MAGALDI NEWS

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C O N T

E N T S

Australia

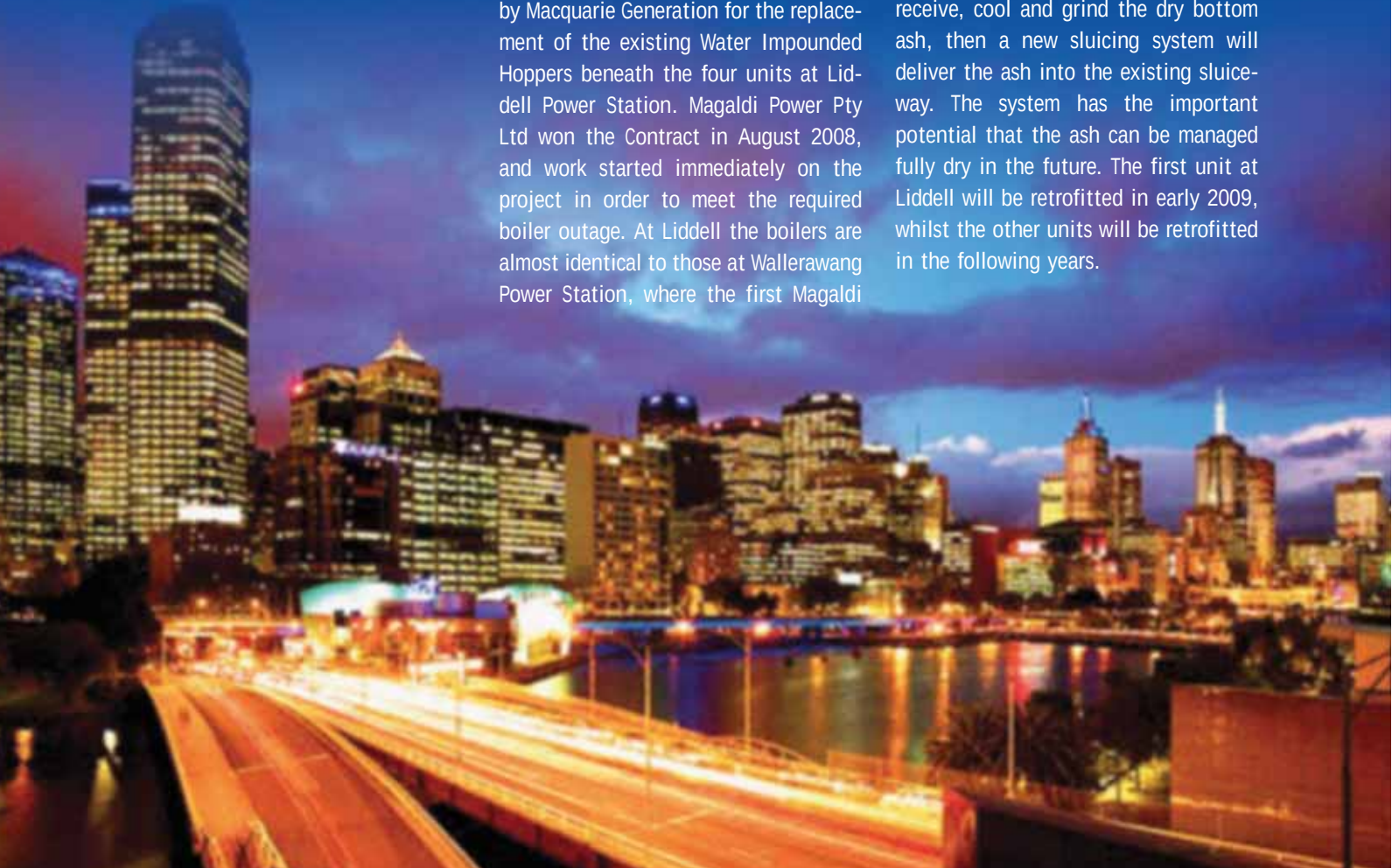
Magaldi's growth Downunder - Dramatic increase of the Market Share in Australia

by **Celestino Agresta** *Sales Area Manager* celestino.agresta@magaldi.com

2008 has represented a fundamental milestone for Magaldi Power Pty Ltd activities in Australia. Several happenings have characterized the year, first of all the confirmation of the Magaldi technologies supremacy in the territory, in fact 2 new important contracts have been awarded to Magaldi Power Pty Ltd both for the supply of the MAC® System in 2 large power stations in New South Wales.

Macquarie Generation- Liddell Power Station 4 x 500 MW

In May 2008 a Public Tender was issued by Macquarie Generation for the replacement of the existing Water Impounded Hoppers beneath the four units at Liddell Power Station. Magaldi Power Pty Ltd won the Contract in August 2008, and work started immediately on the project in order to meet the required boiler outage. At Liddell the boilers are almost identical to those at Wallerawang Power Station, where the first Magaldi system has been operating successfully since 2004, but the MAC Layout will be different due to the different final disposal of bottom ash. The system will receive, cool and grind the dry bottom ash, then a new sluicing system will deliver the ash into the existing sluiceway. The system has the important potential that the ash can be managed fully dry in the future. The first unit at Liddell will be retrofitted in early 2009, whilst the other units will be retrofitted in the following years.



LIDDELL POWER STATION

Owner:	Macquarie Generation
Units:	#1, #2, #3, #4 (4 x 530 MW)
Location:	Muswellbrook, NSW, Australia
Contract Award:	Sept. 2008
Retrofit Schedule:	Unit #3 Start up April 2009
	Unit #4 Start up April 2010
	Unit #2 Start up October 2010
	Unit #1 Start up April 2011
Fuel:	Bituminous Coal
Bottom Ash Rate:	Normal: 8,0 t/h
	Design: 17,0 t/h

ERARING POWER STATION

Owner:	Eraring Energy
Units:	#1, #2, #3, #4 (4 x 530 MW)
Location:	Eraring, NSW, Australia
Contract Award:	Sept. 2008
Retrofit Schedule:	Unit #4 Start up December 2009
	Unit #2 Start up June 2010
	Unit #3 Start up November 2010
	Unit #1 Start up June 2011
Fuel:	Bituminous Coal
Bottom Ash Rate:	Normal: 11,0 t/h
	Design: 16,0 t/h

Eraring Energy - Eraring Power Station 4 x 660 MW

At the same time as Liddell, the public Tender for the replacement of the four (3 + 1 optional) water impounded hoppers at Eraring was issued. At the end of August 2008 Magaldi was nominated the successful Tenderer for this project. Eraring Energy has done a careful and long period of screening of the market before issuing the specification and visited a number of Magaldi, and competitor, installations in Australia and overseas to validate the operations of the MAC® system after many years of operations. Eraring is the largest generating coal fired power station in Australia and this contract constitutes a great award to Magaldi's technology,

The dry ash extraction system configuration at Eraring is very simple: a large refractory lined hopper equipped with bottom doors is installed under the furnace. From there the ash fall onto the MAC® conveyor where it is cooled and transferred to the crushing station. The ash is then discharged into the existing ash sluiceway running along the boiler axis. The extraction of ash will be continuous, differently of what happens with the water impounded hoppers (storing and then downloading), increasing the reliability of the plant. Furthermore all the bottom ash will be ground to 80 mm, and discharged into the sluiceway in a controlled manner. This will result in a more reliable operation of the ash slurry system.

The first unit at Eraring will be retrofitted during the Spring outage 2009, whilst the other units in the following years. For both the Liddell and Eraring Contracts, the benefits expected for the retrofit of the water impounded hoppers are:

- Higher reliability of the bottom ash extraction systems.
- Boiler efficiency increase.
- No clinkers explosions in to the water and consequently much safer operations.

The 2 contracts together with the others already in place in the Country, brought Magaldi Power Pty Ltd market share in New South Wales up to 60%. This means that in 2011, when all the plants will be completed, the Magaldi Dry Bottom Ash Handling Systems will serve 60% of the coal fired power stations in New South Wales (both in terms of units and installed power). Magaldi Power Pty Ltd started its activities in Australia in 2003 and in only 5 years has become the market leader, opening a new era to the bottom ash handling concept: the dry systems.

During 2009 the Australian subsidiary of Magaldi Power S.p.A. is performing the local management of four contracts (Bluewaters, WA; Millmerran, QLD; Liddell and Eraring, NSW), many Italians had to move for periods in the Country in order to support the activities of the company. Till 2011 Magaldi Power Pty Ltd will be busy with two or more plants to be erected per year and with the increasing service activities due to the number of plants and their relevant age.

Chile

A brief overview of the country energetic scenario

by **Vincenzo Quattrucci** *Sales Manager* vincenzo.quattrucci@magaldi.com

In the overall scenario of South America countries, Chile has without doubts the most stable economical and political situation.

Even in these days of global economy slowdown, and recession for some nations, Chile is maintaining positive forecasts, based on the solid foundations given by the introduction of market reforms, a developed economy and a well manifested will to open up to international trade, in particular with the most industrialized countries.

Chile main export and economic index monitor is the copper industry, a sort of thermometer for the economical situation of the country, which by itself accounts for more than 26% of the country electricity demand. For the proper development of the extraction activities of this precious metal, there are many projects under way, since the Chilean electricity industry is wholly in private hands, with the government presence only in a regulatory, monitoring and indicative planning capacity. The market is divided into four grids, dominated by the Sistema Interconectado Central (Central Grid, or more commonly know as the "SIC", supplying energy to the almost 80% of the Chilean population), and including the Sistema Interconectado del Norte Grande (Northern Grid, or "SING" mainly supplying energy to the mining industry), and the southern systems Aysén and Magallenes, very small and limited to the most southern areas.

In the past several years, energy supply security has become a primary concern for the country, which has no significant hydrocarbon resources, to sustain its developing economy. At the beginning of 2000's there were plans supported by the government to realize additional hydroelectric power generation units and import gas within public-private projects, in particular trough land pipelines from Argentina and LNG terminals from overseas. Regarded as a renewable source, hydroelectric power currently covers more than one fifth of Chile's primary-energy needs.

But, since 2004, Argentine gas exports to Chile have fluctuated between 20-50 percent below contracted volumes. To make matters worse, with dramatic increases in international oil prices, replacing gas-fired electricity with diesel has been rather costly for Chile, which has been therefore compelled to examine different strategies for a better balanced energy mix, including a more important contribution given by new coal fired power stations.

In these few years, the country has reacted fast and quickly to this energy crisis: many projects based on coal have been presented for VIA approval, in order to respect and comply with the environmental limitation for the use of this fuel. And one of the technologies used by several Chilean utilities in their effort to have "clean coal" has been the Magaldi MAC® ash cooler. The Magaldi MAC® has a long presence in this country, having be installed in the 1990's in the two coal fired units of Edelnord Mejillones #1 and #2.

The use of this environmental friendly technology has been then extended to Endesa Bocamina 1 unit, and to the new coal fired boilers of Endesa Bocamina 2 and Colbun Coronel # 1, currently under erection.

End user	**COLBUN S.A.**
Plant # Unit	CORONEL #1
MWe	350
Retrofit/New	New
Ash rate	5 t/h
Ash rate max	15 t/h
Burned fuel	Coal
Boiler manufacturer	S.E.S.

End user	**ENDESA**
Plant # Unit	BOCAMINA #2
MWe	350
Retrofit/New	New
Ash rate	5 t/h
Ash rate max	15 t/h
Burned fuel	Coal
Boiler manufacturer	S.E.S.

End user	**ENDESA**
Plant # Unit	BOCAMINA #1
MWe	128
Retrofit/New	Retrofit
Ash rate	2,5 t/h
Ash rate max	10 t/h
Burned fuel	Coal
Boiler manufacturer	F. TOSI

India

2008: Magaldi Power meets the challenge of the Indian Power Sector

by **Aniello Gaglione** *Area Manager* aniello.gaglione@magaldi.com

India is currently the sixth energy consumer of the world: it has been estimated that about 3% of the total worldwide electricity production is consumed by India. The annual local population growth rate of 1.6% combined with continuous economic growth, is making the energy demand of the Country higher and higher.

Currently about 79% of the electricity production is obtained from fossil fuel in which coal plays the prominent role. India has the fourth highest coal reserves in the world, it consumes about 7,5% of the total coal produced worldwide.

The installed power in January 2008 has reached 141 GW (an increase of 9% compared to the previous year) and currently about 54% of this power is achieved through coal. This makes India the third biggest electricity producer in Asia, after China and Japan.

The 11th five-year development plan, introduced in the year 2008 envisages 61 GW to be installed in order to reach the target of about 200 GW within 2012 and giving to the coal a key role.

The Indian Power Sector is still facing many troubles related to the generation and reliability of the equipment with frequent shortages and blackouts. The electricity production is currently not able to keep pace with the high energy demand due to the fast growing economy of the Country.

The increasing number of projects in the Indian Power Sector has been combined with the increasing demand for new "cutting edge" technologies for the new Power Plants which are being manned by plentiful, skilled indigenous workers.

In this view and context, the Magaldi technologies have been really appreciated with consequent success of the Magaldi products and solutions in India for the year 2008: This has also been a very challenging task to achieve.

But let's take a closer look at the background: In early 2005 Magaldi Power got its first contract for a system for a new 300 MW Unit#7 in Durgapur Thermal Power Plant, located in the eastern part of India, an area which has always been suffering from serious problems of water shortages.

Magaldi Power was awarded the turnkey supply of both the dry bottom ash extraction system and the economizer's ash handling system (with a total of 42.8 tons per hour ash). The two Magaldi handling systems were ready to handle the first Indian ash by the beginning of 2008. The feedbacks from both the Owner of the Power Plant, Durgapur Project Ltd., and the Boiler Supplier, Dongfang Electric Co.Ltd., are very satisfactory.

The high added-value of the Magaldi personnel demonstrated during the erection and commissioning works, induced the Owner of the Power Plant in May 2008 to choose Magaldi Power also for the O&M Contract of the dry bottom ash system installed under Unit #7.

A Service Team based in Durgapur area assures the perfect functioning of the first system installed in India, working 24x7 and also would be the training hub catering for the other installations in the country.

From the year 2005 the specific interest of the Indian Power Sector in the dry bottom ash technology of Magaldi has been increasing by leaps and bounds. The outstanding features (water saving, boiler efficiency benefits and possible reuse of the bottom ash) are ensuring that the Magaldi MAC® system is the most apt technol-

ogy in practice. Only during the year 2008, Magaldi Power was awarded three more important Contracts in India.

JSW Energy Ltd. - Ratnagiri 4x300 MW

In July 2007 JSW Energy (Ratnagiri) achieved financial closure of its 1,200 MW power project based on imported coal. A consortium of 21 banks and financial institutions led by State Bank of India had committed to subscrive the entire debt portion (Rs 3,375 crore) of the Rs 4,500 crore project. JSWERL had been promoted by JSW Energy Ltd. (JSWEL), a part of the JSW group headed by Sajjan Jindal.

Since then, JSW and Tata Consulting Engineers have been working together with Magaldi on Ratnagiri project demonstrating a strong confidence in the dry bottom ash extraction and handling system and sharing together a lot of competence and support with the common goal of finding the best solution, tailored to Customer's needs.

Finally JSW Energy (Ratnagiri) Limited has entered into a contract with Magaldi Power for the Supply of dry bottom ash handling system for their 4x300 MW Thermal Power Plant at Jaigad District, Ratnagiri (Maharashtra).

The contract for supply of BTG has been awarded to Shanghai Electric Company, China and the zero date for the project was 4th July 2007. A captive port at Jaigad for import and transportation of coal has also been proposed.

The first unit is expected to be commissioned in September 2009 while the subsequent units are scheduled with a gap of 3 months each other.

Doosan Babcock Energy Itaqui 1x360 MW + Pecem 3x360 MW

In July 2008 Magaldi Power was awarded a new contract with Doosan Babcock UK for the supply of three MAC® dry bottom ash handling systems to be installed in Brazil:

The first project will realize a coal fired Power Station rated at 360 MW, to be built near the port of Itaqui, in the State of Maranhao.

The second project foresees the realization of a coal fired power station with three lines rated at 360 MW each with a combined capacity of 1080 MW, to be built near the port of Pecém, in the State of Cearà.

In December 2008 Doosan Babcock confirmed the outstanding collaboration with Magaldi Power by placing the order for the third line of Pecém Power Station, bringing at four the number of MAC® dry bottom ash handling systems. All the projects are being executed by Doosan Babcock Ltd. Chennai and the installation of the MAC® system will ensure the respect of the stringent environmental rules of the Brazilian State.

OPG Power – Gummidipoondi 1x80 MW + 1x80 MW

This project is related to the Captive Power Plant at OPG Power Generation Pvt. Ltd. Gummidipoondi, Tamil Nadu.

The contract for the first Unit was signed in August 2008. Given the tight timeframe available for the supply of the equipment, the performance required from Magaldi factory was really impressive. The MAC® Extractor, the Post Cooler and all the side equipment were ready at Chennai seaport as early as January 7th, 2009. The outstanding performance achieved persuaded OPG Power to grant Magaldi with the order for the next Unit which is expected for the first half of 2009.

The superior technology represented by the Magaldi dry bottom ash handling system has also been greatly appreciated by Central Electricity Authority in an article "Design features of boilers and auxiliaries being sourced from Chinese manufacturers" dated September 2008 (see figure 1).

In the wake of these challenging results, the Magaldi Power Board has positively deliberated and decided on the Incorporation of a New Magaldi Company in India, whose name has been approved as Magaldi Power India Private Limited.

The office will be located in Kolkata and will denote the desire of Magaldi Power to offer more and more dedicated services to the precious Indian Customers. After the initial gestation period, the Indian Company will act with self-government and also the opening of a local workshop is forecast.

Both our existing and potential Customers are warmly invited to take a careful look at all aspects of Magaldi technologies by contacting our General Manager for India Mr. Debasish Chakraberty at: chakraberty.debasish@magaldi.com and our Area Manager for India Mr. Simone Savastano at: simone.savastano@magaldi.com

REPORT OF THE COMMITTEE TO STUDY
DESIGN FEATURES OF BOILERS AND AUXILIARIES BEING SOURCED FROM CHINESE MANUFACTURERS

Central Electricity Authority, New Delhi, Sept. 2008

Par. 4.3.6
The Durgapur TPP bottom ash plant has been provided with dry bottom ash removal system supplied by M/s Magaldi, an Italian company. This type of system is provided for the first time in India and is found to be superior to the existing system.

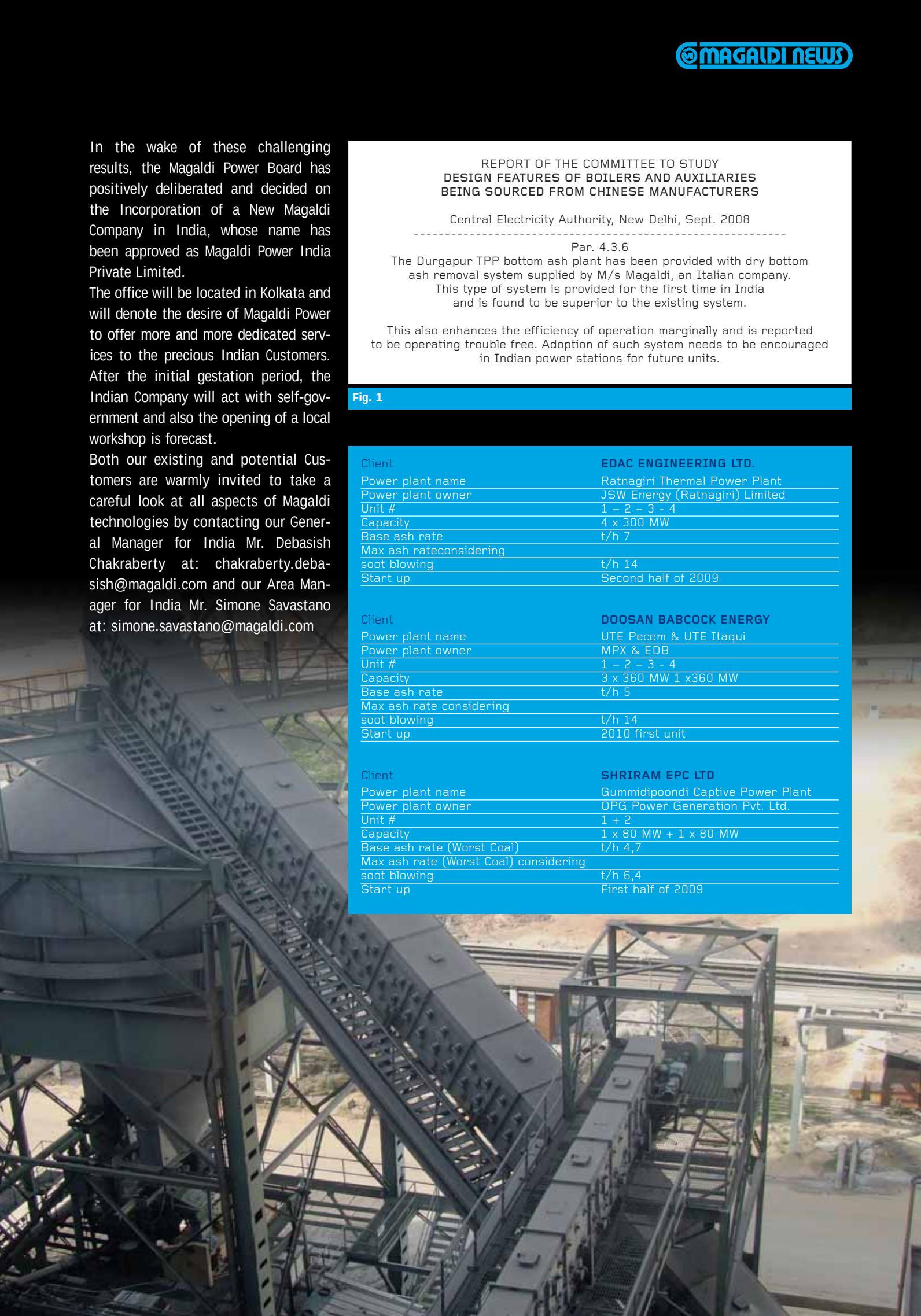
This also enhances the efficiency of operation marginally and is reported to be operating trouble free. Adoption of such system needs to be encouraged in Indian power stations for future units.

Fig. 1

Client	**EDAC ENGINEERING LTD.**
Power plant name	Ratnagiri Thermal Power Plant
Power plant owner	JSW Energy (Ratnagiri) Limited
Unit #	1 – 2 – 3 - 4
Capacity	4 x 300 MW
Base ash rate	t/h 7
Max ash rateconsidering	
soot blowing	t/h 14
Start up	Second half of 2009

Client	**DOOSAN BABCOCK ENERGY**
Power plant name	UTE Pecem & UTE Itaqui
Power plant owner	MPX & EDB
Unit #	1 – 2 – 3 - 4
Capacity	3 x 360 MW 1 x360 MW
Base ash rate	t/h 5
Max ash rate considering	
soot blowing	t/h 14
Start up	2010 first unit

Client	**SHRIRAM EPC LTD**
Power plant name	Gummidipoondi Captive Power Plant
Power plant owner	OPG Power Generation Pvt. Ltd.
Unit #	1 + 2
Capacity	1 x 80 MW + 1 x 80 MW
Base ash rate (Worst Coal)	t/h 4,7
Max ash rate (Worst Coal) considering	
soot blowing	t/h 6,4
Start up	First half of 2009



Germany

Hitachi awarded Magaldi the contract for three dry bottom ash removal systems for Electrabel's new build power plant projects in Germany and Netherlands

by **Günter Baur** *Magaldi Power GmbH General Manager* guenter.baur@magaldi.com

GDF SUEZ Energie Deutschland AG* started in 2008 with the construction of the first power plant at the Rüstersieler Groden in Wilhelmshaven.

Fig.1_Wilhelmshaven 800 MW Power Plant (3D Visualisation GDF SUEZ).

*Electrabel Deutschland AG changed its company name to GDF SUEZ Energie Deutschland AG.

Due to its seaside location, Wilhelmshaven is an ideal place to build a bituminous fired power plant. The coal can be transported to site directly by seagoing vessels in a time and cost effective way. A cooling tower is not required due to the availability of seawater for cooling the power plant and the plant efficiency can be by increased by another one percentage point.

The base load power plant with a gross capacity of 800 MW and a net plant efficiency of 46 % shall start commercial operation in 2012.

The plant location is allowing a later retrofit of components for CO_2 capture when this technology has been fully developed and the economical and

End user	ELECTRABEL GDF Suez
Plant # Unit	WILHELMSHAVEN #1
MWe	800
Retrofit/New	New
Ash rate	4 t/h
Ash rate max	12 t/h
Burned fuel	Coal
Boiler manufacturer	Hitachi Power Europe GmbH

Fig. 2_Photo from the construction site, January 09 (Source: GDF SUEZ).

Fig. 3_Wilhelmshaven 800 MW Power Plant (3D Visualisation GDF SUEZ) th pier.

legal basic conditions for it are established. The groundbreaking ceremony for the Electrabel power plant at Wilhelmshaven took place on 19 September 2008. This date also marks the dawn of the construction works for the power plant at which the Swiss utility BKW FMB Energie AG has a share of 33%.

The subsoil of the building site is the typical marsh at the north-west German seaside. The basement requires piling with over 2.000 piles, each 25 m long. Special machines are used to ram the piles into the ground. Afterwards a concrete slap will be affixed to the piling

For the time being the foundations for the main parts of the plant are under preparation. The construction of the chimney shall start first, followed later on by the turbine building and the boiler house. Compared with existing hard coal-fired power plants, the new unit for the same electricity production needs less fuel and such contributes to the conservation of resources and the CO_2 emission reduction. Also the Magaldi dry bottom ash system contributes to this with its heat recovery from bottom ash which is cooled by air instead of using water with the need of additional treatment.

The new supercritical steam generator will be equipped with the MAC® (Magaldi Ash Cooler). The coarse ash falling down and leaving the furnace through the boiler hopper throat is collected, air-cooled and transported by the Magaldi Superbelt® stainless steel conveyor. After discharge from the Magaldi Superbelt®, the ash size is drastically reduced in two single roller crushers. The further cooling and transportation of the bottom ash is obtained by means of another mechanical conveyor: the Postcooler, having a design similar to the MAC® extractor.

The cooled bottom ash finally is discharged into a dedicated silo with a storage volume of about 1.000 m^3.

The MAC® system for Wilhelmshaven will be delivered in 2010 and its commissioning shall be completed in 2011.

This new contract for Electrabel's new build power plants is the second one after Evonik's Walsum #10, Magaldi receives from Hitachi Power Europe. We are very pleased being selected again for this important order and would like to thank HPE and Electrabel for their confidence in our capabilities and experience.

New technology under development MAC as Postcombustor in case of RDF/biomass co-combustion with coal

by **Rocco Sorrenti** *R&D Manager* rocco.sorrenti@magaldi.com
Daniele Ricci *R&D Engineer* daniele.ricci@magaldi.com

In Italy the coal power generation park is primarily established on pulverized coal-fired power plants. Though the option to apply a RDF / biomass co-combustion with coal can whopping be advantageous for environmental and energy aims, it imposes an accurate control on the co-fuel size distribution fed to the boiler.

The MAP system (Magaldi Ash Postcombustor) has got some interesting capabilities in the RDF / biomass conversion, in case significant amounts of unburnt carbon should be extracted together with coal bottom ash.
The MAP can be qualified as a system able to extract bottom ash and promote the unburnt carbon postcombustion (see picture no. 1). Moreover, it can be considered a system integrated with the boiler, reducing the restrictions on the co-fuel size distribution and enhancing the whole hardiness regarding the co-fuel characteristics and the boiler load fluctuations.
The MAP system has the aim to support and promote the oxidizing phenomena of the unburnt fraction in the bottom ash extracted in a “dry” way (see picture no. 2).
It achieves the greatest advantages whereas, in a co-combustion condition, the coarser RDF / biomass fraction has not a residence time in the combustion chamber long enough to burn completely, due to a slower combustion kinetics. So it falls down together with bottom ash going to increase appreciably its unburnt carbon content.
In January 2007, MAGALDI Ricerche e Brevetti signed a new research agreement with the Scientific Laboratories of “Università di Napoli Federico II” – Chemical Enginneering Department and C.N.R. – I.R.C. (Combustion Research Institute) to investigate, develop and validate a mathematical model to simulate the MAC extractor as a postcombustor.

This mathematical model foresees an initial interface to set the process parameters, the boundary conditions and the type of co-fuel to be burnt.
It assures a certain versatility in case of the co-fuel is RDF or a kind of biomass. Then, it can be divided in two subsets (see picture no. 3):

1. One treats the ash particle fall from the combustion chamber to the bottom hopper and then on the MAC extractor belt.
2. The other one simulates the MAC extractor as a postcombustor.

Usually the easiest part of model evaluation is checking whether a model fits experimental measurements or other empirical data. In models with parameters, a common approach to test this fit is to split data into two disjoint subsets: training data and verification data. The training data are used to estimate the model parameters, while the verification data to test the validity of the general mathematical form of a model.
In the next months, it is planned to collect the above data from an Italian power station, burning RDF or biomass in co-combustion, with the aim to validate the mathematical model.

Patents:

> "Steam generating system and method for discharge of ash" – International Patent No. EP471055 B1s, priority IT1955490 02 March, 1990;

> "Plant and method for dry extracting, cooling heavy ashes and controlling the combustion of high unburnt content residues" – PCT/IT/2007/000118 27 February, 2007.

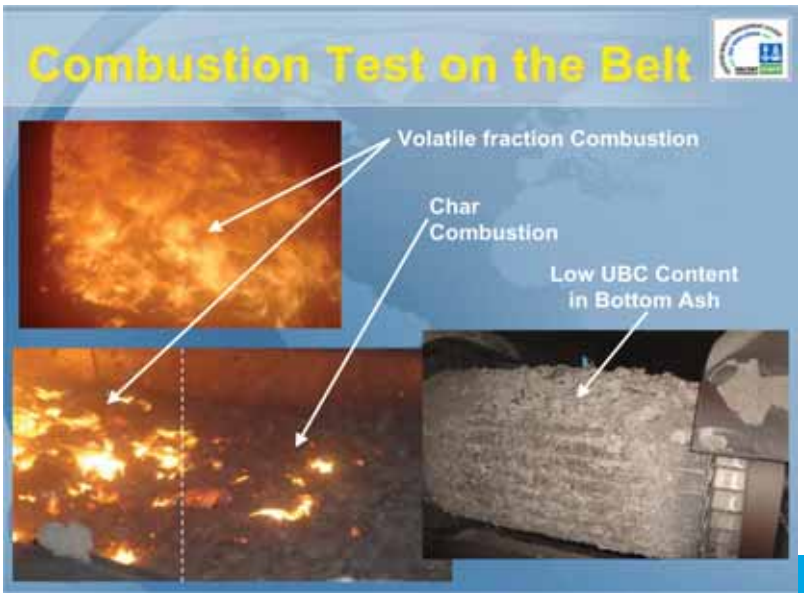


Fig. 1

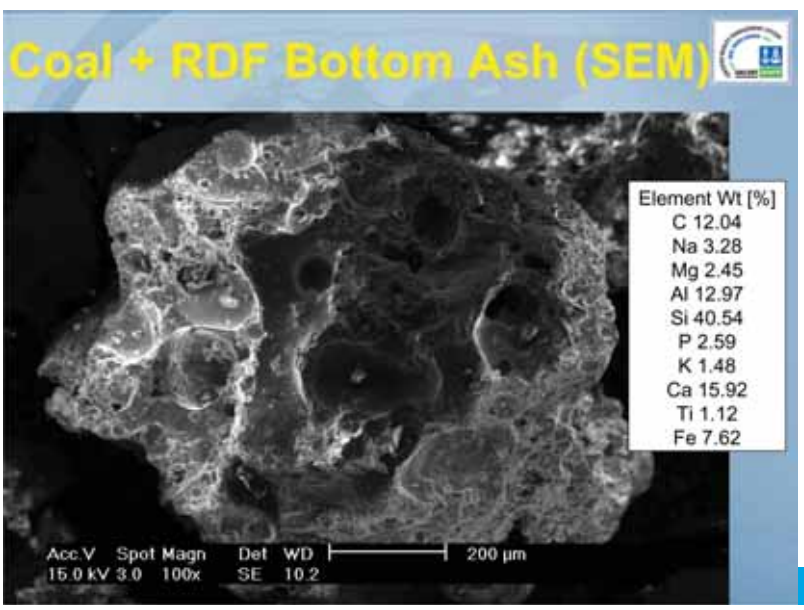


Fig. 2

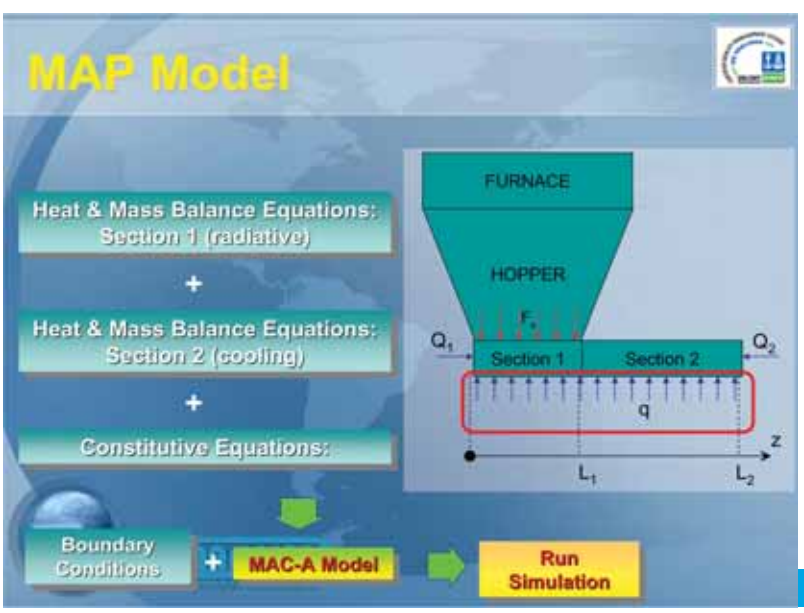


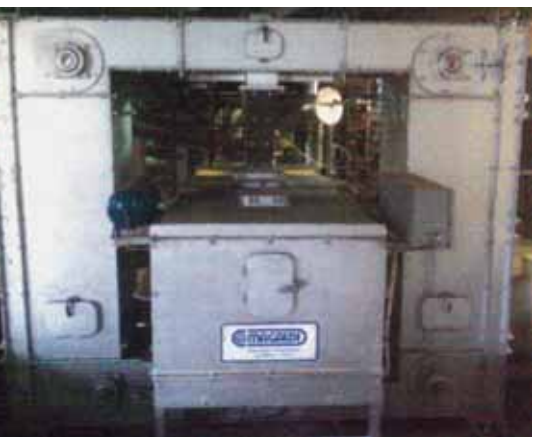
Fig. 3

France

E.ON - LA SNET - EMILE HUCHET Power Plant - Saint- Avold North Ash handling from circulating fluidized bed boilers

by **Matteo Carfagno** *Sales Area Manager* matteo.carfagno@magaldi.com

Emile Huchet power plant, due to its location in Saint-Avold North, halfway between Metz and Sarrebruk, is in the heart of the European electrical network. The construction of the power station, located in the coal basin of the Lorraine, started in 1948. Today the Power Station is equipped with three units (two of them pulverized coal-fired boilers) with a total installed capacity of 1.086 MW.



The unit #4, which was commissioned in 1990, with a capacity of 125 MWe, is one of the first applications of fluidized bed boilers technology in the world, burning fuels with low caloric value in compliance with the European legislation.

Coal is maintained in suspension in the combustion chamber by a flow of forced air; the resident time in the combustion chamber is enough to ensure a complete burn-out of the carbon contained in the fuel. The combustion at low temperature, approx. 850°, and the addition of limestone makes the operation particularly respectful of the environment with reference to the sulphurous anhydride (SO_2) outflow in the air.

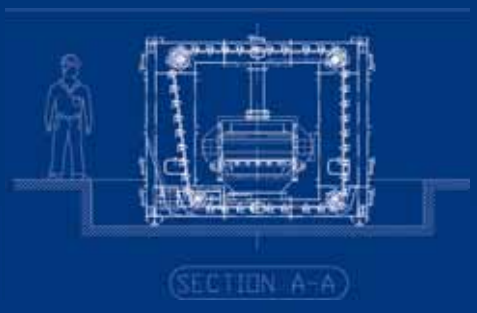
The bed ash is cooled down in a bottom ash cooler from which is discharged into the downstream conveying system.

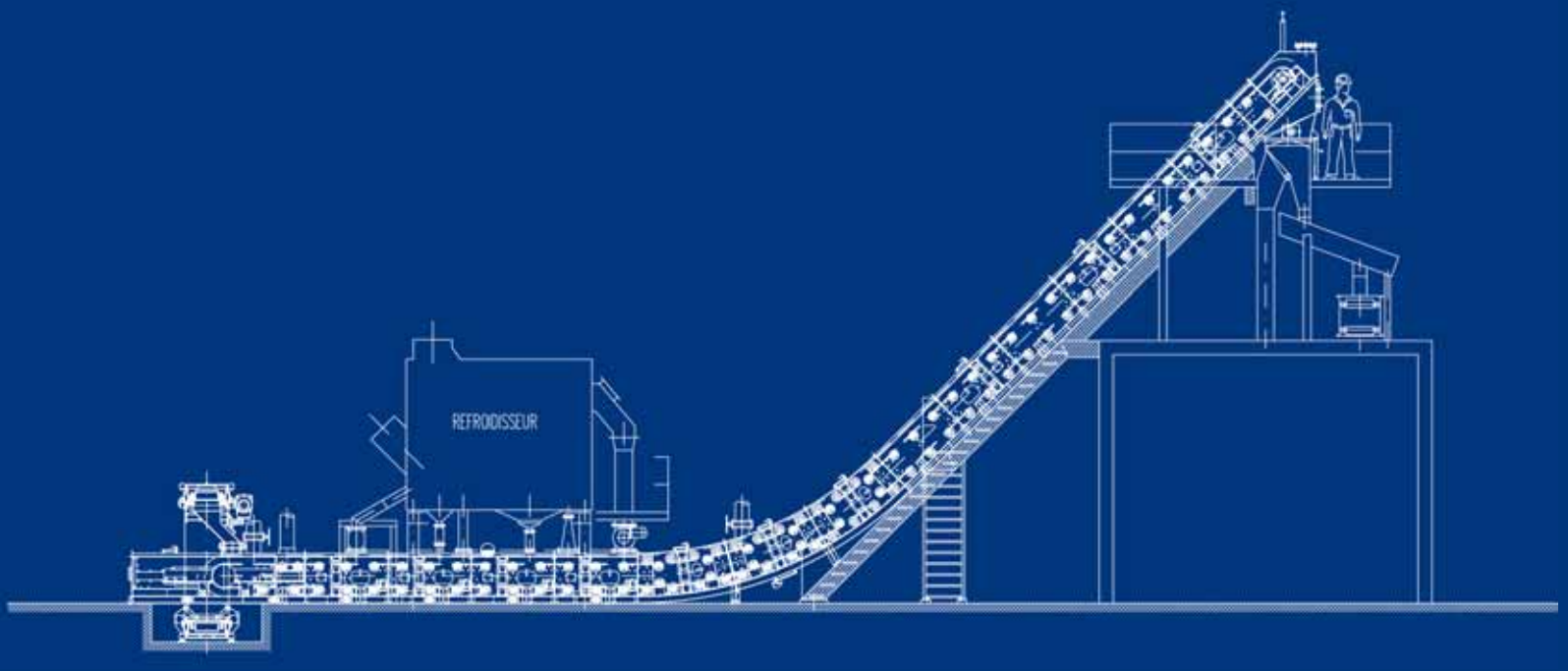
The bed ash handling system was realized by a Redler conveyor, receiving ash with an average temperature of 250°C and peaks of 800°C.

Continuous malfunctions of the Redler led to frequent shutdown of the boiler; as a matter of fact the very abrasive nature and high temperature of the bed ash, caused conveying chain

PROCESS DATA			
Material	**Grain size**	**Capacity**	**Temperature**
bed ash from CFB unit	Normal 0-6 mm Max. 80 mm	15 t/h - 22 t/h	Average 250° \ Max. 800 °C (for short peak load)

EQUIPMENT DATA			
Conveying system	**Center distance**	**Belt width**	**Inclination**
Magaldi Ecobelt Superbelt ED4. NX-0805.155-V	22,5 meters	800 mm	45°





breakages with subsequent unexpected boiler outage.

In those cases the timely intervention of the maintenance personnel was necessary to replace the damaged parts, with safety problems as well as of loss of production.

In order to solve these problems, on June 2006, La SNET decided to replace the Redler conveyor with a Magaldi-Ecobelt conveyor, whose main component is the patented stainless steel belt, the Magaldi-Superbelt, with a special guarantee of 36 months!

The Magaldi Superbelt is a steel pan conveyor belt, specially designed for hot, abrasive, bulk material, such as

- coal ash, lignite;
- pozzolana, limestone, cement clinker, lime;
- silica sand, manganese sinter, lead sinter.

The bed ash coming from the cooler through seven loading points is unloaded and conveyed to the screening point and successively to a storage bin.

The loading area of the Magaldi-Ecobelt conveyor is horizontal and the 7 loading points (one is the main point and the other six represent the fluid bed drains) have been equipped with three rotary valves and four slide gate valves to control the constant ash flow.

The second line of the conveyor is inclined up to 45°, The Magaldi Superbelt has been provided with transversal cleats that can efficiently transport the ash at high inclination.

The Magaldi Ecobelt Conveyor is completely enclosed in an air tight steel casing which guarantees a total environmental protection, avoiding dispersion of dust or powder in the ambient.

All rollers' bearings are located outside the casing in order to ensure tightness and easy maintenance.

In order to improve the efficiency of the Magaldi Ecobelt, has been developed and installed, the Magaldi O-Chain. It allows to remove the residual dust from the bottom of the casing avoiding that the belt drags with wearing consequences.

Its exclusive features include:

- Minimize conveyor wearing.
- To manufacture Magaldi Superbelt conveyors with bigger lengths and equipped with a dust recovering system, without using drag chain conveyor to cover the entire length of the conveyor.
- Easy inspection and maintenance operations, as the Magaldi O-Chain System is applied under the tail section of the conveyor.

P.R. of China

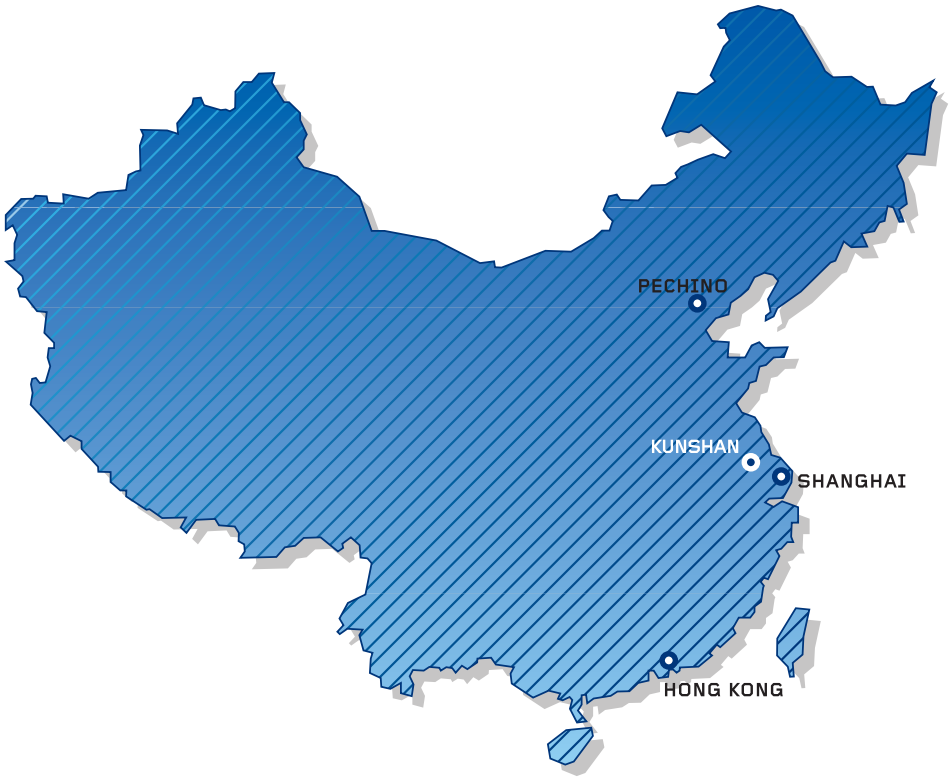
Georg Fischer Kunshan initial operation test and start up

by **Alberto Lalia** *Sales Engineer* alberto.lalia@magaldi.com

The third week of January 2009 the first castings have been produced in the Chinese Georg Fischer Kunshan foundry. In this foundry two Magaldi Casting coolers 85 meters long and 1,6 meter wide have been installed to cool the castings from 650 °C to less than 100 °C.

The installation was a perfect integration of the Italian management directly from the head office of Magaldi in Salerno, the supervision of a Magaldi Indian supervisor and the erection of the equipment by a Chinese sub-contractor company.

In less than 20 days the conveyors have been erected, demonstrating the easy installation property of the Magaldi Superbelt.



In fact the Magaldi conveyor comes in pre-assembled section of 2,8 meters, ready to be bolted each other.
Since the acquisition of the contract Magaldi Power (responsible for casting cooling), Gemco (project coordinator for the complete foundry construction) and Georg Fischer have cooperated for achieving the target: start with the production in the beginning of 2009.
The Research and Development department has studied the cooling of the castings, the engineering department has designed the conveyors and the cooling hood, changing the project as per customer request.
In fact initially the coolers had to be 1200 mm wide loaded by a manipulator, at the end after discussion and different decision of the customer, the Magaldi Casting Cooler has been designed 1600 mm wide, loaded directly from the shake out.
The Magaldi customer oriented philosophy has allowed to match completely the customer request.
Another complete success for the Magaldi Group in foundry business and we are really proud of this event that corresponds with the 80 years anniversary of the Magaldi Company.

Type of plant: Foundry

Owner:	Georg Fischer Automobilguss
Location:	Kunshan - China
Contract award:	March 2008
Material:	Castings
Total Capacity:	40 tons/h (20 t/h for each MCC)
Numbers of Magaldi Casting Cooler:	2
Length:	85 meters
Useful width:	1600 mm
Inlet temperature of the castings:	650 °C
Outlet temperature of the castings:	less than 100 °C

Spain

Magaldi conveyors for forgings transportation in Estamcal Plant

by **Alberto Lalia** *Sales Engineer* alberto.lalia@magaldi.com

Project evolution

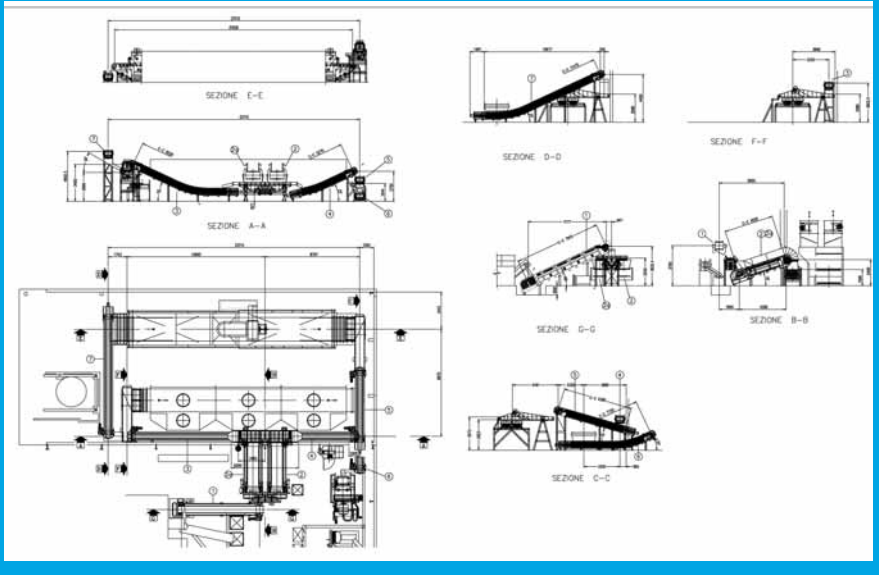
Estamcal is a Spanish customer that at the beginning of 2008 requested a quotation for eight conveyors to be installed in a new forge plant.
After a deep analysis of the project we realized that the Magaldi Superbelt conveyors were too big for the available space. Moreover, the project would have been too expensive in the original configuration required by the customer.
Magaldi Technicians were really excited to work on this task and gave all their efforts to find a creative solution that proved to be brilliant and innovative.
In fact they changed the layout, proposing a solution that fitted the customer requirements and developed custom-made conveyors, small in dimension and "light" in price in order to make the project feasible.

Process description

The process consists in the handling of hot forgings (900° C) coming from an automatic Hatebur press, producing 100 pieces per minute.
The forgings are initially stored onto two Magaldi conveyors, waiting to be gradually fed into an heat treatement furnace. At the outlet of the furnace, the forging are transported into a cooler that cools the pieces in a controlled environment in order to get the proper hardness and metallurgical properties.
After the controlled cooling, the pieces are ready to be sent to the shotblasting through an other Magaldi conveyor.
A total of eight Magaldi conveyors are installed in this plant, successfully commissioned in September 2008, that has been working with great customer satisfaction since then.

Type of plant: Forge

Owner:	Estamcal Estampaciones En Caliente, S.A
Location:	Abadiño - Spain
Contract award:	February 2008
Material:	Forgings
Capacity:	9 t/h
Numbers of Magaldi conveyors:	8



Italy

ENI Group S.p.A. has reached a lowest cost per ton installing two Magaldi Stamler "flat back" reclaim feeders in Gela Refinery (municipality of Gela-Sicily)

by **Alfonso Pirro** *Sales Engineer* alfonso.pirro@magaldi.com

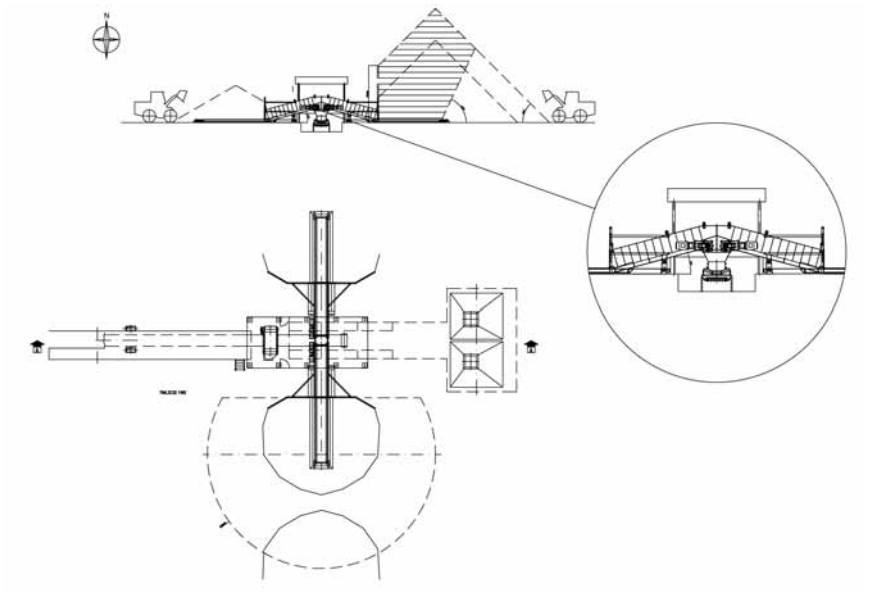
ENI Group S.p.A. has decided to assign to Magaldi Group the contract award for two Magaldi Stamler pet-coke reclaim feeders for the reliability and efficiency improvement of the boiler bunkers feeding system of the 3x150 MWe pet-coke fired Units of Gela Refinery Power Plant (municipality of Gela-southern coast of Sicily).

Client	**ENI S.P.A.**
Power plant name	Gela Refinery S.p.A.
Power plant owner	Gela Refinery S.p.A.
Units	#1, #2, #3
Pet-coke yard capacity	10.000 ton
Throughput – design	300 t/h
Pet-coke design temperature	80 °C
Contract awarded to Magaldi	2007
Start up of on site activities	June 2008
Start-up	May 2008

Gela Refinery is one of the most advanced petrochemical plant in Europe. The great attention and respect that ENI Group always had toward the environment and its employees health conditions, have been the key elements that contributed to the construction of this cost effective and efficient system.

Magaldi Stamler is a fully automated system installed in the existent pet-coke yard that guarantees the continuous feeding @ 300 t/h each machine of the bunkers of the Power Station inside the Refinery.

The old existing system was made by a



carbon steel feeding hopper located under the ground complete with a carbon steel grade with 300 mm mesh to avoid that big lump size from the yard could fall down and broke the downstream rubber belt extractor system. The system has always been a big problem for the customer because of the frequently failures due to the heavy duty application. It meant the huge risk to not refill the boiler bunkers.

Magaldi Stamler gave the customer the opportunity to use a "heavy duty" and dependable reclaiming system in which material is transported completely efficiently and where the process is fully automated.

ENI Group has confirmed the trust for Magaldi in Gela Refinery Power Plant after the previous installations of three Magaldi MAC® dry bottom ash handling system in 1998 and the first European reference Magaldi FDC (Flow Dynamic Conveyor) air floating belt conveyor in 2006.

Why has Gela Refinery installed two Magaldi Stamler reclaimer feeders?

Simply because:

1. Magaldi Stamler "flat back" reclaim feeder is an efficient, cost effective method of reclaiming stockpiles and feeding material. The installed reclaim feeders have been custom designed and built to suit the individual site conditions and Gela Refinery requirements.
2. Eliminate costly civil work & site preparation since in-ground hoppers, grids, tunnels and underground belt systems are no longer needed. It requires only solid, level ground conditions for installation. Then, material forms its own surge hopper, eliminating expensive fabricated upper hoppers and structures.
3. It is versatile and efficient since "flat back" hopperless design allows material to be pushed by dozers or vertically discharged from front-end loaders, trucks, clam shell buckets and excavators directly onto the integral drag conveyor. Its main features are rugged machine frame design for dependable performance and availability, mobility options include skid, wheel, crawler or railroad wheel mounting to match any reclaim condition.

The installation of the Magaldi Stamler and the respect for the environment go along with the most favourable terms of sale that Magaldi Group has proposed to ENI Group, which includes the setting up of a Project Financing process using the construction-management- transfer technique or B.O.T (Built, Operate and Transfer).

This process involves the submission of the Job to the engineering company, including the management of the equipment, for an estimated period of time with the transfer of the equipment ownership to the final customer at the end of the determined period.

The solution entails the ability to manage returns on investment and operative costs through a monthly leasing.

One of Magaldi Group's affiliates is specialized in the management of industrial plants for third parties, and it has obtained for 10 years the management of ENI's plant for the coke loading equipment with the Magaldi Stamler, receiving as a compensation a monthly payment which allows ENI to benefit not only from the adoption of this new technology, but also the costs savings on the investment.

Why has Gela Refinery installed two Magaldi Stamler reclaimer feeders?

- Lower capital cost compared with conventional fixed reclaimers;
- Higher capacity and lower cost per tonne compared with wheel loaders;
- Can be fully automated;
- Easy and quick to install and relocate e.g. for winter stockpiles;
- Can effectively handle wet sticky material.

Renewable energy: solar power project

by **Raffaele Ciotta** *Project Manager* raffaele.ciotta@magaldi.com

In the past forty years, the growing cost of fossil fuels and the increasing of problems due to pollution have motivated a worldwide movement to preserve the environment by promoting the development of technologies based on renewable energy sources, as wind, tides and sun.

Despite the present global economic crisis, the expected photovoltaic's market growth will increase in the next five years.

In particular, the Italian market is considered the most attractive for several reasons:

- The highest growth rate of the business compared to other European countries;
- High solar irradiation (ranging from 3.6 kWh/m2/day to 4.7 kWh/m2/day);
- Strong government incentive.

For the above mentioned reasons, it is estimated a market's annual growth from 500 to 1000 MW this year, that should reach about 1,500 MW in 2010.

Since 2002, the overall amount of worldwide energy generated from this innovative technology is highly increasing by an average of 48% each year, making it the world's fastest-growing renewable and clean energy technology. Financial incentives, such as preferential feed-in tariffs for solar-generated electricity and net metering, have supported solar PV installations in many countries including Germany, Japan, United States, Spain and Italy.

Magaldi Group, in order to fulfil its mission to be an environment friendly company, have recently decided to take this great opportunity, realizing the biggest grid connected power plant on roof in Italy; a full integrated installation of 2 MW, on the coverage of its facility, located in Buccino.

The photovoltaic power plant should be completed in June 2009, will be able to provide 100% of the electricity consumption of the facility.

80 YEARS 1929-2009

MAGALDI GROUP: 80 YEARS OF TRADITION AND SUCCESS

by

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1929
Paolo Magaldi started his business activity in Buccino, his hometown near Salerno, manufacturing a unique leather transmission belt, the Magaldi Superchinghia, patented earlier in 1901 by Emilio Magaldi.

1947
The company moved to Salerno to support the growth of the business.

1969
Paolo Magaldi began to work to a steel belt conveyor for bulk and abrasive material handling; in 1971 the idea came true with the patent of the "EUREMAG" conveyor and the production of some prototypes. His son, Mario, gave a significant contribute motivated by his great passion for technical and mechanical activities.

1971
Unfortunately, both parents of the young Mario died in a tragic accident and he had to take in charge the responsibility of the company. He started the hard work of industrialization and diffusion of the conveying systems based on the steel "EUREMAG belt technology."

1972
A new company named Magaldi Industrie Sas was founded, incorporating workers from the old company Cinghie Magaldi.
Based on the experience gained after years, Magaldi Industrie began to design and supply systems for mechanical transportation of bulk materials and became an exclusive distributor of conveyor components.

1985
Magaldi Industrie, moving ahead with the evolution of the market and thanks to the unique wealth of experience accumulated during the years with the Superbelt (new name of the EUREMAG conveyor), developed the MAC® (Magaldi Ash Cooler) the dry system to handle bottom ashes of solid fuel fired boiler without using water.
This system allows to save million tons of water and ensures a continuous operation of thermoelectric power plants.

1991
A Licensee agreement with the Japanese company, Tsubakimoto Bulk Systems Corp., has been signed to exchange the licences of fabrication of the Superbelt in Japan and the TSUBAKI Bucket Elevators in Europe.

1992
MAGALDI RICERCHE E BREVETTI S.R.L. was founded to develop Magaldi's original technologies.
Since its foundation, Magaldi Ricerche e Brevetti has patented a wide range of new bulk handling technologies which are now applied in power, cement, foundries and other metallurgic industries.

1994
A Licensee agreement with the Japanese company, Kawasaki Heavy Industries Ltd, has been signed for commercialization of MAC® Systems in Japan.

1998
RRS S.r.l. was founded to operate in industrial plants under BOT contracts - Build Operate and Transfer - to Power and Chemical industries.

2001
Magaldi Power S.p.A., the power division of Magaldi Group, was founded to commercialise Magaldi's dry bottom ash handling systems for solid fuel-fired boilers in the power generating industry.

2002
A Licensee agreement with the Japanese company, Kawasaki Heavy Industries Ltd., has been signed for commercialization of FDC (Flow Dynamic Conveyor), an innovative, high-speed idlerless belt conveyor system that uses air pressure to handle bulk materials, in European market

2003
Magaldi Power Pty Ltd was founded in Australia. Located in New South Wales capital, Sydney, this company has already several contracts related to the supply and installation of Magaldi's MAC® dry bottom ash handling systems for coal fired boilers in the Australian power generating industry.

2005
Magaldi Power S.p.A and Allen-Sherman-Hoff (A-S-H), a division of Diamond Power International, Inc., signed a licensee agreement for the design and supply of the Magaldi dry-bottom ash extraction system (the MAC® System) in the United States.

2006
It was celebrated the new Magaldi's workshop in Buccino covering an area of 17.000 sqm. The plant includes two separate buildings: one for the offices and one for manufacturing. The new workshop is located in the Industrial area of Buccino, near the Bianco river.

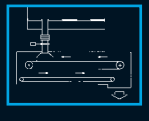
2007
Magaldi Power GmbH was established in Germany. Located in Esslingen next to Stuttgart (capital of Baden-Württemberg), this company is in charge of marketing Magaldi's MAC® dry bottom ash handling systems for coal fired boilers in the German power generating industry.

2008
Magaldi was proud to announce the installation of the 100th unit in the world since the first unit in 1985.

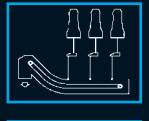
MAGALDI
Dependable technologies

MAC – Magaldi Ash Cooler
Dry bottom ash extraction system

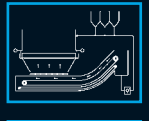
SUPERMAC
Extraction and air/water cooling system
for large quantities of heavy ashes



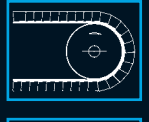
Magaldi Fluimac
Dry ash extraction system for fluid bed boilers



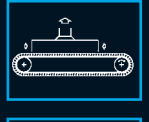
MAGALDI MRS – Magaldi Mill Rejects System
Dry coal mill rejects handling system



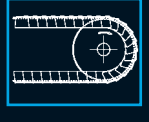
MAR – Magaldi Ash Recycling
Dry extraction and recycling of bottom and fly ash



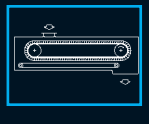
Magaldi Superbelt
Dependable steel belt conveyor



MCC – Magaldi Casting Cooler
Magaldi Superbelt for forced air casting cooling

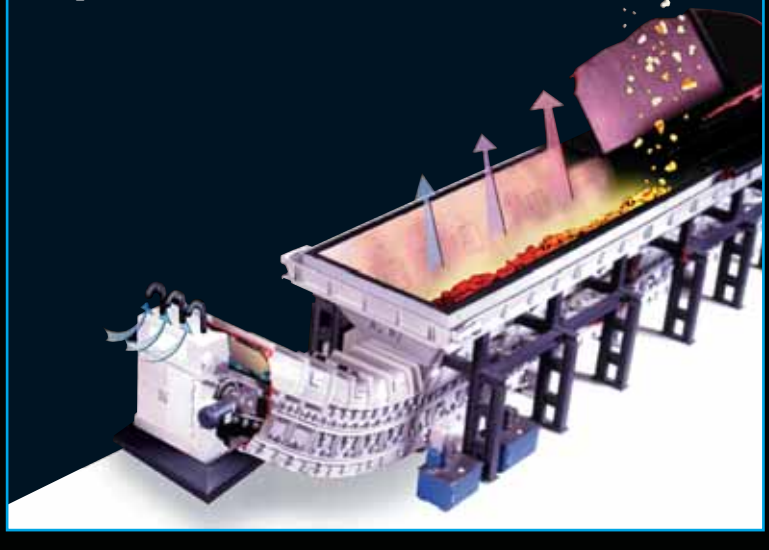


Magaldi Superbelt PR/PRZ
Magaldi Superbelt for casting sorting over sprues



Magaldi Ecosuperbelt
Dust proof Magaldi Superbelt conveyor

Dependable
by innovation since 1929



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