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Validation of a hazard taxonomy with aviation maintenance experts

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Validation of a hazard taxonomy with aviation maintenance experts

1. Why ?

- Hazard identification is a **key step** before **assessing risk** [1] or **perceiving risk** [2].
 - We want to **study risk perception** of mechanics regarding **specifics hazards**.
- Only **one hazard taxonomy** applied to **aircraft maintenance** field found in the **literature** [3].
- **Mechanics and engineers** share a **common objective** of **keeping maintenance activity safe**.

2. What we want?

- To **identify** if the **taxonomy** we created in a **previous work** [4] :
 - is **exhaustive** and **representative** of the **reality** of the **maintenance activity**.
 - is **using** the **appropriated vocabulary** for **designate** the **hazards**.
 - **corresponds** to the way **engineers and aircraft mechanics** **categorise hazard**.

3. Method

Participants

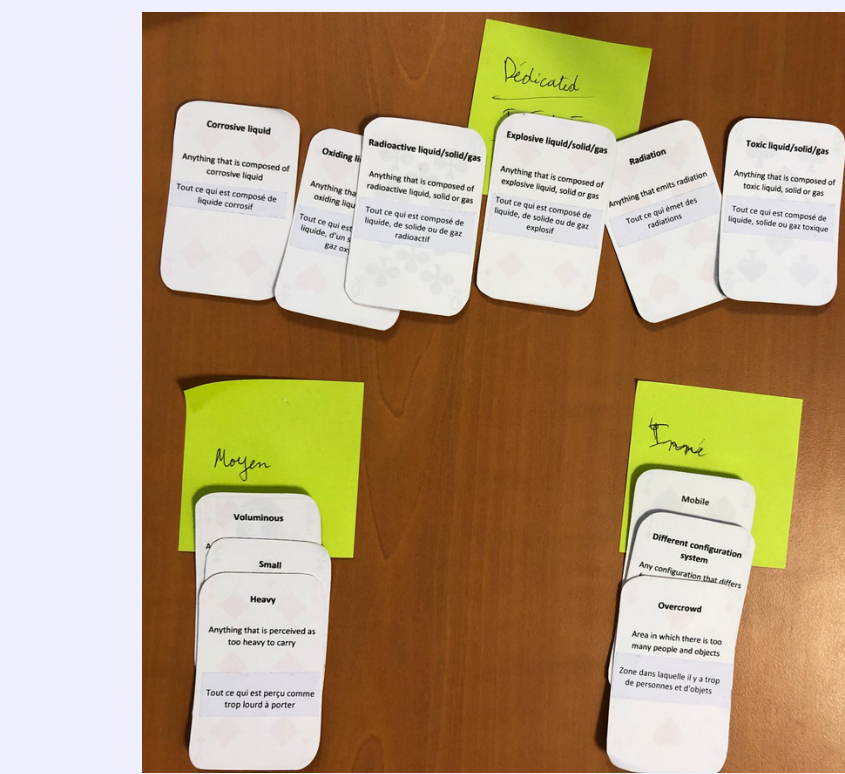
- 19 mechanics from two different maintenance organisms (average age: 43, Men: 19).
- 10 engineers from the same manufacturer (average age: 35, Men: 10).

1. Sorting the 33 cards in categories

Under pressure
Anything that is composed of under pressure liquid/air
Tout ce qui est composé de liquide/air sous pression

Example of a card

2. Naming the category and explain the taxonomy



Example of categories created

3. Answering the questions

- Which card did you find difficult to insert in a category?
- Are the hazards representative of those to which mechanics are exposed during maintenance activities?

4. Results analysis

- Creation of dendrograms with optimal sort.
- Verbatim analysis with Audacity.

4. Results

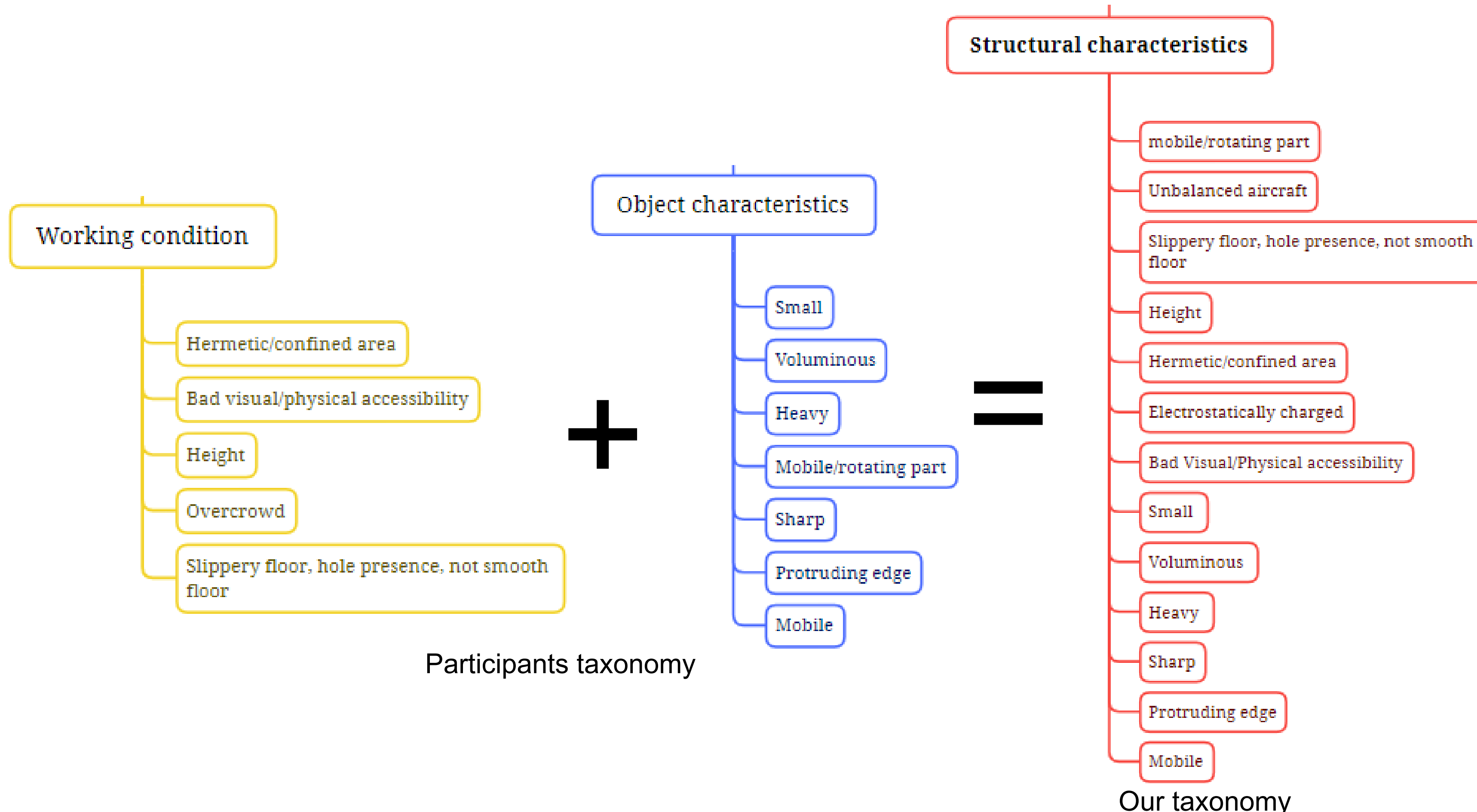
Comparison of the two taxonomies



* Less hazards because participants do not consider "Unbalanced aircraft" and "Different configuration system" as a hazard.

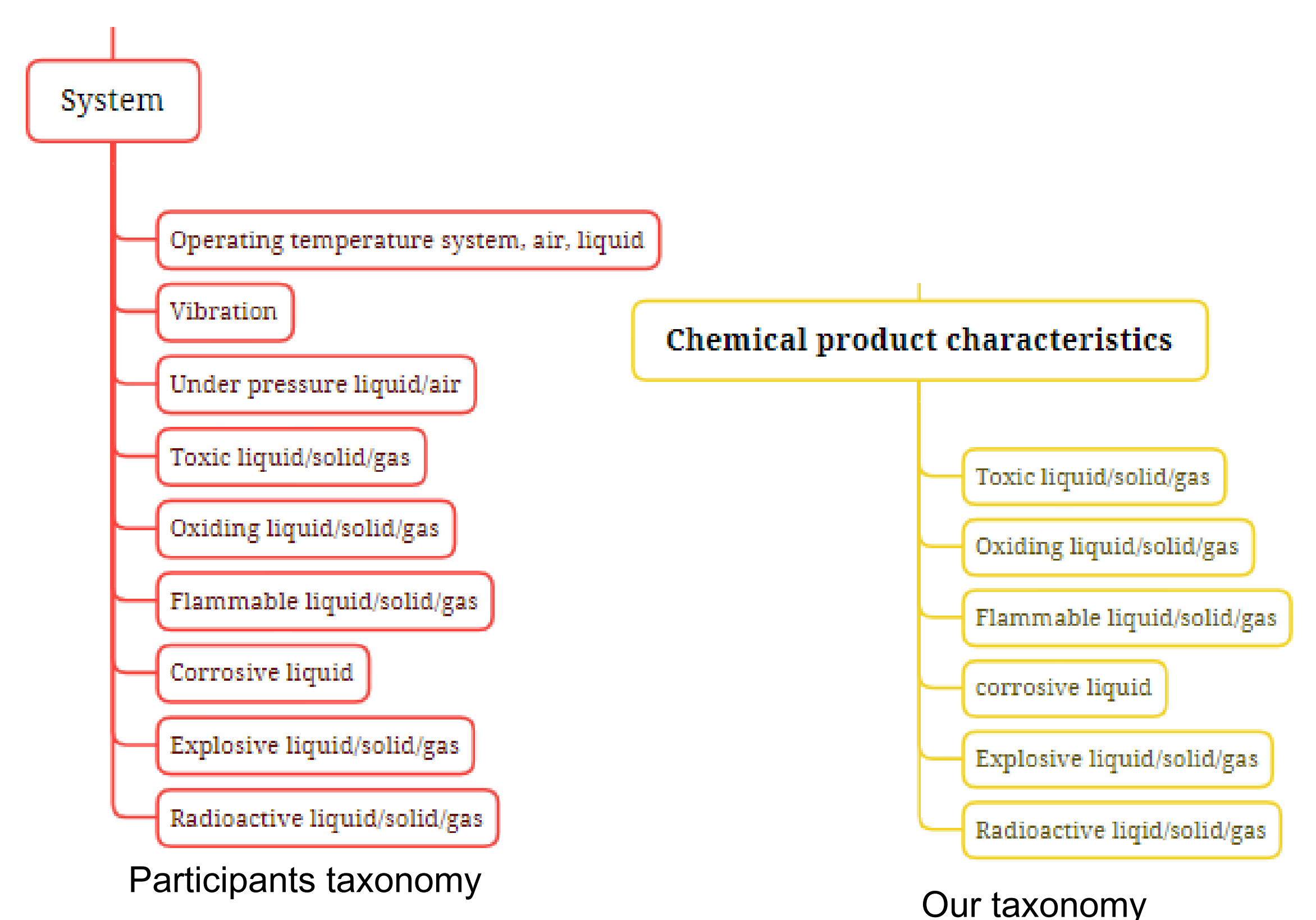
Participants are more specific in their categorisation

Our category "Structural characteristics" is almost a combination of the participants categories "Working condition" and "Object characteristics".



Some discrepancies between our taxonomy and the one of the participants

Participants consider chemical products as a component of the system category.



Exhaustivity and representativeness of the identified hazards

- Participants found the list of hazards sufficiently **exhaustive** and **representative** of the **reality** of the **aircraft maintenance activity**.
- The **vocabulary** was not changed by the participants.

5. Conclusion

- The **33 hazards** we identified are sufficiently **representative** of the **reality** of **maintenance activity**.
- **Mechanics and engineers** seems to **have their own way** to **categorise hazard** and to **understand** the **reality** of **maintenance activity**.
- The **differences** between the **taxonomies** highlight the **importance** of using a **human centered approach**.

6. Bibliography

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2. Pandit, B., Albert, A., Patil, Y., & Al-Bayati, A. J. (2019). Impact of safety climate on hazard recognition and safety risk perception. *Safety Science*, 113(March 2018), 44–53. <https://doi.org/10.1016/j.ssci.2018.11.020>
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