Introduction to RtReports

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What is RtReports ?

A flexible 'rule based' reporting system

- which eliminates report programming and maintains a full history of all report specifications -

Collect – Query – Report – Distribute -Approve

- RtReports integrates current PI automation functionality and manages everything from data retrieval through to report approval and sign off -

Why Now?

- *All of the OSIsoft 'products are aligned' to deliver you an enterprise wide business solutions*

- *RtReports uses all the major features of the PI System:*

  PI Archive + PI Module Db + PI SDK + PI Batch

- *Integrates them with web based technologies such as Web Services and ASP.NET.*

The power of PI !!

- ***PI Archive*** *– provides real time information*
- ***PI Module DB*** *– stores and versions report templates.*
- ***PI Batch DB and BV 3.0 Search Tools*** *– provides rich context and events for reports*
- ***PI Performance Equations*** *– execution engine for state transition equations*
- ***PI SDK*** *– communication protocol, advanced actions*
- ***PI Trend Control*** *– provides streaming trend to reports*

Introduction to RtReports Components

1. Report Editor
report configuration
report formatting

2. Report Generator
browser based report viewing
comment entry, report sign off
There is also a new Excel add in

3. RtReports Web Server
report execution

PI Server
raw data source
report template data storage

1. RtReports Editor - client

Report Editor

- *Configurable report templates are used to specify reporting rules.*
- *Reporting rules can be made up of simple actions or complex expressions.*
- *Report templates are fully versioned with an 'Effective Date' and changes are audit trailed.*

2. RtReports Generator

- *Zero install secure browser access*

- search for context - request report execution

- view results - enter comments - sign off

- print report -

- *Web Server based Report Execution Engine*

- Uses secure web services to deliver report results to the user (or application) -

3. RtReports Web Server

- *The core functionality which executes the report template actions … for any context, event or condition*

perform limit checks against multiple limit types
check ramp rates
find state changes
calculate summaries – max, min, avg, std
get exact time values, start value, end value
retrieve interpolated or compressed data tables
draw trends….
do all of this for any combination of query tag or related tags

- *Supports powerful rule extensibility through building your own conditional logic and action expressions*

What have we done for you ?

Built a Powerful Report Execution Engine !

- A general, highly configurable state machine engine which provides the ability to combine qualification conditions to raise interesting process events. - ***There is nothing like this out there !***

Example

For any batch of 'Never Be Sick' drug that ran in the blue mixing vessel last year:

Check if the vessel temperature ever exceeded QC high limits,
but only in the 3rd iteration of the agitation operation,
but not if the vessel was in testing, or in maintenance…

If it did
then report when it went back below limit
calculate max, min and average temperature
and trend the pressure and pH starting 10 mins before

If it did not then report 'No Exception'

How is a typical RtReport structured?

Secure – Versioned – Audit Trailed

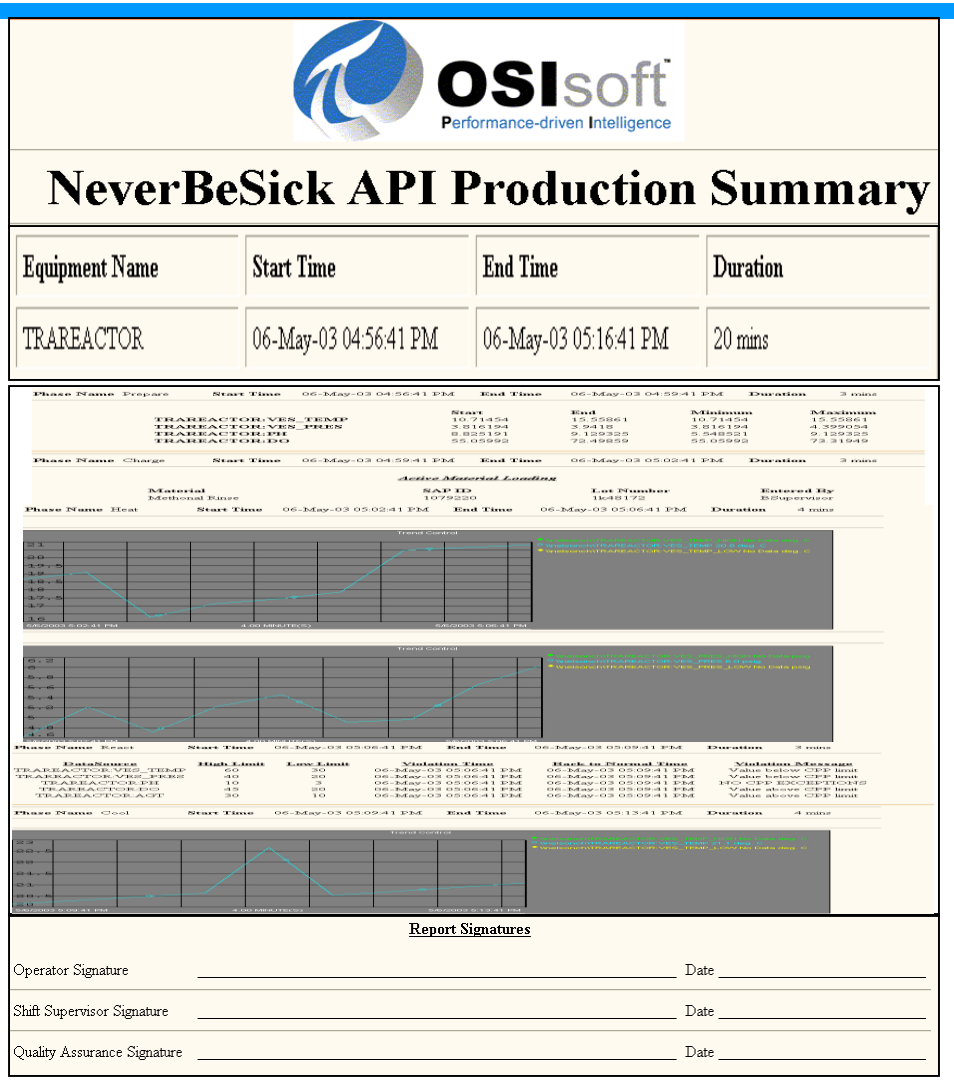
Report Header
Report Name,
Author, Print Date

Context Summary

Report Details:

Timed Values
Limit violations
Ramp rate violations
Tables of data values
Statistics
Expression results
Etc…..

Report Footer



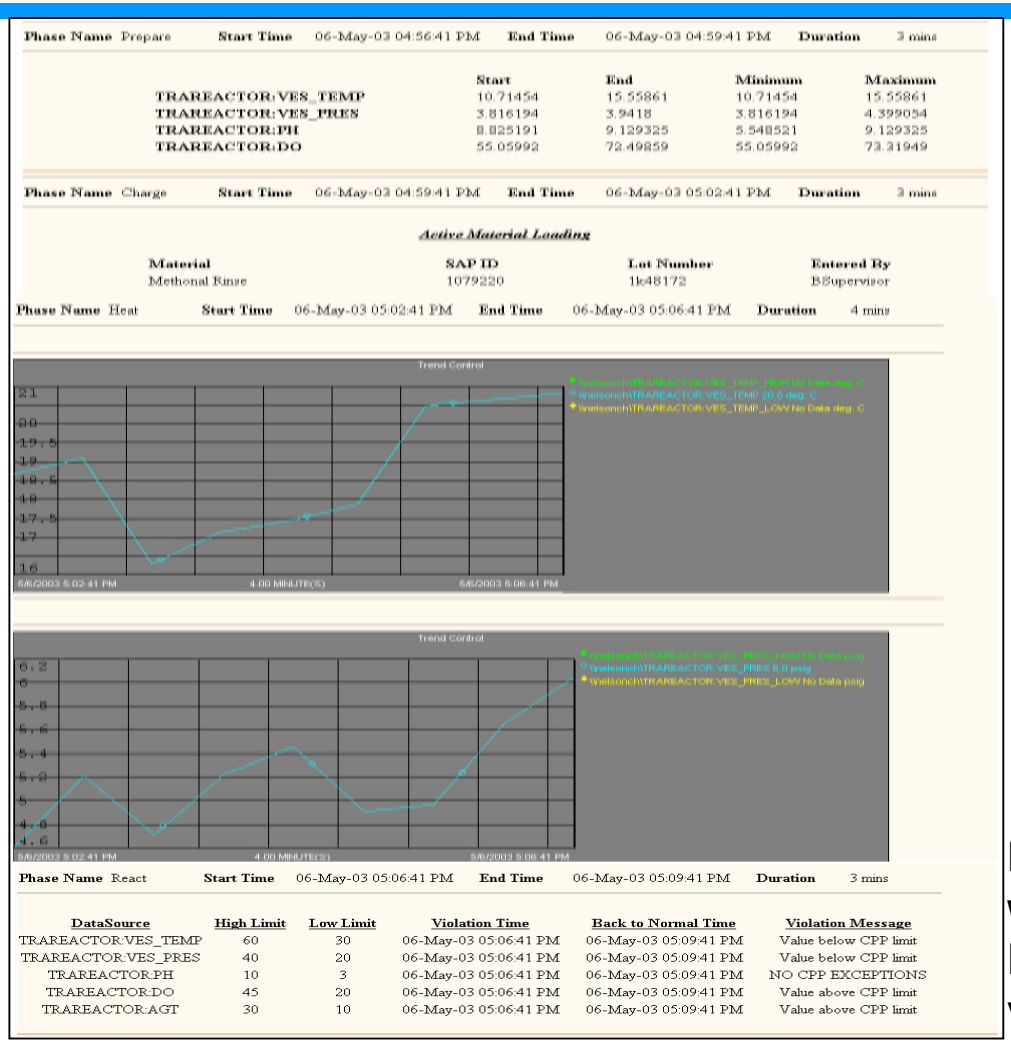
Section Comments and Approvals

Typical RtReport result output

Context, start, end and duration times

Manufacturing details i.e. material additions by an operator

Trends for a conditional period



Phase Name Prepare | Start Time 06-May-03 04:56:41 PM | End Time 06-May-03 04:59:41 PM | Duration 3 mins

	Start	End	Minimum	Maximum
TRAREACTOR:VES_TEMP	10.71454	15.55861	10.71454	15.55861
TRAREACTOR:VES_PRES	3.816194	3.9418	3.816194	4.399054
TRAREACTOR:PH	8.825191	9.129325	5.548521	9.129325
TRAREACTOR:DO	55.05992	72.49859	55.05992	73.31949

Phase Name Charge | Start Time 06-May-03 04:59:41 PM | End Time 06-May-03 05:02:41 PM | Duration 3 mins

Active Material Loading

Material	SAP ID	Lot Number	Entered By
Methonal Rinse	1079220	lk48172	BSupervisor

Phase Name Heat | Start Time 06-May-03 05:02:41 PM | End Time 06-May-03 05:06:41 PM | Duration 4 mins

Phase Name React | Start Time 06-May-03 05:06:41 PM | End Time 06-May-03 05:09:41 PM | Duration 3 mins

DataSource	High Limit	Low Limit	Violation Time	Back to Normal Time	Violation Message
TRAREACTOR:VES_TEMP	60	30	06-May-03 05:06:41 PM	06-May-03 05:09:41 PM	Value below CPP limit
TRAREACTOR:VES_PRES	40	20	06-May-03 05:06:41 PM	06-May-03 05:09:41 PM	Value below CPP limit
TRAREACTOR:PH	10	3	06-May-03 05:06:41 PM	06-May-03 05:09:41 PM	NO CPP EXCEPTIONS
TRAREACTOR:DO	45	20	06-May-03 05:06:41 PM	06-May-03 05:09:41 PM	Value above CPP limit
TRAREACTOR:AGT	30	10	06-May-03 05:06:41 PM	06-May-03 05:09:41 PM	Value above CPP limit

Tag/alias profiles Max, min, avg…

Trends for a context's period

Limit checks with violation value, back to normal time, violation messages

Report Template Building

1) *A report name is specified and a context is chosen (batch, equipment, product, phase…)*
2) *Reporting actions are chosen for the context from a set of pre-defined expressions.*
3) *You can also build and test your own action expressions to extend the rule functionality.*
4) *All report templates are stored in PI with versioning in a secure format.*
5) *Reports layout can be formatted by section into many styles.*

Generating a report

1) *Search for the context (batch, equipment, product, phase…)*
2) *Pick from the list of pre-configured reports to run.*
3) *The Report Engine on the Web Server then executes the rules by accessing the PI Server. Some simple results are obtained by evaluating expressions in a 'multi level state machine'. (a limit check)*
4) *Some report actions automatically use the PI SDK to return extended report results. (draw a trend)*
5) *Report output is view only it can not be selected for editing.*
6) *The generated report can be printed, it is not stored.*

Initial Version Focus

- *Satisfying rigorous government compliance reporting regulations.*

  FDA 21 CFR Part 11

- *Handling a good breadth of report types*

  production summaries, exception reports, utility reports, batch activity logs, daily excursions,

  Title V, Power outage reports, Network problems

- *Data sourced from PI*

Initial Version Pre-release Program

- *We recognized the need to work more closely with our customers to ensure that their requirements are met in the initial Version.*
- *Beta programs in the past have not been that beneficial for both customers and us as they concentrate on bug fixes and are not focused on new requirements and working as a team in the field.*
- *There are significant schedule demands from key customers to get compliant reports running asap. These customers have asked for phased delivery of the report generation and printing functions ahead of editing functions.*

Demo of RtReports Generator

- *Searching features*
- *Changing views*
- *Report Generation*
- *Report Interaction*
- *Switching roles*

Questions

True collaboration is only realized when there is “one version of the truth”