Supporting Material on Incentive Schemes for the 3rd Reference Period of the SES Performance Scheme[1]

[1]: COMMISSION IMPLEMENTING REGULATION (EU) 2019/317 of 11 February 2019 laying down a performance and charging scheme in the single European sky and repealing Implementing Regulations (EU) No 390/2013 and (EU) No 391/2013.

This document does not constitute interpretative legal guidance. Its purpose is to facilitate the RP3 performance plan development process at local level through technical guidance and recommendations. The information and views set out in this document are those of the author and do not necessarily reflect the official opinion of the European Commission.

1 Introduction

Article 11 of the Performance and Charging Implementing Regulation provides for mandatory financial incentives for *en route* and terminal capacity, and cost-efficiency (governed by ***Articles 27*** and ***28***, namely the Traffic risk sharing mechanism and Cost risk sharing mechanism respectively). The regulation also provides for optional additional key performance indicators and targets with financial incentives for environment or for the achievement of the additional performance targets referred to in ***Article 10(3)*** where these support performance improvements in these key performance areas. Due to its overriding nature, there is no incentive scheme for safety.

On a calendar year basis (year n), these incentives shall consist of financial advantages (herein referred to as bonuses) for exceeding and disadvantages (herein referred to as penalties) for underachieving target levels of performance and are to be added to or deducted from (carry-over in year n+2) as a percentage of variation of the determined costs determined costs of air navigation services, according to the level of actual performance achieved.

This note provides support to National Supervisory Authorities (NSAs) on the design and operation of the incentive mechanisms.

2 Mandatory incentive for *en route* and terminal capacity

The capacity key performance area (KPA) includes two key performance indicators (KPIs):

1. The average minutes of *en route* ATFM delay per flight attributable to air navigation services; and
2. The average minutes of arrival ATFM delay per flight attributable to terminal and airport air navigation services

Member States are required to adopt financial incentives for their air navigation service providers (ANSPs) for those KPIs. These incentives are herein noted I_1 and I_2 respectively.

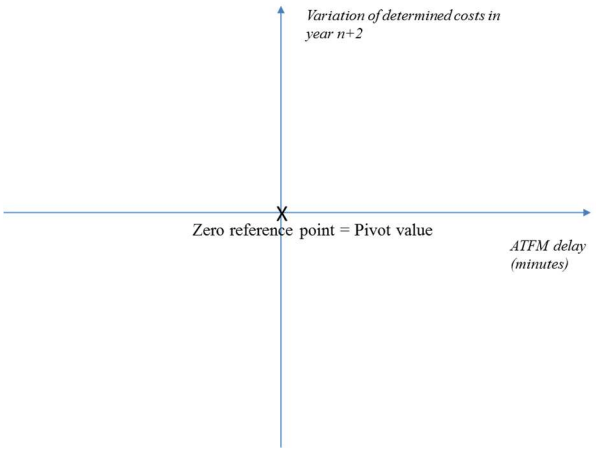
2.1 Key components of I_1 & I_2

2.1.1 Pivot value

The pivot value (***point (c) of Article 11(3)***) is the value engineering incentive provision. This is the value of the ATFM delay (*en route* or arrival) attributable to air navigation services (*en route* or terminal&airport) assigned to trigger the financial incentive effects.

As a convention, the pivot value is the '*zero reference point*', *i.e.* the point on a scale that denotes 'zero' and from which positive and negative readings can be made (centre of the coordinate system).

Figure 1: *'zero reference point': the Pivot value*



2.1.2 Modulation or not of the pivot value

Targets in the KPA of capacity can optionally be subject to modulation (***point (c) of Article 11(3)***) for variances in traffic (in the event of unexpectedly high or low levels of traffic) or to limit the scope of incentives to a sub-set of delay causes, thereby generating an equivalent level of performance to the KPI targets for I_1 and I_2.

Therefore, the pivot values are:

1. the performance targets set in the Performance Plan; or
2. modulated performance targets reflecting:
    a. those causes referred to as ATC capacity, ATC routing, ATC staffing, ATC equipment, airspace management and special event (C, R, S, T, M, P); and/or
    b. significant and unforeseen deviation between actual traffic evolution and original traffic forecast

Application of point 2 above leads to the three situations charted in **Figure 2**, **Figure 3** and **Figure 4** below:

Figure 2: *'zero reference point' = modulated capacity target reflecting C, R, S, T, M, P causes*

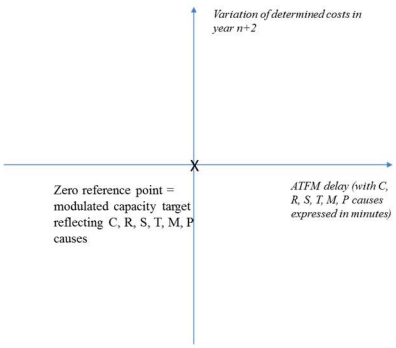


Figure 3: *'zero reference point' = modulated capacity target reflecting significant & unforeseen changes in traffic*

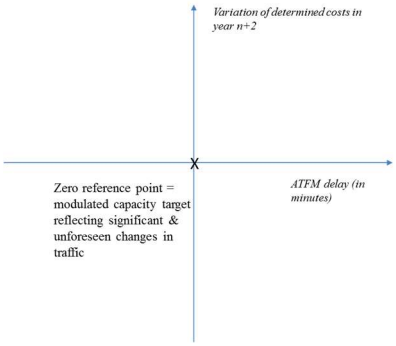
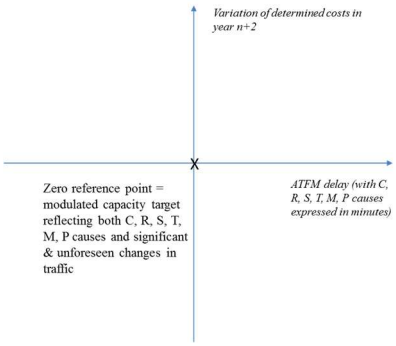


Figure 4: *'zero reference point' = modulated capacity target reflecting both C, R, S, T, M, P causes and significant & unforeseen changes in traffic*



Practicalities of a modulation regime should be considered where delay targets are close to zero.

The modulation mechanism shall be defined in the performance plan and shall apply for each year of the reference period and shall not be changed during the reference period.

2.1.2.1 Target levels of performance adjusted to cover only delay causes related to air traffic control (ATC) capacity, ATC routing, ATC staffing, ATC equipment, airspace management and special events

In specifying the related modulation mechanism of pivot values, the performance plan will provide an estimate of an equivalent level of performance - considering only those causes that can be attributable to the ANSP - that may consider:

a) Historical evolution of the ANSP attributable / non-ANSP attributable causes together with an independent and verifiable method of reconciling delay classification against actual events; and
b) A rationale of how this attribution will evolve over RP3 considering e.g. ATM system upgrade, improved social dialogue, etc.

The performance plans should clearly describe how their incentive schemes isolate CRSTMP related delays.

For avoidance of doubt, ANSP attributable refers to:

Table 1: *Delay causes subject to the incentive scheme (source: EUROCONTROL, Network Manager ATFCM Users Manual, Edition: 22.1, 14/11/2018)*

Regulation Cause	NM Code	Meaning	IATA Code	IATA Delay Causes
ATC Capacity	C	Demand exceeds capacity	81	ATFM due to ATC *en route* demand / capacity
ATC Routings	R	Network solutions / scenarios used to balance demand and capacity	81	ATFM due to ATC *en route* demand / capacity
ATC Staffing	S	Unplanned staff shortage reducing expected capacity	82	ATFM due to ATC staff / equipment *en route*
ATC Equipment	T	Reduction of expected or declared capacity due to the non-availability or degradation of equipment used to provide an ATC service.	82	ATFM due to ATC staff / equipment *en route*
Military	M	Reduction in declared or expected capacity following changes in airspace / route availability due to small scale military activity	82	ATFM due to ATC staff / equipment *en route*
Special Event	P	Reduction in planned, declared or expected capacity or when demand exceeds the above capacities as a result of a major sporting, governmental or social event. It may also be used for ATM system upgrades and transitions. Large multinational military exercises may also use this reason. This category should only be used with prior approval during the planning process.	82	ATFM due to ATC staff / equipment *en route*

2.1.2.2 Target levels of performance adjusted to cover significant and unforeseen variations of traffic

The traffic forecast ranges, in terms of *en route* service units and IFR movements, from low to high growth from the Statistics and Forecast Service (STATFOR) of EUROCONTROL are prepared in conditions of large changes in traffic routing and provides Member States with an aid to managing their own business risks. Uncertainties related to economic growth, geopolitical risks that may result in closures of airspace and variability in traffic flows, airspace capacity bottlenecks, and emerging markets are propagated in the forecast process.

However, outlooks always remain uncertain and often present a mix of upside and downside risks that, depending on their nature, do not always balance out and may present high variability in risk weights across the network. Unexpected events to the economy, competitive pressures for expansion of air carriers, future network structure and airlines' change of routes, are, by definition, extremely difficult to anticipate and plan around and may generate volatility going beyond the uncertainties delineated by the forecast ranges.

Where actual traffic has evolved very differently to the forecast, this leads to potential outcomes that are not a true reflection of the performance of the ANSP:

1. where traffic has grown significantly more than forecast, the ANSP may be unfairly penalised by delays being above target despite the ANSP delivering capacity at or even above what was planned;
2. in the reverse situation, the ANSP may be seen to deliver the target without delivering the planned capacity – thus benefiting unfairly in the capacity performance assessment.

This anomaly is addressed in the regulation by enabling national supervisory authorities, for the purpose of assessing capacity target achievement, to modulate the local capacity target in relation to extreme and unforeseen deviation between actual traffic evolution and original traffic forecast.

This modulation to reflect important volatility due to exogenous factors shall be based on:

- *with respect to I_1*: a known formula that is agreed at the same time as the targets and shall be informed by the reference value at the level of each air navigation service provider from the November release of year n-1 of the Network Operations Plan (NOP) of the Network Manager;
- *with respect to I2*: objective and transparent principles defined in the performance plan.

2.1.3 Dead-band

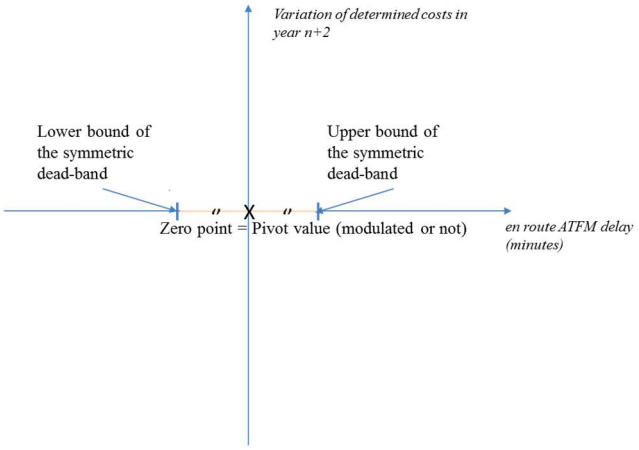
There shall be a symmetric range (***point (d) of Article 11(3))*** around the pivot value (modulated or not) to ensure that minor variations, herein noted Δ_{pv}, in ATFM delay around the pivot value do not lead to any bonuses or penalties. Δ_{pv}, expressed as a fraction of minutes of ATFM delay, is then used to set the lower and upper bounds of the dead-band as follows:

$$\begin{cases} lower\ bound_{dead-band} = pivot\ value - \Delta_{pv} \\ upper\ bound_{dead-band} = pivot\ value + \Delta_{pv} \end{cases}$$

Bonuses only start to be paid when the actual average ATFM delay per flight was less than the lower bound of the symmetric dead-band, and penalties when the actual delay was more than the upper-bound of the symmetric dead-band.

Actual ATFM delay performance has to be understood as actual ATFM delay considering the ATFM delay attribution process in particular with respect to possible traffic orientation schemes to off-load capacity constrained airspace.

Figure 5: *symmetric dead-band*



With the dead-band defined with the pivot value as its centre, and as regards I_1, for reference values in the interval between, say, 0.01 and 0.04 minutes of *en route* ATFM delay, the dead-band width may include non-existing negative values of ATFM delay. For the sake of compliance with *point (d) of Article 11(3)*, this will be considered as an appropriate tolerance interval in the assessment of the draft performance plans.

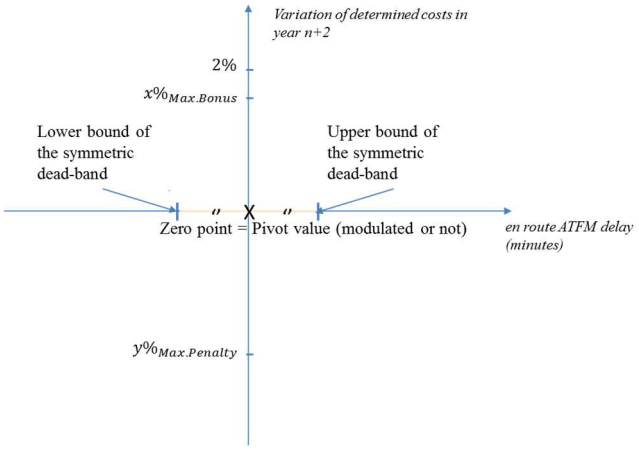
2.1.4 Maximum financial advantages and disadvantages

Financial advantages [resp. financial disadvantages] (***points (e) and (f) of Article 11(3)***) are calculated as a percentage of the determined costs of year n of the air navigation service providers concerned and recovered from [resp. reimbursed to] airspace users through an increase [resp. reduction] of the unit rate in year n+2.

The maximum percentages of bonuses and penalties are noted herein $x\%_{Max.Bonus}$ and $y\%_{Max.Penalty}$. They are defined as follows:

$$\begin{cases} x\%_{Max.Bonus} \leq 2\% \\ y\%_{Max.Penalty} \geq x\%_{Bonus} \end{cases}$$

Figure 6: *Maximum financial advantages and disadvantages*



The setting of the maximum percentage of bonuses and penalties should have material impact on revenue at risk (***point (a) of Article 11(3)***).

The rules related to the maximum percentages $x\%_{Max.Bonus}$ and $y\%_{Max.Penalty}$ apply individually to each of the incentives I_1 (determined costs for *en route* air navigation services) and I_2 (determined costs for terminal air navigation services) respectively, *i.e.*:

$$\begin{cases} x\%_{Max.Bonus_{I1}} \leq 2\% \\ x\%_{Max.Bonus_{I2}} \leq 2\% \\ y\%_{Max.Penalty_{I1}} \geq x\%_{Max.Bonus_{I1}} \\ y\%_{Max.Penalty_{I2}} \geq x\%_{Max.Bonus_{I2}} \end{cases}$$

2.1.5 Application of the maximum financial advantages and disadvantages

2.1.5.1 I_1: incentives on average en route ATFM delay per flight

The alert threshold referred to in ***point (b)(iii) of Article 9(4)*** defines the variation of the reference values as a result of the seasonal updates of the Network Operations Plan in comparison to the reference values from the latest version of the Network Operations Plan available at the time of drawing up the performance plan. Since the required capacity profiles and delay breakdown consider as an input the future traffic demand[1], differential traffic variation rates due to unforeseen traffic shifts will be considered in the required (or otherwise) update of the reference values.

This variation (Article 6(2) of the Implementing Decision setting the setting the Union-wide performance targets for RP3) is defined on the basis of the value of the reference value - $Ref.Value_{Latest\ NOP}$ - from the latest version of the NOP available at the time of drawing up the performance plan as follows:

[1] Capacity assessment and planning guidance document, EUROCONTROL NM, approved by the Network Management Board on 6 June 2013

$$\begin{cases} if\ Ref.Value_{Latest\ NOP} < 0.2'_{en\ route\ ATFM\ delay}, AlertThreshold_{\Delta Ref.Value} = 0.05'_{en\ route\ ATFM\ delay} \\ if\ Ref.Value_{Latest\ NOP} \geq 0.2', AlertThreshold_{\Delta Ref.Value} = 0.04' + Ref.Value_{Latest\ NOP} \times (1 + 5\%) \end{cases}$$

The symmetric range for the application of the maximum financial advantages and disadvantages is then defined by:

$$\begin{cases} lower\ bound_{Max.\ Bonus} = pivot\ value - AlertThreshold_{\Delta Ref.Value} \\ upper\ bound_{Max.\ Penalty} = pivot\ value + AlertThreshold_{\Delta Ref.Value} \end{cases}$$

Where the pivot value is close to zero, the assessment of the performance plan will duly consider the need for symmetry since, in this case, the resulting schemes should be penalty-only schemes.

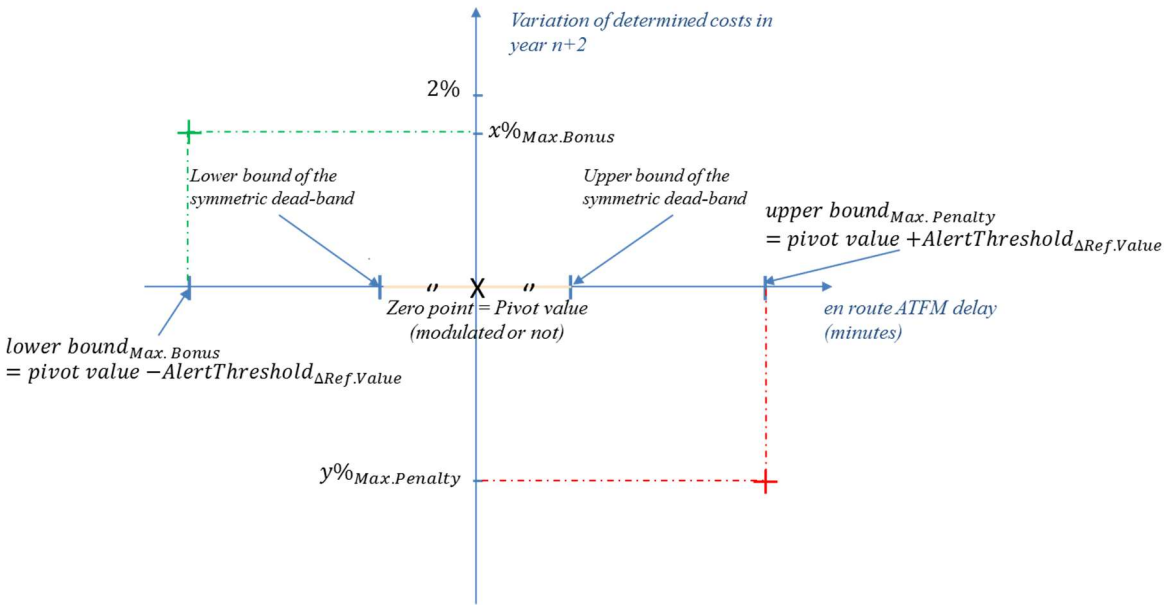
The maximum penalty applies when:

$$average\ en\ route\ ATFM\ delay_{year\ n} \geq upper\ bound_{Max.\ Penalty}$$

The maximum bonus applies when:

$$average\ en\ route\ ATFM\ delay_{year\ n} \leq lower\ bound_{Max.\ Bonus}$$

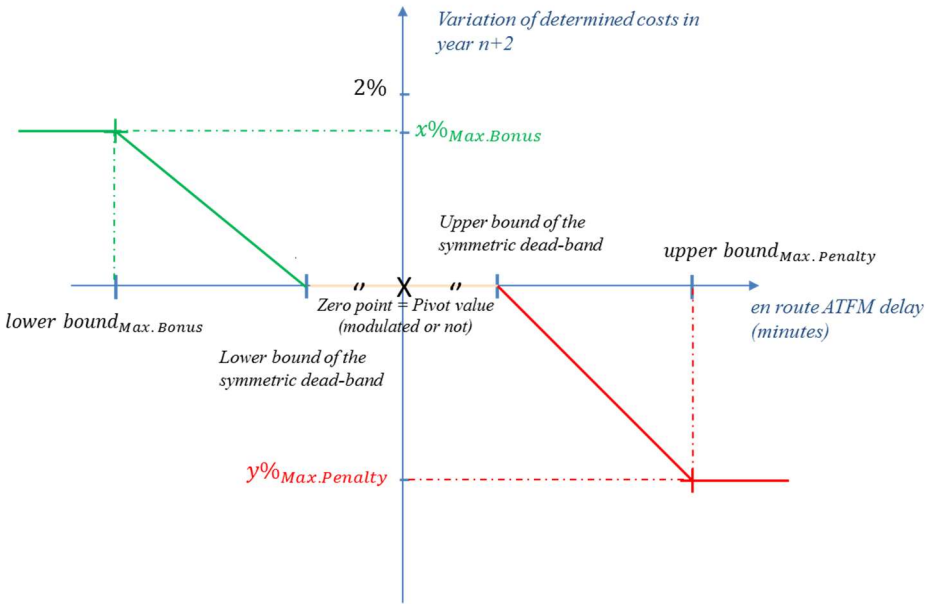
Figure 7: *Application of the maximum financial advantages and disadvantages*



The percentage of the determined costs shall follow a smooth sliding scale (linear) from the point of coordinates (abscissa: $lower\ bound_{dead-band}$; ordinate: 0) up to the point of coordinates (abscissa: $lower\ bound_{Max.\ Bonus}$; ordinate: $x\%_{Max.Bonus_{I_1}}$) as well as from the point of coordinates (abscissa: $upper\ bound_{dead-band}$; ordinate: 0) down to the point of coordinates (abscissa: $upper\ bound_{Max.\ Penalty}$; ordinate: $y\%_{Max.Penalty_{I_1}}$).

The linear progressions are then followed by a plateau as shown in **Figure 8** below.

Figure 8: *Structure of the incentive on average en route ATFM delay (I_1)*

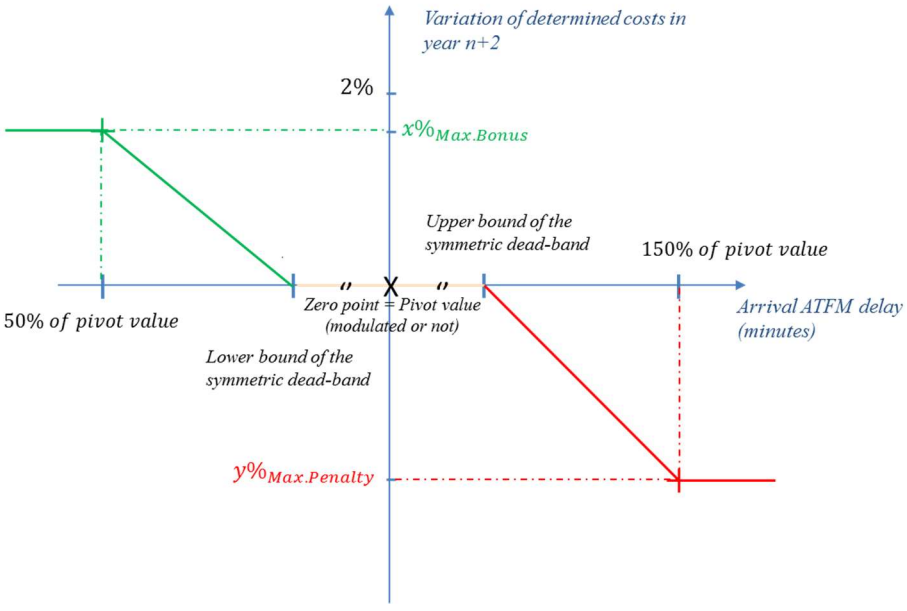


2.1.5.2 I_2: incentives on average arrival ATFM delay per flight

Similarly to I_1, there is a delineation of the incentives zone. With respect to I_2, the maximum penalty to be paid is where the arrival ATFM delay is at 150% and the maximum bonus at 50% of the pivot value. The percentage of the determined costs shall then follow a smooth sliding scale (linear) from the point of coordinates (abscissa: $lower\ bound_{dead-band}$; ordinate: 0) up to the point of coordinates (abscissa: 50% of the pivot value; ordinate: $x\%_{Max.Bonus_{I2}}$) as well as from the point of coordinates (abscissa: $upper\ bound_{dead-band}$; ordinate: 0) down to the point of coordinates (abscissa: 150% of the pivot value; ordinate: $y\%_{Max.Penalty_{I2}}$).

The linear progressions are then followed by a plateau as shown in **Figure 9** below.

Figure 9: *Structure of the incentive on average arrival ATFM delay (I_2)*



In cases where arrival ATFM delay targets are very close to or equal to zero, it is suggested to base the pivot value on a modulated performance target with the 0.00 min delay per flight within the deadband range.

2.1.6 Examples of application for I_1

For the sake of illustration only, sections 2.1.6.1 and 2.1.6.2 below provide the details of the design and operation of I_1 for two hypothetical States, referred to as "A" and "B" respectively.

2.1.6.1 State "A"

The calculation of performance is as for the KPI target for *en route* capacity, *i.e.* it covers all causes and not only be those causes listed as ATC capacity, ATC routing, ATC staffing, ATC equipment airspace management and special event.

Δ_{pv} is of 0.01 minutes of ATFM delay around the pivot value.

$AlertThreshold_{\Delta Ref.Value}$ is of 0.04 minutes of *en route* ATFM delay.

The maximum bonus and penalty under this incentive mechanism for State "A" are:

$$\begin{cases} x\%_{Max.Bonus_{I1}} = 1.0\% \\ y\%_{Max.Penalty_{I1}} = 1.5\% \end{cases}$$

"A" has decided that it is necessary and appropriate to make adjustment (modulation) to allow for variances in traffic as illustrated by the variation of the reference value in the seasonal updates of the NOP.

For the sake of simplicity, the reference values in the NOP determine the annual 'pivot values'.

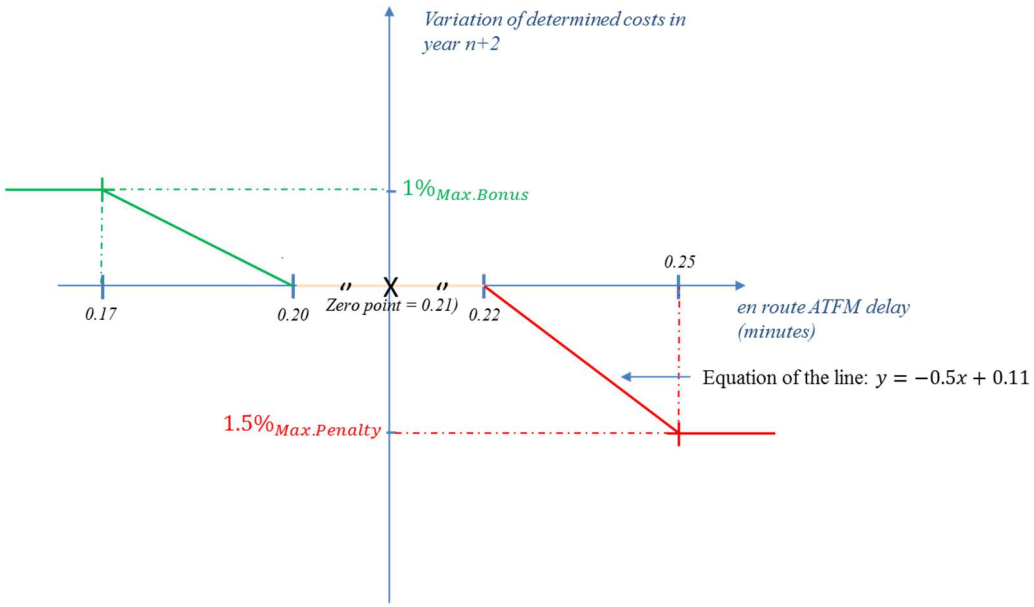
Table 2: State "A" en route capacity target and calculation of thresholds

(minutes of ATFM delay/flight)	2020	2021	2022	2023	2024
Reference values in the NOP[Note 1]	0.22	0.21	0.21	0.21	0.21
Targets in Performance Plan	0.22	0.21	0.21	0.21	0.21
Incentive I1 pivot value	0.22	0.21	0.21	0.21	0.21
Bonus threshold[Note 2]	0.21	0.20	0.20	0.20	0.20
Penalty threshold[Note 3]	0.23	0.22	0.22	0.22	0.22
Application of Max Bonus (≤)[Note 4]	0.18	0.17	0.17	0.17	0.17
Application of Max Penalty (≥)[Note 5]	0.26	0.25	0.25	0.25	0.25

Note 1: from the latest version of the Network Operations Plan available at the time of drawing up the performance plan
Note 2: $pivot\ value - \Delta_{pv}$
Note 3: $pivot\ value + \Delta_{pv}$
Note 4: $pivot\ value - AlertThreshold_{\Delta Ref.Value}$
Note 5: $pivot\ value + AlertThreshold_{\Delta Ref.Value}$

As an example, the year 2022 is considered (red rectangle above).

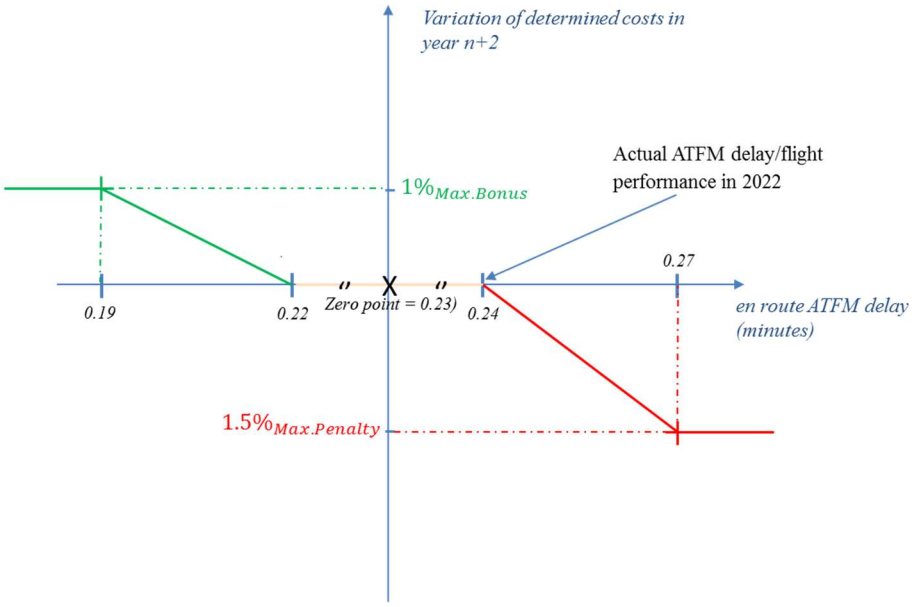
Figure 10: *Structure of the incentive on average en route ATFM delay (I_1) for State "A" as per the Performance Plan for 2022*



In 2022, the actual performance on average *en route* ATFM delay per flight was 0.24 but, due to an unforeseen upward variation in traffic patterns, the November 2021 release of the NOP led to an updated reference value at the level of the air navigation service provider of State "A" for year 2022 of 0.23. The national supervisory authority of State "A" has informed the Commission about the updated annual pivot values for all years $n_{n\geq 2022}$.

The updated structure of the incentive scheme for year 2022 becomes as per **Figure 11** below:

Figure 11: *Structure of the incentive on average en route ATFM delay (I_1) for State "A" for 2022 as a result of the $NOP_{Nov.\ 2021}$ update*



As per the structure of the incentive mechanism in the performance plan for State "A" of **Figure 10** above, the applied penalty in year 2024 (2022+2) would have led to a 1%[2] reduction of the unit rate in

[2] Equation of the line: $y = -0.5x + 0.11$

year 2024. With the modulation of the pivot value as per **Figure 11** above, the actual performance lies in the closed interval of the updated dead-band (upper bound).

2.1.6.2 State "B"

The calculation of performance is as for the KPI target for *en route* capacity, *i.e.* it covers all causes and not only be those causes listed as ATC capacity, ATC routing, ATC staffing, ATC equipment airspace management and special event.

Δ_{pv} is of 0.01 minutes of ATFM delay around the pivot value.

$AlertThreshold_{\Delta Ref.Value}$ is of 0.04 minutes of *en route* ATFM delay.

The maximum bonus and penalty under this incentive mechanism for State "B" are:

$$\begin{cases} x\%_{Max.Bonus_{I1}} = 1.0\% \\ y\%_{Max.Penalty_{I1}} = 1.0\% \end{cases}$$

"B" has decided that it is necessary and appropriate to make adjustment (modulation) to allow for variances in traffic as illustrated by the variation of the reference value in the seasonal updates of the NOP.

For the sake of simplicity, the reference values in the NOP determine the annual 'pivot values'.

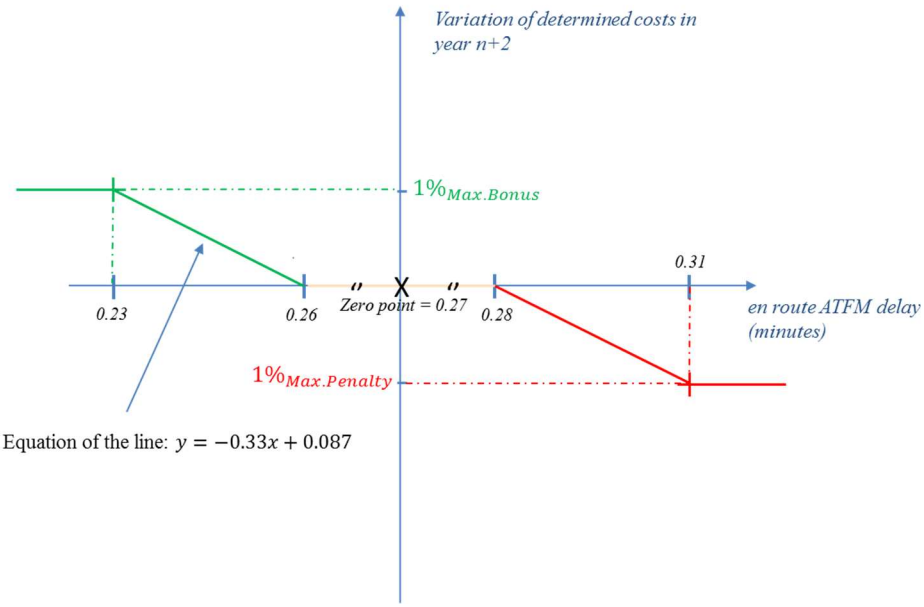
Table 3: State "B" en route capacity target and calculation of thresholds

(minutes of ATFM delay/flight)	2020	2021	2022	2023	2024
Reference values in the NOP	0.28	0.27	0.27	0.26	0.26
Targets in Performance Plan	0.28	0.27	0.27	0.26	0.26
Incentive I1 pivot value	0.28	0.27	0.27	0.26	0.26
Bonus threshold[Note 1]	0.27	0.26	0.26	0.25	0.25
Penalty threshold[Note2]	0.29	0.28	0.28	0.27	0.27
Application of Max Bonus (≤)[Note3]	0.24	0.23	0.23	0.22	0.22
Application of Max Penalty (≥)[Note4]	0.32	0.31	0.31	0.30	0.30

Note 1: $pivot\ value - \Delta_{pv}$
Note 2: $pivot\ value + \Delta_{pv}$
Note 3: $pivot\ value - AlertThreshold_{\Delta Ref.Value}$
Note 4: $pivot\ value + AlertThreshold_{\Delta Ref.Value}$

As an example, the year 2022 is considered (red rectangle above).

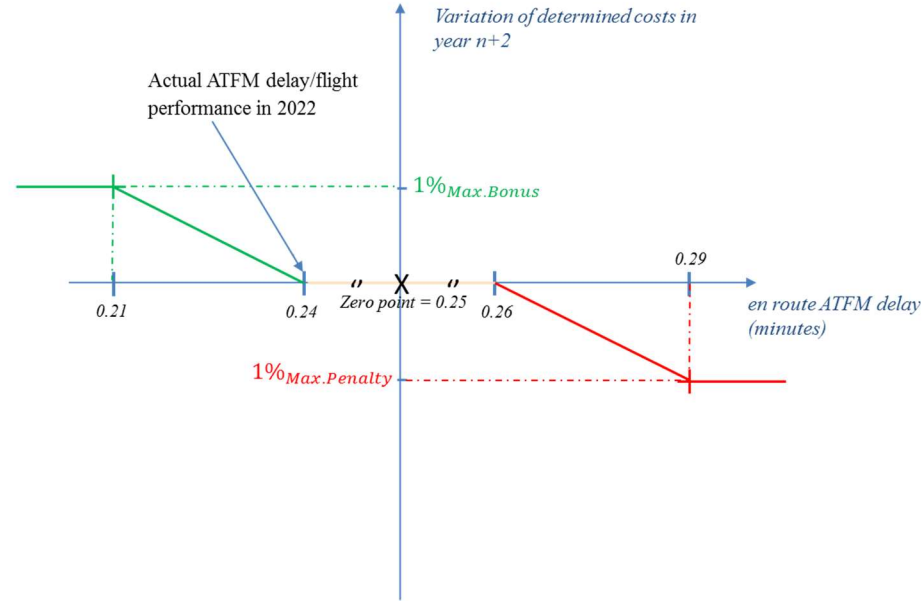
Figure 12: *Structure of the incentive on average en route ATFM delay (I_1) for State "B" as per the Performance Plan for 2022*



In 2022, the actual performance on average *en route* ATFM delay per flight was 0.24 but, due to an unforeseen downward variation in traffic patterns, the November 2021 release of the NOP led to an updated reference value at the level of the air navigation service provider of State "B" for year 2022 of 0.25. The national supervisory authority of State "B" has informed the Commission about the updated annual pivot values for all years $n_{n\geq 2022}$.

The updated structure of the incentive scheme for year 2022 becomes as per **Figure 13** below:

Figure 13: *Structure of the incentive on average en route ATFM delay (I_1) for State "B" for 2022 as a result of the $NOP_{Nov.\ 2021}$ update*



As per the structure of the incentive mechanism in the performance plan for State "B" of **Figure 12** above, the applied bonus in year 2024 (2022+2) would have led to a 0.7%[3] increase of the unit rate in year 2024. With the modulation of the pivot value as per **Figure 11** above, the actual performance lies in the closed interval of the updated dead-band (lower bound).

2.2 Additional elements for I_1 where the performance plan is at FAB level

For the sake of completeness, the text below reproduces the content of ***point (g) of Article 11(3)*** and elaborates the concept of '*sameness*' of the incentive mechanisms for the different air navigation service providers for the key performance area of *en route* capacity.

Where the performance plan is established at functional airspace block level, the following provisions applies.

(i) the national supervisory authorities concerned shall break down the FAB performance target related to the average minutes of *en route* ATFM delay at the level of each individual air navigation service provider concerned, for the purpose of setting incentives at national level. The resulting values shall form the basis for pivot values referred to in **section 2.1.1**;

(ii) the national supervisory authorities concerned shall apply the same incentive scheme, in a consistent manner to all air navigation service providers concerned;

(iii) pivot values for the functional airspace block shall also be used in addition to pivot values at the level of each individual air navigation service provider referred to in in **section 2.1.1**, and shall be based either:

→ on the performance targets at functional airspace block level; or

→ on modulated performance targets at functional airspace block level in accordance with **section 2.1.2**;

(iv) all national supervisory authorities concerned shall jointly decide on whether the pivot values at the level of each individual air navigation service provider and functional airspace block level are to be modulated or not. This decision shall apply in a uniform manner to all pivot values at the level of each individual air navigation service provider and functional airspace block level, for the entire duration of the reference period;

(v) where performance targets at national and functional airspace block level are to be modulated, the same modulation mechanism shall apply to performance targets at national level and functional airspace block level;

(vi) where the total *en route* ATFM delay per flight in year n at the functional airspace block level is higher than the pivot value set for year n and beyond the dead-band (see **section 2.1.3**), bonuses do not apply and penalties apply only to those air navigation service providers for which the actual ATFM delay per flight in year n is higher than the pivot value set for year n and has exceeded the dead-band in the upward direction.

(vii) where the total *en route* ATFM delay per flight in year n at the functional airspace block level is lower than the pivot value set for year n and beyond the dead-band, penalties do not apply and bonuses apply only to those air navigation service providers for which the actual ATFM delay per flight in year n is lower than the pivot value set for year n and has exceeded the dead-band in the downward direction.

With the conjoint reading of (ii), (iv) and (v) above, *sameness* of the incentive schemes for the related air navigation service providers mean:

[3] Equation of the line: $y = -0.33x + 0.0.87$

Table 4: Sameness of incentive schemes

Sameness of incentives (I_1)	Common to all air navigation service providers	Individually set
Decision to modulate the pivot value	☑	
Modulation formula	☑	
$x\%_{Max.Bonus_{I1}}$	☑	
$y\%_{Max.Penalty_{I1}}$	☑	
Δ_{pv}		☑
$AlertThreshold_{\Delta Ref.Value}$		☑ *in accordance with point (b)(iii) of Article 4 and Commission Implementing Decision setting the Union-wide performance targets and alert thresholds for the third reference period*

3 Optional incentives

The regulation provides for additional incentives as long as these encourage air navigation service providers to achieve a high level of performance and meet the associated targets. Such mechanisms should be tailored to local circumstances and focus on performance metrics reflecting specific problems in local airspace.

The issues may vary significantly between ANSPs, but could include:

1. first rotation delays, arising during the morning peak, and having substantial knock-on effects, leading to the accumulation of reactionary delay through the day and preventing airspace users from recovering their original schedules;
2. Long delays, in excess of 15 minutes
   1. and 2. just above may be masked by delay-based metrics calculated as annual averages.
3. proxy indicators for fuel inefficiencies
4. etc.

The **maximum aggregated bonus** for optional incentives mechanisms, $I_{n,\ n\geq 3}$, applied in addition to and independently from I_1 and I_2, sums to 2% and the **maximum aggregated penalty** sums to 4% of the determined costs, *i.e.*:

$$\begin{cases} \sum_{i=3}^{n} x\%_{Max.Bonus_{I_i}} \leq 2\% \\ \sum_{i=3}^{n} y\%_{Max.Penalty_{I_i}} \leq 4\% \end{cases}$$

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