

SPACE PROPULSION SYMPOSIUM (C4)
Interactive Presentations (IP)

Author: Mr. Nadeem Alam

Department of Aeronautical Engineering, Babu Banarsi Das National Institute of Technology and
Management, Lucknow,, India, alam.nadeem94@gmail.com

Ms. Shruti Sneha

SRM University, India, India, shrutisneha2011@gmail.com

CONCEPT AND DEVELOPMENT OF USING HYDROGEN PER OXIDE AS A PROPELLEANT

Abstract

Hydrogen Peroxide has a long history in the space industry and was even used in the Reaction Control System (RCS) for the X-15. Some view hydrogen peroxide as an unstable and dangerous propellant but when handled properly, it is safer than most other options. High-concentration hydrogen peroxide (H₂O₂ hereafter) propulsion system is chosen in this research because H₂O₂ is ITAR-free, nontoxic and easy to produce. As the components designed for either cold gas or hydrazine propulsion system are not suitable for H₂O₂ propulsion system. The requisite environmental tests are scheduled to be performed in the future. Moreover, an air-bearing thrust stand (ABTS) and a real-time data acquisition control system (DACS) were implemented to assess the performance of the proposed H₂O₂ propulsion system. By measuring the distance that the thrust stand has travelled in a given time, the thrust force can be derived from the kinematics equation. To validate the feasibility of the approach, it is scheduled to assess the performance of a cold gas (N₂) propulsion system prior to the H₂O₂ propulsion system.