Workforce Resiliency - STEM* Talent Cultivation

* Science, Technology, Engineering, and Mathematics

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The Aerospace Corporation

Future SatOps Workshop

Ground System Architectures Workshop (GSAW) 2014

Los Angeles, CA

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STEM Talent – A Critical Source of Resiliency

• SatOps deals with sophisticated technical systems, and with complex interconnected information enterprises
• Skilled, capable individuals are required for all phases of the space system lifecycle, including SatOps
• Humans add a level of human judgment, which is critical to successful SatOps
• We all are beneficiaries of STEM education, and we must individually contribute to STEM education
• The following charts describe examples of such proactive contributions
SMC MIT Space Engineering Academy (SEA)

- Top USAF Academy admitted to MIT Aero-Astro Space Systems Laboratory for Masters in Space Systems
- After a 2-year tour at MIT, the SEA graduates report to SMC for their next tour
- So far a dozen officers placed at SMC, with 3 new SEA graduates added annually
- SEA Alums supporting most missions, as well as SMC/XR, development planning
- Prof Dave Miller SEA facilitating recruiting days at MIT
  - Prof Miller is also the Vice Chair of the USAF Scientific Advisory Board (SAB)
- SatOps of small SMC or SEA satellites will be described later today
MIT Space Systems Laboratory (SSL)
University STEM Education

Space Systems Laboratory
Graduate Research spanning architecture, technology development, on-orbit validation, & small sat missions

Space Engineering Academy
Space Systems Masters Program for AF Officers

Conceive-Design-Implement-Operate
Hands-On, Multi-Semester, Undergraduate Capstone Class

Flight program experience
Leadership
prototyping

Used with permission from Prof Dave Miller, Director, MIT-SSL
AF-SSEA Hands-On Approach

Program value continuously assessed by feeding back lessons learned
- Assess how we teach, how we build, and how we validate

Used with permission from Prof Dave Miller, Director, MIT-SSL
Harvey Mudd College (HMC)

- HMC is a top undergraduate engineering college
- Chairing the HMC Engineering Visitors Committee
  - Advisory role for faculty succession, curriculum, accreditation, and development
- Leading dozens of Capstone projects (Computer Science and Engineering “Clinics”) over 20 years
- Serving on the Clinic Advisory Committee
- Recruiting dozens of students and faculty over the years

UCLA, CalTech, USC, UCSB, UCI, Stanford, CSULA…

• The Aerospace Institute Corporate University Affiliates Program (TAI-CUAP)
  – *Facilitates formal relationships with STEM universities*
  – *Challenging projects of mutual technical interest*
  – *Recruiting at all levels*

• Must engage at all levels of STEM education

• STEM engagement described above at university level

• Research shows that STEM loses the boys at 8th grade and the girls at 5th grade
  – *STEM activities are encouraged at all levels*
  – *SMC and Aerospace are engaged at all levels*
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