can occur. These data have allowed the Member State in which the strike occurred to be identified for each date on which delays due to strikes were recorded.

The data obtained from Network Manager have been analysed to identify the prevalence of strikes and their effects on the performance of the European ATM system. **It should be noted that the data provided identifies delays recorded as being due to strike events in the context of the total volume of delay due to all causes**. In discussions with ANSPs and, in particular, airlines, it has become clear that such data do not capture the full consequences of a strike event on the network and on users. This is because flights that are delayed later in the day as a consequence of an initial strike-related delay may not always be captured under this definition as they are recorded as reactionary delays. Such delays may affect flights on routes not directly related to those to, from or even overflying the Member State in which the strike event occurred but arise because of the knock-on effects of the initial strike event. Additional information has been obtained from airlines relating to specific dates when strikes occurred and the wider impact on their operations. These examples are described later in this report.

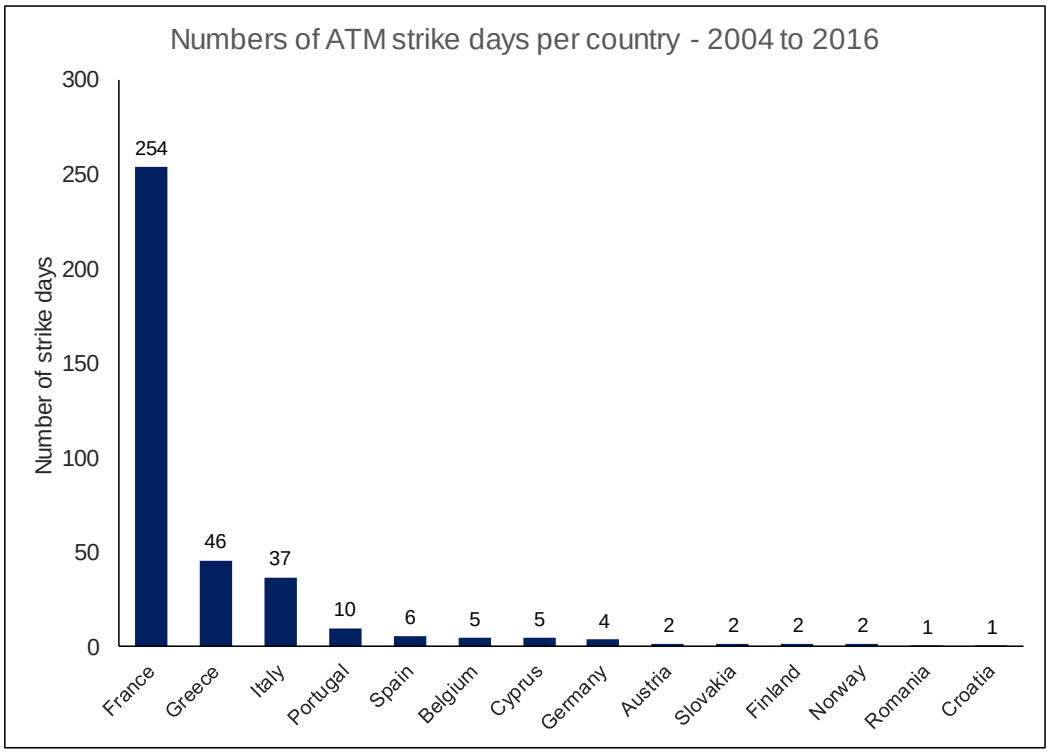
It is also understood that short notice strike events may sometimes be recorded as due to 'staffing issues' and these are not captured in the data as being due to strikes.

4.2.1 Total strikes and delays

The overall numbers of strike days and the recorded delays caused by them during the period from 01 January 2004 to 31 December 2016 are shown, for each Member State that was recorded as having strikes in this period, in Figure 4-1. Figure 4-2 then shows the average delay identified as being due to restrictions directly imposed due to the Member State concerned[4].

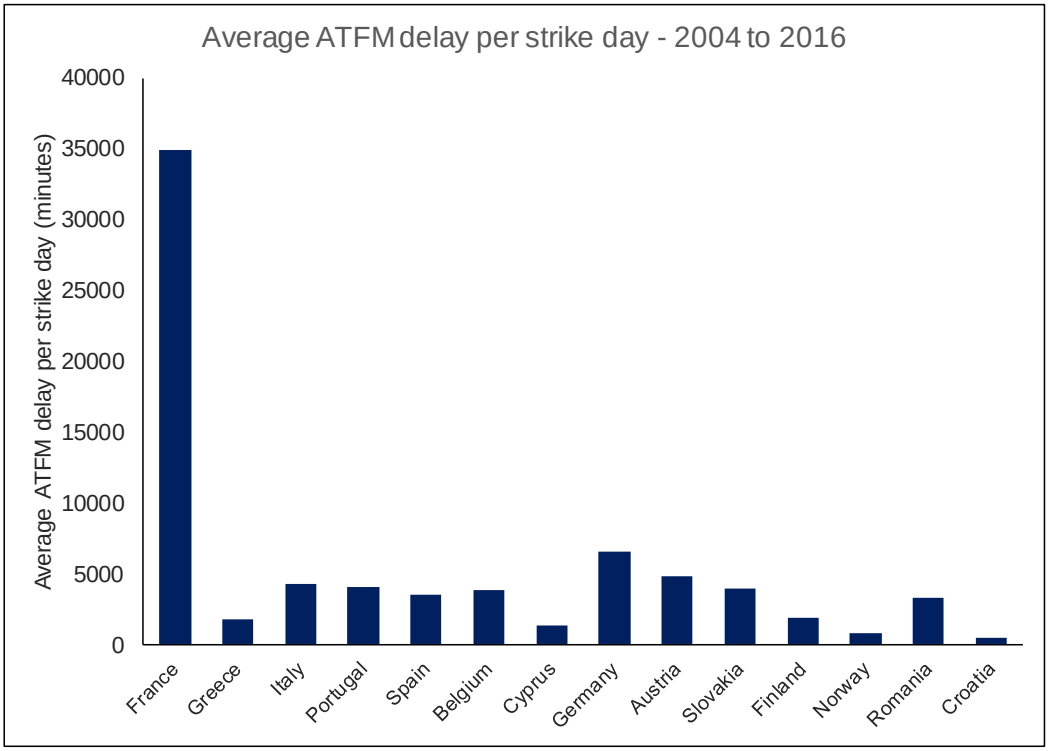
[4] This is delay caused by restrictions imposed compared to the filed flight plan. Hence, it may not fully reflect the actual delay against the scheduled time of departure or arrival where airlines have already replanned the operation.

Figure 4-1 Number of strike days recorded by Member State[5] during period 01 January 2004 to 31 December 2016



Source: Analyses of data provided by Network Manager

Figure 4-2 Average delay incurred per strike day for all Member States[6] in which strikes were recorded



Source: Analyses of data provided by Network Manager

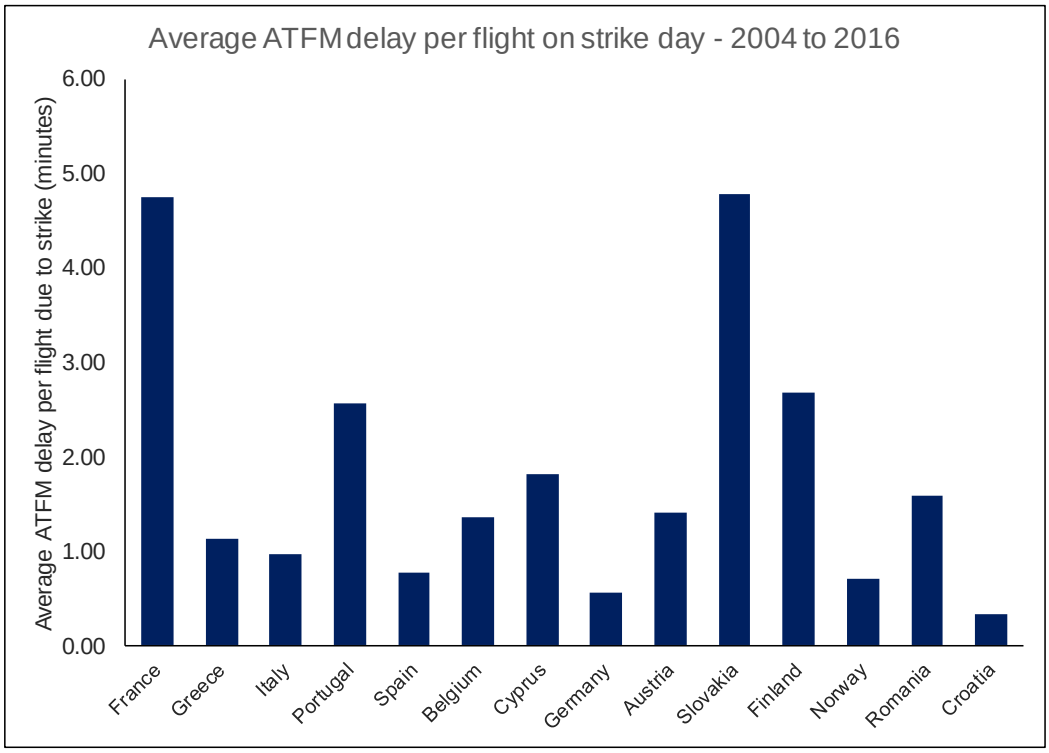
[5] Although Norway is not an EU Member State, it is included here as it has committed to implementing EU aviation legislation
[6] Idem footnote 5

Figure 4-1 shows information on the impact of strikes in 14 Member States from France (254 strike days) to Croatia (one day); no other Member States were recorded as having delays due to ATC industrial action during the period analysed. It can be seen that France has both the highest number of strike days and (from Figure 4-2) the greatest impact on delays on the network. **Over the entire period, 67 % of all strike days occurred in France and caused 96 % of all delays recorded as being due to ATC industrial action.** Greece, Italy and Portugal also had significant numbers of strike days, although the impacts were much less.

From Figure 4-2, it can be seen that, on average, a strike in France causes over 35 000 minutes recorded delay (per day), while in Greece, Italy and Portugal the values are approximately 1 800, 4 300 and 4 100 respectively. It should be noted that the large differences are partly due to the duration of strikes in France, which tend to be for complete days rather than a few hours as in other Member States. In other Member States, both the numbers of strikes and the delays were significantly lower.

It is recognised that **part of the reason that France has such a significantly higher average delay per strike day than other Member States is that it also manages a greater number of flights due to its size and geographical position**. Therefore, additional calculations have been performed to identify the average delay per flight in a Member State's airspace (on a strike day). The calculation divided the total delay in each Member State (due to industrial action) by the total number of flights entering that Member State's airspace on the days in which those (industrial action-related) delays occurred. The results are presented in Figure 4-3.

Figure 4-3 Average delay incurred per flight on strike day (in Member State's airspace) due to industrial action[7]



Source: Analyses of data provided by Network Manager

This approach to the calculation of an average delay effectively removes the scaling due to the volume of traffic handled by each Member State, although it will still be affected by different strike durations. It can be seen that France has a significantly higher average delay than Greece or Italy, while the average delay in Portugal is about half that of France. Slovakia had only a small number of strikes in the period (three); one of which had only a small impact (in terms of delays), but the other two strikes caused quite large total delays, although the traffic in its airspace was low, so the average impact per flight managed by the ANSP was large.

[7] Idem footnote 5

Another issue that was identified in discussion with the NMB Task Force is the impact of the duration of a strike. The analyses presented here show the effects for the full day in which the strike occurred. However, some strikes will be effective for the whole day (in France, for example) and some for only a few hours (for example, Italy or Spain). **This difference in duration of a strike impacts on the numbers of flights delayed or cancelled as well as the total length of delay recorded.**

Further details of the analyses of these data are given in the following sections.

4.2.2 Directly imposed flight delays

The overall results for the number of strikes recorded in the years from 2004 to 2016 and the delays directly due to restrictions imposed in the Member State concerned are shown in Table 4-1. It should be noted that this does not include 'other' delays that may be related to the strike event, not least as such delays were not identified in the data prior to 2012. It also does not include any estimate of the reactionary delays caused to later flights.

Table 4-1 Overall results for numbers of strikes and delay in years from 2004 to 2016

Year	Number of strikes	Total delay (minutes)
2004	12	74 289
2005	21	437 272
2006	30	522 226
2007	19	246 602
2008	36	398 239
2009	22	197 514
2010	80	3 440 728
2011	21	108 217
2012	35	633 964
2013	30	815 721
2014	18	737 003
2015	23	569 648
2016	32	1 068 346
Total (2004 to 2016)	**375**	**9 249 769**

Source: Analyses of data provided by Network Manager

Further KPIs for the performance of the ATM system in relation to delays due to strikes are presented in Table 4-2. As well as the average delay to flights caused by strikes (calculated as the total delay due to the impact of the strike, divided by the total number of flights on the strike day), the table also includes the percentages of total ATFM delay due to strikes. These are calculated as the total delay due to the impact of strikes divided by the total delay due to all causes. These percentages are presented for just the days on which strikes occurred and for the complete year.

Table 4-2 Key performance indicators related to delays during strikes

Year	2004	2005	2006	2007	2008	2009
Average delay per flight due to strike (minutes)[8]	0.25	0.82	0.67	0.47	0.38	0.32
Percentage of total ATFM delay (on strike days)	12.3 %	30.0 %	25.4 %	21.1 %	15.6 %	15.8 %
Percentage of total ATFM delay (annual average)	0.5 %	2.5 %	3.0 %	1.2 %	1.7 %	1.3 %

Year	2010	2011	2012	2013	2014	2015	2016
Average delay per flight due to strike (minutes)	1.59	0.18	0.68	1.12	1.77	1.04	1.40
Percentage of total ATFM delay (on strike days)	42.3 %	9.0 %	41.2 %	56.3 %	70.4 %	44.0 %	49.0 %
Percentage of total ATFM delay (annual average)	12.8 %	0.6 %	5.9 %	10.1 %	8.4 %	4.6 %	8.2 %

Source: Analyses of data provided by Network Manager

Historically, **the worst year for strikes was 2010**, with over twice as many days of strikes as any other year and over three times the delay of any other year. The total delay associated with strikes in 2010 was 12.8 % of the total recorded ATFM delays suffered by the ATM system during the year.

In 2012, 2013 and 2014, the delays associated with strikes were also a significant fraction of the total. On the days on which strikes occurred, the percentage of the total delay that was due to the strike was naturally higher; in 2014, this fraction rose to 70 % of the total delay, with an average delay per flight due to the strike of 1.77 minutes. The average delay per flight due to strikes (on the days that strikes occurred) in 2010 was lower at 1.59 minutes (forming 42.3 % of the total delays on those days) but, because of the large number of strikes during the year, the total delay over the year was much higher (as shown in Table 4-1).

The total recorded delay in the first half of 2016 (to 30 June 2016) due to strikes was greater than any other full year except 2010. However, the number of strikes and their impact was lower over the second half of the year, so the total delay due to strikes by the end of the year remained lower than in 2010. The percentage of the total ATFM delay due to strikes is also high in the first half of the year at almost 16 %.

4.2.3 Delays imposed on other Member States

The analysis above concerns only those delays caused by restrictions directly imposed in the Member State in which the strike occurred and includes delays to overflights as well as those to and from the affected Member State. In some cases, restrictions giving rise to delays will also be imposed by other

[8] This is calculated as the total delay due to strikes during the year divided by the total number of flights (across the full network) on days in which strikes occurred in the same period. The average delay on particular flights which are delayed because of the effects of the strike would be expected to be significantly higher. In these calculations, the 'total delay' includes both the delays recorded in the country in which the strike took place (directly attributed to the strike) and delays imposed in other countries (recorded as 'Other delays (with industrial action referred to in the regulation remark)' in the data provided by Network Manager). Although data for these latter delays are available for the full period from 2004 to 2016, they were not recorded in the period up to 2012 as comprehensively as they have been since.

Member State, particularly where the effect of diverted traffic gives rise to extra loadings on their airspace. Since 2012, some of these 'other' delays have been identified in the Network Manager's data. The effects are illustrated in Figure 4-4 to Figure 4-7 below.

Figure 4-4 Delays imposed in other Member States and third countries due to the effects of a strike in France

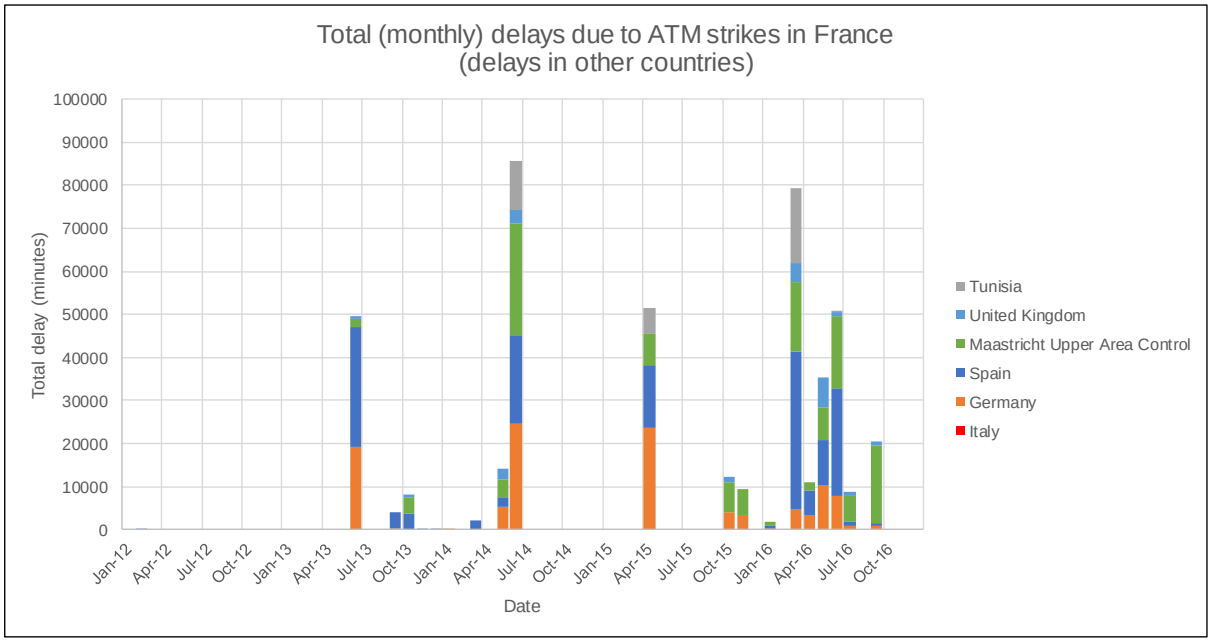


Figure 4-5 Delays imposed in other Member States due to the effects of a strike in Italy

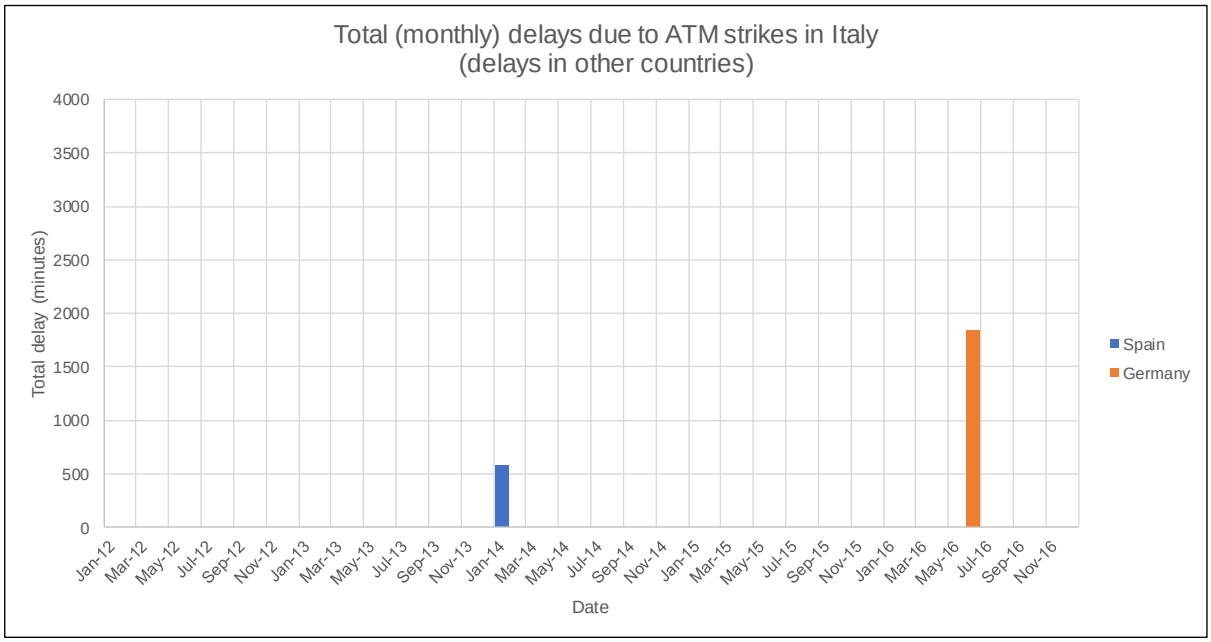


Figure 4-6 Delays imposed in other Member States and third countries due to the effects of a strike in Portugal

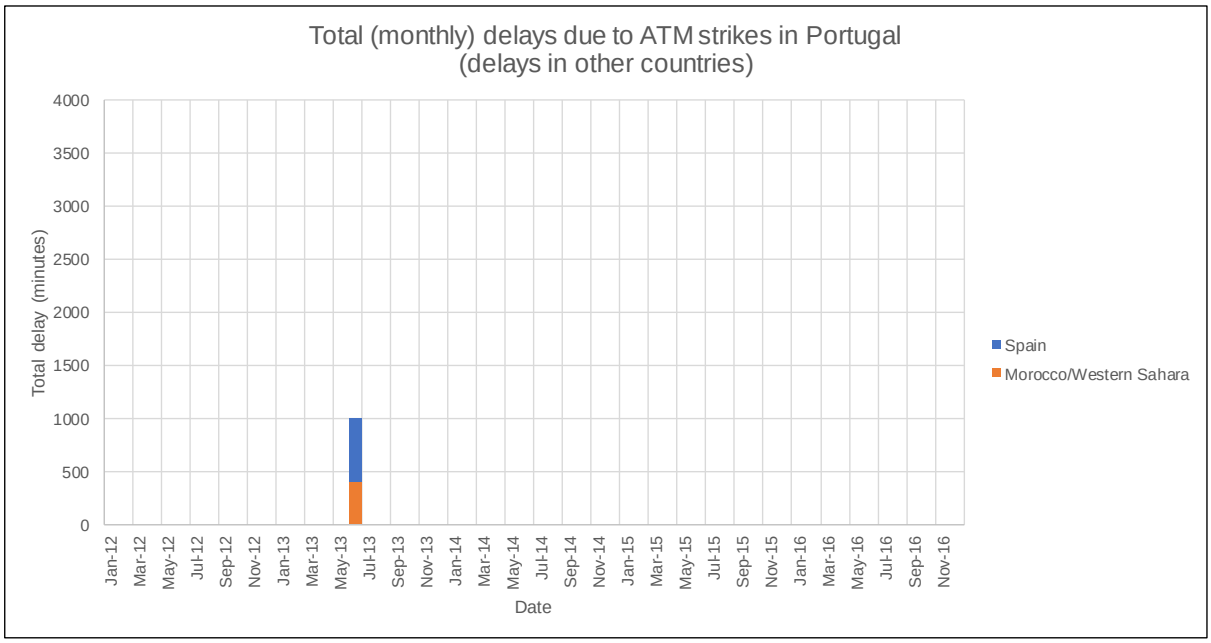
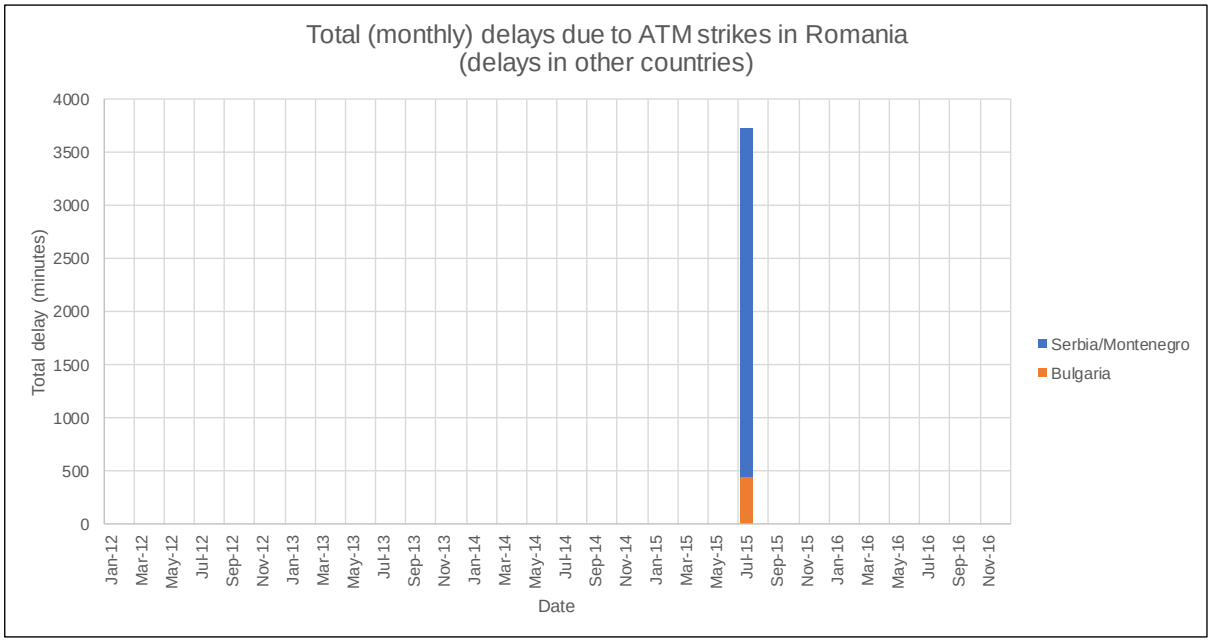


Figure 4-7 Delays imposed in other Member States and third countries due to the effects of a strike in Romania



Source: Analyses of data provided by Network Manager

When comparing the information presented in these figures, it should be noted that the scale of Figure 4-4 (France) is much greater than that of the other three figures (100 000 minutes delay compared with 4 000 minutes delay). **The consequential effects of strikes in France are much more significant for the network as a whole, with neighbouring Member States having to impose substantial delays to flights as a result.** This arises in part due to France's geographic position and the duration of strikes, which tend to be longer than in other Member States. The need to accommodate overflights diverted around France also leads to an increased workload in the other Member States.

4.2.4 Flight cancellations

The historic data held by Network Manager do not contain information on flight cancellations related to strikes. This is partly due to the difficulty in distinguishing flights that are cancelled by the airlines in advance of the strike (when there is sufficient advance notification of the strike) as they may not have submitted a flight plan at that stage. **The Network Manager only records cancellations after a flight plan has been filed, which captures only a fraction of the true cancellations**.

However, it is possible to analyse the historic daily traffic data to calculate an approximation to the number of flights that did not take place on strike days. To do this, the number of flights on days on which strikes occurred have been compared to the number of flights on a benchmark day. Different options were investigated for defining this benchmark day. The approach adopted was to use the equivalent day from the previous year (on the same day of the week), with the number of flights scaled by the average annual growth.

The average annual growth was calculated by considering the numbers of flights on equivalent days in successive years for days on which there were no strikes (in either year) and calculating the average value of the ratios of those numbers of flights. The average year-on-year growth rates calculated in this manner are shown in Table 4-3. These formed the basis for the assessment of the number of cancellations on strike days using the approach outlined above.

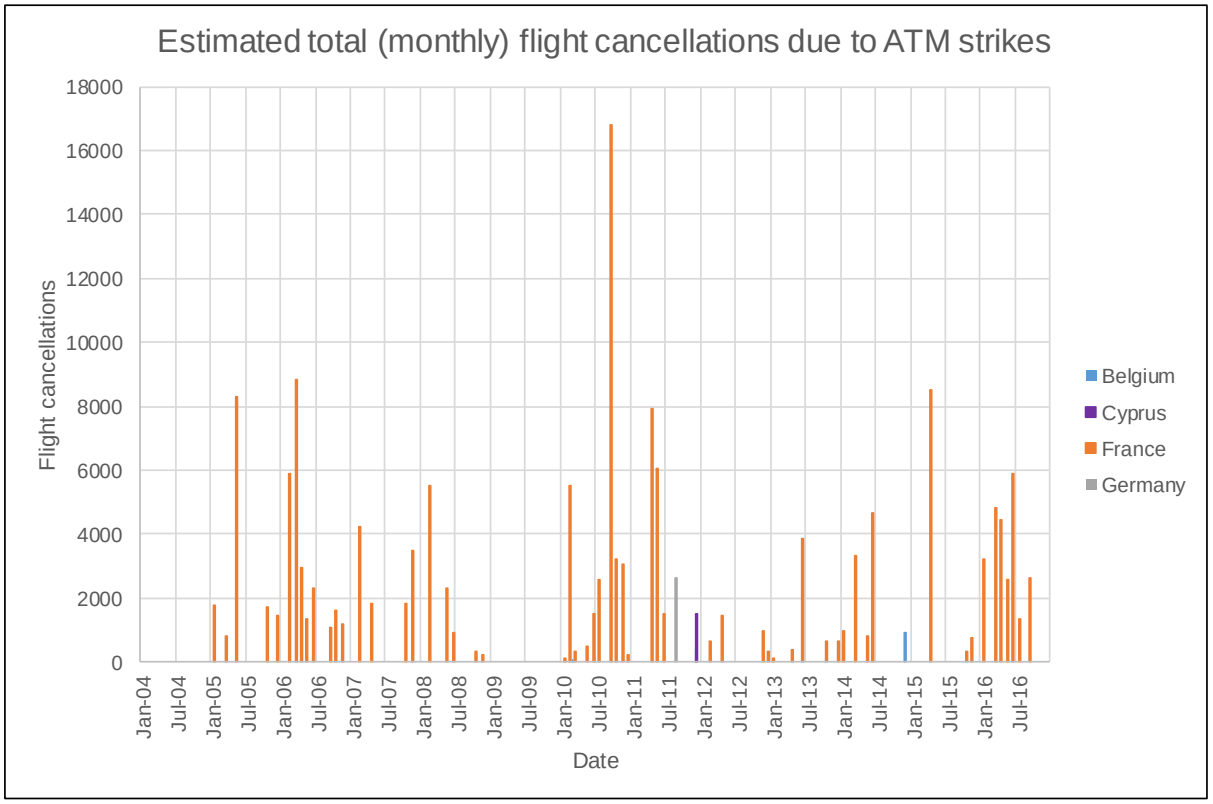
Table 4-3 Calculated average annual traffic growth rates

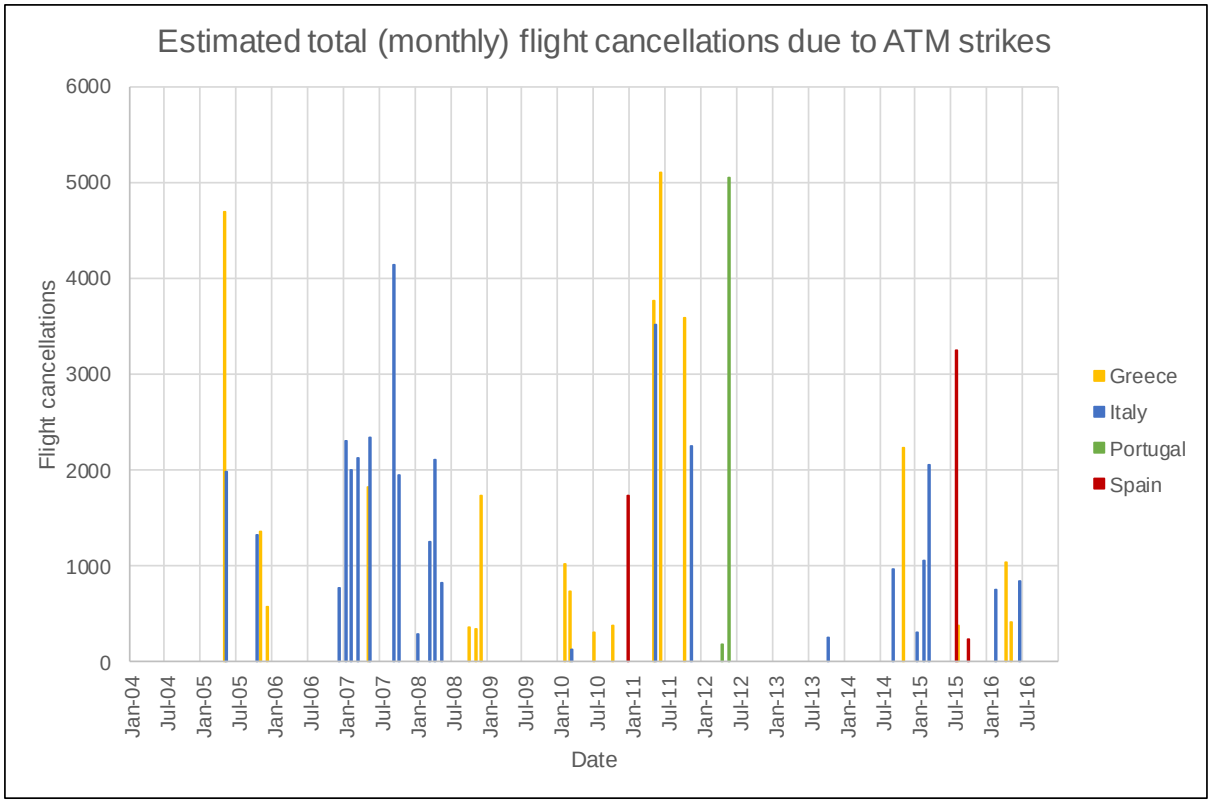
Year	2005	2006	2007	2008	2009	2010
Average growth rate	4.20 %	4.14 %	5.62 %	0.94 %	-5.81 %	0.68 %

Year	2011	2012	2013	2014	2015	2016
Average growth rate	7.03 %	-2.27 %	-0.89 %	2.17 %	1.75 %	3.29 %

Using this approach to estimate the number of flights that did not take place on days on which there were strikes (as indicative of the number of cancelled flights) produces the following results. Figure 4-8 shows the calculated numbers of ‘cancelled’ flights in each month, identified against the Member State in which the strike occurred.

Figure 4-8 Estimated monthly flight cancellations due to strikes





Source: Analyses of data provided by Network Manager

The average daily traffic across the network is about 30 000 flights, or about 900 000 flights per month. The largest value shown on Figure 4-8 is approximately 17 000 flights in September 2010, which represents approximately 1.9 % of the flights in that month.

The total number of flight cancellations calculated in this manner for the Member States with the highest number of strikes over the period from 01 January 2005[9] to 31 December 2016 are shown in Table 4-4. Also shown are the average number of flight cancellations per strike day.

Table 4-4 Calculated numbers of flight cancellations for period 01/01/2005 to 31/12/2016 for Member States with highest numbers of strikes

Member State	Number of Strikes	Total number of cancellations in period	Average number of cancellations per strike day
France	249	162 392	652
Greece	44	29 799	677
Italy	34	35 460	1 043
Portugal	10	5 234	523
Spain	6	5 209	868
Belgium	5	1 398	280
Cyprus	5	1 527	305
Germany	4	2 641	660

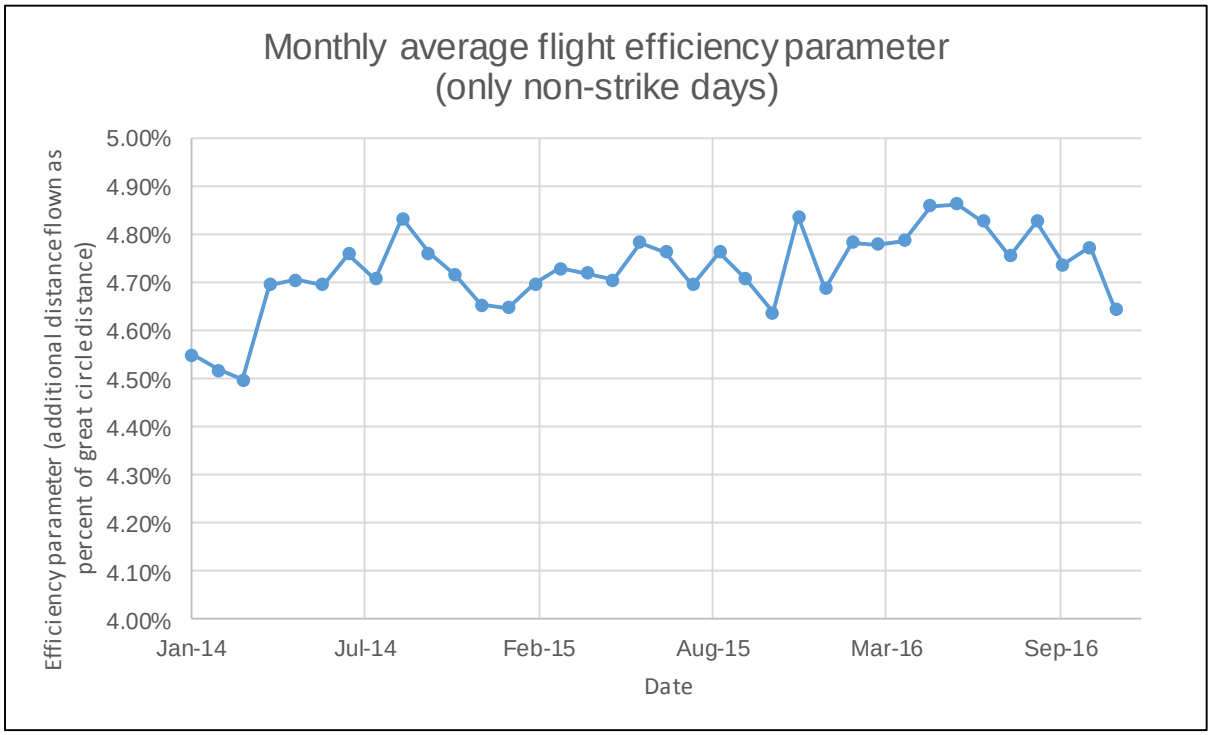
As well as having the greatest number of strikes, France has the greatest number of cancellations through the period. However, it is interesting to note that the average number of cancellations on each strike day is not as high as for some other Member States (though it is important to recognise the uncertainty inherent in these calculations of the number of cancellations using the difference between numbers of flights on different days).

4.2.5 Flight efficiency

The other element of the data relating to the impacts of strikes is the flight efficiency calculation. The data provided (actual distance flown and GC distance) show that the efficiency parameter (the additional distance flown divided by the GC distance) is not zero even in the absence of strikes. Figure 4-9 shows the variation over time of this parameter. As noted earlier, the data required for this element of the analysis is only available from the beginning of 2014.

[9] The data provided by the Network Manager cover the period from 01/01/2004. The approach of calculating the cancellations by comparing the number of flights on a given day with the traffic from one year previously limits the results to start from the beginning of 2005.

Figure 4-9 Monthly average flight efficiency parameters from days on which no strikes were recorded



Source: Analyses of data provided by Network Manager

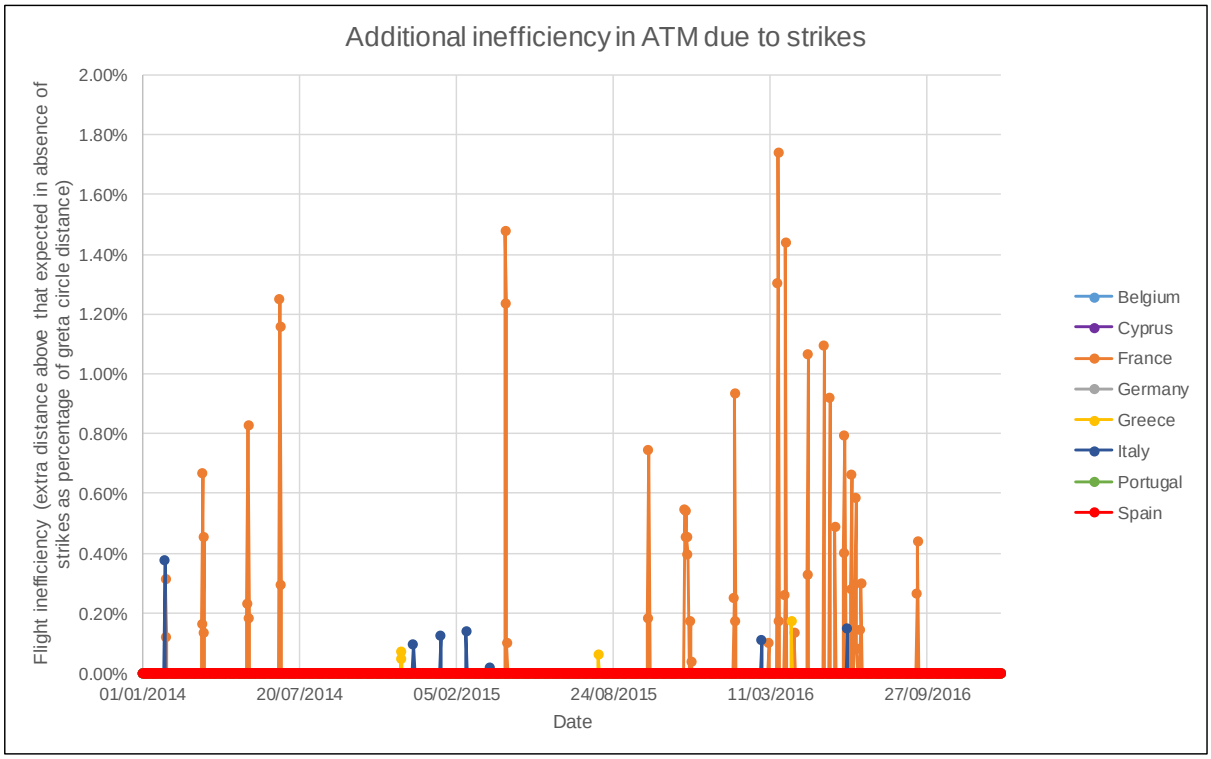
The values shown in Figure 4-9 are averages over the month, including only days on which there were no strikes. As can be seen, the average value is between 4.5 % and 4.9 %. This reflects the extent to which ATM routings diverge from the shortest direct route that might theoretically be possible due to the overall characteristics of the network.

To calculate the impact of strikes on the flight efficiency, the GC distance, scaled to take account of the average flight efficiency of the month (excluding strikes) was subtracted from the actual distance flown on a day on which a strike occurred. This additional distance (associated with the strike) was divided by the GC distance to give the flight efficiency parameter solely related to the strike. For example:

- the actual distance flown (all flights) on 08 April 2015 was 21 251 874 km
- the GC distance on 08 April 2015 was 20 011 418 km
- the average efficiency parameter for April 2015 (for just non-strike days) was 4.72 %
- the additional flight distance due to the strike was calculated as 21 251 874 – 20 011 418*1.0472, giving a value of 295 917 km
- this additional flight distance was divided by the GC distance to give an additional efficiency parameter of 1.48 %

This additional flight efficiency parameter reflects the additional distance flown over the network as a whole, attributable to a strike event. The resulting flight efficiency parameters have been allocated to the Member State in which the strikes occurred and plotted as shown in Figure 4-10.

Figure 4-10 Calculated additional flight efficiency parameter related to the impacts of strikes



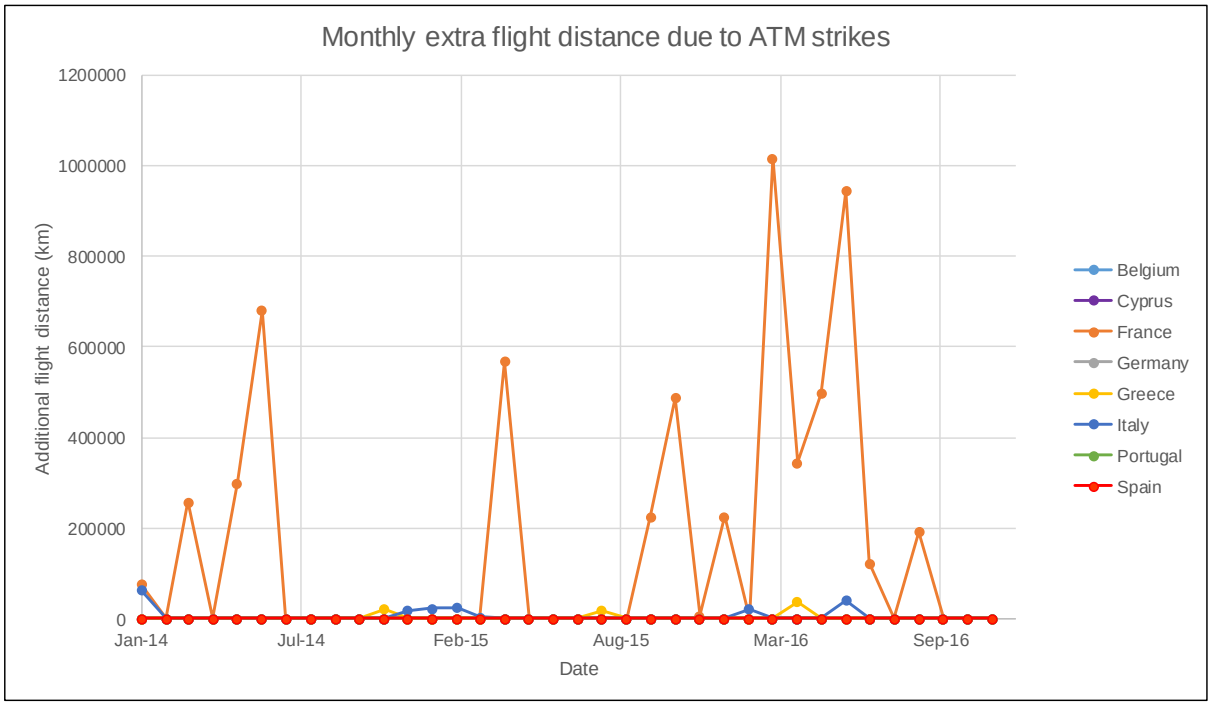
Source: Analyses of data provided by Network Manager

Each bar on Figure 4-10 represents a single strike day. As can be seen, **the additional inefficiency parameter is always less than that which occurs, in any case, in the absence of strikes** (see Figure 4-9), indicating that the additional flight distance is probably localised around the area affected directly by the strike and that the flight efficiency throughout the rest of European airspace is relatively unaffected.

It is evident that, as with the other measures of the effect of strikes, the impact of strikes in terms of additional distance flown is greater in the case of France than for other Member States. This arises partly as a consequence of France's geographic position, resulting in much longer alternative routings, and partly as a consequence of the treatment of overflights more generally, as discussed later in the report.

The additional distance flown on strike days is shown as monthly totals in Figure 4-11. The total additional flight distance calculated in this manner for the 24 months from January 2014 to December 2015 is 2 204 483 km.

Figure 4-11 Monthly totals of the extra flights distance flown due to the impacts of strikes



Source: Analyses of data provided by Network Manager

We have also undertaken some further analysis with a view to understanding the 'shape' of the impact of individual strike events in the different member states in so far as this reflects the different notice periods and minimum standards of service in force. Table 4-5, covering the period from the beginning of 2014 to December 2016, for which we have more detailed data, shows the average impact of individual strike events in Member States where there were multiple strike events over the period. During the period for which these data are available, only a limited number of countries had more than one strike event; it is these countries for which data are shown in Table 4-5.

Table 4-5 Average impacts of strikes in different Member States over period January 2014 to December 2016

Member State of Strike Event	Average Number of Flights Cancelled	Average Increase in Delay per Flight (minutes)	Average Increase in Additional Distance Flown (km)
Spain	47	-0.31	-0.14
France	311	2.37	3.23
Greece	268	0.34	-0.28
Italy	804	0.93	0.28

Source: Analyses of data provided by Network Manager

The results of this analysis highlight the importance of understanding the relative balance between increasing delay, due to allowing more flights to operate, and the impact of a greater number of flights being cancelled but with lower impacts on flight delays and the level of additional distance flown.

The negative values reflect the potential for reduced loadings on the overall network due to the high number of flight cancellations, which may lead to less delay or less additional distance flown. **However, this does not mean that the performance of the network was improved, as the large number of cancellations required are a reflection of the failure of the ATM network to meet the needs of its users.**

We have used this data to gain an understanding of where the balance lies between cancellations, delays and additional distance flown in Section 6.

4.2.6 Conclusions

It is evident that strikes in France have a greater impact in terms of delays and of additional distance flown due to re-routings. This is partly a function of the geographic position of France between northern and southern Europe and between the UK and Ireland and the south-east Mediterranean. It also reflects the fact that strikes in France tend to be of a longer duration than those in other Member States, such as Italy. This greater impact arises despite the minimum level of service in force in France, which allows a proportion of flights still to operate.

In contrast, strike events in other Member States tend to be characterised by higher levels of cancellations, as there are more definitive rules in force as to which flight categories will be handled, but with lower apparent impacts on the network as a whole. However, cancellations may impose costs on users as well as delays. We have used these data to inform an indicative cost benefit analysis that we have carried out to illustrate where the overall balance of benefit and cost may lie in terms of the different types of strikes in the countries for which data are available, principally France and Italy. These calculations are presented in Section 6.1.3

5 Impacts of strikes on service provision

A strike by air traffic controllers may impact flights controlled by the ANSP directly affected by the strike and those controlled by neighbouring ANSPs. This section discusses these impacts, separating the direct impacts (i.e. on the country in which the strike occurs) from those on neighbouring ANSPs.

To inform the understanding of the impacts of strikes on the ANSPs in Europe, interviews were held with representatives from the ANSPs from the following countries: Denmark, France, Greece, Ireland, Italy and Spain. In addition, an interview was held with MUAC, which is responsible for providing air navigation services for the upper airspace over Belgium, Netherlands, Luxembourg and parts of Germany.

Interviews were also carried out with the Portuguese CAA and a Greek Union.

These interviewees were selected as they represented Member States with a range of impacts from strikes, combined with different models of managing strikes (discussed further in section 8.2).

To provide complete information on the results of these interviews, section 5.1 includes an overview of the interviews carried out, an introduction to the national context and discussion of impacts on the national systems of strikes in those countries, while section 5.2 concentrates on the impacts from strikes in neighbouring ANSPs.

In each case, the ANSP or CAA being interviewed had already completed a response to the survey of ANSPs and CAA. Therefore, the interviews were used to investigate some of their responses in greater depth and to understand their opinions regarding the potential for changes to the procedures for mitigating the impact of strikes.

5.1 Impacts on the ANSP affected by strike action

5.1.1 Denmark

5.1.1.1 Introduction

The Danish ANSP, Naviair, manages Danish en-route airspace and provides ATC services for major Danish Airports. In addition to Naviair, the interview included representatives from the Danish CAA (the Danish Transport and Construction Agency (DTCA)) and the union for air traffic controllers.

There is a single air traffic control centre (ACC) in Denmark. There are also other ACCs in Greenland and Jutland.

Based on the interview, the key problems with European ATM (and the achievement of the SES targets) were considered to be the failures of France and Germany to hit their performance targets. The reasons for this are not just strikes. It was felt that more could be achieved by concentrating on how those two countries could meet their targets.

5.1.1.2 Strikes in ATM

The interview confirmed there have been no strikes in Danish air traffic management (ATM) in the period covered by the study. A General Strike occurred in 1999; however, at that time all staff were state employees (civil servants) and were not allowed to strike. Since 2007, the status of the organisation (Naviair) has changed and it is now a private company. Existing staff still have the same contractual terms and conditions (T&Cs) as when they were civil servants, but new staff have new T&Cs, including the right to strike. Civil servants (in general, not just in ATM) are gradually having their T&Cs changed, and have the right to strike. However, no strikes have occurred.

All the interviewees concurred that the key to the lack of strikes is the very good relationships between employers/managers and staff/unions, with regular discussions at many levels and averting conflict through agreement. Strikes are a very infrequent occurrence in Denmark, not just in ATM. This is referred to (frequently) as the 'Danish Model'. This model is considered to have evolved through many years (over 100 years) and is inherent in Danish society. It may not be transferrable to other states.

These regular conversations ensure that threat of a strike does not arise, so there is no real experience in holding conciliation talks to avert a strike. Again, this is wider than just ATM.

The interviewees also noted that air traffic controllers (ATCOs) are not the only members of staff who influence the performance of ATM (e.g. technicians could bring the whole network down if they chose) so overly concentrating on them would be wrong.

Currently, there are no specific agreements regarding the rights of ATM staff to strike. They are very reluctant to introduce legislation on the topic, believing that the Danish Model gives much better results than legislation would.

5.1.1.3 Procedure in the event of strikes and mitigation of impacts

National guidelines are available on how to avoid strikes and how to manage them in the unlikely event that they do occur. There are no specific guidelines related to ATM.

Naviair has its own risk management process, but this covers much wider issues than just strikes.

5.1.1.4 Implications from possible changes to the minimum notification period

There have not been any changes to the minimum notification period in Denmark since 2004.

The interviewees observed that Denmark would **certainly** not implement any legislation related to strikes (minimum notification period or level of service); this would be rejected by the Danish Government on the basis that they already have the Danish Model, which is much better.

Strong concerns were expressed regarding the potential for the Commission to publish 'best practice guidance' that would never be implemented in the country. It was felt that making recommendations on these matters could be counter-productive.

It was noted that the Danish Model is based on a long history of how things are done in Denmark, so it may not be immediately transferrable to other Member States.

It was noted that the airlines had pushed against the previous situation (of ATM provision being a national service) due to concerns over the monopoly situation. Now Europe has a number of privatised ANSPs, with the employees having the right to strike. It was also noted that, in Denmark, even though there is the right to strike, organisational aspects (rather than legal) limit the ability to call local strikes, as they need to be called by the national union.

5.1.1.5 Implications from possible changes to the minimum level of service

Denmark does not have a minimum level of service defined and the interviewees did not see any benefits from introducing one.

5.1.1.6 Costs and benefits

The interviewees did not consider that here would be any benefits from having a harmonised minimum notification period across all Member States.

5.1.2 France

5.1.2.1 Introduction

A telephone interview was held with representatives of the French ANSP, the DSNA. **France has a large area of airspace to manage (about 10 000 flights daily)**, traffic being operated by five ACCs. This contributes to the relatively large impacts that strikes in France have (for example, the large delays incurred). DSNA has approximately 7 750 employees, of which 2 800 are operational ATCOs with a further 300 ATCOs on other duties[10].

5.1.2.2 Strikes in ATM

The analyses of the data provided by the Network Manager showed 254 strike days in France between 2004 and 2016, giving 8.8 million minutes of delay (about 35 000 minutes per strike day on average).

The number of strike days and delays recorded per year are shown in Table 5-1.

Table 5-1 Number of strike days per year for France

Year	Number of strike days	Delays caused by strikes (minutes)	Year	Number of strike days	Delays caused by strikes (minutes)
2004	5	53 566	2011	7	73 064
2005	11	397 794	2012	18	611 948
2006	29	517 831	2013	24	776 222
2007	8	203 427	2014	12	702 969
2008	22	377 901	2015	12	531 099
2009	10	154 314	2016	28	1 051 961
2010	68	3 407 432			

The majority of strikes that have affected ATM services in France have been general civil service strikes, not ATM-specific. In some cases, the ATM-specific unions have not recommended that their members go on strike. The introduction of the Loi Travail in Spring 2016 caused many national strikes in France. These have (in many cases) been supported by ATM staff, even though ATM is explicitly excluded from the law.

For ATM-specific issues, negotiations with the air traffic controllers' unions have generally been successful in averting strikes. For national strikes, discussions are also held with the unions with the aim of agreeing that the union will not participate in the strike; the success depends on the particular context of the strike.

The negotiations to avert ATM-related strikes start when the strike is announced (at least five days in advance) and continue until agreement is reached or the strike is over. A late cancellation of a strike (even after the strike has started for a multi-day strike) is feasible. It is recognised that the uncertainty this causes affects airlines' plans, but the DSNA considers that being able to provide a full service, even at short notice, is better than not.

There are no specific local agreements that affect the right to strike in the ANSP. The right to strike is governed by the rights of all public servants.

5.1.2.3 Procedure in the event of strikes and mitigation of impacts

The defined minimum notification period is five days. This applies to both ATM-specific strikes and national strikes. This minimum notification period is usually complied with.

[10] https://www.eurocontrol.int/sites/default/files/content/documents/single-sky/pru/publications/ace/ACE-2014-Benchmarking-Report.pdf

There is difficulty in determining exactly who will participate in the strike and who will not. **The 'Loi Diard' requires workers in the transportation sector to specify in advance whether they will follow the strike or not. However, it does not apply to ATM.**

Therefore, the ANSP generally requisitions the number of staff they need to keep the relevant sectors (to provide the specified 50 % capacity for overflights) open. If additional staff then report for the shift, they can increase capacity by opening additional sectors; however, they do not have predictability about the ability to do so. **If they had such predictability, the situation would be significantly improved.**

The approach to requisitioning is to requisition enough people to manage the number of sectors that they have identified are required to provide the 50 % of overflights mandated, plus those required to manage the airports that they need to keep open (with reduced capacity for departing and arriving flights).

For national strikes, there may be different levels of response from different ACCs (depending on the context of the strike). In such cases, there may be benefits for airlines to re-route around the ACCs/sectors which are most affected; DSNA can help the airlines to find the best options.

There have also been instances of strikes just in individual ACCs. For example, a strike at the Reims ACC in November 2015 generated 65 000 minutes of ATFM delay.

For departures and arrivals (at reduced capacity), DGAC decide which airports should be regulated and then ask the airlines to reduce their demand (number of flights) by a percentage. The airlines then make their own decisions as to which flights should be cancelled.

Strikes in France are normally full days (midnight to midnight) rather than for a set number of hours. In some cases, strikes have covered multiple days. This aspect contributes to the high total delay caused by a strike in France.

There has been an example of a strike that ran over multiple days, but only for a limited time during the day. In this case, the times selected for the strike (on each day) covered the morning peak time. Note that this differs from the situation in Italy where strikes are not allowed to occur during peak hours.

In general, it is clear that the unions in France are seeking to achieve the maximum impact from strikes; attempts to reduce this impact (while not denying them the right to strike) are likely to be met with resistance.

During a strike, the defined minimum level of service provides for 50 % of the normal capacity for overflights, though these flights are not guaranteed to be without delay. In addition, 16 airports are maintained open (plus another nine overseas). To provide this level of service, the ANSP is authorised to requisition staff (and it normally does).

5.1.2.4 Implications from possible changes to the minimum notification period

The interviewees expressed concerns regarding potential political issues when changing conditions of service.

The current five days notification required is considered to provide enough time to hold discussions with the unions to try to avert the strike and to plan for operations during the strike.

There would be benefits if there were a greater predictability of who would actually work during a strike. A regulation along the same principles as the Loi Diard was considered to be beneficial (maybe with 24 hours notification of the intention to join the strike or otherwise), rather than extending the law itself to include ATM.

It was noted that, although greater predictability would be beneficial, having a situation where everyone declared that they would go on strike (because they were being forced to make a declaration), but then turned up for work on the day, would be no better than the current situation.

5.1.2.5 Implications from possible changes to the minimum level of service

If there were moves to change the minimum service level (for example, to increase the percentage of overflights required to be served), the interviewees expect that they would always only be able to offer this level. They would lose the flexibility to increase the capacity that they can offer when additional staff report for duty. This would be particularly the case during national strikes.

5.1.3 Greece

5.1.3.1 Introduction

The Greek ANSP (the Hellenic Civil Aviation Authority) manages airspace over Greece, including the Greek islands. The organisation has approximately 500 employees.

5.1.3.2 Strikes in ATM

In the period 2004-2016, there has been approximately one strike per year. These generally occur for a duration of four hours and are mainly general strikes. Conversations with air traffic controllers' unions are generally unsuccessful in terms of preventing strikes or reducing their impacts. This is because talks are considered to be a formality during the process. Besides national legislation, there are no specific local agreements in Greece affecting the right to strike in the ANSP.

5.1.3.3 Procedure in the event of strikes and mitigation of impacts

In the event of a strike in Greece, a standard operational plan is followed in order to mitigate its impacts. This is not reliant on the existing notification period, nor the minimum level of service, as the procedures followed are rather standard.

The minimum notification period is generally adhered to, although sometimes it is already known in advance (even up to one month) that a strike will take place. This is especially the case if it is a general strike. There are no specific requirements for the minimum notification period for individuals that hold specific roles within air traffic control.

In Greece, the minimum level of service is determined based on the flights planned and the type of services to be served. In case of a strike, there is a standard plan of the number of ATCOs that should be operational. Further to this, the standard operational plan aims to ensure that specific types of flights are served. These include search and rescue (SAR), state and overflights, which have been agreed between the Civil Aviation Authority and the union. These requirements have taken the form of an internal regulation – the law only requires that the essential service is provided.

These procedures are not reliant on the existing notification period or on the minimum level of service as discussions usually take place one day before the strike. In these situations, dialogue with airlines regarding the minimum level of service to be provided and the prioritisation of flights usually does not take place.

5.1.3.4 Implications from possible changes to the minimum notification period

There have been no changes to the minimum notification period in Greece since 2004. The interviewee did not have an opinion on whether there would be any issues arising from altering the existing minimum notification period but expressed a concern that the national legislation would be difficult to change. This would require action from the Government/Parliament.

5.1.3.5 Implications from possible changes to the minimum level of service

There have not been any significant changes to the minimum level of service in Greece since 2004.

In terms of potential changes to the minimum level of service, the Greek ANSP did not consider it appropriate to implement measures that define the level of staff that must be available during strikes. Instead, the interviewee considered that the allocation of staff is best decided at the ANSP level. In terms of setting a minimum level of service provided as a percentage share of flights, it was considered that this could be possible. However, if the level were high, it would no longer make sense for ATCOs to strike, as there would be no impact on services.

Another option discussed was an alternative prioritisation of services, such as the prioritisation of overflights. The ANSP noted that the prioritisation of overflights already occurs, although operators may not consider this to be very important. Instead, operators tend to be more interested in getting people to their destinations.

To instigate changes, the procedures would vary depending on the nature of the change. Changes to the types of flights to be served would be straightforward, as this is internal regulation, however this may not be the same in the case of setting a minimum percentage of flights to be served. In the event of any changes, the CAA would discuss and agree changes with the union.

5.1.4 Ireland

5.1.4.1 Introduction

An interview was held with the Irish Aviation Authority (IAA), which acts as both CAA and ANSP, although these are functionally separate within the organisation. The interview covered both roles but the responses are presented on a combined basis.

5.1.4.2 Strikes in ATM

Strikes in air traffic management (ATM) services are very rare in Ireland. The last industrial action was in 2009 – this was 2 hours in duration and was related to the introduction of new equipment. However, this was not officially a strike; instead, staff called in 'sick'.

5.1.4.3 Procedure in the event of strikes and mitigation of impacts

At a national level, there is an obligation for the unions to undertake a ballot before strike action and then 7 days' notice of the intention to strike. However IAA is not publicly funded (the costs are covered by charges to users) so it is not treated as public sector or civil service.

The union IMPACT covering controllers also has many members in the public sector so there is a very small residual risk of a national dispute spilling over to ATC. It is considered negligible.

To the extent that there is a risk, IAA would like ATC to be designated as an essential public service so strikes would not be possible at all. However, this is considered unlikely – hence the local action at ANSP level as set out below.

At a national level, compulsory arbitration processes are not required before a strike can be called in the case of ATC. However, IAA has a local agreement (since 2015) with its staff which requires mediation and conciliation followed by binding 'arbitration' to resolve any issue before a strike can be called. The agreement specifies that both sides will adhere to the outcome of arbitration, which means, in practice, that a strike is highly unlikely, as it would constitute a breach of the local agreement.

In Ireland, the minimum level of service only covers emergency flights; however, this is not really an issue, given the very low risk of strikes. If there was a strike, there would be a substantial impact on overflights (transatlantic sector) but re-routing would be possible with substantial delays and costs to the airlines. **In principle, the IAA would be supportive of a requirement to guarantee overflights as a minimum level of service** (although this is secondary to their preference to maintain their current local agreement that mitigates the risk of a strike to negligible).

5.1.4.4 Implications from possible changes to the minimum notification period

Questions in this section were not covered during the interview with the Irish Aviation Authority.

5.1.4.5 Implications from possible changes to the minimum level of service

Questions in this section were not covered during the interview with the Irish Aviation Authority.

5.1.4.6 Costs and benefits

The Irish economy is extremely dependent on air services; therefore, strikes cause significant costs to Ireland. The emphasis in Ireland is therefore placed on reaching an agreement that reduces the chance of this happening to an absolute minimum.

Further options for mitigating the impact of strikes were also discussed during the interview. IAA noted that they are fundamentally opposed to any proposals for ANSPs to have to compensate airlines

5.1.5 Italy

5.1.5.1 Introduction

An interview was carried out with the Italian ANSP, ENAV. ENAV is responsible for handling approximately 1.8 million flights per year from the control towers at 44 airports and four area control centres. The company has approximately 4 200 employees, 1 900 of them being ATCOs (ENAV, 2016).

5.1.5.2 Strikes in ATM

During the period 2004-2016, strikes from staff providing air traffic management services in Italy have occurred approximately three times per year. All rules affecting the right to strike in the ANSP are defined in the national legislation.

Most recent strikes have been associated with the restructuring (privatisation) of ENAV. One union, which represents about 60 % of air traffic controllers (ATCOs), was excluded from discussions under the collective bargaining arrangements. This has been the primary cause of the strikes. Agreement has now been reached to include the union in the discussions, so it is anticipated that the issue will be resolved in the very near future.

Conversations with the air traffic controllers' unions can sometimes help to prevent strikes or to reduce the impacts of planned strikes; however, this is not always the case. Italian law requires notice of between 12 days and 60 days of a planned strike. Further to this, the unions cannot cancel a strike within six days of the planned date, as this would require plans already made by airlines (and other organisations) to be changed.

Strikes are limited in duration, to either four hours (for the first strike related to a particular issue) or eight hours (for subsequent strikes on the same issue), with the aim of reducing the overall impact on the network.

5.1.5.3 Procedure in the event of strikes and mitigation of impacts

In the event of strikes, ENAV has well established plans. When a strike is called, they publish NOTAMs six days in advance via EUROCONTROL, indicating the regulations that they expect to have to impose.

Five days in advance of the strike, ENAV publishes a list of personnel who are required to work (requisitions) to provide the guaranteed minimum level of service. If two strikes are called close together (e.g. one month apart), ENAV is required not to requisition the same employees again.

Two days in advance of the strike, ENAV estimate how many people will not adhere to the strike. If they expect to have enough staff on duty, the requisitioned staff are used on the (guaranteed) upper airspace so that the non-striking staff can be used on the (non-guaranteed) lower airspace flights. This enables ENAV to remove some of the notified regulations and to deliver a service exceeding the minimum guaranteed. In some cases, it may also be able to remove the regulations from some sectors or to define a specific rate of traffic in sectors. **These measures, combined with the limited duration of strikes in Italy, are considered to result in an acceptable level of delays during the strike.**

The requirement for the minimum level of service is not applied at the sector level but the guaranteed flights that will be covered are listed below. This set of flights generally requires about 50 % of staff to be available.

- Flights departing in Italy: all traffic with an estimated off-block time (EOBT) at least one minute before the beginning of the strike.
- International arriving traffic: all traffic that is able to land within 30 minutes from the beginning of the strike.
- Intercontinental flights (arrivals): all intercontinental arriving flights.
- Intercontinental flights (departures): all intercontinental departure flights authorised by the CAA.
- National flights: all national flights ongoing at the beginning of the strike.
- All traffic scheduled to depart between 07:00-10:00 and 18:00-21:00 Local Time and International arriving traffic expected to land within 30 minutes after 10:00 and 21:00 local time.
- Overflights: all guaranteed.
- Connection flight with Italian Islands: Dedicated list of flights to be assured - elaborated by the CAA.

5.1.5.4 Implications from possible changes to the minimum notification period

The representative from ENAV strongly believes that a harmonised minimum notification period (at least five days) would make it much easier to mitigate the impacts of strikes in other countries.

ENAV considers that the most benefits would be to the airspace users, but there would also be some benefits to the ANSPs.

5.1.5.5 Implications from possible changes to the minimum level of service

The representative from ENAV considered that a harmonised minimum level of service (at least guaranteed overflights) would be beneficial in mitigating the impacts of strikes.

The main benefits are thought to be to airspace users.

5.1.5.6 Costs and benefits

In case of a strike in Italy, ENAV will suffer a loss of income due to the lower number of flights managed. For strikes in other countries, additional costs will arise from rostering more staff to cope with the increased traffic.

5.1.6 Maastricht Upper Area Control (MUAC)

5.1.6.1 Introduction

MUAC manages the upper airspace over Belgium, Netherlands, Luxembourg and parts of Germany. It operates a single ACC.

5.1.6.2 Strikes in ATM

No strikes have occurred since the opening of MUAC in 1992. Local agreements are in place at MUAC concerning the right to strike and, in this regard, MUAC is not affected by national legislation. In the period 2004-2016, one strike notification was received but the conciliation process was successful and the strike was called off. It is believed that the strike was called sufficiently far in advance such that no flight cancellations occurred.

Four unions are represented at MUAC but 90 % of union members belong to one union (TUEM). Other unions are associated with EUROCONTROL (including other EUROCONTROL sites). **Overall, the single ACC / site is seen as being an important contributor to the lack of strikes at MUAC**. This allows for a focus on the local issues, which again limits the likelihood of strikes.

5.1.6.3 Procedure in the event of strikes and mitigation of impacts

The interview with the representative from MUAC did not cover any topics in this section.

5.1.6.4 Implications from possible changes to the minimum notification period

The interviewee was asked whether there would be any issues arising from altering the existing minimum notification period to a longer/shorter number of days. However, no issues were identified.

5.1.6.5 Implications from possible changes to the minimum level of service

No real issues were identified in relation to implementing a change in the minimum level of service. Some initial discussions have already been held with unions regarding an increase to 75 %.

Any changes to the minimum level of service would be expected to be made through local agreements with unions (after considering whether such changes would be beneficial at MUAC). If all four Member States that MUAC covers (Belgium, Netherlands, Luxembourg, Germany) decided to implement changes to legislation regarding minimum notification periods or levels of service, MUAC would expect to be asked to follow suit; however, this does not mean that MUAC would automatically have to implement changes if one or more countries changed their national legislation.

5.1.7 Portugal

5.1.7.1 Introduction

An interview was held with a representative from ANAC, the Portuguese National Civil Aviation Authority. The ANSP and the CAA are separate organisations. The ANSP provides the service; the CAA audits it to make sure that it is providing the service correctly. There are no national regulations or other restrictions that limit the right of ANSP employees to take industrial action.

5.1.7.2 Strikes in ATM

Data from the Network Manager was used to identify strikes that have occurred in Portugal. These are summarised in Table 5-2. The causes of these strikes were discussed during the interview. **The majority of strikes in 2012 and 2013 are thought to have been related to General Strikes in**

Portugal rather than being specific to ATM. The 2014 strike may have been related to a call by ETF for widespread strike action.

Most strikes in Portugal have tended to take the form of working to rule, rather than all-out, leading to a reduction in capacity of sectors rather than a closure of Portuguese airspace.

Table 5-2: Strikes in Portugal in the period 2012-2016

Date	Delay (Minutes)	Date	Delay (Minutes)
12 April 2012	116	18 May 2012	849
13 April 2012	3 536	24 May 2012	1 375
19 April 2012	1 154	25 May 2012	534
20 April 2012	840	27 June 2013	27 055
26 April 2012	539	29 January 2014	2 590
11 May 2012	919	30 January 2014	265
17 May 2012	1 057		

Source: Interview with ANAC – data originates from the Network Manager

Portuguese legislation requires a compulsory conciliation meeting and arbitration. These are generally successful and consensus is achieved, which helps to reduce the occurrence of strikes. The conciliation meeting may sometimes include the Ministry as well as the ANSP Board. **Overall, the representative from ANAC was of the opinion that most strikes could be solved through common sense and dialogue.**

Should strike action be decided, there are no time limits on the cancellation of a strike. ANAC recognises the position of some airlines that the late cancellation of a strike still causes (almost) as much disruption as if the strike had gone ahead.

5.1.7.3 Procedure in the event of strikes and mitigation of impacts

The main priority for mitigating the effects of a strike in Portugal is to give the Network Manager early warning. This allows all parties to plan for how to deal with its impacts. The Portuguese ANSP has a requirement for 10 days advance notification of a planned strike; this is generally applicable to the transport sector, rather than being specific to ATM.

The minimum level of service is well defined in Portugal and is as follows:

- Provide public service flights to islands:
  - Two daily flights to and from the Madeira Region
  - Three daily flights to and from Azores Region
  - A daily flight inter-islands in Azores and in Madeira.
- Emergency flights
- At least three contingency routes for overflights.

In addition to these flights, ICAO has assigned the Oceanic flight information region (FIR) to Portugal. It therefore has a responsibility to provide services to the overwater flights (both directions) because of its geographical position.

Concerning overflights, the provision of three contingency routes allows about 33 % of normal overflights to operate normally. The remainder are either cancelled or rerouted around Portuguese airspace. The ANSP has the right to requisition air traffic controllers (ATCOs) to ensure that this level of cover can be provided. An estimated 25 % of ATCOs need to be on duty for this.

5.1.7.4 Implications from possible changes to the minimum notification period

The interviewee from ANAC indicated that there could be benefits arising from possible changes to the minimum notification period. In particular, increased notice of a strike in France or Spain would be beneficial because it would give more time to plan how ANAC will manage the increased traffic. **For**

this purpose, a notification period of 48 hours would give a considerable improvement. There would not be any significant benefits arising from an early notification of which sectors will actually operate during a strike in France.

5.1.7.5 Implications from possible changes to the minimum level of service

Generally, ANAC considers that the current situation in Portugal is quite good, with the use of dialogue and conciliation generally successful in avoiding ATM-specific strikes. The strikes that occurred have been related to General Strikes in the country or in response to a call by the European Transport Workers' Federation (ETF) for Europe-wide action.

The ANAC representative was of the opinion that harmonisation of the minimum level of service to be provided in the event of a strike could be difficult to achieve. This is because the ability to implement such changes would depend on national law; Germany was quoted as an example of a country with different legal processes.

5.1.8 Spain

5.1.8.1 Introduction

An interview was held with representatives from the Spanish ANSP (ENAIRE) and the CAA (Civil Aviation Authority – Ministry of Development). ENAIRE is one of the four largest flight navigation managers in Europe and controls an airspace of 2.19 million square kilometres. It has five control centres and 22 control towers, which manage approximately 1.8 million flights per year (ENAIRE, 2016). ENAIRE has approximately 4 000 employees, of which 2 000 are ATCOs (1 800 of whom are operational)[11].

5.1.8.2 Strikes in ATM

There is no specific legislation concerning the right to strike in air traffic control in Spain; it is covered under national legislation that goes back to 1978.

Overall, strikes in air traffic management services have been very rare in the country in the past few years. The last major strike took place in December 2010 when ATCOs walked out in a coordinated wildcat strike; authorisation was given by the Government to the military to take over ATC operations in eight airports. In 2015, there was one strike. In general, strikes tend to be related to working conditions.

5.1.8.3 Procedure in the event of strikes and mitigation of impacts

Once a strike notification has been submitted (minimum 10 days' notice) a well-established plan is followed:

- ENAIRE (the provider) develops a work plan to identify the minimum number of staff that will be required in different sectors aiming to ensure that certain categories of flights are operated and that the disruption is minimised.
- This plan is then submitted to the Ministry of Development – Civil Aviation Authority. If necessary, it is possible that changes to the plan will be made at this stage. The criteria used include safety reasons, labour standards, and the existing jurisprudence (court cases where the unions had challenged previous decisions) on the matter.
- The plan is reviewed at different levels of the hierarchy within the Ministry of Development before being approved at Secretary of State level. The Secretary issues a decision document concerning the minimum level of services, including the number of controllers to be operating. The decision document is legally binding and enforceable.
- The level of service may vary from ATC sector to sector and the decision takes into account the specific period and the traffic. For example, a higher level of service is required during the summer months or around holidays but a much lower level is required in February – particularly in holiday destinations such as the Balearic Islands.
- ENAIRE notifies the air traffic controllers that need to be in service. These individuals need to confirm receipt of the notification.

[11] https://www.canso.org/enaire

This is a standard procedure, however **early notice (minimum notification period) is helpful since it provides additional time to develop plans to mitigate the impacts of a strike**. The legislation does not require compulsory arbitration before a strike can be called. Instead, there is arbitration following the strike notification that may last until the very last day before a strike and lead to cancellation of the strike.

There are no specific requirements for notification for individuals with specific roles in air traffic control. However, there are specific requirements in terms of the minimum level of service to be provided (such as the level of staff available, level of service, service of specific types of flights). As described above, in each strike case, the minimum level of staff available is determined on the basis of the intended level of service. According to the interviewees, the minimum notification period and the minimum level of service are adhered to and no issues have been reported.

To mitigate the impacts of strikes in Spain, there is a strong focus on deciding the level of service to be provided. The level of service to be provided at the individual sector level is a specific decision that depends on the circumstances and requirements for serving specific categories of flights and flights to Spanish Islands (Canary and Balearic) and remote regions (Ceuta and Melilla) with the rest of the country. The interests/needs of airlines are taken into account when handling strikes but no formal dialogue takes place.

5.1.8.4 Implications from possible changes to the minimum notification period

Potential changes to the minimum notification period has not been raised since the adoption of the relevant legislation in 1977. This is particularly the case as the notification period is set in national legislation and is applicable to all sectors. Changes would require the adoption of separate legislation or a change of the legislation for all sectors. This is considered neither desirable, nor feasible, politically.

Despite the potential challenges, the interviewees suggested that a change to a period of 20 days would give more time for the development of the relevant plans and for coordination with the Network Manager. This would also allow for Regulation 261/2004 (regarding the period of 15 days for aircraft operators (AO) to cancel a flight without the need to compensate passengers (apart from reimbursement)) to be taken into account. As the legislation currently stands, with the current 10-day notification period, AOs have to assume the cost of cancellation. However, it may not be possible legally to make these modifications, as general legislation would need to be revised or specific legislation adopted. In addition, these potential changes would be a reason for strikes among air traffic controllers.

Should any changes occur, it would be a political decision and the government would introduce new legislation following social dialogue. The interviewees consider that it would only be possible to take the relevant action at national level if this was agreed at EU level through social dialogue.

5.1.8.5 Implications from possible changes to the minimum level of service

There is no specific provision in Spanish legislation for a minimum level of service, so potential changes could not be discussed. Instead, a different approach has been adopted where the level of service to be provided is decided on a case-by-case basis. As part of this, court decisions brought by unions challenging the level of service provided in previous strikes is taken into account by ENAIRE/the Ministry of Development.

When deciding the minimum level of service, the level of staff to be available is the parameter that is used. It is the main contentious issue for the unions; however, the individual nature of the decision, depending on the time of year, means that there is flexibility as to what decision can be taken. A potential EU guidance/recommendation document could help in this respect. In terms of the level of service provided (as a percentage of flights), this is currently not the main parameter used during the Spanish process but it is taken into consideration. It is possible that such a criterion could also be used while making the final decision on the level of service, although what this means in terms of the level of staff available may vary depending on the period.

It could be feasible to implement an alternative prioritisation of services. For example, there is no restriction/obstacle for giving priority to overflights and an EU guidance/recommendation would make it easier for the Ministry to justify this and to support any such decision in court – if challenged. However, it will also require that operators accept that there will be more delays in the case of domestic flights.

In addition, no specific procedures would be required to implement this since there is no set rule that needs to be changed. ENAIRE and the Ministry of Development would be involved in the process. No specific timescales could be estimated for the length of time taken to implement guidance of this nature but the interviewees indicated that it could be enacted as soon as a guidance document is issued.

Concerning an optimum minimum level of service, the representatives from ENAIRE and the Ministry of Development indicated that this depends on the sector and period in the year.

5.1.9 United Kingdom

Although not originally included in the list of countries for interview, a brief interview was held with NATS (the ANSP for the UK), principally to gain a greater understanding of the effects on UK airspace of a strike in France.

During the interview, it was noted that **NATS itself had not been subject to strike action for a considerable number of years; this was considered to be the result of an effective social dialogue being in place.** This observation was supported by discussions held during the NMB Task Force meetings.

5.2 Impacts on neighbouring ANSPs

The impacts of a strike on neighbouring ANSPs are felt in a number of ways:

- unforeseen cancellations, due to a strike in another Member State, can result in a shortfall in traffic and consequent reductions in income;
- overflights that seek to route around the affected airspace can lead to additional traffic in adjacent sectors. This may require additional controllers to be rostered or called in on overtime and can still lead to an accumulation of delays in these sectors as the analysis of the data has shown.

These effects are particularly prevalent where there are strikes in France due to its central location in the network. This can have a significant impact on Member States such as Ireland (which controls the airspace for much of the alternative 'Tango' route from northern Europe to Spain) and in Germany. There may also be consequential effects on airports in other Member States if there are substantial delays to flights leading to a local build-up of congestion on the ground, such as at Heathrow and Gatwick airports in the UK, requiring action by the local ANSP.

In general, there will be knock-on consequences from a strike on one Member State that impact operations in neighbouring states. The specific impact will depend on the nature of the strike event and its duration. For this reason, **our discussions with the stakeholders have indicated that neighbouring ANSP's require similar notice periods as the airlines to allow contingency plans to be put in place**, although in some cases this will still be too late to bring additional resources to handle any extra traffic.

5.2.1 Denmark

The interviewees noted that strikes in neighbouring ANSPs do have an impact on flights passing through Danish airspace. However, there is adequate capacity in the system (and agreements are in place with unions to work overtime if required to handle the additional demand; the same applies in the event of bad weather), so there is no impact on the performance of the Danish airspace.

It was noted that the northerly location of Danish airspace tends to reduce the impacts on it, other than delays to flights to and from countries in southern Europe (e.g. Spain).

When a strike occurs in another country, the Network Manager manages the overall network, so they re-route flights to avoid exceeding capacity in any individual sector.

The existing procedures for managing the impacts of strikes in other countries were not felt to be particularly dependant on the existing notification period.

5.2.2 France

The interviewee observed that strikes in ANSPs in neighbouring countries have relatively little impact on the management of French airspace. The additional traffic when strikes are called in neighbouring airspace can usually be managed without requesting additional staff to work.

5.2.3 Greece

Greece experiences impacts from strikes in neighbouring countries – particularly from Italy. These require the opening of relevant air space and some reassignment of air traffic controllers (ATCOs) to help address the increased demand.

When a strike occurs in another country, the approach to managing its impact on Greek airspace is discussed and agreed with the Network Manager. To ensure that the additional demand for the use of the air space can be provided, the Greek ANSP relies on the efficient management of its staff to respond to demand in specific sectors or at specific times of the day. The impacts of strikes are usually managed in this way, as it is not easy for additional staff to work when strikes occur in other countries.

5.2.4 Ireland

IAA believes that if a strike is called in another country, the impacts should be felt in that country and not spread to other states. **Hence, they consider that overflights should be protected and only flights originating in and destined for that country should be affected.** It was noted that this is contrary to what happens when there is a strike in France; for example, flights to Strasbourg are protected, but not overflights. A similar situation occurs in Italy, with protection to some inter-island services.

Strikes in other countries affect Ireland differently. IAA perceives that Ireland is disproportionately affected when strikes occur relative to other countries, as it is an island and more dependent on air connections.

For example, when there is a strike in France, Ireland (in coordination with other ANSPs) opens up the 'Tango' route to Spain from Northern Europe over the Atlantic. This is longer and gives rise to flight delays but mitigates cancellations. IAA receive revenues from the additional flights handled but may incur payments of overtime and they need notice and certainty (which is also needed by the airlines) to organise this in time. Such days are often IAA's busiest.

Information was provided by the IAA on the costs related to two sample strike events. These are presented in Box 1**Error! Reference source not found.**.

Box 1: Indication of the costs of strikes in France to the Irish Aviation Authority

Impacts of two case study strikes in Ireland (source: IAA)

Strike 1: 25th – 27th January 2016 French ATC Industrial Action

- Tuesday 26th January: the only day of any real impact on Shannon ACC. An **additional 165 flights** were served via the Tango Routes when compared with previous weekends. **Ryanair cancelled 240 flights with 42 000 passengers affected**. 34 of these cancelled flights were to/from Ireland. Aer Lingus cancelled one flight and delays on some services were recorded at 70 minutes per rotation.

Strike 2: 20th – 22nd March 2016 French ATC Industrial Action

- Sunday 20th March: Shannon ACC saw an additional 360 flights via the Tango Routes when compared to previous weekends. Aer Lingus cancelled four flights with significant delays per rotation and Ryanair cancelled 220 flights with 42 of these flights to/from Ireland.
- Monday 21st March: Shannon ACC saw an additional 380 flights via the Tango Routes. Aer Lingus cancelled five flights and Ryanair cancelled 297 flights with 57 of these flights to/from Ireland.
- **Total impact of the strike: Additional 740 flights via the Tango Routes and 99 flight cancellations to/from Ireland.**

Overall impacts: the estimated unplanned additional manpower costs to the IAA for En-Route Control and HF services were circa €10 000 for the two days of 26 January and 20 March.

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5.2.5 Italy

During the interview, ENAV commented that it is affected by the strikes in France. To manage the impacts of the strikes, the organisation aims to roster additional staff to cope with the increased number of flights using Italian airspace. They are generally able to do this and it usually does not lead to regulations (restrictions on flights) being imposed in any sectors. A possible exception is the interface between Italian and Tunisian airspace, because Tunisia may not be able to handle all the extra traffic.

When a strike is called in another country, procedures are in place to mitigate the impacts. The greatest impacts are experienced for strikes occurring in France. For example, when notified of a strike in France (usually six to seven days in advance, but sometimes less) more people are added to the relevant shifts to ensure that all the extra traffic can be handled. The expected level of service is published via NOTAMs and the same prioritisation of flights is followed as listed above.

Italy finds that the minimum notification period/minimum level of service is generally adhered to in other countries; however, problems are sometimes experienced with France. In some cases, the notice can be only three or four days, which is not enough time for ENAV to re-roster staff to provide the required level of cover. However, the interviewee said that ENAV manages to provide a good service in these situations.

The representative from ENAV strongly believes that a harmonised minimum notification period (at least five days) would make it much easier to mitigate the impacts of strikes in other countries. **A harmonised minimum level of service (at least guaranteed overflights) would also be beneficial.**

5.2.6 Maastricht Upper Area Control (MUAC)

The interviewees noted that strikes in other countries cause impacts for MUAC. In particular, strikes in France (on average, 10 to 15 per year) have a significant effect. These strikes result in an average of a 25 % increase in delay (above the delays that occur anyway due to airspace capacity limitations) when the strike occurs.

When strikes occur in France, the correct notifications are received through the NDOP procedure. This allows MUAC to arrange for additional staff to be on duty. This process takes time but the normal notification period in France is sufficient for this purpose. **However, MUAC usually does not know which sectors will be affected the most, so many changes to airspace management often occur on the day.** In addition, airlines change their flight plans multiple times, as the situation evolves. The volatility of the service that the French ANSP actually provides is usually the biggest problem in trying to manage the additional demand for flights through MUAC airspace.

An increase in minimum level of service in France would help MUAC by reducing the increase in demand for flights through MUAC airspace. However, the interviewee did not believe that a prioritisation of overflights by France would be of particular benefit to MUAC.

5.2.7 Portugal

The interviewee from ANAC indicated that there could be benefits to the management of Portuguese airspace arising from possible changes to the minimum notification period. In particular, increased notice of a strike in France or Spain would be beneficial because it would give more time to plan how ANAC will manage the increased traffic. **For this purpose, 48 hours' notice of a strike would give a considerable improvement.** There would not be any significant benefits arising to the ANSP from an early notification of which sectors will actually operate during a strike in France.

5.2.8 Spain

The Spanish ANSP is affected by strikes in other countries. In particular, there is a significant impact from strikes in France since they cause significant rerouting. **This requires additional air space to be opened and the introduction of specific restrictions to manage air space due to capacity and safety limitations.**

During a recent strike, a total of 57 000 minutes of delay in Spanish air space were due to the French strike and were recorded as such to EUROCONTROL.

For ATM strikes in other countries, ENAIRE has contingency plans for opening additional western routes and flights over the Canaries. These are not normally used at a high intensity and they require

the issuing of certain rules of operation to ensure the safety of flights. Consequently, there are delays since not all of the demand can be served. It is not possible for ENAIRE to respond to strikes in other countries by increasing number of air traffic controllers. This is because notification for extra work hours or overtime needs to be made at least 2 months in advance.

The procedures for handling strikes in other countries are reliant on the existing notification period to some extent – earlier notification is considered better but this is not seen as being critical.

5.2.9 United Kingdom

NATS considered that a strike in France has a significant effect on UK ATM and that as much notice as possible should be given of any planned strike to enable remedial action to be taken. However, it was noted that such remedial action did have the effect of pushing up costs at NATS at the same time as there is pressure from airlines to reduce route charges.

5.3 Conclusions

The interviews identified that Denmark, Ireland and the UK all have no recent history of strikes in ATM. In each case, this is attributed to a high level of social dialogue between the ANSP and the unions.

MUAC also noted that having a single centre and (mostly) a single union allows local disputes to be managed locally, also contributing to a lack of strikes in the organisation.

Portugal was also of the opinion that the best approach to managing strikes was through good social dialogue.

Several interviewees suggested that a suitable minimum notification period would be five days. It was also noted that notice is required of a strike occurring in another Member State; two days was suggested as a suitable minimum.

Advance knowledge of who would be working during a strike, and hence which sectors will be open, was seen as being of significant benefit by some Member States.

Several Member States felt that the minimum service level should include the requirement to serve 100 % of overflights. This was felt to be particularly important for strikes in France, as the limited service of overflights (50 %) leads to significant impacts on the airspace of neighbouring Member States.

The limited duration of strikes in Italy and Greece (four or eight hours) contributes to minimising the overall impacts on the network.

6 Impacts of strikes on airspace users

6.1 Airlines

In addition to the questionnaires and interviews with ANSPs and CAAs, interviews have been held with a number of other stakeholders, most notably the airlines, as shown in Table 3-2.

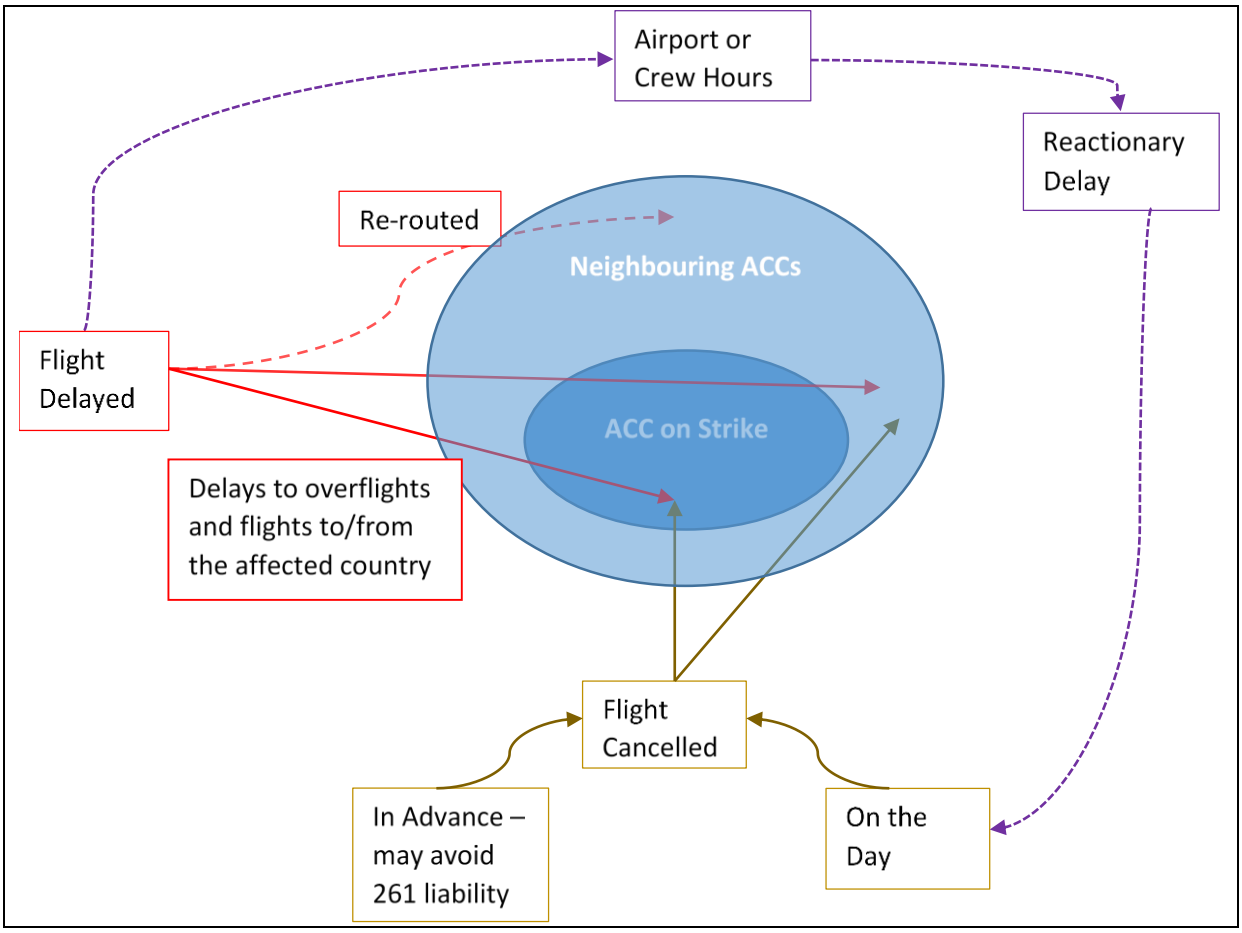
Discussions with the airlines have helped us understand the implications of different types of strike event, identified through the Network Manager's data, and the role that different minimum service provisions and different notice periods have on the decisions by airlines to cancel flights or to incur delay and increase flying distance.

We have sought to identify, by reference to example strike events, how the airlines' operations were affected, including the wider network impacts of reactionary delays to later flights where aircraft crews are delayed or out of position. Such effects are not captured in the Network Manager's data but they reflect the wider disruption to passengers that a strike can cause. The chain of effects is illustrated in the diagram below (Figure 6-1).

In some cases, these effects are felt directly in terms of a flight being delayed, re-routed or cancelled. Other effects are reactionary and may impact flights later in the day and between countries not affected by the strike. These impacts may occur when delays have become so great that flights suffer significant delays or may need to be cancelled to protect crew hours, to safeguard the ability to

operate other flights later in the day, or because airports may close to meet night curfew requirements. Overall, the effects are complex and depend strongly on the specific nature of the strike and the extent and location of delays caused.

Figure 6-1 Delay and Cancellation Effects due to Strikes



The detailed notes from the interviews with the airlines are presented in Annex 2 and these explain the effects more fully.

The information provided by the airlines included the impacts of specific strikes on their operations in 2016. An overview of these effects is given in Table 6-1.

Table 6-1 Summary of information on impacts of strike events on airline operations

Strike event	Air France	easyJet	Lufthansa	Ryanair
France, 26/01/16	287 flight cancellations Average ATFM delay 31 minutes per delayed flight		18 flight cancellations, affecting 7 513 passengers 165 flights delayed, affecting 19 141 passengers Average delay 12 minutes per delayed flight (though average delay against schedule was 32 minutes)	240 flight cancellations, affecting over 39 000 passengers 171 flights delayed Average ATFM delay 36 minutes per delayed flight
France, 20-22/03/16	402 flight cancellations Average ATFM delay 40 minutes (20/03/16) and 59 minutes (21/03/16) per delayed flight	196 flight cancellations 87 flights suffered 'material delays'	45 flight cancellations, affecting 5 430 passengers 124 flights delayed (plus further flights delayed due to late connecting passengers), affecting 22 358 passengers Average ATFM delay 35 minutes per delayed flight (average delay against schedule 90 minutes)	517 flight cancellations, affecting 93 300 passengers 663 flights delayed Average delay 100 minutes per delayed flight
Italy, 17/06/16			26 flight cancellations, affecting 2 790 passengers 45 flights delayed, affecting 6 676 passengers Average ATFM delay 13 minutes per delayed flight (average delay against schedule 45 minutes)	66 flight cancellations, affecting nearly 12 300 passengers 65 flights delayed Average ATFM delay nearly 100 minutes per delayed flight
Italy, 23/07/16 (late cancellation of strike)			12 flights cancelled in advance, affecting 1 144 passengers	Some flights cancelled initially, then reinstated when strike was cancelled

Summaries of the key conclusions from the interviews are given in the following sections.

6.1.1 Minimum Notice Periods

The airlines are on record, through the A4E 'Call for Action'[12], in calling for a 21-day advance notification of strike action as well as 72 hours advance notification of participation in industrial action at individual employee level. These measures are intended to improve the predictability of the level of disruption.

However, **the interviews held during this study suggest that decisions whether to cancel flights tend to take place in the last 24 to 48 hours ahead of a strike event**. There are a number of reasons why this is so:

- Although strikes can be notified well in advance, there is often uncertainty as to whether they will go ahead and, if so, what the duration and impact of the strike will be. Hence, it would be more disruptive for passengers if cancellations were made early, only for the strike to be cancelled or the impacts less than expected;
- The ANSP usually provides information regarding the expected effects of a strike, in terms of the level of service to be provided and the ACCs to be affected, in the last 24 to 48 hours prior to a strike. An example is the notification provided by the French Direction Générale de l'Aviation Civile (DGAC) regarding the requirement for airlines to cancel a percentage of flights to and from particular airports. Therefore, cancellations ahead of this notice would be premature;
- The likely delays to overflights, other than where airspace is closed completely, is not clear, so airlines are reluctant to cancel flights unless it becomes clear that delays will be excessive.

The airlines are seeking a situation in which, once a strike is confirmed, they will have certainty regarding which parts of the ATM system will continue to operate during the strike (and at what capacity). For example, the system operated by the DGAC in France of asking all airlines to cancel a proportion of their flights to affected airports, whilst helpful, still leaves considerable uncertainty as to what will happen on the day of the strike, particularly in terms of the ability to handle overflights. This is due to the lack of certainty regarding the level of service that will be provided at each ACC.

In the circumstances of uncertainty regarding how many flights can be handled and the level of delay that may arise, it is understandable that, at the outset, airlines seek to minimise the number of cancellations to minimise the impact on passengers and other users. However, it is clear that the effects can easily escalate leading to many more reactionary delays and cancellations. This is particularly the case with strikes in France due to its minimum level of service model.

Airlines provided evidence (presented in Annex A.2) of how levels of delay can escalate dramatically on the day when the actual levels of service that are able to be provided become clear. They provided examples of how accumulated delays lead to cancelled flight. **It is this uncertainty that leads to greater levels of disruption to passengers and broader network effects due to reactionary delays building over the day, with a consequence that seemingly unconnected flights later in the day can be subject to major delays and even cancellations.**

The inputs from the airlines have indicated that many of the more disruptive effects might be avoided if there was certainty of the service that would be provided 72 hours ahead of any strike. This would give the airlines the time to re-plan their operations to minimise cancellations and disruption to passengers. It would also provide time for neighbouring ANSPs to plan for the additional traffic through their airspace, such as occurs when the Irish Aviation Authority (IAA) sets up the Tango route between Northern Europe and Spain/Portugal over the Atlantic in coordination with other ANSPs.

In practice, the main benefit of the advance notice period (21 days) for the intention to strike would be that it would provide time for negotiations to avert the strike and to allow airlines to undertake some initial contingency planning. However, close to the strike date, there is greater benefit to the airlines in having certainty about the strike occurring than from a potential cancellation of the planned strike. For example, a strike planned in Italy for 23 July 2016 was announced, overturned by a judge, reinstated then finally overruled by the Government only a few hours before it was due to commence, by which time some flights had already been cancelled. This chain of events was almost as disruptive for airlines and their passengers as if the strike had gone ahead.

[12] https://a4e.eu/call-for-action/

6.1.2 Minimum Levels of Service

The duration of a strike clearly has a substantial impact, as it is possible to recover much more quickly from shorter duration strikes. Other than in France, strikes are often of short duration, for example of about four or eight hours. Whilst disruptive in the short term, **such shorter duration strikes have fewer consequential effects on the network, as they allow airlines to re-plan their operations around the time of the strike**, to the extent feasible.

Another key feature to mitigate the impact of any strike is to guarantee overflights. This is the case in Italy and Greece. Further, when restrictions are in place, the geographic position of these countries means that it is easier to fly around their airspace without substantial increases in distance or major knock on consequences to neighbouring ANSPs, as compared to the position of France.

Uncertainty as to what the 50 % minimum level of service in France will mean in practice, in terms of delay implications, is a particular concern for the airlines. The impacts of a strike in France are exacerbated by the scale of its airspace and its central position in the densest part of the ATM network, as well as the duration of the strike there. Whilst airlines are instructed to cancel a proportion of their flights to affected French airports in the event of a strike, there are no similar guidelines for overflights. Hence, such flights can be subject to substantial disruption and delay if flow rates are reduced. A key level of service requirement for the airlines is, hence, to protect overflights as a minimum to minimise the overall impact on the network.

In most countries, it is normal practice to cancel flights to/from the country and/or affected airports during a strike, except for defined priority flights. Whilst such **cancellations are undesirable from the end user's perspective, the certainty implicit in these regimes means that, once a strike is confirmed, the airlines can plan mitigating action such as rescheduling flights or rebooking passengers**. Hence, the importance of a 72 hour notice period to allow time for this to take place. This is considered less disruptive to passengers than bringing them to an airport and then flights being delayed or cancelled on the day giving rise to substantial congestion at airports and high levels of passenger dissatisfaction.

As evidenced by Lufthansa and Swiss, delays can also have substantial implications for connecting passengers and can result in substantial numbers of missed connections and potentially flight delays to onward connecting flights.

The difficulties caused in France arise because the notice periods tend to be shorter, at least for providing expected impacts at sector level and on overflights. Further, the indicative levels of cancellation may not fully reflect the level of disruption that arises during the strike – it may be more or it may be less and/or of a shorter duration. Commercially, the airlines are reluctant to cancel flights if there is a chance they may be able to operate approximately to time, particularly as this gives rise to less inconvenience to the end user. It is for this reason that strikes in France tend to be more rather than less disruptive despite the efforts of the DGAC and the Direction des Services de la Navigation Aérienne (DSNA) to manage the volume of traffic into the affected area.

The airlines have indicated that, to a large extent, they would prefer the certainty of impact to be known in advance, even if this was necessarily conservative in terms of overstating, rather than understating, the potential impact. This would allow them to implement alternative arrangements for passengers. This is preferable to last minute disruption and cancellations on the day.

6.1.3 Costs to airlines

The airlines were not able to provide systematic evidence on the direct costs to them of strikes. However, we have made an estimate of the cost of a typical strike in the four countries recording strike events since 2014 using Standard Inputs for EUROCONTROL Cost Benefit Analyses[13]. At 2014 values:

- the cost of 1 minute of delay is €110.5
    - includes reactionary delay and passenger value of time costs
- the cost of an extra nautical mile flown is €10.60 (€5.72 per km)
- the cost of a cancelled flight is €17 600

[13] Edition 7.0, November 2015.

- including passenger care and compensation costs, including those arising from the obligations under Regulation (EC) 261/2004
- noting that a high proportion of the costs may be avoided if flights are cancelled in advance

The costs calculated, using these values, of a strike event in the four countries that have experienced moderately frequent strikes in the period from 2014 to date are shown in Table 6-2. As noted above, the data to undertake this analysis are only available for a limited number of countries for which multiple strikes have been recorded since the start of 2014; they relate to the same strike events as shown in Table 4.5. Hence, the analysis is not comprehensive in terms of the range of countries covered. Nonetheless, it does provide insight into whether, if a strike cannot be avoided, it is preferable to cancel more flights to provide certainty of impact or to allow delays to build up in an attempt to allow more flights to operate.

Table 6-2 Calculations of the costs of strikes in different Member States

Member State	Number of strikes	Average delay per strike day (mins)	Average number of canc-ellations per strike day	Average extra distance per strike day (km)	Cost of delay per strike day at €110.5 per minute	Cost of cancellation at €17 600 per flight	Cost of extra distance at €5.72 per km	Average cost of a strike if cancellation costs cannot be mitigated	Average cost of a strike at 25 % cancellation value
France	41	65 001	311	462 022	€ 7 182 592	€ 5 479 395	€ 2 642 765	€ 15 304 752	€ 11 195 205
Greece	3	9 803	268	-3 271	€ 1 083 244	€ 4 710 933	-€ 18 712	€ 5 775 465	€ 2 242 265
Italy	4	26 430	804	7 373	€ 2 920 522	€ 14 152 600	€ 42 172	€ 17 115 294	€ 6 500 844
Spain	5	-8 668	47	11 786	-€ 957 821	€ 821 920	€ 67 414	-€ 68 487	-€ 684 927

These results illustrate how the overall cost of a strike event in France is higher than under other models of minimum service levels.

This analysis is only indicative and depends heavily on the assumptions described. However, the results suggest that **the overall cost to users of a strike event in France (or one that is managed using the French model for minimum level of service, which seeks to limit flight cancellations) is likely to be higher than under the other minimum level of service models**. This is the case when account is taken of the fact that some of the costs of cancellations can be avoided if sufficient advance notice is given and passengers can be rebooked.

The final column in Table 6-2 shows a calculation of the total cost of a strike assuming that only 25 % of the full costs of flight cancellations are actually incurred as most passengers still reach their final destination on a planned basis. When sufficient advance notification of a strike is available and its probable impacts are known (such as in Greece or Italy), airlines may be able to rebook passengers onto other flights and, hence, not incur the full cancellation cost, although some EU261 costs may still be incurred.

On this basis, the cost of a strike in France may be almost double that in other countries where greater certainty of the impact is provided in advance. In practice, the outcome for any given strike is likely to sit between the two values given but **it is clear that the cost to users of a strike in France is likely to be greater than strikes in other countries based on the evidence collected**.

6.2 Link to Regulation (EC) No 261/2004

Regulation (EC) No 261/2004 on Passenger Rights creates a liability on the airlines in the case of flights cancelled less than 14 days before operation and in the case of flights delayed more than three hours on intra-Community flights. **Ideally, therefore, decisions to cancel flights would be taken more than 14 days before operation** but, in reality, for the reasons outlined above regarding certainty, airlines are unlikely to take cancellation decisions so far ahead.

The more pertinent provision of Regulation 261/2004 relates to the liability for compensation. Where a cancellation or delay *'is caused by extraordinary circumstances which could not have been avoided even if all reasonable measures had been taken'*, the airline is not liable for the compensation

payment. Whilst this is relatively straightforward where a flight is to or from the affected country, the justification is less clear in relation to overflights that have been re-routed or in relation to reactionary delays later in the day that may affect flights between seemingly unaffected country pairs. These effects create a substantial financial burden for the airlines that is not recovered through the performance management arrangements.

6.3 Passengers

The impacts on passengers are substantial. As noted in Annex 2, **many thousands of passengers are affected by cancellations and disruption to their travel plans**. Many thousands more are subject to delay. This includes passengers missing connections at hub airports. Overall, the disruption to end users is substantial, leading to social and economic costs of the types described in the PwC work for A4E. These impacts are over and above the measurable effects on the network.

6.4 Conclusions

The interviews with airlines identified a number of key issues regarding the impact of strikes on them and their passengers, together with some options that would improve the situation.

- The key issue for airlines is the certainty of whether a strike will take place or not, along with as much specific information as possible as to the restrictions to be imposed, in order that they can plan. Lack of certainty in terms of capacity for and delays to overflights is a particular issue in the case of France.
- In practice, given the uncertainty as to whether strikes will go ahead, decisions as to whether to cancel flights tend to take place in the last 24 to 48 hours ahead of a strike event in order to minimise disruption to passengers.
- Airlines generally consider it preferable to cancel flights in advance to allow alternative arrangements to be made than to make last minute cancellations when passengers are already at the airport and it may be difficult to organise alternatives.
- Uncertainty that leads to greater levels of disruption to passengers and broader network effects due to reactionary delays building over the day, with a consequence that seemingly unconnected flights later in the day can be subject to major delays and even cancellations. This is a particular problem in the case of France.
- Shorter duration strikes have fewer consequential effects on the network, as they allow airlines to re-plan their operations around the time of the strike. Avoiding peak periods, as in Italy, is also beneficial.
- Airlines generally consider it preferable to cancel flights in advance to allow rebooking of passengers onto alternative flights. This is considered strongly preferable to last minute cancellations when passengers are already at the airport. Delays and cancellations can also have a significant impact on connecting passengers, as evidenced by Lufthansa and Swiss.
- The key message from the airlines is the importance of certainty of impact so that contingency plans can be put in place. To an extent, they would rather that the ANSP overstates the impact than understates it to avoid on the day unplanned disruption.
- Using EUROCONTROL standard cost benefit parameters, we have estimated that a strike in France is more costly to users (including passengers) than a strike in other countries, given the different minimum level of service regimes in force. The difference in cost may be even greater to the extent that regimes providing greater certainty allow airlines to rebook passengers in advance onto alternative services.

7 Analysis of current legal framework

An important element to consider when analysing the impact of strikes on the ATM network is the current legal situation in each Member State[14] and how that may influence the frequency and impact of strikes. The information for this aspect of the study was taken primarily from the responses to the

[14] In this context, the term 'Member State' is used to describe any Member State of EUROCONTROL, although the primary focus of the study is on EU Member States and those other European states who have committed to implement the Single European Sky.

survey of ANSPs and CAAs, supplemented by the additional understanding obtained from the interviews and the discussions held at the NMB Task Force meetings (see Section 3).

7.1 ICAO requirements

Beyond European regulations, the International Civil Aviation Organisation (ICAO) has published Annex 11 to the Chicago Convention, which includes (within Chapter 2.30) the requirement:

> *'Air Traffic Services authorities shall develop and promulgate contingency plans for implementation in the event of disruption, or potential disruption, of air traffic services and related supporting services in the airspace for which they are responsible for the provision of such services'*.

Thus, there are both European and global requirements on ANSPs to ensure contingency planning for disruption to ATM services, including ensuring continuity of service and mitigating the impact in the event of strikes.

7.2 Single European Sky legal framework

The EU has defined the strategy and goals for the development and completion of the Single European Sky, as published in Regulation (EC) No 549/2004 and Regulation (EC) No 1070/2009. A further proposal, SES 2+, was made in 2013 and is currently in the process of approval by the European Parliament and Council.

As noted in section 2.1, the Single European Sky is defined as a key initiative to reform the organisation of European airspace to provide improvements in safety, capacity, efficiency and environmental impacts. The SES 2 legislation introduced a Performance Scheme setting down EU-wide and local targets for the SES, as well as performance monitoring and corrective actions.

The legislation regarding the Single European Sky includes network functions (Commission Regulation No 677/2011) as the air traffic flow and capacity management (Commission Regulation No 255/2010) as well as the designation of a Network Manager. This task is currently assigned to EUROCONTROL.

Although legislation regarding many aspects of the Single European Sky is formulated by the EU, it does not have legal competence on the subject of industrial action by employees of the ANSPs. This legal competence falls to the Member States, so EU-level action can mainly take the form of guidance to the Member States.

7.3 Right to strike

The right of employees to take industrial action, including strikes, is recognised in all EU Member States as a fundamental right of workers (Article 28 of the Charter of Fundamental Rights). It falls outside the scope of EU social policy (article 153(5) of the Treaty on the Functioning of the European Union).

This right to strike extends to employees in ATM in all EU Member States.

Note that in Georgia, which participates in the work of the Network Manager , the right to strike does not apply when work is connected to human safety and that this category includes ATM.

7.4 Minimum notification period

A minimum notification period for a strike is mandated (either by general employment law, specific laws related to ATM or by agreement) in the majority of Member States. The following EU Member States do not have a defined minimum notification period[15]:

- Austria;
- Cyprus;
- Czech Republic;

[15] The same applies to Switzerland, which, although not an EU Member State, is a member of EUROCONTROL and has committed to implement the SES.

- Slovakia.

The minimum notification periods for those Member States that do have them are shown in Table 7-1.

Table 7-1 Minimum notification periods defined for Member States, in ascending order of the value

Country	Minimum Notification	Comments
EU Member States		
Germany	24 hours	
Romania	2 working days	
Hungary	72 hours	24 hours if solidarity strike. Collective agreement rather than national law
Greece	4 days	
Croatia	5 days	2 days for solidarity strike
France	5 days	
Netherlands	5 – 7 days	
Bulgaria	7 days	
Ireland	7 days	
Latvia	7 days	
Malta	7 days	Includes 2 days in which the parties are bound to meet to try to resolve the dispute
Sweden	7 days	
United Kingdom	7 days	Recent legislation is changing this to 14 days
Luxembourg	10 days	
Spain	10 days	
Portugal	10 business days	
Italy	12 days	Maximum 60 days
Estonia	14 days	
Finland	14 days	
Lithuania	14 days	
Poland	14 days	
Belgium	15 days	
Slovenia	15 days	
Denmark	1 month	
Non-EU Member States		
Bosnia and Herzegovina	48 hours	
Norway	4 days	
MUAC	5 days	By internal regulation rather than national law

Country	Minimum Notification	Comments
Montenegro	10 days	
Serbia	10 days	
Macedonia	17 days	Includes 15 days negotiation, then two days formal notification

A few Member States apply different requirements on minimum notification periods for strikes that are solidarity strikes than if they are primary strikes. In fact, many of the strikes that have caused the most disruption over the past few years (particularly those in France) are in support of national strikes by public service unions; the local or ATM-specific union branch may then decide to support the strike or not. The evidence obtained from the interviews indicates that in such cases, the notification given by the union does comply with the minimum level shown in Table 7-1.

In addition to specifying a minimum period for the notification of a strike by the relevant union (as shown in Table 7-1), Croatia also includes a requirements for all individuals to specify whether they will participate in the strike at least 72 hours in advance. A similar law applies to the transport sector in France (the 'Loi Diard'); however, this law does not apply to staff in ATM. As noted above, however, if this law were applied to ATM, it would potentially replace the current provisions, which allow the DSNA to requisition sufficient staff to deliver the Minimum Level of Service commitment.

7.5 Minimum service levels

The number of Member States that have provision for minimum levels of service is lower than the number that have defined minimum notification periods. This may be associated with the 'minimum service level' needing to be specific to ATM, whereas the minimum notification period may be enshrined in national legislation related to all strikes.

The survey and interviews were used to obtain information on minimum service levels for those Member States that have them. It is apparent that the different Member States specify the minimum service level differently, not only in the values used but also in the manner of defining the service level to be provided. Table 7-2 presents these minimum service levels (for Member States that have them), separated by the requirements for servicing overflights and departures/arrivals to airports in the Member State.

Table 7-2 Minimum service levels defined by Member States

Country	Overflights	Departing and Arriving Flights
EU Member States		
Croatia	Minimum of three sectors served (two in winter) to give a minimum of 75 % of the flights prescribed by Network Manager	Maximum duration of strike two hours; no more than eight flights affected
Cyprus	40 % normal capacity	50 % normal capacity
France	50 % normal capacity	Limited number of (defined) airports open. Capacity decided on a case-by-case basis (usually about 80 % capacity)
Greece	100 % (through agreement with unions rather than legislation)	Emergency, SAR, state flights only
Hungary	46 flights per hour	50 % normal capacity
Italy	100 %	All intercontinental; all departures 07:00-10:00 and 18:00-21:00; flights to islands

Country	Overflights	Departing and Arriving Flights
Portugal	3 contingency routes served; to give about 33 % of normal capacity (by agreement rather than legislation)	Public service flights (to islands), emergency flights
Romania	33 % normal capacity	33 % normal capacity
Spain	100 % served (with delays)	On case-by-case basis. Flights to islands.
Non-EU Member States		
Macedonia		Emergency, SAR, state flights only

For Member States that define a minimum service level including flights to islands, this is generally in response to a requirement that the inhabitants of the islands should not be 'cut off' in the event of industrial action.

It was noted in some interviews that the aim of some Member States to service 100 % of overflights did not mean that they are able to do so without imposing delays. This is feasible when a strike lasts only a few hours, as it leaves time during the rest of the delay to recover those delays and hence to serve the normal amount of traffic in one day. For a full-day strike, it may not be possible to service 100 % of overflights (with delays) as the flights later in the day might then arrive at destinations beyond curfew times.

8 Models of strike management

8.1 Introduction

The results of the surveys of ANSPs and CAAs (including that performed by Network Manager to produce the 2013 strike repository) and the interviews performed provide a comprehensive set of information on measures currently used in European ATM to mitigate the impact of strikes and their effects on users. Most of these measures relate either to providing sufficient notice of the strike to enable ANSPs and airlines to take action to manage the effects of the strike or, in a more limited number of cases, to specifying a minimum level of service to be provided during the strike. This section considers the different measures that have been identified and how they are combined into systems for managing strikes in particular Member States.

8.2 Different national models of strike management

Although most Member States have differences in the details of how strikes are managed, compared to other Member States, we can discern groups of Member States that have adopted similar approaches, thus forming a small number of 'models' of strike management in European ATM.

In broad terms, these models can be broken down into two fundamental types; regimes aimed at minimising the risk of a strike occurring, such as the Denmark/Ireland/UK model, and those which focus more on mitigating the consequences of a strike. The minimum level of service requirements in these latter cases are normally laid out in legislation and accompanied by provisions that allow the ANSP to requisition a number of staff to work in order to deliver the required level of service.

In addition to the models identified for managing strikes, the survey of CAAs and ANSPs identified a single state in the Network Manager area (Georgia[16]) in which strikes in ATM are effectively banned. The models outlined below relate to the approaches for managing strikes in Member States in which such forms of industrial action are allowed.

[16] The response from Georgia identified that the right to strike, while recognised in the country, does not apply to 'employees whose work activity is connected with the safety of human life and health'. ATM is considered to fall under that category.

8.2.1 Denmark/Ireland/UK

These Member States employ considerable efforts to maintain a high level of social dialogue with the aim of avoiding disputes escalating to the point of a strike being called. This has largely been successful in avoiding strikes during the period of our analysis. **The successful measures to avoid strikes are based on local agreements between the ANSP and the Unions that define the principles of dialogue, often accompanied by procedures for resolving disputes, with conciliation and arbitration as the last steps in the process.** These agreements typically isolate the ANSP from broader national labour disputes.

These Member States have different minimum notification periods defined by legislation. Both Ireland and the UK have minimum notification periods of seven days (though the minimum period for the UK will shortly rise to 14 days following the recent passing of new legislation), while Denmark has a period of one month.

At the same time, none of these Member States has a defined minimum level of service, as one is not considered necessary given the emphasis on resolving disputes without the need for strike action. In the circumstances, given the absence of recent strikes, it is not possible to determine the effect of any defined minimum level of service on the network.

8.2.2 Italy/Greece

Both of these Member States have experienced a number of strikes in ATM in recent years. Although there have been negotiations to avert strikes, the level of social dialogue has been insufficient to avoid them occurring.

The two Member States have different levels of minimum notification period defined in law (4 days and 12 days, respectively). **The key similarity between them is that they both have minimum service levels that ensure that all overflights will be served**, albeit that **there is no guarantee that there will not be consequential delays** dependent on the workforce available on the day. In Greece, other than for emergencies, all local flights are cancelled for the duration of the strike. In Italy, flights to/from and within Italy are cancelled, except for long haul (intercontinental) arrivals and a defined number of flights linking the outer islands to the mainland. In Italy, in particular, strikes are limited in duration by law, although the length of strikes allowed may increase if the issues are not resolved. There are also limitations that prevent strikes taking place during peak periods (e.g. early in the morning). **The shorter duration of any strike and the clarity as to the flights which will be allowed to operate provide a more certain regime which the airlines can plan around to a large degree.**

As noted, **the strikes that do occur in these Member States are limited in duration, generally to four or eight hours** (by legislation in the case of Italy, where there are also provisions limiting the ability to hold strikes affecting the same area of the country within a given time period). **As a result, it is possible for these two Member States to ensure that all overflights are served**, albeit with delays, as the limited strike duration allows time to catch up with the demand for flights.

This ability to serve all overflights tends to restrict the most significant impacts of a strike to the Member State concerned (e.g. flight cancellations). Passengers on flights that overfly the Member State mostly arrive on the day they wished to travel (though there will be some, mainly business travellers, for whom the delays result in them arriving too late for their planned purpose).

8.2.3 Spain

Spain has achieved generally good relations between the ANSP and the unions. As a result, there has only been a single strike over the last few years.

The minimum notification period for a strike in Spain is 10 days. This provides sufficient time for the ANSP (and those managing surrounding airspace) to implement contingency plans. It also allows time for the airlines to begin planning how they are going to manage flights during the strike.

The minimum level of service that will be provided is decided on a case-by-case basis. The final decision on the service to be provided rests with the Secretary of State. This decision can take account of the level of demand at the time, which is highly seasonally dependent for Spain. The number of controllers required to deliver that minimum service is decided by the ANSP; they have the right to requisition staff if required.

The key aspect of the approach for managing a strike in Spain that sets it apart from other Member States is the ability to take account of the seasonal demand for travel when determining the minimum level of service to be provided, which can be determined according to

local needs. It can be challenged in the courts retrospectively if it is felt to impede the right to strike and this may establish a precedent for future minimum levels of service.

8.2.4 France

Although France has made efforts to foster a good social dialogue, and there is evidence of progress in that direction, most of the recent strikes have been solidarity strikes in support of national labour disputes. As a result, the efforts made to improve social dialogue do not appear to have been very effective in reducing the impact of strikes on passengers.

France has a minimum notification period (through legislation) of five days. Unlike in some Member States, this minimum applies to strikes in support of national strikes as well as those directly related to ATM issues. From the information provided by the airlines and other ANSPs, it is clear that in general, a five-day notification period should allow sufficient time for mitigation actions to be taken. However, in the case of a strike in France, **there remains considerable uncertainty as to the nature and extent of the impacts of the strike (related to the form of the legislated minimum service level) which can limit the effectiveness of the early implementation of mitigation actions**.

The key elements of the minimum service level for France are:

- 50 % of overflights will be served.
- A limited set (pre-defined) of airports will operate.
- The number to flights to and from the open airports will be limited. The limit is determined on a case-by-case basis, but is generally about 80 % of the normal traffic. The airlines are asked to select which flights to cancel.
- The ANSP is able to requisition staff to ensure that the above minimum service can be provided.

The approach to defining the minimum service level in France is clearly intended to mitigate the impacts of the strike by allowing the maximum number of flights (both overflights and departures/arrivals) to operate. However, **the uncertainty as to how the 50 % of overflights will be achieved (which sectors will be open and at what capacity) leads to airlines needing to make late decisions** as to which flights to operate via which routes, resulting in **additional consequential delays and cancellations**. As such, the minimum service level does not, in practice, mitigate the impacts of the strike to the same extent as more clearly defined approaches (such as those in Italy and Greece) are able to.

9 Options to reduce the impacts of strikes

9.1 Introduction

Drawing on the different national models of strike management that have been identified and the benefits and disadvantages identified from the survey and interviews, this section presents actions that may be taken by ANSPs and CAAs to the impact on air navigation services from strikes. It also includes a description of areas for action that were identified by the Network Manager Board Task Force during their discussions.

9.2 Areas for Action

During the course of this study, the study team attended five meetings of the Network Management Board Task Force on Minimum Service Levels. One of the outcomes of these meetings was the generation of a set of areas for action aimed at addressing the impacts of strikes in ATM. The set of actions that was developed has been used to inform the outputs of the current study, as presented in Section 10. The set of actions was updated following the sixth Task Force meeting and is reproduced in Table 9-1. The discussions within the Task Force on the final recommendations are not yet complete, so the actions in the Task Force's final report may differ slightly from those in Table 9-1.

This framework categorises measures in terms of whether, in principle, they are external measures 'imposed' on the ANSP or organisational measures implemented by the ANSP itself to mitigate the impact of strikes. This reflects the extent to which the minimum notice periods levels of service, where they exist, are defined in national legislation (external to the ANSP) rather than something over which the ANSP has direct control.

The outcome of the Task Force's work suggests that there is no single model for a minimum level of service that is clearly preferred; in particular, there are advantages and disadvantages with all of the models identified above and each of them has to be seen as a package of measures (e.g. the Italian 'model').

It was identified that, largely, **the principal mitigating actions all required external action**, i.e. they were not generally under the control of the ANSP itself. In many cases, changes to notification periods or the definition of minimum levels of service would require legislation and, hence, may take some time to bring into effect, particularly where they would require changes to general legislation.

Nonetheless, the Task Force identified areas of best practice that could usefully be promoted, both in terms of notification of strikes and minimum levels of service.

The sections following Table 9-1 discuss the key actions to reduce the likelihood of strikes and to mitigate their effects.

Table 9-1 NMB MSL TF – Emerging Focus Areas of Best Practice and Additional Reforms

	Strategic 2 years – 21 days	Pre-tactical 21 days – 2 days	Tactical 48 hours - event	Post event
	Actions to reduce likelihood/consequence	**Actions to reduce likelihood/consequence**	**Actions to reduce likelihood/consequence**	**Actions to reduce likelihood/consequence**
External measures	• Compulsory arbitration, conciliation prior to strike action notification (for ATM issues) • Minimum notification 14-21 days • Initial notification to stakeholders (adjacent ANSPs, AUs and NM) within 48 hours • NM standard actions to be reviewed annually by NDOP and published • Exempted peak periods (times of day and days of year) • Avoidance of analyzed daily peak periods • Avoidance of identified holiday periods and analyzed top 20 peak traffic days per annum • Maximum strike length 4 hours • Minimum frequency between strikes 14-21 days including mandatory negotiation process between consecutive strikes • Protection of flights overflying the country affected by industrial action while ensuring this does not come at the expense of flights to and from the country affected • Performance Scheme to require robust contingency plans to mitigate strike actions – resilience, recovery and contingency • PRB evaluation • NSA/EASA oversight • ATCO upper airspace evolution away from geographical dependency	• Individual notification of strike participation required 72 hours prior to strike • No cancellation period inside 24 hours (except where issues resolved or by court order) • NSA to provide EC data for expected delay and cancellation with impact statement • Publication of expected delay and cancellation statistics by EC with impact statement		• Delay attribution mechanism • NSA to provide EC data for actual delay and cancellation with impact statement • Publication of actual delay and cancellation statistics by EC with impact statement • Right of redress with ANSPs for the impact of disruption resulting from strike action

Organisational measures	• High-level ANSP social dialogue • A strategic approach to engagement with staff • Regular structured social dialogue intended to educate and engage social partners to minimize potential problems escalating to industrial action • ATCO upper airspace evolution away from geographical dependency	• Roster Staff to optimize: • ATCOs not participating in strike • ATCOs with cross-border sector license • Consultation with Airspace Users at set intervals prior to strike event notifying: • Mitigation actions • Detailed expectations for delay and cancellations • Transparency of initial impact versus mitigated impact	• Consultation with Airspace Users to confirm final arrangements to mitigate strike impact	• Notification to NSA of initial strike impact, management action and resulting impact once management mitigation measures implemented • NSA to provide EC with information of initial strike impact, management actions and resulting impact once ANSP management mitigation measures implemented • Publication by EC of information of initial strike impact, ANSP management actions and resulting impact once ANSP management mitigation measures implemented
Best practices in relation to Minimum Service Levels				
External measures	• Staff requisition enabled to ensure minimum service level • Protection of flights overflying the country affected by industrial action while ensuring this does not come at the expense of flights to and from the country affected	• Individual notification of strike participation required 72 hours prior to strike	• Staff requisition enabled to ensure Minimum Service Level achieved	
Organisational measures		• Define ATCOs needed to deliver Minimum Service Level • Roster Staff to optimize: • ATCOs for Minimum Service Level		

NOTE 1: The Task Force identified the above Best Practice for Mitigation of ANS Strikes – addressing the likelihood and consequence of ANS strikes.

NOTE 2: The Task Force recognizes that Best Practices which could be useful in one Member State, may not be useful in another Member State.

NOTE 3: The below measures were identified and supported by one or more members of the NMB MSL TF however, were not agreed by the NMB MSL TF for inclusion as best practice.

1. Strategic Actions to Reduce Likelihood/Consequence:
   - Incentive/penalty for delays occurred due to strike – ensuring linkage with EU Performance Scheme
   - Separate Operational Supervisor employment conditions & maintain license/proficiency
   - Cross-border sectors designed to achieve an “alternate route network”

    - Service provision by one or a group of third country ANSPs over the airspace affected by strike action
  - Re-structure and train staff to facilitate Cross-border sectors designed to achieve an “alternate route network”
2. Pre-Tactical Actions to Reduce Likelihood/Consequence:
  - Roster Staff to optimize:
    - Supervisors with license/ proficiency capability
    - ATCOs with “reduced traffic/complexity levels” license
3. Post Event
  - Additional en-route charges caused by alternative routings to be reimbursed by ANSP - ensuring linkage with EU Performance Scheme

9.3 Actions that may reduce the likelihood of strikes

The primary focus of the current study is to identify the best practices that would reduce the impacts of strikes that occur in European ATM. However, it became clear from the interviews that an effective way to reduce the impact of strikes in ATM is to reduce the incidence of those strikes. There are a number of examples of good practice toward this aim:

- **Emphasis on Social Dialogue** - Rather than any suggestion to remove or change the right of employees to take industrial action, the clearest example of good practice was seen in those states or ANSPs that had prioritised improving the social dialogue. The evidence suggests that this is the most effective mechanism by which to reduce the number of strikes (i.e. to address the causes of such strikes rather than merely the symptoms when one takes place).

  Both Denmark and Ireland have implemented high levels of social dialogue, with regular and frequent discussion between unions and management and mechanisms in place to seek agreement (or, at least, arbitration) to avoid issues escalating to the point that a strike is considered appropriate by the union. It is evident that national characteristics may influence the success of improved social dialogue as a means to reduce the likelihood of strikes in ATM; nonetheless, it appears that there may be opportunities to obtain reductions in the number of strikes through better relations between management and unions.

- **Social Dialogue Toolkit** - To this end, CANSO, ATCEUC and ETF have prepared a toolbox for successful social dialogue in ATM[17]. The successful implementation of the measures described in the toolbox could be a route to a reduction in the likelihood of strikes in European ATM and, thus, their impact on the overall network. Although strictly outside the terms of reference of our study, we would commend such an approach in the first instance. For this reason, it makes sense to draw attention to the recommended measures in the toolbox, (e.g. mutual recognition of the rights and responsibilities of unions and the management; open meetings to improve communication; early participation of unions when planning actions; use of internal committees to resolve disputes).
- **Organisational Separation** - An important step along the way may be to establish a clear organisational separation between the ANSP and other state bodies. This has been achieved in Ireland, even though the IAA remains in state ownership. Nonetheless, the autonomy granted to the ANSP has allowed them to negotiate a local agreement with the union, with processes of social dialogue enshrined therein. This ensures that the risk of strikes is limited to issues within the ANSP, rather than more general national labour disputes, and facilitates social dialogue between the ANSP and the unions to resolve issues before strikes occur. This is different from the circumstances where a strike may arise from a general dispute about working conditions that may be beyond the control of the ANSP to resolve.

9.4 Actions to mitigate the impact of strikes

9.4.1 Minimum notification period

As shown in Table 7-1, different Member States have a wide variation in minimum notification periods, ranging from 24 hours to one month. Five Member States were found not to have a defined minimum period. To the extent that these minimum notification periods are defined in law, they would be difficult to change. However, there is merit in considering best practices, as there is generally scope for local agreements between the ANSP and its staff to implement longer notification periods than the minimum mandated by national law.

Therefore, to identify the potential best practice for minimum notification periods, it is important to consider how different notification periods may have an impact on the ability of the main organisations to respond; in particular, this includes the ANSPs (both in the Member State in which the strike occurs and neighbouring ones) and the airlines.

Table 9-2 indicates the actions that ANSPs and airlines can take to mitigate the impact of a strike given different periods of notification.

[17] http://www.atceuc.org/documents/pdf/toolbox-for-successful-social-dialogue-in-air-traffic-management.64.html

Table 9-2 Actions that can be taken by ANSPs and airlines given different notification periods

Notification period	Actions by airlines	Actions by ANSPs
More than 14 days	Allows early cancellation of flights – if there is certainty as to the strike and effects. Avoids EU261 liability on cancelled flights before 14 days.	Allows time for negotiation to resolve issues leading to the dispute. Provides sufficient time for neighbouring ACCs to commence planning process to handle additional traffic, subject to requirements for rostering and overtime.
At least 5-7 days	Allows early cancellation of flights – if there is certainty as to the strike and effects.	Provides limited time for negotiation to resolve issues leading to the dispute. Provides sufficient time for neighbouring ACCs to commence planning process to handle additional traffic, subject to requirements for rostering and overtime (may require contingency plans to be in place).
At least 72 hours	Allows cancellation of flights in time for passengers to amend travel plans (to airport) – requires clarity as to required number of cancellations and requirements by sector/airport.	Unlikely to provide time for negotiation to avert the strike. Provides time for ACCs to implement contingency plans. Provides time for advance notification of precise restriction to be applied (depending on certainty of staff available) Detailed planning of mitigating arrangements and alternative routings by neighbouring ACCs, subject to availability of staff.
Less than 48 hours (with clarity as to which staff will work)	No early cancellation of flights feasible. Flight cancellations commence with precise requirements known by sector/airport.	Defined reductions in capacity made by airport/sector Planning of alternative routings, subject to the number of controllers available at neighbouring ACCs.
Less than 48 hours (without clarity as to which staff will work)	No early cancellation of flights feasible. Flight cancellations commence. Uncertainty may give rise to many reactionary cancellations on the day.	Variable impact dependent on staff deciding to work. Last minute planning of alternative routings – depends on number of controllers available at neighbouring ACCs.

The key advantages of different notice periods are summarised below:

- **More than 14 days** - The main advantage of early notification of a potential strike is in terms of providing time for negotiation to seek resolution of the issues. Clearly, this is more relevant where the strike is specific to the ANSP rather than more general solidarity action. This should not be seen as an alternative to robust and ongoing social dialogue but represents an

important stepping-stone in circumstances where such dialogue is not already embedded within the organisation.

Advance notice also gives warning to airlines and neighbouring ANSPs that they may need to take mitigating action and to start the process of putting contingency plans in place. However, given that such advance notice is usually of a more general nature, in terms of the possibility of a strike taking place without specific detail of impacts by ATC centre and airport. Hence, the airlines and neighbouring ANSPs are unable to make definitive plans at that stage due to the lack of information about where and to what extent flights might need to be cancelled or re-routed.

- **5 to 7 days** – this may still allow some time for negotiation to resolve issues but the main merit is in triggering contingency planning. At this stage, however, airlines will still be reluctant to start the process of cancelling flights and neighbouring ANSPs are unlikely to take action to bring in additional staff to cope with any extra demand in their airspace.
- **72 to 48 hours** – at this point, there needs to be greater certainty as to the impact, including at specific geographic locations. This allows airlines and neighbouring ANSPs to take mitigating action and to cancel or re-time flights to minimise disruption to passengers on the day and to the network as a whole. Within this period, the cancellation of a strike can be of itself disruptive. Therefore, whilst in principle cancellation of a strike should be beneficial, particularly if the issues are resolved (as is the legal provision in Italy), it should be recognised that cancellation of a strike at this late stage may still result in disruption. Such late strike cancellations may still incur cancelled flights and disruption to passengers, even if they may mitigate some of the consequential delay effects on the day.

This analysis of the impact at differing notice periods has informed our recommendations as to best practice in the next section. These are based around the following concepts:

- **more than 14 days' notice** - initial indication of an issue which may lead to strike action to give time for initial preparations and ongoing negotiation;
- **5 to 7 days' notice** - confirmation that action is planned triggering the start of contingency planning;
- **72 to 48 hours' notice** - specific notification of the anticipated effect of a strike in terms of affected sectors and flow rates expected to be achievable

9.4.2 Minimum level of service

It is evident from the analyses of the minimum levels of service applicable in the different Member States (those that have such measures defined), that there are significant variations in the nature of the service level specified, as well as the values.

The different forms of the minimum service level identified include the percentage of staff required to be on duty, the percentage of overflights and the percentage of departures and arrivals (to and from airports in the area controlled by the ACC). The latter two elements may also be combined in a single requirement for a minimum percentage of all flights to be managed.

There are also elements of the minimum level of service that relate to the timing of any strike. For example, strikes may be restricted to occur outside of defined peak periods (time of day in Italy, time of year in Spain) or the location of disruption (no consecutive strikes affecting the same part of the country in Italy). There may be limits to the duration of any strike, as in Italy, or the frequency of occurrence (time periods between strikes). **Overall, the impact of an individual strike will be a reflection of the combination of measures in force rather than an individual 'best practice'**. The delivery of a minimum level of service is largely dependent on the ability to requisition a number of controllers to work; therefore, the ability to offer such a minimum level of service is dependent on such a provision being included in any relevant national legislation.

The specification of a minimum number (or percentage) of overflights (i.e. flights not landing in or taking off from the affected country but transiting the airspace) to be managed does not necessarily mean that those flights will be handled without incurring delays. **In Member States where the specified minimum service level includes the requirement to manage 100 % of overflights, the duration of the strike is normally limited to about four or eight hours.** This enables those flights that have been delayed during the strike to be handled the same day, once full service has been restored.

Depending on the Member State and the nature of the social dialogue in force, there is the potential for some difficulties in agreeing a minimum service level that includes the handling of all overflights. Given a limited availability of resources due to a strike, the requirement to serve 100 % of overflights would entail a reduced ability to serve flights to and from the Member State concerned. This prioritisation of overflights at the expense of flights to and from the Member State may cause some problems from a political perspective if preferential treatment is perceived to be given to airlines from other Member States over national airlines. However, it should be noted that some Member States (notable Italy and Greece) do have such a specification in their minimum service level, so these potential problems are not necessarily insurmountable.

A minimum service level that only requires a lower number of overflights to be served (such as the 50 % requirement in France) allows a greater number of flights to and from the Member State to be served. This has clear benefits in reducing flight cancellations and maintaining connections to the Member State; its implementation may also be less sensitive from a political perspective. **However, such an approach leads to a greater number of flights being diverted around the Member State's airspace, resulting in greater disruption to neighbouring ANSPs and the wider network.**

Table 9-3 describes the implications for ANSPs and airlines of some different elements of a minimum service level.

Table 9-3 Implications for airlines and ANSPs of different minimum levels of service during a strike

Minimum Level of Service	Implications for airlines	Implications for ANSPs
Emergency, Medical, Military, Search & Rescue, Royal only	Significant cancellations. Significant delays and requirements to re-route overflights.	Reduction in traffic overall. Neighbouring ACCs may be required to handle overflights on alternative routes.
All Overflights	Isolates impact to flights to and from country concerned. Able to plan cancellations. Reduces risk of consequential delays	Reduction in traffic but few/no other consequential impacts. No/limited implication for neighbouring ACCs
Fixed Reduction in Flights by Route or Airport	Able to plan cancellations. Minimises risk of consequential delays	Overall reduction in traffic. Required alternative routings can be planned. Neighbouring ACCs may be required to handle overflights on alternative routes.
50 % Level of Service (Overflights and Departures/Arrivals)	Uncertainty as to impact as may be variable by sector and airport. Substantial risk of delay building up over the day unless levels of service by sector are clear and guaranteed.	Results in unplanned changes to traffic levels. Consequential delays. Neighbouring ACCs may be required to handle overflights on alternative routes.
Limit Time and Duration of Strikes	Limiting the duration of a strike to around four hours and outside the peak periods can allow flights to be re-planned to minimise disruption to passengers.	May result in increased traffic and consequential delays.

9.4.3 Organisational best practices (insights on benefits and feasibility)

In addition to the measures defined in the original scope of this study, it has become evident that there are actions other than minimum notice periods and minimum levels of service that could serve to mitigate the impact of strikes. These are discussed briefly below.

9.4.3.1 ATCO training to facilitate licensing for similar sectors

One of the issues when a strike occurs is ensuring that there are sufficient staff available in key sectors or across the sectors to mitigate the impact of delays. This arises because it is normal for controllers to have their licenses validated only to work on a set number of sectors. **There could be advantages if there was greater flexibility in the deployment of controllers across sectors**, particularly those with similar characteristics as this would provide ANSPs with greater flexibility to mitigate the impacts, though there may still be a need to reduce flow rates.

9.4.3.2 Cross border operations

It has also been suggested that the above principles might be extended to cross border sectors, i.e. controllers from one Member State providing an ATC service in neighbouring sectors when a strike occurs. There are some very limited precedents for this happening at times of light traffic, such as at night, but, at peak periods, the complexity of traffic flows are likely to require sector specific training and experience. This approach would also give rise to sovereignty issues.

9.4.3.3 Improving Network Management

At present, restrictions on flow rates giving rise to delays are imposed sector by sector. It has been suggested that this can give rise to a compounding effect on delays across the network. Hence, **there may be a role for the Network Manager to harmonise delay restrictions on key routes** across the affected air space to offer airlines the least possible delay.

9.4.3.4 Coordination with airspace users to establish mitigation actions

It is clear that, notwithstanding the substantial impact of strike events in France, **the actions that the DGAC takes to work with users on the day to provide the most up to date information regarding capacity available in different sectors are welcomed**. Without such action, the impact of strike events in France would almost certainly be worse. This represents a good practice when a strike occurs as it mitigates, to a degree, the uncertainty.

9.4.4 Relationship to Performance Management Scheme

At the Network Management Board Task Force meetings, some airlines have stated that they consider that the current performance management system is unfair, as they are required to make compensatory payments to ANSPs when traffic falls below plan. However, there is no requirement for ANSPs to make compensatory payments to airlines when they fail to provide a service as a result of strike action. Nonetheless, there is clear frustration related to the disruption and costs to airlines and their passengers that have been identified.

An important issue is whether the knowledge that the ANSP would suffer a financial penalty could make strikes more, rather than less, likely. Overall, **it is not clear that such a post-event compensation scheme would provide any mitigation for the effect of a strike on the network**. Nevertheless, having such a scheme in place could provide incentives to ANSPs to improve their social dialogue to avoid any penalties that might be imposed if a strike was to occur. At the very least, it has been suggested that the current traffic risk sharing mechanisms should be nullified in the event of a strike to ensure that airlines are not penalised further by having to compensate the ANSP for any shortfall in traffic resulting from a strike in the ANSP. We consider that there is merit in considering these issues further as part of the next Performance Management Scheme.

10 Recommendations of best practice

The analysis outlined above has been drawn upon to derive recommendations for best practices that could serve to mitigate the impact of strikes on the network and, most significantly, on its users including the end users of air transport services, (i.e. passengers and freight shippers). Having very different rules applied in case of strikes does not ease the optimal functioning of the European ATM

network. The best practices presented here have been selected from the options identified as being the most effective and most likely to be able to be adopted in a range of Member States.

It is recognised that not all of these recommended best practices will be relevant or suitable in all Member States, not least because of the different approaches currently undertaken to managing the impact of strikes. However, the adoption of appropriate measures in Member States will serve to mitigate the impact of strikes over the network as a whole.

As noted above, notice periods in relation to strikes are set in national legislation and any deviation from these could only come about through negotiation between the ANSP and its Unions. The same applies in relation to defined minimum levels of service, although these are less well defined in national law in most cases.

10.1 Minimum Notice Periods

The recommendations of best practice in relation to notification periods for strikes, derived from our analysis in Section 6.5, are:

- **21 - 14 days' notice** - initial indication of an issue that may lead to strike action to give time for **initial preparations and ongoing negotiation**. This would require advance notice by the unions of the possibility of a strike of 14 to 21 days – this allows time for negotiation to resolve issues.

  Rapid notification of the possible strike by the ANSP concerned to other European ANSPs and the Network Manager to provide them with advance notice so that they can begin planning the implementation of their contingency plans.
- **5 – 7 days' notice** - **confirmation** that action is planned triggering the start of contingency planning, although negotiations may still be continuing at that stage.
- **72 – 48 hours' notice** - specific notification of the anticipated effect of a strike in terms of affected sectors and flow rates expected to be achievable. This will require **confirmation of definitive effective strike impacts**, including the capacity available by sector and airport for the duration of the strike to allow airlines to plan cancellations with the minimum impact on passengers and for neighbouring ANSPs to plan appropriate contingency measures to handle additional traffic.
- To allow the ANSP to define the impacts of the strike in advance, the best practice should include a **requirement for individuals** to notify their intention to participate in the strike at least 72 hours in advance of the strike.

We fully recognise that the objective is not to impose any notice periods as, in most countries, there are defined legal minimum notice periods and no requirement for staff to be specific as to whether they will work or not. However, as part of a process of social dialogue, it should be an objective to reach a local agreement to provide greater advance notice and clarity as to the impact. An example where this has occurred is Ireland, where ATC staff have agreed to a longer notice period than required under national law as part of a broader local agreement and dialogue.

The Network Manager should consider proactively working with the ANSPs to undertake advance planning of the impact and available capacity to mitigate the impact of cumulative restrictions on the day.

10.2 Minimum Levels of service

From the analyses performed during this study, recommendations have been derived for best practice in setting minimum levels of service during strikes in a flexible manner. These best practices are intended to be implemented by Member States that have decided that it is appropriate to implement a minimum level of service; Member States with little or no history of ATM strikes may decide that setting a minimum level of service is not appropriate for them.

The recommendations for best practice are:

- **Maximum duration** - Setting maximum durations for any strike (e.g. four or eight hours) and ensuring that these can only take place outside of defined peak periods (as in Italy). This

would serve to mitigate a major part of the impact of strikes on airlines as they could plan their operations around the strike periods.

- **Protecting overflights** - Guaranteeing all overflights with a defined maximum level of delay during the strike. This would significantly reduce the impact of the strikes on the wider network and reduce the time for network operations to recover following the strike. It is recognised that ensuring that all overflights can be managed would reduce the service that can be provided for departing and arriving flights (from and to the Member State in which the strike occurs) and that this may not be acceptable to all states. For those Member States where implementation of the recommendation to service all overflights is not acceptable, we recommend that the ANSP seeks to provide a guaranteed level of service for overflights and defines the number or proportion that can be handled with acceptable levels of delay.
- **Certainty of volume** - Where flights to/from and within the Member State are permitted during the strike, the ANSP should provide certainty as to how much traffic can be handled, through requiring a definitive percentage reduction or other defined priorities, e.g. flights serving outlying regions or islands, long haul flights etc. Setting this permitted volume should also take account of a defined maximum level of delay requirement.

In most countries, defined minimum levels of service do not form part of the legal framework for industrial disputes, although they do in a few cases, (e.g. Italy). However, we believe that it should be possible to negotiate such minimum service levels as part of the process of social dialogue.

10.3 Other measures to reduce disruption arising from strikes

10.3.1 Social dialogue

It is clear that the ideal approach to reducing the impact of industrial action in ATM on the functioning of the network is to **reduce the prevalence of strikes and other forms of industrial action, provided that this does not impact on the employee's right to strike**. The efforts of Member States such as Denmark, Ireland and the UK show that this can be achieved.

The successes achieved in those Member States have been the result of good social dialogue between the ANSP and the unions (and employees). To improve social dialogue across the European ATM network, CANSO, ATCEUC and ETF have produced a toolbox of measures[18]; the adoption of relevant measures from the toolbox to enhance social dialogue in each Member State should be considered as good practice.

10.3.2 Organisational design

Whilst it may not be feasible to change national legislation regarding the general right to strike, **it would represent good practice to achieve structural separation between ANSP staff and more general public service strikes**. The staff of an organisation, such as an ANSP, are much less likely to strike in solidarity with such a general strike if they are not, themselves, public servants. Notwithstanding the continued ownership of ANSPs by the State in some countries, this could be achieved by ensuring that the ANSP is established as a separate legal entity with local agreements in place with its staff. Such local agreements reduce the risk of ATM being affected by a national strike related to issues sometimes unconnected with the ANSP, such as general labour or public service strikes. This is achieved by gaining acceptance of specific objectives and targets relevant to the ANSP and is inherently linked to the ability to negotiate local terms and conditions that are distinguishable from those in force across the public sector as a whole.

10.4 Implementation of the best practices

The recommendations of best practice described above should significantly reduce the impact of strikes on delays and cancellations in the European ATM network and would allow the airlines to manage their operations better, leading to reduced impacts on the passengers. In principle, these best practices should be considered carefully by the EU Member States and ATM stakeholders, where needed; we recognise that Member States that have achieved high levels of social dialogue, which have resulted in very few or no strikes in ATM, may determine that changing their regulations

[18] http://www.atceuc.org/documents/pdf/toolbox-for-successful-social-dialogue-in-air-traffic-management.64.html

regarding strikes may be likely to damage that social dialogue. Such Member States may seek to ensure that strikes are avoided through their continued efforts on social dialogue.

The nature of existing legislation regarding strikes varies considerably between Member States. In some Member States, it may be appropriate for changes to be made to industrial relations legislation; in others, this may not be feasible and the best practices will need to be implemented through agreements between the ANSP and the unions.

10.5 Recommendations

In this section, we summarise our recommendations for the implementation of best practice by each of the principal stakeholders. These recommendations are summarised in Table 10-1 at the end of the section.

10.5.1 Recommendations to the European Commission

The study has recognised that obligations related to the exercise of the right to strike are determined by national law; as a consequence, the European Commission has no authority to impose changes in regulations regarding strikes. However, it is able to present recommendations that the Member States concerned should consider carefully.

> **Recommendation 1**: We recommend that the Commission communicates the best practices outlined in this report to the Member States for their consideration and encourages all actors to participate in the implementation of best practices.

> **Recommendation 2**: We recommend that the Commission works with CANSO, ATCEUC and ETF to promote a high quality social dialogue between individual ANSPs and their employees.

The Commission has a strong role to play in the promotion of strengthened high levels of social dialogue in European ANSPs, building on the toolbox produced by CANSO/ATCEUC/ETF. It should promote the toolbox as a means of improving social dialogue between ANSPs and unions and hence reducing the frequency of strikes.

> **Recommendation 3**: We recommend that the Commission considers measures to designate upper airspace as a ‘common resource’, in line with the provisions of the Single European Sky, to reduce the impact of strikes in individual Member States on users of that resource (i.e. overflights).

Given the particular concern regarding the protection of overflights, there would be merit in investigating the feasibility of designating upper airspace as a common resource and facilitating greater resilience in the provision of ATM services at upper levels through ensuring, inter alia, that responsibility can be switched between ATM centres should the need arise.

> **Recommendation 4**: It is recommended that, when developing the SES Performance Scheme, the Commission considers including penalties for ANSPs (and compensation to airlines) when strikes occur or, at least, removes the provisions of the current traffic risk sharing mechanisms when strikes occur.

It has become apparent that there is a measure of concern regarding the costs to airlines for ATM services and the lack of compensation for the extra costs they bear as the result of strikes.

10.5.2 Recommendations to Member States

Member States have a clear role to play in considering whether there is scope to introduce legislation that would formally introduce at least some of the identified best practices into national law relating to strikes, including whether ATM should be declared an essential service (in some form).

> **Recommendation 5**: Member States should consider whether legislation regarding the provision of minimum notification periods and, in particular, minimum levels of service in ATM is appropriate for them. They should also consider whether efforts to maintain and enhance social dialogue would be more likely to achieve the aims of minimising the impacts of strikes on the performance of the European ATM network.

This report describes best practices related to the specification of minimum notification periods and minimum levels of service. It is recommended that Member States should consider whether such

measures are appropriate for themselves (as described in Section 10.4). If they decide that such measures are appropriate, they should consider whether this should be achieved through national legislation or by encouraging the ANSP (probably via the CAA) and the unions to reach agreement on a minimum notification period and a minimum level of service. They should then take appropriate action to implement their decision.

If it is appropriate to introduce new legislation, the best practices described above should be considered to guide the drafting of the legislation.

> **Recommendation 6**: It is recommended that, the minimum level of service should ideally include guarantees to serve all overflights during a strike, although local requirements may reduce the provision slightly below 100 %.

In Member States where the drafting of new legislation regarding strikes is not felt appropriate, the CAA should consider how to encourage the ANSP and the union(s) to implement the best practice to reduce the impacts of strikes.

A number of the more disruptive strikes in recent years have been related to wider labour disputes between public service unions and the Government. A separation of the ANSP as a separate legal entity from the CAA can serve to separate the ANSP staff from wider public service disputes, without restricting their rights to take industrial action over disputes regarding their own employment.

> **Recommendation 7**: To reduce the impact of strikes related to wider labour disputes on ATM services, Member States should consider structurally separating the functions of the ANSP from the CAA, by creating the ANSP as a separate legal entity.

This report describes best practices related to the specification of minimum notification periods and minimum levels of service. It is recommended that Member States should consider whether such measures are appropriate for themselves (as described in Section 10.4). If they decide that such measures are appropriate, they should consider whether this should be achieved through national legislation or by encouraging the ANSP (probably via the CAA) and the unions to reach agreement on a minimum notification period and a minimum level of service. They should then take appropriate action to implement their decision.

10.5.3 Recommendations to ANSPs

The ANSPs bear the main requirements for negotiations with the unions to reduce the likelihood, or impact, of strikes. Hence, there is an important onus on the ANSP to seek to take steps to minimise the impact of strikes, including initiating the social dialogue process where this is not already in place.

> **Recommendation 8**: ANSPs should take the lead in establishing a regular social dialogue with the relevant Trade Unions with a view to agreeing local terms and conditions, resolving disputes before they result in strike action and agreeing measures to mitigate the impact of strikes.

Our analysis has identified the importance of social dialogue with the aim of resolving issues without the need for strike action. This is a key responsibility of ANSPs and it is their duty to maintain a high quality level of the social dialogue with all their staff members, including air traffic controllers.

> **Recommendation 9**: If the Member State decides that it is not appropriate for it to pass legislation related to minimum notification periods or minimum levels of service, it is recommended that the ANSPs aim to reach agreement with the unions regarding such measures. The minimum notification periods and minimum levels of service agreed should be consistent with those recommended in Sections 10.1 and 10.2, if possible.

Agreeing minimum notification periods and minimum levels of service to apply should be a critical part of any social dialogue to establish contingency planning processes in the event that a strike is unavoidable.

> **Recommendation 10**: When the ANSP becomes aware that a strike is likely (i.e. following an initial notification by the union), it should take action to inform the Network Manager and the other ANSPs (particularly those in neighbouring Member States) with no delay (certainly less than 48 hours after being informed that a strike will take place). It should also inform the airlines that it serves. This approach will ensure that all organisations likely to be impacted by the effects of the strike have sufficient notification to put contingency plans into action and make maximum provision to mitigate the effects of the strike.

Once it is clear that the strike is certain (or highly probable) to go ahead, the ANSP should determine what level of service it will be able to offer. It should specify this as accurately as possible (e.g. which sectors and airports will remain open) so that airspace users and other ANSPs can understand the impact on their operations with a high level of certainty and plan accordingly. The agreements with the unions (or legislation, if appropriate) should include provision for this level of detailed specification of the level of participation in the strike.

> **Recommendation 11**: In advance of a strike, the ANSP should inform airspace users, airlines and other ANSPs of the level of service that it will be able to deliver with as much accuracy as possible.

> **Recommendation 12**: ANSPs should consider the potential to mitigate the impacts of a strike by allowing some cross-border management of airspace.

EU Regulation no. 550/2004 (article 10) provides rules under which ANSPs may use other service providers, including air traffic service providers. To enable the delegation of ATM services during strikes, ANSPs should reach agreement with the neighbouring ANSPs and should ensure that their staff are trained to provide such cross-border sector control on a contingency basis. This may also require action by Member States and CAAs.

10.5.4 Recommendations to the Unions

The unions are encouraged to recognise that the recommendations in this report are not intended to restrict the rights of the air traffic controllers to take industrial action to demonstrate their position regarding disputes. The intention is to address the issue of the impact of industrial action on the ATM network beyond the Member State better and to mitigate the impact on the travelling public.

> **Recommendation 13**: The unions are recommended to participate in negotiations with the ANSP to reach agreements on minimum notification periods and minimum levels of service, along the lines of those described in Sections 10.1 and 10.2**,** and to ensure that their members cooperate with the requirements during periods of industrial action.

As identified above, the most effective way to mitigate the impact of strikes on the ATM network as a whole is by ensuring that there is an effective social dialogue in place with the aim of resolving issues without the need to strike. The Unions are key players in ensuring the success of strengthened social dialogue.

10.5.5 Recommendations to the Network Manager

Whilst the Network Manager does not have a role in preventing strikes from occurring or in defining minimum notice periods and minimum levels of service, the Network Manager does have a role in helping to mitigating the effects by ensuring that the capacity available is used effectively.

> **Recommendation 14**: It is recommended that the Network Manager should take a more proactive role in working with the affected ANSP in advance of the strike to plan and manage the available capacity. During strikes, the Network Manager should continue to work proactively with the ANSP to reduce the cumulative regulations and hence reduce the overall delays.

Some airlines interviewed as part of this study have commented that the delays imposed through the regulation of airspace sectors may be greater than necessary as multiple regulations are combined.

> **Recommendation 15**: It is recommended that the Network Manager extend their data collection to include further information on flight cancellations and actual strike durations.

During this study, it has been found that some data are not available from the Network Manager database, such as flight cancellations (including those before and after submission of flight plans) and actual strike durations. It is recognised that these are not key items of data for Network Manager purposes; however, their availability would improve the accuracy of future analyses of the effects of strikes (and other disruptions to network operations). We support the initiatives that the Network Manager is taking to capture consequential restrictions and delay impacts imposed by neighbouring ANSPs resulting from strike action in an adjacent state.

10.5.6 Recommendations to all (decision-makers, ATM operational stakeholders and ATCOs staff)

The study has established that industrial action by ATCOs in one Area Control Centre or State can have a significant impact not only at domestic level but also on the European ATM system; this impact can be heavy and damage the SES performance as a whole. It has also identified that strikes never happen in half of the EU Member States and from time to time in some others, while two-thirds of strike days since the establishment of the SES in 2004 have occurred in one State only.

> **Recommendation 16**: We recommend that the Public authorities, ANSPs and staff concerned should reflect about the above best practices and related recommendations and recognise the need for change.

10.5.7 Implementation

Several of the recommendations described above could be implemented in the near future. These include the promotion of the CANSO/ATCEUC/ETF toolbox for successful social dialogue, the initiation of discussions by the ANSPs with the unions on agreements to implement minimum notification periods (including notification by individuals) and minimum levels of service (or to modify those already in place) and the collection of additional data by the Network Manager.

The preparation of the performance scheme for the period 2020-24 as well as the update of the network functions regulations in 2017 provide an opportunity to address the recommendations related to the management of European airspace (e.g. greater cross-border management, designation of upper airspace as a common resource and the implementation of financial incentives to reduce the frequency of strikes).

Other elements of the recommendations, such as legislation in individual Member States for changes to the structure of the CAA/ANSP, implementation of new minimum notification periods (including notification by individuals of their intention to participate in the strike) need to be considered in the longer term, due to the need to follow normal processes for setting new laws. In general, it would be preferable for the implementation of measures such as minimum notification periods and levels of service to be achieved through agreements between the ANSPs and the unions, rather than through national legislation. Therefore, the consideration of new legislation (if required) should start after the efforts to obtain agreement have completed.

10.5.8 Summary of recommendations

Table 10-1 Recommended best practices to reduce the impacts of strikes on the European ATM network

Best practice	Responsibility				
	European Commission	Member States	ANSP	Unions	Network Manager
Actions to avoid strikes					
Negotiation of local agreements/social dialogue.	Encouragement to action.	Member State to ensure that ATM is not affected by general national labour disputes unrelated to the ANSP.	ANSPs to negotiate local agreements with relevant unions based on best practice social dialogue principles, including conciliation and arbitration to avoid strikes.	Participate in social dialogue and support local agreements.	
Structural and functional separation between the ANSP and other State bodies.	Encouragement to action.	Member States take steps to ensure that the ANSP is a functionally independent body empowered to undertake its own local negotiations on staff terms and conditions.			
Minimum Notification Periods					
Advance notification of intention to strike at least 14 days in advance.	Encouragement to action.	Member States to consider introducing legislation to make mandatory.	ANSP to seek to negotiate as part of local agreement.	Participate in social dialogue and support local agreements.	
Ensure timely (within 48 hours of initial notification) notice given to airlines and	Encouragement to action.	CAA to ensure notice given in conjunction with ANSP. Notice should be as	ANSP to ensure notice given in conjunction with the CAA. Notice should be as		Network Manager begins contingency planning with neighbouring ANSPs

Best practice	Responsibility				
	European Commission	Member States	ANSP	Unions	Network Manager
neighbouring ANSPs.		precise as possible regarding potential impacts.	precise as possible regarding potential impacts.		and airlines.
Notification of precise impact of strike (affected sectors, expected delays etc.) 72 to 48 hours in advance.	Encouragement to action.	Member States to consider adjusting labour laws to require notification of intention to participate in a strike. CAA to work with ANSP to coordinate mitigating action and communicate with users.	ANSP to seek agreement with Unions for individual notification. ANSP to issue details of expected strike impacts	Provide notification of which individuals will take strike action.	Detailed contingency planning with neighbouring ANSPs and airlines. Modelling of impacts and estimates of delays across sectors in the Member State and neighbouring Member States.
Within 24 hours and during strike.	Encouragement to action.	CAA to ensure effective communication with users regarding affected sectors and expected levels of delay.	ANSP to ensure effective communication with users regarding affected sectors and expected levels of delay.	No cancellation of a strike within the last 24 hours unless issues fully resolved.	Network Manager to be proactive in ensuring that cumulative regulations across sectors are not overly penalising.
Minimum Levels of Service					
Protection of Overflights	Encouragement to action.	Member States to consider legislation to introduce minimum guaranteed service level in the event of a strike. This could include guaranteed overflights,	ANSP to ensure that routes for overflights are protected and that delays are minimised. Requisition of sufficient controllers to operate sectors and/or flexible staffing levels to ensure	Unions to cooperate with efforts to ensure that overflights are protected and sufficient staff are available to provide the service.	Network Manager to work with the ANSP and neighbouring ANSPs to mitigate the delay impact on overflights.

Best practice	Responsibility				
	European Commission	Member States	ANSP	Unions	Network Manager
		defined restrictions within the Member State, the power to requisition controllers to work, provisions requiring individual notification of the intention to strike or the declaration of ATM as an essential service. CAA, in conjunction with the ANSP, to define specific restrictions applicable for reductions in traffic.	minimum service levels are delivered.		
Defined impact on movements to/from and within the Member State.	Encouragement to action.		ANSP to define required reduction in traffic by airport/sector. Requisition of sufficient controllers to operate sectors and/or flexible staffing levels to ensure minimum service levels are delivered.	Unions to cooperate with efforts to ensure that overflights are protected and sufficient staff are available to provide the service	Network Manager to work with the ANSP and neighbouring ANSPs to mitigate the delay impact on overflights.
Other Contingency/Mitigation Measures					
Maximum Duration and Frequency of Strikes	Encouragement to action.	Member State to consider legislation to limit duration and frequency of strikes.	ANSP to seek to include within any local agreement provisions which limit the duration and frequency of strikes.	Unions to cooperate in reaching agreements on maximum duration and frequency of strikes.	
Training of Staff to facilitate working across sectors	Encouragement to action.	CAA to mandate training of staff to operate across sectors, including provisions enabling general licensing to operate at reduced traffic levels.	ANSP to ensure that supervisory and other staff are trained to operate as required, including ensuring they are on separate contractual terms.	Unions to cooperate in training initiatives	
Development of	European Commission	Member States and	ANSP to work towards		

Best practice	Responsibility				
	European Commission	Member States	ANSP	Unions	Network Manager
protocols to allow cross-border working	to consider action to make upper airspace a common resource in line with the provisions of the Single European Sky.	CAAs to work towards allowing cross border control of sectors on a contingency basis.	allowing cross border control of sectors on a contingency basis and provide appropriate staff training.		
Modify Performance Management Scheme to provide incentives to minimise the incidence of strikes	European Commission to develop the next Performance Management Scheme to ensure that there are appropriate penalties on the ANSP when strikes occur.				
Develop improved monitoring mechanisms for the impact of strikes.	Work with Network Manager to mandate appropriate reporting.	CAA to report on detailed impacts of strikes.	ANSP to cooperate with CAA to report on the detailed impact of a strike		Develop improved monitoring of strike effects, including length of strike, number of flights affected, delays across sectors and effectiveness of mitigation measures.

ANNEXES

A.1 Annex 1 – Country fiches

The country fiches presented below were initially developed based on information provided through the 2013 strike repository. They were then submitted to the air navigation service provider (ANSP) and civil aviation authority (CAA) in each country, with the request that the information be confirmed, amended or added to. For most countries, a response was received from either the ANSP or the CAA. In a few cases, they submitted a joint response; in others, responses were received from both organisations. For countries where responses were received from both the ANSP and the CAA, these have been combined to provide a single country fiche for this document.

EU Member States

A.1.1 Austria

Austria	
History of strikes since 2004	Two strikes identified in period.
If applicable, what have been the main reasons for strikes?	Better working conditions (salaries, working time, rosters)
Have there been impacts of industrial action in other Member States?	Austria is frequently affected by strikes in France and Italy
Is there a minimum notification period for strikes? If so, what is it?	No
Is there a minimum service level to be provided during a strike? If so, what is it?	No
Is there a list of priority flights during a strike?	Humanitarian and Medical. Search and rescue (SAR). Emergency. State and Military.
Can ATM staff be requisitioned under national law?	No

A.1.2 Belgium

Belgium	
History of strikes since 2004	Five strikes recorded in period. Between 2011 and 2016, there were three ATM-specific strikes in Belgium, of which two had an impact on air traffic services. There was also a single inter-professional strike that had an impact on air traffic services.
If applicable, what have been the main reasons for strikes?	In the period 2011 to 2016, the main cause of strikes was pension reforms.
Have there been impacts of industrial action in other Member States?	Generally low impact on operations but a higher impact on domestic flight cancellations (mainly from strikes in France)

Belgium	
Is there a minimum notification period for strikes? If so, what is it?	Yes, 15 calendar days
Is there a minimum service level to be provided during a strike? If so, what is it?	No.
Is there a list of priority flights during a strike?	State and Military. SAR. Emergency. Humanitarian and Medical.
Can ATM staff be requisitioned under national law?	No

A.1.3 Bulgaria

No response was received to the survey from Bulgaria, so the information below has been obtained from the 2013 strike repository.

Bulgaria	
History of strikes since 2004	No history of strikes
If applicable, what have been the main reasons for strikes?	N/A
Have there been impacts of industrial action in other Member States?	None specified
Is there a minimum notification period for strikes? If so, what is it?	Yes, 7 days
Is there a minimum service level to be provided during a strike? If so, what is it?	No.
Is there a list of priority flights during a strike?	SAR. Emergency. Humanitarian and Medical.
Can ATM staff be requisitioned under national law?	No

A.1.4 Croatia

Croatia	
History of strikes since 2004	In May 2013, there was a solidarity strike of ATCOs (in support of a pilots' strike), 2 hours, 1.000 minutes delays accumulated (Network Manager data indicate 483 minutes delay directly attributable to industrial action), without flight cancellations. In 2015, the arbitration process was executed in the final phase of collective labour negotiations. No official strike occurred.
If applicable, what have been the main reasons for strikes?	As solidarity to a pilots' strike
Have there been impacts of industrial action in other Member States?	Yes. Other EU countries: France, Italy, etc, several times a year – the strikes affect the traffic in Croatia (less operations and less service units)
Is there a minimum notification period for strikes? If so, what is it?	Yes, five days This is reduced to two days for a solidarity strike (supporting other strike) Additionally, the unions have to provide notice of which workers will work and which will not, 72 hours in advance.
Is there a minimum service level to be provided during a strike? If so, what is it?	No requirements at national level. However, an article in the Labour Law states that the employer has to propose, and then the employer and the unions to agree and sign an agreement on the minimum level of service. Based on that, there is an agreement signed between ANSP and ATCO union, defining **the minimum levels:** **Instrument Flight Rules (IFR) Flights at the airports -** Seasonal period: minimum 50 % of the maximum capacity of ATC TWR/APP service. Out of the season: min 1 operation per hour. **IFR Overflights –** 40 % of maximum capacity that has been published. Note: These limitations are valid for regular IFR flights. Exceptions: military, medical etc. must not be affected by strike. Visual Flight Rules (VFR) and training flights – may all be cancelled

Croatia	
Is there a list of priority flights during a strike?	Priority 1: Military, medical etc.: must not be affected by strike Priority 2: Regular IFR flights: may be affected as described above Priority 3: VFR and training flights – may all be cancelled
Can ATM staff be requisitioned under national law?	No.

A.1.5 Cyprus

Cyprus	
History of strikes since 2004	Five strike days in the period. One in December 2011, four in March 2012.
If applicable, what have been the main reasons for strikes?	Pay cuts and austerity measures imposed even when the payroll expenses are covered by the overflight charges.
Have there been impacts of industrial action in other Member States?	Strikes in other countries cause abnormal traffic levels and make resource and sector capacity planning difficult
Is there a minimum notification period for strikes? If so, what is it?	No.
Is there a minimum service level to be provided during a strike? If so, what is it?	**Departing and Arriving Flights:** airport strikes cannot occur more than once a week and for a maximum duration of two hours, provided that not more than 8 flights are affected and that strikes do not occur simultaneously at both airports, Larnaca and Pafos. **Overflights:** three sectors open as a minimum from May to October and two sectors open as a minimum for the rest of the year, provided that these numbers are not less than 75 % of what is prescribed by the NMOC-EUROCONTROL
Is there a list of priority flights during a strike?	Humanitarian and Medical. SAR. Emergency. VIP.
Can ATM staff be requisitioned under national law?	No such law exists. The President of the Republic, as a means of absolute national security/interest can act in this direction if asolutely needed.

A.1.6 Czech Republic

Czech Republic	
History of strikes since 2004	No history of strikes.
If applicable, what have been the main reasons for strikes?	N/A
Have there been impacts of industrial action in other Member States?	No.
Is there a minimum notification period for strikes? If so, what is it?	No.
Is there a minimum service level to be provided during a strike? If so, what is it?	No.
Is there a list of priority flights during a strike?	Hospital. SAR. Emergency.
Can ATM staff be requisitioned under national law?	No.

A.1.7 Denmark

Denmark	
History of strikes since 2004	No history of strikes. This is primarily attributed to agreements between employee organizations and employers and their organizations. The 'Danish model'.
If applicable, what have been the main reasons for strikes?	N/A
Have there been impacts of industrial action in other Member States?	No
Is there a minimum notification period for strikes? If so, what is it?	Yes, one month.
Is there a minimum service level to be provided during a strike? If so, what is it?	No (emergency flights only).
Is there a list of priority flights during a strike?	Emergency flights
Can ATM staff be requisitioned under national law?	Yes.

A.1.8 Estonia

Estonia	
History of strikes since 2004	No history of strikes.
If applicable, what have been the main reasons for strikes?	N/A
Have there been impacts of industrial action in other Member States?	No.
Is there a minimum notification period for strikes? If so, what is it?	Yes, 14 days.
Is there a minimum service level to be provided during a strike? If so, what is it?	No specific requirements defined. However, air navigation services are defined as vital services by the state. This requires that flights departing and arriving from the country have priority.
Is there a list of priority flights during a strike?	There is a list to whom EANS can give priority (Humanitarian and Medical (HOSP), SAR, Emergency and State).
Can ATM staff be requisitioned under national law?	No.

A.1.9 Finland

Finland	
History of strikes since 2004	Network Manager data indicate two strikes since 2004 (January 2008 and April 2009). The response from Finland notes that there were also strikes in 2013 and 2015, though the Network Manager data do not note any delays due to them. All strikes were of short duration (a few hours) and were considered 'illegal' strikes (an illegal strike is one that occurs when bargaining agreements are in force or without the required notification period).
If applicable, what have been the main reasons for strikes?	Bargaining agreements and structural changes in organisation
Have there been impacts of industrial action in other Member States?	No.
Is there a minimum notification period for strikes? If so, what is it?	Yes, 14 days. Strike can be postponed a maximum of 2 weeks by the Ministry of Labour
Is there a minimum service level to be provided during a strike? If so, what is it?	No. Typically 80-85 % of operations are maintained normally, only 10-15 % of operations are affected by the strike
Is there a list of priority flights during a strike?	No.

Finland	
Can ATM staff be requisitioned under national law?	No.

A.1.10 France

France	
History of strikes since 2004	Frequent strikes in period.
If applicable, what have been the main reasons for strikes?	Most strikes are solidarity strikes in support of national public service disputes. Some ATM-specific strikes related to salaries and working conditions.
Have there been impacts of industrial action in other Member States?	Limited impact of strikes in other Member States.
Is there a minimum notification period for strikes? If so, what is it?	Yes, five days.
Is there a minimum service level to be provided during a strike? If so, what is it?	• **Departing and arriving flights:** minimum service requested for airports listed in the applicable regulation (Paris-Orly, Paris-Charles-de-Gaulle, Deauville, Nantes, Clermont-Ferrand, Lyon-St Exupéry, Marseille, Nice, Toulouse-Blagnac, Bordeaux-Mérignac, Poitiers, Limoges, Mulhouse-Bâle, Ajaccio, Bastia, Calvi, Cayenne, Fort-de-France, Pointe-à-Pitre, Saint-Denis-de-la-Réunion, Mayotte, Nouméa-la-Tontouta, Wallis, Papeete-Faaa, Saint-Pierre) • **Overflights:** 50 % of normal capacity offered.
Is there a list of priority flights during a strike?	No except usual priority flights (emergency, humanitarian, medical, military, state, SAR)
Can ATM staff be requisitioned under national law?	Yes. Requisitions are made to ensure the availability of the required number of ATCOs to provide minimum service as defined.

A.1.11 Germany

Germany	
History of strikes since 2004	The Network Manager data identify four strikes in the period, though two caused only very small delays. The German ANSP (DFS) noted that there have been no strikes in the organisation in the period; the two strikes that caused the delays appear to have been in air traffic control services at German airports.
If applicable, what have been the main reasons for strikes?	N/A
Have there been impacts of industrial action in other Member States?	Indirectly affected by industrial action in other States leading to cancellations and rerouting of traffic. Rerouting through German airspace may lead to ATFM measures to be taken in DFS in order to cope with the increased level of traffic
Is there a minimum notification period for strikes? If so, what is it?	Yes, 24 hours.
Is there a minimum service level to be provided during a strike? If so, what is it?	No minimum level; of service defined.
Is there a list of priority flights during a strike?	Humanitarian and Medical. SAR. Emergency. State and Military.
Can ATM staff be requisitioned under national law?	No.

A.1.12 Greece

Greece	
History of strikes since 2004	The analysis of the Network Manager data identified 46 strike days over the period, though some caused only small delays.
If applicable, what have been the main reasons for strikes?	Mainly solidarity strikes in support of national public service strikes.
Have there been impacts of industrial action in other Member States?	Not specified.
Is there a minimum notification period for strikes? If so, what is it?	Yes, four days.
Is there a minimum service level to be provided during a strike? If so, what is it?	Yes. All overflights are allowed. All airports are closed, so no flights are permitted to land at or take off from Greek airports (with the exception of emergency flights, etc.).

Greece	
Is there a list of priority flights during a strike?	VIP. Humanitarian. Hospital. SAR. Emergency. State. Military on operational exercise.
Can ATM staff be requisitioned under national law?	Yes

A.1.13 Hungary

Hungary	
History of strikes since 2004	No strikes that caused any impact on the traffic have occurred since 2004.
If applicable, what have been the main reasons for strikes?	N/A
Have there been impacts of industrial action in other Member States?	Yes.
Is there a minimum notification period for strikes? If so, what is it?	Yes, three days (72 hours). For a solidarity strike, this period is reduced to 24 hours.
Is there a minimum service level to be provided during a strike? If so, what is it?	• **Departing and arriving flights:** 50 % of normal capacity • **Overflights:** 46 flights per hour • **Generally**: provide all necessary ATC to SAR, state, military, emergency and humanitarian flights Other services where minimal service level is required: FIC, FLOW, FDU, MET, ATFN, NOTAM/ARO and ATSEP, support services directly related to safety
Is there a list of priority flights during a strike?	Humanitarian. SAR. Emergency. State. Military.
Can ATM staff be requisitioned under national law?	No.

A.1.14 Ireland

Ireland	
History of strikes since 2004	No strikes have occurred since 2004. IAA has binding adjudication on employment matters for the period 2015 to 2019 as part of a collective agreement.Therefore industrial action is any form is not permitted and would be a breach of the collective agreement.
If applicable, what have been the main reasons for strikes?	Pay and technology.
Have there been impacts of industrial action in other Member States?	None specified in survey response. However, the interview with IAA (the Irish ANSP) noted that additional effort is required by IAA, in collaboration with other Member States, when they need to open the 'Tango' route over the Atlantic when there is a strike in France.
Is there a minimum notification period for strikes? If so, what is it?	Yes, seven days. The previous legacy agreement (rather than national legislation) provided for 14 days' notice.
Is there a minimum service level to be provided during a strike? If so, what is it?	No.
Is there a list of priority flights during a strike?	Humanitarian. Medical. SAR. Emergency. Evacuation.
Can ATM staff be requisitioned under national law?	No.

A.1.15 Italy

Italy	
History of strikes since 2004	There have been 37 strikes (that caused delays) since 2004.
If applicable, what have been the main reasons for strikes?	These are national and local strikes called, mostly by independent trade unions and / or work council (Rappresentanze Sindacali Aziendali (RSA)) established in the company
Have there been impacts of industrial action in other Member States?	Yes. Italy is affected by strikes in France (additional ATCOs required to deal with the additional traffic through Italian airspace).
Is there a minimum notification period for strikes? If so, what is it?	Yes, 12 days notification period.

Italy	
Is there a minimum service level to be provided during a strike? If so, what is it?	• **Departing flights:** all traffic with estimated off-blocks time (EOBT) at least one minute before the beginning of the strike • **International arriving traffic:** all traffic that is able to land within 30 minutes from the beginning of the strike • **Intercontinental Flight:** all intercontinental arriving flights • **Intercontinental Flight:** all intercontinental departure flight authorised by CAA • **National Flight:** all national flight ongoing at the beginning of the strike • **All scheduled departing traffic between 07:00/10:00 and 18:00/21:00 local time and international arriving traffic estimated to land within 30 minutes after 10:00 and 21:00 local time.** • **Overflights:** Guaranteed • **Connection flights with Italian islands**: Dedicated list of flights to be assured is elaborated by the CAA
Is there a list of priority flights during a strike?	State. SAR. Emergency. Humanitarian. Test flights
Can ATM staff be requisitioned under national law?	In case of serious prejudice of services qualified as "general and pre-eminent", the Minister of Infrastructure and Transport, on his own initiative or on demand of the “Strike Regulatory Authority”, and after consulting the same Authority, adopts a reasoned ordinance (in "Order" to accept the strike) with prescription to ensure essential services.

A.1.16 Latvia

Latvia	
History of strikes since 2004	No history of strikes.
If applicable, what have been the main reasons for strikes?	N/A
Have there been impacts of industrial action in other Member States?	None specified.
Is there a minimum notification period for strikes? If so, what is it?	Yes, seven days.

Latvia	
Is there a minimum service level to be provided during a strike? If so, what is it?	No.
Is there a list of priority flights during a strike?	No. The same prioritisation as during a normal day.
Can ATM staff be requisitioned under national law?	Yes.

A.1.17 Lithuania

Lithuania	
History of strikes since 2004	No history of strikes.
If applicable, what have been the main reasons for strikes?	N/A.
Have there been impacts of industrial action in other Member States?	No impacts noted.
Is there a minimum notification period for strikes? If so, what is it?	Yes, for civil aviation services, the minimum notification period is 14 days.
Is there a minimum service level to be provided during a strike? If so, what is it?	• **Departing and arriving flights:** specially for the strike NO, but common minimum level of service – 15 flights/hour for ACC • **Overflights:** common minimum level of service – 15 flights/hour
Is there a list of priority flights during a strike?	Emergency State and military SAR Humanitarian and medical.
Can ATM staff be requisitioned under national law?	No, though staff participating in strikes may be disciplined and fined.

A.1.18 Luxembourg

Luxembourg	
History of strikes since 2004	No history of strikes.
If applicable, what have been the main reasons for strikes?	N/A.
Have there been impacts of industrial action in other Member States?	Occasional impacts of strikes in other countries.
Is there a minimum notification period for strikes? If so, what is it?	Yes, 10 days (following conciliation and mediation processes).
Is there a minimum service level to be provided during a strike? If so, what is it?	No minimum level of service defined.

Luxembourg	
Is there a list of priority flights during a strike?	None specified.
Can ATM staff be requisitioned under national law/	Yes.

A.1.19 Malta

Malta	
History of strikes since 2004	No strikes in period. Some actions that did not affect operations.
If applicable, what have been the main reasons for strikes?	N/A
Have there been impacts of industrial action in other Member States?	Malta is affected by strikes in other countries, through flight cancellations and delays.
Is there a minimum notification period for strikes? If so, what is it?	Yes, seven working days, including two days in which the parties are legally bound to meet to attempt to resolve the dispute.
Is there a minimum service level to be provided during a strike? If so, what is it?	The agreed minimum level of service is declared in the ATFM procedures agreed with the Network Manager covering different ATCO staffing levels. It depends on the number of available ATCOs and the validations that the remaining ones have. The ATFM procedures cover situations when ATCOs are not available for reasons that are not strike action e.g. epidemic etc. However the final outcome is the same i.e. the non-availability of ATCOs (all, or partial)
Is there a list of priority flights during a strike?	No.
Can ATM staff be requisitioned under national law?	There is no legal impediment to requisitioning staff during strikes. However, this is possibly precluded by virtue of the Collective Agreement currently in force.

A.1.20 Netherlands

No response was received to the survey from the Netherlands, so the information below has been obtained from the 2013 strike repository.

Netherlands	
History of strikes since 2004	No history of strikes.
If applicable, what have been the main reasons for strikes?	N/A
Have there been impacts of industrial action in other Member States?	Not specified.

Netherlands	
Is there a minimum notification period for strikes? If so, what is it?	Yes, five to seven days on average.
Is there a minimum service level to be provided during a strike? If so, what is it?	Not defined
Is there a list of priority flights during a strike?	No.
Can ATM staff be requisitioned under national law?	No.

A.1.21 Poland

No response was received to the survey from Poland, so the information below has been obtained from the 2013 strike repository.

Poland	
History of strikes since 2004	No history of strikes.
If applicable, what have been the main reasons for strikes?	N/A
Have there been impacts of industrial action in other Member States?	Not specified.
Is there a minimum notification period for strikes? If so, what is it?	Yes, 14 days.
Is there a minimum service level to be provided during a strike? If so, what is it?	Not defined
Is there a list of priority flights during a strike?	No.
Can ATM staff be requisitioned under national law?	No.

A.1.22 Portugal

Portugal	
History of strikes since 2004	Ten strikes have been identified since 2004.
If applicable, what have been the main reasons for strikes?	Not specified.
Have there been impacts of industrial action in other Member States?	Yes.
Is there a minimum notification period for strikes? If so, what is it?	Yes, 10 business days.

Portugal	
Is there a minimum service level to be provided during a strike? If so, what is it?	There are minimum services of ATC defined by agreement or by decision of an arbitral court. The minimum services of ATC (landings /take-offs and overflights), cover : • flights imposed by critical situations; ambulance flights ; state and military flights; two daily flights to and from the Madeira Region; three daily flights to and from Azores Region; one daily flight inter islands in Azores and in Madeira; • overflights in the Flight Information Regions of Lisbon and Santa Maria, in pre-defined tracks/streams (Europe/Caribbean/South America; Peninsula/Caribbean and South America; West Africa/Canary Islands and North America; Canary Islands/Europe; Europe/Canary Islands).
Is there a list of priority flights during a strike?	Ambulance. SAR. Emergency. State and Military Firefighting.
Can ATM staff be requisitioned under national law?	Yes.

A.1.23 Romania

Romania	
History of strikes since 2004	Only one strike that caused any delays. On 15 July 2015, there was a two-hours warning strike at ROMATSA. The parties reached a common understanding before the conflict evolved further.
If applicable, what have been the main reasons for strikes?	Not specified.
Have there been impacts of industrial action in other Member States?	There are some impacts, but only rarely.
Is there a minimum notification period for strikes? If so, what is it?	Yes, two working days after mediation and arbitration.
Is there a minimum service level to be provided during a strike? If so, what is it?	• **Departing and arriving flights:** A reduced number of departures to fit into a minimum level of 33.33 % of normal day air navigation services (ANS) provision. • **Overflights:** A reduced number of overflights to fit into a minimum level of 33.33 % of normal day ANS provision.

Romania	
Is there a list of priority flights during a strike?	Exempted flights according to the applicable Air Traffic Flow and Capacity management (ATFCM) regulations and procedures (applied also during normal day operations).
Can ATM staff be requisitioned under national law?	No.

A.1.24 Slovakia

Slovakia	
History of strikes since 2004	Two strikes in period (on consecutive days in 2007).
If applicable, what have been the main reasons for strikes?	Not specified
Have there been impacts of industrial action in other Member States?	None specified.
Is there a minimum notification period for strikes? If so, what is it?	No.
Is there a minimum service level to be provided during a strike? If so, what is it?	None defined.
Is there a list of priority flights during a strike?	Humanitarian. SAR. Emergency. State and Military.
Can ATM staff be requisitioned under national law?	No.

A.1.25 Slovenia

Slovenia	
History of strikes since 2004	No history of strikes since 2004.
If applicable, what have been the main reasons for strikes?	The main reasons for previous strikes were organisational issues related to the public sector and salaries. There have been no strikes in Slovenian ATM since the establishment of the state owned company (limited company with no shares on the market) in 2004.
Have there been impacts of industrial action in other Member States?	Partial impact of strikes in other countries reported, but no records are kept.
Is there a minimum notification period for strikes? If so, what is it?	Yes, 15 days.

Slovenia	
Is there a minimum service level to be provided during a strike? If so, what is it?	Some of the requirements are defined by the Aviation Act and some more are defined by the agreement on strike rules: • all SAR, humanitarian or for medical purposes, • military and state flights **Departing and arriving flights**: 50 % of capacity published by NM, **Overflights**: 50 % of capacity published by NM. All the airports where the air traffic control service is provided (mainly international airports) must be opened but with reduced level of capacity (50 %).
Is there a list of priority flights during a strike?	No.
Can ATM staff be requisitioned under national law?	Yes (to provide the required minimum level of service).

A.1.26 Spain

Spain	
History of strikes since 2004	Six strike days since 2004 - one in 2010 and five in 2015.
If applicable, what have been the main reasons for strikes?	Labour conditions (non-economic).
Have there been impacts of industrial action in other Member States?	Frequent impacts of strikes in other countries (mainly France)
Is there a minimum notification period for strikes? If so, what is it?	Yes, 10 days.
Is there a minimum service level to be provided during a strike? If so, what is it?	Determined on a case-by-case basis. If the employer and the employees do not reach an agreement about the minimum level of service to be provided during the strike, the employer (the ATS provider) requests the establishment of that minimum by the Ministry of Transport, Infrastructure and Housing ('Ministerio de Fomento'), which specifies the minimum number of controllers required during the strike. These minima are based upon safety reasons, labour standards and the existing jurisprudence on the matter. No restrictions are applied to specific flights.
Is there a list of priority flights during a strike?	a) Humanitarian.; SAR.; Emergency.; State and Military. b) Flights connecting Spanish Islands (Canary and Ballearic) and remote regions (Ceuta and Melilla) with the rest of the territory. c) Overflights

Spain	
Can ATM staff be requisitioned under national law?	Yes

A.1.27 Sweden

Sweden	
History of strikes since 2004	No history of strikes since 2004.
If applicable, what have been the main reasons for strikes?	N/A.
Have there been impacts of industrial action in other Member States?	Not specified.
Is there a minimum notification period for strikes? If so, what is it?	Yes, seven days.
Is there a minimum service level to be provided during a strike? If so, what is it?	No.
Is there a list of priority flights during a strike?	No.
Can ATM staff be requisitioned under national law?	Yes.

A.1.28 UK

UK	
History of strikes since 2004	No history of strikes since 2004, largely as the result of highly effective arrangements for managing industrial relations.
If applicable, what have been the main reasons for strikes?	N/A.
Have there been impacts of industrial action in other Member States?	Regular impacts from strikes in France.
Is there a minimum notification period for strikes? If so, what is it?	Yes, seven days. This will shortly change to 14 days as the result of the passing of the Trade Union Act, 2016.
Is there a minimum service level to be provided during a strike? If so, what is it?	No.
Is there a list of priority flights during a strike?	Standard ICAO category for flight priorities: • Category A: Aircraft in emergency. Aircraft that have declared a 'Police Emergency'. Ambulance/Medical aircraft when the safety of life is involved. • Category B: Flights operating for search and rescue or other humanitarian reasons. • Category C: Royal flights. Flights carrying visiting Heads of State. • Category D: Flights carrying Heads of Government or very senior government ministers. • Category E: Flight check aircraft engaged on, or in transit to, time or weather critical calibration flights. There would be no prioritisation of flights outside these categories unless directed by the UK CAA.
Can ATM staff be requisitioned under national law?	No.

Other countries

A.1.29 Armenia

Armenia	
History of strikes since 2004	No history of strikes since 2004
If applicable, what have been the main reasons for strikes?	N/A
Have there been impacts of industrial action in other Member States?	No

Armenia	
Is there a minimum notification period for strikes? If so, what is it?	Yes, seven days (Article 74), but in the sphere of Civil aviation it is 14 days (Article 74, Paragraph 4)
Is there a minimum service level to be provided during a strike? If so, what is it?	Yes, (Article 77) In the sphere of civil aviation, there are no specific details in the national legislation concerning flights departing in the country and overflights.
Is there a list of priority flights during a strike?	No
Can ATM staff be requisitioned under national law?	No, Article 79

A.1.30 Bosnia and Herzegovina

Bosnia and Herzegovina	
History of strikes since 2004	No history of strikes since 2004
If applicable, what have been the main reasons for strikes?	N/A
Have there been impacts of industrial action in other Member States?	Marginally.
Is there a minimum notification period for strikes? If so, what is it?	Yes, at least 48 hours in advance.
Is there a minimum service level to be provided during a strike? If so, what is it?	No.
Is there a list of priority flights during a strike?	No.
Can ATM staff be requisitioned under national law?	As determined according to Article 15, of the Official Gazzete of Bosnia and Herzegovina, number 41, dated 3 June 2016.

A.1.31 Georgia

Georgia	
History of strikes since 2004	No history of strikes since 2004. Strikes are not allowed in Georgia by employees whose work activity is connected with safety of human life and health. ATM is included in this category.
If applicable, what have been the main reasons for strikes?	N/A
Have there been impacts of industrial action in other Member States?	No effects on Georgia airspace of strikes in other countries.
Is there a minimum notification period for strikes? If so, what is it?	Three days (for cases where strikes are allowed).

Georgia	
Is there a minimum service level to be provided during a strike? If so, what is it?	No.
Is there a list of priority flights during a strike?	No.
Can ATM staff be requisitioned under national law?	Yes. Personnel whose work activity is connected with safety of human life and health is subject to requisition by the decision of National Court.

A.1.32 Macedonia

Macedonia	
History of strikes since 2004	There have been no strikes since 2004 that created any delays. A single strike occurred in April 2009, but this did not result in any delays.
If applicable, what have been the main reasons for strikes?	None given.
Have there been impacts of industrial action in other Member States?	Some impacts of strikes in other countries – about once per year (principally for strikes in Greece).
Is there a minimum notification period for strikes? If so, what is it?	Yes, two days, following 15-day period of negotiation and conciliation.
Is there a minimum service level to be provided during a strike? If so, what is it?	The requirement to provide a minimum level of service/capacity during a strike is regulated under article 60(f)(1), which states that the personnel in charge of the provision of air navigation services must ensure safe air traffic operations according to the appropriate national legal requirements. Flights that are exempted from the industrial action (meaning flights for which service must be provided) are: • SAR flights; • Hospital and humanitarian flights; • State and OAT flights.
Is there a list of priority flights during a strike?	SAR flights; Hospital and humanitarian flights; State and Operational Air Traffic (OAT – operated under the control of military ATC) flights.
Can ATM staff be requisitioned under national law?	No.

A.1.33 Moldova

Moldova	
History of strikes since 2004	No history of strikes since 2004
If applicable, what have been the main reasons for strikes?	N/A
Have there been impacts of industrial action in other Member States?	No.
Is there a minimum notification period for strikes? If so, what is it?	No.
Is there a minimum service level to be provided during a strike? If so, what is it?	No.
Is there a list of priority flights during a strike?	No
Can ATM staff be requisitioned under national law?	No.

A.1.34 Montenegro

Montenegro	
History of strikes since 2004	No history of strikes since 2004.
If applicable, what have been the main reasons for strikes?	N/A
Have there been impacts of industrial action in other Member States?	No.
Is there a minimum notification period for strikes? If so, what is it?	Yes, 10 days.
Is there a minimum service level to be provided during a strike? If so, what is it?	A decision on the Minimum Level of Service shall be agreed by the competent authority of the state administration, the representative association of employers and the representative unions. All airports in Montenegro will remain open in the event of a strike at a minimum 60 % of the declared capacity.
Is there a list of priority flights during a strike?	No.
Can ATM staff be requisitioned under national law?	No (but the strike is subject to assessment by the National Security Agency of Montenegro).

A.1.35 Norway

Norway	
History of strikes since 2004	Two strikes, on consecutive days in September 2004.

Norway	
If applicable, what have been the main reasons for strikes?	Proposed closure of ACC.
Have there been impacts of industrial action in other Member States?	None specified.
Is there a minimum notification period for strikes? If so, what is it?	Yes, four days.
Is there a minimum service level to be provided during a strike? If so, what is it?	No.
Is there a list of priority flights during a strike?	Humanitarian and Medical. SAR. Emergency. State and Military.
Can ATM staff be requisitioned under national law?	Yes.

A.1.36 Serbia

Serbia	
History of strikes since 2004	No history of strikes since 2004.
If applicable, what have been the main reasons for strikes?	N/A
Have there been impacts of industrial action in other Member States?	Not specified.
Is there a minimum notification period for strikes? If so, what is it?	Yes, 10 days.
Is there a minimum service level to be provided during a strike? If so, what is it?	No.
Is there a list of priority flights during a strike?	No.
Can ATM staff be requisitioned under national law?	No.

A.1.37 Switzerland

Switzerland	
History of strikes since 2004	No history of strikes since 2004.
If applicable, what have been the main reasons for strikes?	N/A.
Have there been impacts of industrial action in other Member States?	Yes.

Switzerland	
Is there a minimum notification period for strikes? If so, what is it?	No.
Is there a minimum service level to be provided during a strike? If so, what is it?	The contingency plans for Skyguide's main centres are an integral part of the letter of agreement (LoA) between Skyguide and the Network Manager. However, the contingency arrangements address "impairment of operations to the extent that ATS can no longer be provided" and do not specifically address industrial action. Existing staffing and rostering procedures for missing shifts/staff would be followed. Service levels and capacity would be reduced accordingly, until operations become impaired to the extent that ATS can no longer be provided. At that point, contingency plans related to "unavailability of ACC" will be invoked (as per LoAs with adjacent centres). A limited number of overflights are accepted (State flights, ambulance flights, emergency and rescue).
Is there a list of priority flights during a strike?	State flights. Ambulance flights Emergency Rescue
Can ATM staff be requisitioned under national law?	Not specified.

A.2 Annex 2 – Notes from interviews with airlines

As noted in the main text, interviews were held with five airlines. Detailed notes from those interviews are presented in this Annex.

A.2.1 Views of Ryanair

In 2016, up until early July, Ryanair operations have been affected by 10 strike events covering all or part of 14 days, resulting in 1 521 flights being cancelled affecting 268 000 passengers. The airline considers that strikes cause significant disruptions to their operations as well as affecting the travel plans of a substantial number of passengers. The effects are not limited simply to the hours for which the strike is in effect or just to the country concerned as the effect of erratic ATC slots and information regarding airport availability leads to a continuous cycle of flight plan re-routings to best optimise the flights operated. Particular considerations include:

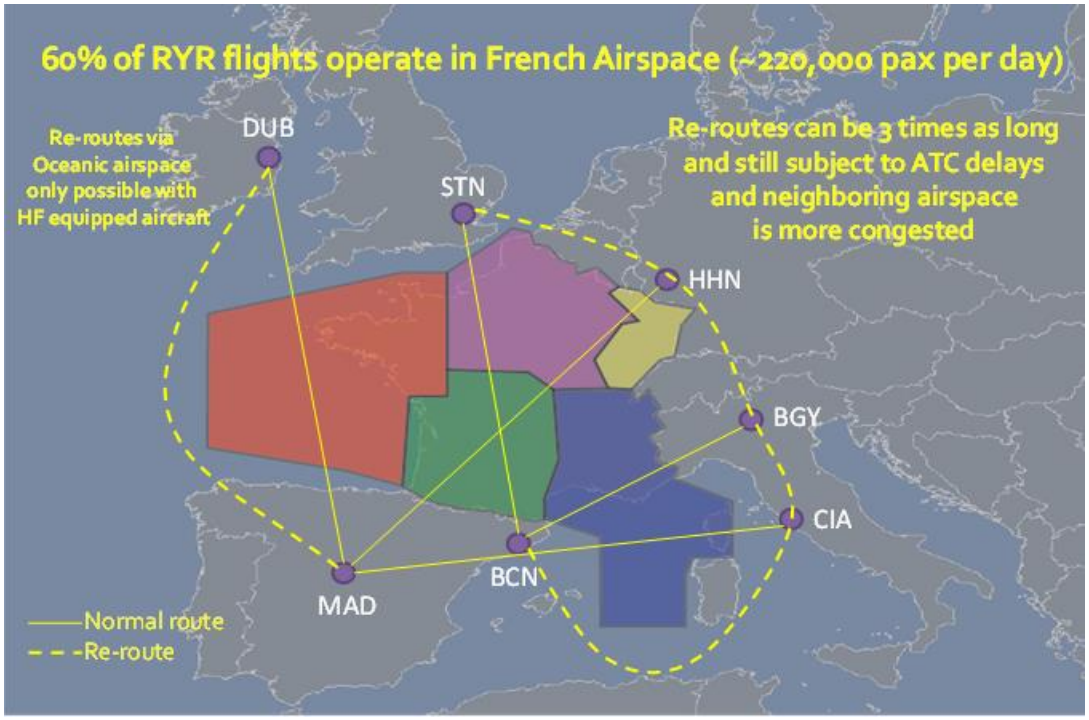
- flight time limitations for aircrew;
- the number of passengers booked and the potential difficulties of rebooking if flights are full and/or there are limited frequencies of service on a route.

Overall, disruption tends to intensify throughout day.

Ideally, Ryanair would like to be clear about a strike and its expected impact 21 days ahead of time to allow flight cancellations and passenger rebooking well ahead of the Regulation 261 time limit (for unlimited right to cancel of 14 days prior to departure). Beyond that timescale, whilst airlines can avoid the liability for compensation when they can demonstrate ‘extraordinary circumstances’, this is less easy to do in respect of consequential and reactionary cancellations that may not be perceived as directly relating to the strike event within a particular country. In practice, however, given the high levels of uncertainty associated with any early notification given of the intention to strike, the airline tends to defer cancellations until the last 48 hours. At this point, the expected impact of a strike is usually clearer so allowing changes to passengers’ arrangements. Nonetheless, in common with other airlines, Ryanair prefers to cancel flights in advance, allowing passengers to make alternative arrangements and avoiding passengers making unnecessary journeys to the airport and suffering delays and congestion there.

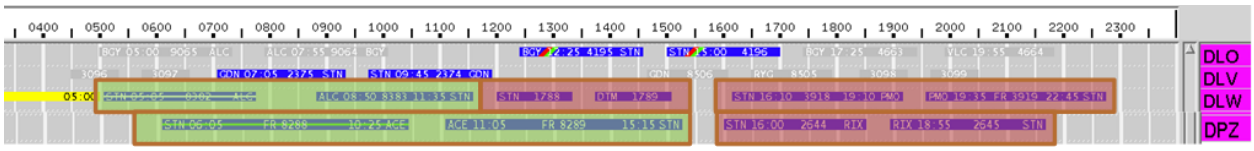
Strikes in France can be particularly impactful, due not only to the way in which minimum levels of service are organised, but also because of its geographic location, as illustrated in Figure A.3-10-1. Overall, some 60 % of Ryanair’s flights normally use French airspace.

Figure A.3-10-1: Illustration of Ryanair impacts from a French ATC Strike[19]



Although Ryanair, in common with other airlines, seeks to mitigate the effects through re-planning the allocation of aircraft and crews, this is particularly complicated for an airline such as Ryanair, as it operates a large fleet and a complex network of flights across Europe linking bases in many countries and other airports. Such mitigation is itself time consuming and resource intensive for the airline. Even so, it is not possible to avoid the consequential implications. The delays caused by a strike event can affect not just flights to/from or across the affected airspace but also later flights that might appear unconnected to the location of the strike. This is illustrated by reference to the expected use of particular aircraft on the day of one of the recent strike events as shown in Figure A.3-10-2. Faced with three-hour delays to cross French airspace or the alternative of taking a longer routing, the airline had no option but to cancel flight segments between Stansted (STN) and Alicante (ALC) and Stansted and Lanzarote (ACE) in order to protect flights later in the day between Stansted and Dortmund, Stansted and Palermo and Stansted and Riga[20]. Accepting the delay would have result in the cancellation of some or all of these later sectors. In deciding which flights to cancel, the airline will take into account the alternatives available and the ease with which passengers affected can be accommodated on alternative flights. It may be easier and less disruptive to cancel flights on routes with higher frequencies of service than one with only a few flights per week.

Figure A.3-10-2: Example of Impacted Aircraft Utilisation



In addition to providing information on the effects of strikes that have occurred in 2016, Ryanair also noted that it can be affected by 'wildcat' industrial action that may not be identified as a strike in the Network Manager data, but may be recorded as staffing issues or similar. Such an event took place in Belgium on 12th April 2016, resulting in the cancellation of 26 flights by Ryanair. The delay effects on the wider network are not specifically identifiable in the data provided by the Network Manager.

Ryanair typically begins to file flight plans around midnight for the following day's operations so if flights have been re-timed because of anticipated disruption, any delay will not be captured in the Network Manager's data, which records delay imposed due to restrictions against the filed flight plan.

[19] DUB – Dublin, STN – Stansted, HHN – Frankfurt Hahn, BGY- Milan Bergamo, CIA – Rome Ciampino, BCN – Barcelona, MAD - Madrid
[20] On aircraft registrations ending DLW and DPZ.

Where strikes are unavoidable – and it was noted that many of the recent strike events affecting France were a result of general labour law reform rather than issues specific to ATC – a key concern was the relative lack of clarity in terms of the impact. This is illustrated through the following specific examples.

A.2.1.1 Strike in France, 26 January 2016

The chronology of the strike on this day, as seen by the airline, is shown in the following table.

22nd January:
• Warning of national strike, consistent with provision for 5 days mandatory notice period, and initial planning conference call with the DGAC;
• During the conference call, it was stated that the strike would cover from evening Monday 25th to morning of Wednesday 27th and that 4 ACCs would be operating at minimum levels of service with a 5th ACC also expected to be badly affected. Indications were given that four airports were likely to experience local difficulties, with a fifth also experiencing difficulties in the morning. It was indicated that 2 airports might possibly close;
• The airlines were asked to cancel 20 % of flights at airports where they had more than 5 turnarounds, which in Ryanair's case only affected two airports directly;
• It was indicated that the strike was expected to go ahead, although talks were still going on;
• An update was planned for Monday 25th January.
25th January:
• Confirmation was given that the national public service strike would go ahead and the anticipated effects were as indicated earlier;
• The NOTAM was issued.
26th January:
• Initially confirmed that 3 not 4 ACCs expected to be at minimum service levels all day, with initial delays of c.25 minutes but that 2 ACCs would experience high delays of c.60/65 minutes in the morning but diminishing. Note that these delays are evident even following the specified reduction in flying programmes;
• Later in the day, there was concern that accumulated delays could result in some flights being impacted by night movement curfews, e.g. at Paris Orly.

Therefore, Ryanair cancelled 236 flights, due to operate on 26th January, in the early afternoon of the 25th January, affecting nearly 39 000 passengers. Of these, 80 were to or from French airports, affecting nearly 12 600 passengers but the majority of flights cancelled were overflights. Four additional overflights were subsequently cancelled during the day on 26th January as a consequence of the actual effects of the strikes, affecting 451 passengers. Overall, cancellations to overflights affected 35 different country pairs. The most affected countries, in terms of passengers booked on the flights were:

Table 10-2 Percentage of passengers by Member State on overflights affected by strike in January 2016

Member State	Percentage of passengers
Spain	39 %
UK	19 %
Germany	11 %
Italy	9 %
Belgium	7 %

Portugal	6 %
Morocco	4 %
Ireland	1 %
Poland	1 %
Sweden	1 %

Across the two days of the 25th/26th January, Ryanair experienced delays of greater than one minute on 171 flights due to the industrial action, averaging 35.7 minutes per delayed flight; however, it has not been possible to break this down between overflights and flights to/from France.

A.2.1.2 Strike in France, 20-22 March 2016

The initial notice for this strike was received on 15th March. On this occasion, a greater number of flights was cancelled, some 517, of which 406 were overflights. Almost half of these cancellations were reactionary cancellations due to accumulated delays. Overall, almost 93 300 passengers were affected, of which 73 300 would have been travelling on overflights. On this occasion, flights affected involved 57 country pairs but the principally affected countries remained largely as in January:

Table 10-3 Percentage of passengers by Member State on overflights affected by strike in March 2016

Member State	Percentage of passengers
Spain	38 %
UK	17 %
Germany	11 %
Italy	10 %
Portugal	7 %
Belgium	5 %
Morocco	3 %
Netherlands	3 %
Ireland	2 %
Sweden	1 %
Denmark	1 %
Hungary	1 %

In addition, there were some impacts on overflights to and from Norway, Romania, Poland and Slovakia.

Across the three days affected by this strike, 663 flights incurred strike related delays, averaging 100 minutes per flight. Interestingly, on the first day (20th March), 335 flights were affected, incurring average delays of 111 minutes per flight. A similar number of flights incurred delay on the second day of the strike but incurred less delay at an average of 88 minutes per flight. By the third day, there were relatively few flights affected by strike related delay. This reflects, at least in part, the timing when flights were cancelled, so reducing the load on the network as a whole. On this occasion, 46 flights were cancelled on the 18th or 19th March reflecting the advance notification of the intent to strike (20 for the 20th March and 26 for the 21st March). These flights were all flights to or from French airports in line with instructions given by the DGAC to cancel a percentage of flights to and from local airports.

There were then a continual series of flight cancellations throughout the day on the 20th March, as the actual impact of the strike became clear, affecting a further 206 flights, of which 20 were to or from French airports. However, in the late afternoon of the 20th March 240 flights were cancelled for the following day, of which 45 were to or from French airports as the level of disruption became clearer. A further 25 overflights were then cancelled during the 21st March.

The actions of Ryanair are reflected in the data that were received from the Network Manager; delays per flight across the Network as a whole due to the strike were approximately 33 % higher on the 20th than on the 21st, but there were twice as many cancelled flights on the 21st as the 20th.

In Ryanair's experience, there can be considerable variation between ACCs in France in terms of the likelihood of large numbers of controllers participating in strikes, with Brest and Marseilles identified as having the highest levels. To some extent, this is reflected in the advance warnings given by the DGAC as set out above. Ryanair also welcomed the efforts made by DSNA to keep airlines informed and to work with the airlines to mitigate the effects.

It was also noted that recent French strikes have been less impactful than those that occurred earlier in the year in terms of flights cancelled and actual delays.

A.2.1.3 Strike in Italy, 17 June 2016

The pattern of cancellations and delays seen by Ryanair during a French strike event can be compared to the pattern seen during an Italian ATC strike; the strike occurred on 17th June 2016 and advance notice was received on 13th June. In this case, 66 flights were cancelled, all of them on the day of the strike. All of these flights were to or from Italy and 14 of them were on purely Italian domestic sectors. In total, almost 12 300 passengers were affected by cancellations. In addition, 65 flights incurred strike related delays at almost 100 minutes per flight on average.

A.2.1.4 Cancelled strike in Italy, 23 July 2016

In practice, it can be almost as impactful for the airline and its passengers when a strike is called off at short notice. This is one reason why flight cancellations tend to be made in the last 24 hours prior to a strike when there is greater certainty that it will actually take place. Once a flight has been cancelled and passengers rebooked to alternative flights, it is virtually impossible to reinstate the flight. The difficulties for the airlines are exemplified by the notification in relation to a planned strike in Italy on 23rd July 2016, where there were a number of legal interventions:

- on 20th June there was a first notice that there was a strike planned for 23rd July and it would be for eight hours;
- on 19th July, the strike was confirmed but the duration reduced to four hours;
- on the 21st July, it was announced that the strike had been cancelled, it is understood as a result of a judicial ruling;
- on 22nd July, the strike was reinstated, initially for four hours, then increased to eight hours and then reduced again to four hours;
- on 22nd July at 19.00, the strike was cancelled.

This highlights why airlines often leave decisions as to which flights to cancel until the day of the strike itself, giving rise to significantly greater disruption to the network and to passengers. In this case, Ryanair had just started the process of flight cancellation when the strike was called off. Passengers on two flights had been informed of expected cancellation but Ryanair was able to reinstate those flights and there were no actual cancellations on the day.

A.2.2 Views of Lufthansa Group

Although they normally receive advance notice of expected strikes affecting countries such as France, Italy and Greece, both Lufthansa and Swiss confirmed that they do not initially take any action towards cancelling flights a long time ahead of the potential strike, leaving cancellations until a few days before the planned strike. This is because strikes do not always take place or the effects may be different from those anticipated. Whilst a longer notice period would be good, it would not affect the timing when flight cancellations would be made. Ideally, cancellations should be made at least a day in advance to allow for rebooking, but certainty as to exactly how many flights need to be cancelled is required at that point. Cancellations on the day should be avoided as far as possible as rearranging passenger flows is more complicated and cumbersome for the passengers. Nevertheless, due to unforeseen situations cancellations on the day cannot be avoided completely.

Strikes in France are more impactful as they affect a large number of overflights, including to Spain and Portugal. The number of airports affected for Lufthansa Group airlines is relatively small and the required number (or percentage) of cancellations on flights to these airports can be planned in advance. However, for overflights, re-routings (leading to delays) and/or any required cancellations are dealt with on the day. It was noted that re-routing flights between Germany and Spain/Portugal to avoid French airspace can double the length of the flight. Often the airline files for a variety of alternative routings to see which one gives them the best performance in terms of earliest departure/arrival. In part, this reflects the changing pattern of impact across France where delays may build up in areas previously less affected whilst other areas become subject to less delay. As a result of the delays caused due to reroutings, other flights may be cancelled as well, as there is no possibility to keep the scheduled flight plan of the specific aircraft. The overall effect on the day can be 'chaotic'. As a consequence of the re-filing of flight plans, the data held by the Network Manager may not reflect the full extent of the delay due to strikes, as only restrictions applied to the last filed flight plan are recorded. The airline provided data giving delays against the published schedule for selected strike events as discussed further below. Overall, it is estimated that the Network Manager's data may only capture around half of the total delay resulting from a strike.

A perceived problem in France is the multiplicity of unions; not all of them strike at the same time, which leads to much greater uncertainty as to the impact of any strike.

The duration of a strike is also a factor. If a strike is only for four hours, as is sometimes the case (e.g. in Italy), then the aim will be to delay the flight to beyond the strike time band or try to land before the strike takes place rather than cancel the flight. This still gives rise to knock-on consequences for later flights and wider disruption and is likely to explain the prevalence of delays in relation to Italian strikes notwithstanding the continuation of overflights.

As with Ryanair, information has been obtained from Lufthansa regarding a number of specific days on which strikes occurred.

A.2.2.1 Strike in France, 25-27 January 2016

For this strike, the Lufthansa Group reported the same chronology of notification as Ryanair. Lufthansa itself cancelled four flights two days in advance of the planned strike, affecting 253 passengers. There were 14 subsequent reactionary cancellations. In total, 18 cancelled flights affected 7 513 passengers. Consequential delays affected 165 flights, affecting a further 19 141 passengers, with an average recorded delay per flight of 12 minutes but actual average delay to the schedule of 32 minutes.

A.2.2.2 Strike in France, 20-22 March 2016

Following the notification of this strike, the airline cancelled 12 flights two days in advance, reflecting the advance notice of cancellations required on services to or from France. These affected 765 passengers. Subsequently, a further 33 flights were cancelled as a reaction to overflight difficulties. In total, 5 430 passengers were affected by cancellation. In addition, 149 flights were affected by delay, carrying 22 358 passengers, with an average recorded delay per flight of 35 minutes but actual average delay to schedule of over 90 minutes.

These average delays highlight the importance of considering the actual impact at the level of individual flights rather than simply the measure of average delay across the network, including flights unaffected by the strike event. For example, on the 21st March, whilst Lufthansa had 80 flights directly affected by slot delays due to the strike, a further 44 aircraft experienced consequential rotational delays. Swiss experienced a similar pattern with 53 flights affected directly by slot delays but a further 20 flights affected by consequential rotational delays.

A particular issue for the Lufthansa Group airlines is maintaining the integrity of hub operations at the key airports. This can give rise to substantial problems where passengers may need to be re-booked a day or more later. On 21st March, Lufthansa had 16 further flights delayed due to late arriving connecting passengers and Swiss experienced additional delays to 32 flights, compared to a normal day. Overall, Lufthansa estimate that 18 % of their passengers were affected by strike related delays on that day and the proportion rises to 35 % for Swiss.

A.2.2.3 Strike in Italy, 17 June 2016

For strikes in Italy and Greece, the impact is much less as overflights are generally protected and flights to and from the country are subject to planned cancellations. Even in a situation where

overflights were affected in these countries (and potentially other smaller countries), it would be easier to re-route to avoid the affected airspace than is the case for France.

For this particular strike, Lufthansa cancelled two flights one day in advance but there were 24 subsequent cancellations, affecting 2 790 passengers in total. A total of 45 flights carrying 6 676 passengers were affected by delays, at an average recorded delay per flight of 13 minutes. However, the average delay against scheduled time was approximately 45 minutes.

A.2.2.4 Cancelled strike in Italy, 23 July 2016

Lufthansa Group highlighted that a late cancellation of a planned strike can lead to almost as much disruption as if the strike had gone ahead. For the strike in Italy, which was planned for 23 July 2016, but cancelled at a late stage, 12 flights were cancelled mid-afternoon on the day before the strike, affecting 1 144 passengers. This illustrates the important balancing act an airline must make between early cancellations and, as a result, the possibility of premature rebooking of passengers and unnecessary flight cancellations in case of a cancelled strike, against delaying the decision to cancel.

A.2.3 Views of Air France

When there are national strikes in France, these can affect Air France operations directly, particularly in relation to ground staff; aircrew belong to a different union. Most ATM strikes in 2016 have been national public service strikes rather than specific to ATM.

Air France highlighted that, whilst they supported the A4E position that overflights should be protected from the impact of strike events, the A4E position also clarified that this must not be at the expense of flights to, from and within the country concerned.

Air France receive the same notification as other airlines, including the need to cancel a proportion of flights at specific airports. When requested by the DGAC, they usually start the process of cancelling flights approximately two days in advance, at least for a first wave of cancellations. A second wave of cancellations may be made about 24 hours in advance when a clearer picture emerges of the likely impact of the strike. They keep in communication with DSNA, but confirm that it is difficult to get intelligence as to exactly how the strike will impact locally.

Like the other airlines, Air France highlighted one of the biggest issues as being the uncertainty created by the way in which the minimum service level is applied in France. Air France does benefit from having some spare aircraft and crew based in Paris, which can be used to mitigate the effects to some extent. This is of benefit to passengers but does come at a cost to the airline. The airline also commented on the reputational damage to its brand of the frequent strikes affecting French airspace, as passengers associate Air France with the cause of the strike. It was also felt that the minimum level of service requirement in France had become a tool used by the unions to create uncertainty and put pressure on the DSNA management.

Air France noted that other transport sectors are subject to a new ‘Loi Diard’ which requires specific notification in relation to levels of staffing in the event of strikes in other transport sectors, requiring individuals to give 48 hours’ notice of their intention to strike. Currently, ATM is not covered by this law but the airline considered that there would be great benefit if the provisions were extended to the DSNA (although we understand from DSNA that if this law were to be applied this could impact on their ability to requisition controllers to work and deliver the 50 % minimum service). As with the other airlines, clarity and predictability are seen as the most important factor enabling the impact of strikes to be mitigated. It was also noted that there had been recent discussions between DSNA and the unions and that this may have been a factor in why the more recent general strikes had been less impactful on ATM.

A further point made by Air France related to the way ATFM restrictions are applied and there was concern that sometimes several restrictions are combined resulting in longer delays than actually required. They indicated that more local discretion to the DSNA to overview individual regulations imposed at the level of the ACC might result in less overall delay across the system.

Unsurprisingly, Air France is little affected by strikes in countries such as Italy or Greece, with only small numbers of flights to those countries affected, although regulated flights did experience 252 minutes of delay in total.

A.2.3.1 Strike in France, 26 January 2016

For this strike, Air France were first notified on 20 January, but they did not begin cancellations until requested by the DGAC about one day in advance. The airline cancelled 230 flights in advance, but a further 57 flights were cancelled on the day. The Paris airports were the most affected; the airline complied with the DGAC requirement to reduce their schedule by airport. However, Air France have expressed the view that the DGAC is sometimes conservative in its assessment of the number of flights that need to be cancelled and the effects are often worse. On the other hand, it may defer cancelling some flights until the last minute in case circumstances improve. On 26 January, the average ATFM delay experienced by Air France was 31 minutes per flight, with Bordeaux ACC giving rise to the greatest impact. Overall, Air France estimates that its lost revenue on the day was of the order of €700 000 before taking into account consequential costs.

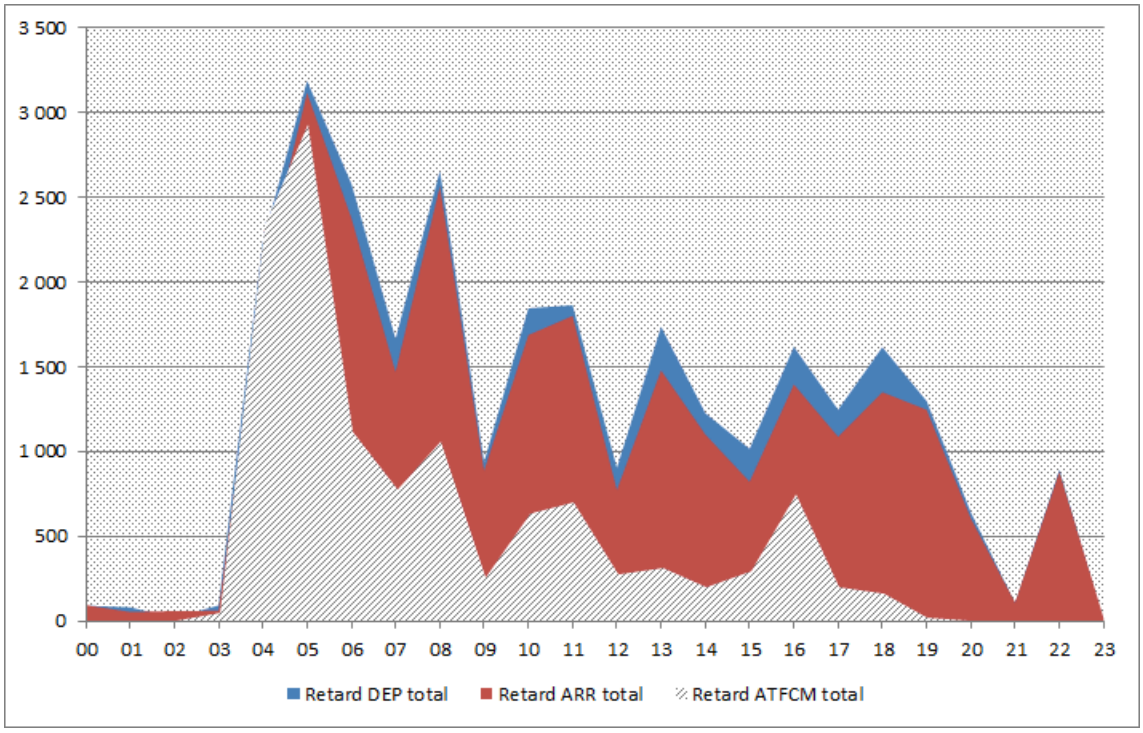
Air France have commented that when cancelling the required number of flights on any day, they will seek to preserve peak period flights carrying more passengers, with the cancellation of more lightly loaded flights. It acknowledged that this might exacerbate delays in the peaks, resulting in more cancellations, but it was a response aimed at trying to inconvenience as few passengers as possible. Where a specific number of flights has to be cancelled, they tend to cancel domestic flights first to protect long haul connecting flights at Paris CDG, as it is more difficult to arrange alternative connections for such passengers. However, if it is a national general strike, it is likely that trains will also be affected resulting in severe inconvenience to travellers as there are no alternative means of travel. There may also be problems in terms of ensuring that all operations get back to Paris Orly before the night curfew.

A.2.3.2 Strike in France, 20-22 March 2016

Air France experienced a similar pattern of difficulties to the other airlines during this strike. The airline cancelled 72 flights in advance, but a further 104 had to be cancelled on the day of 20 March due to the effect of the strike being greater than anticipated. On 21 March, 149 flights were cancelled in advance, but a further 77 were cancelled on the day. Average delays were 40 minutes on 20th March and 59 minutes on 21st March. Whereas Aix ACC had the greatest impact on the 20th, Paris ACC was most impactful on 21st. Overall, Air France estimates the lost revenue from this strike event as €2 200 000. This strike was considered to be one of the most impactful in terms of disruption, particularly due to the impact on Paris. This is more significant for Air France than for other airlines, which will normally be impacted more by strikes affecting Brest; Aix will be more impactful for overflights.

Air France provided the chart below for the strike on 28th April 2016, which illustrates how the initial recorded ATFM delay early in the day results in substantial consequential reactionary delay later in the day. Air France commented that, even though this was not one of the more impactful strikes in France, it still had a substantial impact on their overall operation. With greater predictability, much of the arrival delay, shown in red, and a substantial part of the overall delay shown in grey could potentially have been avoided.

Figure A.3-10-3: Extent of Consequential Reactionary Delays



A.2.4 Views of easyJet

easyJet experience similar difficulties to those reported by Ryanair due to the nature of their network. Approximately 67 % of their flights normally involve use of French airspace. Overflights are a particular issue as the position is never clear in advance and the airline has to estimate the impact.

Whilst it is useful to have advance warning that a strike is in prospect, as this gives the opportunity for local representatives to explore the likelihood and the impact of any strike, detailed planning does not take place until it is certain that the strike will not be called off entirely. Like Ryanair, easyJet coordinates its activities with the DGAC and DSNA in France. However, whilst the overall duration of a strike may be known in advance, the impacts and actual effects are highly subject to the number of controllers that work and this can vary quite widely at each shift changeover time.

A further complication in relation to overflights is the potential for alternative routes to become congested in themselves; for example, there may be limits on the capacity of by-pass routes such as the oceanic 'Tango' route between northern Europe and Spain. When this happens, cancellations become inevitable.

With Italy and Greece, overflights are not usually affected so it is easier to plan. In addition, strike durations are usually shorter and more clear-cut, (e.g. 6-8 hours). The implications for flights to and from Italy are understood and flights can be cancelled and passengers notified in advance, so avoiding difficulties at the airports on the day. This is preferable as passengers are usually more accepting of the situation if they are informed in advance and can make alternative arrangements.

A.2.4.1 Strike in France, 20-22 March 2016

On 22 March 2016, due to the strike in France, easyJet cancelled 196 flights, of which around half were cancelled in advance and the rest on the day A further 87 flights were subject to material delays on the day. During such strike events, whole lines of flying can be affected resulting in knock-on cancellations and delays across the whole network.

A.2.4.2 Strike in France, 14-15 September 2016

Like Ryanair, easyJet reported that the actual impact of more recent strikes in France has been less than strikes earlier in the year. For the strike in France on 14-15 September, the airline cancelled 64

flights in advance but then saw subsequent cancellations on the day of only four or five flights, much less than would have been expected based on the strikes earlier in the year.

A.2.5 Views of IAG/British Airways

BA confirmed that strikes in France have had the greatest impact on their operations. Like the other airlines, they maintain a good relationship with the DSNA with a view to mitigating the impact as far as possible. However, they confirmed that the actual position when there is a strike is subject to much uncertainty. Hence, BA tend to implement any cancellations as late as possible the night before the strike. However, BA consider that it is far easier and less disruptive for passengers to manage cancellations in advance rather than on the day. This applies to known cancellations to and from French airports.

In terms of overflights, BA reported the difficulties in securing re-routings to minimise delay and disruption but noted that very long haul flights transiting the area can often route above the problem areas so the disruption is greatest to flights within Europe. It is not just a matter of seeking to re-route around French airspace, but there is also an issue regarding which levels of airspace are most affected. Often the delay effects spill over into adjacent ACCs, such as MUAC or Germany.

The airline observed that it is possible that more delays will be imposed than are actually required, even when French ACCs are operating, leading to accumulations of delay. BA suggested that the Network Manager might be given more power to determine the appropriateness of any restriction, as currently it has to impose the restriction as specified by the ACC. This echoes a point made by Air France about excessive delays being imposed due to the combination of restrictions. Last minute cancellations and reactionary delays give rise to the greatest problems, particularly when passengers are already at the airport.

BA noted that some of the problems in France have been caused by the transition to new technology equipment, but most recent strikes have been of a general public service nature. The fragmentation between ACCs is seen as a problem, as protocols do not appear to be in place for them to assist each other, as is the case for example between Prestwick and Swanwick in the UK.

There can be ‘hidden’ knock-on consequences from delays in France, as they may result in a bunching or holding of flights on the ground at congested airports such as Heathrow and Gatwick. BA provided data that suggested that on a strike day in France, ATFM and start-up delays imposed at Heathrow and Gatwick can be of the order of four to five times greater than normal because of the disruption caused to operations as those airports are already operating at close to maximum capacity. This is another example of the wider impact of strike events that is not directly captured in the Network Manager’s data on strikes.

In the case of strikes in Italy, which are usually of a shorter duration, it is easier to plan cancellations or to retime flights to avoid cancellation.

A.2.6 Input from A4E Study

To inform the debate on the impact of strikes, A4E commissioned some research from PwC on the broader economic cost of strikes related to the key objective of aviation connectivity to deliver economic growth. The research estimated that the wider economic cost of ATM strikes over the last six years has been €10.4 billion, with a cumulative effect on employment of the loss of 143 000 jobs. The principal impacts cited are reductions in tourist expenditure, lost productivity as a consequence of delays and disruption and lost airline revenues. Whilst the current study is not able to verify these estimates, they give an indication of the scale of potential impacts on the European economy as a whole.

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