

EUROPEAN ORGANISATION FOR THE SAFETY OF AIR NAVIGATION

**EUROCONTROL**



**SUMMARY OF RESPONSES (SOR)  
DOCUMENT FOR THE**

***Draft EUROCONTROL Specification for ATM  
Surveillance System Performance***  
*Formal Consultation 13 September – 18 November 2011*

## DOCUMENT CONTROL

### DOCUMENT CHANGE RECORD

The following table records the complete history of the successive editions of the present document.

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# **1 INTRODUCTION**

## **1.1 GENERAL**

The draft EUROCONTROL Specification for the ATM Surveillance System Performance (ESASSP) has been developed as a result of a request from the former Surveillance Team in order to formulate in a technology independent way and to further develop the requirements specified in the EUROCONTROL Standard Document for Radar Surveillance in En-route Airspace and Major Terminal Areas dating from 1997.

The EUROCONTROL Surveillance Team (SUR T) agreed at the end of 2005 to a development process of bilateral coordination with Member States and created the Surveillance Standard Task Force (SSTF) to undertake the task and limited its scope to the provision of 3 and 5 NM horizontal separation services. This task has been performed in close coordination with the development of the draft Surveillance Performance and Interoperability Implementing Rule for which EUROCONTROL received a mandate in February 2006. The final deliverable of this mandate was provided in July 2010 and the rule has been published in the Official Journal of the European Union on 23/11/2011 as COMMISSION IMPLEMENTING REGULATION (EU) No 1207/2011 of 22 November 2011 laying down requirements for the performance and the interoperability of surveillance for the single European sky.

## **1.2 SCOPE OF CONSULTATION**

As required by the EUROCONTROL Regulatory and Advisory Framework (ERAF), the draft Specification was circulated for comment between 13 September and 18 November 2011 using the EUROCONTROL Notice of Proposed Rule-Making (ENPRM) mechanism for formal consultation. The formal consultation allows all States, Stakeholders and interested parties to express their formal views on the draft EUROCONTROL Specification.

The consultation documentation comprised the draft Specification and a Consultation Response Sheet. In the Response Sheet, the addressees were asked to express their formal view on the draft Specification. Copies were sent directly to the following:

- Civil and Military regulatory authorities and key ATS providers of each EUROCONTROL Member State;
- Regulatory authorities of States' observers at the Provisional Council;
- EC, ECAC, FAA, ICAO, JAA, NATO;
- International Organisations having observer status at the Provisional Council;
- Key trade and professional associations having observer status at the Provisional Council;
- Chairmen of the following bodies:
  - ANSB (copy Secretary of ANSB);
  - CMIC (copy Secretary of CMIC and Head of DCMAC);
  - PRC (copy Secretary of PRC and Head of PRU);
  - SRC (copy Secretary of SRU);

The documentation was also made available through existing working arrangements and to members of the public via the ENPRM web site.

### **1.3 PURPOSE AND STRUCTURE OF DOCUMENT**

The purpose of this Summary of Responses (SOR) document is to provide a consolidation of the main comments received as part of the formal consultation activity, as well as to provide EUROCONTROL's responses to, and disposal of, those comments. This SOR is available on the EUROCONTROL website for information. All the comments made during this consultation have been addressed and their respective responses are reflected in the first released issue of the ESASSP.

The responses section (Section 2) of the document is structured as follows:

- General Response – providing a general analysis of the comments received;
- Consolidated Comments and Responses – summarising the comments made and providing the associated responses.

Two annexes are provided with the document as follows:

- Annex A contains a list of those Stakeholders that provided comments on the draft Specification;
- Annex B provides a table containing all of the comments provided by Stakeholders, the proposed 'disposal' by EUROCONTROL and cross-references to the responses within the main body of the document.

## 2 OUTCOME OF FORMAL CONSULTATION

### 2.1 GENERAL RESPONSE

#### 2.1.1 Review of Comments

The review of comments was carried out by the SSTF at its last meeting in December 2011.

#### 2.1.2 Overall Response

A total of 19 Stakeholders responded to the consultation. The largest sector represented was the Air navigation Service Providers (ANSP); the other represented sectors were regulators (CAA/NSA), military organisations and industry. The 19 Stakeholders provided a total of 137 separate comments.

A majority of the Stakeholders who responded felt that the draft EUROCONTROL Specification for ATM Surveillance System performance was acceptable and provided some amendments to further improve it. A third of the stakeholders felt that the draft ESASSP was not acceptable but would be acceptable with amendments. Eventually one stakeholder stated that the specification was not acceptable under any circumstances.

The number of responses from each category of Stakeholder is shown in the table below.

Response category Stakeholder type	A	B	C	D	Responses received per stakeholder type
ANSP	2	4	4	0	10
CAA/NSA	2	1	1	1	5
Industry	0	0	2	0	2
Military	0	2	0	0	2
Responses received per category	4	7	7	1	19

Legend:

A = Acceptable without amendment

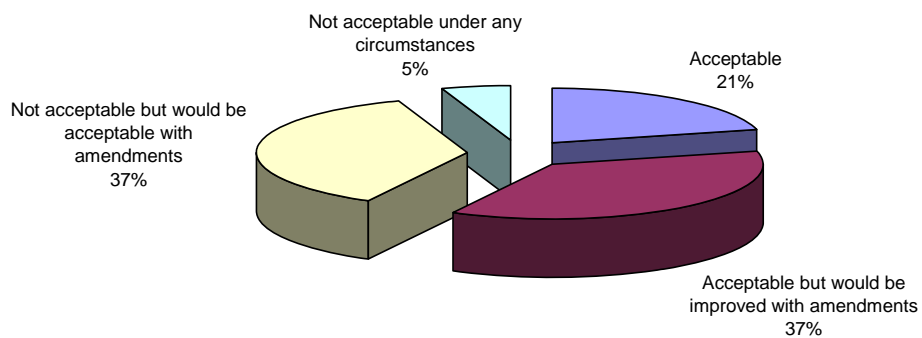
B = Acceptable but would be improved with amendments

C = Not acceptable but would be acceptable with amendments

D = Not acceptable under any circumstances

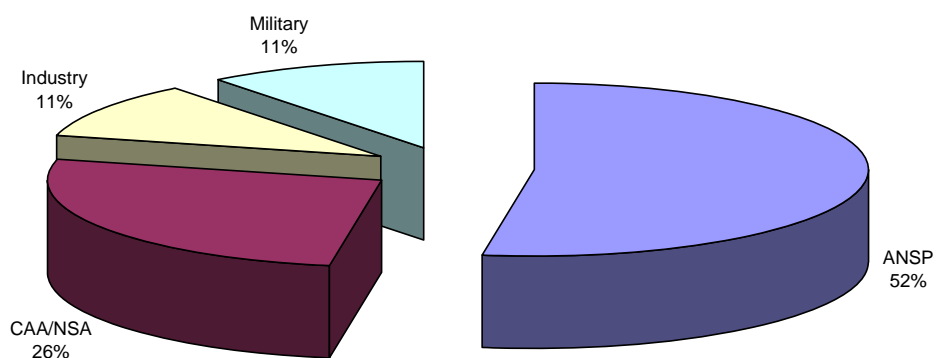
The distribution of the Stakeholders that submitted comments during the consultation period is shown in the chart below.

Responses received per category

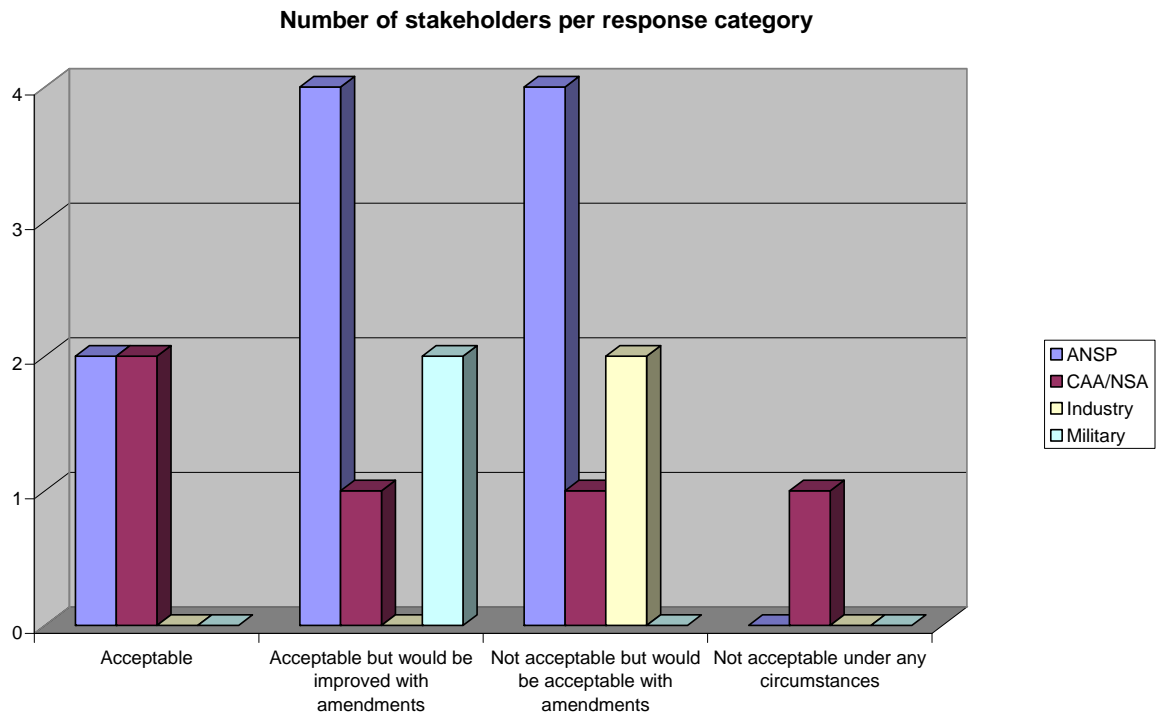


The breakdown of the overall general responses about the draft Specification is shown in the chart below.

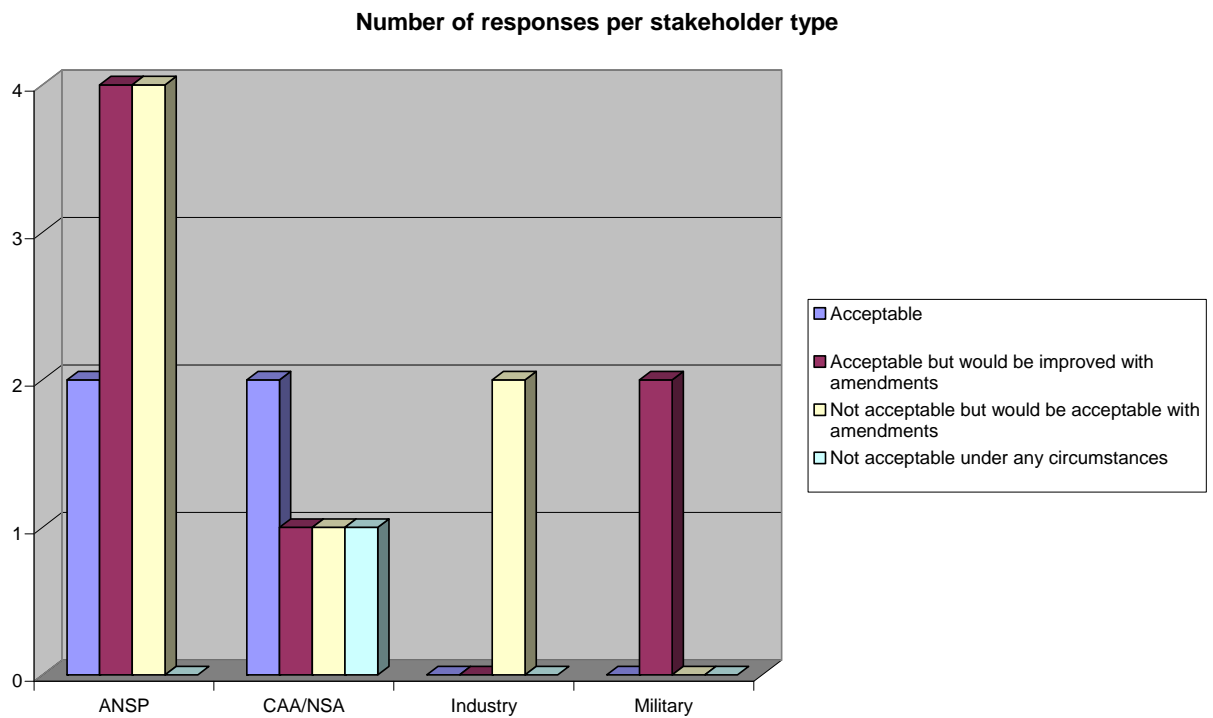
Responses received per stakeholder type



The detailed breakdown per stakeholder type of the overall general responses about the draft Specification is shown in the chart below.



The detailed breakdown per overall general response of the stakeholder type responses about the draft Specification is shown in the chart below.





## **2.2 CONSOLIDATED RESPONSES**

### **2.2.1 Introduction**

This section summarises the main issues arising from the consultation on the contents of the draft Specification. Other comments, including those of a supportive nature, those correcting minor spelling or grammatical errors, those outside of the scope of the draft Specification and/or those not requiring a response have not been included for the sake of brevity. However, all comments submitted are included verbatim in the table at Annex B with their corresponding response.

### **2.2.2 Status of this document with respect to COMMISSION IMPLEMENTING REGULATION (EU) No 1207/2011 of 22 November 2011**

#### **2.2.2.1 Comment**

Some stakeholders misinterpreted this document and considered it as a formal Community Specification (CS) against some provisions of COMMISSION IMPLEMENTING REGULATION (EU) No 1207/2011 of 22 November 2011 (SPI) laying down requirements for the performance and the interoperability of surveillance for the single European sky.

#### **2.2.2.2 Response**

The document was neither presented as, nor intended, to become a CS, outside the normal development cycle of a CS. It has been developed as a EUROCONTROL Specification in the context of ERAF, in accordance with the ENPRM processes. As a EUROCONTROL technical document, it may be used by any interested stakeholder (ANSP) in the process of achieving compliance with the applicable provisions of SPI, as the content of the specification is fully aligned and consistent with the SPI requirements. However it should be noted that as the document is not a CS, it will not provide automatic presumption of conformity with the SPI requirements, therefore the implementers will have to be able to prove the compliance of their implementation solutions with the provisions of SPI.

### **2.2.3 Needs for addressing other applications**

#### **2.2.3.1 Comment**

Several stakeholders noted that this specification addressing the requirements to support 3 and 5 NM needs to be supplemented in order to support other separation minima (2.5 and 10 NM for instance) and other type of surveillance applications (flight path monitoring on parallel ILS approaches for instance).

#### **2.2.3.2 Response**

It was reminded that the terms of reference of the SSTF were limited to the 3 and 5 NM horizontal separation applications which were deemed the most common and demanding applications. Should there be identified common needs to develop similar specifications for supporting other surveillance applications; this will have to be addressed at the appropriate EUROCONTROL steering body (e.g. the future CNS Team that will meet in Spring 2012).

## **2.2.4 Availability of suitable conformity assessment tool**

### **2.2.4.1 Comment**

Several stakeholders noted that the availability of appropriate conformity assessment tool is a key enabler to allow a widespread implementation of that specification and that for the time being there is not yet such a tool available.

### **2.2.4.2 Response**

The conformity assessment methods associated to the performance requirements specified in the ESASSP are detailed within the ESASSP allowing any body to develop suitable conformity assessment tool.

Although the development of an associated conformity assessment tool was not part of the mandate of the SSTF, some activities have been conducted to make sure of the feasibility of suitable conformity assessment tool. A specific SASS-C prototype, containing the appropriate functionality, has been developed to this end.

Stakeholders are invited to report to the SASS-C development steering body on the urgency to implement that functionality within the SASS-C baseline so as to facilitate the implementation of this specification.

## **2.2.5 Applicability of non-cooperative surveillance to provide 3 or 5 NM horizontal separation**

### **2.2.5.1 Comment**

One stakeholder raised the question if non cooperative can be used as a sole means of surveillance to provide 3 or 5 NM horizontal separation or if it can only be used on top of cooperative surveillance to address the possible case of transponder failure.

### **2.2.5.2 Response**

In § 2.4 of the ESASSP it is recommended to implement whenever possible cooperative surveillance system. It is also recognised that non cooperative surveillance system can be and is used as the sole means of surveillance to provide 3 or 5 NM horizontal separation but this should be limited to low traffic density area. In any case, the surveillance system will have to be subject to a safety assessment.

## **2.2.6 Performance requirements vs. safety requirements**

### **2.2.6.1 Comment**

A stakeholder spotted that the status of the document from a safety perspective is not well defined.

### **2.2.6.2 Response**

It was agreed that the requirements specified in this document are minimum performance requirements corresponding to the cases where there is no failure in any of the components of the system and where there is no mismatch with the system design assumptions (e.g. traffic higher than system capacity). The other cases must be addressed by a local surveillance system safety assessment from which specific surveillance system safety requirements will be defined.

## **2.2.7 Respective status of mandatory and recommended requirements**

### **2.2.7.1 Comment**

Some stakeholders pointed out that the coexistence within the same document of mandatory and recommended performance requirements may prove to be problematic in the practical implementation of that specification.

### **2.2.7.2 Response**

Recommended requirements are useful to provide an indication on the performance that may need to be improved in the future.

Moreover it is common practice for specifications to specifically identify the requirements of which the implementation is mandatory to claim compliance with the specification and to differentiate them from the requirements which are optional or recommended. It should also be noted that the specification itself is non-mandatory and has a voluntary status.

Therefore the “mandatory” requirements are mandatory only to those stakeholders which have chosen to implement the specification.

## **2.2.8 Separation between normative elements and informative elements contained in the specification**

### **2.2.8.1 Comment**

One stakeholder noted that Annex D and E are providing informative elements and do not contain normative elements and could be removed from the ESASSP.

### **2.2.8.2 Response**

The SSTF agreed that these annexes were informative; however the information therein was deemed useful. It was agreed to transform these informative annexes into appendices and to regroup them under a second volume of the ESASSP containing all the informative elements.

## **2.2.9 Compatibility of this document with other documents (e.g. ICAO documents)**

### **2.2.9.1 Comment**

One stakeholder required clarifications if there are differences and/or conflicting information between this document and ICAO documents within the same area.

### **2.2.9.2 Response**

This document is consistent with recommendations provided in ICAO Doc 9924.

ICAO Doc 8071 Volume III is also a guidance material which is specific and limited to radar sensor. It is also dated 1998 and is becoming obsolete.

The ESASSP is a voluntary specification. It is consistent with current ICAO standards. It may be adapted if there are contradictions with local regulatory provisions.

## **2.2.10 Scope of the surveillance system**

### **2.2.10.1 Comment**

Some stakeholders highlighted that some contradictory statements were present in the draft specification as whether or not the display system is included in the scope of the surveillance system.

### **2.2.10.2 Response**

It was agreed that the scope of surveillance system performance assessment is end-to-end, i.e. up to where the service is provided, however from a performance measurement perspective it may not be feasible to do so.

Therefore following text for § 4.15 (Conformity assessment measurement point) has been agreed:

The performance shall be assessed at the point where surveillance data is used to provide the service (e.g. 3 or 5 NM horizontal separation).

In practice, performance shall be measured at a point where surveillance data can be recorded in a digitised way and which is as close as possible of where the service is delivered.

If a data processing stage is located in between that recording point and the point where the service is delivered, an analysis shall be performed to determine the contribution of this processing stage to the surveillance system end-to-end performance.

Should the provider of the 3/5 NM horizontal separation not be the provider of the surveillance data used to support the service, it is up to the separation service provider to derive the performance of the provided surveillance data in order to meet the requirements described in this document and provided that he has chosen to apply the present specification.

## **2.2.11 Allocation of performance to the airborne and ground sub-systems**

### **2.2.11.1 Comment**

One stakeholder noted that it would be easier if the requirements were well separated for the airborne and the ground sub-systems.

### **2.2.11.2 Response**

The performance and capability requirements of the airborne sub-system are already defined in Commission Implementing Regulation (EU) No 1207/2011 of 22 November 2011 Article 5 and Annex II and will be further refined in the forthcoming EASA ACNS Certification Specification.

The current draft specifies, in general, the total surveillance system performance requirements assuming the airborne sub-system (i.e. the SSR transponder and its interfaces) is functioning as required. This assumption is clearly stated in the corresponding OSED.

In accordance with the comments referred to in § 2.2.16, in some cases it has been agreed to limit the requirements specified in the document to the ground sub-system performance only.

### **2.2.12 Responsibilities of the different bodies involved in the provision of the separation service**

#### **2.2.12.1 Comment**

One stakeholder noted that depending on the surveillance system architecture different bodies/providers may be involved in the performance of the surveillance data used to provide a separation service, as an example:

- Aircraft operator for the downlink of aircraft data (e.g. pressure altitude)
- Surveillance data provider operating Mode S ground sensors
- Communication service provider ensuring communications between the ground sensors and the ATC centre
- Separation service provider operating the ATC centre

In that case it is not easy to define the respective responsibilities of the different parties involved.

#### **2.2.12.2 Response**

The surveillance system performance shall be measured on the last digital interface before the point where the service is provided. Detected issues shall be investigated and solved with the authorities (sub-service providers) responsible of the equipment being the source of the problem. For example with the aircraft operator should the problem come from the aircraft.

The ESASSP is a technical document that does not address the responsibility and liability of the implementers.

### **2.2.13 Performance requirements per flight vs. global**

#### **2.2.13.1 Comment**

It was noted that there is no clear rationale as whether performance requirements are specified per flights and/or globally for all flights.

#### **2.2.13.2 Response**

It was agreed that the separation service being provided to individual flights, the requirements should, in principle, be specified per flight.

In addition, surveillance performance is becoming more and more dependent upon aircraft function.

It was agreed to provide an explanation for the requirements which are not explicitly specified per flight.

### **2.2.14 Requirements on 100 % of the flights or of the cases**

#### **2.2.14.1 Comment**

A number of stakeholders noted that in practice it may happen that certain flights or cases show a performance below the corresponding requirement; this concerns requirements 5N\_C-R2/4/9/12/13 and 3N\_C-R2/4/9/12/13.

#### **2.2.14.2 Response**

It is recognised that such cases may happen under specific circumstances; however their frequency of occurrence should be very remote and risk mitigation/reduction measures should be defined to further decrease their impact.

This has been reflected in the individual specification statements (R2/4/12/13) and each of these requirements is related to a new requirement (5N\_C-R22 and 3N\_C-R22) to investigate these flights/cases, to conduct an impact assessment and to introduce appropriate risk mitigation/reduction measures if necessary.

For R9 (maximum data age of pressure altitude) it has been agreed by the SSTF to reword the requirement as follows: "Any forwarded pressure altitude data item with an age greater than or equal to 16 s shall be considered as not available when assessing R3, R7, R8 and R10". This will be compatible with system where too old pressure altitude data item are provided but are filtered later on.

#### **2.2.15 Scope of the flights being subject of conformity assessment**

##### **2.2.15.1 Comment**

Several ANSP's noted that in airspace class D or E although separation service is not provided to VFR flights (not necessarily equipped with SSR transponder) they require from their surveillance system the same level of performance on these VFR flights as on the IFR flights to which a separation service is provided and which are equipped with an SSR transponder. Therefore they argue that the conformity assessment should not be limited to the flights to which a separation service is provided.

##### **2.2.15.2 Response**

As the approach adopted by these stakeholders is not applied by all ANSP's it was agreed not to modify the specification with respect to this comment. Nevertheless ANSP's may decide to extend the scope of application of this specification, e.g. to apply the same performance requirements to flight to which a traffic advisory service is provided.

#### **2.2.16 Difficulties to achieve and assess 5N/3N\_C-R12/13**

##### **2.2.16.1 Comment**

In the current way R12 and R13 delays are specified they encompass an airborne delay which is difficult to assess precisely, several stakeholders noted that it may be difficult to reliably measure these delays and they would prefer another approach where only delays at the ground system are concerned.

##### **2.2.16.2 Response**

It was agreed that the approach described in the draft ESASSP could be difficult to implement in practice, therefore it has been agreed to define the start time of these delays as events well identifiable at the level of the ground system:

- First report at sensor level containing the warning indicator/SPI report for R12
- Second report at sensor level containing the new aircraft identity for R13

### **2.2.17 Performance criteria for accuracy requirements**

#### **2.2.17.1 Comment**

It was noted that performance requirements on horizontal position and speed accuracy are specified in terms of maximum RMS value of the error whereas the recent ADS-B performance requirement specifications are based on 95% containment values. Therefore the different approaches make difficult the conversion from one approach to the other.

#### **2.2.17.2 Response**

It is recognised that there are several approaches to specify accuracy requirements and it is not always straightforward to convert the requirements defined using one approach in requirements in accordance with another approach. The selection of the approach has been thoroughly discussed and the agreement made by the drafting group of the specification was to use the RMS approach.

In appendix IV of the document (Annex F of the draft document) there is an approach to convert the ADS-B 95% containment value into RMS for the horizontal position accuracy assuming a specific error distribution model (i.e. Rayleigh distribution). For velocity accuracy it has not been possible to develop a similar simple conversion approach as the requirements in the ESASSP are sub-divided in a velocity module accuracy requirement and a velocity angle accuracy requirement.

It should be noted that the 95% containment value may have some drawbacks where all the cases could be mainly located just below the specified containment value. The RMS approach which takes into account both the systematic error component and the random error component ensure that the errors are more constrained to low values.

### **2.2.18 Vertical separation**

#### **2.2.18.1 Comment**

One stakeholder asked if it was necessary to address 500 ft vertical separation in this specification.

#### **2.2.18.2 Response**

In the mean time we clarified that 500 ft vertical separation is not applied for standard operations. It may be applied for a temporary period of time in case of a transition between radar separation and procedural separation.

### **2.2.19 Standard MTBCF figure of single sensor system**

#### **2.2.19.1 Comment**

One stakeholder noted that standard single sensor system MTBCF performance figure is in the region of 10.000/20.000 hours which is less than the recommended requirements of 40.000 hours of the draft ESASSP.

#### **2.2.19.2 Response**

It was reminded that the EUROCONTROL Standard Document for Radar Surveillance in En-route Airspace and Major Terminal Areas requires double SSR coverage for en-route airspace and major TMA (i.e. to provide respectively 5 and 3 NM horizontal separation) which provides an MTBCF greater than 40.000 hours assuming that both SSR have 10.000/20.000 hours MTBCF.

It was agreed to keep the recommendation of an MTBCF of 40.000 hours.

#### **2.2.20 Definition of cooperative false target reports and false tracks**

##### **2.2.20.1 Comment**

One stakeholder suggested that the criteria for the definition of cooperative false target reports and false tracks were too stringent with respect to the aircraft identity data item. It was suggested to remove the criteria on the presence of aircraft identity data item for false cooperative target report and the criteria on consistent aircraft identity for false tracks.

##### **2.2.20.2 Response**

The SSTF stated that if the criterion on aircraft identity is removed then non cooperative target reports may be considered as false and there is not yet an agreed criterion for false non cooperative target reports.

The SSTF stated that if the identity of track is not stable it is a less credible false track which is of less concerns.

The specification has a voluntary status; therefore one may decide to apply more demanding specifications for specific aspects.

#### **2.2.21 Request to define a maximum probability of occurrence of horizontal outliers**

##### **2.2.21.1 Comment**

One stakeholder noted that there is no requirement on the probability of occurrence of horizontal position outlier.

##### **2.2.21.2 Response**

There is no explicit requirement on the probability of occurrence of horizontal position outliers, however as these target reports are considered as false cooperative target reports they will be indirectly limited by the requirements on false target reports and false tracks.

#### **2.2.22 Requirements on horizontal position and requirements on vertical position are not homogeneous**

##### **2.2.22.1 Comment**

Stakeholders noted that there are fewer requirements applicable to vertical position data item than on horizontal position data item.

##### **2.2.22.2 Response**

The table mapping the different requirements to the different qualities of service has been updated.

It includes a new note to explain that although there is no direct requirement on vertical position correlated error the requirement on pressure altitude correctness will partly address the problem in case of correlated error due to the ground sub-system. Correlated error on vertical position due to the airborne sub-system cannot be detected by a surveillance system; specific systems like height monitoring units should be put in place to address those cases.



Another new note explains that the time consistency of vertical position is partly addressed by the requirement on the average and maximum age of this data item.

## **ANNEXES**

### **ANNEX A**

Annex A contains a list of those Stakeholders that provided comments on the 'Draft EUROCONTROL Specification for ATM Surveillance System Performance' formal consultation.

### **ANNEX B**

Annex B provides a table containing all the comments provided by Stakeholders. The table cross-refers the comments with the associated sections of the SOR and shows the 'Disposal' of each comment, i.e. 'Accepted', 'Partially Accepted', 'Rejected' or 'Noted'.