



FLEXICOM -LNB

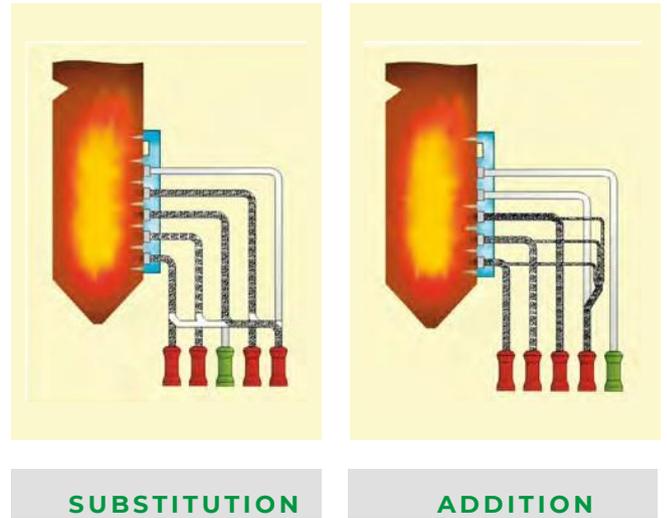
COMBUSTION TECHNOLOGY FOR LOW NO_x
OPERATION AND IMPROVED BOILER PERFORMANCE

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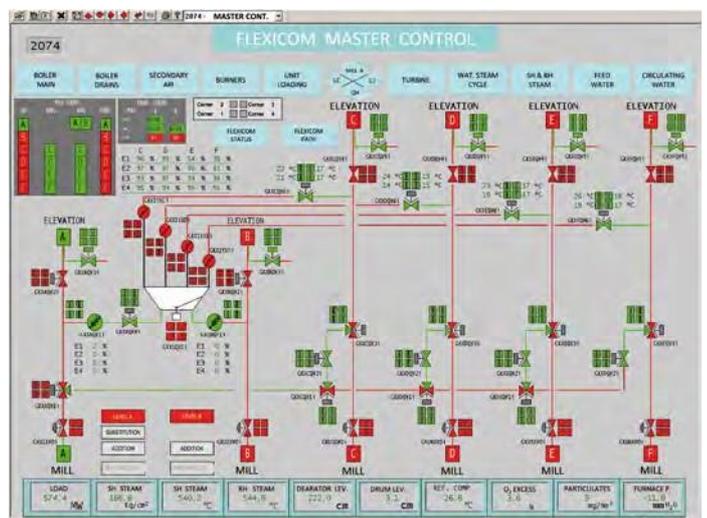
GENERAL OVERVIEW

- FLEXICOM-LNB: ability to regulate burner use for most favorable “in-furnace firedistribution”
- Continuous and steady combustion process operation can be maintained within a defined area avoiding unwanted scenarios promoted by the unavailability of mills, such as “burner gap” which leads to increased NOx and carbon-in-ash
- Retrofit of the combustion system consists of mechanical changes in the pulverized fuel conveying system:
- Substitution System: steady air/fuel supply regardless of mill in service (minimization of NOx, CO, carbon-in-ash and heat rate, increased flexibility for mill maintenance)
- Addition System: maximum stratification (minimum NOx without the increase of flue gases temperature)



COMPETITIVE ADVANTAGES

- Cost-effective solution for NOx reduction compatible with enhanced process safety, availability and efficiency
- Maximum fuel and air stratification avoiding increases in carbon-in-ash, radiant SH surface temperature, SH steam temperature, flue gas temperature
- Parallel increase in boiler and milling system operating flexibility
- Versatile technology to simultaneously address different targets: heat rate, emissions and/or operational constraints
- System design and start-up under NFPA-85 regulations
- Short boiler outage



APPLICATIONS

- Heat rate optimization by controlling steam and flue gas temperatures and minimizing carbon-in-ash
- NOx reduction through application of enhanced combustion conditions (without detrimental effects)
- Reduction of SCR/SNCR capital and operating costs:
- Typical savings in capital costs: 6 - 8% (catalyst volume, reagent storage plantsize)
- Typical savings in operating costs: >30% (catalyst replacement, NH3 reagent consumption)
- Optimization of boiler/milling system availability, operation flexibility and maintenance
- Fuel use optimization: poor quality or difficult fuels, co-firing
- Increased potential for NOx reduction through reburning and ammonia/urea injection
- Cost-effective reduction of mercury emissions by means of improved combustion tunings

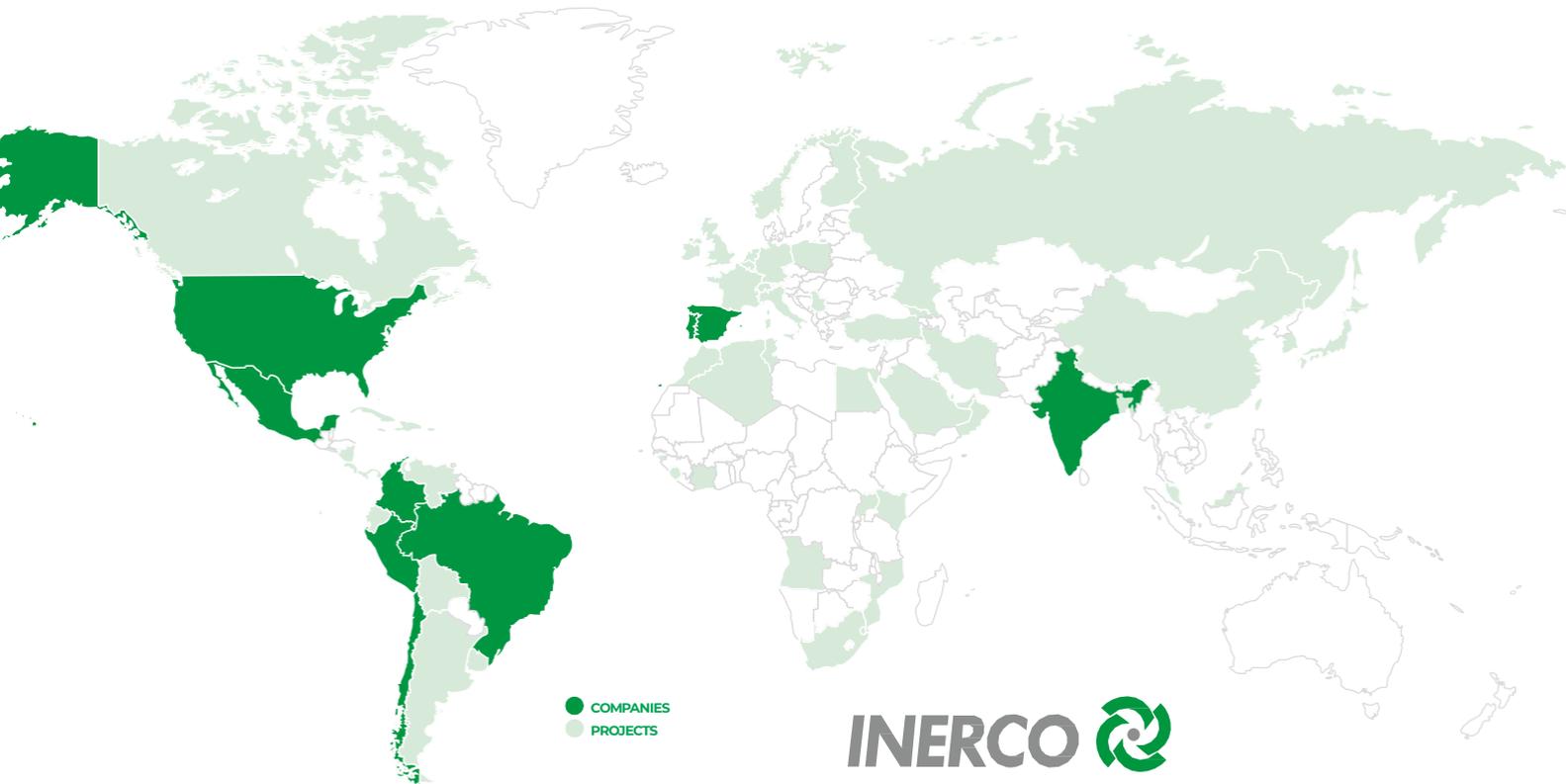


Typical ROI periods as low as 1-2 years

EXECUTIVE SUMMARY



- FLEXICOM-LNB, retrofit of coal pipe layout to:
- Reduce SCR/SNCR capital and operating costs
- Improve heat rate and minimize carbon-in-ash
- Minimize NOx emissions by primary measures (fuel and air staging)
- Enable the use of lower quality fuels
- Control mercury emissions
- NOx generation and combustion efficiency unaffected by change of mills in operation
- Avoidance of typical fuel and air staging collateral problems such as increased carbon-in-ash, corrosion, steam and tube temperatures, flue gas heat losses, etc.
- Advantages of implementing FLEXICOM-LNB:
- Cost-effective solution for NOx reduction
- Improved overall performance and operating flexibility and safety
- Versatile application to multiple objectives



● COMPANIES
● PROJECTS



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OUR CLIENTS

GAS AND ELECTRICITY

Abelló Linde - AGA - Air Liquide - Alstom - BP Solar - CENER - CFE
- Colbún - EON - EDF - EDP - Elcogas - Emgesa - Enagas - Endesa
- Endesa Ireland - EnergieKontor - EON France - EON Italia - EVN -
Gas Natural - GDF Suez - HidroCantábrico - Iberdrola - Intergen - Linde
Gas - MedGaz - Pegop - Praxair - Promigas - PKE Polska - Reganosa
- Saggas - Scottish Power - Viesgo

HYDROCARBONS

Agencia Nacional de Hidrocarburos de Colombia - Asociación
Colombiana del Petróleo - Atofina - Baker Hughes - Bhp Billiton - BP -
Cepsa - CLH - Conoco Philips - Ecopetrol - Exxon Mobil - Mansarovar
Energy Colombia - Petro Santander Colombia - Petróleos de Venezuela
- Petrolífera Petroleum - Petronor - Repsol - Sonatrach

CHEMICAL AND PETROCHEMICAL

BASF - Biofilm - Brenntag - Brinsa - Dow Chemical - ENCE - Ercros -
Erkol - Ferial - FMC Foret - Huntsman Tioxide - MAXAM - Mexichem
- Oiltanking - Propilco - Rhodia - Solvay - UBE - Voridian

MINING

Bhp Billiton - Boliden - Catalina Huanca Sociedad Minera - Cerro
Matoso - CLC - Glencore - Los Quenuales - Matsa - Perubar

CEMENT AND STEEL

Aceralia - Acerinox - Argos - Atlantic Copper - Cementos Portland -
Cemex - Cimpor - EADS - Holcim - IZAR - Lafarge Asland - Malpesa -
Titan America / Separation Technologies - UNESID - Xstrata Zinc - Zinsa

ENGINEERING COMPANIES AND INFRASTRUCTURES

Abengoa - Acciona - Conalvías - Duro Felguera - Elecnor - FCC - Fluor
- Foster Wheeler - Gamesa - General Electric - Inabensa - Intecsa -
Inarsa - Isolux Corsán - Lima Ingeniería y Construcción - OHL - Opain
- Sener - Soluziona - Technip - Técnicas Reunidas - Vicon