

Guest Editorial

DEVELOPMENT IN TEST AND EVALUATION OF ARMAMENTS

Proof and Experimental Establishment (PXE) is the premier DRDO Artillery firing range located along east coast of Odisha, covering 50 km along coast, around 40 km into sea with various range infrastructure built around 3 firing points to conduct artillery weapon firing for fulfilling services requirement and R&D developmental activity. Ordnance factory (OF), public sector unit (PSU) and sister DRDO laboratories are primary users of this Firing Range. DGQA sentences the production lots based on results compiled by PXE. To fulfill the production target as well as various other DRDO, OF and PSU's development trials, dedicated scientific and service community of PXE play untiring role by meticulously planning, executing various trials successfully. This special issue of *Defence Science Journal* on 'Development in Test and Evaluation of Armaments' covers seven technical papers that highlight primarily PXE R&D activity/developmental task for fulfilling dynamic evaluation of present and future artillery weapons.

Padhy and Panigrahi in the paper 'Measuring Projectile Velocity using Shock Wave Pressure Sensors' covers details of shock wave characteristics, generation of N waves, feasibility study of capturing shock wave phenomena using dynamic microphones, and deployment of sensor in dynamic firing conditions and analysis of measured results to arrive at projectile velocity. Sahoo and Laha in the paper 'Coefficient of drag and trajectory simulation of 130 mm supersonic artillery shell with recovery plug or fuze' discuss the coefficient of drag and shock wave pattern for 130 mm artillery shell fitted with recovery plug or fuze are studied, when travelling at zero angle of attack in a supersonic flow of air. Kumar and Co-authors in the paper 'Flow Around a Conical Nose with Rounded Tail Projectile for Subsonic, Transonic, and Supersonic Flow Regimes : A Numerical Study' a numerical study of the flow around a projectile for all ranges of Mach number i.e. subsonic, transonic and supersonic regimes is discussed. It also reported that rounded tail offer less drag than bottail projectile.

Sreeramamurthy and Co-authors in the paper 'Determining Point of Burst of Artillery Shells using Acoustic Source Localisation' deals with the development of reliable, easy-deployment and low-cost method using Acoustic Source Localization technique for measuring location and conformability of HE explosions of artillery shell at terminal point. This paper also presents incorporation of wind effect and comparative analysis made with tracking radar. Appavuraj and Co-authors in the paper 'System Analysis and Design of Armament Integrated Management System' is in the line of enterprise resource planning (ERP), that conglomerate web technology with distributed architecture, to process the Proof and Trial activities through secured flow of data. This paper also delves into resilient high speed network and cloud computing model for implementation of the system.

Choudhury and Co-authors in the paper 'Set Down Study of Projectile in Flight Through Imaging' attempt has been made to study parameter of a projectile in flight to tens of micron accuracy through imaging. It is achieved through high-resolution high-speed imaging of a projectile in flight and then applying necessary algorithm for deblurring and sub-pixel gauging. Gupta and Co-authors in the paper 'Inter-level Spatial Cloud Compression Algorithm' elaborate distributed architecture based inter level compression algorithm. The algorithm can be easily modified to store flying, floating and moving objects with high level of compression in defence applications. The technical papers listed in by this journal thus highlighted the importance of PXE in fulfilling state of art technique for evaluating various ammunition/ordnance of artillery weapons. PXE is globally competent Firing Range that encompasses all area of dynamic evaluation field. This establishment ever ready to undertake challenging task of future DRDO developmental programme.

Director, PXE expresses his heartfelt thanks to the Director, DESIDOC for permitting the publication of these papers in the special issue.

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