40th SMBS / 36th PEDCS / 27th RNTS / 25th SEPS Joint Subcommittee Meeting
ABSTRACT SUBMITTAL FORM

The submission of an abstract is an agreement to complete a final paper for publication and attend the meeting to present this information. In order to ensure receipt of paper selection notification and the meeting invitation, please be sure to complete all information requested in the author and co-author information sections. Abstracts must be submitted electronically; please see submittal instructions located in the call for papers. **The deadline date for the receipt of abstracts is June 20, 2010.**

ABSTRACT INFORMATION

Title: Vortex Shedding Inside a Baffled Air Duct

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MANAGEMENT APPROVAL

The individual below certifies that the required resources are available to present this paper at the above subject JANNAF meeting.

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ABSTRACT SUBMITTAL FORM

Unclassified Abstract
(250-300 words; do not include figures or tables)

Common in the operation of both segmented and un-segmented large solid rocket motors is the occurrence of vortex shedding within the motor chamber. A portion of the energy within a shed vortex is converted to acoustic energy, potentially driving the longitudinal acoustic modes of the motor in a quasi-discrete fashion. This vortex shedding-acoustic mode excitation event occurs for every Reusable Solid Rocket Motor (RSRM) operation, giving rise to subsequent axial thrust oscillations. In order to better understand this vortex shedding/acoustic mode excitation phenomena, unsteady CFD simulations were run for both a test geometry and the full scale RSRM geometry. This paper covers the results from the subscale geometry runs, which were based on work focusing on the RSRM hydrodynamics. Unsteady CFD simulation parameters, including boundary conditions and post-processing returns, are reviewed. The results were further post-processed to identify active acoustic modes and vortex shedding characteristics. Probable locations for acoustic energy generation, and subsequent acoustic mode excitation, are discussed.