

Plant & Machinery Relocation Software



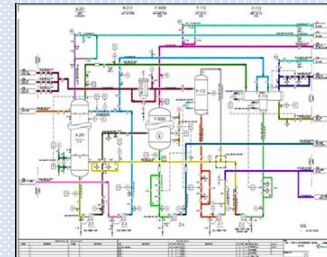
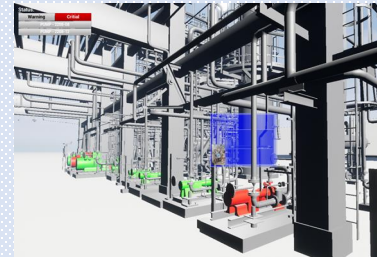
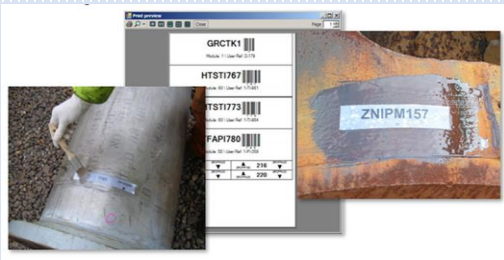
*‘Complete Relocation
Management from Dismantle to
Shipping to Rebuild’.*

Exon Tech Asset Relocation Database

‘Complete Relocation Solutions’.



Exon Tech Ltd have developed a suite of software and processes that are world leading in the field of Asset Relocation. Exon Tech Ltd has integrated Match Marking, Laser Scanning, Intelligent 3D Modelling and Asset Tracking into a unified system that follows the Assets from the start of the relocation to the final assembly and on into the running of the new plant.



The database and reports generated allow monitoring and managing the dismantling process and track each item throughout relocation, with the information recorded allowing the commercial and technical planning and management of future reassembly. Asset Master can benefit all parties involved in the entire plant relocation.

- Financial investors / stake holders – audits and progress reports.
- Dismantling contractors – digitalized match marking system.
- Logistics companies - shipping container manifests and content reports.
- Rebuild contractors – plot layouts, laydown plan, isometrics and P&IDs.
- Engineering Consultants – Intelligent 3D Models AVEVA E3D; PDMS Smart Plant design software.

The Complete Relocation Solution

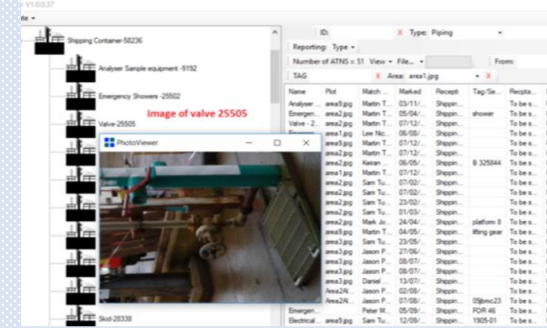
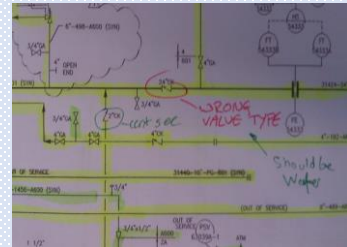
'Dismantle to Rebuild & Commission'

1. Project Server Setup

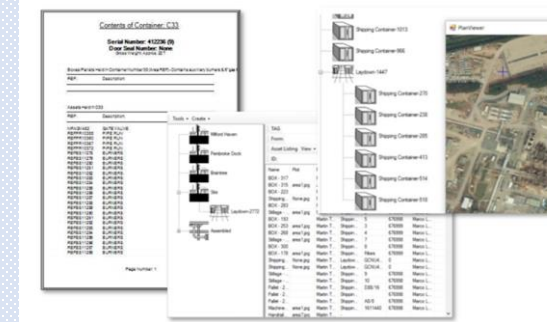
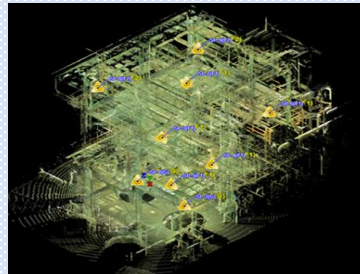
2. Record & Upload

3. Match Mark

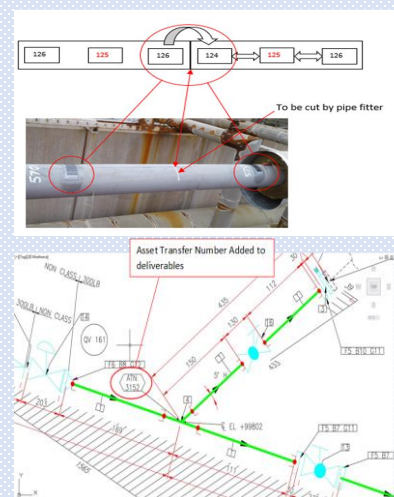
4. Report & Track



6. Rebuild Design & Management



5. Link, Plan & Manage



MODULE 60 DATE OF ISSUE

4x7' + 8' on track from West Battery going East

Section 1: Documentation

RE-ASSEMBLY INSTRUCTIONS FOR MODULE 50

This document should be used in conjunction with the following drawings
See Photographs
M0002
007630M

There are 4 pages enclosed

The above statements were seen to be true by the issuer

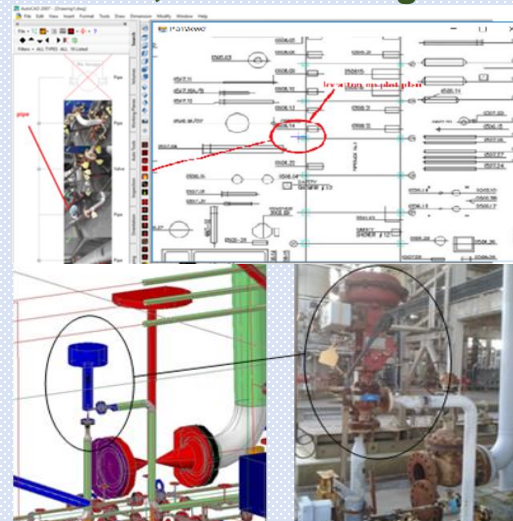
Name of Issuer Signed

Section 2: Re-assembly Team

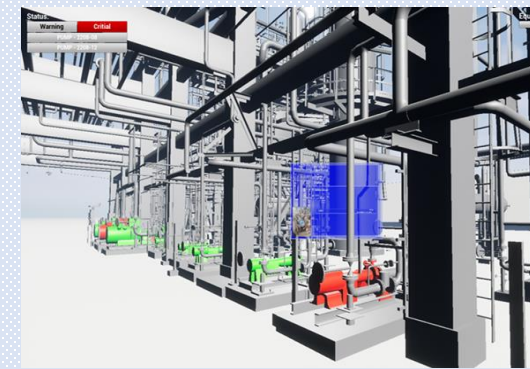
TEAM LEADER (PRINT)

ISSUE NUMBER

NON CONFORMANCES



4. Model & Add Intelligence



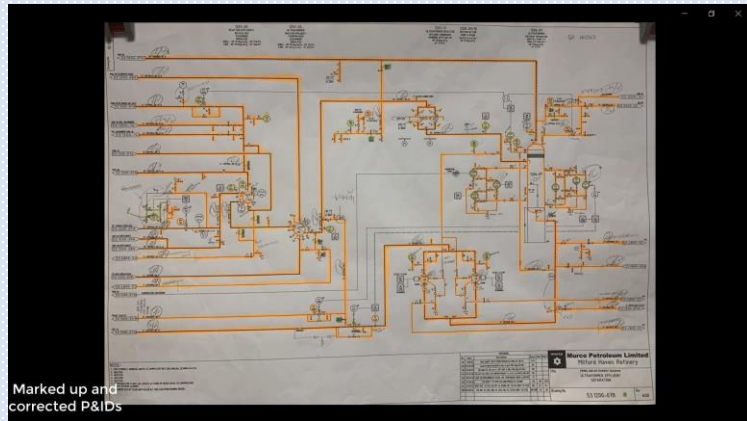
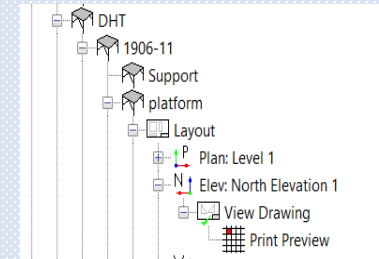
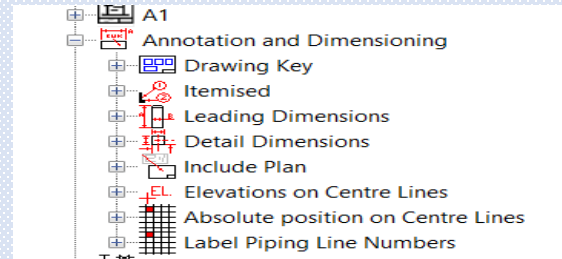
Project Server Set-Up

Document Management, Verification & Control

Exon Tech will set up the project server used to store and manage information throughout the project.

Firstly our teams will find, collate and digitalise thousands from the plant operators or in the drawings office - plant engineering information is a valuable asset that is often lost!

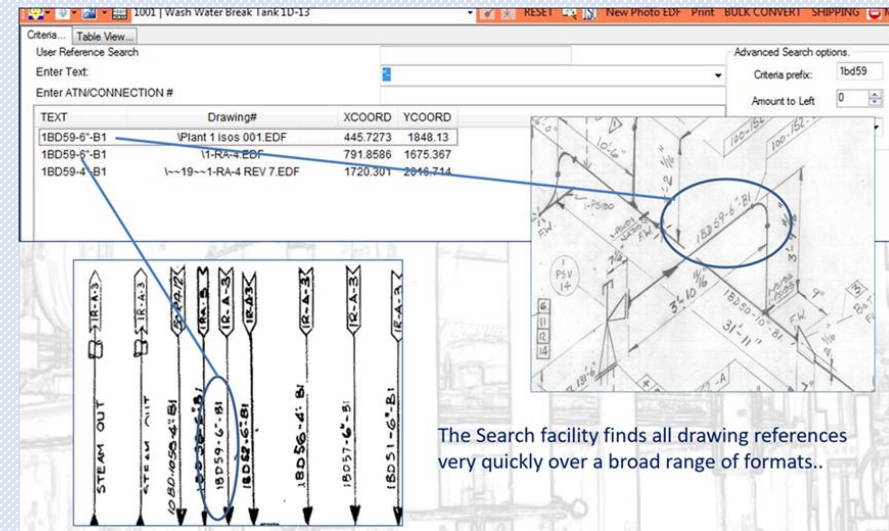
Original P&IDs corrected and digitalised – onsite verification



Our document scanning and management system can be incorporated into many plant operating systems for future use.

Each document will then be referenced, and our systems allow easy management and locating of all.

With the construction of Databases, web apps mobile apps, AutoCAD plug ins and windows apps, using the latest languages, Such as Xamarin, VB, C# ,C++ ,HTML, JavaScript, ASP, SQL,



LiDAR Data Capture

Laser Scanning Creation of a Point Cloud



Our fleet of P30 / P40 laser scanners Leica ScanStation P30/P40 deliver highest quality 3D data and High-Dynamic Range (HDR) imaging at an extremely fast scan rate of 1 million points per second at ranges of up to 270m.



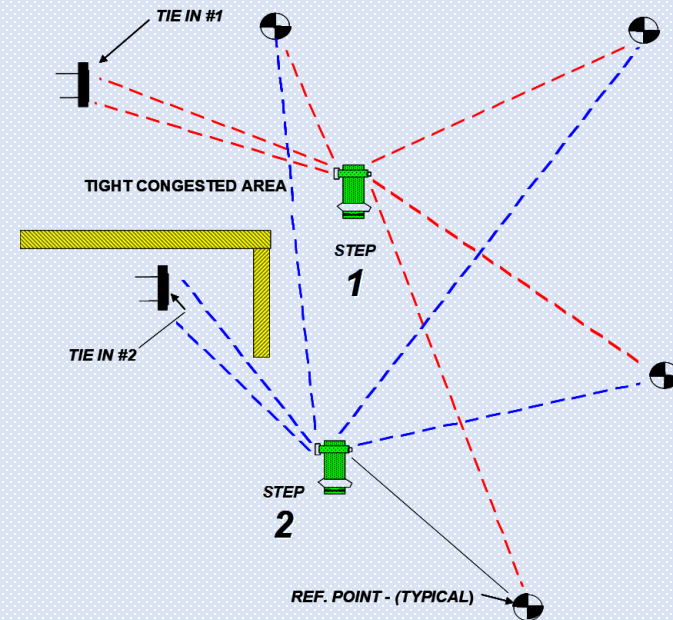
Point Cloud of a Chemical Plant Pakistan captured by 3D Engineering Surveys Ltd. in 2022

3D Engineering Surveys Ltd. Leica P40 Laser Scanner at Sur LNG, Oman - 2017



Six black and white targets will be used to coordinate each scan – target density will be increased around the tie-in points to ensure that accuracy at the “tie-in” will be below the specified 3mm

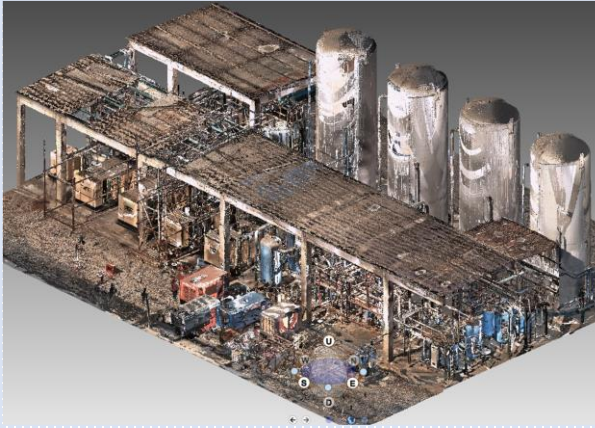
Targets common targets are traversed between adjacent scan positions as well as tied into the ‘primary control’ network



3D Modelling of Point Cloud – AVEVA E3D

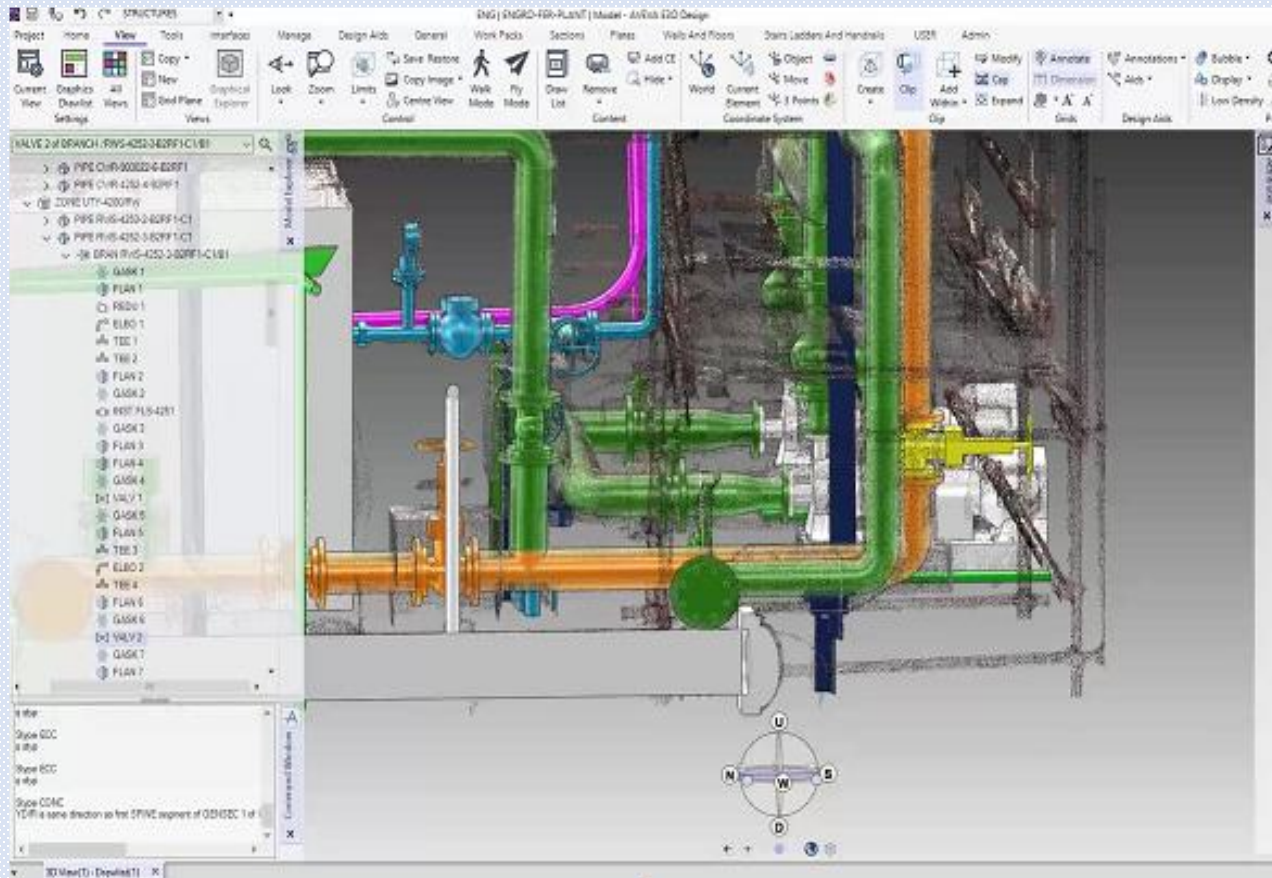
ExonTech AVEVA E3D Modelling & Design Engineers spread between our UK & Manila Offices with combined experience of over 400 YEARS between them!!

The point cloud (.LFD) will be imported into AVEVA E3D Version 3.1.5.0 1 module (E3D Design) for our E3D Modelling team to model the items based on as built (not design) geometry of the plant based upon the point cloud



ABOVE: Point Cloud with AVEVA E3D

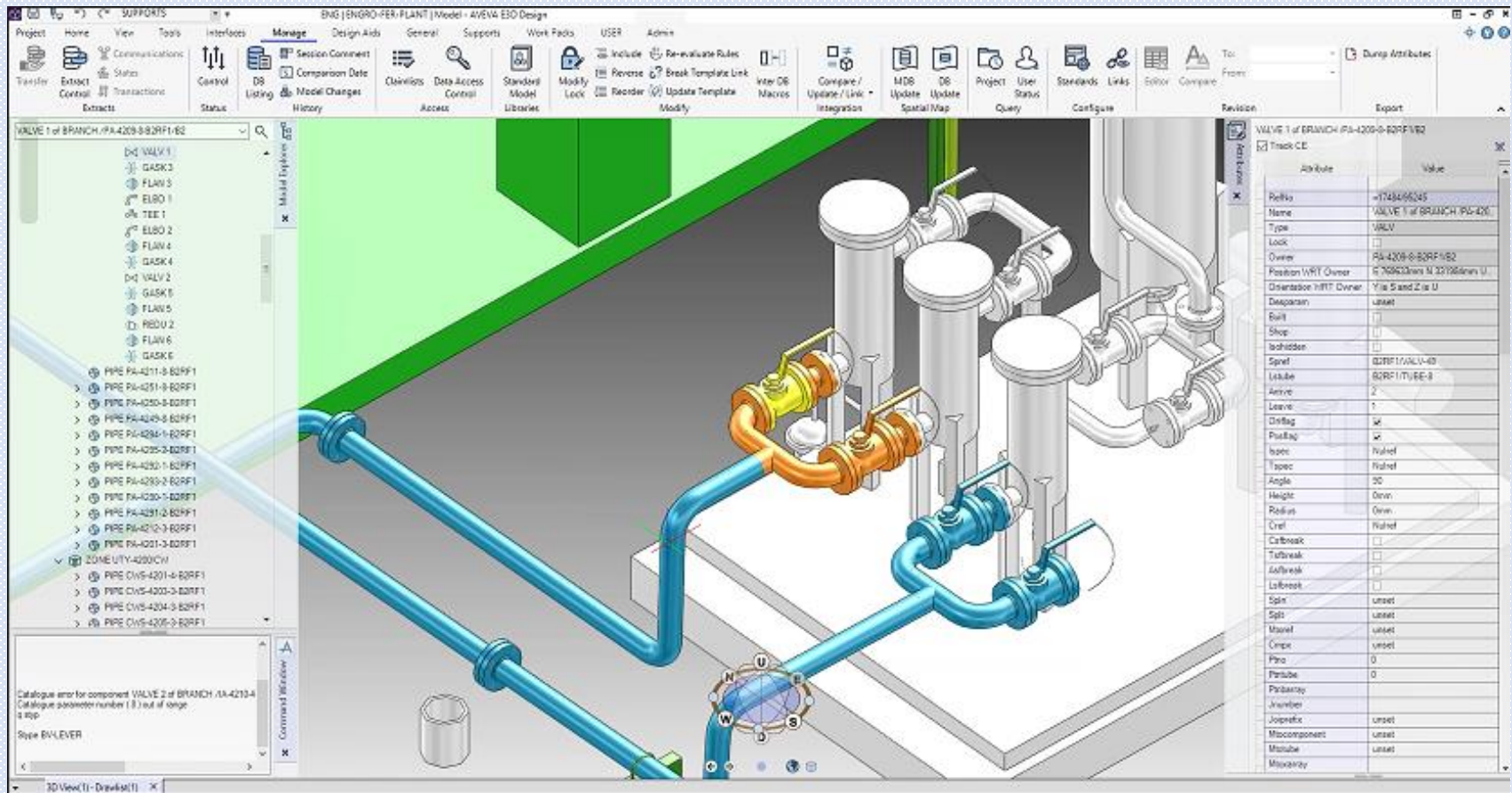
Using the latest version of E3D it is possible to import the .LFD file from Point Cloud Manager and model directly within E3D 'design' package



ABOVE: Point Cloud with 3D Model with AVEVA E3D

3D Modelling & Addition of Intelligence

Using P&IDs and Equipment, Instrument and Line Listings our team is able within E3D Administrator (E3D Design & Paragon) to add intelligence to the model.



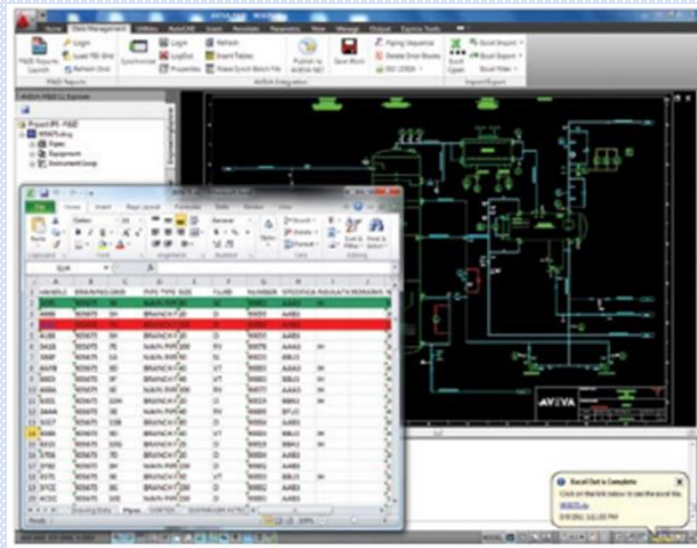
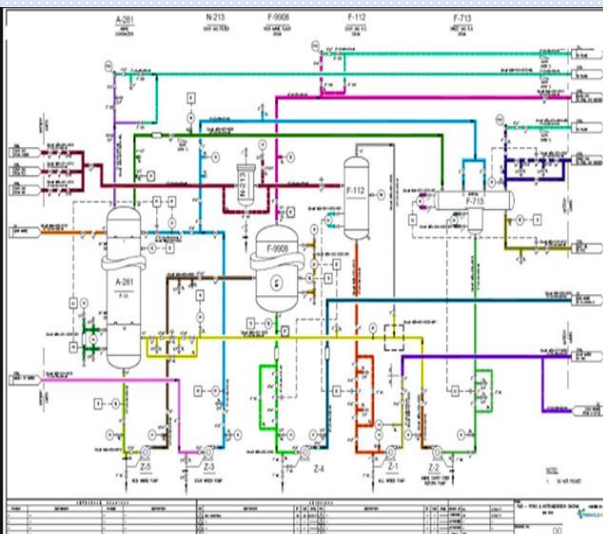
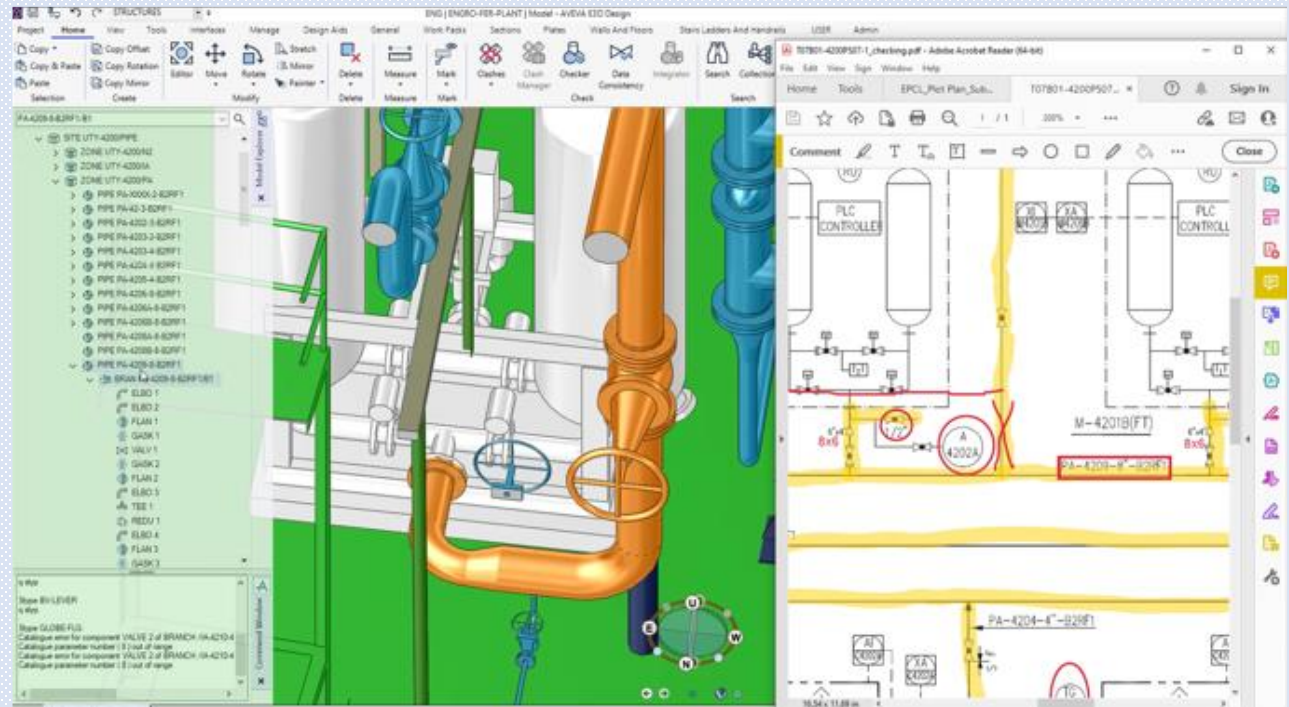
Labelling & Tagging of the model with instrument/equipment/valves tagging and line number, piping classes (Class 150, Class 300, Class 600 etc) flow directions, material specifications, classes, pressure ratings, types of valves (check, gate, butterfly, flow meter, etc.) .

In the case that the plant is “dumb” (no documentation available) 3DES through 25 years of modelling has developed an “intelligence library” using geometry taken from the point cloud and matching with common ‘cats & specs’.

Verification of P&IDs – QA, Update & Generate

Using the as-built (current) model of the plant and overlaying the plant P&ID its is possible to verify and correct to generate revised and updated P&IDs as part of our deliverables.

In the case that the plant has no P&IDs available, or the P&IDs are very unreliable – 3DES can generate P&IDs within E3D Design, Draw, Isodraft, Paragon, MDS & Lexicon)



3DES can upgrade the level of P&IDs to add intelligence making them fully functional “active” from our intelligent model within our fully functional AVEVA digital drawing office.



Digitalised Match Marking

‘The Only Global Digitalized Asset Linking System’



‘Match Marking’ is the process of tagging and logging information of each individual item to be dismantled packed and shipped

As part of our Asset Transfer system Exon tech has developed a match Marking on site tablet application – within a few moments valuable asset information and images can be recorded on site and uploaded each evening into the database.

Our application is proven to reduce the requirement for ‘Match Marker’ on site by as much as 50% and has the ability to upload more asset information than conventional ‘match marking’ methodologies.

Information recorded can be tailored for the client but can include – asset condition; Asset Transfer Number and bar code image ; location on plant; asset plant intelligence; serial tag and ID; line number weight; cut bar code

79084

Creator: Sam Tunstall
Last Edit: Sam Tunstall

Component Image:

Context Image:

Component Cate Pump

Component Type: Vessel

419, 1631 Bundle ON

Serial No./Tag SS Tube

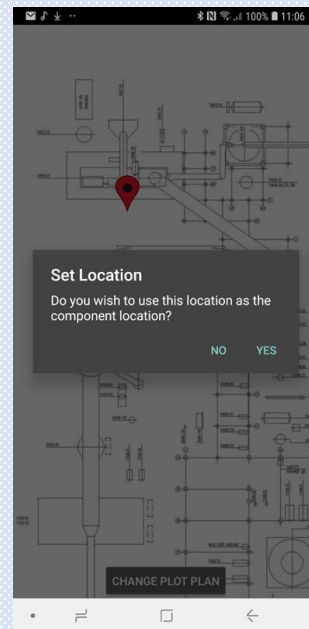
Seal No. Heat Exchanger

Weight (Kg) Test Pots

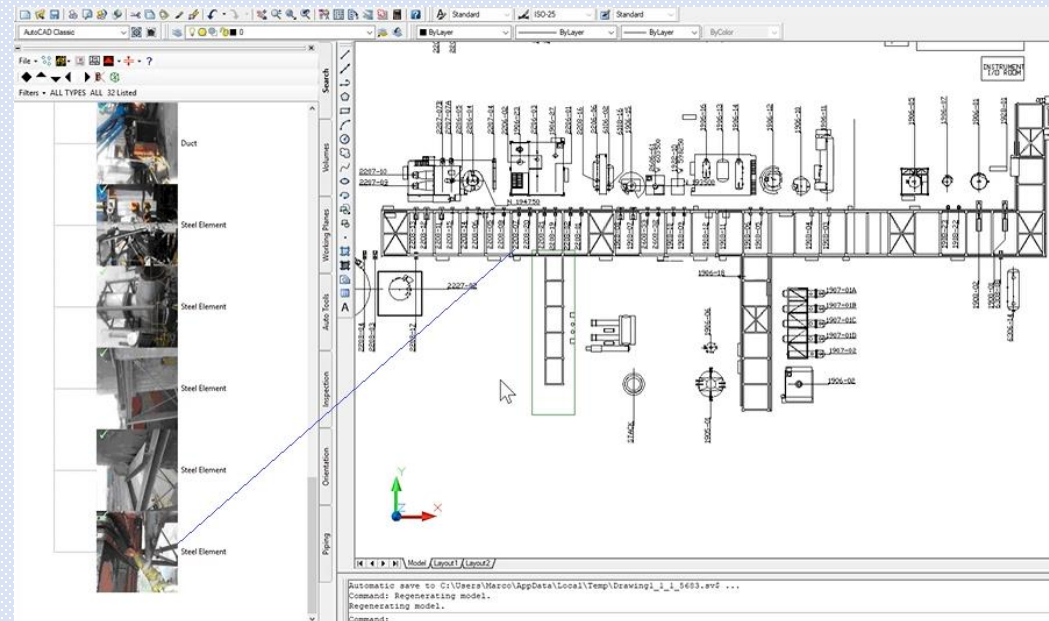
Add Cut Barcode Tank CUT

79066 <|> 79048 Reactor INV

Asset Information Screen



Asset Location Screen



Plant Intelligence ‘tagging & line numbers from P&IDS

Digitalised Match Marking

ATN Marking Up and Label the Assets and Piping

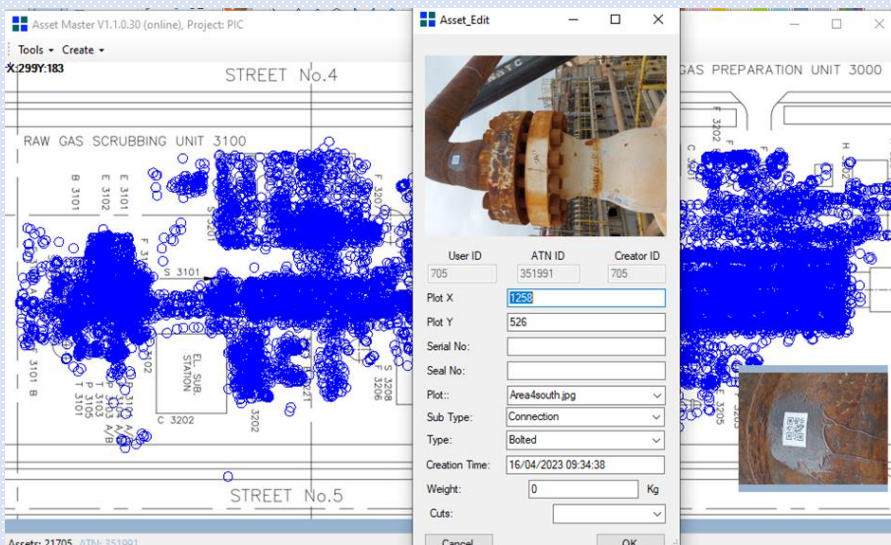
Labels are applied to all assets containing the unique Asset Transfer Number and Bar Code

This information is then uploaded through the tablet apps and can be used to trace the asset and information throughout the entire relocation process



After the label has been printed it can be added to the plant in the correct location. Labelling of the plant is done using resin bonded paper.

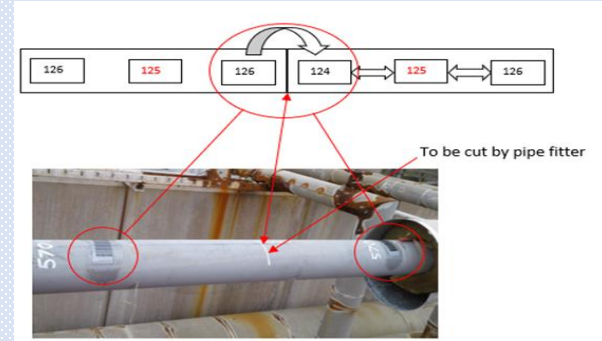
The label gives a direct link to the database and is waterproof, resistant to wear and cheap to create. It simply requires an A4 printer and marine grade epoxy resin and hardener.



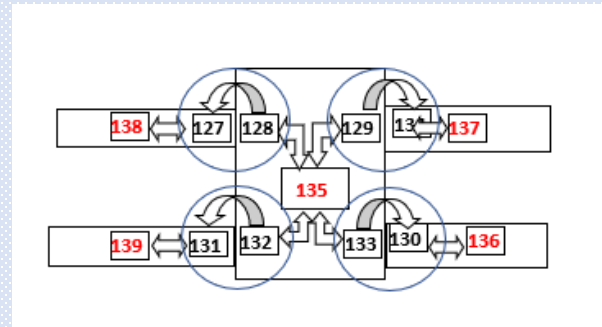
Managing Cuts and Weld

Managing Intelligent Break Points and Cuts

Engineers Mark-up indicates where all of the disconnections and cuts are to be made on the plant. This process links cuts and flanges that are made to dismantle the plant to each asset transfer number.



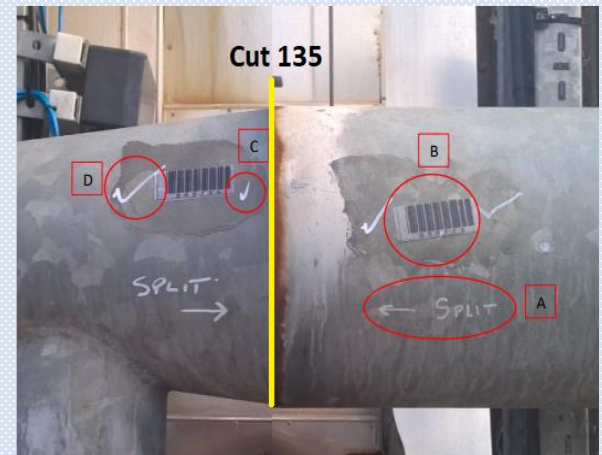
Either side of the break will be match marked with ATN illustrating where adjoining sections during rebuild – scanning barcodes with the app will indicate what matching pairs for rebuild.



All cut positions are linked to the 3D Model with cut code and images for rebuild management and also valuable information for ongoing plant commissioning and operation



Piping engineers optimising cut positions during the dismantling and intelligently recording the information Asset Master is able to quantify and report the amount of welding required to rebuild the plant



Packing, Shipping & Laydown Management

'Logging and Tracking Items & Containers'

The shipping container seal number (ATN) needs to be added to the system. It can be entered into the mobile app.



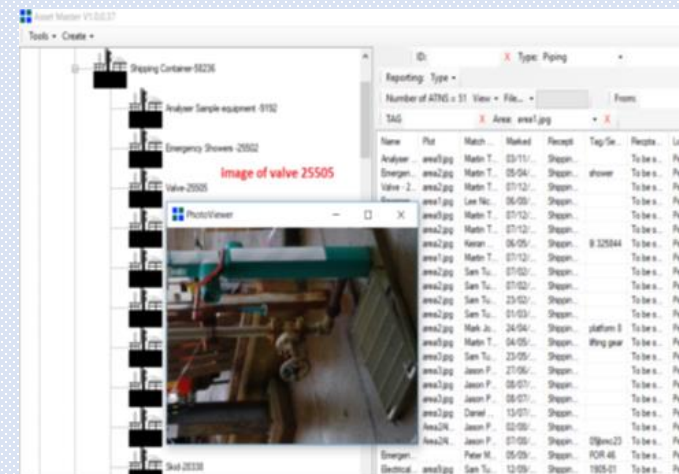
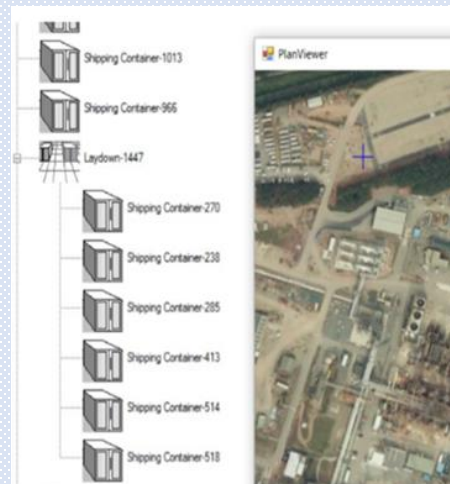
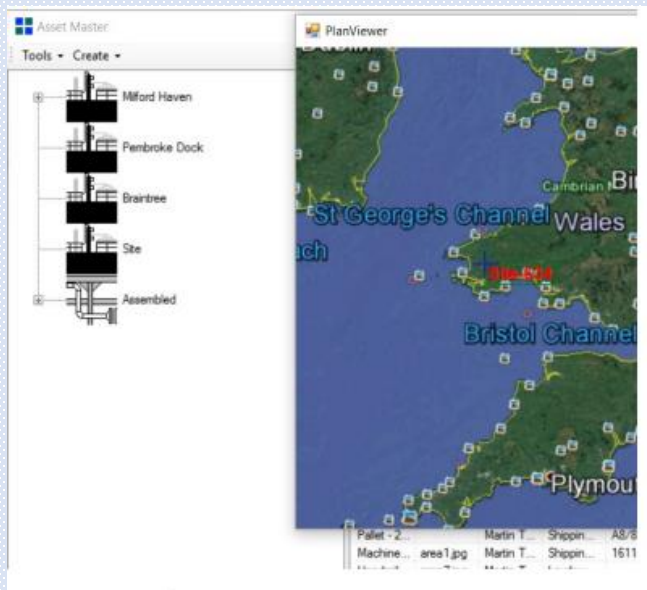
ATN Q Code



The container coded and security sealed and the ATN is scanned and uploaded into the system

A screenshot of a mobile app interface. It shows a form for entering container details, including User ID, ATN ID, and Creation Time. Below the form is a table with columns for Name, Signed, and a date. The table contains one row with the name 'Total Gross Weight' and a value of '23000Kg (231 tonnes)'. The table also shows 'Total items packed: 70'.

Weights and mass can be calculated for to plan shipping



The Container ATN will track the container globally and locally at origin laydown and destination laydown

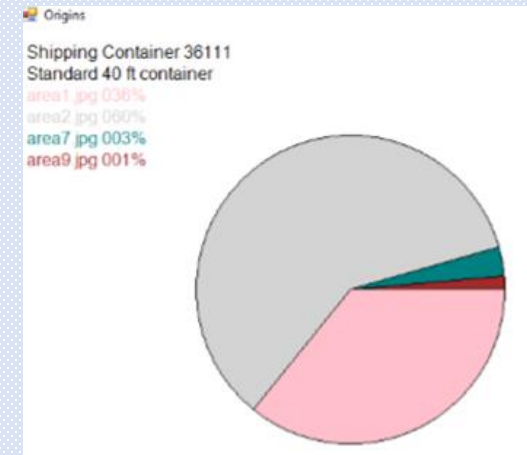
Shipping Manifests & Laydown Management

Optimizing Logistics – Minimizing Costs

Shipping Documents and Manifests

Manifests are generated from the data entered stores in the database. They cannot be directly edited. To change a manifest, the database must be changed. This guarantees conformity between the data on the system and the reports being produced.

The manifest weight option is by default off. The weight option adds the weight column to the manifest and drives the manifest total



Shipping Container - Manifest

This document describes the contents of Shipping Container-238
Loaded By Martin Twigg on 15/9/2016
Shipping Container Serial Number:- GCNU4651087.
Shipping Container Seal Number:- 676998
All unspecified weights in kilograms

Item Ref	Type	Notes	Weight
183	Stillage	7	200
208	Stillage	2	1000
300	BOX	8	20
315	BOX	cardboard box	65
224	Machine Spares	1611440	78
309	Loaded Box	Box that is already loaded	1800
324	Loaded Box	Box that is already loaded	1700
259	Loaded Box	Box that is already loaded	2200
303	Loaded Box	Box that is already loaded	2200
316	Loaded Box	Box that is already loaded	200
229	Loaded Box	Box that is already loaded	100
214	Loaded Box	Box that is already loaded	100
199	Loaded Box	Box that is already loaded	100
266	Pallet	AS/S	1100
308	Stillage	9	1000
323	Stillage	10	1000
206	BOX	10448055	20
296	Pallet	088/16	1100
326	Stillage	11	1000
179	Pallet	for S/S	1100
194	Pallet	c S/S/18	1100
193	BOX	5	20
223	BOX	1	20
283	BOX	6	20
281	Pallet	Standard EuroPallet	1100

Container Loaded and Inspected By: _____
Date of Loading: 26/9/2016

Container was seen to be sealed by: _____
Shipping Container Seal Number:- 676998

Total Gross Weight = 22293Kg (22.293Tonnes)
Total items packed: 25, total packed weight 18343Kg (18.34 Tonnes)

Page No 1

User ID: _____ ATN ID: _____ Creator ID: _____

Plot X: _____ Plot Y: _____

Total No: GCNU4652308

Serial: 676994

Plot: area1.jpg

Type: Shipping Container

Creation Time: 9/15/2016 9:48:44 AM

Weight: 23000 Kg

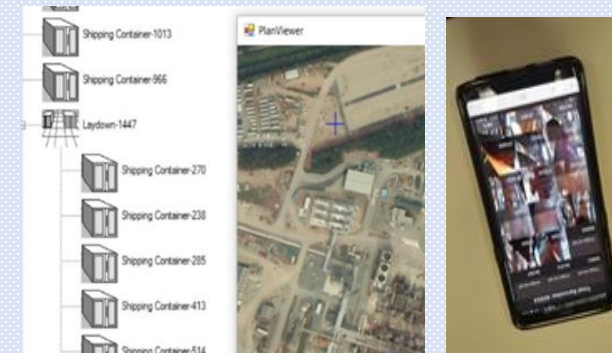
Cancel OK

none bolted connection
none bolted connection
Air duct
0

Date of Loading: 5/10/2016

Container was seen to be sealed by: _____
Shipping Container Seal Number:- 676994

Total Gross Weight: 23000Kg (23Tonnes)
Total items packed: 29



Data analysis tool to optimize laydown with rebuild location

Refabrication & Repair Management

Passport Prevents Missing Items

If any item is deemed unfit for purpose it may need to be repaired, refabricated or replaced prior to shipping

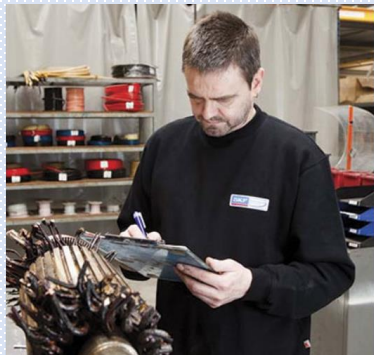


Asset Master will provide reports on the conditions and location (container ID) of items needing attention

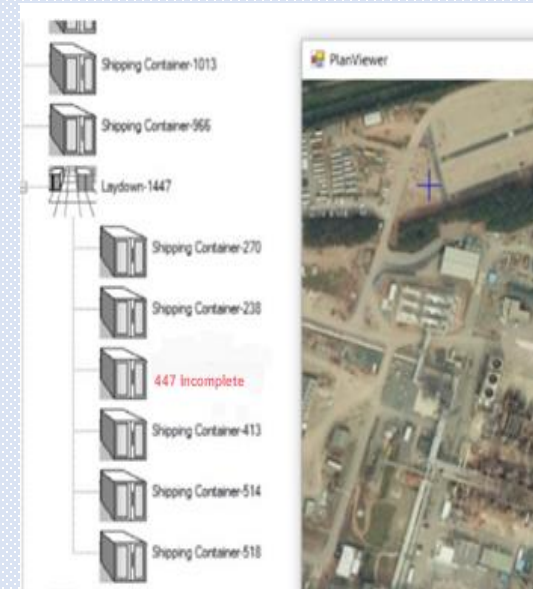


The item will be removed from the database and provided with a passport - documentation informing of ATN, condition (action required), location on plant, ATN of all adjoining components; container to be returned to and the location of the container.

Column	Notes
1 Type	This is the Asset's Type. It can be adjusted in Figure 22 - G.
2 Notes	These notes by default are the Asset's type notes. If there is data in the Assets Serial No field, then they will overwrite the type notes. The Type Notes can be edited in Figure 27 - B - Care should be taken as it will modify the default notes for all assets of this type. To modify the Asset's Notes, use the field in Figure 22 - D: Serial No/Tag.
3 Weight	The Assets weight - by default will be the asset's Type weight Figure 27 - G. If the Asset has been given a weight, then the assets weight will overwrite the Assets Type Weight. The Assets weight can be set in Figure 22 - I. Care should be taken if changing the Type Weight as it will affect all other ATNs of this type that do not have a specific weight set.
4 Total Gross Weight	This is calculated by adding the weight of each asset (using the type default weight if the asset does not have a weight specified). It then adds it to the default weight of the receptacle (in this case a shipping container). The receptacles weight can be set in the Figure 22 - I.
5 Total Packed Weight	This is the weight of the contents of the receptacle. And is calculated by adding the weights of all the contents of the receptacle.
6 Name	This is derived from the type and the ATN. The ATN is not editable.
7 Loaded by and Date	This is the name of the person who loaded the Receptacle and the Date. This is not editable.
8 Serial Number	If this is a Shipping Container, then this should be the Shipping Container's Serial Number that can be set in Figure 22 - D: Serial No/Tag. If a ship, then the ships name can be entered - or for other receptacles a suitable description.
9 Shipping Container Seal No	This Seal Number is set in Figure 22 - E: Seal No. The seal number should be entered here. Site processes must ensure that the seal is used on that shipping container (i.e. issue the Manifest with the seal in an envelope and put a copy inside the door of the container).
10 Manifest Type	This text will vary according to the receptacle type.



If an item removed and passport generated from any container our asset location database will 'flag red' informing container incomplete and relevant shipping documents will not be generated until returned or system override



Dismantling Project Management Consultancy

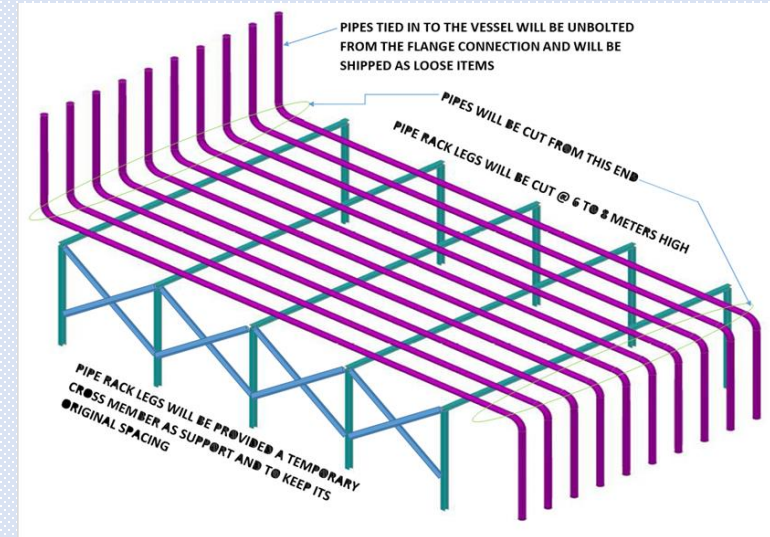
Site Manual & Dismantling Site Supervision.

Refinery relocations are extremely rare and subsequently many dismantling contractors do not have a great deal of relevant project experience to complete the work.

ExonTech has developed a great deal of experience in this field and subsequently we are able to provide an experienced management team to QA and manage the contractor's staff.

Dismantling Site Manual

All dismantling and cutting procedures
Dismantling schedule planned back from rebuild
Handling & Lifting (lift plans).
Laydown, packing and preservation.

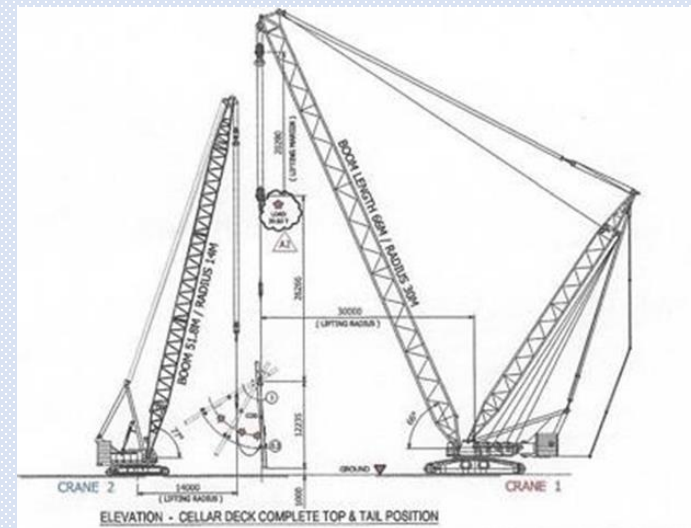


ABOVE: Our engineers designed skids to carry piping out of pipe-racks – Shell Batangas



Site Supervisors

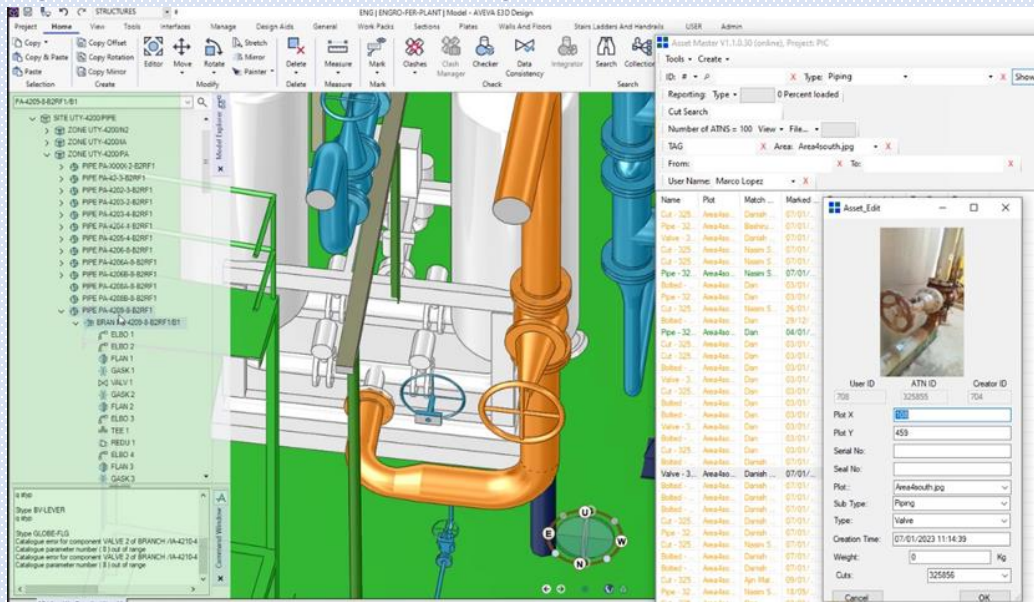
- **Lifting Engineer** – preparation of lift plans, ground checks.
- **Structural (Dismantling) Engineer** - planning dismantling procedure.
- **Packaging Engineer** - planning and supervision of all preservation and seaworthy packing.
- **Load Outs Engineer** – planning & supervision of all movement and laydown of equipment



Redesign and Rebuild

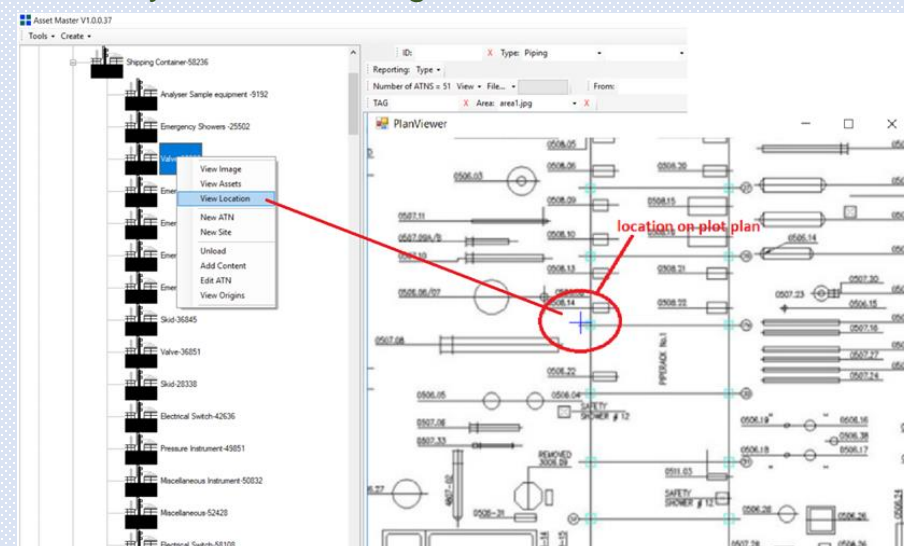
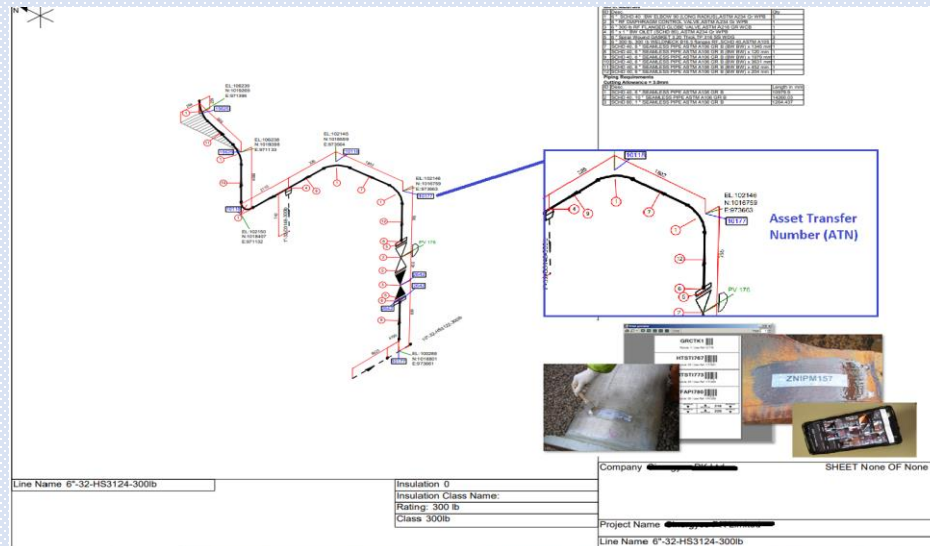
Asset Linking to 3D Model & 2D Drawings

Data Linker (within tablet app.) Automatically links the asset to the model. Once linked – the Asset will inherit all the intelligence of the model, including all the data retrieved from the drawing office for creation of the model.



The Asset Transfer Number can also be linked to the fully intelligent model outputted within AVEVA E3D / PDMS, CADWorx and Smart Plant design packages.

Data Linker within Asset Master can also link ATN to P&ID; Plot Layouts and Intelligent Isometrics

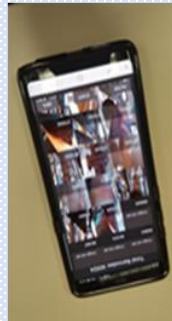
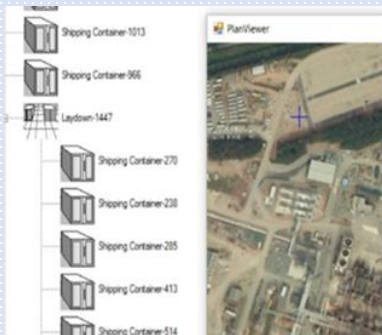


Rebuild Services

Information Collected at Source Site Used to Manage the Rebuild



Ground Anchor Bolt positions can be staked out and drilled by extracting bolt positions from the 3D model



Using the App, Shipping container laydown and equipment management – ensuring optimisation of transport and lifting at site.

MODULE 50
4x3' + 6" on rack from West Battery going East
DATE OF ISSUE:

Section 1: Document Issue

RE-ASSEMBLY INSTRUCTIONS FOR MODULE 50

This document should be used in conjunction with the following drawings
See Photographs
M0002

007653M
There are 4 pages enclosed

The above statements were seen to be true by the issuer

Name of Issuer Signed

Section 2: Re-Assembly Team

TEAM LEADER (PRINT)

ISSUE NUMBER

NON CONFORMANCES

Re-Assembly Instruction - re-build will be the mirror of the disassembly. Our software will issue the task list in the correct order with the correct lifting instructions & procedures. Using any other method will lead to access problems, assembly problems, increased risk of damage to assets, and costs.



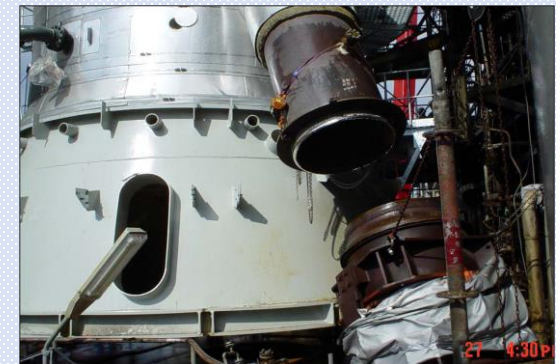
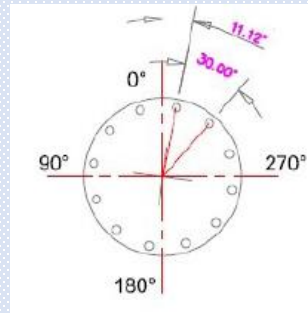
Recording the weld positions during dismantling and using the piping line intelligence from the 3D Model – Asset Master is able to calculate the amount of weld required to rebuild the plant

Rebuild Services

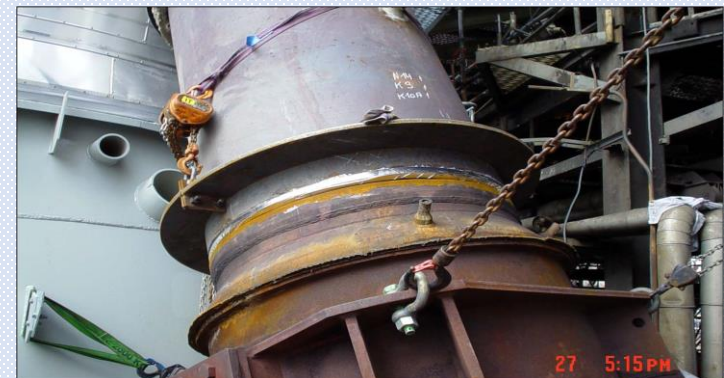
Dimensional Control Surveys – First Time Hook Up



Using the dimensions taken prior to dismantling our engineers at the destination site can Survey Critical Interfaces of Equipment, Structures pipework



- Reduce hot work on site = Improved safety
- First Time fit / single weld hook up (SWHU)
- Reduced construction time on site
- Eliminate risk of failure to fit
- Maintain schedule
- Increase fabrication in offsite controlled environment = Improved safety
- Reduce unplanned works on site = Improved safety



Asset Master: Plant; Factory & Refinery Relocation



Asset Master has been used to successfully relocate over twenty successful plant and refinery relocations globally within a range of industries and facilities including fertilizer plants; heavy oil refineries; soap factory; paper mill; gas pumping stations; power stations. Previous clients include; and for relocation.



Reference: Ammonia Plant dismantled Kemira and rebuilt in Pakistan. Upon completion, the project engineer of Fatima Fertilizers Mr Saeed Akhtar – Kemira Project Engineer – Fatima Fertilizers wrote the following;

“As far as dismantling of ammonia plant is considered, that was really a very good dismantling, packing and shipment. Anyone can imagine that this was a very big task to rebuilt this plant and safely commissioned, and that challenged was completed. I really appreciate the efforts of your team. For rebuilding of ammonia plant the EXON TECH software has done a wonderful role and I think this was the key to success”

Thank You

Our systems and service can be used as a platform to assess the feasibility of the various options for retired assets.

Whether the decision is to relocate an individual unit or resell and relocate an entire plant our software and server make greatly reduced the technical and commercial risk associated with such complex tasks

Our database makes the entire process fully visible to the stake holders; consultants and contractors– bringing all teams and processes together to ensure an efficient relocation

Cost – for the average refinery relocation the cost of our service will be less than 1% of the entire project cost and our systems have significant benefits at every stage of the relocation

If you have any further questions please do not hesitate to contact us.

Exon Tech^{Ltd}
Engineering Projects

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