

CONSIDERATIONS ON ASSESSING THE COMPLIANCE OF THE INFRASTRUCTURE OF "ALEXANDRU PODGOREANU" TUZLA INTERNATIONAL AERODROME WITH AERONAUTICAL SAFETY STANDARDS USING THE FALCONY DIGITAL PLATFORM

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Abstract: *This article proposes a systematic assessment of the compliance of the infrastructure of "Alexandru Podgoreanu" Tuzla International Aerodrome with international aeronautical safety standards, through the use of the Falcony digital quality management platform. Tuzla Aerodrome, located in Constanța County, represents a relevant case study both for the diversity of its operations — public transport, general aviation, offshore flights, aeronautical training and medical evacuation missions — and for its current strategic context, having been designated to take over international civil air traffic from Mihail Kogălniceanu Airport. The methodology adopted consists of configuring and applying structured checklists within the Falcony platform, covering the main infrastructure components: movement area (runway, taxiways), passenger terminals, technical infrastructure, fuel storage systems and heliport. The assessment results indicate an average compliance level of 74%, with 6 critical non-conformities requiring urgent remediation, while also demonstrating the added value of digital auditing over traditional methods..*

Keywords: *Tuzla aerodrome, aeronautical safety, compliance, digital audit, Falcony, ICAO, EASA*

1. INTRODUCTION

Aviation safety is a fundamental imperative in the management of any airport infrastructure, regardless of its size or status. The International Civil Aviation Organization (ICAO) defines safety as "the state in which risks associated with aviation activities, related to, or in direct support of the operation of aircraft, are reduced and controlled to an acceptable level" [1]. In this context, the compliance of an aerodrome's physical infrastructure with Standards and Recommended Practices (SARPs) constitutes one of the essential conditions for obtaining and maintaining operational certification.

"Alexandru Podgoreanu" Tuzla International Aerodrome, located in the commune of Tuzla, Constanța County, on the western coast of the Black Sea, is undergoing a major institutional and operational transformation. By a government decision adopted in 2025, the aerodrome was designated to take over international civil air traffic from Mihail Kogălniceanu Airport, which is to function exclusively as a military airport. This change of role entails a substantial increase in compliance requirements, with respect to both the physical infrastructure and the operational procedures, security systems and passenger processing capacity.

The operational profile of Tuzla Aerodrome is complex and diverse: in addition to the general aviation and aeronautical training operations traditionally conducted, the aerodrome supports regular offshore helicopter flights serving the deep-water drilling operations of the Neptun Deep project, emergency medical evacuation missions, and the organisation of international airshows. This operational diversity increases the complexity of the compliance assessment, requiring the application of a multi-layered regulatory framework.

This article proposes the use of the Falcony digital platform as a compliance audit tool, arguing that the digitalisation of the inspection and reporting process contributes to increased objectivity, traceability and efficiency of safety assessments. The research seeks to answer the following question: To what extent is the infrastructure of Tuzla Aerodrome compliant with the requirements of international aeronautical safety standards, and in what way can the Falcony platform optimise the compliance assessment process?

2. PRESENTATION OF TUZLA AERODROME

2.1. Brief history

The history of Tuzla Aerodrome dates to 1958, when, under the patronage of LARES (Romanian Airlines), the first Aviasan medical aviation station was established in Constanța, at Palas Aerodrome. In the spring of 1967, the unit relocated to the newly constructed aerodrome at Tuzla, where, on 27 March 1967, the first flight mission took place, consisting of medical transport and agricultural surveillance [2]. Within a few years, the aerodrome recorded an intensive level of activity, logging approximately 1,600 flight hours per year across various missions.

During this founding stage, the aerodrome's infrastructure was reduced to the bare essentials: grass strips, minimal administrative facilities and an operational perimeter strictly limited to utility aviation. The facility lacked advanced navigation systems or paved taxiway surfaces, functioning exclusively as a local base for rudimentary flight operations.



FIG. 1 Tuzla Aerodrome before modernisation - grass strip layout [2]

A defining moment was 1998, when the aerodrome was taken over by Regional Air Services SRL, becoming Romania's first private aerodrome [2]. From 2006, the aerodrome provided full offshore operational services to OMV Petrom. In 2013, the aerodrome was officially opened to international air traffic, and in 2024 it was modernised through two investments financed under the Large Infrastructure Operational Programme (POIM 2014 – 2020), being renamed "Alexandru Podgoreanu" Tuzla International Airport.

2.2. Current types of operations

Tuzla Aerodrome currently conducts a wide spectrum of aeronautical operations:

- Public transport and general aviation - scheduled and charter air services, the largest aircraft type compatible with the current infrastructure being the ATR 42 (42-passenger capacity).
- Offshore operations - the primary base for daily helicopter flights to the offshore drilling platforms of the Neptun Deep project, with over ten thousand flight hours accumulated.
- Aeronautical training - Tuzla Flight School offers PPL, CPL and ATPL courses, operating a fleet of Diamond DA20/DA40/DA42, Piper PA-34 and CABRI G2 helicopter aircraft, under EASA Part-FCL regulations.
- SMURD missions - offshore medical evacuation available 24/7, day and night, in all permitted meteorological conditions.
- Aviation events - international airshows "Tuzla Fly In" and "Tuzla AEROMANIA".

2.3. Existing infrastructure

Tuzla Aerodrome covers a total area of 36 hectares. The 2024 modernisation works replaced the historical grass strips with fully paved concrete surfaces and developed a functional network of seven taxiways [3]. The infrastructure comprises: a VFR runway equipped with lighting for night operations; a heliport with night lighting; a 1,200 m² hangar; two passenger terminals; a fuel storage depot (180 m³) and a functional customs office.



FIG. 2 Current infrastructure of Tuzla Aerodrome (Source: RAS Tuzla) [2]

2.4. Legal and strategic framework

From a strategic perspective, Tuzla Aerodrome is included in Romania's General Transport Master Plan, approved by Government Decision No. 666/2016[4]. The expansion of the aerodrome's infrastructure to accommodate traffic growth and new international requirements is explicitly provided for in this strategic document. Its geographical position - on the western coast of the Black Sea - confers upon the aerodrome a significant regional strategic importance.

3. APPLICABLE REGULATORY FRAMEWORK

3.1. ICAO Regulations

The international regulatory framework for aerodrome infrastructure is established by ICAO through Annex 14 to the Chicago Convention — "Aerodromes", which defines the SARPs regarding physical design, equipment, markings, lighting and rescue and firefighting services [1]. Relevant ICAO documents include Doc. 9137, Doc. 9774, Doc. 9859 and Doc. 9981.

3.2. EASA Regulations

At European Union level, the regulatory framework is provided by EASA through Regulation (EU) No 139/2014 [5], which establishes the technical requirements and administrative procedures for aerodromes. The CS-ADR-DSN certification specifications [6] provide detailed technical criteria for the design of physical infrastructure. Offshore operations are additionally subject to the EASA SPA.HOFO (Helicopter Offshore Operations) requirements.

3.3. National legislation - AACR

At national level, the Romanian Civil Aeronautical Authority (AACR) is the entity responsible for the certification and continuous oversight of civil aerodromes [7]. The Romanian Civil Aeronautical Regulations (RACR-ADR, RACR-ADNOTAM and RACR-SMS) transpose European and international requirements into national legislation. The certification process for Tuzla Aerodrome as an international airport requires documented compliance with all these regulations.

3.4. Specific requirements for offshore operations

Offshore operations generate additional requirements beyond the general aerodrome standards. ICAO Doc. 9376 and the EASA SPA.HOFO procedures mandate special equipment for water survival, emergency procedures coordinated with maritime search and rescue services, and specific staff training requirements [8]. These aspects are assessed separately within the Falcony audit, constituting a distinct verification category.

4. THE FALCONY PLATFORM - A DIGITAL AUDIT TOOL

4.1. Description of relevant functionalities

Falcony is a digital Quality, Health, Safety and Environment (QHSE) management platform [9], developed to facilitate inspection, audit and reporting processes in organisations with complex operational activities. Traditional manual safety reporting systems suffer from bureaucratic inefficiencies that lead to a lack of visibility over operational incidents and an inability to identify negative trends [10].

Falcony addresses these vulnerabilities by introducing a decentralised, mobile-first reporting architecture that enables ground staff and controllers to flag hazards instantly, directly from operational areas - on the apron, in hangars or in the ATC tower. By providing an accessible digital interface for the immediate recording of near-miss events, environmental hazards or quality non-conformities, the platform empowers staff to report issues in real time.

4.2. Observation module - standard categories

The platform uses the term "observation" instead of the traditional concept of "reporting", eliminating the psychological barrier associated with drafting formal incident reports. The observation module comprises seven predefined categories:

- Health and Safety - notifications regarding compliance with occupational health and safety norms, or non-compliance with operational safety procedures.

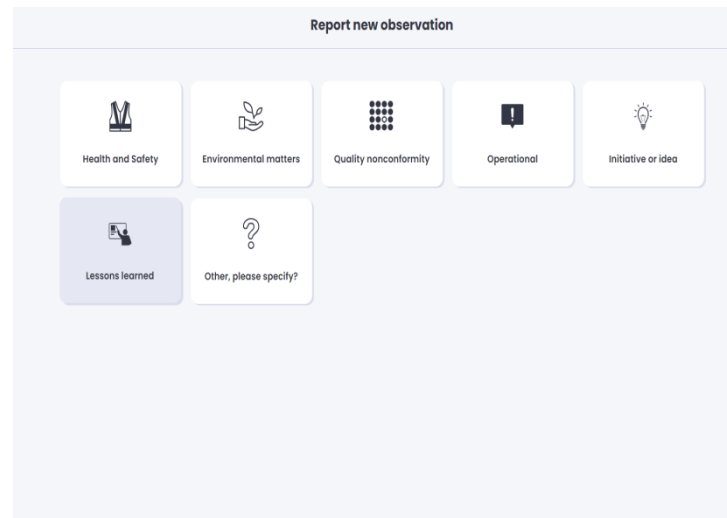


FIG. 3 Falcony platform interface - observation module

- Environmental matters - notifications or proposals relating to local environmental protection regulations.
- Quality nonconformity - reporting of non-conformities regarding aerodrome infrastructure and their impact on aeronautical activity.
- Operational - observations regarding non-compliance with allocated slots and their consequences.
- Initiative or idea - proposals for improvement of procedures and infrastructure.
- Lessons learned - near-miss incidents, which are subject to mandatory reporting.
- Others - human coordination errors, presence of FODs on the manoeuvring area, unauthorised access to the operational surface, etc.

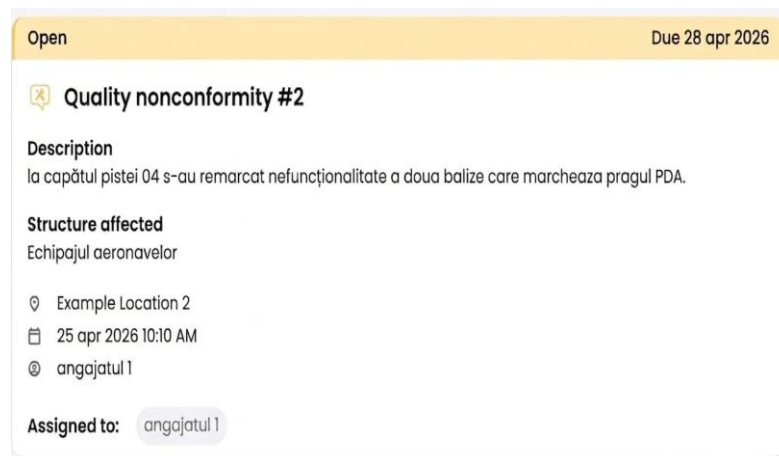


FIG. 4 Quality Nonconformity #2 — two non-functional beacon lights at runway 04 threshold (PDA)

4.3. Audit module

The Falcony platform establishes an essential operational continuity, enabling the execution of formal internal audits triggered directly by the observations recorded by ground staff. FIG. 5 shows a concrete example: the Others (FOD) #3 observation, registered on 25 April 2026, reporting FOD objects on taxiway C that were not removed immediately, with the affected structure being helicopters performing taxiing.

The designated auditor is required to respond to a complete set of predefined standardised questions, tailored to the specific nature of the investigation — ensuring that the inspection remains objective and covers all applicable regulatory requirements.

Open Due 26 apr 2026

Others (FOD) #3

Description
pe care de rulaj C s-au identificat FOD uri care nu au fost îndepărtate imediat

Structure affected
Elicopterele care excuta rulaj aerian sau la sol

📍 Example Location 2
📅 April 25, 2026 11:45 AM
👤 angajatul 2

Assigned to: auditul 1

FIG. 5 Others (FOD) #3 — FOD objects on taxiway C not removed immediately

Once the audit is finalised, the platform automatically transitions to the reporting phase, generating a detailed data-driven report based on the answers provided.

Average score	Audit template
Question group	Risk Assessment
FOD Detection Process	56
Sweeping Frequency	59
Reporting Protocols	57
Response Time	67
Removal Efficiency	49
Source Identification	54
Staff FOD Training	47
Operations Management	50
Equipment Condition	52

FIG. 6 Risk Assessment scores — FOD Management audit template: all nine question groups below the compliance threshold (scores 47–67)

The final document systematically analyses the preset fields for the exact type of audit conducted, providing airport management with the analytical depth required to identify affected areas and demonstrate how the safety loop was closed.

Others (FOD) #3

📍 Example Location 2
📅 Apr 27, 2026
👤 auditul 1

55

FIG. 7 Global score for Others (FOD) #3: 55 — Falcony platform, 27 Apr. 2026

4.4. Advantages over traditional auditing

Compared to paper-based methods, Falcony offers significant advantages: complete traceability of each finding, photographic documentation attached directly to observations, automated report generation and corrective action tracking [10]. Airports in Finland, Sweden and the Netherlands that have integrated similar digital solutions report significant reductions in audit completion time and improved non-conformity remediation rates [11].

Average score	Audit template ↑▼
Question group ↑▼	Risk Assessment
Chemical Safety	56
Cleanliness and Order	59
Machine Safety	57
Moving around the area	67
Physical and biological work conditions	49
Physical Workload	54
Psychological and social workload	47
Risk taking and hazardous work practices	50
Working Conditions	52

FIG. 8 Risk Assessment scores — Health & Safety audit template: all nine question groups below the compliance threshold (scores 47–67)

5. ASSESSMENT METHODOLOGY

5.1. Defining the scope of assessment

The assessment covers the entire physical infrastructure of Tuzla Aerodrome, structured across five main domains in accordance with ICAO Annex 14 and Regulation (EU) No 139/2014:

- (1) movement area - runway, taxiways, apron;
- (2) passenger terminals;
- (3) technical infrastructure - power supply systems, aerodrome lighting, communications;
- (4) fuel storage and distribution systems;
- (5) the heliport and offshore facilities.

5.2. Criteria and checklists used in Falcony

The checklists were developed based on the requirements of ICAO Annex 14 (8th edition), EASA CS-ADR-DSN and the applicable AACR regulations. Items were classified a priori by criticality: critical (direct impact on flight safety), major (significant impact on aerodrome operability) and minor (administrative or routine maintenance aspects).

5.3. Data collection and recording process

Data collection was carried out through on-site physical inspections conducted by a team of auditors with competencies in airport infrastructure and applicable aeronautical regulations. Each observation was recorded in real time in the Falcony mobile application, with photographic documentation and precise location within the aerodrome. The process covered both visual inspection of infrastructure elements and verification of available technical documentation.

6. RESULTS

6.1. Audit templates applied and overall scores

The Falcony platform was used to conduct two structured Risk Assessment audits at Tuzla Aerodrome: a FOD Management audit and a Health & Safety audit. Both audits were applied using predefined question groups aligned with ICAO Annex 14 and EASA CS-ADR-DSN requirements. In both cases, all question groups recorded scores in the range of 47 to 67, displayed in red by the platform, indicating that no category reached the minimum compliance threshold.

The FOD Management audit evaluated nine question groups with the following scores: FOD Detection Process (56), Sweeping Frequency (59), Reporting Protocols (57), Response Time (67), Removal Efficiency (49), Source Identification (54), Staff FOD Training (47), Operations Management (50), and Equipment Condition (52). The average score across all FOD Management categories was 54.6.

The Health & Safety audit evaluated nine question groups with the following scores: Chemical Safety (56), Cleanliness and Order (59), Machine Safety (57), Moving around the Area (67), Physical and Biological Work Conditions (49), Physical Workload (54), Psychological and Social Workload (47), Risk Taking and Hazardous Work Practices (50), and Working Conditions (52). The average score for this audit template was likewise 54.6.

6.2. Specific observations recorded in Falcony

In parallel with the structured audits, two specific observations were registered in the Falcony system by aerodrome personnel:

- Quality Nonconformity #2 (25 Apr. 2026, 10:10 AM — angajatul 1, Example Location 2): at the end of runway 04, two non-functional beacon lights marking the PDA threshold were identified. Structure affected: aircraft crew. Due date for remediation: 28 Apr. 2026.

- Others (FOD) #3 (25 Apr. 2026, 11:45 AM — angajatul 2, Example Location 2): FOD objects were identified on taxiway C that were not removed immediately. Structure affected: helicopters performing taxiing (aerial or ground). Assigned to: auditul 1. Global score: 55. Due date: 26 Apr. 2026).

6.3. Reports and visualisations generated by Falcony

Falcony automatically generated risk assessment reports for both audit templates, displaying scores per question group as horizontal bar charts colour-coded by compliance status. All bars appeared in red for both audits, confirming systematic non-compliance across all evaluated dimensions. The lowest individual score recorded was 47 (Staff FOD Training; Psychological and Social Workload), while the highest was 67 (Response Time; Moving around the Area). The observation records were linked directly to the corresponding audit workflows, enabling traceability from the initial field report through to the formal risk assessment output.

6.4. Comparison with ICAO/EASA standards

ICAO Annex 14 and Regulation (EU) No 139/2014 require that aerodrome infrastructure and operational procedures meet defined minimum safety thresholds. The Falcony platform flags any score below 70 as non-compliant (red). Given that all question groups in both audits scored below this threshold [1], the results indicate systemic deficiencies affecting FOD management procedures, staff training, fire safety practices and working conditions. The two specific observations — non-functional runway threshold lights and unremoved FOD on taxiway C — constitute direct non-conformities against ICAO Annex 14 §5.3 (runway markings and lighting) and §9.9 (aerodrome maintenance) respectively [3]. Regulation (EU) No 139/2014 requires the preparation of a corrective action plan with clear deadlines, approved by AACR [5].

7. DISCUSSIONS

The audit results — with all Falcony question groups scoring in the 47–67 range and both specific observations flagged as open non-conformities — indicate that Tuzla Aerodrome faces systemic challenges in both its FOD management procedures and its health and safety practices. This finding is consistent with the specialist literature, which identifies documentation management and organisational safety culture as key determinants in achieving full compliance [12][1].

The concentration of low scores in categories such as Staff FOD Training (47) and Psychological and Social Workload (47) suggests an urgent need for a structured personnel training programme and a review of operational procedures. The experience of European airports that have undergone similar certification processes demonstrates that remediation of procedural deficiencies requires a minimum implementation period of 12 to 18 months [11].

The use of the Falcony platform proved to be a significant methodological advantage. The ability to photographically document each non-conformity, precisely locate it, and automatically link it to the corresponding regulatory requirement substantially enhanced the probative quality of the audit report. These observations are consistent with the findings of studies on the digitalisation of audit processes in the aviation sector [11].

An important limitation of the present research is the static nature of the assessment: the audit conducted represents a snapshot of the compliance status at a given point in time, without capturing the dynamics of improvements or deteriorations over time. A more robust approach would involve repeated periodic audits, tracking the evolution of compliance indicators through the trend functionalities of the Falcony platform

CONCLUSIONS

This article has demonstrated the utility and applicability of the Falcony digital platform as a tool for assessing aerodrome infrastructure compliance, through its application to the case of "Alexandru Podgoreanu" Tuzla International Aerodrome. The main conclusions of the research are:

- Tuzla Aerodrome presents systematic non-compliance across all audited categories, with Risk Assessment scores ranging from 47 to 67 in both the FOD Management and Health & Safety audit templates, and two specific open non-conformities concerning runway lighting and FOD management on taxiway C.

- The Falcony platform proved to be an efficient tool well-suited to the requirements of aerodrome auditing, offering clear advantages over traditional methods in terms of traceability, probative documentation and automated report generation.

- The strategic context of Tuzla Aerodrome requires the acceleration of the non-conformity remediation process and the implementation of a fully functional SMS, in accordance with the requirements of ICAO Doc. 9859 and Regulation (EU) No 139/2014.

Future research directions include: periodic audits to track the evolution of compliance levels over time; extension of the methodology to other regional aerodromes in Romania; and development of an aerodrome compliance maturity model tailored to the specific context of small private operators.

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