



## **Plant performance calculation**

Product brochure

**Power Generation Applications**  
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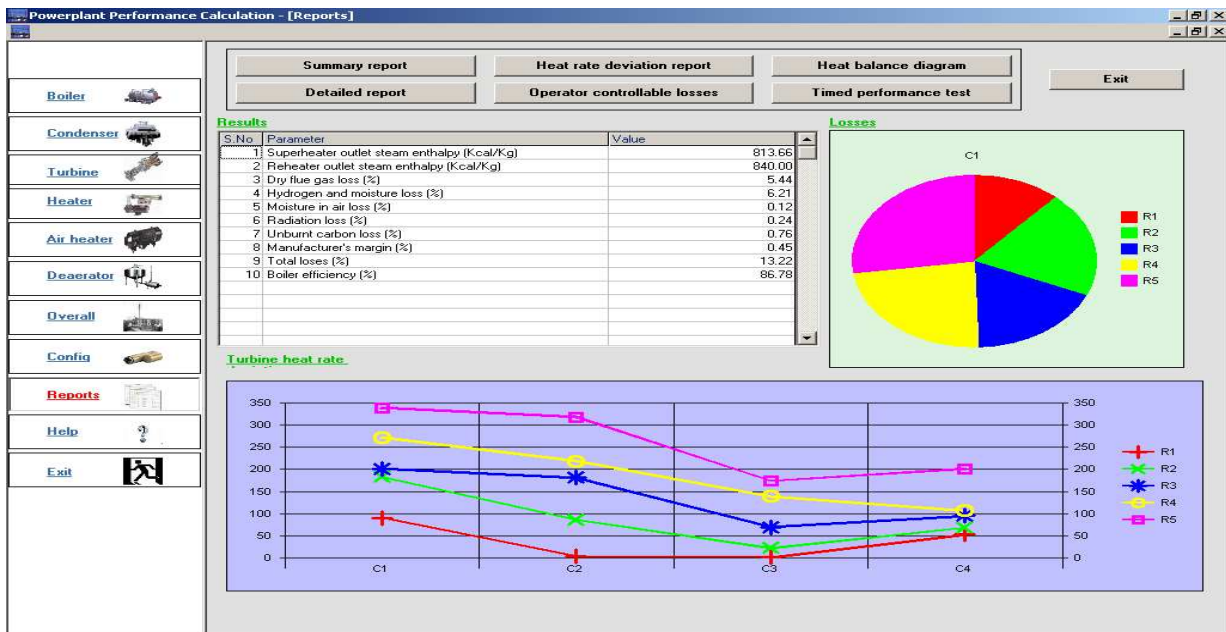
## Plant performance calculation

Plant performance calculation (PPC) software from the power generation applications group of Kalki is a readily deployable, flexible and easy to use performance calculation software. PPC provides online performance calculation as well as extensive report generation facilities that enable a generation utility to maximize the benefits from a DCS implementation.

## Key benefits

The PPC offers a multitude of benefits in a power plant both at the operator level as well as at the operations management level. Some of these key benefits offered include:

- Online performance data allows for minimization of losses and optimized operation
- Ease of use and configuration allows minimal user training



PPC calculations are based on relevant performance test codes (PTC) from ASME such as PTC 4 for steam generators, PTC 6 for turbines. PPC offers a wide spectrum of performance calculation features with unmatched flexibility and ease of use. The software offers a simple configuration utility for integration with a DCS (distributed control system). Calculation results are displayed on screen and are also available in a range of reports.

- and faster user buy-n
- Extensive reports available makes it easier to track individual components as well as unit performance
- Separate heat rate deviation report allows user to know the losses incurred due to sub-optimal operations
- Separate operator controllable losses report makes it possible to minimize losses resulting in huge savings

- Heat balance diagram enables operator to have a simple and intuitive online visualization of the process
- A facility for timed performance tests can be greatly beneficial especially during performance guarantee test runs

### Calculation details

PPC offers efficiency calculation for different components in the steam path and flue gas path. Plant heat rate and overall efficiency are available separately. Some of the calculations handled by PPC include

- Air-heater performance calculations
- Deaerator performance calculations
- Unit heat rate calculations

All the calculations are based on relevant performance test codes and other standards available. The results are available for individual components as well as summary reports for all the components. In addition to these, calculation details report are also available that provides intermediate values derived in each of the calculations (for example, each of the individual

S.No	Parameter	Value
1	Superheater outlet steam enthalpy (Kcal/Kg)	813.66
2	Reheater outlet steam enthalpy (Kcal/Kg)	840.00
3	Dry flue gas loss (%)	5.44
4	Hydrogen and moisture loss (%)	6.21
5	Moisture in air loss (%)	0.12
6	Radiation loss (%)	0.24
7	Unburnt carbon loss (%)	0.76
8	Manufacturer's margin (%)	0.45
9	Total losses (%)	13.22
10	Boiler efficiency (%)	86.78

**Steam generator efficiency calculations (Indirect method)**

Show calculation results

Show calculation details

Reports      Exit

- Boiler efficiency calculations
- Turbo-generator efficiency calculations
- Condenser performance calculations

losses in the case of the boiler efficiency calculation by indirect method). These reports will enable user to have a "feel" of the calculations performed and also to crosscheck for any discrepancies.

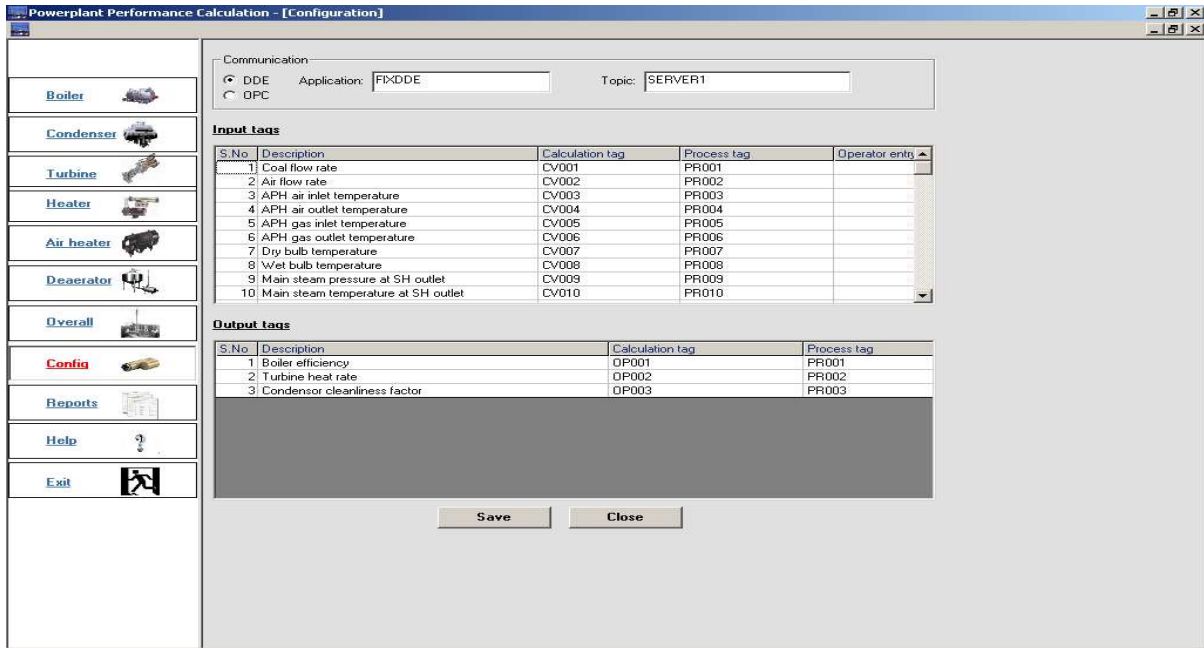
## Configuration utility

PPC comes with a simple configuration utility that allows a user to specify details for the communication with the DCS.

all the calculation results that the PPC needs to write back to the DCS can be configured as "output tags".

## Technical details

Platform: Windows 2000



PPC as a standard product complies with DDE (Dynamic Data Exchange) and OPC (OLE for Process Control) as interface mechanisms. Since most control system packages available today support one or both of these interfaces, PPC can seamlessly integrate with most vendors DCS. In the exceptional case that both interfaces are not available, legacy protocols can be supported as part of our implementation services.

PPC allows user to configure all the inputs that it has to collect from DCS for performing the calculations. Where a certain process point does not exist, it can be configured as an "operator input" for manual entry. Similarly

Software requirements: MS Excel  
Communication Interface: DDE (Dynamic Data Exchange), OPC (OLE for Process Control)

## Further details

For further details on PPC, please write to [sales@kalkitech.com](mailto:sales@kalkitech.com). Phone, fax and mailing details can be had from our website <http://www.kalkitech.com/Contactus.htm>. Details on other solutions like Economic Load Dispatch / Merit order dispatch, Availability Based Tariff, Plant Simulation software, Alarm analysis package etc. can be had from the PGA home page at <http://www.kalkitech.com/powergen.htm>