ID	Type	Outline Number	Title	Description	Solution Type (SOB)	Supplier	Product	Product Release	Base SOB	IMBS Number	Functionality	Feature	Internal Compliance	ROB Criticality	Solution Category
SP7_New-2873	Heading	SP7_New-2873	FS-DE-EN						No						
SP7_New-32944	Heading	1	Introduction						No						
SP7_New-3958	SOB	1-1		The Data Engineering (DE) comprises all tools related to the provision of engineering and parameter data to the Spectrum Power system (during commissioning and subsequent modifications/extensions). The main modules of Data Engineering are the Spectrum Power GIS Data Import Management (GDIM) and the Information Model Management (IMM) component.					No	20-04-11			Compliant - STD	1 - Low	STD
SP7_New-32945	Heading	2	GIS Data Import Management						No						
SP7_New-32953	Heading	2.1	Functional Overview						No						
SP7_New-3974	SOB	2.1-1		GIS Data Import Management (GDIM) enables a Geographic Information System (GIS) to be a source--or the source master--for some data in a Spectrum Power™ 7 (SP7) system. GIS Data Import Management (GDIM) transforms and imports maps and engineering data created in a GIS environment into the Information Model Manager (IMM), the SP7 Engineering System. It is a part of a chain that supports the activation in Spectrum Power runtime databases that support Distribution Management System (DMS) functions. GDIM supports a GIS import with an IMM-maintained High Voltage (HV) network model for a combined sub-transmission or distribution network. GDIM supports the following modes of import: * GIS initial import (bulk import) This import mode performs a transfer of GDIM data to IMM. All existing data that was imported previously is overwritten. Previously imported data into IMM that no longer exists in GDIM will remain in IMM. * GIS incremental import GDIM supports the self-contained incremental import. It determines the differences between two complete GIS data sets and updates the SP7 database accordingly by the addition, deletion or modification of objects. * GIS delta import GDIM also supports the external determined incremental import. The request and reception of files describe the increments. * GDIM IMM change detection IMM change detection checks for consistency between domain-objects in GDIM and IMM.			44444444444		No	20-04-12	Functional Overview		Compliant - STD	1 - Low	STD
SP7_New-32957	Heading	2.1.1	Functional Blocks of GDIM						No						
SP7_New-32970	SOB	2.1.1-1		(image: 1-img83a51b366f6fb0799da352393a2de949_1_en_US_TIFF.jpg) Figure 2-# GDIM Functional Blocks Overview The major functional blocks of the GDIM include * Data extraction The data extraction block interfaces with the GIS database, extracts the data, and uses the information to populate the extracted dataset. It also includes execution of validation rules to check the accuracy of the imported data before processing them further in the transformation module. The validation rules include attribute checks (null, range, and enumeration checks) and consistency checks (phase and voltage check, and graphic consistency check). The validation results or findings are displayed in the GDIM User Interface (UI). For the data extraction from the delivered GIS data, the data structure must be provided in the structure required by GDIM from the GIS system. * GDIM UI This comprises functions for management and control of the GDIM workflow, for example, start stop of import, mode of import, enable or disable data validation, and so on. * Workflow management This comprises the business logic for the GDIM UI, that is, getting the next command, checking whether undo of the previous step is allowed. * Version control Data imported from GIS is maintained in versions. For each new import, a new version is created. * Change management For the self-contained incremental import, the change management functionality performs the detection of differences between two versions of extracted GIS data, the previously imported dataset and the new one received from the GIS. * Data pre-transformation and transformation This group of functions handles the transformation of the extracted data to the format for the engineering IMM. The transformed data is stored in the extracted dataset. Validations are done based on the transformed data, for example, consistency checking of voltage levels and phase information. * Target model output The output writer uses the transformed data and generates XDF files for import into IMM. It is driven by a mapping file which maps the transformed data into the target model. * Extracted dataset All data imported from GIS is stored in GDIM in the extracted dataset. The object model of the extracted dataset (consisting of domain, connectivity, and graphics data) represents a customer independent model of the GIS equipment data. The extracted dataset model remains fixed over					Yes	20-04-12	Functional Overview	Functional Blocks of GDIM	Compliant - STD	1 - Low	STD
SP7_New-32958	Heading	2.1.2	Workflow Overview of GDIM						No						
SP7_New-32971	SOB	2.1.2-1		* GIS -> GDIM - The data extraction imports the data from GIS and writes it into GDIM's extracted dataset. The GDIM extracted dataset is a standardized intermediate schema. * GDIM - During extraction and transformation process, validation rules (attribute and consistency checks) are executed to check the accuracy of the imported data. * GDIM - Change management detects the changes to the previous version in the extracted dataset. * GDIM - Data model transformation transforms the data from the extracted data model as required and appropriate for the engineering system that supplies the Spectrum Power system and stores it in the extracted dataset in the transformed data model. * GDIM - The target model output builds XDF files for graphic and domain data. * GDIM - The generated XDF files are imported into the engineering IMM. * IMM and IMM -> SP7:PrepareTransferActivation to Spectrum Power system. GDIM triggers the activation process. This is handled by the workflow controller using the GDIM UI.					Yes	20-04-12	Functional Overview	Workflow Overview of GDIM	Compliant - STD	1 - Low	STD
SP7_New-32959	Heading	2.1.3	GDIM User Interface and Workflow						No						
SP7_New-32972	SOB	2.1.3-1		The GDIM UI visualizes the current progress and shows log/error messages. On the GDIM UI, the data engineer selects the mode of operation (bulk, incremental mode or delta mode) and choose between stepwise or automatic import. Depending on the settings in the GDIM UI, the workflow coordinates the functions GIS data extraction, change management, data validation, model transformation, and the target model output. After the generation of the eXtensible Data Format (XDF) files by the target model output, the workflow controller creates an IMM job and imports the XDF files into this job. The workflow then calls the validation (can be selected optionally), preparation, transfer, activation to the realtime system, and finalization of this job. The user can select whether the validation is called and if the job should be finalized. After finalization, the GDIM import is finished and the changes become permanent. To start another GIS extraction, the job must be finalized.					Yes	20-04-12	Functional Overview	GDIM User Interface and Workflow	Compliant - STD	1 - Low	STD
SP7_New-32916	Heading	2.2	GIS Data Extraction						No						
SP7_New-3981	SOB	2.2-1		The focus of the data extraction and import is to extract the GIS data from the GIS source systems and use the retrieved data to create the relevant instances in the extracted dataset, which contains a GIS vendor independent representation of the GIS data as required by GDIM. (image: 1-img6a659f53f93df26f9da3522a36fa107c_2_en_US_TIFF.jpg) Figure # Functional Blocks of the GIS Data Extraction The GIS data extraction offers a modular architecture consisting of: * Translation engine * Extraction mapping driving the extraction process in the translation engine By having these three parts within the extraction module, the tasks within are separated into GIS specific and general tasks. The GIS data must be provided by the customer according to our interface specification. The general part of mapping data from source to destination and updating the objects to the target dataset tasks are part of the translation engine. The source GIS are transparent at this point in the process. The interface between the GIS data and the translation engine module is standardized. The extracted GIS data in the extracted dataset is stored using predefined Oracle tables. When writing objects to the extracted dataset, the translation engine performs formal data validation rules against the extracted data. The extracted dataset contains the data which was extracted from the GIS source systems.					Yes	20-04-12	GIS Data Extraction		Compliant - STD	1 - Low	STD
SP7_New-32973	Heading	2.2.1	GIS Data Sources						No						
SP7_New-32976	SOB	2.2.1-1		A GIS can utilize multiple sources of data. Each of these sources may need to be considered by GDIM. To absorb the GIS-centric datatypes and formats, the various GDIM is designed to contain special processing and functionality specific to the relevant GIS and data model. The translation engine drives the relevant data into the extracted data set. The following are the scenarios for GIS data sources: * Single source system Data for all the types are sourced from a single source GIS or format (GIS). * Single source system, static data Only static geometric data and symbology definitions are provided. * Geometric data is provided with a different granularity from the base object, electrical, and connectivity data (for example, multiple DXF are provided). Granularity of graphic data might be on: * Entire network level * Voltage level * Substation level * Feeder level, and so on . * All data must come from one GIS source system.					Yes	20-04-12	GIS Data Extraction	GIS Data Sources	Compliant - STD	1 - Low	STD
SP7_New-32974	Heading	2.2.2	GIS Translation Engine						No						
SP7_New-32977	SOB	2.2.2-1		The translation engine governs the extraction process. The translation engine is a generic mapping engine which translates the data types (for objects, attributes, and values) of the GIS of concern to the data types of the extracted dataset. This generic mapping engine is driven by configurable mapping files. During its processing, this engine uses the GIS data and translates it to the corresponding extracted dataset data using the specified extraction mapping. It then writes this mapped data to the extracted dataset. The translation engine manages the interaction between the various extraction components. It functions as an interface between the GDIM extracted dataset and the GIS. It receives the data from the provided GIS dataset, and translates it according to the extraction mapping to the intermediate data model of the extracted dataset. Based on directives in the mapping file, the engine does the following: * Translates the GIS data to the corresponding extracted dataset data using the type-translation rules configured in the mapping files * Writes the processed data to the extracted dataset The extracted dataset is the same regardless of the data model in the GIS.					Yes	20-04-12	GIS Data Extraction	GIS Translation Engine	Compliant - STD	1 - Low	STD
SP7_New-32975	Heading	2.2.3	DXF Support						No						

<table>
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<tr><td>SP7_New-32978</td><td>SOB</td><td>2.2.3-1</td><td></td><td>GDIM supports the import of static graphics from a DXF file. The supported DXF file format version is AC1024.
DXF parser only supports some dxf entities such as LWPOLYLINE, LINE, TEXT, MTEXT, CIRCLE, ARC and there is a limitation on IMM/ODB side according the maximum pointcount of a polyline.</td><td></td><td></td><td></td><td></td><td>Yes</td><td>20-04-12</td><td>GIS Data Extraction</td><td>DXF Support</td><td>Compliant - STD</td><td>1 - Low</td><td>STD</td></tr>
<tr><td>SP7_New-32957</td><td>Heading</td><td>2.3</td><td>Extracted Dataset</td><td></td><td></td><td></td><td></td><td></td><td>No</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>SP7_New-3985</td><td>SOB</td><td>2.3-1</td><td></td><td>The extracted dataset, which is an Oracle database, serves as an intermediate repository of all data that has been extracted from the GIS source systems. If multiple source systems are applicable on a project, then the extracted dataset represents the combination of those sources. Multiple source systems are not supported from standard system. The schema of the extracted dataset is a hybrid between a GIS type of database and the engineering IMM database Common Information Model (CIM). It represents a generic superset that is intended to be compatible with any GIS source system that requires to be considered. This is to ensure that detection of incremental updates is as straightforward as possible.
The extracted dataset may only represent a subset of the original GIS database, especially if filters are applied.
For example, non-electrical entities which are not relevant or useful for DMS purposes may be maintained in the GIS but not extracted to GDIM.
The extracted dataset is used for storing the GIS data in the GDIM environment for change detection and derivation of the subsequent processing. It holds the current state of the GIS objects or network as of the last extraction. If the data extracted from the GIS was not subject to input filters, then the extracted dataset represents a one-to-one match with the GIS (although the object type or attribute may have changed as a result of mapping between the GIS source system and extracted dataset models). Even though it functions as an intermediate data repository, the extracted dataset is actually another dataset modeled in IMM.
The main information stored in the extracted dataset includes the following:
* Domain and connectivity object data stored in tables resembling those used in the CIM-based engineering IMM dataset
* Geometric data stored in each table
* Additional graphic-related attributes</td><td></td><td></td><td></td><td></td><td>Yes</td><td>20-04-12</td><td>Extracted Dataset</td><td></td><td>Compliant - STD</td><td>1 - Low</td><td>STD</td></tr>
<tr><td>SP7_New-32958</td><td>Heading</td><td>2.4</td><td>Data Validation</td><td></td><td></td><td></td><td></td><td></td><td>No</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>SP7_New-2914</td><td>SOB</td><td>2.4-1</td><td></td><td>GDIM validates the extracted and re-modeled data. Thus, two separate validations are done in GDIM. Field validation performs object individual checks by inspecting the attributes of the data extracted from GIS.
Attribute checks:
* Null check
* Range check
* Enumeration check
Thus, the quality of the received data is verified.
After re-modeling the network by transformation, the resulting network is checked for consistency.
Consistency checks:
* Check phase and voltage of connected objects
Starting point for phase and voltage tracing should be available, for example, feederhead switch.The network needs to be Feederbased. Connected objects must be in same B1 for this validation to work in standard config.
* Detection of de-energized equipment
* Graphic consistency check</td><td></td><td></td><td></td><td></td><td>Yes</td><td>20-04-12</td><td>Data Validation</td><td></td><td>Compliant - STD</td><td>1 - Low</td><td>STD</td></tr>
<tr><td>SP7_New-32959</td><td>Heading</td><td>2.5</td><td>Change Management</td><td></td><td></td><td></td><td></td><td></td><td>No</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>SP7_New-2915</td><td>SOB</td><td>2.5-1</td><td></td><td>GIS provides bulk data or GIS data describing the increments. When GIS provides bulk data then this requires the GDIM application to detect the relevant changes, which is called self-contained incremental (also called incremental bulk) GIS import. GDIM has to perform change detection (which includes connectivity, attribute, and graphic-related modifications) in order to detect the differences between two versions of the GIS data. This change detection is performed by the change management functionality. The GIS provides the whole set of data, change detection finds the changes and provides only the delta data to further processing and further on to IMM.
Change detection is supported by version control which is responsible to maintain multiple versions of the GIS data in the extracted dataset.
For the delta detection, a minimum of two versions of the extracted GIS data are kept in the extracted dataset:
* The last version of the GIS data, called version N. This data corresponds to the network data activated in the operational database ODB.
* The current version of the GIS data, called version N+1. This is the data to be transformed and imported into the engineering system.
Change management detects the changes between version N and version N+1, which is the delta data between the two versions.
The following functions started by the workflow data model transformation processes delta data only.
This detection capability allows subsequent steps to only process a changed set of data, which drastically reduces processing time and speeds up the complete process.
For GIS delta mode (provision of increments by GIS system), the change management is bypassed, however the basic functions of it are used for creating a new GDIM version.</td><td></td><td></td><td></td><td></td><td>Yes</td><td>20-04-12</td><td>Change Management</td><td></td><td>Compliant - STD</td><td>1 - Low</td><td>STD</td></tr>
<tr><td>SP7_New-32960</td><td>Heading</td><td>2.6</td><td>Data Transformation</td><td></td><td></td><td></td><td></td><td></td><td>No</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>SP7_New-2916</td><td>SOB</td><td>2.6-1</td><td></td><td>The model transformation functional block processes the delta data of the current version stored in the extracted dataset and performs the necessary transformations, adjustments, and enhancements to the model. The model transformation then generates the corresponding domain and graphics data and stores it as transformed data. The target model output uses the transformed data to generate XDF files for the import into the engineering IMM dataset.
(image: 1-imga7321897c0b021269da3522a72a3fc02_1_en_US_TIFF.jpg)
Figure # Detailed View of the Model Transformation Functional Block
The model transformation transforms the delta data from the extracted dataset into a model suitable for import into IMM. The data is organized in a hierarchically (for example, the substation has a child voltage level, the voltage level has a child equipment, and so on) and relevant operational names are assigned. The hierarchy and names are then used to construct the Technological Addresses (TA) during the propagation of data from IMM to Spectrum Power. Expansion, contraction, and adjustment of the network model are based on configurable rules. Graphic objects are assigned to network diagrams and their coordinates are adjusted from geographical coordinates to Spectrum Power network diagram coordinates.
The data model transformation is of two types, full and incremental. A full (bulk) transformation is required for initial population and the incremental transformation is utilized in everyday business. The full data transformation is done within one version N while for incremental mode the delta between version N and version N+1 is being the input for the model transformation.
The data model transformation step consists of executing several functions to convert the model schema from what resides in the extracted dataset to what is required in the engineering IMM dataset. It also includes performing several functions to expand or contract the model as required meeting Advanced Distribution Management System (ADMS) operational requirements.
The model transformation is functionally and logically split in the following parts:
* Pre-transformation
Pre-transformation is performed for domain data only. It transforms an edge based into a node based topological model. It consists of topological expansions that are specific to a node-based representation.
* Transformation
Transformation is performed for domain and graphic data. It consists of model expansions, contractions, and adjustments that are transparent from the eventual target system.
* Graphic adjustment
The simple and complex functions classified as part of graphic adjustment are those that do not have an impact on the domain and connectivity data, where the target model or system is transparent.
The following are examples of complex functions that are performed during the graphic</td><td></td><td></td><td></td><td></td><td>Yes</td><td>20-04-12</td><td>Data Transformation</td><td></td><td>Compliant - STD</td><td>1 - Low</td><td>STD</td></tr>
<tr><td>SP7_New-32961</td><td>Heading</td><td>2.7</td><td>Configuration</td><td></td><td></td><td></td><td></td><td></td><td>No</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>SP7_New-2917</td><td>SOB</td><td>2.7-1</td><td></td><td>Two central concepts that pertain to the overall GDIM design are as follows:
* Configuration-driven
* Well-defined, extensible interfaces
The GDIM is designed to allow for the core functionality to remain fixed over time. By making GDIM highly configurable, differences in customer data modes can be addressed by changing or expanding the defined configuration files. These configuration files are then used by the generic mapping engine (relevant both for the extraction module and the transformation module) to map from the source model to the target.
By constructing well-defined, extensible interfaces, additional functions can be developed in the future without impacting existing functionality.
Several of the GDIM modules and/or phases are configuration driven. They include the following:
* The data extraction
* The model transformation
* The target model output</td><td></td><td></td><td></td><td></td><td>Yes</td><td>20-04-12</td><td>Configuration</td><td></td><td>Compliant - STD</td><td>1 - Low</td><td>STD</td></tr>
<tr><td>SP7_New-32962</td><td>Heading</td><td>2.8</td><td>GDIM – IMM Change Detection</td><td></td><td></td><td></td><td></td><td></td><td>No</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>SP7_New-2918</td><td>SOB</td><td>2.8-1</td><td></td><td>The GDIM – IMM change detection checks the consistency between the GDIM and IMM data bases (Spectrum Power 7 engineering system). The last imported GIS dataset is compared with the export from IMM. The result of the compare is a list of equipment that is missing at either side.

(image: 1-Tip.png) | NOTE The GDIM – IMM change detection checks only the equipment that have a GISTAG. Only equipment imported from GIS to IMM have a GISTAG. Manually added objects in IMM do not have a GISTAG. In the compare only the mutual existence of the objects in GDIM and IMM is checked. Objects attributes, or graphics are not compared.</td><td></td><td></td><td></td><td></td><td>Yes</td><td>20-04-12</td><td>GDIM – IMM Change Detection</td><td></td><td>Compliant - STD</td><td>1 - Low</td><td>STD</td></tr>
<tr><td>SP7_New-32963</td><td>Heading</td><td>2.9</td><td>Quality Assurance Server</td><td></td><td></td><td></td><td></td><td></td><td>No</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>SP7_New-2919</td><td>SOB</td><td>2.9-1</td><td></td><td>For a controlled system environment, GDIM can run on a Quality Assurance Server (QAS). This alters the workflow, to provide the option to check the imported data on a non-production environment. For the use of this option, a QAS server must be available, and all data that is in the production system must also be present on the QAS IMM (This includes any data that is not imported from GDIM).
Workflow
After the initial bulk import, GDIM can run from the QAS system to control any GIS data changes provided by GDIM. When a IMM Job is created, it halts the process to enable the user to check if the content of the job is correct and viable for the production system.
After the user verification is done on the QAS system, the job can be propagated from the QAS IMM to the production system by the user. After these steps are finished, GDIM takes over, continues the rest of the workflow necessary and continues to prepare the next job if it is configured to split jobs. The splitting of jobs is relevant for large networks, where a high number of changes are delivered with an incremental or delta dataset which exceeds a total number of >15.000 changed instances.</td><td></td><td></td><td></td><td></td><td>Yes</td><td>20-04-12</td><td>Quality Assurance Server</td><td></td><td>Compliant - STD</td><td>1 - Low</td><td>STD</td></tr>
<tr><td>SP7_New-32964</td><td>Heading</td><td>2.10</td><td>Database Location and Backup</td><td></td><td></td><td></td><td></td><td></td><td>No</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
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SP7_New-3986	SOB	2.10-1		The GDIM Database and Versioning is in the DOR oracle database, under GDIMU, GDIMU_X and GISU Schemas. Moving the database or producing a backup has to be done by a system administrator and is not automated. In case of a database failure, the version history is lost and has to be restored by a backup. It is not possible to repopulate the GDIM database from IMM. If the database is not backed up, GDIM can produce a new version by running a bulk import. Due to processing limitations, the new GDIM version has to be verified against the current IMM by the GDIM – IMM change detection and the GIS data must be adapted to ensure coherency between the naming of objects in the IMM and GDIM database. There exists no database backup or mirroring from the Productive server and QAS Server. If GDIM is running on either of these systems, and the database is compromised by hardware or software failure, there is no option to restore it from the other system.					Yes	20-04-12	Database Location and Backup		Compliant - STD	1 - Low	STD
SP7_New-32965	Heading	2.11	Workflows						No						
SP7_New-32979	Heading	2.11.1	GIS Initial Import						No						
SP7_New-32983	SOB	2.11.1-1		The GDIM system, engineering IMM, and the operational Spectrum Power system is initialized with a bulk export from GIS. This is considered a one-time data migration exercise is done once before the GIS extract workflow is initiated. This process is started on the GDIM UI using the bulk mode. For the initial import GIS extraction and data model transformation is performed, XDF files are written. The further steps to import the data into IMM are done using the GDIM UI.					Yes	20-04-12	Workflows	GIS Initial Import	Compliant - STD	1 - Low	STD
SP7_New-32980	Heading	2.11.2	GIS Incremental Import						No						
SP7_New-32984	SOB	2.11.2-1		* Incremental import supports auto-detection import on the full network model. Data is imported in GDIM in a new extracted dataset. During import, the change management functionality is used for comparing the imported data with the previous version of the data. * The identified changes are transformed within the model transformation and XDF files are written. * The GDIM UI is used for the import of the XDF files to an IMM job as well as calling the preparation, transfer, and activation to the system. (image: 1-Tip.png) | NOTEProper distribution of the changes over all Spectrum Power servers is the responsibility of the Spectrum Power IMM engineering activation, which includes Multisite too.					Yes	20-04-12	Workflows	GIS Incremental Import	Compliant - STD	1 - Low	STD
SP7_New-32981	Heading	2.11.3	GIS Delta Import						No						
SP7_New-32985	SOB	2.11.3-1		* In this case, GIS data describing the increments (deltas) are received. GDIM does not do any change detection. * The identified changes are transformed within the model transformation and XDF files are written. * The GDIM UI is used for the import of XDF files to an IMM job as well as calling for the preparation, transfer, and activation of the system.					Yes	20-04-12	Workflows	GIS Delta Import	Compliant - STD	1 - Low	STD
SP7_New-32982	Heading	2.11.4	GDIM – IMM Change Detection						No						
SP7_New-32986	SOB	2.11.4-1		The GDIM IMM change detection checks the consistency between the IMM and GDIM data bases. The result of the compare is displayed in the GDIM UI.					Yes	20-04-12	Workflows	GDIM - IMM Change Detection	Compliant - STD	1 - Low	STD
SP7_New-32966	Heading	2.12	Non-Functional Topics						No						
SP7_New-32987	Heading	2.12.1	User Interface						No						
SP7_New-32988	SOB	2.12.1-1		GDIM provides a UI that drives and controls the Import process from the GIS and visualizes of the current process status (which phase it is in). The UI can be opened on the ADM server. Through the UI the user can select the mode of operation, whether it is a bulk import or incremental import. Also, the selection of either continuous execution or manual stepwise execution is possible. The GDIM UI provides the following features: * Selection of the operation mode: Bulk or incremental import * Processing of static background data using the DXF plug-in * Selection of continuous execution or stepwise execution * Visualization of the state of the import progress * Selection of validation log * Controlling the GDIM workflow including extraction, change management and transformation * Controlling import to IMM, preparation, transfer and activation to the runtime database * Undo and re-do of versions, discard or invalidate versions if data issues are found, and so on * GDIM – IMM change detection (image: 1-img8bb3cc9999af28aa9da3522a670c1d16_1_en_US_PNG.png) Figure 2-# Sample Display - GDIM User Interface					Yes	20-04-12	Non-Functional Topics	User Interface	Compliant - STD	1 - Low	STD
SP7_New-32946	Heading	3	Information Model Management						No						
SP7_New-32989	Heading	3.1	Functional Overview						No						
SP7_New-33008	Heading	3.1.1	Purpose						No						
SP7_New-33009	Heading	3.1.2	Model Merge Framework						No						
SP7_New-33017	SOB	3.1.2-1		In power companies, several systems exist based on (to varying extents) common power grid or network data of the utility. Thus, the complete model maintenance is split up in different model maintenance systems with defined data responsibilities for a specific data item. For specific parts of the data required for the Spectrum Power 7 system, one of those external systems might be the master. An example for such a system is the Geographical Information System (GIS). The data coming from the different sources needs to be consolidated by IMM into a single CIM based DOM before populating the Spectrum Power 7 runtime system. IMM supports the consolidation of data from different sources through the ability to define the foreign identifiers to allow one-to-one identification in both, the external systems and IMM.					Yes	20-04-13	Functional Overview	Model Merge Framework	Compliant - STD	1 - Low	STD
SP7_New-33010	Heading	3.1.3	Engineering Process						No						
SP7_New-33018	SOB	3.1.3-1		The system engineering process basically consists of three phases: * System configuration * Customization * Data entry All three activities are performed during commissioning. As the requirements of the utility evolve, these activities continue to occur when the system is in operation. In particular, data entry and changes are a normal part of day-to-day system maintenance activity. (image: 1-imgc3f3f55b6f73f9679da3523933978529_1_en_US_TIFF.jpg) Figure 3-2 Engineering Phases In general, system engineering activities follow the sequence of configuration, customization, and data entry. However, one of the key requirements of all phases of the engineering process is that the engineering tools are to accommodate an iterative philosophy of system engineering. This means that changes to previously engineered aspects of the system can be made without losing all the subsequent engineering work that has been done. For example, it is possible to modify system configuration information and to perform a new custom feature implementation after data entry is well underway. System configuration and customization activities occur mainly during the initial system implementation and less frequently when the system is in operation. How data is to be configured specifically for a certain purpose within the Spectrum Power control center system is described in detail in so called Data Modeling Guides, available for the specific application areas of the Spectrum Power control center system. **System Configuration** System configuration comprises the following activities, where applicable: * Provision of hardware (servers as well as the network) * Installation of software (operating system, other third-party software and Spectrum Power software) * Basic configuration of the system **Customization** In this phase, project enhancements of the standard product can be introduced. The CIM based DOM can be extended to fit customer needs. Typically, data is migrated from existing systems and imported into the engineering database. **Data Entry** Data entry describes the process of day to day changes of the data. This is done to account, for example, for changes in the physical structure of the power system network. Maintenance of the power network model is a key activity underlying the various applications in power control center systems. Keeping the static power system network model accurate and up-to-date ensures accurate and useful results within runtime operation. In particular, data entry and changes are a					Yes	20-04-13	Functional Overview	Engineering Process	Compliant - STD	1 - Low	STD
SP7_New-33011	Heading	3.1.4	Domain Object Model						No						
SP7_New-33019	SOB	3.1.4-1		The Spectrum Power DOM provides a logical, object-oriented data model describing power system information, characteristics and behavior. The DOM is based on the CIM V12. **Common Information Model (CIM)** CIM is a set of standards for representing power system components. The IEC standard 61970-301 (Energy Management System Application Programming Interface (EMS API)) that originated from the Electric Power Research Institute Control Center Application Program Interface (EPRI CCAPI) project is a semantic model that describes the components of a power system at an electrical level and the relationships between each component. The IEC 61968-11 (System Interfaces for Distribution Management) extends this model to cover other aspects of power system data exchange such as asset tracking, work scheduling and customer billing. The IEC 62325-301 (Energy Market Communication) extends both these models to cover the data exchanged between participants in electricity markets. These three key standards are collectively known as the CIM for electrical power systems. In practical applications of the CIM it is combined with application and project specific extensions. DOM is CIM-compliant in its basic structure. It matches CIM in those parts where CIM defines information needed for the applications provided by the Spectrum Power system. DOM contains extensions for all parts that are not covered by CIM. For example, communications to the physical equipment in the field, user and console function authority assignments, presentation logic assignments for field equipment in network diagrams, and so on. (image: 1-img63daf5336f76be009da352390a9df611_1_en_US_TIFF.jpg) Figure 3-3 Utilization of CIM Resources by DOM Extensions to the CIM V12 model are handled through the use of namespace assignments. Namespaces do not carry much information in themselves but indicate the origin of the information. The namespaces RDF and CIM are defined in CIM and delineate the CIM standards from customized extensions in DOM. The logical structure provided by the DOM is independent of the physical database implementation and the executable software. Because the DOM hides the underlying physical implementation, it is useful as a basis for application interfaces as well as user interfaces. This de-couples a client application from the implementation details of another application that supplies data or services. **DOM Customization** The DOM can be extended and adapted to specific customer needs. Types, attributes, and associations are assigned to namespaces. RDF is the base namespace, it is extended by CIM. Both namespaces are defined in the CIM standards. DOM extensions for the Spectrum Power domain have an own namespace defined by the product. Customer-specific DOM extensions finally get a customer-specific namespace.					Yes	20-04-13	Functional Overview	Domain Object Model	Compliant - STD	1 - Low	STD
SP7_New-33012	Heading	3.1.5	Functions						No						

SP7_New-33020	SOB	3.1.5-1		Spectrum Power IMM controls the data to be defined and transferred between the engineering database and the Spectrum Power runtime databases. IMM provides functions that act like a set of tools to maintain power system information. The sub-functions of IMM are as follows: * Job management * Domain and graphics model data maintenance * IMM trigger framework * Data import and data export * Validation of data changes * Activation of data changes * Data version management * Reporting * Logs * Multisite environment support * Quality Assurance System (QAS) support * Operator Training Simulator (OTS) support * Access rights * IMM administration					Yes	20-04-13	Functional Overview	Functions	Compliant - STD	1 - Low	STD
SP7_New-33013	Heading	3.1.6	IMM Data Definition						No						
SP7_New-33021	SOB	3.1.6-1		The Spectrum Power IMM functions are a set of tools that allow power system information data to be defined, accessed, and exchanged. These tools also control the transfer of data between the engineering database and the Spectrum Power runtime databases. The propagation of data changes from the IMM to the Spectrum Power applications online runtime databases is designed so that only incremental changes are applied to these databases. The application of the changes to the runtime databases is coordinated so that there is no application downtime – this includes the process interfaces and real-time applications. All changes are immediately available for processing and viewing by operators, and there is no interruption in the real-time operation of the network control center. This process is known as Online Activation. (image: 1-imgc85e1a566f7c44469da352390cb056a1_1_en_US_TIFF.jpg) Figure 3-# Spectrum Power IMM Functional Overview * Engineering data import and export can be done in XDF and RDF formats based on the W3C standard XML. * Partial power grid/network data export can be done additionally in Comma-separated Values (CSV) format. * Editing engineering and graphics data. * IMM Editors used for editing engineering data and Graphics Editor used for editing graphic network diagram data. * Validation features provided by IMM ensures that the data model remains consistent. * Reporting features provided by IMM allow the user to create and view summary or detail reports of type and instance data. * Job management is the method by which changes of the Spectrum Power engineering database are grouped and managed in jobs. * The engineering data is stored in Oracle source data base and go through data preparation and data activation phases to get the changes applied. * Data version management and automatic data model archiving facilities provides a history of model changes including auditing capabilities.					Yes	20-04-13	Functional Overview	IMM Data Definition	Compliant - STD	1 - Low	STD
SP7_New-33014	Heading	3.1.7	IMM Engineering Applications						No						
SP7_New-33022	SOB	3.1.7-1		IMM has a number of engineering applications suitable for the different engineering tasks. (image: 1-img65d5925470b687369da352393f7fa3ae_1_en_US_TIFF.jpg) Figure 3-# General Application Structure of the IMM User Interface The amount of provided applications is dependent of the concrete customer project and configuration. IMM Application provide the following: * Type Editor The Type Editor is used to view and edit properties of a type as well as to create new types. It provides a set of tabbed pages each of which is used to configure a distinct kind of type properties. * Type Inspector The Type Inspector is used to view type properties. Basically it is the read-only version of the Type Editor. * Model and Graphics Editor The Model and Graphics Editor allows viewing and editing of network model and diagram data. It provides structured panels dedicated to different views to the data and rich navigation means through the different views. * Multi-Instance Editor The Multi-Instance Editor is used to view and modify a set of instances including links as well as to search and filter for instances. Queries can be defined, saved and loaded for reuse. The result table can be exported into a CSV file. * Symbol Editor The Symbol Editor allows viewing and editing symbols used on the diagrams. * Color Editor The Color Editor allows viewing and editing color values of color instances used on the diagrams. * Decision Table Editor The Decision Table Editor allows maintaining diagram decision tables for evaluating the presentation of dynamic display objects in the runtime environment. * Shape Style Editor The Shape Style Editor allows creating reusable shape styles which represent a particular graphic property combination that can be assigned to graphic objects. * Style Group Editor The Style Group Editor allows maintaining unique styles matching the values configured in the diagram decision tables by the Decision table editor in a certain style group. * Style Logic Editor The Style Logic Editor allows maintaining style logics for evaluating the style of the presentation					Yes	20-04-13	Functional Overview	IMM Engineering Applications	Compliant - STD	1 - Low	STD
SP7_New-33015	Heading	3.1.8	IMM UI Technology						No						
SP7_New-33023	SOB	3.1.8-1		A typical data engineering console consists of multiple monitors. During an IMM engineering session, the console is connected to the IMM server running on Administrator Server (ADM). Multiple engineering consoles can be connected to the IMM server. The IMM UI client program can be installed on any console in the control center. It runs on Windows or Linux. The client is updated as needed automatically upon login. The initial window loaded is the main screen with the job management user interface and serves as the general access point to the data engineering jobs and IMM engineering applications. The IMM UI client communicates with IMM Server over a secure Message Interchange Communication (MIC) connection. The ADM can run in a spare redundancy configuration. In case of a failure and run up of the spare server, the IMM UI client connection has to be re-established manually. (image: 1-imgc9559f22b3235aaf9da35239753dbfa5_1_en_US_TIFF.jpg) Figure 3-# IMM UI Basic Architecture (1) IPC : Inter Process Communication (2) IMMUIDP: Information Model Management User Interface Data Provider (3) MIC: Message Interchange Communication					Yes	20-04-13	Functional Overview	IMM UI Technology	Compliant - STD	1 - Low	STD
SP7_New-32990	Heading	3.2	Job Management						No						
SP7_New-33024	Heading	3.2.1	Generals						No						
SP7_New-33026	SOB	3.2.1-1		Domain data, graphical network diagram data entry, and engineering activities are under the control of the IMM job management. Job management is the method by which changes of the Spectrum Power engineering database are grouped and managed. A job allows multiple and concurrent users to modify data simultaneously in a secure environment, without impacting the operational databases of the Spectrum Power runtime system. Case Study: Introduce a new substation and propagate this substation to the runtime system. * Create a job in IMM * Edit the new substation domain data, topology and graphical data in the job * Validate the job * Activate the job * Verify the job history Job management controls the definition, usage and deletion of jobs. Job management provides the following functions: * Defining a new job or continuing to work within an existing job. Multiple jobs can exist at one time. * Associating data changes with a specific job. * Viewing data changes associated with a job. * Viewing the job list together with the job status. For example, job reservation details, whether a job has been validated or activated, and so on. * Validation of complete data or incremental data changes in a job. * Activation of data changes to the Spectrum Power runtime system. * Undo of activated data changes to the Spectrum Power runtime system. * Archiving of job changes after a successful activation of the runtime system – if enabled. * Erasing a job discarding all data changes associated with the job. * Finalizing the job to make changes permanent. Data entry and engineering activities include the following: * Manual data entry * Import of bulk or incremental changes from external data model or instance data * Generating change log reports **Job** A job groups data changes that belong together. The job is the unit of data that is finally changed in the engineering database and in the runtime databases of the Spectrum Power system. Each job is identified by a name. Although the job management function provides the capability to group data changes into a job, it is the data engineer who is in control of grouping the changes together. This ability adds great flexibility to the data engineer as to what data changes define an increment of change against the database currently in operation. (image: 1-img084eb9fe70c4938c9da3523935bd81d0_1_en_US_TIFF.jpg)					Yes	20-04-13	Job Management	Generals	Compliant - STD	1 - Low	STD
SP7_New-33025	Heading	3.2.2	Independent Job Mode						No						

SP7_New-33027	SOB	3.2.2-1		In independent job mode, you can view or edit the model as it is at the current time when you are in a job. You see the model as it currently is (the production model used in the Spectrum Power runtime system) plus your job changes. You do not see changes from other jobs unless the jobs are activated. The changes in the job can be considered as overlays on top of the data currently in use online. Each job is a separate overlay so switching between jobs shows the changes in the job overlaying the current data in use. (image: 1-imgdaab9ce7710fefab9da35239293d523b_1_en_US_TIFF.jpg) Figure 3-# Independent Job Mode View (1) Job interlocking prevents different jobs from modifying the same instance and link data to preserve data integrity. This means, that you cannot change the instance data that has been locked by another job and other jobs cannot change your data. (image: 2-imgb42e945470b6898c9da352391a5e23e7_1_en_US_TIFF.jpg) Figure 3-# Independent Job Mode View (2) For example, two different jobs (B and C) cannot edit the same part of equipment within a substation. If you try to change data locked by another job, an error message is issued indicating that the data is locked and your change is aborted. This keeps jobs in the engineering environment independent from each other. They can be processed (for example, activated, undone, or finalized) in any order. **Job Interlocking** Job interlocking applies to individual instances or links in the data model. Adding, modifying or deleting an instance automatically locks the instance itself only. When the user changes an attribute value of an existing instance, this object is locked by the job. If the name of the object is changed, both the old and new names are locked. Both, parent and child objects are not affected. When a new object is added, the new instance is locked. Only this job can create descendants to the newly created instance. When an object is deleted, all child instances are also deleted, and all the deleted instances are locked. Another job cannot insert a new instance with the same name as the deleted instance. The deletion of an instance is prevented if one of the descendants of their links is locked by another job to ensure data integrity. Adding or deleting a link locks this link only. This means that the exact same link, that is, a link that references the same two instances using the same association, cannot be added respectively deleted again by another job. After a job has been activated and finalized or deleted, all interlocks created by this job are released. **Job Interdependency Checks** Job interlocking is performed at engineering design time and supports the user's data maintenance with fine granular individual instance locking, thus allowing utmost parallel editing					Yes	20-04-13	Job Management	Independent Job Mode	Compliant - STD	1 - Low	STD
SP7_New-32991	Heading	3.3	Domain Data Maintenance						No						
SP7_New-33028	SOB	3.3-1		**Overview** Engineering activities to change data require working with large amounts of information with multiple attributes and properties. IMM is the user interface for domain data maintenance within a job. Domain data editors provide means for the following: * Instance data modifications * Data type changes These are provided in different but consistent views of the data according to your intention and workflows. **Creation and Management of Instances** The following instance data modifications can be done from IMM UI within a job: * Create instances * Rename instances * Modify attribute values for instances * Delete instances All descendent instances and their links are also deleted. * Create links * Delete links **Type Changes** Data model maintenance and customizing features allow for the extension of the standard DOM by creating and maintaining custom types. IMM provides means to extend and manipulate the DOM. The following actions are possible: * Creating, modifying, and deleting types. Deletion of types deletes all derived types. A type can be deleted only if all instances of this type have been deleted beforehand. * Creating, modifying, and deleting attributes of a type. Derived types inherit all attributes of its base types. * Creating and deleting associations. DOM modifications can be either performed with the Type Editor or by import of XDF files. When a type change is made, all existing jobs and all subsequent jobs inherit the type change. Since type changes affect the current data model and future jobs, only a user with administrative rights is allowed to make type changes.					Yes	20-04-13	Domain Data Maintenance		Compliant - STD	1 - Low	STD
SP7_New-32992	Heading	3.4	Graphic Data Maintenance						No						
SP7_New-33029	SOB	3.4-1		**Overview** Display construction of network diagrams is completely integrated in the IMM. The Graphics Editor provides means to view, create and modify graphic diagrams and also symbology. The graphical editing creates the link between the instances of the graphic data to instances of the domain data. **Technological Editing** Technological editing allows creation, modification, and deletion of electrical power system domain data and topology in a graphical way. The following workflows are supported: * Create diagrams to represent power network/system graphically. * Create new graphical objects and new domain data. * Link graphical objects to existing domain data. * Create and manipulate the topology of the electrical power system network. * Delete domain data using deletion of graphic objects linking the domain data. * Support creation and usage of user-defined templates that contain domain data and graphic data. Technological editing maintains consistency between graphic data and electrical domain data. **Raster Set Assignment** Generally, rasters are digital aerial photographs, imagery from satellites, digital pictures, or even scanned maps. Picture raster data is often used in geographic displays to convey additional information. Raster data might be organized in raster datasets and raster catalogs. The raster set assignment allows assigning installed raster sets to layers of a diagram and supports PNG and JPG formats.					Yes	20-04-13	Graphic Data Maintenance		Compliant - STD	1 - Low	STD
SP7_New-32993	Heading	3.5	IMM Trigger Framework						No						
SP7_New-33030	SOB	3.5-1		IMM Triggers execute a set of business logic required by downstream applications as it applies to the data. The IMM Trigger functionality provides a user-friendly data entry support. Trigger functions are able to perform actions not only based on an insert, update, and or delete of instances, but also based on current values and situations existing in the database. For example, having triggers that auto-create required instances either as child objects or objects elsewhere in the domain data hierarchy based on certain data criteria, means that there is less data that the user must enter by hand and less chance for human error. **Trigger Events** Triggers are executed based on a trigger event. Trigger events are part of the data model type definitions in DOM. There are five types of events possible. They are as follows: * OnInsert * OnUpdate * OnDelete * OnCutPaste * OnRename The trigger functions are executed after the end of an engineering task. For example, if one task consists of adding three instances of type Breaker and deleting one instance of type Measurement, the trigger function assigned to OnInsert Breaker event will be called three times, once for each Breaker, and the function assigned to OnDelete Measurement will be called once for the Measurement. All necessary trigger functions are called after changes are made by the task and are completely committed to the database. **Trigger Functions** Triggers are data type dependent. They reference types defined by the data model DOM. One generic master trigger package, PkgTrgMaster, resides in the schema directory and handles the calling of all necessary trigger functions. The following trigger functions are supported: * Population of internal (read-only) attributes for instances For example, auto-numbers are needed to support the Spectrum Power runtime system like B1, B2, B3, Diagram, and Nimset numbers. The auto-number defined for an instance A is unique when associated with another instance B. The instances A and B may be a parent child or a reference association. A defined set of associations may drive a certain auto-number. The numbers can be configured to be Reused or Non-reused. * Creation of children or grandchildren instances Auto-create new child objects when a new instance is added. For example, creation of Info's under elements based on the normelement type, creation of data acquisition equipment, creation of RTDS pseudo station, and so on.					Yes	20-04-13	IMM Trigger Framework		Compliant - STD	1 - Low	STD
SP7_New-32994	Heading	3.6	Data Import and Data Export						No						
SP7_New-33031	Heading	3.6.1	General						No						
SP7_New-33033	SOB	3.6.1-1		**Import and Export of Engineering Data in XDF or CIM-RDF** IMM provides an interface to export and import engineering data in XDF and CIM-RDF. Both are XML formats based on W3C standard. The XML is a versatile language for the definition of tags to identify document contents. XML allows third-party products to be used for data editing and pre-validation. CIM-RDF is based on the IEC 61970-452 and IEC 61968-13 standards for the description of electrical power systems. XDF is a proprietary format. IMM supports complete, partial, and incremental import and export in XDF and CIM-RDF. All engineering data can be exported and imported in these formats. Profiles allow filtering of exported engineering data. They are based on types, attributes, and associations. You can define types, attributes, and associations that define a profile. An arbitrary number of profiles are supported. Instance filtering of exported engineering data is based on logical expression containing one or multiple attributes of one type. Instance filtering is provided to allow limiting the exported instances to a set matching a certain use case. The data import and export features of Spectrum Power IMM are used for: * Data migration Transfer of instance data and graphics data from legacy systems. * System upgrade The import or export feature allows you to store the database content in files that are re-imported after system upgrade. * External engineering data modification The import/export feature allows modifying data in external files which, after external entry modification, are re-imported into the IMM data model. * Data backup feature The export function can be used to save the data (the overall data model) to an external file. * Profile-based export Only instances assigned to a certain profile are exported. Following the data import, validation ensures that the new engineering data is consistent and does not conflict with any other engineering data in the system. During export, the specified data information is transferred from the database to external files. **Further Instance Data Export Formats** Partial power grid/network data export in CSV format is supported. In power companies, several systems exist based on (to varying extents) common power grid/network data of the utility. Generally, each system has a database and its own data model maintenance tools optimized to the specific scope of the data. Thus, the complete model maintenance is split up in different model maintenance systems with defined data					Yes	20-04-13	Data Import and Data Export	General	Compliant - STD	1 - Low	STD
SP7_New-33032	Heading	3.6.2	Model Merge Framework						No						

SP7_New-33034	SOB	3.6.2-1		In power companies, several systems exist based on (to varying extents) common power grid/network data of the utility. Generally, each system has a database and its own data model maintenance tools optimized to the specific scope of the data. Thus, the complete model maintenance is split up in different model maintenance systems with defined data responsibilities for a specific data item. For specific parts of the data required for the Spectrum Power system, one of those external systems might be the master. The data coming from the different sources needs to be consolidated by IMM into a single source before populating the Spectrum Power runtime system. An example for such a system is the GIS. Data provided by the GIS gets imported into IMM through the GIS Data Import Management (GDIM) function of Spectrum Power. The following feature of IMM support the consolidation of data from different sources in the CIM based DOM: * Support of foreign identifiers The CIM based DOM in IMM uses, among others, universally unique RDF identifiers. External systems might use foreign unique identifiers (for example, GIS ID) for similar purposes. Foreign identifiers can be defined as such in DOM and allow for one-to-one identification in both systems. Foreign identifiers are treated similarly to RDF identifiers in IMM regarding enforcement of the uniqueness during modification attempts.					Yes	20-04-13	Data Import and Data Export	Model Merge Framework	Compliant - STD	1 - Low	STD
SP7_New-32295	Heading	3.7	Validation of Data Changes						No							
SP7_New-33035	SOB	3.7-1		Validation ensures that the entire data model remains consistent. In addition, it ensures that all necessary data is entered (completeness check). Validation takes place in a maintenance environment, for example, a job, before the changes are activated into the Spectrum Power runtime system. Validation is started either user triggered using the IMM user interface or automatically when saving data that has been entered using an IMM editor. {image: 1-Tip.png} / NOTEIt is recommended to run validation and fix constraint violations before activation. **Validation Areas** Validation can be performed for the following areas: * The data changed in a job * Entire data in the root combined with the data changes in a job (global validation) * Data modified by means of the IMM import **Validation Types** The following validation types can be distinguished: * Inter-object validation Inter-object validation refers to those checks that require multiple instances to ensure data consistency. These checks can also include instances of different types. * Intra-object validation Intra-object validation verifies the correctness of data in a single instance. This is done automatically when the data is saved. If an incorrect data value is entered, an error message is issued. Intra-object validation includes: * Unique value checks These checks verify that the value in an attribute or combination of attributes is not duplicated across multiple instances of an object. * Cardinality checks These checks verify that relationships between types are satisfied. For example, a parent or child relationship. * Required attribute checks These checks verify that a value has been supplied for a required attribute. * Range checks These checks verify that the value is greater than or equal to a minimum value and less than or equal to a maximum value. For example, 1-10. * Enumeration checks These checks verify that a value is member of a specified list of values (enumeration). For example, Yes/No, Open/Close.					Yes	20-04-13	Validation of Data Changes		Compliant - STD	1 - Low	STD
SP7_New-32296	Heading	3.8	Activation of Data Changes						No							
SP7_New-33036	SOB	3.8-1		All power grid domain data and diagram data changes are done in a job. Activation propagates data changes into the Spectrum Power runtime system. The activation ensures that the incremental changes are applied to all applications of the Spectrum Power runtime system, including IMM. In a single failure during activation, the changes are rolled back system-wide. **Activation** Activation is performed in three phases: * Data Preparation Data Preparation generates the change log files for the different application suites, populates Spectrum Power object tables and creates and populates FeBin files for network diagram data for the incremental changes associated with a job. Multiple jobs can be in the prepared state if they are distinct from each other in terms of the operational database of Spectrum Power. Interdependency checks during data preparation are performed to check whether the changes of the job are distinct to all jobs being in prepared, transferred, or activated state. This check is based on the runtime models to ensure data integrity. After a successful data preparation, the incremental changes are ready to be transferred into the offline copy of the operational database. * Data Transfer Data Transfer populates the incremental changes associated with a job to the offline copy (copy 1) of the operational database of Spectrum Power. With this step the Spectrum Power ADM gets involved for the first time. After a successful data transfer, the incremental changes are ready to be activated into the online copy of the operational database. * Data Activation In this phase the incremental job changes are merged into the root of the dataset in the IMM database. Data Activation activates the changes into the online copy (copy 0) of the operational database of Spectrum Power and into the ASRs of Shared Components. **Undo Activation** An Undo Activation is considered as rare and exceptional use-case. Nevertheless, Undo Activation might be the fastest way to return back to normal runtime operation when logically correct, thus without validation errors, but faulty data not describing the real world got activated. Instead of correcting the faulty data under time pressure in a new job, undo activation provides convenient means to undo the changes without losing the former data changes that causes the runtime failure. The faulty data can be corrected in the original job and activated again. Undo Activation has the following two phases: * Undo Prepare					Yes	20-04-13	Activation of Data Changes		Compliant - STD	1 - Low	STD
SP7_New-32297	Heading	3.9	Data Version Management	In this phase, an undo change log is generated for the Shared Components (like HIS) and					No							
SP7_New-33037	SOB	3.9-1		Data version management and automatic static data model archiving facilities provide a history of model changes and allows the user to track data changes over time. Jobs in the IMM model archive provide a past view of the static data model based on the activation time. If archiving is enabled, data is stored in the IMM model archive after a successful job activation or undo activation of the Spectrum Power runtime system. This allows the user to view all jobs that have been activated in the past. The user can run change log reports on archived jobs, access logs, export data, and export data changes in the same way as it is done in the current Real-Time Dataset (RT). The active IMM model archive is a separate read-only dataset; data editing or import is not allowed in order to preserve the history. Retrieving a past model for any point in time enables accurate conclusions to be derived from post-mortem analysis. **DOM Type Changes** Special consideration is made when changing DOM types. Simply applying type changes to the active archive would distort the way instance data looked in the past. However, not applying type changes would mean that future jobs could not be archived. Therefore, type changes that do not affect the instance data are applied directly to the active archive. Type changes that affect the instance data are logically applied. The changed attribute determines which changes are made to the archived instances. **Long Term Archive** Creating a new baseline in the active archive allows the user to transfer a specific historical time frame into a long-term archive. A long-term archive is an oracle dump file that can be stored on external media and can be loaded again into a dataset for any purpose. {image: 1-img6e5c8cd170e558639da3523967 4b056f_1_en_US_TIFF.jpg} Figure 3-II Spectrum Power IMM – Model Archive **Auditing of IMM Jobs** IMM job auditing features provide means to keep track of who made when what changes to the domain and graphical data. For example, when a problem is identified for a given data instance, end users get the ability to identify what jobs made changes to that instance. Auditing features require the jobs being in the active IMM archive. The specific provisions are as follows: * For any job that is finalized, you can export the incremental XDF or RDF change log and view the report of the changes in that job. * The user is able to view the previous value and the new value changed to by the job. * The user is able to view the order in which jobs were activated or undone and when they were finalized. * The user is able to identify the jobs that modified a given instance within a given time frame.					Yes	20-04-13	Data Version Management		Compliant - STD	1 - Low	STD
SP7_New-32298	Heading	3.10	Reporting						No							
SP7_New-33038	SOB	3.10-1		**Data Reporting** Reporting features provided by IMM allow the user to create/view summary or detail reports of type and instance data. **Instance Change Report** The instance change report displays changes within a selected network equipment hierarchy and within any hierarchy below substation like voltage levels or bays. The report contains all changes made in the existing jobs of a dataset to the instance hierarchy. In the independent job mode, the currently opened job in the real-time dataset and the root job are evaluated. **Object Usage Report** The object usage report displays for a selected network equipment hierarchy the linked telemetry data points as well as linked graphical objects in the different network diagrams. The report can be created for substations or any hierarchy below like voltage levels or bays. The telemetry information covers the linked Independent Front-End System (IFS) that is, RTU-Front-End data as well as linked Inter-control Center Communications Protocol (ICCP) data.					Yes	20-04-13	Reporting		Compliant - STD	1 - Low	STD
SP7_New-32299	Heading	3.11	IMM Logs						No							

SP7_New-33039	SOB	3.11-1		IMM provides logs within the log section of the IMM user interface. The log section can be opened in a separate window. Selected logs can be exported to a Comma-separated Values (*.csv) file. The following are the various log types available, depending on the selected dataset, job or data engineering workflow: * IMM Status Log Messages about the state (activation, preparation, and so on) of the job or IMM itself. The messages include severity, job name, time stamp and source. * Task Log Messages about user actions such as copy/paste, cut/paste, delete subtree, modify instance data, modify type data, and so on. The messages include severity, details, time stamp, and source. An object path is a hyperlink that can be used to navigate to the instance in question. * Validation Log Messages about job validation or global validation. The messages include severity, hierarchical path of the instance and the object type. The object path is a hyperlink that can be used to navigate to the instance in question. * Activation Log Contains all the messages that were created during the preparation or activation of a dataset or job. The messages include severity and time stamp. * Import Log Contains all the messages that were created when a user initiated import was done within a dataset or job. The messages include severity, details and time stamp. * Job History Log Shows the status change of the selected job. The messages include last status change, job name, job status, previous job status and user. * Finalized Jobs Log Lists the jobs that were activated and finalized. The messages include last status change, job status, previous job status and user. The individual log can be modified. Predefined columns with additional information can be included; columns can be used for sorting or can be hid. In the active IMM model archive, the Activation Log and Job History Log for the jobs are retained for auditing purposes.					Yes	20-04-13	IMM Logs		Compliant - STD	1 - Low	STD
SP7_New-33000	Heading	3.12	Spectrum Power Operating System						No						
SP7_New-33040	Heading	3.12.1	Multisite Environment Support						No						
SP7_New-33043	SOB	3.12.1-1		The collection of control centers cooperatively managing a power system are known as a multisite system. Multisite systems are usually organized in a main/backup or main/regional configuration. All Spectrum Power systems in a multisite network have the complete data model with formal identical content of information maintained by IMM. There is only one data model master at a time. The Main Control Center takes the role of the data model master. The other control centers of the network are source data-dependent. Main/Backup Control Center Systems having Backup Control Centers require synchronized engineering databases between the Main and Backup Control Centers. Data consistency (editing and activating) between the two sites is guaranteed using Oracle data guard and the IMM activation framework. (image: 1-img9f35d3c670c495229da35239137c7662_1_en_US_TIFF.jpg) Figure 3-# Main/Backup Configuration – Basic Overview When there is a switchover or fail-over, authorized data engineers can set the current Main Control Center as master for IMM at any time. Main/Regional Control Center Regional Control Centers get their source data changes applied through job activation from the Main Control Center. There is no IMM database at a Regional Control Center, thus data engineering is always performed on its Main Control Center. (image: 2-img545512f770c496ac9da352390056d58b_1_en_US_TIFF.jpg) Figure 3-# Main/Regional Configuration – Basic Overview					Yes	20-04-13	Spectrum Power Operating System	Multisite Environment Support	Compliant - STD	1 - Low	STD
SP7_New-33041	Heading	3.12.2	Quality Assurance System (QAS)						No						
SP7_New-33044	SOB	3.12.2-1		A QAS allows testing data changes without any implication to the production system. The production system and QAS are independent from each other. The QAS takes the role of the Data Model Master. Modified and successfully tested IMM data is transferred from QAS to the production system only. Activations of the production system are always triggered on the IMM UI at the QAS. (image: 1-img4dc87ebc70e553ed9da352390f74a9bc_1_en_US_TIFF.jpg) Figure 3-# QAS System Configuration – Basic Overview As long as the QAS is running and is reachable by the production system, domain data modification is not allowed in IMM on the production system. If the QAS is down, authorized data engineers are enabled to set the production system as master for IMM at any time. The mandatory IMM job business model in a QAS system configuration is the independent job mode. If the QAS runs up the first time a full IMM database synchronization is done. If jobs already exist at the production system these are synchronized as well.					Yes	20-04-13	Spectrum Power Operating System	Quality Assurance System (QAS)	Compliant - STD	1 - Low	STD
SP7_New-33042	Heading	3.12.3	Operator Training Simulator						No						
SP7_New-33045	SOB	3.12.3-1		An Operator Training Simulator (OTS) enables operators to practice runtime system operations under simulated conditions. The main system and the offline OTS are independent from each other. (image: 1-img570ef35971345bbb9da3523925336202_1_en_US_TIFF.jpg) Figure 3-# OTS System Configuration – Basic Overview If the OTS runs up the first time a full database synchronization is done with its main system.					Yes	20-04-13	Spectrum Power Operating System	Operator Training Simulator	Compliant - STD	1 - Low	STD
SP7_New-33001	Heading	3.13	IMM Access Rights						No						
SP7_New-33050	SOB	3.13-1		User authorization is performed during log on to Spectrum Power IMM. IMM access rights and instance level access rights are configured within the user administration dataset. By default, a user who is authorized to use Spectrum Power IMM is permitted to view the information available within IMM.					Yes	20-04-13	IMM Access Rights		Compliant - STD	1 - Low	STD
SP7_New-33046	Heading	3.13.1	IMM Access Rights						No						
SP7_New-33051	SOB	3.13.1-1		Data entry and activation in IMM is controlled by access rights. IMM provides granular access rights dependent on the dataset and the requested action. The following individual access rights are supported: * Instance data engineering * Type data engineering * Data activation * Engineering dataset administration * System management information instance data engineering * User Administration (UA) instance data engineering					Yes	20-04-13	IMM Access Rights	IMM Access Rights	Compliant - STD	1 - Low	STD
SP7_New-33047	Heading	3.13.2	Instance Level Access Rights						No						
SP7_New-33052	SOB	3.13.2-1		Access rights can be assigned for each instance individually. They describe what a user is allowed to do with the respective instance in IMM (view, modify, modify and assign new access rights for this instance). Instance level access rights, define on what parts of the power network data model in RT, the user can do modifications. Thus, they limit the user's given IMM access rights.					Yes	20-04-13	IMM Access Rights	Instance Level Access Rights	Compliant - STD	1 - Low	STD
SP7_New-33048	Heading	3.13.3	IMM Console Access Rights						No						
SP7_New-33053	SOB	3.13.3-1		Console access rights allow for location-based access control based on the IMM UI server (console) where the user currently is working. The authorities are always calculated as intersection (common subset) of access rights for console and user. Thus, granted IMM user access rights can be restricted by IMM console access rights.					Yes	20-04-13	IMM Access Rights	IMM Console Access Rights	Compliant - STD	1 - Low	STD
SP7_New-33049	Heading	3.13.4	IMM Job Reservation						No						
SP7_New-33054	SOB	3.13.4-1		A single job is reserved for a particular user during its creation. The current job owner and an authorized user can reassign a job to a different user.					Yes	20-04-13	IMM Access Rights	IMM Job Reservation	Compliant - STD	1 - Low	STD
SP7_New-33002	Heading	3.14	IMM Administration						No						
SP7_New-33055	SOB	3.14-1		**IMM Admin Command Line Tool** The IMM admin tool is used to manage the Spectrum Power IMM datasets. **Managing Datasets** The IMM admin tool provides authorized users the following functionality: * Creating a new dataset (planning dataset). * Clearing all instance data of a dataset. * Clearing all type and instance data of a dataset. * Managing the IMM model archive. * Managing the QAS connection. * Synchronizing ODB-Relations. * Changing dataset properties. For example, definition of the maximum import errors after import gets aborted. **Archive Management** The IMM admin tool allows managing the IMM model archive. It allows the user to enable or disable the archive, to create a long-term archive and to create a new baseline in the active archive. The archive log shows details, such as the timeline where a certain data model version was used at the production system (start date and time, end date and time).					Yes	20-04-13	IMM Administration		Compliant - STD	1 - Low	STD
SP7_New-33003	Heading	3.15	IMM User Interface						No						
SP7_New-33056	Heading	3.15.1	Generals						No						
SP7_New-33077	SOB	3.15.1-1		The IMM UI can be installed on any UI console. IMM UI runs on Windows or Linux. The client is updated as needed automatically upon login. Within the user interface of IMM, multiple editors that are optimized for the various data engineering workflows allow data access and definition covering all aspects of data engineering. The following functions are available in IMM: * Creating types * Creating instances * Creating instances by copying existing instances * Deleting types and instances * Viewing, creating, and modifying attributes and properties of types and instances * Viewing, creating, and deleting associations between types * Viewing, creating, and deleting links between instances * Validating data changes * Activating data changes * Importing and exporting type and instance definitions * Creating reports of types and instance definitions * Creating and modifying graphic diagrams					Yes	20-04-13	IMM User Interface	Generals	Compliant - STD	1 - Low	STD
SP7_New-33057	Heading	3.15.2	Search Function						No						

SP7_New-33078	SOB	3.15.2-1		The search function allows looking up instances by the instance name or parts of the instance name. Entering the name of a parent instance narrows the search range down to the descendants of the selected instance. Placeholder characters can be used to extend the search range. Searching instances based on provided RDF ID, object identifier (GUID) or Spectrum Power Internal Identifier (SIID) is also provided. The result of a search is a list of instances identified by their path. The user can navigate to an instance in the list by double-clicking the path (hyperlink). (image: 1-img6bcf7675a63478ad9da35239461ae501_1_en_US_PNG.png) Figure 3-# Search Function - Instances The search function allows searching for instances by B1/B2/B3/Elem/Info names and numbers as well. (image: 2-img7dca5ea1a6346f749da35239425f9e66_1_en_US_PNG.png) Figure 3-# Search Function - Search by Name (image: 3-imgf1c8ce00a63475219da352391a053f83_1_en_US_PNG.png) Figure 3-# Search Function - Search by Number The search function allows the user to search by the identifier as well. (image: 4-imgf0de49e3a6347c1b9da35239129c8368_1_en_US_PNG.png) Figure 3-# Search Function - Search by ID					Yes	20-04-13	IMM User Interface	Search Function	Compliant - STD	1 - Low	STD
SP7_New-33058	Heading	3.15.3	Online Help						No						
SP7_New-33079	SOB	3.15.3-1		The online documentation consists of released Spectrum Power IMM manuals that have been converted into Portable Document Format (PDF) files. IMM has an integrated online help that provides an extensive guide to the Information Model Management based on the Spectrum Power IMM manuals. Help information can be viewed using the context-sensitive help. This is done by clicking a user interface component and invoking a help viewer to show the related help topic.					Yes	20-04-13	IMM User Interface	Online Help	Compliant - STD	1 - Low	STD
SP7_New-33059	Heading	3.15.4	National Language Support						No						
SP7_New-33080	SOB	3.15.4-1		National Language Support (NLS) is provided. It is used to customize Spectrum Power IMM with the desired language during configuration time. The character strings are translated using a standard translation software package and the transfer to the system is a system feature.					Yes	20-04-13	IMM User Interface	National Language Support	Compliant - STD	1 - Low	STD
SP7_New-33060	Heading	3.15.5	Main Screen						No						
SP7_New-33081	SOB	3.15.5-1		Once the IMM application starts, it opens the main screen. The main screen represents an application framework for the IMM engineering applications. (image: 1-img2fd41e2e69dd902d9da3522a1bd1be21_2_en_US_PNG.png) Figure 3-# IMM Main Screen The main screen is structured into different areas, dedicated to different aspects of data engineering. It has a standard menu bar at the top of the main window to provide access to some commonly used functions. The top left panel shows the list of datasets available in the IMM database. There is a context menu on the dataset with items tailored to the functions available for the selected dataset. The top right panel shows the list of jobs for the selected dataset. The bottom panel has tabs for the various logging facilities. Sections can be resized by dragging the separators between them. The top and bottom halves of the screen can be collapsed by clicking on the title bar for the section. The bottom panel for logging can also be undocked and re-docked.					Yes	20-04-13	IMM User Interface	Main Screen	Compliant - STD	1 - Low	STD
SP7_New-33061	Heading	3.15.6	Job Management						No						
SP7_New-33082	SOB	3.15.6-1		The Job management UI is used for the following: * Create and open a job * Validate and activate a job * Administrate jobs (image: 1-img74e8438a69fcea909da3522a65bc98bb_2_en_US_PNG.png) Figure 3-# Job Management The Job management UI shows the following information about each job that is not finalized: * Job name * Job status * Job owner * Job description Depending on the configured scope of functionality, the following additional information is included: * Job status on PROD (for systems having a separate QAS) * Activation or undone time (in IMM static data model archive only)					Yes	20-04-13	IMM User Interface	Job Management	Compliant - STD	1 - Low	STD
SP7_New-33062	Heading	3.15.7	Type Editor						No						
SP7_New-33083	SOB	3.15.7-1		The Type Editor is used for the following: * Create new types * View and edit existing types (image: 1-img0dedb980e74f19279da3522a3791b295_1_en_US_PNG.png) Figure 3-# Type Editor There is a read-only mode available called Type Inspector. The type inspector is used to view the existing types. (image: 2-Tip.png) | NOTE Types can only be modified and created in the root job of a dataset by users with appropriate access rights. It is recommended to use the Type Editor for small changes only. Modifications of attributes or associations of existing types are not recommended at all. For major changes, external data modeling tools shall be used.Type changes may introduce additional source code changes to take effect in the Spectrum Power 7 system.					Yes	20-04-13	IMM User Interface	Type Editor	Compliant - STD	1 - Low	STD
SP7_New-33063	Heading	3.15.8	Model and Graphics Editor						No						
SP7_New-33084	SOB	3.15.8-1		The Model and Graphics Editor is used to: * View and modify instance properties including links * Create a new instance * View, create, or modify network displays (image: 1-imgb53fe8e774f5ab749da3522a362d834f_2_en_US_PNG.png) Figure 3-# Model and Graphics Editor The screen is structured into different areas, dedicated to different views to the data. It appears once a job is being opened. A set of editors and tools optimized for the various engineering workflows allow data access and definition covering all aspects of data engineering. It has a standard menu bar at the top of the main window to provide access to some commonly used functions. The left panel shows a tree view of the model data. The attributes panel on the right is able to present various views of the object attributes. Between both panels, multiple schematic diagrams and reports can be opened. The model is edited by dragging new objects into the diagrams and connecting their terminals together, disconnecting objects, deleting objects, or by editing the parameters of the objects in the resizable attributes panel. The panels can be resized by dragging the separators between them. **Diagram Concept** A diagram consists of layers in which the presentation details can be distributed to several layers with potentially different magnification or visibility levels. The keypoints are as follows: * Support for regular layers A display consists of a set of layers where decluttering by zooming is possible. The layer concept helps the display designer to organize the grouping and visibility of the network component representation. * Support for overlay layers Overlays are special layers. They can be toggled on/off in run-time regardless of the zoom level. * Layer-based decluttering Each object is assigned to a layer. Layers can be defined to be visible only within a certain zoom range. Only those objects are displayed that belong to a currently visible layer. **Technological Editing** Technological editing allows creation, modification, and deletion of electrical power system domain data and topology in a graphical way during diagram construction. The following workflows are supported: * Create new graphical objects and new domain data using drag and drop from the topology diagram toolbar.					Yes	20-04-13	IMM User Interface	Model and Graphics Editor	Compliant - STD	1 - Low	STD
SP7_New-33064	Heading	3.15.9	Multi-Instances Editor						No						
SP7_New-33085	SOB	3.15.9-1		The Multi-Instance Editor (MIE) allows for user-defined query filters on a combination of data instances, attributes and associations. The retrieved objects and attributes can then be edited similarly to what is possible in the IMM UI. Queries can be defined, saved and loaded for reuse. (image: 1-img566f3cd3a2ce067f9da3522a5eb0fa89_1_en_US_PNG.png) Figure 3-# Multi-Instances Editor					Yes	20-04-13	IMM User Interface	Multi-Instances Editor	Compliant - STD	1 - Low	STD
SP7_New-33065	Heading	3.15.10	Symbol Editor						No						
SP7_New-33086	SOB	3.15.10-1		The Symbol Editor is used to edit symbols used on diagrams. (image: 1-imgc66eccadd3f4a65b9da3522a390d7737_1_en_US_PNG.png) Figure 3-# Symbol Editor Symbols are combinations of graphic primitives. Symbols play an important role for graphical representation of a domain data instance such as a circuit-breaker for the Spectrum Power runtime user interface depending on its current status.					Yes	20-04-13	IMM User Interface	Symbol Editor	Compliant - STD	1 - Low	STD
SP7_New-33066	Heading	3.15.11	Color Editor						No						
SP7_New-33087	SOB	3.15.11-1		The Color Editor is used to view, modify, and define color values for color instances. (image: 1-img38502002e24bb8b29da3522a0562ed85_1_en_US_PNG.png) Figure 3-# Color Editor					Yes	20-04-13	IMM User Interface	Color Editor	Compliant - STD	1 - Low	STD
SP7_New-33067	Heading	3.15.12	Decision Table Editor						No						
SP7_New-33088	SOB	3.15.12-1		The Decision Table editor is used to maintain diagram decision tables for evaluating the presentation of dynamic display objects in the runtime environment based on their status, quality and other information. (image: 1-imgf7d7ced8e26b33ac9da3522a5c1df815_1_en_US_PNG.png) Figure 3-# Decision Table Editor					Yes	20-04-13	IMM User Interface	Decision Table Editor	Compliant - STD	1 - Low	STD
SP7_New-33068	Heading	3.15.13	Shape Style Editor						No						
SP7_New-33089	SOB	3.15.13-1		The Shape Style Editor is used to create reusable shape styles which represent a particular graphic property combination that can be assigned to graphic objects instead of assigning multiple properties one after the other. (image: 1-img9eb68944e2e11f3c9da3522a3378903a_1_en_US_PNG.png) Figure 3-# Shape Style Editor					Yes	20-04-13	IMM User Interface	Shape Style Editor	Compliant - STD	1 - Low	STD
SP7_New-33069	Heading	3.15.14	Style Group Editor						No						
SP7_New-33090	SOB	3.15.14-1		Style groups are used to apply dynamic styles to display objects. The Style Group Editor is used to maintain unique styles matching the rules configured in the diagram decision tables by the Decision Table Editor. (image: 1-img7d8fa466e2f2fd779da3522a3052b381_1_en_US_PNG.png) Figure 3-# Style Group Editor					Yes	20-04-13	IMM User Interface	Style Group Editor	Compliant - STD	1 - Low	STD
SP7_New-33070	Heading	3.15.15	Style Logic Editor						No						
SP7_New-33091	SOB	3.15.15-1		The Style Logic Editor is used to maintain style logics for evaluating the style of the presentation of dynamic display objects in the runtime environment based on the combination of a decision table and a style group. (image: 1-imgde5fe4d7e312a5f99da3522a14a6d540_1_en_US_PNG.png) Figure 3-# Style Logic Editor					Yes	20-04-13	IMM User Interface	Style Logic Editor	Compliant - STD	1 - Low	STD
SP7_New-33071	Heading	3.15.16	Symbol Group Editor						No						

SP7_New-4081	SOB	3.15.16-1		Symbol groups are used to apply dynamic symbols to display objects. The Symbol Group Editor is used to maintain unique symbols matching the rules configured in the diagram decision tables by the Decision Table Editor. (image: 1-imgb32b099be331e4989da3522a073c16be_1_en_US_PNG.png) Figure 3-# Symbol Group Editor					Yes	20-04-13	IMM User Interface	Symbol Group Editor	Compliant - STD	1 - Low	STD
SP7_New-33072	Heading	3.15.17	Symbol Logic Editor						No						
SP7_New-33092	SOB	3.15.17-1		The Symbol Logic Editor is used to maintain symbol logics for evaluating the symbol of the presentation of dynamic display objects in the runtime environment based on the combination of a decision table and a symbol group. (image: 1-img7a9e6f4de36b70d99da3522a6cd16f51_1_en_US_PNG.png) Figure 3-# Symbol Logic Editor					Yes	20-04-13	IMM User Interface	Symbol Logic Editor	Compliant - STD	1 - Low	STD
SP7_New-33073	Heading	3.15.18	Text Style Editor						No						
SP7_New-33093	SOB	3.15.18-1		The Text Style Editor is used to create reusable text styles which represent a particular graphic property combination that can be assigned to graphic text objects. (image: 1-img4c4b3db7e72b1a4b9da3522a5904cc96_1_en_US_PNG.png) Figure 3-# Text Style Editor					Yes	20-04-13	IMM User Interface	Text Style Editor	Compliant - STD	1 - Low	STD
SP7_New-33074	Heading	3.15.19	Analog Representation Editor						No						
SP7_New-33094	SOB	3.15.19-1		The Analog Representation Editor is used to view the defined analog representation styles. (image: 1-img604fd502e73d3cc19da3522a3d9b8128_1_en_US_PNG.png) Figure 3-# Analog Representation Editor					Yes	20-04-13	IMM User Interface	Analog Representation Editor	Compliant - STD	1 - Low	STD
SP7_New-33075	Heading	3.15.20	Auto Save						No						
SP7_New-33095	SOB	3.15.20-1		IMM UI has a functionality that automatically saves the unsaved changes locally into an export file, which can be recovered in case of a disconnect or a system failure happened in the IMM UI context. This is to prevent or limit the loss of work when an unexpected situation happens. The exports are executed in a defined cycle and are automatically indicated to be re-imported when the previously modified Job or Dataset in IMM UI is reopened.					Yes	20-04-13	IMM User Interface	Auto Save	Compliant - STD	1 - Low	STD
SP7_New-33076	Heading	3.15.21	Alarm Response Text Configuration						No						
SP7_New-33096	SOB	3.15.21-1		The IMM UI has also a functionality that allows the operator to configure alarm response text options, for a selected alarm message, using an Alarm-Response Diagram. This diagram is a single-line diagram, created by the data engineer, that contains the instructions on how to react to the alarm. This kind of diagram is located in the folder Presentation → Diagrams → Alarm-Response Diagrams (refer to the following Figure 3-36). (image: 1-img4ab8b81f95c962aa9da35239705c864f_1_en_US_PNG.png) Figure 3-# Alarm-Response Diagram As shown in Figure 4-16, in the diagram view Links to other objects tab, it is possible to link alarms to the Alarm-Response Diagram (highlighted links). The alarm is defined through Element Type + Info, and there are two links that can be used to associate the alarm to the diagram: * DiagramView (Is response page for) ElementType * DiagramView (Is response page for) info If only the element type is linked, the diagram will be used for all alarms of this element type (for example, for all CB alarms). If element type and info are linked, the diagram will be only used for this specific alarm (for example, CB status or CB trip alarm).					Yes	20-04-13	IMM User Interface	Alarm Response Text Configuration	Compliant - STD	1 - Low	STD
SP7_New-33004	Heading	3.16	Technology and Concepts						No						
SP7_New-33097	Heading	3.16.1	Object-Oriented Data Modeling Approach						No						
SP7_New-33102	SOB	3.16.1-1		The CIM is defined in Unified Modeling Language (UML). UML uses an object-oriented approach that describes a model as a collection of classes, class attributes, and associations. Within a system, a class represents a specific type of object being modeled. Each class can have its own internal attributes and relationships with other classes. Each class can be instantiated into any number of separate instances, known as objects in the object-oriented programming paradigm, each containing the same number and type of attributes and relationships, but with their own internal values. DOM uses a domain-oriented notation to describe the power system domain data model. It describes the power system domain data model in terms of the following: * Types (UML classes) * Attributes (UML class attributes) * Associations (UML associations) * Instances (UML instantiated classes) Types, attributes, and associations build the schema for the definition of instances. (image: 1-imgb0e5f34e0c624fcc9da3529601731ef2_1_en_US_TIFF.jpg) Figure 3-# UML Example					Yes	20-04-13	Technology and Concepts	Object-Oriented Data Modeling Approach	Compliant - STD	1 - Low	STD
SP7_New-33098	Heading	3.16.2	IMM Types						No						
SP7_New-33103	SOB	3.16.2-1		**Introduction** A type is a logical structure of the DOM that defines the data organization and representation of a certain resource (for example, a circuit-breaker). Each type can have its own internal attributes and relationships with other types. The full set of types constitutes the DOM. The types supplied by the DOM match the functionality of all Spectrum Power applications. **Type Name** The name is used to identify each type that must be unique across the entire system. Besides a name, types can have one associated label. Labels are language-specific. When accessing type data, IMM automatically retrieves the label. Therefore, only the label is seen from the users' point of view. **Type Attributes** Attributes describe static characteristics of a type. For example, a type Switch can have the attribute Status that describes the current switch position. Each attribute has an associated data type that defines which kind of information can be stored in an attribute. For example, assume the attribute Status from the previously used example has the data type binary value. Accordingly, the attribute Status can only assume the values 0 (Off) or 1 (On). Examples of data types are: Boolean, integer, string and so on. **Type Associations** Associations represent relationships between types. An association implies that one type Has A relationship with another type. For example, generator Is A Member Of substation. Both types involved in the relationship are aware of each other. To define instance hierarchy and instance links, association are used in Spectrum Power IMM. Associations used to define the instance hierarchy are parent-child associations. This relationship forces the arrangement of instances in a certain hierarchical order when instances are defined. Associations used to define links between instances are called reference associations. Reference associations are like parent-child associations. But unlike parent-child associations which enforce a certain instance hierarchy, reference associations are general-purpose relationships which are used to define links between instances. For example, a GeneratingUnit Has A Message Set. Verbs are used to outline the purpose of an association and to reflect the characteristic of the system described by the association. Normally, the used verbs originate from the system domain. For example, Has A, Uses, Operated By.					Yes	20-04-13	Technology and Concepts	IMM Types	Compliant - STD	1 - Low	STD
SP7_New-33099	Heading	3.16.3	Instance Data						No						
SP7_New-33104	SOB	3.16.3-1		Real-world objects of a power system are represented in IMM as instances of data types. For example, Breaker is a type that describes all characteristics and behavior of circuit breakers. The circuit-breaker CB A1 contained within the bay Bay A1 is a real-world object - an instance of the type Breaker whose characteristics and behavior are defined by the type Breaker. The entire set of instances constitutes the domain data and is stored in the DOR along with the data type definitions. The instance is stored in the DOR and can then be accessed by the application software through an Application Program Interface (API) called the Domain Object Interface (DOI). **Instance Categories** IMM instances are categorized in special data containers like process interface, network, and so on. Each instance category represents a group of related instances. (image: 1-img2a16e00537b04f549da35296673a189b_3_en_US_PNG.png) Figure 3-# Examples of Instance Categories * DoNotModify The category contains all those instances that are mandatory for the Spectrum Power 7 system. The instances must not be modified. * General The category contains all those instances common to more than one specific category. There are additional categories of that kind with an application name attached. For example, General-HIS, General-SCADA and so on. These categories contain those general purpose instances specific to the referenced application. * Orphans The category contains information necessary for importing instance data in CIM-RDF format. * Areas The category contains instance data for control areas, tie corridors, and AORs. * ICCP The category contains all ICCP instances. For example, remote control center definitions like link, access, and server and client transfer definitions and data. * Network This category contains the power system network data instances. For example, net companies, substations, switches, and lines. * PI The category contains all instances specific to the process interface. For example, PI servers and channel definitions, RTU and telecontrol data, and characteristic curves definitions.					Yes	20-04-13	Technology and Concepts	Instance Data	Compliant - STD	1 - Low	STD
SP7_New-33100	Heading	3.16.4	Domain Data Topology						No						
SP7_New-33105	SOB	3.16.4-1		When defining how components within a power system network join together, rather than define direct connection between components, DOM uses Terminals and Connectivity Nodes. For example, a very simple electrical circuit containing a Breaker, a Load and a Line exists as real-world objects. (image: 1-imga546d66c70b1370e9da352395caeab8e_1_en_US_TIFF.jpg) Figure 3-# Connectivity Example – Circuit This circuit requires three DOM Instances to represent the pieces of physical conducting equipment: an Energy Consumer, a Breaker, and an AC Line Segment. A Connectivity Node is used to connect these equipment. Even if the connections meet at a T or Star point, the connectivity is accurately represented. (image: 2-img24fb43b070b136529da35239350c5826_1_en_US_TIFF.jpg) Figure 3-# Connectivity Example – Circuit with Connectivity Node In DOM, however, pieces of conducting equipment are not directly associated with Connectivity Nodes. A piece of conducting equipment will have one or more Terminals associated with it, and these Terminals in turn are associated with a single Connectivity Node. The connectivity relationship between the terminals, conducting equipment and connectivity nodes for the example finally looks like the following figure. (image: 3-img4a83c01f70b135299da352390f0c248e_1_en_US_TIFF.jpg) Figure 3-# Connectivity Example – Circuit with Connectivity Node and Terminals Terminals are also used for defining points of connectivity-related measurements in the network such as current flows and voltages.					Yes	20-04-13	Technology and Concepts	Domain Data Topology	Compliant - STD	1 - Low	STD
SP7_New-33101	Heading	3.16.5	Dataset						No						

SP7_Now-33106	SOB	3.16.5-1		A dataset is a set of data that belongs logically together. All datasets together are building the IMM database called DOR. Default settings, the following datasets are installed: * Real-Time dataset (RT) Contains the engineering data (including network diagrams) used in the Spectrum Power runtime system. The dataset provides job management, Instance Level Access Rights (ILAR), synchronization in multisite environments and job propagation in control center environments with QAS. * System Management Information dataset (SMI) This dataset contains data required to configure the relevant Spectrum Power software. It is a dataset without job management, no ILAR and no dataset synchronization between different systems or control centers. The dataset includes the following: * Data about IMM hardware * Software packages, groups and system parameters where applicable * User Administration dataset (UA) This dataset contains data required for UA. It is a dataset without job management, no ILAR and no dataset synchronization between different systems or control centers. The dataset includes the following: * Spectrum Power IMM users and user roles * Spectrum Power IMM consoles and console roles * Areas of Responsibility for RT (ILAR) * Real-Time Past dataset (RT_PAST) This dataset contains all activated jobs that have been archived from it's associated RT – if enabled. The jobs in this dataset are read-only. They can be used to view data and to run reports. Data modifications are not allowed. A RT_PAST can be configured using the IMMCMD commandline tool. * Real-Time Archive dataset (RT_PAST_LT) This dataset contains all locally loaded long-term archives – if enabled. The jobs in this dataset are read-only. A long term archive is an Oracle dump file that can be stored on external media and can be loaded again for any purpose. * Application Configuration dataset (AC) This dataset is without job management, no ILAR, no dataset synchronization between different control centers, but synchronization from QAS to related productive system. It contains configuration data for IMM applications, for example: * Templates and advanced views * IMM UI configuration settings ~~* Multi-Instances Editor queries~~					Yes	20-04-13	Technology and Concepts	Dataset	Compliant - STD	1 - Low	STD
SP7_Now-33005	Heading	3.17	External and Internal Interfaces						No							
SP7_Now-33107	Heading	3.17.1	Data Exchange using XML Files						No							
SP7_Now-33112	SOB	3.17.1-1		XML is a W3C standards-based text format for interchange of data. The data is encoded as plain text, thus allowing it to be both human and machine-readable. An XML file is also called an XML document. **Instance Data Import and Export** IMM provides interfaces for instance data exchange in the following XML formats: * XDF The XDF format has been defined by Siemens. It represents data more compact than the standard CIM-RDF. It is also easier to read since data is organized hierarchically as opposed to CIM-RDF that organizes data flat. * CIM-RDF RDF is an XML schema used to provide a framework for data in an XML format by allowing relationships to be defined between XML nodes. The CIM-RDF format is based on the IEC 61970-452 and IEC 61968-13 standards for the description of electrical power systems. CIM-RDF files do not necessarily contain all hierarchical links which are required to comply with the given instance hierarchy in IMM. Those instances for which no existing parent is defined get imported and are located in the .RDF Orphans container, if configured. Within the .RDF Orphans container, a mapping of orphan instances to its parent container in the IMM hierarchy based on types can be configured, thus allowing to locate those instances in the desired IMM hierarchy during import. Profiles allow filtering of exported engineering data. Profiles are based on types, attributes and associations. Instance filtering of exported engineering data is based on logical expressions containing one or multiple attributes of one type. **Domain Object Model (DOM) Import and Export** The Spectrum Power IMM data model is created using XDF type definition. The DOM can be imported and exported in XDF format. The DOM covers the following: * Types, attributes, associations, and enumerations. * Help messages * Validation rules * IMM Trigger definitions When the XDF Type definitions are imported by IMM, the IMM schema is automatically generated. Complete, partial and incremental DOM import is supported. DOM export can be complete or partial. This allows for ease of adding model extensions to meet fast changing needs. For example, if a new type or attribute is needed in IMM, once the XDF definition of the new type or attribute is imported into IMM, the end-user will immediately be able to use the new					Yes	20-04-13	External and Internal Interfaces	Data Exchange using XML Files	Compliant - STD	1 - Low	STD
SP7_Now-33108	Heading	3.17.2	Data Export using CSV Files						No							
SP7_Now-33113	SOB	3.17.2-1		A CSV is a comma separated values file, which allows data to be stored in a table structured, plain text format. Each line of the file is a data record. Each record consists of one or more fields, separated by commas. The use of the comma as a field separator is the source of the name for this file format. The CSV file format is not standardized. CSV files can be used with any spreadsheet program, such as Microsoft Excel. They differ from other spreadsheet file types in that you can only have a single sheet in a file, they cannot save cell, column, or row styling, and cannot save formulas. A CSV file is not able to describe hierarchical structures by itself, therefore IMM takes care to add the instance path and IID by default. **Instance Hierarchy Export** The instance hierarchy under the selected parent can be exported. Optional profiles and instance filtering of engineering data to be exported are supported similarly to CIM-RDF export. **Multi-Instances Editor Result Table Export** The current content of the Multi-Instances Editor Result Table can be exported. The result table is originated from an Editor query within a selected instance hierarchy.					Yes	20-04-13	External and Internal Interfaces	Data Export using CSV Files	Compliant - STD	1 - Low	STD
SP7_Now-33109	Heading	3.17.3	File Formats for Graphic Data Exchange						No							
SP7_Now-33114	SOB	3.17.3-1		Graphical diagram data and the templates used by the Spectrum Power Graphics Editor can be imported and exported in .XDF and RDF format. These formats allow keeping the links to associated domain data instances, thus it's more than just importing static graphical data. **Symbols in Global Figures** The symbols used in global figures are using the Scalable Vector Graphics (SVG) format. They can be imported and exported in SVG file format by the symbol editor. **Embedded Raster Graphic Images** Raster graphic images (for example photos or photo-realistic images) can be embedded and shown in diagrams. The supported raster image file types are Portable Network Graphic (PNG) and Joint Photographic Expert Group (JPEG).					Yes	20-04-13	External and Internal Interfaces	File Formats for Graphic Data Exchange	Compliant - STD	1 - Low	STD
SP7_Now-33110	Heading	3.17.4	ASR Mapfiles						No							
SP7_Now-33115	SOB	3.17.4-1		ASR mapfiles are mapping instructions that specify how the instance data in IMM is transformed into the structures used by Spectrum Power runtime applications. This mapping is used for incremental and full population of both RDBMS based and SMMF based ASRs. The format of the ASR mapfiles is XML. GenDTS is the General Data Transformation Service application that reads ASR mapfiles, extracts instance data from IMM, and writes the data into ASR specific structures. **SMMF-based ASR Mapfiles** SMMF stands for Shared Memory Map File. When GenDTS processes an SMMF-based ASR mapfile, it generates an output file called the ASR SMMF Change Log. This is a binary file containing the instance data optimized for loading into a Spectrum Power runtime application shared memory. **RDBMS-based ASR Mapfiles** RDBMS stands for Relational Database Management System. RDBMS based ASR mapfiles are similar in format to the SMMF based ones. The generated ASR structures are in one of two formats – either an ASR change log or ASR tables – determined by the ASR runtime system type value in the SMI dataset for the ASR. Depending of the value either an ASR change log is generated or ASR tables are generated. The ASR change log is a binary file. ASR tables are tables within the DOR dataset that are used by job transfer to Spectrum Power relations. These are also referred to as object tables because they match the object structures used by job transfer.					Yes	20-04-13	External and Internal Interfaces	ASR Mapfiles	Compliant - STD	1 - Low	STD
SP7_Now-33111	Heading	3.17.5	Command Line Interface						No							
SP7_Now-33116	SOB	3.17.5-1		The command-line interfaces allow to interact with IMM by typing in commands in a command line tool on the console. The command line tool can be called from a shell or from scripts. The IMM command line tools are supplied together with IMM. **IMM Export** The IMM Export utility allows to export instance data under a defined instance hierarchy from an IMM job in the formats XDF, CIM-RDF, and CSV. The utility is available on the ADM / Linux. **IMM Import** The IMM Import utility allows to import a set of data files into a job. The supported data formats are either XDF or CIM-RDF. The utility is available on the ADM / Linux. **IMMCSVExport (DQL)** The IMMCSVExport utility DQL allows to query IMM instance data in a SQL-like language (DQL) and export the results in CSV. The utility is available on the ADM / Linux. **IMM Admin Tool (IMMCMD)** The IMM admin tool allows to manage the IMM datasets, the IMM static model archive and the QAS connection. The utility is available on the ADM / Linux.					Yes	20-04-13	External and Internal Interfaces	Command Line Interface	Compliant - STD	1 - Low	STD
SP7_Now-33006	Heading	3.18	System Characteristics						No							
SP7_Now-33117	Heading	3.18.1	Auditing						No							
SP7_Now-33122	SOB	3.18.1-1		IMM job auditing keeps track of the last user and the last time graphical or domain instance data changes were made in a job. The previous value and the value changed by a job are reported. For a given instance of data within a specified time frame, the lifecycle of modifications can be identified as well.					Yes	20-04-13	System Characteristics	Auditing	Compliant - STD	1 - Low	STD
SP7_Now-33118	Heading	3.18.2	Authorization and Security						No							

SP7_Now-33123	SOB	3.18.2-1		The IMM security service is part of the overall Spectrum Power security strategy to protect the system against unauthorized use. A multilevel security concept ensures the secure operation of Spectrum Power IMM. The IMM security concept mainly relies on the following: * User authorization by logon * User and IMM console access rights * Security permissions * Instance level access rights **User Authorization** User authorization is performed when the user logs on to Spectrum Power IMM using user name and password. Spectrum Power IMM users are stored within Console and User Management (CUMAN), an application of Spectrum Power 7. The operating system performs user authentication. Alternatively, the Spectrum power user is configured for Single Sign-On (SSO). With this method, the user provides the (Operating System) credentials to login to the workstation and authorized users are allowed to access the Spectrum Power IMM without re-entering username and password credentials. **User Access Rights** Data entry and activation in IMM is controlled by access rights. IMM provides granular access rights dependent on the engineering dataset. For example, RT, UA and the requested action (for example, data engineering, activation). The supported access rights are as follows: * Instance data engineering (EngineeringInstance) Instance access right for RT, Application Configuration (AC) and Planning (if enabled). * Type data engineering (EngineeringType) Type modification access right for RT, Application Configuration (AC) and Planning (if enabled). Type viewing access right for all RT, Application Configuration (AC) and Planning (if enabled), for permission View. * Data activation (Activation) Data activation right for RT. * Engineering dataset administration (EngineeringDatasetAdministration) Dataset administration right for all datasets * System management information instance data engineering (SystemManagementInformation) Instance access right, Type modification access right, Type viewing access right and data activation right for dataset SMI. * UA instance data engineering (SecurityAdministration) Instance access right, Type modification access right, Type viewing access right and data							Yes	20-04-13	System Characteristics	Authorization and Security	Compliant - STD	1 - Low	STD
SP7_Now-33119	Heading	3.18.3	Scalability							No						
SP7_Now-33124	SOB	3.18.3-1		The flexible architecture of IMM provides scalability regarding: * Number of datasets * Data volume per dataset * Number of users working in parallel **Datasets** Data required for the operation of a Spectrum Power system is split into four logical, independent datasets: * Real-time dataset (RT) * System management information dataset (SMI) * Application configuration dataset (AC) * User administration dataset (UA) These four datasets are always delivered together with Spectrum Power IMM. Additional planning datasets can be added, if necessary.					Yes	20-04-13	System Characteristics	Scalability	Compliant - STD	1 - Low	STD
SP7_Now-33120	Heading	3.18.4	Backup and Restore							No						
SP7_Now-33125	SOB	3.18.4-1		The Spectrum Power backup concept provides a mutual interlock of backup and activation by: * Assuring that a user cannot start the activation of a job while a backup process is in progress * Preventing a backup while an activation is running					Yes	20-04-13	System Characteristics	Backup and Restore	Compliant - STD	1 - Low	STD
SP7_Now-33121	Heading	3.18.5	Hardware Deployment							No						
SP7_Now-33126	SOB	3.18.5-1		To meet customer requirements regarding system sizing, availability and performance, different standard hardware configurations are defined. **IMM Deployment within Spectrum Power 7** The deployment scenario supported by IMM within a Spectrum Power 7 system is as follows: {image: 1-imga579e93b70e552679da3523923a9916b_1_en_US_TIFF.jpg} Figure 3-# Principle Deployment Scenario The supported operating system versions, redundancy concepts, control center system configurations, and the defined limits within the Spectrum Power 7 platform apply.					Yes	20-04-13	System Characteristics	Hardware Deployment	Compliant - STD	1 - Low	STD
SP7_Now-33007	Heading	3.19	Non-Functional Topics							No						
SP7_Now-33127	Heading	3.19.1	User Interface							No						
SP7_Now-4118	SOB	3.19.1-1		{image: 1-img05a9816d37b06a2f9da3529676341 16a_3_en_US_PNG.png} Figure 3-# IMM User Interface Showing the Domain Model Tree and Instance Attributes The attributes and attribute values of the selected instance in the instance hierarchy are displayed in the working area. Tooltip help shows a description of the attribute when hovering with the mouse pointer. {image: 2-img204176ad37b06e309da352966f2985b5_2_en_US_PNG.png} Figure 3-# IMM User Interface Showing a Validation Log with Validation Messages {image: 3-img628064cc37b0642e9da3529608f20337_2_en_US_PNG.png} Figure 3-# IMM User Interface Showing the Model and Graphics Editor with an Opened Single-line Diagram {image: 4-img0171160cb37b086ed9da352965edab483_2_en_US_PNG.png} Figure 3-# Detailed Change Log Report {image: 5-imgc534c0073705e989da352965 57e9bac_2_en_US_PNG.png} Figure 3-# IMM Information Window Displaying Help Information for a Selected Data Type Analog					Yes	20-04-13	Non-Functional Topics	User Interface	Compliant - STD	1 - Low	STD
SP7_Now-33128	Heading	3.19.2	Performance Parameters							No						
SP7_Now-33131	SOB	3.19.2-1		Table # Performance Test Results for Data Engineering on a distributed Control Center System Description | Normal Load | High Activity | Peak Load | Unit Typical response time in the scope of dialog actions (data available and loaded locally). | < 1.0 | < 1.5 | n/a | sec Tree: Open tree with 640 substations / 500 children (data available and loaded locally). | < 2.5 | < 3.0 | n/a | sec Time to create a single element (for example, circuit breaker) by copy/paste/rename. | < 4.5 | < 5 | n/a | sec Time to create a feeder by copy/paste/rename. | < 10 | < 10 | n/a | sec Inter Object Validation (using standard rules): Root with max. 1.000.000 data points. | < 2 | < 2 | n/a | h Object Attribute Validation (using standard rules): Root with max. 1.000.000 data points. | < 30 | < 30 | n/a | min Time for job validation (500 data points, using standard rules). | < 30 | < 30 | n/a | sec Activation time for merging job changes into RT, without pre-phases (100 data points). | < 35 | < 55 | n/a | sec Activation time for merging job changes into RT, without pre-phases (500 data points). | < 45 | < 45 | n/a | sec CIM-RDF Import (internal DOM version): max. 1.000.000 data points, root mode. | < 4 | < 4 | n/a | h CIM-RDF Import (internal DOM version): max. 70.000 bus sections (~ 200.000 data points), root mode. | < 48 | < 48 | n/a | min CIM-RDF Incremental Import (internal DOM version): 500 data points, job mode. | < 120 | < 140 | n/a | sec CIM-RDF Export (internal DOM version): max. 1.000.000 data points, root mode. | < 1 | < 1 | n/a | h CIM-RDF Export (internal DOM version): max. 70.000 bus sections (~ 200.000 data points), root mode. | < 12 | < 12 | n/a | min CIM-RDF Incremental Export (internal DOM version): 500 data points. | < 90 | < 90 | n/a | sec					Yes	20-04-13	Non-Functional Topics	Performance Parameters	Compliant - STD	1 - Low	STD
SP7_Now-33129	Heading	3.19.3	Sizing							No						
SP7_Now-33132	SOB	3.19.3-1		| System Sizing | Data Model Related System Operation and Environment Maximum number of supported Emergency Backup Systems for Main Control Center | 1 (maximum) | Maximum number of IMM UIs per ADM | 6 | Information Model Management Application | Maximum file size for data model exchange (import and export) | 10 GB (maximum) | * Maximum data instances to be edited, modified, deleted within a single job | 15 000 | Maximum number of jobs within any RT-dataset (RT, RT_PAST, RT_PAST_LT) | 2000 | Maximum number of additional datasets (PL-datasets) | 5 (maximum) | Maximum size of the coordinate range of a network diagram | 2 000 000 x 2 000 000 units | Maximum number of layers (including overlays and raster layers) per network diagram | 32 | Maximum raster graphic image file size for embedding in a network diagram | 3 MB (maximum) | Maximum raster graphic image file pixel size for embedding in a network diagram | 4096 (maximum) | Data Model (DOM) | Maximum number of IMM instances (including graphical objects) in a dataset | 20 000 000 | * Maximum number of graphical objects in a single network diagram | 25 000 | Maximum number of graphical objects (all network diagrams) | 5 000 000 | * Maximum number of hierarchical levels (depth) | 8 | Maximum number of individual graphical primitives per global figure | 16 | {image: 1-Tip.png} | NOTEAn asterisk (*) in the column "Data Model Related" points out a system sizing parameter that is applying to the electrical network data model.					Yes	20-04-13	Non-Functional Topics	Sizing	Compliant - STD	1 - Low	STD
SP7_Now-33130	Heading	3.19.4	Referenced IEC Standards							No						
SP7_Now-33133	SOB	3.19.4-1		IEC 61970-301: | Energy management system application program interface (EMS-API) – Common information model (CIM) base IEC 61968-11: | System interfaces for distribution management – Common information model (CIM) extension for distribution IEC 62325-301: | Framework for energy market communications – Common information model (CIM) extension for markets IEC 61970-452: | Energy management system application program interface (EMS-API) – CIM Static transmission network model profiles. This is also commonly known as CPSM profile IEC 61970-453: | Energy management system application program interface (EMS-API) - Diagram layout profile IEC 61970-501: | Energy management system application program interface (EMS-API) – Common information model resource description framework (CIM RDF) Schema IEC 61968-13: | System interfaces for distribution management – CIM RDF Model exchange format for distribution. This is also commonly known as CDPSM profile					Yes	20-04-13	Non-Functional Topics	Referenced IEC Standards	Compliant - STD	1 - Low	STD

<table>
<tr><td>SP7_New-40282</td><td>SOB</td><td>SP7_New-40282</td><td></td><td>IEC 61970-301: | Energy management system application program interface (EMS-API) – Common information model (CIM) base
IEC 61968-11: | System interfaces for distribution management – Common information model (CIM) extension for distribution
IEC 62325-301: | Framework for energy market communications – Common information model (CIM) extension for markets
IEC 61970-452: | Energy management system application program interface (EMS-API) – CIM Static transmission network model profiles. This is also commonly known as CPSM profile
IEC 61970-453: | Energy management system application program interface (EMS-API) - Diagram layout profile
IEC 61970-501: | Energy management system application program interface (EMS-API) – Common information model resource description framework (CIM RDF) Schema
IEC 61968-13: | System interfaces for distribution management – CIM RDF Model exchange format for distribution. This is also commonly known as CDPSM profile</td><td></td><td></td><td></td><td></td><td>No</td><td></td><td></td><td></td><td>Compliant - STD</td><td>1 - Low</td><td>STD</td></tr>
<tr><td>SP7_New-40281</td><td>SOB</td><td>SP7_New-40281</td><td></td><td>| System Sizing | Data Model Related
System Operation and Environment
Maximum number of supported Emergency Backup Systems for Main Control Center | 1 (maximum) |
Maximum number of IMM UIs per ADM | 6 |
Information Model Management Application |
Maximum file size for data model exchange (import and export) | 10 GB (maximum) | *
Maximum data instances to be edited, modified, deleted within a single job | 15 000 |
Maximum number of jobs within any RT-dataset (RT, RT_PAST, RT_PAST_LT) | 2000 |
Maximum number of additional datasets (PL-datasets) | 3 (maximum) |
Maximum size of the coordinate range of a network diagram | 2 000 000 x 2 000 000 units |
Maximum number of layers (including overlays and raster layers) per network diagram | 32 |
Maximum raster graphic image file size for embedding in a network diagram | 3 MB (maximum) |
Maximum raster graphic image file pixel size for embedding in a network diagram | 4096 (maximum) |
Data Model (DOM) |
Maximum number of IMM instances (including graphical objects) in a dataset | 20 000 000 | *
Maximum number of graphical objects in a single network diagram | 25 000 |
Maximum number of graphical objects (all network diagrams) | 5 000 000 | *
Maximum number of hierarchical levels (depth) | 8 |
Maximum number of individual graphical primitives per global figure | 16 |
(image: 1-Tip.png) | NOTEAn asterisk (*) in the column “Data Model Related” points out a system sizing parameter that is applying to the electrical network data model.</td><td></td><td></td><td></td><td></td><td>No</td><td></td><td></td><td></td><td>Compliant - STD</td><td>1 - Low</td><td>STD</td></tr>
<tr><td>SP7_New-40280</td><td>SOB</td><td>SP7_New-40280</td><td></td><td>Table # Performance Test Results for Data Engineering on a distributed Control Center System
Description | Normal Load | High Activity | Peak Load | Unit
Typical response time in the scope of dialog actions (data available and loaded locally). | < 1.0 | < 1.5 | n/a | sec
Tree: Open tree with 640 substations / 500 children (data available and loaded locally). | < 2.5 | < 3.0 | n/a | sec
Time to create a single element (for example, circuit breaker) by copy/paste/rename. | < 4.5 | < 5 | n/a | sec
Time to create a feeder by copy/paste/rename. | < 10 | < 10 | n/a | sec
Inter Object Validation (using standard rules): Root with max. 1.000.000 data points. | < 2 | < 2 | n/a | h
Object Attribute Validation (using standard rules): Root with max. 1.000.000 data points. | < 30 | < 30 | n/a | min
Time for job validation (500 data points, using standard rules). | < 30 | < 30 | n/a | sec
Activation time for merging job changes into RT, without pre-phases (100 data points). | < 35 | < 35 | n/a | sec
Activation time for merging job changes into RT, without pre-phases (500 data points). | < 45 | < 45 | n/a | sec
CIM-RDF Import (internal DOM version): max. 1.000.000 data points, root mode. | < 4 | < 4 | n/a | h
CIM-RDF Import (internal DOM version): max. 70.000 bus sections (~ 200.000 data points), root mode. | < 48 | < 48 | n/a | min
CIM-RDF Incremental Import (internal DOM version): 500 data points, job mode. | < 120 | < 140 | n/a | sec
CIM-RDF Export (internal DOM version): max. 1.000.000 data points, root mode. | < 1 | < 1 | n/a | h
CIM-RDF Export (internal DOM version): max. 70.000 bus sections (~ 200.000 data points), root mode. | < 12 | < 12 | n/a | min
CIM-RDF Incremental Export (internal DOM version): 500 data points. | < 90 | < 90 | n/a | sec</td><td></td><td></td><td></td><td></td><td>No</td><td></td><td></td><td></td><td>Compliant - STD</td><td>1 - Low</td><td>STD</td></tr>
<tr><td>SP7_New-40279</td><td>SOB</td><td>SP7_New-40279</td><td></td><td>(image: 1-img05a9816d37b06a2f9da352967634116a_3_en_US_PNG.png)
Figure # IMM User Interface Showing the Domain Model Tree and Instance Attributes
The attributes and attribute values of the selected instance in the instance hierarchy are displayed in the working area. Tooltip help shows a description of the attribute when hovering with the mouse pointer.
(image: 2-img204176ad37b06e309da352966f2985b5_2_en_US_PNG.png)
Figure # IMM User Interface Showing a Validation Log with Validation Messages
(image: 3-img828064cc37b0642e9da3529608f20337_2_en_US_PNG.png)
Figure # IMM User Interface Showing the Model and Graphics Editor with an Opened Single-line Diagram
(image: 4-img017160cb37b086ed9da352965edab483_2_en_US_PNG.png)
Figure # Detailed Change Log Report
(image: 5-imgc634c00737b05e989da35296557e9bac_2_en_US_PNG.png)
Figure # IMM Information Window Displaying Help Information for a Selected Data Type Analog</td><td></td><td></td><td></td><td></td><td>No</td><td></td><td></td><td></td><td>Compliant - STD</td><td>1 - Low</td><td>STD</td></tr>
<tr><td>SP7_New-40274</td><td>SOB</td><td>SP7_New-40274</td><td></td><td>To meet customer requirements regarding system sizing, availability and performance, different standard hardware configurations are defined.
IMM Deployment within Spectrum Power 7
The deployment scenario supported by IMM within a Spectrum Power 7 system is as follows:
(image: 1-imga579e93b70e552679da3523923a9916b_1_en_US_TIFF.jpg)
Figure # Principle Deployment Scenario
The supported operating system versions, redundancy concepts, control center system configurations, and the defined limits within the Spectrum Power 7 platform apply.</td><td></td><td></td><td></td><td></td><td>No</td><td></td><td></td><td></td><td>Compliant - STD</td><td>1 - Low</td><td>STD</td></tr>
<tr><td>SP7_New-40273</td><td>SOB</td><td>SP7_New-40273</td><td></td><td>The Spectrum Power backup concept provides a mutual interlock of backup and activation by:
* Assuring that a user cannot start the activation of a job while a backup process is in progress
* Preventing a backup while an activation is running</td><td></td><td></td><td></td><td></td><td>No</td><td></td><td></td><td></td><td>Compliant - STD</td><td>1 - Low</td><td>STD</td></tr>
<tr><td>SP7_New-40272</td><td>SOB</td><td>SP7_New-40272</td><td></td><td>The flexible architecture of IMM provides scalability regarding:
* Number of datasets
* Data volume per dataset
* Number of users working in parallel
Datasets
Data required for the operation of a Spectrum Power system is split into four logical, independent datasets:
* Real-time dataset (RT)
* System management information dataset (SMI)
* Application configuration dataset (AC)
* User administration dataset (UA)
These four datasets are always delivered together with Spectrum Power IMM. Additional planning datasets can be added, if necessary.</td><td></td><td></td><td></td><td></td><td>No</td><td></td><td></td><td></td><td>Compliant - STD</td><td>1 - Low</td><td>STD</td></tr>
<tr><td>SP7_New-40271</td><td>SOB</td><td>SP7_New-40271</td><td></td><td>The IMM security service is part of the overall Spectrum Power security strategy to protect the system against unauthorized use. A multilevel security concept ensures the secure operation of Spectrum Power IMM.
The IMM security concept mainly relies on the following:
* User authorization by logon
* User and IMM console access rights
* Security permissions
* Instance level access rights
User Authorization
User authorization is performed when the user logs on to Spectrum Power IMM using user name and password. Spectrum Power IMM users are stored within Console and User Management (CUMAN), an application of Spectrum Power 7. The operating system performs user authentication.
Alternatively, the Spectrum power user is configured for Single Sign-On (SSO). With this method, the user provides the (Operating System) credentials to login to the workstation and authorized users are allowed to access the Spectrum Power IMM without re-entering username and password credentials.
User Access Rights
Data entry and activation in IMM is controlled by access rights. IMM provides granular access rights dependent on the engineering dataset.
For example, RT, UA and the requested action (for example, data engineering, activation).
The supported access rights are as follows:
* Instance data engineering (EngineeringInstance)
Instance access right for RT, Application Configuration (AC) and Planning (if enabled).
* Type data engineering (EngineeringType)
Type modification access right for RT, Application Configuration (AC) and Planning (if enabled).
Type viewing access right for all RT, Application Configuration (AC) and Planning (if enabled), for permission View.
* Data activation (Activation)
Data activation right for RT.
* Engineering dataset administration (EngineeringDatasetAdministration)
Dataset administration right for all datasets
* System management information instance data engineering (SystemManagementInformation)
Instance access right, Type modification access right, Type viewing access right and data activation right for dataset SMI.
* UA instance data engineering (SecurityAdministration)
Instance access right, Type modification access right, Type viewing access right and data</td><td></td><td></td><td></td><td></td><td>No</td><td></td><td></td><td></td><td>Compliant - STD</td><td>1 - Low</td><td>STD</td></tr>
<tr><td>SP7_New-40270</td><td>SOB</td><td>SP7_New-40270</td><td></td><td>IMM job auditing keeps track of the last user and the last time graphical or domain instance data changes were made in a job.
The previous value and the value changed by a job are reported. For a given instance of data within a specified time frame, the lifecycle of modifications can be identified as well.</td><td></td><td></td><td></td><td></td><td>No</td><td></td><td></td><td></td><td>Compliant - STD</td><td>1 - Low</td><td>STD</td></tr>
</table>

SP7_New-40264	SOB	SP7_New-40264		The command-line interfaces allow to interact with IMM by typing in commands in a command line tool on the console. The command line tool can be called from a shell or from scripts. The IMM command line tools are supplied together with IMM. **IMM Export** The IMM Export utility allows to export instance data under a defined instance hierarchy from an IMM job in the formats XDF, CIM-RDF, and CSV. The utility is available on the ADM / Linux. **IMM Import** The IMM Import utility allows to import a set of data files into a job. The supported data formats are either XDF or CIM-RDF. The utility is available on the ADM / Linux. **IMMCSVExport (DQL)** The IMMCSVExport utility DQL allows to query IMM instance data in a SQL-like language (DQL) and export the results in CSV. The utility is available on the ADM / Linux. **IMM Admin Tool (IMMCMD)** The IMM admin tool allows to manage the IMM datasets, the IMM static model archive and the QAS connection. The utility is available on the ADM / Linux.					No				Compliant - STD	1 - Low	STD
SP7_New-40263	SOB	SP7_New-40263		ASR mapfiles are mapping instructions that specify how the instance data in IMM is transformed into the structures used by Spectrum Power runtime applications. This mapping is used for incremental and full population of both RDBMS based and SMMF based ASRs. The format of the ASR mapfiles is XML. GenDTS is the General Data Transformation Service application that reads ASR mapfiles, extracts instance data from IMM, and writes the data into ASR specific structures. **SMMF-based ASR Mapfiles** SMMF stands for Shared Memory Map File. When GenDTS processes an SMMF-based ASR mapfile, it generates an output file called the ASR SMMF Change Log. This is a binary file containing the instance data optimized for loading into a Spectrum Power runtime application shared memory. **RDBMS-based ASR Mapfiles** RDBMS stands for Relational Database Management System. RDBMS based ASR mapfiles are similar in format to the SMMF based ones. The generated ASR structures are in one of two formats – either an ASR change log or ASR tables – determined by the ASR runtime system type value in the SMI dataset for the ASR. Depending of the value either an ASR change log is generated or ASR tables are generated. The ASR change log is a binary file. ASR tables are tables within the DOR dataset that are used by job transfer to Spectrum Power relations. These are also referred to as object tables because they match the object structures used by job transfer.					No				Compliant - STD	1 - Low	STD
SP7_New-40262	SOB	SP7_New-40262		Graphical diagram data and the templates used by the Spectrum Power Graphics Editor can be imported and exported in XDF and RDF format. These formats allow keeping the links to associated domain data instances, thus it's more than just importing static graphical data. **Symbols in Global Figures** The symbols used in global figures are using the Scalable Vector Graphics (SVG) format. They can be imported and exported in SVG file format by the symbol editor. **Embedded Raster Graphic Images** Raster graphic images (for example photos or photo-realistic images) can be embedded and shown in diagrams. The supported raster image file types are Portable Network Graphic (PNG) and Joint Photographic Expert Group (JPEG).					No				Compliant - STD	1 - Low	STD
SP7_New-40261	SOB	SP7_New-40261		A CSV is a comma separated values file, which allows data to be stored in a table structured, plain text format. Each line of the file is a data record. Each record consists of one or more fields, separated by commas. The use of the comma as a field separator is the source of the name for this file format. The CSV file format is not standardized. CSV files can be used with any spreadsheet program, such as Microsoft Excel. They differ from other spreadsheet file types in that you can only have a single sheet in a file, they cannot save cell, column, or row styling, and cannot save formulas. A CSV file is not able to describe hierarchical structures by itself, therefore IMM takes care to add the instance path and IID by default. **Instance Hierarchy Export** The instance hierarchy under the selected parent can be exported. Optional profiles and instance filtering of engineering data to be exported are supported similarly to CIM-RDF export. **Multi-Instances Editor Result Table Export** The current content of the Multi-Instances Editor Result Table can be exported. The result table is originated from an Editor query within a selected instance hierarchy.					No				Compliant - STD	1 - Low	STD
SP7_New-40260	SOB	SP7_New-40260		XML is a W3C standards-based text format for interchange of data. The data is encoded as plain text, thus allowing it to be both human and machine-readable. An XML file is also called an XML document. **Instance Data Import and Export** IMM provides interfaces for instance data exchange in the following XML formats: * XDF The XDF format has been defined by Siemens. It represents data more compact than the standard CIM-RDF. It is also easier to read since data is organized hierarchically as opposed to CIM-RDF that organizes data flat. * CIM-RDF RDF is an XML schema used to provide a framework for data in an XML format by allowing relationships to be defined between XML nodes. The CIM-RDF format is based on the IEC 61970-452 and IEC 61968-13 standards for the description of electrical power systems. CIM-RDF files do not necessarily contain all hierarchical links which are required to comply with the given instance hierarchy in IMM. Those instances for which no existing parent is defined get imported and are located in the .RDF Orphans container, if configured. Within the .RDF Orphans container, a mapping of orphan instances to its parent container in the IMM hierarchy based on types can be configured, thus allowing to locate those instances in the desired IMM hierarchy during import. Profiles allow filtering of exported engineering data. Profiles are based on types, attributes and associations. Instance filtering of exported engineering data is based on logical expressions containing one or multiple attributes of one type. **Domain Object Model (DOM) Import and Export** The Spectrum Power IMM data model is created using XDF type definition. The DOM can be imported and exported in XDF format. The DOM covers the following: * Types, attributes, associations, and enumerations. * Help messages * Validation rules * IMM Trigger definitions When the XDF Type definitions are imported by IMM, the IMM schema is automatically generated. Complete, partial and incremental DOM import is supported. DOM export can be complete or partial. This allows for ease of adding model extensions to meet fast changing needs. For example, if a new type or attribute is needed in IMM, once the XDF definition of the new type or attribute is imported into IMM, the end-user will immediately be able to use the new					No				Compliant - STD	1 - Low	STD
SP7_New-40254	SOB	SP7_New-40254		A dataset is a set of data that belongs logically together. All datasets together are building the IMM database called DOR. Default settings, the following datasets are installed: * Real-Time dataset (RT) Contains the engineering data (including network diagrams) used in the Spectrum Power runtime system. The dataset provides job management, Instance Level Access Rights (ILAR), synchronization in multisite environments and job propagation in control center environments with QAS. * System Management Information dataset (SMI) This dataset contains data required to configure the relevant Spectrum Power software. It is a dataset without job management, no ILAR and no dataset synchronization between different systems or control centers. The dataset includes the following: * Data about IMM hardware * Software packages, groups and system parameters where applicable * User Administration dataset (UA) This dataset contains data required for UA. It is a dataset without job management, no ILAR and no dataset synchronization between different systems or control centers. The dataset includes the following: * Spectrum Power IMM users and user roles * Spectrum Power IMM consoles and console roles * Areas of Responsibility for RT (ILAR) * Real-Time Past dataset (RT_PAST) This dataset contains all activated jobs that have been archived from it's associated RT – if enabled. The jobs in this dataset are read-only. They can be used to view data and to run reports. Data modifications are not allowed. A RT_PAST can be configured using the IMMCMD commandline tool. * Real-Time Archive dataset (RT_PAST_LT) This dataset contains all locally loaded long-term archives – if enabled. The jobs in this dataset are read-only. A long term archive is an Oracle dump file that can be stored on external media and can be loaded again for any purpose. * Application Configuration dataset (AC) This dataset is without job management, no ILAR, no dataset synchronization between different control centers, but synchronization from QAS to related productive system. It contains configuration data for IMM applications, for example: * Templates and advanced views * IMM UI configuration settings * Multi-Instances-Editor queries					No				Compliant - STD	1 - Low	STD
SP7_New-40253	SOB	SP7_New-40253		When defining how components within a power system network join together, rather than define direct connection between components, DOM uses Terminals and Connectivity Nodes. For example, a very simple electrical circuit containing a Breaker, a Load and a Line exists as real-world objects. (image: 1-imga546d66c70b1370e9da352395caeab8e_1_en_US_TIFF.jpg) Figure # Connectivity Example – Circuit This circuit requires three DOM Instances to represent the pieces of physical conducting equipment: an Energy Consumer, a Breaker, and an AC Line Segment. A Connectivity Node is used to connect these equipment. Even if the connections meet at a T or Star point, the connectivity is accurately represented. (image: 2-img24fb43b070b136529da35239350c5826_1_en_US_TIFF.jpg) Figure # Connectivity Example – Circuit with Connectivity Node In DOM, however, pieces of conducting equipment are not directly associated with Connectivity Nodes. A piece of conducting equipment will have one or more Terminals associated with it, and these Terminals in turn are associated with a single Connectivity Node. The connectivity relationship between the terminals, conducting equipment and connectivity nodes for the example finally looks like the following figure. (image: 3-img4a83c01f70b135299da352390f0c248e_1_en_US_TIFF.jpg) Figure # Connectivity Example – Circuit with Connectivity Node and Terminals Terminals are also used for defining points of connectivity-related measurements in the network such as current flows and voltages.					No				Compliant - STD	1 - Low	STD

SP7_New-40252	SOB	SP7_New-40252		Real-world objects of a power system are represented in IMM as instances of data types. For example, Breaker is a type that describes all characteristics and behavior of circuit breakers. The circuit-breaker CB A1 contained within the bay Bay A1 is a real-world object - an instance of the type Breaker whose characteristics and behavior are defined by the type Breaker. The entire set of instances constitutes the domain data and is stored in the DOR along with the data type definitions. The instance is stored in the DOR and can then be accessed by the application software through an Application Program Interface (API) called the Domain Object Interface (DOI). **Instance Categories** IMM instances are categorized in special data containers like process interface, network, and so on. Each instance category represents a group of related instances. (image: 1-img2a16e00537b04f549da35296673a189b_3_en_US_PNG.png) Figure # Examples of Instance Categories * DoNotModify The category contains all those instances that are mandatory for the Spectrum Power 7 system. The instances must not be modified. * General The category contains all those instances common to more than one specific category. There are additional categories of that kind with an application name attached. For example, General-HIS, General-SCADA and so on. These categories contain those general purpose instances specific to the referenced application. * Orphans The category contains information necessary for importing instance data in CIM-RDF format. * Areas The category contains instance data for control areas, tie corridors, and AORs. * ICCP The category contains all ICCP instances. For example, remote control center definitions like link, access, and server and client transfer definitions and data. * Network This category contains the power system network data instances. For example, net companies, substations, switches, and lines. * PI The category contains all instances specific to the process interface. For example, PI servers and channel definitions, RTU and telecontrol data, and characteristic curves definitions.					No				Compliant - STD	1 - Low	STD
SP7_New-40251	SOB	SP7_New-40251		**Introduction** A type is a logical structure of the DOM that defines the data organization and representation of a certain resource (for example, a circuit-breaker). Each type can have its own internal attributes and relationships with other types. The full set of types constitutes the DOM. The types supplied by the DOM match the functionality of all Spectrum Power applications. **Type Name** The name is used to identify each type that must be unique across the entire system. Besides a name, types can have one associated label. Labels are language-specific. When accessing type data, IMM automatically retrieves the label. Therefore, only the label is seen from the users' point of view. **Type Attributes** Attributes describe static characteristics of a type. For example, a type Switch can have the attribute Status that describes the current switch position. Each attribute has an associated data type that defines which kind of information can be stored in an attribute. For example, assume the attribute Status from the previously used example has the data type binary value. Accordingly, the attribute Status can only assume the values 0 (Off) or 1 (On). Examples of data types are: Boolean, integer, string and so on. **Type Associations** Associations represent relationships between types. An association implies that one type Has A relationship with another type. For example, generator Is A Member Of substation. Both types involved in the relationship are aware of each other. To define instance hierarchy and instance links, association are used in Spectrum Power IMM. Associations used to define the instance hierarchy are parent-child associations. This relationship forces the arrangement of instances in a certain hierarchical order when instances are defined. Associations used to define links between instances are called reference associations. Reference associations are like parent-child associations. But unlike parent-child associations which enforce a certain instance hierarchy, reference associations are general-purpose relationships which are used to define links between instances. For example, a GeneratingUnit Has A Message Set. Verbs are used to outline the purpose of an association and to reflect the characteristic of the system described by the association. Normally, the used verbs originate from the system domain. For example, Has A, Uses, Operated By.					No				Compliant - STD	1 - Low	STD
SP7_New-40250	SOB	SP7_New-40250		The CIM is defined in Unified Modeling Language (UML). UML uses an object-oriented approach that describes a model as a collection of classes, class attributes, and associations. Within a system, a class represents a specific type of object being modeled. Each class can have its own internal attributes and relationships with other classes. Each class can be instantiated into any number of separate instances, known as objects in the object-oriented programming paradigm, each containing the same number and type of attributes and relationships, but with their own internal values. DOM uses a domain-oriented notation to describe the power system domain data model. It describes the power system domain data model in terms of the following: * Types (UML classes) * Attributes (UML class attributes) * Associations (UML associations) * Instances (UML instantiated classes) Types, attributes, and associations build the schema for the definition of instances. (image: 1-imgb0e5f34e0c624fcc9da3529601731ef2_1_en_US_TIFF.jpg) Figure # UML Example					No				Compliant - STD	1 - Low	STD
SP7_New-40244	SOB	SP7_New-40244		The IMM UI has also a functionality that allows the operator to configure alarm response text options, for a selected alarm message, using an Alarm-Response Diagram. This diagram is a single-line diagram, created by the data engineer, that contains the instructions on how to react to the alarm. This kind of diagram is located in the folder Presentation → Diagrams → Alarm-Response Diagrams (refer to the following Figure 3-36). (image: 1-img4ab8b81f95c962aa9da35239705c864f_1_en_US_PNG.png) Figure # Alarm-Response Diagram As shown in Figure 4-16, in the diagram view Links to other objects tab, it is possible to link alarms to the Alarm-Response Diagram (highlighted links). The alarm is defined through Element Type + Info, and there are two links that can be used to associate the alarm to the diagram: * DiagramView (Is response page for) ElementType * DiagramView (Is response page for) info If only the element type is linked, the diagram will be used for all alarms of this element type (for example, for all CB alarms). If element type and info are linked, the diagram will be only used for this specific alarm (for example, CB status or CB trip alarm).					No				Compliant - STD	1 - Low	STD
SP7_New-40243	SOB	SP7_New-40243		IMM UI has a functionality that automatically saves the unsaved changes locally into an export file, which can be recovered in case of a disconnect or a system failure happened in the IMM UI context. This is to prevent or limit the loss of work when an unexpected situation happens. The exports are executed in a defined cycle and are automatically indicated to be re-imported when the previously modified Job or Dataset in IMM UI is reopened.					No				Compliant - STD	1 - Low	STD
SP7_New-40242	SOB	SP7_New-40242		The Analog Representation Editor is used to view the defined analog representation styles. (image: 1-img604fd502e73d3cc19da3522a3d9b8128_1_en_US_PNG.png) Figure # Analog Representation Editor					No				Compliant - STD	1 - Low	STD
SP7_New-40241	SOB	SP7_New-40241		The Text Style Editor is used to create reusable text styles which represent a particular graphic property combination that can be assigned to graphic text objects. (image: 1-img4c4b3db7e72b1a4b9da3522a5904cc96_1_en_US_PNG.png) Figure # Text Style Editor					No				Compliant - STD	1 - Low	STD
SP7_New-40240	SOB	SP7_New-40240		The Symbol Logic Editor is used to maintain symbol logics for evaluating the symbol of the presentation of dynamic display objects in the runtime environment based on the combination of a decision table and a symbol group. (image: 1-img7a9e6f4de36b70d99da3522a6cd16f51_1_en_US_PNG.png) Figure # Symbol Logic Editor					No				Compliant - STD	1 - Low	STD
SP7_New-40239	SOB	SP7_New-40239		Symbol groups are used to apply dynamic symbols to display objects. The Symbol Group Editor is used to maintain unique symbols matching the rules configured in the diagram decision tables by the Decision Table Editor. (image: 1-imgb32b099be331e4989da3522a073c16be_1_en_US_PNG.png) Figure # Symbol Group Editor					No				Compliant - STD	1 - Low	STD
SP7_New-40238	SOB	SP7_New-40238		The Style Logic Editor is used to maintain style logics for evaluating the style of the presentation of dynamic display objects in the runtime environment based on the combination of a decision table and a style group. (image: 1-imgde5fe4d7e312a5f99da3522a14a6d540_1_en_US_PNG.png) Figure # Style Logic Editor					No				Compliant - STD	1 - Low	STD
SP7_New-40237	SOB	SP7_New-40237		Style groups are used to apply dynamic styles to display objects. The Style Group Editor is used to maintain unique styles matching the rules configured in the diagram decision tables by the Decision Table Editor. (image: 1-img7d8fa466e2f2fd779da3522a3052b381_1_en_US_PNG.png) Figure # Style Group Editor					No				Compliant - STD	1 - Low	STD
SP7_New-40236	SOB	SP7_New-40236		The Shape Style Editor is used to create reusable shape styles which represent a particular graphic property combination that can be assigned to graphic objects instead of assigning multiple properties one after the other. (image: 1-img9eb68944e2e11f3c9da3522a3378903a_1_en_US_PNG.png) Figure # Shape Style Editor					No				Compliant - STD	1 - Low	STD
SP7_New-40235	SOB	SP7_New-40235		The Decision Table editor is used to maintain diagram decision tables for evaluating the presentation of dynamic display objects in the runtime environment based on their status, quality and other information. (image: 1-imgf7d7ced8e26b33ac9da3522a5c1df815_1_en_US_PNG.png) Figure # Decision Table Editor					No				Compliant - STD	1 - Low	STD
SP7_New-40234	SOB	SP7_New-40234		The Color Editor is used to view, modify, and define color values for color instances. (image: 1-img38502002e24bb8b29da3522a0562ed85_1_en_US_PNG.png) Figure # Color Editor					No				Compliant - STD	1 - Low	STD
SP7_New-40233	SOB	SP7_New-40233		The Symbol Editor is used to edit symbols used on diagrams. (image: 1-imgc66eccadd3f4a65b9da3522a390d7737_1_en_US_PNG.png) Figure # Symbol Editor Symbols are combinations of graphic primitives. Symbols play an important role for graphical representation of a domain data instance such as a circuit-breaker for the Spectrum Power runtime user interface depending on its current status.					No				Compliant - STD	1 - Low	STD

SP7_New-40232	SOB	SP7_New-40232		The Multi-Instance Editor (MIE) allows for user-defined query filters on a combination of data instances, attributes and associations. The retrieved objects and attributes can then be edited similarly to what is possible in the IMM UI. Queries can be defined, saved and loaded for reuse. (image: 1-img566f3cd3a2ce067f9da3522a5eb0fa89_1_en_US_PNG.png) Figure # Multi-Instances Editor					No				Compliant - STD	1 - Low	STD
SP7_New-40231	SOB	SP7_New-40231		The Model and Graphics Editor is used to: * View and modify instance properties including links * Create a new instance * View, create, or modify network displays (image: 1-imgb53fe8e774f5ab749da3522a362d834f_2_en_US_PNG.png) Figure # Model and Graphics Editor The screen is structured into different areas, dedicated to different views to the data. It appears once a job is being opened. A set of editors and tools optimized for the various engineering workflows allow data access and definition covering all aspects of data engineering. It has a standard menu bar at the top of the main window to provide access to some commonly used functions. The left panel shows a tree view of the model data. The attributes panel on the right is able to present various views of the object attributes. Between both panels, multiple schematic diagrams and reports can be opened. The model is edited by dragging new objects into the diagrams and connecting their terminals together, disconnecting objects, deleting objects, or by editing the parameters of the objects in the resizable attributes panel. The panels can be resized by dragging the separators between them. **Diagram Concept** A diagram consists of layers in which the presentation details can be distributed to several layers with potentially different magnification or visibility levels. The keypoints are as follows: * Support for regular layers A display consists of a set of layers where decluttering by zooming is possible. The layer concept helps the display designer to organize the grouping and visibility of the network component representation. * Support for overlay layers Overlays are special layers. They can be toggled on/off in run-time regardless of the zoom level. * Layer-based decluttering Each object is assigned to a layer. Layers can be defined to be visible only within a certain zoom range. Only those objects are displayed that belong to a currently visible layer. **Technological Editing** Technological editing allows creation, modification, and deletion of electrical power system domain data and topology in a graphical way during diagram construction. The following workflows are supported: * Create new graphical objects and new domain data using drag and drop from the topology diagram toolbar. * Create new graphical objects and new domain data using copy and paste within and across					No				Compliant - STD	1 - Low	STD
SP7_New-40230	SOB	SP7_New-40230		The Type Editor is used for the following: * Create new types * View and edit existing types (image: 1-img0dedb980e74f19279da3522a3791b295_1_en_US_PNG.png) Figure # Type Editor There is a read-only mode available called Type Inspector. The type inspector is used to view the existing types. (image: 2-Tip.png) | NOTETypes can only be modified and created in the root job of a dataset by users with appropriate access rights. It is recommended to use the Type Editor for small changes only. Modifications of attributes or associations of existing types are not recommended at all. For major changes, external data modeling tools shall be used.Type changes may introduce additional source code changes to take effect in the Spectrum Power 7 system.					No				Compliant - STD	1 - Low	STD
SP7_New-40229	SOB	SP7_New-40229		The Job management UI is used for the following: * Create and open a job * Validate and activate a job * Administrate jobs (image: 1-img74e8438a69fcea909da3522a65bc98bb_2_en_US_PNG.png) Figure # Job Management The Job management UI shows the following information about each job that is not finalized: * Job name * Job status * Job owner * Job description Depending on the configured scope of functionality, the following additional information is included: * Job status on PROD (for systems having a separate QAS) * Activation or undone time (in IMM static data model archive only)					No				Compliant - STD	1 - Low	STD
SP7_New-40228	SOB	SP7_New-40228		Once the IMM application starts, it opens the main screen. The main screen represents an application framework for the IMM engineering applications. (image: 1-img2fd41e2e69dd902d9da3522a1bd1be21_2_en_US_PNG.png) Figure # IMM Main Screen The main screen is structured into different areas, dedicated to different aspects of data engineering. It has a standard menu bar at the top of the main window to provide access to some commonly used functions. The top left panel shows the list of datasets available in the IMM database. There is a context menu on the dataset with items tailored to the functions available for the selected dataset. The top right panel shows the list of jobs for the selected dataset. The bottom panel has tabs for the various logging facilities. Sections can be resized by dragging the separators between them. The top and bottom halves of the screen can be collapsed by clicking on the title bar for the section. The bottom panel for logging can also be undocked and re-docked.					No				Compliant - STD	1 - Low	STD
SP7_New-40227	SOB	SP7_New-40227		National Language Support (NLS) is provided. It is used to customize Spectrum Power IMM with the desired language during configuration time. The character strings are translated using a standard translation software package and the transfer to the system is a system feature.					No				Compliant - STD	1 - Low	STD
SP7_New-40226	SOB	SP7_New-40226		The online documentation consists of released Spectrum Power IMM manuals that have been converted into Portable Document Format (PDF) files. IMM has an integrated online help that provides an extensive guide to the Information Model Management based on the Spectrum Power IMM manuals. Help information can be viewed using the context-sensitive help. This is done by clicking a user interface component and invoking a help viewer to show the related help topic.					No				Compliant - STD	1 - Low	STD
SP7_New-40225	SOB	SP7_New-40225		The search function allows looking up instances by the instance name or parts of the instance name. Entering the name of a parent instance narrows the search range down to the descendants of the selected instance. Placeholder characters can be used to extend the search range. Searching instances based on provided RDF ID, object identifier (GUID) or Spectrum Power Internal Identifier (SIID) is also provided. The result of a search is a list of instances identified by their path. The user can navigate to an instance in the list by double-clicking the path (hyperlink). (image: 1-img6bcf7675a63478ad9da35239461ae501_1_en_US_PNG.png) Figure # Search Function - Instances The search function allows searching for instances by B1/B2/B3/Elem/Info names and numbers as well. (image: 2-img7dca5ea1a6346f749da35239425f9e66_1_en_US_PNG.png) Figure # Search Function - Search by Name (image: 3-imgf1c8ce00a63475219da352391a053f83_1_en_US_PNG.png) Figure # Search Function - Search by Number The search function allows the user to search by the identifier as well. (image: 4-imgf0de49e3a6347c1b9da35239129c8368_1_en_US_PNG.png) Figure # Search Function - Search by ID					No				Compliant - STD	1 - Low	STD
SP7_New-40224	SOB	SP7_New-40224		The IMM UI can be installed on any UI console. IMM UI runs on Windows or Linux. The client is updated as needed automatically upon login. Within the user interface of IMM, multiple editors that are optimized for the various data engineering workflows allow data access and definition covering all aspects of data engineering. The following functions are available in IMM: * Creating types * Creating instances * Creating instances by copying existing instances * Deleting types and instances * Viewing, creating, and modifying attributes and properties of types and instances * Viewing, creating, and deleting associations between types * Viewing, creating, and deleting links between instances * Validating data changes * Activating data changes * Importing and exporting type and instance definitions * Creating reports of types and instance definitions * Creating and modifying graphic diagrams					No				Compliant - STD	1 - Low	STD
SP7_New-40202	SOB	SP7_New-40202		**IMM Admin Command Line Tool** The IMM admin tool is used to manage the Spectrum Power IMM datasets. **Managing Datasets** The IMM admin tool provides authorized users the following functionality: * Creating a new dataset (planning dataset). * Clearing all instance data of a dataset. * Clearing all type and instance data of a dataset. * Managing the IMM model archive. * Managing the QAS connection. * Synchronizing ODB-Relations. * Changing dataset properties. For example, definition of the maximum import errors after import gets aborted. **Archive Management** The IMM admin tool allows managing the IMM model archive. It allows the user to enable or disable the archive, to create a long-term archive and to create a new baseline in the active archive. The archive log shows details, such as the timeline where a certain data model version was used at the production system (start date and time, end date and time).					No				Compliant - STD	1 - Low	STD
SP7_New-40201	SOB	SP7_New-40201		A single job is reserved for a particular user during its creation. The current job owner and an authorized user can reassign a job to a different user.					No				Compliant - STD	1 - Low	STD
SP7_New-40200	SOB	SP7_New-40200		Console access rights allow for location-based access control based on the IMM UI server (console) where the user currently is working. The authorities are always calculated as intersection (common subset) of access rights for console and user. Thus, granted IMM user access rights can be restricted by IMM console access rights.					No				Compliant - STD	1 - Low	STD
SP7_New-40199	SOB	SP7_New-40199		Access rights can be assigned for each instance individually. They describe what a user is allowed to do with the respective instance in IMM (view, modify, modify and assign new access rights for this instance). Instance level access rights, define on what parts of the power network data model in RT, the user can do modifications. Thus, they limit the user's given IMM access rights.					No				Compliant - STD	1 - Low	STD

SP7_New-40198	SOB	SP7_New- 40198		Data entry and activation in IMM is controlled by access rights. IMM provides granular access rights dependent on the dataset and the requested action. The following individual access rights are supported: * Instance data engineering * Type data engineering * Data activation * Engineering dataset administration * System management information instance data engineering * User Administration (UA) instance data engineering					No				Compliant - STD	1 - Low	STD
SP7_New-40193	SOB	SP7_New- 40193		An Operator Training Simulator (OTS) enables operators to practice runtime system operations under simulated conditions. The main system and the offline OTS are independent from each other. (image: 1-img570ef35971345bbb9da3523925336202_1_en_US_TIFF.jpg) Figure # OTS System Configuration – Basic Overview If the OTS runs up the first time a full database synchronization is done with its main system.					No				Compliant - STD	1 - Low	STD
SP7_New-40192	SOB	SP7_New- 40192		A QAS allows testing data changes without any implication to the production system. The production system and QAS are independent from each other. The QAS takes the role of the Data Model Master. Modified and successfully tested IMM data is transferred from QAS to the production system only. Activations of the production system are always triggered on the IMM UI at the QAS. (image: 1-img4dc87ebc70e553ed9da352390f74a9bc_1_en_US_TIFF.jpg) Figure # QAS System Configuration – Basic Overview As long as the QAS is running and is reachable by the production system, domain data modification is not allowed in IMM on the production system. If the QAS is down, authorized data engineers are enabled to set the production system as master for IMM at any time. The mandatory IMM job business model in a QAS system configuration is the independent job mode. If the QAS runs up the first time a full IMM database synchronization is done. If jobs already exist at the production system these are synchronized as well.					No				Compliant - STD	1 - Low	STD
SP7_New-40191	SOB	SP7_New- 40191		The collection of control centers cooperatively managing a power system are known as a multisite system. Multisite systems are usually organized in a main/backup or main/regional configuration. All Spectrum Power systems in a multisite network have the complete data model with formal identical content of information maintained by IMM. There is only one data model master at a time. The Main Control Center takes the role of the data model master. The other control centers of the network are source data-dependent. Main/Backup Control Center Systems having Backup Control Centers require synchronized engineering databases between the Main and Backup Control Centers. Data consistency (editing and activating) between the two sites is guaranteed using Oracle data guard and the IMM activation framework. (image: 1-img9f35d3c670c495229da35239137c7662_1_en_US_TIFF.jpg) Figure # Main/Backup Configuration – Basic Overview When there is a switchover or fail-over, authorized data engineers can set the current Main Control Center as master for IMM at any time. Main/Regional Control Center Regional Control Centers get their source data changes applied through job activation from the Main Control Center. There is no IMM database at a Regional Control Center, thus data engineering is always performed on its Main Control Center. (image: 2-img545512f770c496ac9da352390056d58b_1_en_US_TIFF.jpg) Figure # Main/Regional Configuration – Basic Overview					No				Compliant - STD	1 - Low	STD
SP7_New-40187	SOB	SP7_New- 40187		IMM provides logs within the log section of the IMM user interface. The log section can be opened in a separate window. Selected logs can be exported to a Comma-separated Values (*.csv) file. The following are the various log types available, depending on the selected dataset, job or data engineering workflow: * IMM Status Log Messages about the state (activation, preparation, and so on) of the job or IMM itself. The messages include severity, job name, time stamp and source. * Task Log Messages about user actions such as copy/paste, cut/paste, delete subtree, modify instance data, modify type data, and so on. The messages include severity, details, time stamp, and source. An object path is a hyperlink that can be used to navigate to the instance in question. * Validation Log Messages about job validation or global validation. The messages include severity, hierarchical path of the instance and the object type. The object path is a hyperlink that can be used to navigate to the instance in question. * Activation Log Contains all the messages that were created during the preparation or activation of a dataset or job. The messages include severity and time stamp. * Import Log Contains all the messages that were created when a user initiated import was done within a dataset or job. The messages include severity, details and time stamp. * Job History Log Shows the status change of the selected job. The messages include last status change, job name, job status, previous job status and user. * Finalized Jobs Log Lists the jobs that were activated and finalized. The messages include last status change, job status, previous job status and user. The individual log can be modified. Predefined columns with additional information can be included; columns can be used for sorting or can be hid. In the active IMM model archive, the Activation Log and Job History Log for the jobs are retained for auditing purposes.					No				Compliant - STD	1 - Low	STD
SP7_New-40186	SOB	SP7_New- 40186		**Data Reporting** Reporting features provided by IMM allow the user to create/view summary or detail reports of type and instance data. **Instance Change Report** The instance change report displays changes within a selected network equipment hierarchy and within any hierarchy below substation like voltage levels or bays. The report contains all changes made in the existing jobs of a dataset to the instance hierarchy. In the independent job mode, the currently opened job in the real-time dataset and the root job are evaluated. **Object Usage Report** The object usage report displays for a selected network equipment hierarchy the linked telemetry data points as well as linked graphical objects in the different network diagrams. The report can be created for substations or any hierarchy below like voltage levels or bays. The telemetry information covers the linked Independent Front-End System (IFS) that is, RTU-Front-End data as well as linked Inter-control Center Communications Protocol (ICCP) data.					No				Compliant - STD	1 - Low	STD
SP7_New-40185	SOB	SP7_New- 40185		Data version management and automatic static data model archiving facilities provide a history of model changes and allows the user to track data changes over time. Jobs in the IMM model archive provide a past view of the static data model based on the activation time. If archiving is enabled, data is stored in the IMM model archive after a successful job activation or undo activation of the Spectrum Power runtime system. This allows the user to view all jobs that have been activated in the past. The user can run change log reports on archived jobs, access logs, export data, and export data changes in the same way as it is done in the current Real-Time Dataset (RT). The active IMM model archive is a separate read-only dataset; data editing or import is not allowed in order to preserve the history. Retrieving a past model for any point in time enables accurate conclusions to be derived from post-mortem analysis. **DOM Type Changes** Special consideration is made when changing DOM types. Simply applying type changes to the active archive would distort the way instance data looked in the past. However, not applying type changes would mean that future jobs could not be archived. Therefore, type changes that do not affect the instance data are applied directly to the active archive. Type changes that affect the instance data are logically applied. The changed attribute determines which changes are made to the archived instances. **Long Term Archive** Creating a new baseline in the active archive allows the user to transfer a specific historical time frame into a long-term archive. A long-term archive is an oracle dump file that can be stored on external media and can be loaded again into a dataset for any purpose. (image: 1-imgde5c8cd170e558639da35239674b056f_1_en_US_TIFF.jpg) Figure # Spectrum Power IMM – Model Archive **Auditing of IMM Jobs** IMM job auditing features provide means to keep track of who made when what changes to the domain and graphical data. For example, when a problem is identified for a given data instance, end users get the ability to identify what jobs made changes to that instance. Auditing features require the jobs being in the active IMM archive. The specific provisions are as follows: * For any job that is finalized, you can export the incremental XDF or RDF change log and view the report of the changes in that job. * The user is able to view the previous value and the new value changed to by the job. * The user is able to view the order in which jobs were activated or undone and when they were finalized. * The user is able to identify the jobs that modified a given instance within a given time frame.					No				Compliant - STD	1 - Low	STD
SP7_New-40184	SOB	SP7_New- 40184		All power grid domain data and diagram data changes are done in a job. Activation propagates data changes into the Spectrum Power runtime system. The activation ensures that the incremental changes are applied to all applications of the Spectrum Power runtime system, including IMM. In a single failure during activation, the changes are rolled back system-wide. **Activation** Activation is performed in three phases: * Data Preparation Data Preparation generates the change log files for the different application suites, populates Spectrum Power object tables and creates and populates FxBin files for network diagram data for the incremental changes associated with a job. Multiple jobs can be in the prepared state if they are distinct from each other in terms of the operational database of Spectrum Power. Interdependency checks during data preparation are performed to check whether the changes of the job are distinct to all jobs being in prepared, transferred, or activated state. This check is based on the runtime models to ensure data integrity. After a successful data preparation, the incremental changes are ready to be transferred into the offline copy of the operational database. * Data Transfer Data Transfer populates the incremental changes associated with a job to the offline copy (copy 1) of the operational database of Spectrum Power. With this step the Spectrum Power ADM gets involved for the first time. After a successful data transfer, the incremental changes are ready to be activated into the online copy of the operational database. * Data Activation In this phase the incremental job changes are merged into the root of the dataset in the IMM database. Data Activation activates the changes into the online copy (copy 0) of the operational database of Spectrum Power and into the ASRs of Shared Components. **Undo Activation** An Undo Activation is considered as rare and exceptional use-case. Nevertheless, Undo Activation might be the fastest way to return back to normal runtime operation when logically correct, thus without validation errors, but faulty data not describing the real world got activated. Instead of correcting the faulty data under time pressure in a new job, undo activation provides convenient means to undo the changes without losing the former data changes that causes the runtime failure. The faulty data can be corrected in the original job and activated again. Undo Activation has the following two phases: * Undo Prepare In this phase, an undo change log is generated for the Shared Components (like HIS) and					No				Compliant - STD	1 - Low	STD

SP7_New-40183	SOB	SP7_New-40183		Validation ensures that the entire data model remains consistent. In addition, it ensures that all necessary data is entered (completeness check). Validation takes place in a maintenance environment, for example, a job, before the changes are activated into the Spectrum Power runtime system. Validation is started either user triggered using the IMM user interface or automatically when saving data that has been entered using an IMM editor. (image: 1-Tip.png) | NOTEIt is recommended to run validation and fix constraint violations before activation. **Validation Areas** Validation can be performed for the following areas: * The data changed in a job * Entire data in the root combined with the data changes in a job (global validation) * Data modified by means of the IMM import **Validation Types** The following validation types can be distinguished: * Inter-object validation Inter-object validation refers to those checks that require multiple instances to ensure data consistency. These checks can also include instances of different types. * Intra-object validation Intra-object validation verifies the correctness of data in a single instance. This is done automatically when the data is saved. If an incorrect data value is entered, an error message is issued. Intra-object validation includes: * Unique value checks These checks verify that the value in an attribute or combination of attributes is not duplicated across multiple instances of an object. * Cardinality checks These checks verify that relationships between types are satisfied. For example, a parent or child relationship. * Required attribute checks These checks verify that a value has been supplied for a required attribute. * Range checks These checks verify that the value is greater than or equal to a minimum value and less than or equal to a maximum value. For example, 1-10. * Enumeration checks These checks verify that a value is member of a specified list of values (enumeration). For example, Yes/No, Open/Close.					No				Compliant - STD	1 - Low	STD
SP7_New-40182	SOB	SP7_New-40182		In power companies, several systems exist based on (to varying extents) common power grid/network data of the utility. Generally, each system has a database and its own data model maintenance tools optimized to the specific scope of the data. Thus, the complete model maintenance is split up in different model maintenance systems with defined data responsibilities for a specific data item. For specific parts of the data required for the Spectrum Power system, one of those external systems might be the master. The data coming from the different sources needs to be consolidated by IMM into a single source before populating the Spectrum Power runtime system. An example for such a system is the GIS. Data provided by the GIS gets imported into IMM through the GIS Data Import Management (GDIM) function of Spectrum Power. The following feature of IMM support the consolidation of data from different sources in the CIM based DOM: * Support of foreign identifiers The CIM based DOM in IMM uses, among others, universally unique RDF identifiers. External systems might use foreign unique identifiers (for example, GIS ID) for similar purposes. Foreign identifiers can be defined as such in DOM and allow for one-to-one identification in both systems. Foreign identifiers are treated similarly to RDF identifiers in IMM regarding enforcement of the uniqueness during modification attempts.					No				Compliant - STD	1 - Low	STD
SP7_New-40181	SOB	SP7_New-40181		**Import and Export of Engineering Data in XDF or CIM-RDF** IMM provides an interface to export and import engineering data in XDF and CIM-RDF. Both are XML formats based on W3C standard. The XML is a versatile language for the definition of tags to identify document contents. XML allows third-party products to be used for data editing and pre-validation. CIM-RDF is based on the IEC 61970-452 and IEC 61968-13 standards for the description of electrical power systems. XDF is a proprietary format. IMM supports complete, partial, and incremental import and export in XDF and CIM-RDF. All engineering data can be exported and imported in these formats. Profiles allow filtering of exported engineering data. They are based on types, attributes, and associations. You can define types, attributes, and associations that define a profile. An arbitrary number of profiles are supported. Instance filtering of exported engineering data is based on logical expression containing one or multiple attributes of one type. Instance filtering is provided to allow limiting the exported instances to a set matching a certain use case. The data import and export features of Spectrum Power IMM are used for: * Data migration Transfer of instance data and graphics data from legacy systems. * System upgrade The import or export feature allows you to store the database content in files that are re-imported after system upgrade. * External engineering data modification The import/export feature allows modifying data in external files which, after external entry modification, are re-imported into the IMM data model. * Data backup feature The export function can be used to save the data (the overall data model) to an external file. * Profile-based export Only instances assigned to a certain profile are exported. Following the data import, validation ensures that the new engineering data is consistent and does not conflict with any other engineering data in the system. During export, the specified data information is transferred from the database to external files. **Further Instance Data Export Formats** Partial power grid/network data export in CSV format is supported. In power companies, several systems exist based on (to varying extents) common power grid/network data of the utility. Generally, each system has a database and its own data model maintenance tools optimized to the specific scope of the data. Thus, the complete model maintenance is split up in different model maintenance systems with defined data					No				Compliant - STD	1 - Low	STD
SP7_New-40178	SOB	SP7_New-40178		IMM Triggers execute a set of business logic required by downstream applications as it applies to the data. The IMM Trigger functionality provides a user-friendly data entry support. Trigger functions are able to perform actions not only based on an insert, update, and or delete of instances, but also based on current values and situations existing in the database. For example, having triggers that auto-create required instances either as child objects or objects elsewhere in the domain data hierarchy based on certain data criteria, means that there is less data that the user must enter by hand and less chance for human error. **Trigger Events** Triggers are executed based on a trigger event. Trigger events are part of the data model type definitions in DOM. There are five types of events possible. They are as follows: * OnInsert * OnUpdate * OnDelete * OnCutPaste * OnRename The trigger functions are executed after the end of an engineering task. For example, if one task consists of adding three instances of type Breaker and deleting one instance of type Measurement, the trigger function assigned to OnInsert Breaker event will be called three times, once for each Breaker, and the function assigned to OnDelete Measurement will be called once for the Measurement. All necessary trigger functions are called after changes are made by the task and are completely committed to the database. **Trigger Functions** Triggers are data type dependent. They reference types defined by the data model DOM. One generic master trigger package, PkgTrgMaster, resides in the schema directory and handles the calling of all necessary trigger functions. The following trigger functions are supported: * Population of internal (read-only) attributes for instances For example, auto-numbers are needed to support the Spectrum Power runtime system like B1, B2, B3, Diagram, and Nimset numbers. The auto-number defined for an instance A is unique when associated with another instance B. The instances A and B may be a parent child or a reference association. A defined set of associations may drive a certain auto-number. The numbers can be configured to be Reused or Non-reused. * Creation of children or grandchildren instances Auto-create new child objects when a new instance is added. For example, creation of Info's under elements based on the normelement type, creation of data acquisition equipment, creation of RTDS pseudo station, and so on.					No				Compliant - STD	1 - Low	STD
SP7_New-40177	SOB	SP7_New-40177		**Overview** Display construction of network diagrams is completely integrated in the IMM. The Graphics Editor provides means to view, create and modify graphic diagrams and also symbology. The graphical editing creates the link between the instances of the graphic data to instances of the domain data. **Technological Editing** Technological editing allows creation, modification, and deletion of electrical power system domain data and topology in a graphical way. The following workflows are supported: * Create diagrams to represent power network/system graphically. * Create new graphical objects and new domain data. * Link graphical objects to existing domain data. * Create and manipulate the topology of the electrical power system network. * Delete domain data using deletion of graphic objects linking the domain data. * Support creation and usage of user-defined templates that contain domain data and graphic data. Technological editing maintains consistency between graphic data and electrical domain data. **Raster Set Assignment** Generally, rasters are digital aerial photographs, imagery from satellites, digital pictures, or even scanned maps. Picture raster data is often used in geographic displays to convey additional information. Raster data might be organized in raster datasets and raster catalogs. The raster set assignment allows assigning installed raster sets to layers of a diagram and supports PNG and JPG formats.					No				Compliant - STD	1 - Low	STD

SP7_New-40176	SOB	SP7_New-40176		**Overview** Engineering activities to change data require working with large amounts of information with multiple attributes and properties. IMM is the user interface for domain data maintenance within a job. Domain data editors provide means for the following: * Instance data modifications * Data type changes These are provided in different but consistent views of the data according to your intention and workflows. **Creation and Management of Instances** The following instance data modifications can be done from IMM UI within a job: * Create instances * Rename instances * Modify attribute values for instances * Delete instances All descendent instances and their links are also deleted. * Create links * Delete links **Type Changes** Data model maintenance and customizing features allow for the extension of the standard DOM by creating and maintaining custom types. IMM provides means to extend and manipulate the DOM. The following actions are possible: * Creating, modifying, and deleting types. Deletion of types deletes all derived types. A type can be deleted only if all instances of this type have been deleted beforehand. * Creating, modifying, and deleting attributes of a type. Derived types inherit all attributes of its base types. * Creating and deleting associations. DOM modifications can be either performed with the Type Editor or by import of XDF files. When a type change is made, all existing jobs and all subsequent jobs inherit the type change. Since type changes affect the current data model and future jobs, only a user with administrative rights is allowed to make type changes.					No				Compliant - STD	1 - Low	STD
SP7_New-40175	SOB	SP7_New-40175		In independent job mode, you can view or edit the model as it is at the current time when you are in a job. You see the model as it currently is (the production model used in the Spectrum Power runtime system) plus your job changes. You do not see changes from other jobs unless the jobs are activated. The changes in the job can be considered as overlays on top of the data currently in use online. Each job is a separate overlay so switching between jobs shows the changes in the job overlaying the current data in use. (image: 1-imgdaab9ce7710fefab9da35239293d523b_1_en_US_TIFF.jpg) Figure # Independent Job Mode View (1) Job interlocking prevents different jobs from modifying the same instance and link data to preserve data integrity. This means, that you cannot change the instance data that has been locked by another job and other jobs cannot change your data. (image: 2-imgb42e945470b6898c9da352391a5e23e7_1_en_US_TIFF.jpg) Figure # Independent Job Mode View (2) For example, two different jobs (B and C) cannot edit the same part of equipment within a substation. If you try to change data locked by another job, an error message is issued indicating that the data is locked and your change is aborted. This keeps jobs in the engineering environment independent from each other. They can be processed (for example, activated, undone, or finalized) in any order. **Job Interlocking** Job interlocking applies to individual instances or links in the data model. Adding, modifying or deleting an instance automatically locks the instance itself only. When the user changes an attribute value of an existing instance, this object is locked by the job. If the name of the object is changed, both the old and new names are locked. Both, parent and child objects are not affected. When a new object is added, the new instance is locked. Only this job can create descendants to the newly created instance. When an object is deleted, all child instances are also deleted, and all the deleted instances are locked. Another job cannot insert a new instance with the same name as the deleted instance. The deletion of an instance is prevented if one of the descendants of their links is locked by another job to ensure data integrity. Adding or deleting a link locks this link only. This means that the exact same link, that is, a link that references the same two instances using the same association, cannot be added respectively deleted again by another job. After a job has been activated and finalized or deleted, all interlocks created by this job are released. **Job Interdependency Checks** Job interlocking is performed at engineering design time and supports the user's data maintenance with fine granular individual instance locking, thus allowing utmost parallel editing					No				Compliant - STD	1 - Low	STD
SP7_New-40174	SOB	SP7_New-40174		Domain data, graphical network diagram data entry, and engineering activities are under the control of the IMM job management. Job management is the method by which changes of the Spectrum Power engineering database are grouped and managed. A job allows multiple and concurrent users to modify data simultaneously in a secure environment, without impacting the operational databases of the Spectrum Power runtime system. Case Study: Introduce a new substation and propagate this substation to the runtime system. * Create a job in IMM * Edit the new substation domain data, topology and graphical data in the job * Validate the job * Activate the job * Verify the job history Job management controls the definition, usage and deletion of jobs. Job management provides the following functions: * Defining a new job or continuing to work within an existing job. Multiple jobs can exist at one time. * Associating data changes with a specific job. * Viewing data changes associated with a job. * Viewing the job list together with the job status. For example, job reservation details, whether a job has been validated or activated, and so on. * Validation of complete data or incremental data changes in a job. * Activation of data changes to the Spectrum Power runtime system. * Undo of activated data changes to the Spectrum Power runtime system. * Archiving of job changes after a successful activation of the runtime system – if enabled. * Erasing a job discarding all data changes associated with the job. * Finalizing the job to make changes permanent. Data entry and engineering activities include the following: * Manual data entry * Import of bulk or incremental changes from external data model or instance data * Generating change log reports **Job** A job groups data changes that belong together. The job is the unit of data that is finally changed in the engineering database and in the runtime databases of the Spectrum Power system. Each job is identified by a name. Although the job management function provides the capability to group data changes into a job, it is the data engineer who is in control of grouping the changes together. This ability adds great flexibility to the data engineer as to what data changes define an increment of change against the database currently in operation. (image: 1-img084eb9fe70c4938c9da3523935bd81d0_1_en_US_TIFF.jpg)					No				Compliant - STD	1 - Low	STD
SP7_New-40171	SOB	SP7_New-40171		A typical data engineering console consists of multiple monitors. During an IMM engineering session, the console is connected to the IMM server running on Administrator Server (ADM). Multiple engineering consoles can be connected to the IMM server. The IMM UI client program can be installed on any console in the control center. It runs on Windows or Linux. The client is updated as needed automatically upon login. The initial window loaded is the main screen with the job management user interface and serves as the general access point to the data engineering jobs and IMM engineering applications. The IMM UI client communicates with IMM Server over a secure Message Interchange Communication (MIC) connection. The ADM can run in a spare redundancy configuration. In case of a failure and run up of the spare server, the IMM UI client connection has to be re-established manually. (image: 1-imgc9559f22b3235aaf9da35239753dbfa5_1_en_US_TIFF.jpg) Figure # IMM UI Basic Architecture IPC : Inter Process Communication IMMUIDP: Information Model Management User Interface Data Provider MIC: Message Interchange Communication					No				Compliant - STD	1 - Low	STD
SP7_New-40170	SOB	SP7_New-40170		IMM has a number of engineering applications suitable for the different engineering tasks. (image: 1-img65d5925470b687369da352393f7fa3ae_1_en_US_TIFF.jpg) Figure # General Application Structure of the IMM User Interface The amount of provided applications is dependent of the concrete customer project and configuration. IMM Application provide the following: * Type Editor The Type Editor is used to view and edit properties of a type as well as to create new types. It provides a set of tabbed pages each of which is used to configure a distinct kind of type properties. * Type Inspector The Type Inspector is used to view type properties. Basically it is the read-only version of the Type Editor. * Model and Graphics Editor The Model and Graphics Editor allows viewing and editing of network model and diagram data. It provides structured panels dedicated to different views to the data and rich navigation means through the different views. * Multi-Instance Editor The Multi-Instance Editor is used to view and modify a set of instances including links as well as to search and filter for instances. Queries can be defined, saved and loaded for reuse. The result table can be exported into a CSV file. * Symbol Editor The Symbol Editor allows viewing and editing symbols used on the diagrams. * Color Editor The Color Editor allows viewing and editing color values of color instances used on the diagrams. * Decision Table Editor The Decision Table Editor allows maintaining diagram decision tables for evaluating the presentation of dynamic display objects in the runtime environment. * Shape Style Editor The Shape Style Editor allows creating reusable shape styles which represent a particular graphic property combination that can be assigned to graphic objects. * Style Group Editor The Style Group Editor allows maintaining unique styles matching the values configured in the diagram decision tables by the Decision table editor in a certain style group. * Style Logic Editor The Style Logic Editor allows maintaining style logics for evaluating the style of the presentation					No				Compliant - STD	1 - Low	STD

SP7_New-40169	SOB	SP7_New-40169		The Spectrum Power IMM functions are a set of tools that allow power system information data to be defined, accessed, and exchanged. These tools also control the transfer of data between the engineering database and the Spectrum Power runtime databases. The propagation of data changes from the IMM to the Spectrum Power applications online runtime databases is designed so that only incremental changes are applied to these databases. The application of the changes to the runtime databases is coordinated so that there is no application downtime – this includes the process interfaces and real-time applications. All changes are immediately available for processing and viewing by operators, and there is no interruption in the real-time operation of the network control center. This process is known as Online Activation. (image: 1-imgc85e1a566f7c44469da352390cb056a1_1_en_US_TIFF.jpg) Figure # Spectrum Power IMM Functional Overview * Engineering data import and export can be done in XDF and RDF formats based on the W3C standard XML. * Partial power grid/network data export can be done additionally in Comma-separated Values (CSV) format. * Editing engineering and graphics data. * IMM Editors used for editing engineering data and Graphics Editor used for editing graphic network diagram data. * Validation features provided by IMM ensures that the data model remains consistent. * Reporting features provided by IMM allow the user to create and view summary or detail reports of type and instance data. * Job management is the method by which changes of the Spectrum Power engineering database are grouped and managed in jobs. * The engineering data is stored in Oracle source data base and go through data preparation and data activation phases to get the changes applied. * Data version management and automatic data model archiving facilities provides a history of model changes including auditing capabilities.					No				Compliant - STD	1 - Low	STD
SP7_New-40168	SOB	SP7_New-40168		Spectrum Power IMM controls the data to be defined and transferred between the engineering database and the Spectrum Power runtime databases. IMM provides functions that act like a set of tools to maintain power system information. The sub-functions of IMM are as follows: * Job management * Domain and graphics model data maintenance * IMM trigger framework * Data import and data export * Validation of data changes * Activation of data changes * Data version management * Reporting * Logs * Multisite environment support * Quality Assurance System (QAS) support * Operator Training Simulator (OTS) support * Access rights * IMM administration					No				Compliant - STD	1 - Low	STD
SP7_New-40167	SOB	SP7_New-40167		The Spectrum Power DOM provides a logical, object-oriented data model describing power system information, characteristics and behavior. The DOM is based on the CIM version 12. **Common Information Model (CIM)** CIM is a set of standards for representing power system components. The IEC standard 61970-301 (Energy Management System Application Programming Interface (EMS API)) that originated from the Electric Power Research Institute Control Center Application Program Interface (EPRI CCAPI) project is a semantic model that describes the components of a power system at an electrical level and the relationships between each component. The IEC 61968-11 (System Interfaces for Distribution Management) extends this model to cover other aspects of power system data exchange such as asset tracking, work scheduling and customer billing. The IEC 62325-301 (Energy Market Communication) extends both these models to cover the data exchanged between participants in electricity markets. These three key standards are collectively known as the CIM for electrical power systems. In practical applications of the CIM it is combined with application and project specific extensions. DOM is CIM-compliant in its basic structure. It matches CIM in those parts where CIM defines information needed for the applications provided by the Spectrum Power system. DOM contains extensions for all parts that are not covered by CIM. For example, communications to the physical equipment in the field, user and console function authority assignments, presentation logic assignments for field equipment in network diagrams, and so on. (image: 1-img63daf5336f76be009da352390a9df611_1_en_US_TIFF.jpg) Figure # Utilization of CIM Resources by DOM Extensions to the CIM version 12 model are handled through the use of namespace assignments. Namespaces do not carry much information in themselves but indicate the origin of the information. The namespaces RDF and CIM are defined in CIM and delineate the CIM standards from customized extensions in DOM. The logical structure provided by the DOM is independent of the physical database implementation and the executable software. Because the DOM hides the underlying physical implementation, it is useful as a basis for application interfaces as well as user interfaces. This de-couples a client application from the implementation details of another application that supplies data or services. **DOM Customization** The DOM can be extended and adapted to specific customer needs. Types, attributes, and associations are assigned to namespaces. RDF is the base namespace, it is extended by CIM. Both namespaces are defined in the CIM standards. DOM extensions for the Spectrum Power domain have an own namespace defined by the product. Customer-specific DOM extensions finally get a customer-specific namespace.					No				Compliant - STD	1 - Low	STD
SP7_New-40166	SOB	SP7_New-40166		The system engineering process basically consists of three phases: * System configuration * Customization * Data entry All three activities are performed during commissioning. As the requirements of the utility evolve, these activities continue to occur when the system is in operation. In particular, data entry and changes are a normal part of day-to-day system maintenance activity. (image: 1-imgc3f3f55b6f73f9679da3523933978529_1_en_US_TIFF.jpg) Figure # Engineering Phases In general, system engineering activities follow the sequence of configuration, customization, and data entry. However, one of the key requirements of all phases of the engineering process is that the engineering tools are to accommodate an iterative philosophy of system engineering. This means that changes to previously engineered aspects of the system can be made without losing all the subsequent engineering work that has been done. For example, it is possible to modify system configuration information and to perform a new custom feature implementation after data entry is well underway. System configuration and customization activities occur mainly during the initial system implementation and less frequently when the system is in operation. How data is to be configured specifically for a certain purpose within the Spectrum Power control center system is described in detail in so called Data Modeling Guides, available for the specific application areas of the Spectrum Power control center system. **System Configuration** System configuration comprises the following activities, where applicable: * Provision of hardware (servers as well as the network) * Installation of software (operating system, other third-party software and Spectrum Power software) * Basic configuration of the system **Customization** In this phase, project enhancements of the standard product can be introduced. The CIM based DOM can be extended to fit customer needs. Typically, data is migrated from existing systems and imported into the engineering database. **Data Entry** Data entry describes the process of day to day changes of the data. This is done to account, for example, for changes in the physical structure of the power system network. Maintenance of the power network model is a key activity underlying the various applications in power control center systems. Keeping the static power system network model accurate and up-to-date ensures accurate and useful results within runtime operation. In particular, data entry and changes are a					No				Compliant - STD	1 - Low	STD
SP7_New-40165	SOB	SP7_New-40165		In power companies, several systems exist based on (to varying extents) common power grid or network data of the utility. Thus, the complete model maintenance is split up in different model maintenance systems with defined data responsibilities for a specific data item. For specific parts of the data required for the Spectrum Power 7 system, one of those external systems might be the master. An example for such a system is the Geographical Information System (GIS). The data coming from the different sources needs to be consolidated by IMM into a single CIM based DOM before populating the Spectrum Power 7 runtime system. IMM supports the consolidation of data from different sources through the ability to define the foreign identifiers to allow one-to-one identification in both, the external systems and IMM.					No				Compliant - STD	1 - Low	STD
SP7_New-40164	SOB	SP7_New-40164		Spectrum Power Information Model Management (IMM) is the source data master and manager for domain and graphic data in a Spectrum Power system. IMM provides the ability to efficiently enter and maintain power system related engineering data in a Common Information Model (CIM) based central repository. Engineering data used in Spectrum Power systems consists of the following types of data: * Domain data such as equipment, measurements and topology * Graphic data such as network diagrams and its associations like presentation logic * Static data such as configuration of IMM server, clients, and so on * Application Configuration (AC) data where applicable Complete, partial, and incremental import and export of engineering data is provided through Common Information Model - Resource Description Framework (CIM-RDF) and eXtensible Data Format (XDF) that are based on the W3C standard eXtensible Markup Language (XML). IMM also controls the activation of incremental data changes to the Spectrum Power runtime databases. (image: 1-img388770f6ed6fe8929da3522a78dec31e_1_en_US_TIFF.jpg) Figure # Spectrum Power IMM **User Characteristics** The primary user of the IMM is the data engineer. The data engineer has a technical background and is expected to understand database terminology and concepts, as well as the power system characteristics. The data engineer is responsible for changes to the database information. **Engineering Database** The engineering data is stored in one single source, the Domain Object Repository (DOR). The DOR is split into logical, independent datasets – each holding data for specific purposes (for example: User Administration Dataset (UAD), application configuration dataset, and so on). The DOR provides a logical view into the physical data storage. The physical data storage is a standard Relational Database Management System (RDBMS) from Oracle. The IMM is based on an object-oriented data model. The Domain Object Model (DOM) provides a logical model describing power system information, characteristics and behavior. The DOM is based on the CIM version 12. (image: 2-Tip.png) | NOTECIM is an important industry standard to enable system integration and information exchange based on a common information model. The CIM standards, in particular those of IEC 61970, have reached through several interoperability tests and iterations a maturity level that ensures successful usage. Siemens has supported the standardization effort and interoperability tests from its inception.Siemens is convinced that its products implementing the standards will help to ease integration, reduce implementation costs and					No				Compliant - STD	1 - Low	STD

SP7_New-40137	SOB	SP7_New-40137		GDIM provides a UI that drives and controls the Import process from the GIS and visualizes of the current process status (which phase it is in). The UI can be opened on the ADM server. Through the UI the user can select the mode of operation, whether it is a bulk import or incremental import. Also, the selection of either continuous execution or manual stepwise execution is possible. The GDIM UI provides the following features: * Selection of the operation mode: Bulk or incremental import * Processing of static background data using the DXF plug-in * Selection of continuous execution or stepwise execution * Visualization of the state of the import progress * Selection of validation log * Controlling the GDIM workflow including extraction, change management and transformation * Controlling import to IMM, preparation, transfer and activation to the runtime database * Undo and re-do of versions, discard or invalidate versions if data issues are found, and so on * GDIM – IMM change detection (Image: 1-img8bb3cc9999af28aa9da3522a670c1d16_1_en_US_PNG.png) Figure # Sample Display - GDIM User Interface					No				Compliant - STD	1 - Low	STD
SP7_New-40135	SOB	SP7_New-40135		The GDIM IMM change detection checks the consistency between the IMM and GDIM data bases. The result of the compare is displayed in the GDIM UI.					No				Compliant - STD	1 - Low	STD
SP7_New-40134	SOB	SP7_New-40134		* In this case, GIS data describing the increments (deltas) are received. GDIM does not do any change detection. * The identified changes are transformed within the model transformation and XDF files are written. * The GDIM UI is used for the import of XDF files to an IMM job as well as calling for the preparation, transfer, and activation of the system.					No				Compliant - STD	1 - Low	STD
SP7_New-40133	SOB	SP7_New-40133		* Incremental import supports auto-detection import on the full network model. Data is imported in GDIM in a new extracted dataset. During import, the change management functionality is used for comparing the imported data with the previous version of the data. * The identified changes are transformed within the model transformation and XDF files are written. * The GDIM UI is used for the import of the XDF files to an IMM job as well as calling the preparation, transfer, and activation to the system. (image: 1-Tip.png)	NOTEProper distribution of the changes over all Spectrum Power servers is the responsibility of the Spectrum Power IMM engineering activation, which includes Multisite too.				No				Compliant - STD	1 - Low	STD
SP7_New-40132	SOB	SP7_New-40132		The GDIM system, engineering IMM, and the operational Spectrum Power system is initialized with a bulk export from GIS. This is considered a one-time data migration exercise is done once before the GIS extract workflow is initiated. This process is started on the GDIM UI using the bulk mode. For the initial import GIS extraction and data model transformation is performed. XDF files are written. The further steps to import the data into IMM are done using the GDIM UI.					No				Compliant - STD	1 - Low	STD
SP7_New-40127	SOB	SP7_New-40127		GDIM supports the import of static graphics from a DXF file. The supported DXF file format version is AC1024. DXF parser only supports some dxf entities such as LWPOLYLINE, LINE, TEXT, MTEXT, CIRCLE, ARC and there is a limitation on IMM/ODB side according the maximum pointcount of a polyline.					No				Compliant - STD	1 - Low	STD
SP7_New-40126	SOB	SP7_New-40126		The translation engine governs the extraction process. The translation engine is a generic mapping engine which translates the data types (for objects, attributes, and values) of the GIS of concern to the data types of the extracted dataset. This generic mapping engine is driven by configurable mapping files. During its processing, this engine uses the GIS data and translates it to the corresponding extracted dataset data using the specified extraction mapping. It then writes this mapped data to the extracted dataset. The translation engine manages the interaction between the various extraction components. It functions as an interface between the GDIM extracted dataset and the GIS. It receives the data from the provided GIS dataset, and translates it according to the extraction mapping to the intermediate data model of the extracted dataset. Based on directives in the mapping file, the engine does the following: * Translates the GIS data to the corresponding extracted dataset data using the type-translation rules configured in the mapping files * Writes the processed data to the extracted dataset The extracted dataset is the same regardless of the data model in the GIS.					No				Compliant - STD	1 - Low	STD
SP7_New-40125	SOB	SP7_New-40125		A GIS can utilize multiple sources of data. Each of these sources may need to be considered by GDIM. To absorb the GIS-centric datatypes and formats, the various GDIM is designed to contain special processing and functionality specific to the relevant GIS and data model. The translation engine drives the relevant data into the extracted data set. The following are the scenarios for GIS data sources: * Single source system Data for all the types are sourced from a single source GIS or format (GIS). * Single source system, static data Only static geometric data and symbology definitions are provided. * Geometric data is provided with a different granularity from the base object, electrical, and connectivity data (for example, multiple DXF are provided). Granularity of graphic data might be on: * Entire network level * Voltage level * Substation level * Feeder level, and so on . * All data must come from one GIS source system.					No				Compliant - STD	1 - Low	STD
SP7_New-40121	SOB	SP7_New-40121		The GDIM UI visualizes the current progress and shows log/error messages. On the GDIM UI, the data engineer selects the mode of operation (bulk, incremental mode or delta mode) and choose between stepwise or automatic import. Depending on the settings in the GDIM UI, the workflow coordinates the functions GIS data extraction, change management, data validation, model transformation, and the target model output. After the generation of the eXtensible Data Format (XDF) files by the target model output, the workflow controller creates an IMM job and imports the XDF files into this job. The workflow then calls the validation (can be selected optionally), preparation, transfer, activation to the realtime system, and finalization of this job. The user can select whether the validation is called and if the job should be finalized . After finalization, the GDIM import is finished and the changes become permanent. To start another GIS extraction, the job must be finalized.					No				Compliant - STD	1 - Low	STD
SP7_New-40120	SOB	SP7_New-40120		* GIS -> GDIM - The data extraction imports the data from GIS and writes it into GDIM's extracted dataset. The GDIM extracted dataset is a standardized intermediate schema. * GDIM - During extraction and transformation process, validation rules (attribute and consistency checks) are executed to check the accuracy of the imported data. * GDIM - Change management detects the changes to the previous version in the extracted dataset. * GDIM - Data model transformation transforms the data from the extracted data model as required and appropriate for the engineering system that supplies the Spectrum Power system and stores it in the extracted dataset in the transformed data model. * GDIM - The target model output builds XDF files for graphic and domain data. * GDIM - The generated XDF files are imported into the engineering IMM. * IMM and IMM -> SP7Prepare/Transfer/Activation to Spectrum Power system. GDIM triggers the activation process. This is handled by the workflow controller using the GDIM UI.					No				Compliant - STD	1 - Low	STD
SP7_New-40119	SOB	SP7_New-40119		(image: 1-img83a51b366f6fb0799da352393a2de949_1_en_US_TIFF.jpg) Figure # GDIM Functional Blocks Overview The major functional blocks of the GDIM include * Data extraction The data extraction block interfaces with the GIS database, extracts the data, and uses the information to populate the extracted dataset. It also includes execution of validation rules to check the accuracy of the imported data before processing them further in the transformation module. The validation rules include attribute checks (null, range, and enumeration checks) and consistency checks (phase and voltage check, and graphic consistency check). The validation results or findings are displayed in the GDIM User Interface (UI). For the data extraction from the delivered GIS data, the data structure must be provided in the structure required by GDIM from the GIS system. * GDIM UI This comprises functions for management and control of the GDIM workflow, for example, start step of import, mode of import, enable or disable data validation, and so on. * Workflow management This comprises the business logic for the GDIM UI, that is, getting the next command, checking whether undo of the previous step is allowed. * Version control Data imported from GIS is maintained in versions. For each new import, a new version is created. * Change management For the self-contained incremental import, the change management functionality performs the detection of differences between two versions of extracted GIS data, the previously imported dataset and the new one received from the GIS. * Data pre-transformation and transformation This group of functions handles the transformation of the extracted data to the format for the engineering IMM. The transformed data is stored in the extracted dataset. Validations are done based on the transformed data, for example, consistency checking of voltage levels and phase information . * Target model output The output writer uses the transformed data and generates XDF files for import into IMM. It is driven by a mapping file which maps the transformed data into the target model. * Extracted dataset All data imported from GIS is stored in GDIM in the extracted dataset. The object model of the extracted dataset (consisting of domain, connectivity, and graphics data) represents a customer specific object model of the GIS equipment data. The extracted dataset model remains fixed over					No				Compliant - STD	1 - Low	STD
SP7_New-40103	SOB	SP7_New-40103		OpenSSL This product includes software developed by the OpenSSL Project for use in OpenSSL Toolkit (http://www.openssl.org/). This product includes software written by Tim Hudson (tjh@cryptsoft.com). This product includes cryptographic software written by Eric Young (eay@cryptsoft.com).					No				Compliant - STD	1 - Low	STD
SP7_New-40102	SOB	SP7_New-40102		This document is part of a set of manuals that describes the complete product. Various other product modules may be mentioned or discussed in this document. For more detailed information – or if you have any questions about these products – contact your Siemens representative.					No				Compliant - STD	1 - Low	STD

SP7_New-40101	SOB	SP7_New-40101		**Structure of the Manual** Introduction: Basic information about the component Functionality: Description of different functionality of the component Technology: Information about user interface technology and external data interfaces Algorithm/Concepts (optional): Description of calculation algorithms and concepts					No				Compliant - STD	1 - Low	STD
SP7_New-40100	SOB	SP7_New-40100		**Typical Users** This document is designed for users that are already familiar with operational and technical aspects of power generation and power transmission and distribution as well as the product concepts: System Engineers System Engineers are able to install and to customize the system. They need deep knowledge about the internal structures and processes of the network control system. Data Engineers Data Engineer translate the real network of a utility or the generation plants to the data model of the network control system. They also maintain the data model. Technical Specialists Technical Specialists are responsible for a special technical area which is related to the network control system. This can be the planning department, which plans changes in the network and uses network analyses applications of the network control system or the RTU department, which has to connect the RTU to the network control system. Technical Specialists have to know how specific functions of the network control system work in detail. Project Managers Project Managers have to discuss technical issues with the customer. They need a functional overview about the system and in some cases also specific technical specifications, which describe the way the system works. Those descriptions are also in some cases part of the contract. Proposal Managers Proposal Managers have to be able to read and understand the tender from the customer and to map the required functionality to the product and the way the function can be fulfilled with the product. Depending on the tender, this may also require the knowledge of technical specialists. In addition, Proposal Managers need an overview description of the system for the tender.					No				Compliant - STD	1 - Low	STD
SP7_New-40099	SOB	SP7_New-40099		**Scope** This document provides specific and detailed information on how to use a particular product or product component. {image: 1-Tip.png} | NOTENote that the screenshots used in this document contain sample data which may not be available in some systems.					No				Compliant - STD	1 - Low	STD
SP7_New-40098	SOB	SP7_New-40098		**Proper Use** The product must not be used for any other purposes than that described in the technical documentation. If it is used together with third-party devices and components, these must be recommended or approved by Siemens. The successful and safe operation of this product is dependent on adequate transportation and proper handling, storage, installation, operation, and maintenance.					No				Compliant - STD	1 - Low	STD
SP7_New-40097	SOB	SP7_New-40097		**Qualified Electrical Engineering Personnel** Only qualified and authorized personnel should work with this product after becoming thoroughly familiar with all warnings, safety notices, operating instructions and maintenance procedures.					No				Compliant - STD	1 - Low	STD
SP7_New-40096	SOB	SP7_New-40096		**Notes on Safety** This manual is not a complete index of all safety measures required for operation of the equipment (module or device). However, it includes important information that must be followed for personal safety and to avoid material damage. Information is highlighted and illustrated as follows according to the degree of danger: {image: 1-Standard.png} | WARNING WARNING means that death or severe injury may result if the measures specified are not taken. Comply with all instructions, in order to avoid death or severe injuries. {image: 1-Standard.png} | CAUTION CAUTION means that medium-severe or slight injuries can occur if the specified measures are not taken. Comply with all instructions, in order to avoid moderate or minor injuries. {image: 2-Tip.png} | NOTEImportant information about the product, product handling or a certain section of the documentation which must be given attention.					No				Compliant - STD	1 - Low	STD
SP7_New-40091	SOB	SP7_New-40091		**Revision Record** **Version | Date | Author/Department | Approver/Department | Modifications** | | | | |					No				Compliant - STD	1 - Low	STD
SP7_New-40090	SOB	SP7_New-40090		Subject to changes and errors. The information given in this document only contains general descriptions and/or performance features which may not always specifically reflect these described, or which may undergo modification in the course of further development of the products. The requested performance features are binding only when they are expressly agreed upon in the concluded contract.Document version: FS-DE-EN-v2.4-1.0Edition: 03.2024Version of the product described: v24Q1 | **Copyright**Copyright © Siemens 2024. All rights reserved.The disclosure, duplication, distribution and editing of this document, or utilization and communication of the content are not permitted, unless authorized in writing. All rights, including rights created by patent grant or registration of a utility model or a design, are reserved.**Trademarks**Spectrum Power is a trademark of Siemens. Any unauthorized use is prohibited.					No				Compliant - STD	1 - Low	STD
SP7_New-40089	SOB	SP7_New-40089		Spectrum Power 7 Data Engineering v24Q1 Functional Specification FS-DE-EN |					No				Compliant - STD	1 - Low	STD
SP7_New-3062	Heading	SP7_New-3062	Referenced IEC Standards						No						
SP7_New-3061	Heading	SP7_New-3061	Sizing						No						
SP7_New-3060	Heading	SP7_New-3060	Performance Parameters						No						
SP7_New-3059	Heading	SP7_New-3059	User Interface						No						
SP7_New-3053	Heading	SP7_New-3053	Hardware Deployment						No						
SP7_New-3052	Heading	SP7_New-3052	Backup and Restore						No						
SP7_New-3051	Heading	SP7_New-3051	Scalability						No						
SP7_New-3050	Heading	SP7_New-3050	Authorization and Security						No						
SP7_New-3049	Heading	SP7_New-3049	Auditing						No						
SP7_New-3042	Heading	SP7_New-3042	Command Line Interface						No						
SP7_New-3041	Heading	SP7_New-3041	ASR Mapfiles						No						
SP7_New-3040	Heading	SP7_New-3040	Catalog Support						No						
SP7_New-3039	Heading	SP7_New-3039	File Formats for Graphic Data Exchange						No						
SP7_New-3038	Heading	SP7_New-3038	Data Export using CSV Files						No						
SP7_New-3037	Heading	SP7_New-3037	Data Exchange using XML Files						No						
SP7_New-3031	Heading	SP7_New-3031	Dataset						No						
SP7_New-3030	Heading	SP7_New-3030	Domain Data Topology						No						
SP7_New-3029	Heading	SP7_New-3029	Instance Data						No						
SP7_New-3028	Heading	SP7_New-3028	IMM Types						No						
SP7_New-3026	Heading	SP7_New-3026	Text Style Editor						No			IMM User Interface	Analog Representation Editor			
SP7_New-3025	Heading	SP7_New-3025	Symbol Logic Editor						No			IMM User Interface	Text Style Editor			
SP7_New-3024	Heading	SP7_New-3024	Symbol Group Editor						No			IMM User Interface	Symbol Logic Editor			
SP7_New-3023	Heading	SP7_New-3023	Style Logic Editor						No			IMM User Interface	Symbol Group Editor			
SP7_New-3022	Heading	SP7_New-3022	Style Group Editor						No			IMM User Interface	Style Logic Editor			
SP7_New-3021	Heading	SP7_New-3021	Shape Style Editor						No			IMM User Interface	Style Group Editor			
SP7_New-3020	Heading	SP7_New-3020	Decision Table Editor						No			IMM User Interface	Shape Style Editor			
SP7_New-3019	Heading	SP7_New-3019	Color Editor						No			IMM User Interface	Decision Table Editor			
SP7_New-3007	Heading	SP7_New-3007	Analog Representation Editor						No							
SP7_New-3006	Heading	SP7_New-3006	Text Style Editor						No							
SP7_New-3005	Heading	SP7_New-3005	Symbol Logic Editor						No							
SP7_New-3004	Heading	SP7_New-3004	Symbol Group Editor						No							
SP7_New-3003	Heading	SP7_New-3003	Style Logic Editor						No							
SP7_New-3002	Heading	SP7_New-3002	Style Group Editor						No							
SP7_New-3001	Heading	SP7_New-3001	Shape Style Editor						No							
SP7_New-3000	Heading	SP7_New-3000	Decision Table Editor						No							
SP7_New-2998	Heading	SP7_New-2998	Symbol Editor						No							

SP7_New-2997	Heading	SP7_New-2997	Multi-Instances Editor						No							
SP7_New-2996	Heading	SP7_New-2996	Model and Graphics Editor						No							
SP7_New-2995	Heading	SP7_New-2995	Type Editor						No							
SP7_New-2994	Heading	SP7_New-2994	Job Management						No							
SP7_New-2993	Heading	SP7_New-2993	Main Screen						No							
SP7_New-2992	Heading	SP7_New-2992	National Language Support						No							
SP7_New-2991	Heading	SP7_New-2991	Online Help						No							
SP7_New-2990	Heading	SP7_New-2990	Search Function						No							
SP7_New-2989	Heading	SP7_New-2989	Generals						No							
SP7_New-2983	Heading	SP7_New-2983	Operator Training System						No							
SP7_New-2982	Heading	SP7_New-2982	Quality Assurance System (QAS)						No							
SP7_New-2981	Heading	SP7_New-2981	Multisite Environment Support						No							
SP7_New-2973	Heading	SP7_New-2973	Model Merge Framework						No							
SP7_New-2972	Heading	SP7_New-2972	General						No							
SP7_New-2966	Heading	SP7_New-2966	Independent Job Mode						No							
SP7_New-2965	Heading	SP7_New-2965	Generals						No							
SP7_New-2956	Heading	SP7_New-2956	IMM UI Technology						No							
SP7_New-2955	Heading	SP7_New-2955	IIMM Engineering Applications						No							
SP7_New-2954	Heading	SP7_New-2954	IMM Data Definition						No							
SP7_New-2953	Heading	SP7_New-2953	Functions						No							
SP7_New-2952	Heading	SP7_New-2952	Domain Object Model						No							
SP7_New-2951	Heading	SP7_New-2951	Engineering Process						No							
SP7_New-2950	Heading	SP7_New-2950	Model Merge Framework						No							
SP7_New-2949	Heading	SP7_New-2949	Purpose						No							
SP7_New-2948	Heading	SP7_New-2948	Non-Functional Topics						No							
SP7_New-2947	Heading	SP7_New-2947	System Characteristics						No							
SP7_New-2946	Heading	SP7_New-2946	External and Internal Interfaces						No							
SP7_New-2945	Heading	SP7_New-2945	Technology and Concepts						No							
SP7_New-2944	Heading	SP7_New-2944	IMM User Interface						No							
SP7_New-2943	Heading	SP7_New-2943	IMM Administration						No							
SP7_New-2942	Heading	SP7_New-2942	IMM Access Rights						No							
SP7_New-2941	Heading	SP7_New-2941	Spectrum Power Operating System						No							
SP7_New-2940	Heading	SP7_New-2940	IMM Logs						No							
SP7_New-2939	Heading	SP7_New-2939	Reporting						No							
SP7_New-2938	Heading	SP7_New-2938	Data Version Management						No							
SP7_New-2937	Heading	SP7_New-2937	Activation of Data Changes						No							
SP7_New-2936	Heading	SP7_New-2936	Validation of Data Changes						No							
SP7_New-2935	Heading	SP7_New-2935	Data Import and Data Export						No							
SP7_New-2934	Heading	SP7_New-2934	IMM Trigger Framework						No							
SP7_New-2933	Heading	SP7_New-2933	Graphic Data Maintenance						No							
SP7_New-2932	Heading	SP7_New-2932	Domain Data Maintenance						No							
SP7_New-2931	Heading	SP7_New-2931	Job Management						No							
SP7_New-2930	Heading	SP7_New-2930	Functional Overview						No							
SP7_New-2928	Heading	SP7_New-2928	User Interface						No							
SP7_New-2923	Heading	SP7_New-2923	GDIM – IMM Change Detection						No							
SP7_New-2922	Heading	SP7_New-2922	GIS Delta Import						No							
SP7_New-2921	Heading	SP7_New-2921	GIS Incremental Import						No							
SP7_New-2920	Heading	SP7_New-2920	GIS Initial Import						No							
SP7_New-2909	Heading	SP7_New-2909	DXF Support						No							
SP7_New-2908	Heading	SP7_New-2908	GIS Translation Engine						No							
SP7_New-2907	Heading	SP7_New-2907	GIS Data Sources						No							
SP7_New-2902	Heading	SP7_New-2902	GDIM User Interface and Workflow						No							
SP7_New-2901	Heading	SP7_New-2901	Workflow Overview of GDIM						No							
SP7_New-2900	Heading	SP7_New-2900	Functional Blocks of GDIM						No							
SP7_New-2899	Heading	SP7_New-2899	Non-Functional Topics						No							
SP7_New-2898	Heading	SP7_New-2898	Workflows						No							
SP7_New-2897	Heading	SP7_New-2897	GDIM – IMM Change Detection						No							
SP7_New-2896	Heading	SP7_New-2896	Configuration						No							
SP7_New-2895	Heading	SP7_New-2895	Data Transformation						No							
SP7_New-2894	Heading	SP7_New-2894	Change Management						No							
SP7_New-2893	Heading	SP7_New-2893	Data Validation						No							
SP7_New-2892	Heading	SP7_New-2892	Extracted Dataset						No							
SP7_New-2891	Heading	SP7_New-2891	GIS Data Extraction						No							
SP7_New-2890	Heading	SP7_New-2890	Functional Overview						No							
SP7_New-2881	Heading	SP7_New-2881	Information Model Management						No							
SP7_New-2880	Heading	SP7_New-2880	GIS Data Import Management						No							
SP7_New-2879	Heading	SP7_New-2879	Introduction						No							

SP7_New-1	Heading	SP7_New-2873	FS-DE-EN						No						
SP7_New-1	Heading	1	Introduction						No						
SP7_New-1	SOB	1-1	The Data Engineering (DE) comprises all tools related to the provision of engine...	The Data Engineering (DE) comprises all tools related to the provision of engineering and parameter data to the Spectrum Power system (during commissioning and subsequent modifications/extensions). The main modules of Data Engineering are the Spectrum Power GIS Data Import Management (GDIM)					No	20-04-11			Compliant - STD	1 - Low	STD
SP7_New-1	Heading	2	GIS Data Import Management						No						
SP7_New-1	Heading	2.1	Functional Overview						No						
SP7_New-1	SOB	2.1-1	GIS Data Import Management (GDIM) enables a Geographic Information System (GIS)...	GIS Data Import Management (GDIM) enables a Geographic Information System (GIS) to be a source—or the source master—for some data in a Spectrum Power™ 7 (SP7) system. GIS Data Import Management (GDIM) transforms and imports maps and engineering data created in a GIS environment into					No	20-04-12	Functional Overview		Compliant - STD	1 - Low	STD
SP7_New-1	Heading	2.1.1	Functional Blocks of GDIM						No						

SP7_New-1	SOB	2.1.1-1	Figure 2-# GDIM Functional Blocks Overview The major functional blocks of the GD...	(image: 1-img83a51b366f6fb0799da352393a2de949_1_en_US_TIFF.jpg) Figure 2-# GDIM Functional Blocks Overview The major functional blocks of the GDIM include * Data extraction The data extraction block interfaces with the GIS database, extracts the data, and uses the information to populate the extracted dataset. It					Yes	20-04-12	Functional Overview	Functional Blocks of GDIM	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	2.1.2	Workflow Overview of GDIM						No						
SP7_New-1	SOB	2.1.2-1	* GIS -> GDIM - The data extraction imports the data from GIS and writes it into...	* GIS -> GDIM - The data extraction imports the data from GIS and writes it into GDIM's extracted dataset. The GDIM extracted dataset is a standardized intermediate schema. * GDIM - During extraction and transformation process, validation rules (attribute and consistency checks) are executed					Yes	20-04-12	Functional Overview	Workflow Overview of GDIM	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	2.1.3	GDIM User Interface and Workflow						No						

SP7_New-1	SOB	2.1.3-1	The GDIM UI visualizes the current progress and shows log/error messages. On the...	The GDIM UI visualizes the current progress and shows log/error messages. On the GDIM UI, the data engineer selects the mode of operation (bulk, incremental mode or delta mode) and choose between stepwise or automatic import. Depending on the settings in the GDIM UI, the workflow					Yes	20-04-12	Functional Overview	GDIM User Interface and Workflow	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	2.2	GIS Data Extraction						No						
SP7_New-1	SOB	2.2-1	The focus of the data extraction and import is to extract the GIS data from the...	The focus of the data extraction and import is to extract the GIS data from the GIS source systems and use the retrieved data to create the relevant instances in the extracted dataset, which contains a GIS vendor independent representation of the GIS data as required by GDIM. (image: 1-img6a659					Yes	20-04-12	GIS Data Extraction		Compliant - STD	1 - Low	STD
SP7_New-1	Heading	2.2.1	GIS Data Sources						No						

SP7_New-1	SOB	2.2.1-1	A GIS can utilize multiple sources of data. Each of these sources may need to be...	A GIS can utilize multiple sources of data. Each of these sources may need to be considered by GDIM. To absorb the GIS-centric datatypes and formats, the various GDIM is designed to contain special processing and functionality specific to the relevant GIS and data model. The translation engine					Yes	20-04-12	GIS Data Extraction	GIS Data Sources	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	2.2.2	GIS Translation Engine						No						
SP7_New-1	SOB	2.2.2-1	The translation engine governs the extraction process. The translation engine is...	The translation engine governs the extraction process. The translation engine is a generic mapping engine which translates the data types (for objects, attributes, and values) of the GIS of concern to the data types of the extracted dataset. This generic mapping engine is driven by configurable					Yes	20-04-12	GIS Data Extraction	GIS Translation Engine	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	2.2.3	DXF Support						No						

SP7_New-1	SOB	2.2.3-1	GDIM supports the import of static graphics from a DXF file. The supported DXF f...	GDIM supports the import of static graphics from a DXF file. The supported DXF file format version is AC1024. DXF parser only supports some dxf entities such as LWPOLYLINE, LINE, TEXT, MTEXT, CIRCLE, ARC and there is a limitation on IMM/ODB side according the maximum pointcount of a					Yes	20-04-12	GIS Data Extraction	DXF Support	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	2.3	Extracted Dataset						No						
SP7_New-1	SOB	2.3-1	The extracted dataset, which is an Oracle database, serves as an intermediate re...	The extracted dataset, which is an Oracle database, serves as an intermediate repository of all data that has been extracted from the GIS source systems. If multiple source systems are applicable on a project, then the extracted dataset represents the combination of those sources. Multiple source					Yes	20-04-12	Extracted Dataset		Compliant - STD	1 - Low	STD
SP7_New-1	Heading	2.4	Data Validation						No						

SP7_New-1	SOB	2.4-1	GDIM validates the extracted and re-modeled data. Thus, two separate validations...	GDIM validates the extracted and re-modeled data. Thus, two separate validations are done in GDIM. Field validation performs object individual checks by inspecting the attributes of the data extracted from GIS. Attribute checks: * Null check * Range check * Enumeration check Thus, the quality of					Yes	20-04-12	Data Validation		Compliant - STD	1 - Low	STD
SP7_New-1	Heading	2.5	Change Management						No						
SP7_New-1	SOB	2.5-1	GIS provides bulk data or GIS data describing the increments. When GIS provides...	GIS provides bulk data or GIS data describing the increments. When GIS provides bulk data then this requires the GDIM application to detect the relevant changes, which is called self-contained incremental (also called incremental bulk) GIS import. GDIM has to perform change detection (which includes					Yes	20-04-12	Change Management		Compliant - STD	1 - Low	STD
SP7_New-1	Heading	2.6	Data Transformation						No						

SP7_New-1	SOB	2.6-1	The model transformation functional block processes the delta data of the curren...	The model transformation functional block processes the delta data of the current version stored in the extracted dataset and performs the necessary transformations, adjustments, and enhancements to the model. The model transformation then generates the corresponding domain					Yes	20-04-12	Data Transformation		Compliant - STD	1 - Low	STD
SP7_New-2	Heading	2.7	Configuration						No						
SP7_New-3	SOB	2.7-1	Two central concepts that pertain to the overall GDIM design are as follows: * C...	Two central concepts that pertain to the overall GDIM design are as follows: * Configuration-driven * Well-defined, extensible interfaces The GDIM is designed to allow for the core functionality to remain fixed over time. By making GDIM highly configurable, differences in					Yes	20-04-12	Configuration		Compliant - STD	1 - Low	STD
SP7_New-4	Heading	2.8	GDIM – IMM Change Detection						No						

SP7_New-1	SOB	2.8-1	The GDIM – IMM change detection checks the consistency between the GDIM and IMM...	The GDIM – IMM change detection checks the consistency between the GDIM and IMM data bases (Spectrum Power 7 engineering system). The last imported GIS dataset is compared with the export from IMM. The result of the compare is a list of equipment that is missing at either side. (image: 1-					Yes	20-04-12	GDIM – IMM Change Detection		Compliant - STD	1 - Low	STD
SP7_New-1	Heading	2.9	Quality Assurance Server						No						
SP7_New-1	SOB	2.9-1	For a controlled system environment, GDIM can run on a Quality Assurance Server...	For a controlled system environment, GDIM can run on a Quality Assurance Server (QAS). This alters the workflow, to provide the option to check the imported data on a non-production environment. For the use of this option, a QAS server must be available, and all data that is in the production system					Yes	20-04-12	Quality Assurance Server		Compliant - STD	1 - Low	STD
SP7_New-1	Heading	2.10	Database Location and Backup						No						

SP7_New-1	SOB	2.10-1	The GDIM Database and Versioning is in the DOR oracle database, under GDIMU, GDI...	The GDIM Database and Versioning is in the DOR oracle database, under GDIMU, GDIMU_X and GISU Schemas. Moving the database or producing a backup has to be done by a system administrator and is not automated. In case of a database failure, the version history is lost and has to be restored by a					Yes	20-04-12	Database Location and Backup		Compliant - STD	1 - Low	STD
SP7_New-1	Heading	2.11	Workflows						No						
SP7_New-1	Heading	2.11.1	GIS Initial Import						No						
SP7_New-1	SOB	2.11.1-1	The GDIM system, engineering IMM, and the operational Spectrum Power system is i...	The GDIM system, engineering IMM, and the operational Spectrum Power system is initialized with a bulk export from GIS. This is considered a one-time data migration exercise is done once before the GIS extract workflow is initiated. This process is started on the GDIM UI using the bulk mode. For the initial					Yes	20-04-12	Workflows	GIS Initial Import	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	2.11.2	GIS Incremental Import						No						

SP7_New-1	SOB	2.11.2-1	* Incremental import supports auto-detection import on the full network model. D...	* Incremental import supports auto-detection import on the full network model. Data is imported in GDIM in a new extracted dataset. During import, the change management functionality is used for comparing the imported data with the previous version of the data. * The identified changes are					Yes	20-04-12	Workflows	GIS Incremental Import	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	2.11.3	GIS Delta Import						No						
SP7_New-1	SOB	2.11.3-1	* In this case, GIS data describing the increments (deltas) are received. GDIM d...	* In this case, GIS data describing the increments (deltas) are received. GDIM does not do any change detection. * The identified changes are transformed within the model transformation and XDF files are written. * The GDIM UI is used for the import of XDF files to an IMM job as well as calling for the					Yes	20-04-12	Workflows	GIS Delta Import	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	2.11.4	GDIM – IMM Change Detection						No						

SP7_New-1	SOB	2.11.4-1	The GDIM IMM change detection checks the consistency between the IMM and GDIM da...	The GDIM IMM change detection checks the consistency between the IMM and GDIM data bases. The result of the compare is displayed in the GDIM UI.					Yes	20-04-12	Workflows	GDIM - IMM Change Detection	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	2.12	Non-Functional Topics						No						
SP7_New-1	Heading	2.12.1	User Interface						No						
SP7_New-1	SOB	2.12.1-1	GDIM provides a UI that drives and controls the Import process from the GIS and...	GDIM provides a UI that drives and controls the Import process from the GIS and visualizes of the current process status (which phase it is in). The UI can be opened on the ADM server. Through the UI the user can select the mode of operation, whether it is a bulk import or incremental import. Also, the selection of either					Yes	20-04-12	Non-Functional Topics	User Interface	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3	Information Model Management						No						
SP7_New-1	Heading	3.1	Functional Overview						No						
SP7_New-1	Heading	3.1.1	Purpose						No						
SP7_New-1	Heading	3.1.2	Model Merge Framework						No						

SP7_New-1	SOB	3.1.2-1	In power companies, several systems exist based on (to varying extents) common p...	In power companies, several systems exist based on (to varying extents) common power grid or network data of the utility. Thus, the complete model maintenance is split up in different model maintenance systems with defined data responsibilities for a specific data item. For specific parts of the data					Yes	20-04-13	Functional Overview	Model Merge Framework	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.1.3	Engineering Process						No						
SP7_New-1	SOB	3.1.3-1	The system engineering process basically consists of three phases: * System conf...	The system engineering process basically consists of three phases: * System configuration * Customization * Data entry All three activities are performed during commissioning. As the requirements of the utility evolve, these activities continue to occur when the system is in operation.					Yes	20-04-13	Functional Overview	Engineering Process	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.1.4	Domain Object Model						No						

SP7_New-1	SOB	3.1.4-1	The Spectrum Power DOM provides a logical, object-oriented data model describing ...	The Spectrum Power DOM provides a logical, object-oriented data model describing power system information, characteristics and behavior. The DOM is based on the CIM V12. **Common Information Model (CIM)** CIM is a set of standards for representing power system components. The IEC standard					Yes	20-04-13	Functional Overview	Domain Object Model	Compliant - STD	1 - Low	STD
SP7_New-2	Heading	3.1.5	Functions						No						
SP7_New-3	SOB	3.1.5-1	Spectrum Power IMM controls the data to be defined and transferred between the e...	Spectrum Power IMM controls the data to be defined and transferred between the engineering database and the Spectrum Power runtime databases. IMM provides functions that act like a set of tools to maintain power system information. The sub-functions of IMM are as follows:					Yes	20-04-13	Functional Overview	Functions	Compliant - STD	1 - Low	STD
SP7_New-4	Heading	3.1.6	IMM Data Definition						No						

SP7_New-1	SOB	3.1.6-1	The Spectrum Power IMM functions are a set of tools that allow power system info...	The Spectrum Power IMM functions are a set of tools that allow power system information data to be defined, accessed, and exchanged. These tools also control the transfer of data between the engineering database and the Spectrum Power runtime databases. The propagation of data					Yes	20-04-13	Functional Overview	IMM Data Definition	Compliant - STD	1 - Low	STD
SP7_New-2	Heading	3.1.7	IMM Engineering Applications						No						
SP7_New-3	SOB	3.1.7-1	IMM has a number of engineering applications suitable for the different engineer...	IMM has a number of engineering applications suitable for the different engineering tasks. (image: 1-img65d5925470b687369da352393f7fa3ae_1_en_US_TIFF.jpg) Figure 3-# General Application Structure of the IMM User Interface The amount of provided applications is dependent of the concrete					Yes	20-04-13	Functional Overview	IMM Engineering Applications	Compliant - STD	1 - Low	STD
SP7_New-4	Heading	3.1.8	IMM UI Technology						No						

SP7_New-1	SOB	3.1.8-1	A typical data engineering console consists of multiple monitors. During an IMM...	A typical data engineering console consists of multiple monitors. During an IMM engineering session, the console is connected to the IMM server running on Administrator Server (ADM). Multiple engineering consoles can be connected to the IMM server. The IMM UI client program					Yes	20-04-13	Functional Overview	IMM UI Technology	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.2	Job Management						No						
SP7_New-1	Heading	3.2.1	Generals						No						
SP7_New-1	SOB	3.2.1-1	Domain data, graphical network diagram data entry, and engineering activities ar...	Domain data, graphical network diagram data entry, and engineering activities are under the control of the IMM job management. Job management is the method by which changes of the Spectrum Power engineering database are grouped and managed. A job allows multiple and concurren					Yes	20-04-13	Job Management	Generals	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.2.2	Independent Job Mode						No						

SP7_New-1	SOB	3.2.2-1	In independent job mode, you can view or edit the model as it is at the current...	In independent job mode, you can view or edit the model as it is at the current time when you are in a job. You see the model as it currently is (the production model used in the Spectrum Power runtime system) plus your job changes. You do not see changes from other jobs unless the jobs are activated. The					Yes	20-04-13	Job Management	Independent Job Mode	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.3	Domain Data Maintenance						No						
SP7_New-1	SOB	3.3-1	Overview Engineering activities to change data require working with large amount...	**Overview** Engineering activities to change data require working with large amounts of information with multiple attributes and properties. IMM is the user interface for domain data maintenance within a job. Domain data editors provide means for the following: * Instance data modifications					Yes	20-04-13	Domain Data Maintenance		Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.4	Graphic Data Maintenance						No						

SP7_New-1	SOB	3.4-1	Overview Display construction of network diagrams is completely integrated in th...	**Overview** Display construction of network diagrams is completely integrated in the IMM. The Graphics Editor provides means to view, create and modify graphic diagrams and also symbology. The graphical editing creates the link between the instances of the graphic data to instances of the					Yes	20-04-13	Graphic Data Maintenance		Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.5	IMM Trigger Framework						No						
SP7_New-1	SOB	3.5-1	IMM Triggers execute a set of business logic required by downstream applications...	IMM Triggers execute a set of business logic required by downstream applications as it applies to the data. The IMM Trigger functionality provides a user-friendly data entry support. Trigger functions are able to perform actions not only based on an insert, update, and or delete of instances, but also based on					Yes	20-04-13	IMM Trigger Framework		Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.6	Data Import and Data Export						No						
SP7_New-1	Heading	3.6.1	General						No						

SP7_New-1	SOB	3.6.1-1	Import and Export of Engineering Data in XDF or CIM-RDF IMM provides an interfac...	**Import and Export of Engineering Data in XDF or CIM-RDF** IMM provides an interface to export and import engineering data in XDF and CIM-RDF. Both are XML formats based on W3C standard. The XML is a versatile language for the definition of tags to identify document contents. XML allows third-party					Yes	20-04-13	Data Import and Data Export	General	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.6.2	Model Merge Framework						No						
SP7_New-1	SOB	3.6.2-1	In power companies, several systems exist based on (to varying extents) common p...	In power companies, several systems exist based on (to varying extents) common power grid/network data of the utility. Generally, each system has a database and its own data model maintenance tools optimized to the specific scope of the data. Thus, the complete model maintenance is split up in different					Yes	20-04-13	Data Import and Data Export	Model Merge Framework	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.7	Validation of Data Changes						No						

SP7_New-1	SOB	3.7-1	Validation ensures that the entire data model remains consistent. In addition, i...	Validation ensures that the entire data model remains consistent. In addition, it ensures that all necessary data is entered (completeness check). Validation takes place in a maintenance environment, for example, a job, before the changes are activated into the Spectrum Power runtime system. Validation					Yes	20-04-13	Validation of Data Changes		Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.8	Activation of Data Changes						No						
SP7_New-1	SOB	3.8-1	All power grid domain data and diagram data changes are done in a job. Activatio...	All power grid domain data and diagram data changes are done in a job. Activation propagates data changes into the Spectrum Power runtime system. The activation ensures that the incremental changes are applied to all applications of the Spectrum Power runtime system, including IMM. In a single					Yes	20-04-13	Activation of Data Changes		Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.9	Data Version Management						No						

SP7_New-1	SOB	3.9-1	Data version management and automatic static data model archiving facilities pro...	Data version management and automatic static data model archiving facilities provide a history of model changes and allows the user to track data changes over time. Jobs in the IMM model archive provide a past view of the static data model based on the activation time. If archiving is enabled, data is stored in					Yes	20-04-13	Data Version Management		Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.10	Reporting						No						
SP7_New-1	SOB	3.10-1	Data Reporting Reporting features provided by IMM allow the user to create/view...	**Data Reporting** Reporting features provided by IMM allow the user to create/view summary or detail reports of type and instance data. **Instance Change Report** The instance change report displays changes within a selected network equipment hierarchy and within any hierarchy below substation like					Yes	20-04-13	Reporting		Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.11	IMM Logs						No						

SP7_New-1	SOB	3.11-1	IMM provides logs within the log section of the IMM user interface. The log sect...	IMM provides logs within the log section of the IMM user interface. The log section can be opened in a separate window. Selected logs can be exported to a Comma-separated Values (*.csv) file. The following are the various log types available, depending on the selected dataset, job or					Yes	20-04-13	IMM Logs		Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.12	Spectrum Power Operating System						No						
SP7_New-1	Heading	3.12.1	Multisite Environment Support						No						
SP7_New-1	SOB	3.12.1-1	The collection of control centers cooperatively managing a power system are know...	The collection of control centers cooperatively managing a power system are known as a multisite system. Multisite systems are usually organized in a main/backup or main/regional configuration. All Spectrum Power systems in a multisite network have the complete data model with formal					Yes	20-04-13	Spectrum Power Operating System	Multisite Environment Support	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.12.2	Quality Assurance System (QAS)						No						

SP7_New-1	SOB	3.12.2-1	A QAS allows testing data changes without any implication to the production syst...	A QAS allows testing data changes without any implication to the production system. The production system and QAS are independent from each other. The QAS takes the role of the Data Model Master. Modified and successfully tested IMM data is transferred from QAS to the productio					Yes	20-04-13	Spectrum Power Operating System	Quality Assurance System (QAS)	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.12.3	Operator Training Simulator						No						
SP7_New-1	SOB	3.12.3-1	An Operator Training Simulator (OTS) enables operators to practice runtime syste...	An Operator Training Simulator (OTS) enables operators to practice runtime system operations under simulated conditions. The main system and the offline OTS are independent from each other. (image: 1-img570ef35971345bbb9da3523925336202_1_en_US_TIFF.jpg) Figure 3-# OTS System					Yes	20-04-13	Spectrum Power Operating System	Operator Training Simulator	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.13	IMM Access Rights						No						

SP7_New-1	SOB	3.13-1	User authorization is performed during log on to Spectrum Power IMM. IMM access...	User authorization is performed during log on to Spectrum Power IMM. IMM access rights and instance level access rights are configured within the user administration dataset. By default, a user who is authorized to use Spectrum Power IMM is permitted to view the information available within					Yes	20-04-13	IMM Access Rights		Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.13.1	IMM Access Rights						No						
SP7_New-1	SOB	3.13.1-1	Data entry and activation in IMM is controlled by access rights. IMM provides gr...	Data entry and activation in IMM is controlled by access rights. IMM provides granular access rights dependent on the dataset and the requested action. The following individual access rights are supported: * Instance data engineering * Type data engineering * Data activation * Engineeri					Yes	20-04-13	IMM Access Rights	IMM Access Rights	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.13.2	Instance Level Access Rights						No						

SP7_New-1	SOB	3.13.2-1	Access rights can be assigned for each instance individuall y. They describe what...	Access rights can be assigned for each instance individuall y. They describe what a user is allowed to do with the respective instance in IMM (view, modify, modify and assign new access rights for this instance). Instance level access rights, define on what parts of the power network data					Yes	20-04-13	IMM Access Rights	Instance Level Access Rights	Compliant - STD	1 - Low	STD
SP7_New-2	Heading	3.13.3	IMM Console Access Rights						No						
SP7_New-3	SOB	3.13.3-1	Console access rights allow for location-based access control based on the IMM U...	Console access rights allow for location-based access control based on the IMM UI server (console) where the user currently is working. The authorities are always calculated as intersection (common subset) of access rights for console and user. Thus, granted IMM user access rights can be					Yes	20-04-13	IMM Access Rights	IMM Console Access Rights	Compliant - STD	1 - Low	STD
SP7_New-4	Heading	3.13.4	IMM Job Reservati on						No						
SP7_New-5	SOB	3.13.4-1	A single job is reserved for a particular user during its creation. The current...	A single job is reserved for a particular user during its creation. The current job owner and an authorize d user can reassign a job to a different user.					Yes	20-04-13	IMM Access Rights	IMM Job Reservati on	Compliant - STD	1 - Low	STD

SP7_New-1	Heading	3.14	IMM Administration						No						
SP7_New-1	SOB	3.14-1	IMM Admin Command Line Tool The IMM admin tool is used to manage the Spectrum Po...	**IMM Admin Command Line Tool** The IMM admin tool is used to manage the Spectrum Power IMM datasets. **Managing Datasets** The IMM admin tool provides authorized users the following functionality: * Creating a new dataset (planning dataset). * Clearing all instance data of a dataset.					Yes	20-04-13	IMM Administration		Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.15	IMM User Interface						No						
SP7_New-1	Heading	3.15.1	Generals						No						
SP7_New-1	SOB	3.15.1-1	The IMM UI can be installed on any UI console. IMM UI runs on Windows or Linux....	The IMM UI can be installed on any UI console. IMM UI runs on Windows or Linux. The client is updated as needed automatically upon login. Within the user interface of IMM, multiple editors that are optimized for the various data engineering workflows allow data access and definition covering all					Yes	20-04-13	IMM User Interface	Generals	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.15.2	Search Function						No						

SP7_New-1	SOB	3.15.2-1	The search function allows looking up instances by the instance name or parts of...	The search function allows looking up instances by the instance name or parts of the instance name. Entering the name of a parent instance narrows the search range down to the descendants of the selected instance. Placeholder characters can be used to extend the search range.					Yes	20-04-13	IMM User Interface	Search Function	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.15.3	Online Help						No						
SP7_New-1	SOB	3.15.3-1	The online documentation consists of released Spectrum Power IMM manuals that ha...	The online documentation consists of released Spectrum Power IMM manuals that have been converted into Portable Document Format (PDF) files. IMM has an integrated online help that provides an extensive guide to the Information Model Management based on the Spectrum Power IMM					Yes	20-04-13	IMM User Interface	Online Help	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.15.4	National Language Support						No						

SP7_New-1	SOB	3.15.4-1	National Language Support (NLS) is provided. It is used to customize Spectrum Po...	National Language Support (NLS) is provided. It is used to customize Spectrum Power IMM with the desired language during configuration time. The character strings are translated using a standard translation software package and the transfer to the system is a system feature.					Yes	20-04-13	IMM User Interface	National Language Support	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.15.5	Main Screen						No						
SP7_New-1	SOB	3.15.5-1	Once the IMM application starts, it opens the main screen. The main screen repre...	Once the IMM application starts, it opens the main screen. The main screen represents an application framework for the IMM engineering applications. (image: 1-img2fd41e2e69dd902d9da3522a1bd1be21_2_en_US_PNG.png) Figure 3-# IMM Main Screen The main screen is structured into different					Yes	20-04-13	IMM User Interface	Main Screen	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.15.6	Job Management						No						

SP7_New-1	SOB	3.15.6-1	The Job management UI is used for the following: * Create and open a job * Valid...	The Job management UI is used for the following: * Create and open a job * Validate and activate a job * Administrate jobs (image: 1-img74e8438a69fcea909da3522a65bc98bb_2_en_US_PNG.png) Figure 3-# Job Management The Job management UI shows the following information about each job that is not					Yes	20-04-13	IMM User Interface	Job Management	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.15.7	Type Editor						No						
SP7_New-1	SOB	3.15.7-1	The Type Editor is used for the following: * Create new types * View and edit ex...	The Type Editor is used for the following: * Create new types * View and edit existing types (image: 1-img0dedb980e74f19279da3522a3791b295_1_en_US_PNG.png) Figure 3-# Type Editor There is a read-only mode available called Type Inspector. The type inspector is used to view the existing types. (image: 2-					Yes	20-04-13	IMM User Interface	Type Editor	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.15.8	Model and Graphics Editor						No						

SP7_New-1	SOB	3.15.8-1	The Model and Graphics Editor is used to: * View and modify instance properties ...	The Model and Graphics Editor is used to: * View and modify instance properties including links * Create a new instance * View, create, or modify network displays (image: 1-imgb53fe8e774f5ab749da3522a362d834f_2_en_US_PNG.png) Figure 3-# Model and Graphics Editor The screen is structured					Yes	20-04-13	IMM User Interface	Model and Graphics Editor	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.15.9	Multi-Instances Editor						No						
SP7_New-1	SOB	3.15.9-1	The Multi-Instance Editor (MIE) allows for user-defined query filters on a combi...	The Multi-Instance Editor (MIE) allows for user-defined query filters on a combination of data instances, attributes and associations. The retrieved objects and attributes can then be edited similarly to what is possible in the IMM UI. Queries can be defined, saved and loaded for reuse. (image: 1-					Yes	20-04-13	IMM User Interface	Multi-Instances Editor	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.15.10	Symbol Editor						No						

SP7_New-1	SOB	3.15.10-1	The Symbol Editor is used to edit symbols used on diagrams. Figure 3-# Symbol Ed...	The Symbol Editor is used to edit symbols used on diagrams. (image: 1-imgc66eccadd3f4a65b9da3522a390d7737_1_en_US_PNG.png) Figure 3-# Symbol Editor Symbols are combinations of graphic primitives. Symbols play an important role for graphical representation of a domain data instance such as a					Yes	20-04-13	IMM User Interface	Symbol Editor	Compliant - STD	1 - Low	STD
SP7_New-2	Heading	3.15.11	Color Editor						No						
SP7_New-3	SOB	3.15.11-1	The Color Editor is used to view, modify, and define color values for color inst...	The Color Editor is used to view, modify, and define color values for color instances. (image: 1-img38502002e24bb8b29da3522a0562ed85_1_en_US_PNG.png) Figure 3-# Color Editor					Yes	20-04-13	IMM User Interface	Color Editor	Compliant - STD	1 - Low	STD
SP7_New-4	Heading	3.15.12	Decision Table Editor						No						

SP7_New-1	SOB	3.15.12-1	The Decision Table editor is used to maintain diagram decision tables for evalua...	The Decision Table editor is used to maintain diagram decision tables for evaluating the presentation of dynamic display objects in the runtime environment based on their status, quality and other information. (image: 1-imgf7d7ced8e26b33ac9da3522a5c1df815_1_en_US_PNG.png) Figure 3-# Decision					Yes	20-04-13	IMM User Interface	Decision Table Editor	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.15.13	Shape Style Editor						No						
SP7_New-1	SOB	3.15.13-1	The Shape Style Editor is used to create reusable shape styles which represent a...	The Shape Style Editor is used to create reusable shape styles which represent a particular graphic property combination that can be assigned to graphic objects instead of assigning multiple properties one after the other. (image: 1-img9eb68944e2e11f3c9da3522a3378903a_1_en_US_PNG.png) Figure 3-#					Yes	20-04-13	IMM User Interface	Shape Style Editor	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.15.14	Style Group Editor						No						

SP7_New-1	SOB	3.15.14-1	Style groups are used to apply dynamic styles to display objects. The Style Grou...	Style groups are used to apply dynamic styles to display objects. The Style Group Editor is used to maintain unique styles matching the rules configured in the diagram decision tables by the Decision Table Editor. (image: 1-img7d8fa466e2f2fd779da3522a3052b381_1_en_US_PNG.png) Figure 3-# Style					Yes	20-04-13	IMM User Interface	Style Group Editor	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.15.15	Style Logic Editor						No						
SP7_New-1	SOB	3.15.15-1	The Style Logic Editor is used to maintain style logics for evaluating the style...	The Style Logic Editor is used to maintain style logics for evaluating the style of the presentation of dynamic display objects in the runtime environment based on the combination of a decision table and a style group. (image: 1-imgde5fe4d7e312a5f99da3522a14a6d540_1_en_US_PNG.png) Figure 3-# Style					Yes	20-04-13	IMM User Interface	Style Logic Editor	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.15.16	Symbol Group Editor						No						

SP7_New-1	SOB	3.15.16-1	Symbol groups are used to apply dynamic symbols to display objects. The Symbol G...	Symbol groups are used to apply dynamic symbols to display objects. The Symbol Group Editor is used to maintain unique symbols matching the rules configured in the diagram decision tables by the Decision Table Editor. (image: 1-imgb32b099be331e4989da3522a073c16be_1_en_US_PNG.png) Figure 3-#					Yes	20-04-13	IMM User Interface	Symbol Group Editor	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.15.17	Symbol Logic Editor						No						
SP7_New-1	SOB	3.15.17-1	The Symbol Logic Editor is used to maintain symbol logics for evaluating the sym...	The Symbol Logic Editor is used to maintain symbol logics for evaluating the symbol of the presentation of dynamic display objects in the runtime environment based on the combination of a decision table and a symbol group. (image: 1-img7a9e6f4de36b70d99da3522a6cd16f51_1_en_US_PNG.png)					Yes	20-04-13	IMM User Interface	Symbol Logic Editor	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.15.18	Text Style Editor						No						

SP7_New-1	SOB	3.15.18-1	The Text Style Editor is used to create reusable text styles which represent a p...	The Text Style Editor is used to create reusable text styles which represent a particular graphic property combination that can be assigned to graphic text objects. (image: 1-img4c4b3db7e72b1a4b9da3522a5904cc96_1_en_US_PNG.png) Figure 3-# Text Style Editor					Yes	20-04-13	IMM User Interface	Text Style Editor	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.15.19	Analog Representation Editor						No						
SP7_New-1	SOB	3.15.19-1	The Analog Representation Editor is used to view the defined analog representati...	The Analog Representation Editor is used to view the defined analog representation styles. (image: 1-img604fd502e73d3cc19da3522a3d9b8128_1_en_US_PNG.png) Figure 3-# Analog Representation Editor					Yes	20-04-13	IMM User Interface	Analog Representation Editor	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.15.20	Auto Save						No						

SP7_New-1	SOB	3.15.20-1	IMM UI has a functionality that automatically saves the unsaved changes locally...	IMM UI has a functionality that automatically saves the unsaved changes locally into an export file, which can be recovered in case of a disconnect or a system failure happened in the IMM UI context. This is to prevent or limit the loss of work when an unexpected situation happens. The exports					Yes	20-04-13	IMM User Interface	Auto Save	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.15.21	Alarm Response Text Configuration						No						
SP7_New-1	SOB	3.15.21-1	The IMM UI has also a functionality that allows the operator to configure alarm...	The IMM UI has also a functionality that allows the operator to configure alarm response text options, for a selected alarm message, using an Alarm-Response Diagram. This diagram is a single-line diagram, created by the data engineer, that contains the instructions on how to react to the alarm.					Yes	20-04-13	IMM User Interface	Alarm Response Text Configuration	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.16	Technology and Concepts						No						
SP7_New-1	Heading	3.16.1	Object-Oriented Data Modeling Approach						No						

SP7_New-1	SOB	3.16.1-1	The CIM is defined in Unified Modeling Language (UML). UML uses an object-orient...	The CIM is defined in Unified Modeling Language (UML). UML uses an object-oriented approach that describes a model as a collection of classes, class attributes, and associations. Within a system, a class represents a specific type of object being modeled. Each class can have its own internal					Yes	20-04-13	Technology and Concepts	Object-Oriented Data Modeling Approach	Compliant - STD	1 - Low	STD
SP7_New-2	Heading	3.16.2	IMM Types						No						
SP7_New-3	SOB	3.16.2-1	Introduction A type is a logical structure of the DOM that defines the data orga...	**Introduction** A type is a logical structure of the DOM that defines the data organization and representation of a certain resource (for example, a circuit-breaker). Each type can have its own internal attributes and relationships with other types. The full set of types constitutes the DOM. The types supplied					Yes	20-04-13	Technology and Concepts	IMM Types	Compliant - STD	1 - Low	STD
SP7_New-4	Heading	3.16.3	Instance Data						No						

SP7_New-1	SOB	3.16.3-1	Real-world objects of a power system are represented in IMM as instances of data...	Real-world objects of a power system are represented in IMM as instances of data types. For example, Breaker is a type that describes all characteristics and behavior of circuit breakers. The circuit-breaker CB A1 contained within the bay Bay A1 is a real-world object - an instance of the					Yes	20-04-13	Technology and Concepts	Instance Data	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.16.4	Domain Data Topology						No						
SP7_New-1	SOB	3.16.4-1	When defining how components within a power system network join together, rather...	When defining how components within a power system network join together, rather than define direct connection between components, DOM uses Terminals and Connectivity Nodes. For example, a very simple electrical circuit containing a Breaker, a Load and a Line exists as					Yes	20-04-13	Technology and Concepts	Domain Data Topology	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.16.5	Dataset						No						

SP7_New-1	SOB	3.16.5-1	A dataset is a set of data that belongs logically together. All datasets togethe...	A dataset is a set of data that belongs logically together. All datasets together are building the IMM database called DOR. Default settings, the following datasets are installed: * Real-Time dataset (RT) Contains the engineering data (including network diagrams) used in the Spectrum Power					Yes	20-04-13	Technology and Concepts	Dataset	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.17	External and Internal Interfaces						No						
SP7_New-1	Heading	3.17.1	Data Exchange using XML Files						No						
SP7_New-1	SOB	3.17.1-1	XML is a W3C standards-based text format for interchange of data. The data is en...	XML is a W3C standards-based text format for interchange of data. The data is encoded as plain text, thus allowing it to be both human and machine-readable. An XML file is also called an XML document. **Instance Data Import and Export** IMM provides interfaces for instance data exchange					Yes	20-04-13	External and Internal Interfaces	Data Exchange using XML Files	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.17.2	Data Export using CSV Files						No						

SP7_New-1	SOB	3.17.2-1	A CSV is a comma separated values file, which allows data to be stored in a tabl...	A CSV is a comma separated values file, which allows data to be stored in a table structured, plain text format. Each line of the file is a data record. Each record consists of one or more fields, separated by commas. The use of the comma as a field separator is the source of the name for this file format. The CSV file format					Yes	20-04-13	External and Internal Interfaces	Data Export using CSV Files	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.17.3	File Formats for Graphic Data Exchange						No						
SP7_New-1	SOB	3.17.3-1	Graphical diagram data and the templates used by the Spectrum Power Graphics Edi...	Graphical diagram data and the templates used by the Spectrum Power Graphics Editor can be imported and exported in XDF and RDF format. These formats allow keeping the links to associated domain data instances, thus it's more than just importing static graphical data. **Symbols in Global**					Yes	20-04-13	External and Internal Interfaces	File Formats for Graphic Data Exchange	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.17.4	ASR Mapfiles						No						

SP7_New-1	SOB	3.17.4-1	ASR mapfiles are mapping instructions that specify how the instance data in IMM...	ASR mapfiles are mapping instructions that specify how the instance data in IMM is transformed into the structures used by Spectrum Power runtime applications. This mapping is used for incremental and full population of both RDBMS based and SMMF based ASRs. The format of the ASR					Yes	20-04-13	External and Internal Interfaces	ASR Mapfiles	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.17.5	Command Line Interface						No						
SP7_New-1	SOB	3.17.5-1	The command-line interfaces allow to interact with IMM by typing in commands in...	The command-line interfaces allow to interact with IMM by typing in commands in a command line tool on the console. The command line tool can be called from a shell or from scripts. The IMM command line tools are supplied together with IMM. **IMM Export** The IMM Export utility allows to					Yes	20-04-13	External and Internal Interfaces	Command Line Interface	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.18	System Characteristics						No						
SP7_New-1	Heading	3.18.1	Auditing						No						

SP7_New-1	SOB	3.18.1-1	IMM job auditing keeps track of the last user and the last time graphical or dom...	IMM job auditing keeps track of the last user and the last time graphical or domain instance data changes were made in a job. The previous value and the value changed by a job are reported. For a given instance of data within a specified time frame, the lifecycle of modifications can be					Yes	20-04-13	System Characteristics	Auditing	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.18.2	Authorization and Security						No						
SP7_New-1	SOB	3.18.2-1	The IMM security service is part of the overall Spectrum Power security strategy...	The IMM security service is part of the overall Spectrum Power security strategy to protect the system against unauthorized use. A multilevel security concept ensures the secure operation of Spectrum Power IMM. The IMM security concept mainly relies on the following: * User authorization by					Yes	20-04-13	System Characteristics	Authorization and Security	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.18.3	Scalability						No						

SP7_New-1	SOB	3.18.3-1	The flexible architecture of IMM provides scalability regarding: * Number of dat...	The flexible architecture of IMM provides scalability regarding: * Number of datasets * Data volume per dataset * Number of users working in parallel **Datasets** Data required for the operation of a Spectrum Power system is split into four logical, independent datasets: * Real-time dataset (RT)					Yes	20-04-13	System Characteristics	Scalability	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.18.4	Backup and Restore						No						
SP7_New-1	SOB	3.18.4-1	The Spectrum Power backup concept provides a mutual interlock of backup and acti...	The Spectrum Power backup concept provides a mutual interlock of backup and activation by: * Assuring that a user cannot start the activation of a job while a backup process is in progress * Preventing a backup while an activation is running					Yes	20-04-13	System Characteristics	Backup and Restore	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.18.5	Hardware Deployment						No						

SP7_New-1	SOB	3.18.5-1	To meet customer requirements regarding system sizing, availability and performa...	To meet customer requirements regarding system sizing, availability and performance, different standard hardware configurations are defined. **IMM Deployment within Spectrum Power 7** The deployment scenario supported by IMM within a Spectrum Power 7 system is as follows: (image: 1-					Yes	20-04-13	System Characteristics	Hardware Deployment	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.19	Non-Functional Topics						No						
SP7_New-1	Heading	3.19.1	User Interface						No						
SP7_New-1	SOB	3.19.1-1	Figure 3-# IMM User Interface Showing the Domain Model Tree and Instance Attribu...	(image: 1-img05a9816d37b06a2f9da3529676341 16a_3_en_US_PNG.png) Figure 3-# IMM User Interface Showing the Domain Model Tree and Instance Attributes The attributes and attribute values of the selected instance in the instance hierarchy are displayed in the working area. Tooltip help shows a					Yes	20-04-13	Non-Functional Topics	User Interface	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.19.2	Performance Parameters						No						

SP7_New-1	SOB	3.19.2-1	Table # Performance Test Results for Data Engineering on a distributed Control C...	Table # Performance Test Results for Data Engineering on a distributed Control Center System Description | Normal Load | High Activity | Peak Load | Unit Typical response time in the scope of dialog actions (data available and loaded locally). | < 1.0 | < 1.5 | n/a | sec Tree: Open tree with 640 substation					Yes	20-04-13	Non-Functional Topics	Performance Paramenters	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.19.3	Sizing						No						
SP7_New-1	SOB	3.19.3-1	System Sizing Data Model Related System Operation and Environment Maximum number...	| System Sizing | Data Model Related System Operation and Environment Maximum number of supported Emergency Backup Systems for Main Control Center | 1 (maximum) | Maximum number of IMM UIs per ADM | 6 | Information Model Management Application | Maximum file size for data model exchange					Yes	20-04-13	Non-Functional Topics	Sizing	Compliant - STD	1 - Low	STD
SP7_New-1	Heading	3.19.4	Referenced IEC Standards						No						

SP7_New-1	SOB	3.19.4-1	IEC 61970-301: Energy management system application program interface (EMS-API)...	IEC 61970-301: | Energy management system application program interface (EMS-API) – Common information model (CIM) base IEC 61968-11: | System interfaces for distribution management – Common information model (CIM) extension for distribution IEC 62325-301: |					Yes	20-04-13	Non-Functional Topics	Referenced IEC Standards	Compliant - STD	1 - Low	STD
SP7_New-1	SOB	SP7_New-40282	IEC 61970-301: Energy management system application program interface (EMS-API)...	IEC 61970-301: | Energy management system application program interface (EMS-API) – Common information model (CIM) base IEC 61968-11: | System interfaces for distribution management – Common information model (CIM) extension for distribution IEC 62325-301: |					No				Compliant - STD	1 - Low	STD

SP7_New-4	SOB	SP7_New-40281	System Sizing Data Model Related System Operation and Environment Maximum number...	| System Sizing | Data Model Related System Operation and Environment Maximum number of supported Emergency Backup Systems for Main Control Center | 1 (maximum) | Maximum number of IMM UIs per ADM | 6 | Information Model Management Application | Maximum file size for data model exchange					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40280	Table # Performance Test Results for Data Engineering on a distributed Control C...	Table # Performance Test Results for Data Engineering on a distributed Control Center System Description | Normal Load | High Activity | Peak Load | Unit Typical response time in the scope of dialog actions (data available and loaded locally). | < 1.0 | < 1.5 | n/a | sec Tree: Open tree with 640 substation					No				Compliant - STD	1 - Low	STD

SP7_New-1	SOB	SP7_New-40279	Figure # IMM User Interface Showing the Domain Model Tree and Instance Attribute...	(image: 1-img05a9816d37b06a2f9da3529676341116a_3_en_US_PNG.png) Figure # IMM User Interface Showing the Domain Model Tree and Instance Attributes The attributes and attribute values of the selected instance in the instance hierarchy are displayed in the working area. Tooltip help shows a					No				Compliant - STD	1 - Low	STD
SP7_New-1	SOB	SP7_New-40274	To meet customer requirements regarding system sizing, availability and performa...	To meet customer requirements regarding system sizing, availability and performance, different standard hardware configurations are defined. **IMM Deployment within Spectrum Power 7** The deployment scenario supported by IMM within a Spectrum Power 7 system is as follows: (image: 1-					No				Compliant - STD	1 - Low	STD

SP7_New-4	SOB	SP7_New-40273	The Spectrum Power backup concept provides a mutual interlock of backup and acti...	The Spectrum Power backup concept provides a mutual interlock of backup and activation by: * Assuring that a user cannot start the activation of a job while a backup process is in progress * Preventing a backup while an activation is running					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40272	The flexible architecture of IMM provides scalability regarding: * Number of dat...	The flexible architecture of IMM provides scalability regarding: * Number of datasets * Data volume per dataset * Number of users working in parallel **Datasets** Data required for the operation of a Spectrum Power system is split into four logical, independent datasets: * Real-time dataset (RT)					No				Compliant - STD	1 - Low	STD

SP7_New-4	SOB	SP7_New-40271	The IMM security service is part of the overall Spectrum Power security strategy...	The IMM security service is part of the overall Spectrum Power security strategy to protect the system against unauthorized use. A multilevel security concept ensures the secure operation of Spectrum Power IMM. The IMM security concept mainly relies on the following: * User authorization by					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40270	IMM job auditing keeps track of the last user and the last time graphical or dom...	IMM job auditing keeps track of the last user and the last time graphical or domain instance data changes were made in a job. The previous value and the value changed by a job are reported. For a given instance of data within a specified time frame, the lifecycle of modifications can be					No				Compliant - STD	1 - Low	STD

SP7_New-1	SOB	SP7_New-40264	The command-line interfaces allow to interact with IMM by typing in commands in...	The command-line interfaces allow to interact with IMM by typing in commands in a command line tool on the console. The command line tool can be called from a shell or from scripts. The IMM command line tools are supplied together with IMM. **IMM Export** The IMM Export utility allows to					No				Compliant - STD	1 - Low	STD
SP7_New-1	SOB	SP7_New-40263	ASR mapfiles are mapping instructions that specify how the instance data in IMM...	ASR mapfiles are mapping instructions that specify how the instance data in IMM is transformed into the structures used by Spectrum Power runtime applications. This mapping is used for incremental and full population of both RDBMS based and SMMF based ASRs. The format of the ASR					No				Compliant - STD	1 - Low	STD

SP7_New-4	SOB	SP7_New-40262	Graphical diagram data and the templates used by the Spectrum Power Graphics Edi...	Graphical diagram data and the templates used by the Spectrum Power Graphics Editor can be imported and exported in XDF and RDF format. These formats allow keeping the links to associated domain data instances, thus it's more than just importing static graphical data. **Symbols in Global**					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40261	A CSV is a comma separated values file, which allows data to be stored in a tabl...	A CSV is a comma separated values file, which allows data to be stored in a table structured, plain text format. Each line of the file is a data record. Each record consists of one or more fields, separated by commas. The use of the comma as a field separator is the source of the name for this file format. The CSV file format					No				Compliant - STD	1 - Low	STD

SP7_New-4	SOB	SP7_New-40260	XML is a W3C standards-based text format for interchange of data. The data is en...	XML is a W3C standards-based text format for interchange of data. The data is encoded as plain text, thus allowing it to be both human and machine-readable. An XML file is also called an XML document. **Instance Data Import and Export** IMM provides interfaces for instance data exchange					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40254	A dataset is a set of data that belongs logically together. All datasets togethe...	A dataset is a set of data that belongs logically together. All datasets together are building the IMM database called DOR. Default settings, the following datasets are installed: * Real-Time dataset (RT) Contains the engineering data (including network diagrams) used in the Spectrum Power					No				Compliant - STD	1 - Low	STD

SP7_New-4	SOB	SP7_New-40253	When defining how components within a power system network join together, rather...	When defining how components within a power system network join together, rather than define direct connection between components, DOM uses Terminals and Connectivity Nodes. For example, a very simple electrical circuit containing a Breaker, a Load and a Line exists as					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40252	Real-world objects of a power system are represented in IMM as instances of data...	Real-world objects of a power system are represented in IMM as instances of data types. For example, Breaker is a type that describes all characteristics and behavior of circuit breakers. The circuit-breaker CB A1 contained within the bay Bay A1 is a real-world object - an instance of the					No				Compliant - STD	1 - Low	STD

SP7_New-4	SOB	SP7_New-40251	Introduction A type is a logical structure of the DOM that defines the data orga...	**Introduction** A type is a logical structure of the DOM that defines the data organization and representation of a certain resource (for example, a circuit-breaker). Each type can have its own internal attributes and relationships with other types. The full set of types constitutes the DOM. The types supplied					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40250	The CIM is defined in Unified Modeling Language (UML). UML uses an object-orient...	The CIM is defined in Unified Modeling Language (UML). UML uses an object-oriented approach that describes a model as a collection of classes, class attributes, and associations. Within a system, a class represents a specific type of object being modeled. Each class can have its own internal					No				Compliant - STD	1 - Low	STD

SP7_New-4	SOB	SP7_New-40244	The IMM UI has also a functionality that allows the operator to configure alarm...	The IMM UI has also a functionality that allows the operator to configure alarm response text options, for a selected alarm message, using an Alarm-Response Diagram. This diagram is a single-line diagram, created by the data engineer, that contains the instructions on how to react to the alarm.					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40243	IMM UI has a functionality that automatically saves the unsaved changes locally...	IMM UI has a functionality that automatically saves the unsaved changes locally into an export file, which can be recovered in case of a disconnect or a system failure happened in the IMM UI context. This is to prevent or limit the loss of work when an unexpected situation happens. The exports					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40242	The Analog Representation Editor is used to view the defined analog representati...	The Analog Representation Editor is used to view the defined analog representation styles. (image: 1-img604fd502e73d3cc19da3522a3d9b8128_1_en_US_PNG.png) Figure # Analog Representation Editor					No				Compliant - STD	1 - Low	STD

SP7_New-4	SOB	SP7_New-40241	The Text Style Editor is used to create reusable text styles which represent a p...	The Text Style Editor is used to create reusable text styles which represent a particular graphic property combination that can be assigned to graphic text objects. (image: 1-img4c4b3db7e72b1a4b9da3522a5904cc96_1_en_US_PNG.png) Figure # Text Style Editor					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40240	The Symbol Logic Editor is used to maintain symbol logics for evaluating the sym...	The Symbol Logic Editor is used to maintain symbol logics for evaluating the symbol of the presentation of dynamic display objects in the runtime environment based on the combination of a decision table and a symbol group. (image: 1-img7a9e6f4de36b70d99da3522a6cd16f51_1_en_US_PNG.png)					No				Compliant - STD	1 - Low	STD

SP7_New-4	SOB	SP7_New-40239	Symbol groups are used to apply dynamic symbols to display objects. The Symbol G...	Symbol groups are used to apply dynamic symbols to display objects. The Symbol Group Editor is used to maintain unique symbols matching the rules configured in the diagram decision tables by the Decision Table Editor. (image: 1-imgb32b099be331e4989da3522a073c16be_1_en_US_PNG.png) Figure #					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40238	The Style Logic Editor is used to maintain style logics for evaluating the style...	The Style Logic Editor is used to maintain style logics for evaluating the style of the presentation of dynamic display objects in the runtime environment based on the combination of a decision table and a style group. (image: 1-imgde5fe4d7e312a5f99da3522a14a6d540_1_en_US_PNG.png) Figure # Style					No				Compliant - STD	1 - Low	STD

SP7_New-4	SOB	SP7_New-40237	Style groups are used to apply dynamic styles to display objects. The Style Grou...	Style groups are used to apply dynamic styles to display objects. The Style Group Editor is used to maintain unique styles matching the rules configured in the diagram decision tables by the Decision Table Editor. (image: 1-img7d8fa466e2f2fd779da3522a3052b381_1_en_US_PNG.png) Figure # Style					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40236	The Shape Style Editor is used to create reusable shape styles which represent a...	The Shape Style Editor is used to create reusable shape styles which represent a particular graphic property combination that can be assigned to graphic objects instead of assigning multiple properties one after the other. (image: 1-img9eb68944e2e11f3c9da3522a3378903a_1_en_US_PNG.png) Figure #					No				Compliant - STD	1 - Low	STD

SP7_New-1	SOB	SP7_New-40235	The Decision Table editor is used to maintain diagram decision tables for evalua...	The Decision Table editor is used to maintain diagram decision tables for evaluating the presentation of dynamic display objects in the runtime environment based on their status, quality and other information. (image: 1-imgf7d7ced8e26b33ac9da3522a5c1df815_1_en_US_PNG.png) Figure # Decision					No				Compliant - STD	1 - Low	STD
SP7_New-1	SOB	SP7_New-40234	The Color Editor is used to view, modify, and define color values for color inst...	The Color Editor is used to view, modify, and define color values for color instances. (image: 1-img38502002e24bb8b29da3522a0562ed85_1_en_US_PNG.png) Figure # Color Editor					No				Compliant - STD	1 - Low	STD
SP7_New-1	SOB	SP7_New-40233	The Symbol Editor is used to edit symbols used on diagrams. Figure # Symbol Edit...	The Symbol Editor is used to edit symbols used on diagrams. (image: 1-imgc66ecadd3f4a65b9da3522a390d7737_1_en_US_PNG.png) Figure # Symbol Editor Symbols are combinations of graphic primitives. Symbols play an important role for graphical representation of a domain data instance such as a					No				Compliant - STD	1 - Low	STD

SP7_New-1	SOB	SP7_New-40232	The Multi-Instance Editor (MIE) allows for user-defined query filters on a combi...	The Multi-Instance Editor (MIE) allows for user-defined query filters on a combination of data instances, attributes and associations. The retrieved objects and attributes can then be edited similarly to what is possible in the IMM UI. Queries can be defined, saved and loaded for reuse. (image: 1-					No				Compliant - STD	1 - Low	STD
SP7_New-1	SOB	SP7_New-40231	The Model and Graphics Editor is used to: * View and modify instance properties ...	The Model and Graphics Editor is used to: * View and modify instance properties including links * Create a new instance * View, create, or modify network displays (image: 1-imgb53fe8e774f5ab749da3522a362d834f_2_en_US_PNG.png) Figure # Model and Graphics Editor The screen is structured					No				Compliant - STD	1 - Low	STD

SP7_New-1	SOB	SP7_New-40230	The Type Editor is used for the following: * Create new types * View and edit ex...	The Type Editor is used for the following: * Create new types * View and edit existing types (image: 1-img0dedb980e74f19279da3522a3791b295_1_en_US_PNG.png) Figure # Type Editor There is a read-only mode available called Type Inspector. The type inspector is used to view the existing types.					No				Compliant - STD	1 - Low	STD
SP7_New-1	SOB	SP7_New-40229	The Job management UI is used for the following: * Create and open a job * Valid...	The Job management UI is used for the following: * Create and open a job * Validate and activate a job * Administrate jobs (image: 1-img74e8438a69fcea909da3522a65bc98bb_2_en_US_PNG.png) Figure # Job Management The Job management UI shows the following information about each job that is not					No				Compliant - STD	1 - Low	STD

SP7_New-4	SOB	SP7_New-40228	Once the IMM application starts, it opens the main screen. The main screen repre...	Once the IMM application starts, it opens the main screen. The main screen represents an application framework for the IMM engineering applications. (image: 1-img2fd41e2e69dd902d9da3522a1bd1be21_2_en_US_PNG.png) Figure # IMM Main Screen The main screen is structured into different					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40227	National Language Support (NLS) is provided. It is used to customize Spectrum Po...	National Language Support (NLS) is provided. It is used to customize Spectrum Power IMM with the desired language during configuration time. The character strings are translated using a standard translation software package and the transfer to the system is a system feature.					No				Compliant - STD	1 - Low	STD

SP7_New-4	SOB	SP7_New-40226	The online documentation consists of released Spectrum Power IMM manuals that ha...	The online documentation consists of released Spectrum Power IMM manuals that have been converted into Portable Document Format (PDF) files. IMM has an integrated online help that provides an extensive guide to the Information Model Management based on the Spectrum Power IMM					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40225	The search function allows looking up instances by the instance name or parts of...	The search function allows looking up instances by the instance name or parts of the instance name. Entering the name of a parent instance narrows the search range down to the descendants of the selected instance. Placeholder characters can be used to extend the search range.					No				Compliant - STD	1 - Low	STD

SP7_New-1	SOB	SP7_New-40224	The IMM UI can be installed on any UI console. IMM UI runs on Windows or Linux....	The IMM UI can be installed on any UI console. IMM UI runs on Windows or Linux. The client is updated as needed automatically upon login. Within the user interface of IMM, multiple editors that are optimized for the various data engineering workflows allow data access and definition covering all...					No				Compliant - STD	1 - Low	STD
SP7_New-1	SOB	SP7_New-40202	IMM Admin Command Line Tool The IMM admin tool is used to manage the Spectrum Po...	**IMM Admin Command Line Tool** The IMM admin tool is used to manage the Spectrum Power IMM datasets. **Managing Datasets** The IMM admin tool provides authorized users the following functionality: * Creating a new dataset (planning dataset). * Clearing all instance data of a dataset.					No				Compliant - STD	1 - Low	STD
SP7_New-1	SOB	SP7_New-40201	A single job is reserved for a particular user during its creation. The current...	A single job is reserved for a particular user during its creation. The current job owner and an authorized user can reassign a job to a different user.					No				Compliant - STD	1 - Low	STD

SP7_New-4	SOB	SP7_New-40200	Console access rights allow for location-based access control based on the IMM U...	Console access rights allow for location-based access control based on the IMM UI server (console) where the user currently is working. The authorities are always calculated as intersection (common subset) of access rights for console and user. Thus, granted IMM user access rights can be					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40199	Access rights can be assigned for each instance individually. They describe what...	Access rights can be assigned for each instance individually. They describe what a user is allowed to do with the respective instance in IMM (view, modify, modify and assign new access rights for this instance). Instance level access rights, define on what parts of the power network data					No				Compliant - STD	1 - Low	STD

SP7_New-4	SOB	SP7_New-40198	Data entry and activation in IMM is controlled by access rights. IMM provides gr...	Data entry and activation in IMM is controlled by access rights. IMM provides granular access rights dependent on the dataset and the requested action. The following individual access rights are supported: * Instance data engineering * Type data engineering * Data activation * Engineeri					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40193	An Operator Training Simulator (OTS) enables operators to practice runtime syste...	An Operator Training Simulator (OTS) enables operators to practice runtime system operations under simulated conditions. The main system and the offline OTS are independent from each other. (image: 1-img570ef35971345bbb9da3523925336202_1_en_US_TIFF.jpg) Figure # OTS System					No				Compliant - STD	1 - Low	STD

SP7_New-4	SOB	SP7_New-40192	A QAS allows testing data changes without any implication to the production syst...	A QAS allows testing data changes without any implication to the production system. The production system and QAS are independent from each other. The QAS takes the role of the Data Model Master. Modified and successfully tested IMM data is transferred from QAS to the productio					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40191	The collection of control centers cooperatively managing a power system are know...	The collection of control centers cooperatively managing a power system are known as a multisite system. Multisite systems are usually organized in a main/backup or main/regional configuration. All Spectrum Power systems in a multisite network have the complete data model with formal					No				Compliant - STD	1 - Low	STD

SP7_New-4	SOB	SP7_New-40187	IMM provides logs within the log section of the IMM user interface. The log sect...	IMM provides logs within the log section of the IMM user interface. The log section can be opened in a separate window. Selected logs can be exported to a Comma-separated Values (*.csv) file. The following are the various log types available, depending on the selected dataset, job or					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40186	Data Reporting Reporting features provided by IMM allow the user to create/view...	**Data Reporting** Reporting features provided by IMM allow the user to create/view summary or detail reports of type and instance data. **Instance Change Report** The instance change report displays changes within a selected network equipment hierarchy and within any hierarchy below substation like					No				Compliant - STD	1 - Low	STD

SP7_New-4	SOB	SP7_New-40185	Data version management and automatic static data model archiving facilities pro...	Data version management and automatic static data model archiving facilities provide a history of model changes and allows the user to track data changes over time. Jobs in the IMM model archive provide a past view of the static data model based on the activation time. If archiving is enabled, data is stored in					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40184	All power grid domain data and diagram data changes are done in a job. Activatio...	All power grid domain data and diagram data changes are done in a job. Activation propagates data changes into the Spectrum Power runtime system. The activation ensures that the incremental changes are applied to all applications of the Spectrum Power runtime system, including IMM. In a single					No				Compliant - STD	1 - Low	STD

SP7_New-4	SOB	SP7_New-40183	Validation ensures that the entire data model remains consistent. In addition, i...	Validation ensures that the entire data model remains consistent. In addition, it ensures that all necessary data is entered (completeness check). Validation takes place in a maintenance environment, for example, a job, before the changes are activated into the Spectrum Power runtime system. Validation					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40182	In power companies, several systems exist based on (to varying extents) common p...	In power companies, several systems exist based on (to varying extents) common power grid/network data of the utility. Generally, each system has a database and its own data model maintenance tools optimized to the specific scope of the data. Thus, the complete model maintenance is split up in different					No				Compliant - STD	1 - Low	STD

SP7_New-4	SOB	SP7_New-40181	Import and Export of Engineering Data in XDF or CIM-RDF IMM provides an interfac...	**Import and Export of Engineering Data in XDF or CIM-RDF** IMM provides an interface to export and import engineering data in XDF and CIM-RDF. Both are XML formats based on W3C standard. The XML is a versatile language for the definition of tags to identify document contents. XML allows third-party					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40178	IMM Triggers execute a set of business logic required by downstream applications...	IMM Triggers execute a set of business logic required by downstream applications as it applies to the data. The IMM Trigger functionality provides a user-friendly data entry support. Trigger functions are able to perform actions not only based on an insert, update, and or delete of instances, but also based on					No				Compliant - STD	1 - Low	STD

SP7_New-4	SOB	SP7_New-40177	Overview Display construction of network diagrams is completely integrated in th...	**Overview** Display construction of network diagrams is completely integrated in the IMM. The Graphics Editor provides means to view, create and modify graphic diagrams and also symbology. The graphical editing creates the link between the instances of the graphic data to instances of the...					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40176	Overview Engineering activities to change data require working with large amount...	**Overview** Engineering activities to change data require working with large amounts of information with multiple attributes and properties. IMM is the user interface for domain data maintenance within a job. Domain data editors provide means for the following: * Instance data modifications					No				Compliant - STD	1 - Low	STD

SP7_New-4	SOB	SP7_New-40175	In independent job mode, you can view or edit the model as it is at the current...	In independent job mode, you can view or edit the model as it is at the current time when you are in a job. You see the model as it currently is (the production model used in the Spectrum Power runtime system) plus your job changes. You do not see changes from other jobs unless the jobs are activated. The					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40174	Domain data, graphical network diagram data entry, and engineering activities ar...	Domain data, graphical network diagram data entry, and engineering activities are under the control of the IMM job management. Job management is the method by which changes of the Spectrum Power engineering database are grouped and managed. A job allows multiple and concurren					No				Compliant - STD	1 - Low	STD

SP7_New-4	SOB	SP7_New-40171	A typical data engineering console consists of multiple monitors. During an IMM...	A typical data engineering console consists of multiple monitors. During an IMM engineering session, the console is connected to the IMM server running on Administrator Server (ADM). Multiple engineering consoles can be connected to the IMM server. The IMM UI client program					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40170	IMM has a number of engineering applications suitable for the different engineer...	IMM has a number of engineering applications suitable for the different engineering tasks. (image: 1-img65d5925470b687369da352393f7fa3ae_1_en_US_TIFF.jpg) Figure # General Application Structure of the IMM User Interface The amount of provided applications is dependent of the concrete					No				Compliant - STD	1 - Low	STD

SP7_New-4	SOB	SP7_New-40169	The Spectrum Power IMM functions are a set of tools that allow power system info...	The Spectrum Power IMM functions are a set of tools that allow power system information data to be defined, accessed, and exchanged. These tools also control the transfer of data between the engineering database and the Spectrum Power runtime databases. The propagation of data					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40168	Spectrum Power IMM controls the data to be defined and transferred between the e...	Spectrum Power IMM controls the data to be defined and transferred between the engineering database and the Spectrum Power runtime databases. IMM provides functions that act like a set of tools to maintain power system information. The sub-functions of IMM are as follows:					No				Compliant - STD	1 - Low	STD

SP7_New-4	SOB	SP7_New-40167	The Spectrum Power DOM provides a logical, object-oriented data model describing ...	The Spectrum Power DOM provides a logical, object-oriented data model describing power system information, characteristics and behavior. The DOM is based on the CIM version 12. **Common Information Model (CIM)** CIM is a set of standards for representing power system components. The					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40166	The system engineering process basically consists of three phases:* System confi...	The system engineering process basically consists of three phases: * System configuration * Customization * Data entry All three activities are performed during commissioning. As the requirements of the utility evolve, these activities continue to occur when the system is in operation.					No				Compliant - STD	1 - Low	STD

SP7_New-4	SOB	SP7_New-40165	In power companies, several systems exist based on (to varying extents) common p...	In power companies, several systems exist based on (to varying extents) common power grid or network data of the utility. Thus, the complete model maintenance is split up in different model maintenance systems with defined data responsibilities for a specific data item. For specific parts of the data					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40164	Spectrum Power Information Model Management (IMM) is the source data master and...	Spectrum Power Information Model Management (IMM) is the source data master and manager for domain and graphic data in a Spectrum Power system. IMM provides the ability to efficiently enter and maintain power system related engineering data in a Common Information Model (CIM)					No				Compliant - STD	1 - Low	STD

SP7_New-4	SOB	SP7_New-40137	GDIM provides a UI that drives and controls the Import process from the GIS and...	GDIM provides a UI that drives and controls the Import process from the GIS and visualizes of the current process status (which phase it is in). The UI can be opened on the ADM server. Through the UI the user can select the mode of operation, whether it is a bulk import or incremental import. Also, the selection of either					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40135	The GDIM IMM change detection checks the consistency between the IMM and GDIM da...	The GDIM IMM change detection checks the consistency between the IMM and GDIM data bases. The result of the compare is displayed in the GDIM UI.					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40134	* In this case, GIS data describing the increments (deltas) are received. GDIM d...	* In this case, GIS data describing the increments (deltas) are received. GDIM does not do any change detection. * The identified changes are transformed within the model transformation and XDF files are written. * The GDIM UI is used for the import of XDF files to an IMM job as well as calling for the					No				Compliant - STD	1 - Low	STD

SP7_New-4	SOB	SP7_New-40133	* Incremental import supports auto-detection import on the full network model. D...	* Incremental import supports auto-detection import on the full network model. Data is imported in GDIM in a new extracted dataset. During import, the change management functionality is used for comparing the imported data with the previous version of the data. * The identified changes are					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40132	The GDIM system, engineering IMM, and the operational Spectrum Power system is i...	The GDIM system, engineering IMM, and the operational Spectrum Power system is initialized with a bulk export from GIS. This is considered a one-time data migration exercise is done once before the GIS extract workflow is initiated. This process is started on the GDIM UI using the bulk mode. For the initial					No				Compliant - STD	1 - Low	STD

SP7_New-4	SOB	SP7_New-40127	GDIM supports the import of static graphics from a DXF file. The supported DXF f...	GDIM supports the import of static graphics from a DXF file. The supported DXF file format version is AC1024. DXF parser only supports some dxf entities such as LWPOLYLINE, LINE, TEXT, MTEXT, CIRCLE, ARC and there is a limitation on IMM/ODB side according the maximum pointcount of a					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40126	The translation engine governs the extraction process. The translation engine is...	The translation engine governs the extraction process. The translation engine is a generic mapping engine which translates the data types (for objects, attributes, and values) of the GIS of concern to the data types of the extracted dataset. This generic mapping engine is driven by configurable					No				Compliant - STD	1 - Low	STD

SP7_New-4	SOB	SP7_New-40125	A GIS can utilize multiple sources of data. Each of these sources may need to be...	A GIS can utilize multiple sources of data. Each of these sources may need to be considered by GDIM. To absorb the GIS-centric datatypes and formats, the various GDIM is designed to contain special processing and functionality specific to the relevant GIS and data model. The translation engine					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40121	The GDIM UI visualizes the current progress and shows log/error messages. On the...	The GDIM UI visualizes the current progress and shows log/error messages. On the GDIM UI, the data engineer selects the mode of operation (bulk, incremental mode or delta mode) and choose between stepwise or automatic import. Depending on the settings in the GDIM UI, the workflow					No				Compliant - STD	1 - Low	STD

SP7_New-1	SOB	SP7_New-40120	* GIS -> GDIM - The data extraction imports the data from GIS and writes it into...	* GIS -> GDIM - The data extraction imports the data from GIS and writes it into GDIM's extracted dataset. The GDIM extracted dataset is a standardized intermediate schema. * GDIM - During extraction and transformation process, validation rules (attribute and consistency checks) are executed					No				Compliant - STD	1 - Low	STD
SP7_New-1	SOB	SP7_New-40119	Figure # GDIM Functional Blocks Overview The major functional blocks of the GDIM...	(image: 1-img83a51b366f6fb0799da352393a2de949_1_en_US_TIFF.jpg) Figure # GDIM Functional Blocks Overview The major functional blocks of the GDIM include * Data extraction The data extraction block interfaces with the GIS database, extracts the data, and uses the information to populate the extracted dataset. It					No				Compliant - STD	1 - Low	STD

SP7_New-4	SOB	SP7_New-40103	OpenSSL This product includes software developed by the OpenSSL Project for use...	**OpenSSL** This product includes software developed by the OpenSSL Project for use in OpenSSL Toolkit (http://www.openssl.org/). This product includes software written by Tim Hudson (tjh@cryptsoft.com). This product includes cryptographic software written by Eric Young (eay@cryptsoft.com).					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40102	This document is part of a set of manuals that describes the complete product. V...	This document is part of a set of manuals that describes the complete product. Various other product modules may be mentioned or discussed in this document. For more detailed information – or if you have any questions about these products – contact your Siemens representative.					No				Compliant - STD	1 - Low	STD

SP7_New-4	SOB	SP7_New-40101	Structure of the Manual Introduction: Basic information about the component Func...	**Structure of the Manual** Introduction: Basic information about the component Functionality: Description of different functionality of the component Technology: Information about user interface technology and external data interfaces					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40100	Typical Users This document is designed for users that are already familiar with...	**Typical Users** This document is designed for users that are already familiar with operational and technical aspects of power generation and power transmission and distribution as well as the product concepts: System Engineers System Engineers are able to install and to customize the system. They					No				Compliant - STD	1 - Low	STD

SP7_New-1	SOB	SP7_New-40099	Scope This document provides specific and detailed information on how to use a p...	**Scope** This document provides specific and detailed information on how to use a particular product or product component. (image: 1-Tip.png) | NOTENote that the screenshots used in this document contain sample data which may not be available in some systems.					No				Compliant - STD	1 - Low	STD
SP7_New-1	SOB	SP7_New-40098	Proper Use The product must not be used for any other purposes than that describ...	**Proper Use** The product must not be used for any other purposes than that described in the technical documentation. If it is used together with third-party devices and components, these must be recommended or approved by Siemens. The successful and safe operation of this product is dependent on					No				Compliant - STD	1 - Low	STD

SP7_New-4	SOB	SP7_New-40097	Qualified Electrical Engineering Personnel Only qualified and authorized personn...	**Qualified Electrical Engineering Personnel** Only qualified and authorized personnel should work with this product after becoming thoroughly familiar with all warnings, safety notices, operating instructions and maintenance procedures.					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40096	Notes on Safety This manual is not a complete index of all safety measures requi...	**Notes on Safety** This manual is not a complete index of all safety measures required for operation of the equipment (module or device). However, it includes important information that must be followed for personal safety and to avoid material damage. Information is highlighted and illustrated as follows					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40091	Revision Record Version Date Author/Department Approver/Department Modifications	**Revision Record** **Version** | **Date** | **Author/Department** | **Approver/Department** | **Modifications** | | | |					No				Compliant - STD	1 - Low	STD

SP7_New-4	SOB	SP7_New-40090	Subject to changes and errors. The information given in this document only conta...	Subject to changes and errors. The information given in this document only contains general descriptions and/or performance features which may not always specifically reflect those described, or which may undergo modification in the course of further development of the products. The requested performance features are binding only when they are expressly agreed upon in the concluded contract.Document version: FS-DE-EN.v.2.4.1.0 Edition:					No				Compliant - STD	1 - Low	STD
SP7_New-4	SOB	SP7_New-40089	Spectrum Power 7 Data Engineering v24Q1 Functional SpecificationFS-DE-EN	Spectrum Power 7 Data Engineering v24Q1 Functional Specification FS-DE-EN |					No				Compliant - STD	1 - Low	STD
SP7_New-4	Heading	SP7_New-3062	Referenced IEC Standards						No						
SP7_New-4	Heading	SP7_New-3061	Sizing						No						
SP7_New-4	Heading	SP7_New-3060	Performance Parameters						No						
SP7_New-4	Heading	SP7_New-3059	User Interface						No						
SP7_New-4	Heading	SP7_New-3053	Hardware Deployment						No						
SP7_New-4	Heading	SP7_New-3052	Backup and Restore						No						
SP7_New-4	Heading	SP7_New-3051	Scalability						No						
SP7_New-4	Heading	SP7_New-3050	Authorization and Security						No						
SP7_New-4	Heading	SP7_New-3049	Auditing						No						
SP7_New-4	Heading	SP7_New-3042	Command Line Interface						No						
SP7_New-4	Heading	SP7_New-3041	ASR Mapfiles						No						
SP7_New-4	Heading	SP7_New-3040	Catalog Support						No						

SP7_New-:	Heading	SP7_New-3039	File Formats for Graphic Data Exchange						No						
SP7_New-:	Heading	SP7_New-3038	Data Export using CSV Files						No						
SP7_New-:	Heading	SP7_New-3037	Data Exchange using XML Files						No						
SP7_New-:	Heading	SP7_New-3031	Dataset						No						
SP7_New-:	Heading	SP7_New-3030	Domain Data Topology						No						
SP7_New-:	Heading	SP7_New-3029	Instance Data						No						
SP7_New-:	Heading	SP7_New-3028	IMM Types						No						
SP7_New-:	Heading	SP7_New-3026	Text Style Editor						No		IMM User Interface	Analog Representation Editor			
SP7_New-:	Heading	SP7_New-3025	Symbol Logic Editor						No		IMM User Interface	Text Style Editor			
SP7_New-:	Heading	SP7_New-3024	Symbol Group Editor						No		IMM User Interface	Symbol Logic Editor			
SP7_New-:	Heading	SP7_New-3023	Style Logic Editor						No		IMM User Interface	Symbol Group Editor			
SP7_New-:	Heading	SP7_New-3022	Style Group Editor						No		IMM User Interface	Style Logic Editor			
SP7_New-:	Heading	SP7_New-3021	Shape Style Editor						No		IMM User Interface	Style Group Editor			
SP7_New-:	Heading	SP7_New-3020	Decision Table Editor						No		IMM User Interface	Shape Style Editor			
SP7_New-:	Heading	SP7_New-3019	Color Editor						No		IMM User Interface	Decision Table Editor			
SP7_New-:	Heading	SP7_New-3007	Analog Representation Editor						No						
SP7_New-:	Heading	SP7_New-3006	Text Style Editor						No						
SP7_New-:	Heading	SP7_New-3005	Symbol Logic Editor						No						
SP7_New-:	Heading	SP7_New-3004	Symbol Group Editor						No						
SP7_New-:	Heading	SP7_New-3003	Style Logic Editor						No						
SP7_New-:	Heading	SP7_New-3002	Style Group Editor						No						
SP7_New-:	Heading	SP7_New-3001	Shape Style Editor						No						
SP7_New-:	Heading	SP7_New-3000	Decision Table Editor						No						
SP7_New-:	Heading	SP7_New-2998	Symbol Editor						No						
SP7_New-:	Heading	SP7_New-2997	Multi-Instances Editor						No						
SP7_New-:	Heading	SP7_New-2996	Model and Graphics Editor						No						
SP7_New-:	Heading	SP7_New-2995	Type Editor						No						
SP7_New-:	Heading	SP7_New-2994	Job Management						No						
SP7_New-:	Heading	SP7_New-2993	Main Screen						No						
SP7_New-:	Heading	SP7_New-2992	National Language Support						No						

SP7_New-1	Heading	SP7_New-2991	Online Help						No						
SP7_New-1	Heading	SP7_New-2990	Search Function						No						
SP7_New-1	Heading	SP7_New-2989	Generals						No						
SP7_New-1	Heading	SP7_New-2983	Operator Training System						No						
SP7_New-1	Heading	SP7_New-2982	Quality Assurance System (QAS)						No						
SP7_New-1	Heading	SP7_New-2981	Multisite Environment Support						No						
SP7_New-1	Heading	SP7_New-2973	Model Merge Framework						No						
SP7_New-1	Heading	SP7_New-2972	General						No						
SP7_New-1	Heading	SP7_New-2966	Independent Job Mode						No						
SP7_New-1	Heading	SP7_New-2965	Generals						No						
SP7_New-1	Heading	SP7_New-2956	IMM UI Technology						No						
SP7_New-1	Heading	SP7_New-2955	IIMM Engineering Applications						No						
SP7_New-1	Heading	SP7_New-2954	IMM Data Definition						No						
SP7_New-1	Heading	SP7_New-2953	Functions						No						
SP7_New-1	Heading	SP7_New-2952	Domain Object Model						No						
SP7_New-1	Heading	SP7_New-2951	Engineering Process						No						
SP7_New-1	Heading	SP7_New-2950	Model Merge Framework						No						
SP7_New-1	Heading	SP7_New-2949	Purpose						No						
SP7_New-1	Heading	SP7_New-2948	Non-Functional Topics						No						
SP7_New-1	Heading	SP7_New-2947	System Characteristics						No						
SP7_New-1	Heading	SP7_New-2946	External and Internal Interfaces						No						
SP7_New-1	Heading	SP7_New-2945	Technology and Concepts						No						
SP7_New-1	Heading	SP7_New-2944	IMM User Interface						No						
SP7_New-1	Heading	SP7_New-2943	IMM Administration						No						
SP7_New-1	Heading	SP7_New-2942	IMM Access Rights						No						
SP7_New-1	Heading	SP7_New-2941	Spectrum Power Operating System						No						
SP7_New-1	Heading	SP7_New-2940	IMM Logs						No						
SP7_New-1	Heading	SP7_New-2939	Reporting						No						
SP7_New-1	Heading	SP7_New-2938	Data Version Management						No						
SP7_New-1	Heading	SP7_New-2937	Activation of Data Changes						No						

SP7_New-1	Heading	SP7_New-2936	Validation of Data Changes						No						
SP7_New-1	Heading	SP7_New-2935	Data Import and Data Export						No						
SP7_New-1	Heading	SP7_New-2934	IMM Trigger Framework						No						
SP7_New-1	Heading	SP7_New-2933	Graphic Data Maintenance						No						
SP7_New-1	Heading	SP7_New-2932	Domain Data Maintenance						No						
SP7_New-1	Heading	SP7_New-2931	Job Management						No						
SP7_New-1	Heading	SP7_New-2930	Functional Overview						No						
SP7_New-1	Heading	SP7_New-2928	User Interface						No						
SP7_New-1	Heading	SP7_New-2923	GDIM – IMM Change Detection						No						
SP7_New-1	Heading	SP7_New-2922	GIS Delta Import						No						
SP7_New-1	Heading	SP7_New-2921	GIS Incremental Import						No						
SP7_New-1	Heading	SP7_New-2920	GIS Initial Import						No						
SP7_New-1	Heading	SP7_New-2909	DXF Support						No						
SP7_New-1	Heading	SP7_New-2908	GIS Translation Engine						No						
SP7_New-1	Heading	SP7_New-2907	GIS Data Sources						No						
SP7_New-1	Heading	SP7_New-2902	GDIM User Interface and Workflow						No						
SP7_New-1	Heading	SP7_New-2901	Workflow Overview of GDIM						No						
SP7_New-1	Heading	SP7_New-2900	Functional Blocks of GDIM						No						
SP7_New-1	Heading	SP7_New-2899	Non-Functional Topics						No						
SP7_New-1	Heading	SP7_New-2898	Workflows						No						
SP7_New-1	Heading	SP7_New-2897	GDIM – IMM Change Detection						No						
SP7_New-1	Heading	SP7_New-2896	Configuration						No						
SP7_New-1	Heading	SP7_New-2895	Data Transformation						No						
SP7_New-1	Heading	SP7_New-2894	Change Management						No						
SP7_New-1	Heading	SP7_New-2893	Data Validation						No						
SP7_New-1	Heading	SP7_New-2892	Extracted Dataset						No						
SP7_New-1	Heading	SP7_New-2891	GIS Data Extraction						No						
SP7_New-1	Heading	SP7_New-2890	Functional Overview						No						
SP7_New-1	Heading	SP7_New-2881	Information Model Management						No						
SP7_New-1	Heading	SP7_New-2880	GIS Data Import Management						No						

SP7_New-1	Heading	SP7_New-2879	Introduction						No						

Property	Value
New Work Item Type	tenderROB
New Comments Column	Comments by (.*)
Column	Field
ID	id
Title	title
Severity	severity
WBS Number	wbs
Product Release	product_Release
Description	description
Product	product
Feature	feature
Type	type
Functionality	functionality
Supplier	Supplier
_polarion	_polarion
Solution Type (SOB)	solution_Type
Outline Number	outlineNumber
Base SOB	base_SOB
WBS Number SOB	wbs_string

Type	Label	ID	Field			
SP7_SOB:	Heading	heading	type			
SP7_SOB:	SOB	sob	type			
SP7_SOB:	V2.20	_r01	product_Release			
SP7_SOB:	V2.30	_r02	product_Release			
SP7_SOB:	V2.40	_r03	product_Release			
SP7_SOB:	v22Q1	v22q1	product_Release			
SP7_SOB:	v22Q2	v22q2	product_Release			
SP7_SOB:	v22Q3	v22q3	product_Release			
SP7_SOB:	v22Q4	v22q4	product_Release			
SP7_SOB:	v23Q1	v23q1	product_Release			
SP7_SOB:	v23Q2	v23q2	product_Release			

SP7_SOBs	v23Q3	v23q3	product_Release		
SP7_SOBs	v23Q4	v23q4	product_Release		
SP7_SOBs	V2.20	_r01	product_Release		
SP7_SOBs	V2.30	_r02	product_Release		
SP7_SOBs	V2.40	_r03	product_Release		
SP7_SOBs	v22Q1	v22q1	product_Release		
SP7_SOBs	v22Q2	v22q2	product_Release		
SP7_SOBs	v22Q3	v22q3	product_Release		
SP7_SOBs	v22Q4	v22q4	product_Release		
SP7_SOBs	v23Q1	v23q1	product_Release		

SP7_SOB	v23Q2	v23q2	product_Release		
SP7_SOB	v23Q3	v23q3	product_Release		
SP7_SOB	v23Q4	v23q4	product_Release		
SP7_SOB	V2.20	_r01	product_Release		
SP7_SOB	V2.30	_r02	product_Release		
SP7_SOB	V2.40	_r03	product_Release		
SP7_SOB	v22Q1	v22q1	product_Release		
SP7_SOB	v22Q2	v22q2	product_Release		
SP7_SOB	v22Q3	v22q3	product_Release		

SP7_SOB	v22Q4	v22q4	product_Release			
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SP7_SOB	v23Q2	v23q2	product_Release			
SP7_SOB	v23Q3	v23q3	product_Release			
SP7_SOB	v23Q4	v23q4	product_Release			
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Work Item	Revision	Checksum	Level	Test Field	Read Only	
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SP7_SOB	689283	4a34a95b2	0		0	
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SP7_SOB	689283	a5db667da	0		0	
SP7_SOB	689283	548a0fec1	0		0	
SP7_SOB	689283	3a953c811	0		0	
SP7_SOB	689283	f53e8a402	0		0	
SP7_SOB	689283	1cb89cb61	0		0	
SP7_SOB	689283	ef6426030	0		0	

SP7_SOB	689283	deadfba17	0		0	
SP7_SOB	689283	93413f46d	0		0	
SP7_SOB	689283	b06d81c73	0		0	
SP7_SOB	689283	e179be82a	0		0	
SP7_SOB	689283	b1246962(	0		0	
SP7_SOB	689283	45e6ae554	0		0	
SP7_SOB	689283	8baf9f663	0		0	
SP7_SOB	689283	5115974e5	0		0	
SP7_SOB	689283	69d54c208	0		0	
SP7_SOB	689283	e9935b09c	0		0	

SP7_SOB	689283	6f4f1792e	0		0	
SP7_SOB	689283	9c62382b6	0		0	
SP7_SOB	689283	578d2395	0		0	
SP7_SOB	689283	a3538abf4	0		0	
SP7_SOB	689283	f3882bb03	0		0	
SP7_SOB	689283	9854f3252	0		0	
SP7_SOB	689283	0b47ba46e	0		0	
SP7_SOB	689283	885deea39	0		0	
SP7_SOB	689283	7b31736cb	0		0	
SP7_SOB	689283	97204d216	0		0	

SP7_SOB:	689283	79e7011fb	0		0	
SP7_SOB:	689283	8332cbfee	0		0	
SP7_SOB:	689283	2f0cbf7b4	0		0	
SP7_SOB:	689283	174324b9c	0		0	
SP7_SOB:	689283	b56d79e68	0		0	
SP7_SOB:	689283	a97ce0df7	0		0	
SP7_SOB:	689283	4c3ff3f8d	0		0	
SP7_SOB:	689283	3939fd073	0		0	
SP7_SOB:	689283	8683ee7f3	0		0	
SP7_SOB:	689283	119e9a08a	0		0	

Property	Value					
project.id	SP7_SOBs_New_Structure					
testRun	false					
module.loc	V22Q1/FS-DE-EN					
allowDocu	false					
editableFields						