isoPlan™

Introduction

Plant and equipment undergoing maintenance must have all energy sources isolated (Electrical Circuit Breakers, Valves, etc.) and secured to ensure the plant cannot be inadvertently or deliberately operated whilst work is being undertaken.

A key item required for isolation of plant is:

- The correct identification and selection of the isolation devices and the sequence of device isolation and de-isolation
- Secure storage and easy retrieval of approved “Task Based” isolation plans

Many isolation plans are designed by manually selecting the appropriate isolation device from a P&ID (Piping & Instrumentation Diagram), marking up the P&ID and transferring the isolation device Alpha Numeric Identification data by hand to form an isolation plan.

This is a manual system which has the potential to contain data transfer errors and takes considerable time to do and check.

The isoPlan™ Process

isoPlan™ is a digital system which enables users to:

- Upload isolation device electronic ID data from field devices to the P&ID database in the Plant design, installation and operational phases.
- Generate digital “Lock Out Tag Out” isolation plans for specified tasks directly from CAD (Computer-aided design) formatted drawings such as AutoCAD Plant3D or “Dumb” drawings.
- Store, update and publish isolation plans in a repository located either in the Cloud, or from behind the internal firewalls of user’s systems

Advantages

- Visual and intuitive method using drop down boxes alongside reference P&IDs to enable isolation planers to decide on isolation points and produce isolation plans
- Reduced time to produce isolation plans
- Enhanced safety by containing accurate verifiable plant ID electronic tag data
- Incorporate drawing changes and flagging the requirement to review isolation plans
- Secure storage of user isolation plans and isolation device ID data in the isoPlan™ Repository
- Potential to become an industry Standard as the System is available to providers of Isolation systems using the isoPlan™ SDK (Software Development Tool Kit) and API (Application Interface) tools.

isoPlan™ exploits and enhances the built-in database associated with Intelligent CAD generated drawings by adding in isolation device fields via an isoPlan™ adaptor.

The database fields are then populated via the isoPlan™ Adaptor with unique object (device) electronic identification tag.

These tags are electronically scanned and read in the field and verified against the approved isolation plan device identification tag.

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isoPlan™ can also do this with “Dumb” legacy drawings by creating an object ID database associated with each drawing.

The electronic tag ID covers all electronic methods used in the field to locate and identify specific objects such as NFC ID tags (Near field communication radio identification), Bar Codes, QR codes, Computer visual identification software using digital photography techniques, 3D laser and GPS location software.

Details – (using AutoCAD Plant3D as an example).

An AutoCAD Plant3D SQL Server database instance is extended to include the isoPlan™ fields.

This is a one-time exercise, after this is done any P&ID (piping and instrument diagram), stored in the database can be used as a source of isolation plans.

We provide a SQL (structured query language) script in our SDK (Software Development Toolkit) that automates this step.

isoPlan™ Fields are

- Equipment List
- Isolation Devices
- Isolation Sequence
- De-isolation Sequence
- Isolation Action: Instructions to operate isolation devices, such as open and closed position
- Item with associated readable electronic Identification such as a Near Field Communication (NFC) ID tag which enables the designer to specify an NFC ID for the item of equipment

Those fields are then populated in the P&ID by the isolation planner/designer using the AutoCAD Plant3D User Interface.

This is done for each P&ID using the inbuilt features of AutoCAD Plant 3D and other smart drawing systems, which show extended fields in the same way as native fields.

The isolation planner/designer then runs the Adapter to extract the extended data from the P&ID and results in an isolation plan in the “Planner”.

Behind the scenes, the Adapter uses WCF services [Windows Communication Framework] to populate this data model in the isoPlan™ database in the cloud, using the information extracted from the P&ID.