



Regional Seminar Series Chicago, IL



State-of-the-Art Monitoring

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Empowering Business in Real-time.

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- Building the Suzlon Monitoring Center (SMC)
- Reality Check
- Field Survey
- Choosing OSIsoft, Inc.
- PI Pilot Program
 - Monitored sites
 - Success criteria
 - PI infrastructure
- Expected Results
- Next Steps



Suzlon Wind Energy Corporation



SUZLON
POWERING A GREENER TOMORROW

- Global Wind Turbine Manufacturer
 - Based in Pune, India
 - est. 1995
- 3rd Largest Wind Turbine Manufacturer
 - Suzlon and REpower combine for 9.8% of world market
- 7,000 wind turbines
 - 9500 MW
- 13,000 employees in 25 countries
- U.S. HQ - Chicago, IL
 - Construction, OMS, SCM, Engineering, Special Projects
 - 53 wind farms
 - 974 wind turbines
 - 230+ field technicians



Building the Suzlon Monitoring Center



Early Evolution of the SMC



- People
- Equipment
- Processes



The SMC went live April 1st, 2009

- Quickly expanded to Central / South America & Europe

Country	# of WTG's	MW Capacity
U.S.	974	1900
Brazil	182	382
Spain	111	233
Portugal	49	103
Nicaragua	30	63
Turkey	15	31
Total	1361	2712

- Will add units in Bulgaria and Sweden by end of 2010

- Visualization of the fleet
 - Needed to be logged into the turbine to “see” it
- Lack of high-fidelity data
 - 10-minute average data
- Proactive alerting
 - Strictly reactive
- Notifications
 - 300+ notifications per shift!
- Reporting
 - Excel based
- KPI visibility
- Integration w/ functional groups
- Operational knowledge



Survey Questions	Results
What % of our technician's time is spent on the following?	
Data Mining	15%
Down-Tower Troubleshooting - Looking at inputs and outputs in the system	35%
Up-Tower Troubleshooting - Fact finding/taking measurements	50%
What % of knowledge learned from working on your site do you share with the rest of the US OMS team?	41%
How much more efficient is a technician with 3+ years troubleshooting/repair experience versus 3 months experience?	80%
Out of 100% of time worked, how much time do you spend on the following activities:	
Activity related to reactionary responses	65%
Activity related to proactive action	35%
How long does it take on average to do the following:	
Create a service order	13 min.
Requisition a part (paperwork processing)	21 min.
How much time (per year) would you estimate that you spend performing preventative maintenance vs. required service & maintenance?	3 weeks

Choosing OSIsoft, Inc.



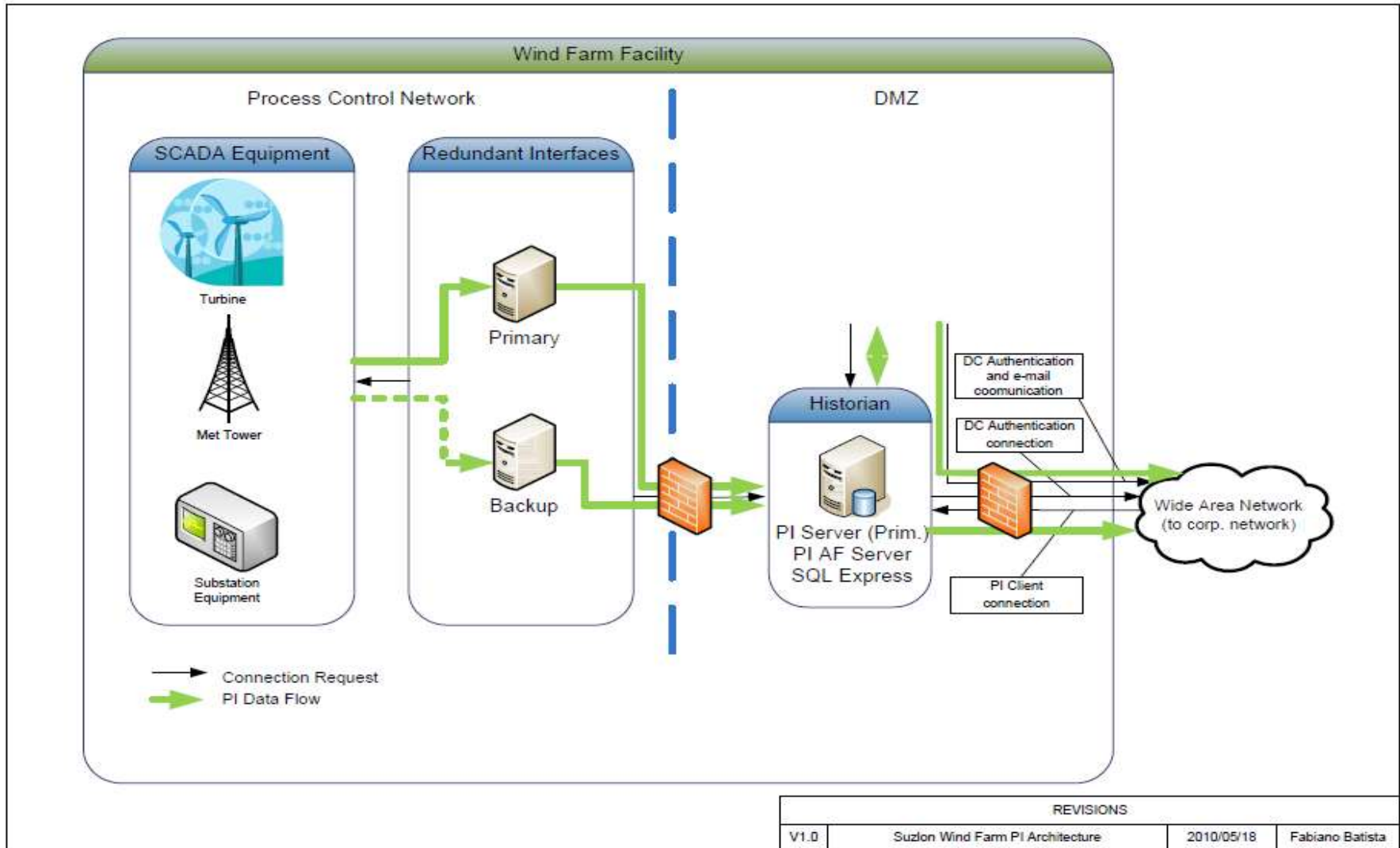
Suzlon's Enterprise Agreement

- Mountain Wind I & II
 - 67 turbines (S88 - 2.1 MW)
- Silver Sage
 - 20 turbines (S88 - 2.1 MW)
- Bingham Lake
 - 12 turbines (S64 - 1.25 MW)

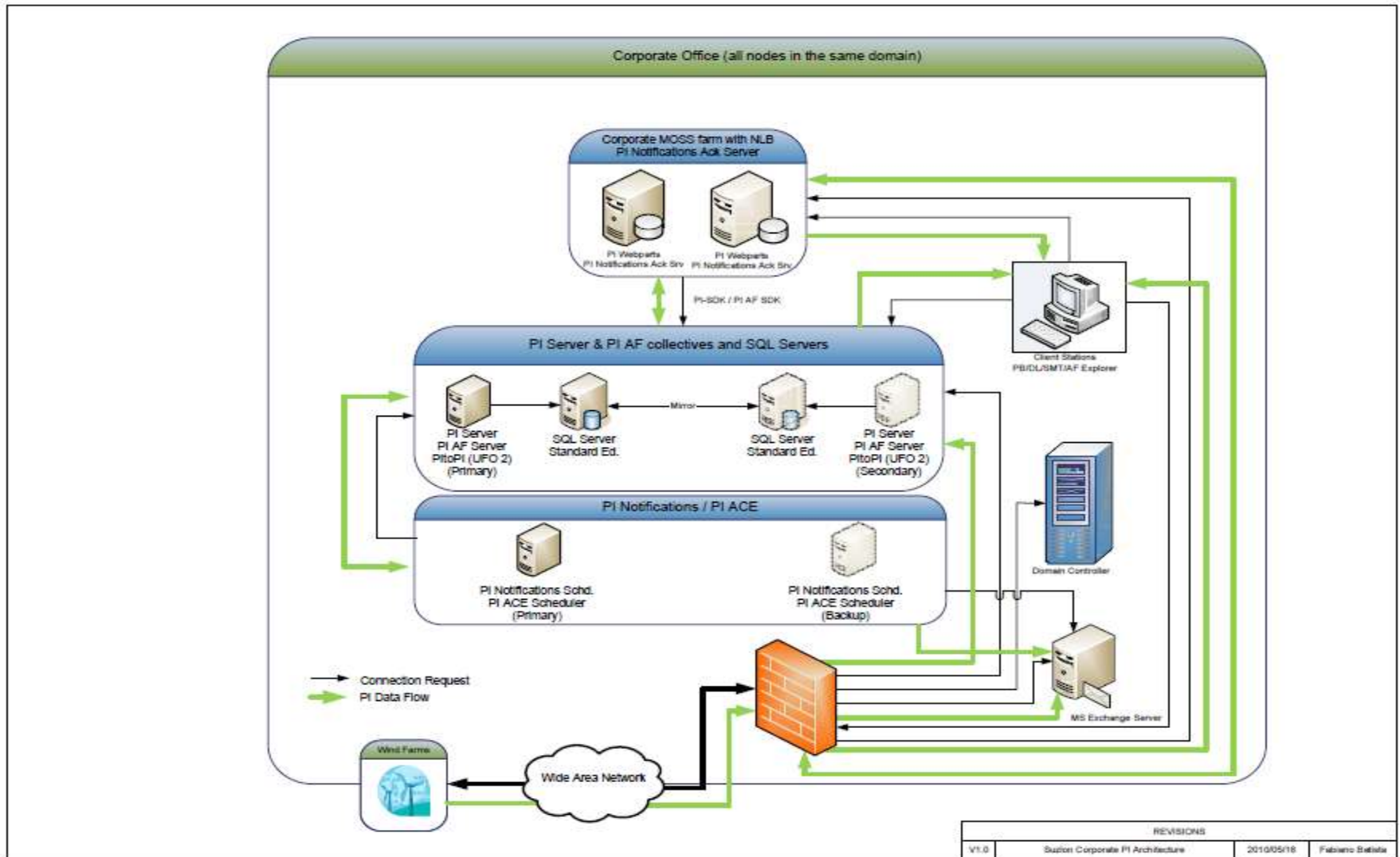


Pilot Program - Scorecard			
No.	Program Goal	Goal Description	Score
#1A	Data Capture	Test the benefits of real time (proposed) vs. 10-minute (current) data capture	0.00
#1B	Data Capture	Test data extraction speed and query size vs. the same functions in SC-Reporting	0.00
#1C	Data Capture	Save data by buffering it during network communication failures	0.00
#2	Early-Warning Detection	Create warning notifications (pre-alarms) as turbine parameters reach higher-than-normal thresholds	0.00
#3	Auto-Notifications	Configure system to link to MS Outlook to send e-mails automatically to the technicians when a warning or alarm is generated by the turbine controller	0.00
#4	Fleet Visibility	Increase fleet visibility by creating multiple displays, dashboards, etc. (unit / site status, fleet statistics, production / performance numbers) for all users	0.00
#5	Performance Reports	Develop real-time performance reports that can be viewed anytime (as defined by the user) and create automatically-generated reports for weekly meetings (by fleet, region, site, turbine)	0.00
#6	Links to Troubleshooting Tools & Guides	Develop fault-specific trends and graphics which can be tied to related parameters and troubleshooting steps - this functionality will be created for all PI users to view and use (including OMS).	0.00
#7	Tie to Portal (SharePoint)	Using system tools on the portal, automatically tying data to portal-based reports, etc.	0.00
#8	Interfacing with Non-Suzlon Equipment	Develop an interface to non-Suzlon equipment (e.g. substation equipment, third-party monitoring systems, etc.).	0.00
#9	Supply Chain Management (SCM) Integration	Prove the concept of using the new system to determine parts life and provide warnings prior to end-of-life	0.00
#10	IT / Network Monitoring	Apply new system functionality to IT equipment and network equipment	0.00
#11	New SMC Asset Development Tools	Update / upgrade the tools and systems required to bring new turbines online with the SMC	0.00
SCALE: 1=did not achieve goal 2=partially met goal 3=met goal 4=exceeded goal 5=can't live without it			

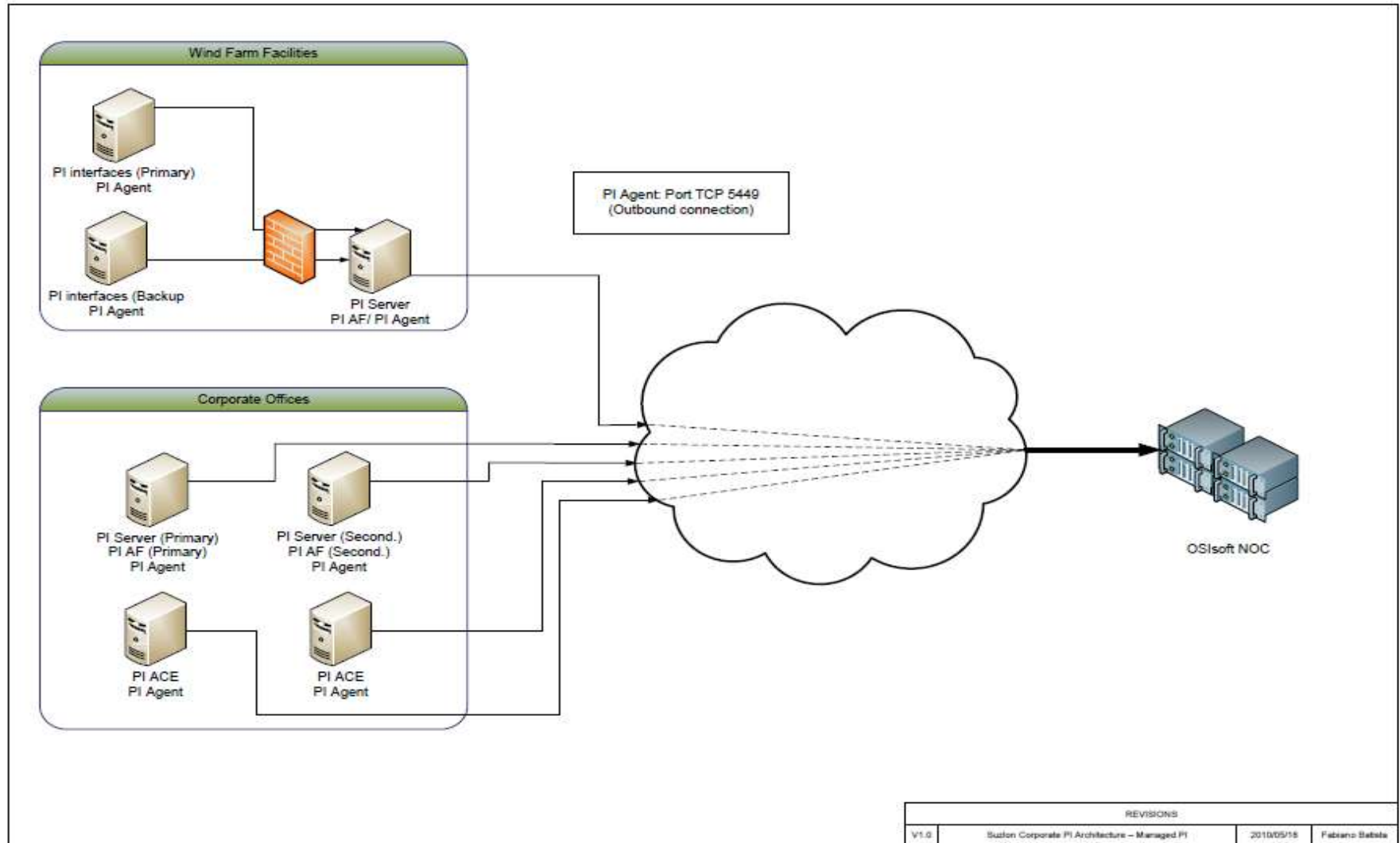
PI System Architecture - Site Layout



PI System Architecture - Corporate Layout



PI System Architecture - NOC Connection



- Enterprise Agreement
 - OSIsoft, Inc. team
 - Center of Excellence
 - vCampus
 - Extranet
 - Value Realization Process
 - Enterprise roadmap
 - Client tools
 - PI ProcessBook
 - PI DataLink
 - PI WebParts
 - PI Notifications
 - PI AF

Fabiano Batista



Ross Convey



David Zeglinski

Expected Results



- Tangible
 - Availability savings (>1%)
 - FTE savings
 - Shift troubleshooting / analysis to SMC
 - Enhanced data mining capabilities
 - Condition-based maintenance program
 - Supply Chain integration
 - Automation of service orders (SAP)
- Intangible
 - Shift from reactionary to proactive
 - Knowledge sharing
 - Instill user-confidence



Future Plans / Next Steps



- Evaluate success criteria
- Domestic roll-out
- Globalization
 - Absorbing Australia
 - substation monitoring
 - Roll-out to India, China, RoW
- New Business
 - Non-Suzlon asset monitoring
- IT monitoring
 - Data & business networks



Questions?



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Thank you

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