

Prolonging the Economic Lifetime of GTCs and FTCs

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Abstract

After decades of operations of environmental systems such as GTCs and FTCs, operating conditions may have changed such that severe pressure is exerted on the remaining economic lifetime. Capacity drift of the constituting components is an additional factor that may weaken the prospects for the systems. As a consequence, investment requirement may become acute or operational limits may be imposed on the associated production plants (smelter and anode baking furnace, respectively). This article describes approaches towards improving performance and stretching the economic lifetime of such systems at optimized capital expenditure. It describes a structured approach to debottlenecking, accommodating all objectives in terms of cost, capacity and energy and emission limitations. The result is an optimum with respect to CAPEX and OPEX, whereby solutions are evaluated based on investment per unit of capacity. In addition, the article presents a project that was executed at Aluminerie de Bécancour with the described objective of prolonging the economic lifetime of the FTC at minimum investment. Process conditions (increased fume volumes, altered pitch burning conditions, pet coke impurities, etc.) had changed significantly since the commissioning of the system in 1985 and during this project, the conditioning tower was replaced with a new and improved design.

Keywords: Environmental systems; GTC capacity; FTC capacity; GTC lifetime; FTC lifetime; debottlenecking.