

**Flight Efficiency Metric and other amendments to
conditions in the NATS En Route plc air traffic
services licence**

**CAA Formal Proposals under section 11(2) of the
Transport Act 2000**

November 2011

Civil Aviation Authority

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Executive Summary

NATS (En Route plc) (NERL), in collaboration with airlines and the CAA, has developed a financially incentivised metric designed to improve the flight path efficiency performance of airlines. This document consults on the modifications that are necessary to the NERL licence to introduce the metric from 1 January 2012.

Flight efficiency is the term commonly used to describe the difference between the actual flight trajectory and a measure of the optimum flight trajectory. Flight efficiency is important as it impacts on CO₂ emissions, airline costs directly (through fuel burn), Emission Trading Scheme costs and indirect costs such as passenger and crew time.

Given the potential benefits to airlines, passengers and the environment, the CAA is keen to introduce a flight efficiency metric, with financial incentives, three years earlier than foreseen under the Single European Sky (SES) Performance Scheme¹. A flight efficiency incentive regime was envisaged in the CAA decision for the current NERL price control (December 2010), which set aside a proportion of bonuses and penalties for this metric once the CAA was assured the metric had reached sufficient maturity for it to be introduced.

These proposals follow CAA's consultation on NERL's initial proposals in August 2011² and take account of consultation responses from the airline community, Eurocontrol and a further submission from NERL. During the consultation period, the CAA facilitated a workshop with NERL and airlines to discuss the metric and financial incentives³.

The CAA shares the view of most respondents that NERL deserves considerable credit for developing the new "3Di score" metric. This is the first metric of this type to be introduced with financial incentives in Europe and builds on the work of Eurocontrol to recognise both horizontal and vertical aspects of flight efficiency. The 3Di score is broadly related to the difference in airline fuel burn between the actual flight and an optimal or preferred flight trajectory.

NERL had initially proposed that the flight efficiency financial incentive regime should be based on the 3Di score and should follow a similar structure to the CAA's delay incentive regimes with a par value and financial payments for performance above or below a deadband.

The CAA agrees with respondents that the incentive regime should be made more stretching than originally proposed by NERL and proposes that:

- The **par value** should be tightened to 24 units in 2012 and 2013 and 23 units in 2014 based on the annual average of daily scores. This is a 1.5 unit reduction on NERL's proposed par value of 25.5 units in the first two years and a 2.5 unit reduction in the last year. The level of NERL's

¹ SES is an initiative to reform the architecture of European air traffic control around traffic flows rather than national boundaries to meet future capacity and safety needs. As part of the SES, the European Commission has established targets for safety, the environment, network capacity and cost-efficiency. Further details are available at: <http://www.eurocontrol.int/dossiers/single-european-sky>

² Available at: <http://www.caa.co.uk/docs/5/Flight%20efficiency%20consultation%20letter%2002082011.pdf>

³ The notes of the workshop are available at: <http://www.caa.co.uk/docs/5/rpg2011/20110905FEMWorkshop.pdf>

proposed par value was based on historic performance. The CAA's proposals reflect a balance between potential efficiency improvements (such as iFACTS which is likely to particularly affect performance in 2014) and the potential upward pressure on the metric from increases in traffic.

- The **deadband** around the par value, should be +/- 3 units, or 21 to 27 units in 2012/13 and 20 to 26 units in 2014. This is a significant tightening of NERL's proposed deadband of 21 to 30 units and reflects users concerns over the cautious nature of NERL's proposals.
- The **payment rate** should be £0.2 million per year (2006 prices) outside the deadband with the flight efficiency regime representing 20% of the money at risk for NERL performance incentives.
- The **Olympic and Paralympic period** should be excluded due to the significant changes in the volume and pattern of traffic over this period.
- Although the incentive regime will be based on the annual average performance, NERL should **publish** its performance against the par value on a monthly basis to increase the reputational incentive on NERL to improve performance.
- There should be an **annual review** of the underpinning parameters which would lead to the suspension of bonus and penalty payments if the estimate of inefficiency changes by more than +/- 3 units. This is an increase on NERL's proposed 1.5 unit threshold which will increase certainty to NERL and other stakeholders.

The CAA considers that this flight efficiency incentive package could provide **significant benefits to users**. If NERL meets the par value target, the 1.5 to 2.5 unit reduction compared to historic performance could be worth up to £120 million (at today's prices) in fuel cost savings to airlines over the remainder of the control period (January 2012 to December 2014 - Reference Period 1 (RP1) of the SES Performance Scheme).

In tightening the incentive package on NERL, the CAA has had regard to the recent European Commission recommendation that Member States take all opportunities to improve their contribution towards the EU wide cost efficiency targets⁴. Whilst flight efficiency benefits do not technically contribute towards the calculation of the EU's cost-efficiency metric, they do nonetheless represent potentially significant financial cost savings to airlines. The early introduction of the metric enables lessons to be learnt for all air traffic management stakeholders and would inform the development of an EU metric for future reference periods of the SES Performance Scheme.

This document also consults formally on a number of generally administrative changes to the licence and regulatory asset base tracking mechanism to remove anomalies.

NERL has indicated that it is minded to accept the changes proposed in this document.

⁴ This can be accessed at: http://www.eurocontrol.int/prc/gallery/content/public/Docs/Assessment_.pdf

The closing date for consultation responses is **8 December 2011**. The CAA will publish its decision statement shortly thereafter once it has considered all responses. The metric will then be introduced formally from 1 January 2012.

1 Introduction

Purpose of this document

1.1 This document invites comments on the CAA's formal proposals to modify conditions in the air traffic services licence held by NERL. These proposals reflect the CAA's proposed decision on the flight efficiency incentive regime, following a consultation on NERL's proposals in August 2011⁵. They take account of consultation responses from the airline community and NERL⁶. This document also formally consults on a number of administrative changes to licence conditions to remove drafting errors that have been highlighted by NERL.

Structure of this document

1.2 This document is structured as follows:

- This first chapter provides background to the development of the flight efficiency incentive regime and invites views;
- Chapter 2 describes the consultation responses and the CAA's proposed decision on the flight efficiency incentive regime;
- Chapter 3 describes the proposed licence amendments associated with the flight efficiency incentive regime;
- Chapter 4 sets out some other generally administrative changes to the licence and regulatory asset base tracking mechanism put forward by NERL.

1.3 There are also three annexes:

- Annex 1 sets out the proposed licence amendments associated with the flight efficiency regime;
- Annex 2 sets out the protocol for calculating the 3Di score and the annual review mechanism; and
- Annex 3 sets out the proposed amendments to the regulatory asset base tracking mechanism.

Background

1.4 In December 2010, the CAA set out its decision on the NERL Control Period 3 (CP3) price control for the scope, structure and level of prices for the four years from 1 January 2011⁷. In that document the CAA acknowledged NERL's work on developing a robust flight efficiency metric which extended the Eurocontrol work on horizontal flight efficiency, to also take into account vertical flight efficiency. NERL termed the new metric the 3Di Score.

⁵ Paragraphs 28 to 32 discuss the flight efficiency metric. The decision document is available at: <http://www.caa.co.uk/docs/5/Flight%20efficiency%20consultation%20letter%2020082011.pdf>

⁶ Available at: <http://www.caa.co.uk/default.aspx?catid=5&pagetype=90&pageid=12584>

⁷ NATS (En Route) plc price control: CAA decision for control period 3 (2011-2014): under Section 11 of Transport Act 2000, UK Civil Aviation Authority, December 2010

- 1.5 The CAA also noted that NERL had been proactive in setting fuel efficiency CO₂ targets for itself through the Operational Partnership Agreement⁸ and hoped to reduce CO₂ by 4 percent during CP3. However, at that time, the CAA considered that there was insufficient time-series data to understand the causal relationships between flight efficiency, the planning and management effort put in by NERL and factors such as changing volumes and patterns of traffic. The CAA therefore stated it would consider introducing a flight efficiency incentive as part of the service quality regime later during CP3.
- 1.6 The CAA stated it would allocate up to 20 percent of the money at risk (£2.4m/4.8m bonus/penalty per year, 2006 prices) to the flight efficiency metric depending on how robust it considers the flight efficiency term to be when it is introduced. If less than 20 percent of the overall money at risk was allocated to the flight efficiency metric, the CAA stated that it would reallocate the difference to the other metrics (which cover delay) on a pro-rata basis. In deciding whether it would reallocate this amount for the remainder of CP3, the CAA stated that it would consider whether NERL had used its best endeavours to develop a robust metric⁹.
- 1.7 NERL undertook the work tracking candidate metrics and evaluation of alternatives prior to the CP3 decision. Subsequent to the decision NERL has focussed on improving its understanding of the new 3Di metric, the factors that affect the metric and the measures that NERL can undertake to improve performance. This has helped NERL develop proposals for the incentive regime in particular the balance between the stability of the metric and level of financial incentive. On 2 August 2011 the CAA published a consultation on NERL's proposals for a flight efficiency incentive regime.
- 1.8 During the course of the development of the flight efficiency regime, the CAA has hosted three workshops where NERL has explained their proposals. In the first two workshops on 22 April 2010 and 30 July 2010, NERL explained the work that it had done to identify a suitable flight efficiency metric for CP3¹⁰. On the 5 September 2011, the CAA hosted a further workshop where NERL explained its proposals for a flight efficiency incentive regime, having completed its assessment. The presentations and minutes of the workshop are available on the CAA website¹¹.
- 1.9 This document summarises the responses to the consultation on the incentive regime and the CAA's proposed decision, together with the associated licence amendments. In formulating its proposals the CAA has considered its statutory duties under section 2 of the Transport Act 2000.

⁸ Arrangements by which NATS consults with its customers on operational issues

⁹ Licence Condition 21 did not allow for reinstatement of the bonus after 2011: however this was not intended to prejudice whether the bonus will be subsequently allocated to the other delay metrics and the CAA will introduce a licence modification if it decides to reinstate the bonus.

¹⁰ The slides for the first workshop are available on the CAA website at:
<http://www.caa.co.uk/docs/5/ergdocs/20100422NERLMetrics.pdf>

¹¹ The minutes and presentations are available at: <http://www.caa.co.uk/docs/5/rpg2011/20110905FEMWorkshop.pdf>

Views invited

- 1.10 Under section 11(1) of the Transport Act 2000 the CAA may modify the conditions of a licence if its holder consents to the modifications. NERL, as the licence holder, has given its consent to the modified conditions described in Annex 1 and 2 of this document.
- 1.11 Under section 11(2) of the Transport Act 2000, before making modifications to the Licence the CAA must publish a notice setting out the proposed modifications and state the period (of not less than 28 days) within which representations may be made regarding the proposed modifications. Accordingly, this document constitutes such a notice and the CAA would welcome comments on the proposed modifications. Any comments should be sent, if possible by e-mail, to barbara.peratasmith@caa.co.uk by **Thursday 8 December 2011**.
- 1.12 Alternatively, comments may be sent by post to:
- Barbara Perata-Smith
Regulatory Policy Group, CAA
4th Floor, CAA House
45-59 Kingsway
London WC2B 6TE
- 1.13 The CAA would expect to make responses available on its website for other interested parties to read as soon as practicable after the period for written comments has expired. Any material that is regarded as confidential should be clearly marked as such.
- 1.14 If you have any questions on the content of this document please contact Tim Griffiths on 020 7453 6240 (or, by e-mail, to tim.griffiths@caa.co.uk).

Next steps

- 1.15 The CAA is allowing a month for comments on the proposals in this document. Subject to the scale and nature of the responses received, the CAA is planning to publish its final decision on modifying the conditions in NERL's licence by the end of December 2011.

2 Flight efficiency incentive regime – proposed decision

Introduction

2.1 In its consultation letter of 2 August 2011 the CAA asked respondents for their views on six questions.

- Do you consider that NERL has used best endeavours to develop a flight efficiency regime?
- Do you agree that there should be a flight efficiency performance regime from the start of 2012 and that it should be on the 3Di score?
- Do you agree with NERL's proposals for the par value and deadband? If not, on what basis should the par value and deadband be set?
- Do you agree that the flight efficiency incentives should be set at £0.2 million per unit capped at 20% of available money at risk? If not, on what basis should payment rates be set?
- Do you agree with the adjustments proposed by NERL? Are there any other adjustments that should be made?
- Do you agree with the annual review process proposed and the threshold for the test?

2.2 The CAA received 11 responses to the consultation from the following organisations:

Respondent
Thomson Airways
British Airways
Aer Lingus
IATA
Heathrow LACC
Thomas Cook
United Airlines
NERL
Monarch
bmi
Eurocontrol

Do you consider that NERL has used best endeavours to develop a flight efficiency regime?

NERL's proposals

- 2.3 NERL has stated that it has undertaken significant efforts to develop the 3Di metric and associated incentive regime. This work has involved evaluating candidate metrics against agreed criteria, developing the entirely new 3Di metric incorporating vertical as well as horizontal flight efficiency, and collecting and analysing data over the last 12 months to establish a track record on which to base the associated incentive regime.

Consultation responses

- 2.4 Overall respondents considered that NERL had used best endeavours and should be congratulated on its work to develop a metric which included both vertical and horizontal inefficiency. Aer Lingus said the metric was innovative and complex. Thomson Airways and United Airlines suggested that the DfT and CAA should support the use of the metric as a model for other European Air Navigation Service Providers (ANSPs).
- 2.5 Some respondents (BA, bmi, IATA, Eurocontrol and the LACC) offered observations on how the metric could be further enhanced:
- the lateral profile should take of the airlines' preferred flight path; and
 - the vertical profile should take full account of the inefficiency introduced by flight planning restrictions.

CAA proposed decision

- 2.6 The CAA considers that NERL has used best endeavours to develop the flight efficiency metric. Furthermore, the CAA shares the view of many respondents that NERL deserves considerable credit for its collaborative work with airlines to develop the first such metric in Europe that takes into account both vertical and horizontal flight inefficiency.

The 3Di flight efficiency metric extends the commonly used Eurocontrol horizontal metric in two ways:

- The 3Di score includes vertical flight efficiency and so considers inefficiency in flight climb, cruise and descent.
- The 3Di score does not impose a 40 nautical mile exclusion area around airports. This ensures that all flight inefficiency is considered including that from stacking close to airports.

2.7 The CAA notes airlines concerns that the impact of vertical tactical (on-the-day) or UK Route Availability Document¹² (UK RAD) restrictions are not reflected in the calculation of flight efficiency. To ensure that this does not create perverse incentives, the CAA has asked NERL to include suitable indicators to monitor potential impacts as part of its Condition 11 report¹³: The CAA's provisional view is that these indicators could include:

- tactical vertical flight restriction hours; and
- the total number and number of changes to flight restrictions included in the RAD.

2.8 The CAA has asked NERL, working with airlines, to identify suitable metrics before the end of this calendar year¹⁴. This will enable the CAA to monitor these indicators and investigate if there are increases without good reason.

Do you agree that there should be a flight efficiency performance regime from the start of 2012 and that it should be on the 3Di score?

NERL's proposals

2.9 In line with the CAA CP3 decision, NERL proposed to introduce an incentive regime based on the annual average 3Di score for the start of 2012.

Consultation responses

2.10 Nearly all respondents remained keen to see the metric introduced from 1 January 2012. A number of respondents (BA, bmi, United Airlines and Monarch) highlighted that this would allow the metric to be refined for CP4. bmi highlighted that further work was required to understand the interaction between the 3Di and delay metrics. Monarch stated that introducing the metric in 2012 would be useful given the increased focus on flight efficiency following the introduction of the Emissions Trading Scheme. Eurocontrol noted concerns over the way in which vertical inefficiency was calculated, in particular, the treatment of vertical flight restrictions.

CAA's proposed decision

2.11 The CAA considers that a flight efficiency performance regime should be introduced from 2012 based on the 3Di metric. The potential benefits to users from its early introduction outweigh the potential benefits of taking further time to refine and enhance it at this stage. Like any incentive metric, it can be further enhanced and developed as lessons are learnt from its performance in practice. Its introduction also enables the SES Performance Review Body to monitor the progress of the metric and inform its potential use in future reference periods of the SES Performance Scheme.

¹² The UK RAD sets out preferred routes for aircraft to fly between destinations which take account of flight restrictions. In addition to these restrictions NERL may also introduce on the day restrictions to deal with congestion in specific areas at peak times.

¹³ NATS provides to its customers under condition 11 of its licence an operational performance report describing traffic, levels, safety, delays and service delivery.

¹⁴ If suitable metrics are not agreed by the end of the year then the CAA's provisional indicators should be introduced.

Do you agree with NERL's proposals for the par value and deadband? If not, on what basis should the par value and deadband be set?

NERL's proposals

2.12 NERL proposed to set the par value at 25.5 units based on the average value of the 3Di metric between 2006 and 2010¹⁵. NERL proposed a deadband, where no payments would be made, of 21 to 30 units (i.e. +/- 4.5 units). This would be symmetric around the par value. NERL suggested that the deadband would cover the impact of changes in traffic volume and unanticipated events in each of the preceding five years.

Consultation responses

2.13 Nearly all respondents suggested that the NERL's proposed par value of 25.5 and deadband of 21 to 30 units were insufficient to incentivise NERL to improve performance. Monarch, Aer Lingus, Thomson Airways and Thomas Cook considered that the par value and deadband should be tightened, with Thomson Airways suggesting that the par value and deadband should form part of the annual review.

2.14 A number of respondents (BA, bmi, IATA and the LACC) suggested that the par value should be reduced to 23 units with a deadband of +/- 3 units. bmi identified a number of reasons to believe that the flight efficiency would improve during CP3:

- iFACTS – which provides up to 20% increase in sector capacity, reducing delay and allowing improved aircraft climb and descent. Such benefits will be realised from 2012;
- NATS' focus on CO₂ emissions will generate other measures to improve flight efficiency for example the Dover/Lydd airspace development which is being implemented this year will reduce CO₂ emissions by 2000t per year;
- Operational freedoms at Heathrow. BAA has recently agreed with DfT to undertake a set of trials in 2011 and 2012 aimed at reducing holding at Heathrow. This could lead to a reduction of what is a large component of the 3Di score;
- The cautious nature of the delay metrics allows a potential trade off with flight efficiency during CP3; and
- The 3Di scores for July and August 2011 were between 21.5 and 23 units, despite rising traffic demand.

2.15 Eurocontrol stated that setting the par value based on historic performance would provide NERL with little incentive to improve flight efficiency. Instead Eurocontrol suggested that the par value should be initially set at 24 units and then the par value and deadband should decrease annually to take account of efficiency improvements, similar to the way that the EU-wide target for the

¹⁵ A 3Di score of 25.5 means on average, each flight burns 25.5% more fuel than its requested optimum.

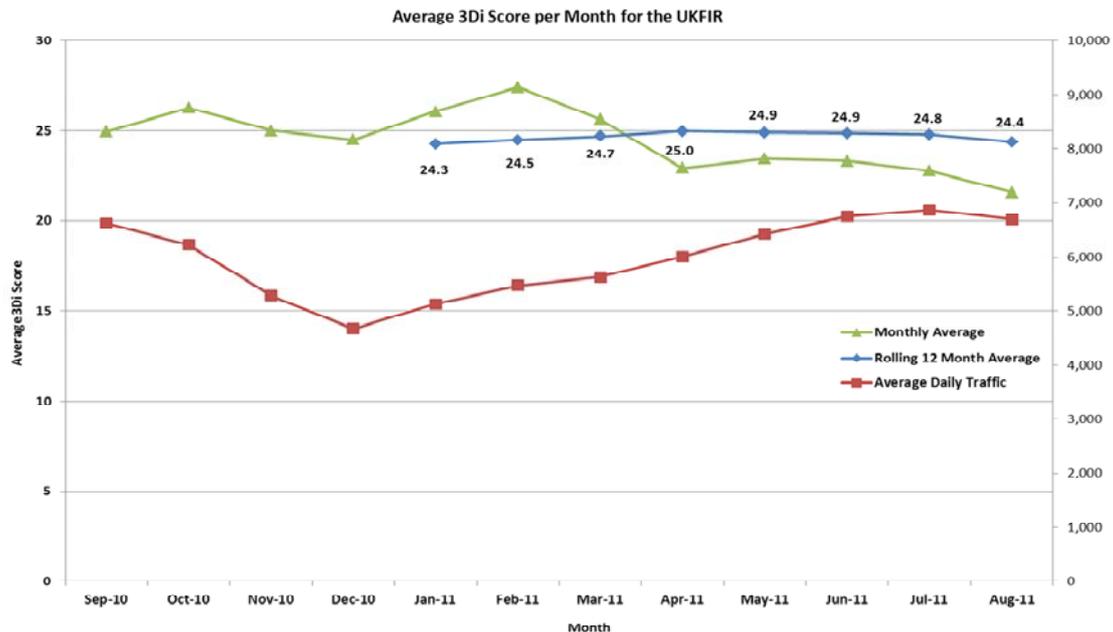
environment improves annually. Eurocontrol felt that the upper limit of the deadband should be 28 units, reflecting forecast traffic growth, with a symmetrical band around the par value, implying a lower limit of 20 units.

CAA's proposed decision

- 2.16 The CAA considers that the flight efficiency regime should be based on a set of stretching but achievable targets with a clear incentive for NERL to improve performance over time.
- 2.17 The CAA considers that NERL's proposed par value of 25.5, while based on historic performance, does not reflect potential improvements in flight efficiency that occur in the remainder of the control period. There are a number of factors that might lead to improved future performance:
- historic performance may not be a good guide to future performance as the metric was not previously incentivised;
 - there are changes that are being introduced which might improve future performance, for example iFACTS; and
 - NATS own CO₂ emission reduction aspirations should help to improve future flight efficiency.
- 2.18 Potentially counterbalancing these factors is upward pressure on the 3Di score due to increased traffic, as greater levels of congestion can make it more difficult to route aircraft on their preferred trajectories.¹⁶
- 2.19 The latest data for August 2011 shows a 12-month moving average flight efficiency score of 24.4 (as shown in Figure 2.1). NERL is also concerned about further upward pressure on the metric owing to an association between the score and traffic growth.

¹⁶ It should be noted that NERL have identified a relationship between the 3Di score and traffic on an annual basis, although there does not appear to be a relationship based on monthly or daily data, presumably due to the impact of weather and other factors, which might be expected to even out over a year.

Figure 2.1: Latest flight efficiency scores



2.20 The CAA considers that an appropriate par value would be 24 units for 2012 and 2013 and 23 units for 2014. This will provide an incentive for NERL to undertake measures to improve flight efficiency to offset the impact of increases in traffic. The reduction in the par value in the final year reflects the likely efficiency benefits from measures such as the implementation of iFACTS, reducing final approach spacing, development of the Manchester terminal area and iTEC which are likely to particularly affect 2014.

NERL has estimated that 1 unit of the metric is equivalent to 35,000 tonnes of fuel and 110,000 tonnes of CO₂ in 2010. At an assumed cost of £620 per tonne of fuel, this gives a fuel saving of £22 million per a 1 unit reduction in the metric. On this basis, assuming NERL meets the par value target over the three year period, the reduction in the par value from 25.5 to 24 units could be worth around £33 million per year in 2012/13 (with all external factors being equal to 2010), with the reduction to 23 units providing a benefit of around £55 million in 2014, at today's prices. This gives an estimated total potential fuel cost saving of around £120 million to airlines over the remaining 3 years of the control period (Reference Period 1).

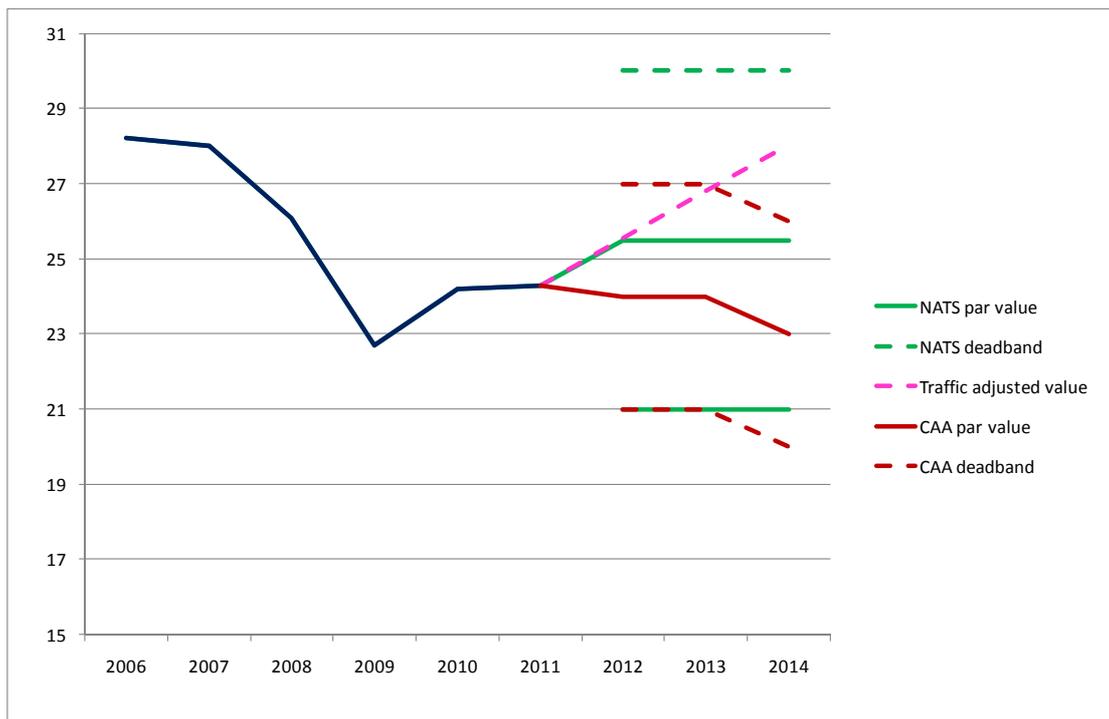
2.21 As traffic growth might be expected to put upward pressure on flight efficiency, towards the end of the current control period, NERL will have to improve efficiency to ensure that under forecast traffic growth it does not have to pay penalties.

2.22 The CAA considers that the deadband should be reduced from +/- 4.5 units to +/- 3 units. At the lower end of the deadband NERL will only receive bonuses if

it improves flight efficiency by more than the EU-wide target on flight efficiency¹⁷.

2.23 In tightening the incentive package on NERL, the CAA has had regard to the recent European Commission recommendation that Member States take all opportunities to improve their contribution towards the EU wide cost efficiency targets. Whilst flight efficiency benefits do not technically contribute towards the calculation of the EU's cost efficiency targets, they do nonetheless represent potentially significant cost savings to airlines.

Figure 2.2: Comparison of CAA and NERL par values and deadbands



Do you agree that the flight efficiency incentives should be set at £0.2 million per unit capped at 20% of available money at risk? If not, on what basis should payment rates be set?

NERL's proposals

2.24 NERL proposed that financial payment rates for both bonuses and penalties should be set at £0.2 million per unit. NERL proposed capping payments at the maximum allowed by the CP3 decision of £2.4 million for bonuses and £4.8 million for penalties (2006 prices). This is 20% of the available money at risk and the maximum proposed by the CAA. If the money at risk on flight

¹⁷ The EU-wide target is a 0.75 percentage point improvement in horizontal flight efficiency between 2009 and 2014. While this is not a like for like comparison the 3Di score for 2009 was 22.7. A 0.75 percentage improvement would therefore bring the 3Di score below 22 units. The lower end of the proposed deadband is 20 units in 2014 and so NERL would only earn bonuses if it substantially outperformed the EU-wide target, although it should be noted that much of the EU-wide improvement could come from improved interfaces between States.

efficiency was reduced then this money would transfer pro-rata to the other performance metrics.

Consultation responses

2.25 In general, respondents agreed with NERL's proposals for a payment rate of £0.2 million per unit with bonuses and penalties capped at 20% of the money at risk. Respondents emphasised the importance of reputational incentives and in particular setting more demanding par values and deadbands. Respondents also suggested that the benefits to airlines of improved flight efficiency in terms of reduced fuel costs would far outweigh any likely financial incentive payments. Two respondents suggested higher payment rates: bmi suggested a payment rate of £0.24 million per unit; and BA suggested both graduated payment rates to incentivise significant improvements in performance and higher penalty rates so that maximum payments were more realistic. IATA stated that it disagreed with bonus payment as airlines already paid for agreed levels of capacity and performance. Eurocontrol states that the proposed payment rate of £0.2 million should be sufficient to encourage the required behaviour from NERL.

CAA's proposed decision

2.26 The CAA considers that the main benefit of the flight efficiency incentive regime will be reputational with NERL seeking to avoid paying penalties and striving to outperform the par value. It is therefore important to set realistic and challenging par values and deadbands. The proposed payment rates of £0.2 million, even if they were significantly increased, would not compensate airlines for changes in flight efficiency. Nevertheless the CAA considers that the proposed payment rates of £0.2 million should be sufficient to provide NERL with an incentive to improve performance.

2.27 The CAA also agrees that payment rates should be symmetrical as this would balance risk and reward. The CAA considers that the maximum money at risk should be set at the proposed 20% as this would avoid increasing payment rates on other metrics where NERL has recently been outperforming.

Do you agree with the adjustments proposed by NERL? Are there any other adjustments that should be made?

NERL's proposals

2.28 NERL proposed that the metric should be adjusted for significant changes in the proportion of overflight traffic (greater than +/- 5%) and that the 2.5 month period of the Olympics and Paralympics should be excluded.

Consultation responses

2.29 In general, respondents did not agree with NERL's proposals to exclude the Olympic and Paralympic period, with many respondents emphasising that it will be business as usual for airlines and NERL will need to continue to focus on flight efficiency. BA, bmi, IATA and the LACC favoured an *ex-post* evaluation with the Olympic and Paralympic period excluded only if it could be

demonstrated that there was a significant and substantial effect. Alternatively bmi suggested that the deadband could be increased by +/- 1 unit for 2012 to allow for the impact of the Olympics. Eurocontrol, United Airlines, Monarch and NERL supported the exclusion of the Olympic and Paralympic period.

- 2.30 No respondents supported an adjustment for adverse weather, as this could occur every year and would therefore be picked up in previous years' scores.
- 2.31 BA, bmi, IATA and the LACC did not agree with the proposed adjustment for overflight traffic as they felt that traffic mix changes would be gradual and any substantial changes could be picked up in the annual review mechanism. Eurocontrol, Monarch, United Airlines and NERL agreed with NERL's proposals. United Airlines also emphasised the need for the metric to reflect forecast traffic growth as airspace complexity would increase with traffic.

The CAA's proposed decision

- 2.32 The CAA is concerned that NERL's focus on flight efficiency may be reduced if the Olympic and Paralympic period is excluded. However, there are a number of drawbacks to the possible alternative approaches. Making an *ex-post* decision on whether to exclude the Olympic period, as suggested by BA, bmi, IATA and the LACC, may create a perverse incentive to make flight efficiency worse during the Olympic and Paralympic period to ensure the period is excluded. bmi's alternative suggestion to increase the size of the deadband by +/- 1 unit during 2012 has drawbacks in that the impact of the Olympics and Paralympics is uncertain and if the allowance is set too high, could lead to a loss of focus on flight efficiency during the rest of the year. Consequently given the problems with alternative approaches the CAA considers that the Olympic and Paralympic period should be excluded from the financial incentive regime.
- 2.33 Nevertheless the CAA considers that NERL should have a continued focus on flight efficiency whether during the Olympics and Paralympics or at other times. Consequently the CAA has asked NERL to publish monthly flight efficiency scores (including during the Olympics and Paralympics) to maximise the reputational incentives on NERL to meet its targets.
- 2.34 The CAA agrees with respondents that adverse weather, volcanic ash or airline strikes have affected flight efficiency in previous years and therefore the CAA does not propose to adjust the performance regime to reflect these events.
- 2.35 The CAA also agrees with a number of respondents that any changes to traffic mix are likely to be gradual. The CAA considers that these changes would be picked up in the annual review mechanism. The CAA therefore proposes not to adjust the regime to reflect changes in the proportion of overflights.

Do you agree with the annual review process and the threshold for the test?

NERL's proposals

- 2.36 NERL proposed an annual review of the metric to test the continued appropriateness of the regression coefficients in the model used to estimate the 3Di score. The test would re-estimate the regression coefficients based on

a representative sample of the latest available annual data. The revised coefficients would then be used to re-estimate the 3Di score. If the difference between the revised and original 3Di score estimates was greater than the threshold then bonus and penalty payments would not be made for that year. NERL proposed to set the threshold at +/- 1.5 3Di units. NERL also set out an alternative threshold of +/- 6 units, which it considered would increase the risk of paying undeserved bonuses or penalties.

Consultation responses

- 2.37 In general, respondents supported the concept of an annual review, although many respondents wanted to extend its scope. bmi suggested that the review should encompass the impact of the Olympics and changes in traffic mix. United Airlines, the LACC, Thomson Airways and Thomas Cook felt that the review should encompass the deadband. BA, bmi, IATA and the LACC considered that the review should be undertaken by the CAA supported by NERL. NERL emphasised the need to limit the scope of the review to the regression equations to minimise the burden on the CAA, NERL and airlines and ensure adequate focus on improving the regime for RP2 (2015 to 2019) of the SES Performance Scheme.
- 2.38 Thomson Airways agreed with the proposed 6% of the par value (+/- 1.5 units) threshold for adjusting values following the review. Other respondents did not feel that they had the technical knowledge to comment.
- 2.39 Eurocontrol raised a concern that the body that developed the model (NERL) also benefits from the financial incentives depending on that model. To address this, Eurocontrol suggested that it was important that performance indicators were independent and airlines should be involved in the annual review.

The CAA's proposed decision

- 2.40 The CAA considers that it is important that the annual review is a mechanistic process to ensure that there is certainty for NERL and airlines about the financial incentive regime going forwards. Consequently the CAA considers that the annual review should be limited to a review of the regression model parameters to ensure that the assumptions underpinning the regime continue to remain valid going forwards and that bonus and penalty payments are appropriate.
- 2.41 The CAA considers that the proposed deadband of +/- 3 units together with the annual review of the regression model should be sufficient to deal with potential changes in traffic volume and mix. Annually reviewing the deadband to take account of changes in traffic volume and mix could improve the accuracy of the regime, however it would also lead to significant stakeholder involvement, and potentially transferring attention from improving the 3Di metric score towards the annual review of the deadband. To maintain focus and certainty the CAA considers that the deadband should be fixed for the rest of the control period. The CAA proposes to set the threshold for changing parameters equal to the

proposed deadband of +/- 3 units. To address the concerns raised by Eurocontrol the CAA considers that the review should be undertaken by NERL but all of the data used to perform the review should be supplied to the CAA so that the analysis can be independently verified.

3 Proposed licence amendments associated with the flight efficiency metric

- 3.1 This chapter briefly describes the proposed licence amendments associated with the introduction of flight efficiency incentive regime.
- 3.2 All amendments associated with the introduction of the flight efficiency incentive regime are made to Condition 21 of the licence. The amendments are summarised below and are set out in Annex 1. Annex 2 sets out the protocol for calculating the 3Di score and the annual review mechanism.
- 3.3 *Paragraph 6* has been amended to revise the caps on penalty payments on the delay metrics and introduce caps on the flight efficiency metric financial incentive. In the original licence there was an assumption that all of the penalty money at risk would rest on the delay metrics until a flight efficiency incentive regime was introduced. The 20% of bonus money at risk that is allocated to flight efficiency was not previously allocated. As the CAA is now proposing to introduce a flight efficiency metric then the penalty caps for 2013 and 2014 have been reduced by 20%. The caps for the flight efficiency regime are set at 20% of the money at risk for bonuses and penalties (values are set in 2006 prices and uplifted for inflation).
- 3.4 *Paragraphs 7 to 14* have been amended to reduce the penalty payment rate on the delay metric as this was consistent with the higher penalty caps. The cap on penalty payments during 2012 has also been reduced consistent with the amendments made in paragraph 6 for 2013 and 2014.
- 3.5 *Paragraph 17* has been amended to include the flight efficiency regime in the correction mechanism. This paragraph also sets out the trigger for the suspension of bonus and penalty payments if the values estimated using the model developed during the annual review exceed the trigger thresholds.
- 3.6 *Paragraph 20* is entirely new and sets out:
 - The method for calculating the flight efficiency metric;
 - The par value and deadband for the metric;
 - The value of the financial incentive payment rate; and
 - The calculation of the financial payments if the metric exceeds the upper and lower deadbands.

4 Other amendments to the licence and regulatory asset base tracking mechanism proposed by NERL

Introduction

- 4.1 The CAA's August 2011 consultation on the flight efficiency metric noted that it would use the opportunity of this document to bring forward proposed amendments to correct for certain drafting anomalies that have been identified in Appendix 3 of the CAA's CP3 decision document (December 2010), which tracks the regulatory asset base (RAB), and the licence.

RAB amendments

- 4.2 The CAA's price control decision for Control Period 3 (CP3) in December 2010 included Appendix 3: Formulae for tracking the regulatory asset base. This Appendix sets out the mechanism that the CAA will adopt in tracking the value of the RAB during CP3 which would then form an input to subsequent reviews. A review of Appendix 3 highlighted several drafting errors which require correction so that the appendix reflects properly the CAA's policy as set out in its December 2010 decision. The proposed changes to the Appendix do not affect CP3 (RP1) prices and are not a change to CAA policy.
- 4.3 The CAA is proposing to make the changes as set out in this section, but first wished to give stakeholders the opportunity to comment. Annex 3 provides a draft of the revised Appendix 3 with the proposed changes marked.
- 4.4 *Paragraphs 9 and 13:* Removal of a typographical error in the definition of CP2 Capitalised Financing Costs and to clarify that capitalised finance costs includes costs arising from the pensions pass through. This adjustment affects both UK Air Traffic Services (ATS) and Oceanic.
- 4.5 *Paragraphs 9 and 13:* Amendments to the definition of the Closing RAB and Defined Benefit Pension Contribution Variance to correctly reflect the CAA's policy to CP2 pension costs, which passed-through the actual pension costs for 2010/11 once known. This amendment affects both UKATS and Oceanic.
- 4.6 *Paragraph 9:* To amend the definition of Closing Working Capital to ensure that there is not double counting by making it clear that the debt created by delaying the pre-2011 price adjustments to the end of CP3 should not be included in the working capital calculation (and therefore subject to an allowance for finance costs) as the debt already includes financing costs. This relates to UKATS only.
- 4.7 *Paragraphs 9 and 13:* Removal of a typographical error in the calculation of the CAA's Assumed Defined Benefit Pension Contributions. This affects both UKATS and Oceanic.
- 4.8 *Paragraph 13:* Removal of typographical errors in the definitions of Backlog Adjustments to Depreciation, Defined Benefit Pension Contribution Variance and The CAA's Assumed Net Capex. This relates to Oceanic only.

- 4.9 *Paragraph 17:* To amend the Rolling Incentive Mechanism (RIM) Adjustment to make it clear that it is clear that O_{CAA} is in 2008/09 prices.
- 4.10 *Paragraph 18:* To the correct the Definition of Terms so that it properly refers to NERL's March 2010 business plan updated for exogenous factors.

Other amendments

- 4.11 NERL has highlighted two drafting anomalies in the licence. The CAA has reviewed NERL's suggestions and proposes to make the following amendments.
- 4.12 *Condition 21, Paragraph 12.* Two of the existing inequalities in condition 21 paragraph 12 do not work as intended in the CAA's decision. The purpose of the expressions was to apply the greater of the T2 or T3 penalties per day. However, since the penalty rates were defined as a negative value the inequalities are the wrong way round and as the current formulae stand the lesser of the T2 or T3 penalties would apply. The CAA hereby proposes to correct the text by adding Modulus signs around the relevant penalty rates as follows:

Existing

$$T2PenRate_t(T2_d)DailyFlights_d > T3PenRate_t(T3DailyScore_d)FFLIGHTS_t$$

$$T2PenRate_t(T2_d)DailyFlights_d \leq T3PenRate_t(T3DailyScore_d)FFLIGHTS_t$$

Proposed text

$$|T2PenRate_t|(T2_d)DailyFlights_d > |T3PenRate_t|(T3DailyScore_d)FFLIGHTS_t$$

$$|T2PenRate_t|(T2_d)DailyFlights_d \leq |T3PenRate_t|(T3DailyScore_d)FFLIGHTS_t$$

- 4.13 *Condition 21 Paragraph 12:* NERL has commented that the wording of paragraph 12 of Condition 21 is confusing. The CAA agrees that the wording can be improved to make the implementation of the paragraph clearer. The CAA is hereby proposing to make the changes in wording set out in the box below (including the changes to the inequalities discussed above).

Delete	Proposed
<p>The implicit penalty for the aggregate of the T2 score relating to equipment failure and T3 delay on the relevant day shall be no greater than whichever of these two measures would imply the greater penalty.</p> <p>In determining whether T2 or T3 apply to days meeting these conditions for relevant day d in year t the following test should apply:</p>	<p>The following mitigation should apply:</p>

And:

Delete	Proposed
<p>If: $T2PenRate_t(T2_d)DailyFlights_d >$ $T3PenRate_t(T3DailyScore_d)FFLIGHTS_t$ then: for day d, the T2 score for equipment failure should apply and the T3 score for the day shall be excluded from the calculation of the annual FT3_t penalty or bonus.</p> <p>If: $T2PenRate_t(T2_d)DailyFlights_d \leq$ $T3PenRate_t(T3DailyScore_d)FFLIGHTS_t$ then: for day d, the T3 score should apply and the T2 score relating to equipment failure shall be excluded from the calculation of the annual FT2_t penalty or bonus.</p>	<p>If: $T2PenRate_t (T2_d)DailyFlights_d >$ $T3PenRate_t (T3DailyScore_d)FFLIGHTS_t$ then: For day d, the T2 numerator for all NERL attributable cause codes shall be included in the annual FT2 penalty or bonus term, the T3 score shall be excluded from the calculation of the annual FT3_t penalty or bonus.</p> <p>If: $T2PenRate_t (T2_d)DailyFlights_d \leq$ $T3PenRate_t (T3DailyScore_d)FFLIGHTS_t$ then: for day d the T2 numerator for all NERL attributable technical cause codes shall be excluded from the annual FT2 penalty or bonus term; the T3 score shall be included in the annual FT3 penalty or bonus term.</p>