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Weight calculation report

CARRIAGE STORE INTERFACE

HISTORY

ISSUE	DATE	AUTHOR	OBJECT
00	**05.07.2023**	**O.SELLIER**	**Initial version**

Table of Content

1. SCOPE

ATOS follow-up the weight evolution and he provide W&B reports in accordance with the W&B control plan in the scope of the equipment reviews. Reports state the maturity of the components (estimated, calculated, or weighed).

W&B reports include:

- Curves representing the current baseline weight status compared to the specified weight values with the timeframe,
- A detailed analysis and explanation of the W&B values evolutions compared to last report,
- Each W&B value will be classified into Estimated, Calculated or Weighed,
- Risks and Opportunities and affected components,
- With clear substantiations, ATOS may propose “Requirement challenges” to Airbus Helicopters if weight reduction opportunity has been identified (i.e.: If a requirement from the Purchaser would possibly revised, a weight saving is achievable).

2. REFERENCED DATA ITEMS

2.1. APPLICABLES DOCUMENTS

Id	Denomination	Reference	Issue
[DA1]	Requirements Specification for CSI HIL	U940N0901E01_RS	B
[DA2]	Statement of work	ER020 04 01-001	L
[DA3]	Supplier Equipment Design	DP080701DCD003	00
[DA4]	Requirements Specification for CSI HIL	U940N0901E01_RS	D
[DA5]	Interface Control Document	DP080701STI001	00

2.2. REFERENCE DOCUMENTS

They are available in the Quality Repository at the latest version.

Id	Denomination	Reference	Issue
[DR1]	Manuel Qualité ATOS (Quality assurance manual)	96QP007	/
[DR2]	Procédure de revue technique (technical review procedure)	95QP001	/
[DR3]	Processus de développement (development process)	DQ11PRO003	/

2.3. ABBREVIATIONS AND ACRONYMS

Abbreviation or acronym	Meaning
CSI	CARRIAGE STORE INTERFACE

3. CURVES FOR WEIGHT ANALYSIS

In the graphs below, the term IND B, IND C and IND D correspond to the issue of the requirement specification.

IND C (full inductif) correspond to the hypothesis that the type of current for power supply & power lines signals are inductive only. Inductive is not the worst case for the relay selection.

IND D Opti delais correspond to the selection of relays to optimize delivery times.

IND D Opti mass correspond to the selection of relays to optimize the mass of the equipment.

3.1. CURVE FOR RELAYS

The graph below shows the weight of relays depending on the versions of the specification.

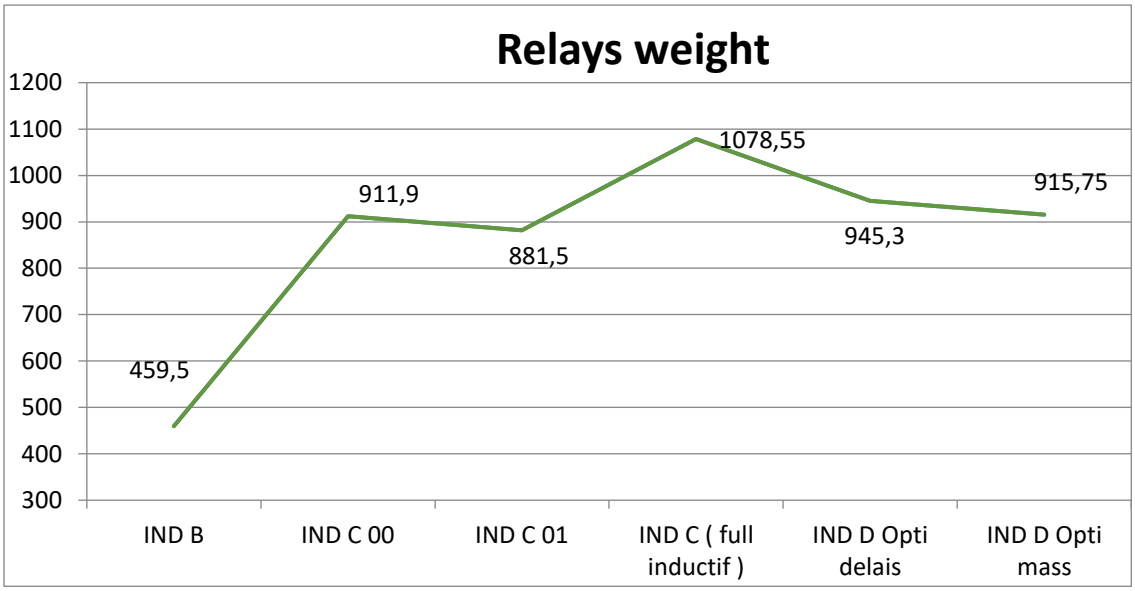

Figure 1 Curve for relays weight

3.2. CURVE FOR RELAYS SPACE ALLOCATION

The graph below shows the space of relays needed to implement them on a PCB depending on the versions of the specification. This surface takes into account the minimum space necessary to have between the relays.

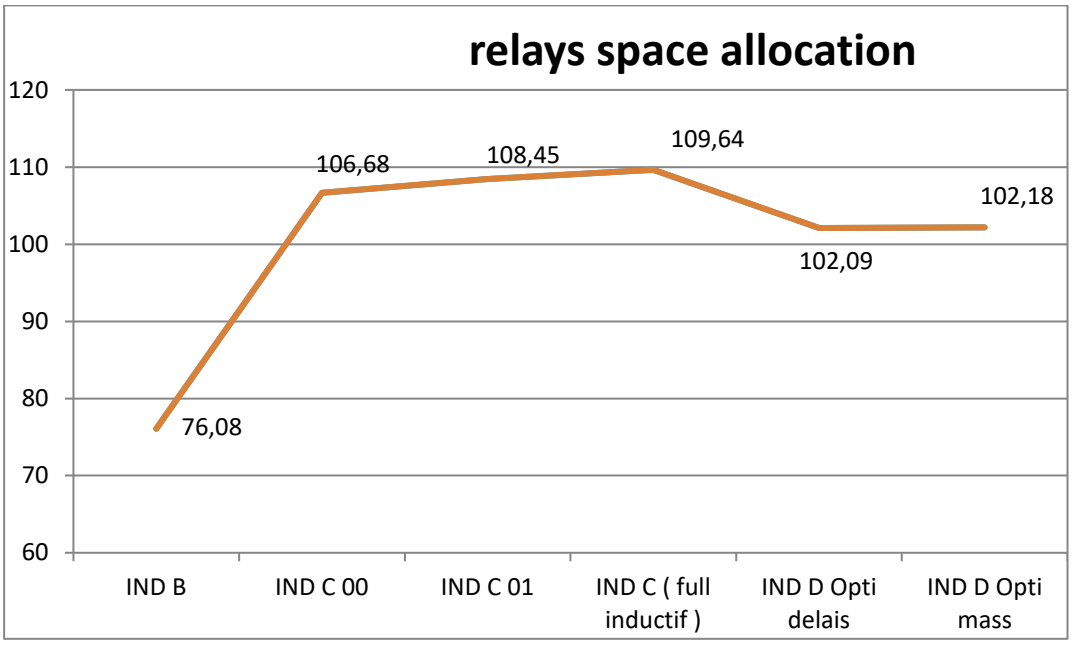

Figure 2 Curve for relay space allocation

3.3. CURVE FOR MECHANICAL WEIGHT

The graph below shows the weight of mechanical and the connectors with a tolerance range of 15% depending on the versions of the specification. This tolerance is due to the estimated weight of parts that cannot be frozen in the actual architecture.

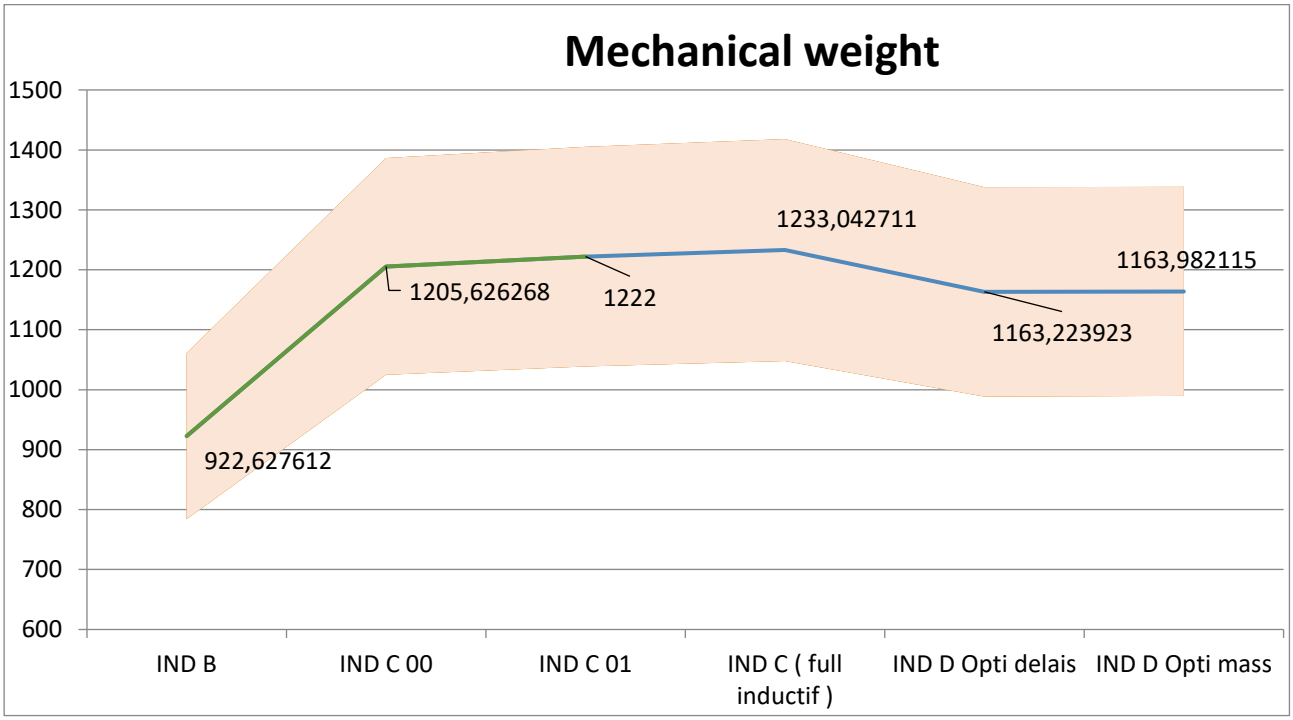

Figure 3 Curve for mechanical weight

3.4. CURVE FOR EQUIPMENT WEIGHT

The graph below shows the weight of the equipment depending on the versions of the specification.

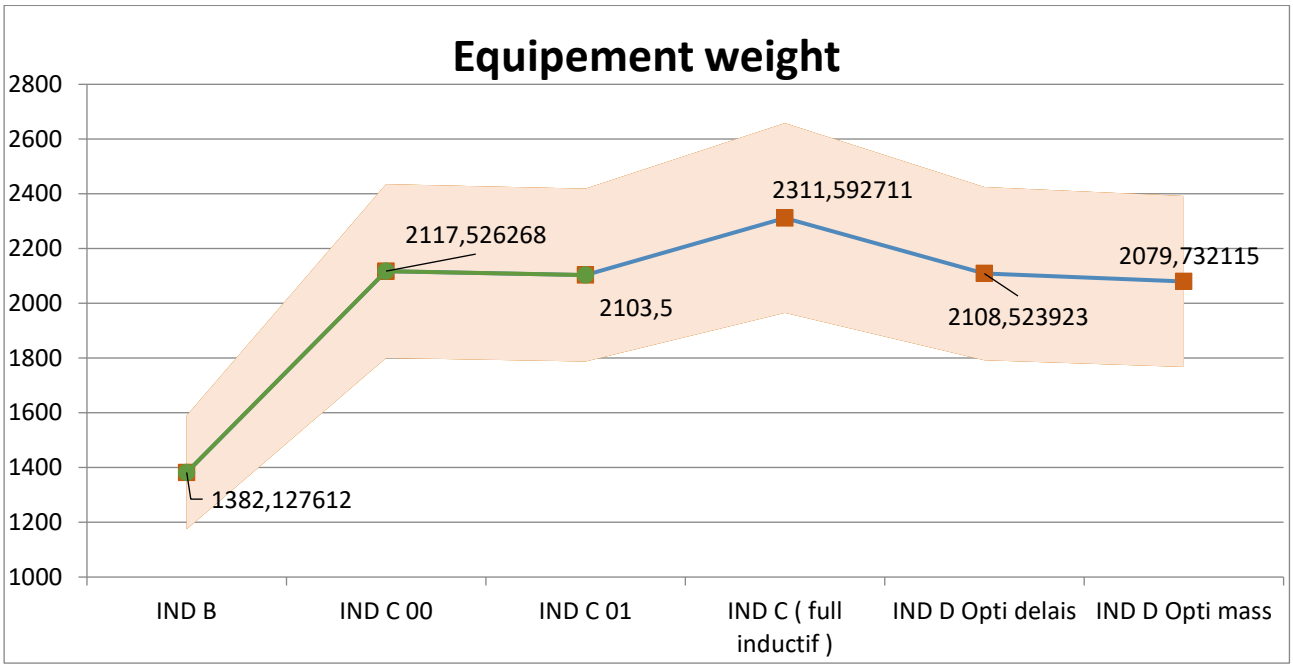

Figure 4 Curve for Equipement weight

4. A DETAILED ANALYSIS AND EXPLANATION OF THE W&B VALUES EVOLUTIONS COMPARED TO LAST REPORT,

The weight estimate with the Requirement Specification Issue B was 1,4 kg, due to RS-CSI-IFELEC-00004 in the Requirement Specification Issue D, the weight estimation is now increased to 2.4kg

5. CLASSIFICATION OF WEIGHT ANALYSIS

For the PDR, all weights analysis are estimated in front of datasheet for each parts of the equipement and the actual hypothesis.

6. RISKS AND OPPORTUNITIES AND AFFECTED COMPONENTS,

- Study for weight optimisation
  - Limitation of cards quantity
  - Optimisation for relays type (current limit/ quantity of stages …)
  - Optimisation for connectors
  - Mecanicals assembly :
    - Type of materials for casing
    - Supports of PCB in casing
    - Reduction the quantity of parts and interfaces
  - Reduction of interfaces quantity in H/C

- Limitations encountered for weight saving
  - Hypothsesis for a nominal usage (fonctions used in same time)
  - Current sizing for power lines
  - Respect of AH constaint for EMI/EMC and environnement
  - Safety impact on design

7. "REQUIREMENT CHALLENGES" TO AIRBUS HELICOPTERS

- DO : Reduction of interfaces quantity in H/C for the 115VAC and 28VDC du to split 28Vdc and 115Ac in sam econnector (like RS ind B).
- TO DO : Improve the logical state to reduce theorical thermic engrainement.
- TO DO : Measure on HC the real current value in all condition for downsize the CSI constraint