The INCOSE Knowledge Library

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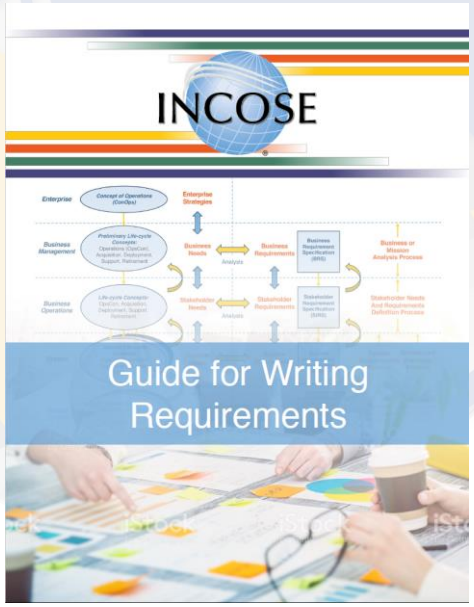
What is INCOSE?

- INCOSE: International Council on Systems Engineering
- Not-for-profit membership organization
- To develop and disseminate the interdisciplinary principles and practices that enable the realization of successful systems
- Provides a series of guides and handbooks, including the INCOSE Guide for Writing Requirement mentioned in this document
- More info at: INCOSE.org

What is INCOSE?

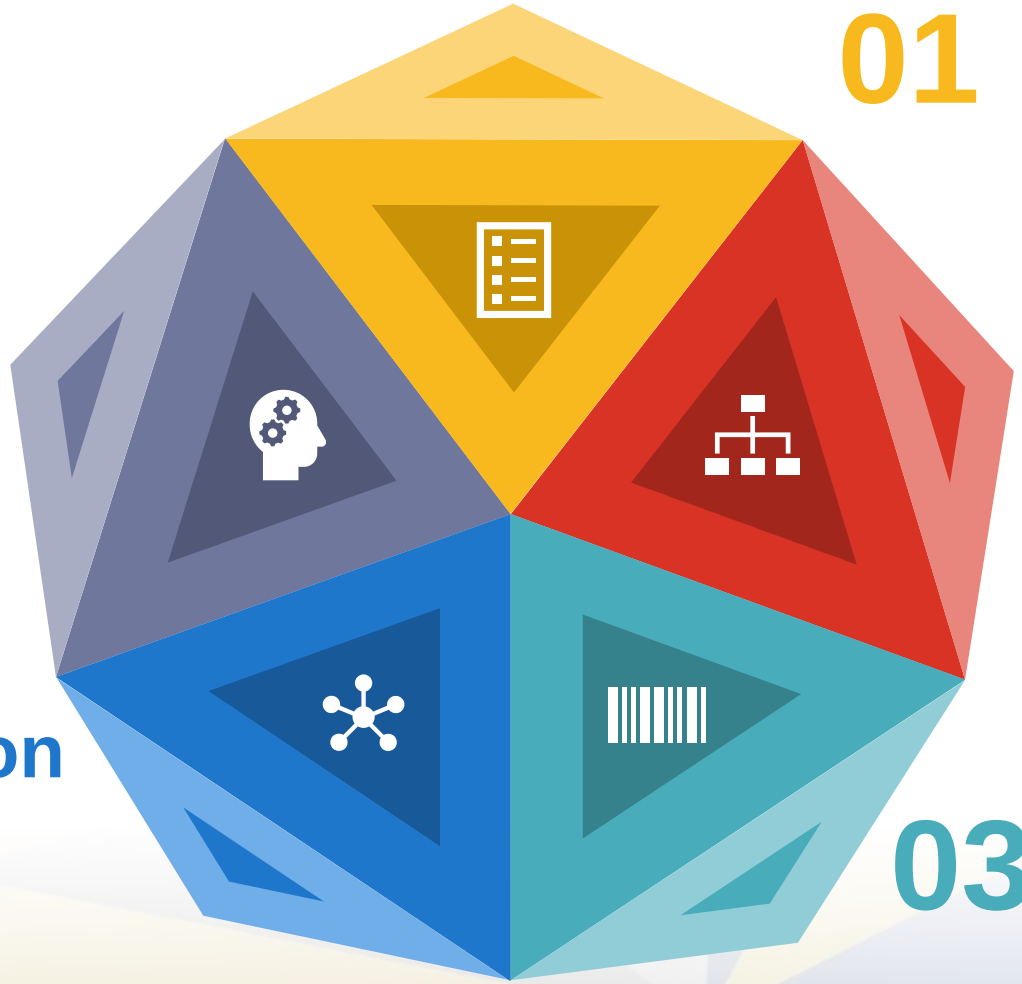
- INCOSE Guide for Writing Requirements
- Describes the process of transformation inherent to the activity of writing and managing requirements
- Describes a number of high-level quality characteristics of requirements, following the ones in the ISO/IEC 29148
- Provides a number of quality rules following the previous characteristics:
  - Concise and measurable rules
- Describes a number of attributes for requirements
- Introduces the notion of requirements patterns



What is a Knowledge Library

- A combination of Knowledge items,
  - of different nature,
  - at different levels of abstraction
- Representing a specific business domain or **area of knowledge**
- With the aim of improving the way projects are managed, including:
  - the promotion of the principle: **quality** *right the first time,*
  - enabling semantic search portals to archive and retrieve assets,
  - thus providing tools to **reuse** assets at different level,
  - and reducing **time** to market,
  - improving the way engineers generate (**author**) new assets,
  - enhancing the way items are inspected and **verified,**
  - Enabling real **interoperability** mechanisms and services,
  - reducing **time** to elaborate documents, systems and projects

What is a Knowledge Library



01 Vocabulary/Glossary

Controlled Organizational and Project Vocabulary for a common understanding among stakeholders

02 SCM/Architectures

Capture the system architectures represented in views and models. Stablish relationships among system and system elements, and among other system entities. Classifying information by meaning, nature…

03 Patterns

Representing a set of agreed-upon templates (grammars) to create and maintain consistent textual artifacts

04 Formalization

Representation of assets semantic through SRL – System Representation Language

05 Reasoning

A combination of rules, and actions to infer information from valuable assets and to control the behavioural part of the knowledge library

Example of Knowledge Library

Vocabulary

Aircraft | Ground segment | System | Operate | Temperature | Environment | Pressure

Architectures - Conceptual model

Temperature → "Operation Range " → [-160ºC , +160ºC]

<Environment>
- Temperature
- Pressure

<Operation>
- Operate
- Work

<System>
- Aircraft
  - A/C 2233
  - A/C 2244

"Greater than (>) "

Patterns

<System> | Shall | <Operation> | At | Minimum | <Environment> | Of | NUMBER | MEASUREMENT UNIT

Formalization

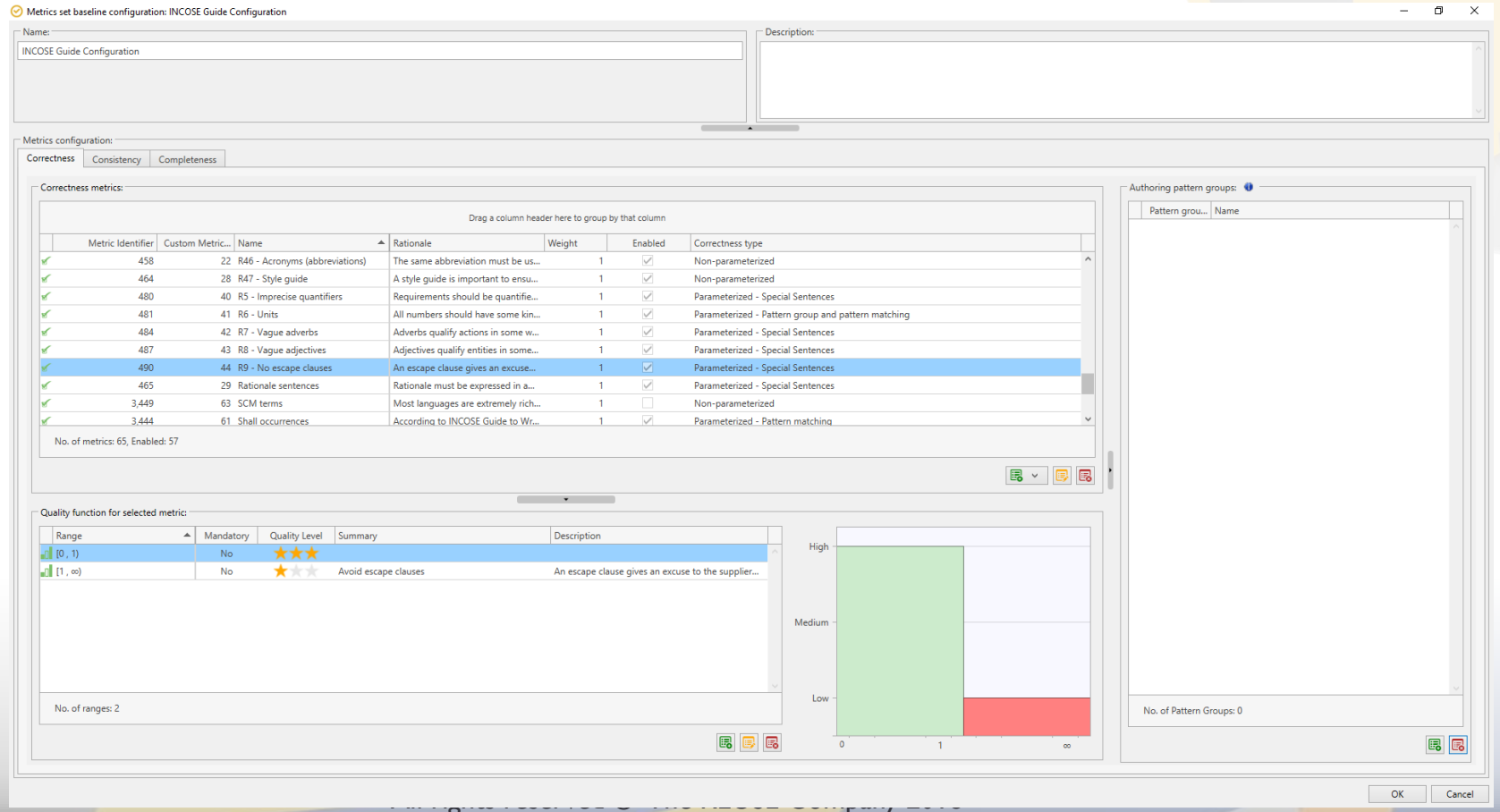
The aircraft shall be able to operate at a minimum temperature of -170º C → Temperature → "Greater than (>)" → -170 | ºC

Reasoning

If NUMBER Lower than (<) -160º ºC Or NUMBER Greater than (>) +160º ºC → ✗

The INCOSE Knowledge Library

- The content of the Knowledge Library is the following:
  - +60 metrics following the 40 rules included in the current version of the INCOSE Guide



The INCOSE Knowledge Library

- Benefits of the library:
  - Possibility to check your requirements documents against the rules as described in the INCOSE Guide
    - Based on VERIFICATION Studio
  - Possibility to analyze the quality of your requirements in real-time, on top of your own Requirements Management System:
    - Based on the Requirements Authoring Tool plugins

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