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Exhibit A05-4: Documentation

1 DOCUMENTATION REQUIREMENTS

1.1.1 Introduction

Id	Requirement	Referring to
A05-4:1.1.1.a	<p>I The purpose of the required documentation and documentation management system for the deliverables is to provide proper conditions for:</p> <ul style="list-style-type: none"> - Operations, maintenance, and servicing to be carried out correctly, safely, and efficiently - Safety and RAM requirements to be met regarding operation and maintenance, personnel, and electrical safety - Asset management, to ensure the Design Life and the specified Life Cycle Cost of the deliverables. 	

1.2 General requirements

Id	Requirement	Referring to
A05-4:1.2.1.1.a	<p>K The Contractor shall deliver documentation which is designed and structured to provide proper conditions for the following, including but not limited to:</p> <ul style="list-style-type: none"> • Operation, maintenance, and repairs • Statutory approval • Commissioning • Asset management • Safety verification • Training • Design review • Modifications • Decommissioning 	
A05-4:1.2.1.1.b	<p>K The Contractor shall as part of the deliverables provide all documentation required for operation and maintenance during their Design Life according to TSI LOC & PAS section 4.2.12 “Documentation for operation and maintenance” and NRA Vehicle regulation FOR-2016-12-19-1846.</p>	TSI LOC & PAS §4.2.12, NRA Vehicle regulation FOR-2016-12-19-1846 (Kjøretøyforskriften)
A05-4:1.2.1.1.c	<p>K The documentation shall confirm that systems, parts, components and interfaces are in accordance with the TSIs and standards used as the basis for the design and use of the vehicle.</p>	

Exhibit A05-4: Documentation

Id	Requirement	Referring to
A05-4:1.2.1.1.d	K The Technical documentation such as, but not limited to, assembly drawings, wiring diagrams, software diagrams, pneumatic diagrams, hydraulic diagrams, and technical descriptions of hardware and software shall be prepared for all systems, parts, components, and interfaces.	
A05-4:1.2.1.1.e	K The technical documentation shall describe the functions of the Trainset, the sub systems' function, their components and performance levels and shall also describe how sub systems interact with each other.	
A05-4:1.2.1.1.f	K The Contractor shall deliver the documentation listed in the “EuroSpec: ‘Specification for the documentation of railway vehicles’, 2016”. <i>The Tenderer shall list the deviation on his scope of Documentation in respect to the “EuroSpec: ‘Specification for the documentation of railway vehicles’, 2016”. The list shall be submitted as part of the preliminary Documentation Plan.</i>	
A05-4:1.2.1.1.g	K The documentation shall always reflect the homologated and approved configuration of the Trainsets.	

1.3 Document Delivery Plan

Id	Requirement	Referring to
A05-4:1.3.1.1.a	K The Contractor shall appoint a documentation manager, responsible for preparing and maintaining a Documentation Plan which is synchronized with the milestone plan as well as ensuring that all Documentation is compliant with all requirements for the Deliverables.	

Exhibit A05-4: Documentation

Id	Requirement	Referring to
A05-4:1.3.1.1.b	<p>K The Contractor shall develop, apply and maintain a Documentation Plan to ensure that requirements and Deliverables related to the Documentation will be fulfilled.</p> <p>The Documentation Plan shall at least contain:</p> <ul style="list-style-type: none"> • The activities required for preparation of the Documentation based on all NT's requirements for the Deliverables, including training documentation according to the requirements in Exhibit A05-5 (Training). • Specification of what types of documents are provided (e.g structure tree, categories, types) and what formats they are delivered in. • Time schedule aligned with the Milestone Plan according to Appendix C1 (NT's Milestone plan) • Plan for development and delivery of the documentation software solution stated in section 1.2 (Software Solution). <p><i>The Tenderer shall demonstrate compliance by submitting a preliminary Documentation Plan in the tender, at least containing:</i></p> <ul style="list-style-type: none"> - <i>Organization,</i> - <i>The Supplier's generic documentation process,</i> - <i>List and time schedule of related Deliverables,</i> - <i>Plan for Deliverables of the documentation software solution.</i> 	Exhibit A05-5 Appendix C1

Exhibit A05-4: Documentation

Id	Requirement	Referring to
A05-4:1.3.1.1.c	<p>E The Documentation Plan shall:</p> <ul style="list-style-type: none"> • Be well-structured. • Be sufficiently detailed and as a minimum consist of the following metadata: EN15380-2 classification, Document class, Document type, Document number, Document title, Revision ID, Revision date, Status, Associated Coach(es), Supplier's group ID, Supplier's group name, Parent document ID, Supplier's document ID, Supplier's document title, Supplier's document revision, Supplier's revision date, Maintenance task ID (where applicable), Supplier's component ID (where applicable). • Be maintained throughout the whole project. • Ensure that capable resources, tools and human resources, are utilized for the preparation, verification, publication, use, updates, validation and handover of the Documentation • Utilize established and well proven procedures, processes and checklists for the preparation, verification, publication, use, updates, validation and takeover of the Documentation. • Ensure trace-ability between Documentation and RAM/LCC and safety information, aswell as maintenance instructions, and schemas and apparatus lists. • List obsolete documents with "NA" or reference to the documents they are replaced by. <p><i>The Tenderer shall demonstrate compliance by submitting a preliminary Documentation Plan</i></p>	

1.4 Design and format

Id	Requirement	Referring to
A05-4:1.4.1.1.a	<p>K All documentation wich is part of the Deliverables shall be in English. Documentation for operation, drivers, and crew manuals shall be delivered in English and Norwegian. Instructions and descriptions shall be written in accordance with the Writing rules of Simplified Technical English, ASD-STE100. For translation into Norwegian, skilled Norwegian resources with experience in train operation shall be involved. All documentation shall use recognized terminology and abbreviations. The contractor shall deliver a terminology database and a list of all abbreviations.</p> <p><i>The Tenderer shall describe the method for translating information and how they will ensure consisent use of terminology througout the documentation and when naming equipment, technical parts, systems, components, and other parts.</i></p>	ASD-STE100, Part 1

Exhibit A05-4: Documentation

Id	Requirement	Referring to
A05-4:1.4.1.1.b	<p>K The Contractor shall only use metric units of measurements in all delivered documents. The Contractor shall use the following formats throughout all delivered documentation:</p> <ul style="list-style-type: none"> • Time format shall be: 24 hours • Date format shall be: dd.mm.yyyy • Decimal separator shall be a comma (,). • Thousands separator shall be a full stop (.) or a space character (). 	
A05-4:1.4.1.1.c	<p>K The documentation shall be structured and have designations and identifications in accordance with Appendix A05-1-3, with Norske tog expansion. This also includes all other text handling on the Trainset, such as component markings and warnings.</p>	Appendix A05-1-3
A05-4:1.4.1.1.d	<p>K The documentation shall be designed and structured consistently and intuitively so that operation, asset management, maintenance, and other technical activities can be carried out in an efficient and cost-effective way. Technical documentation shall be linked to object/components identified in the maintenance program. All hardware/software/objects/components shall be structured in such a way that it can be linked to configuration management system and to documentation describing the object/component, the relations to other parts of the system, and descriptions of maintenance and version. Manuals for operation and maintenance shall be structured in such a way that allows direct access work descriptions for the specific tasks in order to minimize the time needed to locate the relevant instructions.</p> <p><i>The Tenderer shall describe how they intend to structure the documentation to ease maintenance and version control of the information, as well as improve readability, overall user-friendliness and minimize time needed to locate the relevant instructions/descriptions.</i></p>	

1.5 Updates

Id	Requirement	Referring to
A05-4:1.5.1.1.a	<p>K The technical documentation shall be easy to maintain and update. It shall be structured in a manner that reduces the number of documents/systems needed to be updated when changes/modifications are made, to a minimum.</p> <p><i>The Tenderer shall describe how they intend to ensure that the documentation is easy to maintain and update, and how updates are distributed to related documents/system</i></p>	

Exhibit A05-4: Documentation

Id	Requirement	Referring to
A05-4:1.5.1.1.b	<p>K Every new publication in the documentation software solution shall use established procedures agreed with Norske tog. New publications and updates shall only take place after document review and approval.</p> <p><i>The tenderer shall describe the process for document review and approval of new and updated publications.</i></p>	

1.6 Handover of documentation

Id	Requirement	Referring to
A05-4:1.6.1.1.a	<p>K All documentation shall be made available for archiving in NT's document management system.</p> <p><i>The Tenderer shall describe a solution where documentation can be handed over to NT using the Contractor's own Document Management System or another proposed solution.</i></p>	

1.7 Illustrated Parts Catalogue

Id	Requirement	Referring to
A05-4:1.7.1.1.a	<p>K The Contractor shall as a part of the Deliverables provide an Illustrated Parts Catalogue (IPC) in an electronic publication solution. The systems, components, parts, and special tools in the publication solution shall be related to their relevant documentation in the Contractor's document management system. In addition, APIs to Norske tog's asset management system shall be prepared for update of master data.</p> <p>The electronic publication solution shall atleast contain the following functionalites:</p> <ul style="list-style-type: none"> • Functionality for different configurations of the Trainsets. • Accessible for Norske tog and their customers and collaberators. • Different access and funcnality based on the user profile. • Functionality for export/migration of data to other systems. • Possibilities for an active interface to Norske Tog's asset management system for update of master data for materials and information related to them, e.g. OEM data and document relations. 	
A05-4:1.7.1.1.b	<p>K The Contractor shall be responsible for updating the content and maintaining the publication software until the end of the Design Life of the Trainsets.</p>	
A05-4:1.7.1.1.c	<p>K Throughout the Design Life of the Trainsets it shall be possible for Norske tog to maintain the publication solution and its content on their own or by a service agreement with the Contractor. If Norske tog is to maintain the publication solution and its content on their own the Contractor shall provide Norske tog with training and user documentation.</p>	

Exhibit A05-4: Documentation

1.8 Software Solution

Id	Requirement	Referring to
A05-4:1.8.1.1.a	K The Contractor shall as part of the Deliverables provide a documentation software solution through which all Documentation required for operation, Maintenance, Servicing, authority approval, Design Authority and asset management on the Trainsets shall be accessible.	

Exhibit A05-4: Documentation

Id	Requirement	Referring to
A05-4:1.8.1.1.b	<p>K The documentation software solution shall at least contain the following functionalities:</p> <ul style="list-style-type: none"> • Design and structure so that the documentation software solution is available 24/7/365. • A function in which users can report Faults in Documentation and documentation software solution functions. • Different access and functionality based on the user profile. • Accessibility for simultaneous users. • Possibility to keep track of the cause and origin of each documentation update, individually for each user-ID • A function for reviewing and approval of documentation with traceability to user-ID's (e.g. workflows) according to the requirements in section A05-4:1.5 (Updates). • Be revision controlled and revision history shall be clearly visible for the user. • A function for users at login to get an overview of all recent documentation updates, e.g. which documents are new, has been removed or being revised. • Search functionalities, at least: <ul style="list-style-type: none"> o Both in accordance with a part, component, sub system and function structure and in accordance with a physical installation structure, o Based on metadata, e.g. identity and designation, o By full text search. • A function for display information on screen and produce a hard copy printout. • A function to upload new documents and new versions of documents to the system and integrate them in the document structure. • A function for editing information from/in a database. • A function that save all earlier editions of publications and other documentation in an appropriate manner so that Norske tog and their customers and collaborators may, if necessary, read these earlier, no longer applicable, editions. • A function for generating pre-defined reports (e.g. all drawings in identity order, in product structure order etc.). • A function for generating and exporting documents and publications in PDF and an editable format. • A searchable Spare parts and materials database. • User's manual and help functionalities. • Possibilities for mobility such that the solution can be accessed by, as well as displayed on, a range of devices. • Future proofing such that the solution can handle more data and more than the current Fleet within the system. 	A05-4:1.5

Exhibit A05-4: Documentation

Id	Requirement	Referring to
A05-4:1.8.1.1.c	<p>K The Documentation contained in the documentation software solution shall at least contain all information needed for:</p> <ul style="list-style-type: none"> • Maintaining, repairing, fault finding, performing Modifications, electrical refits and upgrades and complicated repairs on the Trainsets. • Servicing • Enabling rebuilding, reinstalling of wiring etc. in case of collision damage and/or fire. • Obtaining Spares, Special Tools and other specific equipment related to the Trainsets. • Describing the Trainsets current and previous configuration on all levels for different systems as well as components. • Operating the Trainsets. • Preparing training material needed to perform Training for operating and maintaining the Trainsets. • Operating and maintaining the devices, systems and components used for Training. • At the end of the Trainsets Lifetime, carry out decommissioning and scrapping of the Vehicles. 	
A05-4:1.8.1.1.d	<p>K The documentation software solution shall be based on a commercially available software.</p>	

Exhibit A05-4: Documentation

Id	Requirement	Referring to
A05-4:1.8.1.1.e	<p>K The Contractor shall finalize and provide a system description of the documentation software solution containing at least:</p> <ul style="list-style-type: none"> • A description of the documentation software solution design regarding required functionalities • An account for the shortest possible search time for navigate or/and search for intended <ul style="list-style-type: none"> o Publication o Maintenance instruction via a link from the Maintenance in the Maintenance Plan and vice versa o Drawing o Part. • Structure for accessing information including work breakdown structure (WBS), tree structure or others • Views and layouts of the system • Description of MMI interfaces including ergonomic and human impacts • Hardware requirements as well as the software environment needed to run the solution • Details of any application interfaces available • Limitations of any mobile solution. <p><i>The Tenderer shall demonstrate compliance by submitting a preliminary system description in the tender.</i></p>	
A05-4:1.8.1.1.f	<p>K Throughout the Design Life of the Trainsets it shall be possible for NT to maintain the document software solution and its content on their own or by a service agreement with the Contractor. If Norske tog is to maintain the documentation software solution and its content on their own the Contractor shall provide NT with training and user documentation.</p>	

1.9 System interfaces

1.9.1 Asset Management System

Id	Requirement	Referring to
A05-4:1.9.1.1.a	<p>K The Contractor shall deliver a documentation software solution with a secure and active interface to NT's Asset Management System to facilitate transferring of masterdata and related information, aswell as direct access to all Documentation relevant for the Asset Management System.</p>	

Exhibit A05-4: Documentation

1.9.2 Maintenance Management Systems

Id	Requirement	Referring to
A05-4:1.9.2.1.a	K The Contractor shall deliver a documentation software solution with a secure and active interface to NT's customers Maintenance Management System to facilitate direct access to all Documentation relevant for the Maintenance Management System.	