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EXECUTIVE COMMITTEE

Agenda Item 20: Innovation in Aviation

INTRODUCTION OF A DIGITAL AUDIT MANAGEMENT MODULE WITHIN TÜRKİYE'S CIVIL AVIATION MANAGEMENT SOFTWARE PLATFORM

(Presented by Türkiye)

EXECUTIVE SUMMARY

This information paper presents the development and implementation of the Digital Audit Management Module within Türkiye's civil aviation management software platform (CTM-ERP) of Corporate Transformation Model (CTM). Designed and operated by the Directorate General of Civil Aviation (DGCA), the module supports comprehensive digital management of risk calculation, audit planning, execution, and findings. The system strengthens regulatory oversight, enhances transparency, and improves the overall safety culture in civil aviation operations.

<i>Strategic Goals:</i>	This working paper relates to Strategic Goals <i>Every Flight is Safe and Secure; No Country Left Behind; The Economic Development of Air Transport Assures the Delivery of Economic Prosperity and Societal Well-Being for All; and Aviation Delivers Seamless, Accessible, and Reliable Mobility for All.</i>
<i>Financial implications:</i>	
<i>References:</i>	Audit Procedures Manual of DGCA Türkiye (SHT-DENETİM)

1. INTRODUCTION

1.1 Audit activities conducted within the aviation sector play a critical role in ensuring flight safety, monitoring operational compliance, and maintaining full adherence to both national and international regulations. These audits encompass a wide range of complex and dynamic processes applied to various types of aviation organizations, including air operators, maintenance organizations, airport operators etc.

1.2 In recent years, the digitalization of audit processes has initiated a significant structural transformation in the way regulatory oversight is conducted. The integration of digital tools for planning, execution, findings management, and reporting enables audit workflows to be managed through a centralized platform. This approach not only enhances operational efficiency but also ensures more effective tracking of preventive and corrective actions, strengthens the accuracy and integrity of audit data,

and fosters a transparent, reliable, and sustainable channel of communication between the regulatory authority and industry organizations.

1.3 Within this context, a web-based audit management module within the national civil aviation digital platform developed and actively used by the national civil aviation authority stands out as a good practice example contributing to both the reinforcement of regulatory compliance and the establishment of a sustainable safety oversight culture.

2. DIGITAL AUDIT MANAGEMENT MODULE

2.1 In order to ensure that civil aviation-related processes are conducted in a more centralized, traceable, and efficient manner, the Directorate General of Civil Aviation (DGCA) of Türkiye has developed a national digital transformation platform accessible via “www.ctmerp.shgm.gov.tr” and the KDM ERP (CTM ERP) mobile application.

2.2 This platform hosts a wide range of modules designed to digitalize various processes in line with the vision of digitalization in the aviation domain. One of these modules, the audit management module, enables the digital monitoring and management of aviation organizations’ compliance with safety and quality standards.

2.3 On the web-based platform, the module offers an end-to-end digital audit process that includes core functions such as risk scoring, audit planning, audit execution, and finding management. Within the module, the audit definitions section allows for the configuration of several key elements such as audit domains, checklists, frequently encountered finding types, audit questions, and risk analysis matrices. Through this section, audit processes are standardized, customized forms can be assigned for different types of audits, and performance indicators for operators can be systematically monitored.

2.4 All audit checklist items have been reviewed and updated to ensure they are analytically measurable. For example, questions related to bird strikes within the scope of an airport audit have been aligned with statistical data available in the system's occurrence reporting module.

2.5 Additionally, risk matrices can be created to categorize non-conformities as low, medium, or high risk, and corrective actions can be prioritized accordingly. The system also allows for the assignment of on-site and off-site checklist questions and supports the definition of performance indicators in key areas such as safety, operations, and maintenance for Air Operators Certificate (AOC) holders.

2.6 For on-site audits, inspectors are required to upload evidence in the form of photographs or videos via the mobile application. In mobile inspections, any visual content captured through the application automatically embeds the inspector's user credentials, geolocation data, and timestamp in the bottom right corner of the image or video.

2.7 There are four main functions of audit management: risk scoring, audit planning, audit execution, and finding pool. These functions ensure that the entire audit lifecycle is carried out digitally and monitored within a centralized structure.

2.8 The risk scoring feature enables the DGCA to evaluate the risk level of each aviation organization based on criteria such as type of operation, previous audit performance, and compliance status. The resulting risk scores are used to determine audit priorities and allocate audit resources efficiently.

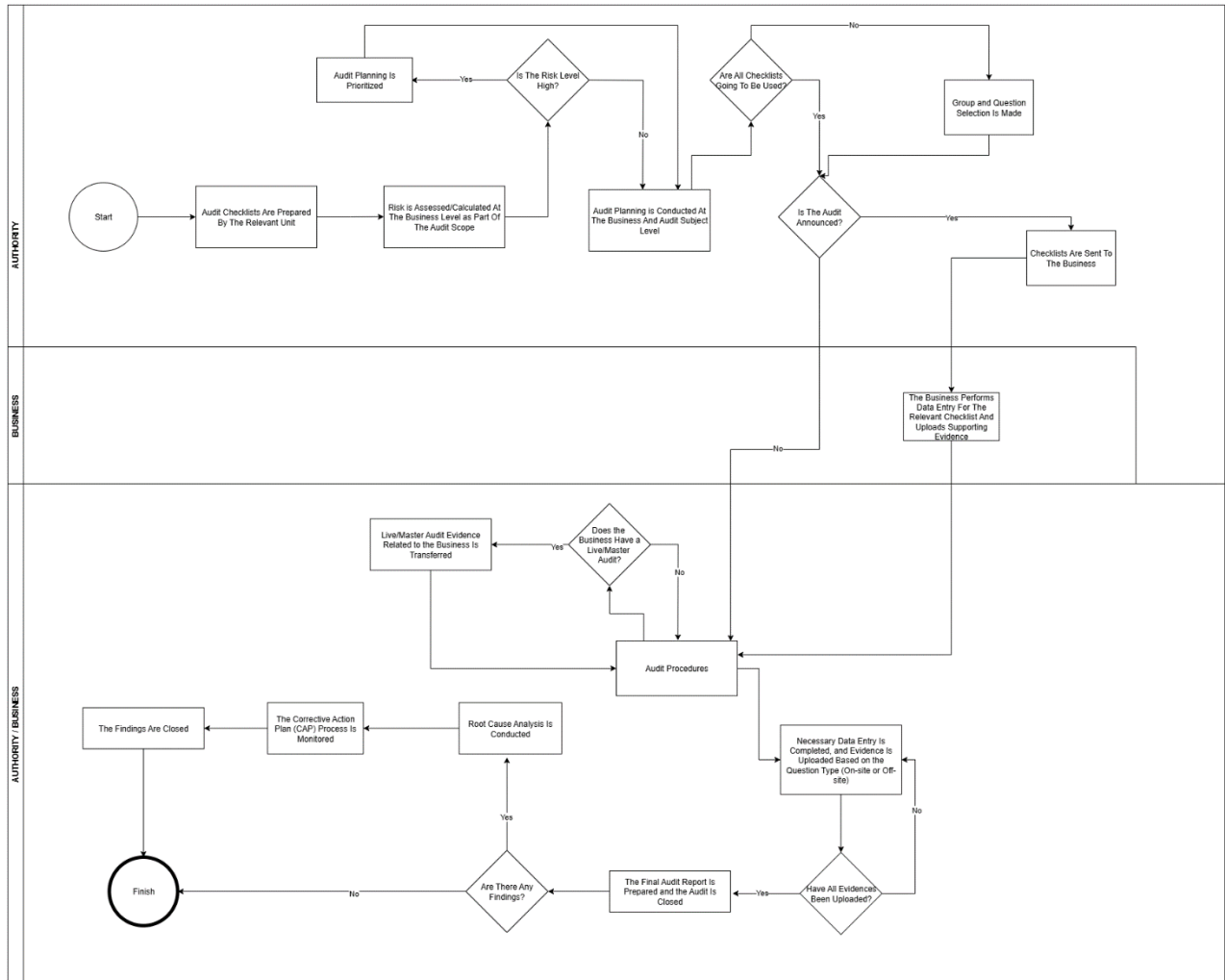
2.9 Through the audit planning screen, annual and periodic audit plans are generated based on risk levels; audit teams are assigned, timelines are scheduled, and coordination with relevant units is established. This planning structure supports both scheduled and risk-based auditing approaches.

2.10 The audit execution screen serves as the main interface for managing all audit activities conducted by the DGCA. Through this interface, audit plans are carried out, documents are made accessible, and findings are recorded. All of the questions identified during audits are entered into the system in real time and supported by relevant documentation. The reporting and evaluation of these findings are carried out in accordance with the DGCA Türkiye's "Instruction on Audit Procedures for Aviation Enterprises (SHT-DENETİM)." All findings are consolidated within a centralized finding pool, which facilitates classification, analysis of similar cases, and use as a reference in future audits.

2.11 Within the web-based audit management system, users are provided access to checklists associated with specific audits. For each checklist, a downloadable PDF report is generated that incorporates QR code functionality designed to enhance user guidance and streamline data entry. Specifically, each question within the checklist is accompanied by two distinct QR codes. The first QR code redirects users to a sample response document, offering illustrative guidance on how the question should be answered. The second QR code facilitates direct interaction with the mobile application, allowing users to input their responses within the system. Additionally, the mobile interface includes functionality for uploading supporting documentation, enabling inspectors to submit relevant evidence during the audit process.

2.12 Moreover, the system enables continuous oversight of each aviation organization by maintaining open access to master audit records based on checklists. It also allows organizations or authorized auditors to upload supporting evidence immediately upon any change in the current status of checklist items. Through this feature, any audit-relevant change within an aviation organization can be instantly recorded in the system and tracked in real time. The ability to provide supporting documentation at each step of the audit process significantly contributes to the overall accuracy, traceability, and reliability of the findings, thereby strengthening the integrity of the audit outcomes.

3. AUDIT PROCESS SWIMLANE FLOWCHART



4. SAMPLE SCREENSHOTS

CHECKLIST DEFINITION

ADD

Organization:

Form Name:

Document number:

Revision Number:

Revision Date:

Form-4 Title/Code to be Approved:

Target group:

Explanation:

Save

Transposition	Organization	Form Name	Document number	Revision	Matrix Value	Revision Date	Form-4 Title/Code to be Approved	Target group	Explanation
	Uganda Revenue Authority	Uganda Revenue Authority	Uganda Revenue Authority	1					
	Uganda Revenue Authority	Uganda Revenue Authority	Uganda Revenue Authority	2					
	Uganda Revenue Authority	Uganda Revenue Authority	Uganda Revenue Authority	3					
	Uganda Revenue Authority	Uganda Revenue Authority	Uganda Revenue Authority	4					
	Uganda Revenue Authority	Uganda Revenue Authority	Uganda Revenue Authority	5					
	Uganda Revenue Authority	Uganda Revenue Authority	Uganda Revenue Authority	6					
	Uganda Revenue Authority	Uganda Revenue Authority	Uganda Revenue Authority	7					
	Uganda Revenue Authority	Uganda Revenue Authority	Uganda Revenue Authority	8					
	Uganda Revenue Authority	Uganda Revenue Authority	Uganda Revenue Authority	9					
	Uganda Revenue Authority	Uganda Revenue Authority	Uganda Revenue Authority	10					
	Uganda Revenue Authority	Uganda Revenue Authority	Uganda Revenue Authority	11					
	Uganda Revenue Authority	Uganda Revenue Authority	Uganda Revenue Authority	12					
	Uganda Revenue Authority	Uganda Revenue Authority	Uganda Revenue Authority	13					
	Uganda Revenue Authority	Uganda Revenue Authority	Uganda Revenue Authority	14					
	Uganda Revenue Authority	Uganda Revenue Authority	Uganda Revenue Authority	15					
	Uganda Revenue Authority	Uganda Revenue Authority	Uganda Revenue Authority	16					
	Uganda Revenue Authority	Uganda Revenue Authority	Uganda Revenue Authority	17					
	Uganda Revenue Authority	Uganda Revenue Authority	Uganda Revenue Authority	18					
	Uganda Revenue Authority	Uganda Revenue Authority	Uganda Revenue Authority	19					
	Uganda Revenue Authority	Uganda Revenue Authority	Uganda Revenue Authority	20					

Preparing Checklist

MATRIX LEVEL DETERMINATION

ADD

Definition:

Value Type:

Risk Value:

Start Date:

End Date:

Explanation:

Save

Transposition	Definition	Value Type	Risk Value	Start Date	End Date	Risk Value	Explanation
1.1	Sign documents and stamps	High	1.00	01-01-2020	01-12-2020	1.00	
1.2	Sign documents and stamps	High	1.00	01-01-2020	01-12-2020	1.00	
1.3	Sign documents and stamps	High	1.00	01-01-2020	01-12-2020	1.00	
1.4	Sign documents and stamps	High	1.00	01-01-2020	01-12-2020	1.00	
1.5	Sign documents and stamps	High	1.00	01-01-2020	01-12-2020	1.00	
1.6	Sign documents and stamps	High	1.00	01-01-2020	01-12-2020	1.00	
1.7	Sign documents and stamps	High	1.00	01-01-2020	01-12-2020	1.00	
1.8	Sign documents and stamps	High	1.00	01-01-2020	01-12-2020	1.00	
1.9	Sign documents and stamps	High	1.00	01-01-2020	01-12-2020	1.00	
1.10	Sign documents and stamps	High	1.00	01-01-2020	01-12-2020	1.00	
1.11	Sign documents and stamps	High	1.00	01-01-2020	01-12-2020	1.00	
1.12	Sign documents and stamps	High	1.00	01-01-2020	01-12-2020	1.00	
1.13	Sign documents and stamps	High	1.00	01-01-2020	01-12-2020	1.00	
1.14	Sign documents and stamps	High	1.00	01-01-2020	01-12-2020	1.00	
1.15	Sign documents and stamps	High	1.00	01-01-2020	01-12-2020	1.00	
1.16	Sign documents and stamps	High	1.00	01-01-2020	01-12-2020	1.00	
1.17	Sign documents and stamps	High	1.00	01-01-2020	01-12-2020	1.00	
1.18	Sign documents and stamps	High	1.00	01-01-2020	01-12-2020	1.00	
1.19	Sign documents and stamps	High	1.00	01-01-2020	01-12-2020	1.00	
1.20	Sign documents and stamps	High	1.00	01-01-2020	01-12-2020	1.00	

Risk Matrix Definition

Creating a Risk Matrix Assessment Formula Calculation

Checklist Question and Sub-Atomic Value Identification

RISK DATA

EDIT

Definition: Last SIGHT Audit (Bonds)

Formula Risk Value: 2.00

Risk Value: 3.00

Explanation:

Save

Definition	Formula	Value	Repeat	Repeat Period	Document	Document Type	Explanation	Approval Date	Approval Status
See SIGHT Definition (g)									
2 Ind SIGHT Bonds (g)									
Incident One SIGHT Bonds (g)									
Kapita Kajian (g)									
Growth Performance (g)		0.00		24 Months					
Domestic Performance (g)		1.00		24 Months					
Domestic Performance (g)		2.00		24 Months					
Domestic Performance (g)		3.00		24 Months					
Domestic Performance (g)		4.00		24 Months					
Domestic Performance (g)		5.00		24 Months					
Domestic Performance (g)		6.00		24 Months					
Domestic Performance (g)		7.00		24 Months					
Domestic Performance (g)		8.00		24 Months					
Domestic Performance (g)		9.00		24 Months					
Domestic Performance (g)		10.00		24 Months					
Domestic Performance (g)		11.00		24 Months					
Domestic Performance (g)		12.00		24 Months					
Domestic Performance (g)		13.00		24 Months					
Domestic Performance (g)		14.00		24 Months					
Domestic Performance (g)		15.00		24 Months					
Domestic Performance (g)		16.00		24 Months					
Domestic Performance (g)		17.00		24 Months					
Domestic Performance (g)		18.00		24 Months					
Domestic Performance (g)		19.00		24 Months					
Domestic Performance (g)		20.00		24 Months					
Domestic Performance (g)		21.00		24 Months					
Domestic Performance (g)		22.00		24 Months					
Domestic Performance (g)		23.00		24 Months					
Domestic Performance (g)		24.00		24 Months					
Domestic Performance (g)		25.00		24 Months					
Domestic Performance (g)		26.00		24 Months					
Domestic Performance (g)		27.00		24 Months					
Domestic Performance (g)		28.00		24 Months					
Domestic Performance (g)		29.00		24 Months					
Domestic Performance (g)		30.00		24 Months					
Domestic Performance (g)		31.00		24 Months					
Domestic Performance (g)		32.00		24 Months					

Records Per Page: 25

shown 1-4 Between 0 Total Registration

Back

Risk Calculation - Risk Data Entry

RISK SCORE CALCULATION

Document	Unit	Performed By	Operation	Risk Status	Risk Status	Last Inspection Date	Risk Score	Calculation Coefficient	Risk Level	Repeat Period	Document Status	Document Type	Explanation	Approval Date	Approval Status
High Risk	High Risk	High Risk	High Risk	High Risk	High Risk	24.06.2025	32.00		High Risk	24 Months					
High Risk	High Risk	High Risk	High Risk	High Risk	High Risk	06.05.2025	27.00		High Risk	1 Year					
High Risk	High Risk	High Risk	High Risk	High Risk	High Risk	20.05.2025	32.00		High Risk	24 Months					
High Risk	High Risk	High Risk	High Risk	High Risk	High Risk	06.05.2025	32.00		High Risk	24 Months					
High Risk	High Risk	High Risk	High Risk	High Risk	High Risk	01.02.2022	3.80		High Risk	1 Year				28.06.2025	
High Risk	High Risk	High Risk	High Risk	High Risk	High Risk	27.05.2025	25.00		High Risk	36 Months					

Determination of Audit Intervals Based on Risk Scores

PLANNING PROCEDURES

ADD Close

Unit: Make Your Choice

Civil Administrative Chief Type: Make Choice

Operation: Enter At Least Three Characters

Audit Year: Make Choice

Control Type: Make Choice

Audit Purpose: Make Choice

Control Form: Make Choice

Audit Month: Make Choice

Resource Type: Make Choice

News Type: Make Choice

Planning Type: Make Choice

How It Happens: Make Choice

Risk Level: Make Choice

Audit Score:

Emergency Situation: Make Choice

Activity Type: Make Choice

Unit (Head of the Delegation): Make Choice

Personal (Head of the Delegation): Enter At Least Three Characters

Planned Start Date: Make Choice

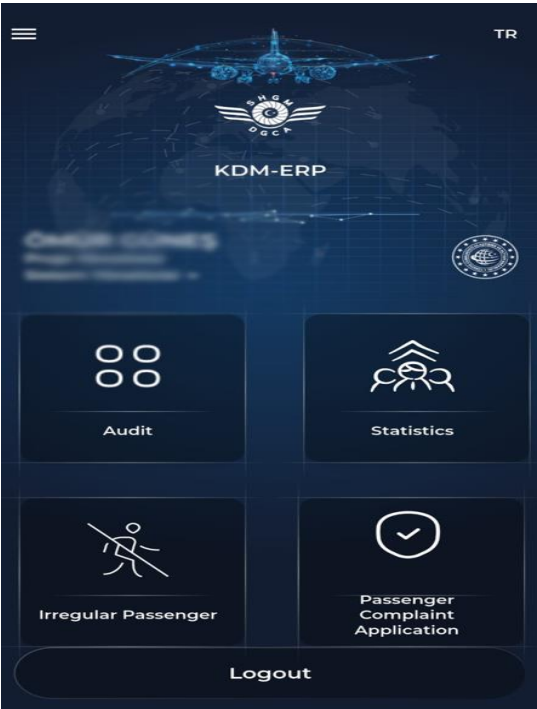
Planned Completion Date: Make Choice

Registration Mark: Make Your Choice

Application Number: Make Choice

Ordnancea Resources Non: Make Choice

Periodic and Non-Periodic Audit Planning



Mobile Application Overview

The image shows two overlapping mobile application screens. The top screen is titled 'Audit' and has a dark header with a back arrow and a filter icon. Below the header is a grey box with a plus icon. The bottom screen is titled 'Details' and has a white header with a back arrow. It displays a list of audit details for 'AGARTHA TEKNOLOJİ'.

AGARTHA TEKNOLOJİ	
Sub-Unit:	-
Audit ID Number:	2020-0000
Audit Plan:	Genel Kurul Kararı ile Kararlı Olarak Kararlı Olarak
Planned Start Date	20/01/2020
Actual Start Date:	20/01/2020
Has Evidences:	No
Sent to Company:	No
Approval Status:	No
Company Last Response Date:	-
Number of Evidences:	0
Number of Closed Evidences:	0
Registration Mark:	-
Organization :	Uygun Standartlar Koordinatörlüğü

At the bottom of the 'Details' screen, there is a dark blue button labeled 'Process' and two circular buttons with download and upload icons.

Mobile Application Audit Details



Audit Procedures via Mobile Application (On-Site Audit Evidence Sample)

[illegible]

Audit Procedures Archive



Final Audit Report with Electronic Signature and QR Code

5. CONCLUSION

5.1 The digital audit management module developed by Türkiye's Directorate General of Civil Aviation represents a significant advancement in enhancing the efficiency, transparency, and traceability of aviation oversight processes. By enabling end-to-end digital management of audit activities, the system contributes to the continuous improvement of safety performance and regulatory compliance, in alignment with ICAO's strategic objectives and oversight framework.

— END —