

Furnace Water Leak Detection and Reduced Conversion Costs Efforts at Aceria Compacta de Bizkaia, Spain using the Goodfellow EFSOP[®] System

Authors:

Kathryn Nikkanen

Marshall Khan

Tenova Goodfellow Inc.

170-7070 Mississauga Road, Mississauga, ON Canada L5N 7G2

Tel: 905-567-3030 Fax: 905-567-3899

Email: info@tgi.ca

Co-Author:

José Gaviña

Aceria Compacta de Bizkaia (ACB)

c/ Chavarri, nº 6, 48910 Sestao – Bizkaia (Spain)

Tel: +34 94 489 44 11 Fax: +34 97 489 44 14

Email: jose.gavina@arcelor.com

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INTRODUCTION

This paper discusses how the Goodfellow EFSOP[®] system was implemented and used to improve safety with a furnace water leak detection and alarm system and to obtain conversion cost savings at Aceria Compacta de Bizkaia (ACB), Spain. The methods of finger-printing furnace off-gas measurements to detect furnace water leaks and process optimization strategies are explained.

Tenova Goodfellow Inc. (TGI), formerly Techint Goodfellow Technologies Inc. has developed the Goodfellow Expert Furnace System Optimization Process (EFSOP[®]), which uses real-time analysis of EAF off-gases to optimize the chemical energy usage within the electric arc furnace. The benefits of the Goodfellow EFSOP[®] System are safety, increased process knowledge, lower conversion costs and increased productivity.

In May 2006, TGI installed and commissioned two (2) EFSOP[®] systems for Aceria Compacta de Bizkaia (ACB), Spain. The main objectives of this installation were to detect furnace water leaks for safety reasons and reduce EAF conversion costs. ACB is a medium-sized steel producer and a part of the Arcelor family of steel mills. Using thin slab technology, they produce more than 1.8 million tons of hot rolled steel coils from scrap and pre-reduced iron yearly. The scrap is melted in two 130 ton electric arc furnaces each fitted with three coherent burners. More information about ACB can be found at their website: www.acb.es.

EFSOP[®] SYSTEM PRINCIPLES OF OPERATION

The EFSOP[®] system is a furnace off gas analysis and burner control system. Figure 1 shows how the Goodfellow EFSOP[®] System works. Off gas from the furnace is extracted at the fourth hole using a patented water cooled probe and is then conditioned and measured in the EFSOP[®] gas analyzer for CO, CO₂, H₂ and O₂ concentrations. Analysis of the furnace off-gas provides insight into the combustion processes in the EAF; allowing the development of optimized practices and permitting the real time closed loop control of EAF injections for energy optimization and reduced conversion costs.