



University Quality Development (UQD) Program

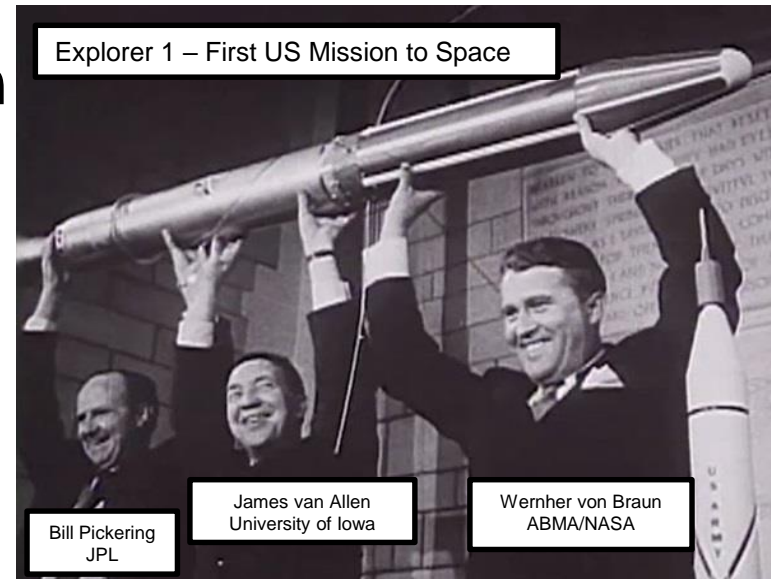
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Historical University Collaboration

All Missions Are a Collaboration of Shared Discoveries

Many Missions Require Instrumentation from University Laboratories



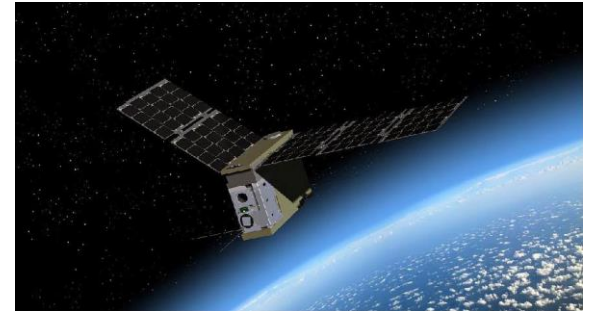
“(JPL to be) Ambassadors to Education”

- James Webb to Cal Tech (Dec 1967)

Current & Future

- Not Just Instrumentation:
 - Full Mission Integrators
 - Hardware Testing
 - CubeSat / SmallSat Constellations

- Full Range Of Programs:
 - Well Grounded Missions
 - Essentially Students Building Toys

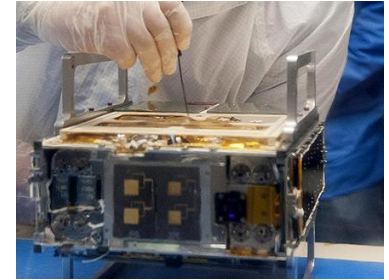


Instrumentation & The University Challenge

- Building Instrumentation Needs Quality Management to be Successful
- Quality Management Modeled on **Convention Manufacturing Environments**
 - Conventional Organization Structures
 - Resourcing for Program Management
- Universities **Rarely** Align with Manufacturing Environment Convention
 - Inconsistent Budget / Budget Sources
- Academia Priority is the Science – But That's the Point
- You can change a culture or a process
You can't change an environment

How Quality Issues Play Out

- These Instruments Aren't "Commercial" or "Production"
They're "Invention"
- Common Situation:
 - Investigator, Engineer, Technician, QA – Could be the same person
 - Build / Test / Fixes the Instrument to Meet to Return Results
 - May Not Plan Build – May Not Capture Changes – May Just Show Test Outcome
 - Sometimes Takes Extra Work / Resources to Recreate Results
- Most Issues Come with Impact to Schedule, Integration, & Resourcing
 - Issues Come Up – Solve by Overstaffing: Increased Source Inspection, Direct Oversight
 - Throw People at the problem
- We get a Instrument that Works, but at Greater Cost than Expected
- Heard Late in Programs: **"If We Known Earlier, (that) Could Be Different"**



Quality Management Is Critical to Mission Success

- For Mission Success –
Quality Assurance Needs to be Mature With a FOCUS ON PREVENTION
- Goal: Implement or Improve Quality Assurance Programs At Universities Building Flight Instrumentation
- However,
 - It Must Be Appropriate for the Facility**
 - It Must Be Tailored to the Needs of the Organization**
 - It Must Be Sensitive to the Challenges At That University**

JPL QA Strategy for FY 2019

- **Develop a Program to Implement / Build / Improve Quality Management Systems At Universities Where it is Needed**

What Does This Process Look Like?

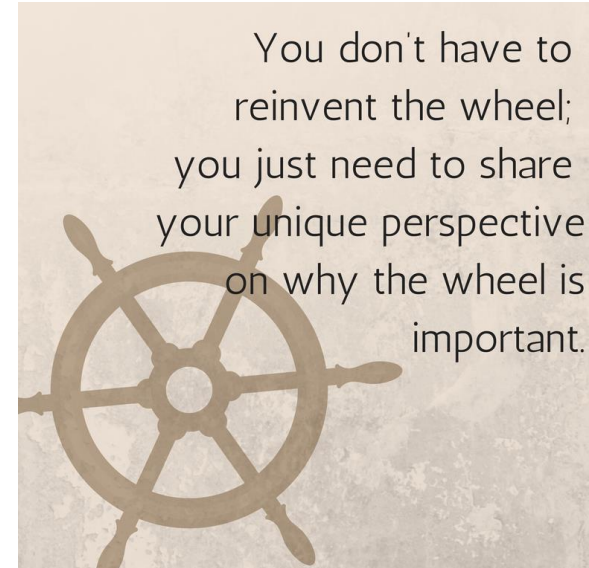
- Assessment
 - Baseline Current State of Quality Assurance
- Planning & Resourcing
 - What Needs To Done; What Should Be Done
 - Likely a Negotiation
- Training
 - **Utilization of AAQ** (more on this)
- Tools / Techniques
 - Common Forms and Processes
 - “Quality in a Box”
- Possibly Utilizing Other Departments In The University as a Source:
 - Have Other Degrees Use Implementing QA part of their Course Study
- **Measurement of Success**
 - Lessons Learned / Feedback



The Academy of Aerospace Quality Advantage

Quality Assurance Is Not Rocket Science,
But You Don't Inherit It. You Have to be Taught Quality!

- Major Challenge Witnessed:
 - Lacking in Spaceflight Quality Training
- Utilize &/or Encourage AAQ Coursework For That Purpose
 - Proposed Primary Curriculum:
 - Intro to NASA Quality Programs
 - Workmanship
 - Quality Planning
 - Process Control
 - Configuration Management ← Key for Engineering to Flight Hardware
 - Documentation Management / Records Management
 - Electrostatic Discharge (as applicable)



Call to arms

Why Am I Here?

- Searching for Partnering Universities
 - See the Challenges From Both Sides of the Table
- Collect Experiences From Other Prime / Customers
 - Build A Risk Portfolio for Mitigation
- Get Feedback
 - Strengths / Weaknesses in Concept
 - Challenges / Opportunities
 - Reactions / Rejections



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