

IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
Interactive Presentations - IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (IP)

Author: Ms. Staten A. Longo
Northrop Grumman Corporation, United States, staten.longo@ngc.com

Mr. Carlos Niederstrasser
Northrop Grumman Corporation, United States, carlos.niederstrasser@ngc.com

Mr. Peter Kueffner
Northrop Grumman Corporation, United States, peter.kueffner@ngc.com

Mr. Christopher H. Baker
Northrop Grumman Corporation, United States, christopher.baker@ngc.com

Mr. Alexander Casciano
Northrop Grumman Corporation, United States, alexander.casciano@ngc.com

Mr. Andrew Stockwell
Northrop Grumman Corporation, United States, andrew.stockwell@ngc.com

Ms. Julianna Neumann
Northrop Grumman Corporation, United States, julianna.neumann@ngc.com

Mr. Mark Hurt
Northrop Grumman Corporation, United States, mark.hurt@ngc.com

TRAINING THE NEXT-GENERATION SPACE INDUSTRY WORKFORCE IN SATELLITE DESIGN
AND MANUFACTURING

Abstract

The aerospace industry is quickly growing and changing, as is the workforce entering the field. Recent graduates joining Northrop Grumman identified a gap between employees with educational exposure to small satellite design projects and those without. Students with satellite design experience found it easier to assimilate into the industry and familiarize themselves with satellite design and manufacturing industry standards. Individuals without this previous knowledge experienced a larger learning curve when first entering the workforce. To mitigate this issue, entry-level Northrop Grumman employees started a new program to develop a small satellite as a means of expanding resources and training opportunities for individuals new to the aerospace industry, particularly those with no previous education in satellite design. The primary and secondary mission objectives are as follows: Primary Mission Objectives 1. Training and cross-training of employees in streamlined satellite design process. Establish a knowledge-sharing environment across multiple disciplines and professional levels. 2. Design a small satellite that can receive and respond to communications and commands while demonstrating flight reliability for parts with little to no flight heritage. Secondary Mission Objectives 1. Design extensible/reusable bus to be used in future missions. 2. Correlate payload performance with environmental measurements. As demonstrated by Primary Mission Objective 1, this project targets the next-generation space industry workforce by establishing a network between experienced professionals and entry level employees. Communication channels will be developed both generationally and across multiple engineering subsystem disciplines. Training will be provided throughout the process for multiple industry design tools and processes including but not limited to simulations software, 3D printing and CAD design, RF development, FPGA development, documentation, deadlines, and design reviews. Employees supporting this project will be exposed to all aspects of satellite development from concept to integration and test all the way through to mission com-

pletion. The resulting spacecraft will contain a sensor suite with the goal of characterizing a variety of sensors, 3D printing techniques, and in house developed avionics. Lessons learned, both from a technical and non-technical perspective, will be extensively documented as a training guide to pass on to future employees joining the aerospace industry. This paper describes the initial establishment of the program from its grass-roots employee conception through its endorsement by management. We detail some of the key organizational and technical features incorporated to make this a successful training program. We additionally present initial lessons learned and early success stories in achieving the desired training goals.