



NPA 2017-21

Technical and operational requirements for remote tower operations

Commentor:	UK CAA
General	
Comment: UK CAA welcomes recognition within the draft Guidelines of the entry into law of Regulation (EU) 2017/373 and its eventual revocation of Regulations (EC or EU) 1034/2011 and 1035/2011. An indication of how and when the document will be amended to reflect 2017/373 taking effect in 2020 (e.g. replacement of references to ICAO text in lieu of 2017/373 text), and subsequent amendments resulting from incorporation of Parts AIM and FPD, plus amendments to Parts ATS and MET would be welcome.	
Justification: Provision of clarity on planned document maintenance.	

Commentor:	UK CAA
Page No: 8	
Paragraph No: 2 nd paragraph beginning “in relation to the argument”.	
Comment: UK CAA agrees that there is no requirement for a specific remote aerodrome ATS rating.	
Justification: Aerodrome control service remains aerodrome control service in terms of the provision of the ATS itself. The processes and systems used by the ATCO to deliver that ATS may change but that is associated with local implementation and should be delivered through the unit training plan and endorsement course. A Unit License Endorsement (ULE) must be passed for each aerodrome and appropriate levels of currency must be maintained for each endorsement.	

Commentor:	UK CAA
Page No: 9	
Paragraph No: Question to stakeholders.	
Comment: UK CAA believes there is no need to include a distinct RTF callsign suffix; pilots should be aware that this is the case through briefing (SERA.2010(b) and ICAO Annex 2	

requirement). There is no requirement to change established RTF procedures regarding the identity of the ATS function being provided.

Justification: Alignment with SERA and ICAO Annex 2.

Commentor: UK CAA

Page No: 9

Paragraph No: Question to stakeholders

Comment: UK CAA does not support the addition of any phraseology to indicate the provision of remote aerodrome ATS. An inclusion in the AIP together with the annotation of the main camera housing (RTR) on the aerodrome chart is considered sufficient.

Justification: Avoidance of superfluous radiotelephony requirements.

Commentor: UK CAA

Page No: 14 onwards

Paragraph No: Draft guidelines

Comment: There is a case for a summary of the SESAR JU remote tower trials and outcomes. However, this would be better presented as an Annex to the Guidelines rather than scattered throughout the draft.

Justification: Better document layout and readability.

Proposed Text: Remove all SESAR JU-related text and present in a dedicated Annex to the Guidelines.

Commentor: UK CAA

Page No: 14

Paragraph No: 1.3 Document Structure

Comment: This is unnecessary (the 'document structure' is addressed by the comprehensive table of contents) and merely adds bulk to the draft. We believe this paragraph should be deleted.

Justification: Better document layout and readability.

Commentor: UK CAA

Page No: 17/18

Paragraph No: 2 “Definitions”

Comment: Presentation of Definitions in unnecessarily repetitive and the lack of alphabetical order does not make for intuitive reading. Presentation as per EU Regulations and EASA AMC/GM convention is preferred and recommended.

Justification: Ease of reference.

Proposed Text Taking into consideration UK CAA comments concerning ‘controller working position (CWP)’, ‘conventional tower’, ‘remote tower’, ‘visual presentation’ and “visual presentation system’, amend to read as follows:

“For the purpose of these Guidelines the following definitions apply.

‘Aircraft movement’ means an aircraft take-off or landing at an aerodrome.

‘Direct visual observation’ means observation through direct eyesight of objects situated within the line of sight of the observer, possibly enhanced by external elements (e.g. binoculars).

‘Identify/identification’ means the ability to couple a detected or recognised object with a specific individual aircraft/vehicle. This may be done via e.g. visual means (e.g. by reading the registration mark of an aircraft), by applying probability theory (e.g. ‘the aircraft/object currently on final must be the same aircraft as I have on my flight strip as there are no other flight strips and no other known aircraft in the aerodrome vicinity’), by system support providing the call-sign or squawk code (or upon squawk ident request), by aircraft position reports, by requesting aircraft turns/movement/flashing lights to identify.

‘Multiple mode of operation’ means the provision of ATS from one remote tower module for two or more aerodromes at the same time (i.e. simultaneously).

‘Operational context’ means the operational characteristics – such as aerodrome size/layout, traffic volume and complexity, related airspace and flight procedures, number of simultaneously served aerodromes, etc. – that should be considered when remote aerodrome ATS is to be implemented.

‘Out-the-window (OTW) view’ means a view of the areas of responsibility of the aerodrome ATS unit from a conventional tower, obtained via direct visual observation.

‘Remote aerodrome ATS’ means provision of aerodrome ATS based on a view of the aerodrome and its vicinity through the means of a visual presentation system (and supported by other technology as needed).

‘Remote tower’ means a facility from which aerodrome ATS can be provided to aerodrome traffic through real-time visual presentation by electronic means of the elements contained in its area of responsibility (manoeuvring area and vicinity of the aerodrome, together with other elements that support the operation where the ATS is provided from a location different from where the view on the visual presentation is acquired from.’

‘Remote tower centre’ (RTC) means a facility housing one or more remote tower modules.

‘Remote tower module’ (RTM) means a combination of systems and constituents from where remote aerodrome ATS can be provided, including one or more CWP(s) and the visual presentation. (It can be compared with the tower cabin of an aerodrome conventional tower.)

‘Single mode of operation’ means the provision of ATS from one remote tower module for one aerodrome at a time.

‘Visual presentation’ means a view of the areas of responsibility of the aerodrome ATS unit, provided by means of a visual surveillance presentation system..

‘Visual surveillance system’ means an electro-optical system providing an electronic visual presentation of traffic and any other information necessary to maintain situational awareness at an aerodrome and its vicinity. A visual surveillance system will normally consist of numerous integrated elements, including sensor(s), data transmission links, data processing systems and situation displays.

‘Workstation’ means the ATCO/AFISO working position, which includes the ATS systems/functions as necessary for the service provision, but excludes the visual presentation.”

Commentor:	UK CAA
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Page No: 17

Paragraph No: Definition of ‘conventional tower’

Comment: A definition of conventional tower is not necessary. An explanation of what the guidelines mean by a ‘conventional tower is better placed in the text in the guidelines placed in parenthesis upon first use of the term.

Justification: Risk associated with a definition at this stage in development.

Proposed Text:

At first use of the term ‘conventional tower’ add ‘(i.e. what has to date been understood as an on-site control tower building’.

Commentor:	UK CAA
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Page No: 17

Paragraph No: Definition of ‘remote tower’

Comment: The definition only states real-time visual presentation, however this doesn’t necessarily mean the visual presentation is by electronic means. One could argue that a conventional tower view acquired by means of having a glass window tower is also a form of a visual presentation.

Justification: Clarity

Proposed Text: Amend to read as follows:

‘remote tower’ means a facility from which aerodrome ATS can be provided to aerodrome traffic through real-time visual presentation by electronic means of the elements contained in its area of responsibility (manoeuvring area and vicinity of the aerodrome, together with other elements that support the operation where the ATS is provided from a location different from where the view on the visual presentation is acquired from.’

Commentor:	UK CAA
<p>Page No: 17</p> <p>Paragraph No: Definition of ‘controller working position (CWP)’</p> <p>Comment: The definition describes a ATCO/AFISO workstation as a ‘CWP’; however, an AFISO is not a controller, therefore it is a misnomer to term this a CWP. It should therefore be described as a workstation. This will further require the removal and replacement of the term CWP from all other text.</p> <p>Justification: Inclusivity of EU regulatory materials.</p> <p>Proposed Text: Amend to read as follows:</p> <p>“Workstation – means the ATCO/AFISO working position, which includes the ATS systems/functions as necessary for the service provision, but excludes the visual presentation.”</p>	

Commentor:	UK CAA
<p>Page No: 17</p> <p>Paragraph No: Definition of “Visual presentation”</p> <p>Comment: It is suggested that a conventional tower view acquired by means of having a glass window tower is also a form of a visual presentation. Therefore, the proposed definition must reflect the means by which the views are presented.</p> <p>Justification: The definition lacks clarity.</p> <p>Proposed Text: Amend to read as follows:</p> <p>‘Visual presentation’ means a view of the areas of responsibility of the aerodrome ATS unit, provided by means of a visual surveillance system.</p>	

Commentor:	UK CAA
<p>Page No: 18</p> <p>Paragraph No: Definition of “Visual presentation system”</p> <p>Comment: Suggest adoption of the ICAO definition of ‘visual surveillance system’ as proposed in state letter AN 7/63.1.1-17/23 and what we believe to be the current ANC position regarding adoption. Pending notification of ICAO’s decision in this regard the UK CAA recommends delaying publication of revised EASA guidance until all are certain of what ICAO has adopted. EASA’s proposed text is useful guidance so could be merged into the proposed ICAO text.</p>	

Justification: For alignment with ICAO terms and definitions.

Proposed Text: Amend to read as follows:

‘Visual surveillance system’ means an electro-optical system providing an electronic visual presentation of traffic and any other information necessary to maintain situational awareness at an aerodrome and its vicinity. A visual surveillance system will normally consist of numerous integrated elements, including sensor(s), data transmission links, data processing systems and situation displays.’

Commentor:	UK CAA
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Page No: 18

Paragraph No: Definition of “Detect/Detection”

Comment: We disagree with the need for the definition of detect/detection. UK CAA proposes the deletion of the definition of detection. Users of the words detect/detection would apply the common understanding of the dictionary definition.

Justification: Detection cannot be limited to visual acuity. There is the possibility of confusion when comparing this definition with the dictionary definition of detect/detection.

Proposed Text: Delete text. However, if EASA remains minded to include the definition, it is more appropriate for it to read:

‘Detect/Detection’ means the ability to determine the presence of an object in the optical field of view for a human eye or for an optical sensor, or the ability to determine the presence of an object by means of electronic signal processing for a non-optical electronic surveillance sensor that uses radio signals.

This is considered more appropriate as it captures visual and non-visual means of detection.

Commentor:	UK CAA
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Page No: 18

Paragraph No: Definition of “Recognise/Recognition”

Comment: The UK CAA ‘does not support incorporation of the definition of ‘recognise/recognition’. Users of the words recognise/recognition should apply the common dictionary meaning of the word.

Justification: No need to define ‘recognise/recognition’.

Proposed Text: Delete text. However, if EASA remains minded to include the definition, it is more appropriate for it to read:

'Recognise/Recognition' means the ability to determine the class, category or type of an object by means of the human eye or an optical sensor, or by means of image processing or radio signal processing capabilities and algorithms.

This is considered more appropriate as it captures visual and non-visual means of recognition.

Commentor:	UK CAA
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Page No: 18

Paragraph No: Definition of 'identify/identification'

Comment: The definition of 'Identify/identification' is not necessary. Users of the words Identify/identification can apply the common understandings of each.

Justification: There is the possibility of confusion when comparing this definition with the common understanding of the term.

Proposed Text: Delete text

Commentor:	UK CAA
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Page No: 19

Paragraph No: Section 3 title: Introduction to remote aerodrome ATS

Comment: We believe the title does not encapsulate the scope of the subsequent text to the extent that it should. In addition, Section 1 is also titled 'Introduction'.

Justification: The draft would be enhanced by a better section title.

Proposed Text: Amend title to read:

'The remote aerodrome ATS concept and modes of operation'

Commentor:	UK CAA
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Page No: 19

Paragraph No: Section 3 sub-paragraphs 4 and 6

Comment: We believe the text is better placed in Section 1 'Introduction'.

Justification: Better placing of text.

Commentor:	UK CAA
Page No: 19	
Paragraph No: Section 3 sub-paragraph 5	
Comment: The text merely provides historical background with no bearing on the Guidelines, and we recommend should be removed.	
Justification: Text appears to serve no purpose.	

Commentor:	UK CAA
Page No: 19	
Paragraph No: Section 3 sub-paragraph 7	
Comment: The text merely provides generic historical background with no bearing on the Guidelines, and we recommend should be removed.	
Justification: Text appears to serve no purpose.	

Commentor:	UK CAA
Page No: 19	
Paragraph No: Paragraph 3.1 title: Concept overview	
Comment: The title does not encapsulate the scope of the subsequent text and should be renamed 'Modes of operation'	
Justification: The draft would be enhanced by a better section title.	
Proposed Text: Amend title to read: 'Modes of operation'	

Commentor:	UK CAA
Page No: 20	
Paragraph No: 3.1, 2 nd sub-paragraph	
Comment: We believe the second sub-paragraph is unnecessary – it does not provide any meaningful insight - and should be removed.	
Justification: Unnecessary text.	

Commentor:	UK CAA
Page No: 20	
Paragraph No: 3.1, Final sub-paragraph	
Comment: We believe the final sub-paragraph in unnecessary and should be removed.	
Justification: Unnecessary text.	

Commentor:	UK CAA
Page No: 20	
Paragraph No: 3.3, 2 nd sub-paragraph	
Comment: The text as presented seems unnecessarily wordy.	
Justification: Unnecessary text.	
Proposed Text: Amend to read as follows: 'Operational applications include, but are not limited to:'	

Commentor:	UK CAA
Page No: 21	
Paragraph No: 3.4 Figure 1	
Comment: We believe Figure 1 does not enhance the text in paragraph 3.4 and therefore is considered unnecessary and could be removed.	
Justification: The graphic appears to be superfluous.	
Proposed Text: Delete graphic. Amend paragraph 3.4 sub-paragraph 2 to reflect deletion of graphic.	

Commentor:	UK CAA
Page No: 22	
Paragraph No: Bullet points 13 & 14	
Comment: The 13 th and 14 th bullets appear to distinguish between detection and tracking by image processing systems based on optical systems - visual tracking) and detection and tracking based on surveillance data - radar tracking. There are many categories of what can	

be considered as “surveillance data”. Further, these two points do not mention “recognition” and “identification” which is also possible by “image processing” or by “radar type” processing.

Justification: UK CAA would seek to expand this list further to provide greater clarity and distinction between the various means.

Proposed Text: Add:

- Dedicated means to facilitate “detection” i.e. presence of a static or moving object or for “recognition” or “identification” using image processing techniques.
- Using image processing techniques for “tracking” an object (i.e) moving object correlation. This is to establish that the detected object is correlated in position and the track is of the same object when moving from one position to another.
- Dedicated means to facilitate the “detection” and tracking in the non-optical field using radio waves such as infrared, laser or other conventional type of surveillance sensor such as primary radar, SSR, MLAT or ADS-B for position data calculation (e.g. range/bearing) of a moving object. (position data may be output in ASTERIX)
- Dedicated means for identifying objects using any conventional type ATS surveillance sensor or using conventional ATS sensor data for labelling purposes;
- Using processing algorithms for recognition of objects and distinguish between classes of objects displayed on the visual presentation,
- Overlay or integration of data from conventional ATS surveillance sensors. A correlation functionality is needed to correlate the “image” on the visual presentation with the surveillance data.

Commentor:

UK CAA

Page No: 23

Paragraph No: 4

Comment: The paragraph seems rather wordy and would benefit from being shortened.

Justification: Need for brevity.

Proposed Text: Replace with:

‘Regardless of the operational context (aerodrome size and complexity, traffic volume/density, the number of simultaneous aerodromes, etc.), the implementation of remote aerodrome ATS will depend upon a local safety assessment, in accordance with the procedures accepted by the relevant competent authority.

SESAR JU trials applied the following descriptions:

- ‘basic and advanced features’ is a division of technical enablers to validate different equipage levels;
- ‘low density aerodromes’ are aerodromes with typically a low capacity utilisation,

where the prevailing traffic is mostly single aircraft movement operations, rarely reaching or exceeding two simultaneous aircraft movements per aerodrome;
— ‘medium density aerodromes’ are aerodromes with typically a medium capacity utilisation, where simultaneous aircraft movement operations can be expected, frequently experiencing more than one aircraft movement simultaneously per aerodrome.’

Commentor:	UK CAA
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Page No: 23

Paragraph No: 4.1, Single mode of operation

Comment: The paragraph seems rather wordy and would benefit from being shortened.

Justification: Need for brevity.

Proposed Text: Replace with:

‘Single mode of operation is, in principle, envisaged to have the potential to be implemented for aerodromes of all sizes and conditions.’

Commentor:	UK CAA
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Page No: 24

Paragraph No: 4.1.1, Final paragraph starting ‘Nevertheless...’

Comment: The paragraph does not allow for a simple operation at densities exceeding low. It should be recognised that at an aerodrome with a ‘simple’ operation, the basic features (potentially with additional mitigations) may be sufficient for that operation without the need for advanced features.

Justification: Enhanced relevance of text.

Proposed Text: Replace with:

‘Depending on the quality of the visual presentation, the basic features may be sufficient for aerodromes where traffic exceeds the low density or low complexity characteristics. However, it is recommended that ATS providers consider using the advanced features especially for medium density aerodromes.’

Commentor:	UK CAA
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Page No: 24

Paragraph No: 4.1.4, Footnote 23

Comment: We recommend quoting the text at Regulation (EU) 2017/373 paragraph

ATM/ANS.OR.A.070 (2017/373 having now been adopted into EU law). Cross-reference to source ICAO material remains necessary given 2017/373's effective date of 2 Jan 20.

Justification: Greater, and more appropriate alignment with other EU regulatory material.

Commentor: UK CAA

Page No: 26

Paragraph No: 4.2.2, Simultaneous aircraft movements on different aerodromes - General Comment

Comment: Recently published SESAR Validation trials at Budapest would seem to have exceeded this provision with 3 airports working traffic at a rate of 30 per hour (Validation 3 airports). EASA are asked to reconsider the validity and appropriateness of the comment as presented.

Commentor: UK CAA

Page No: 29

Paragraph No: 5.1, bullet 5 beginning "When ATS is provided to several..."

Comment: The UK CAA is of the view that this language could be simplified and made more readily understandable.

Justification: Text refinement.

Proposed Text: Replace with:

'When ATS to several aerodromes is provided from one RTC, care should be taken to ensure an RTC does not become a single point of failure for aerodromes which otherwise would not be interdependent. (See also Section 9 for more on this aspect). For example, one aerodrome at an RTC may be planned as an 'alternate' for destination aerodrome at the same RTC so a total failure at that RTC may mean a given flight will have no alternate available.'

Commentor: UK CAA

Page No: 30

Paragraph No: Last paragraph

Comment: We believe it is inappropriate to state that "the visual presentation is based on a visible spectrum sensor-based solution". EASA has previously – and appropriately - stated that thermal or infrared is a non-visible spectrum but the NPA refers in section 3.5 to "use of

infrared cameras outside of the visible spectrum”. UK CAA believes that this means that the primary means of capturing the replicated image on the visual presentation system is via optical camera sensors.

The term “visual cameras” should more correctly read “cameras”; the term is considered too vague and all cameras are ‘visual’ regardless of the spectrum(s) in which they operate

Justification: Need for more precise text.

Proposed Text: Amend to read:

“For the purposes of this document, it is assumed that the video image displayed on the visual presentation is primarily based on an optical sensor-based solution (where cameras in the visible spectrum capture the image at the aerodrome and the image is relayed to the ATCO’s/AFISO’s screens), possibly enhanced by optical sensors from the non-visible spectrum, such as thermal or infrared etc.”

Commentor:	UK CAA
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Page No: 34

Paragraph No: 5.2.4.2, Notes 1 & 2

Comment: We propose that text in both notes is combined for clarity as it appears the first note is contradictory to the second.

Proposed Text: Replace with:

‘**Note:** EUROCAE ED-240 [18] (REQ 01) stipulates a maximum end-to-end delay of 1 second for the visual presentation. However, this should be seen in the context of the specific operational and technical conditions applicable to the site to which aerodrome ATS is provided remotely. Therefore, subject to the submission to and acceptance by the Competent Authority (CA) of an appropriate safety case, an alternative maximum end-to-end delay period may be applied.’

Commentor:	UK CAA
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Page No: 35

Paragraph No: 5.2.4.3, 2nd Note, final sentence

Comment: The final sentence in the 2nd Note states: ‘*The video update rate is therefore recommended to be evaluated and defined for each implementation*’. UK CAA believes that a minimum video update rate should be set, if not by EASA then locally by the competent authority.

Proposed Text: Replace with:

‘While the video update rate can be defined for each different implementation, the

Competent Authority can set a universal minimum refresh rate should they choose to do so.'

Commentor: UK CAA

Page No: 37

Paragraph No: 5.2.5, 1st and 2nd bullets 2 beginning 'visual information from...' and 'Surveillance information from..'

Comment: The words visual and surveillance at the start of these bullets are redundant.

Justification: Need for improved text.

Proposed Text: Amend to read:

information from optical sensors, i.e system detection of moving objects (including also non-cooperative targets) or in the visual field of view (commonly referred to as "visual tracking").

information from ATS surveillance sensors such as radars, ADS-B etc., targeting primarily cooperative targets (commonly referred to as 'radar tracking');

Commentor: UK CAA

Page No: 37

Paragraph No: 5.2.5, 4th bullet beginning 'Overlaid framings/symbols...'

Comment: The text describes the overlays being used 'specifically' in low visibility or bad weather. However, an operator may wish to use these overlays at any time. We recommend 'specifically' should read 'especially'.

Proposed Text: Amend to read:

"especially in darkness and during low visibility conditions".

Commentor: UK CAA

Page No: 37

Paragraph No: 5.2.5, Considerations when implementing visual presentation technical enablers

Comment: This text is considered repetitive – the reader could be referred directly to 4.1.1, 4.1.4 and 4.2.1. We believe no additional text is required

Proposed Text: Replace with:

'Guidance is given in Sections 4.1.1, 4.1.4 and 4.2.1'.

Commentor:

UK CAA

Page No: 41

Paragraph No: Final sentence of paragraph 5.7, 2nd sub-paragraph, beginning "The exact requirements for the recording..."

Comment: This could be interpreted as contradicting the ICAO text referenced at the beginning of paragraph 5.7. NSAs may simply use the existing ICAO 30 day requirements as the benchmark, despite the significant cost associated with that amount of storage.

Justification: Accuracy of EU Regulatory materials.

Proposed Text: Replace with:

"The exact requirements for the recording and retention of systems data specific to remote tower operations should be determined and specified by the CA, taking into account the aspects described herein."

Commentor:

UK CAA

Page No: 42

Paragraph No: 5.9.1, beginning 'The remote tower infrastructure ...'

Comment: The premise of the 'remote tower' is that essentially the operational aspect remains unchanged, therefore this paragraph is considered superfluous and the management of aerodrome assets should not change in remoting the service

Proposed Text: Replace with:

'The remote tower infrastructure should enable the ATCO/AFISO to operate and monitor all pre-existing assets which will remain the responsibility of the remoted service provider.'

Commentor:

UK CAA

Page No: 43

Paragraph No: 5.9.4, Final sentence beginning 'As the monitoring and manoeuvring of such assets are not ATS tasks, ...'

Comment: At many aerodromes these are routinely, ATS tasks.

Proposed Text: Replace with:

“In cases where the monitoring and manoeuvring of such assets are ATS tasks and will continue to be, or at aerodromes where such assets are not ATS tasks...,”

Commentor: UK CAA

Page No: 43

Paragraph No: 5.10, RTC/RTM–aerodrome communication aspects

Comment: This paragraph highlights a critical element of the remote tower concept and we believe, runs the risk of being lost in background noise in its current place in the NPA and should therefore be more prominent. We suggest placing the paragraph earlier in the document.

Commentor: UK CAA

Page No: 44

Paragraph No: 5.11, Part way through final sentence beginning ‘In case of severe failures ...’

Comment: The requirement for monitoring technical systems is laid down elsewhere, so should simply be referenced here. The final sentence talks about closing down the service yet, there should be mitigations in place for systems failures.

Proposed Text: Replace with:

“for the ATCO/AFISO to call for the technical supervisory specialist, close down the service or implement pre-arranged contingency plans”.

Commentor: UK CAA

Page No: 44

Paragraph No: 5.12, Other ATS systems/functions

Comment: As these systems will remain unchanged, we recommend that they are not mentioned, as to do so could confuse the reader.

Proposed Text: Delete paragraph.

Commentor: UK CAA

Page No: 44

Paragraph No: 5.13, Working environment

Comment: We believe this paragraph is too detailed. It refers to a poor working environment and state-of-the-art ergonomic design. All of this is considered superfluous, while each application may want to consider these aspects, cost will be the main driver.

Proposed Text: Delete paragraph.

Commentor:	UK CAA
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Page No: 45

Paragraph No: 5.14.1.1, Handling of abnormal and emergency situations in multiple mode of operation

Comment: This paragraph refers to ABES training which is mandated elsewhere. Each application will need to consider its own mitigation methods; therefore, the cited examples are unnecessary. While multiple mode is a new operation, there should be no significant difference in the emergency procedures. Also, the paragraph would benefit from some minor restructuring.

Proposed Text: Amend the first sub-paragraph to read as follows:

‘The ATS provider should put in place procedures and contingency plans that clearly define how to deal with unexpected events, such as an emergency at one of the aerodromes significantly increasing ATCO/AFISO workload and affecting their ability to continue to provide ATS to all aerodromes under their responsibility. Such procedures and situations require adequate and recurrent training. Each application for multiple mode of operation will require careful consideration for potentially exacerbated emergency situations and therefore the potential exists for enhanced training and mitigations.’

Commentor:	UK CAA
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Page No: 45

Paragraph No: 5.14.1.1, 1st bullet beginning “temporarily delay...”

Comment: An AFISO cannot issue delaying or other actions. We therefore recommend that some text will need to be developed to highlight the actions available to AFISO in these circumstances.

Justification: Consistency of EU Regulatory materials with ICAO provisions.

Commentor:	UK CAA
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Page No: 45

Paragraph No: 5.14.1.1, Note: An RTC Supervisor may support the ATCO/AFISO to apply these procedures.

Comment: The purpose and meaning of this note is not clear and needs to be reworded.

Justification: Unclear text.

Commentor:	UK CAA
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Page No: 46

Paragraph No: 5.14.1.2, Communication procedural aspects in multiple mode of operation, 3rd sub-paragraph

Comment: UK CAA does not believe that such a detailed description of cross-coupling is required, given the common application of this practice in most (if not all) ATS disciplines as and when circumstances permit/require. The individual applications should submit their cross-coupling proposals as a part of their safety submission and each application should be judged on the individual operational requirement.

Proposed Text:

Replace 3rd sub-paragraph with:

‘Each individual application of remote ATS in a multiple mode of operation will need to consider any frequency cross coupling requirements for their operations and submit the relevant safety considerations, mitigation and operational functionality to their Competent Authority for consideration and approval.’

Commentor:	UK CAA
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Page No: 47

Paragraph No: 5.14.2, CWP/RTM design considerations in multiple mode of operation

Comment: Considering the level of detail some aspects have been attributed to in the NPA, we consider that this lacks detail. No mention is made of the potential for variable equipage at sites. It may be that sites have differing equipage levels so it is questioned how that is managed when multiple aerodromes are being controlled at the same time. In a basic sense, how does one control the lights independently at 2 or more aerodromes? This equally applies to flight progress strips, they represent the aircraft and are separated in their respective bays, especially the runway bay. How does one create and manage 2 or more runway bays and which aircraft is in which, and when? A bespoke runway bay may be required for the various configuration of runway bays

Proposed Text:

We recommend that all such areas need to be carefully considered and moderated. We

would suggest the following as an exemplar starting point;

Propose new sub paras for:

- Variable equipage;
- Guidance on the simultaneous use of multiple runway bays;
- Potential hazards of multiple switching i.e. can runway lights at multiple aerodromes be operated simultaneously? If so, brilliance requirements can, for a variety of reasons be different in each location so individual control will still be required (to be considered as part of the design phase).

Variable equipage – control systems must allow for different levels of equipage at different aerodromes being controlled simultaneously. While the objective will be to have the minimum number of control ‘switches’ and these should be ‘shared’ as much as possible, it is inevitable that there will be a requirement for some independent controls specific to certain equipage levels. Where one aerodrome in the multi-mode module has an approved enhancement or overlay that the other(s) do not, that enhancement must be only applicable to that operation and disabled for the others.

Commentor:	UK CAA
Page No: 48 and 49	
Paragraph No: 5.14.4, 5.14.5, 5.14.7	
Comment: The ability to independently control all the required equipment at multiple aerodrome simultaneously is not mentioned. There is a level of technical complexity to the management of a variety of equipment, which may vary in design, control and presentation from site to site. This must be considered in any application considering multiple mode operations.	
Justification: Incomplete guidance	

Commentor:	UK CAA
Page No: 50	
Paragraph No: Chapter 6	
Comment: The management of change is well documented elsewhere (1035/2011) so it is questioned why this is detailed here as well. We recommend simply referring to the source text.	

Commentor:	UK CAA
Page No: 50	

Paragraph No: 6.1.1, Dependencies and interfaces

Comment: The second paragraph of paragraph 6.1.1 contains the word “... shall ...”as follows:

‘In reference to Commission Implementing Regulation (EU) No 1035/2011 [3], Annex II, recital 3.2.1(c)⁷⁵, these dependencies shall be taken into account by the ATS provider when conducting the safety assessment.’

The purpose of the document is to “... provides guidance ...” (paragraph 1.1, page 14 refers), therefore the use of the word “shall” is inconsistent with the purpose of the document. The inclusion of the word “shall” should be restricted to the replication of text taken directly from other documents.

Proposed Text: Replace as follows:

‘Any dependencies are required to be taken into account by the ATS provider when conducting the safety assessment in accordance with Commission Implementing Regulation (EU) No 1035/2011 [3], Annex II, recital 3.2.1(c)⁷⁵.’

Commentor:

UK CAA

Page No: 50

Paragraph No: 6.1.2, Identification of hazards

Comment: We believe that there is too much detail here and recommend that it should remain as a high-level reference to the source text. In addition, paragraph 6.1.2 contains the word “... shall ...”. Replacement text is proposed below.

Justification: The purpose of the document is to “... provides guidance ...” (paragraph 1.1, page 14), therefore the use of the word “shall” is inconsistent with purpose of the document. The inclusion of the word “shall” should be restricted to the replication of text taken directly from other documents.

Proposed Text: Replace with:

In accordance with Commission Implementing Regulation (EU) No 1035/2011[3], Annex II, Sections 3.2.1 and 3.2.476, an ATS provider is required to perform a hazard identification.

Commentor:

UK CAA

Page No: 56

Paragraph No: 6.2.2, 6th bullet

Comment: There is a typo in the 6th bullet point on page 56 – ‘AFIOs’ rather than ‘AFISOs’

Proposed Text: ‘AFISOs’

Commentor:	UK CAA
Page No: 57	
Paragraph No: 6.3.1, 6 th bullet point	
Comment: There is a typo in the 6 th bullet point on page 57, 'AFIOs' should read 'AFISOs'	
Proposed Text: 'AFISOs'	

Commentor:	UK CAA
Page No: 58	
Paragraph No: 6.3.3, Common aspects for a transition/implementation plan	
Comment: We believe there is nothing here which would not equally apply to a conventional tower other than the speed at which the tower will transition to an unplanned termination. We recommend that the text should be consolidated and referenced to source.	

Commentor:	UK CAA
Page No: 59	
Paragraph No: 6.4, Information and cyber security	
Comment: The 4th paragraph of paragraph 6.4 contains the word "... shall ..." as follows:	
<p><i>'Consequently, the introduction of remote aerodrome ATS may affect the security risk assessment and these security vulnerabilities may have an impact on safety. For this reason, these security vulnerabilities may add new causes to the existing safety hazards (e.g. possible corruption of navigation aids information, loss of visual presentation data) or may add new hazards (e.g. complete loss of the provision of ATS). Based on these considerations, the ATS provider shall (in reference to Regulations 1035/2011 and 2017/373, see above) conduct a dedicated security risk analysis and take the necessary measures to protect its systems and constituents against information and cyber security threats. The results of this security risk analysis should be considered as input to the safety assessment.'</i></p>	
Justification: The purpose of the document is to "... provides guidance ..." (paragraph 1.1, page 14 refers), therefore the use of the word "shall" is inconsistent with purpose of the document. The inclusion of the word "shall" should be restricted to the replication of text taken directly from other documents.	

Proposed Text: Replace with:

‘Consequently, the introduction of remote aerodrome ATS may affect the security risk assessment and these security vulnerabilities may have an impact on safety. For this reason, these security vulnerabilities may add new causes to the existing safety hazards (e.g. possible corruption of navigation aids information, loss of visual presentation data) or may add new hazards (e.g. complete loss of the provision of ATS). Based on these considerations, the ATS provider is required in accordance with Commission Implementing Regulation (EU) No 1035/2011 and 2017/373 to conduct a dedicated security risk analysis and take the necessary measures to protect its systems and constituents against information and cyber security threats. The results of this security risk analysis should be considered as input to the safety assessment.’

Commentor: UK CAA

Page No: 60

Paragraph No: 6.5, Contingency planning

Comment: There appears to be an inconsistency of formatting of text replicated from Implementing Regulations. We believe the 1st paragraph replicated below should be italicised.

Justification: The standard appears to be that text taken from other documents and replicated within the NPA are italicised.

Proposed Text:

‘As stipulated by point 8.2 in Annex I of Regulation (EU) No 1035/2011 [3], a service provider – and therefore also the ATS provider – shall have in place contingency plans for all the services it provides in the case of events which result in significant degradation or interruption of its operations.’

Commentor: UK CAA

Page No: 60

Paragraph No: 6.5, Contingency planning

Comment: Section 5.1 paragraph 5 refers to RTC and of the need to exercise caution if an alternate aerodrome is lost because the RTC itself, as a single point of failure, is lost. Paragraph 6.5 should include the requirement for contingency plans to be available in the event of such an occurrence. We therefore recommend that a new sub-paragraph is added to address ‘Failure of RTC’

Commentor: UK CAA

Page No: 62

Paragraph No: 6.6, Remote tower system constituents

Comment: Reference is made to the interoperability regulation EC 552/2004, and it is later concluded that that the ground infrastructure for capturing images and sound should be considered as ATS, not CNS, which aligns with UK CAA policy. However currently there are no specific requirements for ATS within Part B of EC 552/2004 for visual presentation except Human-machine and new concepts of operation. If this understanding is correct, then we suggest the proposed text below should be included.

Justification: Clarity required of the specific requirements for visual presentation, binocular functionality and aerodrome sound.

Proposed Text: Additional item to be added under 'The following is noted:' on page 63:

'Specific requirements as defined in Part B of Regulation (EC) No 552/2004 for Visual Presentation, binocular functionality and aerodrome sound are limited to 'Human-machine interface systems' and 'Support for new concepts of operation'.

Commentor:	UK CAA
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Page No: 65

Paragraph No: 7.1.2, Aerodrome manual

Comment: Aerodrome manual inclusion will differ from application to application and from ANSP to ANSP for different applications, and the list may not be as comprehensive as necessary. For example, there is no mention of interacting with wildlife management, airside work parties and/or direct pilot briefings, which the UK CAA sees as being essential considerations.

Justification: More comprehensive list of examples.

Proposed Text: The following bullets should be added:

- Interaction with wildlife management
- Interaction and briefing of working parties
- Conduct of aerodrome briefings

Commentor:	UK CAA
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Page No: 65

Paragraph No: 7.1.2. Aerodrome manual

Comment: The UK CAA is uncomfortable with such detailed lists however, if they must exist, they should include as many examples as possible and in this instance,

Bullet 3 refers to 'co-ordination'; clarification of what co-ordination means in the context is requested.

Justification: Need for clarification

Commentor:	UK CAA
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Page No: 66

Paragraph No: 7.2.2, Aerodrome safeguarding

Comment: Safeguarding is universal, we believe there is no need to reference it here, other than as proposed below.

Proposed Text: Replace with:

'Aerodrome safeguarding – There are no anticipated additional impacts on aerodrome safeguarding procedures as a result of remote towers.'

Commentor:	UK CAA
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Page No: 67

Paragraph No: 7.2.4, Management of the change to remote aerodrome ATS — Aerodrome operator

Comment: Management of change is addressed in chapter 6. We recommend paragraph 7.2.4 should be incorporated into chapter 6.

Commentor:	UK CAA
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Page No: 70

Paragraph No: 9, Aeronautical information products and services

Comment: We disagree with the level of detail provided. The only change required would be to highlight that the service is provided remotely and marking the SLG on the aerodrome chart.

Proposed Text: Remove all text after the 1st paragraph

Commentor:	UK CAA
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Page No: 71

Paragraph No: 10.2, Qualification and training of AFISOs

Comment: There appears to be an inconsistency of formatting of text replicated from Implementing Regulations. We recommend that the text of this paragraph should be italicised as proposed below.

Justification: The standard appears to be that text taken from other documents and replicated within the NPA are italicised.

Proposed Text:

'With regard to the qualification and training of personnel providing Aerodrome Flight Information Service (AFISOs), it should be noted that at the time of publication of this document, the EU legislation does not include a detailed regulatory framework. However, point 5 of Annex 1 in Regulation 1035/201188 [3] stipulates that an air navigation service provider – and therefore also the AFIS provider – shall employ appropriately skilled personnel to ensure the provision of air navigation services in a safe, efficient, continuous and sustainable manner. In this context, the air navigation service provider shall establish policies for the recruitment and training of personnel. It is left to the Member States to define the appropriate regulatory means to meet this requirement in accordance with the local AFIS provision. To facilitate the development of AFISO training in the case of remote aerodrome ATS, the AMC and GM for the training and qualification of ATCOs can be considered in order to derive training plans and requirements that are appropriate to the local environment.'

Commentor:	UK CAA
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Page No: 71

Paragraph No: 10.3, Qualification and training of ATSEPs

Comment: Paragraph 10.3 states: “Air Traffic Safety Electronics Personnel (ATSEP) involved in the operation and maintenance of equipment, facilities and installations enabling and supporting the remote aerodrome ATS, **should** be adequately trained, qualified and competent to perform their duties in accordance with the requirements laid down in Commission Implementing Regulation (EU) No 1035/2011 [3] (Annex II, point 3.3) ...”

The word “should” implies that it is optional for ATSEPs to be adequately trained, qualified and competent.

Justification: EU 1035/2011 Annex II, point 3.3 states that “Providers of air traffic services **shall** ensure that technical and engineering personnel including personnel of subcontracted operating organisations who operate and maintain ATM equipment approved for their operational use have and maintain sufficient knowledge and understanding of the services they are supporting, of the actual and potential effects of their work on the safety of those services, and of the appropriate working limits to be applied.

The Regulation, which the NPA document references, uses the word “shall”.

Also, 2017/373 Annex XIII (Part-PERS) mandates that all ATSEPs shall be adequately trained and competent.

Proposed Text: Replace with the following:

*“Air Traffic Safety Electronics Personnel (ATSEP) involved in the operation and maintenance of equipment, facilities and installations enabling and supporting the remote aerodrome ATS, **are required to be adequately trained, qualified and competent to perform their duties in accordance with the requirements laid down in Commission Implementing Regulation (EU) No 1035/2011 [3] (Annex II, point 3.3)...**”*

Commentor:	UK CAA
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Page No: Page 71

Paragraph No: 10.3, Qualification and training of ATSEPs

Comment: Regarding ATSEP, reference is made to (EU) No 1035/2011, with Note 89 indicating replacement with (EU) No 2017/373 Annex XIII. However, within Annex XIII no provision is made for training requirements for visual presentation systems or systems providing aerodrome audio.

UK CAA recommends EASA development of appropriate ATSEP training requirements.

Justification: To provide a ‘joined up’ regulatory framework.

Commentor:	UK CAA
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Page No: 72

Paragraph No: 11, References

Comment: This section provides a comprehensive and well-ordered list of references within the draft Guidelines and is most welcome. However, the presentation can be simplified by simply listing the reference materials and not cross-referencing them in the main body of the text. Use of numeric cross-referencing throughout the draft Guidelines (e.g. page 64 paragraph 7) is considered redundant anyway given that the titles of the referenced documents appear in full in the draft text.

In addition, the reference to NPA 2016-09 ‘Requirements for air traffic services’) is considered inappropriate given its ephemeral, non-definitive nature and requires deletion.

Justification: Simpler presentation of reference material.

Proposed Text: ‘Delete ‘referenced’ from the titles of the sub-sections.

Commentor:	UK CAA
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Page No: 77

Paragraph No: 12.2, Table 2: List of operational hazards (SESAR safety assessment — ATC case)

Comment: The UK CAA welcomes the list of operational hazards(OHs) in the table at paragraph 12.2 but believes additional OHs can be identified.

Justification: The need to provide as comprehensive a list of OHs as possible.

Proposed Text: The following additional OHs are proposed:

OH-38: for multiple ops Remote ATS inadvertently provides information/ instructions valid for another aerodrome and not the one being controlled at that specific time, leading to confusion.

OH-39: for multiple ops, remote ATS incorrectly identifies an aircraft at the wrong aerodrome, and issues a clearance or information to the wrong aeroplane.

Commentor:	UK CAA
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Page No: 77

Paragraph No: 12.2 Table

Comment: Clarification is requested on what is meant by infringement and what is meant by tactical conflict.