

Proceedings of the 3<sup>rd</sup> Annual World Conference  
of the Society for Industrial and Systems Engineering,  
San Antonio, Texas, USA  
October 20-22, 2014

## **Analysis of Lifetime of TRIP Steel Welded Joints Using GMAW**

**A. de la Peña<sup>1</sup>, D. Gonzalez<sup>1</sup>, V. López<sup>2</sup>, R. Praga<sup>2</sup> and R. Zúñiga<sup>2</sup>**

<sup>1</sup>Universidad Autónoma de Coahuila Facultad de Sistemas  
Carretera a México Km 13, 25280 Arteaga, COAH, Mexico

<sup>2</sup>COMIMSA (Corporación Mexicana de Investigación en Materiales)  
No 790 Col. Saltillo 400, C.P. 25290 Saltillo, Coahuila. México

Corresponding author's Email: [aidadelap@hotmail.com](mailto:aidadelap@hotmail.com)

**Abstract:** The mechanical and metallurgical properties of elements are important factors for predicting welded joints lifetime. Hence, identification and then utilization of models that adequately represent the behavior of such unions, with the main purpose of predicting the failure probability considering operating conditions is required. In this context, it is useful to perform shear stress tests and model their results to assess their reliability under certain conditions. In the present work, the heat input effect over the reliability and lifetime of gas-metal-arc-welding (GMAW) Transformation-Induced Plasticity (TRIP) steels welded junctions, in advanced high strength type, is studied. The results obtained with different heat inputs used in the manufacture of welding samples show that the mechanical property of the test voltage decreases with increasing heat input to the weld, which has direct effect on its reliability.

*Keywords:* Stress Testing, Reliability, Proportional Hazard Model, Weibull Analysis