APPEL Briefing for Program Management Council

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NASA Academy of Program/Project & Engineering Leadership

April 21, 2009

PMC Action: Provide a briefing to the Agency PMC on OCE APPEL's professional development framework and services for NASA program/project managers and engineers, including its training curriculum, progress toward meeting OMB PM certification requirements, direct support for project teams, and knowledge sharing.*

- Per direction of the Acting Administrator, the scope of this action was broadened to provide the professional development context in which project management certification is taking place.

OMB PM Certification Requirements

Requirements:

Essential agency responsibilities for program administration are included below:

➢ identify and assess the program and project management acquisition workforce

➢ develop this workforce in accordance with the standards

➢ issue FAC-P/PMs

➢ monitor continuous learning achievement

(Source: "OMB Memorandum for Chief Acquisition Officers," April 25, 2007, p. 3.)

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
WASHINGTON, D.C. 20503

OFFICE OF FEDERAL PROCUREMENT POLICY

April 25, 2007

MEMORANDUM FOR CHIEF ACQUISITION OFFICERS

FROM: Paul A. Denett
               Administrator

SUBJECT: The Federal Acquisition Certification for Program and
               Project Managers

Well-trained and experienced program and project managers are critical to the acquisition process and the successful accomplishment of mission goals. A strong partnership between program and project managers and contracting professionals requires a common understanding of how to meet the government's needs through acquisitions that deliver quality goods and services in an effective and efficient manner. This memorandum establishes a structured development program for program and project managers that will improve this partnership and our collective stewardship of taxpayer dollars.

The Federal Acquisition Institute (FAI) led an interagency working group to develop common, essential competencies for the program and project management community. The attached Federal Acquisition Certification for Program and Project Managers (FAC-P/PM) reflects these recommendations and applies to all executive agencies, except those subject to the Defense Acquisition Workforce Improvement Act. The certification shall be accepted by, at minimum, all civilian agencies as evidence that an employee meets the core training and experience requirements.

The certification is required for program and project managers that are assigned to major acquisitions as defined in Office of Management and Budget (OMB) Circular A-11, Part 7, exhibit 300, *Planning, Budgeting, Acquisition, and Management of Capital Assets*. The attached provides more details on transition time, waivers, and the responsibilities of the Chief Acquisition Officer in implementing the policy. Program and project managers assigned to information technology (IT) investments must also meet the technical requirements of the Federal IT Project Manager Guidance Matrix.

The program will be administered by each civilian agency, and FAI will conduct periodic reviews to ensure that the FAC-P/PM program is being managed consistently. Additionally, FAI is mapping the program and project management competencies, which are included in the attachment, to learning objectives that will be used to assess current training or develop new training to meet these requirements. Private vendors, the Defense Acquisition University, and other government agencies offer a variety of online

PM Certification Support

Progress:

🚦 Created a certification process for OMB approval

🚦 Established agency performance goal for PM certification

🚦 Provided Center Implementation Guidelines outlining a common process

🚦 Met with PPMB, PMC, and center technical and human capital POCs to obtain concurrence on certification process

🚦 Created tools and resources for implementation

🚦 Collaborated with SATERN to build capability to record certification status

🚦 Established continuous learning requirements unique to NASA for certified P/PMs

Next Steps:

- Awaiting OMB approval of NASA's approach

- Monitoring and providing support to Centers for meeting the established timelines

- Integrating APPEL project management and systems engineering competencies into SATERN

- Updating SATERN system to accommodate tracking of continuous learning requirements

Initial P/PM Certification Targets

Certification Targets

By October 2009, certify 100%
(n=**69**) of P/PMs managing major
Acquisitions (>$250M LCC),
Including high-visibility projects and/
or large sub-systems or elements
with lower $ value:

- 33% (**23**) certified by May 2009
- 67% (**46**) certified by July 2009

(Targets reviewed by PMC March 2009)

Existing P/PMs to be Certified by 10/09			
Center	PGMs	PMs	Total
ARC	0	1	1
DFRC	0	1	1
GRC	0	0	0
GSFC	6	18	24
JPL	3	7	10
JSC	4	7	11
KSC	1	7	8
LaRC	2	1	3
MSFC	2	9	11
SSC	0	0	0
Total	18	51	69

Leveraging APPEL's Support:

an Agency-wide Resource

for Technical Workforce Development

APPEL Mission and Goals

MISSION

To support NASA's mission by promoting individual, team, and organizational excellence in program/project management and engineering through the application of learning strategies, methods, models, and tools.
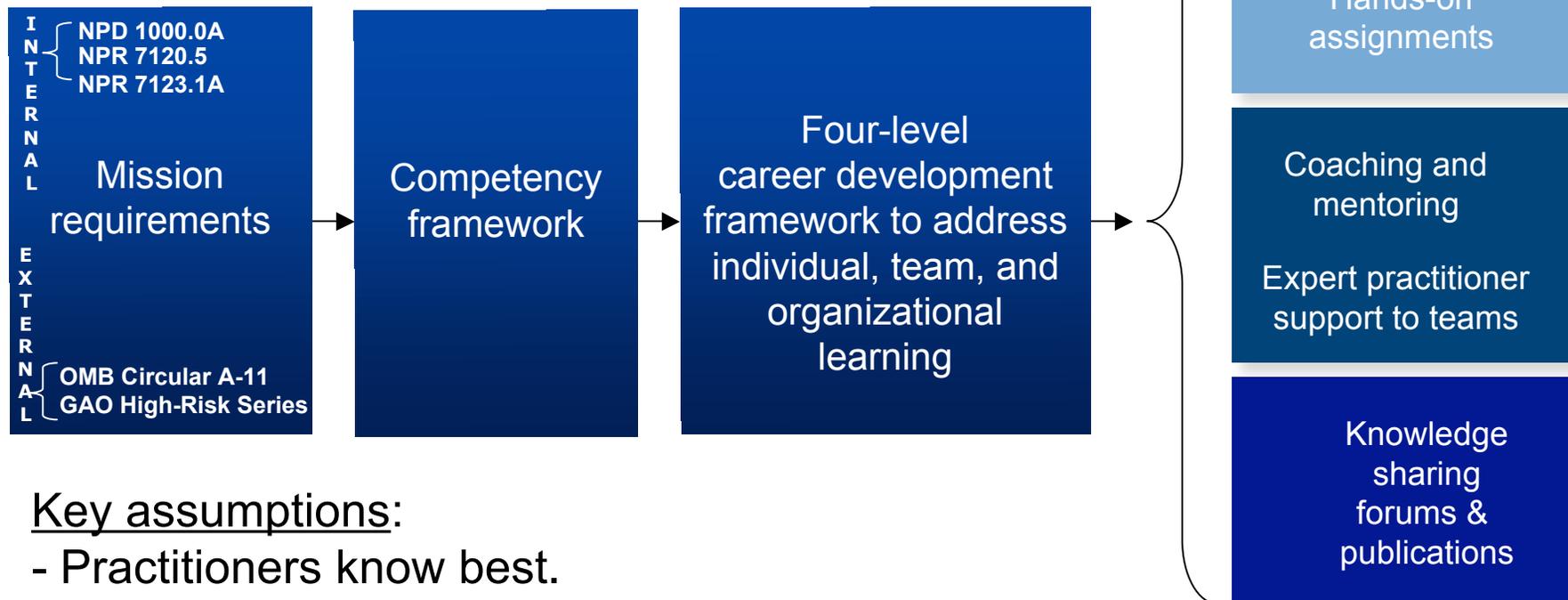
GOALS

- Provide a common frame of reference for NASA's technical workforce.

- Provide and enhance critical job skills.

- Support engineering, program and project teams.

- Promote organizational learning across the agency.

- Supplement formal educational programs.

Career Development Approach

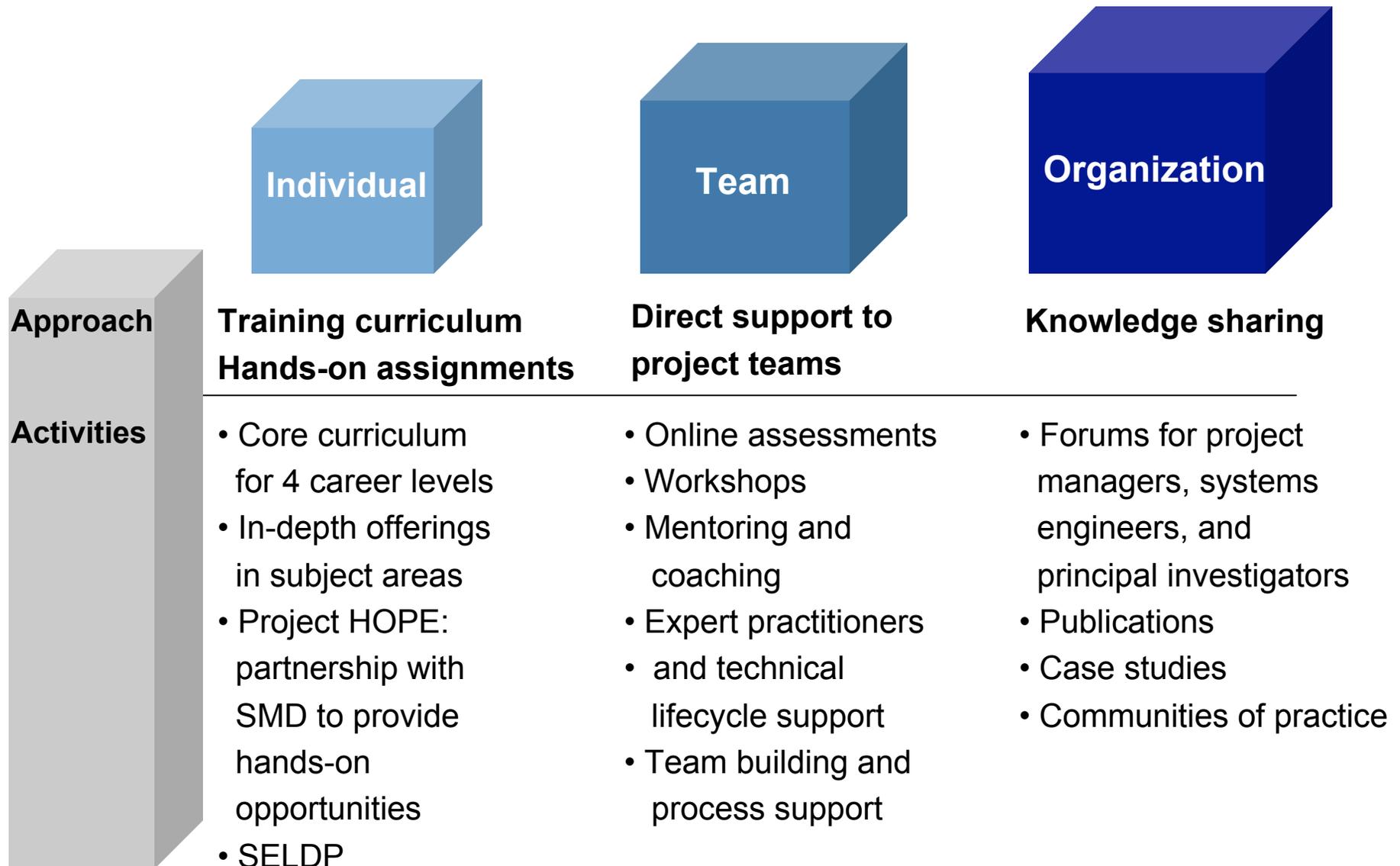APPEL has employed a competency-based approach to career development since the mid-1990s.

INTERNAL
- NPD 1000.0A
- NPR 7120.5
- NPR 7123.1A

Mission requirements

EXTERNAL
- OMB Circular A-11
- GAO High-Risk Series

→ **Competency framework**

→ **Four-level career development framework to address individual, team, and organizational learning**

→

- Training curriculum for all career levels — Hands-on assignments
- Coaching and mentoring — Expert practitioner support to teams
- Knowledge sharing forums & publications

Key assumptions:
- Practitioners know best.
- 85-90% of learning takes place on the job.
- Learning is contextual — different career stages have different requirements.
- Optimal performance and learning come together at the team level.

Continuous Learning for the Technical Workforce

Individual

Team

Organization

Approach	Training curriculum Hands-on assignments	Direct support to project teams	Knowledge sharing
Activities	• Core curriculum for 4 career levels • In-depth offerings in subject areas • Project HOPE: partnership with SMD to provide hands-on opportunities • SELDP	• Online assessments • Workshops • Mentoring and coaching • Expert practitioners • and technical lifecycle support • Team building and process support	• Forums for project managers, systems engineers, and principal investigators • Publications • Case studies • Communities of practice

4-Level Career Development Framework

EXECUTIVE LEVEL
PROGRAM OR VERY LARGE PROJECT MANAGER

- Core: **Executive Program**
- Mentoring; Administrator's Executive Forum
- Leadership by example in knowledge sharing

MID-CAREER
LARGE PM OR SYSTEMS MANAGER

- Core: **Advanced Project Management & Systems Engineering**
- Mentoring
- In-depth courses; rotational assignments
- Participation in knowledge sharing activities

SELDP
PMLDP

SEED
APEX
SMEP

MID-CAREER
SMALL PROJECT MANAGER OR SUBSYSTEM LEAD

- Core: **Project Management & Systems Engineering**
- In-depth courses; team lead assignments; Project HOPE
- Attendance at technical conferences or knowledge sharing activities

ENTRY
PROJECT TEAM MEMBER OR TECHNICAL ENGINEER

- Core: **Foundations of Aerospace at NASA**
- Obtain mentor
- Join professional associations

LEARNING STRATEGIES

- Cohort selected by NASA senior leaders
- Knowledge sharing forums
- Developmental assignments
- Performance enhancement for teams
- Non-traditional and hands-on learning experiences
- APPEL core curriculum

Core Curriculum for the Technical Workforce

Guiding Principles:

1. Competency-based.

2. Focuses on building *NASA-specific* expertise and capability in project management and systems engineering and makes extensive use of NASA case studies.

3. Intended to *supplement* an individual's academic and professional work experience.

Foundations of Aerospace at NASA

Learning objective: to give participants a solid understanding of the NASA organization and its principles of technical excellence.

Project Management & Sys. Engineering

Learning objective: to enhance proficiency in applying project management (PM) and systems engineering (SE) processes and practices over the project life cycle.

Advanced PM & Advanced SE
Learning objective: to give experienced practitioners a deep understanding of the challenges of leading and managing programs and projects in a complex and dynamic environment.

Executive Program
Learning objective: to develop a cadre of highly qualified NASA leaders for executive leadership roles. Participants selected based on recommendations of Center Directors and Associate Administrators.

✓ PMI Registered Provider of Professional Development Units

In-Depth Courses

Guiding Principles:

1. Designed to meet needs of Mission Directorates and centers

2. Emphasis on NASA specific case studies

3. Address OMB/GAO requirements

Design Engineering

Innovative Design for Engineering Apps

7 Axioms of Good Engineering – Learning from Failure

Communications & Leadership

Communicating Tech Issues

Negotiations

Team Leadership

Team Membership

Tech Writing for Engineers

Project Management

Integrating Cost & Schedule

Understanding Proj. Scheduling

Beyond Scheduling Basics

Assessing Project Performance

NASA's Budgeting Process

Performance-Based Statement of Work

Project Mgmt Leadership Lab

Management of Space Technology Programs

Proj Planning Analysis & Control

Scheduling & Cost Control

Understanding EVM

EVM Overview

Beyond EVM Basics

Advanced EVM

International Project Mgmt

Leading Complex Projects

Integrating EVM with Acquisition

Systems Engineering

Concept Exploration & System Architecting

Decision Analysis

Developing & Implementing a SEMP

Fundamentals of Systems Engineering

Space Systems V&V

Transition, Product Delivery & Mission Operations

Project Management & Systems Engineering

Lifecycle, Processes, & Systems Engineering

Project Review Processes & Strategies

Requirements Dev & Mgmt (Individual) (Team)

Risk Management

Continuous Risk Management

NASA Aerospace Topics

Introduction to Aeronautics

Exploration Systems and Space Operations

Mars Mission & System Design Lab

Earth, Moon, and Mars
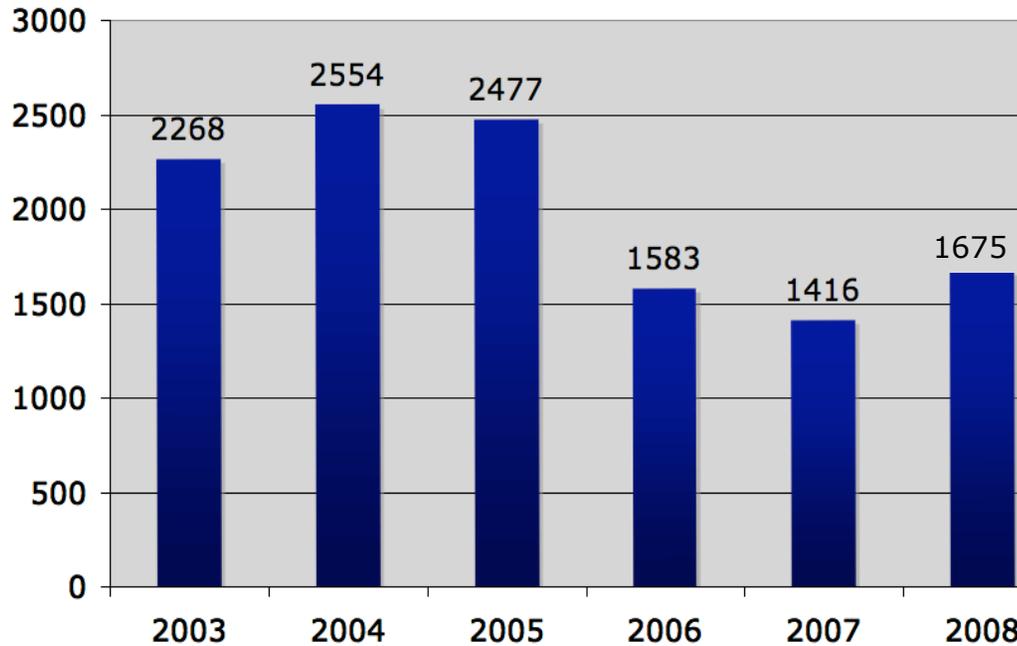
Science Mission Systems Design & Operations

Science Mission Systems Design & Ops Lab

Space Launch & Transportation Systems

Training Utilization

Total Course Participation 2003-2008

Year	Participation
2003	2268
2004	2554
2005	2477
2006	1583
2007	1416
2008	1675

Participation by Center

Center		
Ames Research Center	681	6%
Dryden Flight Research Center	483	4%
Glenn Research Center	991	8%
Goddard Space Flight Center	1375	11%
NASA HQ (and NSSC)	428	4%
Jet Propulsion Laboratory	749	6%
Johnson Space Center	1765	15%
Kennedy Space Center	1721	14%
Langley Research Center	1430	12%
Marshall Space Flight Center	1501	12%
Stennis Space Center	220	2%
Non-NASA Attendees	756	6%
Total Participants	**11973**	**100%**

Exceeded targets in courses related to **GAO High Risk Area**
- Earned Value Management (multiple offerings)
- Program Planning, Analysis, and Control
- Requirements Development and Management
- Lifecycle Processes & Systems Engineering
- Project Management for Contracting Officers
- Project Management & Systems Engineering
- Foundations of Aerospace at NASA

Targeted attendance: 939
Actual attendance: **1206**

Direct Support to Engineering and Project Teams

APPEL offers rapid deployment training at any point in the project life cycle through one-on-one assistance, coaching, mentoring, focused workshops, or large-group sessions in the following areas:

- Team and Leadership Development
- Requirements Development
- Planning and Scheduling
- Program Control Analysis
- Systems Integration Support
- Risk Management
- Software Management
- Technical Review Support

currently supporting over 100 NASA engineering and project teams

Tools and Methods:
- Baseline team and individual assessments
- Team workshops
- Expert practitioners for technical support
- Coaching and mentoring
- Follow-up team and individual assessments

Team Development Utilization

Services Delivered 2001 - June 2008:

Activity	NASA	GSFC	JPL	MSFC	KSC	JSC	ARC	LaRC	GRC
Teams Assessed	475	76	108	35	53	85	51	12	21
Individuals Assessed	1,983	290	273	504	136	165	241	135	136
Individuals Coached	1,279	194	177	359	87	96	161	80	62
Expert Practitioner Hours	6,693	1,243	580	1,307	82	843	1,233	1,243	48
Center Program Manager Hours	17,091	2,480	2,945	2,081	2,565	2,937	1,296	1,266	974

- Team development most requested APPEL service
- Largest share of APPEL resources
- Broadly used by wide spectrum of NASA program/project teams

Annual Utilization Trend =
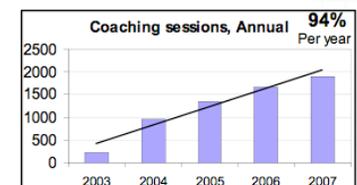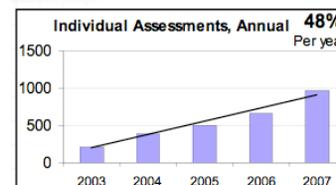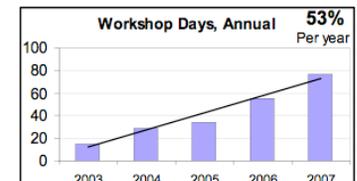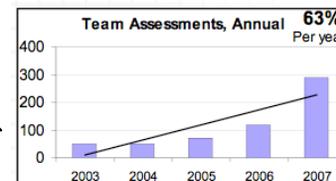
Organizational Learning: Knowledge Sharing

Objectives:

• Capture and transfer knowledge from seasoned program/project managers and engineers across the agency. (GAO)

• Build a learning community of reflective practitioners. (CAIB)

• Facilitate open communication and dialogue. (CAIB, GAO, Rogers Rept.)

Activities:

• **Invitational knowledge sharing forums and workshops**

    – 816 total participants 2003-2008

    – New in 2008: JSC Systems Engineering Forum and PI Forum with SMD for prospective SMEX Principal Investigators

• *ASK Magazine:* 6,000 subscribers; avg. 1,500 daily website hits

• **ASK the Academy e-newsletter:** 1,000+ email subscribers

• **PM Challenge:** 1,200 total participants in 2009

• **Case studies:** 28 NASA cases sponsored/developed

• **Partnerships and exchanges with external organizations**

    – JAXA, PMI Global Corporate Council, CIA, DoE

Measuring APPEL's Effectiveness

Accreditation

    Project Management Institute (PMI) Registered Provider and Corporate Council Membership

Assessment and Testing

    Workforce needs analysis

    Baseline and post-service results for teams and individuals

    Online knowledge measurement tools

Special Assignments by Senior Leadership

    Requests for papers, articles, and case studies on policies and lessons learned

Customer Feedback

    Utilization metrics and user surveys

    Demand for project team services

    Meetings with senior leaders at centers and Mission Directorates

External Validation

    Benchmarking with Aerospace Corp., Perot Systems, MIT, MOWG

Alignment with NASA strategy and OMB/GAO Requirements

    Meet or exceed external goals/benchmarks for project management development

Broad Impact with Constrained Resources

2008 Status

- ✓ 1,675 trained in courses
- ✓ 100+ teams supported
- ✓ 1,200 PM Challenge participants
- ✓ 495 invitational forum participants

Budget FY 02-FY09

Significant Accomplishments

- ✓ SELDP
- ✓ New Principal Investigator Forum in partnership with SMD
- ✓ Exceeded all targets for GAO High Risk Area improvements
- ✓ OMB PM certification

Risks

- New training to repurpose workforce for future challenges
- Changing workforce demographics
- Need for agency-wide systems engineering capability
- Increased external requirements to redirect funding

Challenges and Opportunities

- Helping agency fulfill OMB requirements for PM certification

- Repurposing NASA Workforce
  - Demographic shifts/retirements
  - Transition from Shuttle/Station to Constellation

- Building agency-wide systems engineering capability

- Meeting increasing demand for services with decreased resources

- Leveraging external partnerships (existing and new) to further agency goals

- Integrating knowledge sharing activities as critical after-action functions to further progress as a learning organization