



NASA APPL:

Meeting the Challenges of Project Leadership

KNOWLEDGE

CAPABILITY

PERFORMANCE

NASA PM Conference

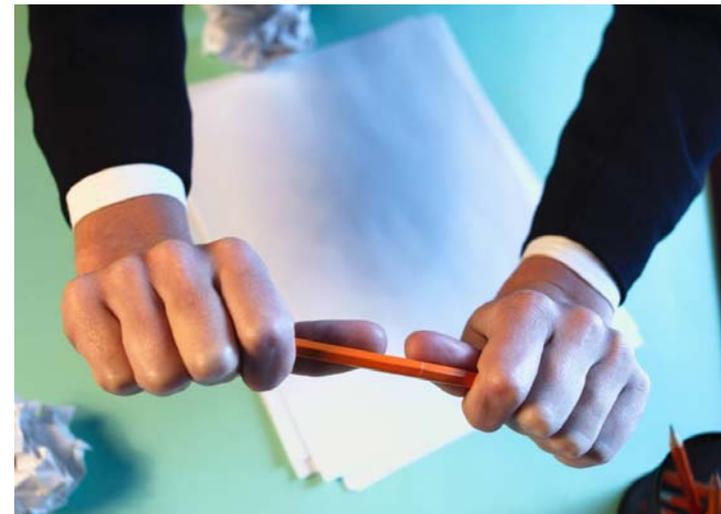
March 30-31, 2004

Dr. Edward J. Hoffman, Director, APPL

Mr. Anthony J. Maturo, Deputy Director, APPL

The challenges that Project Practitioners and teams face today are vast and numerous:

- MISSION SUCCESS
- Return to Flight: Accomplishing CAIB Recommendations
- “Diaz Report” – High Performance Cultures of Openness & Collaboration
- Human Capital – More Projects, Need for More Talent
- Human Exploration – Moon/Mars
- Project Management Capability – Development, Experience, Performance
- Greater Project Complexity
- Earned Value Management
- Full Cost Management
- Meeting the Growing Expectations of Partnering with Industry, Academia and Other Government Agencies
- Meeting ITAR Regulations – Increase in Global Teams



Characteristics of the New Economy

Characteristic

Organization
 Form
 Source of Strength
 Time Frame
 Structure
 Resources
 Reach
 Strategy
 Leadership
 Workers
 Job expectations
 Improvements

20th Century

Hierarchy
 Structured
 Stability
 Slow and deliberate
 Self-Sufficiency's
 Atoms - physical
 Local
 top-Down
 Dogmatic
 Employees
 Security
 Incremental

21st Century

The Web or Network
 Flexible
 Change
 Fast and faster
 Interdependencies
 Bits - Information
 Global
 Bottoms-up
 Inspirational
 Free agents
 Personal Growth
 Revolutionary

1987

Challenger Disaster/Phillips Commission

Program & Project Management Institute (PPMI) established by NASA Deputy Administrator, J.R. Thompson

NASA Culture:

Large, expensive, long-duration programs and projects

PM Needs:

Course curriculum contributing 10% baseline knowledge, PM's contributing 90% experience



1992

New NASA Administration

Career Development Model established to link critical PM capability to NASA-sanctioned learning, and developmental activities to mission requirements and success rather than traditional HR curriculum metrics

NASA Culture:

Emphasized smaller, faster, better, cheaper projects

PM Needs:

Shift from curriculum-based to competency-driven approach

APPL Mission:

“APPL will provide professional development support to NASA teams and individuals through a process that includes education, performance enhancement, on-line tools development and knowledge sharing, in order to develop the recognized world-class practitioners of project management in advance of need.”

Present

The Academy of Program & Project Leadership

INSTITUTIONAL

Processes, Standards, Common Practices

PROJECT

MISSION SUCCESS

- Career Development
- Performance Enhancement
- Knowledge Sharing
- Applied Research

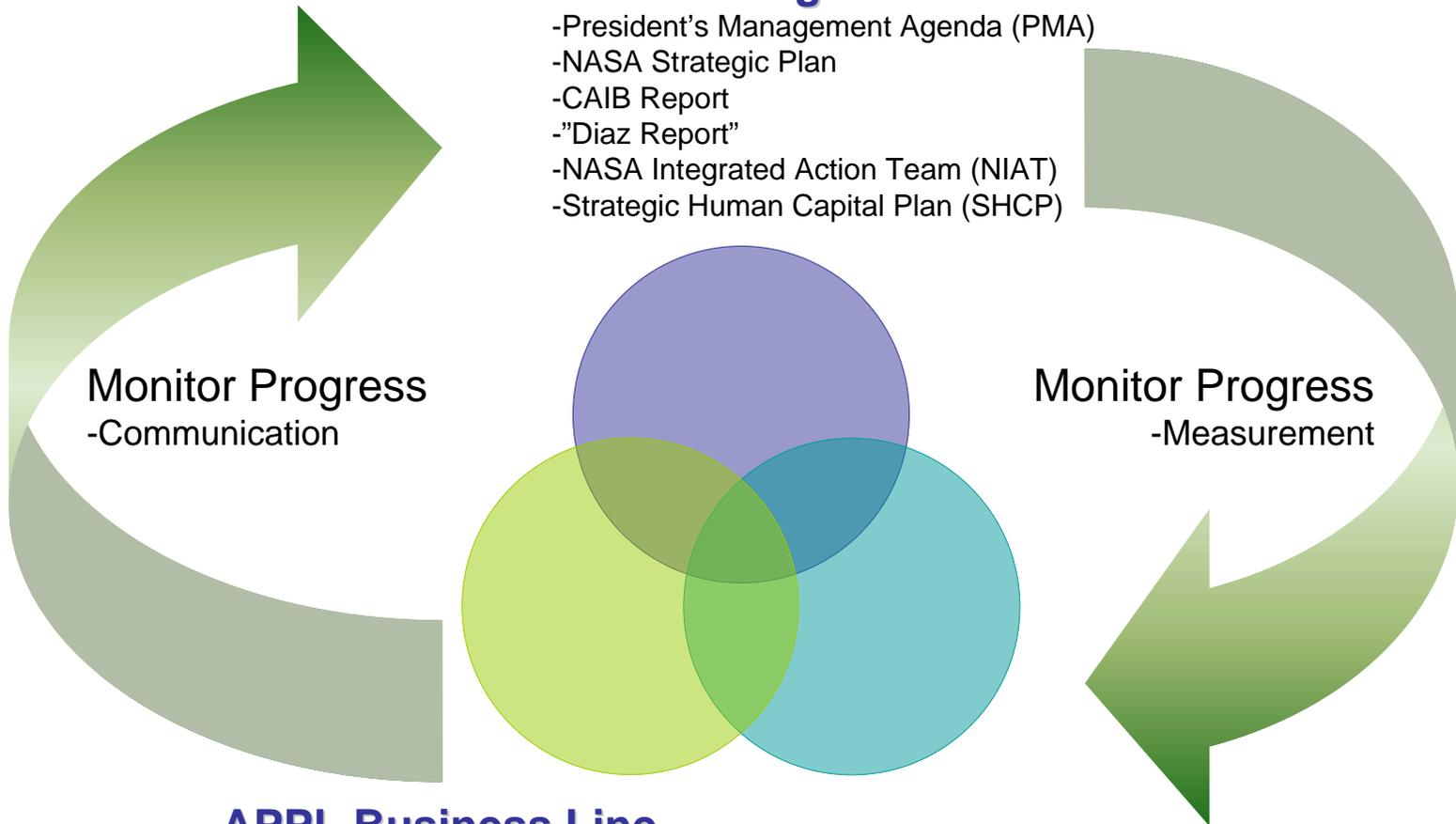


Columbia Accident

Developing a renewed focus on Programs and Projects, their management and their teams

APPL Strategic Direction

- President's Management Agenda (PMA)
- NASA Strategic Plan
- CAIB Report
- "Diaz Report"
- NASA Integrated Action Team (NIAT)
- Strategic Human Capital Plan (SHCP)



Monitor Progress
-Communication

Monitor Progress
-Measurement

APPL Business Line Initiatives

- Performance Enhancement
- Knowledge Sharing
- Career Development
- Applied Research

APPL Strategic Performance Goals

- Vision/Mission
- Objectives/Outcomes

APPL *Then...*

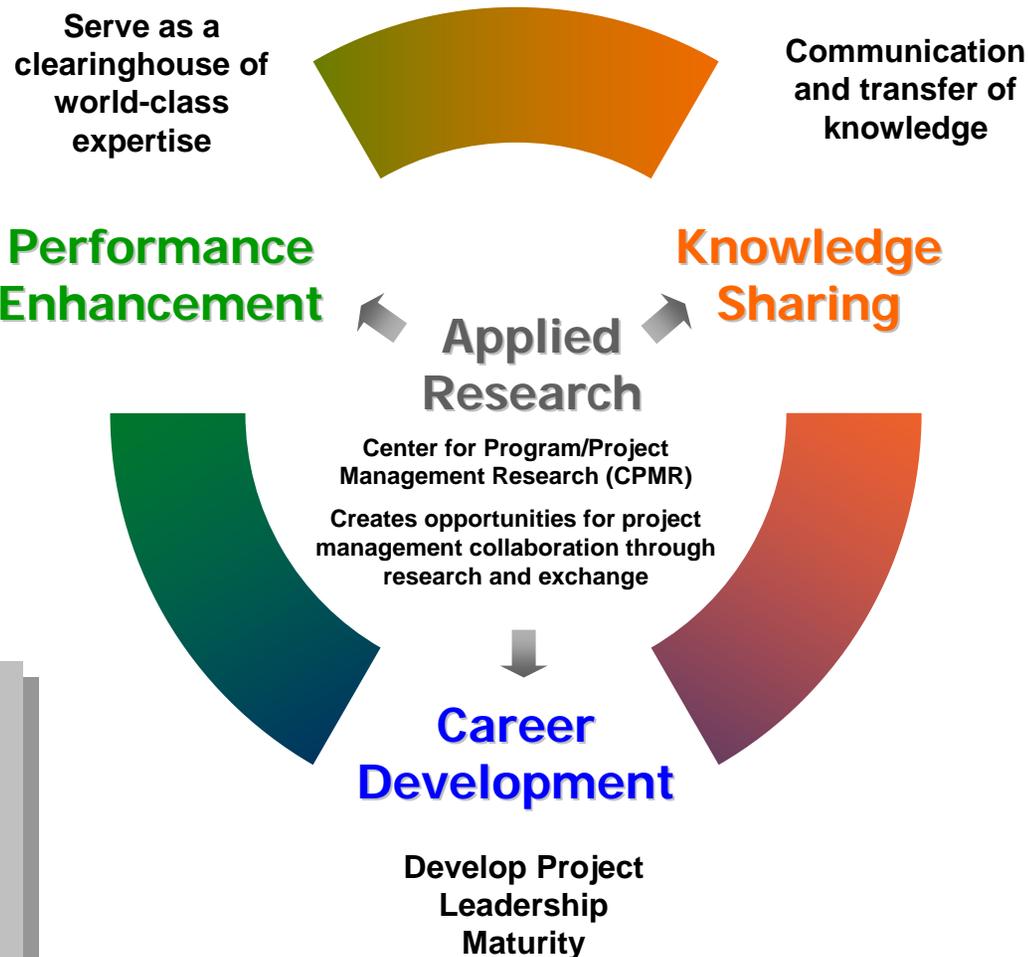
Training, Courses, Curriculum

APPL *NOW...*

KNOWLEDGE

CAPABILITY

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The APPL Blended Learning Process allows NASA project practitioners and teams to request and acquire professional development products and services according to their:

- Level of Knowledge
- Phase in the Project
- Amount of Time to Commit

APPL facilitates the effective pairing of project practitioner talent and the NASA mission. This support provides an Agency benchmark, outlining training and developmental activities in a comprehensive learning strategy.

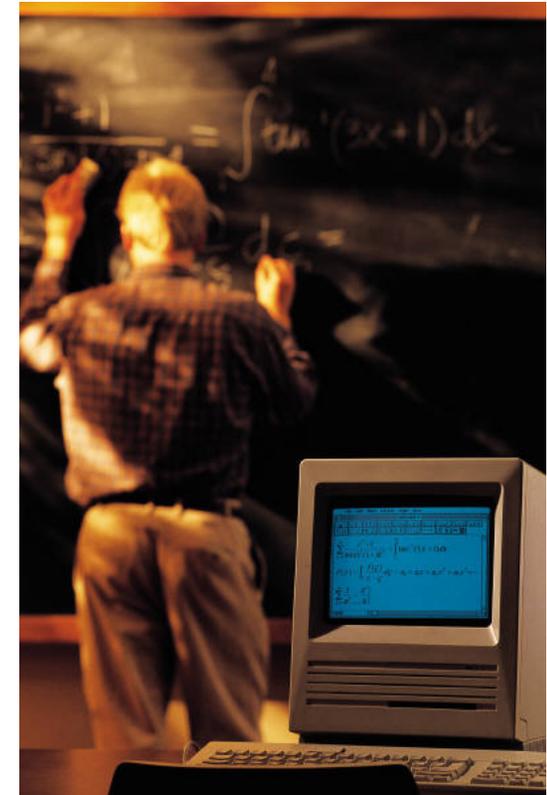
- **Project Management Development Process (PMDP) / ePMDP online**
- **Professional Development Support**
- **MIT/ALO (MIT Advanced Leadership Option)**
- **Course Curriculum**
 - APPL is a Registered Education Provider of PMI Professional Development Units (PDU's)
 - APPL APM/PM courses have been certified by ACE (American Council on Education) for college graduate credits.

Career Development Responds to:

PMA: "Agencies will build, sustain, and effectively deploy the skilled, knowledgeable, diverse and high-performing workforce needed to meet the current and emerging needs of government and its citizens." (pg. 14)

NIAT: "Work with Centers to upgrade NASA Project Management Development Process (PMDP) to assist in the selection, development and assessment of project capability" (section 2.1)

CAIB: "...implement an Agency-wide strategy for leadership and management training that provides a more consistent and integrated Agency-wide approach to career development." (Observation 10.12-1)



➤ NASA Johnson Space Center: International Space Station Robotics:

- After completing the APPL PM/APM courses, a manager for this project team led a brainstorming session to determine best way for implementation of Ground Control for ISS Robotics. The result **reduced cost from initial estimate of \$1M to approximately \$100K.**

➤ NASA Langley Research Center (LaRC): 21st Century Aircraft:

- The Deputy Project Manager reported preparing for an upcoming Non-Advocate Review by applying the whole philosophy of a cohesive project management process as presented in the APM course. By applying the skills learned in class, he and his team successfully developed a Risk Management Plan that **enabled the team to pass the NAR the first time.**

➤ NASA Kennedy Space Center: Facility Planning and Integration:

- The Senior Project Manager led a reassessment of KSC's Pre-Project Planning methodology for construction of facilities based on the knowledge gained from the PM course. The Construction Industry Institute has found that this type of early planning **reduces overall cost growth by approximately 20%.** This is significant considering KSC has a CoF budget of \$20 to \$30 Million annually.

➤ Advanced Project Management (APM) and Project Management (PM) Course Assessment Tests:

- Pre- and Post-Assessment tests were developed to measure the Advanced Project Management (APM) and Project Management (PM) participants' current knowledge of the subject matter prior to attending the courses and the knowledge gained from their participation. The results of these tests show that for the PM course, the class averaged a **51 percent point difference between the two tests, and the APM course averaged a 30 percent point difference.**

APPL is extending the learning environment beyond the classroom to new and existing project teams. The objective is to enhance the project's probability of success by delivering the right knowledge and experts directly to the project team at the right time.

- **Project Mentoring and Coaching**
- **Knowledge Tool**
- **Leadership, Team and Culture/Interface Assessments**
- **Measurements**

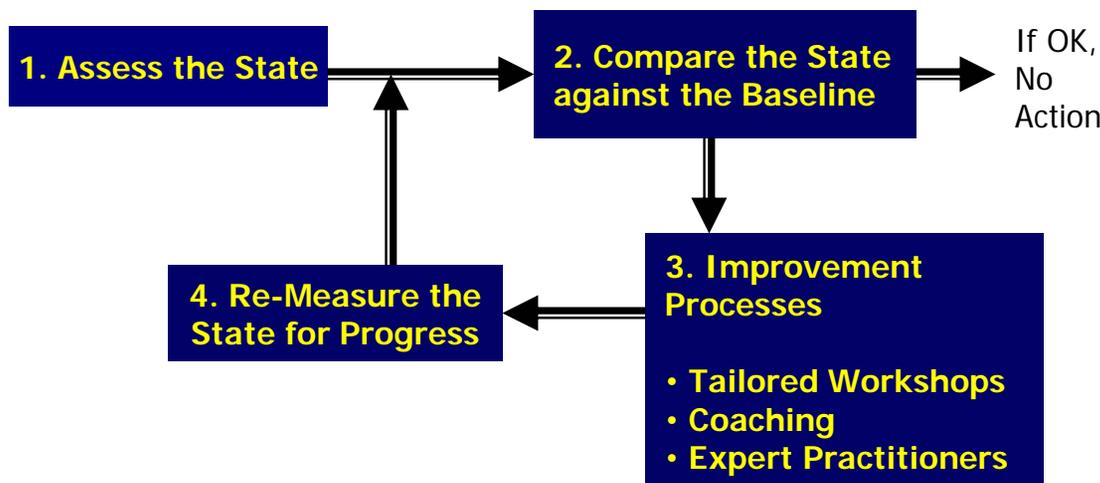
Performance Enhancement Responds to:

NIAT: "Enhanced strategies for Just-In-Time team support for programs and projects" (section 2.2)

MPIA: "Experienced project management or mentoring is essential" (Lessons Learned 1)

TSS-1R: "Establish an integrated team of specialists... to provide continuity throughout the development and operational process" (pg 4-6)

SHCP: "Do not fully benefit from insights/experience of existing leaders when developing future leaders. " (Leadership Pillar, section 5.2)



NIAT: NASA Integrated Action Team

MPIA: Mars Program Independent Assessment Team Report

TSS-1R: Tethered Satellite System Reflight

SHCP: NASA Strategic Human Capital Plan

Through industry partners and subject matter experts, APPL currently provides performance enhancement support to approximately 30 NASA projects and programs every year, positively affecting the performance of more than 1,000 NASA managers and engineers.

Industry Partners:

- **Center for Systems Management**
 - Project Lifecycle Support
 - formulation, implementation & evaluation strategy
 - Systems management and integration
 - Subject matter expert clearinghouse
- **4-Dimensional Systems**
 - Project leadership analysis and strategy
 - Project culture analysis and strategy
 - e-knowledge assessment tools for project teams
 - Performance enhancement Center point of contacts
 - Mentoring and coaching services for project practitioners

A Sample of Subject Matter Experts...

Charlie Pellerin
Paul Mahata
Art Fuchs
Noel Hinners
Kevin Forsberg
Jim Odom
Tom Utzman
John Wheeler
Mark Wilson
Larry Caroff
Frank Martin
Adrienne Pederson
Ken Pederson
Gael Squibb
Charles Fuller
Susan Langlitz
John Conway
Ivan Somers
John Hrstar
Jim Barrowman
John Cormier
Arun Guha
Harold Kane
Richard Waina
Rich Buckman
Joe Cremins
John Chiorini

➤ APPL Support to NASA Engineering and Safety Center (NESC):

- Developed the key processes for operation of NESC, **reducing their development cycle by six months, which amounts to a savings of about \$2.5 Million for NESC.**

"My estimate is that APPL/CSM team has enabled the NESC to reduce the time required to become truly operational by at least six months, and probably more. Given the importance of the NESC mission and the challenges it faces, this is a substantial and noteworthy benefit to NASA."
..... Dr. Michael S. Freeman, NESC Chief Engineer, ARC

➤ APPL Support to NASA Glenn Research Center Program: Ultra-Efficient Engine Technology (UEET):

- Provided just-in-time training, workshops and mentoring to the UEET team on their preparation for the Office of Aerospace Technology (OAT) Cost Validation Review. Avoiding the threat of program cancellation, **the team passed the review saving approximately 3 months of rework.**

"June 5 HOME RUN. Just to let you all know....we did a GRRRRREAT job on the June 5th OAT Cost Validation review!! we do have some follow-up actions, however that may require some additional help from some of you. Thanks to each and every one of you for your hard work and support. We could not have done it without you."
.....Cathy Peddie (NASA GRC, UEET Assistant Program Manager)

➤ APPL Support to NASA Dryden Flight Research Center: Unmanned Aerial Vehicle (UAV) Program:

- Through meticulous planning and facilitation support from APPL, this program was **taken from "ground zero" to a "national level" program with a \$1.01 Billion budget.**

"Your team did an outstanding job facilitating the kickoff meeting, especially in terms of getting program team members from four different NASA centers to coalesce into a positive and productive advocacy team... Thanks again for the initial burst of performance enhancement".
.....John Sharkey (NASA DFRC, UAV Program Manager)

➤ APPL Support to NASA Johnson Space Center: International Space Station – Flight Projects Office:

- Through a series of APPL coaching and facilitation, the fragmented team consisting of government and contract personnel was able to **form a congruent, success-oriented organization.**

" Just a quick note to say thanks. Your staffs have taken on our office org very effectively and efficiently. Their input has already been very valuable..."
.....Matt Leonard (NASA JSC, ISS-FPO Project Manager)

APPL is cultivating a knowledge sharing community of project leaders within the Agency. Experienced project leaders are some of NASA's best sources of knowledge and expertise. Their stories and best practices are shared throughout the Agency.

- **ASK Magazine**
- **Masters Forums**
- **Workshops**
- **Leaders as Teachers & Mentors**
- **Online Case Studies**



Knowledge Sharing Responds to:

PMA: "...effective strategy that will help generate, capture and disseminate knowledge and information that is relevant to the organization's mission" (pg. 13)

SHCP: "Ensure that an integrated, strategic training and development program builds needed Agency leadership competencies." (Leadership Pillar – pg. 11)

NIAT: "Increased mentoring and knowledge sharing at Center level" (section 2.2)

GAO Reports: "Develop ways to broaden and implement mentoring and "storytelling" as additional mechanisms for lessons learning" (GAO-02-195 pg. 47)

CAIB: "Naval Reactors uses many mechanisms to ensure knowledge is retained. ...Current and past issues are discussed in an open forum... NASA lacks such a program." (7.3, pg. 183)

- A Senior NASA Project Manager shared a story regarding her own experiences with Project Reviews in an issue of ASK Magazine. She was contacted by another NASA Project Manager who read the article to discuss the story. That PM applied the lessons learned from the story and **saved approximately \$500,000** on the project's next review process.
- A Project Manager presented a story about down-sizing and cost-cutting at an APPL Master's Forum. A participating PM at the Forum applied the principles and strategies learned from the story to his project which resulted in **less budget cuts** allowing the project team to remain productive.
- The bi-monthly ASK Magazine currently reaches a distribution of **approximately 6,000 people globally in print and currently averages about 2200 hits per day with the online version**. In addition to NASA employees, those benefiting from the shared knowledge include various universities, other government agencies and viewers from currently 60 other countries.
- The Leaders as Teachers and Mentors (LT&M) Program leverages the knowledge and experience of an identified set of current and retired Agency leaders and experts. Currently these **56 participants span APPL's business units** by teaching courses, writing papers, giving presentations, mentoring project teams, and assisting in knowledge-sharing efforts. LT&M has engaged both industry (Raytheon) and the university community (College of William & Mary) in benchmarking LT&M activities .

APPL promotes and develops relationships and partnerships with universities, other government agencies and the private sector in order to facilitate the continuous improvement in program/project management technologies. The fostering of these relationships ensures the latest expertise and advancements are captured and brought into the Agency to enable the development of a high-performance program/project community.

- Center for Program/Project Management Research (CPMR)
- International Project Management Association (IPMA)
- Laboratory for Atmospheric and Space Physics (LASP)
- PMI, ACE, IACET – Accreditation Partnerships



Applied Research Responds to:

NIAT: “Enhance alliances with universities, government and industry” (section 2.2)

SHCP: “Particular attention must be focused on assuring the Agency captures and makes available the wealth of expertise and experience on the current workforce processes – as well as that which resides outside the Agency in similar organizations – to aid in developing the next generation of project/business managers and leaders” (Learning Pillar – pg 10)

PMA: “Automate internal processes to reduce costs internally, within the federal government, by disseminating best practices across agencies.” (pg. 24)

NIAT: NASA Integrated Action Team

SHCP: NASA Strategic Human Capital Plan

PMA: President's Management Agenda

➤ **The Center for Program/Project Management Research (CPMR):**

Partnership with the Universities Space Research Association (USRA) in November of 2003 to engage universities in world-class research addressing internationally significant problems in the discipline of Project Management – with particular emphasis on the Nation’s aeronautics and space program.

- Provides a stable vehicle to engage the brightest & best researchers who will become a long term partner with NASA to address organizational causes for Columbia accident – from P. 1, Chapt.7 of CAIB
- Leverages USRA’s 30 years of experience and facilitate university community’s assistance – in a way that can be integrated within the NASA culture

➤ **University Research Awards (through USRA/CPMR):**

- Gives NASA access to resource pool that will enable a comprehensive reaction to NASA needs
- Workshops, symposia, CPMR fellows, and collaborations with partners facilitate a strong community in PM to take objective scrutiny of how NASA can improve its PM practices and foster a culture of openness based on strong engineering principles
- Assist NASA to develop and apply metrics to PM in order to measure the effect of changes to Agency practices, relative to, e.g., CAIB recommendations

➤ **CPMR-led NASA-University Exchange Program:**

- Directly contributes to NASA’s Human Capital Plan with this robust NASA recruiting tool by utilizing University student hands-on experience with NASA projects
- Facilitate more diverse, flexible, and interdisciplinary project teams to address increasingly complex and high-pressure projects, e.g, return to flight

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Performance Enhancement	Dr. Paul Mahata	SME's, Expert Practitioners, Team Assessments, Systems Mgmt	CSM, Inc.	(703)787-8094	pmahata@csm.com
Performance Enhancement	Dr. Charlie Pellerin	Knowledge Tools	4-D Systems	(303)494-9104	c@cpellerin.com
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APPL VISION:

Providing for Project Practitioners to Excel

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