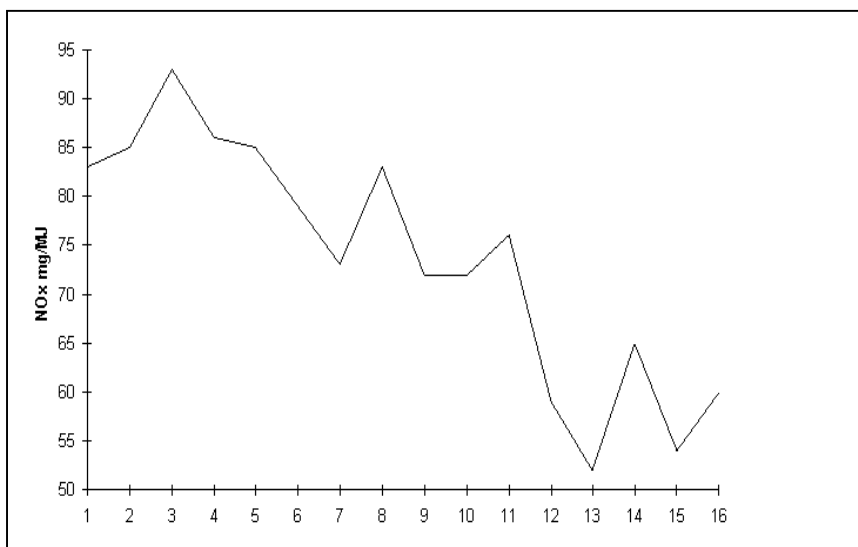


MultiSimplex Combustion Optimizer 2.1



MultiSimplex fits all solid fuel plants

- Up to 30% reduction of NO_x- and CO-emissions
- Integration into the current process control system
- Automates the control of the combustion
- Adjusts optimization targets for different process cases
- Does not need a process model, but can use output from process models
- Cost efficient compliance with 2005 EU emission regulations



MultiSimplex stepwise minimization of the NO_x-emissions, applied on a 100 MW, combined solid fuel and oil incinerator. In a series of 16 steps a 25% reduction in NO_x output was achieved.

Efficient Combustion Optimization

Emissions from incinerators are a major environmental problem. To achieve an optimal, cost efficient combustion with simultaneous maximized power output and minimized NO_x- and CO emissions is therefore highly desirable. Emission reductions with maintained power output are, however, often an expensive or complex task since raw materials and process conditions are continuously changing.

MultiSimplex Combustion Optimizer solves this problem by integrating a highly efficient combustion optimization algorithm with the current control system of the incinerator plant and automates a combustion optimization. This results in a cost efficient and continuous reduction of emissions, while at the same time maintaining or increasing power output.

User defined priorities

The unique *joint response* function makes it possible for users to prioritize different optimization targets. This makes it possible to reduce f.e. NO_x emissions while at the same time reducing CO emissions in a cost efficient manner. This makes the following combination possible:

- NO_x (minimize, priority 1)
- CO (keep below target level)
- Power (maximize, priority 2)

Economical reward

The flexible and cost efficient *MultiSimplex* system for emission minimization results in substantial annual savings by reduced NO_x-fees and other emission fees, while at the same time automating the combustion control. (See technical specification for installation examples)

Reference

"After the installation of the MultiSimplex system we have seen an approximate 7% reduction of the NO_x emissions and a substantial reduction of CO spikes. However, the biggest advantage of the system is that it allows operators to carry out more important tasks than just adjusting the air flows" Torbjörn Harrysson, Stora Enso Nymölla AB

Technical Specification

Control variables

Different processes have different control variables. The variables below are examples of *MultiSimplex* input:

- Primary air flow
- Secondary air flow
- Plant specific air flows
- Rotamix
- Rofa

Response variables

Different processes have different response variables that should be controlled optimally. The variables below are examples of *MultiSimplex* response variables that can be controlled separately, in combination or according to user priority:

- Production cost
- NO_x emissions
- CO emissions
- Power

Other possible response variables:

- Dust
- CO₂
- NH₂

Result evaluation

A powerful *MultiSimplex* function is the possibility to prioritize and weigh different optimization targets. When the control goals for the response variables with highest priority have been achieved, *MultiSimplex* automatically focus on achieving goals with lower priority¹.

User Interface

Is used for:

- Identification of *MultiSimplex* results
- Choosing process case
- Choose between manual control/*MultiSimplex* control
- Modifying optimization targets
- Modify optimization criteria and configuration

Core architecture

Highly efficient emission minimization algorithm on PC platform. The algorithm calculates new settings for the control variables, using a patented analysis of the response, resulting from changes in control variable settings¹.

Recommended system requirements

Minimum

- 400 MHz Pentium II
- 256 MB RAM, plus 5 bytes RAM per 5K tags
- 2GB Hard disc memory

Recommended

- 1.2 GHz Pentium III or larger
- 512 MB RAM

Operative system

Microsoft Windows 2000 Professional, Server or Advanced Server with SP3 or Microsoft Windows XP with SP1

Communication

MultiSimplex can communicate with all modern control systems and uses f.e. the following protocols:

- DDE
- DLL
- OPC
- OLE
- etc

Installation examples

Stora Enso Nymölla AB, Sweden:

Input: Secondary and tertiary air flows

Result: Automatic control of the combustion and approximately 15% NO_x emission reduction.

Söderenergi, Igelsta plant, Sweden:

Input: Lower and upper secondary air flows, tertiary air flow, left and right Rofa damper positions and air ratio.

Result: Automatic control of the combustion, control of NO_x emissions and CO emissions.

Options

MultiSimplex Combustion Optimizer can be installed separately or as an integrated part of other software or hardware such as SNCR systems.

¹ See www.grabitech.se for detailed information.

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