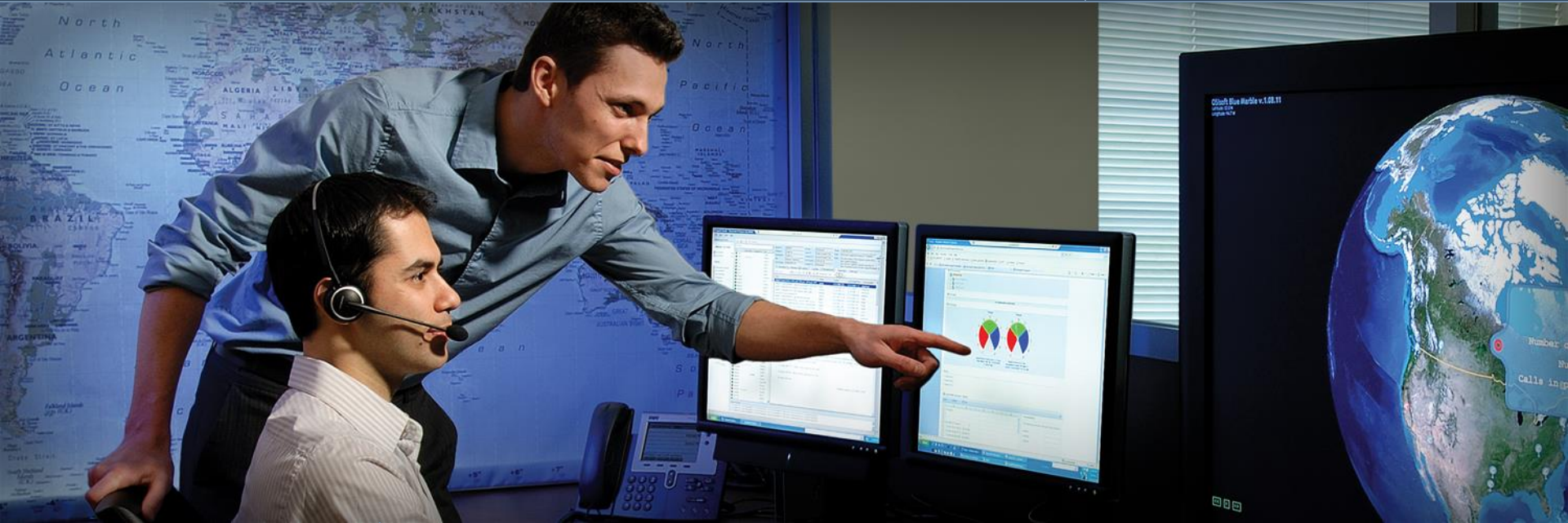




Regional Seminar Series Southern California



OSIsoft Enterprise Agreement

Anthony Narag
Sr. Manager, Operations Information Systems
Amgen

January 21, 2010

Empowering Business in Real Time.

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Somewhere, something incredible is waiting to be known.

Carl Sagan

Data is what allows us to know that we have arrived.

... to serve patients



Marie
Enbrel® (etanercept)



Chanitra
EPOGEN® (Epoetin alfa)

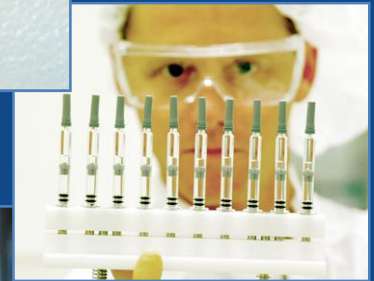
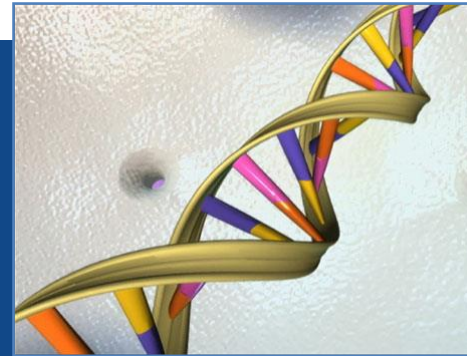


Tony
Sensipar® (cinacalcet HCl)

Amgen: A Biotechnology Pioneer



- Founded in 1980, Amgen was one of the first biotechnology companies to successfully discover, develop and make protein-based medicines
- Today, we're leading the industry in its next wave of innovation by:
 - Developing therapies in multiple modalities
 - Driving cutting-edge research and development
 - Continuing to advance the science of biotechnological manufacturing



Our Values Drive Our Success



Amgen Values

- Be science-based
- Compete intensely and win
- Create value for patients, staff, and stockholders
- Be ethical
- Trust and respect each other
- Ensure quality
- Work in teams
- Collaborate, communicate, and be accountable



Benefits to Millions of Patients



EPOGEN[®]
(EPOETIN ALFA)



Kineret[®]
(anakinra)



Sensipar[®]
(cinacalcet HCl) Tablets
30mg 60mg 90mg



NEUPOGEN[®]
(FILGRASTIM)



Neulasta[®]
(pegfilgrastim)



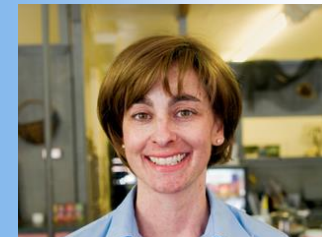
Kepivance[®]
(palifermin)



Aranesp[®]
(darbepoetin alfa)



Enbrel[®]
etanercept



Vectibix[™]
(panitumumab)

Leading Biotech Manufacturing



Expanding Manufacturing Base



Rhode Island



Lake Centre



Thousand Oaks



Bothell



Longmont



Puerto Rico



Seattle



Fremont

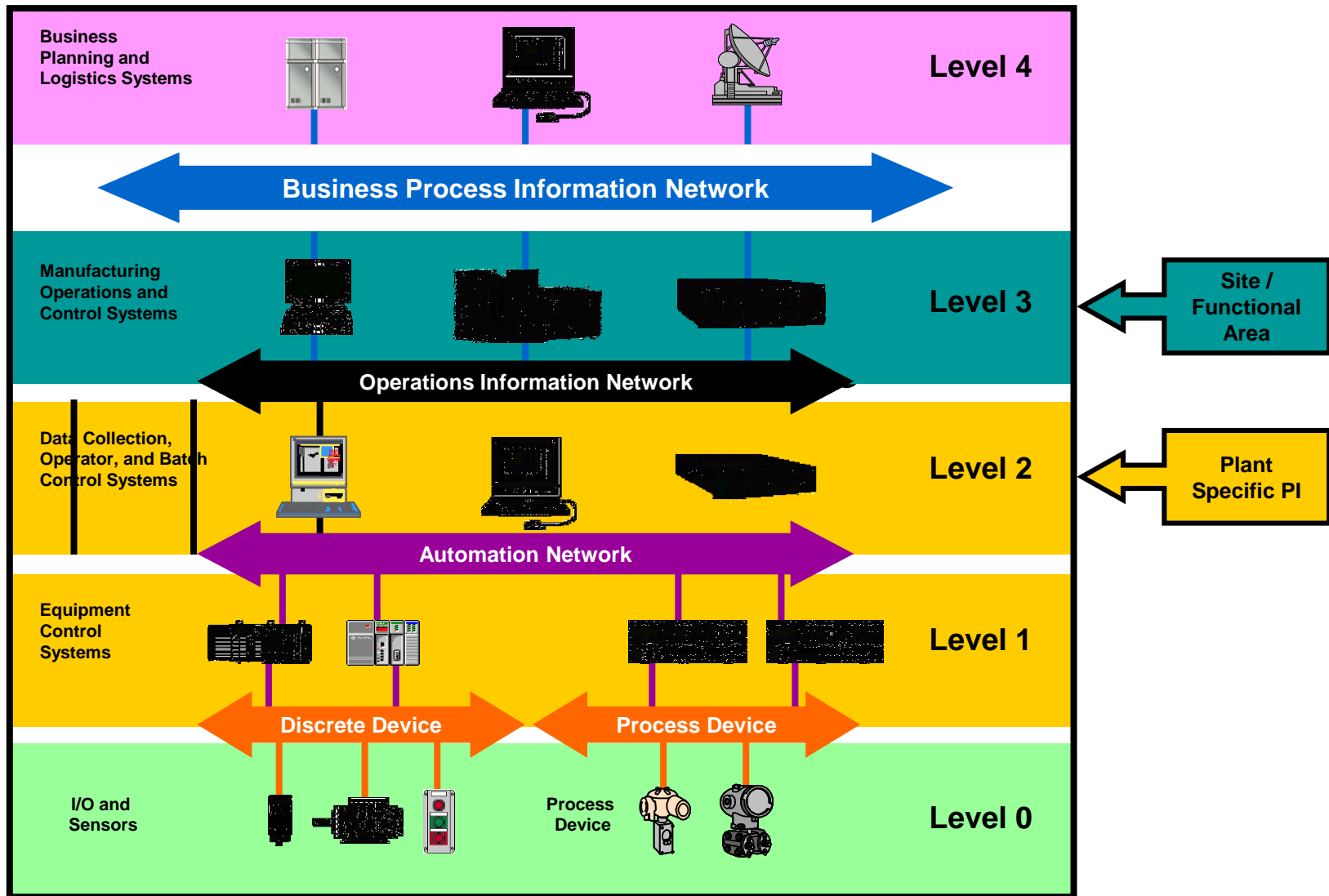


Cork

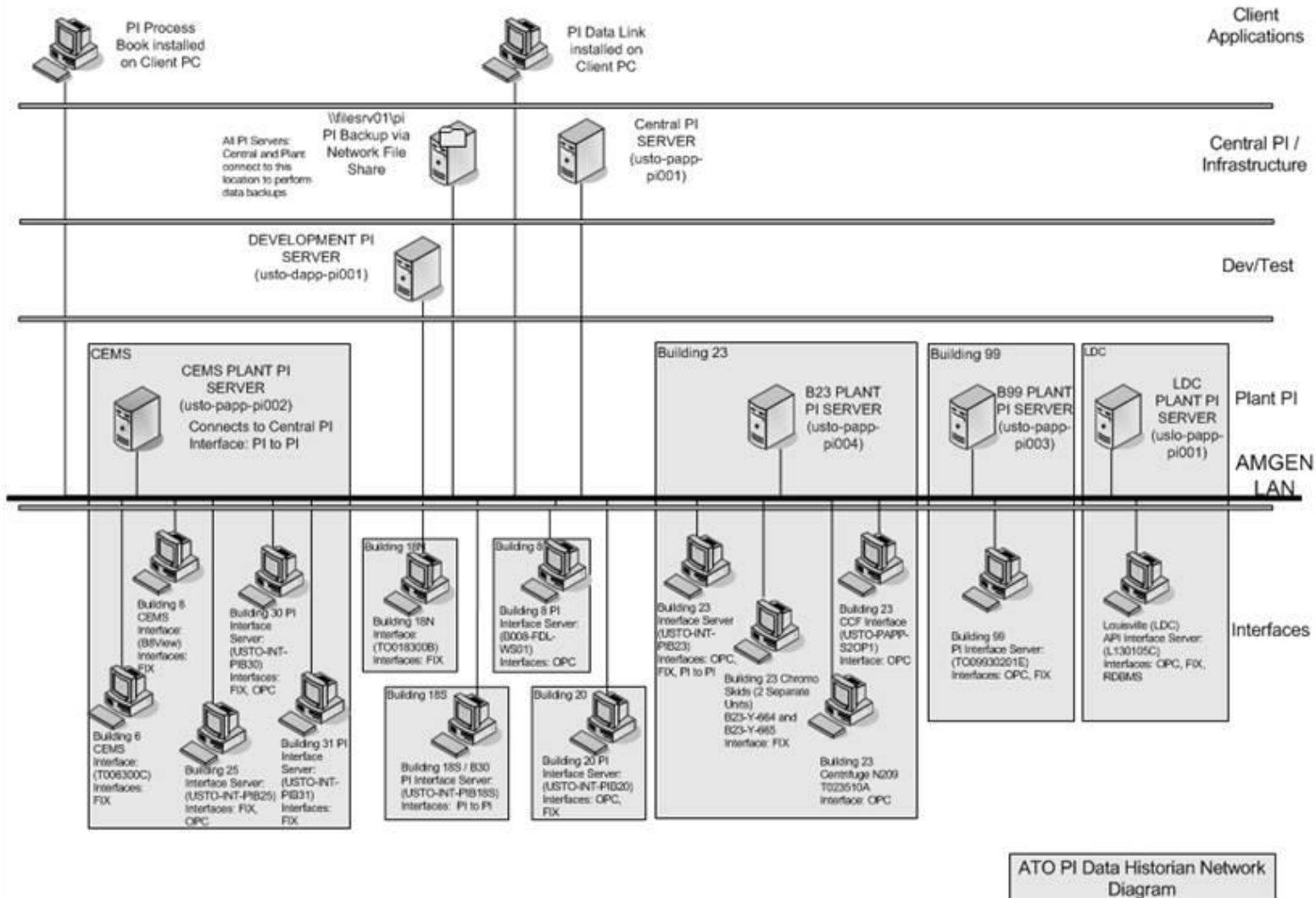


- Amgen selected OSIsoft's PI as our standard data historian platform in 2001
- Corporate pricing agreement in effect from 2001 - 2006
- All manufacturing sites deployed PI to collect process data
- Entered into an Enterprise Agreement with OSIsoft
- OSIsoft engaged in major upgrade in Thousand Oaks in 2009

Enterprise Integration



USTO PI System Architecture



- **Thousand Oaks**
 - 1 Central PI server
 - 4 Building-level PI servers
 - 15 Interface servers
 - 40+ source systems
 - 250 users
 - > 25,000 tags
- **Corporate Wide:**
 - 17 PI servers
 - > 1,000 users
 - > 150k tags

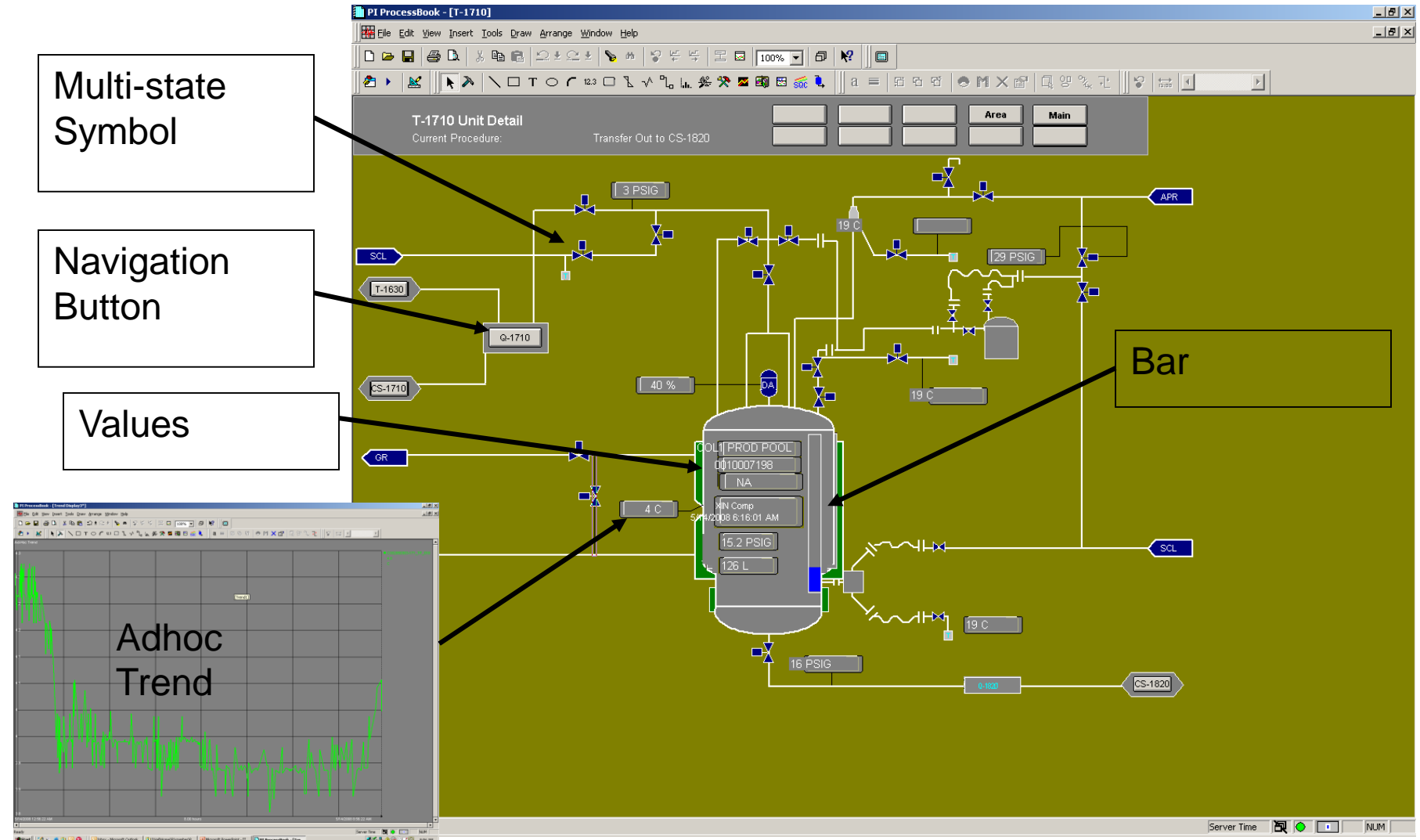
Applications	AWA	AFR	ATO	ACO	AML	ARI
Batch Reports		X			X	X
Alarm Excursion Reporting	X	X			X	
Real-time Trends	X	X	X	X	X	X
Embedded Actiview Trends			X		X	
Real-time Batch Trends				X		
Real-time Multi-Variate Analysis						X
Real-time Event Notification				X		
Chromatography Transition Analysis				X	X	
Historical Performance Analysis	X	X	X	X	X	X
Plant Data Warehouse				X	X	X
Use Based Maintenance				X		
Energy Management/Usage				X		X

Sample User Generated Applications



- **Business Value**
 - Allows staff to view the current process from their desks
- **Technologies Used**
 - PI ProcessBook
 - Multi-state objects, bars, values, navigation buttons
 - VB for adhoc trends (DevNet download)
- **Development Process**
 - Screen capture of SCADA graphic
 - Overlaid symbols

Real Time Graphics

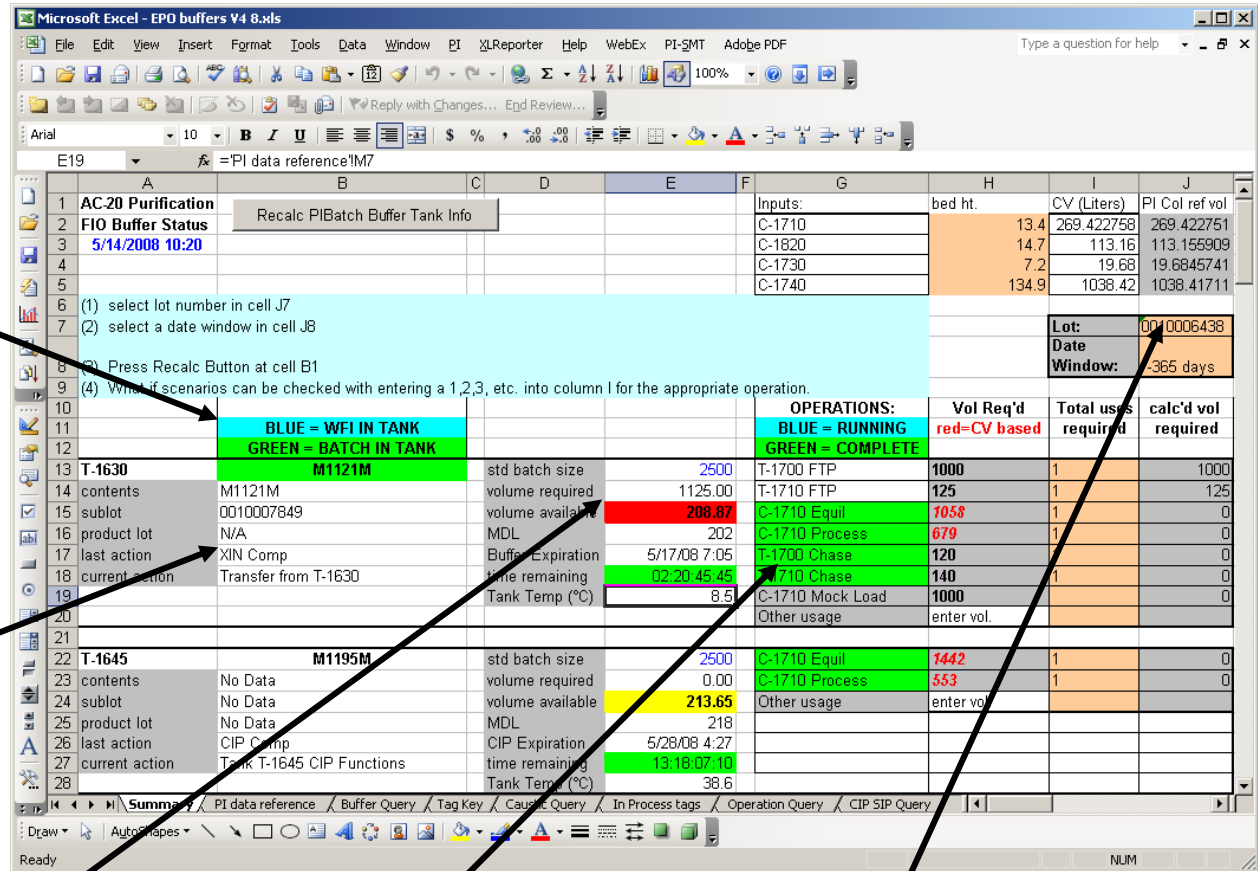


- **Business Value**
 - Provides an overview of work in process, equipment status, and identifies remaining material requirements to assess against availability identifying potential shortfalls
- **Technologies Used**
 - PI Datalink
 - Compressed data, current values, archive values
 - Batch searches
 - Excel functions, conditional formatting, data validation
 - VB for sequencing execution
- **Development Process**
 - Converted paper based tracking

Buffer Usage

Conditional
Formats

Current Values



The screenshot shows an Excel spreadsheet titled "Microsoft Excel - EPO buffers V4 8.xls". The spreadsheet contains a table with columns A through J. The table is divided into sections for different tanks and operations. The first section is for "AC-20 Purification" and "FIO Buffer Status". The second section is for "T-1630" and "M1121M". The third section is for "T-1645" and "M1195M". The table includes various data points such as "std batch size", "volume required", "volume available", "MDL", "CIP Expiration", "time remaining", and "Tank Temp". The table also includes a "Vol Req'd" column with a "red=CV based" conditional format. The "Total uses required" and "calc'd vol required" columns are also present. The spreadsheet is using the "PI data reference" formula in cell E19. The "Conditional Formats" box points to the "BLUE = WFI IN TANK" and "GREEN = BATCH IN TANK" cells. The "Current Values" box points to the "T-1630" and "T-1645" rows. The "Excel Functions" box points to the "Recalc PIBatch Buffer Tank Info" button. The "Batch Searches" box points to the "Lot:" and "Date:" cells. The "Data Validation" box points to the "Window:" cell.

	A	B	C	D	E	F	G	H	I	J
1	AC-20 Purification	Recalc PIBatch Buffer Tank Info				Inputs:	bed ht.	CV (Liters)	PI Col ref vol	
2	FIO Buffer Status					C-1710	13.4	269.422758	269.422751	
3	5/14/2008 10:20					C-1820	14.7	113.16	113.155909	
4						C-1730	7.2	19.68	19.6845741	
5						C-1740	134.9	1038.42	1038.41711	
6	(1) select lot number in cell J7									
7	(2) select a date window in cell J8									
8	(3) Press Recalc Button at cell B1									
9	(4) What if scenarios can be checked with entering a 1,2,3, etc. into column I for the appropriate operation.									
10										
11		BLUE = WFI IN TANK				OPERATIONS:		Vol Req'd	Total uses	calc'd vol
12		GREEN = BATCH IN TANK				BLUE = RUNNING		red=CV based	required	required
13	T-1630	M1121M	std batch size		2500	T-1700 FTP		1000	1	1000
14	contents	M1121M	volume required		1125.00	T-1710 FTP		125	1	125
15	sublot	0010007849	volume available		208.87	C-1710 Equip		1058	1	0
16	product lot	N/A	MDL		202	C-1710 Process		679	1	0
17	last action	XIN Comp	Buffer Expiration		5/17/08 7:05	T-1700 Chase		120	1	0
18	current action	Transfer from T-1630	time remaining		02:20:45.45	T-1710 Chase		140	1	0
19			Tank Temp (°C)		8.5	C-1710 Mock Load		1000	1	0
20						Other usage		enter vol.		
21										
22	T-1645	M1195M	std batch size		2500	C-1710 Equip		1442	1	0
23	contents	No Data	volume required		0.00	C-1710 Process		553	1	0
24	sublot	No Data	volume available		213.65	Other usage		enter vol.		
25	product lot	No Data	MDL		218					
26	last action	CIP Comp	CIP Expiration		5/28/08 4:27					
27	current action	Tank T-1645 CIP Functions	time remaining		13:18:07.10					
28			Tank Temp (°C)		38.6					

Excel Functions

Batch Searches

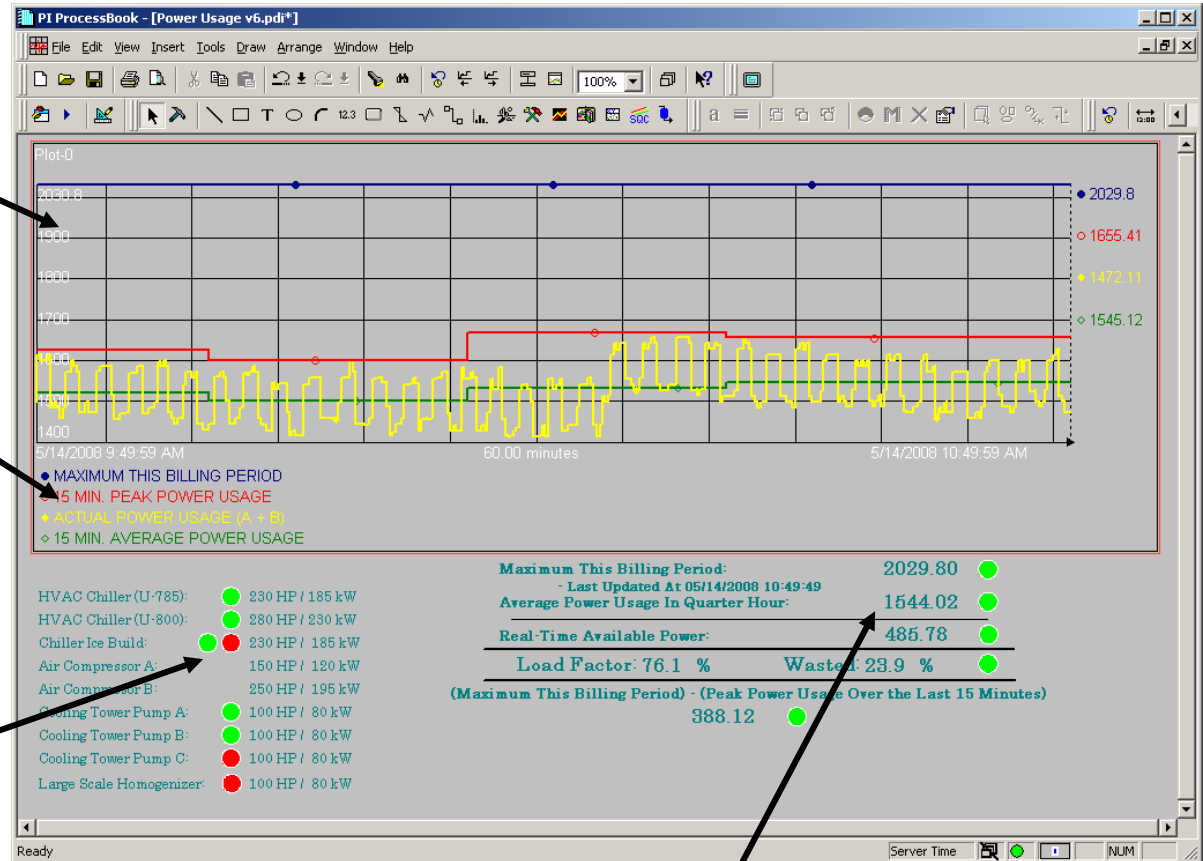
Data Validation

- **Business Value**
 - Tracks power consumption to identify peak load times in an effort to smooth the demand curve
- **Technologies Used**
 - PI ProcessBook
 - Calculation datasets
 - Continuous trends
 - Multi-state objects
 - VB for manual entered peak and associated calculations
- **Development Process**
 - Converted paper based tracking

Time Based
Trend

Calculated
Datasets

Multi-State
Symbols



VB Variables

Enterprise Agreement (EA)

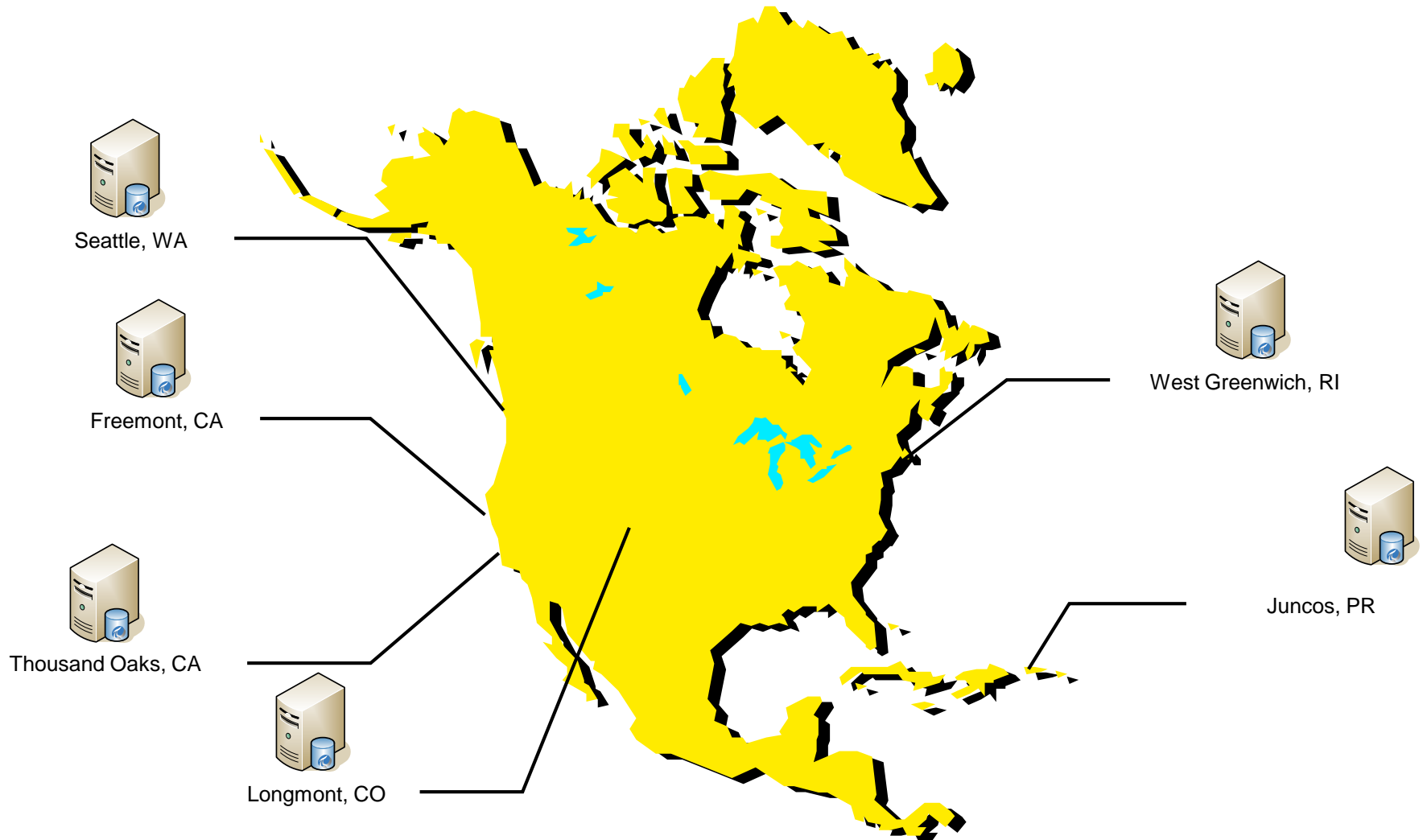




- **Opportunity Statement**
 - OSIsoft's PI widely used
 - Batch report generation
 - In-depth process analysis and optimization,
 - Troubleshooting, investigation, and root cause analysis
- **Business Drivers**
 - Supports IS Strategy - key component in:
 - Manufacturing IS blueprint
 - Current integration efforts
 - Cost Savings - decreases overall cost for Amgen

- Tag/server based pricing has limited the adoption of architecture required to support enterprise implementations
- Procurement savings by avoiding many POs, managing bids, etc
- Time saved avoiding individual investment justifications and client license management
- Managed PI with remote support will save system administration time

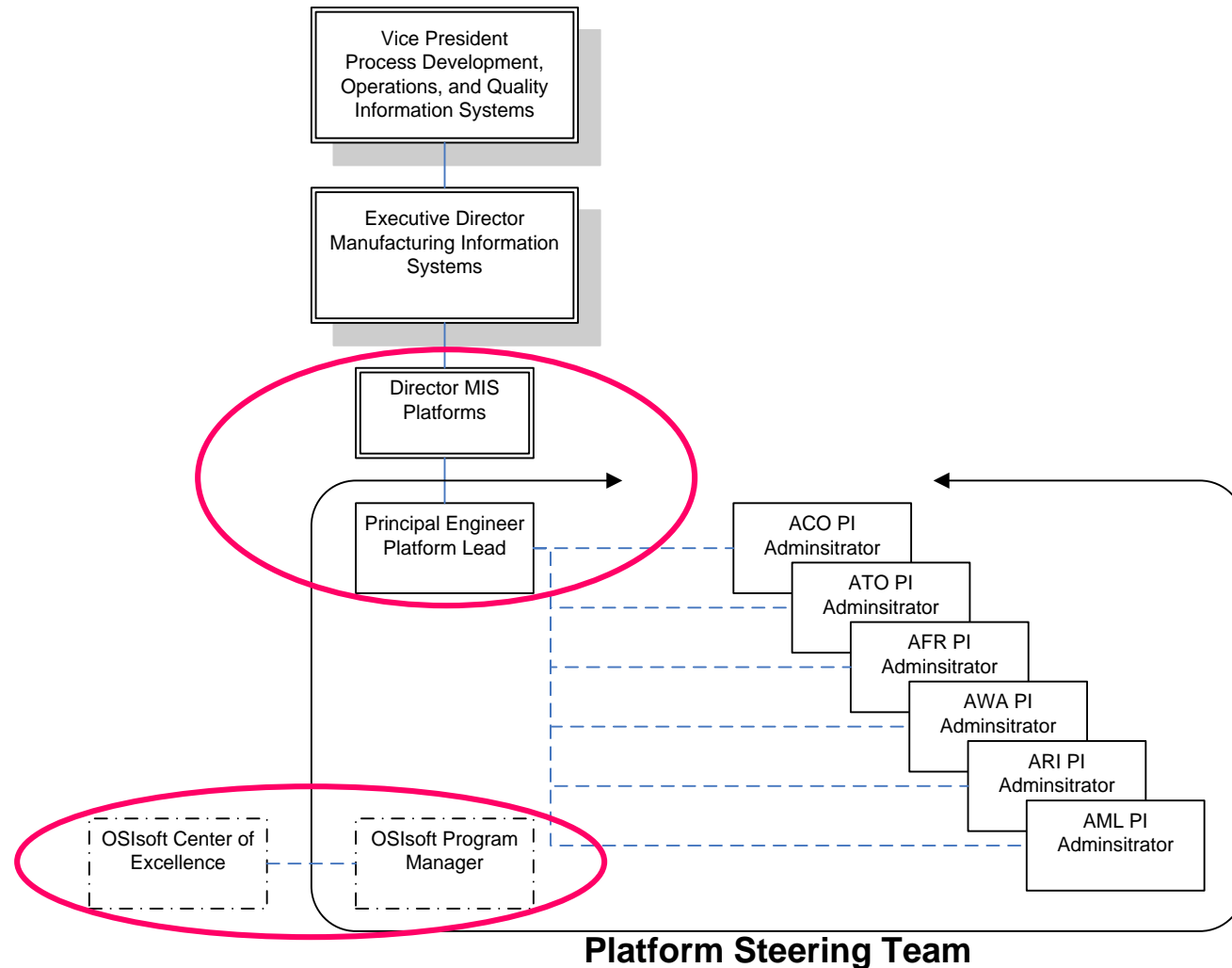
- All Program Implementation Services by OSIsoft included
- “Managed PI” - 24/7 System Monitoring Application
- Named OSIsoft Program Manager and Enterprise Architect
- Professional services agreement for consulting and architecture guidance
- Increased access to training and user conferences
- Dedicated OSI resources that helped in data migration
- Escalation of bug fixes found during upgrade
- Leveraged OSI COE
 - Development of standard validation templates
 - White papers and guidance documents

Our Distributed Asset Base



1. Dedicate resources to manage the distributed platforms.
2. Establish a governance structure to manage distributed systems.
3. Build a cross site support team to develop best practices.  **OSIsoft Program Manager**
4. Define standard architectures, configuration, and processes.  **OSIsoft Center of Excellence**
5. Measure adherence to standards as a means of assessing risk.

Organizational Structure



- Based on Industry Standards S88 & S95
- Aligned to Enterprise Architecture Principles
- Driven by Business Requirements
- Establish a Common Architecture
 - Hardware - build scalable robust storage and retrieval
 - Software - promote application and documentation reuse
- Direction on Configuration
 - Tags and Aliases - naming standards
 - Module Database - equipment model
 - Batch Database - procedural model
 - Security
- Process and Procedures for Use and Administration

- Establishing Common Configuration Items
- Determining Limits from Automation Vendors
- Legacy Installations - “if it ain’t broke don’t fix it”
- Establishing a Virtual Team
- Validation and Testing Requirements
- Managing the Change Cycle

- Consistent implementations across sites that enables growth and provides resilient data access
- All sites leverage managed PI to monitor system performance allowing us to focus on business process improvements
- Develop a distributed shared support model that reduces replication of testing
- Further the user base skill set to improve data based decision making
- Continue to monitor and assess our progress



Thank you

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