Applying PI System – For Improving Process Condition & Process Optimization

Presented by

PRASAD SHINDE

ULTRATECH CEMENT LTD H.O.(Mumbai)

SEP 23, 2011

Agenda

- ✓OSIsoft products and services.
- ✓Overview of UltraTech Cement Limited.
- ✓PI System Architecture at UltraTech Cement Ltd.
- ✓PI Utilization at UltraTech Cement Ltd.
- ✓Business Challenges & solutions.
- ✓Results & benefits.
- ✓Case Studies
- ✓Future Plans.

OSIsoft Products & Services

- PI Enterprise server
- PI Server 2010 with PI AF(Asset Framework)
- PI-OPC DA Interface
- PI-Modbus Interface
- PI ProcessBook:- On line data monitoring & trending.
- PI DataLink:- Graphical interface to retrieve data & build function & calculations.
- PI AlarmView:- Overall alarm structure & detailed information on specific points.
- PI SQC Client:- Extensively used in quality control.
- PI Profile View
- PI Batch View
- PI Notifications:- Instant communication through email & sms.
- PI System Mangement Tool(SMT)
- PI Manual Logger
- PI SDK

UltraTech Cement Limited

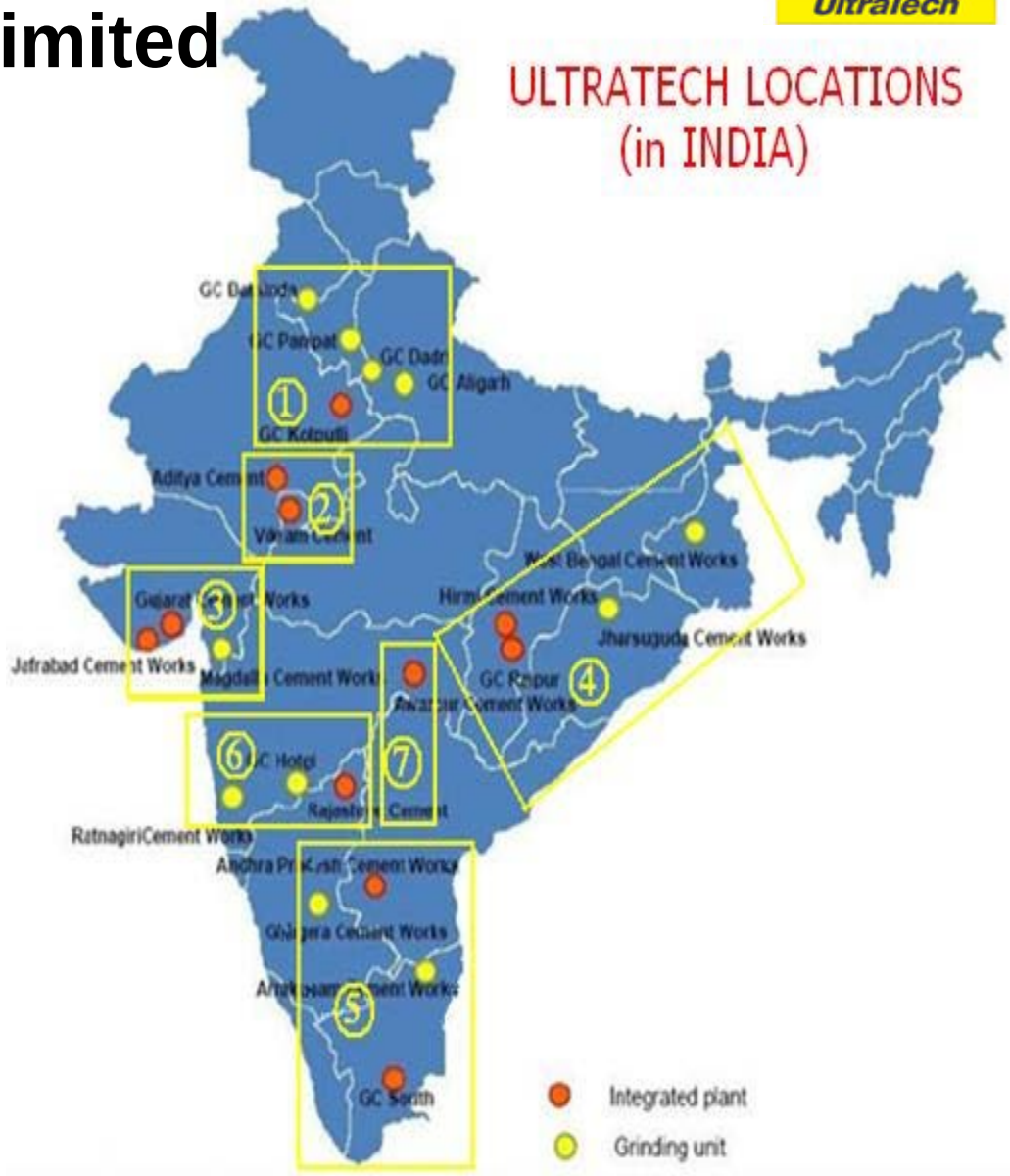
Manufacturing locations

- 11 Integrated Plants
  1 White Cement Plant
  1 Clinkerisation plant in UAE

- 15 Grinding Units
  11 in India
  2 in UAE
  1 each in Bahrain & Bangladesh

- 5 Bulk Terminals
  4 in India
  1 in Srilanka
  .

- 73 RMC(Ready Mix Concrete) units

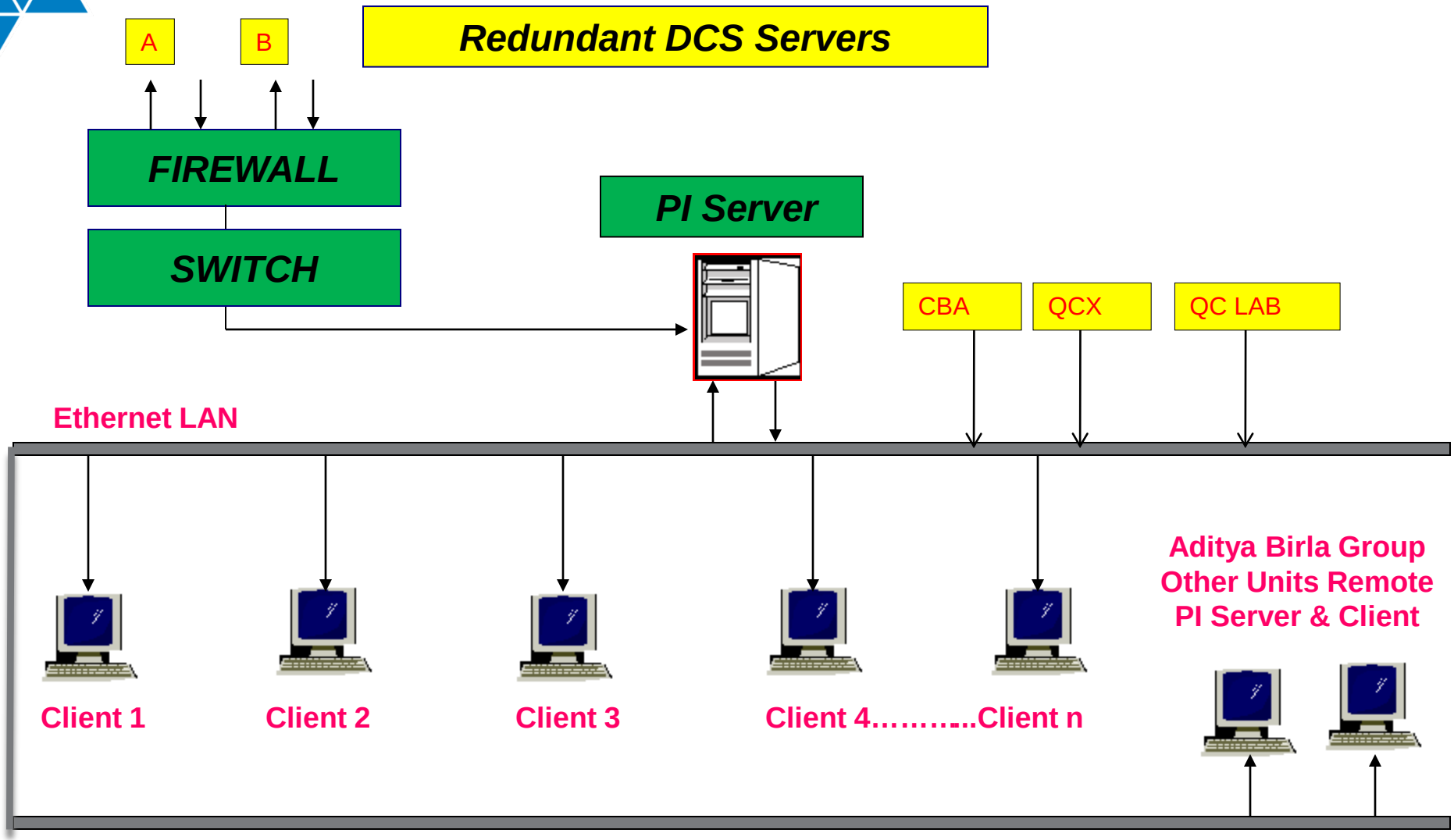


Overview of UltraTech Cement Limited

- Flagship company of Aditya Birla Group.
- Eighth largest cement producer in the world.
- Grey Cement annual capacity – 52 MTPA(Includes ETA Star Cement).
- White Cement annual capacity – 0.55 MTPA.

We are committed to Green, Clean and Safe environment.

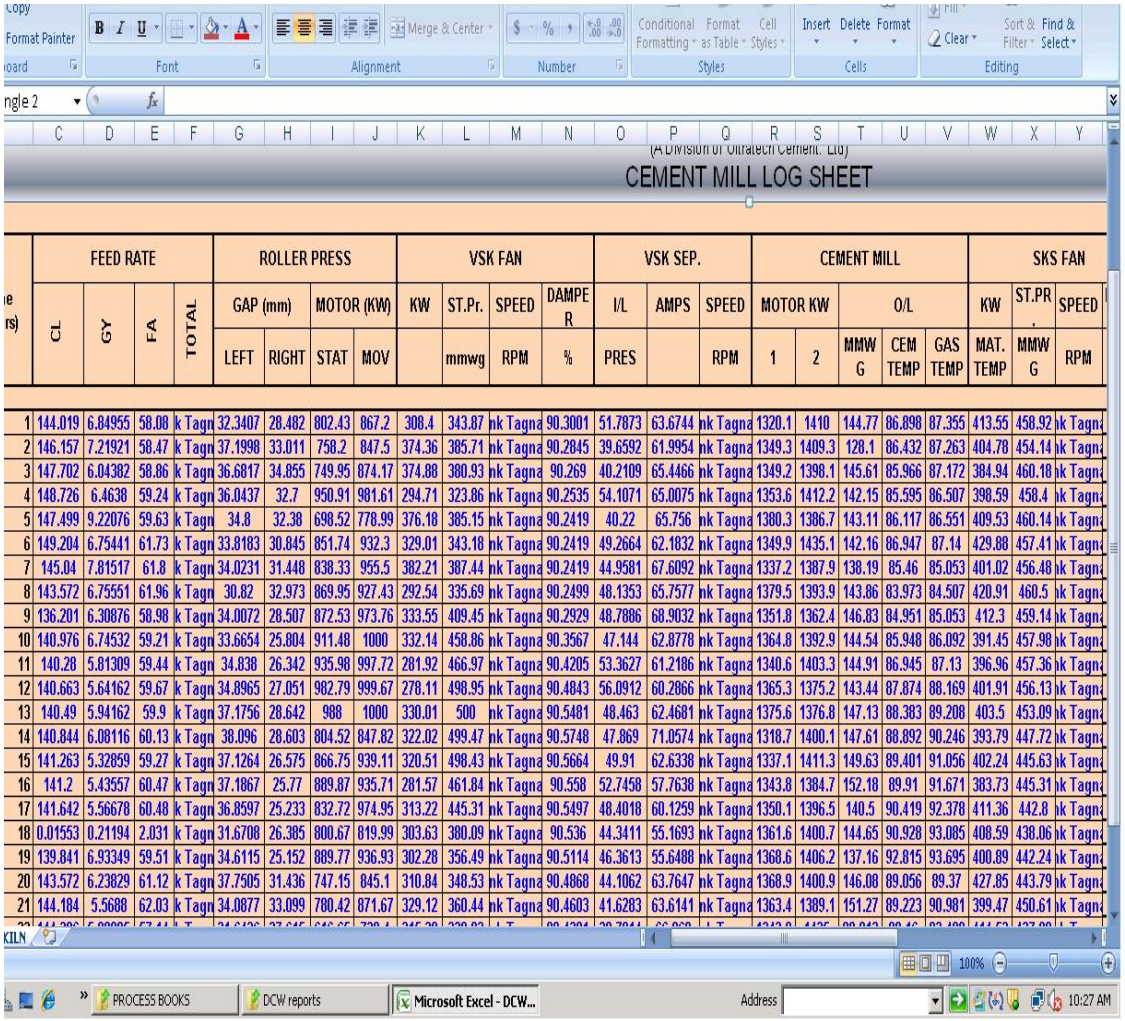
PI SYSTEM ARCHITECTURE



PI System Utilization at UltraTech Cement Ltd.

- Bring all relevant data from various sources such as operational data sources on a single platform.
- Appropriate access of data provided to engineers based on roles & delivered in uniform & consistent manner.
- Real time data collection used for study & analysis.
- Generation of shift/daily reports through PI DataLink utility.
- Monitoring of real time data through PI ProcessBook & generation of user specific reports for particular equipment or section.
- Reports generated used for necessary action & improvement.

Report Generation



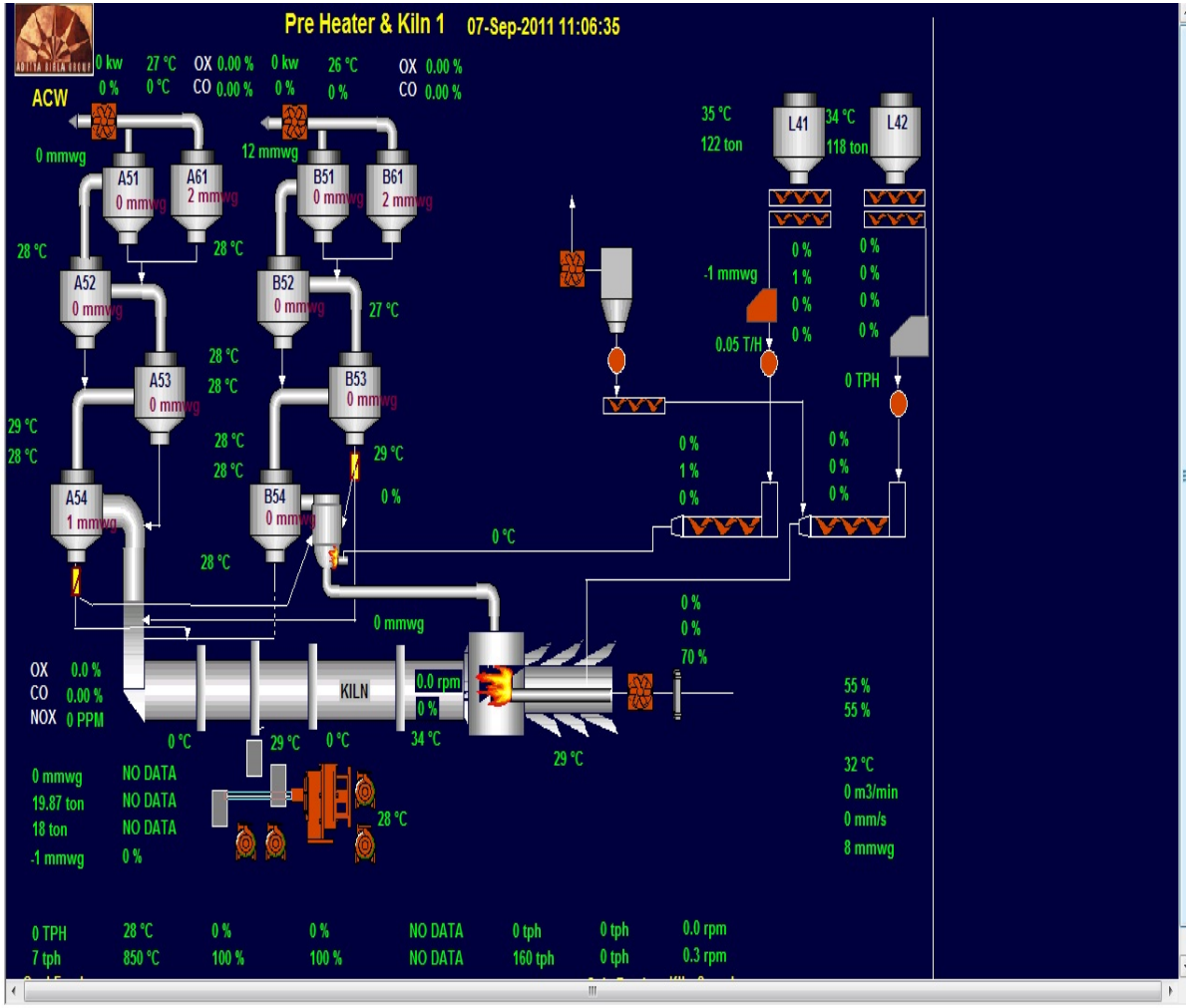
(A Division of Ultratech Cement. Ltd)

CEMENT MILL LOG SHEET

	FEED RATE				ROLLER PRESS				VSK FAN				VSK SEP.			CEMENT MILL					SKS FAN		
	CL	GY	FA	TOTAL	GAP (mm)		MOTOR (KW)		KW	ST.Pr.	SPEED	DAMPER	I/L	AMPS	SPEED	MOTOR KW		O/L			KW	ST.PR.	SPEED
					LEFT	RIGHT	STAT	MOV		mmwg	RPM	%	PRES		RPM	1	2	MMWG	CEM TEMP	GAS TEMP	MAT. TEMP	MMWG	RPM
1	144.019	6.84955	58.08	k Tagn	32.3407	28.482	802.43	867.2	308.4	343.87	nk Tagna	90.3001	51.7873	63.6744	nk Tagna	1320.1	1410	144.77	86.898	87.355	413.55	458.92	nk Tagna
2	146.157	7.21921	58.47	k Tagn	37.1998	33.011	758.2	847.5	374.36	385.71	nk Tagna	90.2845	39.6592	61.9954	nk Tagna	1349.3	1409.3	128.1	86.432	87.263	404.78	454.14	nk Tagna
3	147.702	6.04382	58.86	k Tagn	36.6817	34.855	749.95	874.17	374.88	380.93	nk Tagna	90.269	40.2109	65.4466	nk Tagna	1349.2	1398.1	145.61	85.966	87.172	384.94	460.18	nk Tagna
4	148.726	6.4638	59.24	k Tagn	36.0437	32.7	950.91	981.61	294.71	323.86	nk Tagna	90.2535	54.1071	65.0075	nk Tagna	1353.6	1412.2	142.15	85.595	86.507	398.59	458.4	nk Tagna
5	147.499	9.22076	59.63	k Tagn	34.8	32.38	698.52	778.99	376.18	385.15	nk Tagna	90.2419	40.22	65.756	nk Tagna	1380.3	1386.7	143.11	86.117	86.551	409.53	460.14	nk Tagna
6	149.204	6.75441	61.73	k Tagn	33.8183	30.845	851.74	932.3	329.01	343.18	nk Tagna	90.2419	49.2664	62.1832	nk Tagna	1349.9	1435.1	142.16	86.947	87.14	429.88	457.41	nk Tagna
7	145.04	7.81517	61.8	k Tagn	34.0231	31.448	838.33	955.5	382.21	387.44	nk Tagna	90.2419	44.9581	67.6092	nk Tagna	1337.2	1387.9	138.19	85.46	85.053	401.02	456.48	nk Tagna
8	143.572	6.75551	61.96	k Tagn	30.82	32.973	869.95	927.43	292.54	335.69	nk Tagna	90.2499	48.1353	65.7577	nk Tagna	1379.5	1393.9	143.86	83.973	84.507	420.91	460.5	nk Tagna
9	136.201	6.30876	58.98	k Tagn	34.0072	28.507	872.53	973.76	333.55	409.45	nk Tagna	90.2929	48.7886	68.9032	nk Tagna	1351.8	1362.4	146.83	84.951	85.053	412.3	459.14	nk Tagna
10	140.976	6.74532	59.21	k Tagn	33.6654	25.804	911.48	1000	332.14	458.86	nk Tagna	90.3567	47.144	62.8778	nk Tagna	1364.8	1392.9	144.54	85.948	86.092	391.45	457.98	nk Tagna
11	140.28	5.81309	59.44	k Tagn	34.838	26.342	935.98	997.72	281.92	466.97	nk Tagna	90.4205	53.3627	61.2186	nk Tagna	1340.6	1403.3	144.91	86.945	87.13	396.96	457.36	nk Tagna
12	140.663	5.64162	59.67	k Tagn	34.8965	27.051	982.79	999.67	278.11	498.95	nk Tagna	90.4843	56.0912	60.2866	nk Tagna	1365.3	1375.2	143.44	87.874	88.169	401.91	456.13	nk Tagna
13	140.49	5.94162	59.9	k Tagn	37.1756	28.642	988	1000	330.01	500	nk Tagna	90.5481	48.463	62.4681	nk Tagna	1375.6	1376.8	147.13	88.383	89.208	403.5	453.09	nk Tagna
14	140.844	6.08116	60.13	k Tagn	38.096	28.603	804.52	847.82	322.02	499.47	nk Tagna	90.5748	47.869	71.0574	nk Tagna	1318.7	1400.1	147.61	88.892	90.246	393.79	447.72	nk Tagna
15	141.263	5.32859	59.27	k Tagn	37.1264	26.575	866.75	939.11	320.51	498.43	nk Tagna	90.5664	49.91	62.6338	nk Tagna	1337.1	1411.3	149.63	89.401	91.056	402.24	445.63	nk Tagna
16	141.2	5.43557	60.47	k Tagn	37.1867	25.77	889.87	935.71	281.57	461.84	nk Tagna	90.558	52.7458	57.7638	nk Tagna	1343.8	1384.7	152.18	89.91	91.671	383.73	445.31	nk Tagna
17	141.642	5.56678	60.48	k Tagn	36.8597	25.233	832.72	974.95	313.22	445.31	nk Tagna	90.5497	48.4018	60.1259	nk Tagna	1350.1	1396.5	140.5	90.419	92.378	411.36	442.8	nk Tagna
18	0.01553	0.21194	2.031	k Tagn	31.6708	26.385	800.67	819.99	303.63	380.09	nk Tagna	90.536	44.3411	55.1693	nk Tagna	1361.6	1400.7	144.65	90.928	93.085	408.59	438.06	nk Tagna
19	139.841	6.93349	59.51	k Tagn	34.6115	25.152	889.77	936.93	302.28	356.49	nk Tagna	90.5114	46.3613	55.6488	nk Tagna	1368.6	1406.2	137.16	92.815	93.695	400.89	442.24	nk Tagna
20	143.572	6.23829	61.12	k Tagn	37.7505	31.436	747.15	845.1	310.84	348.53	nk Tagna	90.4868	44.1062	63.7647	nk Tagna	1368.9	1400.9	146.08	89.056	89.37	427.85	443.79	nk Tagna
21	144.184	5.5688	62.03	k Tagn	34.0877	33.099	780.42	871.67	329.12	360.44	nk Tagna	90.4603	41.6283	63.6141	nk Tagna	1363.4	1389.1	151.27	89.223	90.981	399.47	450.61	nk Tagna

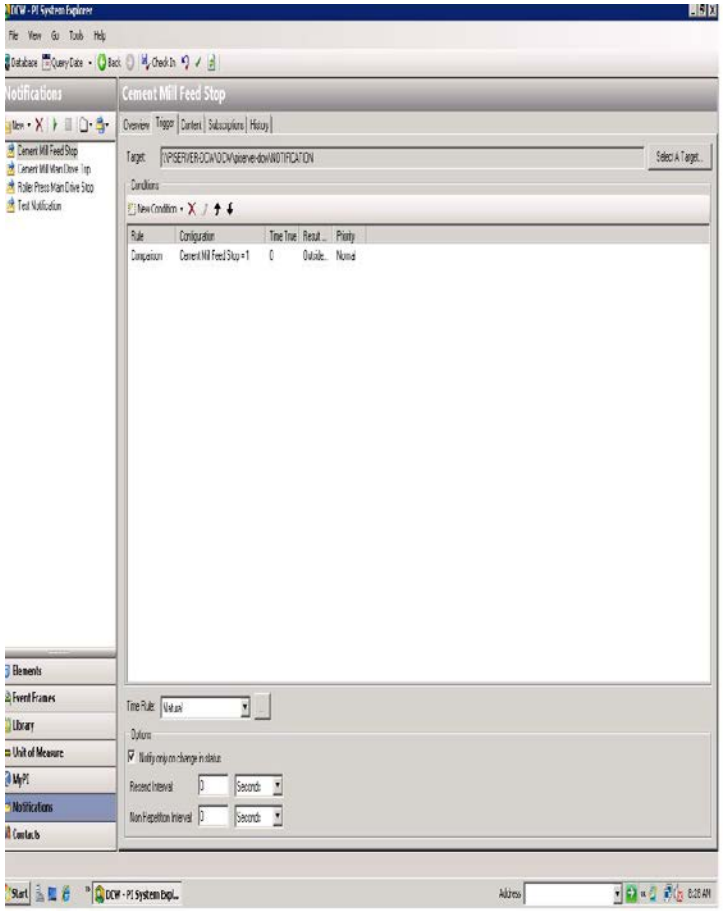
Generation of report for critical parameters of section

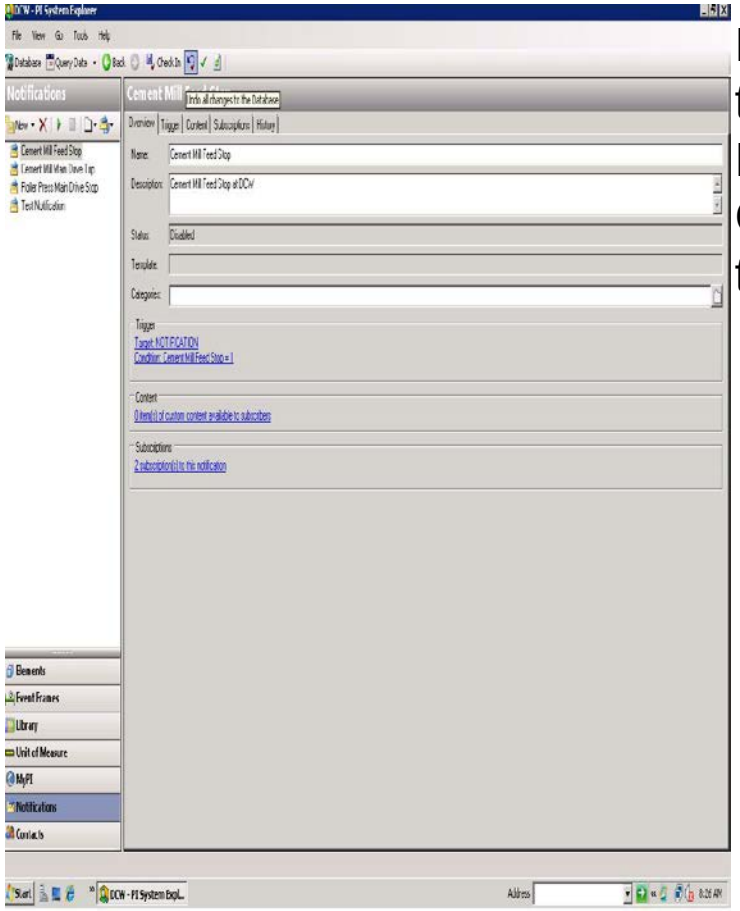
Real time data monitoring



Monitoring of real time data for study & analysis

PI Notifications through Email



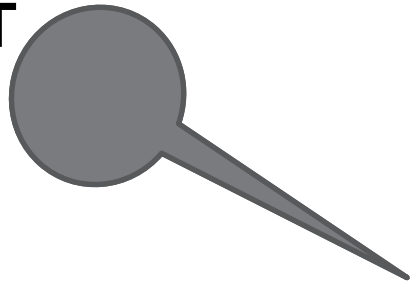


Notification to the concerned Based on Critical condition through Email

PI Notifications through SMS

- Instant updates of critical parameters through SMS on mobile.
- E.g.:- Quick information of quality parameters to the Mines department for corrective action without information from QC department.

SMS ALERT



SiO2=30.66 ,CaO=29.83, MgO=30.34
K2O =15.20,LSF=29.13,Na2O=29.67

PI System Utilization at UltraTech Cement Ltd.

- On line SQC to predict potential process as well as quality problem.
- Huge database for analyzing plant behaviour in different process condition.
- Monitoring process & identify root causes of problem to reduce unaccounted losses.
- Performing condition based maintenance & reduce equipment downtime through predictive maintenance.

Business Challenges

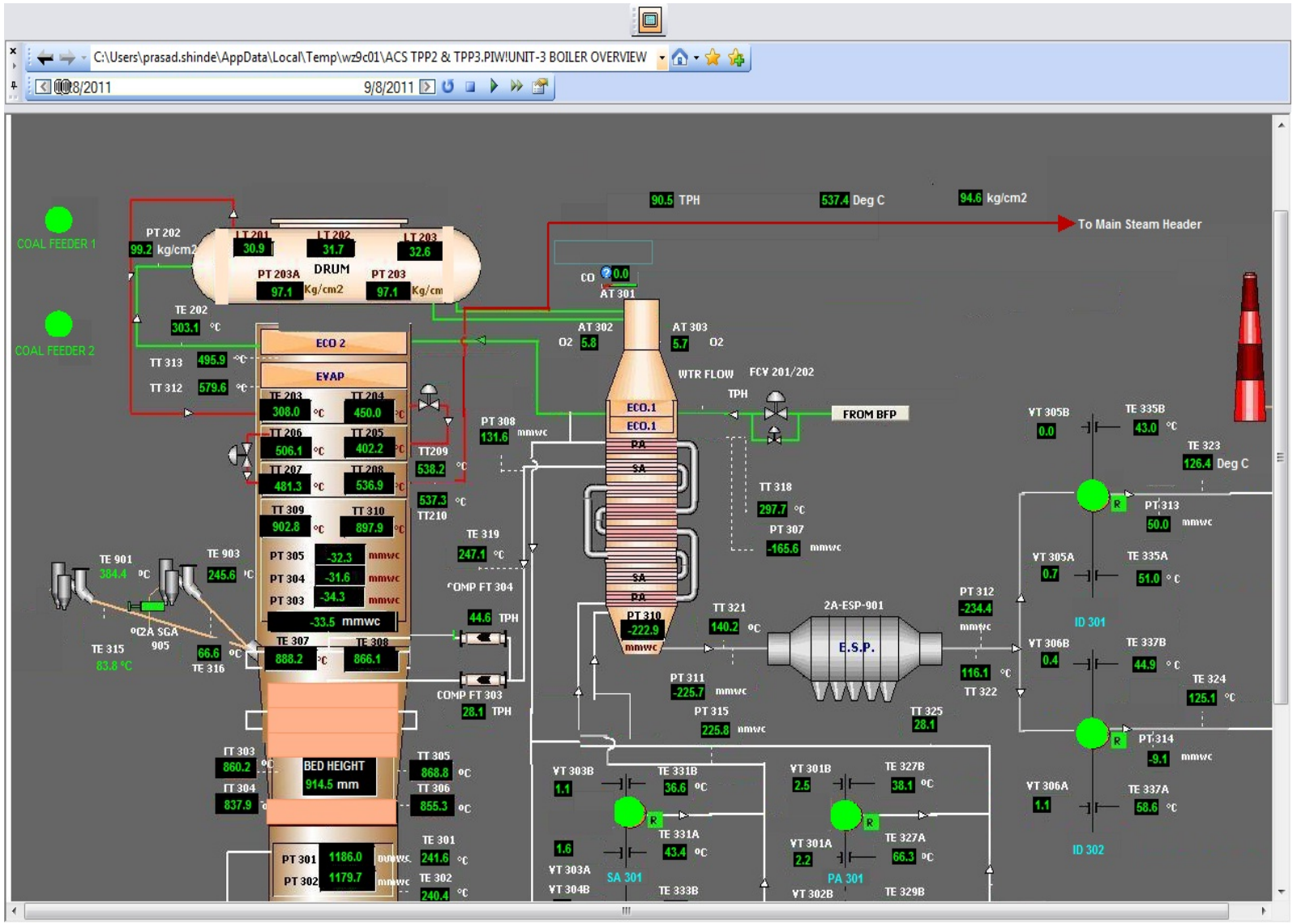
- Execution of PI System in power plants.
- Process & Quality control parameters through online SQC tool.
- Manual data entry in PI System.

Business solution

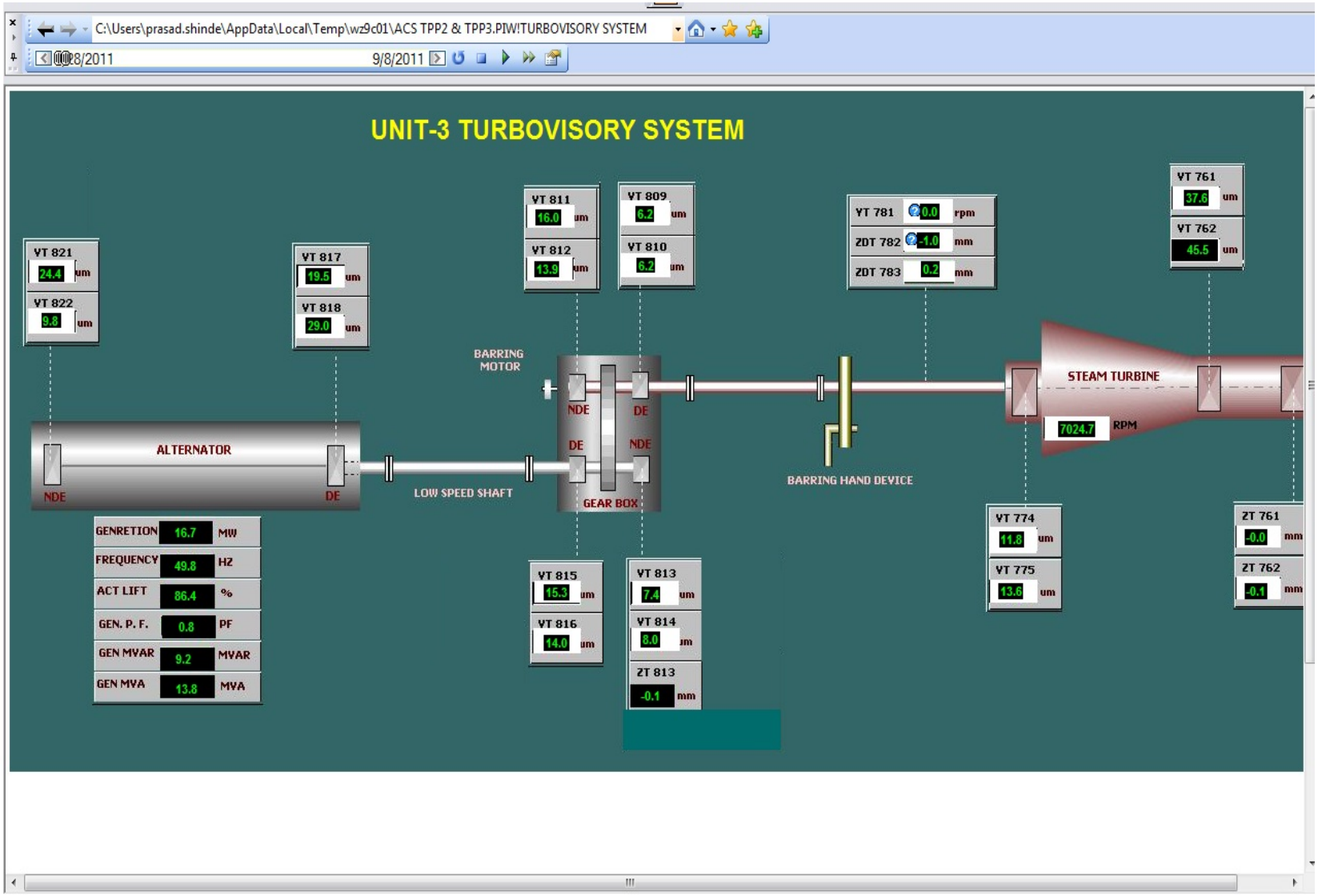
PI System execution in power plant

- Integrated power plant DCS data in to PI System by PI-OPC DA interface
- Configuration was done with Interface PC(for buffered data) & Hardware firewall.
- Allowed access to 5450,135 ports & all other ports blocked for secured communication.
- Real time information for boiler & turbine accessories through PI ProcessBook.
- Generation of power reports & data analysis through PI DataLink
- Capturing of millisecond timestamp for having the sequence of events records to enhance the analysis.

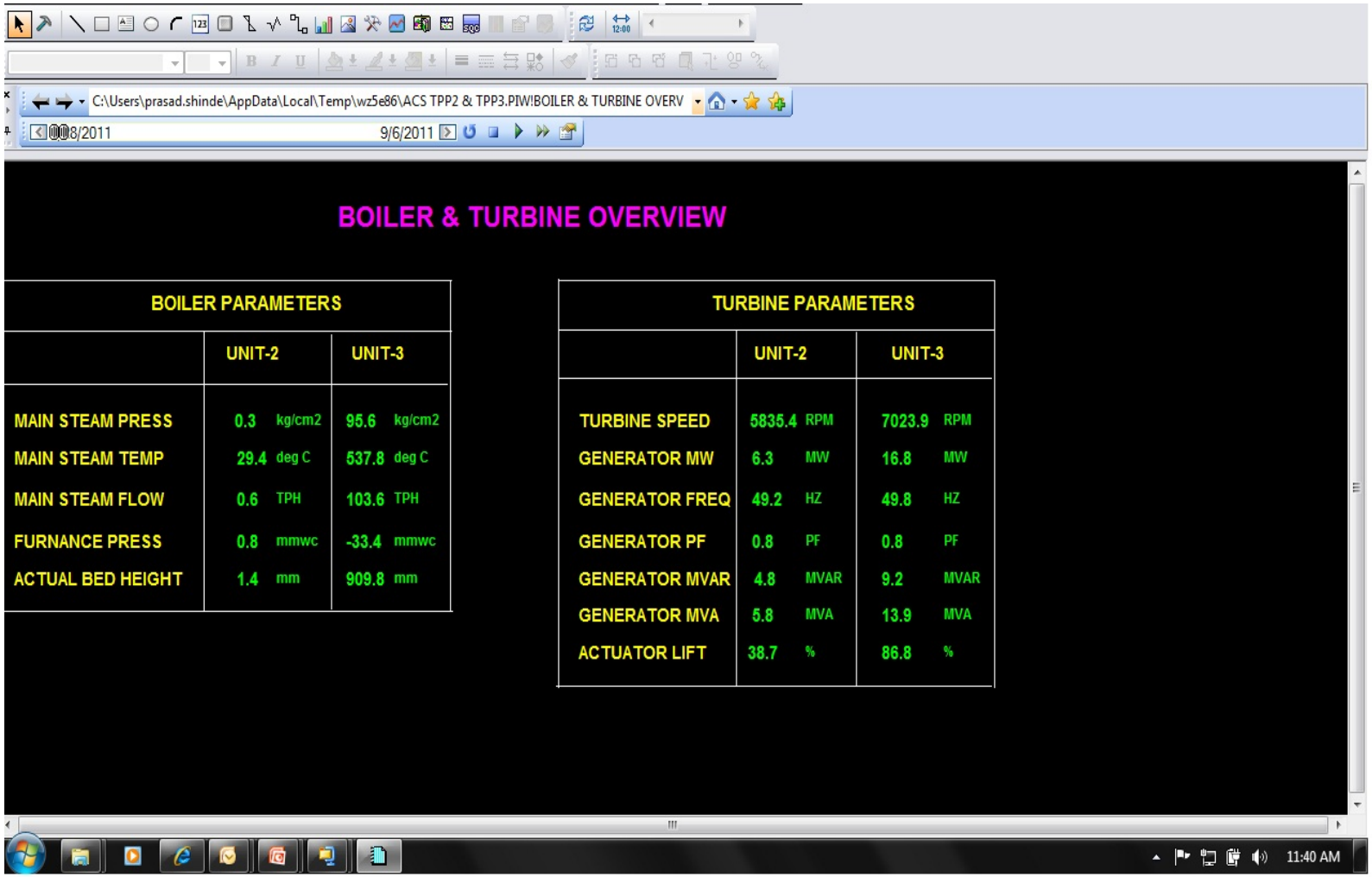
BOILER OVERVIEW



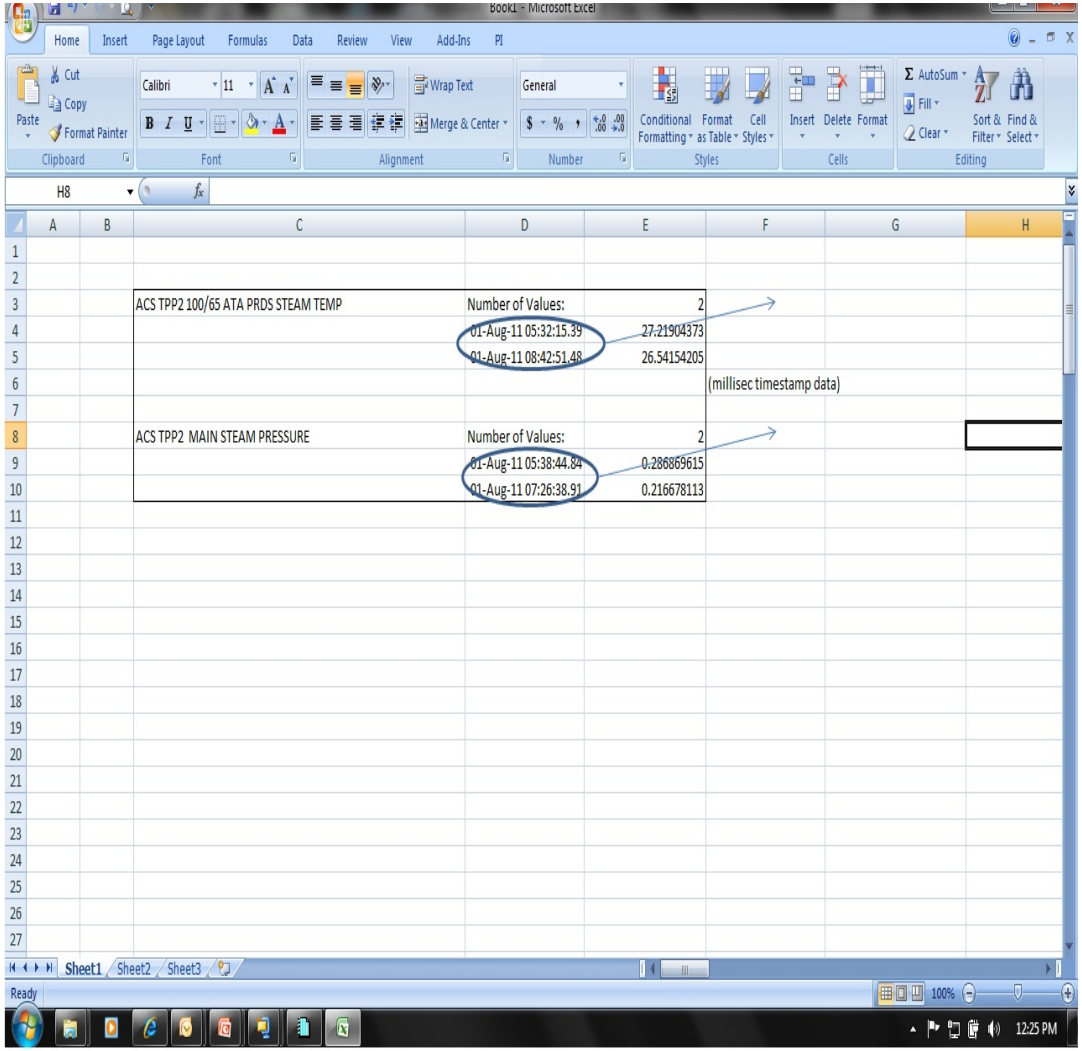
TURBINE OVERVIEW



OVERALL OVERVIEW



Millisecond timestamp Data capturing



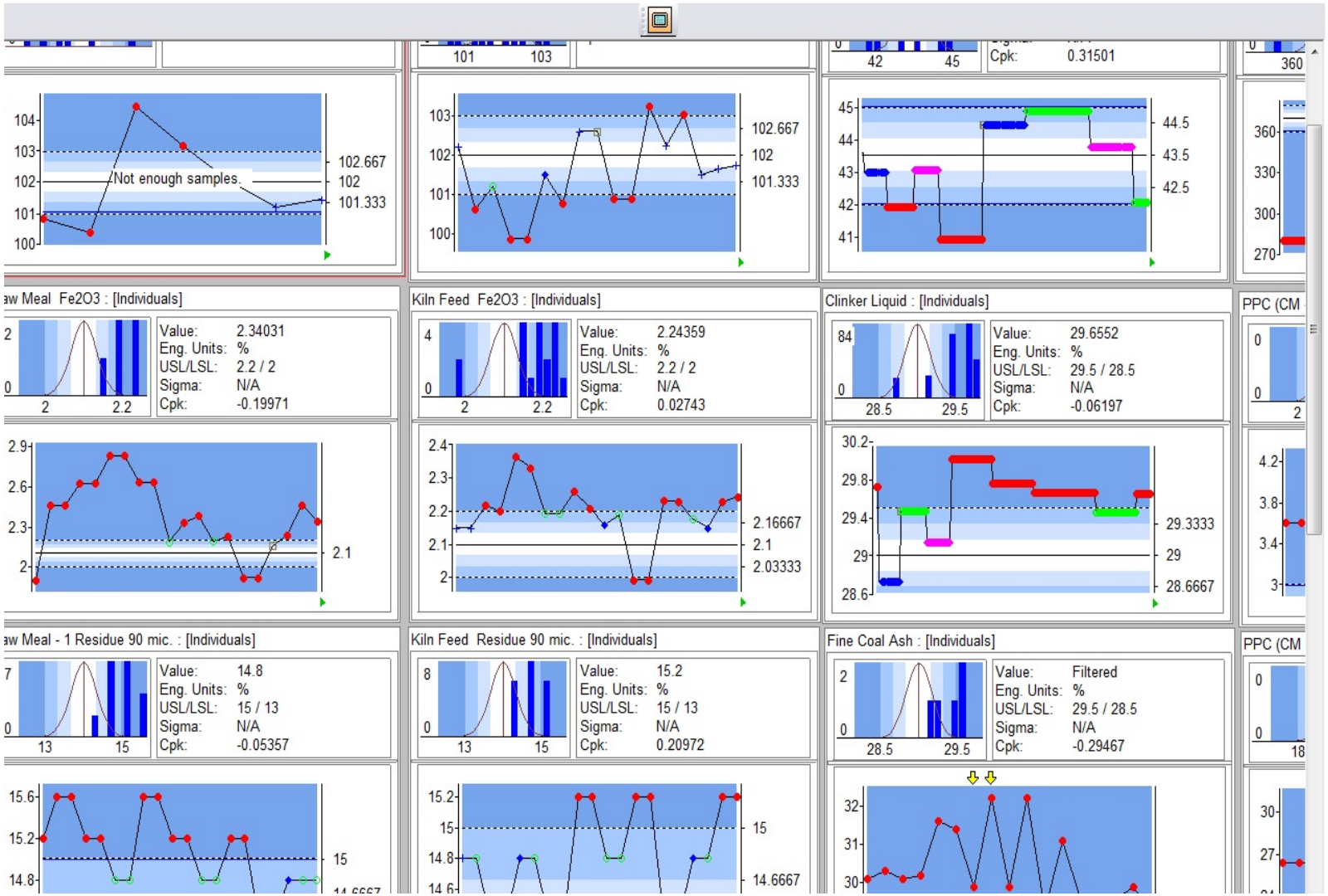
To have sequence of events record for data analysis

Business solution

Quality parameters through SQC tool

- On line trends of critical quality control parameters.
- Corrective actions based on SQC trends.

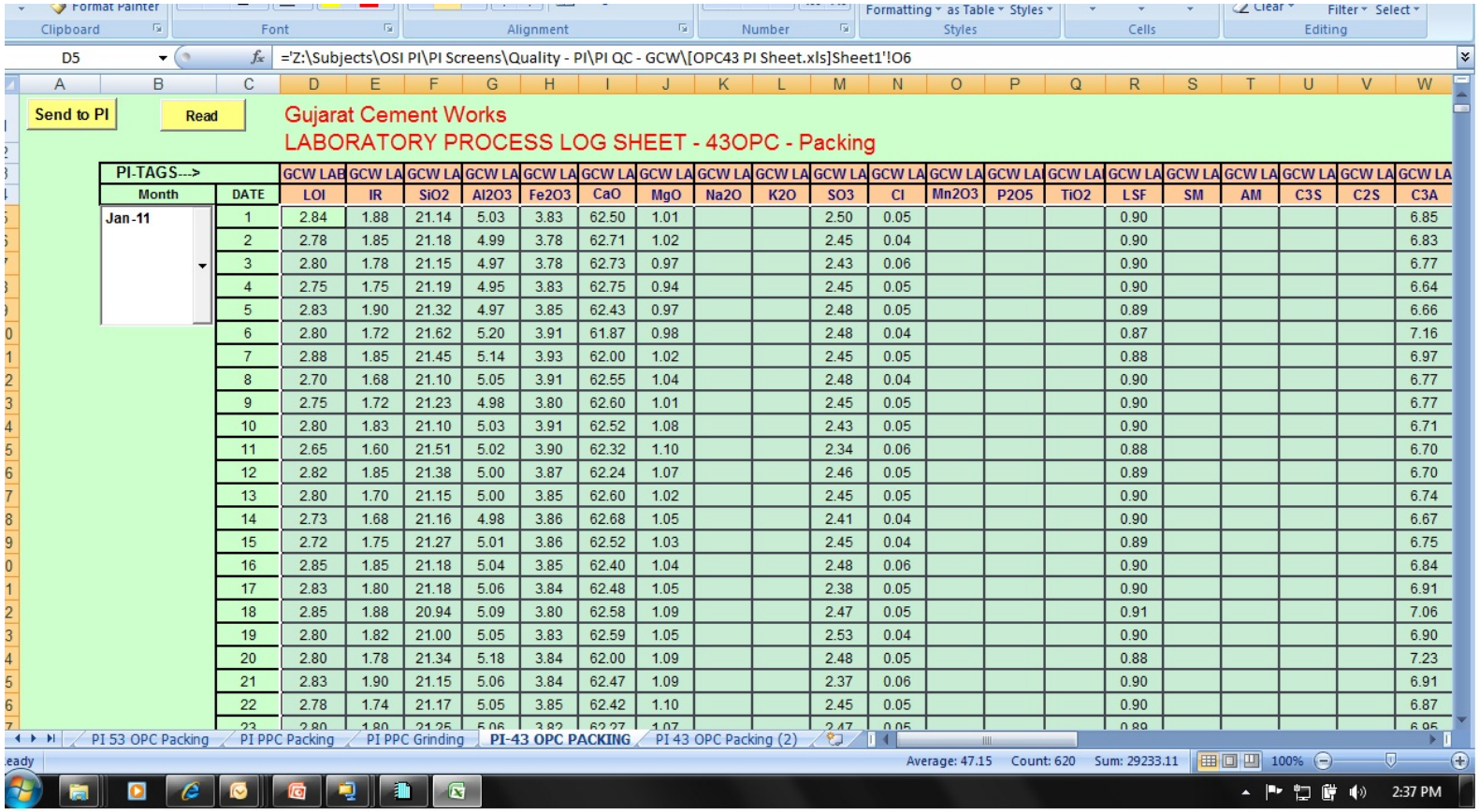
Online SQC trends



MANUAL ENTRY OF QUALITY PARAMETERS

- Quality data entered in to PI System by manual entry log sheet.
- Sending & reading of data from PI System developed through VB Script.
- QC people enter hourly, monthly data in PI System by manual entry log sheet, & use the same for analysis.
- Compilation of PI data from different units for report generation at plant & corporate level.

MANUAL DATA ENTRY IN PI SYSTEM



Send to PI | Read

Gujarat Cement Works

LABORATORY PROCESS LOG SHEET - 43OPC - Packing

PI-TAGS--->		GCW LAB	GCW LA	GCW LA	GCW LA	GCW LA	GCW LA	GCW LA	GCW LA	GCW LA	GCW LA	GCW LA	GCW LA	GCW LA	GCW LA	GCW LA	GCW LA	GCW LA	GCW LA	GCW LA
Month	DATE	LOI	IR	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	SO3	Cl	Mn2O3	P2O5	TiO2	LSF	SM	AM	C3S	C2S	C3A
Jan-11	1	2.84	1.88	21.14	5.03	3.83	62.50	1.01			2.50	0.05				0.90					6.85
	2	2.78	1.85	21.18	4.99	3.78	62.71	1.02			2.45	0.04				0.90					6.83
	3	2.80	1.78	21.15	4.97	3.78	62.73	0.97			2.43	0.06				0.90					6.77
	4	2.75	1.75	21.19	4.95	3.83	62.75	0.94			2.45	0.05				0.90					6.64
	5	2.83	1.90	21.32	4.97	3.85	62.43	0.97			2.48	0.05				0.89					6.66
	6	2.80	1.72	21.62	5.20	3.91	61.87	0.98			2.48	0.04				0.87					7.16
	7	2.88	1.85	21.45	5.14	3.93	62.00	1.02			2.45	0.05				0.88					6.97
	8	2.70	1.68	21.10	5.05	3.91	62.55	1.04			2.48	0.04				0.90					6.77
	9	2.75	1.72	21.23	4.98	3.80	62.60	1.01			2.45	0.05				0.90					6.77
	10	2.80	1.83	21.10	5.03	3.91	62.52	1.08			2.43	0.05				0.90					6.71
	11	2.65	1.60	21.51	5.02	3.90	62.32	1.10			2.34	0.06				0.88					6.70
	12	2.82	1.85	21.38	5.00	3.87	62.24	1.07			2.46	0.05				0.89					6.70
	13	2.80	1.70	21.15	5.00	3.85	62.60	1.02			2.45	0.05				0.90					6.74
	14	2.73	1.68	21.16	4.98	3.86	62.68	1.05			2.41	0.04				0.90					6.67
	15	2.72	1.75	21.27	5.01	3.86	62.52	1.03			2.45	0.04				0.89					6.75
	16	2.85	1.85	21.18	5.04	3.85	62.40	1.04			2.48	0.06				0.90					6.84
	17	2.83	1.80	21.18	5.06	3.84	62.48	1.05			2.38	0.05				0.90					6.91
	18	2.85	1.88	20.94	5.09	3.80	62.58	1.09			2.47	0.05				0.91					7.06
	19	2.80	1.82	21.00	5.05	3.83	62.59	1.05			2.53	0.04				0.90					6.90
	20	2.80	1.78	21.34	5.18	3.84	62.00	1.09			2.48	0.05				0.88					7.23
	21	2.83	1.90	21.15	5.06	3.84	62.47	1.09			2.37	0.06				0.90					6.91
	22	2.78	1.74	21.17	5.05	3.85	62.42	1.10			2.45	0.05				0.90					6.87

RESULTS & BENEFITS

- Real time performance management.
- Positive results in terms of investment, process.
- Quick information of real time & historical data to right people for informed business decision.
- Process data to concerned individuals for effective process management & efficient data analysis & reporting.
- Optimization of production
- Predict & minimize unplanned outages based on real time usage information.

PLANT OPERATIONAL RELATED DATABASE & KNOWLEDGE MANAGEMENT

- Integration of all data from different platforms eg- process parameters, Laboratory analysis, Energy management, analysers etc.
- Transparency of data i.e. availability of information to everybody in the organisation.
- Inter unit access of data through WAN.
- Communication with Central control room minimized.
- Plant information related database are used as an input for process optimization, troubleshooting & also provide an information for effective deployment of predictive & preventive maintenance.
- Availabilty of data history for study & analysis.

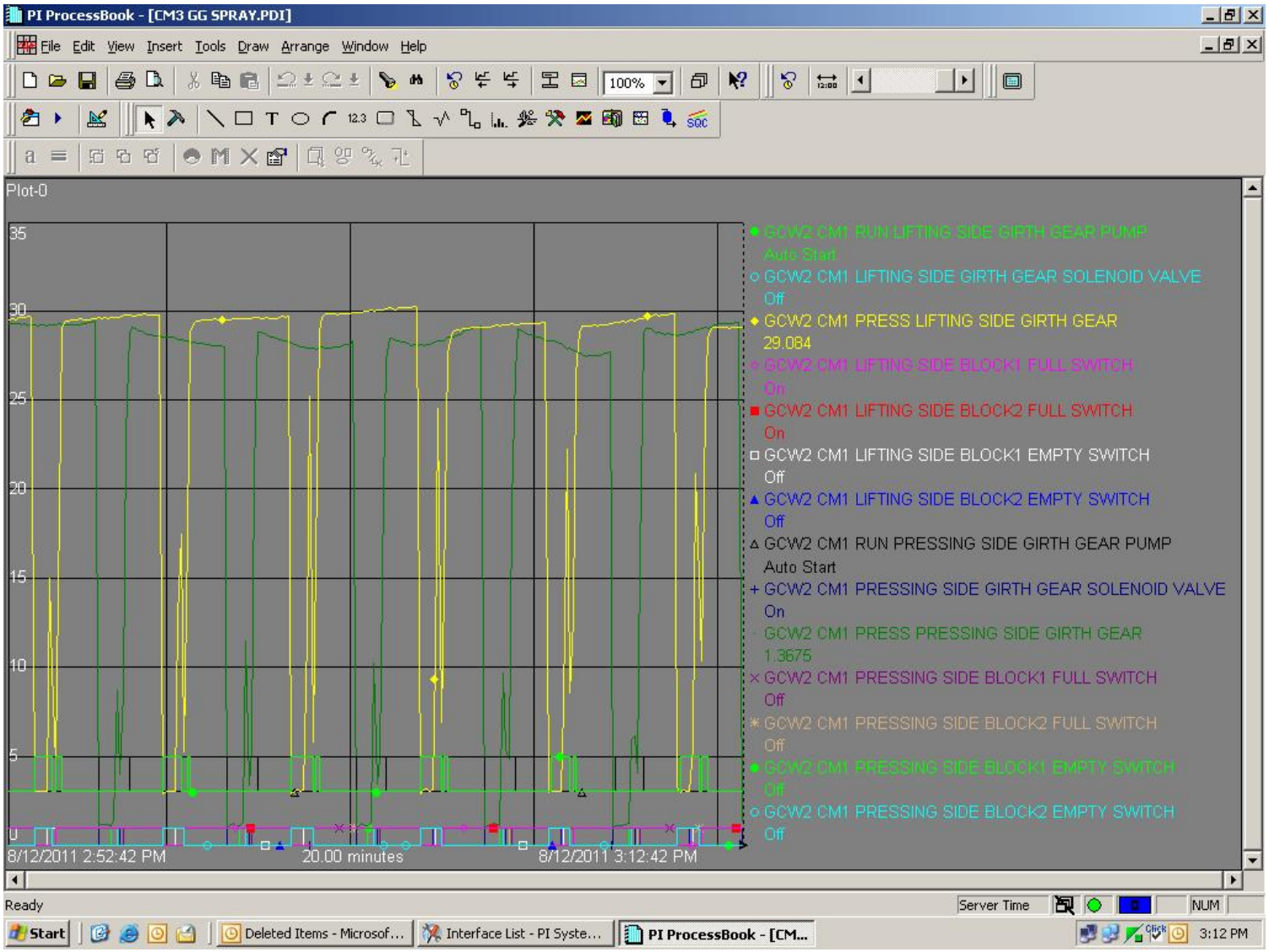
CASE STUDIES

1 Process optimization of Girth Gear Lubrication system

- Normally automatic interval spray lubrication used where applied lubrication volume is controlled by spray.
- Problem addressed:- Cement Mill Girth Gear grease consumption was very high.
- Action taken:- Grease Consumption was optimized by spray lubrication ON/OFF time.

  Checking for ON/OFF time was done by the concerned engineers through PI system & hence optimized the spray pattern by setting ON/OFF time.
- Results:- Girth Gear grease consumption was reduced & benefits were achieved.

Observations through Trend



2 Improvement in Maintenance

- Increase in equipment safety by identifying & preventing potential based problems through condition based maintenance programs.
- Reduction in production downtime & lower maintenance costs.
- Repairing & replacement of spares based on running hours of plant equipment for efficient production.
- Timely alerts through PI System regarding maintenance of equipment e.g. replacement of lubricants in equipments based on running hours.

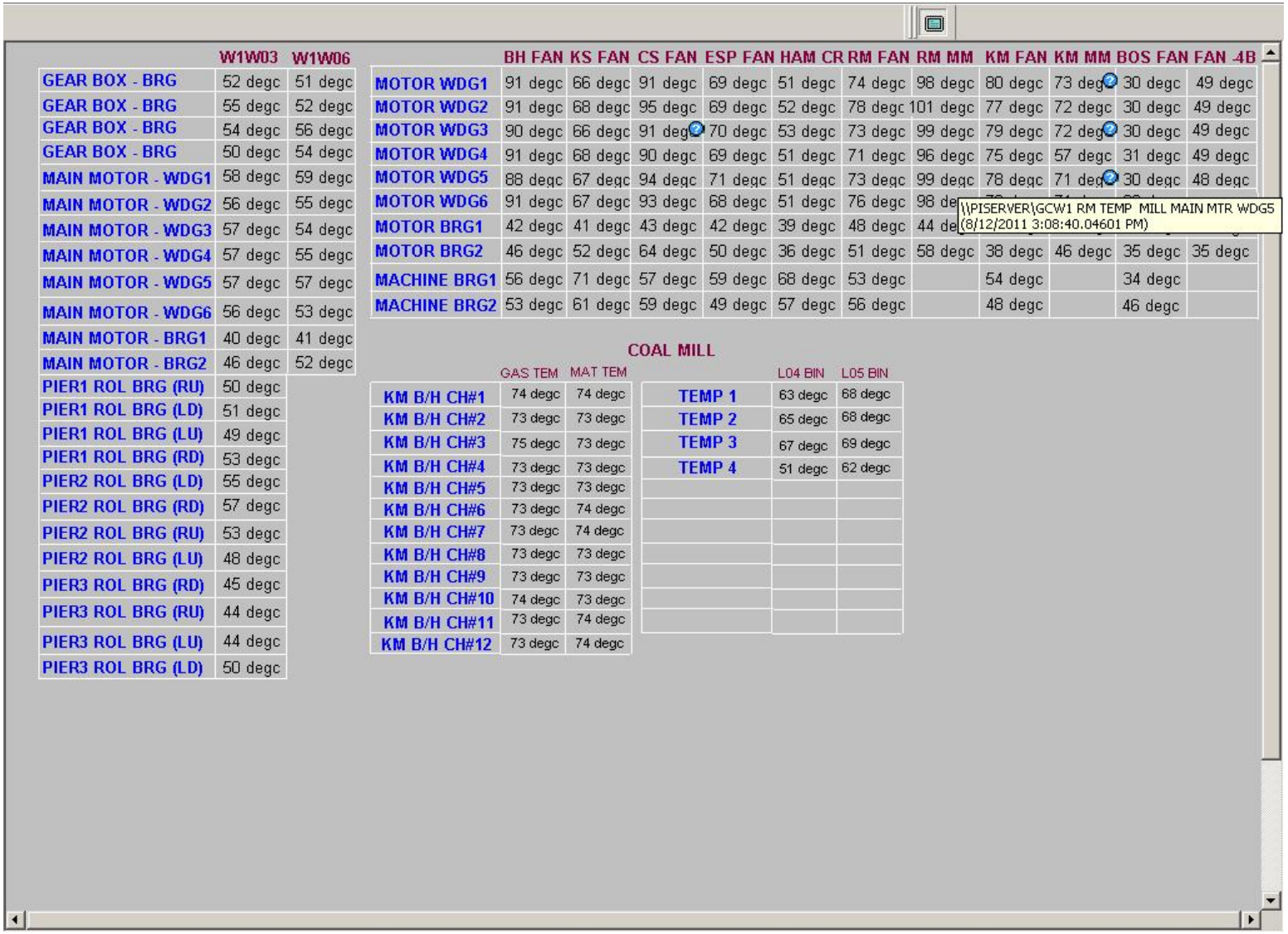
Equipment Run hour report

DAILY RUNNING HOURS OF MACHINE																
SN	Equipment	04-01-05	04-02-05	04-03-05	04-04-05	04-05-05	04-06-05	04-07-05	04-08-05	04-14-05	04-15-05	04-16-05	04-17-05	04-18-05	04-19-05	04-20-05
1	451CP	22.1718	20.0402	22.5627	16.9054	16.424	10.292	5.18253	12.0798	6.92188	23.0969	1.03279	0	0	0	0
2	711CP	0	0	0	0	0	0	9.2031	10.0237	10.3993	0	19.9855	21.9443	18.7643	21.9593	17.7602
3	451BC3	14.5612	5.73673	11.764	5.51922	5.8375	4.38587	10.2898	14.7618	13.1353	13.1876	16.0849	11.7985	7.39755	16.221	9.25231
4	711BC4	16.0393	18.1986	20.7835	5.91618	13.8098	8.19701	11.1237	17.4879	14.3811	18.3902	16.824	19.0041	16.0427	14.9912	10.9923
5	751CR1	23.9891	15.8682	23.2682	23.9613	22.5682	21.0402	24.0002	23.5057	18.39	17.6379	5.23226	11.9223	20.1668	16.6224	19.7696
6	721BM1	21.77	23.9833	23.9833	2.88279	18.2639	8.23833	18.0505	23.9833	23.3115	23.8533	23.0425	23.9833	21.9678	23.9833	13.9122
7	721CP1	22.1318	24.0002	24.0002	3.11752	18.421	7.51369	18.2793	9.4987	10.1809	0	0	0	0	0	4.81864
8	721CP2	0	0	0	0	0	0	0	14.4987	7.91172	24.0002	23.626	24.0002	24.0002	24.0002	9.66203
9	761CP1	17.7835	16.3515	16.0348	15.6176	9.4548	8.96061	6.33643	6.40951	15.9272	14.7643	21.9894	18.3293	14.836	16.1337	13.7262
10	761CP2	9.83982	0	0	0	6.89646	8.79534	2.56001	6.54451	9.41634	0	0	0	0	0	0.80859
11	761CP3	8.45478	16.3529	16.0321	15.619	2.4153	0	3.70836	9.09894	6.71088	14.2518	22.1602	18.1307	14.836	16.3462	13.6445
12	761CP4	4.21126	4.82555	5.5601	0	4.25056	6.29258	2.51817	0.3764	6.25375	7.56014	14.5448	12.2193	11.3305	11.9811	10.0454
13	761CP5	8.33045	6.06372	4.5753	10.7085	1.62922	0	2.43227	9.92103	4.99691	2.86937	0	0	0	0	0
14	761CP6	0	0	0	3.16585	0.63006	0.86387	0	0	0.06804	0	0	0	0	0	0
15	821CP1	0	0	0	11.0626	0.37639	8.52785	0	0	0	0	0	0	0	0	5.90839
16	821CP2	7.11117	0	0	2.4653	0	0	0.12777	0	0.59168	0	2.7028	0	0	0	0.05277
17	821CP3	6.51672	0	0	9.52839	5.45783	8.92229	1.09723	0	0	0	2.70558	0	0	0	0
18	900RWP	0.94417	4.79311	0.94029	0.95834	5.85977	1.38195	0.89306	1.93056	0.93612	0.95835	1.59167	3.41392	0.99167	1.85418	3.33474
19	900DWP	12.289	10.789	8.64505	9.22176	15.2904	9.94869	10.01	14.0126	7.7209	9.50841	8.33757	6.85839	11.5476	10.3776	9.69454
20	900PWP2	24.0002	24.0002	24.0002	9.65092	18.2965	9.93286	18.099	24.0002	18.4238	24.0002	23.6535	24.0002	24.0002	24.0002	17.4099
21	900PWP1	0	0	0	9.27147	11.4968	6.24476	3.79276	0	0	0	0	0	0	0	2.03612
22	900HWP	24.0002	24.0002	24.0002	24.0002	24.0002	19.9874	24.0002	24.0002	18.4224	24.0002	23.4938	24.0002	24.0002	24.0002	21.0835
23	900CTF	24.0002	24.0002	24.0002	23.9835	19.6071	16.729	24.0002	24.0002	18.4238	24.0002	23.6924	24.0002	24.0002	24.0002	19.8182
24	761BL1	0	0	0	0	0	0	0	0	0	1.88723	22.3424	18.3321	15.4068	17.3671	15.2751
25	761BL2	18.282	16.9057	15.8557	15.664	9.73897	9.48147	6.68783	12.3723	17.2262	12.5448	0	0	0	0	0
26	761BL3	0	0	0	0	0	0	0	2.26971	9.68787	0	0.42778	0	9.56979	18.7793	13.8362
27	761BL4	18.8779	23.9946	24.0002	3.04948	18.341	7.24118	18.1504	16.5596	7.91189	24.0002	23.1105	22.6363	9.06091	0.06112	0
28	761BL5	22.096	23.9877	24.0002	3.06615	18.3382	7.25785	18.1476	14.0721	17.9623	24.0002	8.31449	22.6502	22.8405	24.0002	13.8501
29	761BL6	0	0	0	0	0	0	0	6.62532	0	0	15.2168	0	0	0	0

On line conditioning monitoring of equipment

- Monitoring of motor winding, bearing temperature, motor fan, speed, kw, vibration through PI ProcessBook application.
- Comparison of the above concerned parameters based on concerned sections for study, analysis & hence performing corrective action when required.

On line conditioning monitoring of equipment



	W1W03	W1W06
GEAR BOX - BRG	52 degc	51 degc
GEAR BOX - BRG	55 degc	52 degc
GEAR BOX - BRG	54 degc	56 degc
GEAR BOX - BRG	50 degc	54 degc
MAIN MOTOR - WDG1	58 degc	59 degc
MAIN MOTOR - WDG2	56 degc	55 degc
MAIN MOTOR - WDG3	57 degc	54 degc
MAIN MOTOR - WDG4	57 degc	55 degc
MAIN MOTOR - WDG5	57 degc	57 degc
MAIN MOTOR - WDG6	56 degc	53 degc
MAIN MOTOR - BRG1	40 degc	41 degc
MAIN MOTOR - BRG2	46 degc	52 degc
PIER1 ROL BRG (RU)	50 degc	
PIER1 ROL BRG (LD)	51 degc	
PIER1 ROL BRG (LU)	49 degc	
PIER1 ROL BRG (RD)	53 degc	
PIER2 ROL BRG (LD)	55 degc	
PIER2 ROL BRG (RD)	57 degc	
PIER2 ROL BRG (RU)	53 degc	
PIER2 ROL BRG (LU)	48 degc	
PIER3 ROL BRG (RD)	45 degc	
PIER3 ROL BRG (RU)	44 degc	
PIER3 ROL BRG (LU)	44 degc	
PIER3 ROL BRG (LD)	50 degc	

	BH FAN	KS FAN	CS FAN	ESP FAN	HAM CR	RM FAN	RM MM	KM FAN	KM MM	BOS FAN	FAN -4B
MOTOR WDG1	91 degc	66 degc	91 degc	69 degc	51 degc	74 degc	98 degc	80 degc	73 degc	30 degc	49 degc
MOTOR WDG2	91 degc	68 degc	95 degc	69 degc	52 degc	78 degc	101 degc	77 degc	72 degc	30 degc	49 degc
MOTOR WDG3	90 degc	66 degc	91 degc	70 degc	53 degc	73 degc	99 degc	79 degc	72 degc	30 degc	49 degc
MOTOR WDG4	91 degc	68 degc	90 degc	69 degc	51 degc	71 degc	96 degc	75 degc	57 degc	31 degc	49 degc
MOTOR WDG5	88 degc	67 degc	94 degc	71 degc	51 degc	73 degc	99 degc	78 degc	71 degc	30 degc	48 degc
MOTOR WDG6	91 degc	67 degc	93 degc	68 degc	51 degc	76 degc	98 de				
MOTOR BRG1	42 degc	41 degc	43 degc	42 degc	39 degc	48 degc	44 de				
MOTOR BRG2	46 degc	52 degc	64 degc	50 degc	36 degc	51 degc	58 degc	38 degc	46 degc	35 degc	35 degc
MACHINE BRG1	56 degc	71 degc	57 degc	59 degc	68 degc	53 degc		54 degc		34 degc	
MACHINE BRG2	53 degc	61 degc	59 degc	49 degc	57 degc	56 degc		48 degc		46 degc	

\\PISERVER\GCW1 RM TEMP MILL MAIN MTR WDG5
(8/12/2011 3:08:40.04601 PM)

COAL MILL

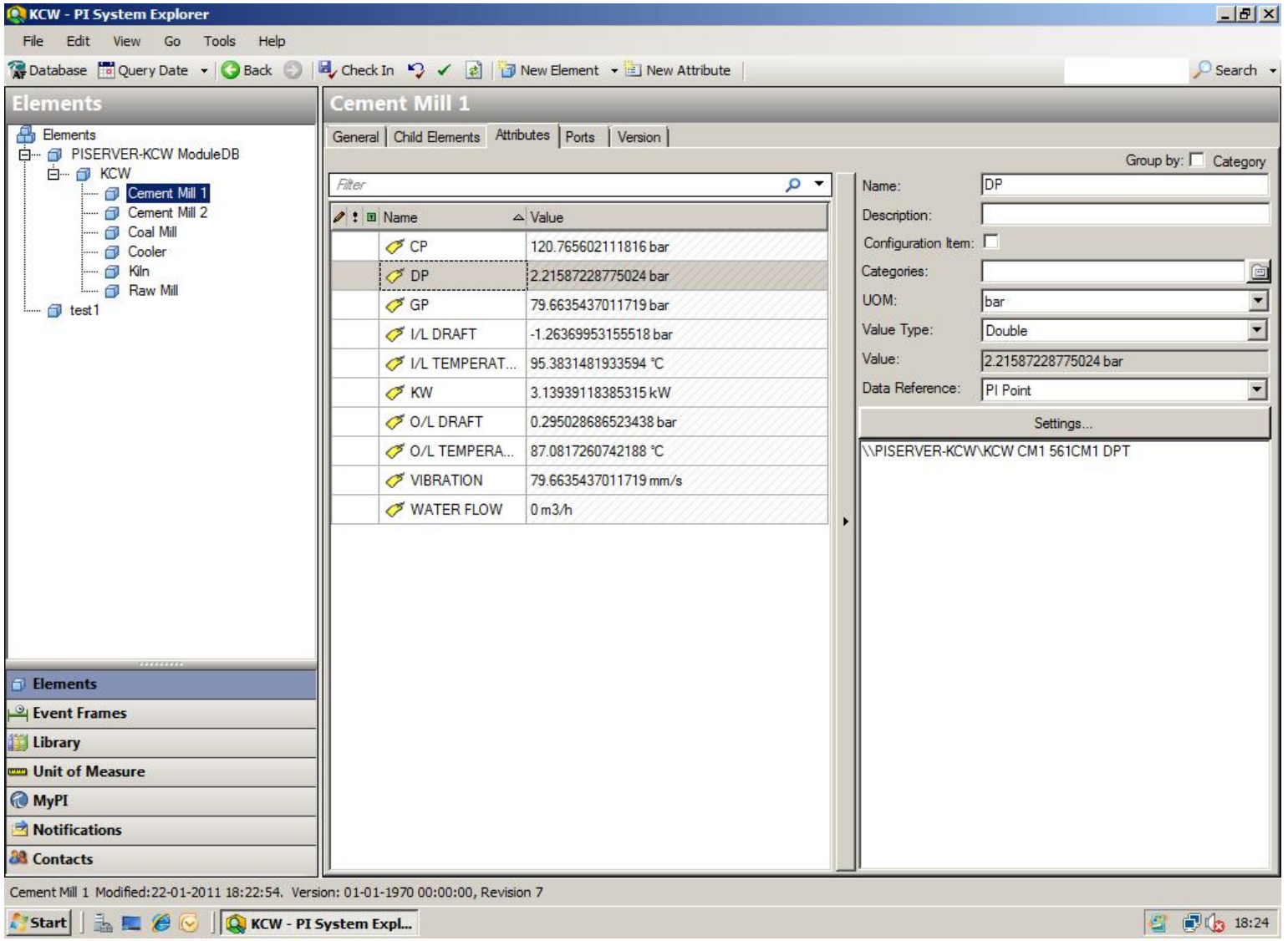
	GAS TEM	MAT TEM
KM B/H CH#1	74 degc	74 degc
KM B/H CH#2	73 degc	73 degc
KM B/H CH#3	75 degc	73 degc
KM B/H CH#4	73 degc	73 degc
KM B/H CH#5	73 degc	73 degc
KM B/H CH#6	73 degc	74 degc
KM B/H CH#7	73 degc	74 degc
KM B/H CH#8	73 degc	73 degc
KM B/H CH#9	73 degc	73 degc
KM B/H CH#10	74 degc	73 degc
KM B/H CH#11	73 degc	74 degc
KM B/H CH#12	73 degc	74 degc

	L04 BIN	L05 BIN
TEMP 1	63 degc	68 degc
TEMP 2	65 degc	68 degc
TEMP 3	67 degc	69 degc
TEMP 4	51 degc	62 degc

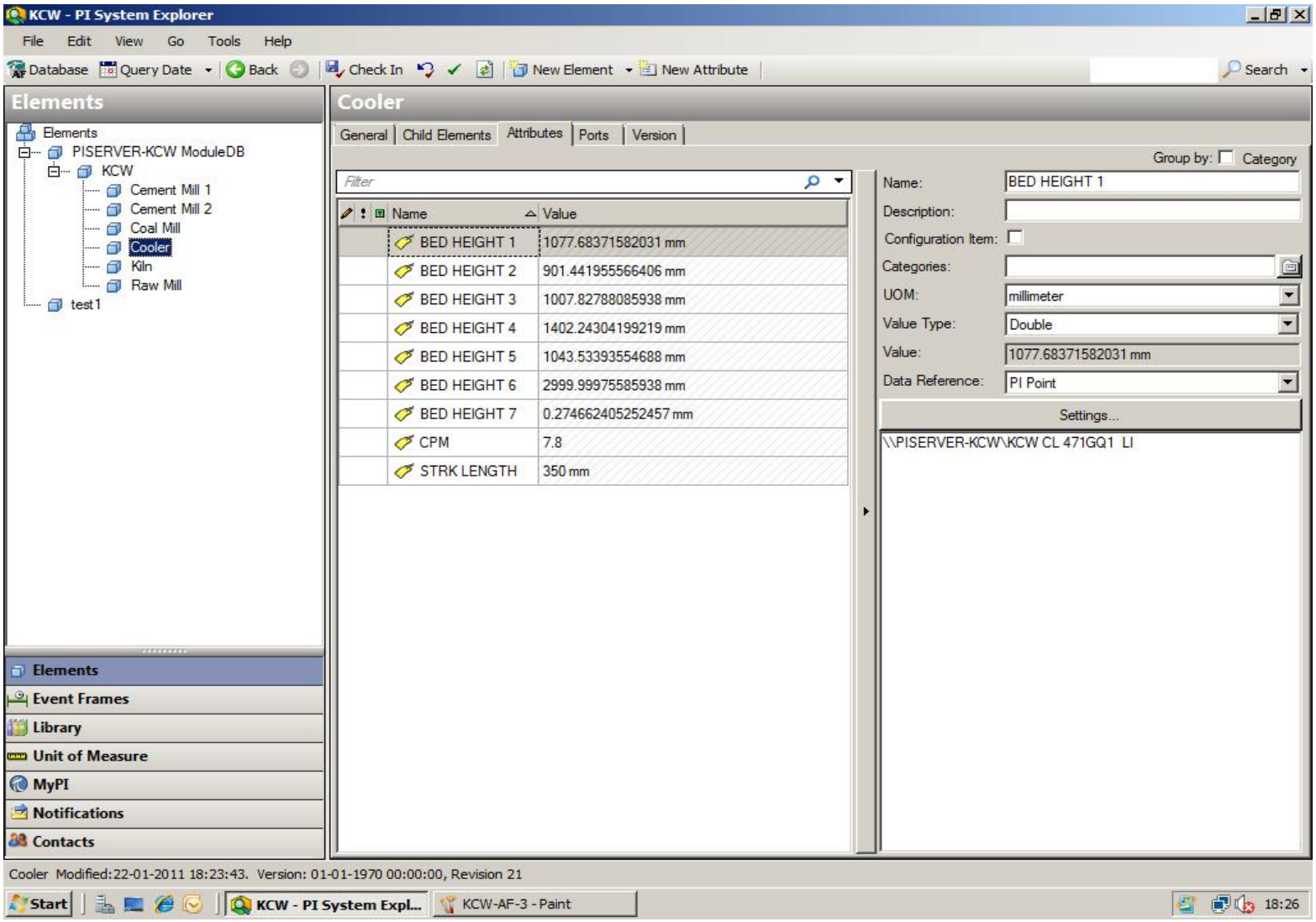
3 Process optimization through PI AF Utility

- More focus on user centric objects called elements, & less focus on PI tags
- Organizing & structuring PI data, by having an asset model according to the objects that users are more familiar with.
- AF(Asset Framework) basically based on element, user oriented objects that reference PI data.
- Use of PI system explorer to create databases in AF, according to the user requirements.
- Monitoring & analysis of Data through PI AF on single screen.

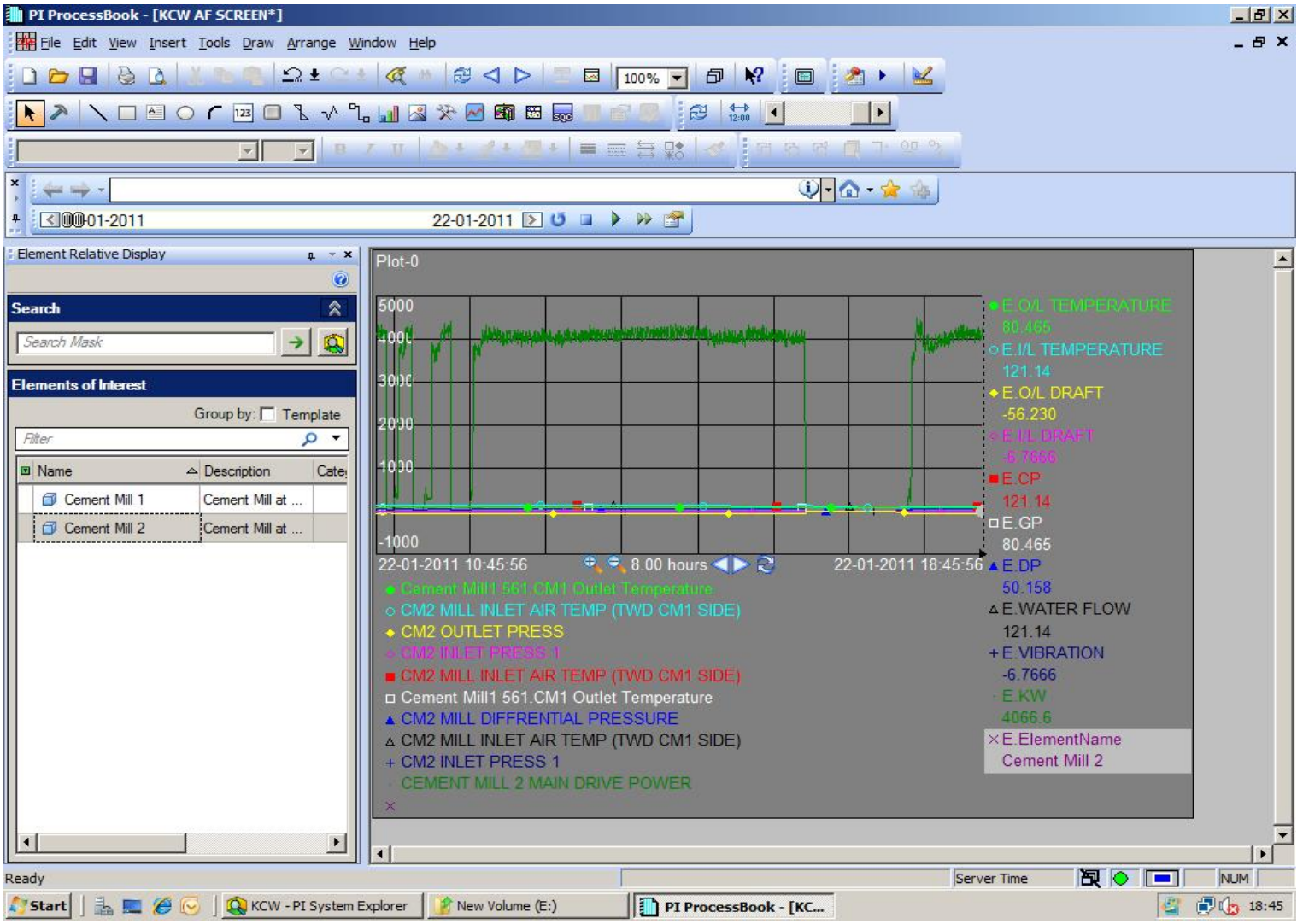
Analysis through PI AF



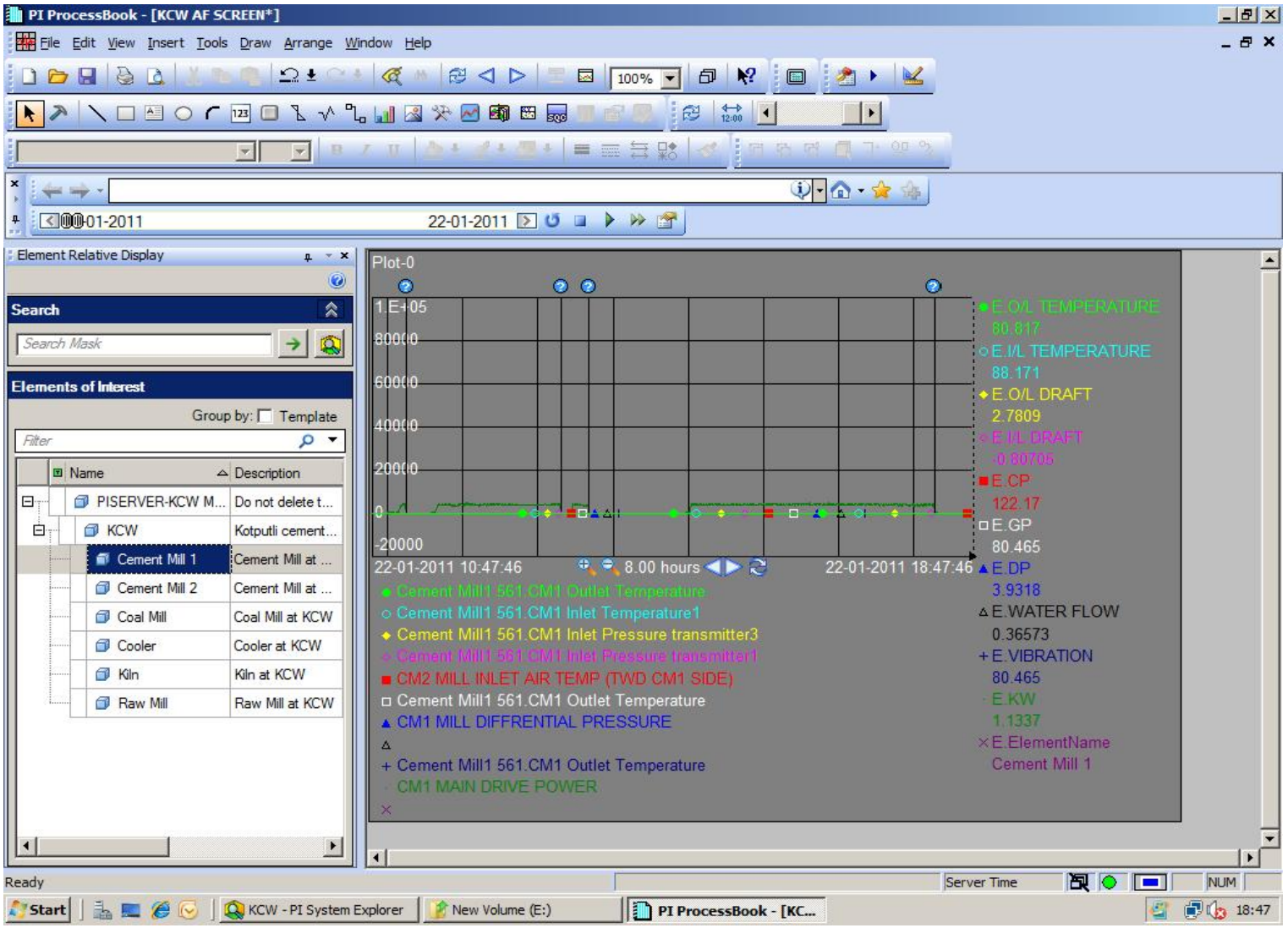
Analysis through PI AF



Analysis through PI AF



Analysis through PI AF



Future Plans

- Extension of PI System to majority of power plants.
- Implementation of PI statistical tools in all group units.
- Implementation of web based application like PI WebParts.
- Data capturing from Lab equipments.
- Connecting PI Server to Smartphone's for display of trends/status.