Base Load Power Hub (BLPH)

3D MODEL MANAGEMENT PROCEDURE

Document Number: 123A90-PML-DIG-PRO-00004

Document Class: 2

01	19/07/2025	Accepted for Construction (AFC)	V. Fasoli	G. Casolo	C. Giunchi
00	10/10/2023	Issue for Review (IFR)	V. Fasoli	G. Casolo	D. Lo Sterzo
Rev.	Date	Description	Prepared	Reviewed	Approved

This document undergoes an issuance cycle within EDMS Fusionlive". Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy.

Revision / Change Log

Rev.	Description
00	Issue for Review (IFR)
01	Accepted for Construction (AFC)

HOLDS LIST

No.	Description
1	
2	
3	
4	

Table of contents

1 INTRODUCTION 6
1.1 PROJECT OVERVIEW 6
1.1.1 Project Location 6
1.1.2 Project Concept 7
2 DOCUMENT SCOPE 8
2.1 REFERENCES 8
2.2 DEFINITIONS 8
2.3 ACRONYMS 9
3 Scope of Work 10
3.1 Objectives of the 3D Model 10
3.2 3D CAD System 11
3.3 Structure and Building 11
3.4 Safety 11
3.5 Instrumentation 11
3.6 Electrical 12
3.7 Architectural 12
3.8 Piping 12
3.8.1 Piping lines studies creation 13
3.9 HVAC 13
3.10 Support Design 13
3.11 Equipment Modelling 13
3.12 Handling 14
3.13 Escape Routes 14
3.14 Access Routes 14
3.15 Maintenance Volumes 15
3.16 Fire Water Nozzle Coverage Elements 15
3.17 Crane Radius 15
3.18 Exclusions Zones 15

This document undergoes an issuance cycle within EDMS Fusionlive". Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy.

3.19 Future Equipment and Piping 15

4 3D model organisation 16

4.1 E3D Administrator - Data Base 16

4.2 3D Model Coordinator 16

4.3 3DO (3D Operator) 16

4.4 Activities description 17

5 Engineering Development 19

5.1 P&ID Changes 19

5.2 Equipment/Skid Information 19

5.4 ISOMETRIC 20

6 3D model verification 21

6.1 Design Review 21

6.2 Clash review 21

7 MODEL DATA COMPILING: GENERAL RULES 22

7.1 Compiling Name Property for Tagged Elements 22

7.2 Compiling Name Property for Non-Tagged Elements 22

7.3 Model Data Compiling 22

8 AS-BUILT 23

List of Figures

Figure 1 - HOLLANDSE KUST NOORD WIND PARK Location Map 6

Figure 2 - Wind Park Details 7

Figure 3 – BLPH Concept 7

Figure 4 – BLPH Digital Plant Design Platform 7

This document undergoes an issuance cycle within EDMS Fusionlive". Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy.

List of tables

Table 1 - Reference Documents 8

Table 2 - Definitions 9

Table 3 - Acronyms 10

Table 4 – Data Centric Design Tools 10

List of Attachments

Doc. No.	Description
123A90-PML-DIG-PL-00004_Att01	Project Specific 3D Requirements
123A90-PML-DIG-PL-00004_Att02	3D Model Progress Calculation

1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.1.1 Project Location

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

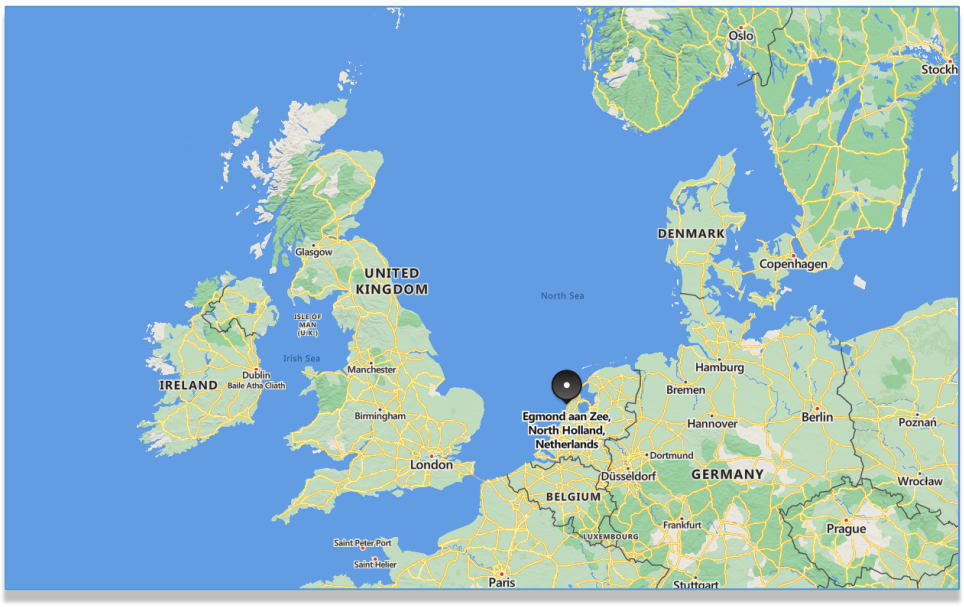


Figure 1 - HOLLANDSE KUST NOORD WIND PARK Location Map

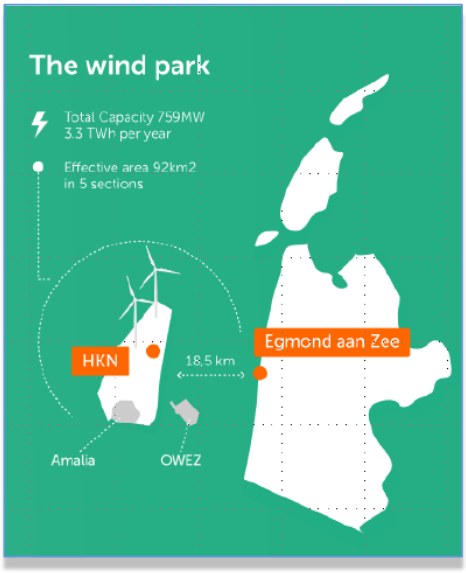


Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.1.2 Project Concept

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

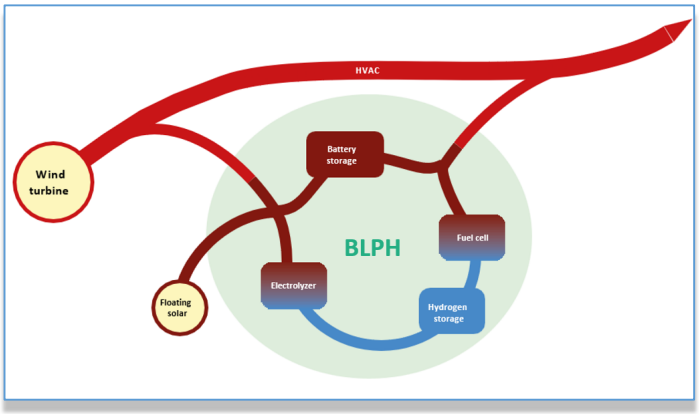


Figure 3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

2 DOCUMENT SCOPE

The overall objective of the COMPANY regarding the Information Management is to ensure that the CONTRACTOR provides COMPANY with the minimum level of information required to effectively manage its assets and business. Good quality information adds value throughout the full lifecycle of the Asset from Project Execution through Operations to Decommissioning.

COMPANY intend to maximise the use of project information by using it in digital systems which will manage and validate all information, enabling improvements in engineering and construction information consistency, enabling quick search capability between all related data and documentation sources, and integrating with other digital systems including 3D models, photogrammetry, Asset, Facility, Operational and Production management systems.

2.1 REFERENCES

Doc. No.	Description

Table 1 - Reference Documents

2.2 DEFINITIONS

Term	Description
Attribute	Property or characteristic of an Asset object
Commissioning	The functional verification of equipment and facilities that are grouped together in systems

Company	The party that initiates the project. The term "COMPANY" may also include agents or consultants authorized to act for, and on behalf of, COMPANY.
Construction	The project activity at which equipment and structures are installed/erected.
Contract	An acceptance of legal relations between two or more parties for the transfer of goods or services for value.
Data	The term «data» refers to a collection of structured information that can be supplied to, stored in or processed by an IT application. Data is always associated to the time at which exclusively created.
Engineering Database	Managed collection of process plant data that represents information about objects for a particular Asset.
Information	Information in the form of documents and data including drawings, indexes, databases, 2D and 3D models etc.
Operation	The organization responsible for operating the plant after start up.
Project	Unique process, consisting of a set of coordinated and controlled activities with start and finish dates, undertaken to achieve an objective conforming to specific requirements, including the constraints of time, cost and resources.
Project Tools	Refer to all the applications used during the project execution, including Engineering systems (e.g. 2D and 3D cad), procurement systems, construction systems, etc.
Tag	Label composed of letters and numbers allowing to uniquely identify an Asset's object.

Table 2 - Definitions

2.3 ACRONYMS

Acronym	Description
NA	Not Applicable
LCI	Life Cycle Information
MTO	Material Take-Off
PCV	Pressure Control Valve
E3D	Aveva Everything 3D Software
PAU	Plant Area Unit

PID	Process and Instrumentation Diagram
PBS	Plant Breakdown Structure
MDR	Master Document Register
E	Engineering Phase
P	Procurement Phase
C	Construction Phase
DMS	Document Management System

Table 3 - Acronyms

3 SCOPE OF WORK

The Detail Engineering of the BLPH project includes the realisation of a 3D model.

The 3D CAD Model is a collection of graphical data and databases which describes the facilities of a plant for design, checking and visualisation purposes. The 3D CAD Model is accessed via a 3D CAD system. The graphical data and the engineering attributes shall be an integral part of an engineering database supporting the design process which will be ultimately owned by the Company.

The 3D CAD engineering databases shall allow integration and consistency of the different design stages and the different disciplines, such as piping, civil, structure, mechanical, safety, instrumentation, electrical and HVAC equipment into one 3D CAD Model.

3.1 OBJECTIVES OF THE 3D MODEL

The 3D CAD Model shall provide a visual check on safety, operability and maintainability of the facility during the engineering, procurement, construction, commissioning, installation, production and maintenance phases.

The 3D CAD Models delivered to the Company should allow as a minimum to:

- Perform clash checks to ensure 3D CAD Model is clash free;
- Confirm proper escape ways and access for maintenance, handling and lifting;
- Confirm process requirements for slopes, low points, etc.;
- Extract Material Take-off (Bills of Material);
- Produce 2D engineering drawings such as plot plans, layouts with safety distances, plan and elevation views, etc.;
- Produce piping drawings;
- Produce safety drawings;

- Produce other engineering disciplines drawings as structural, HVAC, instrumentation and electrical, etc.
- Extract data for specific studies such as piping stress analysis, 3D explosion modelling, radiation studies, gas dispersion studies, etc.;
- Allow Real-Time visualization of the 3D CAD Model using third party software

3.2 3D CAD SYSTEM

3D Model of the topsides BLPH Platform will be developed with the AVEVA E3D software version 3.1.6.

For 3D review, Autodesk Navisworks 2020 will be used.

3.3 STRUCTURE AND BUILDING

All primary and secondary structural steel members, including columns and bracings of the BLPH Topsides and Transition Piece will be developed and defined in the TEKLA software and imported in E3D with a specific tool (TEKLA interoperability).

3.4 SAFETY

Escape ways will be developed and defined in the 3D model. Safety drawings (escape ways, safety equipment…) will be extracted from 3D model.

The following safety equipment are intended to be considered in the 3D model during the Detail Engineering stage (if any):

- Deluge skids,
- Fire Hydrants and Fire Monitors
- Safety Showers
- Twin Agents skids
- Bottle racks for fire extinguishing systems
- Lifesaving equipment

3.5 INSTRUMENTATION

The following will be considered during the Detail Engineering phase in the 3D model:

- All instrumentation valves (PCV, PSV, ,…) piping flow elements, etc…, flowlines, critical lines and lines in congested areas will be considered in 3D model.
- For "off-line" instrumentation, only tappings will be indicated, with due consideration taken to installation /access and process constraints.
- Trays and ladders shall be modelled if their sizes are above or equal to 100mm.

3.6 ELECTRICAL

The following will be considered during the Detail Engineering phase in the 3D model:

- Electrical equipment (Junction boxes, heat tracing, lighting fixtures and their support, small power sockets, welding outlets and power junction boxes, local Control Stations and their supports (if any), Field Electrical panels (if any) and cable trays/ladder and their supports in the substation false floor, MCT frames, etc…)
- Trays and ladders shall be modelled if their sizes are above or equal to 100mm.
- Equipment in technical room will be modelled in 3D model.

3.7 ARCHITECTURAL

All buildings and shelters including architectural items, such as roofs, walls, ceilings, floors, louvres and relief panels shall be modelled.

All equipment and furniture located inside buildings, technical rooms, control rooms, etc. shall be modelled. The electrical, instrumentation and telecom equipment (switchboard, transformer, cabinets, panels, etc.) located inside buildings shall be modelled within the corresponding discipline.

All doors, gates and windows shall be modelled respecting the following requirements:

- Doors shall be modelled in open position and as unique object independent of the wall.
- Windows shall be modelled in closed position.
- Gates shall be modelled in open position and as a unique object.

For walls and architectural layers related to the walls, such as insulation or fireproofing, corresponding opening shall be modelled at the location of doors and windows.

All penetrations through buildings and shelters with piping, cables, ducts, etc. shall be modelled.

3.8 PIPING

All piping lines, including underground piping, as defined in the P&IDs and whatever the nominal diameter for the As-Built 3D CAD Model, shall be modelled with in-line appurtenances and instruments. The corresponding insulation, proofing and tracing information shall be included in the 3D CAD Model.

The requirements for modelling of piping in equipment packages are identical to modelling of piping outside package boundaries.

The manual valves should be modelled in the position (open/close) corresponding to the normal production situation, in accordance with P&IDs requirements.

The instrumented and automated valves shall be modelled with the corresponding actuators, accessories and access platforms when necessary.

All piping and valves, including manual valves shall be tagged in the 3D CAD Model in accordance with P&ID.

Piping MTO will be generated from the 3D model.

3.8.1 Piping lines studies creation

The 3DO's shall model all non-official lines, such as copies, other purposes lines or lines without a specific project name, on hierarchy "000-PIPE-STUDY".

For a line study generated from an existing project line as an alternative, the 3DO shall input the attribute NAME of related PIPE with the existing line name plus the ending "-STUDYn", where n indicates the progressive number assigned following the" creation priority order.

In case of a new line with incomplete number or undefined data, the 3DO shall input on name attribute the fluid code with the addition of the ending "-STUDYn", where "n" indicates the progressive number assigned following "th" creation priority order.

The 3DO shall model all lines without line number and piping class on hierarchy "000-PIPE- STUDY": lines can be moved to proper hierarchy only once all missing data are fully defined.

All lines created under the "000-PIPE-STUDY" hierarchy will be deleted before issuing in as built.

3.9 HVAC

All HVAC equipment and packages, including at a minimum coolers and chillers, shall be modelled with corresponding relevant ducts accessories (dampers, valves, sensors, etc.) and supports.

3.10 SUPPORT DESIGN

All piping/cable tray/HVAC support will be modelled and shown on the 3D Model, using the MDS module of E3D and leveraging on the Project specific Multidisciplinary Supports Catalogue.

Support MTO will be generated from the 3D model.

3.11 EQUIPMENT MODELLING

All mechanical equipment shall be modelled with as a minimum, vessel trims, instrumentation, nozzles, skirts and supporting items. Modelling shall be made according to equipment data sheets and further updated with Vendor data.

In addition to the nozzles connected to process lines, all nozzles for instrument connections shall be modelled in order to validate the layout of the vessel area and the definition of the necessary access platforms to the instruments or valves.

Packaged or skidded equipment shall follow the same requirements as mechanical equipment and shall be modelled with the same level of detail as outside package boundaries. All tagged components shall be included in the 3D CAD Models as individually selectable geometric objects.

As part of the modelling of the mechanical equipment, handling and maintenance areas shall be considered and modelled.

3.12 HANDLING

All main handling ways (main routes used for equipment transfer to the deck laydown area) will be considered in the 3D model during the Detail Engineering stage. Handling volumes for main mechanical equipment will be also modelled to avoid obstructions. In particular, the 3D modelling will take into account the heaters bundle removal area as well as the pig's removal area, as required.

In addition, all the transfer volumes (hatches) will be defined in the 3D model.

Main fixed handling equipment (monorail, davit) will be shown.

3.13 ESCAPE ROUTES

Escape routes are reproduced by a STRU or EQUI element with at least two equipment primitive boxes, with:

- A footprint box with height 100 mm above deck or floor, with OBST 1 and level 0-10 (visible)
- A headroom box above the footprint box with the escape route actual height, with OBST 1 and level 8-10 (hidden)
- The footprint box and headroom box shall have the same width.

3.14 ACCESS ROUTES

Access routes are represented by a STRU or EQUI element with at least two equipment primitive boxes, with:

- A footprint box with height 100 mm above deck or floor, with OBST 1 and level 0-10 (visible)
- A headroom box above the footprint box with the escape route actual height, with OBST 1 and level 8-10 (hidden)
- The footprint box and headroom box shall have the same width.

3.15 MAINTENANCE VOLUMES

Elements representing maintenance volumes shall have OBST 1 and Level 8-10. These volumes provide a dedicated space necessary for maintenance (for ex. equipment internal parts and valves).

3.16 FIRE WATER NOZZLE COVERAGE ELEMENTS

If cone and pyramid graphical elements are placed in the model to show the volume and area that a fire water nozzle covers, the AVEVA Plant equipment primitives used to display such nozzle coverage shall have OBST 0 and Level 8-10 in order to be normally hidden in the model.

3.17 CRANE RADIUS

Design elements used to represent the radius of movement of a crane in the facility shall use level 8-10 and OBST 0. The elements representing the physical crane itself, shall use level 0- 10 and OBST 2.

3.18 EXCLUSIONS ZONES

Exclusion zones for transportation, installation and drilling activities will be modelled as required.

3.19 FUTURE EQUIPMENT AND PIPING

Future equipment and Piping will be considered for space reservation.

This document undergoes an issuance cycle within EDMS Fusionlive". Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy.

4 3D MODEL ORGANISATION

4.1 E3D ADMINISTRATOR - DATA BASE

The E3D administrator - data base is responsible for the following activities:

- Development and updating of the piping data base
- Administration of user files
- Allocation of user files
- File maintenance
- Control of all documentation associated with the system
- Set-up and preparation of data exchange between AVEVA DIAGRAMS & AVEVA ENGINEERING
- Import of Piping Classes from CLA PUMA/ELENA.
- Import of the 3D structural steel model, developed with TEKLA.

4.2 3D MODEL COORDINATOR

The overall supervision of the non structural 3D modelling activities will be performed by a 3D Piping co-ordinator. He will be responsible for the following activities:

- Co-ordination/filing of the disciplines input in the 3D Model activities under his responsibility
- Coordination of the non-structural 2D CAD production
- Coordination with the discipline lead engineers with regards to layout design issues and preparation of Review Comment Sheets
- Development of the plot plans, piping, escape routes and mechanical handling layouts
- Coordination of software issues and preparation of Problem Report Sheets
- Assist the project management in setting the project review
- Ensure management of equipment data used in the 3D Model
- Responsible of 3D model schedule and review session
- Interface with other disciplines
- Ensure that the 3D model is developed according to the latest applicable data
- Instruction to modify the 3D model is managed by layout engineer through official intenal memo

4.3 3DO (3D OPERATOR)

- 3DO executes the plant modelling under piping PSL supervision, with the documentation received.

- Checks the activities done and sends back to piping PSL the documentation used for correct archiving.

4.4 ACTIVITIES DESCRIPTION

At the start of the project the Piping DM, Piping PSL and 3DA check the 3D model basic rules for the following points, with particular focus on:

- Project setting on Aveva E3D;
- Database creation;
- Piping class and catalogues import;
- 3DO's system accesses;
- 3D modelling team responsibilities;
- 3D modelling procedure details.

The 3D modelling procedure provides for the following steps:

The PSL's send to Piping PSL the list with the item and relevant drawing. The piping PSL transfers the same document and information to 3DO's.

Rules for pending information (HOLD ITEM): if any, it shall be properly identified and communicated by PSL's to Piping PSL, who will ensure proper visibility and tracking The 3DO's execute the 3D modelling under piping PSL supervision.

The 3DO's give back to Piping PSL the documentation used during 3D modelling activities for correct archiving.

3D model progress will be updated by extracting all reference data from modelled items. 3DA is responsible to extract data and report with particular reference to piping MTO.

PSL's are checking that the relevant activities are made according to the contractual/technical documentation and the best engineering practices.

PSL's shall perform the following activities:

- Transfer to Piping PSL, as soon as possible, all necessary information useful for 3D modelling activities such as document work copies, check copies and preliminary documents in progress;
- For the purpose of assigning the correct progress data, certify all items status.
- Check relevant items, in compliance with the last document revision.
- Interface with Piping PSL to guarantee the modelling correctness and consequently the correct engineering development.

This document undergoes an issuance cycle within EDMS Fusionlive". Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy.

- Provide support to 3DO's during activities relevant to their discipline items.
- Organize periodical 3D model Interference Check.

PEM, as mutually agreed with all PSL's, organizes in advance - ahead of the scheduled 3DMR - an internal 3DMR.

Three (3) different 3D model review steps are foreseen, according to the engineering progress, at 30%, 60% and 90%.

Following the official 3DMR, Piping PSL prepares the 3DMR Report for official issue to client.

This document undergoes an issuance cycle within EDMS Fusionlive". Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy.

5 ENGINEERING DEVELOPMENT

The following rules will govern the engineering for Detail Engineering the 3D Model.

5.1 P&ID CHANGES

A complete monitoring of the P&ID changes will be performed. As part of the monitoring, the following procedure will be followed:

- P&ID revision will be issued to the 3D Piping co-ordinator with all changes clearly identified
- The 3D Piping co-ordinator will evaluate the impact on the 3D Model
- The 3D Piping co-ordinator will then planned accordingly the updating of the 3D Model

5.2 EQUIPMENT/SKID INFORMATION

The integration of 3D CAD Models of equipment or packages developed by Subcontractor or Vendor into the 3D CAD Model is under the Contractor responsibility.

The Contractor shall ensure that import is relevant with the level of detail of the main 3D CAD Model which generally implies shape simplification and detail being removed from the original 3D CAD Model provided by the Subcontractor or Vendor.

It may be tolerated to integrate 3D CAD Model of equipment or packages developed with a third party software directly within the main 3D CAD Model provided that:

- the exchange format will be compatible with MCAD module of Aveva E3D, such as STEP-File, IFC, AutoCAD Files (.dwg dxf), Inventor Files (*.ipt, *.iam), Revit Files (*.rvt, *.rfa), SolidEdge Files (*.par, *.asm, *.pwd,*.psm), SolidWorks Files (*.sldprt, *.sldasm, *.sldfpp, *asm), STEP Files (*.stp, *.step, *.stpz, *.stp.z), Universal 3D Files (*.u3d).
- the exchange file is cleaned of any unnecessary details that would slow down the 3D CAD Model, such as, but not limited to: internals elements, bolting, fillets, chamfers, engraving, holes, etc. prior to its integration within the 3D CAD Model.
- Items involved in the cabling design (local JB's, control Panels, Motors, …) shall be modelled by CONTRACTOR as Aveva equipment, with the connection points.

This document undergoes an issuance cycle within EDMS Fusionlive". Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy.

5.4 ISOMETRIC

The 3D Model shall be used to developed and issue fabrication deliverables as isometrics with the "ISODRAFT" module.

All the isometric information shall be as minimum as following:

- Line Number;
- Process Data;
- Piping Material List;
- Notes and information;
- Document Number;
- Revisons and data.
- The ISO format has imported directly in Isodraft.

6 3D MODEL VERIFICATION

The objective of this paragraph is to set out the principal rules for review and checking of the 3D Model during the Detail Engineering phase.

6.1 DESIGN REVIEW

On a continual basis, internal design review check of the 3D model will be organised. "Walkthrough" capability of the design review software will be used.

Each problem encountered will be formally detailed with drawings extracted from the 3D model.

6.2 CLASH REVIEW

At detailed engineering stage, once the model has reached a certain level of complexity, a validation of the overall modelling must be performed and clash freeing procedure must be initiated, the aim of this procedure being to resolve all different clashes existing within the model. As this checking requires to stop all activities on the model, the following procedure will be followed during the project:

- A date for clash checking is set by the 3D coordinator.
- Clash check program is run and a clash action report is issued. This report shall be sorted by discipline and shall differentiate the different types of clash.
- Resolution of the clashes is performed with all disciplines involved. Solutions are review and agreed by the disciplines. Some clashes may also be accepted.
- Modifications are performed, and a new clash check is performed to confirm the clash free status of the model and a finalized clash report is issued.

This document undergoes an issuance cycle within EDMS Fusionlive". Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy.

7 MODEL DATA COMPILING: GENERAL RULES

During the activity of items modelling, the project naming rules shall apply in order to have the information and the data easily available, as well as to ensure uniformity in their filling and simplify navigation in the model.

The use of item standard naming rules allows:

- Immediate availability of information
- Item's status required to update the model progress

7.1 COMPILING NAME PROPERTY FOR TAGGED ELEMENTS

Tagged elements shall be modelled by 3DO's indicating the TAG Code present in the original document in the NAME attribute of the element.

7.2 COMPILING NAME PROPERTY FOR NON-TAGGED ELEMENTS

3DO shall model all non-tagged elements, for example:

- ESCAPE WAYS;
- MAINTENANCE AREA;
- LAY DOWN AREA;
- VOLUME …;

into the respective area of the model, filling the NAME property with a brief description of the object.

The correct description is agreed with the discipline PSL and shall be consistent among the project and same type of elements.

3DO periodically extracts reports to check the correct modelling and status of non-tagged ele- ments.

7.3 MODEL DATA COMPILING

The modelled elements have attributes to be filled with project data; these data can be viewed, extracted and used during design.

3DO shall enter the attributes of each discipline item into the dedicated module.

General project data (for ex. line list data, equipment list data) come from Engineering through the executing of C/U feature by the 3DO.

During 3D model development, 3DO'S shall fill in the following data:

- NAME id of the modelled element, corresponding to the TAG (in case of tagged elements) or to a defining word (in case of non-tagged elements)

- :STATUS progress status, to be compiled only when the element is modified, as defined in Att. 02.
- :SITUATION element condition: New / Existing / Future / Hold / Loose / Hook-Up / Trim Line
- :DRWGNO Reference document number, for ex. P&ID; Data Sheet; Plot plan
- :DRWGREV Reference document number revision

In case of uncertain data, 3DO'S shall input a brief description of the origin of the data used.

Ex.:

DRAWING NUMBER – "data import from feed": element modelled as in FEED engineering

DRAWING NUMBER – "pump catalogue, 14/05/2017": element modelled using a pump catalogue.

8 AS-BUILT

The 3d model will be updated with the As-built Documentation produced from various disciplines during erection activities. Moreover, field welds will be added on piping lines.

All UDA (User Defined Attribute) reference drawings will be update with As-built revision.

After these activities, All DB descriptions (Content Type) will be switched from project [PRO] to As-built [ASB]

All items with the "STUDY" suffix will be deleted before issuing as constructed.

As-Built 3D model will be handed over before starting up (RFSU).

As built will be generated based on Red Line Mark-up (RLMs) generated during erection, construction, commissioning and start-up.