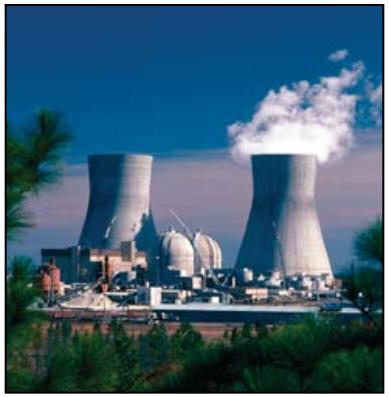
Process, Power and Marine Division

SmartPlant 3D Workflows

Management Overview Training


INTERGRAPH

SmartPlant 3D

Significant Workflows

- Access Control
- Cross-discipline interaction points
- Relationships
- To-do list
- Interference checking
- Automated drawing production
- Work Breakdown Structure
- Catalog Management

Access Control

- Via Windows Domain Groups added to SP3D Permission Groups
- Permissions are on data (what can be created and where it can be placed in a hierarchy) and not on commands (who can run a command)

Cross-Discipline Information Exchange

- SmartPlant 3D is a tightly integrated application. All environments or disciplines share a single catalog database and model database. Use of these integration points must be well understood before putting SmartPlant 3D in production environments. These integration points will definitely affect some of the current workflows around exchange of information between various disciplines.
  - Piping Connections to Equipments.
  - HVAC ducts connections to Equipments.
  - Foundation Ports on Equipments and Structure Foundations on Ports
  - Pipe Supports attached to Piping & Structure
  - Ability to place secondary steel as needed by non-structural disciplines.
  - Transfer of data from SmartPlant P&ID and Intools via TEF
  - Shared code lists between disciplines.

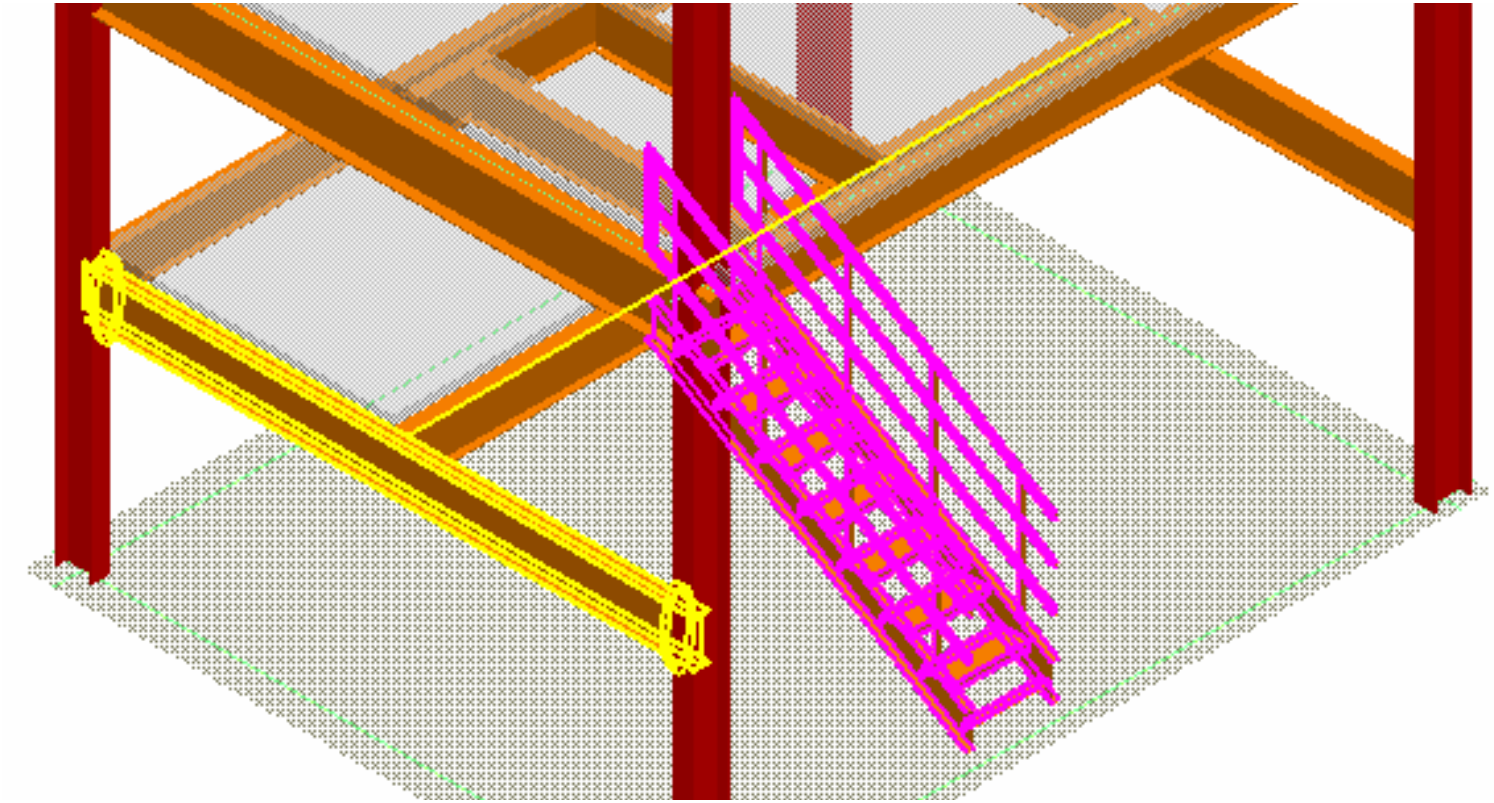
Relationships

- Relationships are key to SmartPlant 3D.
- Proper understanding will benefit project and lack of understanding could hamper work.
- Relationships are created as model is being built.
- Relationships help determine impact of design change.

Relationships

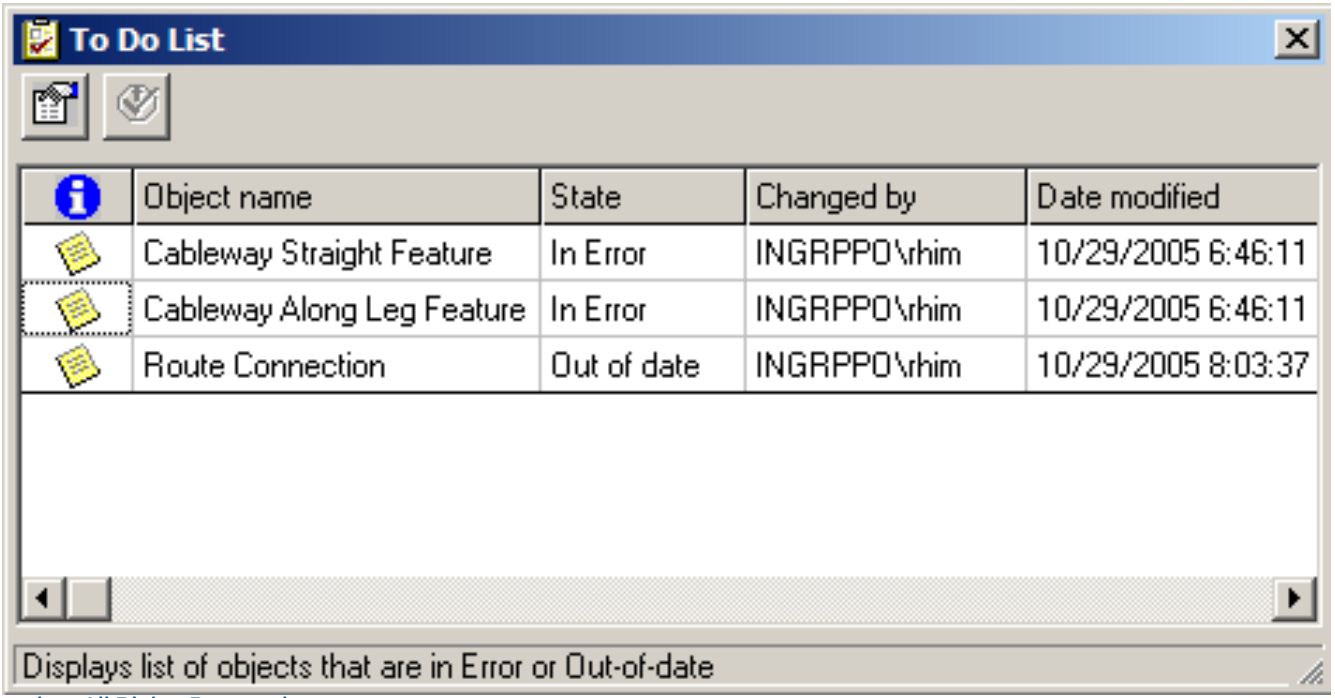
- Relationships help define modification behavior
- Types of Relationships
  - Position by point
    - Column placed at grid intersection
  - Position by plane
    - Equipment Placed on a slab
  - Location determined by other object
    - Piping Connected to Nozzle

Relationship Example



To Do List

- An object's relationship with another object become inappropriate, the system generate an Error entry in the To Do List. For example gap between nozzle and piping.
- A relationship has changed between to object, but the person who modified the objects only have write access to one of the object. The system generate an Out of Date entry in the To Do List



To Do List Management

- It is important to continuously monitor To Do List for creating error free designs.
- Existence of To Do List items adversely affects processes like Drawing Generation, Reporting, Upgrades, Copy/Paste etc.
- Special reports are available in SP3D that can be used to monitor To Do List by CAD coordinators.
- Drawings can show existence to To Do List in the form of a special note. This feature could be used by checkers.

Interference Checking (IFC): Overview

- With SP3D, Interference Checking is continuous process
- Objective is to find the clash as soon as it is created and let user resolve it.
- Requires work process change where designers should try to avoid clashes getting created instead of Check-Review-Approve/Resolve cycle.
- It is still possible to generate report and review clashes off-line

IFC: Process Methodologies

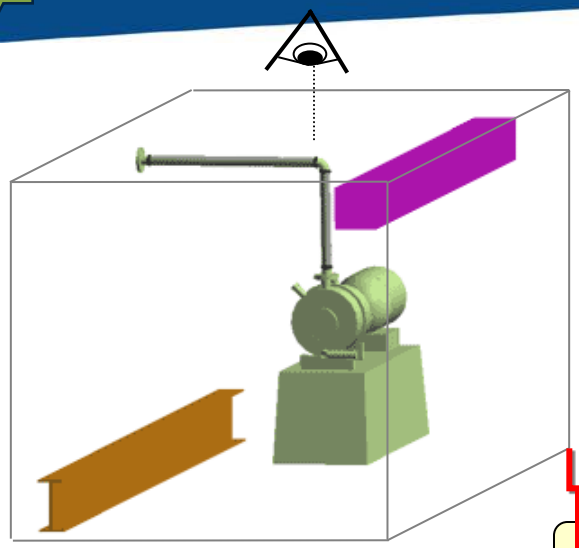
Database Detect	Local Detect
Runs all the time (System Admin. choice)	Works only within the current session
Minimizes impact on users and improves performance	Provides immediate graphical feedback (works in a dynamic mode)
Creates persistent interferences that are stored in the model database	Shows interferences when the pointer is idle for a brief amount of time; based on a hesitation approach
Based on administrator settings (controlled by permission groups)	Based on individual user settings
Provides feed back on how much has been checked	Checks only created and modified items
Users can visualize the interferences (persistent items)	Clears dynamic interferences after refreshing workspace

Resolving Interferences

- SmartPlant 3D finds interferences on continuous basis as they get created.
- SmartPlant 3D provides customizable pre and post processing of routines. These should be used to reduce false clashes.
- Users should be trained to create designs that are clash free (as opposed to creating clash and resolving through formal review process)

Automated Drawing Production

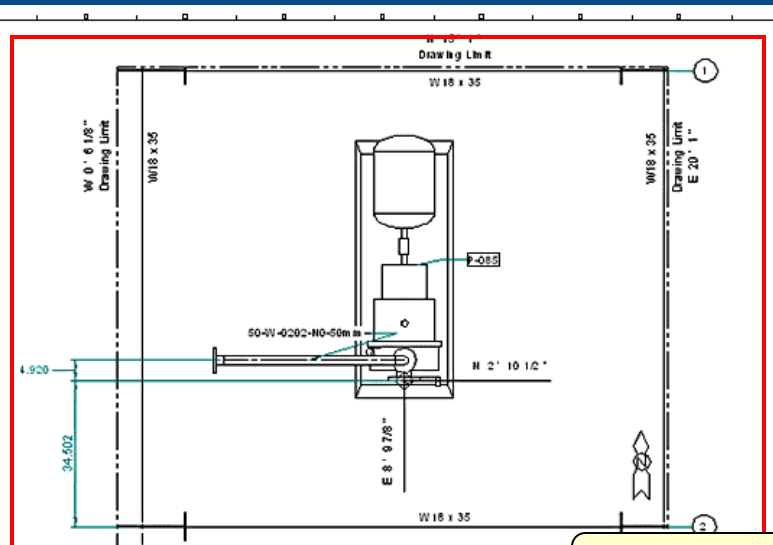
- SmartPlant 3D Drawing Creation can be fully automatic.
- Drawing is essentially a graphical report generated from database.
- Proper configuration will produce a drawing that is complete with dimensions, labels and annotations.



Template

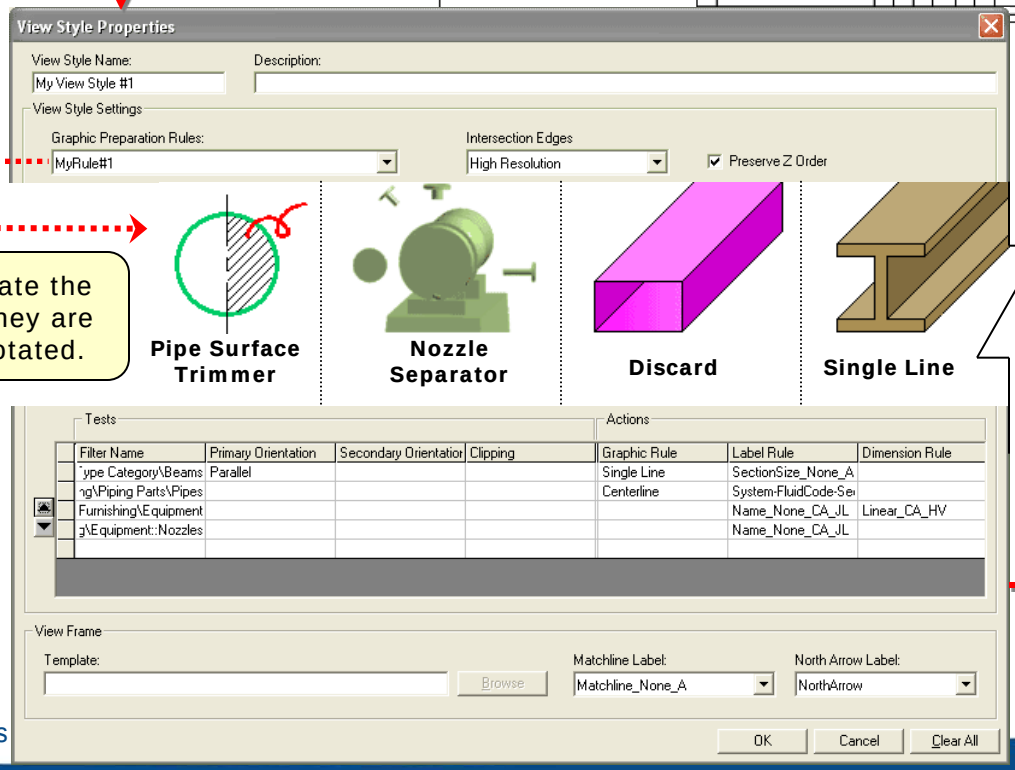
Properties

1. Look Plan
2. Use View Style
3. ¼" = 1'



Objects Funneled Through the View Style

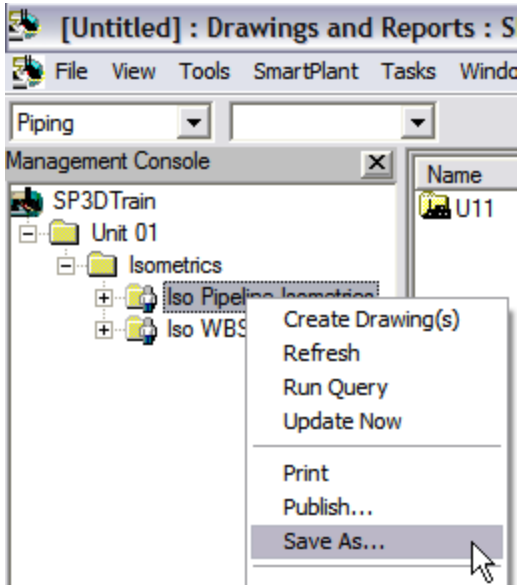
Final Drawing

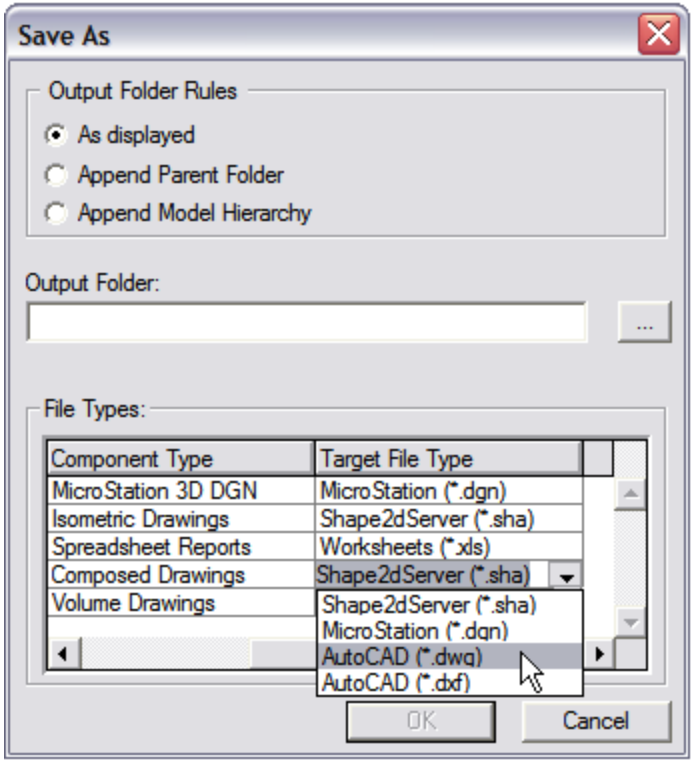


We can manipulate the objects before they are tested and annotated.

Drawings

- Drawings are stored in the database.
- Drawings can be saved to file system in any format.





WBS Creation / Management

- Work Breakdown Structure (WBS) functionality in SP3D provides flexible grouping mechanism for 3D objects.
- WBS assignments can be done automatically as items are placed in the model or after they are created.
- WBS assignments can be used for various purposes like reporting, naming, drawings, status control etc.

WBS Grouping Examples

- Defining modules for modular construction
- Defining work packages for managing status and issue.
- Defining Scope of a contract, project
- Defining Scope of Outputs – Isometric Sheet, Stress Isometric

Catalog Management

- Management of Catalog
- Single catalog for all disciplines
- Projects must have defined work process for managing catalog
- Plan for catalog changes and propagation to model