European Aviation Safety Agency

Comment-Response Document 2015-04

Technical and operational requirements for remote tower operations

CRD TO NPA 2015-04 — RMT.0624 — 3.7.2015
Related Decisions: 2015/014/R and 2015/015/R

EXECUTIVE SUMMARY

This Comment-Response Document (CRD) contains the comments received on NPA 2015-04 (published on 23 March 2015) and the responses provided thereto by EASA.

During the NPA public consultation, EASA received 446 comments from 32 commentators representing competent authorities, ATS providers, staff representatives, individuals and others (e.g. airport associations, industry). Out of the 446 comments received, 218 (approximately 50 %) have been accepted or partially accepted, while 133 (only 30 %) have not been accepted, and 95 (approximately 20 %) have been noted (mostly supportive comments and subjects to be considered for further rulemaking developments). Generally, stakeholders supported and welcomed the approach followed by EASA through the publication of the NPA.

EASA expresses its appreciation to stakeholders who have provided not only their individual comments on the draft proposals, but also conveyed their coordinated views through the relevant European stakeholder groups. EASA considers that the comments received contribute significantly to the development of balanced rules.

EASA reviewed the comments and provided responses thereto with the contribution of the rulemaking group experts who participated in the drafting of the subject proposals.

In summary, the main subjects that were identified are the following: approach at regulatory level, definitions, functionalities (basic equipage and enhanced equipage), references to the level of safety, human–computer interaction functions, hazards classification and characteristics (references to severity classification and SWAL level) and the impact on airspace users.

EASA trusts that the responses in this CRD satisfy the commentators insofar that they provide further clarifications on the issues raised.

Based on the comments and responses, Decision 2015/014/R and Decision 2015/015/R were developed.

Applicability	
Affected regulations and decisions:	ED Decision 2015/010/R of 16 March 2015 ‘Requirements on Air Traffic Controller licensing’
Affected stakeholders:	Air Navigation Service Providers; aerodrome operators; competent authorities; Air Traffic Management system developers; airspace users
Driver/origin:	SESAR; safety; proportionality and cost-effectiveness; technological developments
Reference:	Not applicable

Process map	
Concept Paper:	No
Terms of Reference:	9.12.2014
Rulemaking group:	Yes
RIA type:	Full
Technical consultation during NPA drafting:	No
Publication date of the NPA:	23.3.2015
Duration of NPA consultation:	6 weeks
Review group:	No
Focussed consultation:	Yes
Publication date of the Opinion:	Not applicable
Publication date of the Decision:	2015/Q2

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1. Procedural information

1.1. The rule development procedure

The European Aviation Safety Agency (hereinafter referred to as the 'Agency') developed this CRD in line with Regulation (EC) No 216/2008[1] (hereinafter referred to as the 'Basic Regulation') and the Rulemaking Procedure[2].

This rulemaking activity is included in the Agency's Rulemaking Programme for 2014–2017 under RMT.0624. The scope and timescale of the task were defined in the related Terms of Reference (see process map on the title page).

The draft Acceptable Means of Compliance (AMC) and Guidance Material (GM) have been developed by the Agency based on the input of the RMT.0624 Rulemaking Group. All interested parties were consulted through NPA 2015-04[3], which was published on 23 March 2015. 446 comments were received from interested parties including industry, national aviation authorities, and social partners.

The process map on the title page contains the major milestones of this rulemaking activity.

1.2. The structure of this CRD and related documents

This CRD provides the full set of individual comments, and responses thereto, received on NPA 2015-04. For the resulting rule text, please refer to Decision 2015/014/R and Decision 2015/015/R.

1.3. The next steps in the procedure

The first Decision adopting Guidance Material on the implementation of the remote tower concept for single mode of operation and the second one amending the Acceptable Means of Compliance and Guidance Material (Annexes I, II and III) to Commission Regulation (EU) 2015/340 shall be published by the Agency concurrently with CRD 2015-04.

[1] Regulation (EC) No 216/2008 of the European Parliament and of the Council of 20 February 2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, and repealing Council Directive 91/670/EEC, Regulation (EC) No 1592/2002 and Directive 2004/36/EC (OJ L 79, 19.3.2008, p. 1).

[2] The Agency is bound to follow a structured rulemaking process as required by Article 52(1) of the Basic Regulation. Such process has been adopted by the Agency's Management Board and is referred to as the 'Rulemaking Procedure'. See Management Board Decision 01-2012 of 13 March 2012 concerning the procedure to be applied by the Agency for the issuing of Opinions, Certification Specifications and Guidance Material (Rulemaking Procedure).

[3] http://www.easa.europa.eu/document-library/notices-of-proposed-amendment/npa-2015-04

2. Summary of comments and responses

The summary of the comments received on NPA 2015-04 is provided in the Explanatory Note to Decision 2015/014/R.

3. Individual comments and responses

In responding to comments, a standard terminology has been applied to attest the Agency's position. This terminology is as follows:

(a) **Accepted** — The Agency agrees with the comment and any proposed amendment is wholly transferred to the revised text.

(b) **Partially accepted** — The Agency either agrees partially with the comment, or agrees with it but the proposed amendment is only partially transferred to the revised text.

(c) **Noted** — The Agency acknowledges the comment but no change to the existing text is considered necessary.

(d) **Not accepted** — The comment or proposed amendment is not shared by the Agency.

(General Comments)	-

comment	*64* comment by: *DFS Deutsche Flugsicherung GmbH* DFS highly welcomes the way EASA has introduced the topic. The guidance material thoroughly respects the large field of various issues that have to be regarded when implementing a professional remote tower concept. However within the guidance material the description of what and why an action has to be taken sometimes focuses on a single means or even offers detailed values which could lead to the impression that these are default values and methods. We recommend that the material is more of an explanatory and reminding character and does neither impede an ATSP to apply other methods or produce an environment which results in different figures nor force a competent authority to accept an approach solely according to this material. This is especially related to the proposed safety assessment criteria and method and contradicts to one statement in this document: "*The remote tower concept, as a change to the functional system, does not require any specific safety assessment methodology.*" The detailed requirements of SESAR about safety assessment in this GM go beyond the requirements of Commission Implementing Regulation (EU) No 1035/2011 - and its successor (NPA 2014-13, 2013-08). This leads to confusion or even misinterpretation and may possibly deteriorate the results of the safety assessments. Furthermore the existing rules about the safety management system and risk classification scheme according to Regulation 1035/2011 Annex II Section 4 (RCS) aim at achieving **an acceptable level of safety**. This should be the term used throughout the document and the aim of the safety assessment on a remote tower operation - both for a change in service and for new implementation. These are our main comments and concerns; our change proposals will be found in the related parts of chapters 3 and 4. Furthermore we recommend some editorials.
response	*Noted* The Agency thanks DFS for the comments; they will be taken into consideration in the

respective sections of the proposed GM.

comment *98* comment by: *CANSO*

CANSO highly welcomes the way EASA has introduced the topic. The guidance material thoroughly respects the large field of various issues that have to be regarded when implementing a professional remote tower concept.

CANSO has the following high level comments on the NPA:

a. In the NPA there are several references to documents not of public domain, developed within SESAR. Therefore it is not clear which SESAR document has been used as a reference and what instead was excluded.

b. Despite of the comments made in the RMG, the NPA still does not clarify the EASA position in relation to the meteo observations and forecast. It's only indicated that it can be delegated to the airport operator. This solution solves the practical problem, but creates a regulatory one. The meteo observations belong to the Meteorological Service (Reg. 1035/11) and who provides this service has to be certified and designated by the State, not by the ANSP.

c. The following definitions do not clarify all possible intermediate situations related to the tower location and/or environmental conditions, air traffic service provision cannot be exclusively based on direct visual observation (e.g. Use of cameras in the Tower)

1. "Aerodrome conventional tower" means a facility located at an aerodrome from which ATS can be provided to aerodrome traffic through ~~the maintenance of~~ direct visual observation of the area of responsibility of the ~~aerodrome~~.
2. "Aerodrome remote tower" means means a remote facility from which ATS can be provided to a distant aerodrome.

d. Our remote tower experts involving both EUROCAE and EASA related working group realized that there are some discrepancies between the two organization's ongoing documents, mainly in the "Equipage" content. We believe that it would be a mutual benefit for both of us if the two organizations could harmonize their documents in every detail and we kindly suggest further cooperation between them. Our experts are open to contribute in any joint work.

e. The description of what and why an action has to be taken sometimes focuses on a single means or even offers detailed values which could lead to the impression that these are default or even minimum values and methods. We recommend that the material is more of an explanatory and reminding character and does neither impede an ATSP to apply other methods or produce an environment which results in different figures nor force a competent authority to accept an approach solely according to this material. This is especially related to the proposed safety assessment criteria and method and contradicts to one statement in this document: "The remote tower concept, as a change to the functional system, does not require any specific safety assessment methodology."
We suggest removing the indicated values, detailed recommendations and description of the SESAR work in the whole document. Rules and guidance material about safety assessment are available in the frame of Regulation 1035/11 and its successor (NPA 2014-

18, 2013-08).

f. The NPA is more or less focusing on describing the methodology to be applied for the safety assessment of the implementation of remote aerodrome ATS provision, as a change to the ATM/ANS functional system (systems, personnel and procedures). The NPA is not defining the technical and operational requirements that have to be met in respect of remote tower operations.

response

Noted

The Agency thanks CANSO for the comments; they will be taken into consideration in the respective sections of the proposed GM.

comment

117 comment by: *ENAV*

a. In the NPA there are several references to documents not of public domain, developed within SESAR. Therefore it is not clear which SESAR document has been used as a reference and what instead was excluded.

b. Despite of the comments made in the RMG, the NPA still does not clarify the EASA position in relation to the meteo observations and forecast. It's only indicated that it can be delegated to the airport operator. This solution solves the practical problem, but creates a regulatory one. The meteo observations belong to the Meteorological Service (Reg. 1035/11) and who provides this service has to be certified and designated by the State, not by the ANSP.

c. The security dimension should be better addressed. The security risk assessment is just a part of the safety risk assessment and it is limited only to the physical security.
This approach is not in line with the Common Requirements Regulation (in particular with the provisions contained in Annex I paragraph 4).

d. The following definitions do not clarify all possible intermediate situations related to the tower location and/or environmental conditions, air traffic service provision cannot be exclusively based on direct visual observation (e.g. Use of cameras in the Tower):

1. "Aerodrome conventional tower" means a facility located at an aerodrome from which ATS can be provided to aerodrome traffic through the maintenance of direct visual observation of the area of responsibility of the aerodrome.

2. "Aerodrome remote tower" means a facility from which ATS can be provided to aerodrome traffic through real-time visual presentation of the elements contained in its area of responsibility (airfield and vicinity) together with other elements that may support the operation.

response | *Noted*

As for the reference to the definitions, the comment is taken into consideration in the respective part (Section 3) of the proposed GM.

comment | *133* comment by: *EUROCONTROL*

General comments made by EUROCONTROL

The document should include an overall presentation of both the Remote Tower concept and architecture and should also explain how Single operations relate to Multiple operations, to contingency and to Remote Tower Centre operations.

EUROCONTROL welcomes the pragmatic approach taken by EASA, thus allowing interested parties to benefit from a first set of guidance material in a timely manner.

The overall quality and relevance of NPA 2015-04 are appreciated.

response | *Accepted*

The Agency thanks EUROCONTROL for the supportive comment.

As defined in the scope, and in the context of the decision taken by the Agency to address the remote tower concept from the perspective of a 'phased approach', only the single mode of operation has been included in the scope thus leaving open the possibility of addressing other modes of operation in future regulatory measures.

comment | *139* comment by: *UK CAA*

Page No: General

Paragraph No: General

Comment: NPA 2015-04 section 3 contains valuable and readily understood text concerning means of compliance and guidance material applicable to the technical (rather than institutional and personnel) aspects of the introduction of remote towers. UK CAA believes that stakeholders unfamiliar with the content of NPA 2015-04 may not in the future be aware of the guidance relating to technical aspects of remote tower implementation contained within it. The loss of this material would therefore be significant; it needs to be retained at Agency level for use by Member States and industry stakeholders alike pending any future remote tower-related rulemaking activity.

The Agency's intentions regarding the retention/preservation of this material following closure of the NPA are not clear – clarification is therefore requested, and the Agency is invited to indicate the means by which the material can be retained. For example, are Community Standards to be developed?

Justification: There is a need to preserve the material applicable to the technical (rather than institutional and personnel) aspects of the introduction of remote towers contained

	within NPA 2015-04.
response	*Accepted* The Agency thanks the UK CAA for the supportive comment. According to the rule development processes, after the NPA public consultation period and after having taken into consideration the inputs provided by the stakeholders, NPA 2015-04 will lead to an Agency Decision.

comment	*199* comment by: *ROMATSA* 1. The material is aimed at covering only the single mode of operations where ATS is provided from a RTM for only one aerodrome at a time, despite the wider applicability of the RTW concept. Therefore, we propose to reword the the title in order to reglect this limitation.
response	*Not accepted* Due to the fairly early stages of the remote tower concept, and the fact that further experience is yet to be gained, the Agency considered it necessary to address the remote tower concept in phases and, taking into consideration that some Member States are already implementing the concept (or have the intention to do so), the Agency considered it necessary to take action swiftly. Work has started by addressing simpler scenarios (e.g. single mode of operation in low traffic density environments) and will probably progress with more complexity as the concept evolves and further valuable experience will be gained from implementation projects.

comment	*200* comment by: *ROMATSA* 1. The NPA does not clarify the EASA position in relation to the meteo observations and forecast. It's only indicated that it can be delegated to the airport operator. This solution solves the practical problem, but creates a regulatory one as the meteo observations belong to the Meteorological Service that are certified in accordance with Reg. (EU) 1035/2011 and designated by the State, not by the ANSP, in accordance with Art. 9 of Reg (EC) 550/2004.
response	*Not accepted* The Agency considers that the meteorological service provision aspects are outside the scope of this NPA, and that are fully covered by other means within the current regulatory framework.

comment	*201* comment by: *ROMATSA* 1. The NPA is not defining the technical and operational requirements that have to be met in respect of remote tower operations as it is provided in the title. Instead the NPA is mainly focused on the describing the methodology to be applied for the safety assessment of the implementation of remote aerodrome ATS provision, as a change to the ATM/ANS functional system (systems, personnel and procedures).
response	*Not accepted* The objective of NPA 2015-04 is to facilitate the implementation and operational approval of

	the remote tower concept. The basic principle for achieving this objective is that the implementation of the remote tower concept represents a change in the ATM functional system, for which the corresponding safety assessment has to be conducted. However, the Agency does not agree with the opinion of the commentator, as many other aspects and elements are included in the document.
comment	*202* comment by: *ROMATSA* 1. In order to avoid the confusion a precise terminology shall be adopted, e.g. in the material there is used several terms as „conventional tower", „local conventional tower" and „local tower".
response	*Accepted* Some of the definitions are amended in order to ensure consistency and clarity.
comment	*203* comment by: *ROMATSA* We propose to replace all over the document the wording "(at least the) same level of safety as in current operations" with "acceptable level of safety". For example at Section 3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.2. Safety assessment methodology — 3.2.2.6. Determination of the safety objectives and safety requirements (page 21), the Change proposal for 2nd para is: 8. "The ATS provider should pay special attention to some particular aspects that, based on the SESAR safety work, would require the definition of specific safety objectives and/or safety requirements in order to ensure ~~that the~~ **an acceptable** level of safety ~~as in the current operations from a local tower~~ (as defined through the safety criteria)."
response	*Not accepted* As indicated throughout the document, the scope and objective of the proposed text is to maintain the level of safety in those specific cases where these services are provided from a remote tower compared to their provision from a conventional tower, as well as to promote the development of a new technology associated with the remote tower concept, thus ensuring its safe implementation. At the same time, the GM covers the single mode of operation, as it is also described in the text. Based on this premise, Section 3 of the proposed document addresses both what is defined as 'basic equipage' and 'enhanced equipage'. In the case of the basic equipage, the analyses and validation exercises conducted in the frame of the SESAR project have shown that for certain operational contexts (see Section 3.2.3.) the functionalities presented in the basic equipage may be sufficient to provide the same level of safety as in the current operations at an aerodrome, subject to the confirmation by the corresponding safety assessment of the local implementation. On the other hand, the Agency recognises that the development of new technology will offer opportunities to implementers to include new functionalities in the short term, and are also taken into consideration within the scope of the standardisation bodies currently dealing with the remote tower concept. Therefore, the Agency believes that the enhanced equipage should not be ignored — being, however, aware of the early stage and limited maturity of its

functionalities. For this reason, the proposed text presents the need for the ATS provider to conduct an in-depth evaluation of the selected enhanced functionalities, including the necessary validation activities and human performance assessment, as part of the corresponding safety assessment of the local implementation.
In any case, new text has been added in order to reinforce the need to take into consideration the aforementioned early stage of those functionalities catalogued as enhanced and to ensure they are appropriately taken into consideration in the context of the safety assessment.

comment

204 comment by: *ROMATSA*

1. The following statement is included in the document "The remote tower concept, as a change to the functional system, does not require any specific safety assessment methodology." We suggest to keep that idea along the document and remove the indicated values, detailed recommendations and description of the SESAR work in the whole document. Rules and guidance material about safety assessment are available in the frame of Regulation (EU) 1035/2011 and its successor (NPA 2014-18, 2013-08).

response

Noted

The purpose of this statement is to indicate that the safety assessment to be conducted for the implementation of the remote tower concept can be performed following the approved safety management procedures. When referring to the safety assessment methodology, no specific elements are identified to be particular of the remote tower concept. Nevertheless, the Agency considers it necessary to make reference to the SESAR works, as a source of validated data, to be considered in the proposed GM.

comment

212 comment by: *René Meier, Europe Air Sports*

Europe Air Sports thanks the Agency for the preparation of NPA 2015-04. We carefully studied the text proposed, bearing in mind the possible impact Remote Towers may have on users flying light aircraft to such aerodromes.

Remote Towers will surely help to keep ATM costs down, it most probably is a suitable solution for aerodromes with mixed IFR/VFR traffic up to 20'000 movements per year. Because this traffic mix will exist we have to insist on the point that we oppose to any equipment requirements going beyond what is in place today for General Aviation aircraft.

response

Noted

comment

223 comment by: *CAA-NL*

The Netherlands supports this NPA and seen the completeness and the detail of the explanatory note and the proposed guidance material on the implementation of the remote tower concept we think the executive summary may state that this NPA addresses *the safety issues* instead of *a safety issue.*
However we do have some detailed comments.

response

Accepted

The Agency thanks CAA-NL for the supportive comment; it has been taken into consideration.

comment	*224* comment by: *CAA-NL* At various places there is terminology used that is not ICAO compliant: Starting from paragraph 2.1 Background and further the abbreviation AFISO is used. AFISO is a non-ICAO term which does not exist in Annex 11, Doc 4444. Circular 211-AN/128 and EU 923/2012. This should refer to the 'Flight Information Service Officer (FISO)'. When FIS is provided by an AFIS unit, the FISO license should have an ADR rating.
response	*Accepted* Accepted.

comment	*283* comment by: *IFATCA* IFATCA finds the approach in the NPA balanced. All the points have been covered. For the general information please find attached the IFATCA policy. **2014 Page 3 2 2 18 ADME 2.15 REMOTE AND VIRTUAL TOWER** Technology has created the possibility to provide aerodrome control service from a location other than the aerodrome itself. This new concept is being developed both in SESAR and NEXTGEN and is also studied in other countries such as Australia. This document studies the factors behind the interest in remote towers as well as the potential advantages and areas of concern. **IFATCA Policy is: ATCOs shall not be required to provide a Remote and Virtual tower service for more than one aerodrome simultaneously.** See: Resolution B8 - WP 92 – Gran Canaria 2014 **IFATCA Policy is: Separation standards and procedures for Remote and Virtual Towers shall be developed or adapted and implemented based on a robust safety case and the demonstrated capabilities of the system.** See: Resolution B9 - WP 92 – Gran Canaria 2014 **IFATCA Policy is: Standards, procedures and guidance for Remote and Virtual Towers are required.** See: Resolution B10 - WP 92 – Gran Canaria 2014
response	*Accepted* The Agency thanks IFATCA for the supportive comment.

comment	*287* comment by: *IFATCA* Question of clarification for IFATCA: Why are the issues only expressed as ¨recommendations¨? The introduction of the remote tower concept is a fundamental change in the ATC. It changes the way aerodrome control is provided like nothing else! This change should be better regulated . Recommandations should be standards. ¨Should¨ should be ¨must¨.
response	*Not accepted* Due to the fairly early stages of the remote tower concept, and the fact that further experience is yet to be gained, the Agency considered it necessary to address the remote tower concept in phases. This 'phased approach' is intended to also evolve from the regulatory 'level' perspective as implementation progresses and some experience can be

gained and conclusions can be drawn.

comment *347* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
General Comment	Further to my statement in the ATM/ANS TAG meeting of April 2015, I would like to express my full support to this task and warmly congratulate EASA for such an excellent work. The document and the guidelines it contains are thorough and encompassing, taking a genuine total system approach to the task. All aspects of the change are treated in an exhaustive, methodical and complete manner, including the fundamental interaction with the aerodrome operator.	-

response *Accepted*

The Agency thanks AESA/DSANA for the supportive comment.

comment *348* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
General Comment	In order to give this guidelines a formal status, and apart from the **ED Decision** envisaged in **section 1.4** of this NPA, consideration could be given to include this material in ***Part-ATS*** through the current activities of **RMT.0464**.	In order to give these splendid guidelines full status within the EASA regulatory scheme. This has already been stated by myself in the ATM/ANS TAG meeting of April 2015.

response *Accepted*

The Agency thanks AESA/DSANA for the supportive comment; the proposal will be taken into consideration for future regulatory measures/actions.

comment *349* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
General Comment	This document assumes that SESAR work on this subject has	This implicit assumption has to be borne in mind to ensure traceability and review of the guidelines in

	been demonstrated to be "*safe*". AESA doesn't challenge this assumption but makes it explicit so that it is borne in mind whilst using the guidelines.	case there is a revision of the outcomes of SESAR activities in this domain with impact on safety.

response *Noted*

comment *411* comment by: *Carl Norgren, Swiss Int Air Lines*

SWISS takes note of the contents of NPA 2015-04 without further comment.

response *Noted*

comment *446* comment by: *René Meier, Europe Air Sports*

A general remark after completion of the task of writing comments:

We are fully aware of the fact that this NPA's title is "Technical and operational requirements for remote tower operations". The system as a whole is consists of the three elements

1) Remote Tower
2) Aerodrome
3) Air Traffic

In the "intro" the Agency makes the statement which ends with the words "thus ensuring a safe implementation." In our view a safe implementation only is possible when all aspects of ATC, of aerodrome operations and of flight operations are dealt with at the same time. Does the Agency plan to prepare AMC/GM covering the aerodromes and the aircraft operators aspects in due time?

response *Accepted*

The Agency fully agrees with the statement made by the commentator and strongly believes it is important to treat the remote tower concept implementation as a 'multi-actor' scheme.
Regarding future developments, this guidance has been proposed taking into consideration that due to the fairly early stages of the remote tower concept, and the fact that further experience is yet to be gained, it is necessary to address the remote tower concept in phases. This 'phased approach' is intended to also evolve from the regulatory 'level' perspective as implementation progresses and some experience can be gained and conclusions can be drawn.

comment *454* comment by: *comments provided on behalf of FIT/CISL italian trade union*

Attachment #1

Please see attached PDF.

response *Noted*

The Agency thanks FIT/CISL for the comments; they have been taken into consideration in the respective sections of the proposed GM.
Due to the explanatory nature of this section, and regarding the comment submitted on specific aspects which are contained in successive sections, the responses are provided within the proposed GM and AMC, contained in Section 3 onwards.

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comment *41* comment by: *HungaroControl*

General comment: Our remote tower experts involving both EUROCAE and EASA related working group realized that there are some discrepancy between the two organization's ongoing documents, mainly in the "Equipage" content. We believe that it would be a mutual benefit for both of us if the two organization could harmonize their documents in every detail and we kindly suggest further cooperation between them. Our experts are open to contribute in any joint work.

response *Noted*

As stated in the proposed GM, the Agency, being also part of the EUROCAE WG-100, has the firm intention to align (when possible) with the work produced by the aforementioned group, and takes duly into account the ongoing activities. However, due to the difference in time of the the activities and the deliverables at this point, full alignment does not seem possible, given that the document production from the EUROCAE standards is still being discussed.

comment *243* comment by: *NATS National Air Traffic Services Limited*

NATS highly welcomes the way EASA has introduced the topic. The guidance material thoroughly respects the large field of various issues that have to be regarded when implementing a professional remote tower concept.

NATS has the following high level comments on the NPA:

a. In the NPA there are several references to documents not of public domain, developed within SESAR. Therefore it is not clear which SESAR document has been used as a reference and what instead was excluded.

b. Despite of the comments made in the RMG, the NPA still does not clarify the EASA position in relation to the meteo observations and forecast. It's only indicated that it can be delegated to the airport operator. This solution solves the practical problem, but creates a regulatory one. The meteo observations belong to the Meteorological Service (Reg. 1035/11) and who provides this service has to be certified and designated by the State, not by the ANSP.

c. The following definitions do not clarify all possible intermediate situations related to the tower location and/or environmental conditions, air traffic service provision cannot be exclusively based on direct visual observation (e.g. Use of cameras in the Tower)

1. 'Aerodrome conventional tower' means a facility located at an aerodrome from which ATS can be provided to aerodrome traffic **mainly** ~~through the maintenance of~~ direct visual observation of the area of responsibility of the **tower** ~~aerodrome~~.

2. 'Aerodrome remote tower' means a facility from which ATS can be provided to aerodrome traffic through real-time visual presentation of the ~~elements contained in its~~ area of responsibility of the tower (~~airfield and vicinity~~) together with other elements that may support the operation.

d. Our remote tower experts involving both EUROCAE and EASA related working group realized that there are some discrepancies between the two organization's ongoing documents, mainly in the "Equipage" content. We believe that it would be a mutual benefit for both of us if the two organizations could harmonize their documents in every detail and we kindly suggest further cooperation between them. Our experts are open to contribute in any joint work.

e. The description of what and why an action has to be taken sometimes focuses on a single means or even offers detailed values which could lead to the impression that these are default or even minimum values and methods. We recommend that the material is more of an explanatory and reminding character and does neither impede an ATSP to apply other methods or produce an environment which results in different figures nor force a competent authority to accept an approach solely according to this material. This is especially related to the proposed safety assessment criteria and method and contradicts to one statement in this document: "The remote tower concept, as a change to the functional system, does not require any specific safety assessment methodology."
We suggest removing the indicated values, detailed recommendations and description of the SESAR work in the whole document. Rules and guidance material about safety assessment are available in the frame of Regulation 1035/11 and its successor (NPA 2014-18, 2013-08).

f. The NPA is more or less focusing on describing the methodology to be applied for the safety assessment of the implementation of remote aerodrome ATS provision, as a change to the ATM/ANS functional system (systems, personnel and procedures). The NPA is not defining the technical and operational requirements that have to be met in respect of remote tower operations.

response

Accepted

The Agency thanks NATS for the supportive comment.

Due to the explanatory nature of this section, and regarding the comment submitted on specific aspects which are contained in successive sections, the responses are provided within the proposed GM and AMC, contained in Section 3 onwards.

comment

299 comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

The scope for this GM shoudl be singel operations for low traffic density aerodromes with few simoultanious movements. The GM does not adhere to this scope and on several occations mixes in more advanced features i.e. the cool stuff...

The single operations based on the basic equippage has reached a V5 maturity, it is in operations and extensive knowledge resides within LFV. The neat funtions listed as enhanced are at best at V3 maturity, some probably V2 or less. why even mentione this in the GM in the first place.

A more reasonable approach could be to mentione in the explenatoty note that there might me new technical options around the corner but is should not be in the GM.

response

Not accepted

As indicated throughout the document, the scope and objective of the proposed text is to maintain the level of safety in those specific cases where these services are provided from a remote tower compared to their provision from a conventional tower, as well as to promote the development of a new technology associated with the remote tower concept, thus ensuring its safe implementation. At the same time, the GM covers the single mode of operation, as it is also described in the text. Based on this premise, Section 3 of the proposed document addresses both what is defined as 'basic equipage' and 'enhanced equipage'. In the case of the basic equipage, the analyses and validation exercises conducted in the frame of the SESAR project have shown that for certain operational contexts (see Section 3.2.3.) the functionalities presented in the basic equipage may be sufficient to provide the same level of safety as in the current operations at an aerodrome, subject to the confirmation by the corresponding safety assessment of the local implementation.
On the other hand, the Agency recognises that the development of a new technology offers opportunities to implementers to include new functionalities in the short term, and are also taken into consideration within the scope of the standardisation bodies currently dealing with the remote tower concept. Therefore, the Agency believes that the enhanced equipage ignored — being, however, aware of the early stage and limited maturity of its functionalities. For this purpose, the proposed text presents the need for the ATS provider to conduct an in-depth evaluation of the selected enhanced functionalities, including the necessary validation activities and human performance assessment as part of the corresponding safety assessment of the local implementation.
In any case, new text has been added in order to reinforce the need to take into consideration the aforementioned early stage of those functionalities catalogued as enhanced and to ensure they are appropriately taken into consideration in the context of the safety assessment.

comment *423* comment by: *Civil Aviation Authority Norway*

The Norwegian CAA has no comments to NPA 2015-04.

response *Noted*

2. Explanatory Note — 2.1. Background p. 5-6

comment *129* comment by: *FAA*

Propose rewriting this section as follows:

2.1 ***Background***
The Remote Tower Operations concept has been studied in the context of the Single European Sky ATM Research (SESAR) Programme for many years. This concept introduces

the possibility to provide aerodrome air traffic service to an aerodrome from a remote location, and is starting to be implemented, driven by the "SESAR Solution", by a number of Member States across Europe. The Remote Tower Operations concept could introduce a potential increase in safety associated with the use of visual technologies that may provide some safety enhancements in low visibility situations (although nothing currently prevents using this technology when air traffic service is provided from a conventional tower). The possibility to label objects moving in the aerodrome and its vicinity may also aid in preventing runway incursions.

At the ICAO level, the provision of ATS is defined in Annex 11 'Air Traffic Services', Doc 4444, Doc 7030 and Doc 9426. The provision of aerodrome air traffic services (ATS) has been based on one fundamental principle: the direct **visual observation** of the traffic by the air traffic controller (ATCO) or the aerodrome flight information officer (AFISO) within their area of responsibility, as stated by the ICAO regulatory framework in Doc 4444 (PANS-ATM), and, as guidance material, ICAO Circular 211-AN/128 and EUROCONTROL's Manual on AFIS, respectively. These documents refer to the need of maintaining visual observation at all times on all flight operations on and in the vicinity of an aerodrome, as well as vehicles and personnel on the manoeuvring area. The meaning of "visual observation" referenced in the relevant ICAO documents is questioned by the community, and the various stakeholders involved give different interpretations of its meaning. It is therefore necessary to establish clarity and common understanding on this subject, with the objective of being able to verify the applicability of the established ICAO ATS procedures, or to develop additional requirements and/or guidance which fit with the established ATS provision framework and in particular with the principle of visual observation.

As defined in Article 2.32 of Commission Implementing Regulation (EU) No 923/2012, as well as in Annex 11 and Doc 4444, ATS includes the following elements:

- flight information service
- alerting service
- air traffic advisory service, and
- air traffic control service

Air traffic control (ATC) service is provided by licensed ATCOs for the purpose of preventing collisions between aircraft and, on the manoeuvring area, between aircraft and obstructions. ATCOs are also responsible for expediting and maintaining an orderly flow of air traffic. The aerodrome flight information service (AFIS) is the term used to describe the provision of information useful for the safe and efficient conduct of traffic at those aerodromes where the competent authority determines that the provision of ATC service is not necessary, or is not needed on a 24-hour basis. Except for cases when relaying clearance from air traffic control, AFISOs shall only pass information and warnings to pilots. Pilots are therefore wholly responsible for maintaining proper spacing in conformity with the applicable rules of the air. The remote tower concept also foresees provision of alerting service, which is defined as the service provided to notify appropriate organizations regarding aircraft in need of search and rescue aid, and assist such organizations as required.

The development and introduction of new technologies now make it possible to provide ATC or AFIS services from a remote location. The direct visual observation by personnel physically present at the aerodrome will be replaced by cameras and sensors providing a visual presentation of the area of responsibility, adding information from other sources (when

available) such as radar, multilateration or other positioning and surveillance systems providing the positions of moving objects within the aerodrome movement area and its vicinity. The latest trials and validation activities have demonstrated the viability of the concept. Moreover, the approach followed by some stakeholders suggests, and has been validated by the SESAR Programme, that the implementation of the Remote Tower Operations concept for the provision of aerodrome ATS would also permit safety improvements in operations with aircraft, vehicles and persons operating within the airspace and/or the areas of the aerodrome. The increasing number of initiatives taken worldwide to provide remote aerodrome ATS have been duly noted also by ICAO, as indicated in the ICAO Global Air Navigation Plan (Doc 9750) and in the Working Document for the 'Aviation System Block Upgrades' of 28 March 2013 (Section B1-RATS Remotely Operated Aerodrome Control).

response *Noted*

The Agency thanks the FAA for the comment and takes the suggested text duly into account which will be also used in further sections within the document, where specific aspects are considered from a different perspective (that is, from the GM and AMC perspective rather than from an explanatory perspective).

comment *134* comment by: *EUROCONTROL*

Page 6 - 2.1 Background

Lines from 13 to 16

EUROCONTROL makes a request for clarification through an answer to, at least, two questions.

Text "... as it is also validated by the SESAR project (...) the areas of the aerodrome" is a bit ambiguous.
What exactly does "as is also validated by SESAR'' mean? It has been assessed and proposed as a safety enhancement under certain visibility conditions but has it been properly validated in the safety assessment compared to current OPs?

Last paragraph

EUROCONTROL makes a comment and asks a question:

The text "The meaning of 'visual observation' referenced in the relevant ICAO documents is somehow questioned by the aviation community, and the various stakeholders concerned interpret differently its meaning." should be put into the context and spirit of when it was written.
At the time when Doc 4444 was written, 'visual observation' could only have meant 'seeing' (using the power of the eyes), and is therefore not open to interpretation. RTO requires other terms/definitions, as illustrated in 3.1, and the corresponding performance requirements. This would seem to imply the need for an update of Doc 4444.

Given the content of this paragraph, is EASA intending to become active on the subject?

response *Noted*

Due to the explanatory nature of this section, and regarding the comment submitted on specific aspects which are contained in successive sections, the responses are provided within the proposed GM and AMC contained in Section 3 onwards.

comment

189 comment by: *ATCEUC - Air Traffic Controllers European Unions Coordination*

The text already includes, in brackets, that nothing prevents the use of visual technologies when the service is provided from a conventional tower. This means that it's not the concept of remote towers that brings a potential increase in safety. Only some tools are able to provide a potential increase in safety and none of them are included in the basic equipage, this means the text is misleading and should not be part of this publication.

response

Accepted

The text is amended to state that some of the visual technologies used in the remote tower concept could be used also in conventional towers.

comment

274 comment by: *Prospect ATCOs' Branch UK*

We cautiously support the introduction of remote towers, provided it is in a planned incremental way, with adequate protections in place to ensure that the level of safety does not suffer detriment. ATM providers must ensure that in the quest to cut costs, the service and levels of safety are maintained and it is incumbent on EASA working with national Competent Authorities to ensure this is the case. Adequate visual representation and appropriate surveillance methods must be in place, to counter the deficiencies by replacing the OTW concept. Furthermore all normal interactions with not only aircraft, but other activities on the aerodrome manoeuvring area (e.g. maintenance or operations vehicles) must be able to take place.

We however are disappointed that EASA seem to have taken an extremely 'light touch' with respect to providing an adequate implementing rule (in not proposing one at all) and minimal AMC, but rather adopting GM. There are numerous issues mentioned in the explanatory note which in any other domain would be subject to proper disciplined, well thought through and consulted regulation. This approach is not consistent with normal EASA regulatory behaviour. Topics that should be subject to thorough implementing rule regulation should include:

Specific ATCO licensing requirements.
Detail on the transfer of tasks traditionally completed by the ATCO or AFISO to another entity at the aerodrome (Met, runway condition assessment etc).
Technological requirements on all issues including levels of visual representation and other surveillance methods, maintenance, security etc. A EU wide definition of 'visual observation' until defined by ICAO.
Transition and introduction of the remote tower service.
Methods of operation of more than one remote tower at a RTC.
Abnormal situations, contingency and emergency procedures.
Human factors elements when operating at a RTC

response

Noted

Due to the fairly early stages of the remote tower concept, and the fact that further experience is yet to be gained, the Agency considered it necessary to address the remote

tower concept in phases. This 'phased approach' is intended to also evolve from the regulatory 'level' perspective as implementation progresses and some experience can be gained and conclusions can be drawn.

comment

296 comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

1st comment
The GA should adhere to ICAO definitions. MANOUVERING AREA AND IN THE VINCINITY OF AN AERODROME. ref 4444 7.1.1.2

2nd comment
...possibility to label objects moving... this implies mixing existing, defined sevices, even if this techically feasable its not feasable with respect to the service.

3rd comment
With current definition of the services we have strong concerns over mixing defined services. in surveillance infomration is overlayed there is a need for thourough validation of the function. And generally we oppose mixing services just because its technically feasable.

response

Noted

Due to the explanatory nature of this section, and regarding the comment submitted on specific aspects which are contained in successive sections, the responses are provided within the proposed GM and AMC contained in Section 3 onwards.

comment

416 comment by: *SINCTA - Portuguese Air Traffic Controllers' Union*

It is not the concept that brings about a potential increase in safety, but the use of visual technologies which could potentially be used also on conventional towers. Therefore, the statement is misleading and should be reviewed.

response

Accepted

The text is amended to state that some of the visual technologies used in the remote tower concept could be used also in conventional towers.

comment

447 comment by: *Malta Air Traffic Controllers' Association*

The text already includes, in brackets, that nothing prevents the use of visual technologies when the service is provided from a conventional tower. This means that it's not the concept of remote towers that brings a potential increase in safety. Only some tools are able to provide a potential increase in safety and none of them are included in the basic equipage, this means the text is misleading and should not be part of this publication.

response

Accepted

The text is amended to state that some of the visual technologies used in the remote tower concept could be used also in conventional towers.

2. Explanatory Note — 2.2. Overview of the issues to be addressed — 2.2.1. Safety assessment methodology p. 6

comment *213* comment by: *René Meier, Europe Air Sports*

Safety Assessment Methodology
page 6/61

We fully agree with this statement. The writer of these lines leads the project "IFR without ATC" at Grenchen (LSZG) airport where sailplanes, SEP and MEP aircraft operate as well as busines jets and turboprops, and where parachute ops are undertaken. The total number of movements per year is in the area of 70'000 to 80'000. We looked at thr Remote Tower concept, we think the local operations are too complex, for this reason we now continue working on a mixed system with aerodrome ops hours during which ATC not always might be offered.

I added this remark because we heard that glider ops and parachute ops would have to be restricted when arrivals and departures according to IFR take place. This, of course, is not acceptable to our community.

We propose therefore to carefully study all impacts on all users the change to a Remote Tower will provoke. The impacts of the change should be the starting point for any of the three safety assessment which surely will be required, the first one covering all ATM aspects, the second one covering those of the entire aerodrome, the third one covering all flight operations.

response *Accepted*

The Agency thanks the commentator for the supportive comment.

comment *350* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Explanatory Note Section 2.2 '*Overview of issues to be addressed*'	Although actually taken into consideration through the document, AESA misses the formal treatment of the **meteorological service provision aspects** as a separate item. In particular, this would refer to provision of METAR, TAF and local QNH. AESA also misses an explicit treatment of the Automatic Terminal Information Service (**ATIS**) which is normally used in ATS provision.	In order to achieve full completeness of the guidelines and address the full range of aspects as separate, interrelated items.

response | *Not accepted*

The Agency considers that the meteorological service provision aspects are outside the scope of this NPA, and are fully covered by other means within the current regulatory framework.

2. Explanatory Note — 2.2. Overview of the issues to be addressed — 2.2.2. Operational context p. 6-7

comment | *190* comment by: *ATCEUC - Air Traffic Controllers European Unions Coordination*

Is it possible to perform a safety assessment analysing the changes of the operational concept without taking in due account the problems and limitations of the new technology? The EUROCAE WG-100 standardisation requirements are not known and if the Agency is going to recognise them as AMC, the NPA should include them.

response | *Accepted*

As stated in the proposed GM, the Agency, being also part of the EUROCAE WG-100, has the firm intention to align, when possible, with the work produced by the aforementioned group and takes duly into account the ongoing activities, which are still under development.

comment | *214* comment by: *René Meier, Europe Air Sports*

2.2.2. Operational context
page 6/61

We are not as optimistic as the writer of the original text, we see clear restrictions in the number of movements, the complexity of operations taking place and of the characteristics of the aerodrome.

One other operational element, important for the VFR GA pilot, are the restricted possibilities of automated weather observation.

Rationale:
AutoMETAR are a good thing, but it never really replaces visual observation or correction by humans observing weather phenomena on-site.

response | *Noted*

The comment and the concern expressed by the commentator are noted.

Due to the explanatory nature of this section, and regarding the comment submitted on specific aspects which are contained in successive sections, the responses are provided within the proposed GM and AMC contained in Section 3 onwards.

comment | *448* comment by: *Malta Air Traffic Controllers' Association*

	Is it possible to perform a safety assessment analysing the changes of the operational concept without taking in due account the problems and limitations of the new technology? The EUROCAE WG-100 standardisation requirements are not known and if the Agency is going to recognise them as AMC the NPA should include them.
response	*Accepted* As stated in the proposed GM, the Agency, being also part of the EUROCAE WG-100, has the firm intention to align, when possible, with the work produced by the aforementioned group and takes duly into account the ongoing activities, which are still under development.

2. Explanatory Note — 2.2. Overview of the issues to be addressed — 2.2.3. ATS provider's role and performance p. 7

comment	*26* comment by: *LFV* loss-of-depth perception has no impact on the visual presentation.
response	*Accepted* Due to the explanatory nature of this section, and regarding the comment submitted on specific aspects which are contained in successive sections, the responses are provided within the proposed GM and AMC contained in Section 3 onwards. In this case, the comment is accepted and the respective section is amended accordingly.

comment	*297* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)* Why would remote tower introduce the need for surveillance coverage? This section implies that surveillance information is somehow needed when windows are replaced by cameras annd screens...
response	*Not accepted* As indicated throughout the document, the scope and objective of the proposed text is to maintain the level of safety in those specific cases where these services are provided from a remote tower compared to their provision from a conventional tower, as well as to promote the development of a new technology associated with the remote tower concept, thus ensuring its safe implementation. At the same time, the GM covers the single mode of operation, as it is also described in the text. Based on this premise, Section 3 of the proposed document addresses both what is defined as 'basic equipage' and 'enhanced equipage'. In the case of the basic equipage, the analyses and validation exercises conducted in the frame of the SESAR project have shown that for certain operational contexts (see Section 3.2.3.) the functionalities presented in the basic equipage may be sufficient to provide the same level of safety as in the current operations at an aerodrome, subject to the confirmation by the corresponding safety assessment of the local implementation. On the other hand, the Agency recognises that the development of a new technology offers opportunities to implementers to include new functionalities in the short term, and are also taken into consideration within the scope of the standardisation bodies currently dealing with the remote tower concept. Therefore, the Agency believes that the enhanced equipage ignored — being, however, aware of the early stage and limited maturity of its

functionalities. For this purpose, the proposed text presents the need for the ATS provider to conduct an in-depth evaluation of the selected enhanced functionalities, including the necessary validation activities and human performance assessment as part of the corresponding safety assessment of the local implementation.
In any case, new text has been added in order to reinforce the need to take into consideration the aforementioned early stage of those functionalities catalogued as enhanced and to ensure they are appropriately taken into consideration in the context of the safety assessment.

comment *429* comment by: *Wideroe Flyveselskap AS*

2.2.7/2.2.7/2.2.8/3.2.2.1/3.3.1.2
The Norwegian ANSP AVINOR is hard at work evaluating and implementing remote tower at AFIS aerodromes. These aerodromes were commissioned 40 years ago and are mostly Short Take-Off and Landing airports with 800 meters runway typically situated in mountainous terrain and/or are exposed to severe weather and challenging wind patterns in the approach or take-off sector.
Several incidents and fatal accidents in the early years led to a structured approach to increased safety. Non-precision conventional approaches have been complemented with precision GBAS approaches and regular safety meetings between the ANSP, airport owner and the aircraft operators have increased the level of safety.
In a new regime where the roles between ANSP, airport operators, ATC operators may change provisions should be made for continued and regular meetings aiming at increasing the level of safety.
The acquired experience and knowledge over the last 40 years at the existing aerodromes must be documented and structured. Any particular information not covered by general documentation, procedures and training must be included in the aerodrome manual and reflected in the qualification and training of the ATCOs and AFISOs. In example, the experienced AFISO can by evaluating the weather situation make a fairly accurate assumption if an aircraft on approach will have to abandon the approach or make it to a successful landing. This information is of vital importance to the flight crew and the implementation of remote tower must ensure that such information is not lost.

response *Noted*

2. Explanatory Note — 2.2. Overview of the issues to be addressed — 2.2.4. System aspects p. 7

comment *138* comment by: *EUROCONTROL*

Page 7 - 2.2.4 System aspects

1st paragraph - Lines 6 to 9

EUROCONTROL makes a suggestion.

Text "... considering the SESAR project's results, the implementation by stakeholders and other aspects in order to facilitate the initial deployment of this technology by the different ATS providers. This should be considered as an initial specification to be further developed in order to duly take into consideration the outcomes of the EUROCAE WG-100, ..." gives rise to

a suggestion under the form of a question: will use be made also of the experience gained though early pioneer implementations (such as that in Sweden, Norway...)?

response *Accepted*

The Agency believes that the question raised by the commentator has a response already included in the quoted text ('the implementation by stakeholders...').

As stated in the proposed document, due to the fairly early stages of the remote tower concept, and the fact that further experience is yet to be gained, the Agency considered it necessary to address the remote tower concept in phases. One of the main reasons to proceed this way is to gain experience through different sources, one of them being recent implementations.

comment *140* comment by: *UK CAA*

Page No: 7 of 61

Paragraph No: 2.2.4

Comment: Paragraph 2.2.4 refers to 'the respective standards'. It is unclear what these are – if they are the Minimum Aviation System Performance Specifications (MASPS) referred to later in the paragraph, it is unclear who will own these 'standards' and what their legal status will be.

Justification: Clarification.

response *Noted*

The paragraph which refers to the EUROCAE WG-100 aims to provide standards (Minimum Aircraft System Performance Specification (MASPS)) on remote tower operations, focussing initially on visual presentation.
As regards the legal aspect, it must be noted that EUROCAE standards are recommendations only. EUROCAE is not an official body of the European Institutions; its recommendations are valid as statements of official policy only when adopted by a particular government or conference of governments.

comment *351* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Explanatory Note Section 2.2.4 '*System aspects*'	AESA supports the approach expressed in the second paragraph of this **section 2.2.4** relating to the splitting into constituents of the system to be consistent with the assumptions and approach taken by **EUROCAE WG-100**.	As already stated in that same paragraph, it is important to ensure a seamless transition from a DSU-based compliance to a Declaration Of Conformity (DOC)-based compliance, once the standards (and associated CSs) are available.

response *Accepted*

The Agency thanks AESA/DSANA for the supportive comment.

As stated in the proposed GM, the Agency, being also part of the EUROCAE WG-100, has the firm intention to align, when possible, with the work produced by the aforementioned group and takes duly into account the ongoing activities, which are still under development.

Due to the explanatory nature of this section, and regarding the comment submitted on specific aspects which are contained in successive sections, the responses are provided within the proposed GM and AMC contained in Section 3 onwards.

2. Explanatory Note — 2.2. Overview of the issues to be addressed — 2.2.5. Abnormal situations and contingency procedures p. 7-8

comment *141* comment by: *UK CAA*

Page No: 7 of 61

Paragraph No: 2.2.5

Comment: The UK CAA believes that failed communications and reduced/nil visual reference are not new risks, rather they are risks in a new context. It is recommended that current operations should ensure provision for both communications failures and low visibility procedures in both 'conventional' and remote tower scenarios.

Justification: To provide better explanation of potential remote tower operational risks.

response *Accepted*

The Agency agrees with the statement made by the commentator. However, due to the nature of the remote tower systems and consituents, there are new elements/factors which could cause failure in either visual or voice communications. The intention of the text is to cover those cases.

2. Explanatory Note — 2.2. Overview of the issues to be addressed — 2.2.6. Transition plan p. 8

comment *142* comment by: *UK CAA*

Page No: 8 of 61

Paragraph No: 2.2.6

Comment: The UK CAA believes this paragraph is too prescriptive. The availability of the existing control tower building during the transition and post-transition period is a matter for agreement on a project-by-project basis. There needs to be a transition plan. The availability of existing control tower building may or may not be a part of that. If the control tower building ceases to be available early in the transition, the risks this poses need addressing like any other as part of the project.

It is suggested that it would be sufficient to indicate that a transition plan acceptable to the service provider and the competent authority is agreed as part of the project.

Justification: Less prescriptive text could cover all transition plans regardless of the individual circumstances of the project.

response *Not accepted*

The Agency believes that the proposed text, as part of the nature of the GM proposed, contains references to the way the transition plan should be developed and at the same time it is considered flexible enough to allow for agreements, provided that the different steps and phases within the process are appropriately documented and followed and, finally, remarking that the transition plan should be subject to the safety assessment and thus to the approval by the competent authority.

comment *352* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Explanatory Note Section 2.2.6 '*Transition plan*' Section 3.2.11 '*Transition plan*'	AESA fully supports this explicit and exhaustive treatment of the **transition plan**, its phases, proposed procedures and content.	The transition plan (and its dedicated safety assessment) is the cornerstone of the safe implementation of the remote tower concept.

response *Accepted*

The Agency thanks AESA/DSANA for the supportive comment.

2. Explanatory Note — 2.2. Overview of the issues to be addressed — 2.2.7. ATCOs'/AFISOs'qualifications and training p. 8-9

comment *86* comment by: *skyguide Corporate Regulation Management*

Since the unit endorsement course is meant for student ATCOs or ATCOs from another unit, the Agency proposes to set out the same very high-level performance and training objectives for the conversion training, in the form of additional GM, which will cover changes in the operational environment. ~~Turning a conventional tower into a remotely operated tower is certainly a change in the operational environment which requires the appropriate training of the affected ATCOs.~~

Comment: Training requirements shall be decided by the local Training Centre, as they are best place to understand the needs.

response *Not accepted*

The proposed text only states a fact, which is that the replacement of a conventional tower

environment with a remote tower environment represents a change in the operational environment that should be subject to training. Therefore, the Agency considers the text is appropriate and does not see the need to modify it.

comment *276* comment by: *Prospect ATCOs' Branch UK*

We strongly disagree that no modification to regulation 2015/340 is required. The technical and operational differences to a traditional tower are significant enough to warrant remote tower operations to have their own licencing endorsement. This would be consistent with other approaches to OCS and TCL. Given that the technology is immature it gives more strength, not less, to the argument a specific endorsement is required to ensure that ATCOs are properly trained, and the differences in operation are properly understood by those providing a service. It is likely that at a remote tower centre differences in operation from a traditional tower would be sufficient to justify a new rating endorsement. The endorsement would ensure training to cover specific areas to include, but not limited too:

Differences in visual perception from video screens compared to a traditional OTW view.
Lack of or a replacement to traditional sound.
Enhanced surveillance methods, be it infra red cameras, a traditional ATM display or pan, tilt and zoom cctv tv cameras.
Specific failure modes associated with remote tower technology.
Any new phraseology required.
Differences in interaction with the aerodrome authority and vehicle movements.
Remote Tower Centre methods of operation and specific human factors and team management training to remote tower operations.

We strongly support that every aerodrome whether or not being provided with a service by a remote tower requires its own unit endorsement in line with regulation 2015/340.

response *Not accepted*

As stated in the Explanatory Note, due to the very specific local technologies and operating methods, the Agency does not yet see a real need to support the establishment of a generic remote tower qualification by regulatory means. Should the technology used become more harmonised and widespread, this option can of course be analysed anew.
The Agency believes that the comparison with the OCN or the TCL (as stated by the commentator) cannot be established, since for the case of the remote tower the ATS provision does not change (for the case of ATC, it is Aerodrome Control Service, as if it were provided from a remote tower).
On the particular aspects and elements identified by the commentator, the Agency believes that almost all of them are duly covered already by the proposed GM (e.g. sound, visual presentation characteristics, failure and degraded modes, etc.), and disagrees with the need to have any change in phraseology.

Nevertheless, the Agency thanks the commentator for the supportive comment on the requirement for the aerodromes to constitute their own unit endorsements.

comment *317* comment by: *DATCA*

An additional endorsement should be introduced for RTO ATCOs and AFISOs. When working in an artificial enviroment there is a lot of factors you need to be aware of and these requires

extra training. The gap between RTO and conventionel tower is to large to bridge without additional training.

response *Not accepted*

The Agency agrees with the principle stated by the commentator on the need for training, and believes that the proposed text is in line with this statement. In any case, the training and its approval by the competent authority are subject to the particular conditions of local implementation. As stated in the proposed text, due to the very specific local technologies and operating methods, the Agency does not yet see a real need to support the establishment of a generic remote tower qualification by regulatory means.

comment *353* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Explanatory Note Section 2.2.7 '*ATCOs'/AFISOs' qualifications and training*'	In relation to the harmonisation of the training objectives for remote towers across the EU, AESA misses the explicit reference to specific training in the **proficient use of the new technologies and equipment** introduced to enable and support the provision of remote ATS. This would in particular apply to camera control (conventional and PTZ), equipment that replaces the direct eyesight of the ATCO/AFISO, though it shouldn't be limited to it.	Now that visual observation in the remote location is enabled by specific technologies and equipment and no longer relies on the physical senses of the ATCO/AFISO, it is of paramount importance that the ATCO/AFISO handle them with absolute fluency in order to ensure prompt and safe reaction to any event. In fact, the handling of the equipment should be as transparent as possible in order to ensure the same level of performance by the ATCO/AFISO in remote operations.

response *Partially accepted*

The Agency agrees with the statement made by the commentator, and believes that the proposed text covers the proficient use of new technologies. However, the Agency does not consider it appropriate to make an explicit reference to any of the possible solutions that could be part of the system, allowing for flexibility to be applied to the particular local implementations.

comment *430* comment by: *Wideroe Flyveselskap AS*

2.2.7
WF as a commercial air transport operator favour the requirement that every aerodrome is covered by its own unit endorsement.

response *Accepted*

The Agency thanks the commentator for the supportive comment.

2. Explanatory Note — 2.2. Overview of the issues to be addressed — 2.2.8. Aerodrome aspects — Possible reassignment of tasks between the ATS provider and the aerodrome operator p. 10

comment

42 comment by: *HungaroControl*

e.g. runway surface condition assessment - inappropriate example, see Annex 14 para 2.9.1: Information on the condition of the movement area and the operational status of related facilities shall be provided to the appropriate aeronautical information services units, and similar information of operational significance to the air traffic services units, to enable those units to provide the necessary information to arriving and departing aircraft. The information shall be kept up to date and changes in conditions reported without delay.

response

Noted

It should be noted that the intent of the example is neither to imply that this particular task falls under the ATS functions nor that it should be performed by the ATS provider, as this is a clear responsibility of the aerodrome operator (see for example *ADR.OPS.A.015 Coordination between aerodrome operators and providers of aeronautical information services* of Commission Regulation (EU) No 139/2014 of 12 February 2014 laying down requirements and administrative procedures related to aerodromes pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council (OJ L 44, 14.2.2014, p. 1)).

It is also clearly stated at the beginning of the respective sentence that this may be one of the '*...tasks which although they fall under the responsibility of the aerodrome operator, had been performed by the ATS provider...'*, of course without implying that this is the norm.

In any case, the Agency is of the opinion that the example is appropriate because it is based on existing practice.

comment

113 comment by: *CANSO*

"e.g. runway surface condition assessment" - inappropriate example, see Annex 14 para 2.9.1: Information on the condition of the movement area and the operational status of related facilities shall be provided to the appropriate aeronautical information services units, and similar information of operational significance to the air traffic services units, to enable those units to provide the necessary information to arriving and departing aircraft. The information shall be kept up to date and changes in conditions reported without delay.

response

Noted

It should be noted that the intent of the example is neither to imply that this particular task falls under the ATS functions nor that it should be performed by the ATS provider, as this is a clear responsibility of the aerodrome operator (see for example *ADR.OPS.A.015 Coordination between aerodrome operators and providers of aeronautical information services* of Commission Regulation (EU) No 139/2014 of 12 February 2014 laying down requirements and administrative procedures related to aerodromes pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council (OJ L 44, 14.2.2014, p. 1)).

It is also clearly stated at the beginning of the respective sentence that this may be one of

the '*...tasks which although they fall under the responsibility of the aerodrome operator, had been performed by the ATS provider...'*, of course without implying that this is the norm.

In any case, the Agency is of the opinion that the example is appropriate because it is based on existing practice.

comment *216* comment by: *René Meier, Europe Air Sports*

2.2.8. Aerodrome aspects
Possible reassignment of tasks...
page 10/61

A reassignment of task surely will follow the implementation of the Remote Tower concept. This task will not be easy.

Rationale:
Experience made shows us that this will be a time-consuming process because there will be a workload shift from the ATC operator to the aerodrome operator, with financial consequences, because most probably the aerodrome now needs more staff than before and because of the now different training requirements, we particularly think of weather observation duties, of preparing ATIS messages and others. For sure there also will be changes to different part of the infrastructure as power supply, remotely controlled lighting and radios as well as installations at the aerodrome required to mitigate risks of e.g. comm failure, deterioriating weather situation, aircraft technical problems and other situations.

response *Noted*

The Agency thanks the commentator for their opinion.

comment *244* comment by: *NATS National Air Traffic Services Limited*

"e.g. runway surface condition assessment" - inappropriate example, see Annex 14 para 2.9.1: Information on the condition of the movement area and the operational status of related facilities shall be provided to the appropriate aeronautical information services units, and similar information of operational significance to the air traffic services units, to enable those units to provide the necessary information to arriving and departing aircraft. The information shall be kept up to date and changes in conditions reported without delay.

response *Noted*

It should be noted that the intent of the example is neither to imply that this particular task falls under the ATS functions nor that it should be performed by the ATS provider, as this is a clear responsibility of the aerodrome operator (see for example *ADR.OPS.A.015 Coordination between aerodrome operators and providers of aeronautical information services* of Commission Regulation (EU) No 139/2014 of 12 February 2014 laying down requirements and administrative procedures related to aerodromes pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council (OJ L 44, 14.2.2014, p. 1)).

It is also clearly stated at the beginning of the respective sentence that this may be one of the '*...tasks which although they fall under the responsibility of the aerodrome operator, had been performed by the ATS provider...'*, of course without implying that this is the norm.

	In any case, the Agency is of the opinion that the example is appropriate because it is based on existing practice.

comment	*284* comment by: *IFATCA* Trials have shown that this is one of the most relevant economical issues in the future with a single remote facility. IFATCA wonders if it is the role of EASA to look into these more organisational and financial issues.
response	*Noted* It should be noted that the intent of this exercise is not to impose an organisational set-up as a result of the introduction of the concept of remote ATS provision, as different organisational/financial solutions may be employed in each case, depending on the particularities of each aerodrome.

2. Explanatory Note — 2.2. Overview of the issues to be addressed — 2.2.8. Aerodrome aspects — Tasks which, due to their nature, are aerodrome-related but which will need to be modified/enhanced in order to satisfy newly created needs arising from the implementation of the concept of remote ATS provision p. 11

comment	*424* comment by: *René Meier, Europe Air Sports* 2.2.8. Aerodrome aspects page 11/61 Tasks which...will need to be modified... Besides the installation of new equipment, probably in safety-sensitive areas, we found, when we studied the impacts of Remote Tower solutions or IFR operations without ATC that a considerable amount informing flight crews and training ground staff will be required, the latter in order to maintain the timely availability of all required information to the ATCO seving the remote location. Rationale: Ground staff at the remote location must be made aware of the fact that they are to only one's to dispose of every operational detail whose knowledge is vital to the competent ATCO. Information gathering and distribution becomes more important when a Remote Tower is in operation.
response	*Noted*

2. Explanatory Note — 2.2. Overview of the issues to be addressed — 2.2.9. Airspace user aspects p. 11-12

comment	*27* comment by: *LFV* Lights on when entering airspace has never been up to discussion in SESAR and is not the right way to handle this. Suggestion is to remove this part or more adress it as a suggestion to the pilot to turn the lights on when needed. i.e IT will only work in certain weather conditions and it cant be used for any separations.
response	*Accepted*

The reference is removed.

comment

143 comment by: *UK CAA*

Page No: 11 of 61

Paragraph No: 2.2.9

Comment: It is believed that the potential need for aircraft to have lights on for some systems should not be required as this is contrary to the objective stated at 2.3. If the visual capability is such that lights are required then it is not a suitable technical standard. Regardless, the lighting capability of aircraft during daytime may be such that this is unlikely to add any benefit.

Justification: To set correct expectations and realistic measures.

Proposed Text: Delete reference to assessment of the need for aircraft to have lights on.

response

Accepted

The reference is removed.

comment

217 comment by: *René Meier, Europe Air Sports*

2.2.9. Airspace users aspects
page 11/61

We take note of the statement that airspace users should by no means be negatively impacted. To achieve this, the safety assessements covering the aspects we mentioned before are of utmost importance. These assessments will then bring best results when really all stakeholders are invited to co-operate.

Rationale:
As (most probably) CTR's remain in place around aerodromes with Remote Towers we do not see the need to create TMZ's or the need for other equipment than what we carry on board today.

response

Noted

comment

298 comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

Based onthe experience in Sweden we can not understand the requirements for lights-on. This seems to be based on assumptions or ideas and not on sound validation results.

response

Accepted

The reference is removed.

comment

431 comment by: *Wideroe Flyveselskap AS*

2.2.9/3.2.3.2

	WF as a commercial air transport operator strongly supports a requirement for surveillance and that TMZ are established.
response	*Accepted* The Agency thanks the commentator for the supportive comment.

2. Explanatory Note — 2.2. Overview of the issues to be addressed — 2.2.10. Remote tower operations p. 12

comment	*135* comment by: *EUROCONTROL* **Page 12 - 2.2.10 Remote tower operations** 2nd paragraph - First 3 lines EUROCONTROL makes a suggestion. The text “Based on the complexity and characteristics of each of the aforementioned situations, it seems reasonable to introduce the concept with a phased approach, where the first phase would be the single mode of operation and then other modes may possibly follow…” gives rise to a suggestion. Even if only one single mode is addressed here, specific functions and roles within the RTC in which the corresponding RTM will be implemented should be also defined (for example, the role of the supervisor).
response	*Noted* Due to the explanatory nature of this section, and regarding the comment submitted on specific aspects which are contained in successive sections, the responses are provided within the proposed GM and AMC contained in Section 3 onwards.

comment	*195* comment by: *Flughafen Berlin Brandenburg GmbH* FBB welcomes the idea and the future implementation of the concept of remote tower operations. While the initial scope of this NPA relates "only" provision of ATS from a Remote Tower Module, FBB would like to mention some further aspects: 1. Requirements for conventional contingency working places for convetional towers: Currently, in the case of abnormal situations during the operation of conventional towers, contingency working places are required that provide a direct line of sight to the area of the aerodrome to be observed. Considering the outcome of the future design efforts, contingency working places located at an aerodrome might be less dependend on traditional visual observation. 2. "Blending" of conventional and remote tower operations during standard operations: As stated in section 2.2.8 (page 9), the requirement for direct visual observation clearly interrelates with the tower position and height and the size and the arrangement of runways and taxiways at the aerodrome. The technical and operational advances related to the remote tower concept might also be implemented in conventional towers in cases where the size of the aerodrome or buildings

	next to the tower / on the aerodrome would have required the construction of a new or additional tower. FBB would like to make a point regarding the scope and complexity of the requirements: While the "pure" concept of remote tower operations clearly needs a robust set of safety measures, the requirements for the scenarios described above should be derived from the share of "advanced" elements with a conventional on one side and a remote tower on the other side of the range. Hence, a "blending" of conventional and remote tower aspects within a conventional tower should be covered by a differentiated approach that relates to relevant issues for the tower or aerodrome location in question.
response	*Noted* The Agency thanks the commentator for providing their perspective, which will be taken into due consideration.

comment	*218* comment by: *René Meier, Europe Air Sports* 2.2.10. Remote Tower operations page 12/61 We think a possibility should be created to have ATC operating hours beeing different from aerodrome operating hours. Rationale: This would ensure optimisation of the operations of both entities: Allowing for ATC operating hours being different from aerodrome operating hours would enhance flexibility of the latter, particularly when it comes to VFR operations with light aircraft engaged in non-commercial operations: Even best-equipped destinations are not of interest to us when they not are accessible because of requirements CAT may have, but not our operators.
response	*Noted* The Agency does not fully understand the comment. The basic prerequisite for the provision of ATS service at an aerodrome at a certain time is that the aerodrome is open and operating.

comment	*277* comment by: *Prospect ATCOs' Branch UK* We support the phased approach as suggested in the NPA. We do not understand how in any scenario an equivalent level of safety can be ensured if an ATCO is providing a service to more than one remote tower simultaneously. Again there should be implementing rule regulatory requirements to prevent this. Extreme care and appropriate study would also be required if an ATCO was operating a remote tower service with another rating such as APP. It may be appropriate in time for an ATCO to provide a service from a RTC to more than one remote tower sequentially, moving from one tower to another, provide appropriate human factor and other issues are properly mitigated.
response	*Accepted* The Agency thanks the commentator for the supportive comment and notes the expressed concern regarding the provision of aerodrome ATS remotely by means of a mode different from the single one.

comment 285 comment by: *IFATCA*

IFATCA is opposed to multiple Remote Tower operational centre, as this operational concepts triggers a different level of needs when it comes to Training, degraded modes, emergency situation and licencing issues.
IFATCA proposes that if a state wishes to implement multi remote tower facilities that EASA looks into rulemaking and or AMC,GM establishment for this very specific and new way of providing ATS. Elements like rating, qualification, endorsements and recency will have to be assessed.

response *Accepted*

The Agency notes the expressed concern regarding the provision of aerodrome ATS remotely by means of a mode different from the single one.

comment 354 comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Explanatory Note Section 2.2.10 '*Remote tower operations*'	AESA supports the **phased approach** introduced by these guidelines by limiting their intended scope to address the **single mode of operation** (provision of ATS from a Remote Tower Module (RTM) for only one aerodrome at a time).	AESA supports the rationale stated by EASA: "*Based on the complexity and characteristics of each of the aforementioned situations, it seems reasonable to introduce the concept with a phased approach, where the first phase would be the single mode of operation and then other modes may possibly follow (together with a set of additional requirements/standards, when needed)*".

response *Accepted*

The Agency thanks AESA/DSANA for the supportive comment.

comment 355 comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Explanatory Note Section 2.2.10 '*Remote tower operations*'	The fact that "*under this mode of operation, there can be several units managed by different ATCO or AFISO from one remote location, usually referred to as RTC*" makes one wonder whether this could naturally lead to an "undercover" multiple mode of operation.	It is clear that this cannot be avoided. The comment is made solely as food for thought.

response *Accepted*

The Agency understands the commentator's concern. To this regard, it is considered that the text contained in further sections clarifies the scope and intention of the proposed GM, limited for the time being to the single mode of operation.

comment *356* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Explanatory Note Section 2.2.10 '*Remote tower operations*'	The idea of gaining "*the necessary experience with the new technology and working concept that would ensure optimisation of operations and safety as far as its future development is concerned*" necessarily implies reporting to EASA of that experience. If this is so, this activity (reporting to EASA feedback on actual implementation) should be made explicit and formalised in a simple, pragmatic way.	How else could that experience by gained by EASA as the body in charge of the future development of this concept? This clarification (and possible formalisation) would ensure that the experience gained is in fact fed back into this process.

response *Accepted*

As stated in the document, work has started by addressing simpler scenarios (e.g. single mode of operation in low traffic density environments) and will probably progress with more complexity as the concept evolves and further valuable experience will be gained from implementation projects. The Agency's intention is to take into consideration this experience in future regulatory measures, while working closely on validation and implementation activities'

comment *432* comment by: *Wideroe Flyveselskap AS*

2.2.10/3.2.5.1
The exploratory note states that; "…..the implementation of the remote tower concept are built upon the assumption that airspace should by no means be negatively impacted."
WF is assuming that a single mode of operation will not have a negative effect, provided the RTM is operational throughout the opening hours of the aerodrome.
However, having supervised the switch mode testing performed by ANSP Avinor in the test RTC in Bode for the RVM at Rost and Vaeroy the assumption is that holding may be expected if simultaneous operation at two or more aerodromes are taking place. This negative impact is not related to compromised safety. It is only economical and could be easily mitigated via economic compensation or reduced unit rates.

response *Accepted*

	The Agency understands the commentator's concern and will consider it appropriately. As stated in the scope, this guidance is intended to cover the 'single mode of operation' as defined in the document. Nothing prevents this guidance from being used by the ATS providers through the different alternatives, as long as they comply with the content of the guidance.

2. Explanatory Note — 2.2. Overview of the issues to be addressed — 2.2.11. Regulatory framework analysis p. 12

comment	*144* comment by: *UK CAA* **Page No:** 12 of 61 **Paragraph No:** 2.2.11 **Comment:** It is stated that implementation shall comply with ICAO regulations. ICAO compliance is a State obligation for those elements of ICAO SARPs and PANS that have not been transposed into EU law. Furthermore, ICAO SARPs and PANS may be inappropriate, inadequate or require contextualisation for the remote tower concept. Therefore, the statement made is considered inappropriate. Instead it would be helpful if a fundamental aspect of the NPA was to identify all relevant ICAO content (SARP and PANS) to ensure that it was appropriate for remote towers, and where necessary provide guidance on application and any potential variation that might be required. **Justification:** Appropriate contextualisation **Proposed Text:** Replace with: '…shall comply with EU regulations. ICAO requirements should be complied with as far as possible subject to State differences.'
response	*Noted*

2. Explanatory Note — 2.2. Overview of the issues to be addressed — 2.2.11. Regulatory framework analysis — Remote towers as a change to the functional system p. 12

comment	*278* comment by: *Prospect ATCOs' Branch UK* We fully support that appropriate safety assessments must be completed when implementing remote aerodrome ATS provision.
response	*Accepted* The Agency thanks the commentator for the supportive comment.

comment	*300* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)* ATM/ANS getting a bit ahead of ourselfs... ATM!
response	*Accepted*

comment	*301* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)* ...as safe as the ATS provided locally... We do not agree with the wording. I do not diisagree that provision should be safe however one measure to ensure safety is to reduce capacity... and were not sure that its reflected in the statement.
response	*Not accepted* The Agency believes that the reference to capacity is made with sufficient clarity in the proposed text, as it reads '...demonstrate that the remote provision of ATS for an aerodrome is as safe as the ATS provided locally (from a conventional tower) in equivalent conditions of traffic (in terms of capacity and movements) and operational environment'.

comment	*425* comment by: *René Meier, Europe Air Sports* 2.2.11. Regulatory framework analyses page 12/61 May we add to your "Remote towers as a change to the functional system" that in addition to the ATM/ANS functional system/personnel/procedures and the aerodromes aspects also those of the flight crews should be included in the safety assessments? Rationale: An ATM safety assessement surely will be accompanied by an aerodrome safety assessment on by one covering the flight operations. Due to this fact flight crews experiences should be integrated in any such project from the beginning. The flight crews are the ANSP's and the aerodrome's customers, in the end, the flight crews of an operator are the most important factor when it comes to accept the Remote Tower concept or to its rejection.
response	*Partially accepted* The Agency agrees with the commentator and strongly believes it is important to treat the remote tower concept implementation as a 'multi-actor' scheme. However, the Agency also believes that the proposed text does not prevent at all from taking into consideration the contributions coming from different experts being part of the aviation community and sees, therefore, no need to amend the text.

comment	*433* comment by: *Wideroe Flyveselskap AS* 2.2.11/3.2.2/3.3.2.4 Implementation of remote tower is most likely requiring commercial aircraft operators to perform a safety assessment before operation at an aerodrome operated by ATCO or AFISO is taking place. If so, this should be reflected in the rule making for CAT. Such a safety assessment may result in costly mitigation(s). This should be compensated via reduced unit rates.
response	*Noted* The Agency believes that any of the measures or actions to be taken by the aircraft operators are outside the scope of this proposed GM and sees, therefore, no need to amend the text.

2. Explanatory Note — 2.2. Overview of the issues to be addressed — 2.2.11. Regulatory framework analysis — Compliance with ICAO and EU regulations p. 12

comment

286 comment by: *IFATCA*

this sentence is confusing. According to IFATCA's understanding ATS at an airport cannot be provided without being physically present. So this statement would prohibit the Remote Tower Concept.

response

Not accepted

The Agency agrees with the commentator; yet, it does not understand the statement made on the prohibition of the remote tower concept. The intention of the text is to state that the remote provision of ATS should at least be as safe as today's operations are of a conventional tower (the definition of the aerodrome conventional tower can be found in Section 3.1).

comment

302 comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

And national regulations... this section should also be better tied to the first segment in 2.2.11

response

Not accepted

Based on the comment made, the Agency considers it important to remark that national regulations shall comply with EU regulations, ICAO Standards and various binding regulatory material, and not the opposite.

2. Explanatory Note — 2.2. Overview of the issues to be addressed — 2.2.12. Aeronautical Information Publication (AIP) p. 12

comment

136 comment by: *EUROCONTROL*

Page 12 - 2.2.12 Aeronautical Information Publication (AIP)

EUROCONTROL makes a suggestion.

The fact that the Air Traffic Services are remotely provided should also be included in the corresponding AIP documentation (e.g. the schedule of remote operations, not just technical aspects such as camera masts being recorded on charts).

response

Not accepted

The purpose of the AIP section is to cover those aspects that are specific to the remote tower implementation. The final objective is to provide aerodrome ATS. The schedule associated to the service provision is already part of the AIP, so the Agency considers there is no need to include it in the section.

comment

434 comment by: *Wideroe Flyveselskap AS*

2.2.12

It should be clearly stated in the charts provided in the AIP if the aerodrome is operated by a remote tower.

response *Not accepted*

Although this information is subject to be published by the Member States, based on the principle that the remote tower concept is 'just' a means to provide aerodrome ATS, the Agency does not consider the need to include this fact in the charts, unless local implementation characteristics create a significant impact on airspace users, for which other means would have to be considered (except those included in Section 3.5).

2. Explanatory Note — 2.3. Objectives p. 13

comment *145* comment by: *UK CAA*

Page No: 13

Paragraph No: 2.3

Comment: The first sub-paragraph states:

'This proposal forms the first phase of the work for single mode of operation and is based on research, development and validation activities conducted so far within the SESAR project.'

Therefore, this NPA appears to facilitate only single mode of operation of remote tower (as per the definition proposed). Agency clarity in this regard is requested.

Justification: Clarification required.

response *Noted*

Due to the fairly early stages of the remote tower concept, and the fact that further experience is yet to be gained, the Agency considered it necessary to address the remote tower concept in phases.

As stated already in the Executive Summary (cover page), NPA 2015-04 introduces guidance on the implementation of the remote tower concept for single mode of operation.

comment *154* comment by: *EUROCONTROL*

Page 13 - 2.3. Objectives

EUROCONTROL makes a suggestion.

Text "Further work will be conducted by the Agency in order to:
· address future developments concerning the remote tower concept; and …" gives rise to a suggestion: this section should include how the remote tower concept is to be implemented in a RTC.

EUROCONTROL makes a comment.

Text “This work will be closely linked with EUROCAE WG-100, whose aim is to develop an industry standard on technical aspects of the remote tower concept.” gives rise to a comment: For the moment this group is only focusing on producing MASPs for the visualisation reproduction system for Remote Tower.

response *Noted*

The proposed guidance shall be applicable to the implementation of the concept.

Regarding the EUROCAE WG-100 developments, the Agency, being also part of the EUROCAE WG-100, considers it important to align with the technical standards to be developed in the future.

comment *275* comment by: *Prospect ATCOs' Branch UK*

Remote Tower technology is emerging and not fully understood. The lack of regulatory intervention allows for different ANSPs, manufactures and Competent Authorities to apply a disparate approach to the introduction of remote towers, and this is contrary to the harmonisation and consistency approach taken by EASA in many other areas. Why does EASA take a strong regulatory approach in areas that are well understood but fail to do so in emerging technology where the safety elements are not understood and experience is limited? It would seem much more sensible – and indeed responsible, to start with a strong regulatory approach and then modify this as common standards and methods of operations are evolved by all stakeholders, rather than allowing a ‘free for all’ which will require intervention to harmonise in the future.

response *Noted*

Due to the fairly early stages of the remote tower concept, and the fact that further experience is yet to be gained, the Agency considered it necessary to address the remote tower concept in phases, and taking into consideration that some Member States are already implementing the concept (or have the intention to do so), the Agency considered it necessary to take action swiftly.

Work has started by addressing simpler scenarios (e.g. single mode of operation in low traffic density environments) and will probably progress with more complexity as the concept evolves and further valuable experience will be gained from implementation projects.

comment *279* comment by: *Prospect ATCOs' Branch UK*

We feel that in line with Article 2 (1) of the basic regulation, a proposed implementing rule would serve the union better, by mandating requirements to ensure a high level of safety. We are unsure how non binding guidance material fulfils this legal requirement.

response *Noted*

Due to the fairly early stages of the remote tower concept, and the fact that further experience is yet to be gained, the Agency considered it necessary to address the remote tower concept in phases. This ‘phased approach’ is intended to also evolve from the regulatory ‘level’ perspective as implementation progresses and some experience can be gained and conclusions can be drawn.

comment	*303* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)* it shall also meet EU regulations and national regulations.
response	*Noted* The Agency is taking into consideration the current regulatory framework when developing such GM.

comment	*304* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)* at least equivalent... strong requirement, some shortcommings could be delt with using different mitigations. no?
response	*Noted* Due to the novelty of and limited operational experience with the concept at this stage, and taking into consideration the basic principle followed by which the implementation of the remote tower concept is considered a change in the ATM functional system, the Agency strongly believes that the safety objective comparisons shall be made against 'today's' operations (conventional tower). Therefore, the text remains unchanged, stating this fact.

comment	*305* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)* No mentioning of the already operational implementation (V5) only SESAR work (V3) ref first comment on executive summary. *The scope for this GM should be singel operations for low traffic density aerodromes with few simoultanious movements. The GM does not adhere to this scope and on several occations mixes in more advanced features i.e. the cool stuff...* *The single operations based on the basic equippage has reached a V5 maturity, it is in operations and extensive knowledge resides within LFV. The neat funtions listed as enhanced are at best at V3 maturity, some probably V2 or less. why even mentione this in the GM in the first place.* *A more reasonable approach could be to mentione in the explenatoty note that there might me new technical options around the corner but is should not be in the GM.*
response	*Not accepted* As indicated throughout the document, the scope and objective of the proposed text is to maintain the level of safety in those specific cases where these services are provided from a remote tower compared to their provision from a conventional tower, as well as to promote the development of a new technology associated with the remote tower concept, thus ensuring its safe implementation. At the same time, the GM covers the single mode of operation, as it is also described in the text. Based on this premise, Section 3 of the proposed document addresses both what is defined as 'basic equipage' and 'enhanced equipage'. In the case of the basic equipage, the analyses and validation exercises conducted in the frame

of the SESAR project have shown that for certain operational contexts (see Section 3.2.3.) the functionalities presented in the basic equipage may be sufficient to provide the same level of safety as in the current operations at an aerodrome, subject to the confirmation by the corresponding safety assessment of the local implementation.
On the other hand, the Agency recognises that the development of a new technology offers opportunities to implementers to include new functionalities in the short term, and are also taken into consideration within the scope of the standardisation bodies currently dealing with the remote tower concept. Therefore, the Agency believes that the enhanced equipage ignored — being, however, aware of the early stage and limited maturity of its functionalities. For this purpose, the proposed text presents the need for the ATS provider to conduct an in-depth evaluation of the selected enhanced functionalities, including the necessary validation activities and human performance assessment as part of the corresponding safety assessment of the local implementation.
In any case, new text has been added in order to reinforce the need to take into consideration the aforementioned early stage of those functionalities catalogued as enhanced and to ensure they are appropriately taken into consideration in the context of the safety assessment.

comment *357* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Explanatory Note Section 2.3 '*Objectives*'	AESA supports the clear link established between this **NPA 2015-04** and **RMT.0464** on ***Part-ATS***. Further to this, AESA supports the idea that "*the Agency will aim to recognise this standard as part of the means of compliance with the presumption of regulatory compliance*" and encourages EASA to push it further in order to ensure the presumption of regulatory compliance.	It is important that the total system be thoroughly consistent and that these guidelines serve indeed as reliable means of compliance.

response *Noted*

The Agency thanks the commentator for their support.

comment *408* comment by: *GSommer FRQ*

"The visual reproduction and the system support shall enable visualisation and environmental reproduction of the areas of responsibility of the ATS provider at least equivalent to those provided from a control tower."

This wording implies that the visual reproduction system has to provide the same "resolution" than the human eye. This has been discussed also in the EUROCAE WG-100 and was discarded as not beeing a successful approach.

response *Not accepted*

The Agency's intention through the proposed text is not to state that 'the visual reproduction system has to provide the same "resolution" as the human eye', but rather to clarify that the visual presentation, as defined in Section 3.1., should provide a view equivalent, in terms of visual coverage, to the one available at the corresponding conventional tower.

2. Explanatory Note — 2.4. Summary of the Regulatory Impact Assessment (RIA) of the options p. 13-14

comment *87* comment by: *skyguide Corporate Regulation Management*

Option 1: ~~Draft~~ guidance on remote tower aspects and AMC/GM for ATCOs/AFISOs.
Comment: If there is a need for guidance material, it should not be at a draft version.

response *Accepted*

comment *146* comment by: *UK CAA*

Page No: 13 of 61

Paragraph No: 2.4

Comment: Option 1 suggests the material in NPA section 3 will be preserved post-NPA but it is not made clear what the 'vehicle' will be. The Agency is invited to clarify its plans for the preservation and future application of this material following the end of the NPA's consultation period. UK CAA's general comment on retention of NPA 2015-04 content relating to technical aspects of remote tower implementation also refers.

Justification: Clarification.

response *Noted*

According to the rule development processes, after the said public consultation period and after having taken into consideration the inputs provided by the stakeholders, NPA 2015-04 will lead to an Agency Decision.

comment *147* comment by: *UK CAA*

Page No: 13 of 61

Paragraph No: 2.4

Comment: Whilst the UK CAA welcomes the proposed guidance material contained within NPA 2015-04 section 3, given EUROCAE-100's ongoing work regarding technical standards, it is not clear why the Agency has elected to proceed with the NPA at this point in time, rather than wait for the conclusion of EUROCAE-100's work so that EUROCAE-100 outcomes could be included. The Agency is invited to clarify why the current course of action has been taken, rather than wait for EUROCAE-100 to conclude its work.

Justification: Clarification.

response *Noted*

Due to the fairly early stages of the remote tower concept, and the fact that further experience is yet to be gained, the Agency considered it necessary to address the remote tower concept in phases, and taking into consideration that some Member States are already implementing the concept (or have the intention to do so), the Agency considered it necessary to take action swiftly.
Work has started by addressing simpler scenarios (e.g. single mode of operation in low traffic density environments) and will probably progress with more complexity as the concept evolves and further valuable experience will be gained from implementation projects. From this perspective, the Agency, being also part of the EUROCAE WG-100, considers it important to align with the future standards to be developed by the group.

comment

176 comment by: *EUROCONTROL*

Page 14 - 2.4 Summary of the Regulatory Impact Assessment (RIA) of the options

Option 1 - 1st "-"

EUROCONTROL makes a suggestion:

To add that the RTC aspects for the implementation of the remote tower concept for single mode of operations are not covered either.

response

Not accepted

The Agency believes that the aspects contained in the GM cover elements of the remote tower concept at this stage for what has been defined as single mode of operation, and based on the premise of considering the remote tower concept implementation as a change in the ATM functional system.

comment

220 comment by: *René Meier, Europe Air Sports*

2.4. Summary of the RIA...
page 14/61

We agree with Option 1.

Rationale:
The option covers all elements to be considered.

response

Noted

comment

280 comment by: *Prospect ATCOs' Branch UK*

We would suggest that an option 2 is required, which would involve an implementing regulation and associated AMC and GM, laying down rules for compliance for the operation of remote towers. We reject the argument in the NPA that this would be over regulation, and indeed regulation is required to ensure an appropriate level of safety. For this option not to even be considered in the NPA is concerning. By having only options that leave all the flexibility to ATM providers, rather questions how his approach ensures harmonisation, a common approach across member states and Competent Authorities and one set of standards. Presumably in due course EASA will be faced with many different approaches by

different ATM providers and Competent Authorities, which will require another RMT to standardise. Why not complete that work now?

response *Noted*

Due to the fairly early stages of the remote tower concept, and the fact that further experience is yet to be gained, the Agency considered it necessary to address the remote tower concept in phases. This 'phased approach' is intended to also evolve from the regulatory 'level' perspective as implementation progresses and some experience can be gained and conclusions can be drawn.

comment *358* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Explanatory Note Section 2.4 '*Summary of the Regulatory Impact Assessment (RIA) of the options*'	Although actually taken into consideration through the document, AESA misses the formal treatment of the **meteorological service provision aspects** as a separate item. In particular, this would refer to provision of METAR, TAF and local QNH. AESA also misses an explicit treatment of the Automatic Terminal Information Service (**ATIS**) which is normally used in ATS provision.	In order to achieve full completeness of the guidelines and address the full range of aspects as separate, interrelated items.

response *Not accepted*

The Agency considers that the meteorological service provision aspects are outside the scope of NPA 2015-04, and that are fully covered by other means within the current regulatory framework.

3. Proposed guidance on the implementation of the remote tower concept p. 15

comment *118* comment by: *ENAV*

Review the usage of the word "shall" within Chapter 3, to be consistent with its guidance-material nature (it is sometimes used to refer to requirements established in other documents, which might be considered appropriate, sometimes to establish requirements out of the document itself, which would be not).

response *Noted*

The comment is noted and each case is revised separately. It is important to remark that the use of the modal verb 'shall' is permitted and used commonly even at GM level.

comment	*281* comment by: *Prospect ATCOs' Branch UK* General Comment We welcome the issues that are discussed in this section, and the identification on the aspects of remote tower operations which are commented on. It is well researched and it is apparent much thought and study has been conducted in to all of the possible issues. We feel many of these elements should be elevated to AMC, supported by an implementing regulation, to require ATM providers to take full cognisance of the guidance.
response	*Noted* The Agency thanks the Prospect ATCOs' Branch UK for their comments and will take them duly into consideration.

comment	*406* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)* The SCOPE of this GM is not clearly defined, the effect is that the material seems to be a little all over the place. The scope for this GM should be singel operations for low traffic density aerodromes with few simoultanious movements. The GM does not adhere to this scope and on several occations mixes in more advanced features i.e. the cool stuff...and on other occations makes cleas statements on the "low end scope" The single operations based on the basic equippage has reached a V5 maturity, it is in operations and extensive knowledge resides within f.i. LFV which is not included in the GM. The neat funtions listed as enhanced are at best at V3 maturity, some probably V2 or less. why even mentione this in the GM in the first place. A more reasonable approach could be to mentione in the explenatoty note that there might me new technical options around the corner but is should not be in the GM.
response	*Noted* As indicated throughout the document, the scope and objective of the proposed text is to maintain the level of safety in those specific cases where these services are provided from a remote tower compared to their provision from a conventional tower, as well as to promote the development of a new technology associated with the remote tower concept, thus ensuring its safe implementation. At the same time, the GM covers the single mode of operation, as it is also described in the text. Based on this premise, Section 3 of the proposed document addresses both what is defined as ‘basic equipage’ and ‘enhanced equipage’. In the case of the basic equipage, the analyses and validation exercises conducted in the frame of the SESAR project have shown that for certain operational contexts (see Section 3.2.3.) the functionalities presented in the basic equipage may be sufficient to provide the same level of safety as in the current operations at an aerodrome, subject to the confirmation by the corresponding safety assessment of the local implementation. On the other hand, the Agency recognises that the development of a new technology offers opportunities to implementers to include new functionalities in the short term, and are also taken into consideration within the scope of the standardisation bodies currently dealing

with the remote tower concept. Therefore, the Agency believes that the enhanced equipage ignored — being, however, aware of the early stage and limited maturity of its functionalities. For this purpose, the proposed text presents the need for the ATS provider to conduct an in-depth evaluation of the selected enhanced functionalities, including the necessary validation activities and human performance assessment as part of the corresponding safety assessment of the local implementation.

In any case, new text has been added in order to reinforce the need to take into consideration the aforementioned early stage of those functionalities catalogued as enhanced and to ensure they are appropriately taken into consideration in the context of the safety assessment.

3. Proposed guidance on the implementation of the remote tower concept — 3.1. Definitions p. 15

comment *28* comment by: *LFV*

Bullet 8. OTW **cannot be equivalent** to the corressponding tower due its placement will most likely be different. This regarded to hight and angle of its placement. **OTW should be the same as mentioned in 3.2.5.2 first section**

response *Partially accepted*

The definition of the 'out-the-window view' is amended and, for the sake of clarity, a new definition of 'visual presentation' is added.

comment *50* comment by: *Prof. Filippo Tomasello*

definition of 'aerdrome remote tower': instead of "may support operation", it could be better "required to support operation". E.g. COM and recording are necessary, not optional. Other components (e.g. support to ground navigation) may be considered "necessary" in that case by the involved aerdrome operator and service provider.

response *Partially accepted*

The definition is reworded following the commentator's suggestion.

comment *51* comment by: *Prof. Filippo Tomasello*

'Remote Tower Module' should be defined as well.

response *Accepted*

comment *106* comment by: *CANSO*

CANSO would like to suggest the following definitions:

1. 'Aerodrome conventional tower' means a facility located at an aerodrome from which ATS can be provided to aerodrome traffic mainly through ~~the maintenance~~ of direct visual observation of the area of responsibility of the tower ~~aerodrome~~.

2. Aerodrome remote tower' means a remote facility from which ATS can be provided to a

single or multiple distant aerodromes.

4. 'Direct visual observation' means observation through direct eyesight of objects situated within the line of sight of the observer ~~(through 'out-the-window view' means),~~ possibly enhanced by external elements (e.g. binoculars).

The definition of 'Single mode of operation' is not clear, especially the concept "at a time".

7.'Single mode of operation' means the provision of ATS from a Remote Tower Module (RTM) for only one aerodrome at a time "

8.'Out-the-window view' means:

- a view equivalent, in terms of visual coverage, to the one available at the corresponding conventional tower; or, ~~when available~~
- in the absence of a conventional tower, or when other locations are deemed more beneficial, ~~the 'out-the-window' view shall mean~~ an unobstructed view of all the areas of responsibility of the tower.

Clarification: The word "tower" that we proposed to be added at the very end of the definition is not referred to an object, rather to an ATS unit.
9. Visual presentation (A definition of "Visual Presentation" appears necessary to complement that of "Aerodrome remote tower", just like "Direct visual observation" is complementary to "Aerodrome conventional tower". The definition should be based on 3.2.5.2 and reasonably mention the "Out-the-window view".)

The NPA states:
The meaning of 'visual observation' referenced in the relevant ICAO documents is somehow questioned by the aviation community, and the various stakeholders concerned interpret differently its meaning. It is therefore necessary to establish clarity and common understanding on this subject, with the objective of being able to verify the applicability of the established ICAO ATS procedures, or to develop additional requirements and/or guidance which fit with the established ATS provision framework, in particular with the principle of visual observation.
These definitions and application are fundamental to this – need to ensure that guidance/rules do not result in reinforcing regulation that needs changing

response

Partially accepted

1. Accepted.

2. Not accepted. The proposed definition is in line with the ICAO provisions, with the purpose to distinguish between a 'conventional tower' and a 'remote tower'.

4. Accepted.

8. Partially accepted. The definition has been redefined as 'visual presentation' and the commentator's proposal has been taken into consideration for this definition.

9. Accepted. Visual presentation is defined.

comment *119* comment by: *ENAV*

1."Aerodrome conventional tower - means a facility located at an aerodrome from which ATS can be provided to aerodrome traffic through the maintenance of direct visual observation of the area of responsibility of the aerodrome".

"Aerodrome conventional tower" means a facility located at an aerodrome from which ATS can be provided to aerodrome traffic mainly through ~~the maintenance of~~ direct visual observation of the area of responsibility of the tower ~~aerodrome~~.

2."Aerodrome remote tower - means a facility from which ATS can be provided to aerodrome traffic through real-time visual presentation of the elements contained in its area of responsibility (airfield and vicinity) together with other elements that may support the operation".

'Aerodrome remote tower' means a facility from which ATS can be provided to aerodrome traffic through real-time visual presentation of the ~~elements contained in its~~ area of responsibility of the tower ~~(airfield and vicinity)~~ together with other elements that may support the operation.

4. "Direct visual observation - means observation through direct eyesight of objects situated within the line of sight of the observer (through 'out-the-window view' means), possibly enhanced by external elements (e.g. binoculars)".

'Direct visual observation' means observation through direct eyesight of objects situated within the line of sight of the observer ~~(through 'out-the-window view' means)~~, possibly enhanced by external elements (e.g. binoculars).

7."Single mode of operation' means the provision of ATS from a Remote Tower Module (RTM) for only one aerodrome at a time"

The definition is not clear, especially the concept "at a time".
8."Out-the-window view - means a view equivalent, in terms of visual coverage, to the one available at the corresponding conventional tower, when available.
In the absence of a conventional tower, or when other locations deemed more beneficial, the 'out-the-window' view shall mean an unobstructed view of all the areas of responsibility of the ATCO/AFISO".

"Out-the-window view" means:
· a view equivalent, in terms of visual coverage, to the one available at the corresponding conventional tower; or~~, when available~~

· ~~I~~in the absence of a conventional tower, or when other locations deemed more beneficial, ~~the 'out-the-window' view shall mean~~ an unobstructed view of ~~all~~ the area~~s~~ of responsibility of the ~~ATCO/AFISO~~tower.

9. Visual presentation (*A definition of "Visual Presentation" appears necessary to complement that of "Aerodrome remote tower", just like "Direct visual observation" is complementary to "Aerodrome conventional tower". The definition should be based on 3.2.5.2 and reasonably mention the "Out-the-window view".)*

response

Partially accepted

1. Accepted. Text is reworded.

2. Partially accepted. Text is reworded.

4. Accepted.

8. Partially accepted. The definition has been redefined as 'visual presentation' and the commentator's proposal has been taken into consideration as regards this definition.

9. Accepted. Visual presentation is defined.

comment

148 comment by: *UK CAA*

Page No: 15 of 61

Paragraph No: 3.1

Comment: It is suggested that the creation of new definitions in AMC or GM is inappropriate and that it would be more suitable to include them in the covering regulation.

Justification: The definitions would appear to have no legal standing if they are not included in the regulatory material.

response

Noted

The definitions are considered essential to facilitate the understanding of the document's content. In order to clarify this aspect, the reasoning is added in Section 3.1.

comment

149 comment by: *UK CAA*

Page No: 15 of 61

Paragraph No: 3.1

Comment: The concept of defining a "conventional tower" seems unnecessary. A Control Tower should be considered to be a "conventional tower" unless it is a remote tower. There is reference in the document to the conventional tower being the "local tower". This is not defined.

In addition, definitions for 'Remote Tower Centre' and 'Remote Tower Module' are considered necessary.

Justification: Clarity.

Proposed Text:

"Remote Tower Centre' means a unit established to provide aerodrome control services for aerodromes under its jurisdiction by means of aerodrome remote tower facilities."

"Remote Tower Module' means an aerodrome remote tower facility at a remote tower centre."

response

Partially accepted

The references to the 'local conventional tower' are removed for consistency with the term defined.

The Agency considers it necessary to make a distinction between the 'aerodrome conventional tower' and the 'aerodrome remote tower'. Therefore, these definitions remain in the document.

comment

177 comment by: *EUROCONTROL*

Page 15 - 3.1. Definitions

4. 'Direct visual observation'

EUROCONTROL makes a comment that gives rise to a suggestion:

The terms visual observation and direct visual observation are confusing.

EUROCONTROL thinks that:
• Direct visual observation should be defined to mean 'seeing' something (i.e. using the power of the eyes), whereas;
• Visual observation could then mean using the 'out-the-window' equivalent of direct visual observation (e.g. using cameras, surveillance etc.).

response

Partially accepted

The definitions of 'direct visual observation' and 'out-the-window view' are amended, and a definition for 'visual presentation' is added in order to enhance clarity.

comment

245 comment by: *NATS National Air Traffic Services Limited*

NATS would like to suggest the following definitions:

1. 'Aerodrome conventional tower' means a facility located at an aerodrome from which ATS can be provided to aerodrome traffic mainly through ~~the maintenance of~~ direct visual observation of the area of responsibility of the aerodrome tower.

2. 'Aerodrome remote tower' means a facility from which ATS can be provided to aerodrome traffic through real-time visual presentation of the ~~elements contained in its~~ area of responsibility of the tower (~~airfield and vicinity~~) together with other elements that may support the operation.

	7."Single mode of operation' means the provision of ATS from a Remote Tower Module (RTM) for only one aerodrome ~~at a time~~ " The definition is not clear, especially the concept "at a time". Out-the-window view' means: • a view equivalent, in terms of visual coverage, to the one available at the corresponding conventional tower, which should permit visual observation of all the areas of responsibility of the ATCOs/AFISOs; or, • in the absence of a conventional tower, or when other locations are deemed more beneficial, means unobstructed view/s of all the areas of responsibility of the ATCOs/AFISOs. The document states: The meaning of 'visual observation' referenced in the relevant ICAO documents is somehow questioned by the aviation community, and the various stakeholders concerned interpret differently its meaning. It is therefore necessary to establish clarity and common understanding on this subject, with the objective of being able to verify the applicability of the established ICAO ATS procedures, or to develop additional requirements and/or guidance which fit with the established ATS provision framework, in particular with the principle of visual observation. These definitions and application are fundamental to this – need to ensure that guidance/rules do not result in reinforcing regulation that needs changing The NPA states (page 6): The meaning of 'visual observation' referenced in the relevant ICAO documents is somehow questioned by the aviation community, and the various stakeholders concerned interpret differently its meaning. It is therefore necessary to establish clarity and common understanding on this subject, with the objective of being able to verify the applicability of the established ICAO ATS procedures, or to develop additional requirements and/or guidance which fit with the established ATS provision framework, in particular with the principle of visual observation. These definitions and application are fundamental to this – need to ensure that guidance/rules do not result in reinforcing regulation that needs changing. The following definitions do not clarify all possible intermediate situations related to the tower location and/or environmental conditions, air traffic service provision cannot be exclusively based on direct visual observation (e.g. Use of cameras in the Tower) 1. "Aerodrome conventional tower" means a facility located at an aerodrome from which ATS can be provided to aerodrome traffic through the maintenance of direct visual observation of the area of responsibility of the aerodrome. 2. "Aerodrome remote tower" means a facility from which ATS can be provided to aerodrome traffic through real-time visual presentation of the elements contained in its area of responsibility (airfield and vicinity) together with other elements that may support the operation.
response	*Partially accepted* 1. Accepted. Text is reworded.

2. Partially accepted. Text is reworded taking into consideration some of the commentator's suggestions.

7. Not accepted. The Agency believes it is necessary to explicitly state that through the single mode of operation only one aerodrome can be provided with ATS by one ATCO/AFISO at a time.

Regarding the definition of the 'out-the-window view', the comment is partially accepted. The definition has been redefined as 'visual presentation' and the commentator's proposal has been taken into consideration as regards this definition.

The Agency also believes these definitions should be alligned with the ICAO existing provisions.

comment

288 comment by: *IFATCA*

IFATCA finds this definition misleading. We propose therefore to replace the out the window view - by a synthetic or virtual and/or reconstructed out of the window view. This in order to clearly identify that it is not the reality - but a reproduced reality.

Further IFATCA would welcome that a definition of what such a view needs to cover is added. meaning that it is in most aerodrome not sufficient to see the runway and or the apron - but that the full aerodrome circuit is being reproduced as well - as other wise an ATCO will not be able to provide ATS in the vicinity of the airport without a mandatory transponder equipage and
needed surveillance equipment. (many of the aerodrome have a signficant part of the approach in the surrounding of an airport and need to be covered by a surveillance tool - if nobody is physically at the airport.

response

Accepted

The definition has been redefined as 'visual presentation'.

comment

306 comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

Why not use the ICAO def.

ICAO Annex 11 states

Aerodrome control tower. A unit established to provide air traffic control service to aerodrome traffic. Aerodrome traffic. All traffic on the manoeuvring area of an aerodrome and all aircraft flying in the vicinity of an aerodrome.

response

Not accepted

The Agency considers it necessary to make a distinction between the 'aerodrome conventional tower' and the 'aerodrome remote tower'. Therefore, these definitions remain in the document.

For the sake of consistency, the ICAO provisions were taken into consideration when defining both the 'aerodrome conventional tower' and the 'aerodrome remote tower'.

comment

307 comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

Definition 2

Airfield and vincinity?, we propose (maneouvring area and vicinity of the aerodrome)

response

Accepted

comment

308 comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

definition 4.

Direct visual observation is not a good definition, its only used on a few occations in the GM. why not then and there be more clear of whais intenden. visual observation... from a conventional TWR...?

response

Partially accepted

The Agency believes this definition is needed in order to differentiate between the visual observation through direct eye contact and the visual observation through the remote tower system means.

In any case, a new definition addressing 'visual presentation' is added as complementary to this definition, in order to enhance understanding.

comment

309 comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

Definition 8. the definition does not work. equivalent is a strong requirement and referes back to a baseline which (the existing tower, even if there is a disclaimer) may be missleading. The OTW could be better or worse that the baseline and still sufficient to provide safe service.

response

Accepted

The definition has been redefined as 'visual presentation' and the commentator's proposal has been taken into consideration as regards this definition.

comment

359 comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Proposed guidance on the implementation... Section 3.1 '*Definitions*' *1. 'Aerodrome conventional tower'*	AESA suggests to modify the definition of '*Aerodrome conventional tower*' as follows: "*means a facility located at an aerodrome from which ATS can be provided to aerodrome traffic* **mostly** *through the maintenance of direct visual observation of the area of responsibility of the aerodrome*".	Aerodrome conventional tower can make use of equipment and systems (e.g. cameras, SMR) to enhance the direct visual observation of places where this direct visual observation is not feasible.

response *Accepted*

comment *360* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Proposed guidance on the implementation... Section 3.1 '*Definitions*' *2. 'Aerodrome remote tower*'	The definition of '*Aerodrome remote tower*' makes it possible for the facility (RTC) to be located at the aerodrome itself, as there is no indication of the contrary. AESA suggests to modify the definition of '*Aerodrome conventional tower*' as follows: "*means a facility* **not located at an aerodrome** *from which ATS can be provided to* **that** *aerodrome traffic through real-time visual presentation of the elements contained in its area of responsibility (airfield and vicinity) together with other elements that may support the operation*".	In order to make clear the remote tower concept and for consistency with the definition of '*Aerodrome conventional tower*'.

response *Not accepted*

The aerodrome remote tower does not necessarily have to be located at a place different from the aerodrome provided with the ATS. The concept is based on the possibility to provide ATS through the replacement of the 'out-the-window view', regardless of the location of the facility.

comment *361* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Proposed guidance on the implementation... Section 3.1 '*Definitions*' *3.* '*Aviation undertaking*'	A different definition of this same term is included as **definition 13** of **Annex I** to the future ATM/ANS regulation that will result from **Opinion No 03/2014**. In the draft of the future ATM/ANS regulation circulated for **SSC/56**, the definition is the following, different from the one presented in this **NPA 2015-04**: "*means an entity, person or organisation, other than the service providers regulated by this Regulation that is affected by or affects a service delivered by a service provider*".	In order to ensure consistency of the total system and avoid confusion and misalignment between regulations.

	Both definitions should be consistent. In fact, it might be more sensible to remove this definition and refer to the definition of the future ATM/ANS regulation (if the timelines of both activities allow for this synchronisation).	

response *Noted*

Noted. The only purpose of the definitions is to facilitate the understanding of the elements contained in the document. In any case, the intention is to align also this definition with the one contained in NPA 2015-04.

comment *362* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Proposed guidance on the implementation... Section 3.1 '*Definitions*' *8.* '*Out-the-window view*'	In the second paragraph of the definition of '*Out-the-window view*', it should say: "*In the absence of a conventional tower, or when other locations* **are** *deemed more beneficial, the 'out-the-window' view shall mean an unobstructed view of all the areas of responsibility of the ATCO/AFISO*".	Typographical error.

response *Accepted*

comment *407* comment by: *AvinorANSP*

to point 8 : The OTW does not give an unobstructed view today due to the tower roof.Suggest to phrase definition of OTW as the view from the conventional tower.

response *Accepted*

The definition of 'out-the-window view' is amended.

comment *410* comment by: *GSommer FRQ*

"'Single mode of operation' means the provision of ATS from a Remote Tower Module (RTM) for only one aerodrome at a time."

Currently there are 3 modes seen in the remote tower community:

- Single - permanent 1:1 relation of a RTM to an aerodrome
- Switching - Sequential (temporary) 1:1 realation of a RTM to an aerdrome out of multiple

	aerodromes • Multiple - 1:n relation of a RTM to multiple aerodromes at the same time The single mode definition above is not clear enough, as it would also be valid for switching mode.
response	*Not accepted* As stated in the scope, this guidance is intended to cover the 'single mode of operation' as defined in the document. Nothing prevents ATS providers from using this guidance through the different alternatives, as long as they comply with the content of the guidance.

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.1. Identification of the change p. 15-17

comment	*4* comment by: *LFV* Bullet list Basic Equipage: Bullet 3 och 4 are not specific for the remote tower. Equivalent adaptation may be used for another ATS unit.
response	*Partially accepted* As stated in the document, the elements contained in the list are either new or modified in some way to be adapted to the remote provision of ATS. In any case, the text is reworded to enhace clarity.

comment	*5* comment by: *LFV* Last section: The normal procedures at the local tower should be sufficient at the remote tower when it comes to operational context. No extra functionalities should be necessary to handle the same traffic.
response	*Not accepted* As stated in the proposed text, the possible need for extra functionalities to be implemented should be identified based on the results of the necessary safety assessment to be conducted. As the text is in line with this statement, the Agency does not consider it necessary to amend it.

comment	*29* comment by: *LFV* Basic equipage should also include Visual Communication/SLG /signal light gun according to basic regulation
response	*Accepted*

comment	*43* comment by: *HungaroControl* • voice, data communication, meteorological data - MET data shall be available for remote ATS at Basic level equipage
response	*Accepted*

Meteorological data is included as an example of 'management of assets'.

comment *44* comment by: *HungaroControl*

Dedicated means to facilitate the detection and tracking of obstructions/foreign objects on the manoeuvring area (e.g. personnel or animals). - FOD detection is not an ATS responsibility. See Annex 14, para 2.9 Condition of the movement area and related facilities

response *Accepted*

comment *45* comment by: *HungaroControl*

- Functionalities to facilitate judging the aircraft's position or altitude (depth of vision for

the operator e.g.based on survaillance data or binocular functionality)

response *Not accepted*

The Agency does not consider it necessary to quote any examples regarding the functionalities to be used for the purpose stated in the text.

comment *52* comment by: *Prof. Filippo Tomasello*

The remote tower may be 'at' a single aerodrome (e.g. in the aerodrome perimeter, but on the ground floor), but also remote from the aerodrome (e.g. colocated with the TWR at a different aerdrome or located at an ACC or elsewhere). It could be better to say: '... necessary for the operation of the remote tower ~~at~~ **serving** a single aerodrome....'

response *Noted*

The Agency considers that the present proposal is the most adequate one. Therefore, the Agency prefers to keep the text unchanged.

comment *53* comment by: *Prof. Filippo Tomasello*

why only infrared cameras? Technology offers a range of different solutions in the optical or non-optical bands. Perhaps it would be better to say: 'use of infrared cameras or other equipemt for remote sensing'

response *Partially accepted*

The list is based on known, existing functionalities. In any case, the text 'but not limited to' is included in order not to prevent from having additional elements.

comment *54* comment by: *Prof. Filippo Tomasello*

equipement should also include:

- recording of voice/data/images
- replay facilities
- power supply
- air conditioning or equipment cooling
- processiong and data storing capabilities

response

Accepted

The elements proposed by the commentator are already included in the various sections of the proposed GM.

comment

67 comment by: *DFS Deutsche Flugsicherung GmbH*

5th bullit of "enhanced equipage":
the term "operator" should be replaced by ATCO/AFISO in order not to mix it with the aircraft operator.

change proposal:

Functionalities to facilitate judging the aircraft's position or altitude (depth of vision for the ~~operator~~ ATCO/AFISO).

Note: "Operator (ATCO/AFISO)" or "operator" appears several times in the document, e.g. 3.2.4, 3.2.5.1, 3.2.5.2.) where the identification as "ATCO/AFISO" would be clearer.

response

Accepted

comment

88 comment by: *skyguide Corporate Regulation Management*

~~The ATS provider should take into account that the analyses and validation exercises, performed in the frame of the SESAR project, have shown that for certain operational contexts (see Section 3.2.3.) the functionalities presented in the **basic equipage may be sufficient** to provide the same level of safety as in the current operations (local conventional tower), subject to the confirmation by the corresponding safety assessment of the local implementation.~~

Comment: The relevant ANSP shall determine the equipment requirements.

response

Not accepted

The equipment requirements shall be based on the results of the safety assessment to be conducted. However, the Agency considers it necessary to take into consideration recent validation exercises and the results obtained by the existing bodies.

comment

107 comment by: *CANSO*

"The ATS provider should take into account that the analyses and validation exercises, performed in the frame of the SESAR project, have shown that for certain operational contexts (see Section 3.2.3.) the functionalities presented in the basic equipage may be sufficient to provide the same level of safety as in the current operations (local conventional tower), subject to the confirmation by the corresponding safety assessment of the local implementation"

- It's not defined anywhere what is a "Local Conventional Tower".
- The will of highlighting that the transition from conventional TWR to remote one (even with the only basic configuration) does not change the level of safety) is very tough, it would be better to speak of acceptable level of safety. This approach could better support local safety

assessment.

The substitution of the term “same level of safety as in current operations” shall be replaced by “acceptable level of safety” and kept consistent throughout the document.

response *Not accepted*

Due to the novelty of and limited operational experience with the concept at this stage, and taking into consideration the basic principle followed by which the implementation of the remote tower concept is considered a change in the ATM functional system, the Agency strongly believes that the safety objective comparisons shall be made against ‘today’s’ operations (conventional tower). Therefore, the text remains unchanged, stating this fact.

comment *114* comment by: *CANSO*

voice, data communication, **meteorological data** - MET data shall be available for remote ATS at Basic level equipage

response *Accepted*

Meteorological data is included as an example of ‘management of assets’.

comment *115* comment by: *CANSO*

- *Dedicated means to facilitate the detection and tracking of obstructions/foreign objects on the manoeuvring area (e.g. personnel or animals).* - **FOD detection is not an ATS responsibility. See Annex 14, para 2.9 Condition of the movement area and related facilities**
- *Functionalities to facilitate judging the aircraft’s position or altitude (depth of vision for the operator* **e.g.based on survaillance data**)

response *Partially accepted*

The reference to ‘foreign objects’ is removed.

The Agency does not consider it necessary to include any examples of functionalities to accomplish the proposed objectives.

comment *120* comment by: *ENAV*

“The ATS provider should take into account that the analyses and validation exercises, performed in the frame of the SESAR project, have shown that for certain operational contexts (see Section 3.2.3.) the functionalities presented in the basic equipage may be sufficient to provide the same level of safety as in the current operations (local conventional tower), subject to the confirmation by the corresponding safety assessment of the local implementation”

- It’s not defined anywhere what is a “Local Conventional Tower”.
- The will of highlighting that the transition from conventional TWR to remote one (even with the only basic configuration) does not change the level of safety) is very tough, it would be better to speak of acceptable level of safety. This approach could better support local safety assessment.

response *Partially accepted*

The text is amended for consistency, and the reference to ‘local conventional tower’ is deleted.

Due to the novelty of and limited operational experience with the concept at this stage, and taking into consideration the basic principle followed by which the implementation of the remote tower concept is considered a change in the ATM functional system, the Agency strongly believes that the safety objective comparisons shall be made against 'today's' operations (conventional tower). Therefore, the text remains unchanged, stating this fact.

comment *150* comment by: *UK CAA*

Page No: 15 of 61

Paragraph No: 3.2

Comment: It is suggested that the collation of all of the aspects of safety assessment that must be completed into a Goal Structured Notation depiction should be included as this would significantly assist in user understanding of the scope and aspects of the complete safety argument. This would then allow localised additions/changes as necessary, and evidences to meet the goals to be provided.

Justification: Supports simplifying and easing the safety assurance process and ensures complete coverage of safety assurance.

response *Not accepted*

The Agency understands the potential benefits of the Goal Structured Notation. However, due to the different practices among Member States, it considers that this method should not be included in the proposed text in order not to condition the use of the proposed GM.

comment *151* comment by: *UK CAA*

Page No: 15 of 61

Paragraph No: 3.2.1

Comment: The value in identifying and defining Basic and Enhanced Equipage is questioned. The impression given in the NPA is that individual remote tower projects will fall neatly into one or the other. In practice, each is likely to be somewhere on a spectrum of solutions, rather than one or the other.

Justification: The value of the proposed text is questioned.

response *Noted*

As indicated throughout the document, the scope and objective of the proposed text is to maintain the level of safety in those specific cases where these services are provided from a remote tower compared to their provision from a conventional tower, as well as to promote the development of a new technology associated with the remote tower concept, thus ensuring its safe implementation. At the same time, the GM covers the single mode of operation, as it is also described in the text. Based on this premise, Section 3 of the proposed document addresses both what is defined as 'basic equipage' and 'enhanced equipage'. In the case of the basic equipage, the analyses and validation exercises conducted in the frame

of the SESAR project have shown that for certain operational contexts (see Section 3.2.3.) the functionalities presented in the basic equipage may be sufficient to provide the same level of safety as in the current operations at an aerodrome, subject to the confirmation by the corresponding safety assessment of the local implementation.
On the other hand, the Agency recognises that the development of a new technology offers opportunities to implementers to include new functionalities in the short term, and are also taken into consideration within the scope of the standardisation bodies currently dealing with the remote tower concept. Therefore, the Agency believes that the enhanced equipage ignored — being, however, aware of the early stage and limited maturity of its functionalities. For this purpose, the proposed text presents the need for the ATS provider to conduct an in-depth evaluation of the selected enhanced functionalities, including the necessary validation activities and human performance assessment as part of the corresponding safety assessment of the local implementation.
In any case, new text has been added in order to reinforce the need to take into consideration the aforementioned early stage of those functionalities catalogued as enhanced and to ensure they are appropriately taken into consideration in the context of the safety assessment.

comment *183* comment by: *EUROCONTROL*

Page 15 - 3.2.1 Identification of the change

- Basic equipage

EUROCONTROL asks for a clarification.

The text under the form of a list that follows "The remote tower functionalities can be classified in two different categories: …" needs clarification. This list may be different depending on the type of air traffic control service to be provided (i.e. only aerodrome control service or aerodrome control service AND approach control service). The NPA should be clear as to the type of service on which the guidance focuses.

Page 16 - 3.2.1 Identification of the change

- Enhanced equipage

EUROCONTROL makes a suggestion:

The text under the form of a list that follows "Presentation to the ATCO/AFISO of additional overlaid information (visual overlays). The type of overlaid information may include (some of the elements are the result of other advanced visualisation features): …" gives rise to a suggestion: specific views of, for example, runway thresholds, taxiways holding points, aprons, etc., could also be part of this overlaid information (visual overlays).

response *Not accepted*

The Agency believes that the scope of the proposed GM is clear and only concerns aerodrome ATS. Approach control has no relationship whatsoever to the remote tower concept.

Regarding the second comment, the list of elements is provided as an example, and does not

prevent the inclusion of other elements.

comment

191 comment by: *ATCEUC - Air Traffic Controllers European Unions Coordination*

If the functionalities to facilitate judging the aircraft's position or altitude (depth of vision for the operator) are only part of the enhanced equipage, how could the validation exercises, provided in the frame of the SESAR project, considered the basic equipage to be sufficient to provide the same level of safety as in the local conventional tower? At least EASA, as the safety agency, should question these results because assumptions are being made based on those reports.

It's also stated that in aerodromes with more traffic, the ATS provider should evaluate the possibility to complement the basic equipment.

With this kind of approach it's possible to have remote towers dealing with high volumes of traffic without the tools to provide the service because basic equipment does not even include the resolution of the depth vision issue.

response

Not accepted

The text is amended to clarify that these functionalities are purposed to assist in judging the aircraft's position or altitude.

It is possible to implement the remote tower concept at aerodromes where traffic density is higher using only the functionalities of the basic equipage, subject to the results of the safety assessment to be conducted and to the approval (based on these results) of the competent authority.

comment

205 comment by: *DGAC/DSAC - french NSA*

A main hazard identified is related to the Out The Window view. The most probable risk may be the lack of detection of obstructions on the maneuvering area, especially on airports spotted for the first remote towers.

Proposal:
Add an item to the basic equipage:
Dedicated means to facilitate the detection and tracking of obstructions/foreign objects on the maneuvering area (e.g. personnel or animals).

response

Not accepted

As it is now defined in Section 3.1, visual presentation provides a view equivalent, in terms of visual coverage, to the one available at the corresponding conventional tower. The areas referred to by the commentator are included, so the Agency considers that no additional means should be included.

comment

246 comment by: *NATS National Air Traffic Services Limited*

The ATS provider should take into account that the analyses and validation exercises, performed in the frame of the SESAR project, have shown that for certain operational contexts (see Section 3.2.3.) the functionalities presented in the basic equipage may be sufficient to provide the same level of safety as in the current operations (local conventional

	tower), subject to the confirmation by the corresponding safety assessment of the local implementation" • It's not defined anywhere what is a "Local Conventional Tower". • The will of highlighting that the transition from conventional TWR to remote one (even with the only basic configuration) does not change the level of safety) is very tough, it would be better to speak of **acceptable level of safety**. This approach could better support local safety assessment. • The substitution of the term "same level of safety is in current operations" shall be replaced by "acceptable level of safety" and kept consistent throughout the document.
response	*Not accepted* Due to the novelty of and limited operational experience with the concept at this stage, and taking into consideration the basic principle followed by which the implementation of the remote tower concept is considered a change in the ATM functional system, the Agency strongly believes that the safety objective comparisons shall be made against 'today's' operations (conventional tower). Therefore, the text remains unchanged, stating this fact.

comment	*247* comment by: *NATS National Air Traffic Services Limited* voice, data communication, **meteorological data** - MET data shall be available for remote ATS at Basic level equipage
response	*Accepted* Meteorological data is included as an example of 'management of assets'.

comment	*248* comment by: *NATS National Air Traffic Services Limited* Functionalities to facilitate judging the aircraft's position or altitude (depth of vision for the operator **e.g. based on surveillance data)**
response	*Partially accepted* The reference to 'foreign objects' is removed. The Agency does not consider it necessary to include any examples of functionalities to accomplish the proposed objectives.

comment	*289* comment by: *IFATCA* The basic setup does not define a set angle of view. 3.3.2.6 states ¨at least the manouvering area and traffic circuit¨ The OTW should at least represent a 200 degree to provide for proper situational awareness.
response	*Not accepted* The Agency believes that setting a value for the wideness of the visual presentation would be too prescriptive and is unnecessary, and considers that this element should be subject to the different local implementation characteristics.

comment	*290* comment by: *IFATCA*

With regard to the analyses and validation excercises carried out by SESAR. IFATCA has been involved in the SESAR project and has highlighted that some of the OSED material used to conduct validation excercises has not been completed due to the specific nature of the research project SESAR. e.g. Step 2 and 3 have in certain excercises been adapted in order to meet the limited scope of the validation plate form.
Therefore IFATCA proposes that each new undertaking of introducing a Remote Tower Facility shall be validated and assessed independently of the SESAR results.

response *Partially accepted*

The SESAR work and the associated validation activities conducted have been included as a starting point for the implementation process. However, as also stated in the section, this fact does not preclude the need to conduct a safety assessment prior to the implementation of the concept, subject to the approval of the corresponding competent authority, which is totally in line with the commentator's request.

comment *310* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

Sound should be a bulletpoint under (basic) equipage, not an "option" in the following text.

response *Not accepted*

Taking into consideration the different practices among the Member States, where the need to have environmental sound is considered very differently, the Agency is of the opinion that this element of the system should be subject to the local implementations, based also on human performance assessments.

comment *311* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

We oppose that enhanced equipage should be mentioned in the GM due to lack of maturity.

ref comment on executive summary

The scope for this GM shoudl be singel operations for low traffic density aerodromes with few simoultanious movements. The GM does not adhere to this scope and on several occations mixes in more advanced features i.e. the cool stuff...

The single operations based on the basic equippage has reached a V5 maturity, it is in operations and extensive knowledge resides within LFV. The neat funtions listed as enhanced are at best at V3 maturity, some probably V2 or less. why even mentione this in the GM in the first place.

A more reasonable approach could be to mentione in the explenatoty note that there might me new technical options around the corner but is should not be in the GM.

response *Not accepted*

As indicated throughout the document, the scope and objective of the proposed text is to maintain the level of safety in those specific cases where these services are provided from a remote tower compared to their provision from a conventional tower, as well as to promote the development of a new technology associated with the remote tower concept, thus

ensuring its safe implementation. At the same time, the GM covers the single mode of operation, as it is also described in the text. Based on this premise, Section 3 of the proposed document addresses both what is defined as 'basic equipage' and 'enhanced equipage'. In the case of the basic equipage, the analyses and validation exercises conducted in the frame of the SESAR project have shown that for certain operational contexts (see Section 3.2.3.) the functionalities presented in the basic equipage may be sufficient to provide the same level of safety as in the current operations at an aerodrome, subject to the confirmation by the corresponding safety assessment of the local implementation.
On the other hand, the Agency recognises that the development of a new technology offers opportunities to implementers to include new functionalities in the short term, and are also taken into consideration within the scope of the standardisation bodies currently dealing with the remote tower concept. Therefore, the Agency believes that the enhanced equipage ignored — being, however, aware of the early stage and limited maturity of its functionalities. For this purpose, the proposed text presents the need for the ATS provider to conduct an in-depth evaluation of the selected enhanced functionalities, including the necessary validation activities and human performance assessment as part of the corresponding safety assessment of the local implementation.
In any case, new text has been added in order to reinforce the need to take into consideration the aforementioned early stage of those functionalities catalogued as enhanced and to ensure they are appropriately taken into consideration in the context of the safety assessment.

comment

312 comment by: *DATCA*

RTO should only be engaged if the level of safety remain the same or increases compared to cenventionel tower operations. The basic equipage is far to simple to cope with reality. Some of the functionalities in the enhanced equipage should be mandatory to maintain a sustainable and resilient enviroment to guarantee an acceptable level of situational awareness and safety.

response

Not accepted

Recent validation activities and even implementations (approved by competent authorities based on the results of the corresponding safety assessment) have shown the viability of the concept and the applicability of the basic equipage to certain operational conditions. Therefore, the text remains unchanged.

comment

313 comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

The wording implies that the implementor need the enhanced options to provide a safe service

In addition to the functionalities included in the basic equipage, enhanced equipage includes some additional options intended to further improve the situational
awareness and conflict detection capabilities of the ATCO/AFISO

Situational awareness is mentioned in the beginning, conflict detection comes out of the blue when describing the enhanced equipage.

response

Not accepted

As indicated throughout the document, the scope and objective of the proposed text is to maintain the level of safety in those specific cases where these services are provided from a remote tower compared to their provision from a conventional tower, as well as to promote the development of a new technology associated with the remote tower concept, thus ensuring its safe implementation. At the same time, the GM covers the single mode of operation, as it is also described in the text. Based on this premise, Section 3 of the proposed document addresses both what is defined as 'basic equipage' and 'enhanced equipage'. In the case of the basic equipage, the analyses and validation exercises conducted in the frame of the SESAR project have shown that for certain operational contexts (see Section 3.2.3.) the functionalities presented in the basic equipage may be sufficient to provide the same level of safety as in the current operations at an aerodrome, subject to the confirmation by the corresponding safety assessment of the local implementation.
On the other hand, the Agency recognises that the development of a new technology offers opportunities to implementers to include new functionalities in the short term, and are also taken into consideration within the scope of the standardisation bodies currently dealing with the remote tower concept. Therefore, the Agency believes that the enhanced equipage ignored — being, however, aware of the early stage and limited maturity of its functionalities. For this purpose, the proposed text presents the need for the ATS provider to conduct an in-depth evaluation of the selected enhanced functionalities, including the necessary validation activities and human performance assessment as part of the corresponding safety assessment of the local implementation.
In any case, new text has been added in order to reinforce the need to take into consideration the aforementioned early stage of those functionalities catalogued as enhanced and to ensure they are appropriately taken into consideration in the context of the safety assessment.

comment

314 comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

Dedicated means to facilitate the detection, recognition, identification (e.g. based on surveillance data or on flight plan correlation) and tracking (e.g. labels directly in the visual presentation) of aircraft.

by overlaying surveillance on the OTW there is a major risk in mixing services provided by ATCO...

swe flygplatskontrolltjänst vs övervakningstjänst.

response

Accepted

A reference to what the commentator states is included in the document.

comment

315 comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

Presentation to the ATCO/AFISO of additional overlaid information (visual overlays). The type of overlaid information may include (some of the elements are the result of other advanced visualisation features):

This concept can not be validated enough to be in GM?!? V2 maturity?

have you ever seen a conventional tower with the checklists tejped to the windows?

We strongly oppose that the GM includes anything that contributes to the cluttering of the OTW

response *Partially accepted*

The text is amended to highlight the need to consider the impact these functionalities may have on human performance.

comment *316* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

... basic equipage may be sufficient to provide the same level of safety as in the current operations (local conventional tower)

Object to the comparison to current operations. The concept may be applied to a aerodrome without existing tower or where the current tower does, by several reasons, does not provide a good baseline.

response *Accepted*

The text is amended in order to clarify that this comparison can only be made in those cases where a conventional tower previously existed at the aerodrome subject to the provision of remote tower services.

comment *318* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

Nevertheless, in case that the operational context of the target aerodrome exceeds that referred
above, the ATS provider should evaluate the possibility of complementing the basic equipage with
additional functionalities (enhanced) in order to ensure an appropriate level of mitigation of the
operational risks. In this case, the ATS provider should conduct an in-depth evaluation of the selected enhanced functionalities, including the necessary validation activities and human performance
assessment, in addition to the corresponding safety assessment of the local implementation.

Here the GM basically states that one needs gizmos and gadgets to provide a safe service remotly on anything larger than a remote regional airport. we do not agree, the concept based on whats beeing called the basic equipage could be sufficient on significatly larger airports, even thoug not yet validated there.

It all hinges on the local conditions f.i. the SID and STAR and how well the TMC has lined up inbound traffic. more so that advances in technology....

response *Not accepted*

As indicated throughout the document, the scope and objective of the proposed text is to maintain the level of safety in those specific cases where these services are provided from a remote tower compared to their provision from a conventional tower, as well as to promote

the development of a new technology associated with the remote tower concept, thus ensuring its safe implementation. At the same time, the GM covers the single mode of operation, as it is also described in the text. Based on this premise, Section 3 of the proposed document addresses both what is defined as 'basic equipage' and 'enhanced equipage'. In the case of the basic equipage, the analyses and validation exercises conducted in the frame of the SESAR project have shown that for certain operational contexts (see Section 3.2.3.) the functionalities presented in the basic equipage may be sufficient to provide the same level of safety as in the current operations at an aerodrome, subject to the confirmation by the corresponding safety assessment of the local implementation.
On the other hand, the Agency recognises that the development of a new technology offers opportunities to implementers to include new functionalities in the short term, and are also taken into consideration within the scope of the standardisation bodies currently dealing with the remote tower concept. Therefore, the Agency believes that the enhanced equipage ignored— being, however, aware of the early stage and limited maturity of its functionalities. For this purpose, the proposed text presents the need for the ATS provider to conduct an in-depth evaluation of the selected enhanced functionalities, including the necessary validation activities and human performance assessment as part of the corresponding safety assessment of the local implementation.
In any case, new text has been added in order to reinforce the need to take into consideration the aforementioned early stage of those functionalities catalogued as enhanced and to ensure they are appropriately taken into consideration in the context of the safety assessment.

comment *409* comment by: *AvinorANSP*

Enhanced eqipage, bullet point 3 :
consdider also recognition and identification for vehicles

response *Not accepted*

The Agency does not consider it necessary, from the operational point of view, to recognise and identify vehicles. Therefore, the text remains unchanged.

comment *418* comment by: *SINCTA - Portuguese Air Traffic Controllers' Union*

EASA should facilitate the validation exercises reports that considered the basic equipage to be sufficient to provide the same level of safety as in the current conventional operations. For instance, depth of vision is only part of the enhanced equipage and it seems arguable to say the same level of safety is provided without it, despite the type of operation.

Leaving it to the ATS provider to decide if certain tools should complement the basic equipment may render a level of service insufficient for the type of operation, given the fact that some of the optimum tools are not considered to be basic equipment. Safety may be compromised.

response *Not accepted*

The SESAR work and the associated validation activities conducted have been included as a starting point for the implementation process. However, as also stated in the section, this fact does not preclude the need to conduct a safety assessment prior to the implementation of the concept, subject to the approval of the corresponding competent authority.

comment *436* comment by: *Wideroe Flyveselskap AS*

3.2.1/3.2.2.1/3.2.3.1
WF as a commercial air craft operator is expecting many non-controlled AFIS aerodromes to be operated by remote towers in the future. With more than 51000 flights operated at AFIS aerodromes every year the highest level of safety is imperative. As a minimum should all the elements described in the enhanced equipage be required for aerodromes serving commercial air transport.

response *Not accepted*

Recent validation activities and even implementations (approved by competent authorities based on the results of the corresponding safety assessment) have shown the viability of the concept and the applicability of the basic equipage to certain operational conditions. In any case, and ultimately, as reflected in the proposed GM, the implementation needs should be based on the results of the safety assessment to be conducted.
Therefore, and based on the previous reasoning, the Agency does not consider it necessary to review the proposed text.

comment *449* comment by: *Malta Air Traffic Controllers' Association*

If the functionalities to facilitate judging the aircraft's position or altitude (depth of vision for the operator) are only part of the enhanced equipage, how could the validation exercises, provided in the frame of the SESAR project, considered the basic equipage to be sufficient to provide the same level of safety as in the local conventional tower? At least EASA, as the safety agency, should question these results because assumptions are being made based on those reports. It's also stated that in aerodromes with more traffic, the ATS provider should evaluate the possibility to complement the basic equipment. With this kind of approach it's possible to have remote towers dealing with high volumes of traffic without the tools to provide the service because basic equipment does not even include the resolution of the depth vision issue.

response *Not accepted*

The SESAR work and the associated validation activities conducted have been included as a starting point for the implementation process. However, as also stated in the section, this fact does not preclude the need to conduct a safety assessment prior to the implementation of the concept, subject to the approval of the corresponding competent authority.

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.2. Safety assessment methodology p. 17

comment *76* comment by: *DFS Deutsche Flugsicherung GmbH*

	It is not clear, why we shall follow a “methodology-independent approach” from SESAR, and in the same time have compliance with the requirements from Regulation (EU) No 1035/2011. We recommend to **fully delete second paragraph** of chapter 3.2.2 "Furthermore, and while following....."
response	*Partially accepted* The paragraph has been reworded and the reference to ‘methodology independent approach’ has been deleted.

comment	*99* comment by: *CANSO* 3.2.2 safety assessment methodology The descriptions of the SESAR considerations about safety assessment are much too detailed and often exceed the Commission Implementing Regulation (EU) No 1035/2011 - and its successor (NPA 2014-13, 2013-08). This leads to confusion or even misinterpretation and may possibly deteriorate the results of the safety assessments. We recommend to fully delete second paragraph of chapter 3.2.2 "Furthermore, and while following....."
response	*Partially accepted* The paragraph has been reworded and the reference to ‘methodology independent approach’ has been deleted.

comment	*249* comment by: *NATS National Air Traffic Services Limited* 3.2.2 safety assessment methodology The descriptions of the SESAR considerations about safety assessment are much too detailed and often exceed the Commission Implementing Regulation (EU) No 1035/2011 - and its successor (NPA 2014-13, 2013-08). This leads to confusion or even misinterpretation and may possibly deteriorate the results of the safety assessments. We recommend to fully delete second paragraph of chapter 3.2.2 "Furthermore, and while following....."
response	*Accepted* The paragraph has been reworded and the reference to ‘methodology independent approach’ has been deleted.

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.2. Safety assessment methodology — 3.2.2.1. Scope, boundaries, interfaces and operational environment characterisation p. 17-18

comment	*6* comment by: *LFV* Section after bullet list: What is meant by the last sentence?
response	*Accepted* The text is reworded to ensure clarity.

	The intention is to state that all the elements which are specific to the remote tower concept should be considered as part of the change, and therefore are subject to the safety assessment to be conducted.

comment	*30* comment by: *LFV* "number of simultaneous movements" what does this mean? (4th line) Is it in the CTR, in the TMA, only aircraft or a mix of aircraft and veichles.
response	*Noted* The definition of 'movement' is already included in the document and means 'the operation of an aircraft for take-off and landing'.

comment	*39* comment by: *DFS Deutsche Flugsicherung GmbH* The second last para of chapter 3.2.2.1 explains that "The aerodrome's technical environment may be characterised through the description of the existing communication, navigation and surveillance systems available at the aerodrome plus the available safety nets. They do not necessarily change as a result of providing ATS remotely. This technical characterisation does not include the installation of the remote tower equipment at the aerodrome and it should be considered as part of the safety assessment." The last sentence is unclear in scoping the subject of the safety assessment. The following proposed text may bring more clarity: "This technical characterisation does not include the installation of the remote tower equipment at the aerodrome. Those features of the technical characterisation of the former conventional tower, which are affected by the change, and the remote tower equipment itself should be considered as part of the safety assessment."
response	*Accepted*

comment	*68* comment by: *DFS Deutsche Flugsicherung GmbH* 3.2.2.1 4th bullit: the term "traffic information" is already reserved in ATC language. We recommend to use "traffic characteristics" instead: traffic characteristics ~~information~~ (e.g. number of movements per day, number of simultaneous movements, type of traffic, aircraft fleet mix);
response	*Accepted*

comment	*103* comment by: *CANSO* The second last para of chapter 3.2.2.1 explains that "The aerodrome's technical environment may be characterised through the description of the existing communication, navigation and surveillance systems available at the aerodrome plus the available safety nets. They do not necessarily change as a result of providing ATS remotely. This technical characterisation does not include the installation of the remote tower equipment at the aerodrome and it should be considered as part of the safety assessment."

	The last sentence is unclear in scoping the subject of the safety assessment. The following proposed text may bring more clarity: "This technical characterisation does not include the installation of the remote tower equipment at the aerodrome. Those features of the technical characterisation of the former conventional tower, which are affected by the change and the remote tower equipment itself, should be considered as part of the safety assessment." 3.2.2.1 4th bullet: The term "traffic information" is already reserved in ATC language. We recommend to use "traffic characteristics" instead: traffic characteristics ~~information~~ (e.g. number of movements per day, number of simultaneous movements, type of traffic, aircraft fleet mix);
response	*Accepted*

comment	*184* comment by: *EUROCONTROL* **Page 17 - 3.2.2.1. Scope, boundaries, interfaces and operational environment characterisation** 3rd "-" on aerodrome layout complexity EUROCONTROL makes a comment: Runways configuration is also an important factor (parallel, crossing), which in fact has not really been tested in SESAR work (at least in P 6.9.3).
response	*Accepted* The list is provided merely as an example of the characteristics of the aerodrome's operational context to be considered. In any case, the elements suggested by the commentator are added as an example of the aerodrome's layout complexity items.

comment	*221* comment by: *René Meier, Europe Air Sports* 3.2.2.1 Scope... page 17/61 Under airspace related aspects we would like to add "low flight networks", "helicopter landings sites at hospitals" and add "Point in Space" (PinS) procedures" explicitely to "type of flight procedures". complete. Rationale: All other elements are covered, but "PinS" become more and more important, as well as "low flight networks."
response	*Not accepted* The list is provided merely as an example of the characteristics of the aerodrome's operational context to be considered. The Agency believes it is not necessary to include the

elements proposed by the commentator as examples. However, this does not prevent those implementing the concept from taking them into consideration as part of the possible analysis of the aerodrome's operational context.

comment

226 comment by: *CAA-NL*

In paragraph 3.2.2.1. The formal terminology from ICAO annex 11 is not Terminal Manoeuvring Area (TMA), but: Terminal Control Area (TCA).

response

Accepted

comment

250 comment by: *NATS National Air Traffic Services Limited*

The second last para of chapter 3.2.2.1 explains that "The aerodrome's technical environment may be characterised through the description of the existing communication, navigation and surveillance systems available at the aerodrome plus the available safety nets. They do not necessarily change as a result of providing ATS remotely. This technical characterisation does not include the installation of the remote tower equipment at the aerodrome and it should be considered as part of the safety assessment."
The last sentence is unclear in scoping the subject of the safety assessment. The following proposed text may bring more clarity:
"This technical characterisation does not include the installation of the remote tower equipment at the aerodrome. **Those features of the technical characterisation of the former conventional tower, which are affected by the change and** the remote tower equipment itself, should be considered as part of the safety assessment."

3.2.2.1 4th bullet:
The term "traffic information" is already reserved in ATC language.
We recommend to use "traffic characteristics" instead:
traffic **characteristics** ~~information~~ (e.g. number of movements per day, number of simultaneous movements, type of traffic, aircraft fleet mix);

response

Accepted

comment

319 comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

We understand the intention with the segment but the specific reference to WAN might not be accurate for two reasons. For certain constituent the change to remote operatins might not impact the function in any way. and secondly there are other technical solutions than WAN technology.

response

Accepted

The example is removed from the text.

comment

321 comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

- type of services

ATS serivces, include ALRS

response	*Accepted* The text is reworded in order to include the provision of all possible air traffic services.

comment	*322* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)* TMA = Terminal Control Area
response	*Accepted*

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.2. Safety assessment methodology — 3.2.2.2. Interdependencies and assumptions p. 18-19

comment	*7* comment by: *LFV* Even though it could be if use to include aerodrome operator, other ATS/ANSPs etc, The ANSP providing the remote tower may only be responsible for its own mitigations.
response	*Accepted* The Agency agrees with the statement made by the commentator. However, the text is reworded in order to enhance clarity.

comment	*77* comment by: *DFS Deutsche Flugsicherung GmbH* The interactions with aviation undertakings and other service provider related to safety assessment exceed the current Regulation 1035/2011. The interdependencies should be taken into account, but the details of interactiosn will depend on the local design. A phraseology using terms like "take into consideration", "consider" rather than "should" would be appropriate for such GM in order to prevent it from having AMC character as stated in our general comment.
response	*Not accepted* The Agency believes that the proposed text does not contradict the current regulatory framework; it clarifies it further instead (within the nature and basic principle of the GM).

comment	*455* comment by: *comments provided on behalf of FIT/CISL italian trade union* Attachment #2 Please see attached PDF.
response	*Not accepted* As regards the comments submitted to this section, the Agency believes that the proposed text does not contradict the current regulatory framework; it clarifies it further instead (within the nature and basic principle of the GM). In relation to the proposal to 'elevate' the text to the Implementing Rule level, due to the fairly early stages of the remote tower concept, and the fact that further experience is yet to

be gained, the Agency considered it necessary to address the remote tower concept in phases. This 'phased approach' is intended to also evolve from the regulatory 'level' perspective as implementation progresses and some experience can be gained and conclusions can be drawn. Taking this into consideration, and also as a result of the associated Regulatory Impact Assessment (RIA), the Agency considers that the best way to address the concept at this point in time is through the form of GM and AMC.

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.2. Safety assessment methodology — 3.2.2.3. Safety criteria p. 19

comment *78* comment by: *DFS Deutsche Flugsicherung GmbH*

This explanation could lead to the impression that the safety assessment has to be made both against the current (conventional) tower operation and against the remote concept. It should become clear that only the change or the new remote tower is subject to the assessment.

Following our general comment on the aim of safety assessment according to Regulation 1035/2011, the second paragraph needs to be revised to indicate that **the aim of the safety assessment shall be to demonstrate an acceptable level of safety** for the ATS provided remotely:

change proposal for 2nd para:

"Then, the aim of the safety assessment shall be to demonstrate that ATS provided remotely has an acceptable level of safety ~~for one aerodrome are as safe as ATS provided currently locally in equivalent conditions of traffic (in terms of capacity and movements) and operational environment than in current operations~~. In case there is a change to ~~these~~ traffic-related parameters, compared with the current operations, the safety criteria should be reviewed and adapted to the new situation.

response *Not accepted*

Due to the novelty of and limited operational experience with the concept at this stage, and taking into consideration the basic principle followed by which the implementation of the remote tower concept is considered a change in the ATM functional system, the Agency strongly believes that the safety objective comparisons shall be made against 'today's' operations (conventional tower). Therefore, the text remains unchanged, stating this fact.

comment *100* comment by: *CANSO*

3.2.2.3 safety criteria
This explanation could lead to the impression that the safety assessment has to be made both against the current (conventional) tower operation and against the remote concept. To our view it should become clear that the safety level that needs to be achieved is that of a tower operation with similar traffic characteristics. The term "shall" is not appropriate for GM.

It would be better if EASA drew no distinction for RTO compared to safety assessments as per the Opinion 03/2014.

Change proposal for 2nd para:

Then, the aim of the safety assessment would be to demonstrate that ATS provided remotely for an aerodrome has an acceptable level of safety. *In case there is a change there is a change to these traffic-related parameters, compared with the current operations, the safety criteria should be reviewed and adapted to the new situation.*

It is also IMPORTANT to foresee the possibility of having a remote tower for a new aerodrome where no tower exists.

Change proposal for 1st para:
"Keeping in mind that the main driver for the implementation of the remote tower concept is related to ~~cost savings~~ cost efficiency, the safety criteria to be applied should ensure that the level of safety after the introduction of the remote tower concept is at least not reduced with respect to the current operations based on a local (conventional) tower

response

Partially accepted

Due to the novelty of and limited operational experience with the concept at this stage, and taking into consideration the basic principle followed by which the implementation of the remote tower concept is considered a change in the ATM functional system, the Agency strongly believes that the safety objective comparisons shall be made against 'today's' operations (conventional tower). Therefore, the text remains unchanged, stating this fact.

In any case, as suggested by the commentator, the text is changed in order to include the possibility to implement the remote tower concept at a location where no conventional tower exists.

The suggestion to amend the text regarding 'costs' is accepted.

comment

152 comment by: *UK CAA*

Page No: 19 of 61

Paragraph No: 3.2.2.3

Comment: 'Skill projection': higher levels of competence at the remote tower can be seen as beneficial because their skill can be deployed to point of delivery and be better than local abilities. As such it is considered to be an important safety driver, and should therefore be included

Justification: To ensure this major safety benefit is not overlooked.

Proposed Text: Amend to read:

'Keeping in mind that the main driver for the implementation of the remote tower concept is related to cost savings, the safety criteria to be applied should ensure that the level of safety after the introduction of the remote tower concept is at least not reduced **(and to the greatest possible degree enhanced)** with respect to the current operations based on a local (conventional) tower.'

response

Noted

The Agency will always welcome a solution that could improve the level of safety. However, it is considered that there is no need to include the suggested wording in the proposed text, as the way it has been proposed does not prevent further safety level improvements.

comment

251 comment by: *NATS National Air Traffic Services Limited*

3.2.2.3 safety criteria
This explanation could lead to the impression that the safety assessment has to be made both against the current (conventional) tower operation and against the remote concept. To our view it should become clear that the safety level that needs to be achieved is that of a tower operation with similar traffic characteristics.
change proposal for 2nd para:
Then, the aim of the safety assessment shall be to demonstrate that ATS provided remotely for one aerodrome are as safe as ATS provided currently locally in equivalent conditions of traffic (in terms of capacity and movements) and operational environment than in current operations. **It is therefore recommended to aim at a safety level which has been determined already for a comparable equivalent local ATS**. In case there is a change to these traffic-related parameters, compared with the current operations, the safety criteria should be reviewed and adapted to the new situation.

response

Not accepted

Due to the novelty of and limited operational experience with the concept at this stage, and taking into consideration the basic principle followed by which the implementation of the remote tower concept is considered a change in the ATM functional system, the Agency strongly believes that the safety objective comparisons shall be made against 'today's' operations (conventional tower). Therefore, the text remains unchanged, stating this fact.

comment

323 comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

..as safe as the ATS provided locally... we do not agree with the wording. We do not diisagree that provision should be safe however one measure to ensure safety is to reduce capacity... and were not sure that its reflected in the statement. the reference to current operations might be missleading, there might be no current operations to act as baseline.

response

Accepted

The text is amended in order to clarify that this comparison can only be made in those cases where a conventional tower previously existed at the aerodrome subject to the provision of remote tower services.

comment

324 comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

Proposal

safety is as least ... with respect to a similar conventional tower.

Change all current to simmilar....

response

Not accepted

The Agency believes that the proposed wording is more appropriate than the one suggested by the commentator, as the word 'similar' could potentially create ambiguity. Therefore, the text remains unchanged.

comment

437 comment by: *Wideroe Flyveselskap AS*

3.2.2.3
The proposed guidance is stating; "…. Keeping in mind that the main driver for the implementation of the remote tower concept is related to cost saving, ……".
An equal or higher level of safety is imperative when introducing the remote tower concept. Having said that it should be noted that any cost saving should also benefit the airspace user, not only beneficial to the ANSP or aerodrome operator.

response

Not accepted

In the text there is no explicit mention of the aviation domains that may be benefited. Therefore, the Agency does not see the need to amend the text according to the commentator's suggestion.

comment

456 comment by: *comments provided on behalf of FIT/CISL italian trade union*

Attachment #3

Please see attached PDF.

response

Not accepted

As regards the comments submitted to this section, the Agency believes that the proposed text does not contradict the current regulatory framework; it clarifies it further instead (within the nature and basic principle of the GM).
In relation to the proposal to 'elevate' the text to the Implementing Rule level, due to the fairly early stages of the remote tower concept, and the fact that further experience is yet to be gained, the Agency considered it necessary to address the remote tower concept in phases. This 'phased approach' is intended to also evolve from the regulatory 'level' perspective as implementation progresses and some experience can be gained and conclusions can be drawn. Taking this into consideration, and also as a result of the associated Regulatory Impact Assessment (RIA), the Agency considers that the best way to address the concept at this point in time is through the form of GM and AMC.

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.2. Safety assessment methodology — 3.2.2.4. Identification of hazards and failure conditions p. 19

comment

8 comment by: *LFV*

The SESAR Safety Work has been done using the Safety Reference Material (SRM) from SESAR WP 16.06.01. The SRM goes beyond the requirements in (EU) No 1035/2011.

response

Not accepted

The Agency believes that the proposed text does not contradict the current regulatory framework; it clarifies it further instead (within the nature and basic principle of the GM).

comment	*31* comment by: *LFV* - undetected erroneous/corrupted data - undeteced delayed data Its not possible or at least hard to detect something you dont know. How should this be performed? Please describe more?
response	*Noted* The intention of the proposed text is to identify and implement mitigation measures in order not to be faced with a case where those elements can pose a risk.

comment	*79* comment by: *DFS Deutsche Flugsicherung GmbH* The first paragraph refers to the list of hazards identified within SESAR examinations. It is OK to offer a list of hazards but following our argumentation at the beginning of the NPA the results achieved within the SESAR safety assessment shall not be subject to this GM. Hazards, effects and the severity of the effects are very special for any local conditions, not comparable to other locations and have to be defined very accurate. **Therefore we recommend to change paragraph 2 accordingly (and delete the severity classification in the table of Appendix 2:** They are presented in **Table 2** for ATC provision and in **Table 3** for AFIS provision, including a short description and their operational effects ~~and severity of the effects~~
response	*Accepted* The severity classification scheme is removed.

comment	*101* comment by: *CANSO* 3.2.2.4. Identification of hazards and failure conditions First paragraph last sentence refers to the list of hazards identified within SESAR examinations. It is OK to offer a list of hazards but following our argumentation at the beginning of the NPA the results achieved within the SESAR safety assessment shall not be subject to this GM; both because hazards, effects and the severity of the effects are very special for any local conditions, not comparable to other locations and have to be defined very accurate as well as due to the non-public and intransparent character of the SESAR results, applied method and inconsistency or even missing figures. For example: for the same identified effects (Imminent collision), the severity classification used for hazards OH-16 and OH-17 (SC3) is different from the one in the OH-08 (SC2). It is furthermore inexplicable how a conclusion on the "safety" of the remote operations can be reached without an analysis of such hazards in OH-31-33. Therefore we recommend to change paragraph 2 accordingly (and **delete the severity classification in the table of Appendix 2:** They are presented in **Table 2** for ATC provision and in **Table 3** for AFIS provision, including a short description and their operational effects ~~and severity of the effects~~. 3.2.2.5 first sentence In consequence, has to be re-worded:

For information purposes, Table 2 and Table 3 list ~~include the severity classification for~~ the ~~listed~~ operational hazards identified in the frame of the SESAR safety work, and were taken as a basis for the identification of the safety requirements.

response *Noted*

The severity classification scheme is removed.

comment *185* comment by: *EUROCONTROL*

Page 19 - 3.2.2.4. Identification of hazards and failure conditions

EUROCONTROL makes a suggestion:

The two following extracts from the NPA "In addition to these operational hazards, the ATS provider should identify those hazards at functional level corresponding to the main functionalities identified in the remote tower system (see Section 3.2.5.)" […] "Based on these failure conditions, the ATS provider should identify additional hazards at functional level. They will be called 'functional hazards'." give rise to a suggestion: there should only be one list of hazards, all defined at the same level.
In this respect, assessing failure conditions for the several functions of the system certainly helps to complete the list of hazards, but should not lead to the creation of a second list of hazards defined at a different level.
Finally, the identified functional hazards, as indicated in the guidance, would be causes leading to the operational hazards from the list included in Appendix 2.

response *Accepted*

The text is amended in order to include the possibility to combine both type of hazards in a single list.

comment *252* comment by: *NATS National Air Traffic Services Limited*

3.2.2.4. Identification of hazards and failure conditions
First paragraph last sentence refers to the list of hazards identified within SESAR examinations. It is OK to offer a list of hazards but following our argumentation at the beginning of the NPA the results achieved within the SESAR safety assessment shall not be subject to this GM; **both because** hazards, effects and the severity of the effects are very special for any local conditions, not comparable to other locations and have to be defined very accurate **as well as due to the non-public and intransparent character of the SESAR results, applied method and inconsistency or even missing figures.**
It is furthermore inexplicable how a conclusion on the "safety" of the remote operations can be reached without an analysis of such hazards in OH-31-33.

Therefore we recommend to change paragraph 2 accordingly (and **delete the severity classification in the table of Appendix 2:**

They are presented in **Table 2** for ATC provision and in **Table 3** for AFIS provision, including a short description **and their** operational effects ~~and severity of the effects~~.

3.2.2.5 first sentence
In consequence, has to be re-worded:
For information purposes, Table 2 and Table 3 list ~~include the severity classification for~~ the ~~listed~~ operational hazards identified in the frame of the SESAR safety work, and were taken as a basis for the identification of the safety requirements

response *Accepted*

The severity classification scheme is removed.

comment *325* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

Table 2 is placed in the appendix 2

response *Accepted*

The corresponding reference is made.

comment *326* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

table 3 is placed in the appendix 3

response *Accepted*

The corresponding reference is made.

comment *327* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

Table 3 for AFIS do not include severity.

response *Accepted*

The severity classification scheme is removed.

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.2. Safety assessment methodology — 3.2.2.5. Assessment of the hazards' effects p. 19-20

comment *32* comment by: *LFV*

Confirm the meaning is to identify differences between the normal operations i TWR and the operations made from RTO (RTC)

All lines is the same for both types of operations and as we can see it.

response *Noted*

The objective of this section is to identify those conditions which might be more significantly

affected by the particular aspects of the remote tower operation. Some of these conditions are listed as an example. In any case, the ATS provider should conduct an assessment of the hazards' effects and the classification of their severity, taking into account the particularities of the operational environment (e.g. airspace, aerodrome characteristics).

comment *108* comment by: *CANSO*

At the nominal condition list it would be appreciated to add "Equipment (visual presentation included) in scheduled maintenance" instead at the abnormal condition, add "Equipment (visual presentation included)in extraordinary/unscheduled maintenance ".

response *Not accepted*

The comment refers to 'unscheduled maintenance'. The Agency believes that the suggestion is not fully correct, as maintenance, by its nature, should always be scheduled as part of a maintenance programme, and thus it has no operational impact (this activity should be performed 'off-line' and planned in advance). Therefore, the text remains as proposed.

comment *121* comment by: *ENAV*

At the nominal condition list it would be appreciated to add "Equipment (visual presentation included) in scheduled maintenance" instead at the abnormal condition, add "Equipment (visual presentation included)in extraordinary/unscheduled maintenance "

response *Not accepted*

The comment refers to 'unscheduled maintenance'. The Agency believes that the suggestion is not fully correct, as maintenance, by its nature, should always be scheduled as part of a maintenance programme, and thus it has no operational impact (this activity should be performed 'off-line' and planned in advance). Therefore, the text remains as proposed.

comment *131* comment by: *DFS Deutsche Flugsicherung GmbH*

For the same reason as mentioned in comment 79 on chapter 3.2.2.4, the reference to **SESAR severity classes should be removed**:

For information purposes, Table 2 and Table 3~~include the severity classification for the~~ liste~~d~~s operational hazards identified in the frame of the SESAR safety work, ~~and~~ which were taken as a basis for the identification of the safety requirements.
The ATS provider should evaluate the severity classification
~~and update it appropriately~~ taking into account the particularities of the operational environment (e.g. airspace, aerodrome characteristics).

response *Accepted*

Severity classifications are removed.

comment *153* comment by: *UK CAA*

Page No: 20 of 61

Paragraph No: 3.2.2.5

Comment: The wording '… management of flights during darkness conditions…' is considered to be an inadequate way of referring to reduced light or night. In addition, prevailing meteorological conditions during the day can reduce lighting levels to such an extent that imagery presentation within a remote tower may be diminished.

Justification: Clarity and appropriateness.

Proposed Text: Amend to read:
'…management of flights in reduced light (e.g. twilight) and at night …'

response *Accepted*

comment *155* comment by: *UK CAA*

Page No: 20 of 61

Paragraph No: 3.2.2.5

Comment: The text appears to imply that the remote tower is only related to remote aerodromes with very low volumes of traffic requiring only a single ATCO (ADV or ADI) or AFISO and contingency tower provision. It is unclear if this implication is intended or correct.

Justification: Clarification.

response *Not accepted*

The Agency believes that the proposed text is in line with the scope of this GM (remote provision of aerodrome ATS for single mode of operation), and also with the validated conditions referred to along Section 3.2.

comment *188* comment by: *EUROCONTROL*

Page 19 - 3.2.2.5. Assessment of the hazards' effects

EUROCONTROL makes a suggestion:

The suggestion refers to the first sentence of the first paragraph. A note should be added in order to explain that these severity classes were allocated within the frame of the SESAR safety work using several 'Severity classification schemes (SCSs)' (one per each different type of accident: MAC, RWY Collision, TWY collision, CFIT, Wake Vortex accident), for which a specific Risk Classification Scheme (RCS) was associated. The requirements were then derived taking into account these several SCSs and RCSs.

Page 20 - 3.2.2.5. Assessment of the hazards' effects

<u>First paragraph of the page</u>

EUROCONTROL makes two suggestions:

The first suggestion refers to the first paragraph of the page. As mentioned before (see comment on 3.2.2.4), the functional hazards assessment (FHA) should be done only on one

type of hazards, namely the operational ones.

In the same paragraph, concerning the sentence "The assessment should be performed under normal operations and abnormal conditions.", EUROCONTROL makes an observation that gives rise to a second suggestion:

In principle the hazards assessment is done in "nominal conditions" (the assessment of multiple failure and degraded modes is rarely done in current FHAs). The hazards are to be assessed in the nominal operational conditions in which the remote tower concept is to be implemented.

2nd paragraph of the page

EUROCONTROL makes a request for verification with a view to making sure that the SESAR operational uses cases are actually used in the guidance document.

3rd example in the list of use cases in nominal conditions

EUROCONTROL makes a suggestion:

This use case should rather be considered as an abnormal condition.

Last paragraph of the page

EUROCONTROL makes a suggestion:

Both the cause analysis and the CMA are to be done to the same hazards previously assessed, i.e. the operational hazards (see comment on 3.2.2.4).

List of examples of abnormal conditions

EUROCONTROL makes a suggestion:

Reference to other (perhaps less nominal, but not unusual) operations such as helicopter autorotation's, overhead joins, practice forced landing etc. should be included.

response

Partially accepted

Page 19 - 3.2.2.5. Assessment of the hazards' effects
The Agency has decided not to include any severity classification in the document.

Page 20 - 3.2.2.5. Assessment of the hazards' effects
First paragraph of the page

The Agency does not share the statement made by the commentator, as hazards related to abnormal conditions can also be assessed.

2nd paragraph of the page
The list of use cases included in the document is based on the SESAR use cases.

3rd example in the list of use cases in nominal conditions

Text is amended as suggested.

Last paragraph of the page
Noted.

List of examples of abnormal conditions

Text is amended as suggested.

comment *253* comment by: *NATS National Air Traffic Services Limited*

At the nominal condition list it would be appreciated to add "Equipment (visual presentation included) in scheduled maintenance" instead at the abnormal condition, add “Equipment (visual presentation included)in extraordinary/unscheduled maintenance "

response *Not accepted*

The comment refers to ‘unscheduled maintenance’. The Agency believes that the suggestion is not fully correct, as maintenance, by its nature, should always be scheduled as part of a maintenance programme, and thus it has no operational impact (this activity should be performed ‘off-line’ and planned in advance). Therefore, the text remains as proposed.

comment *328* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

table 3 afis does not include severity classification.

response *Accepted*

The Agency has decided not to include any severity classification in the document.

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.2. Safety assessment methodology — 3.2.2.6. Determination of the safety objectives and safety requirements p. 21-22

comment *9* comment by: *LFV*

Using both SESAR operational hazards and following the SMS process and (EU) No 1035/2011 would be inconsistent.

response *Not accepted*

The Agency believes that the proposed text does not contradict the current regulatory framework; it clarifies it further instead (within the nature and basic principle of the GM).

comment *10* comment by: *LFV*

Section after first list of bullets: The SESAR operational Hazards is absolute. How will the corresponding safety objectives for the local tower be calculated?

response *Accepted*

The text is amended to clarify that the listed items are included as examples.

comment	*46* comment by: *HungaroControl* — loss or malfunction of the ATCO's/AFISO's ~~manoeuvring~~ controlling / operating capability of the visual and non-visual navigation aids.
response	*Accepted*

comment	*55* comment by: *Prof. Filippo Tomasello* Not all ATSP may be suitably equipped to carry out safety assessments. The guidelines should allow such providers to take advantage of properly accredited qualified entities (ref. Art. 13 BR) to carry out safety assessment, if deemed appropriate.
response	*Not accepted* The Agency agrees with the statement made by the commentator. However, the Agency also believes that the guidance does not preclude the application of the referenced article. Therefore, the Agency sees no need to amend the text.

comment	*65* comment by: *DFS Deutsche Flugsicherung GmbH* **The last paragraph of 3.2.2.6 about SWAL must be removed from the GM**. Regulation 482/08 will be repealed and substitued by the new Regulation on "Common Requirements for ATM/ANS and Safety Oversight" which contains all the information necessary to perform the safety assessment and does not prescribe to apply the SWAL methodology. Therefore the GM should not focus on one single factor, which implies that this is a default value. Furthermore is the allocation of a SWAL very specific to local conditions and not comparable.
response	*Partially accepted* The text is based on the current regulatory framework, so the Agency believes that the reference to Commission Regulation (EC) No 482/2008 is appropriate. The text is amended to remove the SWAL level reference.

comment	*69* comment by: *DFS Deutsche Flugsicherung GmbH* 3.2.2.6 4th bullit: the sentence including the term "manouvring capability" is irritating, we recommend to re-word: ~~loss or malfunction of the ATCO's/AFISO's manoeuvring capability of the visual and non-visual navigation aids~~ loss or malfunction of the operability of visual and non-visual navigation aids by the ATCO/AFISO
response	*Accepted*

The text is amended.

comment 70 comment by: *DFS Deutsche Flugsicherung GmbH*

3.2.2.6 bottom of page, 2nd bullit
More detail on what an "active area" means would be helpful, e.g. Temporary Restricte Area, Special Activity Area"

response *Accepted*

The text is amended for clarification.

comment 102 comment by: *CANSO*

3.2.2.6. Determination of the safety objectives and safety requirements
The last paragraph of 3.2.2.6 about SWAL **must be removed** from the GM.
Regulation 482/08 will be repealed and substituted by the new Regulation on "Common Requirements for ATM/ANS and Safety Oversight" which contains all the information necessary to perform the safety assessment and does not prescribe to apply the SWAL methodology. Therefore the GM should not focus on one single factor, which implies that this is a default value.
Furthermore is the allocation of a SWAL very specific to local conditions and not comparable.

response *Partially accepted*

The text is based on the current regulatory framework, so the Agency believes that the reference to Commission Regulation (EC) No 482/2008 is appropriate.

The text is amended to remove the SWAL level reference.

comment 116 comment by: *CANSO*

*— loss or malfunction of the ATCO's/AFISO's ~~manoeuvring~~ **controlling** / **operating** capability of the visual and non-visual navigation aids*.
->We advise to change manoeuvring to controlling or operating

response *Accepted*

The text is amended.

comment 132 comment by: *DFS Deutsche Flugsicherung GmbH*

Following our general comment on the aim of safety assessment according to Regulation 1035/2011 and the character of this document (the GM), the second paragraph should be re-phrased:

~~The ATS provider should pay special attention to some~~ When defining specific safety objectives and/or safety requirements in order to ensure an acceptable level of safety, the following particular aspects ~~that~~, based on the SESAR safety work, ~~would require the definition of specific safety objectives and/or safety requirements in order to ensure that the level of safety is the same as in the current operations from a local tower (as defined through the safety criteria). Those aspects are the following~~ were taken into consideration:

- ...

response

Not accepted

Due to the novelty of and limited operational experience with the concept at this stage, and taking into consideration the basic principle followed by which the implementation of the remote tower concept is considered a change in the ATM functional system, the Agency strongly believes that the safety objective comparisons shall be made against 'today's' operations (conventional tower). Therefore, the text remains unchanged, stating this fact.

comment

156 comment by: *UK CAA*

Page No: 22 of 61

Paragraph No: 3.2.2.6

Comment: The paragraph at the top of page 22 makes reference to Commission Regulation (EU) 482/2008 which is correct as it is still in force but will be withdrawn when the ATM IR is issued. It will be necessary for EASA to remove all reference to Commission Regulation (EU) 482/2008 when the ATM IR enters law.

Justification: Need for appropriate cross-references.

response

Noted

As stated by the commentator, the text is based on the current regulatory framework, so the Agency believes that the reference to Commission Regulation (EC) No 482/2008 is appropriate.

In any case, the Agency thanks the commentator for the remark.

comment

187 comment by: *CANSO*

Proposal to change the 2nd para:
"The ATS provider should pay special attention to some particular aspects that, based on the SESAR safety work, would require the definition of specific safety objectives and/or safety requirements in order to ensure **an acceptable level of safety** (as defined through the safety criteria).""

response

Not accepted

Due to the novelty of and limited operational experience with the concept at this stage, and taking into consideration the basic principle followed by which the implementation of the remote tower concept is considered a change in the ATM functional system, the Agency strongly believes that the safety objective comparisons shall be made against 'today's' operations (conventional tower). Therefore, the text remains unchanged, stating this fact.

comment

196 comment by: *EUROCONTROL*

Page 21 - 3.2.2.6. Determination of the safety objectives and safety requirements

4th paragraph - 2nd sentence (starting by "Nevertheless, the safety assessment activities should evaluate whether some safety requirements (mitigation measures) are necessary...".

	EUROCONTROL makes a suggestion: Not only mitigation measures should be identified. Integrity and availability are not the only parameters potentially affecting the safety in this case, but also the latency of the surveillance data being provided (or the refreshing rate too).
response	*Not accepted* Latency (described in the document under the term 'end-to-end delay') is considered in other sections of the document. Therefore, the Agency believes there is no need to amend the text.

comment	*206* comment by: *DGAC/DSAC - french NSA* This NPA 2015-05 makes implicit references to the NPA 2014-13 by mentioning the use of "safety criteria" and relative risk analysis. In the same time, the current regulations 1035/2011 and 1034/2011 are still used as regulatory references in chapter 5 and through the whole document. Consequently, until the publication of the new regulation, references to possible future material should be more detailed and explained. In addition, the achievement of this relative risk analysis seems difficult to achieve due to the introduction of new hazards on the link between the remote tower and the airfield. The change should probably decrease the safety on some criteria and may increase the safety on others criteria. <u>Proposal:</u> Until the publication of the new regulation, references to possible future material should be more detailed and explained.
response	*Noted* As stated in the scope, the text is based on the current regulatory framework. At the same time, the Agency is of the opinion that the proposed text already considers the need for alignment with the future regulatory framework and takes into consideration the need for future developments to be aligned in the context of this rulemaking task.

comment	*241* comment by: *ATC the Netherlands* With respect to the notification of SWAL2 for the software units we would like to know if EASA considers this as a requirement or as a example.
response	*Accepted* The text is amended to remove the SWAL level reference.

comment	*254* comment by: *NATS National Air Traffic Services Limited* 3.2.2.6. Determination of the safety objectives and safety requirements The last paragraph of 3.2.2.6 about SWAL **must be removed** from the GM. Regulation 482/08 will be repealed and substituted by the new Regulation on "Common

Requirements for ATM/ANS and Safety Oversight" which contains all the information necessary to perform the safety assessment and does not prescribe to apply the SWAL methodology. Therefore the GM should not focus on one single factor, which implies that this is a default value.
Furthermore is the allocation of a SWAL very specific to local conditions and not comparable

response *Partially accepted*

The text is based on the current regulatory framework, so the Agency believes that the reference to Commission Regulation (EC) No 482/2008 is appropriate.

The text is amended to remove the SWAL level reference.

comment *255* comment by: *NATS National Air Traffic Services Limited*

— loss or malfunction of the ATCO's/AFISO's ~~manoeuvring~~ **controlling / operating** capability of the visual and non-visual navigation aids.
->We advise to change manoeuvring to controlling or operating

Change proposal for 3rd para:

"In addition to the technological aspects, the assessment of other human performance aspects (such as workload and boredom, situational awareness and perception) will be required through simulations and shadow operations **to ensure the human performance is not negatively impacted."**

response *Accepted*

The text is amended.

comment *329* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

We oppose "critical parts", the document shoudl use the ICAO terms "manoeuvring area and the vicinity of the aerodrome".

response *Accepted*

comment *363* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Proposed guidance on the implementation... Section 3.2.2.6 '*Determination of the safety objectives...*'	This section should be revisited to ensure compatibility both with the current **regulation (EU) No 1035/2011** and the future ATM/ANS regulation that will result from **Opinion No 03/2014**, regulation that will embody **NPA 2014-13**.	The part of the future ATM/ANS regulation stemming from **NPA 2014-13** is a major change from the way we currently proceed. If these guidelines are to be inserted in that new scheme through **RMT.0464**, they have to be totally consistent with the future ATM/ANS regulation.

response	*Accepted* The Agency thanks AESA/DSANA for the proposal and states its agreement with it. The Agency is of the opinion that the proposed text already considers the need for alignment with the future regulatory framework and takes into consideration the need for future developments to be aligned in the context of this rulemaking task.

comment	*426* comment by: *AvinorANSP* Reference to the exact SWAL level for the software units involved in the visual presentation system when applied to view the critical parts of the aerodrome should be avoided. We suggest only to refere to SWAL allocation process identified in the respectiv Software Safety Assurance System , which shall comply with the Commission Regulation (EU) No 482/2008
response	*Accepted* The text is amended to remove the SWAL level reference.

comment	*457* comment by: *comments provided on behalf of FIT/CISL italian trade union* Attachment #4 Please see attached PDF.
response	*Not accepted* As regards the comments submitted to this section, the Agency believes that the proposed text does not contradict the current regulatory framework; it clarifies it further instead (within the nature and basic principle of the GM). In relation to the proposal to 'elevate' the text to the Implementing Rule level, due to the fairly early stages of the remote tower concept, and the fact that further experience is yet to be gained, the Agency considered it necessary to address the remote tower concept in phases. This 'phased approach' is intended to also evolve from the regulatory 'level' perspective as implementation progresses and some experience can be gained and conclusions can be drawn. Taking this into consideration, and also as a result of the associated Regulatory Impact Assessment (RIA), the Agency considers that the best way to address the concept at this point in time is through the form of GM and AMC.

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.2. Safety assessment methodology — 3.2.2.7. Human performance assessment p. 22

comment	*81* comment by: *DFS Deutsche Flugsicherung GmbH*

The integration of Human Performance into Safety Assessments is currently not fully developed, it may be meaningful to regard some aspects through other means. The GM should therefore neither strictly separate the "technology associated impacts" from "other aspects (such as workload)" nor strictly allocate them to either a SA process or another means.
The term "assessment" should therefore be substituted by "consideration" and the methodology applied not be prescribed. The title is misleading.

change proposal:

"3.2.2.7. Human performance aspects ~~assessment~~
The introduction into service of the remote tower concept has direct implications on human factors as it may influence the capability of the ATCO/AFISO to accomplish their allocated tasks and to meet their job requirements.
The concept envisages the introduction of new standards in the technology associated to image presentation, which encompasses several aspects. The ATS provider should ~~assess the~~ consider a potential impact of this new technology in the workplace situation where it will be applied, taking into account the working environment and the ergonomic infrastructure.
Where this is not always feasible within the safety assessment, ~~In addition to these technological aspects, the assessment of~~ ~~other~~ (e.g. as it is for human performance aspects such as workload and boredom, situational awareness and perception) ~~will be required~~ these may as well be dealt with through simulations and shadow operations.
A list of elements and examples of human performance aspects is available in Appendix 1."

response

Partially accepted

The objective of the proposed text is to emphasise the importance to conduct a human performance assessment. In order to clarify it, the text is amended to state that the human performance assessment could be included in the safety assessment.

comment

179 comment by: *CANSO*

Change proposal for 3rd para:

"In addition to the technological aspects, the assessment of other human performance aspects (such as workload and boredom, situational awareness and perception) will be required through simulations and shadow operations **to ensure the human performance is not negatively impacted**."

response

Accepted

comment

197 comment by: *EUROCONTROL*

Page 22 - Human performance assessment

3rd paragraph

EUROCONTROL makes a suggestion:

The guidance should strongly recommend active shadow mode operations since passive shadow mode operations will not provide this kind of evidence in human performance

aspects.

response *Accepted*

comment *282* comment by: *Prospect ATCOs' Branch UK*

We fully support the requirement for a human performance assessment and as this is important with respect to the operation of a remote tower it should as a minimum be elevated to AMC.

response *Accepted*

The Agency thanks the commentator for the supportive comment.

comment *291* comment by: *IFATCA*

Appendix 1
Resilience/ fatigue is a great human performance issue. It must be looked at during safety assessments. Rosters/ manning must be adapted.

response *Accepted*

The Agency agrees with the commentator on the importance of fatigue as a human performance issue. The text is amended.

comment *364* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Proposed guidance on the implementation... Section 3.2.2.7 '*Human performance assessment*'	One of the aspects associated with the introduction of new standards in the technology associated to image presentation is the specific training in the **proficient use of the new technologies and equipment** introduced to enable and support the provision of remote ATS. This would in particular apply to camera control (conventional and PTZ), equipment that replaces the direct eyesight of the ATCO/AFISO, though it shouldn't be limited to it.	Now that visual observation in the remote location is enabled by specific technologies and equipment and no longer relies on the physical senses of the ATCO/AFISO, it is of paramount importance that the ATCO/AFISO handle them with absolute fluency in order to ensure prompt and safe reaction to any event. In fact, the handling of the equipment should be as transparent as possible in order to ensure the same level of performance by the ATCO/AFISO in remote operations.

response *Partially accepted*

The Agency agrees with the statement made by the commentator, and believes that the proposed text covers the proficient use of new technologies. However, the Agency does not

consider it appropriate to include an explicit requirement for any of the possible solutions that could be part of the system, thus allowing for flexibility to be applied to the particular local implementations.

comment *458* comment by: *comments provided on behalf of FIT/CISL italian trade union*

Attachment #5

Please see attached PDF.

response *Not accepted*

As regards the comments submitted to this section, the Agency believes that the proposed text does not contradict the current regulatory framework; it clarifies it further instead (within the nature and basic principle of the GM).
In relation to the proposal to 'elevate' the text to the Implementing Rule level, due to the fairly early stages of the remote tower concept, and the fact that further experience is yet to be gained, the Agency considered it necessary to address the remote tower concept in phases. This 'phased approach' is intended to also evolve from the regulatory 'level' perspective as implementation progresses and some experience can be gained and conclusions can be drawn. Taking this into consideration, and also as a result of the associated Regulatory Impact Assessment (RIA), the Agency considers that the best way to address the concept at this point in time is through the form of GM and AMC.

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.3. Operational context p. 22

comment *109* comment by: *CANSO*

"Appendix 1 summarises all those characteristics related to the operational context of remote ATS provision that should be taken into consideration when performing the safety assessment"

In the Appendix 1 there are not references to the operating environment (as quoted in the rest of text), but to the human factor (that has to be considered during a safety assessment anyway).

response *Accepted*

The text is reworded to ensure consistency.

comment *122* comment by: *ENAV*

1. "Appendix 1 summarises all those characteristics related to the operational context of remote ATS provision that should be taken into consideration when performing the safety assessment"

In the Appendix 1 there are not references to the operating environment (as quoted in the rest of text), but to the human factor (that has to be considered during a safety assessment

	anyway).
response	*Accepted* The text is reworded to ensure consistency.

comment	*198* comment by: *EUROCONTROL* **Page 22 - Operational context** 3rd paragraph - 1st sentence EUROCONTROL requests for a clarification: The current title of Appendix 1 is "Human Performance aspects". This title does not correspond to the content. 3rd paragraph - 2nd sentence EUROCONTROL requests for a clarification: Appendix 1 does not cover what the sentence says.
response	*Accepted* The text is reworded to ensure consistency.

comment	*256* comment by: *NATS National Air Traffic Services Limited* "Appendix 1 summarises all those characteristics related to the operational context of remote ATS provision that should be taken into consideration when performing the safety assessment" In the Appendix 1 there are not references to the operating environment (as quoted in the rest of text), but to the human factor (that has to be considered during a safety assessment anyway).
response	*Accepted* The text is reworded to ensure consistency.

comment	*257* comment by: *NATS National Air Traffic Services Limited* Change proposal for 1st para: "The remote tower concept is, in principle, envisaged to be implemented at aerodromes of all sizes and conditions. Therefore, it seems reasonable to define those elements that would make an aerodrome suitable for the provision of remote ATS while maintaining or increasing safety as if with respect to the service was provided from a conventional tower at the aerodrome."
response	*Partially accepted* The text is amended to state that safety should at least be maintained in comparison to the

level of safety of current operations (from a conventional tower).

comment *292* comment by: *IFATCA*

Stating the operational context as a basis for safety assessments is too short. What can the outcome be? ATCOs must be properly trained as a conclusion from the operational context and the safety assessments. Therefore Training must be explicitly looked upon

response *Accepted*

The Agency agrees with the statement made by the commentator on the importance of training and at the same time believes that training has been appropriately covered through the proposed document.

comment *330* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

Use ICAO definition "manoeuvring area and in the vicinity of the aerodrome."

response *Accepted*

comment *413* comment by: *AvinorANSP*

It should be noted that the quality of the visual presentation could exceed direct visual observation due to the quality of technology used (e.g. light sensitivity might be better than the human eye).

response *Not accepted*

The Agency believes that the proposed text does not contradict the statement made by the commentator and, therefore, believes no amendments are needed.

comment *419* comment by: *SINCTA - Portuguese Air Traffic Controllers' Union*

Care must be exercised when stating the applicability of such a new concept. As far as we understand, the validation exercises have only demonstrated this concept to be applicable at low-density aerodromes with a single mode of operation. Nevertheless, EASA should made provide all stakeholders with the results of the validation exercises.

Moreover, several PSO have highlighted the fact that the Remote Operation must be single mode only.

response *Noted*

As stated in the document, recent validation activities and even implementations have shown the viability of the concept at a particular scenario based on particular equipment functionalities. However, as also stated in the document, this fact does not preclude the

need to develop the corresponding safety assessment based on each of the local particularities and conditions, which shall be approved by the competent authority.

It should also be noted by the commentator that the scope of this GM covers what has been defined as 'single mode of operation'.

comment *438* comment by: *Wideroe Flyveselskap AS*

3.2.3/3.2.5.2
Visual presentation can not, given the present technology, be equal to direct visual observation. However, frames on aircrafts and/or objects providing information on the flight, bearing, distance, altitude, speed etc will easily mitigate this shortcoming. Just look at the functionality built into video war games that young boys quickly master with impressive skill and knowledge.

response *Not accepted*

The proposed text does not consider that visual presentation could be equal to direct visual observation. A definition for 'visual presentation' is included in the document. The Agency believes that this definition adds clarity.

comment *450* comment by: *Malta Air Traffic Controllers' Association*

EASA is stating remote tower concept is to be implemented at aerodromes of all sizes and conditions but limits the application of this GM to low density aerodromes based on the results of the validation exercises without any analysis. It's also said that the single mode operation for remote provision of ATS may be applied to low density but at the same time allows aerodromes where traffic density exceeds the limits to follow the guidelines of basic and enhanced equipage.

response *Not accepted*

The SESAR work and the associated validation activities conducted have been included as a starting point for the implementation process. However, as also stated in the section, this fact does not preclude the need to conduct a safety assessment prior to the implementation of the concept, subject to the approval of the corresponding competent authority.

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.3. Operational context — 3.2.3.1. Traffic density p. 23

comment *11* comment by: *LFV*

What is a low density airport? In the example it can be an aircraft every sixth minute in and out from CTR/TMA. Total movement of 240 a day!?!
Maybe it should be mentioned more as a low density airspace? Aerodrome includ veichles aswell.

What is the connection between traffic density and the need for enhanced equipage? The

procedures used in the local tower should be adequate also in the remote tower.

note 14 is it the Swedish Approval? If so its set higher to 4 movements simultaneus. The limit was also set by the ANSP, in this case LFV. Just to follow a normal implementation

response *Noted*

The text contains a reference to what is meant by 'low density aerodrome'.

As indicated throughout the document, the scope and objective of the proposed text is to maintain the level of safety in those specific cases where these services are provided from a remote tower compared to their provision from a conventional tower, as well as to promote the development of a new technology associated with the remote tower concept, thus ensuring its safe implementation. At the same time, the GM covers the single mode of operation, as it is also described in the text. Based on this premise, Section 3 of the proposed document addresses both what is defined as 'basic equipage' and 'enhanced equipage'. In the case of the basic equipage, the analyses and validation exercises conducted in the frame of the SESAR project have shown that for certain operational contexts (see Section 3.2.3.) the functionalities presented in the basic equipage may be sufficient to provide the same level of safety as in the current operations at an aerodrome, subject to the confirmation by the corresponding safety assessment of the local implementation.
On the other hand, the Agency recognises that the development of a new technology will offer opportunities to implementers to include new functionalities in the short term, and are also taken into consideration within the scope of the standardisation bodies currently dealing with the remote tower concept. Therefore, the Agency believes that the enhanced equipage ignored — being, however, aware of the early stage and limited maturity of its functionalities. For this purpose, the proposed text presents the need for the ATS provider to conduct an in-depth evaluation of the selected enhanced functionalities, including the necessary validation activities and human performance assessment as part of the corresponding safety assessment of the local implementation.
In any case, new text has been added in the corresponding section in order to reinforce the need to take into consideration the aforementioned early stage of those functionalities catalogued as enhanced and to ensure they are appropriately taken into consideration in the context of the safety assessment.

comment *157* comment by: *UK CAA*

Page No: 23 of 61

Paragraph No: 3.2.3.1

Comment: The statement regarding traffic density '(… low density is defined as being mostly a single movement, rarely exceeding two simultaneous movements)' seems to create the dividing line between basic and enhanced equipage. It is unclear whether this is the intention of the text.

Justification: Clarification.

response *Noted*

As indicated throughout the document, the scope and objective of the proposed text is to maintain the level of safety in those specific cases where these services are provided from a

	remote tower compared to their provision from a conventional tower, as well as to promote the development of a new technology associated with the remote tower concept, thus ensuring its safe implementation. At the same time, the GM covers the single mode of operation, as it is also described in the text. Based on this premise, Section 3 of the proposed document addresses both what is defined as 'basic equipage' and 'enhanced equipage'. In the case of the basic equipage, the analyses and validation exercises conducted in the frame of the SESAR project have shown that for certain operational contexts (see Section 3.2.3.) the functionalities presented in the basic equipage may be sufficient to provide the same level of safety as in the current operations at an aerodrome, subject to the confirmation by the corresponding safety assessment of the local implementation. On the other hand, the Agency recognises that the development of a new technology will offer opportunities to implementers to include new functionalities in the short term, and are also taken into consideration within the scope of the standardisation bodies currently dealing with the remote tower concept. Therefore, the Agency believes that the enhanced equipage ignored — being, however, aware of the early stage and limited maturity of its functionalities. For this purpose, the proposed text presents the need for the ATS provider to conduct an in-depth evaluation of the selected enhanced functionalities, including the necessary validation activities and human performance assessment as part of the corresponding safety assessment of the local implementation. In any case, new text has been added in order to reinforce the need to take into consideration the aforementioned early stage of those functionalities catalogued as enhanced and to ensure they are appropriately taken into consideration in the context of the safety assessment.

comment	*192* comment by: *ATCEUC - Air Traffic Controllers European Unions Coordination* EASA is stating remote tower concept is to be implemented at aerodromes of all sizes and conditions but limits the application of this GM to low density aerodromes based on the results of the validation exercises without any analysis. It's also said that the single mode operation for remote provision of ATS may be applied to low density but at the same time allows aerodromes where traffic density exceeds the limits to follow the guidelines of basic and enhanced equipage.
response	*Noted* The SESAR work and the associated validation activities conducted have been included as a starting point for the implementation process. However, as also stated in the section, this fact does not preclude the need to conduct a safety assessment prior to the implementation of the concept, subject to the approval of the corresponding competent authority.

comment	*215* comment by: *EUROCONTROL* **Page 23 - 3.2.3.1 Traffic density** EUROCONTROL requests, through the form of a question, that a clarification is included: What is meant by movement in this context? In SESAR, movements included both aircraft and vehicles (not just aircraft).
response	*Noted*

For the purpose of better understanding the document, the definition of 'movement' can be found in Section 3.1. 'Definitions'.

comment

331 comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

The results of the validation exercises available so far 14 show that the single mode of operation for the remote provision of ATS may be applied to low-density aerodromes (where low density is defined as being mostly a single movement, rarely exceeding two simultaneous movements). Therefore, based on the validation exercises and the associated safety assessments conducted, this guidance material can only confirm the sufficiency of the basic equipage in low-density aerodromes subject to the confirmation by the corresponding safety assessment of the local implementation. For aerodromes where traffic density exceeds the above-mentioned characteristics, the ATS provider should follow the guidelines stated in Section 3.2.1.

We do not agree that Section 3.2.1 gives guidance as stated above.The statement adheres to the scope defined in the Pre-RIA but implies that the answer is in more technical aid to the controller, that is what we do not agree with.

yet again. whats in operations has per definition achieved V5 maturity, SESAR validation resutls corresponds to V3...

response

Not accepted

As indicated throughout the document, the scope and objective of the proposed text is to maintain the level of safety in those specific cases where these services are provided from a remote tower compared to their provision from a conventional tower, as well as to promote the development of a new technology associated with the remote tower concept, thus ensuring its safe implementation. At the same time, the GM covers the single mode of operation, as it is also described in the text. Based on this premise, Section 3 of the proposed document addresses both what is defined as 'basic equipage' and 'enhanced equipage'. In the case of the basic equipage, the analyses and validation exercises conducted in the frame of the SESAR project have shown that for certain operational contexts (see Section 3.2.3.) the functionalities presented in the basic equipage may be sufficient to provide the same level of safety as in the current operations at an aerodrome, subject to the confirmation by the corresponding safety assessment of the local implementation.
On the other hand, the Agency recognises that the development of a new technology will offer opportunities to implementers to include new functionalities in the short term, and are also taken into consideration within the scope of the standardisation bodies currently dealing with the remote tower concept. Therefore, the Agency believes that the enhanced equipage ignored — being, however, aware of the early stage and limited maturity of its functionalities. For this purpose, the proposed text presents the need for the ATS provider to conduct an in-depth evaluation of the selected enhanced functionalities, including the necessary validation activities and human performance assessment as part of the corresponding safety assessment of the local implementation.
In any case, new text has been added in order to reinforce the need to take into consideration the aforementioned early stage of those functionalities catalogued as enhanced and to ensure they are appropriately taken into consideration in the context of the safety assessment.

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.3. Operational context — 3.2.3.2. Air traffic characteristics p. 23

comment *12* comment by: *LFV*

The size of an aircraft should not be important when considering the visual presentation needs. The visual presentation should be good enough to identify an airspace infringement regardsless of the size of the aircraft.
All type of aircrafts and sizes should be handled as in tower today.

response *Accepted*

The reference to size is removed from the text.

comment *56* comment by: *Prof. Filippo Tomasello*

Nothing prevents the remote tower to be used only for limited periods of time, with a conventional tower used at other times. E.g. the conventional tower could be used during the day (more passenger traffic) and the remote tower at night, or the contrary at aerodrome principally serving freight carriers with traffic peak overnight. Or an aerodrome may be intensively used for about one week during an air display (e.g. Farnbourough) and much less for the rest of the year. This possibility should be highlighted in the guidalines.

response *Accepted*

The Agency agrees with the statement made by the commentator. The text does not preclude this possibility, so it is understood that no amendment is needed.

comment *219* comment by: *EUROCONTROL*

Page 23 - 3.2.3.2 Air traffic characteristics

2nd sentence

EUROCONTROL makes a change request followed by a justification:

When considering the visual presentation needs, the type of aircraft should also be taken into account, not only the size and equipment. For example, the visual presentation may need to show helicopters whose movements are in essence very different from those of planes. Similarly, military jets could imply the need for more stringent requirements than those required for slower aircraft, mainly civil.

response *Accepted*

The text is amended to include a reference to the ‘mix of aircraft’.

comment *222* comment by: *René Meier, Europe Air Sports*

3.2.3.2. Air traffic characteristics
page 23/61

	In addition to the type and the characteristics of the air traffic types of aircraft engaged and distribution in time during operating hours is important. A key issue could be how to implement planning the expected traffic. Rationale: Traffic peaks identical in time windows are in our view to be avoided.
response	*Accepted* The Agency believes that the concern stated by the commentator is addressed by Section 3.2.3.1 'Traffic density'.

comment	*439* comment by: *Wideroe Flyveselskap AS* 3.2.3.2 It is preferable that dedicated VFR holding patterns and IFR holding patterns are established ensuring a clear path for aircrafts on approach, landing, take-off and climb. Once the area is free the next aircraft may proceed. The question to how such an approach to dealing with simultaneous traffic in G-airspace can be incorporated remains unanswered and should be solved.
response	*Noted* The comment is noted, as the Agency does not see the direct implication on remote tower operations.

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.3. Operational context — 3.2.3.3. Characteristics of the aerodrome's layout p. 23

comment	*13* comment by: *LFV* What significance does the validation have for the implementation of remote tower?
response	*Noted* As indicated throughout the document, the scope and objective of the proposed text is to maintain the level of safety in those specific cases where these services are provided from a remote tower compared to their provision from a conventional tower, as well as to promote the development of a new technology associated with the remote tower concept, thus ensuring its safe implementation. The analyses and different validation exercises conducted in the frame of the SESAR project have shown that for certain operational contexts (see Section 3.2.3.) and for certain functionalities, the operation is considered as validated, from the safety perspective. This is something to be taken into account as a reference. However, based on local particularities and characteristics, the corresponding safety assessment shall be conducted and approved by the corresponding competent authority.

comment	*225* comment by: *EUROCONTROL* **Page 23 - 3.2.3.3. Characteristics of the aerodrome's layout**

2nd paragraph

EUROCONTROL questions the correctness of the statement on the validated airfield characteristics and, therefore, requests a clarification:

The only thing validated in SESAR was the case of 'single runway' airport. Airports with 'parallel runways' or 'crossing runways' have not been included in SESAR validation activities. Have these validations been done outside of SESAR activities? This comment needs also to be read in conjunction with EUROCONTROL's comment on runway configuration (in 3.2.2.1).

response *Accepted*

The text is amended in order to clarify that the validation activities were focussed on a single runway aerodrome.

comment *414* comment by: *AvinorANSP*

runway entries , change to taxiways

response *Accepted*

comment *427* comment by: *René Meier, Europe Air Sports*

3.2.3.3. Characteristics of the aerodrome's layout
page 23/61

Third part of the text: We firmly believe that not only ONE safety assessment needs to be done, unless the ATM aspects, the aerodrome aspects, and the flight ops aspects are included.

Rationale:
The set of safety assessments must cover all aspects. The flight crews are best in place to contribute greatly to find adequate solutions when risk mitigation measures are looked for to enhance safety on ground, because they have to observe what is in place, and suffer from the consequences of lacks in co-operation.

response *Noted*

The Agency partly agrees with the commentator. The safety assessment should cover all actors, and the concept should be looked at as a multi-actor change. The proposed text already intends to cover both the perspective of the ATM side (ANSP) and the aerodrome operator (in Section 3.3). Therefore, the Agency is of the opinion that the statement made by the commentator has been already taken into consideration throughout the text.

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.3. Operational context — 3.2.3.4. Airspace characteristics p. 23

comment *180* comment by: *CANSO*

The following para should be added:
In any case, the aerodrome capacity for the target aerodrome should not be negatively

	impacted by the provision of ATS from a remote control site under normal conditions.
response	*Not accepted* This section is intended to cover the airspace characteristics of the target aerodrome, and includes details on the class of airspace. The Agency is of the opinion that the proposal made by the commentator (regarding capacity) is not related to the content of this section. Therefore, its content remains as initially proposed.

comment	*227* comment by: *CAA-NL* 3.2.3.4. A controlled aerodrome may be situated in uncontrolled airspace (class F or G) as well. Airspace class C or D is only relevant in case a CTR (due to IFR flight path protection) has been established.
response	*Accepted* The text is modified to avoid misunderstandings.

comment	*258* comment by: *NATS National Air Traffic Services Limited* The following para should be added: In any case, the aerodrome capacity for the target aerodrome should not be negatively impacted by the provision of ATS from a remote control site under normal conditions
response	*Not accepted* This section is intended to cover the airspace characteristics of the target aerodrome, and includes details on the class of airspace. The Agency is of the opinion that the proposal made by the commentator (regarding capacity) is not related to the content of this section. Therefore, its content remains as initially proposed.

comment	*428* comment by: *René Meier, Europe Air Sports* 3.2.34. Airspace characteristics page 23/61 First paragraph: Remark: It is intersting to read about "airspace F" as a possibly associated airspace for the case of AFIS provision only. Rationale: We have been of the opinon class F airspaces only are accepted as a measure limited in time.
response	*Noted*

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.3. Operational context — 3.2.3.5. Aerodrome infrastructure and surroundings (physical orography) p. 23

comment	*57* comment by: *Prof. Filippo Tomasello*

	The Agency should perhaps mention geographical data bases supporting minimum safe altitude warnings (MSAW)
response	*Not accepted* The Agency does not consider the need to include MSAW in the document, as it has no direct relationship to remote towers.

comment	*158* comment by: *UK CAA* **Page No:** 23 of 61 **Paragraph No:** 3.2.3.5. **Comment:** The UK CAA welcomes the proposed guidance material but notes that little mention is made of data transmission requirements, and no mention is made regarding the broadband capacity and speed requirements/specifications associated with remote towers. Limited broadband capabilities in geographically remote areas/marginal communities may preclude the application of the remote tower concept in the very areas that could most benefit from them. Requirements for data transmission/broadband requirements associated with remote towers should also be considered. **Justification:** Clarification.
response	*Not accepted* The Agency believes that the elements mentioned by the commentator have been implicitly included in the documents, mainly through the section that covers the system aspects. In order not to be too prescriptive at this point, and due to the immaturity of the different solutions, the Agency considers it more appropriate not to limit some of those characteristics (e.g. broadband capacity) and to focus on 'performance-based' elements.

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.3. Operational context — 3.2.3.6. Environmental characteristics p. 24

comment	*33* comment by: *LFV* First line - add also PTZ and/or hotspot cameras and also add the line for sun protection (filters or other technical solution)
response	*Not accepted* Paragraph 3.2.3.6 contains environmental characteristics. The comment seems to be misplaced.

comment	*58* comment by: *Prof. Filippo Tomasello* Not only the environmental conditions should be considered, but also the infinite variety of means to monitor the environment. The latter may include e.g. drones to monitor birds. The guidelines do not need to be specific on such monitoring devices, but should allow in principle their use, with words not linked to a specific technology.

response	*Noted*

comment	*231* comment by: *René Meier, Europe Air Sports* 3.2.3.6. Environmental characteristics page 24/61 Basic weather observation training should be given to selected aerodrome staff. Rationale: Means like e.g. AutoMETAR only are not a viable solution for weather observation. It is sufficient for defining horizontal visibility, wind directions and barometric measures. The "Birds and other animals" problem can be solved by different means like fences or cameras. We prefer cameras. Rationale: In the case of smaller aerodromes fences are of doubtful value, a real risk for animals and aircraft. Different means to mitigate the bird strike risk are available, but none of them is 100 % reaches 100 % efficiency.
response	*Noted* The Agency agrees with the statement made by the commentator on the importance of training and at the same time believes that training has been appropriately covered through the proposed document.

comment	*238* comment by: *EUROCONTROL* **Page 24 - 3.2.3.6. Environmental characteristics** EUROCONTROL makes a change request: The “Type of Clouds” should be included in the list of environmental conditions to be taken into consideration for the development of the safety assessment.
response	*Not accepted* The Agency considers that the ‘type of clouds’ does not represent a significant element to be considered and, therefore, sees no need to include it in the environmental conditions.

comment	*440* comment by: *Wideroe Flyveselskap AS* 3.2.3.6 On many AFIS aerodromes in Norway is wind, and especially variable wind, a factor that have resulted in several landing incidents, including hull losses caused by gear collapse. For aerodromes experiencing difficult wind patterns a system should be designed and implemented that provides "wave off" in case the operating limits are exceeded. This "wave off" should be in the form of a dedicated light or light pattern since human factors render aural warnings likely to be incomprehensible to flight crew under severe task loading. The "wave off" system should be activated by the ATCO or AFISO after having read the wind and issued "cleared to land" or "runway free"".

	The "wave off" system should not be mandatory. Operators wishing to exploit such a system should provide wind limitation for programming of the "wave off" system ensuring that the capabilities of the aircraft and flight crew is taken into due consideration.
response	*Accepted* The Agency agrees with the commentator on the importance of wind as an element to be considered within the environmental factors. In line with this fact, the proposal already includes this element.

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.4. Operator's roles and performance — 3.2.4.1. Roles p. 24

comment	*1* comment by: *Swedavia Air Traffic Management dept.* **Suggest to change the wording last sentence to:** "Nevertheless, the technical solution should, if same level of ATS service is choosen, allow the ATCO´s/AFIS main responsibilities to be unchanged transferring to remote tower services from local (conventional tower)"
response	*Not accepted* The Agency does consider the existing text appropriate and, therefore, believes that no amendments are needed.

comment	*67* ❖ comment by: *DFS Deutsche Flugsicherung GmbH* 5th bullit of "enhanced equipage": the term "operator" should be replaced by ATCO/AFISO in order not to mix it with the aircraft operator. change proposal: Functionalities to facilitate judging the aircraft's position or altitude (depth of vision for the ~~operator~~ ATCO/AFISO). Note: "Operator (ATCO/AFISO)" or "operator" appears several times in the document, e.g. 3.2.4, 3.2.5.1, 3.2.5.2.) where the identification as "ATCO/AFISO" would be clearer.
response	*Accepted*

comment	*239* comment by: *EUROCONTROL* **Page 24 - 3.2.4.1 Operator's role** 2nd sentence EUROCONTROL makes a proposal to complement the current content: It should be mentioned that the role of the supervisor in a RTC may be 'broader' than in current operations (e.g. supporting ATCO in case of workload, or taking in charge some coordination tasks, or being involved in the emergency situations). This needs to be defined by the several assessments (safety, human performance) done for the local implementation

	and taking into account the local operational and environmental conditions.
response	*Not accepted* The Agency is of the opinion that the role of the supervisor should be covered by the ANSPs from an organisational point of view and, therefore, should be included in this GM. In order to be consistent with this statement, and for the sake of clarity, the text is amended appropriately.

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.4. Operator's roles and performance — 3.2.4.2. Training and competence requirements p. 24

comment *365* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Proposed guidance on the implementation... Section 3.2.4.2 '*Training and competence requirements*'	This section should be revisited to ensure compatibility both with the current **regulation (EU) No 1035/2011** and the future ATM/ANS regulation that will result from **Opinion No 03/2014**, regulation that will embody **NPA 2014-13**.	If these guidelines are to be inserted in that new scheme through **RMT.0464**, they have to be totally consistent with the future ATM/ANS regulation.

response *Accepted*

The Agency thanks AESA/DSANA for the proposal and states its agreement with it. The Agency is of the opinion that the proposed text already considers the need for alignment with the future regulatory framework and takes into consideration the need for future developments to be aligned in the context of this rulemaking task.

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.5. System/equipment aspects p. 24-25

comment *14* comment by: *LFV*

Which is the connection between this section and safety assessment?

Should this bullet be after 3.1 instead? Seems misplaced.

response *Not accepted*

As stated previously in other sections of the document, the implementation of the remote tower concept is seen as a change in the functional system, which requires a safety assessment to be conducted. The safety assessment should also cover the system equipment aspects. The Agency understands the section is appropriately placed.

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.5. System/equipment aspects — 3.2.5.1. RTM/RTC concept p. 25-26

comment	*59* comment by: *Prof. Filippo Tomasello* Then also the RTC deserves a definition in the initial chaprter of the guidelines.
response	*Accepted*

comment	*67* ❖ comment by: *DFS Deutsche Flugsicherung GmbH* 5th bullit of "enhanced equipage": the term "operator" should be replaced by ATCO/AFISO in order not to mix it with the aircraft operator. change proposal: Functionalities to facilitate judging the aircraft's position or altitude (depth of vision for the ~~operator~~ ATCO/AFISO). Note: "Operator (ATCO/AFISO)" or "operator" appears several times in the document, e.g. 3.2.4, 3.2.5.1, 3.2.5.2.) where the identification as "ATCO/AFISO" would be clearer.
response	*Accepted*

comment	*89* comment by: *skyguide Corporate Regulation Management* If the RTC is composed of several RTMs, the ATS provider should ensure that the ATCO/AFISO use similar operating methods and procedures for all the aerodromes connected to an RTM/RTC and that all RTMs in an RTC should be standardised in terms of Human-Machine Interface (HMI) and equipment (in order to contribute to the overall improvement of uniformity of ATM services). **Comment**: This should be the case as far as practicable. However, it should be understood and anticipated that there will always be minor differences between the RTM's.
response	*Noted* As stated in the text, the objective is that the ATS should ensure alignment of the operating methods and procedures of all aerodromes involved.

comment	*110* comment by: *CANSO* "RTM is the term used to refer to the work station of an operator (ATCO/AFISO) from which remote ATS is provided". • The use of "an operator" in the RTM definition might suggest that each RTM can be used by a single operator. This aspect of the RTM definition is not elsewhere specified, therefore it is suggested to avoid unnecessary constraints and to remove the indefinite article "an". • See also chapter 3.2.1

	5th bullet of “enhanced equipage”: the term “operator (ATCO/AFISO)” should be replaced by “ATCO/AFISO” in general. Proposal for change of chapter 3.2.5.1: “RTM is the term used to refer to the work station of ~~an operator (~~ATCOs/AFISOs~~)~~ from which remote ATS is provided” "The ATS provider may decide that the provision of remote ATS from an RTM would be from a centralised facility known as RTC. RTC (see Figure 1) can house one or more RTMs where remote ATS may be provided to one or several aerodromes in normal conditions or to one aerodrome in contingency situations.” • The reference to the contingency situation should be excluded from the present document that is related only to the single mode operation. It is not clear in the definition of RTM if it is considered possible the use of different RTM (with separate visual presentation for distinct ATCO or FISO) in the same airport.
response	*Accepted* The text is amended as proposed regarding the term ‘operator’. The text is also amended in order not to distinguish between the normal operation and the one under contingency measures, as they would be both part of the single mode of operation. The footnote again remarks that the guidance is intended to cover only the single mode of operation (as stated previously also in the scope), as it has been defined in the corresponding section.
comment	*123* comment by: *ENAV* 1. “RTM is the term used to refer to the work station of an operator (ATCO/AFISO) from which remote ATS is provided”. The use of "an operator" in the RTM definition might suggest that each RTM can be used by a single operator. This aspect of the RTM definition is not elsewhere specified, therefore it is suggested to avoid unnecessary constraints and to remove the indefinite article "an".
response	*Accepted*
comment	*124* comment by: *ENAV* 1. “The ATS provider may decide that the provision of remote ATS from an RTM would be from a centralised facility known as RTC. RTC (see Figure 1) can house one or more RTMs where remote ATS may be provided to one or several aerodromes in normal conditions or to one aerodrome in contingency situations.” • The reference to the contingency situation should be excluded from the present document that is related only to the single mode operation. • It is not clear in the definition of RTM if it is considered possible the use of different RTM (with separate visual presentation for distinct ATCO or FISO) in the same airport.

response	*Accepted* The text is amended as proposed regarding the term 'operator'. The text is also amended in order not to distinguish between the normal operation and the one under contingency measures, as they would be both part of the single mode of operation. The footnote again remarks that the guidance is intended to cover only the single mode of operation (as stated previously also in the scope), as it has been defined in the corresponding section.

comment	*125* comment by: *ENAV* 1. "An RTC can be set up as shown in Figure 1, with multiple RTMs and one or more supervisor positions (depending on the size and requirements of the RTC)". In the figure there are no references to the supervisor. This role and responsibilities are not described in the document, nor this matter was inserted in the licence and training part. It is suggested to re-name the role of supervisor to avoid confusion with the his current role in the ops room, and to better specify role and responsibilities.
response	*Accepted* The supervisor position and role are subject to the ATS provider organisational needs. The text is amended in order to clarify that.

comment	*193* comment by: *ATCEUC - Air Traffic Controllers European Unions Coordination* What does it mean the third sentence? Does this mean the ATS provider may decide to allocate more aerodromes to a single ATCO? Because it looks the only way you can improve efficiency of the resources and as far as we know this document was designed for single mode operations.
response	*Noted* The text contains a footnote in order to remark that the guidance is intended to cover only the single mode of operation (as stated previously also in the scope), as it has been defined in the corresponding section.

comment	*228* comment by: *CAA-NL* 3.2.5.1. contains the following text: "If the RTC is composed of several RTMs, the ATS provider should ensure that the ATCO/AFISO use similar operating methods and procedures for all the aerodromes connected to an RTM/RTC and that all RTMs in an RTC should be standardised in terms of Human-Machine Interface (HMI) and equipment (in order to contribute to the overall improvement of uniformity of ATM services)." Although we see the merit of promoting the standardisation and uniformity of this text, as it stands now it will hamper further development with gradual expansion out of the single mode of operation or introducing enhanced equipage at one of the remote controlled aerodromes when this will add to the operational safety.
response	*Partially accepted*

The intention of this paragraph is to reflect the suitability of having a standard HMI and similar procedures at the RTC, as it is recognised to be positive from a human factor/performance point of view. This fact is not mandatory and could not always be possible to achieve, as it would be subject to the characteristics and operational needs of the different operated aerodromes. However, the Agency considers it is still remarkable enough to be included as a suggestion to the ATS provider.

comment *240* comment by: *EUROCONTROL*

Page 25 - 3.2.5.1 RTM/RTC concept

Entire paragraph

EUROCONTROL makes a suggestion concerning the guidance document structure :

This conceptual information on Remote Tower Module (RTM) and Remote Tower Centre (RTC) is not given a sufficiently prominent position in the document and is provided at a too late stage in the reading.

4th paragraph - 1st sentence

EUROCONTROL makes a suggestion:

The guidance document should clarify the type of remote tower service being provided (assumed to be single).

Footnote 16

EUROCONTROL makes two suggestions:

The guidance document should also confirm that the developed material is mainly addressing low-density aerodromes.

For larger aerodromes, even for a single mode of operation, the guidance document should address the role of the supervisor.

response *Partially accepted*

Entire paragraph
The Agency believes that the coverage given to the RTM/RTC section is balanced, taking into consideration the early stage of the concept and the 'local characteristics' nature' and organisational aspects this specific topic comes along with, providing the ATS provider with some flexibility to address it.

4th paragraph, 1st sentence
The text contains a footnote in order to remark that the guidance is intended to cover only the single mode of operation (as stated previously also in the scope), as it has been defined in the corresponding section. Therefore, the Agency understands that the proposed text is in line with the commentator's proposal.

Footnote 16 (number has changed after some amendments)
The specific objective of this rulemaking task is to maintain the level of safety in those specific cases where these services are provided from a remote tower compared to their provision from a conventional tower, as well as to promote the development of a new technology associated with the remote tower concept, thus ensuring its safe implementation.
At the same time, the proposed document introduces guidance on the implementation of the remote tower concept for single mode of operation. The analyses and validation exercises conducted in the frame of the SESAR project have shown that for certain operational contexts, as it could be the case for low density aerodromes (as defined in Section 3.2.3.), the concept may be applicable considering that the same level of safety is maintained as in the current operations, and on the premise of the use of the basic equipage (as defined in Section 3.2.1). Again, this has to be confirmed by the corresponding safety assessment, to be conducted by the ATS provider (and approved by the competent authority) based on local characteristics.
Taking this into consideration, the intention of this guidance is not to prevent the implementation of the concept at aerodromes were density exceeds the above-mentioned characteristics. In those cases, the remote tower concept may well be applicable, subject to the results of the corresponding safety assessment.

comment *259* comment by: *NATS National Air Traffic Services Limited*

"RTM is the term used to refer to the work station of an operator (ATCO/AFISO) from which remote ATS is provided".

- The use of "an operator" in the RTM definition might suggest that each RTM can be used by a single operator. This aspect of the RTM definition is not elsewhere specified, therefore it is suggested to avoid unnecessary constraints and to remove the indefinite article "an".

See also chapter 3.2.1
5th bullet of "enhanced equipage": the term "operator (ATCO/AFISO)" should be replaced by "ATCO/AFISO" in general.

Proposal for change of chapter 3.2.5.1:
"RTM is the term used to refer to the work station of ~~an operator~~ (ATCO**s**/AFISO**s**) from which remote ATS is provided"

"The ATS provider may decide that the provision of remote ATS from an RTM would be from a centralised facility known as RTC. RTC (see Figure 1) can house one or more RTMs where remote ATS may be provided to one or several aerodromes in normal conditions or to one aerodrome in contingency situations."

- The reference to the contingency situation should be excluded from the present document that is related only to the single mode operation.
- It is not clear in the definition of RTM if it is considered possible the use of different RTM (with separate visual presentation for distinct ATCO or FISO) in the same airport.

<DFS does not support to request more material or even to create a new supervisor role>

response *Accepted*

The text is amended as proposed regarding the term 'operator'.

The text is also amended in order not to distinguish between the normal operation and the

	one under contingency measures, as they would be both part of the single mode of operation. The footnote again remarks that the guidance is intended to cover only the single mode of operation (as stated previously also in the scope), as it has been defined in the corresponding section.
comment	*293* comment by: *IFATCA* As indicated above. IFATCA is opposed to multiple remote tower facilities as it brings in a complete new working environment with unforeseen impacts on licensing, equipage and as well elements which cannot be imagined (e.g. compulsory transponder equipage, new surveillance methodologies etc.) A standardized Design for the RTMs within the RTC does again imply a safety issue.CWP must be the same, especially when ATCOs hold multiple endorsements. But each RTM should be unique in a way to improve situational awareness.
response	*Accepted* The Agency understands the commentator's concern. It is considered that the text contained in the different sections of this document clarifies the scope and intention of the proposed GM, which is currently limited to the single mode of operation.
comment	*332* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)* Remove 3.2.5.1 This section describes RTM and RTC which are NOT in the definition list. hence this section resembels a sales pitch for a specific technical solution. the text itself seems to orginate from one specific vendor of equipment. including this segment seriously undermines the credability of the GM
response	*Accepted* RTC and RTM are now included in the definitions (Section 3.1).
comment	*334* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)* The ability to swap RTMs will depend on many factors, such as ATCO licensing (see Chapter 4). Why highlight licencing? "SWAP" is above and beyond the scope of the GM.
response	*Not accepted* In case the implementation allows the provision of ATS to several airports from one RTM (always under the terms of the 'single mode of operation'), licensing has to be considered, since there is a need to hold the unit endorsement of all the aerodromes to which the service is provided (as stated in Section 4).
comment	*335* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen,*

	Luftfartsavdelningen) *The ATS provider's decision on the number of available RTMs in an RTC will depend on the number of aerodromes connected to the RTC. Nevertheless, additional/spare RTMs may also be included based on contingency requirements.* There are other means to acheve the desired function. The text seems to derrive from a glossy sales pitch brouchures
response	*Noted* As the commentator suggests no proposal for any amendment, the Agency considers that the text is appropriate and, therefore, there is no need to amend it.

comment	*336* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)* the RTC is composed of several RTMs, the ATS provider should ensure that the ATCO/AFISO use similar operating methods and procedures for all the aerodromes connected to an RTM/RTC and that all RTMs in an RTC should be standardised in terms of Human-Machine Interface (HMI) and equipment (in order to contribute to the overall improvement of uniformity of ATM services). ...similar op methods and procedures... only here, why? Seems to be out of scope!
response	*Not accepted* The intention of this paragraph is to reflect the suitability of having a standard HMI and similar procedures at the RTC, as it is recognised to be positive from a human factor/performance point of view.

comment	*415* comment by: *AvinorANSP* only if all RTMs are used for all personell/services. If the RTMs are dedicated to either AFIS or ATC or even in categories within the two groups performing different level of service (e.g. Single or Multi), different HMI could be beneficial.
response	*Noted* The intention of this paragraph is to reflect the suitability of having a standard HMI at the RTC, as it is recognised to be positive from a human factor/performance point of view.

comment	*420* comment by: *SINCTA - Portuguese Air Traffic Controllers' Union* One again, caution must be exercised when referring to allocation between RTM and aerodrome. It should be clear that despite the allocation, only single mode operation is accepted.

response | *Accepted*

The text contains a footnote in order to remark that the guidance is intended to cover only the single mode of operation (as stated previously also in the scope), as it has been defined in the corresponding section.

comment | *451* comment by: *Malta Air Traffic Controllers' Association*

What does it mean the third sentence? Does this mean the ATS provider may decide to allocate more aerodromes to a single ATCO? Because that's the only way you can improve efficiency of the resources and as far as we know this document was designed for single mode operations.

response | *Noted*

The text contains a footnote in order to remark that the guidance is intended to cover only the single mode of operation (as stated previously also in the scope), as it has been defined in the corresponding section.

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.5. System/equipment aspects — 3.2.5.2. Human–computer interaction functions — Visual presentation p. 26-28

comment | *16* comment by: *LFV*

First list of bullets on page 28: This approach seems complicated.

response | *Noted*

comment | *25* comment by: *LFV*

The end-to-end delay should be the same regardless of the density at the aerodrome.

response | *Not accepted*

This parameter drives the ATCO/AFISO situational awareness and the maximum value allowed depends on the operational needs (e.g. number of movements). Very low density aerodromes represent the simplest operational context and, hence, would allow the possibility of longer end-to-end delays as far as there will be less movements and vehicles to monitor. Then, the 1-second value has been selected for this very low density aerodromes, so it represents the maximum value for any other scenario. Nevertheless, for more complex environments more restrictive (lower) end-to-end delay values should apply in order to ensure adequate ATCO/AFISO situational awareness. This should be determined by the safety assessment, as indicated in the guidance.

comment | *60* comment by: *Prof. Filippo Tomasello*

Enhanced or synthetic vision systems are spreading in the cockpit to support navigation in low visibility conditions. There is no reason to limit the sensors serving a remote tower to the visible spectrum. This is only to please the labour unions of ATCOs, but prohibing tower ATCO to use modern technology does not serve aviation safety. Enhanced or synthetic vision systems should be explicitly allowed.

response | *Noted*

The intention of the paragraph is not to prevent different solutions from being developed. The statement made on the visible spectrum camera-based solution is just an assumption on which the visual presentation is based. Further technological developments and the use of other visual presentation means (e.g. infrared cameras) are at this point catalogued as enhanced functionalities.

comment | *67* ❖ comment by: *DFS Deutsche Flugsicherung GmbH*

5th bullit of "enhanced equipage":
the term "operator" should be replaced by ATCO/AFISO in order not to mix it with the aircraft operator.

change proposal:

Functionalities to facilitate judging the aircraft's position or altitude (depth of vision for the ~~operator~~ ATCO/AFISO).

Note: "Operator (ATCO/AFISO)" or "operator" appears several times in the document, e.g. 3.2.4, 3.2.5.1, 3.2.5.2.) where the identification as "ATCO/AFISO" would be clearer.

response | *Accepted*

comment | *71* comment by: *DFS Deutsche Flugsicherung GmbH*

Page 28 3rd bullit:

Identification of the conditions under which ~~that~~ the ATCO/AFISO may perform each of the actions ...

response | *Accepted*

comment | *105* comment by: *CANSO*

Paragraph "Sound reproduction" of chapter 3.2.5.2 should indicate that this is an option. In many cases the construction of a tower is such as to prevent the ATCO from surrounding noise. Thus, it might not be adequate to implement such functionality when changing to remote tower operations. Therefore, indeed, this must be subject to a human performance assessment, when actually thinking of reproducing sound.
We propose following text changes for clarity:
"This function refers to the capture and reproduction of the aerodrome's background sounds at the CWP. It is aimed at further improving the ATCO's/AFISO's situational awareness by combining visual presentation and surrounding noise.
If this function is implemented for actual outdoor sound reproduction, the volume should be adjustable and it should be possible to be turned off by the operator (ATCO/AFISO).
It is important to note that within current operations the background sounds may be suppressed from the ATCO/AFISO on purpose, e.g. through noise reduction means or a distant location of the control tower building. The application of this function might therefore not be an option, when changing from such service to remotely controlled service.

~~In any case~~ If taken into consideration, this functionality should be subject to a human performance assessment.

response *Partially accepted*

The text is amended to include the rationale of the comment.

comment *126* comment by: *ENAV*

1. "The maximum allowable end-to-end delay should be determined by the safety assessment taking into account the operational context but, in any case, it should not be longer than 1 second, as this value is considered to be the maximum delay allowed for very low-density aerodromes (which are representative of the simplest operational contexts)."

This is the only quantitative reference to the system performance. It is not clear the exception than other indicators. There are other very important aspects that require attention (eg. Size and position of the display, definition, frame rate, etc.), that have not been minimally treated.

response *Not accepted*

End-to-end delay is considered as one of the major drivers of the ATCO/AFISO situational awareness. The Agency has considered it necessary to define a maximum value, as this parameter is considered to have a direct effect on the ATCO/AFISO capability, in comparison to the direct visual observation, without other means that could compensate for the differences in time between the reality and the presentation to the ATCO/AFISO. On the other hand, the 1-second value was selected due to the fact that this is the figure that is currently found acceptable in the simplest operational scenarios. It has been considered as an absolute maximum that should not be exceeded in any operational environment. Other operational scenarios of higher complexity, as characterised in the GM, would lead to more restrictive (lower) end-to-end delay values as a result of the safety assessment. This may be further detailed and standardised as a result of the ongoing activities within the EUROCAE WG-100. Nevertheless, currently, the proposed value is aligned with the current considerations.

In any case, the Agency does not share the commentator's view regarding the treatment of other system aspects such as frame rate or other different image quality factors, as they are also included and referenced in the text. However, given their importance and their impact on the system and the operational performance, the Agency does not consider them as critical as the end-to-end value, so they remain subject to the safety assessment results, based on performance requirements.

comment *159* comment by: *UK CAA*

Page No: 29 of 61

Paragraph No: 3.2.5.2

Comment: Reference is made to Annex 11 requirements concerning binocular functionality. Despite searching, no reference to such a requirement can be found in Annex

11. If there is an ICAO requirement on this subject, it is questioned whether electronic binocular function is adequate for compliance or does the guidance anticipate the need to file a Difference.

Justification: Clarification and appropriate referencing.

response *Accepted*

The text is amended to state the correct reference (Doc 9624).

comment *182* comment by: *CANSO*

Paragraph on top of page 27 indicates "The maximum allowable end-to-end delay …. should not be longer than 1 second, as this value is considered to be the maximum delay allowed for very low-density aerodromes…."

As stated in the general comment, the provision of detailed quality and performance figures leads to the impression that these are default or even minimum/maximum values. In fact, the required performance is a result of the safety assessment. Furthermore the explanation "that this is considered to be" gives no hint on the source of this consideration and should be prevented.

response *Partially accepted*

End-to-end delay is considered as one of the major drivers of the ATCO/AFISO situational awareness. The Agency has considered it necessary to define a maximum value, as this parameter is considered to have a direct effect on the ATCO/AFISO capability, in comparison to the direct visual observation, without other means that could compensate for the differences in time between the reality and the presentation to the ATCO/AFISO. On the other hand, the 1-second value was selected due to the fact that this is the figure that is currently found acceptable in the simplest operational scenarios. It has been considered as an absolute maximum that should not be exceeded in any operational environment. Other operational scenarios of higher complexity, as characterised in the GM, would lead to more restrictive (lower) end-to-end delay values as a result of the safety assessment. This may be further detailed and standardised as a result of the ongoing activities within the EUROCAE WG-100. Nevertheless, currently, the proposed value is aligned with the current considerations.
Regarding the specific sentence the commentator is refering to, the text is amended in order to improve clarity.

comment *194* comment by: *ATCEUC - Air Traffic Controllers European Unions Coordination*

The value of the end-to-end delay is included as GM, which has a very low legal value, and all the remaining factors are to be determined by the safety assessment without having any reference value included in this NPA.

What does it mean "sufficient quality" when you're talking about binocular functionality?

response *Noted*

End-to-end delay is considered as one of the major drivers of the ATCO/AFISO situational awareness. The Agency has considered it necessary to define a maximum value, as this parameter is considered to have a direct effect on the ATCO/AFISO capability, in comparison

	to the direct visual observation, without other means that could compensate for the differences in time between the reality and the presentation to the ATCO/AFISO. On the other side, the 1-second value was selected due to the fact that this is the figure that is currently found acceptable in the simplest operational scenarios. It has been considered as an absolute maximum that should not be exceeded in any operational environment. Other operational scenarios of higher complexity, as characterised in the GM, would lead to more restrictive (lower) end-to-end delay values as a result of the safety assessment. This may be further detailed and standardised as a result of the ongoing activities within the EUROCAE WG-100. Nevertheless, currently, the proposed value is aligned with the current considerations. Regarding the specific reference to the 'sufficient quality' made by the commentator, this text is intended to ensure that, based on the results of the safety assessment and performance analysis, the referenced quality guarantees safe operations.
comment	*229* comment by: *CAA-NL* 3.2.5.2. related to end to end delay. We think the proposed maximum end to end delay of 1 second is too long. We suggest to be closer to the value in other SESAR projects of 0.3 of a second.
response	*Not accepted* End-to-end delay is considered as one of the major drivers of the ATCO/AFISO situational awareness. The Agency has considered it necessary to define a maximum value, as this parameter is considered to have a direct effect on the ATCO/AFISO capability, in comparison to the direct visual observation, without other means that could compensate for the differences in time between the reality and the presentation to the ATCO/AFISO. On the other hand, the 1-second value was selected due to the fact that this is the figure that is currently found acceptable in the simplest operational scenarios. It has been considered as an absolute maximum that should not be exceeded in any operational environment. Other operational scenarios of higher complexity, as characterised in the GM, would lead to more restrictive (lower) end-to-end delay values as a result of the safety assessment. This may be further detailed and standardised as a result of the ongoing activities within the EUROCAE WG-100. Nevertheless, currently, the proposed value is aligned with the current considerations. However, this does not preclude the possibility to reach lower values, if needed, as a result of the safety assessment.
comment	*242* comment by: *ATC the Netherlands* P27: in combination with these performance, the remote tower should include a monitor of the frozen image and the corresponding alerts..... The reference to which images and alerts is missing. For this we would like to challenge if an extra monitor is needed in all cases.
response	*Not accepted* The text refers to the need for the system to have an alert in order to warn about the presence of a frozen image, which would have a major impact on the operations safety. The Agency considers that the text is clear enough and, therefore, no amendment is needed.

comment	*260* comment by: *NATS National Air Traffic Services Limited* Paragraph "Sound reproduction" of chapter 3.2.5.2 should indicate that this is an option. In many cases the construction of a tower is such as to prevent the ATCO from surrounding noise. Thus, it might not be adequate to implement such functionality when changing to remote tower operations. Therefore, indeed, this must be subject to a human performance assessment, when actually thinking of reproducing sound. We propose following text changes for clarity: "This function refers to the capture and reproduction of the aerodrome's background sounds at the CWP. It is aimed at further improving the ATCO's/AFISO's situational awareness by combining visual presentation and surrounding noise. If this function is implemented for actual outdoor sound reproduction, the volume should be adjustable and it should be possible to be turned off by the operator (ATCO/AFISO). **It is important to note that within current operations the background sounds may be suppressed from the ATCO/AFISO on purpose, e.g. through noise reduction means or a distant location of the control tower building. The application of this function might therefore not be an option, when changing from such service to remotely controlled service.** ~~In any case~~ **If taken into consideration**, this functionality should be subject to a human performance assessment.
response	*Partially accepted* The text is amended to include the rationale of the comment.

comment	*261* comment by: *NATS National Air Traffic Services Limited* Paragraph on top of page 27 indicates "The maximum allowable end-to-end delay …. should not be longer than 1 second, as this value is considered to be the maximum delay allowed for very low-density aerodromes…." As stated in the general comment, the provision of detailed quality and performance figures leads to the impression that these are default or even minimum/maximum values. In fact, the required performance is a result of the safety assessment. Furthermore the explanation "that this is considered to be" gives no hint on the source of this consideration and should be prevented.
response	*Partially accepted* End-to-end delay is considered as one of the major drivers of the ATCO/AFISO situational awareness. The Agency has considered it necessary to define a maximum value, as this parameter is considered to have a direct effect on the ATCO/AFISO capability, in comparison to the direct visual observation, without other means that could compensate for the differences in time between the reality and the presentation to the ATCO/AFISO. On the other hand, the 1-second value was selected due to the fact that this is the figure that is currently found acceptable in the simplest operational scenarios. It has been considered as an absolute maximum that should not be exceeded in any operational environment. Other operational scenarios of higher complexity, as characterised in the GM, would lead to more restrictive (lower) end-to-end delay values as a result of the safety assessment. This may be further detailed and standardised as a result of the ongoing activities within the EUROCAE WG-100. Nevertheless, currently, the proposed value is aligned with the current

considerations.
Regarding the specific sentence the commentator is refering to, the text is amended in order to improve clarity.

comment *273* comment by: *EUROCONTROL*

Page 26 - Visual presentation

1st paragraph

EUROCONTROL makes a suggestion:

Include apron too, if required.

Pages 27 and 28 - Image quality factors

Page 27 - Last paragraph - Last sentence

EUROCONTROL makes a statement that gives rise to a suggestion through the form of a question:

These are key aspects that have to be addressed and agreed. Should there not be a reference to WG-100 work?

Page 28 - 2nd paragraph - 3rd sentence

EUROCONTROL asks a question:

Which validation activities are being referred to?

response *Not accepted*

Page 26 - Visual presentation
1st paragraph
As stated in Section 3.3.2.6, at aerodromes where ATS is provided remotely and the respective ATS unit is also responsible for the provision of apron management services at the aerodrome, cameras should be also located to provide visual presentation of an unobstructed view of the apron(s) under the responsibility of that ATS unit. The text is purposed to address the general responsibilities of the ATS provider. However for a particular aerodrome, the safety assessment may conclude that the apron area should also be visible or for those cases where the ATS is also responsible for the apron management service.

Page 27 and 28 - Image quality factors
Last paragraph, last sentence
The proposed guidance contains several references to the ongoing work of the EUROCAE WG-100. As stated in the same section (3.2.5), the elements described in it are likely to be further explained and detailed once the EUROCAE WG-100 outcome is available.

Page 28 - 2nd paragraph, 3rd sentence
The text refers to the validations that shall be conducted during the implementation process

and prior to the operational approval.

comment

333 comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

PTZ? Thats a constituent or a component in a technical solution delivered by one vendor. why not use the term binocular function

response

Accepted

The reference to PTZ is replaced by binocular functionality.

comment

337 comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

... in any case, it should not be longer than 1 second, as this value is considered to be the maximum delay allowed for very low-density aerodromes

Based on what evidence? there are no evidence for this statement! By throwing a arbitrary number based an gut feeling alone into the guidance material this may have a contradictory effect to what the agency wants to achieve. Implementors will focus more on the hard number than what effect the delay might have. 1.2 second may be perfectly OK in one implemetation whilst 0.6 will not in another. Bluntly, by putting the figure there the credability of this materierial is undermined.

response

Not accepted

End-to-end delay is considered as one of the major drivers of the ATCO/AFISO situational awareness. The Agency has considered it necessary to define a maximum value, as this parameter is considered to have a direct effect on the ATCO/AFISO capability, in comparison to the direct visual observation, without other means that could compensate for the differences in time between the reality and the presentation to the ATCO/AFISO. On the other hand, the 1-second value was selected due to the fact that this is the figure that is currently found acceptable in the simplest operational scenarios. It has been considered as an absolute maximum that should not be exceeded in any operational environment. Other operational scenarios of higher complexity, as characterised in the GM, would lead to more restrictive (lower) end-to-end delay values as a result of the safety assessment. This may be further detailed and standardised as a result of the ongoing activities within the EUROCAE WG-100. Nevertheless, currently, the proposed value is aligned with the current considerations.

comment

338 comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

On the other hand, binocular functionality may also include, as part of the enhanced functionalities,
automatic tracking of moving aircraft, vehicles or obstructions (e.g. personnel or large animals).

Why include reference to enhanced funtionalities when there are no validation results, proof, of the added valure.

response *Not accepted*

As indicated throughout the document, the scope and objective of the proposed text is to maintain the level of safety in those specific cases where these services are provided from a remote tower compared to their provision from a conventional tower, as well as to promote the development of a new technology associated with the remote tower concept, thus ensuring its safe implementation. At the same time, the GM covers the single mode of operation, as it is also described in the text. Based on this premise, Section 3 of the proposed document addresses both what is defined as 'basic equipage' and 'enhanced equipage'. In the case of the basic equipage, the analyses and validation exercises conducted in the frame of the SESAR project have shown that for certain operational contexts (see Section 3.2.3.) the functionalities presented in the basic equipage may be sufficient to provide the same level of safety as in the current operations at an aerodrome, subject to the confirmation by the corresponding safety assessment of the local implementation.
On the other hand, the Agency recognises that the development of a new technology will offer opportunities to implementers to include new functionalities in the short term, and are also taken into consideration within the scope of the standardisation bodies currently dealing with the remote tower concept. Therefore, the Agency believes that the enhanced equipage ignored — being, however, aware of the early stage and limited maturity of its functionalities. For this purpose, the proposed text presents the need for the ATS provider to conduct an in-depth evaluation of the selected enhanced functionalities, including the necessary validation activities and human performance assessment as part of the corresponding safety assessment of the local implementation.
In any case, new text has been added in order to reinforce the need to take into consideration the aforementioned early stage of those functionalities catalogued as enhanced and to ensure they are appropriately taken into consideration in the context of the safety assessment.

comment *366* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Proposed guidance on the implementation... Section 3.2.5.2 '*Human-computer interaction functions*' Visual presentation	AESA fully supports the establishment of a value for the **end-to-end delay**.	It is important to make these guidelines fully pragmatic and useful. The establishment of one of the key parameters associated to this concept is necessary for the guidelines to give real guidance.

response *Accepted*

The Agency thanks AESA/DSANA for the supportive comment.

comment *367* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION

Proposed guidance on the implementation... Section 3.2.5.2 '*Human-computer interaction functions*' Visual presentation	AESA wonders whether more guidance would be of use in this **section 3.2.5.2** and whether the contents of the ongoing standardisation works of **EUROCAE WG-100** on '*Remote and Virtual Towers*' would be of support to this section.	At the end of the day, wouldn't all this boil down to the specification of the cameras used for the provision of the remote service?

response *Noted*

As stated in the proposed GM, the Agency, being also part of the EUROCAE WG-100, has the firm intention to align, when possible, with the work produced by the aforementioned group and takes duly into account the ongoing activities. However, due to the difference in time the activities and the deliverables have at this point, it seems inevitable to have a full alignment, given that the document production from the EUROCAE standards is still being discussed.

comment *412* comment by: *GSommer FRQ*

"Video data fusion combining different inputs from the available sensors and generating an aggregated system track for a dedicated object."

This is in contradiction to the functionalities and components described for a remote tower system below and aboe the sub-functions and requires tracking technologies, additional sensors, ...

response *Accepted*

The text is amended in order to make it consistent.

comment *417* comment by: *AvinorANSP*

All the comments are to the points in the capter about avoiding irregularities:
What if a slight flickering impression increases situational awerness and the correspomnding decision making capability? Suggest that guideline adress this.
The goal must be to produce the best situational awerness and decision making capability with the least amount of stress caused by the visual presentation. But most likely it will be a trade off.
Very slow moving objects appear to be standing still to the human brain. Especially objects with red light have the ability to confuse the brain with regard to direction and speed of the object.
The text here could be used in the two previos points: avoid any unwanted

response *Not accepted*

The Agency believes that the elements the commentator refers to should be thoroughly analysed in the context of the human performance aspects.

comment *452* comment by: *Malta Air Traffic Controllers' Association*

The value of the end-to-end delay is included as GM, which has a very low legal value, and all the remaining factors are to be determined by the safety assessment without having any reference value included in this NPA. What does it mean “sufficient quality” when you’re talking about binocular functionality?

response *Noted*

End-to-end delay is considered as one of the major drivers of the ATCO/AFISO situational awareness. The Agency has considered it necessary to define a maximum value, as this parameter is considered to have a direct effect on the ATCO/AFISO capability, in comparison to the direct visual observation, without other means that could compensate for the differences in time between the reality and the presentation to the ATCO/AFISO. On the other hand, the 1-second value was selected due to the fact that this is the figure that is currently found acceptable in the simplest operational scenarios. It has been considered as an absolute maximum that should not be exceeded in any operational environment. Other operational scenarios of higher complexity, as characterised in the GM, would lead to more restrictive (lower) end-to-end delay values as a result of the safety assessment. This may be further detailed and standardised as a result of the ongoing activities within the EUROCAE WG-100. Nevertheless, currently, the proposed value is aligned with the current considerations.
Regarding the specific reference to the ‘sufficient quality’ made by the commentator, this text is intended to ensure that, based on the results of the safety assessment and performance analysis, the referenced quality guarantees safe operations.

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.5. System/equipment aspects — 3.2.5.2. Human–computer interaction functions — Binocular functionality p. 29

comment *368* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Proposed guidance on the implementation... Section 3.2.5.2 '*Human-computer interaction functions*' Binocular functionality	Full consideration must be taken of the **resolution of the cameras** (and the images sent by them after compression/decompression) in order to achieve a meaningful zoom to fully support the related ATCO/AFISO tasks.	Poor resolution at source can be poorly enhanced at destination, even with sophisticated zoom algorithms.

response *Accepted*

The proposed guidance takes into consideration the importance of the image quality factors, and includes them as an important part of the system specification.
In any case, the Agency agrees with the statement made by the commentator, and believes

that the proposed guidance is already in line with this statement, hoping at the same time that, as the concept evolves, future developments and standards will more specifically address these elements (e.g. EUROCAE WG-100).

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.5. System/equipment aspects — 3.2.5.2. Human–computer interaction functions — Sound reproduction p. 29

comment *40* comment by: *DFS Deutsche Flugsicherung GmbH*

Paragraph "Sound reproduction" of chapter 3.2.5.2 should indicate that this is an option. In many cases the construction of a tower is such as to prevent the ATCO from surrounding noise. Thus, it might not be adequate to implement such functionality when changing to remote tower operations. Therefore, indeed, this must be subject to human performance considerations, when actually thinking of reproducing sound.

We propose following text changes for clarity:

"This function refers to the capture and reproduction of the aerodrome's background sounds at the CWP. It is aimed at further improving the ATCO's/AFISO's situational awareness by combining visual presentation and surrounding noise.
If this function is implemented for actual outdoor sound reproduction, the volume should be adjustable and it should be possible to be turned off by the operator (ATCO/AFISO).
It is important to note that within current operations the background sounds may be suppressed from the ATCO/AFISO on purpose, e.g. through noise reduction means or a distant location of the control tower building. The application of this function might therefore not be an option, when changing from such service to remotely controlled service.
~~In any case~~ If taken into consideration, this functionality and the elements of human performance should be subject to ~~a human performance~~ the safety assessment, as far as practicable.

response *Partially accepted*

The text is amended to include the rationale of the comment.

comment *265* comment by: *EUROCONTROL*

Page 26-30 - 3.2.5.2 Human-computer interaction functions

Last sentence of page 26, continued on page 27

EUROCONTROL makes an observation that gives rise to a suggestion:

There is no guidance on how to determine the maximum allowable end-to-end delay as part of the safety assessment.

This should be related to the use cases mentioned in comment on 3.2.2.5.

Page 27 - 2nd paragraph - 3rd sentence

EUROCONTROL makes an observation that gives rise to a suggestion:

There is no guidance on how to determine the minimum allowable frame as part of the safety assessment.

This should be related to the use cases mentioned in comment on 3.2.2.5.

Image quality factors

EUROCONTROL makes a suggestion:

The guidance material should indicate that this aspect has to be part of the safety and the human performance assessment.

Page 28 - Last paragraph

EUROCONTROL makes a suggestion:

Image compression (e.g. 360° in 220°) should also be included in the description of the set up for the visual presentation screens.

Page 29 - Binocular functionality

EUROCONTROL makes a suggestion:

This functionality could also be combined with infrared in order to potentially enlarge its use in darkness and in other low visual conditions.

Page 29 - Air-ground voice/data communications

EUROCONTROL makes a comment:

Data link was not tested in the frame of SESAR work.

Page 30 - 2nd paragraph - Sentence "The maximum allowable delay (...) flight crew and controller"

EUROCONTROL makes an observation that gives rise to a suggestion:

There is no guidance on how to determine the maximum allowable delay as part of the safety assessment.

This should be related to the use cases mentioned in comment on 3.2.2.5.

Page 30 - 2nd paragraph - Last sentence "Additionally, the safety assessment (...) information available at the ATCO/AFISO."

EUROCONTROL makes an observation that gives rise to a suggestion:

The use of 'sound' here can be misunderstood.

Explicit references should be made to 'R/T voice' and 'ambient sound', both of which need to be synchronised with visual information.

response *Partially accepted*

Page 26-30 - 3.2.5.2 Human-computer interaction functions

Last sentence of page 26, continued on page 27
The determination of the maximum end-to-end delay will be subject to the particular conditions of the aerodrome and should be subject to dedicated validation activities as part of the necessary safety assessment. Nevertheless, the Agency has considered it necessary to include a maximum allowed end-to-end delay value (1 second) corresponding to the simplest operational scenario.

Page 27 - 2nd paragraph, 3rd sentence
The determination of the maximum frame rate will be subject to the particular conditions of the aerodrome and should be subject to dedicated validation activities as part of the necessary safety assessment.

Image quality factors
Accepted. The image quality factors are included in the corresponding list of human performance aspects to be considered (Appendix 4).

Page 28 - Last paragraph
Accepted.

Page 29 - Binocular functionality
The use of infrared is part of the enhanced equipage that has not been validated yet. Therefore, the Agency considers it is not appropriate to address it at this stage.

Page 29 - Air-ground voice/data communications
The purpose of the text is to be descriptive, not to make the statement that this element has been validated. Therefore, the Agency considers the text appropriate.

Page 30 - 2nd paragraph: Sentence 'The maximum allowable delay (...) flight crew and controller'
See first answer to this comment.

Page 30 - 2nd paragraph: Last sentence 'Additionally, the safety assessment (...) information available at the ATCO/AFISO.'
Accepted.

comment *345* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

If this function is implemented for actual outdoor sound reproduction, the volume should be adjustable and it should be possible to be turned off by the operator (ATCO/AFISO).

In any case, this functionality should be subject to a human performance assessment.

Why is human performance assessment hightlighted for sound but not for the other (basic) funcionalities?

response *Noted*

Due to the fact that many ATS providers have decided to insulate conventional towers against aerodrome sound/noise, the Agency understands this function should be optional and subject to the safety assessment. The rest of the functions listed in Section 3.2.1 are understood as necessary for the operation and, therefore, they are included in the basic equipage. However, as stated in the text, all the functionalities are subject to the confirmation by the corresponding safety assessment that takes into consideration the local implementation characteristics.

comment *369* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Proposed guidance on the implementation... Section 3.2.5.2 '*Human-computer interaction functions*' Sound reproduction	AESA wonders whether this function actually exists in a conventional tower further to what can be actually heard in the tower.	Care must be taken not to introduce functions that were non-existent in a conventional tower in order to make the change as smooth as possible. Further to this, this function could impair the situational awareness of the ATCO/AFISO, which normally operates in towers isolated to avoid, in fact, the loud noises made by aircraft on and in the vicinity of an aerodrome.

response *Accepted*

The Agency fully agrees with the commentator's proposal, as the proposed text already considers this fact by means of making the sound reproduction an optional element (as stated also in section 3.2.1 as part of the basic equipage functionalities), subject to the human performance (and safety) assessment.

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.5. System/equipment aspects — 3.2.5.2. Human–computer interaction functions — Voice/data communication p. 29-30

comment *17* comment by: *LFV*

The maximum allowable delay should not differ from the one in an ACC.

response *Not accepted*

Visual observation is not a necessary element of the type of ATS provided from an ACC. Therefore, the Agency believes that the correspondance established by the commentator is not appropriate.

comment

161 comment by: *UK CAA*

Page No: 30 of 61

Paragraph No: Ground–ground voice/data communications

Comment: It is recommended that the text should also refer to UHF voice communications and the ability to cross link.

Justification: Completeness of text.

response

Accepted

The text is amended in order not to make reference to any technology used.

comment

343 comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

Also, especially for a backup or emergency radio system, a dedicated and independent backup
connection between the aerodrome and the RTM or RTC will be required. Standard fall-back solutions,
such as handheld radios used directly in the local conventional tower, cannot be applied to the remote
tower scenario.

To much assumptions! Standard fallback might be possible, and might be the best solution for some implementations. The essential aspect is that the implementor have to make conciderations on the fallback

response

Accepted

The text is amended to state that the use of some of these solutions (e.g. handheld radios) is limited to coverage characteristics.

comment

344 comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

Additionally, the safety assessment should consider the relative timing between this communication and the visual presentation to the ATCO/AFISO (driven by the end-to-end delay) in order to ensure the necessary level of coherence between the image and sound information available at the ATCO/AFISO

The stetement is not wrong but implies a bigger problem than it actually is. The additional delay caused by the transmission would most likely be significantly less that the responstime of a slow pilot. most likely the added transmission times will not be noticable. The added delay due to transmission is most likely measurend in 10 och 100 of miliseconds. Small delays may cause problems in VCS systems by that is an technical issue and shoudl be delt with in

tuning of the systems.

response *Noted*

As the commentator agrees with the statement included in the text, the Agency believes that there is no proposal to amend the text.

comment *370* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Proposed guidance on the implementation... Section 3.2.5.2 '*Human-computer interaction functions*' Voice/data communication	AESA suggests that the **maximum allowable delay for the remote command of the local aerodrome** be in line and consistent with (lower than) the end-to-end delay established in **section 3.2.5.2**.	To ensure consistency of the system as a whole as the "*whole system operational delay*" will be set by its "*weakest link*" (highest delay).

response *Not accepted*

The Agency considers that the end-to-end delay regarding visual presentation does not have a direct relationship to the latency associated to the management of assets. In any case, as stated throughout this section, the latency associated to the management of assets should be considered when performing the safety assessment.

comment *371* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Proposed guidance on the implementation... Section 3.2.5.2 '*Human-computer interaction functions*' Voice/data communication	In relation to the use of **handheld radios**, these could in fact be used as **fall-back solution** if within range of the aerodrome remotely controlled.	In order not to discard *a priori* possible solutions of a robust and affordable nature.

response *Accepted*

The text is amended to state that the use of some of these solutions (e.g. handheld radios) is limited to coverage characteristics.

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.5. System/equipment aspects — 3.2.5.2. Human–computer interaction functions — Visual communication p. 30-31

comment *18* comment by: *LFV*

What is the definition of "visual range".

response *Accepted*

The text is amended and the visual range reference is removed in order to avoid misunderstandings.

comment *72* comment by: *DFS Deutsche Flugsicherung GmbH*

page 30 visual communication 3rd bullit:
The possiblity to indentify moving ailerons or rudder may be reduced when using panoramic vision unless the PTZ (panorama-tilt-zoom) mode is applied.
This may be added to the first sub-bullit

- moving ailerons (or rudder), in daylight or at least
- movement of aircraft caused by move of ailerons (or rudder)

response *Not accepted*

The Agency considers that the movement of the aircraft as a result of the movement of ailerons and rudder is not considered a means of visual communication. Therefore, it is considered that there is no need to amend the text.

comment *160* comment by: *UK CAA*

Page No: 30 of 61

Paragraph No: Visual Communication

Comment: The NPA seems to give significant priority to signal lamp availability. It is unclear whether this is the intent of the wording as the remote operation of signal lamps may cause some difficulty, it is also unclear whether signalling lamps can be controlled remotely.

Justification: Clarification.

response *Noted*

Having signalling lamp is a requirement of the control tower. Therefore, the implementation of the remote tower system has to take this into consideration and provide means for their correct use.

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.5. System/equipment aspects — 3.2.5.3. Voice and data recording p. 31

comment *266* comment by: *EUROCONTROL*

Page 31 - 3.2.5.3. Voice and data recording

EUROCONTROL makes a suggestion:

The safety assessment for the local implementation has to ensure the 'non-interference' (no degradation or lost, etc.) of the voice and data recording system with the information presented in the visualisation system used for an operational purpose, i.e. ATS provision. This was an outcome of the SESAR safety assessment.

response *Accepted*

comment *441* comment by: *Wideroe Flyveselskap AS*

3.2.5.3
Strict protocol for use of voice and data recordings must be put in place to prohibit misuse of such information by persons and organizations. Such data should only be used for for statistical analysis and/or incident and accident investigation only. If used for statistical analysis the data should be anonymous. For use in investigation after incidents or accidents a court order should be presented to allow release of the recordings.
Flight crew should be notified in the training material, and possibly the AIP, that video footage and sound are recorded and stored.

response *Not accepted*

The Agency believes that there should be no difference when comparing the treatment of the recordings in a remote tower environment to today's practices at conventional towers. Therefore, the Agency considers there is no need to amend the text.

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.5. System/equipment aspects — 3.2.5.4. Management of assets — Aerodrome lighting system management p. 31

comment *19* comment by: *LFV*

The use of ILS CAT III indicates that its not a low-density airport.

response *Not accepted*

From a regulatory perspective, there is no relationship between the ILS category and the traffic density at an aerodrome. Therefore, the Agency considers the text appropriate.

comment *73* comment by: *DFS Deutsche Flugsicherung GmbH*

3.2.5.4 1st bullit:
We suggest to use the technical term "light gun":

remotely operate the light gun ~~signalling lamp located in the aerodrome premises~~;

response *Not accepted*

The term 'signalling lamp' is contained in ICAO Annex 14. Therefore, in order to ensure consistency with the ICAO provisions, the Agency considers the term appropriate.

comment	*104* comment by: *CANSO* 3.2.5.4 1st bullet: remotely operate the *signalling lamp located in the aerodrome premises*; ??? Shouldn't that be the light gun? Please check for consistency in the document. remotely operate the light gun ~~signalling lamp located in the aerodrome premises~~;
response	*Not accepted* The term 'signalling lamp' is contained in ICAO Annex 14. Therefore, in order to ensure consistency with the ICAO provisions, the Agency considers the term appropriate.

comment	*262* comment by: *NATS National Air Traffic Services Limited* 3.2.5.4 1st bullet: remotely operate *the signalling lamp located in the aerodrome premises; ???* Shouldn't that be the light gun? Please check for consistency in the document. remotely operate the light gun ~~signalling lamp located in the aerodrome premises~~
response	*Not accepted* The term 'signalling lamp' is contained in ICAO Annex 14. Therefore, in order to ensure consistency with the ICAO provisions, the Agency considers the term appropriate.

comment	*267* comment by: *EUROCONTROL* **Page 31 - Aerodrome lighting system management** EUROCONTROL makes a suggestion: The visualisation reproduction system should also allow the ATCO/AFISO to clearly identify when the lights on the manoeuvring area and the visual navigation aids need to be switch on or off (with respect to outside light and meteorological conditions). <u>Last sentence</u> EUROCONTROL makes an observation that gives rise to a suggestion: There is no guidance on how to determine the maximum allowable delay as part of the safety assessment. This should be related to the use cases mentioned in comment on 3.2.2.5.
response	*Not accepted* As part of the safety assessment, and as addressed throught the respective sections, the visual presentation should be representative of the real conditions. This would allow the ATCO/FISO to correctly manage the lighting systems. <u>Last sentence</u> The determination of the maximum allowable delay will be subject to the particular conditions of the aerodrome and should be subject to dedicated validation activities as part of the necessary safety assessment.

The use cases are intended to define operational environments for which the remote tower concept should be evaluated (including the trade-off of the different parameters).

comment

342 comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

The remote operation of the signalling lamp might be subject to delays due to communication latency from the RTC to the aerodrome infrastructure. The maximum allowable delay should be determined by the safety assessment taking into account the operational context in order to ensure the ATCO's/AFISO's ability to act timely.

The wording implies that communication latency is a major factor for manageing assets. The intrucution of RTC might not change the concept och technology for managing assets compared to a conventional local tower. The concept then introducec slighty longer cabels which in turn may introduce several 10th of miliseconds in additional delay. f.i. the controller HMI for managing assets could have far more impact on the experience than the additional cabeling. point beeing that a the entire (functional) system have to be tuned. comment concerns all assets.

response

Not accepted

The text is purposed to remark the latency as an aspect to be taken into consideration for the implementation of the remote tower concept. Its criticality shall be determined by the corresponding safety assessment, subject to local implementations, and specially in those cases where the nature of the asset introduces differences when comparing it to the current operations (from a conventional tower).

comment

372 comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Proposed guidance on the implementation... Section 3.2.5.4 '*Management of assets*' Aerodrome lighting system management	AESA suggests that the **maximum allowable delay for the remote operation of the signalling lamp** be in line and consistent with (lower than) the end-to-end delay established in **section 3.2.5.2**.	To ensure consistency of the system as a whole as the "*whole system operational delay*" will be set by its "*weakest link*" (highest delay).

response

Not accepted

The Agency considers that the end-to-end delay regarding visual presentation does not have a direct relationship to the latency associated to the management of assets. In any case, as stated throughout this section, the latency associated to the management of assets should be considered when performing the safety assessment.

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.5. System/equipment aspects — 3.2.5.4. Management of assets — Alarm management p. 31

comment *268* comment by: *EUROCONTROL*

Page 31 - Alarm management

1st paragraph - 1st sentence

EUROCONTROL makes an observation that is complemented by a suggestion:

ATCO/AFISO maintaining the ability to monitor and trigger accident, incident and distress alarms as applicable to the aerodrome is not enough.

The remote tower system should also support the involvement of the ATCO/AFISO (or supervisor) in the management of the corresponding situation.

response *Accepted*

The Agency agrees with the statement made by the commentator and at the same time believes that the proposed text does not negatively affect this possibility. Therefore, it is understood that no text amendment is needed.

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.5. System/equipment aspects — 3.2.5.5. RTC–aerodrome communication aspects p. 32

comment *61* comment by: *Prof. Filippo Tomasello*

The normal case is that the gound-ground COM provider is not certified and hence it has to be indirectly under safety oversight thorugh the the SMS of the certified ATSP. But nothing prevents the certification of a COM SP for the services it delivers. In this case the ATSP does not need to oversee the safety of the COM SP, since the latter is directly overseen by the authority. The cases are respectively similar to ground handling (normally under oversight by the certified commercial air operators) and to aerodrome services (the aerodrome is separately certified and it is not responsibility of the ATSP to oversee it). The possibility of existence of a certified COM provider should be mentioned. This double possibility is clearly mentioned, e.g. in par. 6.5.4 of ICAO Doc 10019. It should be mentioned also in the guidelines.

response *Noted*

The Agency agrees with the statement made by the commentator. However, the Agency considers this is not specific to the remote tower concept and, therefore, it is not necessary to amend the text.

comment *207* comment by: *DGAC/DSAC - french NSA*

A main hazard identified is related to the link between the airport and the RTC. There should be guidance on what is considered acceptable in this domain.

Proposal:

A dual independent link should be implemented between the Remote Tower and the Airport. Using two of the following items could be an acceptable means of compliance:

- Standard ground link based on PSTN;
- Dedicated ground link;
- Radio link;
- Satellite link.

response *Partially accepted*

The text is amended to include the need to analyse and identify redundancy needs through the process of architecture design.

However, the Agency considers that the means of achieving the corresponding redundancy elements should not be specified in this guidance and at the same time it considers that these elements should be derived from the results of the architecture design and might be specific for each of the communication links.

comment *373* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Proposed guidance on the implementation... Section 3.2.5.5 '*RTC-aerodrome communication aspects*'	AESA considers that building **redundancy** in the system design is a more reliable way to "*take the communication aspect into account when designing the technical architecture*" than basing this on appropriate SLAs.	Considering that "*the RTC concept relies on communications as a critical enabler*", reliability and robustness have to be built into the concept. Being dependent on third parties is not the best way to achieve this.

response *Noted*

In line with the statement made by the commentator, the intention of the text is to remark that when the ANSP relies on third-party providers, it should ensure that this does not affect the correct functioning of the system.
In any case, the text is amended to include the need to analyse and identify redundancy needs through the process of architecture design.

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.5. System/equipment aspects — 3.2.5.6. Technical supervision p. 32-33

comment *269* comment by: *EUROCONTROL*

Pages 32-33 - 3.2.5.6. Technical supervision

EUROCONTROL makes a suggestion that is justified by an observation:

Last sentence of page 32, continued on page 33

Those technical failures / modes having an operational impact should also be presented to the ATCO/AFISO. This need was identified in the pioneer implementation by LFV.

response *Accepted*

comment *346* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

This section is extremly vague, what is the purpose of this segment in the GM? larger ATS may have technical supervisors on duty 24/7. small ATS may not. the ATCO / AFISO may have the task.... What is the minimum level all ATS units need to achieve? What is the process all implementers need to perform in order to acheieve the minimum level...

response *Noted*

This section is intended to remark both the importance of the technical supervision, as part of the implementation of the remote tower concept, and the provision of guidance on the way the technical supervision may be organised, always attending on several local aspects (taking into consideration the ATS provider organisational characteristics and the specificities and needs of the system implemented).

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.6. Siting aspects p. 33

comment *94* comment by: *skyguide Corporate Regulation Management*

Proposal:
Involve future remote tower controller in design and development to ensure ergonomics. Guarantee and validate the suppliers asking for certification or ISO normes on ergonomics aspects.

response *Noted*

The Agency thanks the commentator and notes their proposal.

comment *162* comment by: *UK CAA*

Page No: 33 of 61

Paragraph No: 3.2.6

Comment: The NPA states that the term 'The vicinity of an aerodrome' is defined in Chapter 1 of ICAO Doc 4444 as 'aircraft in, entering or leaving an aerodrome traffic circuit'. This is not strictly correct. Doc 4444 states that 'an aircraft is in the vicinity of an aerodrome when it is in, entering or leaving an aerodrome traffic circuit' in defining the term for 'Aerodrome traffic'. Therefore Doc 4444 is providing guidance but does not offer a definition of the

term. It is recommended the text is amended to make it more appropriate.

Justification: Appropriateness and clarity.

response *Accepted*

The text is amended to ensure consistency with ICAO Doc 4444.

comment *374* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Proposed guidance on the implementation... **Section 3.2.6 '*Siting aspects*'**	In the prior-to-last item of the enumeration included in **section 3.2.6**, where it says "- *night-time lighting glare*" it should say "- *night-time lighting glare;*" instead (add a semicolon at the end).	Typographical error.

response *Accepted*

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.7. RTM ergonomics p. 34

comment *62* comment by: *Prof. Filippo Tomasello*

Since the information provided to the ATCOs in a remote tower may be much richer (e.g. labels in her/his field of view) than in a conventional tower, looking at traditional ergonomics (e.g. lighting, physical dimensions, cooling, etc.) is necessary but not sufficient. Even the cognitive aspects should be considered.

response *Accepted*

The Agency agrees with the comment and believes that the application of new technologies and enhanced functionalities should be assessed from a human aspect and human performance point of view, as part of or in combination with the safety assessment. To this regard, new text within Section 3.2.1 is proposed.

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.8. Information and cyber security p. 34

comment *237* comment by: *EUROCONTROL*

Page 34 - 3.2.8 Information and cyber security

1st paragraph - 2nd sentence

EUROCONTROL makes a comment:

In case of visual presentation failure, communications with aircraft and vehicles will become

critical.

3rd paragraph - 2nd sentence

EUROCONTROL makes a suggestion that is followed by a justification:

The complete loss of the remote ATS should be identified as an operational hazard from the safety perspective. Causes related to 'security' issues are not the only ones that can lead to this hazard.

response *Noted*

The Agency agrees with the comment regarding the importance of the criticality of loss of the visual presentation, which is in line with the proposed text.

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.9. Remote tower system constituents p. 35-36

comment *20* comment by: *LFV*

Second section: The possibilty to switch between airports entails dependency.

response *Noted*

comment *47* comment by: *Prof. Filippo Tomasello*

Voice/data are not CNS, buit only COM. Conversely "navigation aids management" may belong to NAV and not ATS

response *Not accepted*

As the classification is made by distinguishing between CNS and ATS (and COM is part of the CNS), the Agency considers it is not necessary to amend the text.

The text is amended to align with the corresponding section on management of navigation aids. In any case, as contained in ICAO Annex 11 and Doc 4444, the management of navigation aids is considered to be part of ATS.

comment *66* comment by: *DFS Deutsche Flugsicherung GmbH*

Having regard to current presentations of ATS systems and constituents we suggest to separate the first function and use two lines instead of one line:

~~Visual presentation~~	~~Visual presentation~~ ~~Binocular functionality~~ ~~Visual communication~~	~~ATS~~

Visual data processing	Binocular functionality Visual communication	ATS

	HMI Visual presentation ATS
response	*Not accepted* The table contains a first level decomposition of the system and its constituents. In order to be consistent with this approach, the description is considered to be appropriate.

comment	*95* comment by: *skyguide Corporate Regulation Management* **Proposal**: *Nice to have SMR (Surface Movement Radar) in addition to video cameras.*
response	*Noted* In Section 3.2.1, the proposed guidance establishes a differentiation attending on the different functionalities the system may present (basic equipage and enhanced equipage). SMR is included as part of the enhanced equipage.

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.10. Abnormal situations and contingency procedures p. 36-37

comment	*90* comment by: *skyguide Corporate Regulation Management* the ~~continuation~~ safe stop of the service in case of major failure; **Comment**: There is no need to continue the service, but to stop it in a safe way for all involved aircraft.
response	*Partially accepted* The text is amended in order to clarify that one of the elements to be taken into consideration for the development of the contingency plan should be the impact a major failure would have on the service provision.

comment	*163* comment by: *UK CAA* **Page No:** 37 of 61 **Paragraph No:** 3.2.10 **Comment:** The 3rd sub-paragraph states: "*.. the remote tower shall enable, as in current operations, the detection of unexpected flights in the area of responsibility where ATS are being provided"* Where an existing ATS function is TWR/APP only, the means for achieving this are limited. The most common means of identifying unexpected aircraft is through a

surveillance function available to the Approach or Centre Sector. The requirement for the Remote Tower should be no greater than this.

Justification: The additional requirement is not justified.

response

Not accepted

The Agency believes that the proposed text does not imply the need to have any additional measures compared to today's operations, as the text reads '...as in current operations'. Therefore, the Agency understands that there is no need to amend it.

comment

232 comment by: *René Meier, Europe Air Sports*

3.2.10. Abnormal situations...
page 37/61

You write "in case ATS provision is affected by degradation...remote ATS provision shall be ceased...". We propose to publish GNSS approaches and departure to all aerodromes served by a Remote Tower.

Rationale:
Such procedures reduce considerably the risk of a system failure for aircraft en-route to destination whose Remote Tower is momentarily unservicable.

response

Not accepted

The Agency does not agree with the proposal made by the commentator as it is considered to be outside the scope and rationale of this GM.

comment

375 comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Proposed guidance on the implementation... Section 3.2.10 '*Abnormal situations and contingency procedures*'	The requirements listed for the case that ATS provision is affected by the degradation of the system or during an abnormal situation seem to overlap. In particular, this would apply to **requirements 2**, **7**, **8** and **9** related to unplanned terminations.	Requirements must be simple, straightforward and encompassing in order to avoid misunderstanding and future issues with the implementation of the guidelines.

response

Accepted

The text is amended in order to group the different bullet points related to the same aspect into a single one.

comment	*442* comment by: *Wideroe Flyveselskap AS* 3.2.10 General knowledge of RVM/RTC and procedures to be followed in abnormal situations and contingency procedures should be included in training programs for flight crew. Flight crew should be notified in the training material that video footage and sound are recorded and stored.
response	*Not accepted* Flight crew training is not part of the scope of the proposed GM. Therefore, the Agency considers that there is no need to amend the text.

comment	*459* comment by: *comments provided on behalf of FIT/CISL italian trade union* Attachment #6 Please see attached PDF.
response	*Not accepted* As regards the comments submitted to this section, the Agency believes that the proposed text does not contradict the current regulatory framework; it clarifies it further instead (within the nature and basic principle of the GM). In relation to the proposal to 'elevate' the text to the Implementing Rule level, due to the fairly early stages of the remote tower concept, and the fact that further experience is yet to be gained, the Agency considered it necessary to address the remote tower concept in phases. This 'phased approach' is intended to also evolve from the regulatory 'level' perspective as implementation progresses and some experience can be gained and conclusions can be drawn. Taking this into consideration, and also as a result of the associated Regulatory Impact Assessment (RIA), the Agency considers that the best way to address the concept at this point in time is through the form of GM and AMC.

3. Proposed guidance on the implementation of the remote tower concept — 3.2. Safety assessment of the changes to the functional system — 3.2.11. Transition plan p. 37-39

comment	*48* comment by: *Prof. Filippo Tomasello* Excellent. The transition plan is an essential element for the safety of ANS: it should stay there. Difficult to understand for airworthiness experts, which think about an aircraft towed to hangar (and hence removed from service) during implementation of major changes. On the contrary ANS is 24/7 and never stops. So a transition, without disruption of operations, need to be carefully planned prior to being safely executed.
response	*Accepted* The Agency thanks the commentator for the supportive comment.

comment	*49* comment by: *Prof. Filippo Tomasello* In the third phase of the transition, the original location may remain in shadow mode for few days, to be still available in case of any problems (e.g. software bugs) suddenly emergening

at the freshly operational remote location.

response *Accepted*

The Agency agrees with the principle of the comment and considers it an example of a possible measure for a 'fallback' solution. At the same time, the Agency believes that the proposed text does not prevent at all from carrying out such action, so it is understood that there is no need to amend it.

comment *130* comment by: *FAA*

Section 3.2.11 should be split into two sub-sections: one addressing a transition plan for migration of ATS from the local tower to a remote facility, and a second addressing non-towered aerodromes wishing to establish remote provision of ATS and/or AFIS. This second sub-section should note that establishment of remotely provided ATS and/or AFIS services at non-towered aerodromes must be compliant with international standards, as well as be planned to mitigate any additional hazards posed by the remote provision of these services. The information contained in Appendix 1 (Human performance aspects), Appendix 2 (List of operational hazards for ATC services), and Appendix 3 could be referenced as the basic criteria that should be addressed when transitioning *or* establishing new services.

response *Partially accepted*

Taking into consideration the scenarios where no conventional tower exists, the Agency does not consider necessary the establishment of a totally different plan addressing this case.
For the cases where non-towered aerodromes wish to establish remote provision of ATS, this should be considered as a deployment of ATS, as for the case of conventional towers been implemented at non-tower aerodromes, but also taking into account the particularities of the remote ATS, as described in the guidance.

However, the Agency believes that this situation has to be taken into consideration and, therefore, the text is amended to include this possibility.

comment *164* comment by: *UK CAA*

Page No: 37 of 61

Paragraph No: 3.2.11

Comment: The UK CAA believes this paragraph is too prescriptive. The availability of the existing control tower building during the transition and post transition period is a matter for agreement on a project-by-project basis. There needs to be a transition plan. The availability of existing control tower building may or may not be a part of that. If the control tower building ceases to be available early in the transition, the risks this poses need addressing like any other as part of the project.

It is suggested it would be sufficient to indicate that a transition plan acceptable to the service provider and the competent authority is agreed as part of the project.

Justification: Less prescriptive text could cover all transition plans regardless of individual circumstances of the project

response | *Not accepted*

The Agency believes that, as part of the nature of the proposed GM, the proposed text contains references to the way the transition plan should be developed and at the same time it is considered flexible enough to allow for agreements, provided that the different steps and phases within the process are appropriately documented and followed and, finally, remarking that the transition plan should be subject to the safety assessment and thus to competent authority approval.

comment | *233* comment by: *René Meier, Europe Air Sports*

3.2.11. Transition plan
page 37/61

Question: What comes first, the transition plan or the safety assessment?

Rationale:
We had long discussions on this, in the end we agreed on undertaking all safety assessments before preparing transitions plans and before writing concepts of operation.

response | *Noted*

The transition plan's objective is to address the way ATS are migrated from the conventional tower to the remote facility, in coordination with the aerodrome operator. It should be elaborated and be subject to the safety assessment, with the final objective being to ensure a safe transition.

comment | *352* ❖ comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Explanatory Note Section 2.2.6 '*Transition plan*' Section 3.2.11 '*Transition plan*'	AESA fully supports this explicit and exhaustive treatment of the **transition plan**, its phases, proposed procedures and content.	The transition plan (and its dedicated safety assessment) is the cornerstone of the safe implementation of the remote tower concept.

response | *Accepted*

The Agency thanks AESA/DSANA for the supportive comment.

comment | *377* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Proposed guidance on the implementation...	AESA fully supports the establishment of a **transition plan**	The transition plan is the cornerstone of an effective and safe

Section 3.2.11 '*Transition plan*'	so thorough and well developed.	implementation of this concept.

response *Accepted*

The Agency thanks AESA/DSANA for the supportive comment.

comment *378* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Proposed guidance on the implementation... Section 3.2.11 '*Transition plan*'	AESA wonders if it is always feasible for an ATCO/AFISO to ensure that ATS is appropriately (safely) terminated prior to an unplanned termination, due to the very nature of an unplanned termination.	Consideration must be taken of the case in which this is not actually feasible in order to cater for (and mitigate) such a case.

response *Accepted*

The Agency understands the commentator's concern. It believes that the proposed text constitutes an objective and the means to achieve it should be considered by the ATS provider.

3. Proposed guidance on the implementation of the remote tower concept — 3.3. Aerodrome-related aspects p. 39

comment *379* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Proposed guidance on the implementation... Section 3.3 '*Aerodrome-related aspects*'	AESA very much welcomes this **section 3.3**, that establishes the **aerodrome operator** in its true role of actual partner to the ATS provider in the implementation of the remote service provision.	As already said, the aerodrome operator is the actual partner of the ATS provider in the implementation of the remote service provision. This has to be made very clear all through the guidelines to ensure an effective and safe implementation of this concept.

response *Noted*

The Agency shares the view that a holistic approach is needed for the implementation of similar projects.

comment *380* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Proposed guidance on the implementation... **Section 3.3 '*Aerodrome-related aspects*'**	In the last sentence of **section 3.3**, where it says "*The following aspects should be taking into consideration to meet this objective*" it should say "*The following aspects should be ~~taking~~ **taken** into consideration to meet this objective*" instead.	Typographical error.

response *Accepted*

The text is amended as suggested.

3. Proposed guidance on the implementation of the remote tower concept — 3.3. Aerodrome-related aspects — 3.3.1. Certification and approval — 3.3.1.1. Documentation to be provided by the aerodrome applicant at the initial aerodrome certification p. 39-40

comment *34* comment by: *LFV*

the provison of light **OR** pyrotechnic ("and" will be hard to fullfill)

response *Not accepted*

The text is based on existing provisions of Commission Implementing Regulation (EU) No 923/2012 (SERA.3301, Appendix 1), which specifically refer to 'Light and pyrotechnic signals', while the 'pyrotechnic signals' are meant to be used in order to convey a specific instruction to pilots.

comment *63* comment by: *Prof. Filippo Tomasello*

The documentation, as per Reg. 552, should possibly include declarations of conformity or suitability for use of constituents, to avoid duplication of assessments after installation on the site.

response *Noted*

The Agency notes the proposal. Article 5 of Regulation (EC) No 552/2004 on the interoperability of the European Air Traffic Management network, which still applies and therefore it imposes certain legal obligations on the organisations concerned, prescribes the conditions related to the use of the EC declaration of conformity or suitability for the use of constituents.
However, the objective of NPA 2015-04, and more specifically the material which is commented on, does not relate to the implementation of the said Regulation, as its focus is on the additional/differentiated information that needs to be provided to the competent authority in the context of aerodrome certification.

comment *381* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Proposed guidance on the implementation... Section 3.3.1.1 '*Documentation to be provided by the aerodrome applicant...*'	In both instances in **section 3.3.1.1**, where it says "*RFSS*" it should say "*RF**F**S*" instead.	Typographical error.

response *Accepted*

The text is amended as suggested.

3. Proposed guidance on the implementation of the remote tower concept — 3.3. Aerodrome-related aspects — 3.3.1. Certification and approval — 3.3.1.2. Aerodrome manual p. 40

comment *35* comment by: *LFV*

the provison of light **OR** pyrotechnic ("and" will be hard to fullfill)

response *Not accepted*

The text is based on the existing provisions of Commission Implementing Regulation (EU) No 923/2012 (SERA.3301, Appendix 1), which specifically refer to 'Light and pyrotechnic signals', while 'pyrotechnic signals' are meant to be used in order to convey a specific instruction to pilots.

comment *165* comment by: *UK CAA*

Page No: 40 of 61

Paragraph No: 3.3.1.2

Comment: The inclusion of pyrotechnic signals raises the question by the UK CAA as to whether there is a way to remotely control munitions.

Justification: Clarification.

response *Noted*

The text is based on the existing provisions of Commission Implementing Regulation (EU) No 923/2012 (SERA.3301, Appendix 1), which specifically refer to 'Light and pyrotechnic signals', and therefore has to be addressed. The way in which these SERA provisisions will be addressed, in the context of the introduction of the remote ATS concept, depends on the technological solutions employed by the applicant. In any case, the aerodrome manual should contain relevant information.

3. Proposed guidance on the implementation of the remote tower concept — 3.3. Aerodrome-related aspects — 3.3.2. Operational aspects — 3.3.2.1. Coordination between the aerodrome operator and the ATS provider in the event of system failure p. 40

comment *234* comment by: *René Meier, Europe Air Sports*

3.3.2.1. Coordination...
page 40/61

Closing the aerodrome because of ATS systems failure must be the very last measure and only applicable to IFR traffic, except for a "ceiling and visibility" situation rendering impossilbe all flight operations. You name the ANSP and the aerodrome, but you forgot the customer. To exactly define what still will be possible even with degraded systems all stakeholders have be involved in finding solutions, not only the ANSP or the aerodrome, operators must be consulted as well when conditions are established, as the envisaged air operations consist of the three elements "ATC", "aerodrome", "aircraft".

Rationale:
This is in-line with the idea of collaborative decisions making. The more remote an aerodrome is situated, the more isolated an operating site is, the more important are these measures.

response *Noted*

According to the relevant provisions of Annex 11 and PANS-ATM, it is absolutely necessary for the ATS personnel to maintain visual observation of the aerodrome and its vicinity. Thus, in case of failure of facilities, installations and equipment which are necessary for the visual presentation of the aerodrome and its vicinity, it is understood that the operations may not continue. Similarly, a malfunction to the communication systems employed may lead to the same conclusion. In such cases, it is the Agency's view that action needs to be taken immediately.

In any case, the responsibility for determining the need for the interruption of the operations lies with the relevant certificate holder who may also consult other organisations, depending of course on the nature and urgency of the issue.

3. Proposed guidance on the implementation of the remote tower concept — 3.3. Aerodrome-related p. 41-43

aspects — 3.3.2. Operational aspects — 3.3.2.4. Remote provision of ATS — Management of the change — Aerodrome operator

comment *166* comment by: *UK CAA*

Page No: 41 of 61

Paragraph No: 3.3.2.4

Comment: Guidance on maintaining a day- to-day operational relationship between the ATS management (of the remote tower) and aerodrome management team should be included. Also information on the effect on ATCO awareness and knowledge of the aerodrome when remotely located is required, which should connect with the contents of GM2 ATCO D 080(b).

Justification: Appropriate guidance material is needed to assist implementation.

response *Partially accepted*

The Agency has included additional topics that need to be included in the aerodrome manual to address the suggested issues. However, the Agency believes that the issue of the operational relationship between the aerodrome operator and the ATS provider has a local character that depends also on the complexity of the operations, and as such is a matter of the arrangements that will be in place between the aerodrome operator and the ATS provider.

comment *235* comment by: *René Meier, Europe Air Sports*

3.3.2.4. Remote provision-Management of change-Aerodrome operator
page 41/61

We think the management of change has to start with the safety assessments. Based on the resultats, training could be started.

Rationale:
Most probably training the staff on ground becomes quite complex because of new tasks (e.g. filing or closing flight plans, probably weather observation/informationas well as ATIS preparation and propagation).

response *Noted*

Indeed, the safety assessment is a *sine qua non* condition for change management. The necessity to conduct an assessment for the particular case is addressed in the third and fourth paragraph of Section 3.3.2.4. The list of areas for which specific attention needs to be given during this process already includes training, without suggesting that training requirements should be developed irrespectively/independently of the results of the safety assessment.

3. Proposed guidance on the implementation of the remote tower concept — 3.3. Aerodrome-related aspects — 3.3.2. Operational aspects — 3.3.2.5. Power supply at aerodromes p. 43

comment	*91* comment by: *skyguide Corporate Regulation Management* Cameras and related facilities located at an aerodrome, for enabling and supporting the remote provision of ATS, should be provided with a secondary power supply capable of supplying power when there is a failure of the primary power supply. Electric power supply connections to such cameras and related facilities should be so arranged that they are automatically connected to the secondary power supply on failure of the primary power supply. **Comment**: *It is our belief that the most important facility should be the voice communication, which should have the highest power availability and therefore have a third power supply installed by the use of a battery.*
response	*Not accepted* According to the current ICAO provisions, communication systems are required to be provided with a secondary power supply in order to ensure safety and continuity of service. In any case, the relevant service provider may always decide to use additional power supply sources.

comment	*167* comment by: *UK CAA* **Page No:** 43 of 61 **Paragraph No:** 3.3.2.5 **Comment:** It is recommended that the length of time secondary power should be available should be included **Justification:** Appropriate guidance material to assist implementation
response	*Not accepted* The length of time the availability of the secondary power supply depends on the actual technical solution employed in each case. Existing ICAO requirements regarding secondary power supply focus on the switchover time and not on the length of time the availability of the secondary power supply. In any case, it is expected that the length of time the availability of the secondary power supply should be such that ensures safety and continuity of service until corrective action is taken, as appropriate.

3. Proposed guidance on the implementation of the remote tower concept — 3.3. Aerodrome-related aspects — 3.3.2. Operational aspects — 3.3.2.6. Cameras at aerodromes p. 43

comment	*2* comment by: *Swedavia Air Traffic Management dept.* **Suggest change the wording to:** At aerodromes where ATS is provided remotley, appropriately located cameras should be used to provide visual presentation of an unobstructed view of the the local area of resposibility. Typically this would inlclude: -the aerodrome´s manoeuvring area, including local specific areas of responsiblity outside this area

-relevant parts of the aerodrome´s traffic circuit
-arriving and departing traffic

response *Not accepted*

The Agency believes that the proposed wording does not ensure that the cameras will practically cover all necessary areas at the aerodrome.

comment *3* comment by: *Swedavia Air Traffic Management dept.*

Suggest removal of de-icing/anti-icing facilities since this is not always a part of the ATS provision. This area of interest is covered by the sugestion previously submitted under the same paragraph.

response *Accepted*

The subparagraph titled 'Location of de-icing/anti-icing facilities' is removed, as suggested, since its objective is already covered by the provisions of the previous subparagraph which specifically refers to such facilities.

comment *168* comment by: *UK CAA*

Page No: 43 of 61

Paragraph No: 3.3.2.6

Comment: It is unclear why a distinction is being made in the case of de-icing activities. All areas on the aerodrome that provide for aircraft operations should be visible to the ATS provider.

Justification: Clarity.

response *Partially accepted*

The reason for making specific reference to such facilities stems from the relevant ICAO Annex 14 provisions (already transposed in the EU system as EASA Certification Specifications (CSs) for aerodrome design), requiring their visibility from the control tower. In any case, the subparagraph titled 'Location of de-icing/anti-icing facilities' is removed since its objective is already covered by the provisions of the previous subparagraph which specifically refers to such facilities.

comment *376* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

change the sentence to "the vicinity of the aerodrome".

response *Accepted*

3. Proposed guidance on the implementation of the remote tower concept — 3.4. Possible impacts on airspace users p. 44

comment *169* comment by: *UK CAA*

Page No: 44 of 61

Paragraph No: 3.4

Comment: It is not understood how requiring users to request permission to land is mitigation to being unable to maintain adequate visual surveillance, unless what is really meant is that ATC instruct the aircraft to land

Justification: Clarity**.**

response *Accepted*

The text is amended to remove this statement.

comment *170* comment by: *UK CAA*

Page No: 44 of 61

Paragraph No: 3.4

Comment: The availability of SSR data in the Remote Tower should not in itself dictate, or be dictated by, the establishment of a TMZ. If a TMZ is established, this should be in response to an identified risk for which the TMZ is determined to be the solution.

Justification: Clarity and appropriateness of proposed text.

response *Accepted*

The Agency agrees with the commentator. The proposed text is intended to remark that as a result of the safety assessment, a mitigation measure for a potential risk could be the use of SSR and, therefore, the necessary establishment of a TMZ. In any case, the text is amended for clarification.

comment *294* comment by: *IFATCA*

Is any impact on airspace users generally expected/accepted? If so, would they include changes to existing procedures (traffic circuit, landing lights)? Is any further equipment necessary (transponders)?

validation/transition
What is the minimum required duration of a validation period? It must be ensured that the majority of characteristics of future remote operations are confirmed prior to cut over. Siting, equipage, training are hugely influenced by i.e. type of service, traffic mix, position of the sun... These situations cannot be evaluated within short amounts of time!

response *Noted*

In principle, as recent implementation and validation activities have shown, the remote tower concept should not impact airspace users. However, the safety assessment could identify potential risk for what mitigation measures could have an impact on airspace users (e.g. need to use transponders). The text is intended to remark this fact.

comment	*422* comment by: *AvinorANSP* We propose to shorten this chapter substantially by saying that the remote tower solution should not have a negative impact on airspace users, and that the solution shall be subject to a safety assessment to ensure that the solution is as-safe or safer than the conventional solution.
response	*Partially accepted* The text is amended in line with the commentator's proposal.

3. Proposed guidance on the implementation of the remote tower concept — 3.5. AIP p. 44

comment	*36* comment by: *LFV* Maybe also add new contact information to RTC if moved to another location.
response	*Not accepted* The information suggested by the commentator shall be published as part of the mandatory information regarding the provision of 'conventional' ATS. For this reason, the Agency believes it is not necessary to include these elements.

comment	*171* comment by: *UK CAA* **Page No:** 44 of 61 **Paragraph No:** 3.5 **Comment:** The reference to potential AIP change is appropriate. However, what is missing is a common text (including suggested place within an aerodrome's AD entry) stating that a remote tower is in place, and a common means of depicting the location of the signalling lamp. **Justification:** Appropriate guidance material to assist implementation
response	*Not accepted* The Agency believes that both stating a place for these elements to be published in the AIP and depicting the location of the signalling lamp would be too prescriptive. Therefore, the text remains unchanged, giving some flexibility to the stakeholders to implement this elements locally.

comment	*443* comment by: *Wideroe Flyveselskap AS* 3.5 Flight crew should be notified in the training material and possibly the AIP that video footage and sound are recorded and stored.
response	*Not accepted* The elements suggested by the commentator are not part of the mandatory elements to be published in the AIP. Therefore, the text remains unchanged.

4. Draft Acceptable Means of Compliance and Guidance Material to Commission Regulation (EU) 2015/340 (Draft EASA Decision) p. 45-47

comment	*137* comment by: *DFS Deutsche Flugsicherung GmbH* GM3 ATCO.D.060(c) Unit endorsement course In line with our comment on the scope of the safety assessment this text must read: "... providing ~~at least the same~~ an acceptable level of safety ~~as from a local (conventional) tower~~. "
response	*Not accepted* Due to the novelty of and limited operational experience with the concept at this stage, and taking into consideration the basic principle followed by which the implementation of the remote tower concept is considered a change in the ATM functional system, the Agency strongly believes that the safety objective comparisons shall be made against 'today's' operations (conventional tower). Therefore, the text remains unchanged, stating this fact.

comment	*172* comment by: *UK CAA* **Page No:** 45 of 61 **Paragraph No:** AMC1 ATCO.B.020(a) **Comment:** The CAA suggests use of the word 'develop' to be more appropriate in this context than 'constitute'. **Justification:** Use Of English. **Proposed Text:** Consider changing the word 'constitute' to 'develop'.
response	*Not accepted* The Agency believes that the term 'constitute' matches the intention of the AMC. Regarding the proposal made by the commenator, it is believed that the word 'develop' cannot be used when referring to the establishment of a unit endorsement. Therefore, the text remains unchanged.

comment	*173* comment by: *UK CAA* **Page No:** 45 of 61 **Paragraph No:** GM1 ATCO.D.055(a) **Comment:** A Remote Tower Centre (RTC) could conceivably house multiple remote tower facilities. It is therefore questioned whether it is legitimate to view such a facility as one Air Traffic Control unit **Justification:** Clarification.
response	*Not accepted* The Remote Tower Centre (RTC) would only constitute a unit in terms of establishing a unit

training plan, which could be composed of several unit training courses (as many aerodromes as controlled by the RTC). This GM should be read in conjunction with AMC1 ATCO.B.020(a), which states that 'each aerodrome should constitute its own unit endorsement'.

In any case, and in order to enhance clarity, a definition of RTC is added.

comment *174* comment by: *UK CAA*

Page No: 45 of 61

Paragraph No: GM3 ATCO.D.060(c)

Comment: 'Remote Tower Module' is incorrectly abbreviated to 'RMT'.

Justification: Incorrect abbreviation.

Proposed Text: Amend to read: '…Remote Tower Module (RTM)…'

response *Accepted*

comment *210* comment by: *DGAC/DSAC - french NSA*

- About GM4 ATCO.D.060(c), Subject 2: HUMAN FACTORS:

The National Supervisory Authority is wondering about the lack of topics and subtopics in this part. In comparison, on the same subject, there are topics and subtopics in Regulation 340/2015.

- About GM1 ATCO.D.085:

The reference to GM3 ATCO.D.060 seems to be wrong

Proposal:

Should we not make reference to GM4 ATCO.D.060(c)?

response *Partially accepted*

The text contains a general subject objective defined for the 'Human factors' subject in order to address the need to consider the specific human factors influence on the remote provision of aerodrome control service, as the definition of specific topics and subtopics in addition to those contained in Commission Regulation (EU) 2015/340 for the aerodrome control instrument rating training (which are applicable to the case of remote ATC provision) is not considered necessary at this stage.

The reference to GM3 ATCO.D.060 is amended and the GM now refers to GM4 ATCO.D.060.

comment *211* comment by: *DGAC/DSAC - french NSA*

About GM1 ATCO.D.085, last subparagraph:

Lack of understanding

Proposal:

Would it not be better to explain it in a new GM: "Conversion training - Training for ATCO coming back towards conventional tower"?

response *Not accepted*

As the GM refers to conversion training, the Agency believes that the reference is placed appropriately.

comment *230* comment by: *CAA-NL*

GM3 ATCO.D.060(c) Unit endorsement course
There is a Typo in the abbreviation of Remote Tower Module (RMT),, it should be (RTM) as elsewhere in the text.

response *Accepted*

comment *295* comment by: *IFATCA*

GM1 ATCO D 085 IFATCA does not understand the last sentence on page 47:
Why is conversion training necessary for the change from remote to conventional? Should there not be a bigger need for conversion training from conventional to remote?

response *Accepted*

The GM is amended to clarify that conversion training should cover both the case of the change from conventional tower to remote tower and vice versa.

comment *382* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

Learners ~~shall~~ acquire knowledge...

GM = should

response *Not accepted*

In order to be consistent with the content of ED Decision 2015/010/R adopting Acceptable Means of Compliance and Guidance Material to Commission Regulation (EU) 2015/340, the use of "shall" seems appropriate, since there are several references of the same nature in the referred Decision (e.g. GM2.ATCO.D.060 (c)).

comment *383* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Draft Acceptable Means of Compliance	One of the aspects associated with the implementation of this new	Now that visual observation in the remote location is enabled by specific

and Guidance Material… **Section 4 '*Draft AMC & GM to Commission Regulation (EU) 2015/340 (Draft EASA Decision)*'** **GM1 ATCO.D.055(a) Unit training plan**	concept is the specific training in the **proficient use of the new technologies and equipment** introduced to enable and support the provision of remote ATS. This would in particular apply to camera control (conventional and PTZ), equipment that replaces the direct eyesight of the ATCO/AFISO, though it shouldn't be limited to it.	technologies and equipment and no longer relies on the physical senses of the ATCO/AFISO, it is of paramount importance that the ATCO/AFISO handle them with absolute fluency in order to ensure prompt and safe reaction to any event. In fact, the handling of the equipment should be as transparent as possible to ensure the same level of performance by the ATCO/AFISO in remote operations.

response *Noted*

The comment is noted. In line with the commentator's belief, the Agency is also of the opinion that the correct use of the equipment is a crucial aspect of providing safe ATS.

comment *384* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Draft Acceptable Means of Compliance and Guidance Material… **Section 4 '*Draft AMC & GM to Commission Regulation (EU) 2015/340 (Draft EASA Decision)*'** **GM1 ATCO.D.085 Conversion training**	In **GM1 ATCO.D.085**, when reference is made to **GM3 ATCO.D.060** it should be made to **GM4 ATCO.D.060** instead.	In order to ensure consistency of the total system and avoid confusion and future issues with the implementation of the AMC/GM.

response *Accepted*

comment *387* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

Subtopic RTO 1.3 — Advanced Visual Features (AVF) — Technologies, if available, to enhance visual
presentation

Were aware that the segment states "if availiable" but as mentioned before its out of scope for this GM.

response *Not accepted*

As indicated throughout the document, the scope and objective of the proposed text is to maintain the level of safety in those specific cases where these services are provided from a remote tower compared to their provision from a conventional tower, as well as to promote the development of a new technology associated with the remote tower concept, thus ensuring its safe implementation. At the same time, the GM covers the single mode of operation, as it is also described in the text. Based on this premise, Section 3 of the proposed document addresses both what is defined as 'basic equipage' and 'enhanced equipage'. In the case of the basic equipage, the analyses and validation exercises conducted in the frame of the SESAR project have shown that for certain operational contexts (see Section 3.2.3.) the functionalities presented in the basic equipage may be sufficient to provide the same level of safety as in the current operations at an aerodrome, subject to the confirmation by the corresponding safety assessment of the local implementation.

On the other hand, the Agency recognises that the development of a new technology will offer opportunities to implementers to include new functionalities in the short term, and are also taken into consideration within the scope of the standardisation bodies currently dealing with the remote tower concept. Therefore, the Agency believes that the enhanced equipage ignored — being, however, aware of the early stage and limited maturity of its functionalities. For this purpose, the proposed text presents the need for the ATS provider to conduct an in-depth evaluation of the selected enhanced functionalities, including the necessary validation activities and human performance assessment as part of the corresponding safety assessment of the local implementation.
In any case, new text has been added in order to reinforce the need to take into consideration the aforementioned early stage of those functionalities catalogued as enhanced and to ensure they are appropriately taken into consideration in the context of the safety assessment.

comment

390 comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

The subject objective is:
Learners ~~shall~~ should appreciate the necessity

response

Not accepted

In order to be consistent with the content of ED Decision 2015/010/R adopting the Acceptable Means of Compliance and Guidance Material to Commission Regulation (EU) 2015/340, the use of 'shall' seems appropriate, since there are several references of the same nature in the referred Decision (e.g. GM2.ATCO.D.060 (c)).

comment

393 comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

The subject objective is:
Learners ~~shall~~ should recognise specific abnormal situations and manage

response

Not accepted

In order to be consistent with the content of ED Decision 2015/010/R adopting the Acceptable Means of Compliance and Guidance Material to Commission Regulation (EU) 2015/340, the use of 'shall' seems appropriate, since there are several references of the same nature in the referred Decision (e.g. GM2.ATCO.D.060 (c)).

comment	*396* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)* Subtopic ABN 2.2 — Loss or degradation of the labelling system, if available Outside of scope of the GM.
response	*Not accepted* As indicated throughout the document, the scope and objective of the proposed text is to maintain the level of safety in those specific cases where these services are provided from a remote tower compared to their provision from a conventional tower, as well as to promote the development of a new technology associated with the remote tower concept, thus ensuring its safe implementation. At the same time, the GM covers the single mode of operation, as it is also described in the text. Based on this premise, Section 3 of the proposed document addresses both what is defined as 'basic equipage' and 'enhanced equipage'. In the case of the basic equipage, the analyses and validation exercises performed in the frame of the SESAR project have shown that for certain operational contexts (see Section 3.2.3.) the functionalities presented in the basic equipage may be sufficient to provide the same level of safety as in the current operations at an aerodrome, subject to the confirmation by the corresponding safety assessment of the local implementation. On the other hand, the Agency recognises that the development of a new technology will offer opportunities to implementers to include new functionalities in the short term, and are also taken into consideration within the scope of the standardisation bodies currently dealing with the remote tower concept. Therefore, the Agency believes that the enhanced equipage ignored — being, however, aware of the early stage and limited maturity of its functionalities. For this purpose, the proposed text presents the need for the ATS provider to conduct an in-depth evaluation of the selected enhanced functionalities, including the necessary validation activities and human performance assessment as part of the corresponding safety assessment of the local implementation. In any case, new text has been added in order to reinforce the need to take into consideration the aforementioned early stage of those functionalities catalogued as enhanced and to ensure they are appropriately taken into consideration in the context of the safety assessment.

comment	*397* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)* Shouldn't it be GM4 ATCO.D.060(C)?
response	*Accepted*

comment	*398* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)* The conversion training for air traffic controllers providing aerodrome control service from a remote tower should at least include the subjects... with respect to the following segment, pls clarify that this segment concerns convertring from conventional to remote tower.

response | *Accepted*

The GM is amended to clarify that conversion training should cover both the case of the change from conventional tower to remote tower and vice versa.

comment | *460* comment by: *comments provided on behalf of FIT/CISL italian trade union*

Attachment #7

Please see attached PDF.

response | *Not accepted*

Regarding the comment made to this section, and as stated in the Explanatory Note of the NPA 04-2015, the Agency believes some of the content should remain as GM taking into consideration its nature, as some of it is seen from an explanatory perspective.

5. References p. 48-49

comment | *21* comment by: *LFV*

As the SESAR safety work has used the SRM, it should be listed as a reference.

response | *Not accepted*

The conclusions from the validation exercises performed in the context of the SESAR project have been taken into consideration, and several remote tower documents stemming from SESAR have been listed as a reference. The Agency considers that all the documentation taken as reference is contained in the list.

comment | *270* comment by: *EUROCONTROL*

Page 48 - 5.3. Reference documents

11th reference

EUROCONTROL provides an information that should give rise to an update:

Update to latest version 00.01.01 available.

response | *Accepted*

comment | *385* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
References Section 5.3 '*Reference documents*'	In the reference to **regulation (EU) No 1035/2011**, where it says "*Regulation (EU) No 1035/2011 Commission Implementing Regulation (EU) No 1035/2011 of 17 October 2011 (…)*" it should say "~~*Regulation (EU) No 1035/2011*~~ *Commission Implementing Regulation (EU) No 1035/2011 of 17 October 2011 (…)*" instead (remove the repetition at the beginning).	Typographical error.

response | *Accepted*

comment | *386* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
References Section 5.3 '*Reference documents*'	In the reference to **regulation (EU) No 139/2014**, where it says "*Commission Regulation (EU) 139/2014 of 12 February 2014 (…)*" it should say "*Commission Regulation (EU)* **No** *139/2014 of 12 February 2014 (…)*" instead (add '*No*' between '*(EU)*' and '*139/2014*').	Typographical error.

response | *Accepted*

6. Appendices — 6.1. Appendix 1: Human performance aspects p. 50-51

comment | *37* comment by: *LFV*

Remove "depth of perception". Its not a technology.

The technical descreption in mentioned in the 3rd line from bottom "Capabillity of visual presentation.

"cone of silence" is this specific for RTO? The same problem occur in the normal tower even if you move around? Does this really have impact on the operations?

response | *Accepted*

comment | *82* comment by: *DFS Deutsche Flugsicherung GmbH*

Related to our comment (no 81) on chapter 3.2.2.7 we recommend to re-word the subtitles/introduction to the list of aspects:

6.1 Appendix 1: Human performance aspects

Technology aspects
...
~~Elements of the human performance assessment~~ Aspects of direct visual observation replacement
....
other human performance-related aspects
Apart from the above-mentioned elements, some other aspects not strictly related to the direct visual observation replacement need to be ~~assessed~~ considered....
....

response | *Accepted*

A reference is added in order to state that those human performance aspects are related to the replacement of the direct visual observation with the visual presentation.

The listed aspects should be assessed, as proposed in other sections, within the safety assessment. The text is reworded to ensure consistency.

comment | *175* comment by: *UK CAA*

Page No: 50 onwards

Paragraph No: Appendices 1-4

Comment: The appendices are introduced in a non-sequential manner in Section 3. If they are to be used in conjunction with the material in Section 3 then they warrant renumbering to facilitate sequential introduction.

Justification: To provide clarity and user friendliness.

response | *Accepted*

Appendices 1 and 4 are rearranged to be referenced in order of appearance in the document.

comment | *271* comment by: *EUROCONTROL*

Page 50 - Appendix 1: Human performance aspects

EUROCONTROL makes a general comment:

Both content and purpose of this Appendix are unclear. See comment on section 3.2.3.

<u>Elements of the human performance assessment</u>

EUROCONTROL makes a suggestion:

Vehicles, animals, obstacles... should be included under "— ATCO/AFISO capacity to detect all aircraft".

response | *Noted*

comment | *388* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Appendices **Section 6.1 '*Appendix 1: Human performance aspects*'** **Technology aspects**	In the prior-to-last item of the enumeration included in **section 6.1** for **Technology aspects**, where it says "- *Quality of the visual presentation to allow the ATCO to discriminate distance between objects*" it should say "- *Quality of the visual*	There is no reason for this aspect to apply solely to ATCOs.

	*presentation to allow the ATCO**/**AFISO** to discriminate distance between objects*" instead.	

response *Accepted*

comment *389* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Appendices **Section 6.1 '*Appendix 1: Human performance aspects*'** **Other human performance-related aspects**	In the enumeration presented in **section 6.1** for **Other human performance-related aspects**, AESA believes that the fifth item "*- Potential impact on VFR flights, compared to the equivalent in a conventional TWR environment Effect of the types (...)*" should be split in **two items** as follows: "*- Potential impact on VFR flights, compared to the equivalent in a conventional TWR environment* *- Effect of the types of airspace surrounding the aerodrome concerned (e.g. class C and D) on issuing take-off clearances*".	In order to make sense of the item. It actually seems to be a formatting error.

response *Accepted*

comment *391* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Appendices **Section 6.1 '*Appendix 1: Human performance aspects*'** **Other human performance-related aspects**	In the first paragraph of **section 6.1** for **Other human performance-related aspects**, where it says "*(...) The following aspects should be used as an example:,*" it should say "*(...) The following aspects should be used as an example:~~,~~*" instead (remove the comma at the end of the sentence).	Typographical error.

response *Accepted*

comment *399* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)*

— Maintenance of continuous watch through visual contact on all ~~flight operations and all people and vehicle movement on the manoeuvring area~~ flight operations in the vicinity of the

	aerodrome. Effect of time delays on visual presentation in all situations, with special importance for the case of emergency situations (e.g. runway incursions)
response	*Partially accepted* The text is amended to ensure consistency throughout the document.

comment	*400* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)* — Screens arrangement ~~(e.g. 6 or 9 screens, 240 or 360 degrees)~~ the addes infomation just confuses
response	*Not accepted* The Agency considers that the examples are given for clarity purposes, and not to create confusion. The text remains unchanged.

comment	*401* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)* — Integrated flight data label information (if available), both with static information and with dynamic information, and measures to prevent the label from shadowing visual information — Visual object tracking functionality (if available), either automatically (rotation, tilt to the desired elevation angle and focus at the indicated distance) or through a manual pan-and-tilt/zoom function these stems from enhances functionalities, outside of scope of this GM
response	*Not accepted* As indicated throughout the document, the scope and objective of the proposed text is to maintain the level of safety in those specific cases where these services are provided from a remote tower compared to their provision from a conventional tower, as well as to promote the development of a new technology associated with the remote tower concept, thus ensuring its safe implementation. At the same time, the GM covers the single mode of operation, as it is also described in the text. Based on this premise, Section 3 of the proposed document addresses both what is defined as 'basic equipage' and 'enhanced equipage'. In the case of the basic equipage, the analyses and validation exercises conducted in the frame of the SESAR project have shown that for certain operational contexts (see Section 3.2.3.) the functionalities presented in the basic equipage may be sufficient to provide the same level of safety as in the current operations at an aerodrome, subject to the confirmation by the corresponding safety assessment of the local implementation. On the other hand, the Agency recognises that the development of a new technology will offer opportunities to implementers to include new functionalities in the short term, and are also taken into consideration within the scope of the standardisation bodies currently dealing with the remote tower concept. Therefore, the Agency believes that the enhanced equipage ignored — being, however, aware of the early stage and limited maturity of its functionalities. For this purpose, the proposed text presents the need for the ATS provider to conduct an in-depth evaluation of the selected enhanced functionalities, including the

necessary validation activities and human performance assessment as part of the corresponding safety assessment of the local implementation.
In any case, new text has been added in order to reinforce the need to take into consideration the aforementioned early stage of those functionalities catalogued as enhanced and to ensure they are appropriately taken into consideration in the context of the safety assessment.

6. Appendices — 6.2. Appendix 2: List of operational hazards for ATC services p. 52-54

comment *22* comment by: *LFV*

The use of the word "incorrectly" makes the hazards very unclear. What's to be corrected? What's to be compared to the local tower?

Please remove the word "Remote" its the same regardless if its remote or not.

response *Not accepted*

The text has been drafted based on the results of the SESAR project, so the Agency prefers to keep it in line with the source, as this list is provided as a mere reference.

comment *23* comment by: *LFV*

OH-27: What is meant by "operational hazards" when it is the ATC that fails?

response *Accepted*

The text is amended in order to clarify that both operational and functional hazards are included.

comment *74* comment by: *DFS Deutsche Flugsicherung GmbH*

6.2 and 6.3.
The bold indication and numbers of the tables do not fit with the headline to the tables.

response *Accepted*

comment *80* comment by: *DFS Deutsche Flugsicherung GmbH*

According to Regulation 1035/2011 the focus of the safety assessment is on the change. This list is obviously a list of possible hazards concerning the whole system but not the change(s) only.
To prevent confusion on the scope of the analysis we suggest to clarify this in the explanation.

Furthermore, according to our comment (No 79) on chapter 3.2.2.4 we suggest to **delete the right column with severity classification (SESAR).**

Table 2 below lists all potential ~~the~~ operational hazards~~,~~ and the operational effects ~~and the severity classification~~ for the ATC services, according to the results of the SESAR safety work, whithout regard whether these are affected by a change.

response	*Accepted*

comment	*127* comment by: *ENAV* For the same identified effects (Imminent collision), the severity classification used for hazards OH-16 and OH-17 (SC3) is different from the one in the OH-08 (SC2). Proposal: Change consistently the severity.
response	*Accepted* The severity classification is removed from the table.

comment	*128* comment by: *ENAV* In hazards OH-31, OH-32, OH-33 and OH-34 the severity is not identified. It is inexplicable how a conclusion on the "safety" of the remote operations can be reached without an analysis of such hazards.
response	*Accepted* The severity classification is removed from the table.

comment	*208* comment by: *DGAC/DSAC - french NSA* Incorrect references "Table 3" <u>Proposal:</u> To be corrected
response	*Accepted*

comment	*263* comment by: *NATS National Air Traffic Services Limited* <deleted for the argument that severity classes shall not be subject to this GUI>
response	*Accepted*

comment	*272* comment by: *EUROCONTROL* **Page 52 - Appendix 2: List of operational hazards for ATC services** EUROCONTROL confirms an earlier comment and makes a suggestion: Comment raised already on 3.2.2.5, could be addressed here. An explanatory note should be included to clarify that these severity classes were allocated in the frame of the SESAR safety work using several 'Severity classification schemes - SCSs' (one per each different type of accident: MAC, RWY Collision, TWY collision, CFIT, Wake Vortex accident) to which a specific Risk Classification Scheme is associated. The requirements where then derived taking into account these several SCSs and RCSs.
response	*Partially accepted*

The severity classification is removed from the table. Therefore, the comment can no longer be considered.

comment *392* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Appendices **Section 6.2 '*Appendix 2: List of operational hazards for ATC services*'** **OH-16** **OH-17**	Both operational hazards **OH-16** and **OH-17** have as operational effects an imminent collision. This would qualify as severity **SC2** within the SESAR scheme. They both however have been assigned an **SC3** severity. We suggest to change these severities to **SC2**.	For consistency's sake with the rest of the table.

response *Partially accepted*

The severity classification is removed from the table.

comment *394* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Appendices **Section 6.2 '*Appendix 2: List of operational hazards for ATC services*'**	At the beginning of **section 6.2**, when reference is made to **Table 3** it should be made to **Table 2** instead.	Typographical error.

response *Accepted*

comment *445* comment by: *René Meier, Europe Air Sports*

Both drafts "Initial list of operational hazards"

The "initial list" for the AFIS case as well as the "initial list" for the ATC case are applicable as "standard/normalised initial lists" in the case of "on-site ATC" and "remote ATC".

Mistakes made by ATCO's and/or flight crews will be difficult to counter or to correct if detected late or not at all, but this such situations are not unique to aerodromes with Remote tower operations.

Question: Are there lists containing mitigation measures available already?

Rationale:
Such lists would be helpful. Of course, identical situations probably do not really exist, but similiar ones demanding similar mitigations.

An "ARADLC", an Aerodrome to Remote ATC Data Link Communication, could also help,

response *Not accepted*

The list is provided as an example of the identified hazards to be considered when implementing the remote tower concept. In order to achieve the desired level of safety, mitigation measures have to be put in place.

6. Appendices — 6.3. Appendix 3: List of operational hazards for AFIS services p. 54-55

comment *38* comment by: *LFV*

remove the word "remote" also for this part

response *Not accepted*

The text has been drafted based on the results of the SESAR project, so the Agency prefers to keep it in line with the source, as this list is provided as a mere reference.

comment *209* comment by: *DGAC/DSAC - french NSA*

Incorrect references “Table 4”

Proposal:

To be corrected

response *Accepted*

comment *395* comment by: *AESA / DSANA*

PART	COMMENT	JUSTIFICATION
Appendices **Section 6.3 '*Appendix 3: List of operational hazards for AFIS services*'**	At the beginning of **section 6.3**, when reference is made to **Table 4** it should be made to **Table 3** instead.	Typographical error.

response *Accepted*

comment *444* comment by: *René Meier, Europe Air Sports*

Appendices
6.3. Appendix 3: List of operational hazards for AFIS services

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Question: Who will develop mitigation measures? With appropriate training a high level of competence will be achieved, fail-safe checklist will be helpful, but there must be a means to avoid the hazards we found on your list.

Rationale:
Some of these hazards are killing the implementation of the Remote Tower concept in the AFIS case, starting with OH-AFIS-01, continuing with OH-AFIS-04 and OH-AFIS-07. to name just three of the hazards.

response *Not accepted*

The list is provided as an example of the identified hazards to be considered when implementing the remote tower concept. In order to achieve the desired level of safety, mitigation measures have to be put in place.

6. Appendices — 6.4. Appendix4: Checklist for the approval of the implementation of the remote tower concept p. 55-56

comment *24* comment by: *LFV*

Why is there a need for enhanced equipage functionalities based on traffic density? The procedure at the local tower should be sufficient also in the remote tower to handle the traffic at the aerodrome.

response *Not accepted*

As indicated throughout the document, the scope and objective of the proposed text is to maintain the level of safety in those specific cases where these services are provided from a remote tower compared to their provision from a conventional tower, as well as to promote the development of a new technology associated with the remote tower concept, thus ensuring its safe implementation. At the same time, the GM covers the single mode of operation, as it is also described in the text. Based on this premise, Section 3 of the proposed document addresses both what is defined as 'basic equipage' and 'enhanced equipage'. In the case of the basic equipage, the analyses and validation exercises conducted in the frame of the SESAR project have shown that for certain operational contexts (see Section 3.2.3.) **where traffic density was one of the elements taken into consideration,** the functionalities presented in the basic equipage may be sufficient to provide the same level of safety as in the current operations at an aerodrome, subject to the confirmation by the corresponding safety assessment of the local implementation.

On the other hand, the Agency recognises that the development of a new technology will offer opportunities to implementers to include new functionalities in the short term, and are also taken into consideration within the scope of the standardisation bodies currently dealing with the remote tower concept. Therefore, the Agency believes that the enhanced equipage ignored — being, however, aware of the early stage and limited maturity of its functionalities. For this purpose, the proposed text presents the need for the ATS provider to conduct an in-depth evaluation of the selected enhanced functionalities, including the necessary validation activities and human performance assessment as part of the corresponding safety assessment of the local implementation.

In any case, new text has been added in order to reinforce the need to take into consideration the aforementioned early stage of those functionalities catalogued as enhanced and to ensure they are appropriately taken into consideration in the context of the safety assessment.

comment *178* comment by: *ENAV*

The security risk analysis is a subset of the safety assessment, so it is not expected a security risk treatment (the most important phase) and it is not expected that the security risks can affect other aspects such as capacity, performance, economic impact, reputation, as it is required by SECRA (SESAR).

response *Noted*

comment *186* comment by: *CANSO*

The following aspects should be added in the list to be considered during the approval by the Competent Authority of the remote tower concept:
- Fulfilment of the applicable interoperability requirements of the systems/constituents associated with remote tower operation.
The following topics may be added in the list of elements to be included into the safety assessment:

- reassignment of tasks among the ATS provider and the aerodrome operator and impact on operating procedures;
- analysis of the interdependencies with other service providers and aviation undertakings, and analysis of the necessary coordination processes and procedures

response *Accepted*

The proposed elements are added.

comment *236* comment by: *René Meier, Europe Air Sports*

Appendix 4: Checklist for the approval...
page 55/61

We would place the safety assessments at the top of the list. We had quite long discussions on this, some stakeholders placed "Concept of Operations" at the top of the list, other said starting with safety assessments based on the fundamental idea of the change is better. In the end, we are actually applying both tracks...

Rationale:
Thinking of safety from the beginning searching for solutions not delivering the required safety standard will be avoided, frustration and unnecessary expenses as well.

response *Not accepted*

The elements of the list are not sorted in terms of prioritisation. All these elements (but not only them) are to be taken into consideration, with no exception.

comment *264* comment by: *NATS National Air Traffic Services Limited*

	The following aspects should be added in the list to be considered during the approval by the Competent Authority of the remote tower concept: - Fulfilment of of the applicable interoperability requirements of the systems/constituents associated with remote tower operation. The following topics may be added in the list of elements to be included into the safety assessment: • reassignment of tasks among the ATS provider and the aerodrome operator and impact on operating procedures; • analysis of the interdependencies with other service providers and aviation undertakings, and analysis of the necessary coordination processes and procedures;
response	*Accepted* The proposed elements are added.

6. Appendices — 6.6. List of acronyms p. 60-61

comment	*402* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)* ANS = Air Navigation Services ANSP = Air Navigation Services Provider
response	*Not accepted* To ensure consistency with other available documents where ANS and ANSP correspond to 'air navigation service' and 'air navigation service provider' respectively, the text remains unchanged.

comment	*403* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)* ATCO = Air Traffic Controller Officer
response	*Accepted*

comment	*404* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)* NOTAM = Notices to airmen
response	*Not accepted* Taking into consideration other available documentation, the agreed term for the acronym 'NOTAM' is 'notice to airmen'. Therefore, the text remains unchanged.

comment	*405* comment by: *Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)* TMA = Terminal control area
response	*Accepted*

comment	*435* comment by: *René Meier, Europe Air Sports* Appendices 6.6. List of acronyms Remark: We think it is not so important to make difference between an acronym and an abbreviation, but it could be done... Then: "CS" also stands for "Certification Specifications" in the EASA-world. Question: Should both be on the list?
response	*Accepted* The list of acronyms contains the reference to community specifications. However, in order to avoid any possible misunderstandings, the acronym is described also in the text.

4. Appendix A — Attachments

FIT comments to the Opinion.pdf
Attachment #1 to comment #454

FIT comments to the Opinion.pdf
Attachment #2 to comment #455

FIT comments to the Opinion.pdf
Attachment #3 to comment #456

FIT comments to the Opinion.pdf
Attachment #4 to comment #457

FIT comments to the Opinion.pdf
Attachment #5 to comment #458

FIT comments to the Opinion.pdf
Attachment #6 to comment #459

FIT comments to the Opinion.pdf
Attachment #7 to comment #460

