Some Day I'll Find a Way: Upgrading Design with Plant Design Suite

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Autodesk Global Services

Class Summary

- This roundtable is a discussion of an Autodesk Consulting engagement for the SoCalGas Engineering Design Group to develop a strategy and solution to replace the existing 2D CAD tools and adopt full 3D intelligent design. The project introduces BIM for Engineering Design with an “agile” implementation plan to accelerate adoption. The recommended solution used Plant Design Suite, including P&ID and Structural Detailing, in combination with AutoCAD Electrical, Civil3D and Vault to completely replace the existing systems and provide significant productivity improvements. In this class we will discuss the process conducted to develop the system solution business and functional requirements, the solution design and the business justification for 2D to 3D design adoption. We will also discuss the implementation strategy based on best practices and agile methods to completely train and upgrade the design and engineering data management environment.

Key Learning Objectives

At the end of this class, you will be able to:

- Describe best practices for migrating a 2D Engineering Design Group to adopt 3D and BIM
- Understand how Autodesk Plant Design Suite, Civil3D, Electrical and Vault can be used to collaborate
- Understand how Vault can be used to improve engineering workflows and engineering data management
- Propose a study to develop specifications, solution architecture and implementation plan for 2D to 3D

Company | Profile

Sempra Energy

- Largest natural gas utility in the US and a major factor in international gas markets
  - Regulated Businesses
    - San Diego Gas and Electric
    - Southern California Gas Co

SoCalGas

- Delivering clean, safe and reliable gas to its customers for over 140 years
- Largest natural gas distribution utility in US
- 20.9 million consumers ; 5.8 million meters

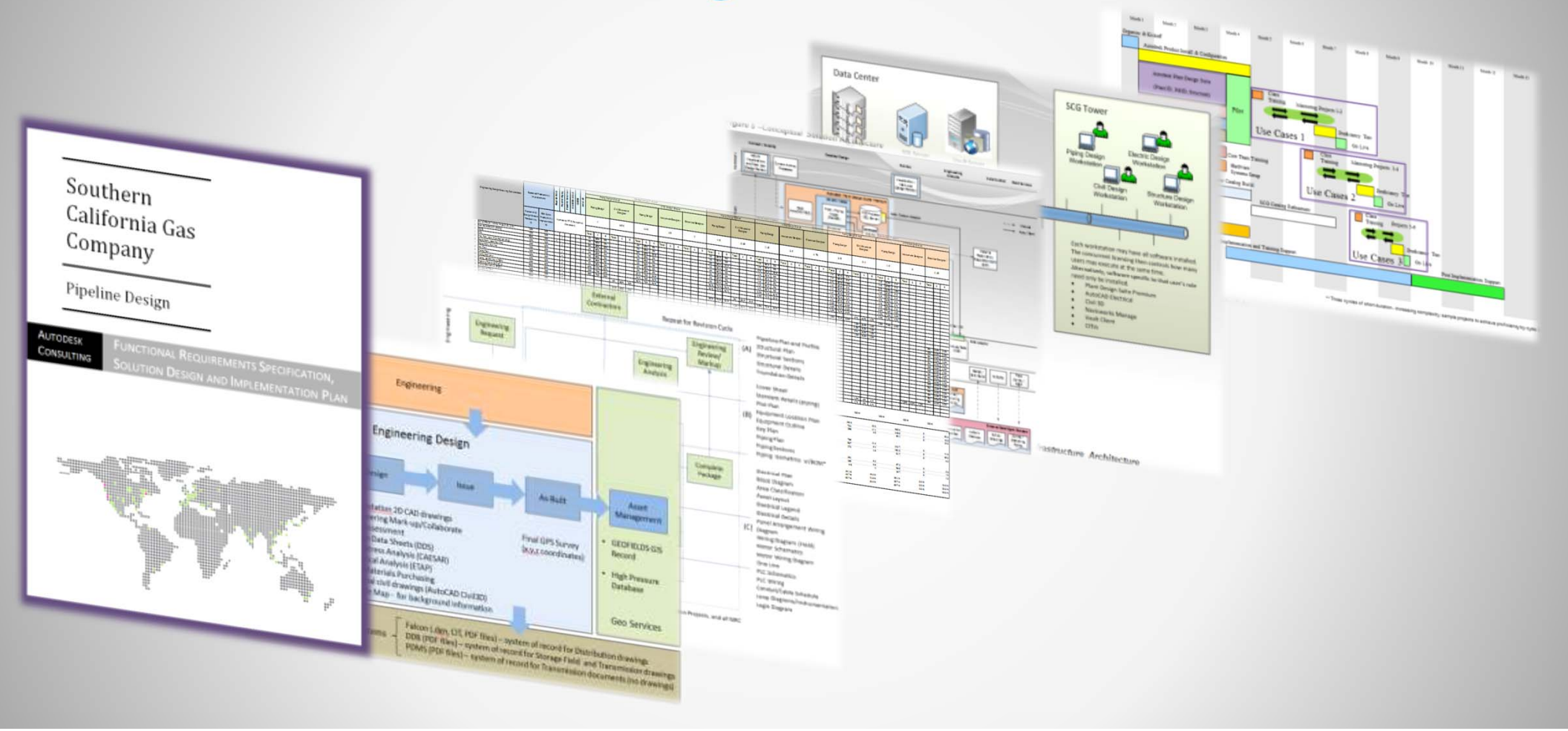
Why Change?

Engineering Design / Measurement, Regulators and Controls (MRC) Groups served three internal client organizations:

- Storage Fields
- Transmission
- Distribution

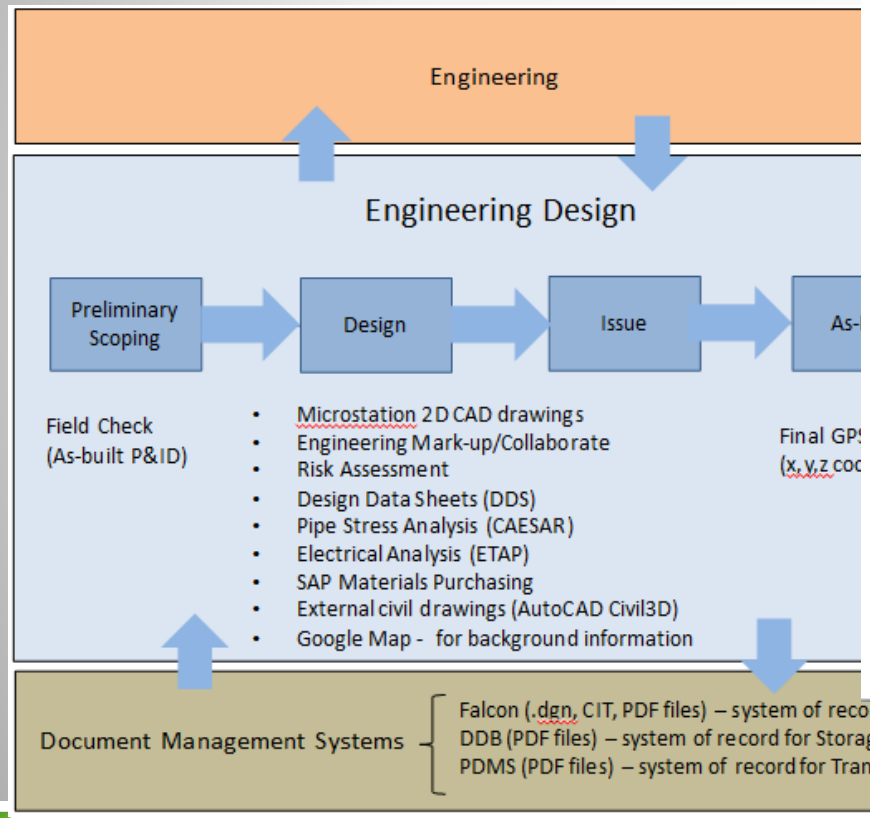
- Pressure to improve efficiency to keep work “in-house”
- Current 2D Bentley Microstation on Microsoft XP, support ending in 2014
- Engineering document revision control challenges
- Maturing workforce and pressures to modernize and move to 3D

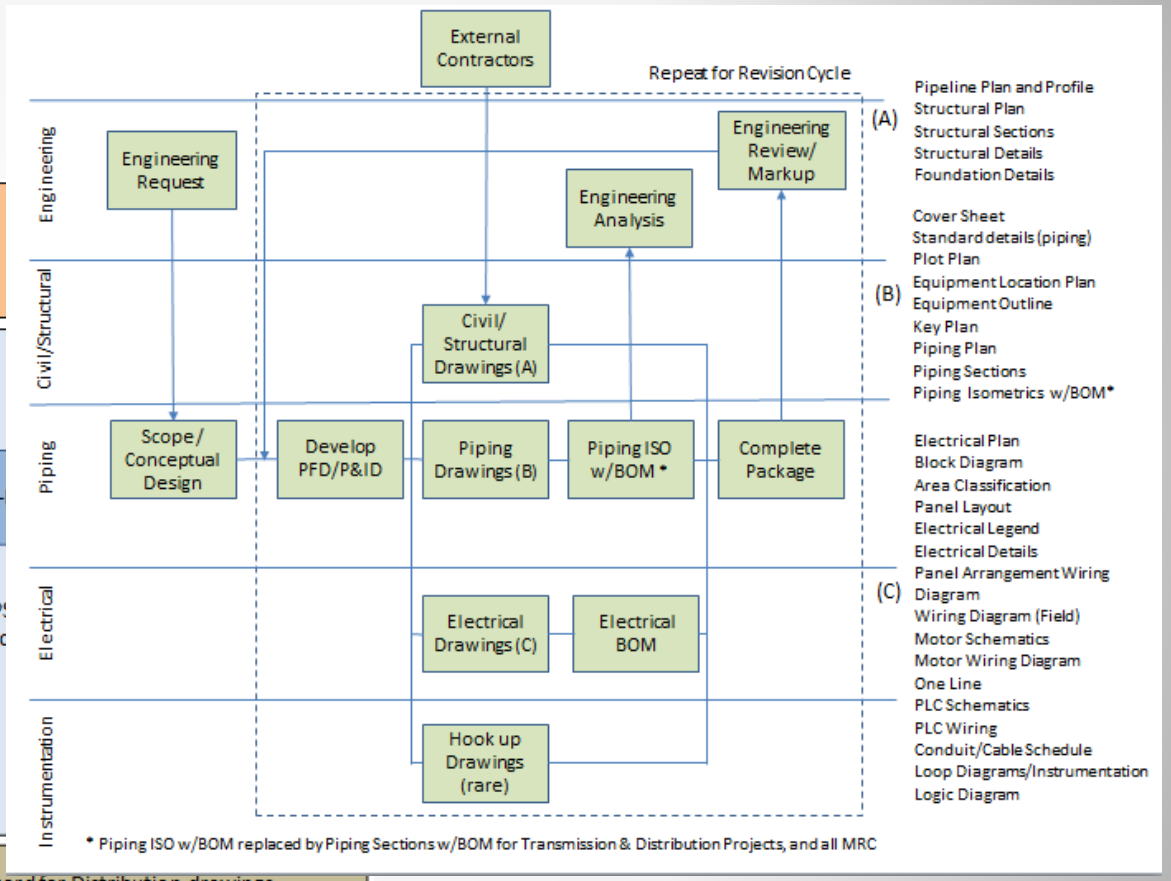
How We Planned the Migration to 3D



Day One – Hour One

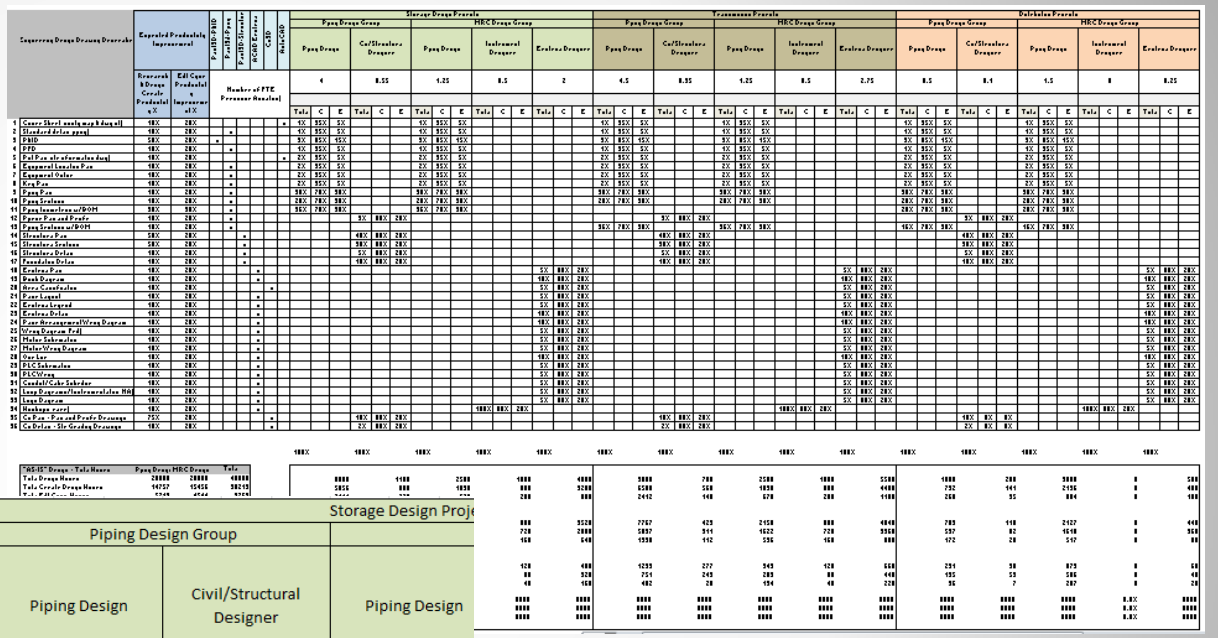
Workflows and Design Products





Detailed Assessment

- Analysis by engineering discipline, design product, software tool, expected savings



	Engineering Design Drawing Deliverables	Expected Productivity Improvement		Plant3D-P&ID	Plant3d-Piping	Plant3D-Structural	ACAD Electrical	Civil3D	AutoCAD	Storage Design Proj								
										Piping Design Group								
										Piping Design			Civil/Structural Designer			Piping Design		
		Research & Design Create Productivity %	Edit Cycle Productivity Improvement %	Number of FTE (Personnel Allocation)						4			0.55			1.25		
										Total	C	E	Total	C	E	Total	C	E
1	Cover Sheet (vicinity map & dwg list)	10%	20%						x	1%	95%	5%				1%	95%	5%
2	Standard details (piping)	10%	20%		x					1%	95%	5%				1%	95%	5%
3	P&ID	50%	20%	x						3%	85%	15%				3%	85%	15%
4	PFD	10%	20%		x					1%	95%	5%				1%	95%	5%
5	Plot Plan (site information dwg)	10%	20%						x	2%	95%	5%				2%	95%	5%
6	Equipment Location Plan	10%	20%		x					2%	95%	5%				2%	95%	5%
7	Equipment Outline	10%	20%		x					2%	95%	5%				2%	95%	5%
8	Key Plan	10%	20%		x					2%	95%	5%				2%	95%	5%
9	Piping Plan	10%	20%		x					30%	70%	30%				30%	70%	30%
10	Piping Sections	10%	20%		x					20%	70%	30%				20%	70%	30%

Conceptual Architecture

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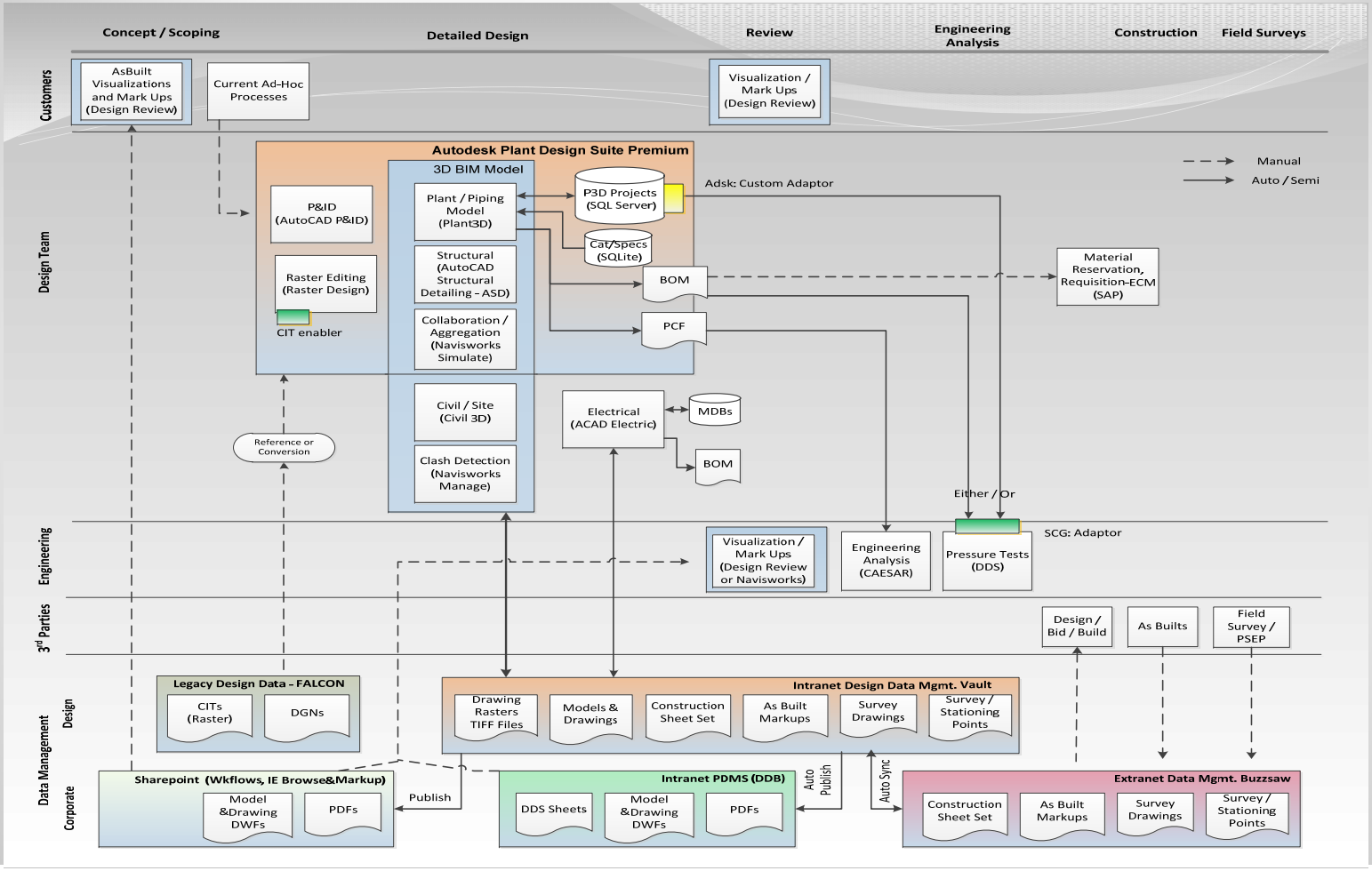
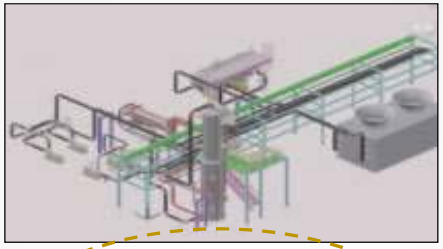
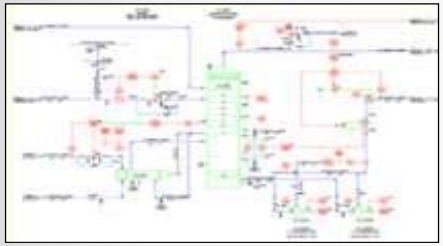


Autodesk Plant Design Suite | Workflow



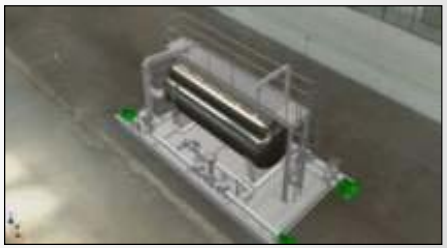
3D MODELING & DOCUMENTATION
AutoCAD® Plant 3D
AutoCAD Electrical
Autodesk Civil 3D

P&ID DESIGN & DRAFTING
AutoCAD® P&ID



GENERAL DESIGN & DRAFTING
AutoCAD and Raster Design®

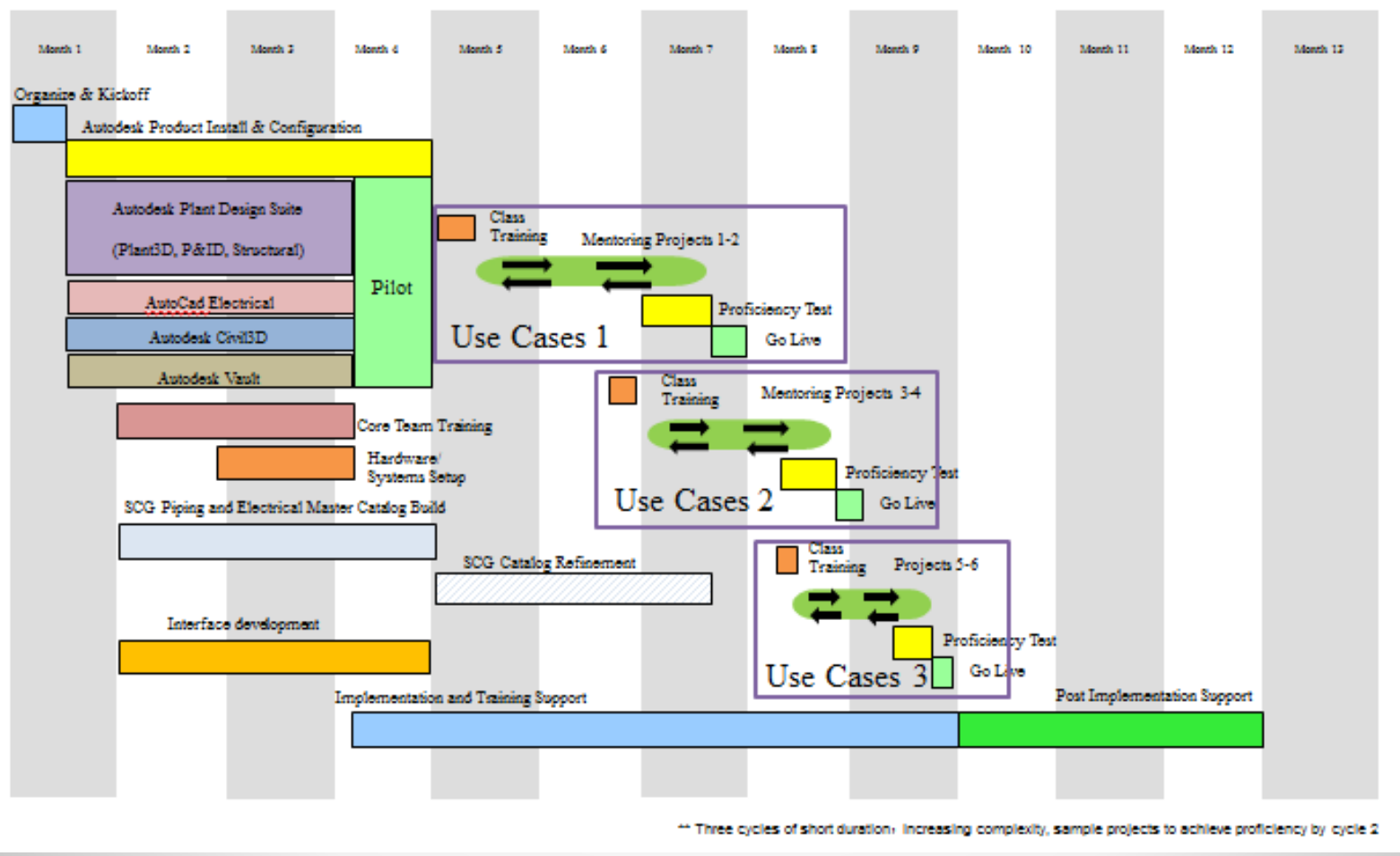
STRUCTURAL DESIGN & DETAILING
AutoCAD® Structural Detailing



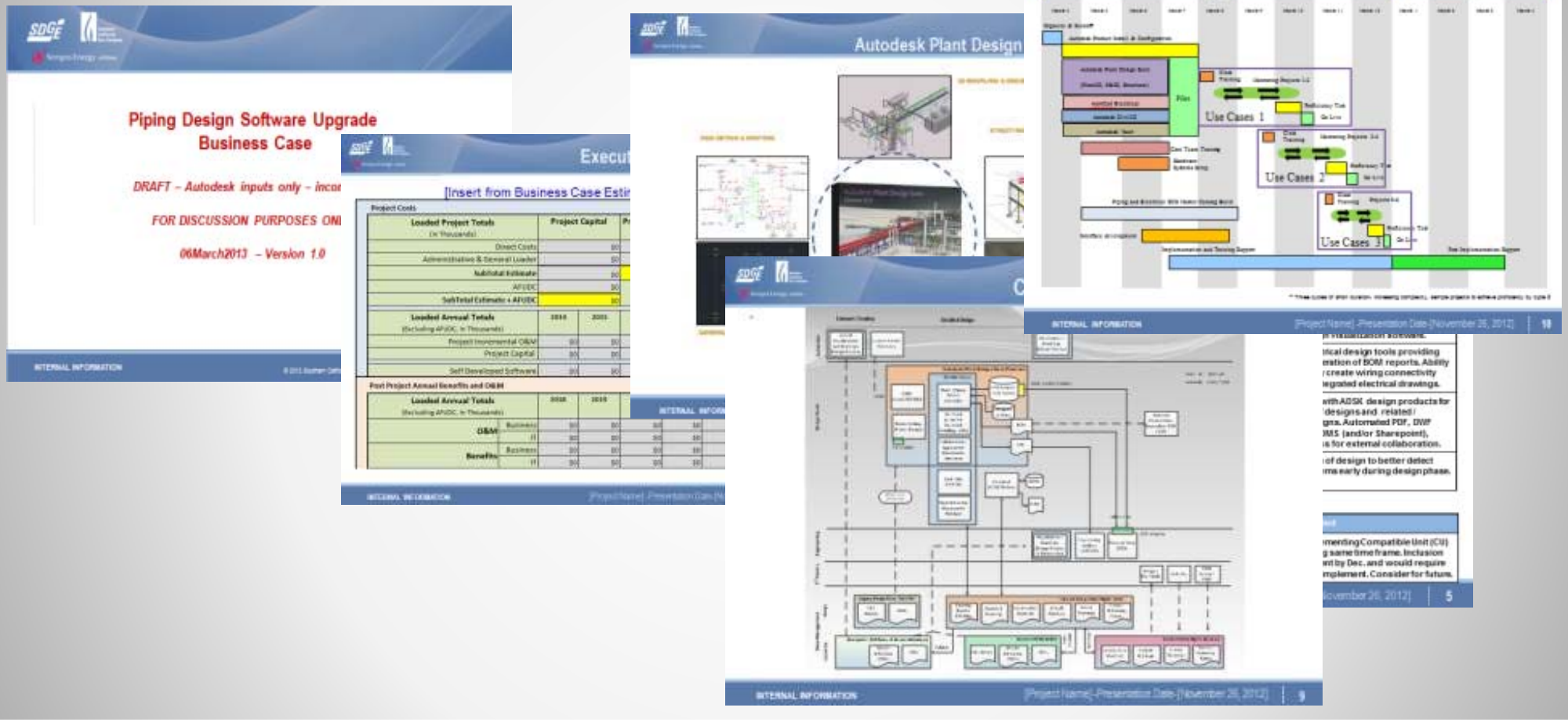
EQUIPMENT & SKID DESIGN
Autodesk® Inventor.

MODEL AGGREGATION, REVIEW & CLASH DETECTION
Autodesk® Navisworks

Implementation Plan



Presenting the IT Business Case



Roundtable Moderated Discussion

Roundtable Discussion Questions

- What was SCG's vision and decision making process that you went through to plan and justify the system ?
- Did SCG quantify an expected ROI for the benefits expected?
- What is the greatest technical challenge you expect in order to implement a fully intelligent 3D model based design system?
- Do you expect the system to be accepted by the end users and how are you preparing the organization for change?
- What are your future plans for the system?

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