

# GUIDE



## 8 STEPS TO IMPLEMENT AN EFFECTIVE SOLUTION FOR SOOTBLOWING IN RECOVERY BOILERS



HEAT MANAGEMENT

## ABOUT THIS GUIDE

HISS (High Impact Soot System) is a novel method for optimizing sootblowing. During the process of choosing a system, questions about the implementation is often asked because most people do not have previous experience of this process.

We have developed this document to give you interested in an HISS solution an overview of the implementation process and what is crucial to make it efficient and smooth.

This document also describes how you can get support and help with your implementation.

### Description of the HISS solution

For those with no previous knowledge of the HISS solution, we give you a brief overall description.

The patented HISS technology makes your steam sootblowing system more efficient in managing clogging and also increases the efficiency of power boiler and recovery boilers.

### This leads to results such as

- Increased efficiency
- Reduced steam consumption and reduced cost of sootblowing
- Enables sootblowing twice as often in critical areas

Basically all cleaning from a soot blower takes place on one stroke of the soot blower, when the impulse of the steam jet removes the fouling on the heating surfaces. When the sootblower retracts, close to no further cleaning occurs. In conventional sootblowing, 50% of the steam is therefore practically wasted, while the ash is allowed to sinter to hard deposits almost impossible to remove with sootblowers

With HISS, several sootblowers can run in parallel and without steam flow on the return. In other words; more sootblowing, shorter time between sootblowing, ash being easier to remove and smaller consumption of steam for sootblowers.

## What does the process look like to introduce a HISS solution for a Recovery Boiler?

The implementation of a HISS solution may vary a lot depending on the specific Black Liquor Recovery Boiler

**However, the process is general and is done in 8 steps:**

1. Preliminary study of the current situation of the boiler and its operation
2. Buy HISS solution
3. Prepare for implementation
4. Technical implementation
5. Checks before commissioning
6. Commissioning
7. Follow-up of results
8. Ongoing Maintenance

We will now go through the different steps and what they mean.

## 1 PRE-STUDY OF THE CURRENT SITUATION

To ensure a correct quotation and an effective implementation of the project, a pre-study is conducted.

### What does the pre-study contain?

- Interpretation of operational data as specified by Heat Management

Definition of desired improvement goals e.g:

- Increased capacity
- Lower operating costs
- Description of the current automation process
- Description of the current sootblowing solution
- Description of current control system
- Description of how the boiler is designed
- Description of electrical installation

### Resources and time

The following resources need to be available:

- Operational engineers
- Automation engineers
- Operation manager

The pre-study can usually be conducted in one week

## 2 BUY HISS SOLUTION

Heat Management offers a solution based on the results of the pre-study.

- The offer can be designed as a turn key or as a solution that the customer installs (with project management from us) and is taken into operation by Heat Management.
- Terms and conditions: EXW (Stockholm) Incoterms2010. Guarantees are given for steam saving, the function overlapping sootblowing, and machine warranty for the steam valve actuators.
- The offer is designed by Heat Management or any representative in that region.

## 3 PREPARATIONS FOR IMPLEMENTATION

Because implementation is made in connection with a planned outage, careful preparation is required before the technical solution is implemented. The extent of the implementation and how it works depends on factors such as:

- The current electrical installation
- Which control system is being used
- Whether other soot cleaning systems are affected
- Condition of the present sootblowing system

### **The preparations consist of the following steps:**

- Develop technical description
  - Boiler
  - Electrical system
  - Control system
- Project planning
- Identify the resources that need to be involved and back up if problems with personnel arise during the project

## 4 TECHNICAL IMPLEMENTATION

Parts of the technical implementation can often be prepared before the outage to reduce the risks of problems and delays in connection with the outage.

### **The technical implementation consists of the following parts:**

- Rebuilding the electrical system
- Rebuilding the control systems or possibly addition of new control system.
- Adding pneumatic actuators on the sootblower steam valves
- Installation of the pneumatic system for the valves
- Possible mechanical improvements or adjustments of the current sootblowers

A normal outage of 5-10 days is well enough for introducing HISS. The actuators are pre-installed and are taken into operation at a later time by loosening a locking screw

## 5 CONTROLS BEFORE OPERATION

After the technical implementation, checks are made. The checks usually consist of the following steps:

1. Check the electrical system so that the power works as intended. This is called "check out".
2. Test of sootblowers without steam, so-called "dry run".

## 6 COMMISSIONING

Now it's time to start operation of the boiler. When this is done, the sootblowers are taken into operation according to the following steps:

1. Put the sootblowers into operation. Sootblower cleaning effect is followed up by monitoring that the fouling process is under control (that differential pressure is stable, steam flows and steam temperatures match previously measured and that the sootblower operation runs smooth).

2. When the HISS system is turned on, the following questions usually arise:

- Verification that the new sootblowing system works
- Check the cooling flow is ok by measuring the lance temperature
- Check that the overlapping operation work as intended
- Follow-up of differential pressure over tube bundles being stable, that steam flows and steam temperatures are consistent with previously measured and that sootblower operation runs smooth.

It normally takes about 6-12 months before full effect is reached, due to time required for finding optimal settings of where to focus sootblowing etc.

## 7 FOLLOW-UP OF RESULTS

When the operation of the HISS system is started, continuous monitoring of the result is done by checking the following parameters:

- Verification of cleaning effect by checking the above-mentioned points: Ensure that differential pressure is stable, steam flows and steam temperatures match previously measured and that sootblower operation is smooth.
- Tune-in of sootblower setpoints together with the mill. Follow-up monthly first 3 months and then every other month, during months 4 - 12.
- The results are monitored continuously and compared with the goals that were set up in connection with the pre-study.

## 8 MAINTENANCE

If the entire implementation is done correctly, you can usually expect less maintenance than before the HISS system was introduced. The whole new system is documented and maintenance routines adjusted.

### **Need for external help and internal competence**

The internal skills needed are normally:

- Project Manager
- Staff with process and automation knowledge
- Staff with electric system knowledge
- Technicians that perform mechanical maintenance

If the customer wishes, we offer project management and implementation of the different parts of the project.

### **Pitfalls and risks in an implementation**

The risk of introducing a HISS system is small, as long as careful preparation has been made as described in this document.

Any problems are usually related to the quality and fitness of the current sootblowers, and that you have not done a sufficiently detailed plan and prepared with appropriate resources and back-up for them during the technical implementation.

Want to know more about the patented HISS technology and how it can make your steam sootblowing system an effective tool for managing clogging and increasing the efficiency of your power boilers and recovery boilers?

Contact us at Heat Management and we will tell you more!

## ABOUT HEAT MANAGEMENT

Heat Management helps their clients increase the efficiency, availability and lifetime of their industrial boiler in an environmentally friendly and sustainable way. Clients are power/heating plants, pulp mills or marine boilers.

Heat Management's technology improves fouling prevention, thus increasing the boiler efficiency by either optimizing the steam boiler system or by using infra-sound cleaning, big-data operation analysis and CFD. Our patented products have been successfully installed in many countries and in many applications since the 1970s.

[www.heatmanage.com](http://www.heatmanage.com)

