AIDA Case Study
Models, documentation

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Summary

This document aims at gathering all the content of the AIDA case study realized in the frame of the S2C project.

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Table of Contents

Evolutions....3
1 Document content....4
2 Case study description....4
3 System engineering activities....5
4 Safety analyses....6

Evolutions

Version	Date	Modified §	Modification summary	Modified by
1	31/03/2022	N/A	Creation	R.Demachy
2	21/10/2022	2-3-4	Update for final delivery : - reference to open-source repositories - details of all versions realized and used in S2C	R.Demachy
3	22/03/2023	1	Update of header and footer to be in line with new S2C template Addition of the link to AIDA storage	S. Delavault

1 Document content

This document aims at gathering all the elements that constitute the AIDA case study used in the S2C project. Although the final objective of the project is to distribute these elements through a public repository, this intermediate deliverable contains the case study elements as .zip archives.

The reader shall keep in mind that at this stage of the project, the case study does not aims at being complete:

- The requirements associated to the various systems, sub-systems and items are not complete. When they exist, they are mainly related to the safety activities (safety requirements generated from FHA and PASA actitivies, etc…)
- The safety model covers only the functional architecture, and does not take into account logical/physical aspects.
- The safety documents do not cover all the perimeter and the systemic levels of the case study.

All the documents, analyses, models described here are available there: https://sahara.irt-saintexupery.com/AIDA

2 Case study description

AIDA is composed of a quadcopter drone, a control computer and a remote control as illustrated in Figure 1. The mission of AIDA is to help the pilot to inspect the aircraft before flight. The quadcopter drone is piloted automatically or manually. In manual mode, the pilot guides the inspection of the aircraft by the drone. In automated mode, the drone follows a flight plan and records the video of the inspected zone (see Figure 2 for a flight plan and video capture examples).

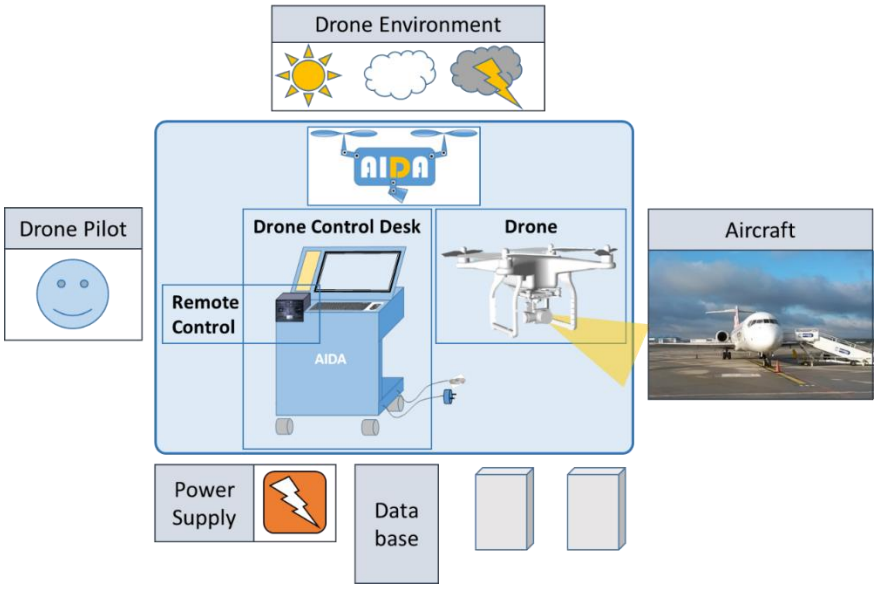

Figure 1: Illustration of AIDA Product Breakdown Structure (PBS) and its environment

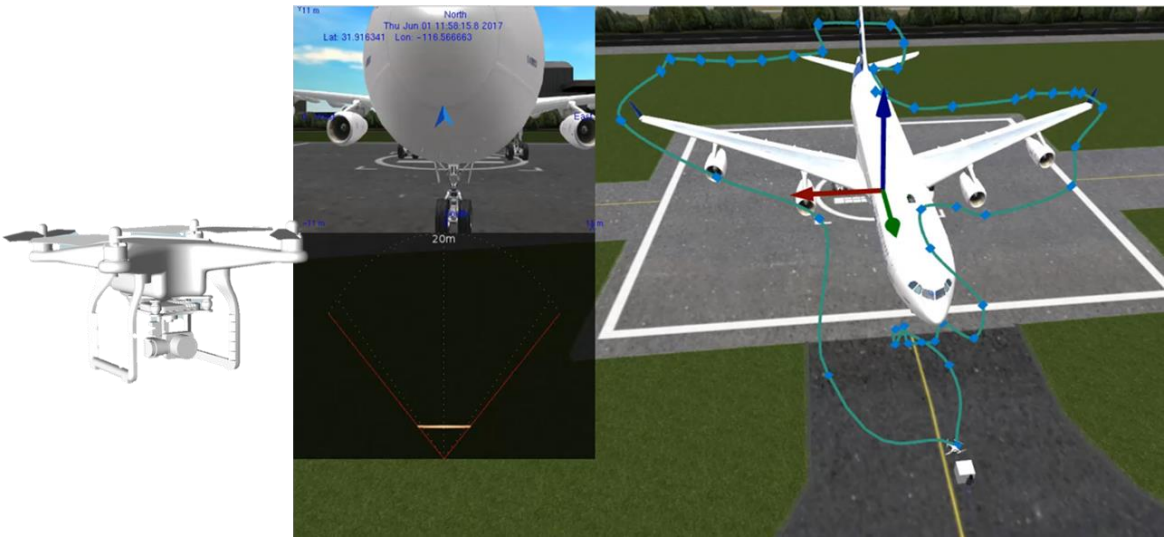

Figure 2: Illustration of AIDA mission

Table 1 gives the metrics for AIDA system models.

Type of model element	MBSE model	MBSA model
High level functions (including external ones)	~20	~10
Leaf functions	~130	~110
Ports	~500	~500
Communication between functions	~290 flows	~380 segments

Table 1: Approximate metrics on MBSE and MBSA models for the AIDA study case (valid for the versions mentioned in this document)

From a safety point of view, FHA (for acronyms see §2.3 of **Erreur ! Source du renvoi introuvable.**) identifies four failure conditions:

- FC CAT: “Uncontrolled drone (drone fly away) in an unauthorized area”
- FC HAZ: “Uncontrolled drone in an authorized area”
- FC MAJ: “Loss of drone capability leading to mission abortion”
- FC MAJ: “Loss of drone protection”

3 System engineering activities

The System Engineering elements of the case study are available on the following repository: https://sahara.irt-saintexupery.com/AIDA/AIDAArchitecture

Several versions of the study case have been used and/or created during the S2C project. The table below details these versions and gives the associated tag in the corresponding repository.

System version	Description	Associated tag
V4.2	System version available at the beginning of the project	V4.2
V4.3	Minor evolution of V4.2, also available at the beginning of the projet.	V4.3
V4.4.1	First intermediate versions between V4.3 and V4.4 final, with evolutions of the functional architecture only	V4.4.1

V4.4.2	Second intermediate versions between V4.3 and V4.4 final, with evolutions of the functional architecture only	V4.4.2
V4.4.3	Third intermediate versions between V4.3 and V4.4 final, with evolutions of the functional architecture only. Functional architecture freeze for V4.4	V4.4.3
V4.4 final	final V4.4 system version, with complete refactor of logical and physical architecture	V4.4_final
V4.5	final system architecture version for S2C project	V4.5

Each commit contains a readme file that explains the content and the licensing terms.

4 Safety analyses

The Safety Analyses elements of the case study are available on the following repository: https://sahara.irt-saintexupery.com/AIDA/AIDASafety

Several versions of the study case have been used and/or created during the S2C project. The table below details these versions and gives the associated tag in the corresponding repository.

Safety version	Description	Associated tag
V4.2_Safety1	Safety model (functional) and CLs associated to System version V4.2	V4.2_Safety1
V4.3_Safety5	Safety model (functional) and CLs associated to System version V4.3	V4.3_Safety5
V4.4.1_Safety1	First version of Safety model (functional) and CLs associated to System version V4.4.1	V4.4.1_Safety1
V4.4.2_Safety1	First version of Safety model (functional) and CLs associated to System version V4.4.2	V4.4.2_Safety1
V4.4.2_Safety2	Second version of Safety model (functional) and CLs associated to System version V4.4.2	V4.4.2_Safety2
V4.4.3_Safety1	First version of Safety model (functional) and CLs associated to System version V4.4.3	V4.4.3_Safety1
V4.4.3_Safety2	Second version of Safety model (functional) and CLs associated to System version V4.4.3	V4.4.3_Safety2
V4.4.3_Safety3	Third version of Safety model (functional) and CLs associated to System version V4.4.3	V4.4.3_Safety3
V4.4 final	Final version of Safety model (functional) and documents associated to System version V4.4	V4.4_final
V4.5	Final version of Safety models (functional and physical) and documents associated to System version V4.5	V4.5
V1	AltaRicaWizzard_AIDA_Model.zip (physical model associated to system version 4.5)	N/A

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