

Automated Visual Inspection with Drone, by Airbus

A4A NDT Forum
San Antonio, 27-29 Sept. 2022

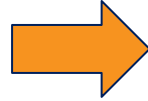
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Manual vs Automated Visual Inspection



As Is:
Manual **A/C** inspection



To Be:
A/C inspection using **Drone**

Current Pain Points

- **Time** Consuming
- A/C **unavailability** due to unscheduled events causes a loss to operators
- **Towing** the A/C to hangar during unscheduled events
- Not a **safe** environment for the inspector
- Difficult to **access** and **track** the inspection data
- Inspection reporting is not **standardized**

- General Visual Inspection, AMM scheduled task → indoors
- GVI after lightning strike, unscheduled task → indoors and outdoors

Visual Inspection with Drone(s)...

A quite widespread idea around the world...

Drone is attractive... it's fun and looks easy as ABC...

First projects launched in 2013, with announced entry into service in 2014... Didn't happen...

WHY? The mission of a drone doing a visual inspection is to detect defects/damages expected to be detected.

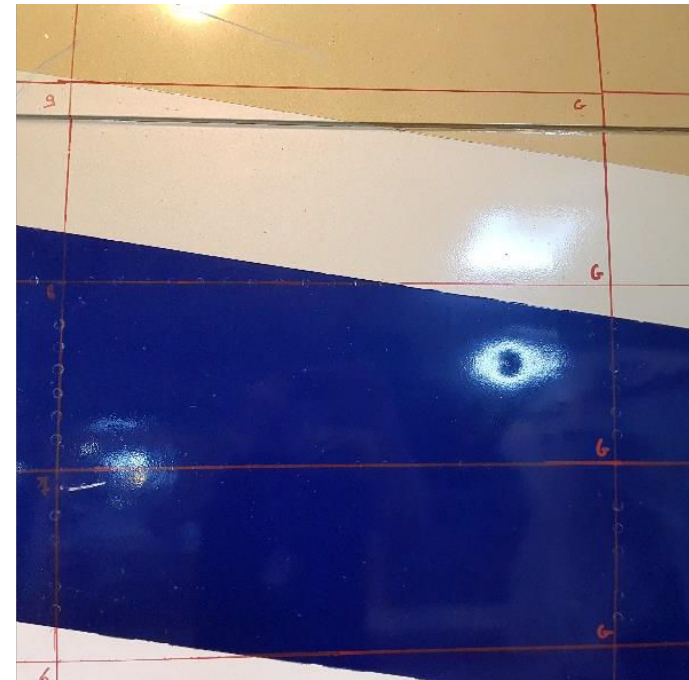
It's not about flying and taking nice pictures!

Visual Inspection with a drone
is an INSPECTION topic

Automated Visual Inspection with Drone

Back to what matters

- Ensure detection
- Minimize inspection time



Not only a matter of number of pixels!

Automated Visual Inspection with Drone

Design of a visual inspection system to be embarked on a drone

- Work with inspectors to understand their operating mode for detection



- An engineering phase to design an efficient inspection strategy and visual inspection payload

Drone package content

- **Hardware**
 - Drone
 - Tablet PC - with software to set-up and check the drone flight
 - Ground Station, light and easy to use for navigation and easy pictures & video processing
 - Spare batteries and other accessories
- **Software**
 - to choose the inspection flight
 - to analyse the pictures and generate report
 - Cloud Service to store the data and access
- **Yearly maintenance** package.
- All material will be delivered in two suitcases to ease transport and installation



Pre-flight steps

Mission & flight plan selection

1 2 3 4 5 6
Mission Settings Flight Plan Calibration UAV Check System Check Start

Mission Settings

A/C Type*

MSN / Registration *

Flight Cycles*

Inspection Type*

Inspection Context*

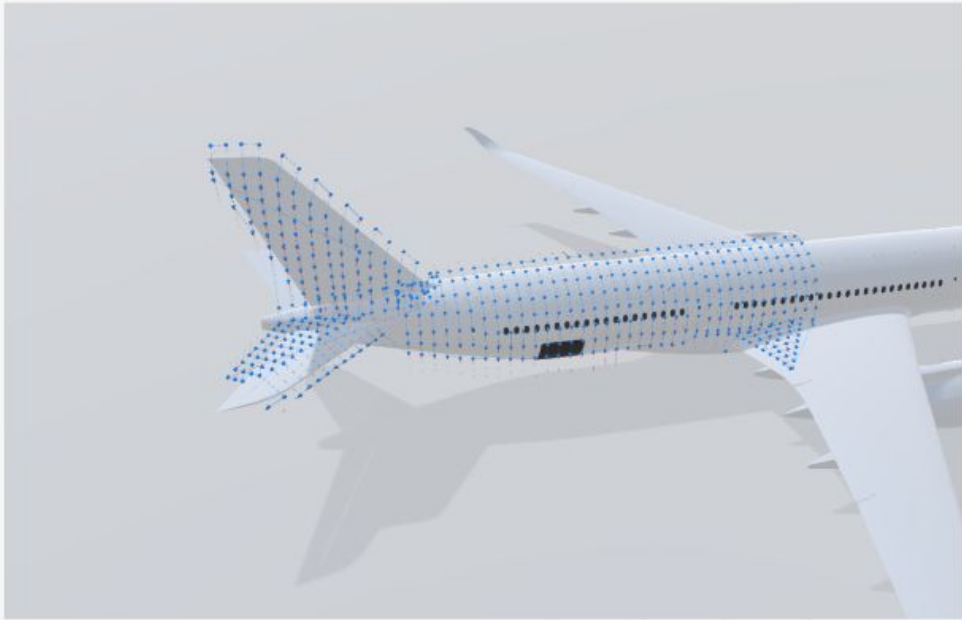
Inspector Name

Location

* Mandatory fields

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1 2 3 4 5 6
Mission Settings Flight Plan Calibration UAV Check System Check Start



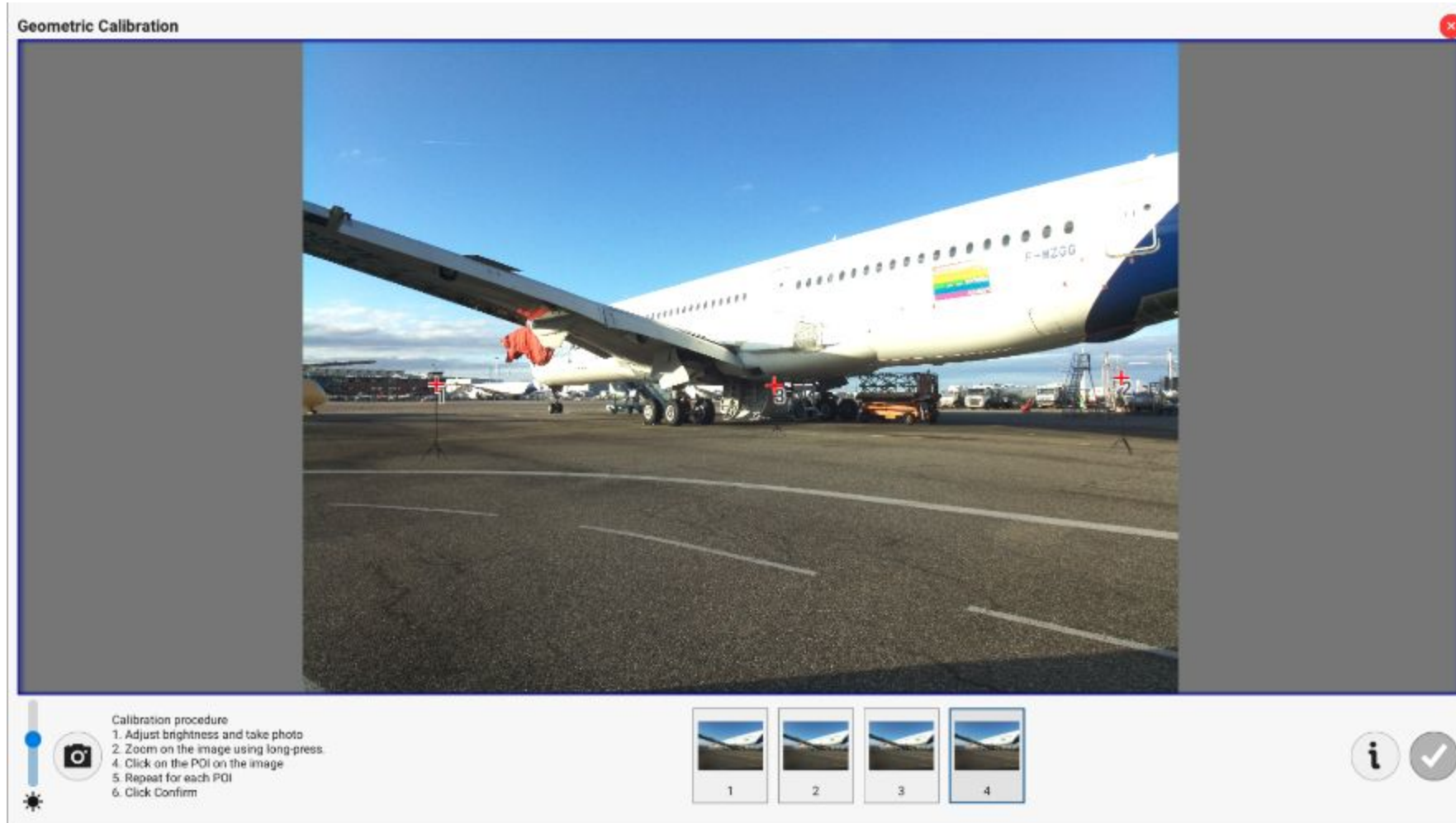
Flight plan settings

Select an area of interest

Select a flight plan:

Pre-flight steps

Flight calibration



Pre-flight steps

Pre-flight checks & summary

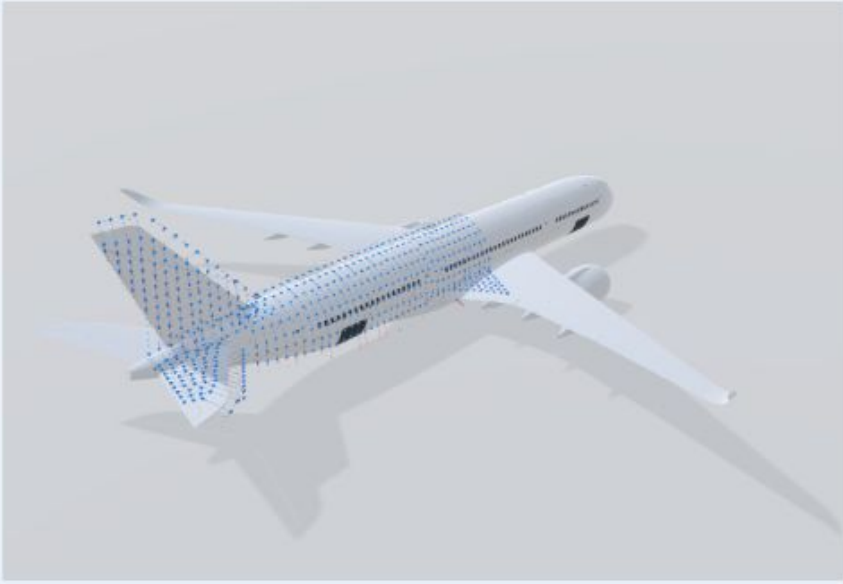
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BY AIRBUS & COINTEGRITY

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Mission SettingsFlight PlanCalibrationUAV CheckSystem CheckStart

Mission overview



A350-900_XXX-FC_500-GVI Zonal Inspection-Back Right-19/09/2022 10:09:08
19/09/2022 | Demo

Mission Details

Inspection Type	Gvi
Inspection Context	Outdoor
MSN	XXX
A/C Model	A350-900
Area of interest	BackRight

Status

UAV Battery	90%
Tablet Battery	100%
Disk space	120GB
Connection strength	95%
Communications	OK
Mechanical state	OK
Position	OK

← Previous

Abort Mission

Start

General Visual Inspection Flight



Post-flight: analysis

Inspection creation

Create a new inspection

Aircraft Type: A320

Aircraft Model: A320-200N

MSN / Registration: A320N-M90

Flight Cycles: 0

Task: General Visual Inspection of upper half of fuselage

Jobcard Number:

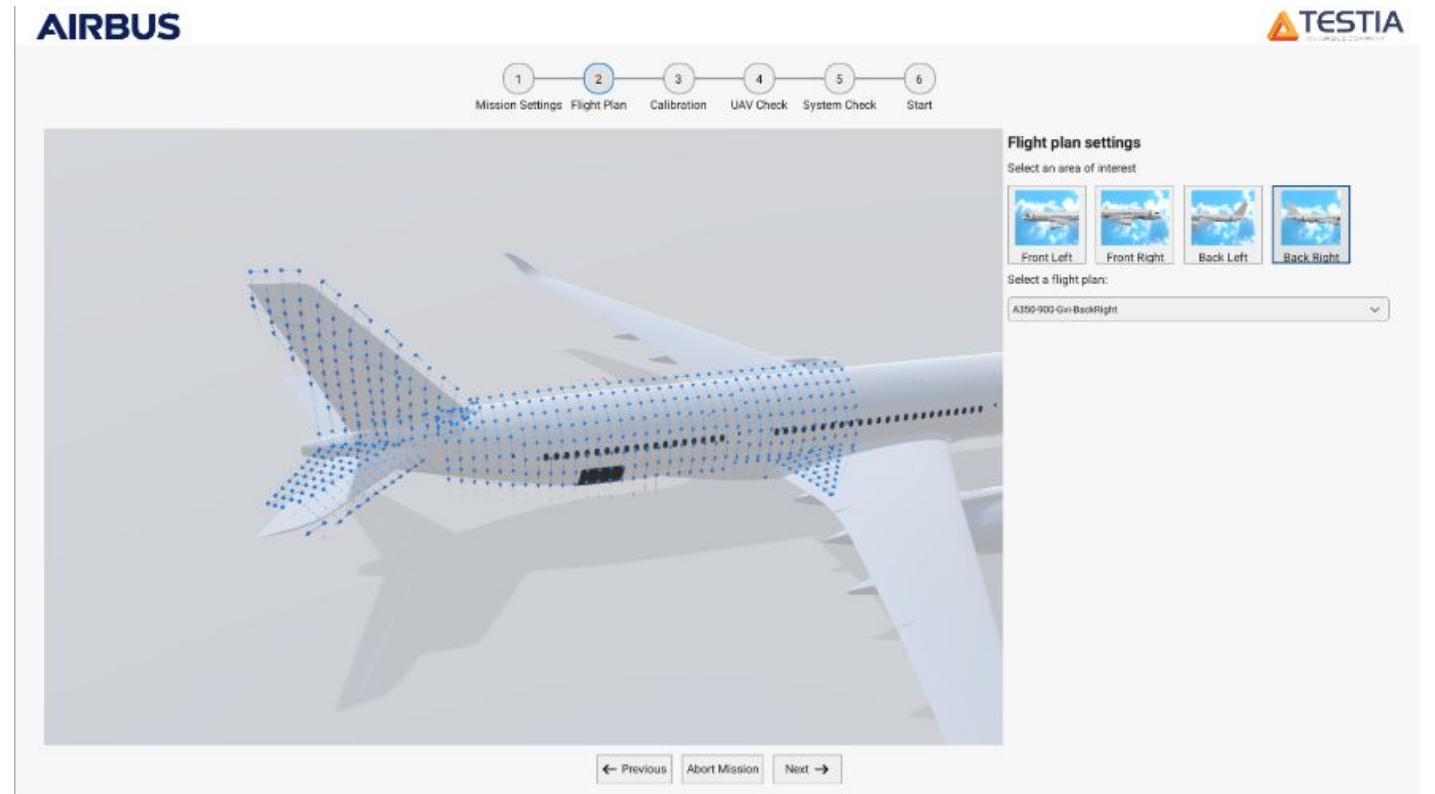
Inspector Name:

Description:

Flights

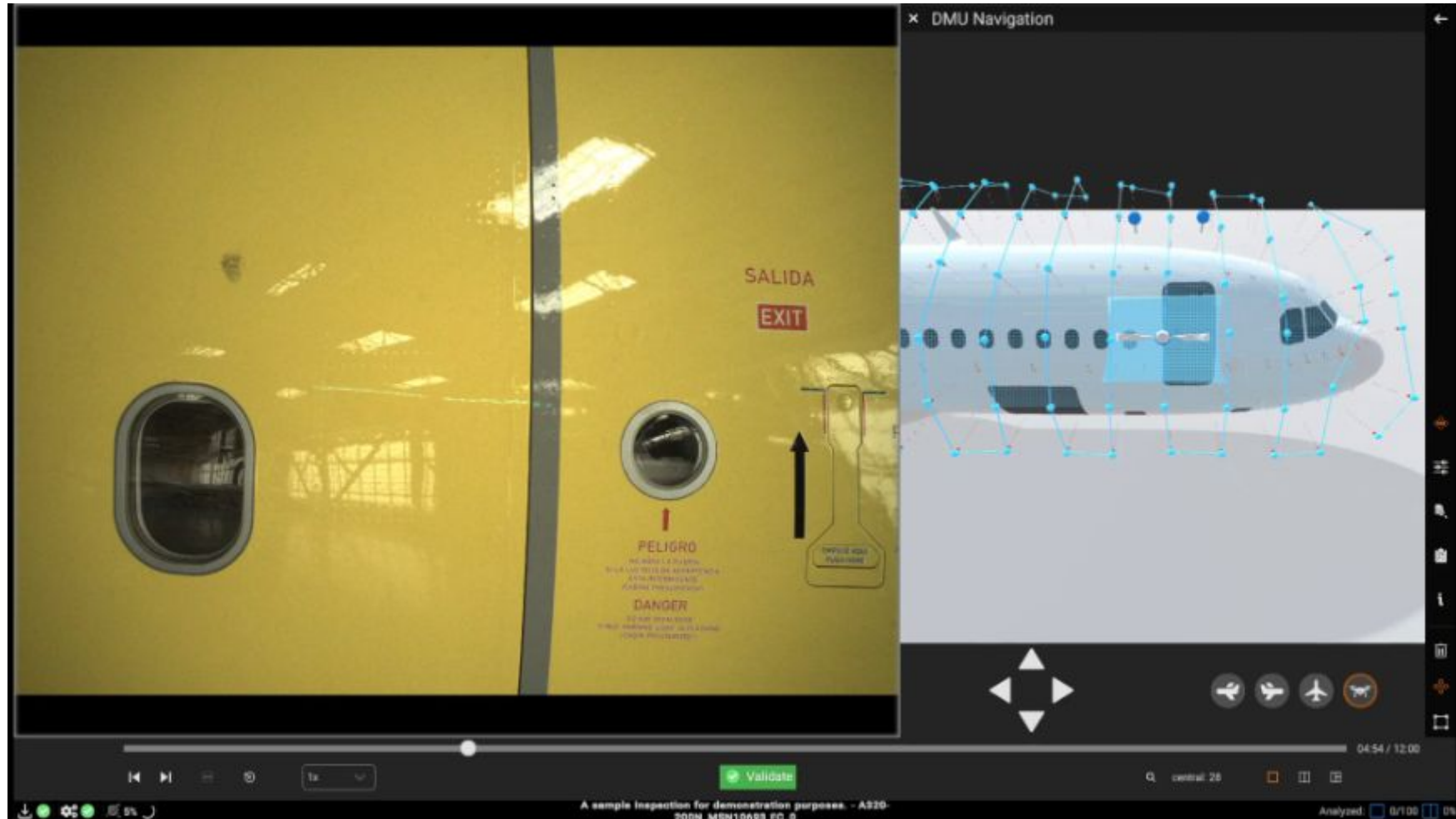
00126	Tuesday, 19 July 2022 16:54	Local
✓	Type: GVI Zonal inspection Indoor Area: Back Right	
00125	Tuesday, 19 July 2022 16:55	Local
✓	Type: GVI Zonal inspection Indoor Area: Back Right	

Cancel Create



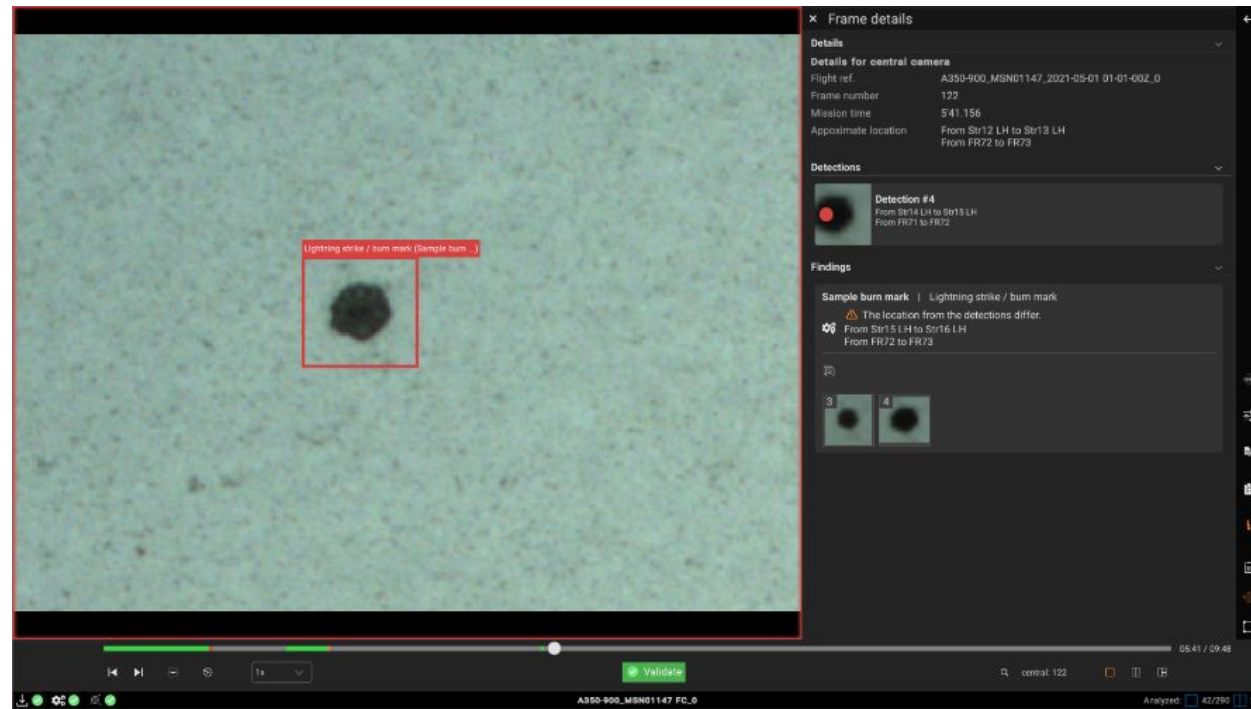
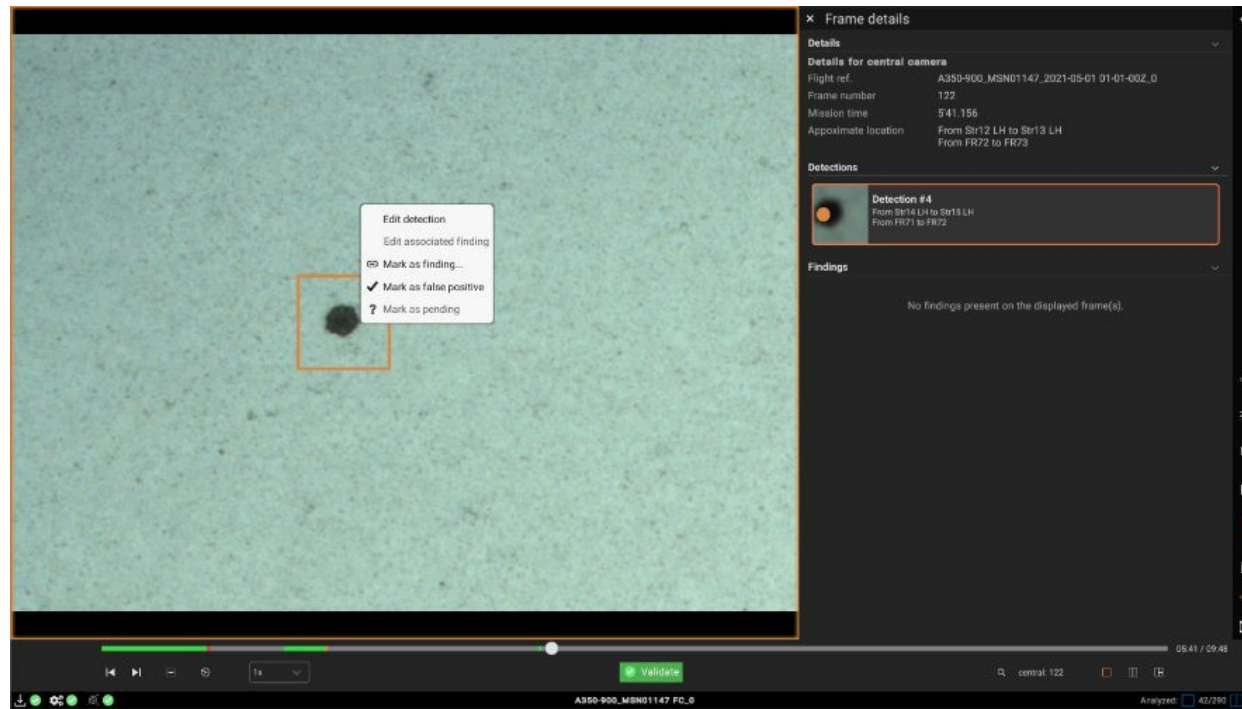
Post-flight: analysis

Navigating through inspection data



Post-flight: analysis

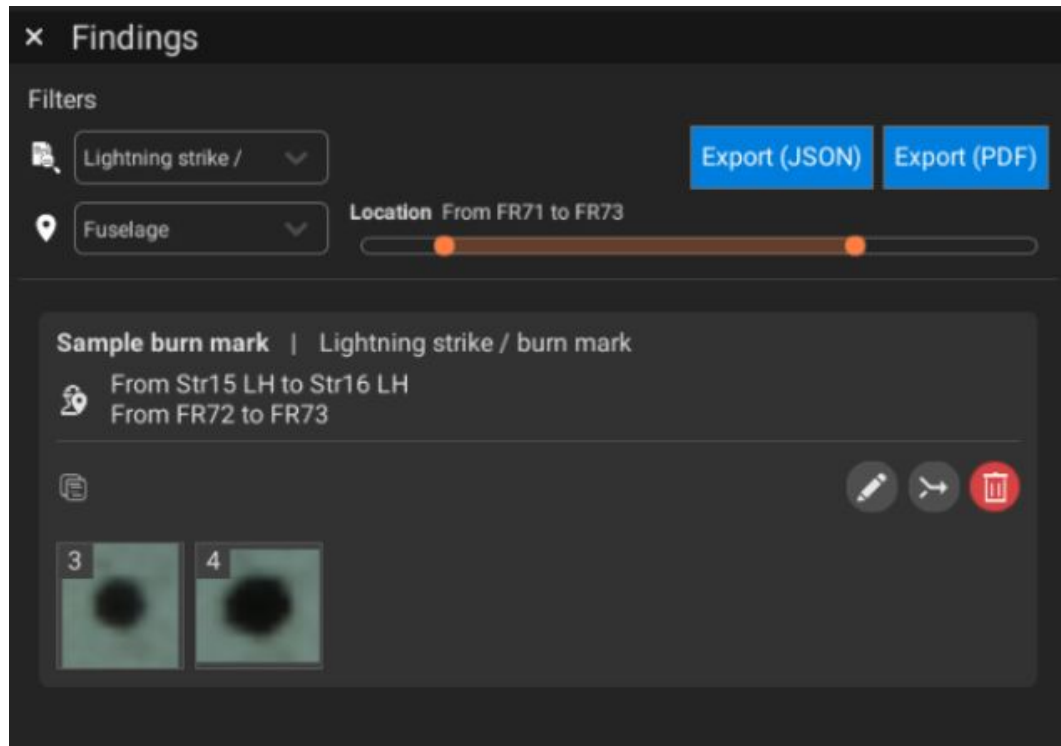
Damage labelling



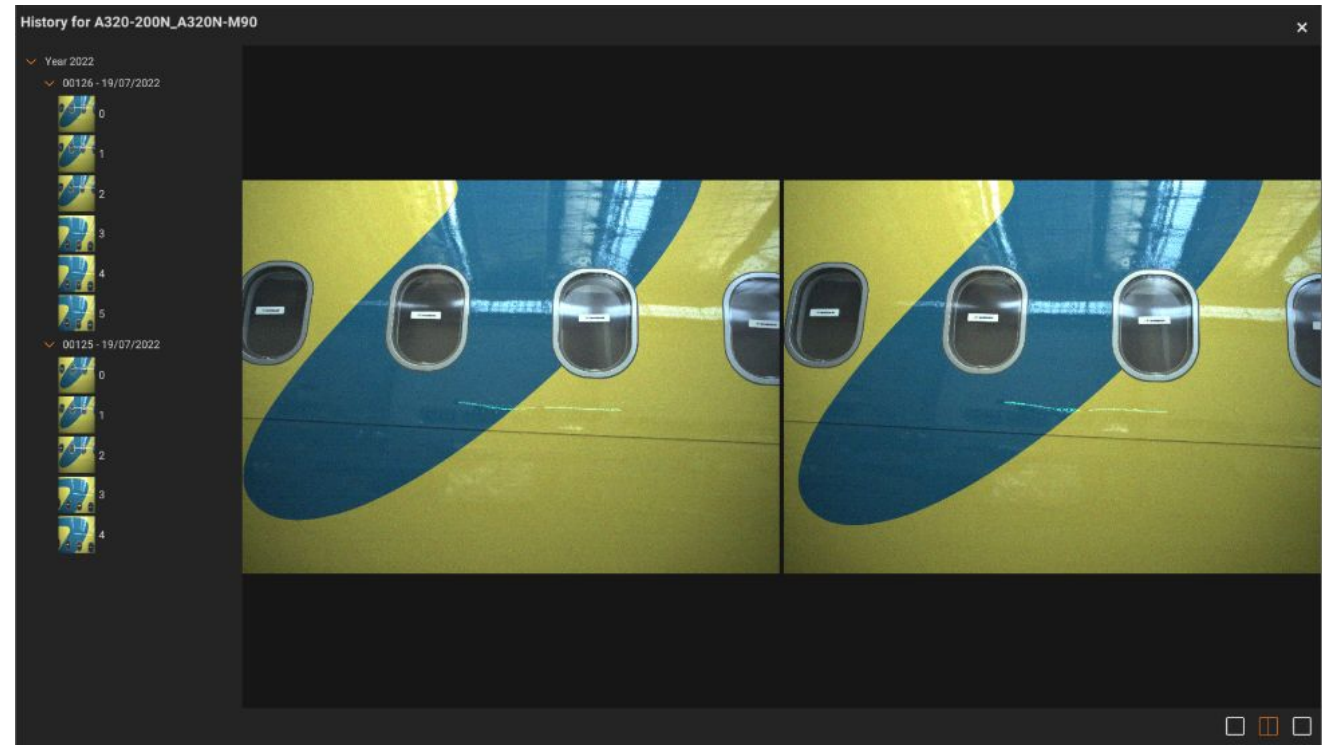
Post-flight: analysis

Data review features

Filtering



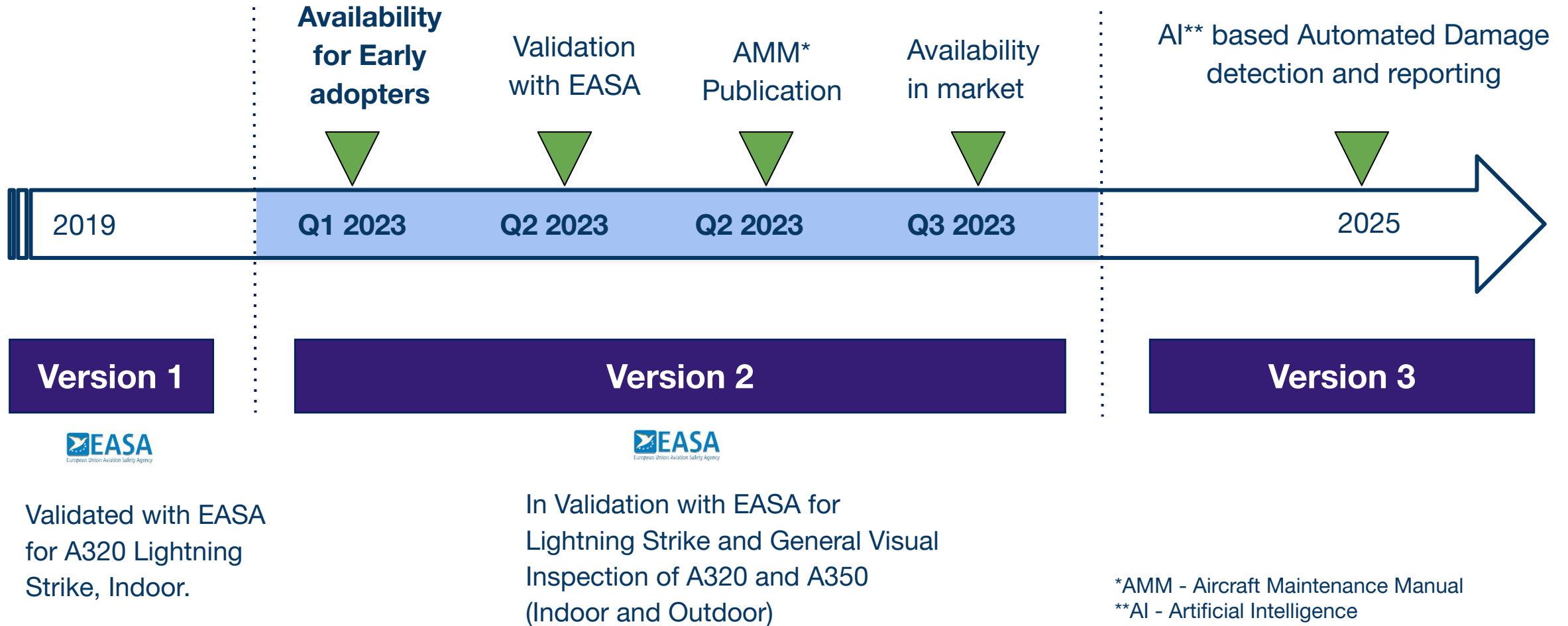
Comparison with previous inspections



Video

- Promotional video

Inspection Drone roadmap



Thank you

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