



**SPECIALISTS  
IN INDUSTRIAL  
CHEMICAL CLEANING  
AND AIR & STEAM  
BLOWING**

SERVICES  
BROCHURE



# COMBINED CYCLE POWER PLANTS

Since 2003 the Solarca Group has obtained a large amount of experience in the cleaning of CCGP being a leader on the European Market and completing a large amount of projects worldwide.

## SERVICES

Hydrotesting

Pre-comissioning descaling of the HRSG's and steam and water systems.

Gas lines descaling, air blowing and drying

Chemical Cleaning of utility systems

NOx control water injection systems

Auxiliary Steam Supply

Db Min Continuous Steam Blowing

Discontinuous Steam Blowing

Air Blowing

Magnetite Formation

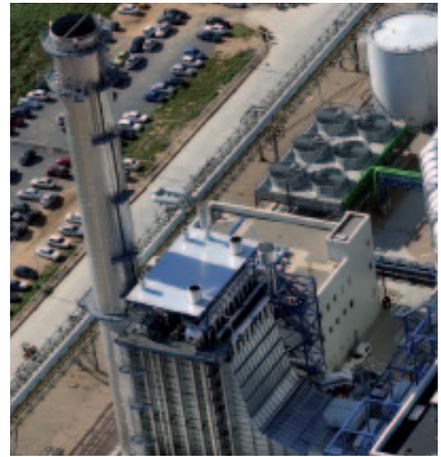
Waste Treatment of the Cleaning Solution



More than 90 combined cycle cleaned in different countries over the last 10 years

A large number of developments and improvements on its equipment and technology has lead Solarca Group to be able to minimize the operational times for the HRSG's cleaning while always achieving excellent results.

Offering integrated services of Chemical Cleaning and Steam and Air Blowing, Solarca Group is able to offer a combined package with the maximum coordination between the stages that minimizes the overall program times for the projects.



# THERMAL POWER STATIONS

**Solarca also has great experience on the pre operational and maintenance chemical cleaning of Boilers in Fuel and Coal Conventional Power Plants, Biomass Plants, Energy From Waste Plants etc...**

## SERVICES

Water and Steam Chemical Cleaning

Fuel Gas Side Chemical Cleaning

Cooling systems

Condensers

Flushing of lube oil systems

Over the years, a continuous improvement of our methods in the Chemical Cleaning of Power Plants, driven by our development programs and experience, has lead the Solarca Group to have different maintenance and pre-operational chemical cleaning methods that are always selected according to the fouling levels, deposits composition, corrosion allowances for the cleanings.

In most cases, the Solarca Group is also able to offer an "in situ" waste treatment service of the cleaning solutions that reduces the cost of the final disposal of the cleaning solution.



# REFINERY AND PETROCHEMICALS

## Chemical cleaning and decontamination services

Over its 25 years, a significant proportion of the activities of the Solarca Group have always been focused on the Petrochemical Industry and Refineries.

A good long term relationship with several petrochemical sites and refineries in Europe, helped the Solarca Group to learn from the developing opportunities how to offer the cleaning services that would cover all the maintenance and shut down requirements on these sites.

The services are all carried out based on an engineering study that defines the best treatment to apply, the monitoring analysis that guarantee the effectiveness of the cleanings always minimizing the waste generated.

In some applications, Solarca Group uses Biodegradable products or offers a pre treatment service that reduces significantly the amount of waste that needs to be disposed.



## SERVICES

- Pyrophoric Deposits Decontaminations
- Degassing Decontaminations
- Heavy hydrocarbon and sludge removal
- Fin Fan Exchangers Cleanings
- Quench water systems
- On-line cleaning of heat exchangers
- Distillation Columns
- Lube Oil circuits
- On-line external cleaning of Furnaces
- Hard Scale Deposits Removal
- Chemical Cleaning of heat exchangers



# STEAM AND AIR BLOWING

**Integrating SABSCO's knowhow on the services in the Solarca Group, has put the companies into an advantaged position in front of its competitors**

SABSCO's Steam and Air blowing is a process for the removal of oxide scales and construction debris. This process uses high velocity steam or air to mechanically remove the debris. The three main methods used are: dB Min Steam Blowing, Pressure Cycle Steam Blowing and Air Blowing.



## dB Min STEAM BLOW

- Continuous steady state conditions
- Reduced noise level
- Optimised blow duration
- Blowing achieved at low pressure
- Steam flow requirement is approximately 30% of maximum capacity.

## CONVENTIONAL STEAM BLOW

- Transient steam conditions
- Higher noise level
- Longer blow duration and high number of blowing cycles
- Higher CFR can be achieved
- Steam lines subjected to high mechanical forces and thermal stresses



## AIR BLOWING

- Discontinuous
- Air blowing cycles at high pressure
- Instantaneously creates high flow rates using a quick opening valve
- High drag forces giving very effective fluidisation of debris
- Considerable reduction of cleaning programme time and commissioning.



**The Solarca Group owns three Booster Unit Compressors that can compress up to 3500 scfm of air up to 55 bar.**



# CHEMICAL CLEANING MAINTENANCE SERVICES

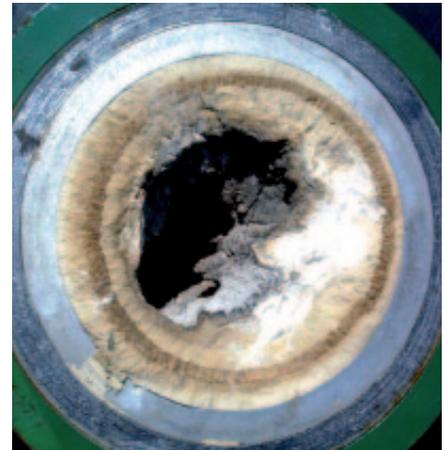
**Its outstanding expertise in the field, combined with a strong R+D activity allows the Solarca Group to determine the best approach to guarantee a satisfactory result on each of its projects.**

Solarca Group's wide experience and knowledge of industrial sectors allows us a wide range of chemical cleaning solutions to our clients. This includes the chemical and petrochemical industries, the power industry, paper mills, the automotive and naval industries, etc...



## SERVICES

- On and off-line cleaning of heat exchangers
- Plate heat exchangers
- Evaporators and condensers
- Filters
- Process fluid lines
- Gas supply lines
- Compressed air lines
- Distillation columns
- Cooling towers
- Air coolers
- Fin Fan coolers
- Fire protection water systems
- Cooling and lubrication oil circuits
- Diesel oil circuits



## LINE DRYING

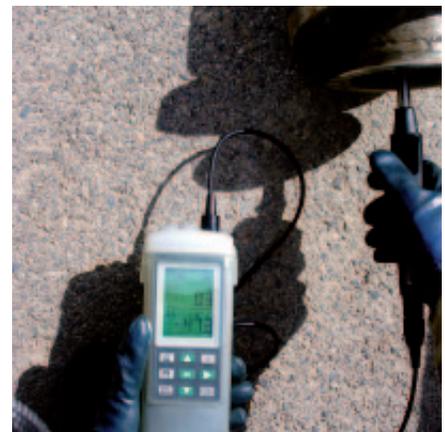
**Line drying is used on pipeline and equipment that requires drying to a low dew point prior to commissioning.**



## METHOD

- Line Piggaged to remove large quantities of water
- System pressurised and released to expel remaining water
- A continuous blow is performed to dry the line
- Procedure optimization for the minimization of operating times, flow rates and air drying conditions. Direct measurement of Dew Point on site.

The process involves flushing the line with nitrogen or dry air and can achieve a dew point up to -45°C. Large quantities of water can also be removed using pigs passed through the line.



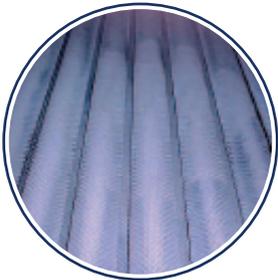
# ON-LINE FURNACE CLEANING

The use of increasingly heavier fuels creates a greater build-up of deposits both in the radiating and convecting areas of the furnace, creating a significant loss of production capacity and efficiency.

Solarca Group's On-Line Cleaning Technique, applied to the radiating and convecting areas of process furnaces by specialized and experienced staff, is able to remove the ashes and deposits accumulated at the tube's surface, achieving an immediate improvement on the furnace performance.



BEFORE



DURING



AFTER



## ADVANTAGES

An innovative, quick, efficient and safe technique

Applicable to a wide range of furnaces

Allows recovery of the unit's yield without any shutdown

Quick recovery of the cleaning costs

Wet and dry application procedures

# TANK CHEMICAL CLEANING

Solarca Group has the equipment and expertise required to carry out the chemical cleaning of deposits in tanks and columns by using rotating ball sprays, thereby eliminating the need for personnel confined space entry.

The design of our equipment allow us to work with a variety of chemical cleaning agents, such as organic and inorganic acids, alkalis and surfactants in order to leave surfaces de-scaled and passivated.

**No requirement for atmosphere measurement, autonomous breathing apparatus, stand-by watch or rescue teams as there is no physical entry into the tank.**

## ADVANTAGES

Maximum safety during the cleaning

Elimination of risks caused by confined space entry

Low chemical solution volume required

Quicker and more efficient execution of the works



# PREOPERATIONAL DESCALING

## OBJECTIVES

To remove the deposits (oxides, dust and other debris) accumulated during the erection of the plant elements

To form a interim protective layer over the descaled surface ready for unit start-up

A reduction of commissioning program times



Drum internals (before)



Drum internals (after)

## ONE PHASE CLEAN

The advances in the research and development of new cleaning techniques allows the company to offer the "one phase clean" process for pre-commissioning descaling. This cleaning concept has many advantages over the traditional methods:

### ADVANTAGES

Reduction in the time required for chemical cleaning

Lower water usage

Lower volumes of waste to treat

Lower environmental impact

Reduction in overall cleaning costs



# THERMOSOLAR PLANT, CONCENTRATING SOLAR POWER PLANTS

## COVERED CSP TECHNOLOGIES:

Parabolic Trough
Solar Power Tower:
<ul style="list-style-type: none"> <li>Molten salt power tower system</li> <li>Pressurized-water thermal storage system, and saturated-steam receiver and turbine</li> </ul>
Integrated Solar Combined Cycle (ISCC)
Linear Fresnel



## SERVICES FOR THERMOSOLAR PLANTS:

Cleaning and drying of HTF System:
<ul style="list-style-type: none"> <li>Solar Field</li> <li>Steam Generating Block</li> </ul>
Chemical cleaning of closed cooling system
Flushing of the turbine lubrication system
Cleaning and blowing of the water/steam system:
<ul style="list-style-type: none"> <li>Chemical cleaning</li> <li>Steam/air blowing of steam systems</li> </ul>
Temporary pipings for chemical cleaning drying and blowing

## BLOWING AND DRYING HTF SYSTEMS

We are able to perform the cleaning and drying of the HTF piping, both in the solar field and the steam generating block. The cleaning consists of low pressure blowing and "pigs" launching at a speed ranging from 30 to 200 ft/sec, and slug flushing cleaning.

**More than 30 Solar Power Plants,  
 successfully cleaned in Spain**

## POWER BLOCK CHEMICAL CLEANING OPTIONS

Flushing
Degreasing
Pickling
Passivation
Preservation
One-phase-clean

Guaranteed compliance with all pre-operational cleaning requirements

Systems larger than 200.000 gallons and up to 14.000 GPM recirculation flow rate

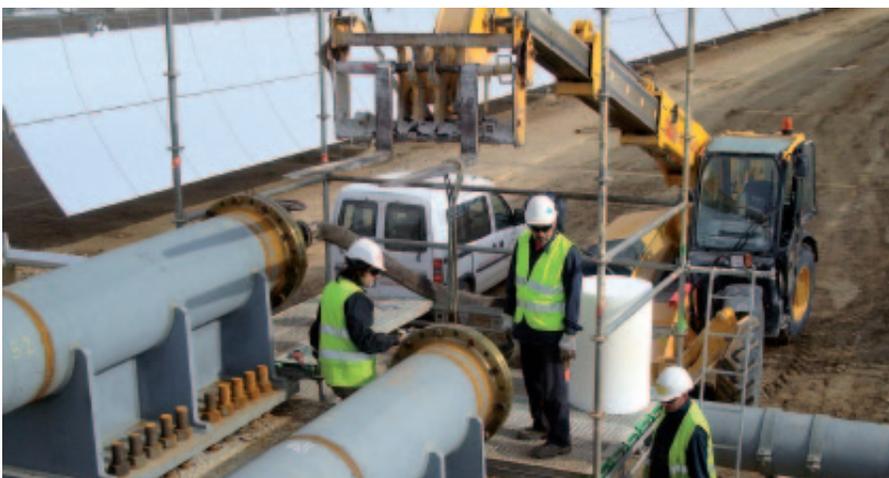
Providing steam blowing exit piping and knock-out pots

Providing double "Y" piping layout with more than 400TPH of steam capacity

Meet and exceed the acceptance criteria of GE, Siemens, Alstom, MHI, etc.

## POWER BLOCK BLOWING STEAM SYSTEMS

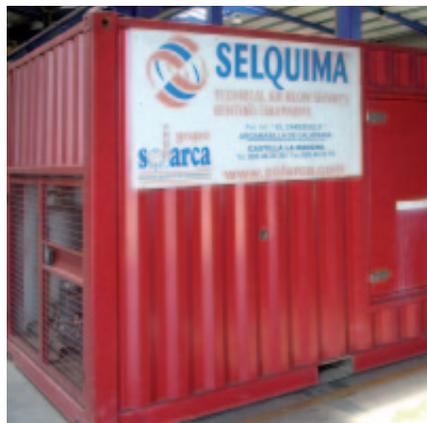
Silent steam blowing
Air blowing



# SPECIALIZED EQUIPMENT HIRE

## EQUIPMENT

- Electrical and diesel pumps up to 1300m<sup>3</sup>
- Booster air compressor equipment up to 55 bar pressure
- Electric power units up to 750KVA
- Tank and balloon storage different volumes
- Auxiliary equipment for chemical cleaning
- Measure and registration instruments for chemical cleaning control
- Steam and air blowing necessary equipment (silencers, pipes, target inserters, valves...)
- Auxiliary steam boilers up to 12 TPH steam





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