



Editorial

Third Special Section on Pressure Vessels Technology Applied to Gun Tubes

Nowadays, artillery and armor are characterized by rapid reaction, high maneuverability and mobility, and high technological sophistication. Modern artillery and tank guns call for maximal range, rate of fire, and fire precision as well as for highly energetic and effective ammunitions. These multiple and contradictory constraints suggest extreme firing conditions of the gun, including high chamber pressure, severe temperatures, and a harsh corrosive environment, but weight reduction and geometrical compactness of the gun barrels as well.

In the last decade, Gun Tubes conferences became a unique and important stage upon which recent significant technological and strategic developments in large gun tube design and manufacturing are presented. It started with GT2002 conference which was followed by GT2005 both held in Oxford, UK. The papers of these conferences were published in two special issues of the Journal of Pressure Vessel Technology in Aug. 2003 and in May 2006, respectively. Gun Tubes 2011 was held at Cranfield University at the Defence Academy of the United Kingdom in Shrivenham in Apr. 2011. The opening session included a keynote lecture entitled: "Precision vs. Suppression—The Indirect Fire System in the Joint Fires Era" that was delivered by Col. Mike Ross of the Royal Artillery. Four major sessions were held during the conference focusing on four major topics: The process of autofrettage and its influence on the fatigue life of gun tubes; erosion and heat transfer in gun barrels; modelling of gun performance; and simulation of hydraulic and swage autofrettage processes.

Twelve technical papers presented at GT2011 are included in this special issue of the Journal of Pressure Vessel Technology

(several others will appear in a later issue of the journal). These papers encompass all areas of pressure vessel technology applied to gun tubes including hydraulic and swage autofrettage processes and their numerical simulation, barrel material characterization under reversed loading accounting for the Bauschinger effect, the ultimate autofrettage process, re-autofrettage of gun tubes, measurement of residual stresses in autofrettaged barrels, fatigue life of gun tubes and its simulation, analysis of thermal and stress transients in gun tubes, protective coatings and liners for gun tubes and their replacement, and gun dynamic performance simulation.

The GT 2011 conference was organized by Cranfield University, DCMT, at the Defence Academy of the United Kingdom. It was sponsored by the U.S. Army European Research Office, the U.S. Army RDECOM—ARDEC—Benet Laboratories, ASME Pressure Vessels and Piping Division, BAE Systems, KMT Waterjet Systems, United Defense, Rheinmetall, and the Institution of Mechanical Engineers, UK. We extend our thanks to all the authors and reviewers, to the executive and steering committees and to Mrs. Betsy Lawton and Mrs. Lynn Anderson who contributed to a successful and enjoyable conference. Special thanks to Dr. Amer Hameed without whose leadership and persistence this conference would have never materialized. Last, but not least, our thanks to Professor G. E. Otto Widera and Ms. Jessica Bulgrin who made this special journal section possible.

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Guest Editor