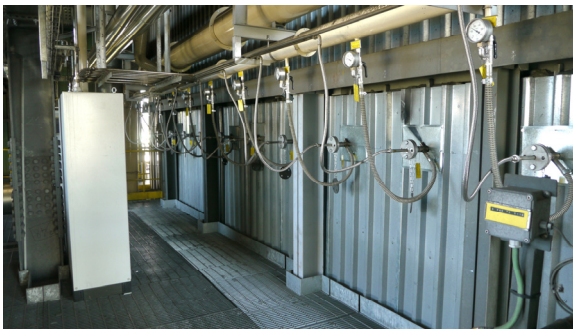




# Installation of the Ecotube System at CTGB (Le Gol) Power Plant, France

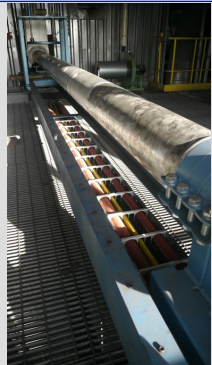


The installation at CTGB is the third coal-fired unit to be equipped with an Ecotube System. The pulverized coal unit at CTGB (Reunion Island, Indian Ocean) comprises six rear wall burners rated at 33,6 MW<sub>th</sub> each and 6 large OFA ports. The unit was commissioned in 2006 by ANSALDO Caldae (Italian builder). The boiler is also fitted with a spreader stoker system and a water cooled grate enabling burning of bagasse (sugar can fibbers). So far the unit has only operated with coal. The unit is fitted with so called “Low NO<sub>x</sub> Burners” but after commissioning the unit failed to meet the stipulated emission standards for NO<sub>x</sub> and CO. (300 mg and 100 mg @ 6% O<sub>2</sub>). After a BAT review by the operator during 2010/11 they ordered an Ecotube System coupled with a wall type SNCR system. The unit was equipped with 2 Ecotubes (with incorporated urea injection nozzles) and a front wall SNCR system comprising 2 injector levels. This retrofit installation was designed and fitted in late 2011 and commissioning took place in March 2012.

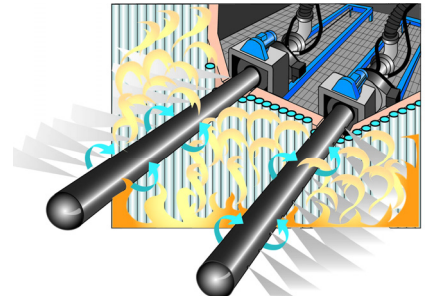


The Ecotube System in CTGB now works successfully both as a combustion optimisation tool (reducing formed NO<sub>x</sub> and CO). NO<sub>x</sub> is further reduced with the incorporated urea injection system to values of < 200 mg/Nm<sup>3</sup> if needed.

An important advantage for the customer has been the cost reduction achieved by being able to use less urea for NO<sub>x</sub> reduction compared to a traditional SNCR system. The Ecotube System reduces formed NO<sub>x</sub> from the combustion process by air staging as a first step thus reducing urea consumption by 65% to meet the current emission standard.

<b>Plant:</b>	Le GOL (CTGB) Power Plant	
Plant owner:	Séchilienne SIDEC	
Boiler:	Pulverized Coal	
Purpose of installation:	NO <sub>x</sub> and CO Reduction	
Year of installation:	2011/2012	
Operating time:	> 8000 hours/year	
Power output:	200 MW <sub>th</sub> approx 58 MWe	
Steam output:	200 t/h, 540°C	
Fuel:	Coal (South African)	
<b>Pre Ecotube Emissions*</b>	* All values correspond to mg/Nm <sup>3</sup> @ 6% O <sub>2</sub>	
NO <sub>x</sub>	450/500	
CO	100/200 (over 200 during wall cleaning cycles)	
<b>Post Ecotube Emissions*</b>		
NO <sub>x</sub>	280	
CO	< 50 (even during wall cleaning cycles)	

The Ecotube system optimizes the combustion process in boilers. Ecotubes are retractable lances which penetrate the boiler furnace wall and are equipped with injection nozzles. The Ecotube system supplies a small proportion of the combustion air under high pressure through the high velocity nozzles. Injection of high velocity air streams creates radically improved **mixing** of the partially burned combustion products, so enabling efficient completion of combustion and significantly reduced emissions of pollutants like NO<sub>x</sub> and unburned components – CO, VOC (Volatile Organic Compounds), particles etc. Improved mixing enables the boiler to run at a lower air/fuel ratio, thus resulting in a higher thermal efficiency. Another important feature is the opportunity to increase thermal output of the boiler.



**ECOTUBES also supply either solid or liquid urea, anhydrous or liquid ammonia for DeNO<sub>x</sub> or limestone for DeSO<sub>x</sub>.**

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