



### process+ benefits

- + improved process stability & performance
- + targeted trouble shooting and process optimisation
- + reduced operating costs
- + consistent operating practices
- + concise reporting of KPI's (key performance indicators)
- + Quick ROI (3 months)

## Ensuring optimal analysis & performance levels in control loops

### Rationale

Plant control loops typically perform very badly. For example, up to 85% of all control loops are ineffective in automatic mode, while 50-60% suffer from design problems and/or equipment failures. The reality is that fewer than 5% of loops work well in automatic mode in any given plant. Process Plus offers an effective solution to identifying, monitoring and correcting poorly performing loops, resulting in better performance and improved production. There is also significant loss of value in all aspects of plant operation hidden in poor base layer control. Process Plus exposes these real losses and provides the tools to address the underlying causes, thus realising the full potential of the plant.

### Product description

- Analyses of the performance of control loops and control elements
- Prioritization of loops' performance
- Automatic, daily distribution of appropriate reporting sections to specified users via email
- CSense™ Process Plus industrial server installed on site
- Control loop performance benchmarking
- On-line monitoring and diagnostics of control loops

### Quotes

"Never have I seen a product give so much useful information in such a short period of time"  
Brian Talbot, Process Control Manager, Impala Platinum.

"I often feel that I am a lone voice 'crying in the wilderness' about the abysmal state of control in most plants worldwide. It really pleases me when I can produce supporting evidence from other people that this is in fact the case."  
Michael Brown of Michael Brown Control Engineering.



The various features for the product are listed below:

### OPERATIONAL FEATURES

- Built on CSense technology.
- Control element analysis. This provides direct measurements of control element reversal rate, movement index and indications of problems such as poor control element sizing, failed control element or stiction and hysteresis.
- Controller analysis. Tracks the time that the loop is not performing to specification. These specifications include out of limits percentages as well as the percentage of time the loop is in various modes such as "maintenance", "manual", "automatic" etc. modes.
- Seamless integration with plant infrastructure. Plant tags are read using OPC and the user interface is web based.
- Rich, customisable reporting capabilities.
- Full user access control with password protection. Users can be given administrator privileges to change the system configuration.
- Easy configuration of loops, reports and users.

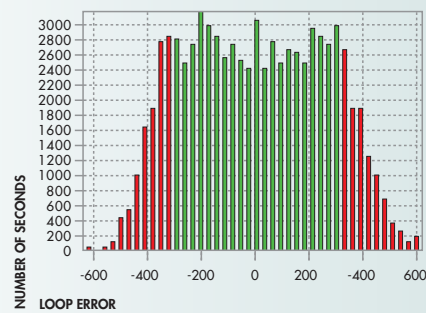
### REPORTING FEATURES

- Performance overview for fast overall health assessments.
- Emailed daily summaries
- Detailed loop reports for each loop in the plant.
- Controller output report.
- Control element report shows element reversals, movement index etc.
- Configuration change report tracks loop parameter changes made outside of Process Plus.
- Individual shift reports.
- Drill down to detailed reports from summary reports.
- Create custom reports and queries.
- Export reports in Adobe Acrobat and Microsoft Excel (csv) formats.

ERROR HISTOGRAM FOR BUS MIXER POWER J2 150

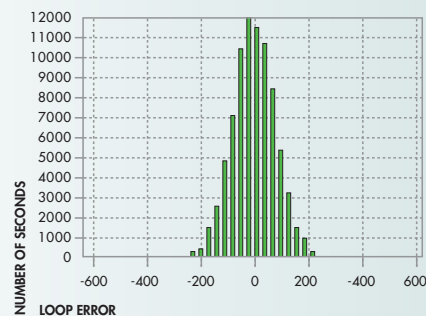
### BEFORE

Histogram of the process variable for the plot in the image to the right. The red lines indicate the relative time spent out of limits for this loop.

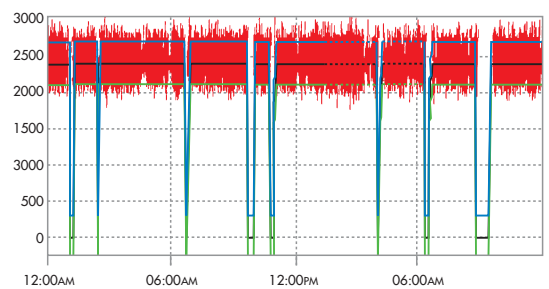


### AFTER

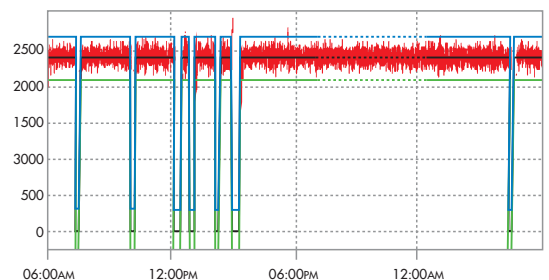
Histogram for the image to the right, indicating that the process is now always within operating limits.



PV TREND FOR LOOP BUS MIXER POWER J2 150



**BEFORE** Process variable trend over time (red) showing significant excursions outside of the process limit settings (blue & green).



**AFTER** Process variable trend plot for the same process after remedial action. Note the PV is now within limits.



November 2003 +

This is an excerpt from an article, written by Dr Maurice McDowell, technical journalist. It is about the really excellent work performed by Erich Holm and his control team at Chrome International South Africa.

### Control loop optimisation in a chrome plant: Case History 74

“Obviously an objective of installing Process+ was to ensure that control loops were being used in automatic mode. In the week that the software came online (week 7) the reporting system indicated that almost 60% of the control loops were switched off. This problem was highlighted and immediately addressed with the results showing a dramatic decrease in following weeks to between 20 and 30%. By week 30 a further dramatic improvement saw only 10% of the loops not operating automatically. Another indicator of the effectiveness of the system is the percentage of time that control loops are operated in manual mode (data again provided by the reporting system). During week 8 this was almost 10% but was reduced in roughly linear form to just over 3% by week 29. Obviously an increase in this percentage would highlight a problem that needs to be addressed.

Overall, the time that control loops were either off or in manual mode was reduced from 41% to 14%, a figure that represents a vastly improved utilisation of the installed capital base. Obviously, with these loops operating optimally in automatic mode, production performance will be significantly enhanced with lower manufacturing costs associated with reduced wastage.”

+ The full article can be read at <http://instrumentation.co.za/regular.aspx?pkIRegularId=1570>

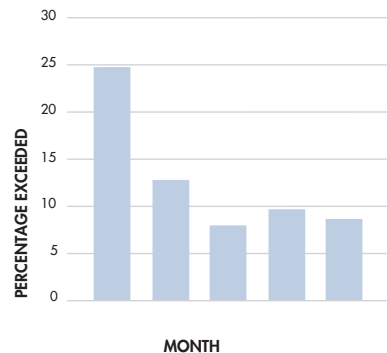
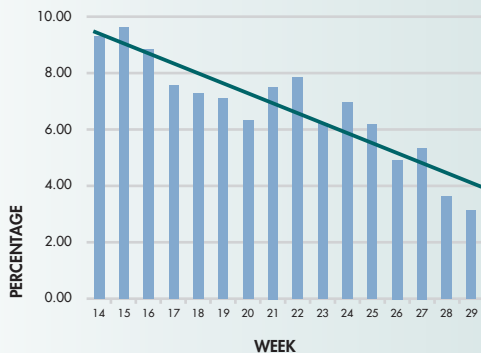
#### IMPALA PLATINUM

#### PROCESS+: CONTROL LOOPS IN MANUAL MODE

#### MONTHLY AVERAGE

**% Manual**  
**Linear (% Manual)**

Month on month percentage of time that loops exceeded limits. Note reduction obtained in three months.



#### Chrome International

- Energy savings through reduced steam usage: ±US\$ 25k savings p.a.
- Increased plant availability: Savings on CA washes due to proper density control: US\$ 50k savings p.a.
- Increased plant availability: Less bag-house trips due to change in control strategy: ±US\$ 25k savings p.a.
- ROI on initial investment of 200% in the first year.
- Reduced manual mode operation from 8% of loops to 3.25% of loops in 14 weeks.

#### Impala Platinum

- Achieved improved plant operability and stability
- Rolled out CSense Process+ to all plants
- Continued Performance Monitoring of Process Control Systems
- Reduction in loop limits exceeded from 24% to 8% in 5 months.

## USERS AND ACCESS

- Configurable user roles such as Administrator, Operator etc.
- User permissions set on a per role basis

## CONFIGURATION

- Create and delete user roles
- Add users to roles
- Modify role permissions
- Schedule automated reporting
- Manage email distribution of reports
- Customise report templates and distribution lists
- Complete shift configuration
- Configure loop categories and priorities
- Configure per loop graph settings

## REPORTING

### + CUSTOM REPORTS

- Full customisation of email reports
- Only users with authorised roles can customise email reports
- Drill down into problem areas directly from the emailed reports

### + STANDARD REPORTS

- Performance overview
- Summary report for all loops
  - Shows historical trends
- Detailed loop report
- Used to analyse individual loops
  - Full controller performance analysis
- Shift reports
- Filter reports on individual shifts
- Summary reports
- Shows worst performing high priority loops
  - Drill down to individual loop reports
  - Drill down to individual shifts
  - Sort and filter by priority
  - Shift comments in daily reports

### + IMPROVED GRAPHING

- Improved and configurable scaling of graphs
- Better default graph settings
- On-the-fly custom graph and statistics generation

## ADVANCED QUERY TOOL

- Generate arbitrary queries using Query Based Example
- Queries can be saved for future use
- Output in tables or CSV files

## DATA EXPORT FUNCTIONALITY

- Export reports in PDF format
- Export data in CSV format

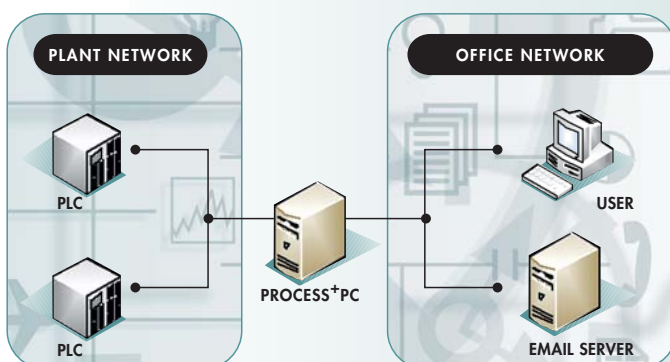
## COMMENTS

- Comments can be added for each loop/day/shift
- Comments included in summary report

## GENERAL

- Seamless upgrade from previous versions
- Shift support
- Drill down to individual shift
- Fully configurable shifts
  - Factory days are different from calendar days
  - Gaps between shifts OK
  - Fully configurable shift times & names
- Import/export
  - Streamlined import and export of CSV files
  - Robust import process
- More compact database storage
  - Easier and quicker queries
  - 20 days records in free SQL Express (4G cap)
- Ported to CSense industrial server v4.0

## SYSTEM ARCHITECTURE



## SALES AND SUPPORT

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