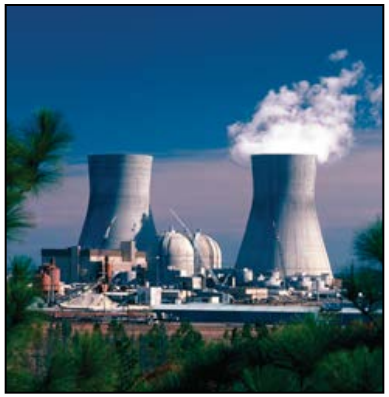
Process, Power and Marine Division

SmartPlant 3D Datacentric Application

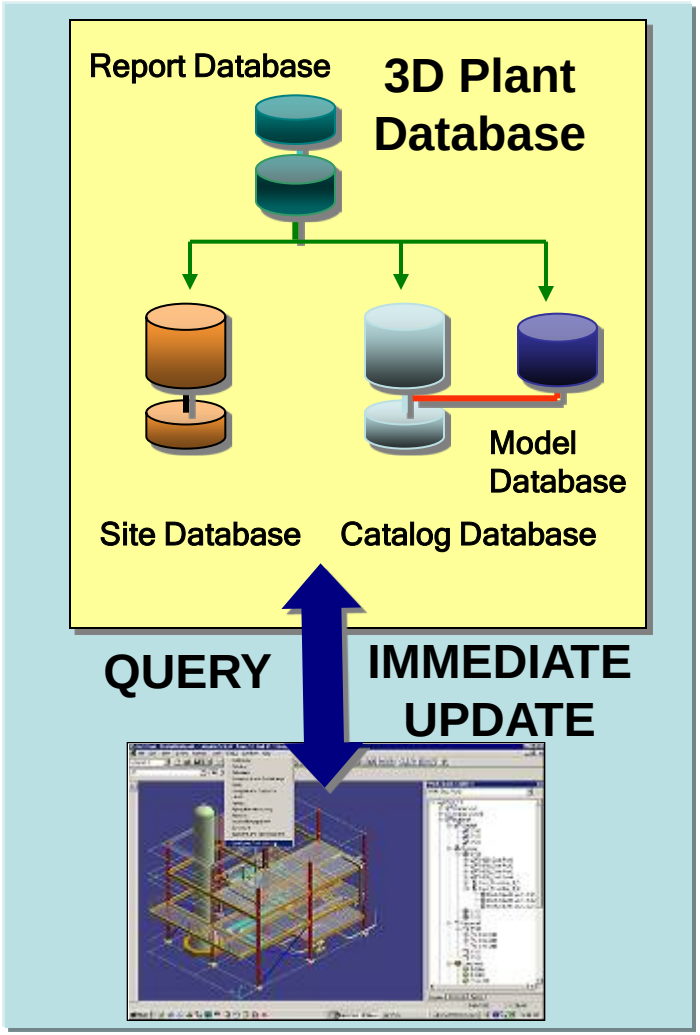
Management Overview Training


INTERGRAPH

Enabling Architecture/Technology

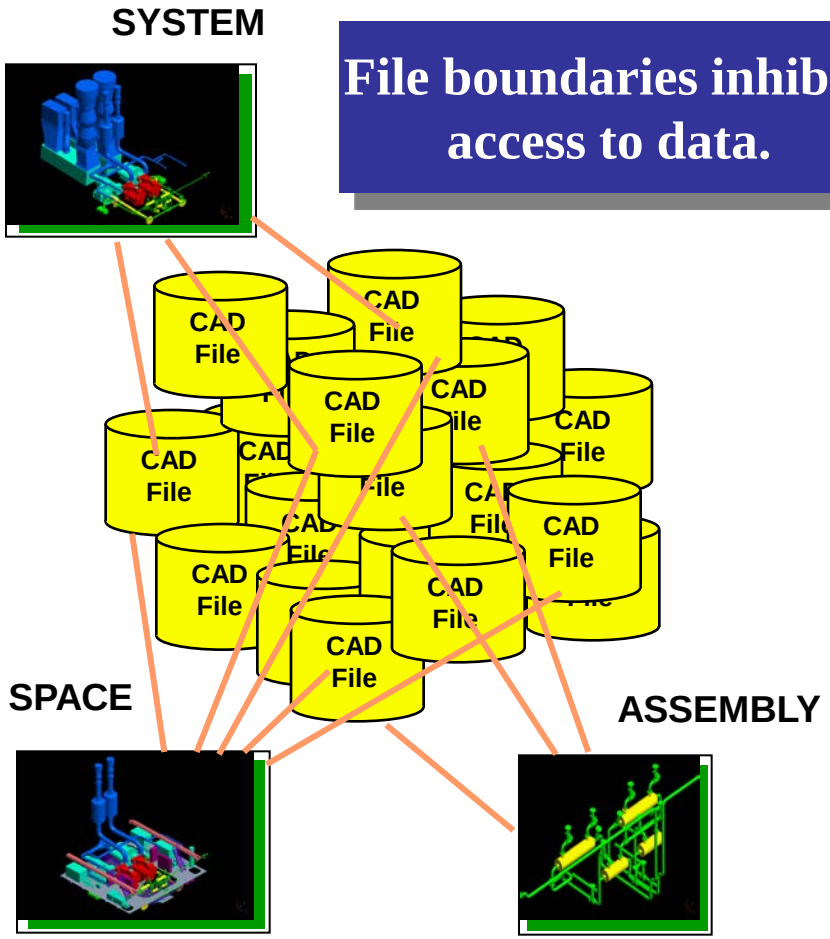
- **Data Centric Approach**
  - All model data stored in Object-based 3D Plant Relational Database
  - All drawings are intelligent 'reports' from the 3D plant model
  - Based MS SQL Server or Oracle (Enterprise Versions)
- **Direct Rendering of Plant Database**
  - No CAD engine required
  - No dependency on Microstation
- **Workshare Enabled**
  - Based on database replication
  - Standard feature of relational database

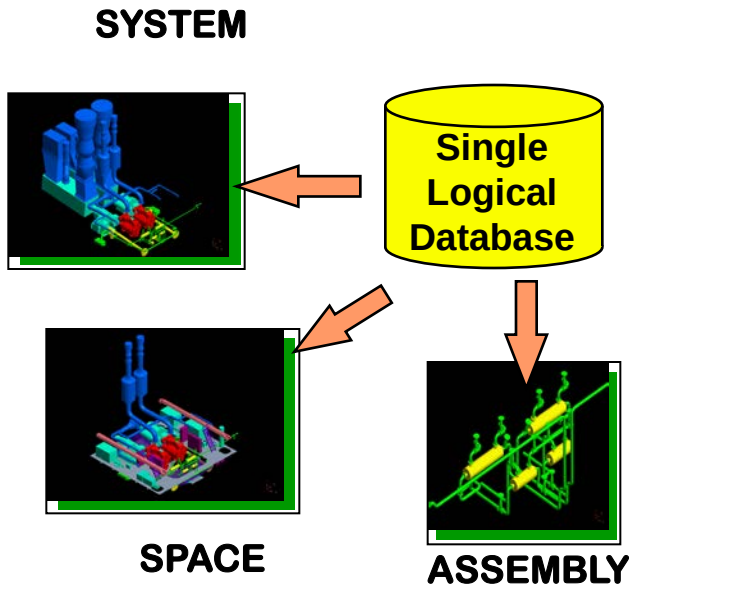


Data Centric Application

- For end user, its an application where
  - Engineer can focus on engineering rather than deliverables
    - Flexible view of the engineering data
    - Work in sections that help solve the problem
    - Creates an engineering model of the problem
    - Manage change based on engineering view of the problem
  - Deliverables are a report from the application
- For projects, it helps address pressures of
  - Increasing complexity and size of engineering project
  - Increased pressure on schedule
  - Increased regulatory compliance
- From a technology perspective
  - Data is stored in a database, not in CAD files (CAD centric)
  - Traditional CAD is used only to touch up deliverables (drawing centric)

Single Database

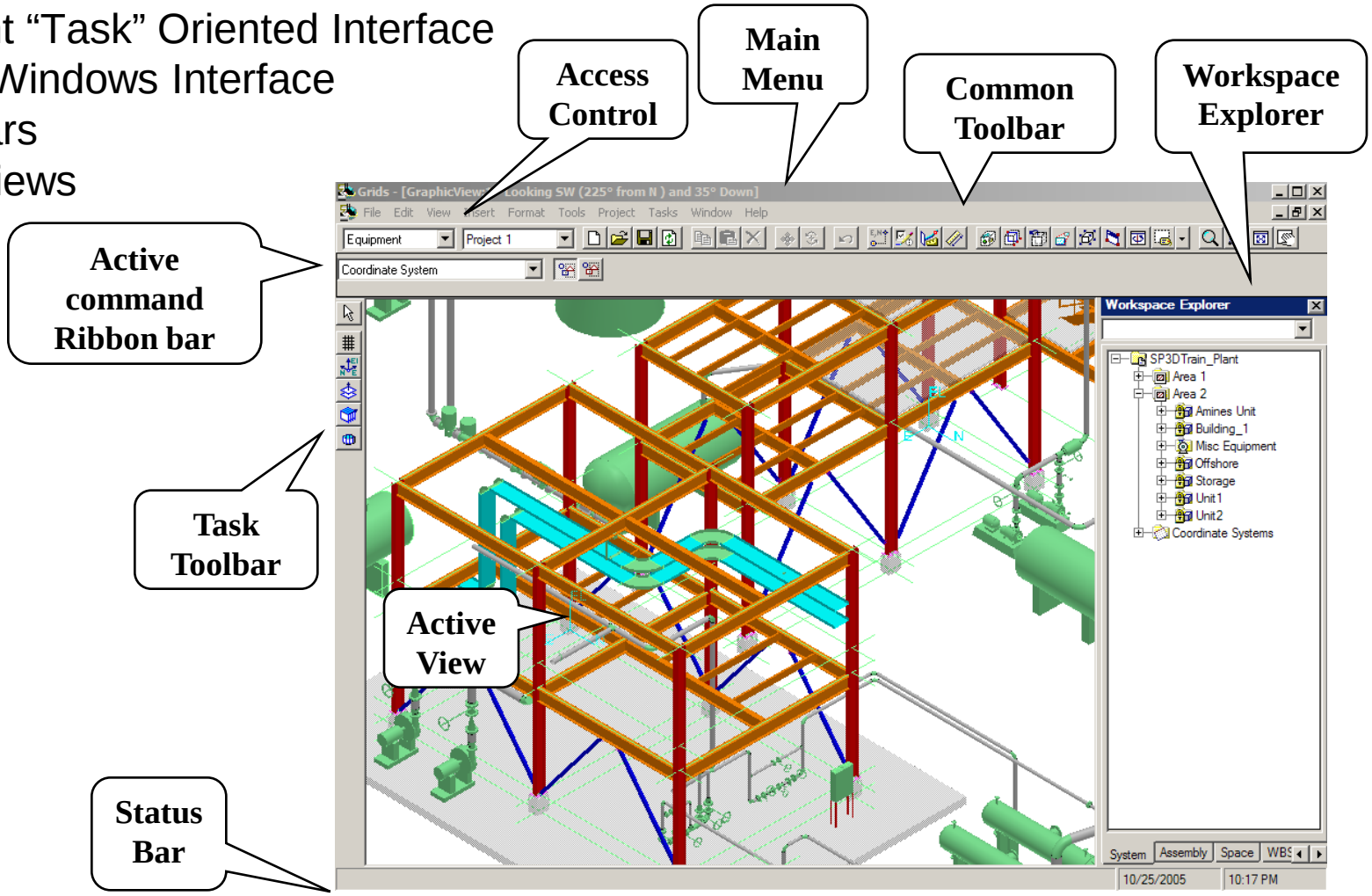




Databases provide easy access to arbitrary subsets of data.

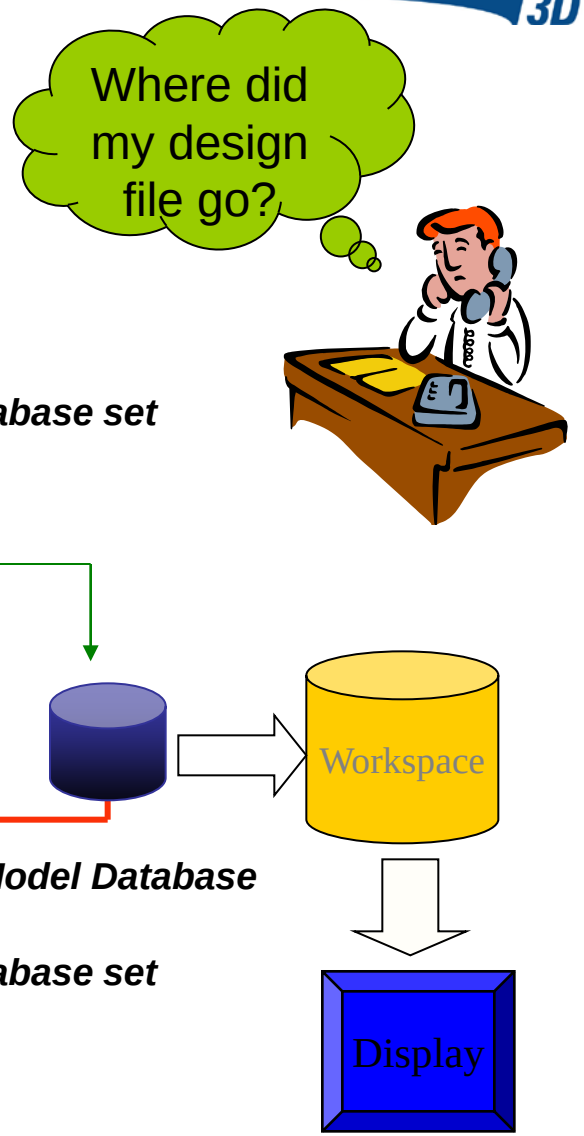
Common Windows Based User Interface

- SmartPlant “Task” Oriented Interface
- Common Windows Interface
- Ribbon Bars
- Graphic Views



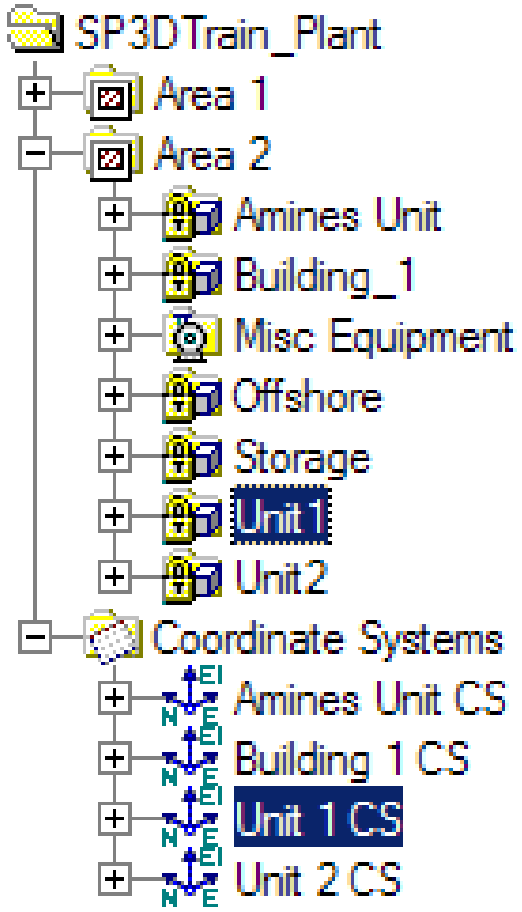
Querying Data

- Define Workspace (filter on database):
- See only the data you want to see
- Builds a logical “Working Set”
  - System
  - Assembly
  - Spatial (Volume or Planes)
  - Logical Permission Group
  - Object Types/Properties
  - Work Breakdown Structure
- Saved Session Files



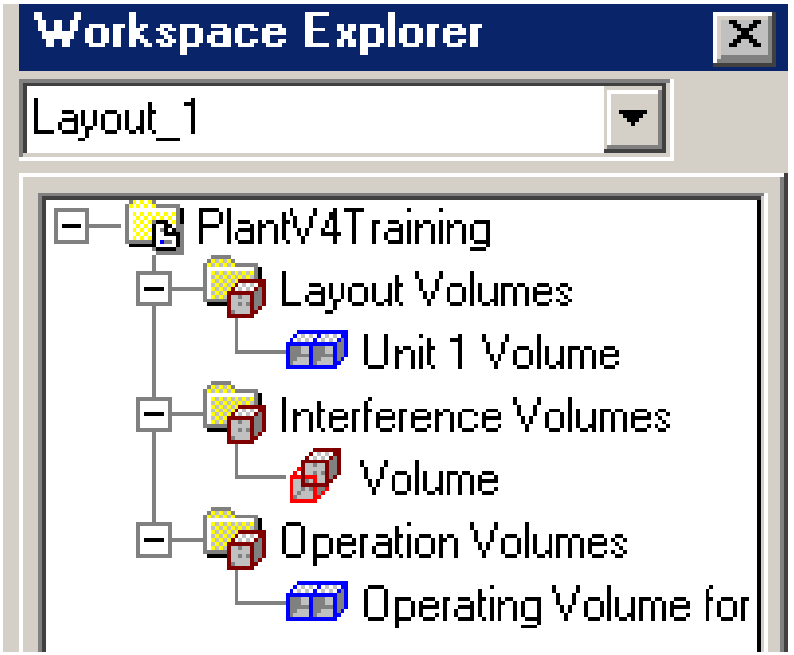
Systems Hierarchy

- System is a primary way of grouping objects.
- Systems have other systems as children creating a hierarchy with unlimited levels
- Each system can contain several child subsystems
- Project needs to manage these hierarchies and keep it organized



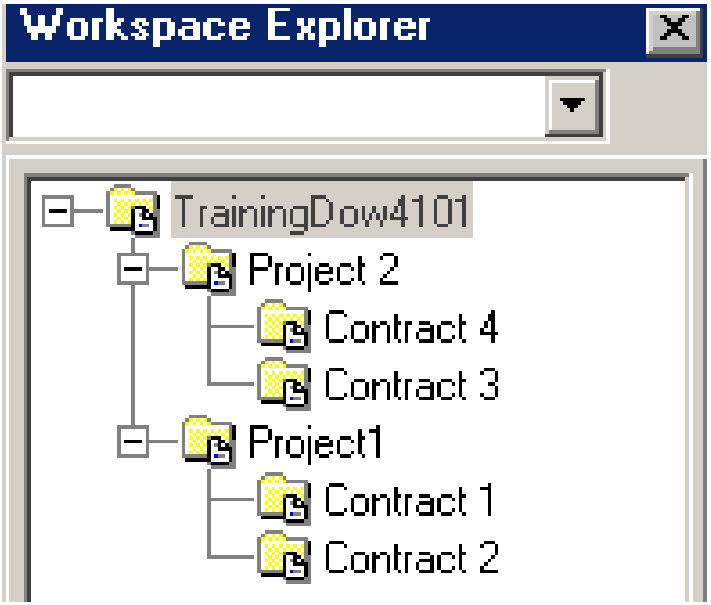
Space Hierarchy

- Space Management Task provides functionality to pre-define volumes such as design area, hazard zones etc.
- These spaces may be “typed” as Areas, Interference Volumes or Zones
- Spaces can be used for queries by volume and surface style rules based on queries



Work Break Down Structure

- WBS provides functionality to group objects arbitrarily
- First level is project
- Second level and below could be Contract, Design Area, Group etc.
- WBS item contain design objects.
- Design Objects can belong to one or more non-project items such as contract



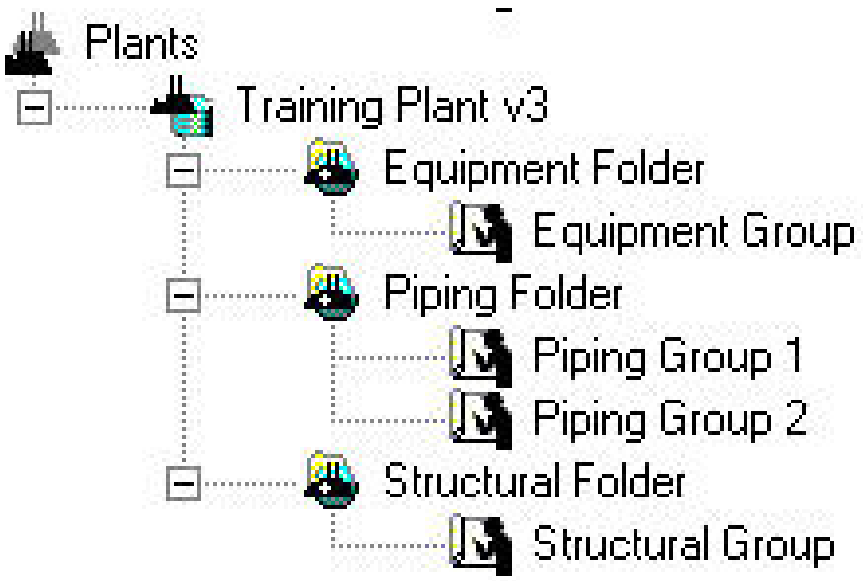
Work Break Down Structure - Types

- Types could be customized to meet project requirements
- Assignments could be done automatically as objects are created or after they are created through specific commands

WBSItemType ShortDescription	WBSItemPurpose ShortDescription
Contract Group	
	Contract Group Piping
	Contract Group Civil
	Contract Group Architecture
	Contract Group Electrical
	Contract Group Instrument
	Contract Group Mechanical
Contract	
	Contract Fabrication
	Contract Erection
	Contract Fabrication and Erection
	Reference
	Other
Design Area	
	Design Area Piping
	Design Area Civil
	Design Area Architecture
	Design Area Electrical
	Design Area Instrument
	Design Area Mechanical
Group	
	Group Miscellaneous
	Group Piping
	Group Structure

Permission Group Hierarchy

- Plant/Catalog
  - Top level item in the hierarchy
- Permission Group Folder
  - A set used to organize permission groups
- Permission Group
  - Portion of plant/catalog over which various people have various levels of access/responsibility.
- Every object belongs to a Permission Group.



Change Management

- Changes during design always happen and SP3D provides built-in mechanism to manage.
  - Changes in Catalog (Spec Revisions) trigger change in the model through Synchronization process.
  - Change in the model trigger more changes. Such as equipment moving results in requirement to move pipeline.
  - Change is managed through To Do List therefore it is important to keep the To Do List clean to produce accurate design.
- Demonstration AVI
  - Equipment has been relocated. Piping user reviews To Do List and accepts the change.

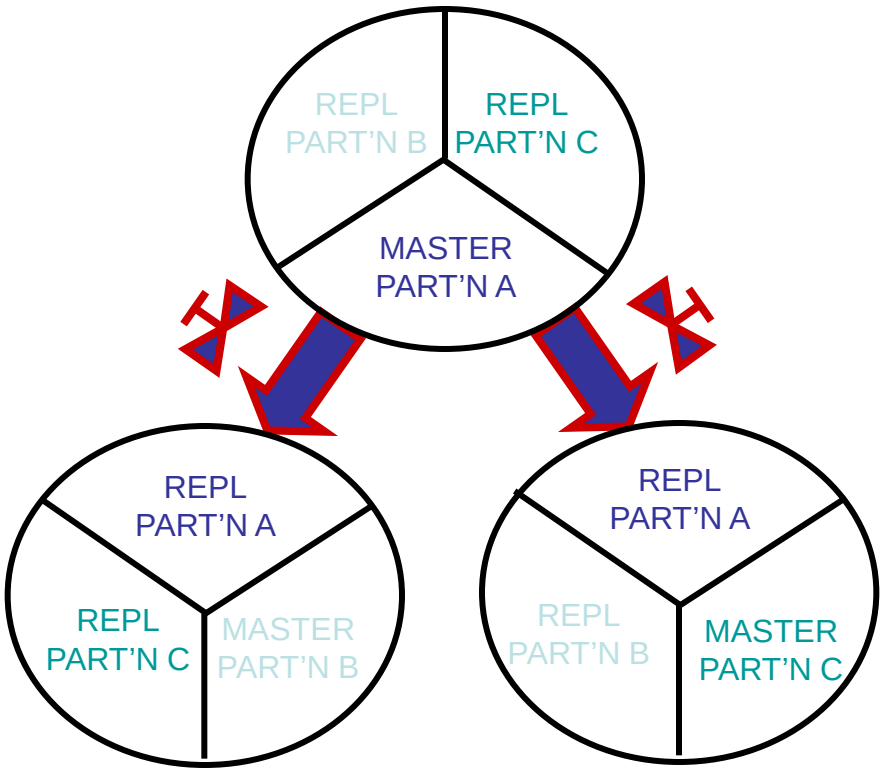
Approval Status

- All objects in SmartPlant 3D carry following information
  - Approval Status
  - Created By and Date Created
  - Modified By and Date Modified
  - Approval Status can be used to lock the design.
  - Dates and User information can be used to track progress and provides auditing information.

What is Global Workshare (GWC)?

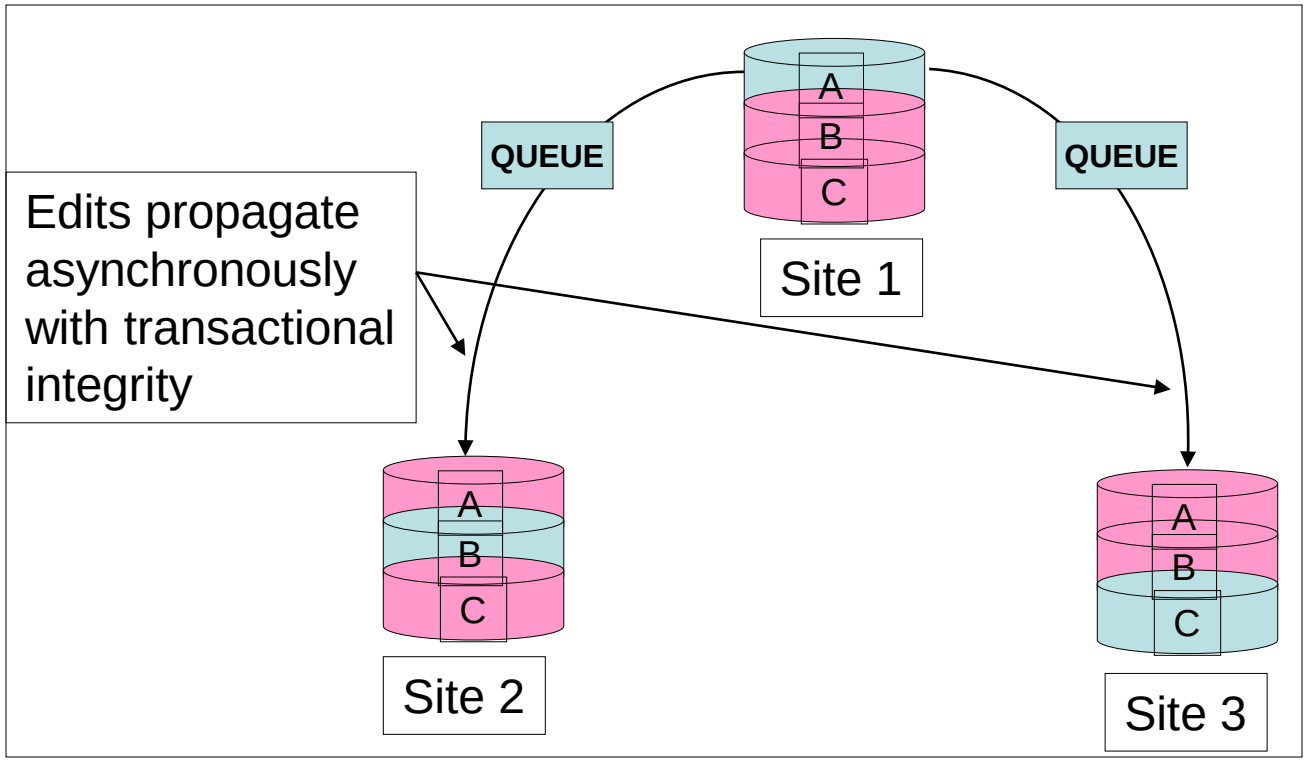
- Workshare allows a single company to run projects from multiple geographical locations or for multiple companies in different locations to work on the same project. In the SmartPlant 3D Global Workshare, data sharing between different locations is achieved through scheduled or near real-time model database replication of the entire plant to all satellite locations.
- Objects are remote location are treated as read only. So similar workflows apply. For example if user tried to branch into a header pipe which was created at remote site then a To Do List entry is created to handle the modification to the header.

Global Workshare



- Incremental, asynchronous transactions
- Transactions contain changed data only
- Low bandwidth requirements
  - No continuous connection
  - No master update
  - Only data transferred, no CAD

Workshare Example



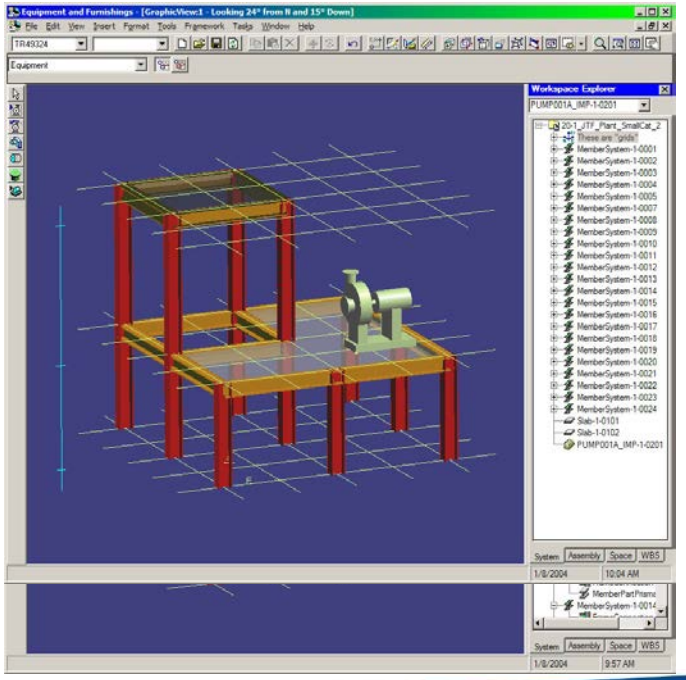
Edit partitions can be relocated at any time

Editable partition

Read-only partition

What does GW enable you to do?

- The intent of the GW in SP3D is to make the complexities of model sharing across locations transparent to the end user. A network link between the satellites and the host is required for data replication, but work can continue even when the network is unavailable.

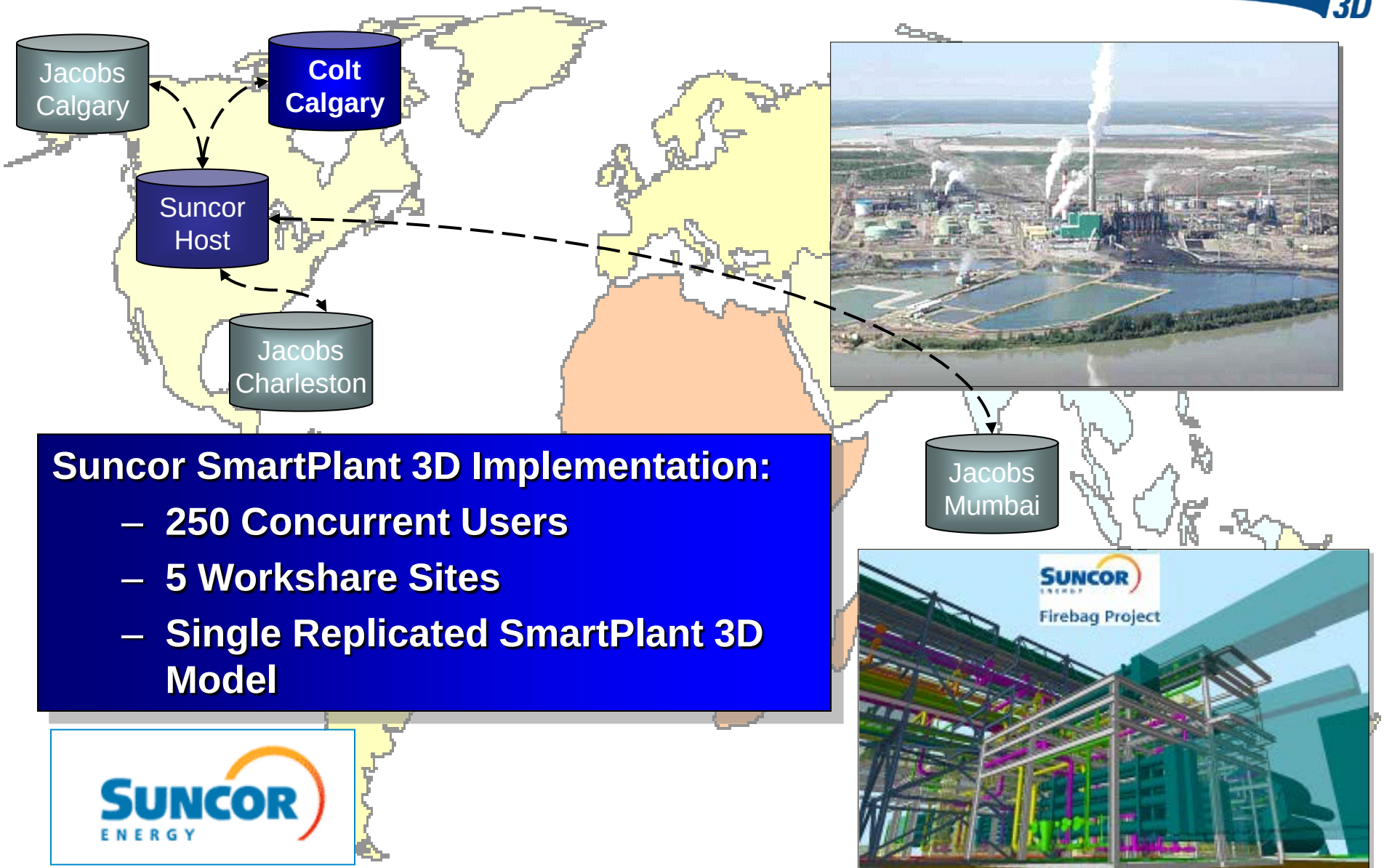


Office A: Structure and Grids Placed.

Office B: Equipment placed on the Slab from Office A.

Office A & B see combined work.

SmartPlant 3D



Suncor SmartPlant 3D Implementation:

- 250 Concurrent Users
- 5 Workshare Sites
- Single Replicated SmartPlant 3D Model

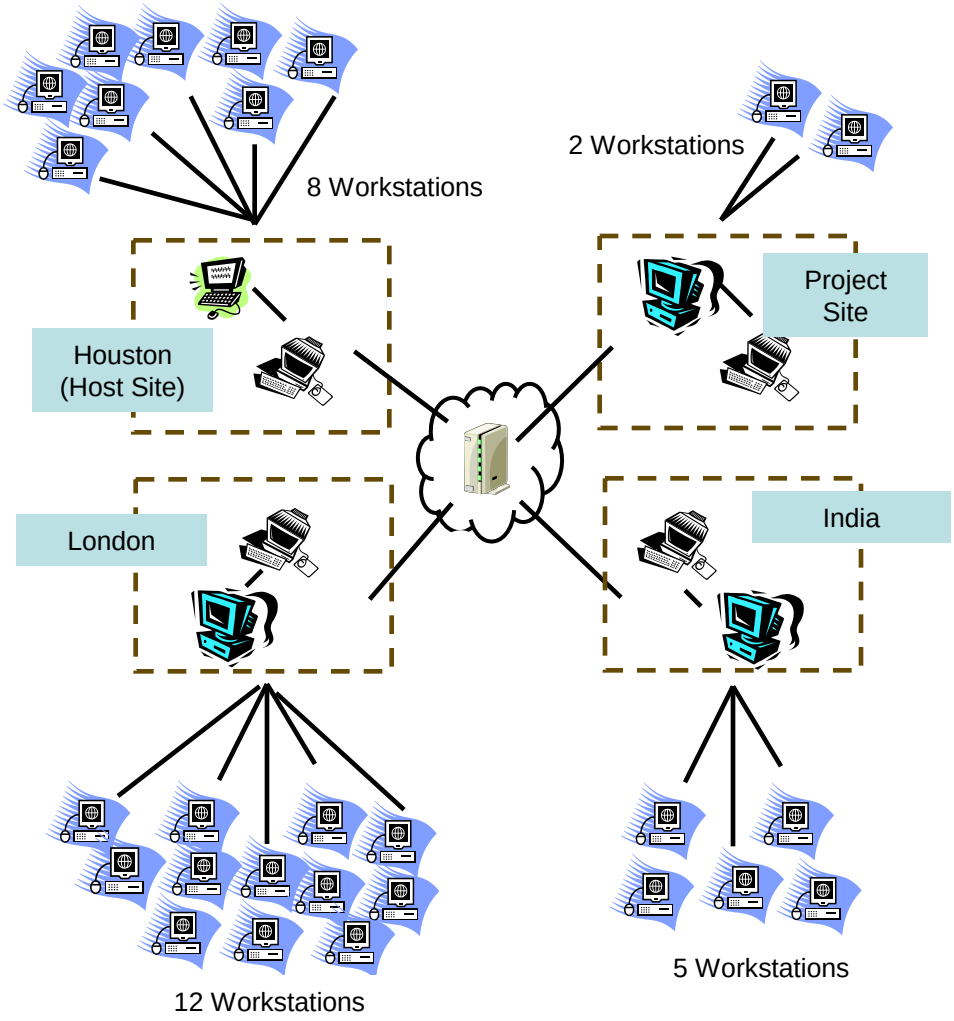
SUNCOR ENERGY

SmartPlant 3D

SmartPlant 3D

Shaw Stone & Webster SmartPlant 3D Workshare Scenario

- Host/Satellite Workstations & Administrators
- Host Data Server
- Host/ Satellite Distribution Server
- Satellite Data Server(s)
- LAN/ WAN connection



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