

Implementing Enterprise Business Integration & Lessons Learned

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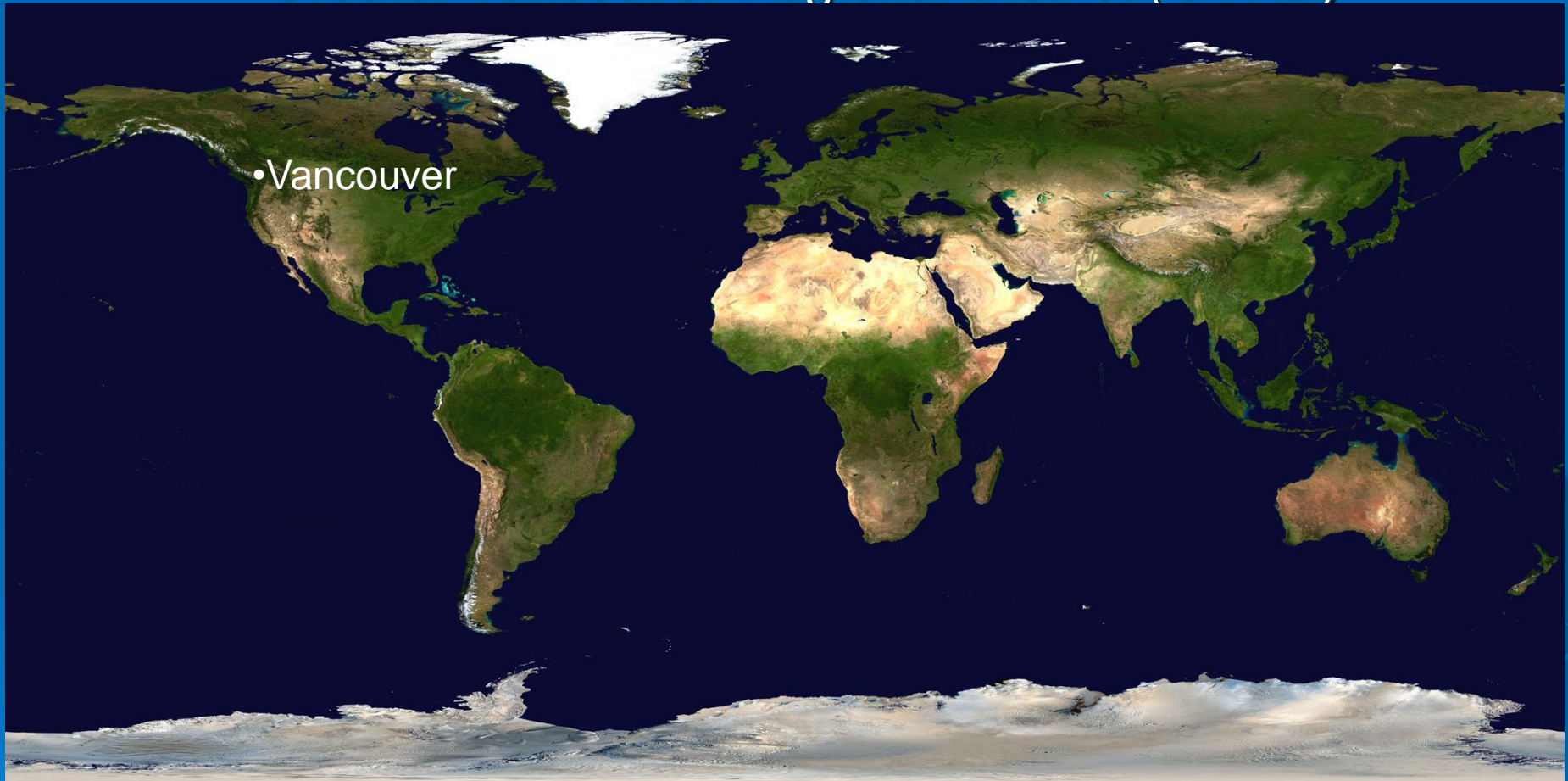
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Agenda

1. Background
2. Enterprise Business Integration Roadmap
3. Challenges and Solutions
4. Lessons Learned / Take-Aways
5. Q & A

Background

- Greater Vancouver Regional District (GVRD)



- Parks Management
- Building a sustainable region

- 27 air quality monitoring sites
- 3600 affordable housing units

Enterprise Business Integration Roadmap

The Vision

- To achieve a **sustainable region**, the GVRD will better enable and integrate the business allowing improved **decision making** to drive lower costs, to improve **quality of product and service**, and to increase efficiency by better using and **managing our technology**.

How do we achieve this?



Professional Expertise

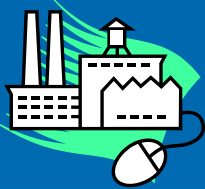
- EIC Solutions Ltd.
- Vancouver BC company
- Business Oriented Solutions through Technology Management
- Multidisciplinary expertise
- Quality and Value are remembered, when price is forgotten

Roadmap

Teamwork



Technology

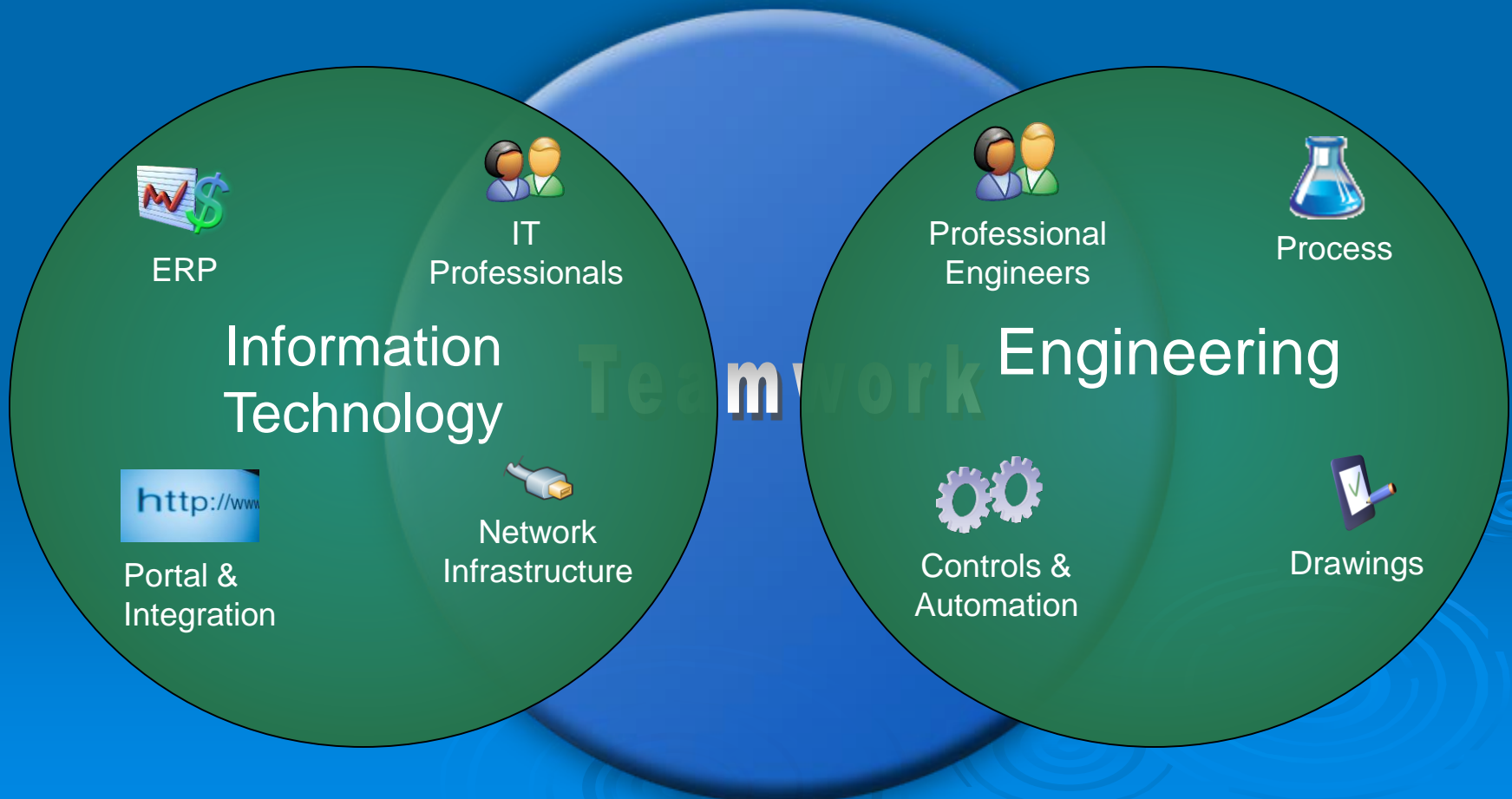


most importantly,

Culture

Roadmap

- Bridging the IT and Engineering Worlds
- Working together to remove silos



Major Themes

Five major themes necessary to harmonize the two worlds enabling enterprise business integration:

- Core Business Support
- Standardize and Simplify IT Systems
- Implement Intranet Portal and Integration Broker
- Unified Process Control and Automation Data
- Control Costs and Measure ROI

Core Business Support

Challenge

- 15% of all IT projects fail
- 51% are completed with cost overruns, time overruns, and lack functionality to support the business (Schwartz 2004)
- Due to lack of user involvement and executive buy-in

Solution (6 months)

- IT participation as a partner in O&M business strategy sessions
- Workshops included all levels of the organization especially executives
- Created IT Steering Committees with various departments

Sample result: lines of business enabled to share knowledge, to review, and to prioritize IT dependent projects.

Standardize and Simplify IT

Challenge

- Array of disparate operating systems, databases, infrastructure, and development environments
- Applications: retire, contain, or strategic?
- Reduce lifecycle costs and better meet the needs of the business

Solution (18 months)

- Servers: Windows 2000 / 2003
- Desktops: Windows XP
- Databases: SQL 2000
- Development: .Net
- Upgrades and web based thin clients

Sample Result: payroll run times on our ERP system decreased from 27 hours to minutes.

Intranet Portal & Integration Broker

Challenge

- Client demand for self-service and personalization
- Make better business decisions in a timely manner
- Information requests across multiple applications

Sample result: runtime hours from plant equipment are used for predictive maintenance instead of pre-determined periodic maintenance.

Solution (Portal)

- Complete corporate intranet re-design and launched on MS Sharepoint Portal Server 2003 within 5 months
- Team sites, collaboration, financials, CAD drawings, operational reports...
- Ready for personalization and single sign-on

Solution (Integration Broker)

- Single source data integration between ERP, Managed Maintenance, Process Control systems through MS Biztalk Server 2004 within 12 months
- Manual and redundant data entry replaced with automated and auditable single source data

Unified Process Control & Automation Data

Challenge

- Multitude of control systems including SCADA, DCS, PLC, data loggers, and monitoring stations (100,000+ tags total)
- Data kept in silos
- Unreliable systems prone to failure
- How do we reliably and accurately collect this data and make it easily available to anyone in the organization through a web portal on a standard IT desktop?

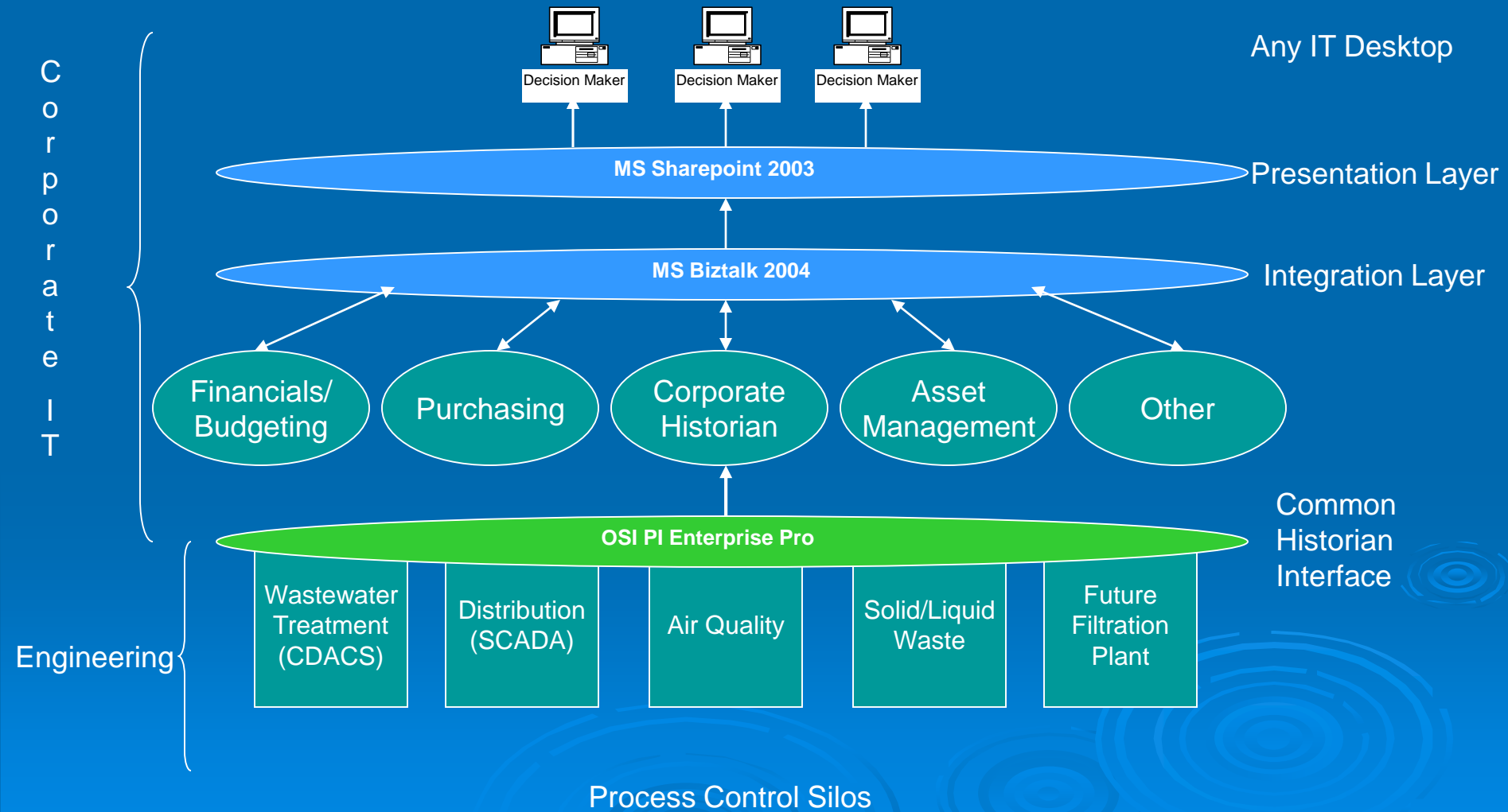
Solution (started in June 2004)

- Corporate Historian Roadmap (June 2004) provided a common standard for all new and existing historians while meeting business functionality across the entire GVRD
- Integrate process control/automation data to ERP, Laboratory Information Management System etc...
- Mitigate risk of system failure of existing historians

Corporate Historian

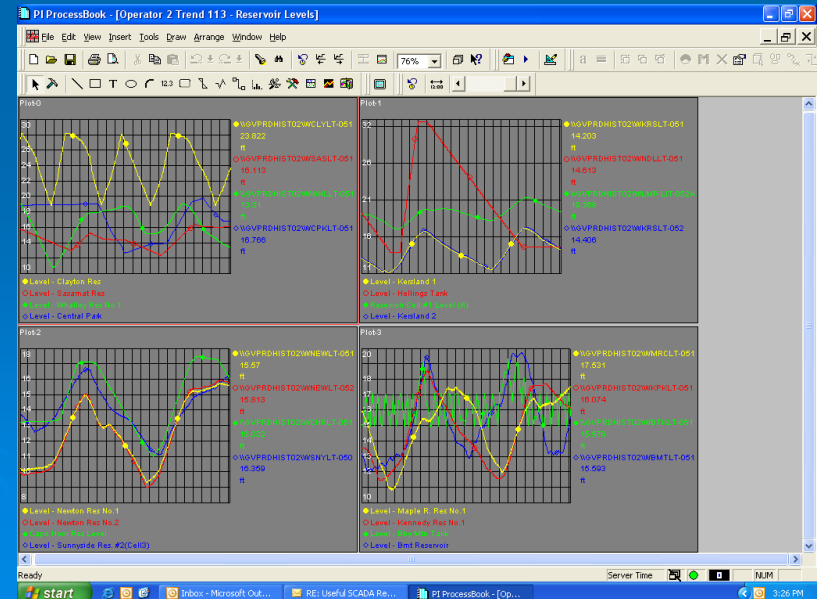
“to efficiently create, manage, archive, store, retrieve, and integrate all process control data in support of decision making models across and throughout all levels of the organization”

Conceptual Architecture



Accomplishments to Date

- Corporate Historian Roadmap (June 2004)
- OSI Pilot Project (September 1, 2004 – December 31, 2004)
- OSI PI in Production for SCADA, 10,000 tags (January 1, 2005)
- Currently, 250,000 tag server @ Head Office collecting 50,000 tags from remote facilities
- Additional 3 facilities and 30,000 tags online by September 2005
- Ample scalability for future projects and facilities across the organization
- RTWebparts, ProcessBook, and Datalink reports



Sample KPIs

Daily report of water pumping station levels, system pressures, and fill rates

Microsoft Excel - SCADA_24hour_report.xls

Greater Vancouver Regional District

GVRD Water System - 24 Hour Report

Sheet 1

Report Parameters

Begin Date: 2005/03/30 0:
End Date: 2005/03/31 0:

Maximum Flows	Time	Max. Flow (MGD)	Reservoir Levels	Time	High (ft.)	Time	Low (ft.)	End (ft.)	Water Pumping Stations	Max. Pumps Running
74.4 Seymour Area										
Seymour West	7:16:18	73.2	Burnaby Mountain Res.	21:59:24	16.2	0:00:00	12.4	15.1	Burnaby Mtn.	2
Seymour East	7:16:18	73.2	Burnaby Mountain Tank	3:56:03	19.4	11:17:49	15.0	15.6	Cape Horn	2
Seymour Combined	7:16:18	147.6	Central Park	16:47:24	19.4	0:00:00	11.8	17.2	Cape Horn 2	2
Capilano No. 4	0:00:00	-0.1	Greenwood	7:44:18	26.5	21:47:24	26.2	26.2	Central Park	1
Capilano No. 5	9:27:34	4.9	North Delta (Hellings)	10:17:19	30.2	0:00:00	18.2	20.2	Capilano to Prospect	2
Capilano Combined	9:27:49	4.7	Kennedy Park	5:36:18	17.3	0:00:00	12.6	14.4	Capilano to Glenmore	1
Coquitlam No. 2	20:12:09	260.0	Newton 1	9:58:49	18.4	0:00:00	15.2	16.1	Grandview	1
Coquitlam No. 3	20:11:09	262.2	Newton 2	10:16:49	18.8	0:00:00	13.1	16.0	Kersland	0
Coquitlam Combined	20:11:39	116.4	Pebble Hill 1 & 2	20:23:24	15.0	0:00:00	11.2	14.8	Little Mountain	0
Combined Source Flow	20:11:39	252.6	Pebble Hill 3	10:21:34	12.6	0:00:00	12.1	12.4	Mahon	0
			Westbunco	6:31:03	17.0	20:32:24	11.9	12.8	Maple Ridge	0
19 Levels										
Capilano Lake Level	0:00:00	550.6	Capilano						North Delta	0
Capilano Drum Gate Elev.	0:33:48	550.0	Kersland 1	6:26:33	13.8	14:18:23	10.4	12.5	Pebble Hill	n/a
Capilano Spill	1:10:30	0.6	Kersland 2	6:22:03	13.9	14:35:08	10.4	12.5	Sasamat	1
Seymour Lake Level	1:05:03	789.7	Little Mountain 1	6:26:48	20.8	20:20:54	17.9	19.0	Vancouver Heights	0
Coquitlam Lake Level	1:07:33	571.2	Little Mountain 2	6:29:18	21.8	20:24:39	18.9	20.0	Westbunco	1
			Sasamat	6:42:03	18.5	21:37:09	11.3	11.5	Westbunco 2	2
26 Intake Turbidity										
Capilano	9:12:34	10.0	Coquitlam							
Seymour	14:52:08	1.2	Vancouver Heights	6:38:33	16.7	19:34:39	9.4	10.3		
Coquitlam	4:03:03	8.5	Cape Horn	15:19:53	16.0	22:35:24	14.2	14.6		
			Clayton	19:50:39	28.8	13:05:49	18.9	23.5		
			Grandview	0:00:00	9.8	23:02:09	9.3	9.3		
			Maple Ridge	4:26:03	18.0	15:44:38	13.4	15.8		

Ready

start

Inbox - Microsoft Out...

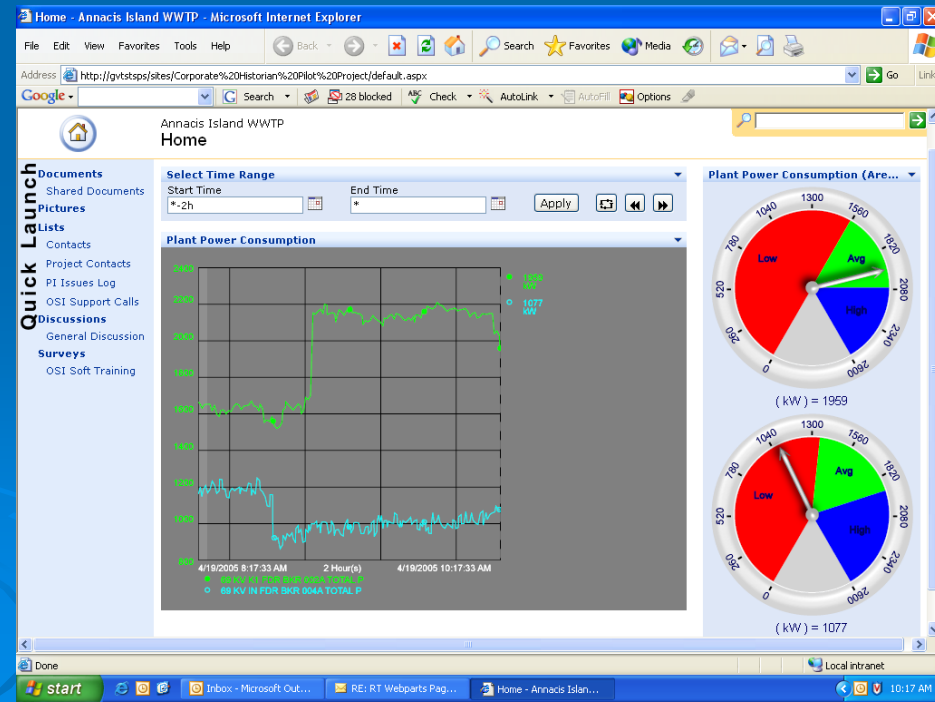
RE: Useful SCADA Re...

Microsoft PowerPoint...

Microsoft Excel - SCADA...

3:35 PM

Power Consumption
@ Annacis Island
Wastewater
Treatment Plant



Control Costs / Measure ROI

Challenge

- Strive for practical solutions
- Reduce costs
- Value perceived or received by residents of Greater Vancouver

Results

- Soft costs are invaluable but discounted to zero dollar value
- IT streamlining has saved \$700,000 per year in labour and \$200,000 per year in software support/maintenance costs
- Corporate Historian project using OSI PI will save \$1 million on a five year NPV basis due to procurement through economies of scale

Lessons Learned / Take-Aways

Leadership – a champion is required

Roadmap – vision backed by facts and expertise

Value – cost effective solutions that meet business needs

People – the most important aspect... buy-in, teamwork, and culture

Q & A

“Keep the momentum going!”

Tom Heath
VP, Operations and Maintenance
GVRD

