



# Implementing SA-CMM

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## Outline



- ▲ Introduction (Video)
- ▲ Overview of SA-CMM
- ▲ Systems vs. Software Acquisition
- ▲ First Baseline Assessment
- ▲ Getting Started
  - ◆ Master Plan
  - ◆ Infrastructure (SAPT & Internal SOPs)
  - ◆ Metrics
  - ◆ Training (Abrams Process Improvement Web Site)



## Outline



- ▲ GAP Analysis
  - ◆ Mapping
  - ◆ Developing SOPs
- ▲ Abrams Document Generation Practices
  - ◆ Acquisition Professional (AcqPro)
    - ◆ Requirement/Scope of Work
    - ◆ Source Selection Plan (SSP)
    - ◆ Justification and Approval (J&A)
- ▲ Institutionalization
  - ◆ Abrams Digital Archive System (ADAS)
- ▲ Lessons Learned
  - ◆ Creating PATs



## Introduction



- ▲ Software Acquisition Capability Maturity Model (SA-CMM), Version 1.02, April 1999
- ▲ Developed by Software Engineering Institute (SEI), Pittsburgh, PA
- ▲ Private and Government Acquisition Experts participate in its development.
- ▲ Provides Acquisition Community Consistent Framework with which to operate.



## Introduction



- ▲ PM Abrams Effort Began September 1999
- ▲ Mr. Gansler Signs “Software Evaluations for ACAT I Program” Letter (26 Oct 1999)
  - ◆ Makes CMM DOD Policy for Contractors
  - ◆ DOD Policy Goal Effective Immediately
    - ★ Minimum Full Compliance With SEI CMM
    - ★ Level 3 - If Not CMM, Then Approved Equivalent
  - ◆ Will Be Incorporated Into the DOD 5000



## Introduction



- ▲ Process Improvement Goals for PM Abrams
  - ◆ Capture Best Practices
    - ★ Studies Estimate Loss of Over 50% of TACOM Workforce Before 2007
    - ★ Training of New Associates at PM Abrams
  - ◆ Achieve SA-CMM Level 3
  - ◆ Increase Return On Investment (ROI)
  - ◆ Develop In-House SA-CMM Expertise
  - ◆ Enhance Internal and External Communications



## Introduction



- ▲ PM Abrams’ Goals (cont’d)
  - ◆ Establish PM Abrams as Center of Excellence
    - ★ Leader in Cohesive Teaming, ACAT 1 Program Mgmt., Contractor Mgmt., Communications, & the SA-CMM
  - ◆ Establish Level Playing Field with Contractors
    - ★ Abrams Position: We Must Be Level 3 to Evaluate and Work With Our Level 3 Contractors



Abrams Power Demo



# SA-CMM Overview



## What Is SA-CMM?

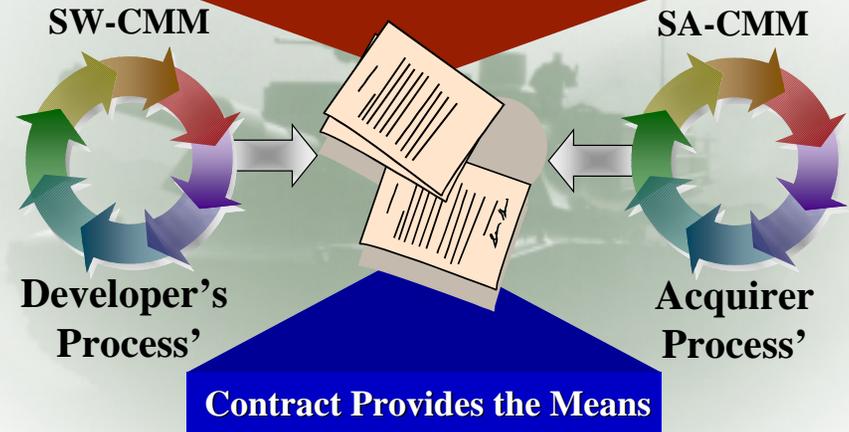
- ◆ Process Improvement
- ◆ Framework for Consistency & Quality
- ◆ Provides Organizational Stability
- ◆ Lends Itself to Best Uses of Resources
- ◆ Establishes Level Playing Field With Industry
  - ★ GDLS is SW-CMM Level 3
  - ★ Software Integration Lab (SIL)



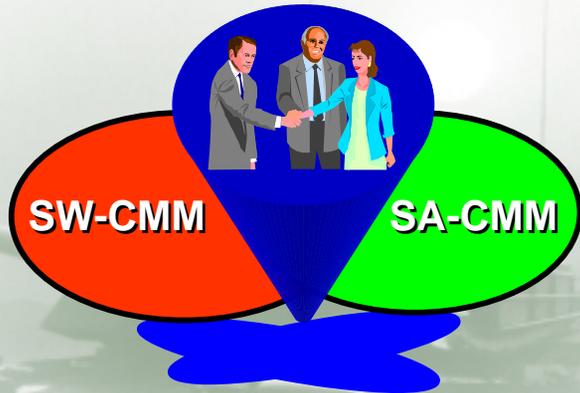
# SA-CMM Overview



Models Provide the Maturity and Confidence



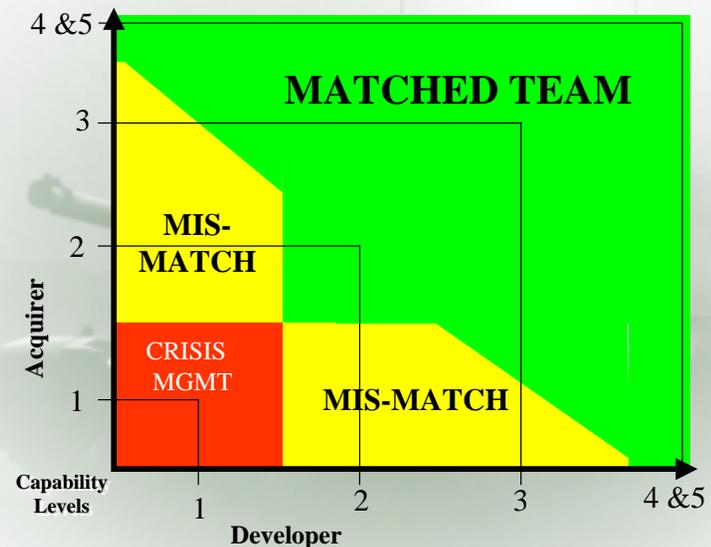
# SA-CMM Overview



The Models provide a nucleus for consistency, understanding of the mission, and the enhancement of the *interrelationship* between the Software Developer and the Acquirer



# Buyer/Supplier Mismatch





# SA-CMM Overview



Level	Focus	Key Process Areas (KPA's)
5 Optimizing	Continuous Process Improvement	Acquisition Innovation Management Continuous Process Improvement
4 Quantitative	Quantitative Management	Quantitative Acquisition Management Quantitative Process Management
3 Defined	Process Standardization	Training Program Acquisition Risk Mgmt Contract Performance Mgmt.
2 Repeatable	Basic Project Management	Transition to Support Evaluation Contract Tracking & Oversight Project Management Requirements Development & Mgmt. Solicitation Software Acquisition Planning
1 Initial	Competent People and Heroics	Not Applicable



# Overview of SA-CMM



Level	Focus	Key Process Areas (KPA's)
5 Optimizing	Continuous Process Improvement	Quantitative Acquisition Mgmt. Quantitative Process Mgmt.
4 Quantitative	Quantitative Management	Quantitative Acquisition Management Quantitative Process Management
3 Defined	2 Repeatable	Basic Project Management Transition to Support Evaluation Contract Tracking & Oversight Project Management Requirements Development & Mgmt. Solicitation Software Acquisition Planning
2 Repeatable	1 Initial	Competent People and Heroics
1 Initial	Competent People and Heroics	Not applicable

1st QTR 01 Goal



# SA-CMM Overview

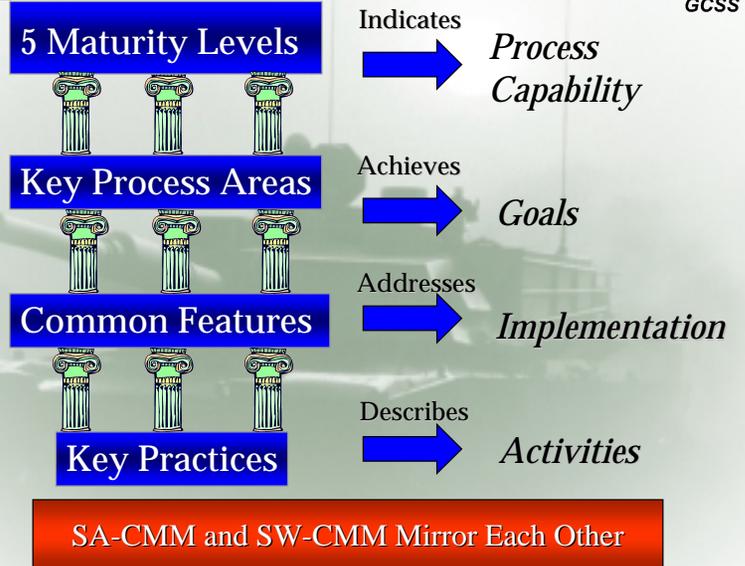


Level	Focus	Key Process Areas (KPA's)
5 Optimizing	Continuous Process Improvement	Quantitative Acquisition Mgmt. Quantitative Process Mgmt.
4 Quantitative	3 Defined	Process Standardization Training Program Acquisition Risk Mgmt Contract Performance Mgmt. Project Performance Mgmt. Process Definition & Maintenance
3 Defined	2 Repeatable	Basic Project Management Transition to Support Evaluation Contract Tracking & Oversight Project Management Requirements Development & Mgmt. Solicitation Software Acquisition Planning
2 Repeatable	1 Initial	Competent People and Heroics
1 Initial	Competent People and Heroics	Not applicable

4th QTR 01 Goal



# Overview of SA-CMM





## Overcoming The Dilemma



- ▲ Created a Major Communications Problem
  - ◆ Training
  - ◆ Staff at PM Abrams
  - ◆ SEI



I don't buy  
**HARDWARE!**

I don't buy  
**SOFTWARE!**



## Overcoming The Dilemma



Our Tank AND its Software



## Systems Acq. vs. SW Acq. Communicate



- ▲ What do the words mean to each person?
  - ◆ Software
  - ◆ Hardware
  - ◆ Acquisition
  - ◆ Contract
  - ◆ Systems
- ▲ Listen, Record and Train
  - ◆ Listen to the meaning
  - ◆ Record their interpretation of the meaning
  - ◆ Analyze all the meanings
  - ◆ Train for consistency of interpretation



## Systems Acq. vs. SW Acq.



- ▲ Issue at PM Abrams
  - ◆ Assess the differences between systems acquisition vs. software acquisition to determine whether the SA-CMM was an appropriate model for PM Abrams.
  - ◆ Consider our two main objectives
    - ★ Reach SA-CMM Level 3
    - ★ Improve our process



## Systems Acq. vs. SW Acq.



- ▲ Recommendations for PM Abrams
  - ◆ Continue using the SA-CMM as written
  - ◆ Mentally train people to replace the word “Software” with “System”
  - ◆ Document and record any shortcomings of the model under “non-model” findings/processes
  - ◆ Treat “non-model” findings with a lower priority, to be addressed after SA-CMM requirements have been addressed
  - ◆ Use Software SA-CMM for the formal assessments



## Systems Acq. vs. SW Acq.



- ▲ Reasoning
  - ◆ Our key deficiency was a lack of written & institutionalized procedures
  - ◆ SEI is developing a CMMi model backed by OSD (Integrated SA-CMM and SW-CMM)
  - ◆ Currently SEI recommends PM Abrams follows SA-CMM due to PM Abrams being a purely acquisition organization
  - ◆ The SA-CMM does fit our method of doing business. No need to pursue changes.



## Systems Acq. vs. SW Acq.



- ▲ SEI: Only about 10% of the model can NOT be replaced with the word “system.”
- ▲ The remaining 90% of the model the terms “software” and “system” are interchangeable.



## Digital Solutions Preparing for the Assessment



**DEMO**



Abrams Digital Archive System



## First Baseline Assessment



- ▲ Designate Management Steering Group (MSG)
  - ◆ Division Chiefs from the 5 Major Divisions at PM Abrams
  - ◆ Executive MSG consists of PM & DPM
- ▲ Organized a Systems Acquisition Project Team (SAPT)
  - ◆ Representative from each of the 5 Divisions at PM Abrams
  - ◆ Requested/received experienced personnel
    - ★ Problems with time demands



## First Baseline Assessment



- ▲ Survey Downloaded from SEI Website
  - ◆ First effort to determine how we stacked up to the model
  - ◆ Questions related to general background & KPAs
  - ◆ Customized
    - ★ Terminology confusion “systems vs. software”
    - ★ Some questions were mis-interpreted
      - CMM terminology does not match our terminology
      - Some words or phrases have specific meanings at PM Abrams
    - ★ Added some questions
    - ★ Dropped some Level 3 questions



## First Baseline Assessment



- ▲ Survey (cont'd)
  - ◆ Time intensive - about 3 hours each time
  - ◆ Interview conducted according to assessment rules
    - ★ Lead interviewer to ask the questions & define terms
    - ★ Additional interviewers to take notes or ask clarifying questions
    - ★ Strict confidentiality
  - ◆ Combine results from all interviewers – also time intensive
  - ◆ Results labeled (by level of interviewees) & sent to SEI for analysis



## First Baseline Assessment



- ▲ Presentation to Entire Workforce
  - ◆ Training on SA-CMM Concepts
  - ◆ Upcoming Baseline Assessment
  - ◆ Reasons for Process Improvement
  - ◆ Stress We're Not Re-Inventing the Wheel but Primary Goal for Level 2 is Capture Best Practices
- ▲ Short Training Session for Each Division on What to Expect During the Assessment



## Training Internal Assessment Team



- ▲ Suggest In-depth Model Training
- ▲ Target Terminology Problems
- ▲ Reduce Confusion
- ▲ Reduces Posturing during Assessment
- ▲ Aids in Collaborating

**Adequacy of this training will help guide early success!**



## First Baseline Assessment



- ▲ Assessment Team
  - ◆ External team members (4)
    - ★ Very limited pool of certified SA-CMM assessors
      - Schedule & create contract well in advance
      - Recommend SEI assistance in baseline assessment
    - ★ Lead assessor was certified
    - ★ Remaining 3 not certified but experienced with SW-CMM assessments
  - ◆ Internal team members (4)
    - ★ Chosen from SAPT according to availability (for preparation & the week of assessment)
    - ★ Backup team members a good idea
- ◆ 8 is really too many, 4-6 is more workable



## First Baseline Assessment



- ▲ Assessment Logistics
  - ◆ Reserve 2 conference rooms
    - ★ War room for assessment team
    - ★ Interview room
  - ◆ Prepare interview schedule well in advance
    - ★ Remind interviewees periodically
  - ◆ Gather/catalogue relevant artifacts
    - ★ Start your "archive" system well in advance of the first assessment/review
      - Organize Early
      - Plan Out the Process for Housing the Information
      - Provide Easy to Use Access

**From Chaos To Discipline**



## First Baseline Assessment



- ▲ Lessons Learned
  - ◆ Much More Preparation for EVERYONE
    - ★ Mock Assessment
    - ★ Terminology (this never stops)
  - ◆ Much More Effort to Relate CMM Concepts & Terminology to internal Practices
    - ★ Led to No Assessment of T2S KPA
  - ◆ Allow Time and Contractually Require Customization of Scripts Based on Mapping of Terminology



## First Baseline Assessment



- ▲ Lessons Learned (cont'd)
  - ◆ Groupings of Interviewees should be Functional (IPT), Not Organizational
  - ◆ More Extensive Training



## Getting Started



- ▲ Master Plan for Process Improvement
  - ◆ Keep body of plan simple and direct
    - ★ Use Appendices for detailed information
  - ◆ MS Project Task
  - ◆ Schedule is Updated weekly at SAPT meetings
  - ◆ Assign Tasks to SAPT Members
- ▲ Bi-weekly briefings with MSG
- ▲ Weekly SAPT meetings
  - ◆ Agenda reflects status report of MS Project tasks



## Getting Started



- ▲ Master Plan Sections
  - ◆ Revision History
  - ◆ Purpose of this Document
  - ◆ Overview
  - ◆ Executive Overview
  - ◆ Expected Benefits of Process Improvement at PM Abrams
  - ◆ Process Improvement Goals
  - ◆ Results of Baseline Evaluation



## Getting Started



- ▲ Master Plan Sections (cont'd)
  - ◆ Agenda to Address Baseline Evaluation Results
  - ◆ Related Process Improvement Efforts/Groups
  - ◆ Assumptions and Risks
  - ◆ Infrastructure for the Improvement Program
  - ◆ Training Requirements
  - ◆ Communication Plan
  - ◆ Tools
  - ◆ Configuration Management
  - ◆ Metrics



## Getting Started



- ▲ Master Plan Sections (cont'd)
  - ◆ Appendix A: Results of Baseline Evaluation by KPA
  - ◆ Appendix B: Schedules and Deliverables
  - ◆ Appendix C: Charters
    - ★ SAPT
    - ★ MSG
  - ◆ Appendix D: Procedure for Developing PATs
  - ◆ Appendix E: PAT Orientation
  - ◆ Appendix F: Terminology



## Getting Started



- ▲ MS Project Tracking Tasks
  - ◆ KPA Mapping
  - ◆ GAP Analysis
  - ◆ Metrics
  - ◆ ADAS
  - ◆ Communications
  - ◆ AcqPro
  - ◆ Level 2 Assessment Preparations
  - ◆ Training

**Need Resources!**



## Getting Started



- ▲ Metrics
  - ◆ Identify any existing metrics
  - ◆ Level 2 metrics generally consist of KPA status reporting
  - ◆ Some confusion over Level 2 definition of metrics and what metrics are applicable



## Getting Started



- ▲ Developing Infrastructure SOPs
  - ◆ Develop template for SOPs
  - ◆ Initial SOPs
    - ★ Submitting SOP Ideas
    - ★ Developing PATs
  - ◆ Establish Review Cycle
    - ★ Review by PAT members
    - ★ Review by SAPT representative
    - ★ Review by MSG
      - Division Chiefs Appoint Alternates for SOP reviews
    - ★ Review by Executive MSG



## Getting Started



### ▲ Template SOP

- ◆ Version history table
- ◆ Introductory Section
  - ★ SOP number
  - ★ SA-CMM reference
  - ★ Process Owner
  - ★ Effective Date
- ◆ Purpose
- ◆ Applicability
- ◆ Definitions

#### Recommend SOPs:

1. Mandatory
2. Written by the subject matter experts on the floor



## Getting Started



### ▲ Template SOP (cont'd)

- ◆ References (Other Relevant SOPs or Documents)
- ◆ Procedure
  - ★ Pre-requisites
  - ★ Tasks
  - ★ Output Artifacts & Success Criteria
- ◆ Responsibilities (Tasks assigned to specific groups)
- ◆ Exhibits
- ◆ Signature Block for PM or DPM



## Getting Started



### ▲ Training

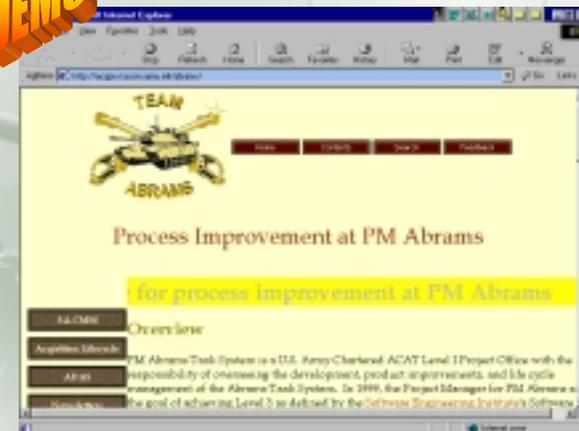
- ◆ Basic SA-CMM Concepts for entire workforce
  - ★ Recommend customization & joint presentation w/ SEI
  - ★ Focus on current assessment goals
- ◆ Managing Technology Change
- ◆ Process definition
- ◆ Acquisition metrics
- ◆ Improving communications
- ◆ Level 2 certification training
- ◆ PAT/IPT training



## Abrams Process Improvement Web Site



DEMO





# GAP Analysis



- ▶ Mapping KPAs to Existing Procedures/Artifacts at PM Abrams
- ▶ Identify SOPs required
- ▶ SEI Assistance
  - ◆ Prioritize New SOPs
  - ◆ Validate Mapped Artifacts as Sufficient
- ▶ Create PATs to Develop SOPs
- ▶ Develop SOPs
- ▶ Submit to Review Cycle



# GAP Analysis



Acquisition Process Architecture Framework (APAF)  
SEI Software Acquisition - Capability Maturity Model  
MAPPING PROCESS

ARTIFACTS by KPA

	Effort Type	AC1	AC2	AC3	AC4	AC5	AC6	AC7	AC8	SAP	SOL	RDM	PM	EVL	T2S
1.0 Acquisition Program Management															
1.1 Requirements Development	Requirements Planning/Draft Requirements Doc&Changes/Recomm and Changes to Combat Developer/Develop Training Requirements	SAP/CTO	SAP/T2S	SOL/T2S	T2S	SAP	RDM							11/12/13/14/18/20	
1.2 Plan Program	1.2.1 Prepare For Manage MS Decision Review 1.2.2 Plan & Manage Program Schedules	SAP/SOL/PM/CTO	SAP/SOL											33/36	
	Develop Plans & MS Decision Documents (APB, Acq Stgy, TEMP, MIPS)/ Update Supporting Documents/ Perform Interagency Coordination Develop Internal Program Schedules/Coordinate & Analyze Contractor Schedules	SAP/PM	SAP/SOL/CTO/T2S	SAP/T2S	SAP/T2S	SAP/PM								4/17/33/6	

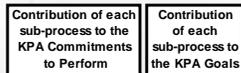
**Mapping Strategies  
DOD IDE to SA-CMM  
Why? Terminology**



# GAP Analysis



Evaluation Key Process Area  
Mapping Abrams Processes to  
KPA Goals, Commitments, Abilities, Activities, Measurements and Verifications



Division	Processes	SOP#	Artifact	V1	V2	M1	AC1	AC2	AC3	AC4	AC5	AC6	A1	A2	A3	A4	C1	C2	C3	G1	G2	G3	
Logistics/ Engineering/ PMO/ Contracting/ PA&T	Develop specific and derived Test Requirements based on system requirements documents		PM Abrams Evaluation SOP/PM Abrams Input to TRADOC Issues & Criteria (I&Cs)					X															
Logistics/ Engineering/ PMO/ Contracting/ PA&T/T&E IPT	Develop tests to support evaluation of all criteria/develop schedule/update program risk management assessment		1st Draft Test & Evaluation Master Plan (TEMP)/ Updated Program Risk Mgmt Plan																				

**Mapping strategies  
SA-CMM to Internal**



# Institutionalization



- ▶ 3 Components Must be Present for Assessment
  - ◆ 1) Artifact Itself
  - ◆ 2) Management Knowledge of Artifact & Its Usage
  - ◆ 3) Staff Knowledge of Artifact & Its Usage
  - ◆ Last 2 Known as "Institutionalization"
- ▶ Plan for Institutionalization
  - ◆ Allow sufficient time
  - ◆ Training
  - ◆ Division briefings



## Institutionalization



### ▲ Tools Used

- ◆ Website
  - ★ Selectable List of Policies & SOPs
- ◆ Review Cycle
- ◆ Individual training
- ◆ Divisional meetings to discuss SOPs



## Institutionalization



### ▲ Tools Used (cont'd)

- ◆ Quality Assurance Policy
  - ★ Requires Staff to Follow Documented SOPs
  - ★ Requires All Mgmt. to Include Process Improvement in Annual Reviews & Monitor Compliance
  - ★ Annual Review of all SOPs Belonging to a Given Division
  - ★ Waiver Process w/ Executive MSG Signature



## Digital Solution Process Improvement Document Generation



Acquisition Professional Software



## Lessons Learned



### ▲ PAT Teams

- ◆ Keep Size Small
  - ★ Staffed by Divisions Most Directly Affected
- ◆ Begin w/ Clearly Defined, Achievable Goals
  - ★ Create Model as Starting Point of Discussion
  - ★ Model Developed by 1 or 2 People - Recognized Expert
  - ★ Thus, Larger PAT is Mostly Advisory
- ◆ Use a lead author with PAT review/input



## Lessons Learned



- ▲ Review Cycle Needs Designated Alternates for the Division Chiefs
- ▲ “Plan” to Lose Key People
  - ◆ Permanently
  - ◆ Short-Time
- ▲ Assign Full-Time Coordinators w/ Part-Time Assistance from All Divisions

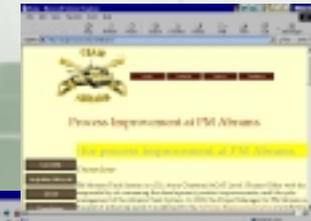


## Lessons Learned



### ▲ Constant Communications

- ◆ Briefings
- ◆ Newsletters
- ◆ Conversations
- ◆ Website
- ◆ Training
- ◆ Other



Abrams Power Demo