
	Group IT Business Requirement Specification (BRS) DEM-03388-X3T7_BRSF_Enterprise Engineering Management System	Template Identifier	240-83570075	Rev	6
		Authorisation Date	9 November 2018		
		Review Date	December 2021		

SERVICE REQUEST DETAILS

Business Division	Distribution(Dx), Group Technology(GT), Transmission(Tx) & Generation(Gx)
Business Requestor(s)	Bongi Teti, Cyril de Beer, Debbie Harding
Business Senior Manager	Alwie Lester, Dr Titus Mathe
Demand Name	DEM-03388-X3T7_BRSF_Enterprise Engineering Management System


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1. CONTROL TABLE

The table that defines what sections of the document need to be completed for the different types of BRS's is available at the end of the document.


DOCUMENT TRACKER

Date	Author Name	Changes (section changed, page number, from what to what)
28/08/2019	Nombali Mashile and Mathys Willemse	Compile draft Full BRS (BRSF) for Integrated Engineering Project Planning Design System using ICT demand management registration form.
02/09/2019 to 06/09/2019	Nombali Mashile and Mathys Willemse	Updating draft BRSF.
09/09/2019 to 20/09/2019	Nombali Mashile and Mathys Willemse	Updating draft BRSF with inputs from the Distribution (Dx) workshop.
30/09/2019 to 11/10/2019	Nombali Mashile and Mathys Willemse	Updating draft BRSF with inputs from the Generation (Gx), Transmission (Tx), Distribution (Dx) workshops.
14/10/2019 to 31/10/2019	Nombali Mashile and Mathys Willemse	Updating draft BRSF with inputs from SME's.
01/11/2019 to 15/11/2019	Nombali Mashile and Mathys Willemse	Reviewing and updating use cases.
18/11/2019 to 20/12/2019	Nombali Mashile and Mathys Willemse	Updating draft BRSF with additional inputs from SME's.
21/01/2020 to 31/01/2020	Nombali Mashile and Mathys Willemse	Finalising draft BRSF to be sent for review.
03/02/2020	Nombali Mashile and Mathys Willemse	Sent draft BRS to business for review.
23/03/2020	Nombali Mashile and Mathys Willemse	Reviewed and updated BRS with final inputs received from SME's.

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2. CUSTOMER AND STAKEHOLDER DETAILS


2.1 Customer Information

Name	Department & Division	Role / Expertise	Contact Info	Participation
Signatories listed in Section 16 (Document Acknowledgement) and section 17 (Document Approval)				
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Dr Titus Mathe	Group Technology(GT) Project Engineering	General Manager Senior Business Manager/ Business Sponsor- GT	011 800 5028 079 068 7081	Review and approve the BRS.
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Saneshan Govender	GT Generation(Gx) Plant Engineering	Corporate Specialist Engineering Senior Business Manager/Business Sponsor- GT Generation Plant Engineering	011 800 2467 083 586 2283	Review and approve the BRS.
Amelia Mtshali	GT Design Base & Operating Unit Support	General Manager Senior Business Manager/Business Process Owner: PDE	011 871 2625 082 829 9984	Review and approve the BRS.
Cyril de Beer	GT Business Process	Chief Engineer Business Process Owner- GT Generation Plant Engineering	011 800 4890	SME to participate in all workshops and review draft BRS.
Bongi Teti	Group Technology(GT) Design Tools and Systems	Snr Advisor Engineering Services Business Requestor & SME	011 516 7436 084 953 9692	Subject Matter Expert (SME) to participate in all workshops and review draft BRS.
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Name	Department & Division	Role / Expertise	Contact Info	Participation
Subject Matter Experts (SME's) that attended BRS compilation workshops and provided inputs into the BRS.				
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Andries Botha	Dx Maintenance & Operations(M&O) Network Management Centre	Snr Controller Network Controlling	051 404 2023 083 999 0325	Participated in BRS compilation workshop(s).
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Name	Department & Division	Role / Expertise	Contact Info	Participation
Subject Matter Experts (SME's) that attended BRS compilation workshops and provided inputs into the BRS.				
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Name	Department & Division	Role / Expertise	Contact Info	Participation
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Jackie Herndler	GT Engineering Systems & Support Centre of Excellence(CoE) (Gx)	Manager Computer Aided Design(CAD) Drawings & Maps	011 800 6424 072 404 4304	Participated in BRS compilation workshop(s).
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Riaan Venter	GT Civil & Structural Department (Gx)	Chief Engineer Prof Civil	011 800 3908 072 871 6608	Participated in BRS compilation workshop(s).
Cyril de Beer	GT Engineering Systems & Support CoE (Gx)	Chief Engineer Prof Engineering	011 800 4898	Participated in BRS compilation workshop(s).
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Bongi Teti	GT Design Tools and	Snr Advisor Engineering	011516 7436	Participated in BRS

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Name	Department & Division	Role / Expertise	Contact Info	Participation
Subject Matter Experts (SME's) that attended BRS compilation workshops and provided inputs into the BRS.				
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Jayandra Haridas	GT Integration & Project Engineering-Cluster B	Snr Technologist Electrical	011 800 3089 082 377 1284	Participated in BRS compilation workshop(s).
Daniel Malan	GT Power Delivery Engineering	Engineer Prof Mechanical	011 800 4637 072 125 0933	Participated in BRS compilation workshop(s).
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Shane De Koe	Gx Design & Specification	Chief Draughtsperson Designing	021 941 5805 083 270 0515	Participated in BRS compilation workshop(s).
Abdul Gire	Gx Engineering Support	Manager Design & Specification	021 941 5861 084 485 7776	Participated in BRS compilation workshop(s).
Wesley Klinck	GT Engineering Systems & Support CoE	Snr Technician Engineering	011 800 8111 060 509 3438	Participated in BRS compilation workshop(s).
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Subject Matter Experts (SME's) that attended BRS compilation workshops and provided inputs into the BRS.				
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2.2 Group IT Information

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Tebogo Mathekga	Group IT Business Relationship Management	Group IT Business Relationship Manager	011 800 5768 081 328 0359	Review and approve the BRS.
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Shaun Solomon	Group IT Strategy Execution & Architecture	Group IT Chief Architect	011 800 3833 083 557 2077	Review and approve the BRS.
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Name	Department & Division	Role / Expertise	Contact Info	Participation
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Johan Jonker	GIT IT ITSO-Business Systems Support & Maintenance	Group IT Snr Advisor Application Support	011 651 6823 082 347 3872	Provide application support Participated in BRS compilation workshop(s).
Natasha Lapin	GIT Information Management	Group IT Middle Manager Information Management	021 522 3333 082 899 8022	Provide application support Participated in BRS compilation workshop(s).
Sean Tucker(GIT Peaking)	GIT Information Management	Group IT Snr Advisor Inst IT Architecture	021 941 5869 082 563 6830	Provide application support Participated in BRS compilation workshop(s).

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3. GLOSSARY OF TERMS / DEFINITIONS

Term	Definition
Automesh	It is an automated process of creating computer models for finite element analysis from 3D data image
Analytics	Refers to the business intelligence capability.
Business Continuity	Business continuity encompasses planning and preparation to ensure that an organization can continue to operate in case of serious incidents or disasters and is able to recover to an operational state within a reasonably short period.
Business Intelligence	The term Business Intelligence (BI) refers to technologies, applications and practices for the collection, integration, analysis, and presentation of business information. The purpose of Business Intelligence is to support better business decision making. It can also be described as a broad set of data analysis applications, including ad hoc analysis and querying, enterprise reporting, online analytical processing (OLAP), mobile BI, real-time BI, operational BI, cloud and software as a service BI, open source BI, collaborative BI and location intelligence.
Business Requirements Specification	Business requirements specification is the eliciting, analysing and documenting of business requirements early in the development cycle to guide the design of the solution.
Business Rule	A business rule is a rule that defines or constrains some aspect of business and always resolves to either true or false. Business rules are intended to assert business structure or to control or influence the behaviour of the business. Business rules describe the operations, definitions and constraints that apply to an organization. Business rules can apply to people, processes, corporate behaviour and computing systems in an organization, and are put in place to help the organization achieve its goals.
Change Request	A change request is when an enhancement is made to an existing system that meets specific criteria.
Corona	Corona is a discharge caused by electrical overstress. For transmission lines, the insulating material in which the discharge occurs is the air adjacent to insulator or conductor surfaces, when the electrical stress at these surfaces exceeds the critical value. The ionization of the air can cause a glow around the conductor as well as radio noise.
Disaster Recovery / Disaster Recovery Plan	A disaster recovery plan (DRP) is a documented process or set of procedures to recover and protect a business IT infrastructure in the event of a disaster. Such a plan, ordinarily documented in written form, specifies procedures an organization is to follow in the event of a disaster. It is "a comprehensive statement of consistent actions to be taken before, during and after a disaster".
Directa	It is a database of drawing templates
Extensibility	Extensibility is a software engineering and systems design principle that provides for future growth. It is also a measure of the ability to extend a system and the level of effort required to implement an extension.
External Agents	Sends information to and receive information from analysis area of study/focus area.
Fenestration	It is the arrangement of windows in a building.
Innovation	Innovation generally refers to changing processes or creating more effective processes, products and ideas. For businesses, this could mean implementing new ideas, creating dynamic products or improving your existing services. Predominantly focuses on digitisation type projects.
Interoperability	The ability of computer systems or software to exchange and make use of information.

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Term	Definition
MAPI compliant	MAPI (Messaging Application Program Interface) is a Windows file structure which allows other software to add files to an email. Any email software that can accept MAPI files is said to be MAPI compliant.
Masonry	It is the building of structures from individual units which are laid in and bound together by mortar (brickwork).
Micro Station	Micro Station is a client-based Computer Aided Design (CAD) software solution for two and three dimensional design and drafting. Several extensions and applications are available to Micro Station to add certain functionalities related to specific sectors.
Parametric	The word 'parametric' is used to describe methods in math that introduce an extra, independent variable called a parameter to make them work. For example, consider the parametric equations of a circle. The circle is defined this way using two equations.
Penetrometer	A penetrometer is a device used to test the strength of a material.
Pretension	Pretension is when steel cables in sleeves are set in the forms, tensioned and then the concrete is poured. Post tension is when sleeves are set in the forms, concrete poured, and the steel cables fed through the sleeves. After this, the tension is applied to the cables.
Process	Set of activities that describe how an activity is executed.
Project	A project consists of a concrete and organized effort motivated by a perceived opportunity when facing a problem, a need, a desire or a source of. It seeks the realization of a unique and innovative deliverable, such as a product, a service, a process, or in some cases, a scientific research. Each project has a beginning and an end, and as such is considered a closed dynamic system. It is developed along the 4 Ps of project management: Plan, Processes, People, and Power. It is bound by the triple constraints that are calendar, costs and norms of quality, each of which can be determined and measured objectively along the project lifecycle. Each project produces some level of formal documentation, the deliverable(s), of course, and some impacts, which can be positive and/or negative.
Prioritise requirements	Each requirement to be prioritised High, Medium and Low High- Extremely Important—Must Have Medium- Important- Good to Have Low- Not important- Nice to Have
ProjectWise	ProjectWise is a software suite that facilitates collaboration between various stakeholders and is used to manage engineering drawings and related data. It is a server based solution, with various means of client access.
SketchUp file	It is a 3D modelling computer program for a wide range of drawing applications such architectural, interior design, landscape architecture, civil and mechanical engineering, film and video game design.
Solver	Solver is a piece of mathematical software, possibly in the form of a stand –alone computer program or as a software library that solves a mathematical problem. A solver takes problem descriptions and calculates their solution.
Software License Purchase	A software license is a legal instrument (usually by way of contract law, with or without printed material) governing the use or redistribution of software. All software is copyright protected, in source code as also object code form. The only exception is software in the public domain. A typical software license grants the licensee, typically an end-user, permission to use one or more copies of software in ways where such a use would otherwise potentially constitute copyright infringement of the software owner's exclusive rights under copyright law.
Stereo lithography file	It is a file format native to the stereo lithography CAD software created by 3D systems.

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Term	Definition
Standard for the exchange of product	Standard for the exchange of product is a file extension for a 3D graphic file used by CAD software. STP files are used to store 3D image data in an American Standard Code for Information Interchange (ASCII) format, following the standards defined in ISO10303-21: Clear Text Encoding of the exchange structure.
Submittals	The act of submitting data about a product.
System	An organized, purposeful structure that consists of interrelated and interdependent elements (components, entities, factors, members, parts etc.). These elements continually influence one another (directly or indirectly) to maintain their activity and the existence of the system, in order to achieve the goal of the system.
Transmittals	The process of passing a document to explain the contents thereof. Each transmittal package describe the document being sent, as well as the sender and the recipients, explains why the documents are being sent and specifies what is expected of the recipients in the way of acknowledgement or response.

4. BUSINESS REQUIREMENTS SPECIFICATION FOCUS

The purpose of this document is to record and confirm the business requirements for:

- Potential total or partial system replacement of the existing system (total replacement of current system /current system partially replaced with new system)

5. REASON FOR THE REQUIREMENT

5.1 Define the current business challenges / issues that need to be addressed

In order to ensure that suitable, cost-effective business solutions are in place, it is the best practise to survey the market for alternative solutions.

The support and maintenance contract for Enterprise Engineering Management System (EEMS) will expire in February 2020. The current EEMS has been in use for more than 30 years, has +-8 million available drawings which are saved on the system. National Treasury requires an open tender to source a system that has the lowest cost of ownership with the best business fit for purpose.


Without an Integrated Engineering Project Planning Design and Document Management System, Generation, Transmission and Distribution will not be able to:

- ↳ Plan and execute asset creation and maintenance projects
- ↳ Conduct plant maintenance
- ↳ Provide engineering and design assurance to minimise engineering liabilities and risk.
- ↳ Improve turnaround time on production plant modifications to plant design and related drawings. Long turnaround time poses a risk of plant damage, load losses and power trips. It also poses a risk to personnel safety if they have to work on an outdated drawing that does not reflect changed design parameters and requirements.
- ↳ Perform specialised engineering planning and design
- ↳ Manage engineering work
- ↳ Perform technical management
- ↳ Perform engineering design

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- ↳ Performance technical assurance
- ↳ Maintain design base

5.2 Define the high level gaps between the “As-Is” and “To-Be” state

As Is Statement	To Be Statement	Therefore the high level gap is:
<p>The support and maintenance contract of the Enterprise Engineering Management System(EEMS) will no longer be supported because it is going to expire. It has been in use for +- 30 years.</p> <p>.</p>	<p>A cost-effective business solution that will fulfil the requirement of an integrated engineering enterprise suite for planning design(including CAD drawing tool), project collaboration and document management system/software that is required by the Eskom Generation(Gx), Transmission(Tx), Group Technology(GT) and Distribution(Dx) to assist with managing specialized engineering work, project planning, execution, design and engineering document management.</p> <p>The solution should comply with International Organization for Standardisation (ISO) 55000 in relation to asset design, support and maintenance.</p>	<p>Sustained vendor support that ensures the supply / design, testing, installation, commissioning, maintenance and support of the provided application.</p> <p>There will be no valid contract for the EEMS to assist with integrated engineering project planning and documents management.</p>

6. AS IS AND TO BE BUSINESS PROCESS ACTIVITY MAPPING

6.1 As-is business process


- 6.1.1 Impacted Process Control Manuals(PCM's) that are envisaged to be supported by this demand request mentioned below:

PCM number	PCM description	ARIS / EHPUM link
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PCM number	PCM description	ARIS / EHPUM link
240-42722776	Engineering Design	https://hyperwave.eskom.co.za/240-42722776
240-43542447	Maintenance of Design Base	https://hyperwave.eskom.co.za/240-43542447
240-44460228	Finalise Engineering Work	https://hyperwave.eskom.co.za/240-44460228
240-44509543	Design System	https://hyperwave.eskom.co.za/240-44509543
240-53459042	Perform Substation Engineering	https://hyperwave.eskom.co.za/240-53459042
240-53573084	Perform Structures & Buildings Engineering	https://hyperwave.eskom.co.za/240-53573084
240-127750926	Geomatics Management	https://hyperwave.eskom.co.za/240-127750926
32-1216	Manage Documents and Records	https://hyperwave.eskom.co.za/0x936e3246_0x08d41254
240-53573085	Perform Dams, Waterways and Hydro Engineering	https://hyperwave.eskom.co.za/240-53573085
240-42838229	Engineering Business Management	https://hyperwave.eskom.co.za/240-42838229
240-42722819	Engineering Work Management	https://hyperwave.eskom.co.za/240-42722819
240-54041235	Specialised Engineering	https://hyperwave.eskom.co.za/240-54041235
240-46977377	Manage Engineering Interfaces	https://hyperwave.eskom.co.za/240-46977377
240-43400017	Technical Management	https://hyperwave.eskom.co.za/240-43400017
240-42722776	Engineering Design	https://hyperwave.eskom.co.za/240-42722776
240-43170220	Technical Assurance	https://hyperwave.eskom.co.za/240-43170220
240-43542447	Maintenance of Design Base	https://hyperwave.eskom.co.za/240-43170220
240-53573084	Perform Structures & Buildings Engineering	https://hyperwave.eskom.co.za/240-53573084
240-53573086	Perform Roads and Railways Engineering	https://hyperwave.eskom.co.za/240-53573086
240-53573079	Perform Geotechnical Engineering	https://hyperwave.eskom.co.za/240-53573079
240-53458817	Perform Bulk Material Handling Plant Engineering	https://hyperwave.eskom.co.za/240-53458817
240-53458841	Perform Chemical Engineering	https://hyperwave.eskom.co.za/240-53458841
240-53458961	Perform Line Engineering	https://hyperwave.eskom.co.za/240-53458961
240-53458797	Perform PTM&C Systems Engineering	https://hyperwave.eskom.co.za/240-53458797
240-53459006	Perform High Voltage Plant Engineering	https://hyperwave.eskom.co.za/240-53459006
240-53459108	Perform Coal Power Plant Boiler Engineering	https://hyperwave.eskom.co.za/240-53459108
240-53458931	Perform Coal Power Plant Turbine Engineering	https://hyperwave.eskom.co.za/240-53458931
240-53573106	Perform Renewable Power Plant Engineering	https://hyperwave.eskom.co.za/240-53573106
240-53458874	Perform Gas Power Plant Engineering	https://hyperwave.eskom.co.za/240-53458874
240-53459028	Perform Power Plant Electrical Engineering	https://hyperwave.eskom.co.za/240-53459028

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PCM number	PCM description	ARIS / EHPUM link
240-53458811	Perform Control and Instrumentation Engineering	https://hyperwave.eskom.co.za/240-53458811
240-53458738	Perform Low Services Engineering	https://hyperwave.eskom.co.za/240-53458738
240-53459042	Perform Substation Engineering	https://hyperwave.eskom.co.za/240-53459042

6.2 To-be business process

6.2.1 Any new business processes that will be a result of this requirement, if applicable. If no change in business process, state that.

The requirements are based on the current PCMs and business operations. The solution should support the current operations and the future requirements that are known. Thus the current operations dictate the solution requirements. When the solution is acquired the PCM documents will be updated referencing the new solution.

7. BUSINESS REQUIREMENTS

7.1 High level Requirements

Business requires the availability of enterprise suite of integrated engineering planning and design system (including CAD drawing tools), project collaboration, and engineering document management software to be used by Eskom's Transmission, Distribution, Group Technology and Generation divisions. An enterprise-engineering tool that will provide Eskom with a single repository to retrieve, edit, update and store baseline engineering and technical design information. A system that will be automated and enable the engineering functions to be efficient and effective See below structure diagram.

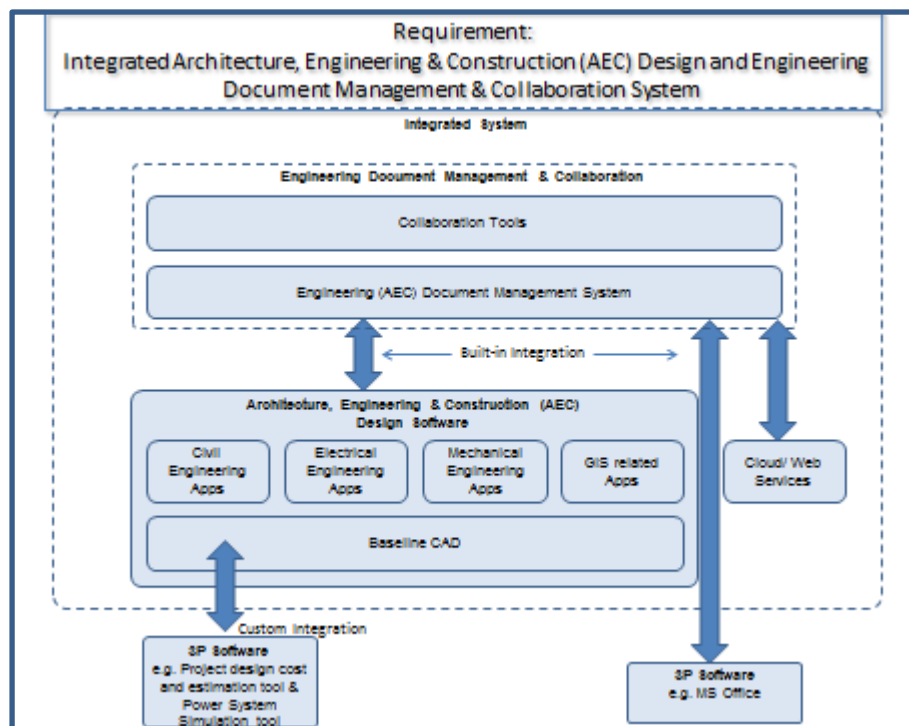



Figure 1: An overview of integrated engineering document and collaboration system

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The enterprise engineering management system is currently being utilised to fulfil and meet Eskom's current requirements which include:


- ↳ Manage system access
- ↳ Manage availability of CAD drawing files
- ↳ Manage technical drawing and document files
- ↳ Creating and managing projects, CAD and industry standards
- ↳ Creating, tracking and managing transmittals and submittals
- ↳ Manage project and contractor performance insights
- ↳ Manage project information and deliverables
- ↳ Manage and control engineering documents content, records and compliance
- ↳ Manage and mitigate project contract risks
- ↳ Track change orders and other requests
- ↳ Workflow management
- ↳ Audit trail
- ↳ 3D Modelling
- ↳ Documentation
- ↳ Visualisation
- ↳ Creating and modifying 2D and 3D drawings
- ↳ Importing of 3D scan data
- ↳ Re model 3D scan data
- ↳ Create drawings including isometrics, P&ID, machine and workshop drawings
- ↳ CAD (Computer-aided Design) functionality
- ↳ Specialised engineering functionalities which includes:
 - substation design
 - electrification design
 - concrete design
 - bridge design
 - steelwork design
 - masonry design
 - technical design
 - architectural design
 - rail, road and dams, waterways and hydro design
 - Structural analysis.
 - Geotechnical
 - Bulk material handling engineering
 - Chemical engineering
 - Line engineering
 - PTM&C systems
 - High voltage
 - Coal power plant turbine
 - Renewable power plant
 - Gas power plant
 - Power plant electrical engineering
 - Control and Instrumentation
- ↳ Engineering Document Management functionality

Eskom currently uses Hyperwave as a generic Document Management System (DMS). The option of maintaining technical documents on Hyperwave was considered but there are a number of reasons why technical documents, models and drawings should be managed differently from generic documents, and why Hyperwave would thus not be feasible for managing technical documents, especially CAD drawings, including:

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- Loss of productivity due to no integration with design tools.
- A cumbersome document registration process that is not suitable for design iterations.
- No functionality for collaboration on designs (red-lining, etc.).
- Loss of CAD-specific functionality such as shared cell libraries, spooling to plotters etc.
- The need for a common repository for all technical documents to prevent loss of data due to multiple data sources which are not fully backed up.
- Linking tools directly used for Gx, Tx, Dx and GT designs.

7.2 Detailed requirements and Business rules


Standard system functionality required to enable the user to perform the following activities:

Functionality grouping	BRS Number	Functionality	Business Rule No and Description	Priority/phasing
Manage System Access	BRS1-A1	Register a user.		H
	BRS1-A2	Configure user access profile <ul style="list-style-type: none"> • System administrator • Business administrator • Document controller • Project end users <ul style="list-style-type: none"> ○ Read only access ○ Edit user access ○ Draftsperson [Edit user + CAD access] ○ Web view access 	BR1: Comply with Eskom Security Policy 32-85 BR2: Authenticate users using Active Directory	H
	BRS1-A3	Inform user about access granted.		H
	BRS1-A4	Capability to activate /de-activate user account.		H
	BRS1-A5	Run and or print end user access reports.		H
	BRS1-A6	Access geometry requiring object enablers.		H
Customise user interface	BRS2-B1	Capability to create folders.		H
	BRS5-B2	Capability to customise pane view as per user preference.		H
	BRS2-B3	Save customised pane view to become part of selection list of views.		H
	BRS2-B4	Add shortcut to change view.		H
	BRS2-B5	Access view toolbar and allow user to select different view.		H

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Functionality grouping	BRS Number	Functionality	Business Rule No and Description	Priority/phasing
	BRS2-B6	Enable/ Disable document previous revision views.		H
	BRS2-B7	Enable/ Disable document attributes views: Ability to select document attributes such as: a. Unique ID b. Item no c. Legacy Filename d. Document title e. Document description f. Grid g. Substation name h. Bay i. Revision number j. Date		H
	BRS2-B8	View folder structure on different hierarchical levels across all business divisions in SAP. a. High level folders per Division b. Design base folders c. Installed plant as build lines folder overview which contains sub-folders for the various lines installed d. Substation folder overview e. Work in progress project folder f. Archived projects g. Project template overview contains standardised folders that can be copied when a new project is created. These folders are: <ul style="list-style-type: none"> ↳ Cross functional documents ↳ HV plant engineering ↳ Integration. ↳ Lines engineering ↳ Protection ↳ Telecommunication ↳ Metering & Control (PTM&C) ↳ Substation engineering ↳ Reference folders ↳ Power plant engineering ↳ Renewable power plant ↳ Perform geo- technical engineering ↳ Chemical engineering structures and buildings ↳ Roads and railways ↳ Dams waterways & hydro ↳ Coal power plant turbine and boiler ↳ Temporary space-unallocated folders. 	BR3: As build folder is based on the Project Management (PM) structure and may not be changed unless the requested change is first applied in System Application and Products System (SAP) Project Management (PM) - Gx, PDE, Tx not for Dx BR4: Reference documents need to be managed at the end of the development phase and to be kept under the respective folders within the Technical reference Doc folder.	H

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Functionality grouping	BRS Number	Functionality	Business Rule No and Description	Priority/phasing
	BRS2-B9	Capability to allow users to create folders according to their specific needs.		H
	BRS2-B10	Capability to integrate with current enterprise systems.		H
	BRS2-B11	Capability to aggregate, assemble and reference data of multiple types and formats.		H
	BRS2-B12	Import, open and reference Industry Foundation Class (IFC) files.		H
Manage projects	BRS3-C1	Capability configure project standard template folder.	BR5: New project only to be created by CoE BR6: Each project shall only be created once the standard project template has been configured to cater for all disciplines.	H
	BRS3-C2	Ability for the user to copy/paste existing standard project template folder for re-use.		H
	BRS3-C3	Capability to rename project and change project attributes.		H

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Functionality grouping	BRS Number	Functionality	Business Rule No and Description	Priority/phasing
	BRS3-C4	Capability to update and upload project folder with supporting documentation.	BR7: The copied project document will have its own unique ID in the new project folder. Project number automated copy and paste, rename new folder and embedded documents BR8: Document controller will remove the finalised state of the current drawing once the modified drawing has been approved. BR9: Standard reference drawings that have not been verified shall remain in the legacy drawings folder. Access control is required which can be configured by the system administrator.	H
	BRS3-C5	Ability to allow versions of documents updated or uploaded.		
	BRS3-C6	Search and view project documentation use an external viewer/portal such as CAD tools.		H
	BRS3-C7	Capability to archive project folder.	BR10: Business Administrator/ Document controller can archive project folders	H
	BRS3-C8	The solution should have an embedded help function enabling first line support to end users.		H
	BRS3-C9	Capability to build asset life cycle.		H

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Functionality grouping	BRS Number	Functionality	Business Rule No and Description	Priority/phasing
	BRS3-C10	Capability to build project life cycle.		H
Create and modify drawings	BRS4-D1	Capability to create 2D and 3D drawings.	240-86973501: Engineering drawing standards.	H
	BRS4-D2	The solution should be able to do the following: <ul style="list-style-type: none"> Search documents on metadata fields and index stored text data. Utilize the existing metadata and not require re-work. 	36-943: Engineering drawing office and engineering documentation standard.	H
	BRS4-D3	CAD drawings to have the following functionality: <ul style="list-style-type: none"> a) 2D line drawing b) 3D modelling c) Create 2D drawing from 3D mode d) CAD drone to reference background data such as raster e) Create contour lines from points, lidar, terrain etc f) Create/develop BOQ's or other specified material quantities from drawings. 	240-87658920: Standard drawing practice for CAD users. 240-83563472: Drawing standard for substations: Power Plant.	H
	BRS4-D4	Capability to modify 2D and 3D drawings <ul style="list-style-type: none"> Ability to incorporate current existing drawing formats to utilize the current standard drawing templates for border sheets and title blocks. Ability to do design history tracking. 		H
	BRS4-D5	Capability to import 2D and 3D scan data <ul style="list-style-type: none"> Ability to import reference data such as existing drawings, scanned documents and 3Dpoint cloud data. View and manipulate point-cloud data. 		H

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Functionality grouping	BRS Number	Functionality	Business Rule No and Description	Priority/phasing
	BRS4-D6	Capability to remodel 2D and 3D scan data <ul style="list-style-type: none"> Ability to do parametric 2D & 3D modelling driven by constraints formulas and spreadsheets (dimension driven design). 		H
	BRS4-D7	Capability to create hyperlinks.		H
	BRS4-D8	Ability to arrange design, convert images, share and distribute drawings by sending links of various files by email		H
	BRS4-D9	Ability to bring in referenced views of 3D models into a 2D drawing/sheet.		H
	BRS4-D10	Ability to bring in reference data such as existing drawings, scanned documents and 3Dpoint cloud data		H
	BRS4-D11	Ability to generate Parts/Materials list table to insert on drawings or export to excel		H
	BRS4-D12	Ability to do design history tracking and version		H
	BRS4-D13	Ability to create catalogue cells e.g. South African National Standards (SANS) pipe fittings, structural members from spreadsheets.		H
	BRS4-D14	Capability to allow users create pre-defined macros.		H
	BRS4-D15	Ability to integrate seamlessly with Eskom's standard GIS systems and related infrastructure.		H
	BRS4-D16	Ability to do Finite Element Analysis (FEA) within the CAD model or provide capability to integrate to the existing one within the business.		H
	BRS4-D17	Ability for the system to automatically generate ISO expiration alerts.		
	BRS4-D18	Ability to work with different file formats e.g. Reni diagrams.		H
	BRS4-D19	Ability to produce high graphical definition a drawing using multiple documents sets that is consistently applied across the project.		H

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Functionality grouping	BRS Number	Functionality	Business Rule No and Description	Priority/phasing
	BRS4-D20	Get a live view of the project status in sheet orientation. As the design changes, so will the sheets.		L
	BRS4-D21	Capability to edit directly in the design model and the application should update the sheets.		H
	BRS4-D22	Capability to auto populate cabling diagrams from key circuit diagrams (Control Plant Drawings).		H
	BRS4-D23	Ability to provide drawings which are compatible to the existing CAD system to allow users to view and edit the drawings. Should be fully integrated between the CAD system and the document management system.		
Manage availability of drawing data	BRS5-E1	Capability to search documents on metadata fields and index stored text data.		H
	BRS5-E2	Provide full search on attributes/metadata such as: a. Drawing number b. Description/Title c. Third party/contractor drawing number d. Contractor name e .Discipline e.g. civil, electrical f. Date archived g. Date modified h. Power Station name		
	BRS5-E3	Bulk uploading of files by: a. drag and drop using selected allocated multiple files. b. Import multiple data files.		H

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Functionality grouping	BRS Number	Functionality	Business Rule No and Description	Priority/phasing
	BRS5-E4	<p>User must be able to import and export documents to external files such as:</p> <ul style="list-style-type: none"> a. Design Files (DGN) b. Drawing Files(DWG) c. Drawing Exchange Format (DXF), d. Portable Document Format(PDF) e. Microsoft Excel File Extension(XLS) f. Microsoft Word file extension(DOC) g. Text (TXT) file h. Home Site Project(HSP) file i. Computer Aided Manufacturing (CAM) file j. Keyhole Markup Language(KML) and Keyhole Markup language Zipped(KMZ) k. Shapefile:*.shp l. Extensible Markup Language file(XML) m. Project Complete Management(PCMP) file n. Substation Configuration Description(SCD) o. Microsoft PowerPoint file Extension (PPT) p. Joint Photographic Experts Group (JPEG) 2000 q. Tagged Image File Format(TIFF) r. Universal3Dimension(U3D) s. Industry Foundation Class(IFC) t. Rhino 3DM u. Stereo Lithography (STL) v. Virtual Reality Modelling Language(VRML) world w. SketchUP <p>Mechanical CAD file formats such as:</p> <ul style="list-style-type: none"> x. Jump To File(JTF) open CAD file y. Initial Graphics Exchange Specification (IGES) z. Parasolid aa. ACIS bb. Standard ACIS Text(SAT) cc. Computer Graphics Metafile(CGM) dd. Standard for The Exchange of Product Data (STEP) ee. Breda, Reg No 2002 ff. Wavefront 3D object file gg. Collaborative Design Activity (Collada) hh. Filmbox (FBX) 		H

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Functionality grouping	BRS Number	Functionality	Business Rule No and Description	Priority/phasing
	BRS5-E5	Capability to keep records of data fields linked to a document and drawing file.		H
	BRS5-E6	Ability to check-in and out of a document by editing, access audit trail records.		H
	BRS5-E7	Capability to allow switching between automatic and manual saving and set interval of automatic saving.		H
	BRS5-E8	Ability to recover saved drawings.		H
	BRS5-E9	Provide full automated audit trail traceability and able to view changes.		H
	BRS5-E10	Capability to apply standard or customised document protection rules.		H
	BRS5-E11	Capability to provide drawings status management as follows: A .Active drawings b. Archived drawings c. Saved drawings d. Check in/check out of drawings.		
	BRS5-E12	Ensure digital security by: a. Controlling digital rights to view, edit, print and copy files and documents content b. Establishing pre-defined expiration dates for design files c. Confirming status and approvals using digital signatures.		H
	BRS5-E13	Provide viewing office documents without native application such as web browser.		H
	BRS5-E14	Enable remote printing and plotting.		H
	BRS5-E15	Enable automatic handling of reference files.		H
	BRS5-E16	Enable document linking by auto populating cabling diagram and control plant.		H
	BRS5-E17	Enable activity log by viewing the number of times the document is accessed.		H
	BRS5-E18	Provide web browser viewing and redlining functionality.		H
	BRS5-E19	Support simple and user friendly batch plot/prints including PDFs.		H
	BRS5-E20	Enable notifications and Messaging Application Program Interface (MAPI) compliance.		H

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Functionality grouping	BRS Number	Functionality	Business Rule No and Description	Priority/phasing
	BRS5-E21	Enable document viewing, publishing and linking.		H
	BRS5-E22	Ability to save and scan files to folders.		H
	BRS5-E23	Capability to add drawings that were modified offline.		H
	BRS5-E24	Capability to add drawings that were checked out in directa during the migration.		H
	BRS5-E25	Capability for the user to be able to share and distribute CAD engineering drawings with the same reference.		H
	BRS5-E26	Capability to add and view new CAD drawings.		H
	BRS5-E27	User to be able to open multiple drawing files.		H
	BRS5-E28	User to have the ability to draw status report of drawings.		H
Manage documents	BRS6-F1	User to be able to: a. Create a new document number b. Register a new document number c. Compile the document d. Review the document e. Approve the document f. Publish the document g. Withdraw/archive/supersede document h. Search documents based on any metadata field or combination thereof.		H
	BRS6-F2	Ability to view, search, import and export documents.		H
	BRS6-F3	Capability for the system to handle varying document sizes as configuration sizes are dependent on the tools being used.		H
	BRS6-F4	Capability for the system to allow user defined numbering conventions to be implemented (this is to cater for different conventions used by different CoE).		H
	BRS6-F5	System to allow various documents and data types to be checked in into the system.		

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	BRS6-F6	Ability to keep all documents in a centralised database for all divisions to prevent loss of data due to multiple data sources which are not fully backed up.		H
	BRS6-F7	Ability to track changes on the document and other requests.		H
	BRS6-F8	System to allow documents to be searched based on any metadata field or combination thereof.		H
	BRS6-F9	Capability to modify document templates.	BR11: System administrators will be allowed to update the modified template.	H
	BRS6-F10	Capability to access documents and folders available on the web browser.		H
	BRS6-F11	Capability to access documents, folders, workflow and control functions allowed per user role.	BR12: System administrators will provide access according to the user roles.	H
	BRS6-F12	Capability to have access to a group of documentation files linked to a specified folder e.g. a. Plant breakdown structure or project departments will have access control per folder and work flow.		H
	BRS6-F13	Capability to track documents as per the project number.		H
	BRS6-F14	Capability to create, track and manage transmittals and submittals.		H
	BRS6-F15	Capability to automatic archiving of previous documents and configurable by the administrator and end user.		H
	BRS6-F16	Ability to provide a full system audit trail to record actions of check in, check out documents and notifications. The following information logs to be kept: a. User details b. Date and time c. Action performed		H
	BRS6-F17	Maintain an error log for all system errors and retain these logs for at least 3 months.		H

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	BRS6-F18	Provide compatibility to edit existing documents as currently supported by the CAD system.		H
	BRS6-F19	Capability for automatic file locking on check-out.		H
	BRS6-F20	Capability to manage records.		H
	BRS6-F21	Capability to perform digital asset management.		H
	BRS6-F22	Capability to perform digital rights management.		H
Manage workflow rules	BRS7- G1	Ability to create the work flow.		H
	BRS7-G2	Ability to manage the workflows.		H
	BRS7-G3	Capability to do parallel workflow activities.		H
	BRS7-G4	Manage project work flow and transmittals <ul style="list-style-type: none"> Document controller configure/ issuing transmittal End user receive transmittal notification by an e-mail Acknowledge transmittal Respond and comment on transmittal.		H
	BRS7-G5	Capability to do custom workflow (Workflow following any order and defined workflow). Capability for the system to allow required work flow to be configured and used as per related processes. This should include document management, engineering change management and stakeholder requirements management.		H
	BRS7-G6	Capability to categorise workflows into collections and including a search bar to quickly locate them by name.		H
	BRS7-G7	Ability to assign people to specific activities.		H
	BRS7-G8	Ability to send notifications via email or push notifications to remind of upcoming approvals.		H
	BRS7-G9	Track details, history and audit trails activity regarding specific tasks.		H
	BRS7-G10	Ability to re-assign/redirect the workflow activity.		H

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	BRS7-G11	Modified documents need to be checked in by the user in order for the most recent changes to be made available to all users and allow other users to make changes, if required.		H
	BRS7-G12	Capability to review and approve workflows.		H
	BRS7-G13	Capability to implement project delivery workflows.		H
	BRS7-G14	Provide authorization workflow management as per delegation of authority.		H
Revision and version management	BRS8-H1	Search and open existing document identified for editing.		H
	BRS8-H2	Capability to check out the document.	BR13: When a document is checked out, a readable copy will remain on the server and a checked out document will be editable by user who checked it out	
	BRS8-H3	Capability to apply changes to the document.	BR14: Allow to restore the older version of the document and override the latest version so that it becomes un-readable	H
	BRS8-H4	Capability to save the document with the new version number adding comments to the changes applied and check-in the document.	BR15: Latest revision/version of the document will become editable and previous version will stay a readable copy. Automatically archive the previous version of the document	H

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	BRS8-H5	Delete active version and select any versions.	BR16: User profile allowed to delete documents could only be system administrator. BR17: When a document is on final status, only a system administrator can change and update the document status	H
	BRS8-H6	Notification messaging with an e – mail for functions such as: a. New revision b. Workflow state changes	BR18: When a document remains in a check out status for a pre-defined period, notify system user by e-mail, when exceeding maximum check out duration escalate by notifying one level up. When changes are applied and document is check in, notify all people involved in the project about the latest available revision/version of a document.	H
	BRS8-H7	Ability to check the document back into the server and allow other users to open the document for editing.		H

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	BRS8-H8	The system to send an email notification to: a. Remind the user to check in the document, after a specified period of time, usually about a week; b. Notify the responsible party that the document has not been checked in, after the maximum time period has expired. In most cases escalation should happen if the document has been checked out for over a week, however in the case of working directories the time period will be daily; c. All affected users when a new / updated configuration is loaded onto the system; and d. Inform all people involved in a project, when there is an update in any of the related project documents.		H
	BRS8-H9	Protect drawings to prevent two changes to happen on the same version.		H
Manage reports	BRS9-I1	Capability to create standard reports.		H
	BRS9-I2	The solution should allow users to customise or configure reports as per user defined needs.		
	BRS9-I3	Ability to publish publicly /privately web based reports on the system and local PC.		H
	BRS9-I4	Generate standard reports on pre-defined frequencies.		
	BRS9-I5	Download and save reports on local PC.		

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	BRS9-I6	<p>The following reports are required:</p> <p>a. Weekly reports, indicating all the documents that are checked out, how long it has been checked out, name of the person who has check out the document by and any comments added.</p> <p>b. A dashboard overview of all documents flagged as being edited; along with its high-level status. i.e. within allocated time / overdue / escalated.</p> <p>c. A dashboard overview of all documents that are flagged as being checked out for edited, versus the allocated user.</p> <p>d. A design base completeness report, which indicates what documents are missing, per as-built folder, against a predefined required documents checklist.</p>		H
Manage engineering services	BRS10-J1	Capability to share and save files.		H
	BRS10-J2	Capability to access, view, share and save engineering application files.		
	BRS10-J3	Ability to view engineering models and mark PDF's.		H
	BRS10-J4	Capability to receive, send and manage transmittals and submittals.		H
	BRS10-J5	Capability to report, manage and resolve engineering challenges.		H
	BRS10-J6	Capability to collect, manages, view and approve engineering field data.		H
	BRS10-J7	Capability to access and gain insight on past, current and future engineering performance.		H
Manage collaboration services	BRS11-K1	Capability to access or and read-only to design integration content.		H
	BRS11-K2	Capability to check in/out with design integration content.		H
	BRS11-K3	Capability to collect data from engineering fields.		H
	BRS11-K4	Capability to collect data from engineering fields.		H
Manage design integration	BRS12-L1	Capability to integrate engineering applications.		H
	BRS12-L2	Capability to automate title block generation.		H

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	BRS12-L3	Capability to manage dependencies and references.		H
	BRS12-L4	Capability to manage drafting, modelling project and industry standards.		H
	BRS12-L5	Capability to manage work spaces		H
	BRS12-L6	Capability to create and manage specifications.		H
	BRS12-L7	Capability to leverage delta file transfer and caching.		H
Perform structural design	BRS13-M1	Capability to implement building information management (BIM) capability for building maintenance.		H
	BRS13-M2	Capability to perform asset reliability management		H
Perform structural analysis	BRS14-N1	Capability to perform the following types of analysis in 2D and 3D: a. Linear Analysis b. P-Delta/ Second order analysis c. Non-linear analysis d. Buckling analysis e. Dynamic analysis (Modal, seismic, harmonic). f. Response spectra analysis g. Time history analysis h. Creep analysis i. Shrinkage analysis j. Fatigue analysis k. Pushover analysis		H
	BRS14-N2	Ability to create and analyse the following element types: a. Beam elements (Straight, and curved and tapered) b. Plate, shell and membrane elements c. Plane stress and plane strain elements d. Solid and tetrahedral elements e. Contact elements f. Composite elements g. Cable elements h. Library of standard sections profiles in SA		H
	BRS14-N3	Capability to create and analyse the following material types: a. Concrete b. Steel c. Timber d. Aluminium e. Customised materials		H

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	BRS14-N4	Capability for interactive model generation.		H
	BRS14-N5	Capability to generate automesh.		H
	BRS14-N6	Capability to select profiles from the South African section profile database.		H
	BRS14-N7	Capability to custom section input.		H
	BRS14-N8	Capability to analyse a general section property.		H
	BRS14-N9	Capability to generate wind loading.		H
	BRS14-N10	Capability to automatically generate design envelopes (Bending, Shear, Torsion).		H
	BRS14-N11	Capability to import architectural drawing/models to develop 3D structural models for analysis and later be used for relevant designs.		H
	BRS14-N12	Capability to export design loads/stresses to design modules.		H
	BRS14-N13	Capability to assigned spring supports and prescribed displacements.		H
	BRS14-N14	Capability to release nodes in any degree of freedom and to vary stiffness at nodes.		H
	BRS14-N15	Capability to analyse the structure in accordance with SANS and Eurocode loading codes for seismic and wind actions to structure.		H
	BRS14-N16	Capability for a CAD integrated modelling environment that provides bidirectional, direct and associative interfaces which allow the user to alter the design parameters or dimensioning without needing to reapply loads, supports or re-specify boundary conditions.		H

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	BRS14-N17	Capability to allow the user to modify dimensions of a structure, without requiring remodelling the structure. a. The user can use native CAD geometry directly, without requiring translation of intermediate geometry formats. b. The model is not built up from elementary nodal level by the user, but instead the program uses a 3D CAD model to generate elements as required.		
Perform concrete design	BRS15-O1	Capability to perform the concrete member design of beams, slabs, columns, foundations, retaining walls and pile caps.		H
	BRS15-O2	Capability to perform crack width (bending and thermal) design.		H
	BRS15-O3	Capability to perform punching shear design.		H
	BRS15-O4	Capability to perform pre-stressed member design.		H
	BRS15-O5	Capability to perform a custom section design.		H
		Capability to design concrete member sections for flexure, axial, shear, torsion and deflection in accordance to SANS and Eurocode standards.		H
	BRS15-O6	Capability to model reinforced concrete shapes such as concrete beams, columns, slabs, walls, spread footings, and continuous footings, all with parametric behaviour. Changes to the concrete shape cause the rebar to adjust automatically.		H
	BRS15-O7	Capability to model complex reinforced concrete shapes, including curves, sloping, or non-orthogonal shapes.		
	BRS15-O8	Capability to generate calculation reports.		H
	BRS15-O9	Capability to generate engineering sketches.		H
	BRS15-O10	Develop bending schedules.		H
	BRS15-O11	Capability to generate Bill of Materials, which includes quantities, cut lengths, member profiles.		H

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	BRS15-O12	Capability to interface with analysis model.		H
	BRS15-O13	Capability to produce rebar placing drawings, including sections, plans, details, bar bending schedules, material take-offs and beam/column/footing schedules, all based on the 3D model.		H
Perform geotechnical engineering	BRS16-P1	Capability to monitor rock performance and stability.		H
Perform steelwork design	BRS17-Q1	Capability to perform steelwork design.		H
	BRS18-R1	Capability to perform the following design checks: a. Cross and longitudinal bending b. Shear c. Axial force d. Torsion e. Combined bending, shear, axial force and torsion f. Interaction check for different conditions.		H
	BRS18-R2	Capability to analyse members exposed to elevated temperatures.		H
	BRS18-R3	Capability to analyse deflection.		H
	BRS18-R4	Capability to perform crane gantry girder analysis and design.		H
	BRS18-R5	Capability to design in accordance with: a. SANS 10162-1 and 2, b. Eurocodes 1, 2 and 3 c. British Standard		H

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	BRS18-R6	Capability to perform connection design, which includes the following as minimum: a. Using member forces extracted from the analytical model b. Allow for custom loading c. Base plate design d. Beam column connections (pinned and fixed) design e. Fin plate design f. End plate (pinned and fixed) design g. Haunch connection design h. Bracing connections design i. Welding design j. Beam /Column splice connections design k. Gusset plates design l. Double angle web cleats design		H
	BRS18-R7	Capability to develop bill of materials/bill of quantities.		H
	BRS18-R8	Capability to analyse custom sections.		H
	BRS18-R9	Generate calculation reports, including connection diagrams.		H
	BRS18-R10	Generate engineering design sketches.		H
	BRS18-R11	Capability to interface with analysis model.		H
	BRS18-R12	Capability to create layouts/ legend showing allocated connection and member names/ groups.		H
Perform bridge design	BRS18-R13	Capability to produce drawings for all steel shapes, connections, and plate-work from the 3D model. Easily create comprehensive drawings including dimensions, notes, labels, and part lists. Any out-of-date drawings are automatically updated based on changes to the 3D model.		H
	BRS19-S1	Capability to perform bridge modelling.		H
	BRS19-S2	Capability to do analysis for bridge design.		H
	BRS19-S3	Capability to capture roadway geometry and topography.		H
	BRS19-S4	Capability to design and analyse concrete and steel bridges.		H

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	BRS19-S5	Capability to generate detail reports.		H
	BRS19-S6	Capability to create 3D and 2D drawings for sections, elevations plans.		H
	BRS19-S7	Capability to develop detail rebar schedules, quantities and drawings using the ability to integrate with structures software.		H
	BRS19-S8	Capability to perform bridge clash detection.		H
	BRS19-S9	Capability to perform sequence construction and phasing.		H
Perform masonry design	BRS20-T1	Capability to perform masonry design.		H
	BRS20-T2	Capability to generate calculation reports.		H
	BRS20-T3	Capability to generate design sketches.		H
	BRS20-T4	Capability to generate Bill of Quantities.		H
	BRS20-T5	Capability to design of the following for all loading types incl. live, dead, seismic, wind, explosion/ blast forces: <ol style="list-style-type: none"> Stiffened and unstiffened single-leaf and cavity walls; Variable support conditions, including partially fixed; Switch between design codes (SANS, Eurocodes and British Standards) to compare results; Concentrated vertical load analysis and design; Add lateral line loads at any point on the wall; Load bearing and infill wall panels; Opening span direction options; Piers in tension or compression; In-plane loads for shear walls; Include multiple wind posts; Masonry walls and columns. 		H

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Perform advanced structural analysis	BRS21-U1	The advanced structural analysis software/program further has the following functionality: a. Ability to analyse effect of temperature loads, b. Ability to transfer heat between elements exposed to different temperature conditions. c. Ability to accurately determine the thermally induced stresses due to increase temperature conditions in bodies that are fully or partially restrained.		H
	BRS21-U2	Capability to perform load analysis of loose or partially connected bodies contained in a structure subjected to non-linear and non-static loads, a. For example seismic load analysis of water or solids containing structure, such as load imposed onto structure from coal in a silo during a seismic event.		H
	BRS21-U3	Capability to exercise parameter and dimensioning control a. The user can create attributes and parameters with the CAD system that is directly used to generate the FEA model, meshing or analysis. i.e. the user can create a parameter for the diameter of a cylinder. If this diameter is revised, the user can then update this parameter, whereby the FEA model is automatically updated accordingly and all relationships to the cylinder is maintained/not broken.		H
	BRS21-U4	Capability to perform automatic merging of nodes when meshing complex shapes that meet/coincide, where no intervention is required from the user to align nodes between the converging shapes.		H

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	BRS21-U5	Capability to generate boundary conditions between structures' surfaces that are disjointed and that may collide, slide, slip or press against each other, with frictional forces accounted for and where the one body can impose a load onto and deform the adjacent body. Examples include modelling of friction grip bolted connections, pretensioning, slide bearings and contact modelling.		H
	BRS21-U6	Capability to model loads as functional loads.		H
	BRS21-U7	Capability to analyse machine block foundation for dynamic loading, including rotating and reciprocating machines and soil spring options.		H
	BRS21-U8	Capability to perform in-depth analysis review using dynamic graphs and detailed formulae in reports.		
Perform architectural design	BRS22-V1	Capability to have a built in 3D rendering option and have an ability to be export or plugin to other 3D rendering programs		H
	BRS22-V2	Capability to have tools (floor slab tool, wall tool, windows and doors tool, roof tool) these tools should allow the user to adjust measurements (heights, widths etc.) without having to draw every single line of each component in a model space.		H
	BRS22-V3	Capability for all tools to be able to show different finishes for walls, windows, doors, floors and roofs, these are important for the concept phase where 3D modelling is done, it becomes easier for every discipline to see what exactly a building being presented by an Architect is going to look like.		H
	BRS22-V4	Capability to generate schedules of doors and windows used in the drawing.		H
	BRS22-V5	Capability to generate schedules of floor areas, room numbers etc.		H

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	BRS22-V6	Capability to generate fenestration calculations.		H
Perform 3D modelling/ Technical Design	BRS23--W1	Capability to create and modify 2D and 3D drawings.		H
	BRS23--W2	Capability to import 3D scans data.		H
	BRS23--W3	Capability to remodel 3D scans data.		H
	BRS23--W4	Capability to create drawings including isometrics, Piping and Instrumentation Diagram (P&ID), machine and workshop drawings.		H
	BRS23--W5	Capability to modify element attributes including but not limited to: <ul style="list-style-type: none"> a. Line weights b. Colour c. Line style d. Transparency 		H
	BRS23--W6	Capability to generate parts/materials list table to insert on drawings or export to excel.		H
	BRS23--W7	Capability to create property tags and populated business data.		H
	BRS23--W8	Capability to create catalogue cells e.g.; SANS pipe fittings, structural members from spreadsheets.		H
	BRS23--W9	Capability to do clash detection of hard objects, maintenance and clearance volumes.		H
	BRS23--W10	Capability to script macros to automate repetitive tasks.		H
	BRS23--W11	Capability to use geographic co-ordinate projection systems and synchronise with 3D representation of the earth based satellite imagery system.		H
	BRS23--W12	Capability to perform terrain modelling.		H
	BRS23--W13	Capability to have interoperability and be flexible to interface with other systems.		H
	BRS23--W14	Capability handle large 3D models with may consist of elements, surfaces, solids, smart solids, meshes, point clouds, raster's.		H
	BRS23--W15	Capability to perform 3D modelling and produce drawings to the level of detail design.		H

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	BRS23—W16	Capability to integrate with Building Information Management (BIM).		
	BRS23—W17	Capability to perform Finite Element Analysis (FEA) within the CAD model.		H
	BRS23—W18	Capability to direct free form modelling.		H
	BRS23—W19	Capability to convert images and pdf files to DGN and DWG and managing raster to vector.		H
	BRS23—W20	Capability for CAD work to be done in an integrated environment and to collaborate from different Eskom sites.		H
	BRS23—W21	Capability to have point cloud feature recondition (piping and structure).		H
	BRS23—W22	Capability to access and view Reni diagrams.		H
	BRS23—W23	Capability to view and edit single line diagrams and network diagrams.		H
	BRS23—W24	Capability to import 3D model into structural analysis software.		H
	BRS23—W25	Capability to perform 3D modelling and technical design.		H
	BRS23—W26	Capability to perform arrangement design.		H
	BRS23—W27	Capability to perform draughting 2D engineering drawings.		H
	BRS23—W28	Capability to generate process flow diagram.		H
Perform roads and railways design	BRS24-X1	Capability for user to design application for surveying, drainage, subsurface and utilities.		H
Perform rail design	BRS25-Y1	Capability to analyse rail track regressions – convert surveys of track data into full alignments by using a regression analysis.		H
	BRS25-Y2	Capability for automated rail drawing.		H
	BRS25-Y3	Capability to automate rail drawing production, including profiles and cross sections.		
	BRS25-Y4	Capability for design and analyse rail and road corridors.		H
	BRS25-Y5	Capability to design and place rail signals.		H

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	BRS25-Y6	Capability for design modelling – ability to easily integrate imagery, point clouds and 3D meshes into design and construction models.		H
	BRS25-Y7	Capability to design rail track drainage systems and geometry.		H
	BRS25-Y8	Capability to design yard, station, and siding.		H
	BRS25-Y9	Capability to design rail overhead line systems.		H
	BRS25-Y10	Capability to reuse common design layouts.		H
Perform road design	BRS26-Z1	Capability to create horizontal and vertical alignments.		H
	BRS26-Z2	Capability to create profiles and cross-sections.		H
	BRS26-Z3	Capability to design and analyse corridors.		H
	BRS26-Z4	Capability to design in context – by easily integrating traditional survey, imagery, point clouds, and 3D reality meshes into design and construction models.		H
	BRS26-Z5	Capability to model and analyse terrain.		H
	BRS26-Z6	Capability to model, analyse and design complete storm water and sanitary sewer networks.		H
	BRS26-Z7	Capability to model earthworks.		H
	BRS26-Z8	Capability to reuse common design layouts.		H
	BRS26-Z9	Capability to perform road way design.		H
Manage dams, waterways and hydro analysis	BRS27-AA1	Capability to perform water distribution modelling and analysis.		H
	BRS27-AA2	Capability to allocate and estimate sanitary loads by: <ul style="list-style-type: none"> a. Applying hydrographs, patterned loads, and unit loads using comprehensive and customizable engineering libraries. b. Assessing consumption, flow monitoring, land use, or census data in GIS to automatically estimate and import sanitary loads into sewer models. 		H

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	BRS27-AA3	Capability to allocate and estimate storm water loads by: a. Loading models with wet weather runoff flows derived from precipitation using the built-in rainfall distributions or user-defined rainfall events. b. Computing appropriate runoff methods.		H
	BRS27-AA4	Analyse hydraulics and combined sewer overflows: Multiple solvers analysing: Saint Venant equations, convex/gradually varied flow solver (steady-state analysis for extreme flow conditions and extended period simulations), and rational/gradually varied flow solver.		H
	BRS27-AA5	Capability to analyse Hydrogen Sulphide Formation a. Identify at risk of damage networks from hydrogen sulphide (H ₂ S) formation, which can lead to potential collapses if not addressed. b. Produce average concentration runs, display result maps of the network, and compare H ₂ S formation according to various conditions such as temperature.		H
	BRS27-AA6	Capability to analyse inlet capacities by: a. Calculating the proportion of storm water runoff that will enter an inlet versus the proportion that will be carried downstream in a gutter or pond on the road surface. b. Accurately confirming that the spread of flow in a gutter doesn't exceed design requirements.		H

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	BRS27-AA7	<p>Capability to build and manage hydraulic models by:</p> <p>Leveraging and importing many well-known external data formats, this maximizes ROI (Return on Investment) on geospatial and engineering data and automates input data generation.</p>		H
	BRS27-AA8	<p>Capability to design and analyse culverts by:</p> <p>Selecting from a library of standard culvert shapes, materials, and entrance conditions, then compute culvert headwater and tailwater elevations using calculation methodologies outlined in South African National Roads Agency(SANRAL) drainage manual and other appropriate literature</p>		H
	BRS27-AA9	<p>Capability to design and analyse low impact development controls by:</p> <p>Modelling the effect that low impact development controls have in retaining runoff before it enters the storm water system.</p>		H
	BRS27-AA10	<p>Capability to design and analyse pond dams, inlets and outlets by:</p> <p>Setting the maximum outflow rate, estimate storage, and check the outlet design and final design</p>		H
	BRS27-AA11	<p>Capability to design sanitary sewers by:</p> <ol style="list-style-type: none"> Minimizing capital investments by entering design restrictions: velocities, slopes, cover depths, and pipe and manhole matching offsets. Recommending the most cost-effective pipe sizes and inverts elevations, avoiding unnecessary pipe trench excavation, while meeting design restrictions. 		H

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	BRS27-AA12	<p>Capability to design storm water system by:</p> <p>Minimizing capital investments by entering design restrictions: velocities, slopes, cover depths, and pipe and inlet matching offsets. The software product recommends the most cost-effective pipe sizes and invert elevations, avoiding unnecessary pipe trench excavation, while meeting design restrictions.</p>		H
	BRS27-AA13	<p>Capability to simulate water quality by:</p> <p>Simulating the generation, inflow, and transportation and treatment of any number of user-defined pollutants, such as total suspended solids or heavy metals.</p>		H
	BRS27-AA14	<p>Capability to design and analyse culverts by:</p> <p>Selecting from a library of standard culvert shapes, materials, and entrance conditions, then compute culvert headwater and tailwater elevations using calculation methodologies outlined in SANRAL Drainage Manual and other appropriate literature.</p>		H
	BRS27-AA15	<p>Capability to interpret and present modelling results by:</p> <p>Viewing detailed tables, reports, rating curves, and more, that show results of the hydraulic calculations performed.</p>		H

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	BRS27-AA16	Capability to add real-world digital context and visualization by: a. Assessing flood risks for urban, riverine, and coastal systems with real-world digital context in the form of a 3D reality mesh from Context Capture. b. Bring simulations to life by generating realistic visualizations of flood events helping stakeholders understand the risks and impacts of flooding events and potential mitigation actions.		H
	BRS27-AA17	Capability to analyse flood inundation areas and flood hazard by: Easily calculating the extent of flooded areas and estimate the flood hazard based on water column heights and peak flow velocities		H
	BRS27-AA18	Capability to produce visually appealing animations by: Exploring and present model results using a wide range of integrated visualization capabilities, including the option to make smooth, continuous animations of the obtained results.		H
	BRS27-AA19	Capability to set up scenario management by: Creating new scenarios and make comparisons among different alternatives which allows rapidly find the best solution for flood risk mitigation.		H

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	BRS27-AA20	Capability to simulate river flows by: a. Calculating river flow using kinematic, dynamic, and diffusion wave approaches. b. Simulating the exchange of water between the river flow and (sub) surface flow based on hydraulic gradients and contains capabilities to estimate the drainage network from topographic maps and to interpolate cross sections in space.		H
	BRS27-AA21	Capability to simulate surface runoff by: a. Multiple methods to route surface runoff, including kinematic, dynamic, and diffusion wave approaches, using a fully distributed 2D grid with an optional 1D grid. Water from surface runoff can infiltrate, enter into a river, or evaporate. b. Containing capabilities to prepare spatial data required to calculate surface runoff. For example, the application estimates manning's coefficients from land use maps.		H
	BRS27-AA22	Capability to simulate urban/rural floods by: Simulating flooding in urban/rural areas by integrating capabilities, fully evaluate the flow of water in the piped subsurface network, river and coastal systems, the surface flow, and the exchange of water between all those systems.		H
	BRS27-AA23	Capability to work in a visual rich environment by: Integrating GIS engine that allows: open, edit, and visualize all kinds of data files that the model needs. Layers can be styled in multiple ways.		H

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	BRS27-AA24	<p>Capability to analyse transients by:</p> <p>Controlling transients by performing a transient analysis to locate trouble spots and determine appropriate surge control strategies. Precise transient simulation to decrease the risk of approximating the behaviour of protective devices and rotating equipment (pumps and turbines).</p>		H
	BRS27-AA25	<p>Capability to analyse pipe and valve criticality by:</p> <p>Finding the weak links in water distribution systems and assess the adequacy of isolation valves. Evaluate the ability to isolate portions of the system and serve customers using different valve locations. Automatically generate network segments once the isolation valve data is supplied.</p>		H
	BRS27-AA26	<p>Capability to assess fire flow capacity by:</p> <p>Using a water distribution hydraulic model to access and identify where fire protection is inadequate. Design improvements such as the sizing and location of pipes, pumps, and tanks in order to meet fire-flow and protection requirements.</p>		H
	BRS27-AA27	<p>Capability to design water distribution systems by:</p> <p>Using a hydraulic model results to help optimize the design of complex water distribution systems and utilize built-in scenario management features to keep track of design alternatives. Optimize the design.</p>		H

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	BRS27-AA28	Capability to develop flushing plans by: Optimizing flushing programs with multiple conventional and unidirectional flushing events in a single run.		H
	BRS27-AA29	Capability to increase velocity in mains to flush out solids and stale water, with the primary indicator of the success of flushing being the maximum velocity achieved in any pipe during the flushing operation.		
	BRS27-AA30	Capability to identify water loss by: Conserving water and increase revenues by reducing water loss. Leverage flow and pressure data to find locations for detailed sonic leak detection.		H
	BRS27-AA31	Capability to study the amount by which one can expect to reduce leakage by reducing pressure and see the impact on customer service.		
	BRS27-AA32	Capability to manage energy use by: Modelling pumps accurately using hydraulic modelling, including complex pump combinations and variable speed pumps, to understand the impact that different pump operational strategies have on energy usage.		H
	BRS27-AA33	Capability to minimize energy related to pumping costs while maximizing system performance.		

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	BRS27-AA34	<p>Capability to prioritize pipe renewal by:</p> <p>Identifying the pipes that should be considered for replacement or repair. Pipe links are ranked based on several aspects, including property- and performance-based criteria. Benefits that result include improved asset planning, increased distribution capacity, and maximum returns on capital expenditures.</p>		H
	BRS27-AA35	<p>Capability to simulate networks in real time by:</p> <p>Connecting calibrated hydraulic models to Supervisory Control and Data Acquisition (SCADA) systems so that the initial boundary conditions for the model are automatically updated with the latest real-time data.</p>		H
	BRS27-AA36	<p>Capability to use the real-time model to keep an eye on the system and help ensure it is operating effectively.</p>		
	BRS27-AA37	<p>Capability to create project deliverables by:</p> <ul style="list-style-type: none"> a. Generating consistent, high-quality deliverables such as paper plots, reports, 2D/3D PDFs, i-models, and 3D physical models. b. Creating annotation, display styles, and reports directly from the embedded properties of objects to ensure that they will always remain in sync with the design model during work-in-progress. 		H

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	BRS27-AA38	Capability to design in context by: a. Clearly understanding existing conditions and accelerates design modelling workflows with the ability to easily integrate imagery, point clouds, and 3D reality meshes into design and construction models. b. Integrate geospatial information to ensure that models are precisely geospatially located.		H
	BRS27-AA39	Capability to design with 3D parametric modelling by: a. Developing complex design models with a wide range of design modelling tools, including surface, mesh, feature, and solid modelling. b. Building parametric functional components with predefined variations to easily find and manage many similar components. c. Using drawing extraction tools which automatically immerse drawings within models for improved clarity and streamlined documentation workflows.		H
	BRS27-AA40	Capability to enforce standards by: a. Ensuring the proper application of organizational and project-specific standards and content. b. Applying templates to control geometry and data standards such as styles for dimensions, text, lines, detail symbols, and more. Once designs are complete, use automated tools to check drawings for standards compliance. Discover how one can manage design changes and drawing standards, and control and protect files.		H

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	BRS27-AA41	Capability to lay out and annotate drawings by a. Creating precise drawings using a comprehensive set of drafting tools to rapidly progress designs from concept to completion. b. Using persistent constraints to maintain design intent and speed drafting and annotation workflows with intelligent, interactive snapping and dynamic data entry.		H
	BRS27-AA42	Capability to produce animations and renderings a. Secure stakeholder confidence by producing realistic movies and simulations from design, construction, and operational models. Choose from key frame and time-based animation. b. Get results faster, using live on-screen animation previews and distributed network processing. Create lifelike visualizations and access online and delivered libraries of physically correct materials, lighting, and rich photorealistic content.		H
	BRS27-AA43	Capability to visualize and analyse designs: a. Understand designs more clearly by analysing and performing data visualizations on models based on their geometry or underlying attributes. b. Perform analysis of real-world solar exposure and shading. c. Apply real-time display styles to visualize models based on each object's height, slope, aspect angle, and other embedded properties. d. Visualize reality meshes based on associated spatial and attribute data.		H

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	BRS27-AA44	Capability to work collaboratively on designs by: <ol style="list-style-type: none"> Viewing and working with design information from others in real time using live referencing of 2D and 3D DGN, DWG, and large image files, refreshed on demand. Creating and exchanging digital mark-ups of designs. Tracking and easily understand changes made to design files, even at the component-level, throughout their lifecycle. Improve enterprise-wide collaboration through integration. 		H
	BRS27-AA45	Capability to work in a personalized environment <ol style="list-style-type: none"> Confidently work in the right context for each project with the required settings and standards automatically applied. Instantly get help and achieve mastery with access to a comprehensive library of learning content. Personalize and group tools and tasks and reduce keystrokes with customizable menus. 		H

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	BRS27-AA46	Capability to access manufactured components by: <ul style="list-style-type: none"> a. Accessing cloud services enabling faster access and more consistent use of manufactured components and organization or project-specific content and standards. b. Use the parametric components in specific applications and industries across multidiscipline project teams, while supporting knowledge sharing between personnel and enabling the persistence of component information across the asset lifecycle. 		H
	BRS27-AA47	Capability to automate the production of high-quality drawings, including multidiscipline documentation sets, which are consistent across the entire project.		H
	BRS27-AA48	Capability to conceptualize and detail site designs by: <ul style="list-style-type: none"> a. Creating, revising, and optimizing multiple design scenarios for commercial, industrial projects. b. Conceptualize and detail design features using auto-drawing capabilities and interactive 3D modelling. 		H
	BRS27-AA49	Capability to integrate multidiscipline models in site designs by: Ensuring models represent all project information by incorporating site designs, drainage, driveways, buildings, and other site features. Import models to readily view the model holistically in the proposed environment.		H

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	BRS27-AA50	<p>Capability to model, analyse, and design complete storm water and sanitary sewer networks by:</p> <ul style="list-style-type: none"> a. Creating, manipulating, designing, and analysing storm water and sewer networks that are fully integrated with civil infrastructure project. b. Manipulating networks in plan or profile views, displaying not only the drainage model but also other utilities. 		H
	BRS27-AA51	<p>Capability to optimize earthwork by:</p> <p>Employing a highly advanced optimization engine for earthwork allowing designers to quickly and easily explore alternatives. Solver to run thousands of iterations based on designer-defined constraints for each site layout to find the best cost of construction. Differing design scenarios can be evaluated, design changes can be implemented, and critical grading elements such as walls and berms can be dynamically evaluated for cost.</p>		H

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Functionality grouping	BRS Number	Functionality	Business Rule No and Description	Priority/phasing
	BRS27-AA52	<p>Capability to optimize site layout by</p> <ul style="list-style-type: none"> a. Simplifying site layouts with designer-defined parametric drawing capabilities of parking lots, buildings, drives, and walkways. Intelligent site layout offers iterative and dynamic interaction of key design components across the project, dramatically speeding up the design process and allowing designers to focus on engineering and efficiency. b. Design changes, whether exploring alternatives or addressing client feedback, are fast and easy due to the dynamic interaction of elements. c. Re-position buildings, modify parking areas, and add drives and walks all while evaluating the results and responding to project stakeholder feedback. 		H
	BRS27-AA53	<p>Capability to perform design-time analysis by:</p> <p>Ensuring visibility into overall project performance with design-time analytics to achieve optimized design outcomes for a wide variety of analysis such as drainage, terrain, safety, grading, site visibility, and more.</p>		H
	BRS27-AA54	<p>Capability to reuse common design layouts by:</p> <p>Using civil cells to ensure standards are implemented, increase design quality, and eliminate the need to repeatedly design common configurations. If a user can design it, then a civil cell can handle it. There is no limit to the simplicity or complexity of a civil cell.</p>		H

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Functionality grouping	BRS Number	Functionality	Business Rule No and Description	Priority/ phasing
	BRS27-AA55	Capability to support BIM workflows by: Exporting digital deliverables, including Industry Foundation Class (IFC), to support industry BIM workflows. Use Asset Manager to include component attribution for a more efficient, data-rich BIM deliverable. Advance your BIM workflows in a digital twin authoring environment while supporting the creation of all traditional and digital design deliverables.		H
	BRS27-AA56	Capability to visualise designs by: a. Experiencing designs in real time with constraint-driven templates, a context sensitive intuitive interface, and dynamic 3D modelling. b. Visualizing the design at any time and on demand within the modelling workflow. No translations, software, or special workflow process is needed.		H
Manage line engineering	BRS28-BB1	Capability to evaluate, isolate portions of the system and serve customers using different valve locations. Automatically generate network segments once the isolation valve data is supplied.		H
	BRS28-BB2	Capability to manipulate networks in plan or profile views, displaying not only the drainage model but also other utilities.		H

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Functionality grouping	BRS Number	Functionality	Business Rule No and Description	Priority/phasing
	BRS28-BB3	Capability to perform engineering design for substations such as: a. Protection Schemes b. Metering c. Substation layouts d. Earthing and grounding layouts e. Architectural drawings for control rooms f. Create 2D drawings for construction and substation electrical layout g. Create schematic drawings for control purposes h. Create graphs and simulations i. Civil design j. Structural design k. Stormwater management/hydrologic analysis/hydraulic structure design l. Drainage design to support water based fire protection systems m. Access road design.		H
	BRS28-BB4	Capability for user to be able to access attributes and selects design, complex overhead lines in different voltages including: a. Survey b. Tower spotting- line design- c. Route selection d. Substations and other infrastructure		H
	BRS28-BB5	Capability to design land surveying using line lidar visual.		H
	BRS28-BB6	Capability to create 3D substation models and 2D drawings: a. Design substation physical layout b. Design substation protection and control c. Estimate substation materials d. Generate substation construction deliverables.		H
	BRS28-BB7	Capability to design structures and export PLS CAD files		H
	BRS28-BB8	Capability to design of access roads in and around substations/sites.		H
	BRS28-BB9	Capability to exchange intelligent CAD information by exporting and importing attribute data shape files.		H

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Functionality grouping	BRS Number	Functionality	Business Rule No and Description	Priority/phasing
	BRS28-BB10	Capability for Geographic Information System (GIS) interoperability (ability of computer system or software to exchange and make use of information)-creation and analysis of 2D and 3D models.		H
	BRS28-BB11	Capability to allow user to be able to perform the following: a. Specification of plant equipment b. Design of safety and working clearances c. Design of foundation, structures and busbars d. Design of lightning shielding systems. e. Design of utilities for the substation. f. Design of cabling systems.		H
	BRS28-BB12	Capability for the user to mark and count occupied stands for electrification projects.		H
	BRS28-BB13	Capability to export data to a geospatial software application displays a virtual globe which offers the ability to analyse and capture geographical data to see if stands are aligned.		H
	BRS28-BB14	Capability for control diagram and plant protection schematics, power plant substation, electrical, mechanical, architectural and civil design.		H
	BRS28-BB15	Capability to view all multiple files from other package version files		H
	BRS28-BB16	Capability for terrain modelling and raster files.		H
	BRS28-BB17	Capability to design cadastral lines, roads and servitudes.		H
	BRS28-BB18	Capability to manage maps by: a. Merging maps b. Integrating plans and designs c. Operate diagrams d. Check fault level of the infrastructure.		H
	BRS28-BB19	Capability to support the creation, maintenance, analysis and sharing of 2D and 3D geospatial information and create contours.		H

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Functionality grouping	BRS Number	Functionality	Business Rule No and Description	Priority/phasing
Manage coal power plant turbine engineering	BRS29-CC1	Capability for condition monitoring diagnostics and collection of vibration signals for: a. Turbo machinery b. Hydro turbines and generators c. Wind turbines d. Reciprocating compressors e. Industrial gas turbines f. Aero derivative gas turbines g. Electric motors.		H
	BRS29-CC2	Capability to use 2D and 3D tools.		H
	BRS29-CC3	Capability for Standard for the Exchange of Product (STP) files compatibility. It is a usable interfacing file type used between different programs.		H
	BRS29-CC4	Control and Instrumentation(C&I) design database for creating models that links, panel arrangement drawings, cross-reference drawings, automated diagram.		H
Migration management	BRS30-DD1	Provide migration toolset to import data from the current system to the new system.		H
	BRS30-DD2	Capability for the audit trail for migration, errors, exception report and for fixing.		H
	BRS30-DD3	Capability to allow the form rebuild for all current workflow.		H

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7.3 Information/data requirements

7.3.1 Define the following information:

Classification of data / information	Data / Information type	Confidentiality of information (refer to previous page for quick reference)	Confidentiality level of information (refer to previous page for quick reference)	Availability of data	Migration of data
Operational, governance and legislative requirements	↳ Structural data ↳ Process mechanical & piping ↳ Instrumentation data ↳ Electrical data ↳ Building data ↳ Drafting and deliverables ↳ Construction and commissioning data ↳ Visualisation data ↳ Project collaboration & document management data ↳ Asset management & performance data ↳ Site and structure design data ↳ Data analysis	Controlled disclosure	High	24/7/365	Data Migration is required for all EEMS suite applications All data required to migrate from the current Eskom configuration to the cloud based version


7.3.2 If any data is currently not available the business needs to define the plans they have in place to ensure how and when the data will be available.

BRS Number	Gap	Owner of data	Business plan to source data
	Not applicable		

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7.4 System Requirements

Nr	Requirement Name	Functionality	Phasing / Priority
SR1	Assets	<ul style="list-style-type: none"> • Capability for the system to be compatible to the Eskom's current assets which have 500 CAD software platform v8i Node licences from EEMS. • Capability to have 10 DMS servers to be decentralised country wide at remote sites with their own database instances and files. There are +- 2TB of files per site(+20TB). Estimated 8,000 000 dgn CAD files (proprietary format). Hardware to be supplied by the proposed solution provider. • Capability for the database data and files to be in a controlled secured environment which keeps records of the physical files with versions, attached metadata, workflows, audit trail and access rights. Supplier should supply the database service as part of the maintenance and support contract. • Capability for the data assets to be transferrable without losing any part of the data. • Capability to support +- 2000 active users in Eskom using the current CAD systems. 	High

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Nr	Requirement Name	Functionality	Phasing / Priority
SR2	CAD	<ul style="list-style-type: none"> • CAD common capability and compatibility with DMS, Cloud and Web services. • Capability to be compatible to reference files, workspace files, access rights and CAD software platform dgn v8i and i-model file formats. • Capability to keep files in a native format which is in .dgn v8i format. • Capability to publish .dgn v8i files to i-model file format for cloud & web services. • Capability to publish all other files to pdf format for web view users. • Capability to perform and handle 2D and 3D capacity. • Capability to interface with databases. • Capability to add on specialised software such as integrated CAD applications and customised workspace files. 	High

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Nr	Requirement Name	Functionality	Phasing / Priority
SR3	Specialised integrated CAD applications	<ul style="list-style-type: none"> • Capability to have specialised EEMS integrated added software such as: <ul style="list-style-type: none"> ↳ EEMS substation ↳ EEMS structural enterprise ↳ EEMS Inroads ↳ EEMS open plans civil storm ↳ EEMS Map (Geospatial) • Capability to integrate with third party applications from various integrated vendors such as: <ul style="list-style-type: none"> ↳ Power System Simulation Tool- Engineering design lines ↳ Project Design Costing Tool- ↳ NIS- GIS ↳ uCheetah- Engineering design lines ↳ Terra Solid- Civil extension functionality 	High

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Nr	Requirement Name	Functionality	Phasing / Priority
SR4	Customised integrated added CAD applications and work space files	<ul style="list-style-type: none"> • Capability to interface directly with the following customised integrated added software which requires the same functionality when replacing the existing system: <ul style="list-style-type: none"> ↳ MS Access databases(mdb) including XLS & text files ↳ Custom Macros(+ 100 programs) ↳ CAD software platform Visual Basic for Applications(VBA) (+- 20 programs) ↳ CAD software platform Model Development Language(MDL) programs(+20 programs) ↳ Cell libraries(+500 lib's) • Capability to convert the following custom workspace files to be compactible : <ul style="list-style-type: none"> ↳ +- 1500 font libraries ↳ +- 1500 seed files ↳ +- 1500 line styles ↳ +-1500 colour tables ↳ +- 1500 pen tables ↳ +- 1500 print/plot drivers 	High

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Nr	Requirement Name	Functionality	Phasing / Priority
SR5	DMS system integrated with CAD	<ul style="list-style-type: none"> • Capability to manage and integrate existing CAD software platform v8i files in native form which Eskom own 500 node licences. • Capability to integrate with CAD and cloud web service • Capability to integrate with CAD reference files (vector (dgn) & raster (tif,ecw, etc). • Capability to be compatible with the current suite of engineering project collaboration software designed for the architecture engineering, construction industries: <ul style="list-style-type: none"> ↳ Metadata functionality ↳ Version history functionality ↳ Audit trail and history functionality ↳ Numbering system functionality which has customised specialised data per site ↳ Workflow status functionality which has customised specialised data per site. • Require the following mandatory technology functionality: <ul style="list-style-type: none"> ↳ Delta file transfer (DFT) with SQL encryption. ↳ Database indexing contents of DMS which access the vector data information inside the native .dgn v8i files. ↳ AD security setup ↳ Spatial data integration 	High

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Nr	Requirement Name	Functionality	Phasing / Priority
SR6	Cloud and Web services	<ul style="list-style-type: none"> • Capability for control over design, deliverables and the users working on the design. • Common capability and shared service across desktop, mobile, server and cloud. • Capability to access personal learning material, paths and history. • Capability to receive automatic product updates, notifications and product related news. • Capability for project centric analysis and dashboards. • Capability for personal sharing using i-model file format. • Capability to manage user rights, document rights, version controls, audit history records and metadata. • Capability to work offline without internet connection.(software is localised, therefore create or check-out files beforehand and when online, check-in the files). • Capability to access learning content about the software. • Capability for the project information to be stored using encrypted data sent and stored in the Eskom approved cloud platform. 	High

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Nr	Requirement Name	Functionality	Phasing / Priority
SR7	Data migration	<ul style="list-style-type: none"> • Capability for the current +-8 million files in native format .dgn v8i files to be compatible to the CAD software platform. • Required the reference links of the current CAD software .dgn v8i master files including nesting referencing. • Capability for data migration of the following information: <ul style="list-style-type: none"> ↳ Metadata ↳ Version history system information ↳ Audit trail history ↳ Numbering system ↳ Workflow and status information. • Specified timeframe of the system setup and configurations. • Specified timeframe of data migrations which include: <ul style="list-style-type: none"> ↳ Data mapping ↳ Data cleaning ↳ Data transfer migration ↳ Data verification ↳ User Acceptance Testing(AUT) 	High
SR8	Infrastructure	<ul style="list-style-type: none"> • The DMS system should be hosted close at each site using file or caching servers for maximum speed performance but should also be available centralised (Cloud and Web services) for other regions. • Each remote site should have database instances preferably MS Sql Server. • CAD and specialised extension software should be packaged using Microsoft (MS) System Centre Configuration Manager (SCCM). 	High

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Nr	Requirement Name	Functionality	Phasing / Priority
SR9	System performance	<ul style="list-style-type: none"> System performance variables such as network size, network performance, market exposure (Capability to screen the market for an enterprise system similar to this product which was successfully implemented in the past few years which is still performing with support and maintenance agreements). Capability for proof of concept which will include system demonstration testing before acceptance of the product. 	High
SR10	Cost	<ul style="list-style-type: none"> Cost breakdown on the following which includes time frame: <ul style="list-style-type: none"> ↳ Infrastructure and setup.(various options) ↳ Licences ↳ Data migration and support ↳ Training-(Re-training of all users to use the new system). 	High
SR11	Geospatial content	<ul style="list-style-type: none"> Capability to support GIS principles such as Open Geospatial Consortium (OGC), exchange and use of GIS metadata. 	High

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7.5 Data flow diagram OR Context diagram

The figure below depict the an overview of engineering document management and project collaboration system

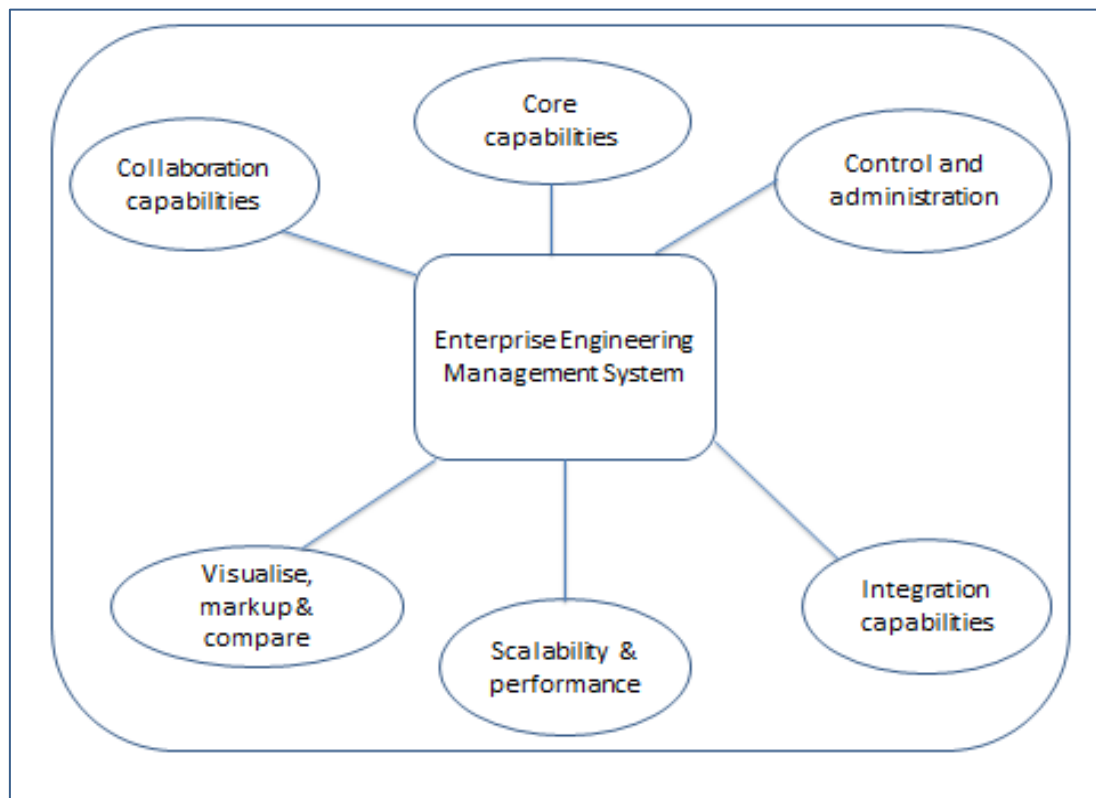


Figure 2: An overview of engineering document management and project collaboration system

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Figure 3: Architect Engineering Construction & Owner (AECO) operated Management System

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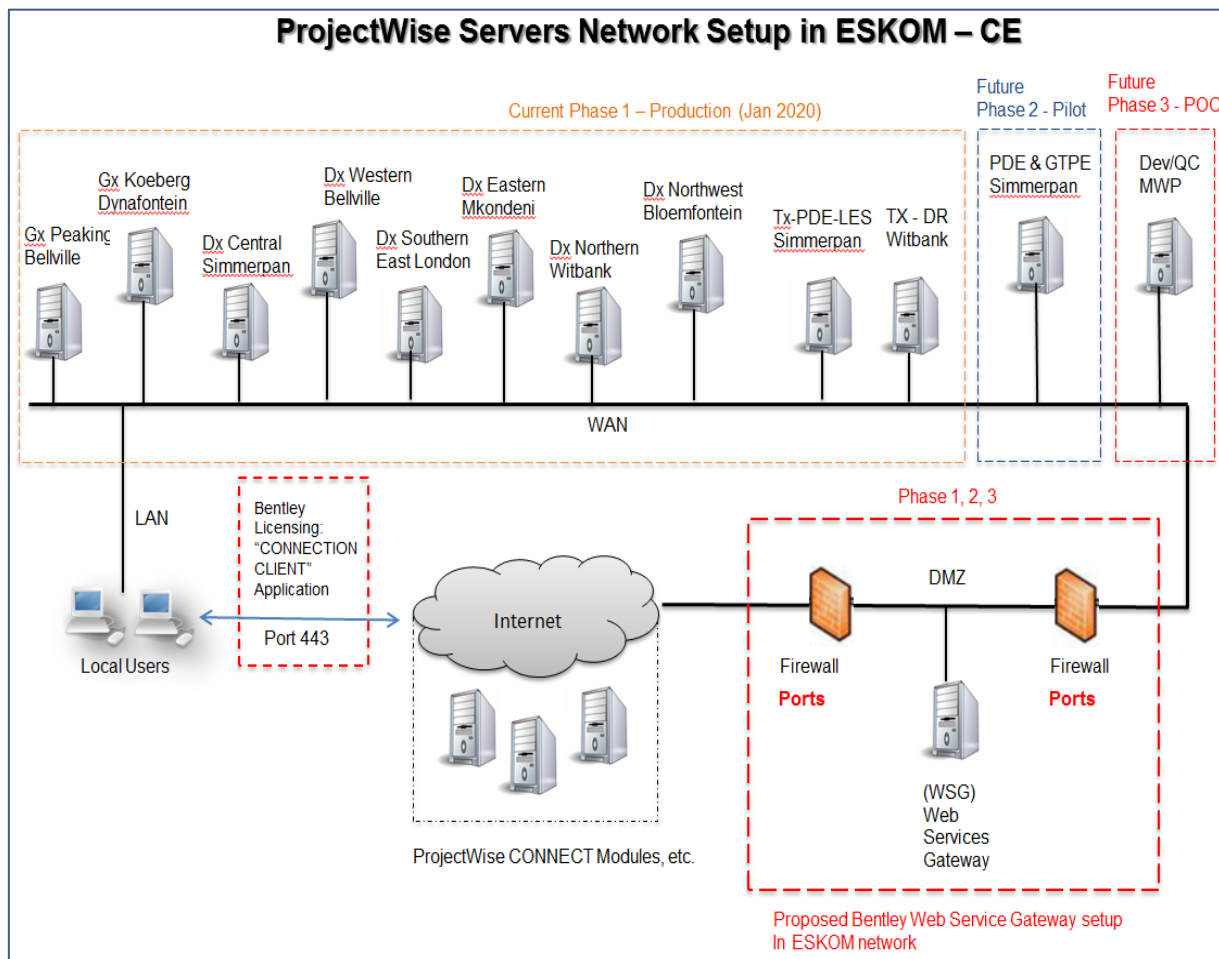



Figure 4: Current centralised engineering project collaboration servers setup (Phase 1)

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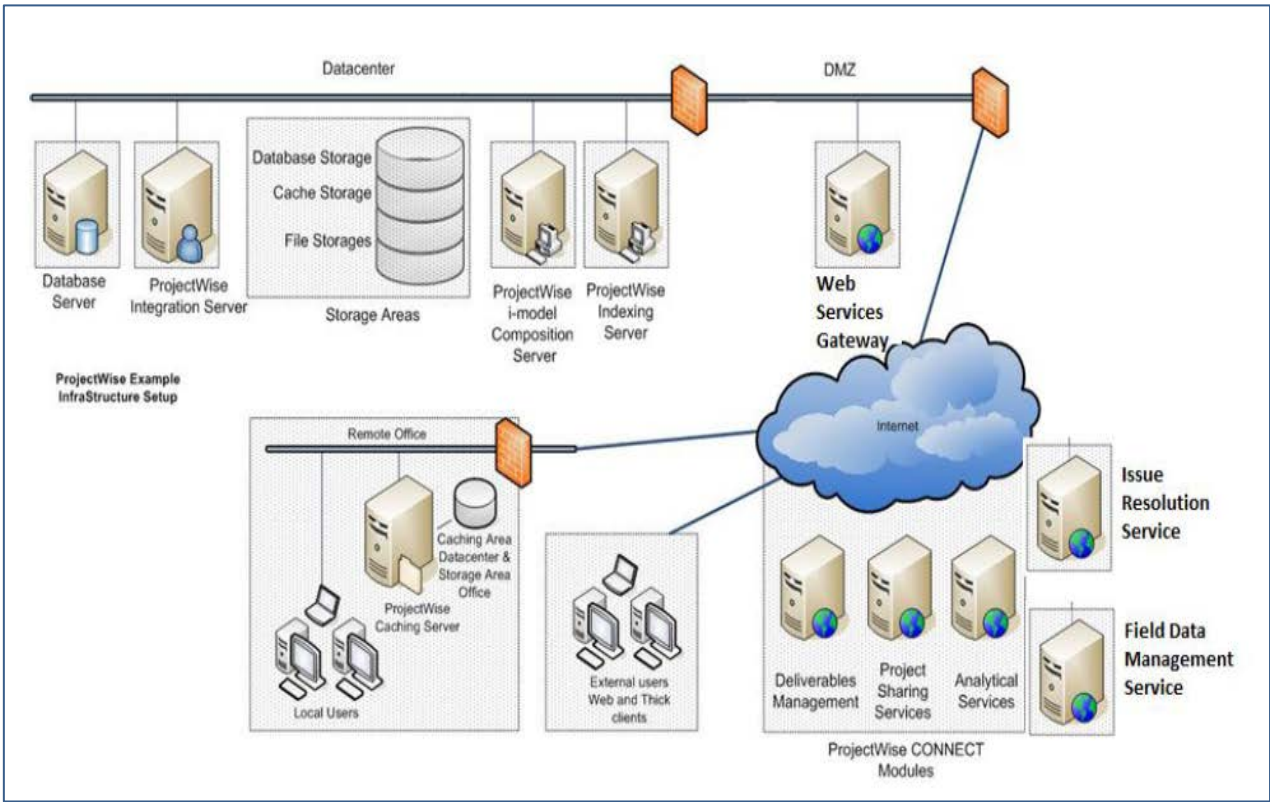



Figure 5: Typical centralised engineering project collaboration infrastructure

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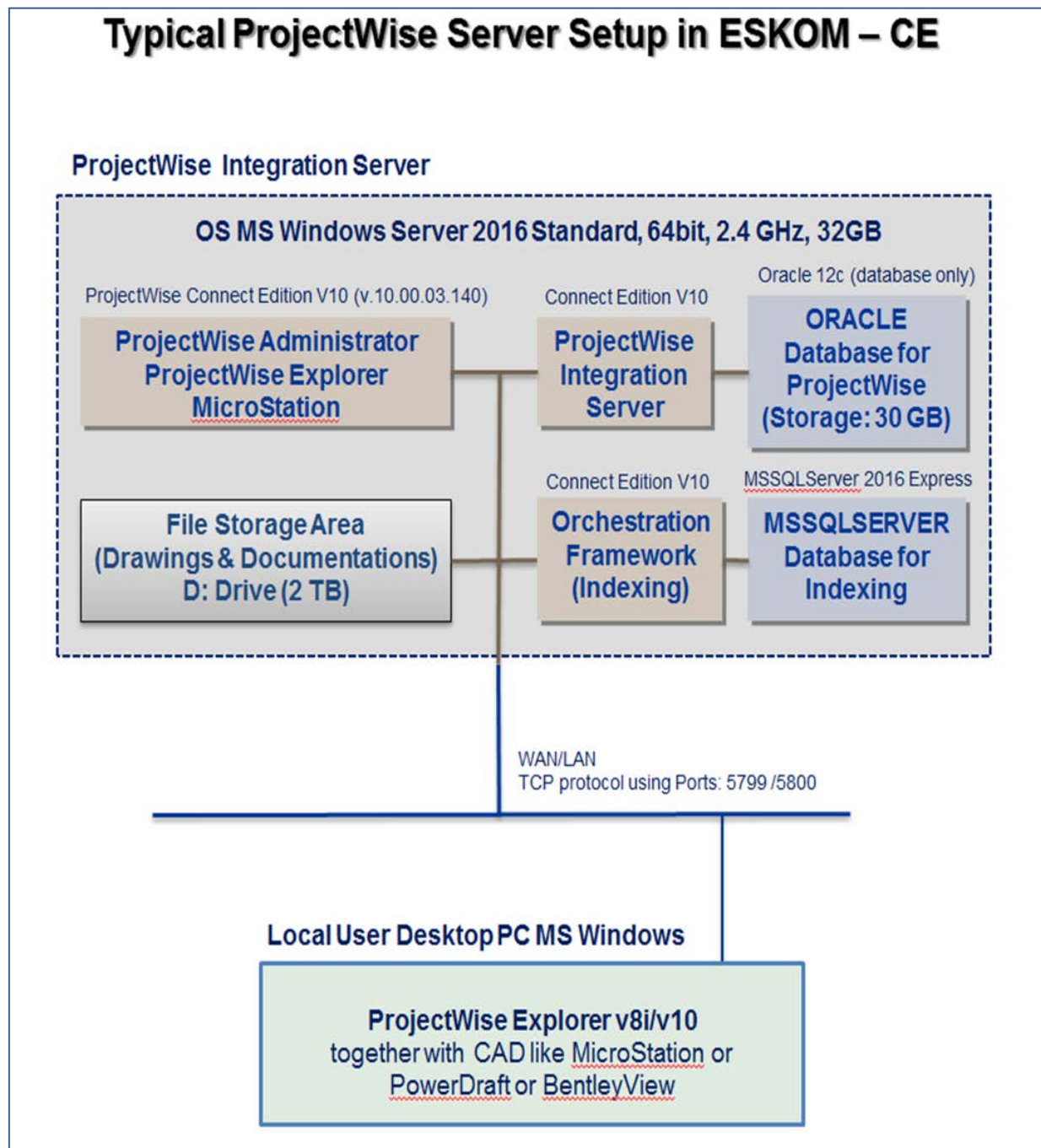



Figure 6: Current engineering project collaboration decentralised server setup

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7.6 Use Case Diagram

The diagram below depicts an overview of the use cases for the Enterprise Engineering Management System (EEMS)

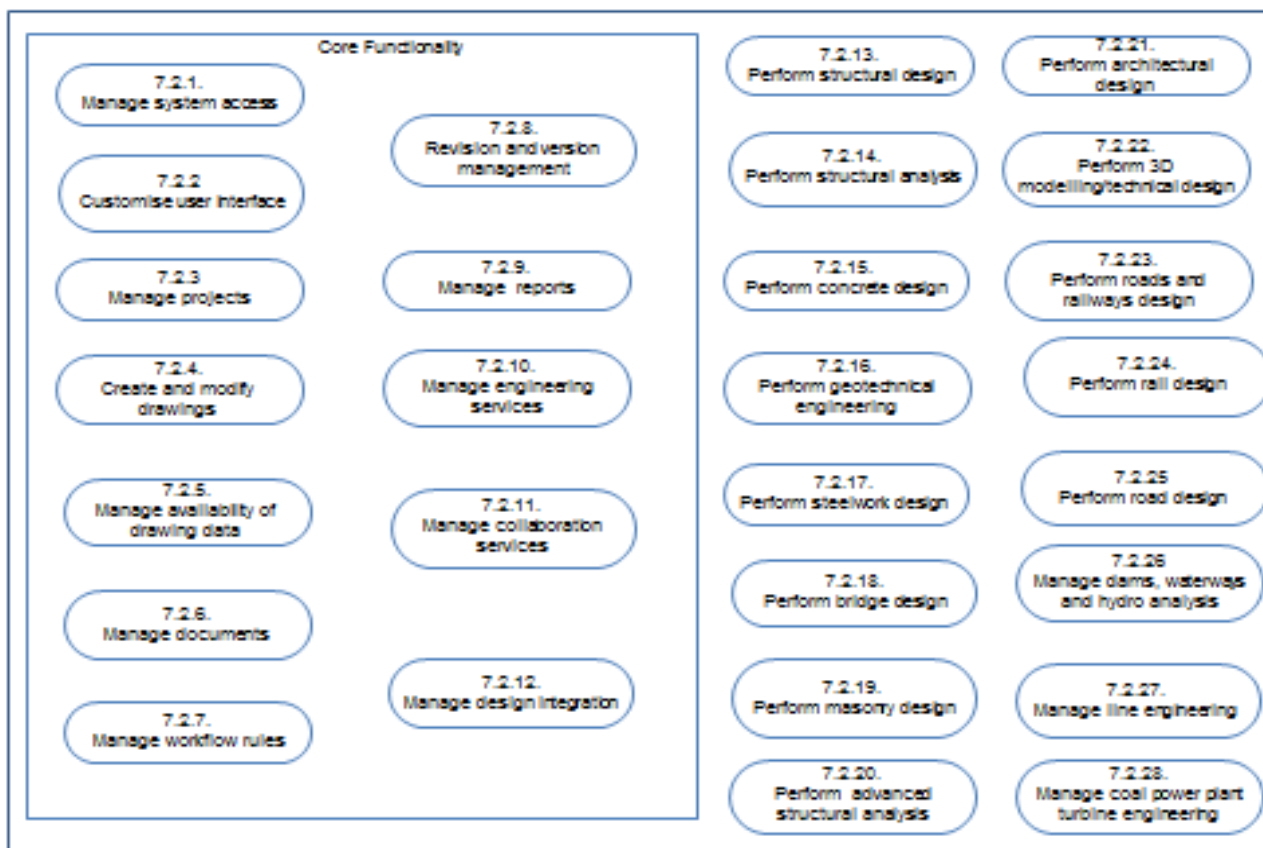


Figure 7: Overview of EEMS Use Cases

7.5.1 Manage standard EEMS functionality


MAIN OBJECTIVE:

The section entails the system access management functionality, customisation of user interface, management of projects, creation and modification of drawings, manage availability of drawing data, management of documents, revision and version management, management of reports, perform structural, concrete, bridge, masonry and architectural designs.

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HIGH-LEVEL USE CASE DESCRIPTIONS

BRS Nr	Functional grouping	Functionality
7.2.1.	Manage System Access	<p><u>Description of use case:</u></p> <p>Specify the security protocols for Eskom employees and third party access. Control and authenticate system access. Register end user and configure access profile on approved request received.</p> <p>System to be configurable to allow groups to have full rights (add/edit/view) to their data whilst providing other users with limited/ view only access. System to support a web interface for remote users to access the system. Enforce password management by mandatory password changes every 30 days.</p>
7.2.2.	Customise user interface	<p><u>Description of use case:</u></p> <p>Customise the look and feel of the application as per end user preference. Save user preferred views as a template and enabled for use by different end users i.e. personal view vs public view.</p>
7.2.3.	Manage projects	<p><u>Description of use case:</u></p> <p>Create and maintain new project folders with supporting documentation. Configure project standard template folder. Each project shall only be created once the standard project template has been configured to cater for all disciplines.</p>
7.2.4.	Create and modify drawings	<p><u>Description of use case:</u></p> <p>Create and modify 2D and 3D drawings. Import and remodel 2D and 3D scanned data. Convert images, share and distribute drawings by sending links of various files by email.</p>
7.2.5.	Manage availability of drawing data	<p><u>Description of use case:</u></p> <p>Manage availability of drawing data by enabling multiple end users to access, edit, view, and store various data files and formats. Keep audit trail on any changes of drawing data and records as well as activity logs on the number of times a document is being accessed.</p>
7.2.6.	Manage documents	<p><u>Description of use case:</u></p> <p>Register a new document. Compile, approve, save all related project documents. Keep all documents in a centralised database to prevent loss of data due to multiple data sources. Handle varying document sizes as configuration sizes are dependent on the tools being used.</p>
7.2.7.	Manage workflow rules	<p><u>Description of use case:</u></p> <p>Capability to do custom workflow (workflow following any order and defined workflow). Capability for the system to allow required work flow to be configured and used as per related processes. This should include document management, engineering change management and stakeholder requirements management.</p>

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BRS Nr	Functional grouping	Functionality
7.2.8.	Revision and version management	<p><u>Description of use case:</u></p> <p>Manage project documentation and information by applying check-out, check-in controls and revision/ version management on the relevant documents. Save document with new version/revision (latest version/revision of the document will become editable and previous version will stay readable). Notify document check-out/in status.</p>
7.2.9.	Manage reports	<p><u>Description of use case:</u></p> <p>Create, customise and configure various reports as per end user requirements/needs. Publish, generate and save reports. Keep an audit trail on any changes of drawing data and records of the reports.</p>
7.2.10.	Manage engineering services	<p><u>Description of use case:</u></p> <p>Access, view, share and save engineering application files. View engineering models and mark PDF's. Receive, send and manage transmittals and submittals. Report, manage and resolve engineering challenges. Collect, manage, view and approve engineering field data. Access and gain insight on past, current and future engineering performance</p>
7.2.11.	Manage collaboration services	<p><u>Description of use case:</u></p> <p>Review and approve workflows. Check in/out design integration content. Collect data from engineering fields.</p>
7.2.12.	Manage design integration	<p><u>Description of use case:</u></p> <p>Implement project delivery workflows. Integrate engineering applications. Automate title block generation. Manage dependencies, references drafting, modelling project and industry standards and work spaces.</p>
7.2.13.	Perform structural design	<p>Implement building information management (BIM) capability for building maintenance. Perform asset reliability management.</p>
7.2.14.	Perform structural analysis	<p><u>Description of use case:</u></p> <p>Perform 2D and 3D analysis. Create and analyse element types such as beam elements, plate, shell and membrane elements, composite and contact elements etc. Create and analyse material types such concrete, steel, timber aluminium and customised materials. Generate wind loading and automesh.</p>
7.2.15.	Perform concrete design	<p><u>Description of use case:</u></p> <p>Design concrete member sections for flexure, axial, shear, torsion and deflection in accordance to South African National Standards (SANS) and Eurocode standards.</p> <p>Model reinforced concrete shapes such as concrete beams, columns, slabs, walls, spread footings, and continuous footings, all with parametric behaviour. Changes to the concrete shape cause the rebar to adjust automatically. Model complex reinforced concrete shapes, including curves, sloping, or non-orthogonal shapes.</p>

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BRS Nr	Functional grouping	Functionality
7.2.16.	Perform geotechnical engineering	<u>Description of use case:</u> Monitor rock performance and stability.
7.2.17.	Perform steel work design	<u>Description of use case:</u> Produce drawings for all steel shapes, connections, and plate-work from the 3D model. Easily create comprehensive drawings including dimensions, notes, labels, and part lists. Any out-of-date drawings are automatically updated based on changes to the 3D model. Analyse custom sections, develop bill of materials/quantities and generate calculations reports, connection diagrams and engineering design sketches.
7.2.18.	Perform bridge design	<u>Description of use case:</u> Create bridge modelling design, analyse bridge design, capture roadway geometry and topography, perform bridge clash detection, sequence construction and phasing.
7.2.19.	Perform masonry design	<u>Description of use case:</u> Perform masonry design; generate calculation reports and bill of quantities.
7.2.20.	Perform advanced structural analysis	<u>Description of use case:</u> Analyse effect of temperature loads, transfer heat between temperature conditions. Accurately determine the thermally induced stresses due to increase temperature conditions in bodies that are fully or partially restrained.
7.2.21.	Perform architectural design	<u>Description of use case:</u> Adjust measurements and heights of floor slab, walls, windows, doors and roof tools. Generate schedules of doors and windows used in the drawing, generate schedules of floor areas, room numbers etc. and generate fenestration calculations.
7.2.22.	Perform 3D modelling/ technical design	<u>Description of use case:</u> Create drawings including isometrics, Piping and Instrumentation Diagram (P&ID), machine and workshop drawings. Import reference data such as existing drawings, scanned documents and 3D point cloud data and incorporate current existing drawing formats to utilize the current standard drawing templates for border sheets and title blocks.
7.2.23.	Perform roads and railways design	<u>Description of use case:</u> Design application for surveying, drainage and subsurface utilities.
7.2.24.	Perform rail design	<u>Description of use case:</u> Analyse rail track regressions – convert surveys of track data into full alignments by using a regression analysis. Design and analyse rail and road corridors and place rail signals. Integrate imagery, point clouds and 3D meshes into design and construction models. Design rail track drainage systems, design track geometry, yard, and station and rail overhead line systems.

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BRS Nr	Functional grouping	Functionality
7.2.25.	Perform road design	<p><u>Description of use case:</u></p> <p>Create horizontal and vertical alignments. Create road profiles and cross- sections. Design and analyse corridors. Model and analyse terrain, earthworks and complete water sanitary and sewer networks.</p>
7.2.26.	Manage dams, waterways and hydro analysis	<p><u>Description of use case:</u></p> <p>Water distribution modelling and analysis. Allocate and estimate sanitary loads by applying hydrographs, patterned loads, and unit loads using comprehensive and customizable engineering libraries. Assessing consumption, flow monitoring, land use, or census data in GIS to automatically estimate and import sanitary loads into sewer models. Allocate and estimate storm water loads by loading models with wet weather runoff flows derived from precipitation using the built-in rainfall distributions or user-defined rainfall events.</p> <p>Analyse hydraulics and combined sewer overflows, hydrogen sulphide formation by identifying risk of damage from hydrogen sulphide (H₂S) formation, which can lead to potential collapses if not addressed. Produce average concentration runs, display result maps of the network, and compare H₂S formation according to various conditions such as temperature.</p> <p>Design and analyse low impact development controls, pond dams, sanitary sewer, and storm water system and simulate water quality by simulating the generation, inflow, and transportation and treatment of any number of user-defined pollutants, such as total suspended solids or heavy metals. Analyse flood inundation areas and flood hazard by easily calculating the extent of flooded areas and estimate the flood hazard based on water column heights and peak flow velocities.</p>
7.2.27.	Manage line engineering	<p><u>Description of use case:</u></p> <p>Perform engineering design for substations such as:</p> <ol style="list-style-type: none"> Protection Schemes Metering Substation layouts Earthing and grounding layouts Architectural drawings for control rooms Create 2D drawings for construction and substation electrical layout Create schematic drawings for control purposes Create graphs and simulations Civil design Structural design Stormwater management/hydrologic analysis/hydraulic structure design Drainage design to support water based fire protection systems Access road design <p>Access attributes and selects design overhead lines in different voltages including survey, tower spotting line design, route selection, land surveying using line lidar visual, substations and other infrastructure. Manage maps by merging, operate diagrams, check fault level of the infrastructure and integrate plans and designs of the maps. Supports the creation, maintenance, analysis and sharing of 2D and 3D geospatial information and create contours</p>

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BRS Nr	Functional grouping	Functionality
7.2.28.	Manage coal power plant turbine engineering	<p><u>Description of use case:</u></p> <p>Condition monitoring diagnostics and collection of vibration signals for:</p> <ul style="list-style-type: none"> a. Turbo machinery b. Hydro turbines and generators c. Wind turbines d. Reciprocating compressors e. Industrial gas turbines f. Aero derivative gas turbines g. Electric motors <p>Design cadastral lines, roads and servitudes and use 2D and 3D tools.</p>
7.2.29.	Migration management	<p><u>Description of use case:</u></p> <p>Provide migration toolset to import data from the current system to the new system. Capability for the audit trail for migration, errors, exception report and for fixing. Capability to allow the form rebuild for all current workflow.</p>

7.7 Legal requirements for Enterprise Engineering Management System

BRS Number	Functionality	Legal Requirement. Response Y/N If Yes, provide legal document number / clauses
BRS1-BRS28	Provide reliable, predictable and affordable electricity in line with the approvals and the regulatory model by the National Electricity Regulator	<p>Yes</p> <p>As per the following Grid and Distribution Codes: NRS047, NRS048, NRS057, NRS058, NRS069, NRS071, NRS076, NRS082 and NERSA Power Quality directive,</p> <p>Transmission codes OSH Act Electricity Regulations Act ISO 9001 South African Grid Code ISO 10303-21:2016: Clear text encoding of the exchange structure</p>


7.8 Intellectual Property

All intellectual property belongs to Eskom.

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8. REPORTING REQUIREMENTS

8.1 High level reporting requirements

8.1.1 High level reporting requirements in number form.

Nr	Report Name	Functionality	Define strategic objective being supported	Define Key Performance Indicator (KPI) being measured	Phasing / Priority
RR1	Standard report set	Weekly report reports indicating: a. all the documents that are checked out b. how long the document has been checked out c. name of the person checked out the document and any comments added.	Provide reliable, predictable and affordable electricity in line with the approvals and regulatory model by National energy regulator of South Africa (NERSA).	No KPI – mainly standard report sets for document management	High
RR2	Dashboard reports	Overview report of all documents flagged as being edited, along with its high level status i.e. within allocated time/overdue/escalated. Overview of all documents that are flagged checked out for editing versus documents allocated per user.	Provide reliable, predictable and affordable electricity in line with the approvals and regulatory model by NERSA.	No KPI – mainly dashboard reports for document management	High

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Nr	Report Name	Functionality	Define strategic objective being supported	Define Key Performance Indicator (KPI) being measured	Phasing / Priority
RR3	Design completeness report	Design completeness report which indicates what documents are missing per as built folder against a predefined document check list.	Provide reliable, predictable and affordable electricity in line with the approvals and regulatory model by NERSA.	% Completeness equals the number of completed documents divide by the predefined document checklist per project	
RR4	Audit trail report	Audit trail report on any changes to drawing data and records	Provide reliable, predictable and affordable electricity in line with the approvals and regulatory model by NERSA.	No KPI – mainly audit trail reports for document management	High
RR5	Activity log report	To report on the number of times a document is accessed and what changes were effected	Provide reliable, predictable and affordable electricity in line with the approvals and regulatory model by NERSA.	No KPI – mainly log reports for document management	High

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8.2 Detailed reporting requirements

8.2.1 Define the reporting requirements in number form ensuring that the functionality is sorted per report.

Reporting requirements are included in the detailed requirements section of this document- refer to section 7.2.5.

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9. NON FUNCTIONAL REQUIREMENTS

9.1 User interface requirements

9.1.1 High level user interface requirements in relation to the functionality required.

User interface requirements are included in the detailed requirements section of this document – refer to section 7.2 above

9.2 System Integration requirements


9.2.1 Define if and what the system integrations might be.

BRS Number	Sending System Owner (if known)	Receiving System Owner (if known)	What information needs to be integrated
BRS 29	EEMS	CAD software platform	<ul style="list-style-type: none"> • Design and drafting • 2D and 3D designs • Drawings which include schematics(single-line diagrams, operating diagrams, protection scheme schematics, geographical drawings such as servitude and way-leave diagrams and site plans • Substation primary plant • Clash resolutions • Subsurface utilities design and analysis • Sewer, water and storm
BRS 30	CAD software platform	EEMS	<ul style="list-style-type: none"> • Design and drafting • 2D and 3D designs • Drawings which include schematics(single-line diagrams, operating diagrams, protection scheme schematics, geographical drawings such as servitude and way-leave diagrams and site plans • Substation primary plant • Clash resolutions • Subsurface utilities design and analysis • Sewer, water and storm
BRS 31	EEMS	System Application and Products System(SAP) Material Management(MM)	<ul style="list-style-type: none"> • BOQ and BOM • To create reservation number

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BRS Number	Sending System Owner (if known)	Receiving System Owner (if known)	What information needs to be integrated
BRS 32	SAP MM	EEMS	<ul style="list-style-type: none"> • BOQ and BOM • To create reservation number
BRS 33	EEMS	Eskom National Contract Material Agreements(ENCMA)	<ul style="list-style-type: none"> • Material list • Material description • Material number
BRS 34	ENCMA	EEMS	<ul style="list-style-type: none"> • Material list • Material description • Material number
BRS 35	EEMS	SAP procurement	<ul style="list-style-type: none"> • Create purchase orders for materials
BRS 36	SAP procurement	EEMS	<ul style="list-style-type: none"> • Create purchase orders for materials
BRS 37	EEMS	SAP Supply Relationship Management(SRP)	<ul style="list-style-type: none"> • External material to be procured
BRS 38	SAP SRM	EEMS	<ul style="list-style-type: none"> • External material to be procured
BRS 39	SAP PSR	EEMS	<ul style="list-style-type: none"> • External material to be procured
BRS 40	EEMS	Network Information System(NIS)	<ul style="list-style-type: none"> • Route and profile diagrams for HV, MV and LV lines
BRS 41	Network Information System(NIS)	EEMS	<ul style="list-style-type: none"> • Route and profile diagrams for HV, MV and LV lines
BRS 42	EEMS	PowerLine Systems(PLS)-Suite	<ul style="list-style-type: none"> • Powerlines design to calculate tensions, clearances, wind loading
BRS 43	PowerLine Systems(PLS)-Suite	EEMS	<ul style="list-style-type: none"> • Powerlines design to calculate tensions, clearances, wind loading
BRS 44	EEMS	Engineering project collaboration software	<ul style="list-style-type: none"> • Project collaboration & document management • CAD drawing files data • Workflow management • Transmittals and submittals • Integrate engineering applications
BRS 45	Engineering project collaboration software	EEMS	<ul style="list-style-type: none"> • Project collaboration & document management • CAD drawing files data • Workflow management • Transmittals and submittals • Integrate engineering applications

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BRS Number	Sending System Owner (if known)	Receiving System Owner (if known)	What information needs to be integrated
BRS 46	EEMS	Structural analysis and design software	<ul style="list-style-type: none"> Building designer which includes architectural, structural, electrical, mechanical and plumbing Structural data, pro steel and pro concrete Global design code
BRS 47	Structural analysis and design software	EEMS	<ul style="list-style-type: none"> Building designer which includes architectural, structural, electrical, mechanical and plumbing Structural data, pro steel and pro concrete Global design code
BRS 48	EEMS	Design application for surveying, drainage, utilities and roadway design	<ul style="list-style-type: none"> Site and infrastructure design
BRS 49	Design application for surveying, drainage, utilities and roadway design	EEMS	<ul style="list-style-type: none"> Site and infrastructure design
BRS 50	EEMS	GIS and mapping software	<ul style="list-style-type: none"> Site and infrastructure design Geographical information
BRS 51	GIS and mapping software	EEMS	<ul style="list-style-type: none"> Site and infrastructure design Geographical information
BRS 52	EEMS	Professional-level application used for production of 2D/3D drafting and detailing	<ul style="list-style-type: none"> Drafting/ deliverables and mark-up
BRS 53	Professional-level application used for production of 2D/3D drafting and detailing	EEMS	<ul style="list-style-type: none"> Drafting/ deliverables and mark-up
BRS 54	EEMS	Application for integrating and processing reality modelling data	<ul style="list-style-type: none"> Site and infrastructure design
BRS 55	Application for integrating and processing reality modelling data	EEMS	<ul style="list-style-type: none"> Site and infrastructure design
BRS 56	EEMS	Asset information management software	<ul style="list-style-type: none"> Asset management & performance
BRS 57	Asset information management software	EEMS	<ul style="list-style-type: none"> Asset management & performance

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BRS Number	Sending System Owner (if known)	Receiving System Owner (if known)	What information needs to be integrated
BRS 58	EEMS	Design software	<ul style="list-style-type: none"> Site and infrastructure design Land development and site modelling
BRS 59	Design software	EEMS	<ul style="list-style-type: none"> Site and infrastructure design Land development and site modelling
BRS 60	Design software	EEMS	<ul style="list-style-type: none"> Site and infrastructure design Land development and site modelling
BRS 61	EEMS	Software product that connects the design office and the construction site	<ul style="list-style-type: none"> Site and infrastructure design
BRS 62	Software product that connects the design office and the construction site	EEMS	<ul style="list-style-type: none"> Site and infrastructure design
BRS 63	EEMS	Document management	<ul style="list-style-type: none"> Design drawing models, documents and tools
BRS 64	Document management	EEMS	<ul style="list-style-type: none"> Design drawing models, documents and tools
BRS 65	CAD software platform	Power System Simulation Software Tool(PSSST)	<ul style="list-style-type: none"> Project network design Electrical simulations Project design simulation results
BRS 66	Power System Simulation Software Tool (PSSST)	CAD software platform	<ul style="list-style-type: none"> Electrical simulations results Project design simulation results
BRS 67	CAD software platform	Project design cost estimation tool	<ul style="list-style-type: none"> Project design Generate bills of materials and bill of quantities
BRS 68	Project design cost estimation tool	CAD software platform	<ul style="list-style-type: none"> Project design Generate bills of materials and bill of quantities
BRS 69	Project design cost estimation tool	Eskom National Contract Material agreement	<ul style="list-style-type: none"> Project design Generate bills of materials and bill of quantities
BRS 70	ENCM	SAP MM	<ul style="list-style-type: none"> BOQ and BOM
BRS 71	SAP MM	ENCM	<ul style="list-style-type: none"> BOQ and BOM
BRS 72	SAP MM	Project design cost estimation tool	<ul style="list-style-type: none"> Reservation number
BRS 73	Project design cost estimation tool	SAP MM	<ul style="list-style-type: none"> Reservation number

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BRS Number	Sending System Owner (if known)	Receiving System Owner (if known)	What information needs to be integrated
BRS 74	GIS	EEMS	<ul style="list-style-type: none"> Geospatial data (HV,MV,LV networks) Integrate 3D earth based satellite imagery data content
BRS 75	EEMS	GIS	<ul style="list-style-type: none"> Geospatial data (HV,MV,LV networks) Integrate 3D earth based satellite imagery data content
BRS 76	EEMS	Microsoft Share Point	<ul style="list-style-type: none"> Document collaboration information
BRS 77	Microsoft Share Point	EEMS	<ul style="list-style-type: none"> Document collaboration information
BRS 78	EEMS	Autodesk Vault	<ul style="list-style-type: none"> Drawings and model related to tower design
BRS 79	EEMS	Microsoft Outlook	<ul style="list-style-type: none"> E-mail notification Read and delivery confirmation log E-mail notifications
BRS 80	Microsoft Outlook	EEMS	<ul style="list-style-type: none"> E-mail notification Read and delivery confirmation log
BRS 81	SCADA	EEMS	<ul style="list-style-type: none"> Snapshot of existing network diagram with switching status of the equipment.
BRS 82	EEMS	SCADA	<ul style="list-style-type: none"> Snapshot of existing network diagram with switching status of the equipment
BRS 83	EEMS	BIM	<ul style="list-style-type: none"> Structural and building information
BRS 84	BIM	EEMS	<ul style="list-style-type: none"> Structural and building information
BRS 85	FEA	CAD	<ul style="list-style-type: none"> Simulate structural and mechanical equipment
BRS 86	CAD	FEA	<ul style="list-style-type: none"> Simulate structural and mechanical equipment
BRS 87	EESP	CAD	<ul style="list-style-type: none"> Electronic signature
BRS 88	CAD	EESP	<ul style="list-style-type: none"> Electronic signature
BRS 89	CAD	DMS	<ul style="list-style-type: none"> 2D and 3D Drawings
BRS 90	DMS	CAD	<ul style="list-style-type: none"> 2D and 3D Drawings
BRS 91	EEMS	Power BI	<ul style="list-style-type: none"> Performance reports
BRS 92	Power BI	EEMS	<ul style="list-style-type: none"> Performance reports
BRS 93	EEMS	Eskom Electronic Signature Solution(EESS)	<ul style="list-style-type: none"> Digital signature
BRS 94	Eskom Electronic Signature Solution(EESS)	EEMS	<ul style="list-style-type: none"> Digital signature
BRS 95	EEMS	uCheetah	<ul style="list-style-type: none"> Engineering design lines

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BRS Number	Sending System Owner (if known)	Receiving System Owner (if known)	What information needs to be integrated
BR 96	uCheetah	EEMS	<ul style="list-style-type: none"> Engineering design lines
BR 97	EEMS	Terra Solid	<ul style="list-style-type: none"> Civil extension
BR 98	Terra Solid	EEMS	<ul style="list-style-type: none"> Civil extension

9.3 Access requirements


9.3.1 Different types of access roles that is required.

BRS Number	Role	Define different types of access and what permissions that role has
BRS AR1	System Administrator	The system administrator will support the application, database and infrastructure. This will be done by Group IT – ITSO team
BRS AR 2	Business Administrator	<p>The business administrators will be responsible for:</p> <ul style="list-style-type: none"> Setting up folders Managing users access rights within ProjectWise Managing archival process Retrieval of superseded versions of a document and will assist in cases where users need assistance e.g. deleting a new revision created accidentally
BRS AR3	Document Controller	<p>The document controller will be responsible for:</p> <ul style="list-style-type: none"> Issuing transmittals to target recipients for review and approval Managing responses to transmittals Placing documents in the finalized state and Removing the document from finalized state to enable the creation of a new revision

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BRS Number	Role	Define different types of access and what permissions that role has
BRS AR4	Document Controller for As- Built folder	<p>The as-built document controller will be responsible for:</p> <ul style="list-style-type: none"> • Placing as built documents in the finalized state • Removing the document from finalized state to enable the creation of a new revision and • Updating the folder with the new revisions, on approval and implementation on site
BRS AR5	Edit User	<p>An Edit user has full Read and Write access to ProjectWise Folders, Workflow States & Documentations, as defined by the business administrator. The user will use ProjectWise Explorer client software and EEMS view for CAD drawings.</p> <p>The edit user will be responsible for:</p> <ul style="list-style-type: none"> • Registering the technical documentation on the PW system • Attaching the file • Tracking the workflow status of the document • Notifying the Document Controller of the intended target audience for a document that needs to be issued via transmittals for review or approval
BRS AR6	Draftsperson	Draftsperson will have full access to Read and Write and require CAD software platform
BRS AR7	Web View User	Web View user will access the system view and print documents
BRS AR 8	Basic user	Access to view and download
BRS AR 9	Advanced user	Access with read and write
BRS AR 10	Super user	Full access to read, write and the ability to override a check out e.g. if a user is ill or in the case of emergency
BRS AR 11	Administrator	Ability to add/remove user access and manage the system

- Be configurable to allow groups to have full rights (add/edit/view) to their own data, while providing other users limited/only view access.
- Allow for centralized user management

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9.4 Archiving requirements

9.4.1 State the retention / archiving period required for the data/information.

Retention Period
<ul style="list-style-type: none"> As per archiving requirements, solution should comply with the International Organisation for Standardisation (ISO 9001:2008) As per 240-56296995: Standard for records retention periods. Ability to backup network data, system configuration, reports, historical data and everything should be restorable. Automatic and manual archiving shall be possible. Automatic archiving shall be done cyclically with user-definable archiving philosophies.

9.5 Disaster recovery requirements

9.5.1 High- level disaster recovery requirements.

Support the back-up and disaster recovery requirements according to Eskom's standards

- ↳ 32-385 IT continuing/ Disaster Recovery (DR) standard
- ↳ 240-79747329: Standard for business continuity management
- ↳ 240-55410927: Cyber security standard for operational technology
- ↳ 240-47615255: Eskom IT disaster recovery strategy

Data loss	Time to recover
Business need data to be available 24/7/365	<ul style="list-style-type: none"> Business cannot operate without the system. System recovery time of less than 24 hours Have physically isolated production and disaster recovery environments Automatically replicated to a disaster recovery site and be set up such that it switches automatically between the operational and the Disaster Recovery(DR) as the need arises

9.6 Security

As per Eskom's Information Security Policy (32-85) Information Resources are Eskom's critical assets requiring a high level of protection. Sufficient measures commensurate with the risk shall be taken to protect these Information Resources against accidental or unauthorised modifications, disclosure, and/or destruction, as well as to assure the confidentiality, integrity, and availability of Eskom's Information Resources.


The purpose of the Information Security Policy (32-85) is to minimise the following risks and exposure:

- Data integrity, availability, and confidentiality being compromised
- Breach of confidentiality
- Breach of legislation or non-compliance with regulatory or ethical standards

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- Loss of, or damage to, equipment
- Connection of divisions' systems to uncontrolled environments
- Reputational risk
- Financial loss through loss of confidential Eskom information
- Excessive access levels, unsecured connections, and poorly secured third-party connections

Each implemented component of Integrated Engineering Project Planning Design system must be protected to ensure that it does not expose any risk to the confidentiality, integrity, and availability of Eskom's Information Resources.

Logical Access Control

- Logical access to Eskom's Information Resources is protected through utilisation of unique user IDs and passwords. All users shall have their identity verified with a user ID and password (or by other means that provide equal or greater security, for example, biometrics, graded authentication) prior to being permitted to use Eskom's Information Resources.
- Passwords are highly secret and confidential and shall be handled in the most secure way. Users are responsible for all activities performed on the network under their account. Passwords are set to expire after 30 days and shall be changed by the user. User IDs established for a non-employee/contractor shall have a specified expiration date, unless approved by the security advisor. If an expiration date is not provided, a default of 30 days shall be used.
- Where supported by technology, the system shall display the last use of the individual's account so that unauthorised use may be detected and the system lock user account after 3 unsuccessful attempts.
- All user ID creation, deletion, and change activity performed by system administrators and others with privileged user IDs shall be secured.
- Concurrent connections to the network are not permitted/not allowed.
- Critical logical access activities shall be logged to an audit trail and monitored to identify potential misuse of systems or information.
- Logical access to source code shall be allowed only for authorised personnel.
- Refer to policy number 32-351 Information Security Logical Access Control Standard

Third-Party Access Control

- The least-privileges principle shall be applied to any third-party connection.
- Refer to the policy of Acceptable use of information and information systems policy number 240-103449776.

Remote Access Security

- Remote access to Eskom's network and Information Resources is restricted, and it shall only be granted to users who have been identified and verified and have appropriate information security clearance as may be deemed appropriate by the relevant information manager.
- Remote access shall only be provided via remote access facilities that are approved by Eskom such as Virtual Private Network (VPN).
- All connections between Eskom internal networks and the Internet (or any other publicly accessible computer network) shall include an approved firewall.
- Refer to Remote access IT and OT standard number 32-273.


Data Retention

- The information created and stored by Eskom's information systems shall be retained for a minimum period that meets both legal and business requirements, as prescribed in the formal procedure.

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- Day-to-day electronic information retention shall ensure that past and current business information is readily available to authorised users and that archives are both created and accessible in case of need.
- Refer to policy for records retention period's number 240-56296995.

System Acquisition, Development, and Maintenance

- All software developments shall always follow an approved system development methodology.
- The integrity of Eskom operational software code shall be safeguarded using a combination of technical access controls and restricted privilege allocation and robust procedures.
- The production, test, and development environment shall be segregated.
- The acquisition and development procedure of application systems shall take into account the security requirements and controls, which shall be tested as part of the system development-testing phase.
- Post-implementation reviews shall be conducted for new or significantly changed application systems.
- Formal change control procedures shall be utilised for all amendments to systems.
- Any changes to routine systems operations are to be fully tested and approved before being implemented.
- Necessary upgrades and patches to the systems shall have the associated risks identified and be carefully planned, incorporating tested fall-back procedures.
- System faults are to be formally recorded and reported to those responsible for software support/maintenance.
- Data used for testing purposes shall be protected and controlled.
- Refer to over-arching Group IT Policy number 240-53716911.

Change Control

- Changes are to be fully tested in an isolated, controlled, and representative environment and approved before being implemented.
- Any software change and/or update shall be controlled with version control.
- Fall-back procedures for aborting and recovering from unsuccessful changes shall be documented and tested.
- Information Resources documentation shall be updated on the completion of each change and old documentation shall be archived or disposed of as per the Documentation and Data Retention Policies.
- The use of live data for testing a new system or system changes may only be permitted where adequate controls for the security of the data are in place.
- Data is to be protected against unauthorised or accidental changes.
- Refer to Information Security Policy number 32-85

Malicious Code

- New software, portable media, and information in electronic format from external sources shall be scanned for malicious program code before introduction into the Eskom network.
- Refer to Information Security Malicious Code (Anti-Virus) procedure number 32-360.

9.7 Business continuity requirements


9.7.1 Confirm the business continuity information.

Business continuity plan exists	Y
Name of BCP	BCP 32-385 rev 1.3 240-49448549: GIT ProjectWise Continuity Plan

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Name of BCP owner	n/a
If BCP does not exist, what plans are in place from a customer view to define a BCP	n/a
If BCP needs to change, what plans are in place from a customer view to update the BCP	n/a

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10. PRECONDITIONS

10.1 Preconditions and dependencies that impact the business requirement

Unique identifier number	Business Activities	Processes	Projects (IT and Business)	Technology (if known)	Other (define)
PD1	Change management to ensure users buy into the new solution.		Project management resource in IT and business to implement new solution.		Precondition
PD2	Eskom shall adopt and use standard out of the box product functionality with minimal customization.	Support	Project management resource in IT and business to implement new solution.		Precondition
PD3	Latest editions of all policies, procedures, standards, etc. to be available.		New solution to ensure adherence to the relevant policies, procedures, standards, etc./		Dependency
PD4	Ensure all system users attend training.		Training of users and support staff		Precondition
PD5	Micro station functionalities for Power System Simulations and Project design and Costing Estimation tools.	Network Planning PCM Network Design PCM Network Optimisation PCM	IT testing the market to replace the project design tool and power simulation tool	Inspired interfaces: <ul style="list-style-type: none"> • Retic Master • Power Office DigSilent: <ul style="list-style-type: none"> • Power Factory • Stationware 	Dependency

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11. TRAINING

11.1 High level training requirements:

BRS Number	Functionality
All	User to be trained to access and use all enterprise engineering management system functionalities as per their user-defined roles.
All	Eskom support staff to be trained to enable them to deliver at least level 1 and 2 system support.
All	Training activities and training material shall be supplied and provided by the service provider/vendor
All	Supplier/vendor to provide online training

11.2 Possible types of high level training that will be required:

Course Name/Types of training
System support training for Eskom support staff and ITSO Application and Development (A&D) team
Process training(where applicable)
Training for system administrator and super user on customising the system functionality
Train the trainer to train end users in the OU's

12. CORPORATE, DIVISIONAL AND DEPARTMENTAL PLAN ALIGNMENT

12.1 Strategic alignment


12.1.1 Select the Eskom Shareholder's Strategic Intent Statement (SIS) that are supported by this requirement:

SIS	Supported (Y/N)	How
Provide reliable, predictable and affordable electricity in line with the approvals and regulatory model by NERSA.	Y	The requirement will support safe operation by meeting safety and operating standards, as well as operational maintenance by reflecting plant/equipment "as-designed" state, which is critical during maintenance and change-outs.

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SIS	Supported (Y/N)	How
Ensure and maintain a financially viable and sustainable company.	Y	<p>The inability to perform adequate integrated engineering planning and design, project collaboration, and document management will place the Capital Expenditure (Capex) plan at risk, and projects may not be timeously executed.</p> <p>The Wires business deals with an annual budget in excess of R10 Billion, and the Generation business in excess of R15 Billion, and even if 10% of this investment is in any way compromised, the impact may be significant.</p>
Consolidate socio-economic contribution to ensure alignment to national transformation imperatives.	Y	<p>The inability to perform integrated engineering and design, project collaboration, and document management for new projects and for the electrification plan, will severely compromise the notion of achieving universal access to electricity, in line with the Government Plan.</p> <p>It will further hinder the provision of an adequate network, thus limiting economic growth prospects and the ability to grow the economy, thus further impacting on the increasing of unemployment rates in the country.</p>
Reduce the impact on the environment.	Y	Reduce environmental footprint by using electronic design and file transfer and workflow capabilities, integration with Governmental departments with regards to formats in applying for authorisations
Ensure that company structure is responsive to changing energy landscape.	N	N/A
Submit annual strategic documents and report on progress.	N	N/A
Conduct reporting in line with regulatory model, with profit and loss for each licensee.	N	N/A

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12.1.2 Divisional Focus areas / mandates being supported and indicate how the requirement is in support thereof.

The main division mandates supported are Distribution, Transmission, Group Technology and Generation.

Distribution:

The Distribution wires mandate is to operate the asset by building, operating and maintaining distribution assets, while also acting in the national interest by actively partnering with the wider industry in resolving distribution industry issues and enhancing stakeholder relations. The Distribution network provides non-discriminatory access to the distribution power system to third parties, which includes Independent Power Producers (IPPs).

Distribution retail's mandate is to put the customer at the centre of the business and guide Eskom towards the overall objective of achieving fully satisfied and serviced customers.

The above mentioned is underpinned by the appropriate systems, processes, policies and procedures, and focused and energised employees.

Distributions' purpose is to operate the asset and provide reliable electricity by building, operating and maintaining distribution assets, while also acting in the national interest by actively partnering with the wider industry in resolving distribution industry issues and enhancing stakeholder relations.

The Enterprise Engineering Management System (EEMS) is the platform that assist in performance improvement of network planning, project management, network engineering design, land development and plan maintenance which support Eskom's ability to comply with NERSA compacted targets. It will enable Dx to achieve the following strategic objectives:

- Operate a sustainable Distribution(Dx) network that delivers on client expectations
- Ensure financial prudence
- Implementing innovative technologies for business efficiencies across the value chain
- Migrate towards full compliance to the regulatory framework governing network performance

Transmission:

Eskom Group Transmission has a mandate to reliably control, maintain, plan, expand and provide access to an interconnected transmission system, trade energy, influence customer demand and effect opportunities in the SADC region.


Transmission will continue to play a key role in contributing towards sustainable development through asset creation, project management, grid and network planning and maintenance management. The solution will enable Transmission (Tx) to achieve the following objectives:

- Sustain system performance for system minutes and major incidents
- Continue asset renewal and strengthening of the network towards attaining N - 1 compliance
- Undertake grid expansion to unlock system capacity for IPPs and new load customers
- Contract and facilitate the connection of IPP's into the Eskom grid.

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Group Technology:

Group Technology's mandate is to ensure Eskom's ability to operate, maintain, build, refurbish and design the asset base in a manner which is safe, standardised and sustainable. This can be achieved by following a systematic, reliable, repeatable, and optimised approach in terms of performance, cost and risk.

The solution will enable Group Technology (GT) to achieve the following objectives:

- Engineering design package development for asset creation and plant modifications
- Providing technical assurance and specialist plant support to Eskom operating units to achieve the required plant and network availability, reliability and legislative compliance
- Support Generation and Transmission, Distribution plant maintenance, commissioning and overall availability through specialised plant life cycle services.
- Provide asset management services for assurance that operating, maintenance and refurbishment of Generation, Transmission and Distribution assets is methodical, consistent, auditable and supportive of long term plant health.

Group IT:

Group IT's mandate is to enable the user (employee and customer) through the use of technology, infrastructure and process automation by simplifying the user experience.

The solution promotes standardisation and data quality through a single data source, system configuration and data quality checks. The system ensures that common business, design rules and standards are enforced through system configuration and improving engineering data quality. Managing engineering document management and project collaboration system should be supported by an approved Eskom cloud web based computing service as per GIT strategy and Cloud policy 240-134085928.

Generation Plant Engineering:

To provide a professional, effective approach to engineering work delivery to Eskom across the organisation, primarily focused on technical asset integrity and health assurance over the long term.

12.1.3 Departmental Focus areas / mandates being and indicate how the requirement is in support thereof.

Various departments in Distribution, Transmission, Group Technology and Generation are impacted by the Enterprise Engineering Management System to enable their focus areas / mandates:

Within Distribution the solution supports:


- ↳ Project engineering and design
- ↳ Project data management- drawings, spatial & attribute data
- ↳ Project engineering draughting information management compliance
- ↳ Provide and maintain design tools to enable efficiency

Within PDE the solution is responsible:

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- ↳ for providing operational support to the operating units and compiling engineering research requirements, detailed engineering designs, standards and maintenance and operating philosophies.

Mandate Generation Plant Engineering:

- ↳ Gx Plant Engineering is responsible for establishing and maintaining engineering Centre of Excellence's (CoE's) for all Eskom's power generation needs, for new build projects and for design support on operating assets and is also accountable for the development of the processes and governance for all design work on Power Generation Plant:

Group IT Service Operations (ITSO's) mandate it to develop, provide, operate, and transition end-to-end IT services and infrastructure, in order to enable Eskom's operational, financial and new build sustainability. ITSO's focus areas supported are:

- Reduce expensive and risky software customization.
- Reduce system maintenance and support (life cycle cost)
- Reduce interface cost and complexity.
- Improve in-house support skills base with fewer bespoke applications and it can be militated against shortage of skilled resources on EEMS products with related experience.
- Regularly scheduled product and related component releases are straight forward and designed to protect existing configurations.
- Support for simple configuration and minor extensions rather than expensive customizations

13. CHANGE REQUEST COSTING ONLY

This section is not required for a BRSF.

14. POSSIBLE OPTIONS

This section is not required for the current BRSF

15. REFERENCES


The following documents have been referenced or used to compile this Business Requirements Specification including Process Control Manuals.

Number	Name	Location
240-103449776	Acceptable Use of Information and Information System Policy	https://hyperwave.eskom.co.za/240-103449776
240-108650238	Group Distribution Business Plan 2018/19 -2022/23	https://hyperwave.eskom.co.za/240-108650238
240-125797682	Cloud Adoption Strategy	https://hyperwave.eskom.co.za/240-125797682
240-128814601	User Guide- Power Delivery Engineering and Transmission	https://hyperwave.eskom.co.za/240-128814601
240-47615255	Eskom IT Disaster Recovery Strategy	https://hyperwave.eskom.co.za/240-47615255

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Number	Name	Location
240-49448549	Smallworld IT continuity Plan	https://hyperwave.eskom.co.za/240-49448549
240-50201762	Group IT IS Network Security Standard	https://hyperwave.eskom.co.za/240-50201762
240-53716911	Over-arching Group IT Policy	https://hyperwave.eskom.co.za/240-53716911
240-55410927	Eskom's Cyber Security Standard for Operational Technology	https://hyperwave.eskom.co.za/240-55410927
240-56296995	Eskom Standard for records retention periods	https://hyperwave.eskom.co.za/240-56296995
240-56927206	Eskom Corporate Plan FY2019/20 – FY2021/22	https://hyperwave.eskom.co.za/240-56927206
240-76613085	User Requirements Specification for Transmission and Distribution Design Base Documentation Repository	https://hyperwave.eskom.co.za/240-76613085
240-79747329	Standard for business continuing management	https://hyperwave.eskom.co.za/240-79747329
240-83563472	Drawing standard for substations: power plants	https://hyperwave.eskom.co.za/240-83563472
240-86973501	Engineering Drawing Standard	https://hyperwave.eskom.co.za/240-86973501
240-87658920	Standard drawing practice for CAD users	https://hyperwave.eskom.co.za/240-87658920
32-273	Remote access IT and OT Standard	https://hyperwave.eskom.co.za/32-273
32-360	Information security malicious code(Anti-virus) procedure	https://hyperwave.eskom.co.za/32-360
32-377	Eskom IS firewall standard	https://hyperwave.eskom.co.za/32-377
32-85	Information Security Policy	https://hyperwave.eskom.co.za/32-85
32-351	Information Security Logical Access Control Standard	https://hyperwave.eskom.co.za/32-351
32-385	IT continuity/ Disaster Recovery(DR) standard	https://hyperwave.eskom.co.za/32-385
32-540	SmallWorld disaster recovery procedure	https://hyperwave.eskom.co.za/32-540
36-943	Engineering drawing office and engineering documentation standard	https://hyperwave.eskom.co.za/36-943
474-10891	GT Turbine Plant Centre of Excellence Operational Planning Ops plan	https://Hyperwave.eskom.co.za/0x936e32460x078059e2
Not applicable	PDE Ops plan	https://Hyperwave.eskom.co.za/PDEOperationalPlan_2015_19
Not applicable	ISO 55000 document	Internet

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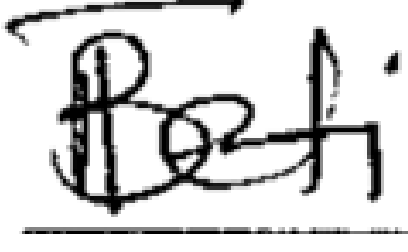







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16. DOCUMENT ACKNOWLEDGEMENT

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Disclaimer: Formal governance processes will need to be followed prior to obtaining approval for the implementation of the business requirements specification and the initiation of a project plan.

Name	Role	Signature	Date
Bongi Teti	Business Requestor & Subject Matter Expert		15/04/2020
Debbie Harding	Business Requestor & Subject Matter Expert		14/04/2020
Mathys Willemse	Group IT Business Process Management Business Analyst		08/04/2020
Nombali Mashile	Group IT Business Process Management Business Analyst		08-04-2020
Johannes Erasmus	Group IT ITSO Snr Advisor		09/04/2020
Johan Jonker	Group IT ITSO Snr Advisor	 Content noted only	09/04/2020
Leon Fourie	Group IT Information Solution Manager		09/04/2020
Shaun Solomon	Group IT Enterprise Architect		
Tebogo Mathekga	Group IT Business Relationship Manager		09/04/2020
Not applicable	Subject Matter Experts: Refer to list of SME's in section 2.1 of this document	Not required	n/a

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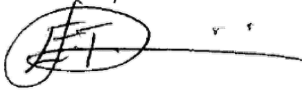

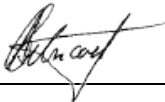
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17. DOCUMENT APPROVAL

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Name	Role	Signature	Date
Alwie Lester	Senior Business Manager / Business Sponsor- Dx		20 April 2020
Dr Titus Mathe	Senior Business Manager / Business Sponsor- GT		17 April 2020
Prince Moyo	Senior Business Manager / Business Sponsor- PDE		17/04/2020
Azwimbavhi Mamanyuha	Senior Business Manager / Business Sponsor-Dx Operations Support		15/4/2020
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Cyril de Beer	Business Process Owner: GT Generation Plant Engineering		2020/04/14
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Carlos Betencourt	Group IT Portfolio Manager		09/04/2020

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18. ABBREVIATIONS

Abbreviation	Description
2D	Two Dimensional
3D	Three Dimensional
AC	Asset Creation
AECO	Architecture Engineering Construction Owner
ACE	Analytics Centre of Excellence Department
ASCII	American Standard Code for Information Interchange
ARIS	Architecture of Integrated Information Systems
BCP	Business Continuity Plan
BI	Business Intelligence (also known as Analytics)
BIM	Building Information Management
BOM	Bill Of Material
BOQ	Bill Of Quantity
BPM	Business Process Manager
BS	British Standards
BRS	Business Requirements Specification
CAD	Computer Aided Design
CAM	Computer Aided Manufacturing
CAPEX	Capital Expenditure
CBR	California Bearing Ratio
CGM	Computer Graphics Metafile
C&I	Control & Instrumentation
CoE	Centre of Excellence
Collada	Collaborative Design Activity
CR	Change Request
DFT	Delta File Transfer
DMS	Document Management System
DCP	Dynamic Cone Penetrometer
DR	Disaster Recovery
DFD	Data Flow Diagram
DGN	Design File
DOC	Microsoft Word file
DWG	Drawing File
DXF	Drawing Exchange Format
Dx	Distribution

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Abbreviation	Description
EC	Eurocode
ECOU	Eastern Cape Operating Unit
EEMS	Enterprise Engineering Management System
ENCMA	Eskom National Contract Material Agreement
EERI	External Event Response Initiative
Esri	Environmental Systems Research Institute
FEA	Finite Element Analysis
FBX	Film Box
FSOU	Free State Operating Unit
GEO	Geographic
GIS	Geographic Information System
GIT	Group Information Technology Division, also referred to as Group IT
GOU	Gauteng Operating Unit
GT	Group Technology
Gx	Generation
H2S	Hydrogen Sulphide
HSP	Home Site Project
HV	High Voltage
IFC	Industry Foundation Class
IGES	Initial Graphics Exchange Specification
ISO	International Organisational Standardisation
ITSO	Information Technology Service Operations
IT	Information Technology
JPEG	Joint Photographic Experts Group
JTF	Jump To File
KML	Keyhole Markup Language
KMZ	Keyhole Mark-up Language Zipped
KPA	Key Performance Area
KPI	Key Performance Indicator
KZNOU	KwaZulu Natal Operating Unit
LOU	Limpopo Operating Unit
MAPI	Messaging Application Program Interface
M&O	Maintenance & Operations
Mb	Megabyte
MDL	Model Development Language
MM	Material Management

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	Group IT Business Requirement Specification (BRS) DEM-03388-X3T7_BRSF_Enterprise Engineering Management System	Template Identifier	240-83570075	Rev	6
		Authorisation Date	9 November 2018		
		Review Date	December 2021		

Abbreviation	Description
MOU	Mpumalanga Operating Unit
MS	Microsoft
NED	Network Engineering Design
NIS	Network Information System
NWOU	North West Operating Unit
OGC	Open Geospatial Consortium
PCM	Process Control Manual
PCMP	Project Complete Mapped File
PDE	Power Delivery Engineering
PDF	Portable Document Format
P&ID	Piping and Instrumentation Diagram
PLS	Power Line Systems
PM	Project Management
PTM&C	Protection Telecommunication Metering and Control
ROI	Return On Investment
SANRAL	South African National Roads Agency
SANS	South African National Standards
SAP	System Application and Products System
SAT	Standard Acis Text
SCADA	Supervisory Control and Data Acquisition
SCCM	System Centre Configuration Manager
SCD	Substation Configuration Description
SIS	Strategic Intent Statement
SLA	Service Level Agreement
SRM	Supply Relationship Management
STEP	Standard for The Exchange of Product
STL	Stereo Lithography
SWEO	Small World Electric Office
TIFF	Tagged Image File Format
Tx	Transmission
TXT	Text file
U3D	Universal 3 Dimension
UAT	User Acceptance Testing
UI	User Interface
VBA	Visual Basic for Applications
VB	Visual Basic

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Abbreviation	Description
VPN	Virtual Private Network
VRML	Virtual Reality Modelling Language
WCOU	Western Cape Operating Unit
XLS	Microsoft Excel File Extension
XML	Extensible Mark-up Language

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19. CONTROL TABLE

This table defines what sections of the document need to be completed for the different types of BRS's.

Section Number	Section Description	Change Request	BRS1	BRS2	BRS A (Analytics)	Innovation Project
2.1	Customer information	Y	Y	Y (Review)	Y	Y
2.2	Group IT information	Y	Y	Y (Review)	Y	Y
3	Glossary of terms / definitions	Y	Y	Y (Review)	Y	Y
4	Business requirements specification focus area	Y	Y	Y (Review)	Y	Y
5	Reason for the requirement					
5.1	Define the current business challenges / issues that need to be addressed	Y	Y	Y (Review)	Y	Y
5.2	Define the high level gaps between the "As-Is" and "To-be" business	Y	Y	Y (Review)	Y	Y
6	As-is and To-be business process mapping					
6.1	As-is business process	Y	Y	Y (Review)	Y	Y
6.2	To-be business process	N	N	Y (Review)	Y	Y
7	Business requirements					
7.1	High level requirements	Y	Y	Y (Review)	Y	Y
7.2	Detailed requirements and business rules	Y	Y	Y (Review)	Y	Y
7.3	Information/data requirements	Y	Y (Highlevel)	Y (Detail)	Y (Detail)	Y (Highlevel)
7.4	Data flow diagram / Context diagram	N	N	Y	Y	N
7.5	Use case diagram	N	N	Y	N	Y (Optional)
7.6	Legal requirements	Y	Y	Y (Review)	Y	Y

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Group IT
Business Requirement Specification (BRS)
DEM-03388-X3T7

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Section Number	Section Description	Change Request	BRS1	BRS2	BRS A (Analytics)	Innovation Project
7.7	Intellectual property	Y	Y	Y (Review)	Y	Y
8	Reporting requirements					
8.1	High level reporting requirements	Y	Y	N	Y	Y
8.2	Detailed reporting requirements	Y	Y (Review)	Y	Y	N
9	Non-functional requirements					
9.1	User interface requirements	N	N	Y	Y	N
9.2	System Integration requirements	N	N	Y	Y	N
9.3	Access requirements	Y (Depends)	N	Y	Y	Y
9.4	Archiving requirements	N	N	Y	N	Y
9.5	Disaster recovery	N	Y	Y (Review)	Y	N
9.6	Business continuity	N	N	Y	Y	N
10	Out of scope and preconditions					
10.1	Define any preconditions and dependencies that impact the business requirement	Y	Y (Highlevel)	Y (Review)	Y	Y (Highlevel)
11	Training					
11.1	High level training requirements	Y	N	Y	Y	N
11.2	Possible types of high level training that will be required	Y	N	Y	Y	N
12	Corporate, divisional and departmental plan alignment					
12.1	Business strategy supported	Y	Y	Y (Review)	Y	Y
12.1.1	Eskom strategic pillar/s that are supported by this requirement	Y	Y	Y (Review)	Y	Y
12.1.2	Critical targets that are supported by this requirement	Y	Y	Y (Review)	Y	Y
12.1.3	Divisional plans supported by this requirement	Y	Y	Y (Review)	Y	Y

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Section Number	Section Description	Change Request	BRS1	BRS2	BRS A (Analytics)	Innovation Project
12.1.4	Departmental plans supported by this requirement	Y	Y	Y (Review)	Y	Y
13	Change request costing (BRM responsibility according to demand management process)	Y	N	N	N	N
14	Possible options	Y	N	N	Y (Depends)	N
15	References	Y	Y	Y (Review)	Y	Y
16	Document acknowledgement	Y	PDF no signatures	Y	Y	Y
17	Document approval	Y	PDF no signatures	Y	Y	Y
18	Abbreviations	Y	Y	Y (Review)	Y	Y
19	Control table					

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