

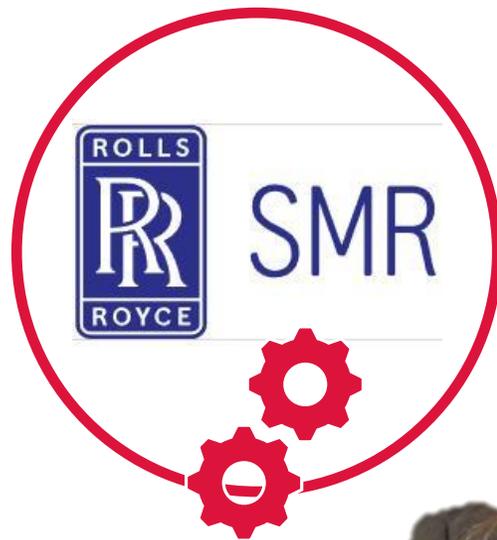
Bridging the gap:

Digital Information Management and ISO19650 Compliance in SMR Projects



PAULA MOTA

*Managing Consultant
Assystem*



Assystem Introduction.

OUR BUSINESS

Assystem is an independent, international company with one key mission: to **accelerate the energy transition** throughout the world.

Assystem has three core offers: Engineering, Project/ Programme Management and Digital.

TURNOVER BY SECTOR*

70%

Nuclear

3%

Energy & grids

23%

Cities & urban development

4%

Defence & security infrastructures

€578m

revenue

7,500

employees

TOP 3

ranked in the TOP 3 independent nuclear engineering companies in the world



SMR



*Turnover from the 2023 financial report

Assystem Introduction.

ASSYSTEM IN THE UNITED KINGDOM

+25
years UK experience

Assystem is supporting the United Kingdom's switch to low-carbon energy, transport, and infrastructure.

To meet its goal of carbon neutrality by 2050, the UK is investing heavily in nuclear and renewable energies.

700
employees

10
offices

**schofield
lothian**



LOGIKAL
Project Intelligence



an
assystem

ASSYSTEM
PM&C

an
assystem



SMR

Project Controls
EXPO
London, UK

RR SMR Introduction.



**The Rolls-Royce SMR:
designed for global success**

Rolls-Royce SMR Ltd is a technology vendor offering a complete SMR power plant on a turnkey basis.

UK Government Grant Funding



Rolls-Royce SMR has received UK Government funding of £210m as part of Phase 2 of the Low-Cost Nuclear Challenge Project, administered by UKRI.



SHAREHOLDERS



Rolls-Royce Group



Constellation Energy



BNF Resources UK Ltd



Qatar Investment Authority

The Rolls-Royce SMR power plant is the **only solution that takes a fully modular approach** to deploying proven nuclear technology. A highly competitive source of 'always-on' clean energy for grid and industrial uses. Reducing project risk and providing certainty through a repeatable, factory-built product with low capital cost.

270
tonnes of hydrogen

500,000
District heating for a city of

1 million
Clean electricity to power over (homes)



SMR

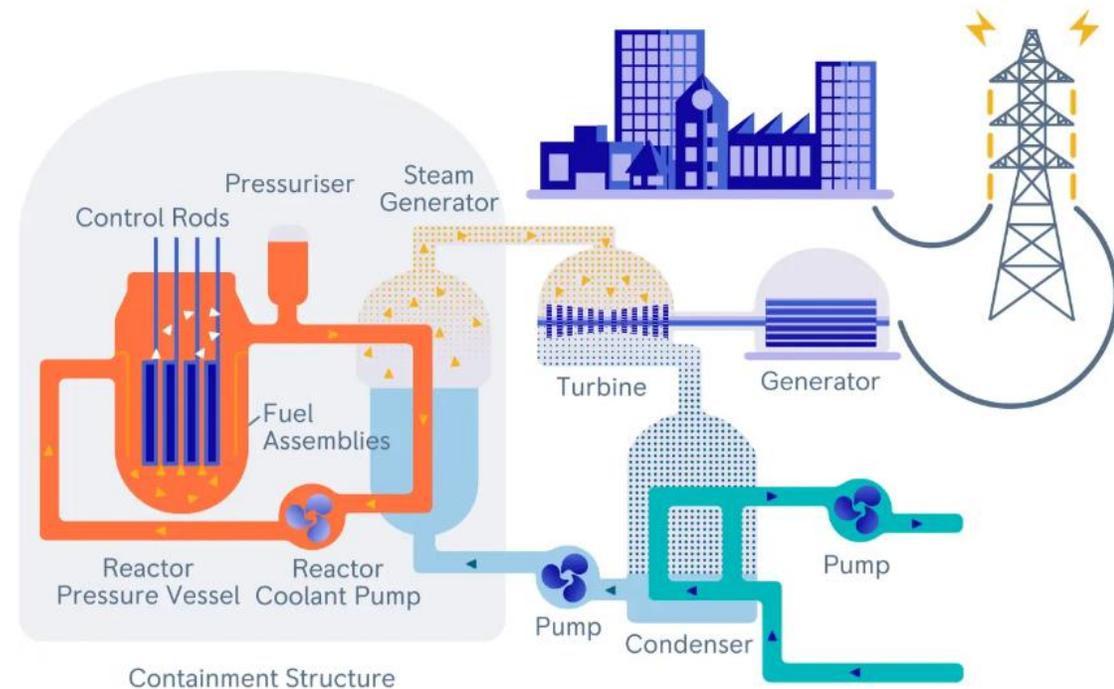


**LET'S TALK
ABOUT
SMALL
MODULAR
REACTOR**



What is SMR?

- A Small Modular Reactor (SMR) is a type of nuclear fission reactor that is **smaller in size**, and output compared to conventional nuclear power stations. These reactors are **factory-built, transported to site, and assembled modularly**, allowing for quicker and more flexible deployment.
- This unique 'factory-built' approach means that approximately **90% of the plant will be factory fabricated**, tested and delivered to site as modules, where they will be assembled and commissioned by the Rolls-Royce.
- Offering a complete nuclear power station as a manufactured product delivers the **cost and risk reductions and quality improvements** associated with factory fabrication.



RR SMR value proposition has 4 key elements for SMR success into the global marketplace

LOW COST

- A highly competitive source of always on clean energy

DELIVERABLE

- Reducing risk and providing certainty with a factory built commoditised product

INVESTABLE

- Designed to attract traditional forms of capital through a low-risk factory-based solution

GLOBAL & SCALABLE

- Making a meaningful impact across multiple countries, meeting unprecedented demand for clean energy



SMR



The Rolls-Royce SMR in numbers

SITE FOOTPRINT AREA:

100,000 m²*

ELECTRICAL
CAPABILITY

UP TO 470 MWe

THERMAL
CAPACITY

1358 MWth

FUEL CYCLE

18
MONTHS

DESIGN LIFE

60
YEARS

MULTIPLE
ACTIVE AND PASSIVE
SAFETY SYSTEMS

121 INDUSTRY STANDARD
FUEL MODULES

*inclusive of berm, exclusive of cooling water island

**LET'S TALK
ABOUT
ISO 19650**



What is the ISO 19650 ?

- International standard for managing information over the whole life cycle of a built asset using BIM
- **Purpose:** Improve collaboration, efficiency, and data consistency across all parties involved in the project



ISO 19650 Certification

Formal recognition that an organisation or project team follows the information management principles set out in Iso standard for BIM.

Purpose

- Demonstrates that the organisation has a structured and standardised approach to managing digital information.
- Proves compliance with International BIM best practices.
- Builds trust with clients, partners and stakeholders.
- Improves efficiency, collaboration and data accuracy across project life cycle.

Accrediting Bodies

BSI (British Standard Institution), TUV SUD, Lloyd's Register (LRQA), BRE (Building Research Establishment)

The logo for BSI (British Standard Institution) consists of the lowercase letters 'bsi.' in a bold, black, sans-serif font. The period at the end is a solid red dot.

SMR



Our main objective with ISO 19650 certification

Reinforces RR SMR's leadership in **setting high standards for digital delivery**, promoting trust, quality, and long-term value across the nuclear sector.



SMR



**LET'S TALK
ABOUT
ISO 19650
CERTIFICATION
PROCESS**



Process Assessment



STAGE 1



STAGE 2



STAGE 3



SMR



Process Assessment



STAGE 1



STAGE 2



STAGE 3

JULY 2024

Presented the documents produced for a potential client

Still in the pre-contract stage

Demonstrated proposed workflows



SMR



Process Assessment



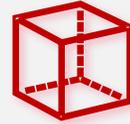
STAGE 1

JULY 2024

Presented the documents produced for a potential client

Still in the pre-contract stage

Demonstrated proposed workflows



STAGE 2

SEPTEMBER 2024

Presented a simulation of the planned activities

Used Teamcenter as the Common Data Environment (CDE)

Showcased approval and revision schemes.



STAGE 3



SMR



Process Assessment



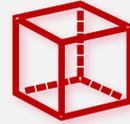
STAGE 1

JULY 2024

Presented the documents produced for a potential client

Still in the pre-contract stage

Demonstrated proposed workflows



STAGE 2

SEPTEMBER 2024

Presented a simulation of the planned activities

Used Teamcenter as the Common Data Environment (CDE)

Showcased approval and revision schemes.



STAGE 3

OCTOBER 2025

Presented the updated versions of the documents to potential clients

Still in the pre-contract stage

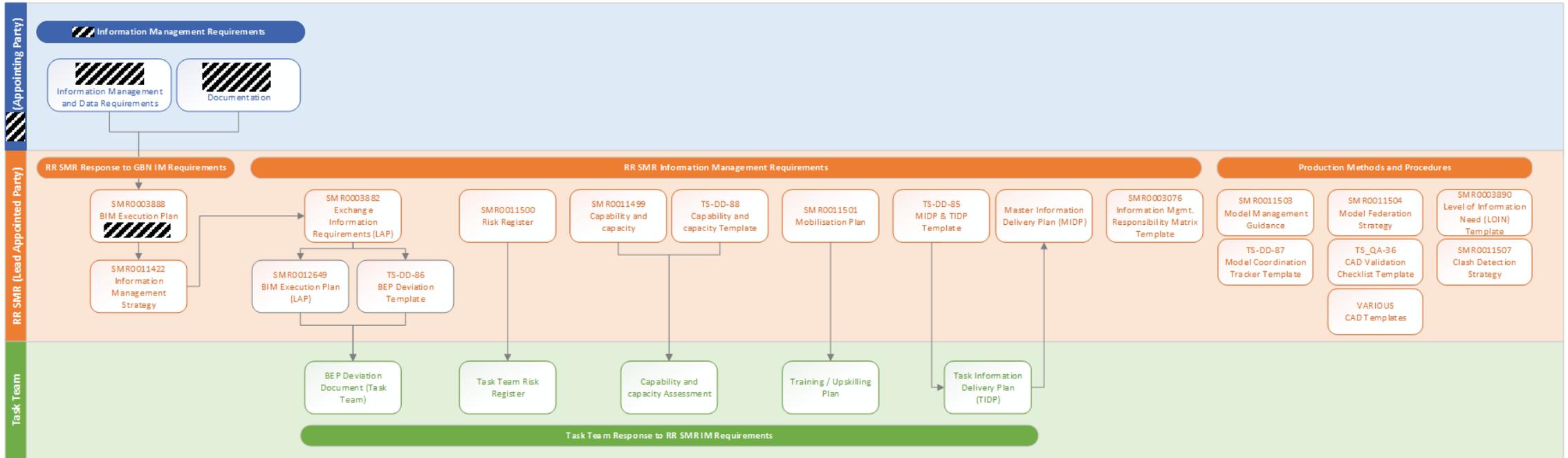
Demonstrated the evolution of the CDE from Teamcenter to ProjectWise



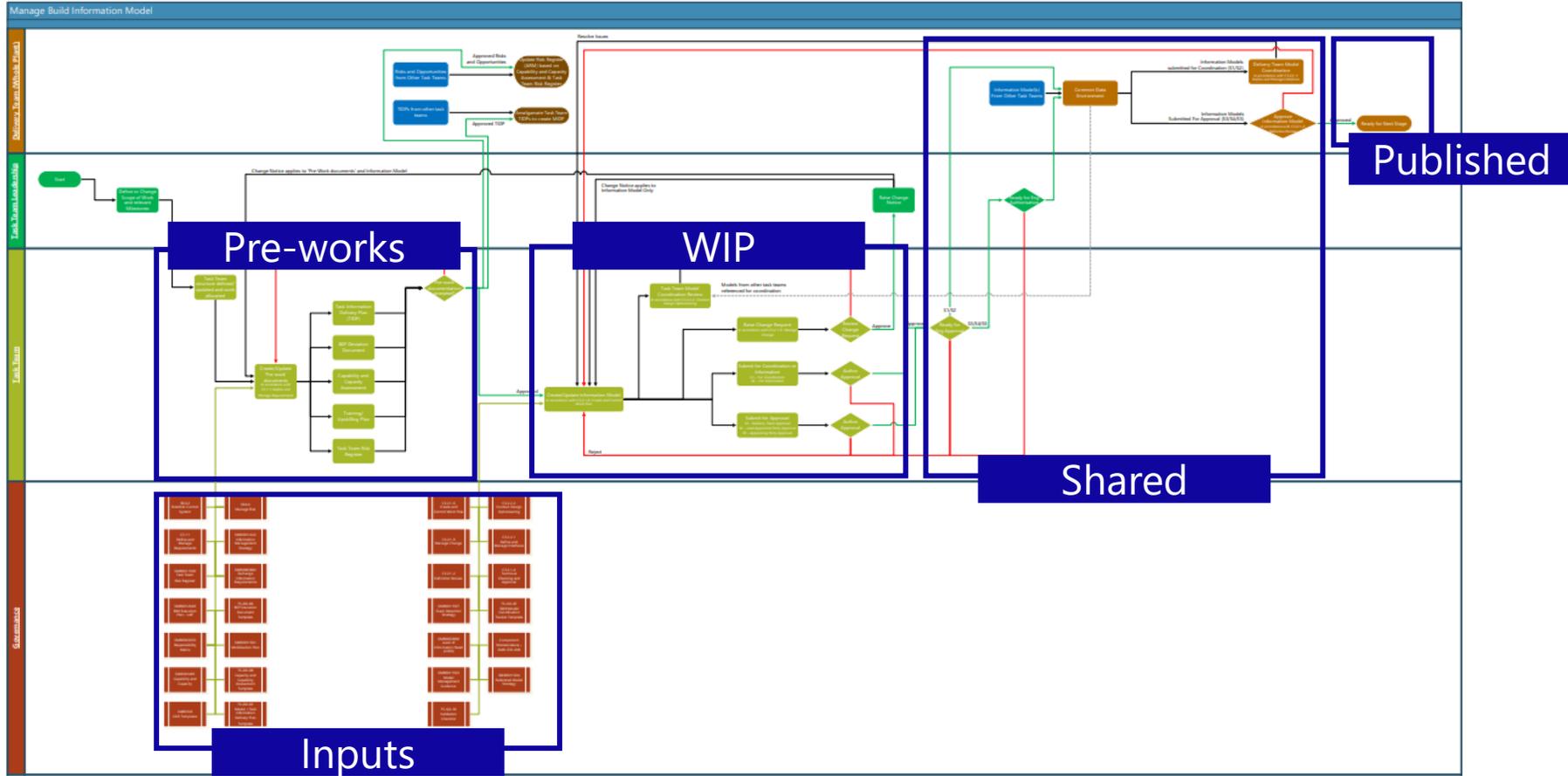
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Document hierarchy



Workflow



BIM suite of documents

SMR0011422_2 - Information Management Strategy

SMR0003882_1 - Exchange Information Requirements - LAP

SMR0012649_2 - BIM Execution Plan - LAP

SMR0003076_1 - Information Mgmt. Responsibility Matrix (IMRM)

SMR0011499_2 - Capability and capacity

SMR0011500_1 - Risk register

SMR0011501_2 - Mobilisation plan

SMR0011503_1 - Model Management Guidance

SMR0011504_2 - Model Federation Strategy

SMR0011507_1 - Clash Detection Strategy

SMR0003890_2 - Level of Information Need (LOIN)

TS-DD-85 SMR MIDP and TIDP Template

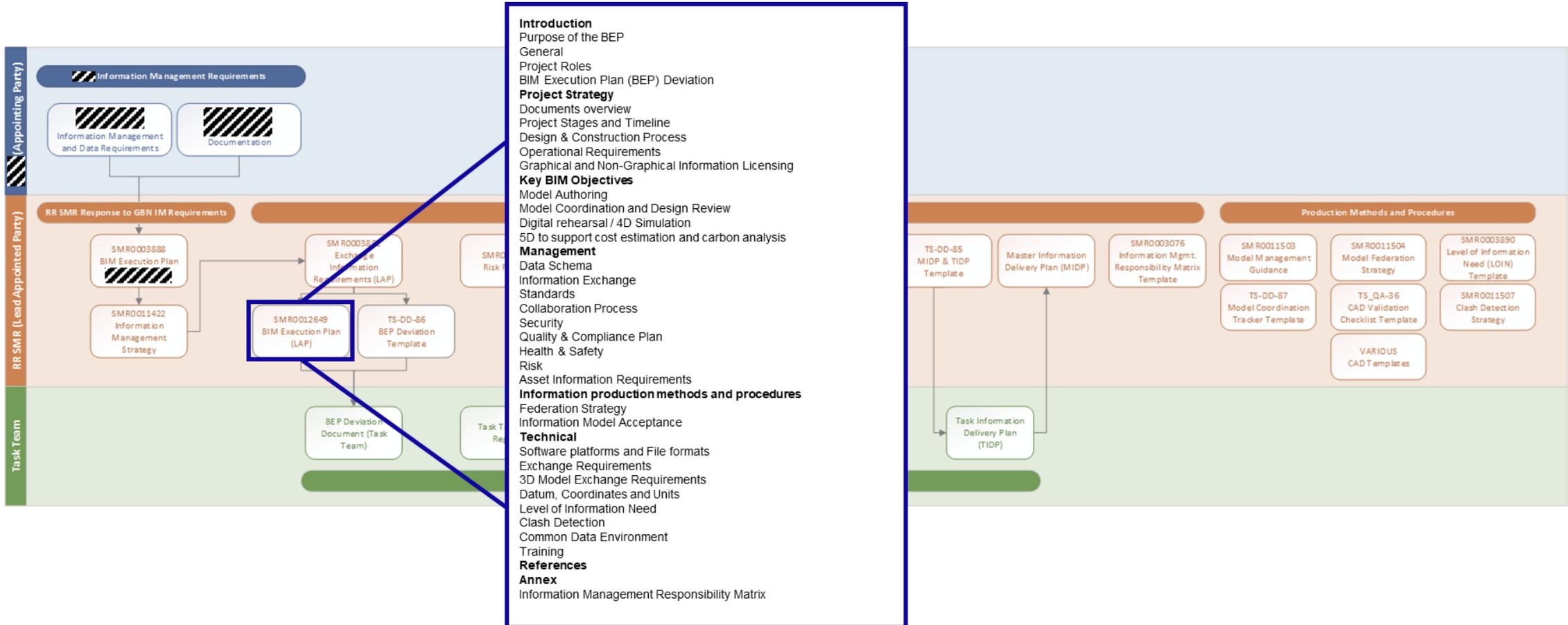
TS-DD-86 - BIM Execution Plan (BEP) - Deviation Template



SMR



BIM Execution Plan



Demonstration Steps

- Step 1 – Submit, Check and Approve Initial Documents 
- Step 2 – Submit, Check and Approve Pre-Work Documents 
- Step 3 – Submit, Check and Approve MIDP and Risk Register
- Step 4 – Submit, Check and Approve Models and Drawings 001 (S1), 002 (S2) and 003 (S3) 
- Step 5 – Submit, Check and Approve Change Request 001 (S1), 002 (S2) and 003 (S3) 
- Step 6 – Submit, Check and Approve Validation CAD Checklist
- Step 7 – Submit, Check and Approve Model Federation

 Cycles of rejection and new versions



SMR



Initial Documents



| DOCUMENT NUMBER | TITLE | AUTHOR | ENG APPROV |
|-----------------|------------|--|------------|
| 1 | SMR0011422 | Information Management Strategy | |
| 2 | SMR0003882 | Exchange Information Requirements - LAP | |
| 3 | SMR0012649 | BIM Execution Plan - LAP | |
| 4 | SMR0003076 | Information Mgmt. Responsibility Matrix - Template | |
| 5 | SMR0011499 | Capability and capacity | |
| 6 | TS-DD-88 | Template Capability and Capacity | |
| 7 | TS-DD-85 | | |
| 8 | SMR001151 | | |
| 9 | SMR001151 | | |
| 10 | TS-DD-86 | | |
| 11 | SMR000388 | | |
| 12 | SMR001151 | | |
| 13 | SMR001151 | | |
| 14 | SMR000388 | | |
| 15 | SMR001151 | | |
| 16 | TS-QA-36 | | |
| 17 | TS-DD-87 | | |
| 18 | TS-DD-18 | | |
| 19 | TS-DD-19 | | |
| 20 | TS-DD-20 | | |
| 21 | SMR-STD-0 | | |

Overview Related Objects Changes 3D Where Used Attachments History Workflow Relations Participants Simulation Physical Test Reports All Properties

DOCUMENT LEVEL PROPERTIES

Government Classification: No Classification
 Commercial Sensitivity: Private
 3rd Party Commercially Sensitive: No
 Export Controlled: Not Subject to Export Control
 Export Classification: UK/Not Listed
 Personal Information: No

PROPERTIES

ID: SMR0011422
 Revision: 001
 Name: Information Management Strategy
 Type: SMR Document Revision
 Release Status: Released
 Date Released: 04-Oct-2024
 Document Template: TS-DD-01 - Technical Report Template
 RDS-PP Code:
 E3S Case: No
 Lifetime Quality Record: No

ATTACHMENTS

Document for MRO:
 Retention Category: Private
 Internal Distribution List:
 External Distribution List:
 Non-SMR Document ID:
 Owner:
 Group ID: Engineering_Integration.Plant
 Last Modifying User: infodba (infodba)
 Checked-Out:
 Checked-Out By:

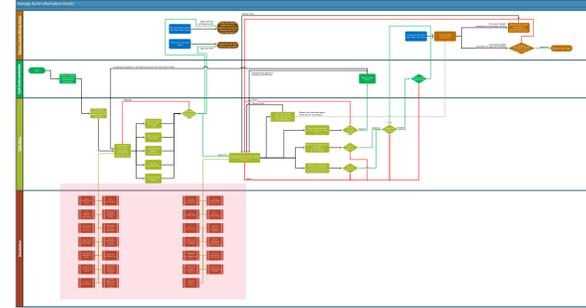
CHECKLIST

SMR0011422-001.pdf
 SMR0011422_Information Man...
 UK/Not Listed

PREVIEW

SMR0011422-001.pdf PDF 04-Oct-2024

1 of 22



Overview Related Objects Changes 3D Where Used Attachments History Workflow Relations Participants Simulation Physical Test Reports All Properties

SMR0011422:001-Information Management Strategy > SMR Document Issue Process: SMR0011422:001-Information Management Strategy

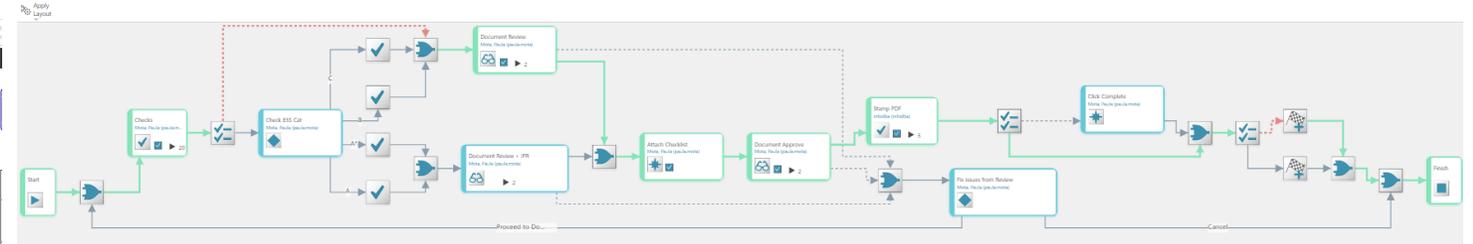
CURRENT AND COMPLETED TASKS

| Task | Status | Performer | Assignee Origin | Due Date | End Date | Comments |
|--------------------------------|-----------|-----------|-----------------|----------|-------------|----------------------|
| Document Approve | Approved | | | | 04-Oct-2024 | |
| Document Approve - Signoff | Approve | | | | 04-Oct-2024 | Checked and approved |
| Document Approve - Select Team | Completed | | | | 04-Oct-2024 | |
| Attach Checklist | Completed | | | | 04-Oct-2024 | N/A |
| Document Review | Approved | | | | 04-Oct-2024 | |
| Document Review - Signoff | Approve | | | | 04-Oct-2024 | Well done good job |
| Document Review - Signoff | Approve | | | | 04-Oct-2024 | Doc check approved |
| Document Review - Signoff | Approve | | | | 04-Oct-2024 | Looks good :) |
| Document Review - Select Team | Completed | | | | 04-Oct-2024 | |

UPCOMING TASKS

None

DIAGRAM



Executive Summary

This document is a comprehensive guide covering every aspect of project information management. It outlines the standards, roles, responsibilities, and processes for effective information management, providing a complete roadmap for the project's success.

The introduction establishes the document's purpose, provides an overview of the client, details the project scope and objectives, and lists the applicable standards. The information section identifies the project, describes the project's phases and schedule, and specifies current information needs. The roles and responsibilities section defines the protocol for managing project information, outlines high-level strategic roles and their responsibilities, and details specific roles and duties within the project. The common data environment (CDE) section provides an overview of the CDE and describes its configuration. The information container requirements section defines the requirements for information containers, specifies acceptable file formats, and limits file sizes. The information container metadata section explains the importance of metadata, details the process for managing revisions and document status, and provides templates and cover sheet guidelines. It also specifies how to handle references. The information container naming convention section establishes naming conventions for information containers and lists their attributes. The information container quality assurance section outlines the process, details the checks required for document control, and describes the approval process. Finally, the superseding/withdrawing section provides guidelines for superseding or withdrawing documents within the CDE.

This document ensures that all project information is managed efficiently and accurately. By following the outlined processes, we can confidently support the successful delivery of the RR SMR project, knowing that the information is in the best possible state.

| | | | | |
|----------|-------|----------------------|-----------------------------|------------------|
| Author | Sign: | Print: Paula Mota | Role: BIM Engineer | Date: Teamcenter |
| Reviewer | Sign: | Print: Paddy Corkery | Role: Digital Engineer Lead | Date: Teamcenter |



Models & Drawings

| DOCUMENT NUMBER | NAME | AUTHOR | ENG APPROV. |
|-----------------|--|--------|-------------|
| 1 DEV0000032 | MODULE, SYSTEM | | |
| 2 DEV0000033 | AUXILIARY BUILDING A - ARCHITECTURAL - MODEL SPLASH SCREEN | | |
| 3 DEV0000034 | AUXILIARY BUILDING A - ARCHITECTURAL - GA | | |
| 4 DEV0000035 | AUXILIARY BUILDING A - ARCHITECTURAL - ROOF | | |

▼ DESIGN LEVEL PROPERTIES

Government Classification: No Classification
 Commercial Sensitivity: Private
 3rd Party Commercially Sensitive: No
 Export Controlled: Not Subject to Export Control
 Export Classification: UC/Not Listed
 Units of Measure: EA

▼ PROPERTIES

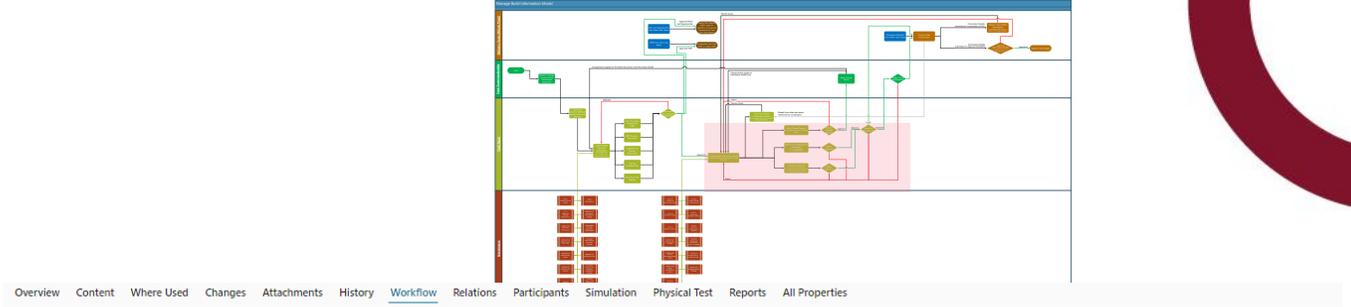
ID: DEV0000038
 Revision: 003
 Basic Name: BUILDING
 Name Modifier(s): AUXILIARY A
 Second Title: STRUCTURAL - MODEL SPLASH SCREEN
 Combined Name: BUILDING AUXILIARY A - STRUCTURAL - MODEL SPLASH SCREEN
 Description: BUILDING AUXILIARY A - STRUCTURAL - MODEL SPLASH SCREEN
 Part Required: True
 Assign To Generic Part: Design-Other Revision
 Type: Approved
 Release Status: Approved
 Date Released: 15-Oct-2024
 Effectivity:

Transport Tier:
 Safety Classification:
 Security Classification:
 ASME Code Class:
 QA Grade:
 BIM Status Code: 53
 BIM Level of Development: 300
 BIM Revision Prefix: P
 RDS-PP Product Class:

Owner:
 Group ID:
 Last Modifying User: Dedrick, Paul (paul.dedrick)
 Checked-Out:
 Checked-Out By:
 Current Location Code:

▼ PREVIEW

DEV0000038/003 PDF 15-Oct-2024 787 KB

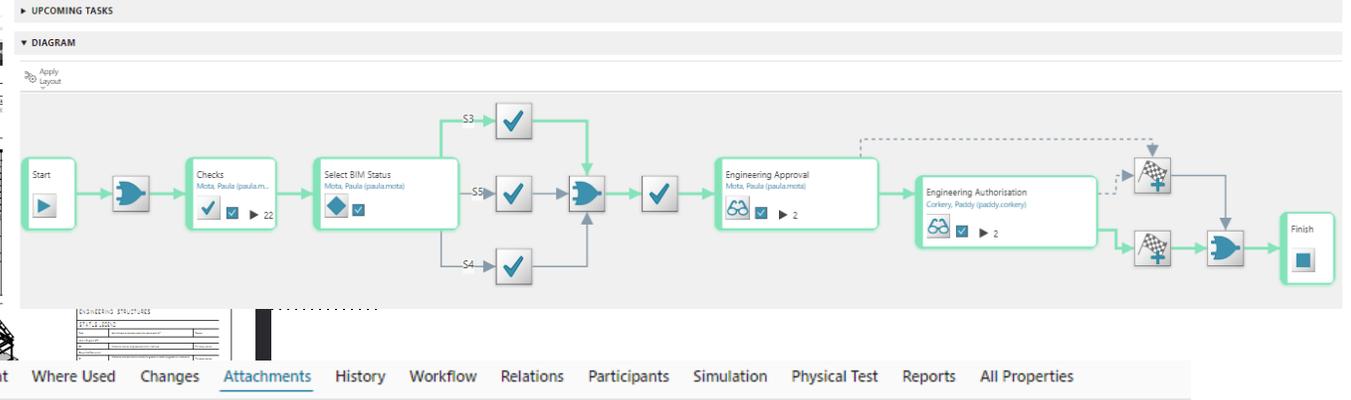


Overview Content Where Used Changes Attachments History Workflow Relations Participants Simulation Physical Test Reports All Properties

DEV0000038/P003-BUILDING_AUXILIARY_A - STRUCTURAL - MODEL SPLASH SCREEN > SMR BIM 53/54/55 Approval: DEV0000038/P003-BUILDING_AUXILIARY_A - STRUCTURAL - MODEL SPLASH SCREEN

▼ CURRENT AND COMPLETED TASKS

| Task | Status | Performer | Assignee Origin | Due Date | End Date | Comments |
|---|-----------|-----------|-----------------|----------|-------------|----------|
| Engineering Authorisation | Approved | | | | 15-Oct-2024 | |
| Engineering Authorisation : Signoff | Approved | | | | 15-Oct-2024 | |
| Engineering Authorisation : Select Team | Completed | | | | 15-Oct-2024 | |
| Engineering Approval | Approved | | | | 15-Oct-2024 | |
| Engineering Approval : Signoff | Approved | | | | 15-Oct-2024 | Approval |
| Engineering Approval : Signoff | Approved | | | | 15-Oct-2024 | |
| Engineering Approval : Signoff | Approved | | | | 15-Oct-2024 | |
| Engineering Approval : Select Team | Completed | | | | 15-Oct-2024 | |
| Select BIM Status | Completed | | | | 15-Oct-2024 | |



Overview Content Where Used Changes Attachments History Workflow Relations Participants Simulation Physical Test Reports All Properties

▼ FILES

| File Name | Release Status | Owner | Date Modified |
|--------------------------------------|----------------|-------|-------------------|
| DEV0000038/003 PDF | Approved | | 15-Oct-2024 13:18 |
| DEV0000038/003 Shared Metadata Cache | Approved | | 15-Oct-2024 13:18 |
| DEV0000038/003 Revit File | Approved | | 15-Oct-2024 13:18 |
| DEV0000038/003 IFC File | Approved | | 15-Oct-2024 13:18 |



LET'S TALK ABOUT CHALLENGES

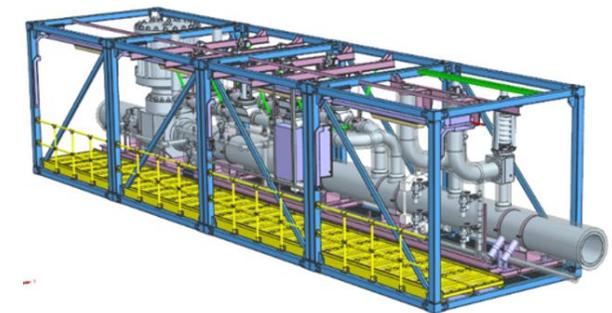
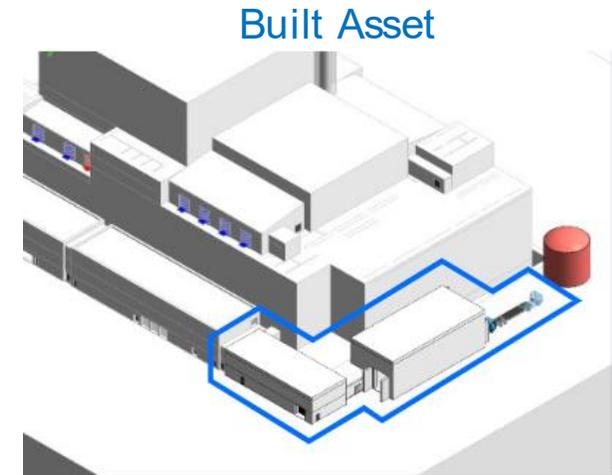


Implementation Challenges



Implementing BIM at RRSMR presented unique challenges

- High design complexity
- Handling of classified information
- A hybrid environment of construction assets and modular product components which were considered as products



A key complexity was the dual nature of the project

- Construction Assets: Traditional building elements
- Products: Modular components manufactured off-site with full lifecycle data

Modular Components



SMR



Interoperability & Format Conflicts



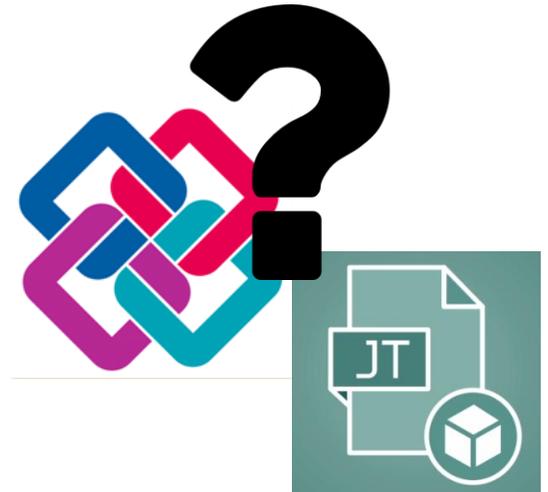
The coexistence of different design tools created interoperability issues

- Construction models: Developed in AEC Autodesk software
- Product models: Developed in Siemens Software



IFC was the initial choice for data exchange

- Not ideal for product models
- STEP and JT formats emerged as more suitable for Siemens NX workflows.

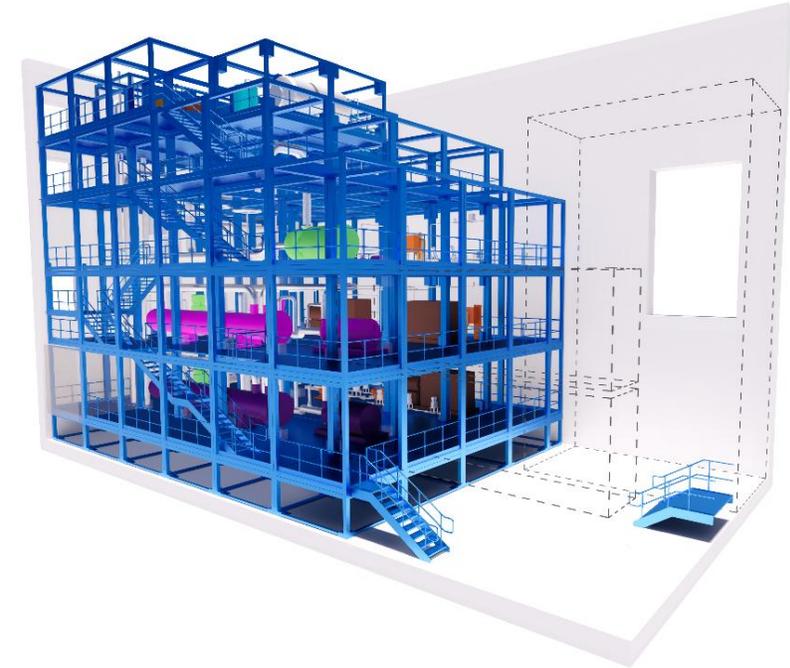


Federating Modules onto single blocks



A strategic solution was developed

- By appointing a key stakeholder responsible for federating product components into a single layout model per island.
- This flow facilitated:
 - Coordination with architectural and MEP teams
 - Clash detection and accountability
- The stakeholder had access to export tools for both IFC and STEP formats, enabling multidirectional data exchange.



The strategy culminated in the creation of the Federated Model

- Integrated components from all task teams
- Supported by a series of coordination workshops
- Ensured alignment across disciplines and improved model quality



KEY TAKEAWAYS



an
assystem

 **Project Controls**
EXPO
London, UK

Key Takeaways

Information Management

Strong Foundations

- Set up clear processes for managing project information.
- Created document and model control through the CDE.

Smart Model Integration

- Combined design data from different tools.
- Defined a clear method for sharing and checking models.

People and Process

People and Ways of Working

- Improved collaboration and understanding.
- Identified the need for more training in digital tools and standards.

Improved Quality

- Simplify model exchange and reduce rework during approvals.
- Strengthen data quality and traceability across all models.

Key Takeaways

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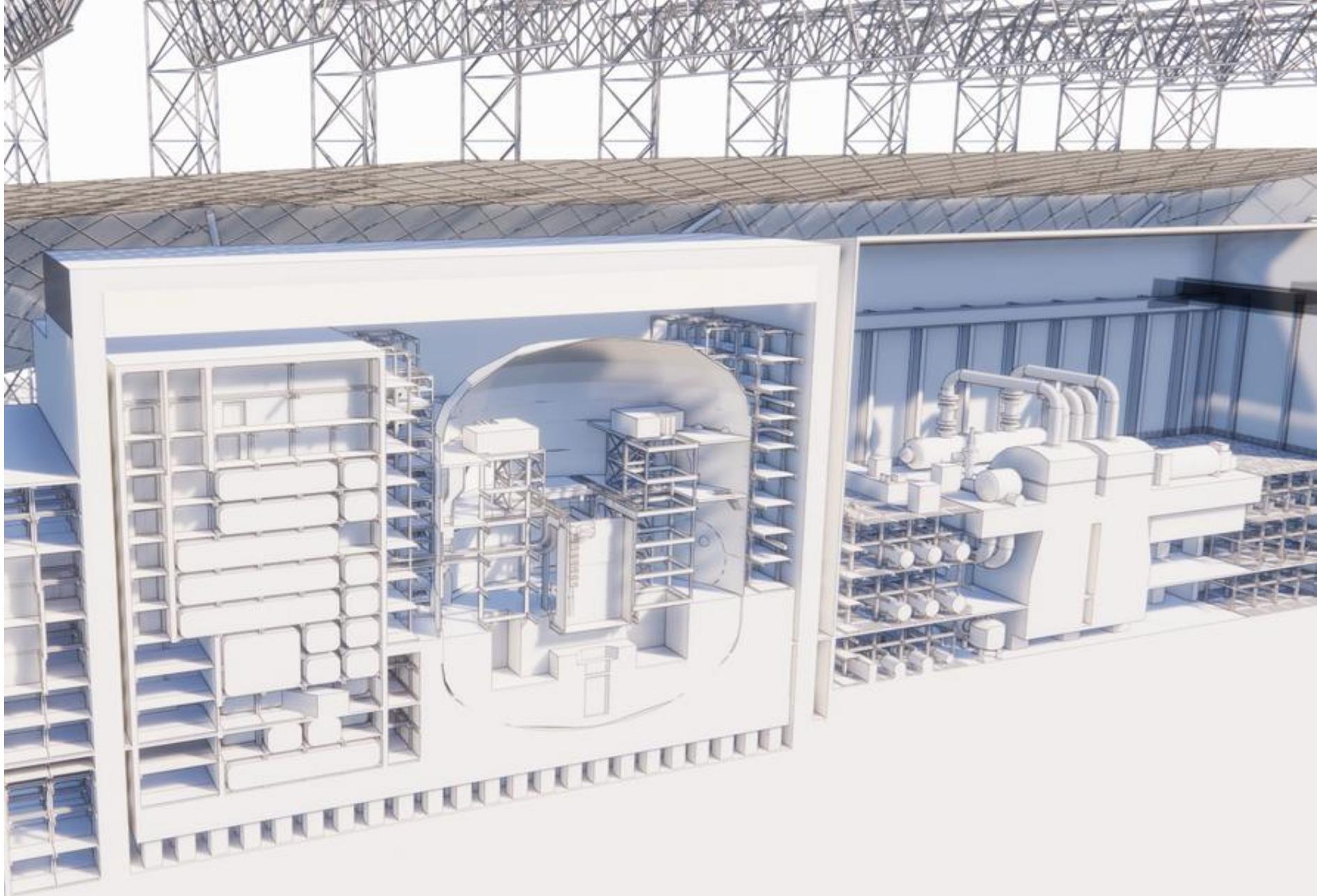
- Simplify model exchange and reduce rework during approvals.
- Strengthen data quality and traceability across all models.

LET'S TALK ABOUT CONCLUSION



A whole power plant approach

focused on standardisation, repeatability, commoditisation where allowable



Building a workforce for the future

- For Assystem and Rolls-Royce SMR, our people are our greatest asset.
- Maintaining skills and expertise across the business is vital to support the sustainable growth of the organisation.



The workforce throughout Rolls-Royce SMR and its supply chain needs to be diverse, competent and equipped with the right mix of skills, experience and expertise to safely deliver the highest quality products and services.

Developing an engaged, passionate and motivated workforce is an important part of the Rolls-Royce SMR vision - supporting continuous development and enabling people to be their best is a priority. Rolls-Royce SMR is striving to be an employer of choice, to develop a world-leading culture and be a fantastic place to work. In support of its work to deploy the technology around the globe, Rolls-Royce SMR is collaborating with other organisations to develop equivalent skills internationally.

Bridging the gap:

**Digital Information Management
and ISO19650 Compliance in
SMR Projects**

**Thank
You**



PAULA MOTA
pmota@assystem.com