

**Review of Policy ADME 2.6:
RESPONSIBILITY AND FUNCTIONS OF AERODROME CONTROLLERS WITH
REGARD TO SURFACE MOVEMENT**

Presented by TOC

SUMMARY

This paper reviews the existing policy ADME2.6 in the light of recent advances affecting or replacing visual observation in aerodrome control towers.

1. INTRODUCTION

- 1.1. The existing IFATCA policy on ADME 2.6 addresses the use of Closed-Circuit Television (CCTV) and other surveillance systems in the tower for visual observation. The introduction of CCTV and visual surveillance systems (VSS) in remote and digital tower concepts have necessitated a review of this policy to ensure a proper alignment with current realities, ICAO Doc 4444 (PANS-ATM) and other IFATCA policy such as ADME 2.14 on remote and virtual towers.
- 1.2. This review will focus on use of CCTV and Visual Surveillance Systems (VSS) in the tower and the necessary safeguards to prevent obstruction of the ATCO's view from the tower.
- 1.3. Brief History of policy ADME 2.6

This policy was first formulated and accepted at the conference of 1996 in Tunis, Tunisia. There was a review of the policy prepared by PLC for the 2007 Conference in Istanbul, Turkey. The working paper proposed by the committee sought to define the term 'visual observation' and refine the policy statement. This review also introduced caveats under which "any future ATM concepts will be accepted". Thereafter, a review of the ADME section of the TPM was presented in WP59 at the 2022 virtual Conference. Directors approved the draft recommendations to ADME 2.6, creating its current form. This WP59 also recommended a further review of the policy to take account of new advances in digital ATS, remote and virtual tower concepts.

2. DISCUSSION

2.1 The existing policy ADME2.6 in the IFATCA Technical and Professional Manual (TPM) reads (IFATCA, 2024):

ADME2.6 Responsibility and Functions of Aerodrome Controllers with Regard to Surface Movement

In aerodrome control towers, CCTV shall not be used to replace visual observation. The use of CCTV shall only be accepted to supplement visual observation where:

- It has been proven by a safety analysis that at least the same level of safety can be guaranteed;
- Contingency procedures are in place

The layout of runways and taxiways and the provision of visual aids should be such as to enable simple and easily understood instructions to be issued and complied with.

Where a separate apron management service is established, personnel engaged in issuing specific ground clearances, instructions and clearance delivery should be trained and licensed to exercise these functions.

Safeguards should be imposed to prohibit the development of any structure that would impede the direct visual observation from the tower.

Where apron management services are established and not provided by an aerodrome ATS Unit, aerodrome controllers shall not be held liable for accidents or incidents that occur whilst aircraft are under the jurisdiction of the Unit providing such a service”.

2.1. Below we shall analyse the parts of the policy statement that affect use of CCTV and visual observation, as referred to in par 1.2 above. We shall analyse them line by line, to check for improvements or consistency with ICAO documents and other IFATCA policies.

2.2. **‘In aerodrome control towers, CCTV shall not be used to replace visual observation’.**

The first part of the statement expresses IFATCA’s opposition to the replacement of visual observation in an aerodrome control tower, with CCTV. Take note that ‘visual observation’ is required at the tower according to ICAO Doc 4444 (PANS-ATM Chp. 7.1.1.2) which states among other things (ICAO, 2016a):

“Watch shall be maintained by visual observation, augmented in low visibility conditions by an ATS surveillance system when available”.

2.3. **What is visual observation?**

Even though ICAO has no standard definition for visual observation, IFATCA policy (ADME 2.3) states (IFATCA, 2022):

“Observation through direct eyesight of objects situated within line of sight of the observer possibly enhanced by binoculars”.

The definition is supported by a paper presented at the ICAO Middle East Air Navigation Planning and Implementation Regional Group (MIDAPIRG) meeting in 2022, which defined visual observation as:

“Observation through direct eyesight of objects situated within the line of sight of the observer, possibly enhanced by external elements” (ICAO CNS SG, 2022).

- 2.4. The definition above indicates that visual observation refers to direct human eyesight or out-of-the-window observation from the tower. This then excludes use of mirrors, cameras and other media for visual observation except for use in a supplementary role. This is inconsistent with the latest edition of PANS-ATM (ICAO, 2016a amended 2020 chp7.1.1.2.1) which states that:

“Visual observation shall be achieved through direct out-of-the-window observation, or through indirect observation utilizing a visual surveillance system which is specifically approved for the purpose by the appropriate ATS authority”.

- 2.5. This indicates that ICAO permits use of visual surveillance systems to achieve visual observation, aside from the out-of-the-window view. IFATCA may need to review its policy on visual observation to align with ICAO provisions, unless other justifications are provided.

- 2.6. Use of CCTV in Conventional Aerodrome Control Towers

CCTV has been used to complement visual observation achieved through direct eyesight of ATCOs by covering blind spots or areas of the manoeuvring area outside the line of sight of the ATCO, obscured by some installations or other obstacles around the aerodrome. In this case the CCTV is playing a supplementary role to visual observation by direct eyesight (out-of-the-window view). This case is in line with IFATCA’s position and does not violate the policy under review.

- 2.7. Use of Visual Surveillance System (VSS) in Digital Air Traffic Services (DATS)

Digital Air Traffic Services refers to the concept in which air traffic control services may be provided to an aerodrome from a remote location via digital means without direct visual observation (EASA, 2020). The concept, sometimes referred to as remote towers or digital towers, utilises a combination of cameras or CCTVs as part of a visual surveillance system that replaces the need for direct out-of-the-window visual observation. The VSS is defined in PANS-ATM as (ICAO, 2016b):

“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”

- 2.8. The VSS is designed to replicate or complement the ‘out-of-the-window’ view of the conventional tower utilizing an integrated system of sensors, data transmission links, data processing systems and situation displays (EASA, 2020). This enhances situational awareness and helps in the provision of air traffic services from remote locations as applied to the remote tower concept.

- 2.9. The use of VSS for visual observation is part of the technical enablers for the installation of DATS outlined by European Union Aviation Safety Agency (EASA) (EASA, 2020). The system is used to transmit a digital visual representation of the aerodrome to a tower manned by an ATCO in a remote location thereby replacing the ‘out-of-the-window’ (OTW) view of the conventional tower. VSS are used for digital or remote towers in Sweden (Saab Group, 2023), the UK (NATS, 2023), among others around the world.
- 2.10. In conventional towers the VSS can be used to supplement the direct visual observation of the ATCO by bringing blind spots into their view. Singapore Changi Airport is an example where this is being used to supplement visual observation. with plans to fully replace direct visual observation with this system in the future (Changi Group, 2023). Australia has recently amended their regulations to permit the use of VSS for similar purposes (Civil Aviation Safety Authority, 2022).
- 2.11. These examples of the use of VSS seem in conflict with both the policy under review and IFATCA’s definition of visual observation in ADME 2.3 of the TPM (referred to in par 2.4 above). It suggests that the level of safety provided by visual observation in the tower and the protection afforded the ATCO may be impaired if substituted by a CCTV or VSS (IFATCA, 2007). This implies that it is incapable of meeting the safety standards required.
- 2.12. ICAO position on use of CCTV for visual observation:
- The use of CCTV for visual observation is covered under visual surveillance systems in the PANS-ATM. The latest edition permits use of VSS for visual observation both for DATS and conventional towers when approved by the appropriate ATS authority. The relevant portion states in Chapter 7.1.1.2.1 thus (ICAO, 2016c):
- “Visual observation shall be achieved through direct out-of-the-window observation, or through indirect observation utilizing a visual surveillance system which is specifically approved for the purpose by the appropriate ATS authority”*
- 2.13. The statement above indicates that visual observation can be achieved indirectly by the VSS when duly authorised by the regulator. This is consistent with the ATS Planning Manual (ICAO Doc 9426) which indicates that CCTV or other electronic systems can be used for surveillance in the tower. The relevant portion states (ICAO, 2016d):
- “Surveillance by the aerodrome controller is normally done by visual means (eyesight) alone, mechanically through the use of binoculars to improve eyesight or electronically, through the use of radar or closed-circuit television”.*
- 2.14. Finally, policy ADME 2.14 on ‘Remote and Virtual towers’ infers that IFATCA is generally not opposed to the deployment of the DATS concept and hence must not be seen to be opposed to the use of cameras or other optical sensors for ‘visual observation’ which is a vital component of the concept.

2.15 For the reasons mentioned above, it will be challenging to argue against the use of CCTV or any combination of camera or optical systems, such as VSS, for visual observation in both DATS and conventional towers. The use of VSS or CCTV in the tower aligns with PANS-ATM provisions, making this policy section outdated.

2.16 The next statement of the policy says that:
“The use of CCTV shall only be accepted to supplement visual observation where:”

Whereas the first sentence of the policy (examined under paragraph 2.3 above) emphatically states its opposition to the use of CCTV for visual observation, this part provides two conditions under which CCTV can be used in the tower as supplementary aids for visual observation. As a supplementary aid it still excludes use of CCTV for visual observation of the entire aerodrome (especially the manoeuvring area) as used in DATS. This still restricts use of CCTV only as an additional aid to the direct visual observation of the airfield in cases where the controller’s view is obstructed by some structure or to eliminate blind spots. Furthermore, as pointed out in par. 2.5 above the PANS-ATM permits the use of VSS for visual observation in both conventional and DATS towers. It is then appropriate that the policy be modified to recognize this fact and align with the ICAO position.

2.17 “It has been proven by a safety analysis that at least the same level of safety can be guaranteed:”

Safety analysis (or assessment) is a standard requirement prior to the implementation of new concepts or installation of new equipment. There are ICAO documents (such as DOC 9859) that give details about safety assessment in this regard (ICAO, 2018). This caveat is then consistent with such requirements and still valid. The requirement for safety assessment is also inferred in PANS-ATM 7.12 which states that (ICAO, 2016a):

Visual surveillance systems used in the provision of aerodrome control services shall have an appropriate level of reliability, availability and integrity. The possibility of system failures or significant system degradations, which may cause complete or partial interruptions of service, shall be assessed and taken into account in the definition of the level of service provided in order to ensure that there is no degradation in the safety level of the services rendered. Backup facilities or alternative operational procedures shall be provided.

2.18 We can therefore argue that this is well covered by PANS-ATM and no longer needed as part of the policy and can be deleted.

2.19 **“...contingency procedures are in place.”**

To prevent equipment degradation or service impairment, backup facilities or alternative procedures are recommended. ICAO DOC4444 (PANS-ATM 7.12.1.1-ICAO, 2016a) recommends such a practice in the implementation of VSS technology. IFATCA policy WC10.2.7 also covers the provision of equipment “on hot standby” in case of degradation or unserviceability of primary equipment¹⁴. This part of the policy is then appropriate and consistent with best practices.

2.20 We nevertheless argue that since it is well provided for in the PANS-ATM and the IFATCA Technical and Professional Manual (TPM) this part of the policy is no longer necessary and should be removed.

“Safeguards should be imposed to prohibit the development of any structure that would impede the direct visual observation from the tower”.

2.22 The statement above recommends protecting the view of the ATCO from being obstructed as to impede visual observation which is required under ICAO Doc4444 (PANS- ATM chp. 7.1) for provision of aerodrome control services². This situation is applicable to both conventional aerodrome towers and digital or virtual towers concept. In both cases unregulated structures could be erected in the way of the ATCO’s line of sight or the visual surveillance system which will impair situational awareness of the ATCO providing aerodrome control service. Both situations are to be avoided, and safeguards are then necessary to prevent this condition from occurring. This statement is valid, still relevant and requires no amendment.

3. CONCLUSIONS

3.1 This paper has examined sections of the policy statement ADME 2.6 from the TPM concerning the **“Responsibility and Functions of Aerodrome Controllers Regarding Surface Movement”** specifically focusing on the use of CCTV for visual observation.

After analysing the sections of the policy under review we conclude as follows:

3.2 “In aerodrome control towers, CCTV shall not be used to replace visual observation.

VSS and CCTV are in use in several countries around the world. Their use in the tower for visual observation aligns with provisions in the PANS-ATM therefore making this section of the policy redundant.

3.3 “The use of CCTV shall only be accepted to supplement visual observation where:

- **It has been proven by a safety analysis that at least the same level of safety can be guaranteed;**
- **Contingency procedures are in place”**

The use of VSS or CCTV in the tower aligns with PANS-ATM provisions, rendering this policy section outdated and subject to deletion. The intent of this statement is sufficiently addressed within the PANS-ATM and can be inferred from WC10.2.7 of the Technical and Professional Manual (TPM). Therefore, it is recommended that this statement be removed as it is redundant at this point.

3.4 Overall we can conclude that removing these sections of the policy will neither weaken nor adversely affect the ATCO in providing aerodrome control services under the circumstances anticipated by this policy. We emphasize that the intent of this section of the policy ADME2.6 is sufficiently covered in the PANS-ATM, especially chapter 7 and the IFATCA TPM under WC10.2.4 and WC10.2.7 (IFATCA, 2022).

3.5 **“Safeguards should be imposed to prohibit the development of any structure that would impede the direct visual observation from the tower”.**

This section is still relevant and should remain in the policy to ensure the ATCO's situational awareness is not impaired.

3.6 We have suggested updating IFATCA's stance on using VSS or CCTV for visual observation to align with ICAO DOC4444 and TPM policy ADME 2.14 on 'Remote and Digital Towers'. This will necessitate a review of policy ADME 2.3 on 'visual observation' as it is outdated and inconsistent with ICAO DOC4444. It is however outside the scope of this paper.

4. DRAFT RECOMMENDATIONS

4.1 It is recommended that existing policy ADME 2.6 is replaced with amended policy as shown below.

ADME2.6 Responsibility and Functions of Aerodrome Controllers with Regard to Surface Movement

In aerodrome control towers, CCTV shall not be used to replace visual observation. The use of CCTV shall only be accepted to supplement visual observation where:

- **It has been proven by a safety analysis that at least the same level of safety can be guaranteed;**
- **Contingency procedures are in place**

The layout of runways and taxiways and the provision of visual aids should be such as to enable simple and easily understood instructions to be issued and complied with.

Where a separate apron management service is established, personnel engaged in issuing specific ground clearances, instructions and clearance delivery should be trained and licensed to exercise these functions.

Safeguards should be imposed to prohibit the development of any structure that would impede the direct visual observation from the tower.

Where apron management services are established and not provided by an aerodrome ATS Unit, aerodrome controllers shall not be held liable for accidents or incidents that occur whilst aircraft are under the jurisdiction of the Unit providing such a service”.

Existing Policy ADME 2.6 is amended to read: :

~~In aerodrome control towers, CCTV shall not be used to replace visual observation. The use of CCTV shall only be accepted to supplement visual observation where:~~

- ~~• It has been proven by a safety analysis that at least the same level of safety can be guaranteed;~~**
- ~~• Contingency procedures are in place~~**

The layout of runways and taxiways and the provision of visual aids should be such as to enable simple and easily understood instructions to be issued and complied with.

Where a separate apron management service is established, personnel engaged in issuing specific ground clearances, instructions and clearance delivery should be trained and licensed to exercise these functions.

Safeguards should be imposed to prohibit the development of any structure that would impede the direct visual observation from the tower.

Where apron management services are established and not provided by an aerodrome ATS Unit, aerodrome controllers shall not be held liable for accidents or incidents that occur whilst aircraft are under the jurisdiction of the Unit providing such a service”.

4.2 It is recommended that existing policy ADME 2.3 Visual Observation and New Tower Concepts requires a full policy review and be added to a future TOC working programme.

5. REFERENCES

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