TECHNIQUES FOR LIQUID ROCKET COMBUSTION SPONTANEOUS STABILITY AND ROUGH COMBUSTION ASSESSMENTS

R.J. Kenny
NASA Marshall Space Flight Center
Huntsville, AL

C. Giacomoni
All Points Logistics, LLC.
Huntsville, AL

M.J. Casiano
NASA Marshall Space Flight Center
Huntsville, AL

S.R. Fischbach
Qualis Corp.
Huntsville, AL

ABSTRACT

This work presents techniques for liquid rocket engine combustion stability assessments with respect to spontaneous stability and rough combustion. Techniques covering empirical parameter extraction, which were established in prior works, are applied for three additional programs: the F-1 Gas Generator (F1GG) component test program, the RS-84 preburner component test program, and the Marshall Integrated Test Rig (MITR) program. Stability assessment parameters from these programs are compared against prior established spontaneous stability metrics and updates are identified. Also, a procedure for comparing measured with predicted mode shapes is presented, based on an extension of the Modal Assurance Criterion (MAC).