# PRR 2014

## Performance Review Report
## Executive Summary

An Assessment of Air Traffic Management in Europe
during the Calendar Year 2014

Performance Review Commission | May 2015

EUROCONTROL

## Background

This report has been produced by the Performance Review Commission (PRC). The PRC was established by the Permanent Commission of EUROCONTROL in accordance with the ECAC Institutional Strategy 1997. One objective of this strategy is "to introduce a strong, transparent and independent performance review and target setting system to facilitate more effective management of the European ATM system, encourage mutual accountability for system performance…"

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The PRC has made every effort to ensure that the information and analysis contained in this document are as accurate and complete as possible. Only information from quoted sources has been used and information relating to named parties has been checked with the parties concerned. Despite these precautions, should you find any errors or inconsistencies we would be grateful if you could please bring them to the PRU's attention.

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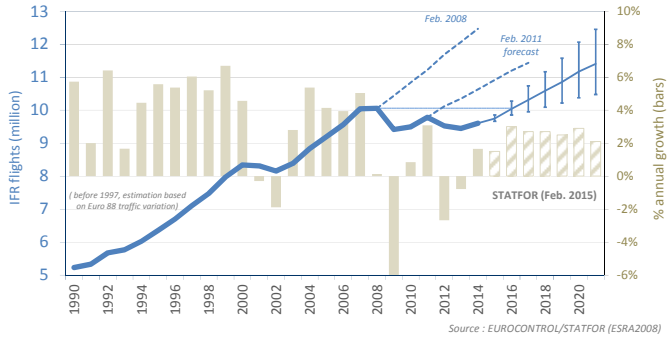
# European ATM Performance

## TRAFFIC

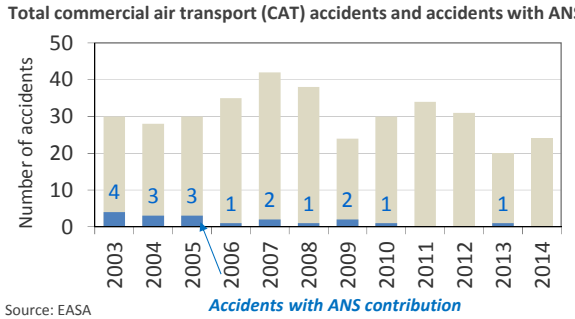



| IFR flights | Eurocontrol | Variation |
|---|---|---|
| 2014 | 9.60 M | + 1.7% ↑ |

After the decrease between 2011 and 2013, average daily IFR flights in Europe increased by +1.7% in 2014 with notable regional variations.

For 2015, the STATFOR 7-year forecast (2015) expects European flights to grow by +1.5% in the baseline scenario.

## SAFETY

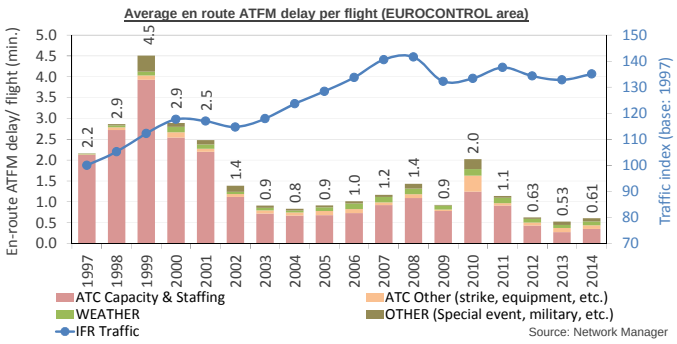



| Accidents with ANS contribution | Eurocontrol | Variation |
|---|---|---|
| 2014 | 0 | -1 ↓ |

Overall, safety levels in Europe continue to remain high, yet with scope for further improvements in some areas.

Over the past five years, there were only two accidents where ANS was a factor in the causal chain of events.

## CAPACITY

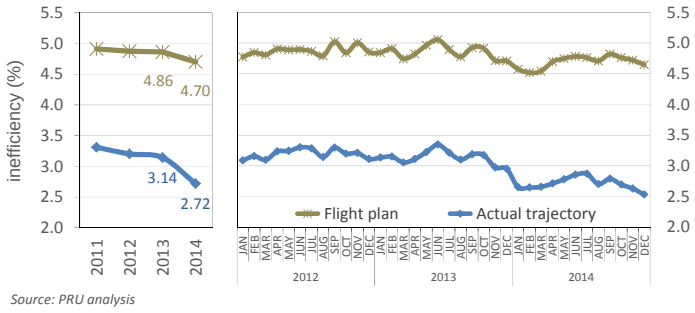



| En-route ATFM delay per flight | Eurocontrol | Variation |
|---|---|---|
| 2014 | 0.61 | +0.08 ↑ |

After the best year on record in 2013, en-route ATFM delays increased again to 0.61 minutes per flight in 2014.

The most constraining ACCs in 2014 were Nicosia, Warsaw, Lisbon, Athinai/Macedonia, Canarias, Brest, Reims, and Marseille.

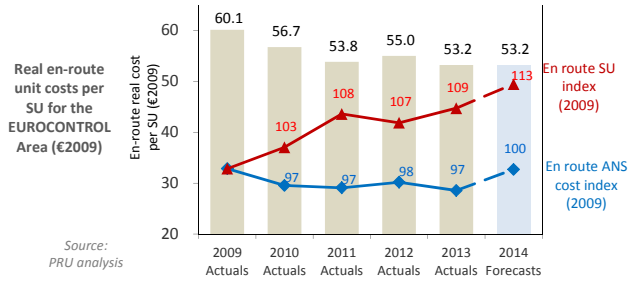
## ENVIRONMENT




| En-route flight efficiency (vs. flight plan) | Eurocontrol | Variation |
|---|---|---|
| 2014 | 4.70% | -0.16%pt. ↓ |

En-route flight efficiency continued to improve in 2014. The level of inefficiency in filed flight plans in Europe decreased from 4.86% to 4.70% and actual trajectories improved at an even higher rate from 3.14% to 2.72%.

## COST-EFFICIENCY




| En-route ANS costs per SU (€2009) | Eurocontrol | Variation |
|---|---|---|
| 2013 | 53.2 | -3.3% ↓ |

In 2013, en-route ANS costs decreased by 1.3% while en-route service units grew by +2.1% leading to an overall decrease of en-route unit costs by -3.3% compared to 2012.

## Introduction

PRR 2014 presents an assessment of the performance of European Air Navigation Services (ANS) for the calendar year 2014.

## ANS in European Air Transport

After the decrease between 2011 and 2013, flights in Europe increased again by +1.7% in 2014 with a positive medium term outlook. According to the latest STATFOR 7-year forecast (2015), flights are expected to grow by 1.5% in 2015 and to continue with an annual average growth rate of 2.5% between 2014 and 2021.

However, despite the positive growth in 2014 and the promising outlook, the impact of the economic crisis on the industry is still prominent. At European level, there were almost three million flights less in 2014 than initially predicted before the economic crisis in 2008.

Whereas the number of flights still remains below 2008 levels in 2014, there has been a continuous increase in average aircraft size and passenger numbers during the period which suggests that airlines responded to the crisis with a reduction in the number of services but with, on average, larger aircraft. Hence, as a result of the increase in average aircraft weight and longer flights, en-route service units (+5.9%) grew notably stronger than flights (+1.7%) in 2014.

With the exception of Albania, Armenia, Malta, Moldova and Ukraine, all EUROCONTROL states showed a positive growth in 2014, with Turkey remaining the main contributor to the growth in Europe. Four of the five largest States (Germany, Italy, UK, and Spain) experienced a traffic growth close to the high forecast scenario in 2014 and traffic was even higher than predicted in the high forecast scenario in Greece and Cyprus.

European traffic was affected by a number of foreseen and unforeseen events in 2014. The tragic loss of MH17, in Ukrainian airspace in July was undoubtedly the most significant event in European airspace during 2014. As a result, there was a notable shift of traffic. While traffic in Ukraine and Moldova dropped by -36.9% and -24.2% respectively, traffic in Bulgaria (24.1%), Romania (16.6%), Hungary (11.6%), Turkey (11.2%), and Slovakia (9.8%) increased far beyond forecast levels but could be accommodated without noteworthy delays.

Worldwide, airline safety improved to the best level on record with a rate of one fatal accident per 2.38 million flights in 2014. In the EUROCONTROL area safety levels remain high although preliminary 2014 data suggests a slight increase in total commercial air transport accidents and ANS-related incidents in 2014 following the lowest level on record in 2013.

Compared to 2013 (which was the best year on record), arrival punctuality in Europe decreased slightly from 84.0% to 83.7% in 2014. Reactionary delay, caused by delay which could not be absorbed on subsequent flight legs, remains the largest single delay group (44.5%) in 2014, followed by delays due to turn round issues (37%). The ANS-related share (en-route and airport combined) in total departure delays was 13.3% in 2014.

Although the decrease in arrival punctuality in 2014 was mainly driven by a deterioration in turn-round performance at airports, en-route ATFM delays also increased compared to 2013. Due to this increase in en-route ATFM delay in 2014 and an increase in flights at slightly better efficiency levels (taxi-out, en-route, terminal) than in 2013, estimated total additional ANS-related operating time increased by 2.4% in 2014.

The total economic evaluation of ANS performance presents a consolidated view of direct ANS costs and estimated indirect ANS-related costs (ATFM delays, additional taxi-out and ASMA time, horizontal en route flight efficiency) borne by airspace users.

In the Single European Sky (SES) area, actual en-route and terminal ANS costs in 2013 were lower than initially projected in last year's PRR, suggesting that ANSPs were able to adjust their costs to the -1.3% decline in traffic in 2013. Hence, combined with the notable lower delay related costs observed in 2013, total economic costs decreased by -3.5% compared to 2012 (initial projection for 2013 was +0.9%).

Based on the latest available ANS cost projections for 2014, estimated total economic ANS-related costs in the SES area are estimated to increase by 2.4% compared to 2013. The increase is mainly driven by the projected increase in en-route and terminal ANS costs and the notable increase in en-route ATFM delays in 2014.

## Safety (2013/2014)

Overall, safety levels in Europe continue to remain high, yet with scope for further improvements in some areas.

Over the past four years (2011-2014) there were no fatal ANS-related **accidents** and only one accident with ANS contribution (MET related) in 2013. The number of **serious incidents** with ANS contribution continued the positive trend observed since 2010 and decreased further in 2014 to the lowest level on record. Separation minima infringements remained the single largest category for serious ANS-related incidents, followed by runway incursions. Although considerable progress has been made over the past years, there is still a need to further improve safety data quality and completeness.

After the continuous increase in reporting levels between 2004 and 2012, the total number of incidents reported fell again by 17% in 2013. However, with the available data it is difficult to differentiate whether the decrease in 2013 is due to genuine safety performance improvements or a drop in the level of reporting. Overall, final 2013 data was received from 36 the reporting from EUROCONTROL Member States via the Annual Summary Template (AST) reporting mechanism and the preliminary 2014 data was submitted by a record number of 40 States.

Although already flagged up as a crucial area for improvement in previous PRRs, the share of unclassified incidents, as reported through the AST mechanism, remained unacceptably high in 2013 even though improvements are visible. There is an urgent need for further action in order to closely monitor trends and to support the prevention of similar incidents. Lastly, more effort should be put in place by the Member States to ensure that the number of ATM related occurrences not severity classified, continues to decrease.

The need to accelerate the deployment of automatic safety data monitoring to complement manual reporting was also already addressed in last year's report. The latest available information from the Network Manager suggests that 14 Member States now use ASMT which represents an increase of two States compared to 2013. However, there is a concern that the implementation of A-SMGCS Level 1 (improved surveillance) lags behind. By 2014, only 52% of the 46 airports have achieved full operational capability. Being a prerequisite for the implementation of A-SMGCS Level 2 (Surveillance + Safety Nets), this indicates that additional work is still needed in order to achieve the objectives set in the ATM Master Plan by the end of 2017 and avoid delayed implementation of Level 2. The use of A-SMGCS or other equivalent runway safety programmes to improve reporting and safety performance is strongly encouraged by the PRC.

To ensure that safety remains an integral part in the evolution of the more and more complex aviation system, States and service providers are encouraged to proactively engage in safety risk modelling. The improved understanding of how the various elements of the ATM system contribute to overall safety levels not only helps to better identify risk areas today but also how modifications to the system could improve performance in the future.

## Operational En-route ANS Performance (2014)

After the continuous improvement between 2010 and 2013, (reaching the lowest level of en-route ATFM delay per flight on record in 2013 (0.53 minutes per flight)), en-route ATFM delays in the EUROCONTROL area increased again to 0.61 minutes per flight in 2014.

The performance deterioration in 2014 was mainly attributed to ATC capacity issues confirming concerns already highlighted in PRR 2013 that ATFM delays could spike, when traffic grows again, unless sufficient attention is focussed on capacity planning and deployment.

In 2014, European traffic flows and capacity management were affected by a number of significant events including the downing of Malaysian Airline MH17 in Ukrainian airspace in July. The ensuing total closure of airspace in the eastern part of Ukraine generated many re-routings in that region. Traffic in Bulgaria, Romania, Hungary, Turkey, and Slovakia increased far beyond forecast levels but, thanks to the efforts of those ANSPs, they were accommodated without significant delays.

While capacity constraints can occur from time to time, area control centres (ACCs) should not generate high delays on a regular basis. In 2014, the most constraining ACCs were Nicosia (failure to implement capacity plans), Warsaw (issues with the implementation of the new PEGASUS 21 system), Lisbon (reoccurring issues in November), Canarias (capacity planning and delay classification issues), Athinai/Macedonia (insufficient capacity in summer), Reims (capacity planning), Brest and Marseille (ATC industrial action) which accounted together for

more than half of all European en-route ATFM delays (54.6% ) but only for 17.8% of total flight hours controlled.

It is essential, particularly in view of the considerable lead times, to carefully plan and also deploy capacity in line with projected traffic growth. Over-conservative capacity planning removes buffers against unexpected traffic increases and increases the risk of significant disruption to aircraft operations.

Although the unexpected changes in traffic flows in 2014 had a moderate negative effect on European flight efficiency in 2014, overall, there was a notable improvement in 2014, confirming the positive trend observed over the past years. Coordinated by the Network Manager, 30 of the 64 ACCs had implemented various steps of Free Route Operations by the end of 2014 with clear benefits in terms of flight efficiency.

In 2014, the level of inefficiency in filed flight plans in Europe decreased from 4.86% to 4.70% and actual trajectories improved at an even higher rate from 3.14% to 2.72%. Whereas the stronger improvement in actual trajectories is positive in terms of fuel burn and $CO_2$ emissions, the widening of the gap between planned and actual flown trajectories needs to be monitored closely as it has a negative impact on network predictability.

A voluntary review of only three Member States identified significant differences, not only between the national arrangements and the FUA specification but also between the individual Member States, in how the airspace is managed to provide the optimum benefit for civil and military airspace users. A wider review could help to better identify and understand existing shortcomings and identify best practice for the future benefit of all airspace users.

## Operational ANS Performance at Airports (2014)

In 2014, IFR movements at the top 30 airports increased by +2.7% compared to the previous year, which is stronger than the European traffic growth in 2014 (+1.7% vs. 2013). Despite the growth in 2014, traffic at the top 30 airports remains 3.3% below 2008 levels. Compared to 2013, the number of passengers at the top 30 airports increased by +5.8% in 2014 (9.9% above 2008 levels).

There were notable differences in growth between airports in 2014. The Turkish airports continued their remarkable growth already observed in previous years and, following a traffic decrease at Paris Charles de Gaulle and Frankfurt airport, London Heathrow now ranks first in terms of average daily movements in Europe.

Operational cancellations at airports were included for the first time in this year's report. Overall, around 1.5% of the flights confirmed by the air carrier the day before operations were cancelled in 2014. Data on cancellations were not available from all airports and thus limit the scope of the analysis of this report. With the on-going establishment of the airport operator data flow specification, the level of reporting will improve in the future.

In order to avoid excessive disruptions in daily operations, demand at larger airports is already regulated strategically in terms of volume and concentration through the airport capacity declaration process. On the day of operations, ANS plays a key role in balancing traffic with available capacity at airports within the given infrastructural and environmental constraints and in the integration of airports in the European network. In view of the considerable downward adjustment of airport expansion plans in Europe, the optimised use of available capacity is crucial to keep delays to a minimum.

The indicators used for the evaluation of ANS-related performance relate to the management of the inbound (i.e. arrival ATFM delay and ASMA additional time) and outbound (i.e. ATC pre-departure delay and additional taxi out time) traffic flow and are consistent with the SES performance scheme.

In 2014, the average additional time for ASMA and taxi-out improved slightly at the top 30 European airports whereas airport ATFM arrival delays and ATC pre-departure delays increased at the same time.

London Heathrow, Frankfurt, Amsterdam Schiphol, Rome Fiumicino, Zurich, and the two Istanbul airports had the most notable impact on the network in 2014. The underlying reasons differ by airport and range from the airport scheduling process to the ability to sustain declared capacity in various circumstances on the day of operations.

Improved data exchange fostered by A-CDM implementation and increased situation awareness are key enabler for performance improvements at airports. However the mere availability of information does not automatically resolve issues without proactively addressing relevant optimisation processes.

For example, initial work on XMAN demonstrated positive improvements in term of reducing the additional ASMA time for London Heathrow. The better use of cross-border arrival management (linking the terminal approach and

en-route function), is a key enabler for the absorption of possible holdings in a more environmental friendly manner, as the absorption takes place in the en-route phase through reduced cruise speed.

On the other hand, local constraints at Rome Fiumicino pose a challenge to take advantage of the benefits of A-CDM with a view to the optimisation of departure sequencing process.

The evaluation of daily taxi-out performance shows that the current performance framework does not sufficiently address the impact of adverse weather on the performance indicators. Future work is required in order to better evaluate the level of efficiency in such conditions (e.g. de-icing conditions).

## ANS Cost-efficiency (2013)

PRR2014 analyses performance in 2014 for all KPAs, except for cost-efficiency, which analyses performance in 2013 as this is the latest year for which actual financial data are available.

The pan-European system **en route cost-efficiency performance** improved in 2013. Real en-route costs per service unit decreased by -3.3% compared to 2012, reflecting a decrease of -1.3% in total costs and an increase of +2.1% in SUs. Total en-route costs were also -5.6% lower than planned, responding to SUs which were -5.3% lower than forecast.

However, costs can be significantly impacted year on year by changes in (accounting) provisions for future liabilities (mainly for pensions). As highlighted in PRR 2013, the volatility of these (accounting) provisions raises concerns in the context of charging and performance, as changes in these provisions, which can be significant, do not necessarily represent costs directly attributable to the provision of ANS in the year in which they are recorded.

For the SES States, 2013 is the second year of application of the “determined costs” method with specific risk-sharing arrangements. For the other nine EUROCONTROL States participating in the Route Charges System, the “full cost-recovery method” continued to apply in 2013. The evaluation between SES states and the 9 other states does not yet show clear trends.

Under the determined costs method, the amounts ultimately paid by the airspace users differ from the actual costs due to the traffic risk-sharing, cost-sharing and other adjustments provided in the Charging Regulation. The PRC computes that, in 2013, these “true costs for users” are +3.5% higher than the actual costs of States/ANSPs but -2.0% lower than the determined costs provided for 2013 in the RP1 performance plans. This should be seen in the context of actual costs in 2013 which are -5.9% lower than planned in the RP1 performance plans. The fact that several States/ANSPs demonstrated lower costs than planned was duly considered during the RP2 assessment process in order to ensure that users benefit from the cost reductions achieved during RP1.

The outlook for 2014-2019 suggests that the recent improved cost performance will not continue. Instead current plans/forecasts show costs stabilizing over the period. The forecast decrease in en-route unit cost (-2.2% per year on average between 2013 and 2019) is due to the forecast increase in SUs.

**Terminal ANS unit costs (TNSUs)** decreased by -3.6% between 2012 and 2013 reflecting a reduction of -3.9% in terminal ANS costs in real terms and a small traffic decrease (-0.3%, TNSU).

The outlook for 2015-19 shows a slower rate of decline in costs. Terminal ANS unit costs are forecast to decrease by -2.4% per year on average, reflecting an average reduction of -0.5% p.a. in costs and an average increase of +2.0% p.a. in TNSUs

**Gate-to-gate unit economic costs** (i.e. en-route plus terminal ATM/CNS provision costs plus taking account of the cost of delay) decreased by -3.6% in 2013, reflecting both the reduction in ATFM delays unit costs compared to 2012 (-18.2%) and a decrease in gate-to-gate unit ATM/CNS provision costs (-1.9%). However the increased levels of ATFM delays observed in 2014 suggests that unit economic costs could be higher in 2014.

The benchmarking analysis of **gate-to-gate unit ATM/CNS provision costs** indicates that the reduction of -1.9% in 2013 compared to 2012 is mainly due to the reduction of -3.0% in support costs (70% of total costs). Over the 2009-2013 period, pan-European unit ATM/CNS provision costs significantly reduced by -2.2% p.a., reflecting a gradual decrease in unit support costs and increasing ATCO productivity while ATCO employment costs remained fairly constant.

## PRC Recommendations 2014

| *Recommendation* | *Rationale for the recommendation* |
|---|---|
| a. The PC is invited **to note** the PRC's Performance Review Report for 2014 (PRR 2014) and to submit it to the Permanent Commission. | |
| b. The PC is invited **to request** the Director General EUROCONTROL to investigate the factors contributing to the high number of poorly coded, unclassified and undetermined safety occurrences and to propose lines of action to PC 44 (December 2015) on how to improve the situation. | *Although already flagged up as a crucial area for improvement in previous PRRs, the share of unclassified incidents, as reported through the AST mechanism, remained unacceptably high even though improvements are visible.* |
| c. The PC is invited**:**<br>i. **to request** Member States, to task their ANSPs to develop and implement capacity plans which are, at a minimum, in line with the Reference Capacity Profile (from the NOP); and to ensure that capacity is made available during peak demand,<br>ii. **to ask** the Director General EUROCONTROL to report on those States that have insufficient capacity plans compared to the Reference Capacity Profile to PC 44 (December 2015). | *Sufficient capacity plans must be developed and implemented in advance of traffic demand. It is evident that several Member States have downgraded and postponed existing capacity plans despite the predicted rise in future traffic figures. This short-sighted behaviour promises serious disruption to the network and to aircraft operations, especially during peak traffic periods.* |
| d. The PC is invited**:**<br>i. **to request** the PRC, in accordance with Article 10h of the PRC's Terms of Reference, to review arrangements for civil military coordination and cooperation in the Member States by the end of 2015;<br>ii. **to request** the civil and military authorities in the Member States to assist the PRC to conduct this review;<br>iii. **to ask** the PRC to report to PC 44 (December 2015). | *Review of only three Member States identified significant differences, not only between the national arrangements and the FUA specification but also between the individual Member States, in how the airspace is managed to provide the optimum benefit for civil and military airspace users.* |

# About the Performance Review Commission

The Performance Review Commission (PRC) provides independent advice on European Air Traffic Management (ATM) Performance to the EUROCONTROL Commission through the Provisional Council.

The PRC was established in 1998, following the adoption of the European Civil Aviation Conference (ECAC) Institutional Strategy the previous year. A key feature of this Strategy is that "*an independent Performance Review System covering all aspects of ATM in the ECAC area will be established to put greater emphasis on performance and improved cost-effectiveness, in response to objectives set at a political level*".

The PRC reviews the performance of the European ATM System under various Key Performance Areas. It proposes performance targets, assesses to what extent agreed targets and high-level objectives are met and seeks to ensure that they are achieved. The PRC/PRU analyses and benchmarks the cost-effectiveness and productivity of Air Navigation Service Providers in its annual ATM cost-effectiveness (ACE) Benchmarking reports. It also produces ad hoc reports on specific subjects.

Through its reports, the PRC seeks to assist stakeholders in understanding from a global perspective why, where, when, and possibly how, ATM performance should be improved, in knowing which areas deserve special attention, and in learning from past successes and mistakes. The spirit of these reports is neither to praise nor to criticise, but to help everyone involved in effectively improving performance in the future.

The PRC holds 5 plenary meetings a year, in addition to taskforce and ad hoc meetings. The PRC also consults with stakeholders on specific subjects.

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PRC Members must have senior professional experience of air traffic management (planning, technical, operational or economic aspects) and/or safety or economic regulation in one or more of the following areas: government regulatory bodies, air navigation services, airports, aircraft operations, military, research and development.

Once appointed, PRC Members must act completely independently of States, national and international organisations.

The Performance Review Unit (PRU) supports the PRC and operates administratively under, but independently of, the EUROCONTROL Agency. The PRU's e-mail address is PRU@eurocontrol.int.

The PRC can be contacted via the PRU or through its website www.eurocontrol.int/prc.

## PRC PROCESSES

The PRC reviews ATM performance issues on its own initiative, at the request of the deliberating bodies of EUROCONTROL or of third parties. As already stated, it produces annual Performance Review Reports, ACE reports and ad hoc reports.

The PRC gathers relevant information, consults concerned parties, draws conclusions, and submits its reports and recommendations for decision to the Permanent Commission, through the Provisional Council. PRC publications can be found at www.eurocontrol.int/prc where copies can also be ordered.

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