



NASA Presentation to G12 Space Sub-Committee

Columbus, Ohio

September 17, 2013

Michael J. Sampson
michael.j.sampson@nasa.gov

NASA Goddard Spaceflight Center (Greenbelt)
Safety and Mission Assurance Directorate
301-614-6233

Co- Manager NEPP Program

<http://nepp.nasa.gov>

NEPP Budget FY14



- A slight increase over FY13, post cut, post sequestration levels
- A new emphasis on COTS, especially automotive to offer affordability for higher risk, lower budget missions (Class D)
- No funding for photonics for a second year
- Concentration is on near-term benefits
- US government space organizations must continue to find new ways to cooperate in order to do more with less

Lunar Atmosphere and Dust Environment Explorer (LADEE)

- Launched September 6, 2013 from the NASA Wallops Flight Facility (WFF) in Virginia
 - First deep space mission launched from WFF
 - WFF is part of the Goddard Space Flight Center (GSFC)
- NASA Class D mission
- Managed by NASA Ames Research Center (ARC)
- Instruments managed by NASA GSFC
- To orbit moon and gather detailed information about its atmosphere
- Modular bus designed to be multi-use, produced on an assembly-line
- Extensive use of COTS electronic parts
- First payload launch by Orbital Science's Minotaur V

To be posted to TechAmerica Web Workspace on the restricted access member's area at <http://workspace.techamerica.org/kws> and to be published on nepp.nasa.gov.

3



OOPS! Frogonaut



To be posted to TechAmerica Web Workspace on the restricted access member's area at <http://workspace.techamerica.org/kws> and to be published on nepp.nasa.gov.

4

Another Launch from WFF

- Antares launch re-scheduled for tomorrow
- Developed to demonstrate commercial re-supply of International Space Station (ISS)
- NASA Commercial Orbital Transportation Services (COTS)
- Derivative from Pegasus, Taurus and Minotaur
- Payload is Orbital's Cygnus capsule
 - Called an advanced maneuvering spacecraft
 - Common service module
 - Plus pressurized cargo module
 - Carries crew supplies, spares and experiments to ISS

To be posted to TechAmerica Web Workspace on the restricted access member's area at <http://workspace.techamerica.org/kws> and to be published on nepp.nasa.gov.

5

Class D and Cubesats

- Class D are typical spacecraft but with a budget capped at \$250 million and with high risk tolerance
- Cubesats are small, low-cost experimental spacecraft based on a modular cubic structure
- Class D will likely use COTS extensively, as well as "heritage" hardware to contain cost
- Each NASA Center is developing its own approach
- NEPP would like to find some common ground to be able to share lessons learned and economies of scale as well as presenting a more consistent "face" to our supply chain



To be posted to TechAmerica Web Workspace on the restricted access member's area at <http://workspace.techamerica.org/kws> and to be published on nepp.nasa.gov.

6

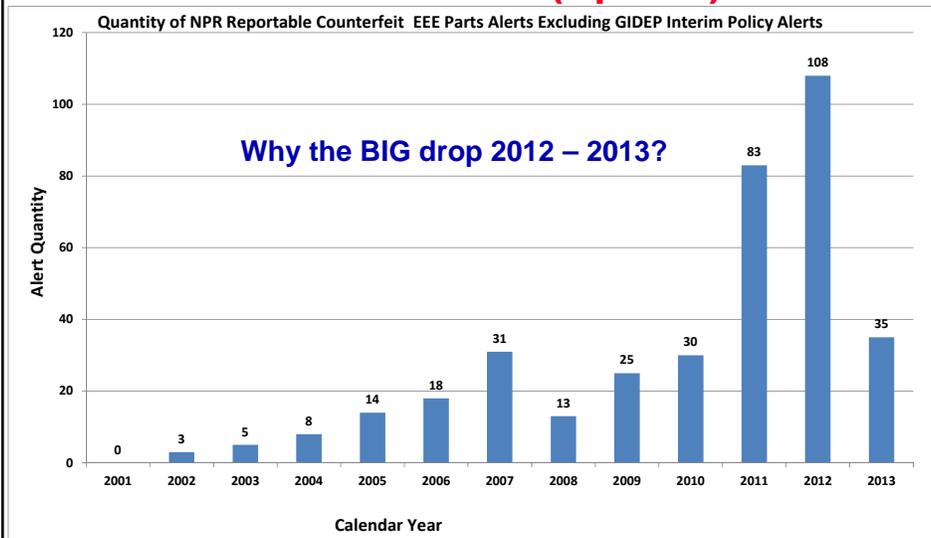
NASA Class D and Cubesat Workshop Agenda

- NASA and support contractors ONLY
- To be held at GSFC, Tuesday September 24th, also on-line
- Introduction, Ground Rules, and Objectives
 - Ken LaBel/GSFC
- EEE Parts Categories
 - Overview - Shri Agarwal/JPL
 - Automotive Electronics – Mike Sampson/GSFC
- NASA/Center/JPL Approaches to EEE Parts for Class D Missions and CubeSats
 - Risk Discussion – Jesse Leitner/GSFC
- COTS EEE Parts Usage/Screening/Qualification and Fault-tolerant Architecture Discussion
 - Alternative methods? - TBD
- Go-forward Discussion
 - What can we agree upon? Parts plan components? Minimum requirements and parts review? Guideline? COTS database? Reliability tools?

To be posted to TechAmerica Web Workspace on the restricted access member's area at <http://workspace.techamerica.org/kws> and to be published on nepp.nasa.gov.

7

GIDEP and Counterfeit Electronic Parts 2001 thru 2013 (Update)



To be posted to TechAmerica Web Workspace on the restricted access member's area at <http://workspace.techamerica.org/kws> and to be published on nepp.nasa.gov.

8

Detecting Counterfeits - Concerns

- **Legislation encourages reporting as suspect, even when the evidence is poor**
- **Independent distributors who also sell detection services have a conflict of interest**
- **Test reports need review (sanity check) before reporting to GIDEP**
- **OCMs remark, even laser marking on gold-plated lids, So to reiterate:**
 - **Detecting Counterfeits Takes Care**
 - **Detecting Counterfeits Needs the OCM (if possible)**
 - **Detecting Counterfeits Accurately Requires Good Procedures**

To be posted to TechAmerica Web Workspace on the restricted access member's area at <http://workspace.techamerica.org/kws> and to be published on nepp.nasa.gov.

9

MY To Do List

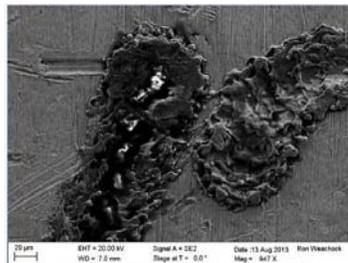
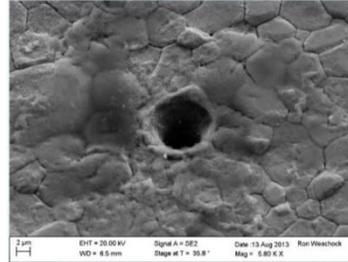
- **Hermeticity**
 - **Plan to fill any remaining gaps in the NASA "round robin" study**
 - **Concentrate on solving the gross leak detection dilemma**
- **Base Metal Electrode (BME) capacitors**
 - **NEPP sponsored testing and analysis have provided a basis for risk assessment and the potential for separating good lots (long lived) from poor**
 - **Continue NASA support for the G11 BME task group**
- **Copper bond wires/bond pads**
 - **Should the space community be concerned?**
 - **Is there a time scale for introduction for MIL QML?**
- **Laser marking/etching**
 - **Specific requirements required**

To be posted to TechAmerica Web Workspace on the restricted access member's area at <http://workspace.techamerica.org/kws> and to be published on nepp.nasa.gov.

10

Laser Marking/Etching Concern

- Can “drill” holes
- NASA had system-level short-circuit failure
- Suspected hermeticity escape – small package
- Not new, similar part in 2004 GIDEP
- Current M19500 coverage is limited
 - External Visual at 40X



To be posted to TechAmerica Web Workspace on the restricted access member's area at <http://workspace.techamerica.org/kws> and to be published on nepp.nasa.gov.

11