ERJU SYSTEM PILLAR

Template - System Interface Description

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Abstract	This document is a template for the System Interface Description deliverable which is required per EN 50126-1:2017 - phase 5 for a system under consideration.
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1 Preamble

1.1 Purpose

This document describes the *<system interface>* between the <*system A*> and the <*system B*> as required per SPPRAMSS-349 - [EN 50126-1:2017] phase 5 (architecture and apportionment of system requirements).

Note to author: Add here references or links to the input documents of this system interface description. Depending on the case, these are the SPPR-7906 - System Definition, SPPR-7909 - System PRAMS Risk Assessment Report and SPPR-7912 - System Security Risk Assessment Report (for System Level 3 or 4) or the SPPR-7924 - System Architecture Description and SPPR-7925 - System Interface Description (for System Level 5). The actual full references shall be placed in the appendix.

If useful (e.g. re-use among several interfaces), this document could be created only for some layer(s) of the interface.

The interface description could be seen as an extension of:

- *System Definition document for external interfaces (from the point of view of the System under Consideration)*
- *System Architecture document for internal interfaces (from the point of view of the System under Consideration)*

1.2 Intended Audience

*Note to author: This section shall **describe the intended audience** for this document.*

1.3 Document Context

*Note to author: This section shall **describe the context** for this document.*

1.4 Glossary

*Note to author: Please **add here references to existing applicable definition work items** in the System Pillar glossary or **insert a macro which lists** those work items. Please use the SPPROCESS/30 SP Metadata Management/Glossary Usage Guidelines : 722351 and avoid duplications of definition work items and the manual creation of new ones in this document.*

No references

2 Interface overview

Note to author: This section provide give an overall description of the system interface support by overview diagrams. Name the two interface partners and explain the interface purpose. If possible provide diagram showing the interface partners in its context. Describe the two interface partners (e.g., description of physical element.)

Recommendation: Please keep this chapter concise and do not duplicate the information captured in the subsequent chapters. Write all the other sections first and only then write a shortened summary here in this chapter as the last step. If applicable, insert here one or more interface diagrams showing how (sub)system or compoents are generally interconnected following the views as defined in SPPROCESS/ SEMP Annexes/SEMP Annex M2 Capella diagram rules : 722351.

*Note: show and describe **all** interface layers (e.g. according to the OSI / ISO model).*

- *For a **simple interface** (e.g. power supply interface), the overview section is followed by a physical layer section describing electrical and mechanical characteristics (e.g. plug 220 V).*
- *For a **medium interface** (e.g. logical contacts), the overview section is followed by application layer and physical layer sections.*
- *For a **complex interface** (e.g. ETCS air gap), the overview section is followed by application layer, relevant protocol layers (at least one) and physical layer sections.*

Interface partner A Name and description use work item SPPR-10062 - System .

Interface partner B Name and description use work item SPPR-10062 - System.

Provide an overview table at the start of each layer for the static description (source + target of exchanges, purpose).

3 <interface layer X>

Note to author: This section shall describe the interface in layer-based approach with level by level with a section dedicated to each level. Provide a useful chapter heading for each interface layer. The tailoring of this chapter is done in the overview section that defines if the interface is a simple, medium or complex one.

For each level, if a standard is used (e.g. RFC), refer to it and mention any limitation or tailoring (e.g. part of the standard not supported, MTU for Ethernet communications, etc.). Standard interface definition re-used, limitations and tailoring

3.1 Message description

Note to author: Provide exchange items (messages) including link from the messages to the data classes that are described in the next chapter.

Use work item SPPR-10105 - Exchange Item .

3.2 Data description

Note to author: Provide a static description of the interface which do not change as the interface is used, or over time.

- *General: Predominant interface charactericstics based on system requirements and the architecture decisions made which led to the choice of the system interface (RAM, safety, cybersecurity, performance, message rates, ...)*
- *For network communications: Class diagrams with classes, syntax of data, range, types, properties or units (e.g. of a procotol as part of the interface on a specific OSI layer).*
- *For physical interfaces: Physical support (wire, bus, fibre optics, radio waves, air pipe…), System interaction point (connector and pins for an electrical interface, coupling connector for a pneumatic interface, antenna for radio signals, bolts for a mechanical interface…), Physical signals (voltage, current, air pressure…)*

Use work item SPPR-10104 - Class .

3.3 Behaviour description

Note to author: Provide a dynamic description of the behavioural parts of the interface parts related to the interface layer. This includes possible protocols or patterns of how the interacting systems react to stimulus, or what logical sequencing happens, etc.

Note regarding the scope: The functional requirements of each interacting system are placed in in the respective system requirements specification which refers to this interface description and the specific behaviours in this chapter. Please do not include system requirements in this document.

Examples:

- *initialisation, information flow, errors (means of detection and any backups) (for network communications)*
- *flow control (volume, frequency, limits), sequencing of exchanges and timing (for exchange protocols)*
- *signal conversion for an electronic interface (NRZ, Manchester…) (for physical interfaces)*
- *pressure variations for a brake peak and transient behaviour (for physical interfaces)*
- *sequences / scenarios (for logical interfaces)*
- *exchanged data (messages) and their structure (technnology-independent) (for logical interfaces)*

Interdependencies to other interface layers:

- *analysis of dependencies between levels like time-out values among OSI layers, disconnection detection and reconnection, etc*
- *consideration of service access points (vertical between OSI layers) or APIs.*

4 Non-functional characteristics

Note to author: Provide non-funtional charactericstics of the interface which do not change as the interface is used, or over time. This includes predominant interface charactericstics based on the architectural decisions made which led to the choice of the system interface (Examples: RAM, safety, cybersecurity, performance, message rates, ...).

Note regarding the scope: The non-functional requirements of each interacting system are placed in in the respective system requirements specification which refers to this interface description and the specific non-functional characteristics in this chapter. Please do not include system requirements in this document.

The characteristics can be also placed in the section "Data description" depending on the actual content and specific needs.

5 Appendix

Note to author: Put here references to applicable input documents, standards and regulations.