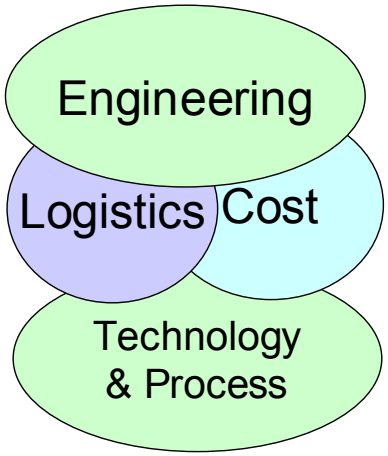
Process for Evaluating Logistics Readiness Levels (LRLs) for Acquisition Systems

October 26, 2005



Aging Aircraft Integrated Product Team (AAIPT)
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Agenda

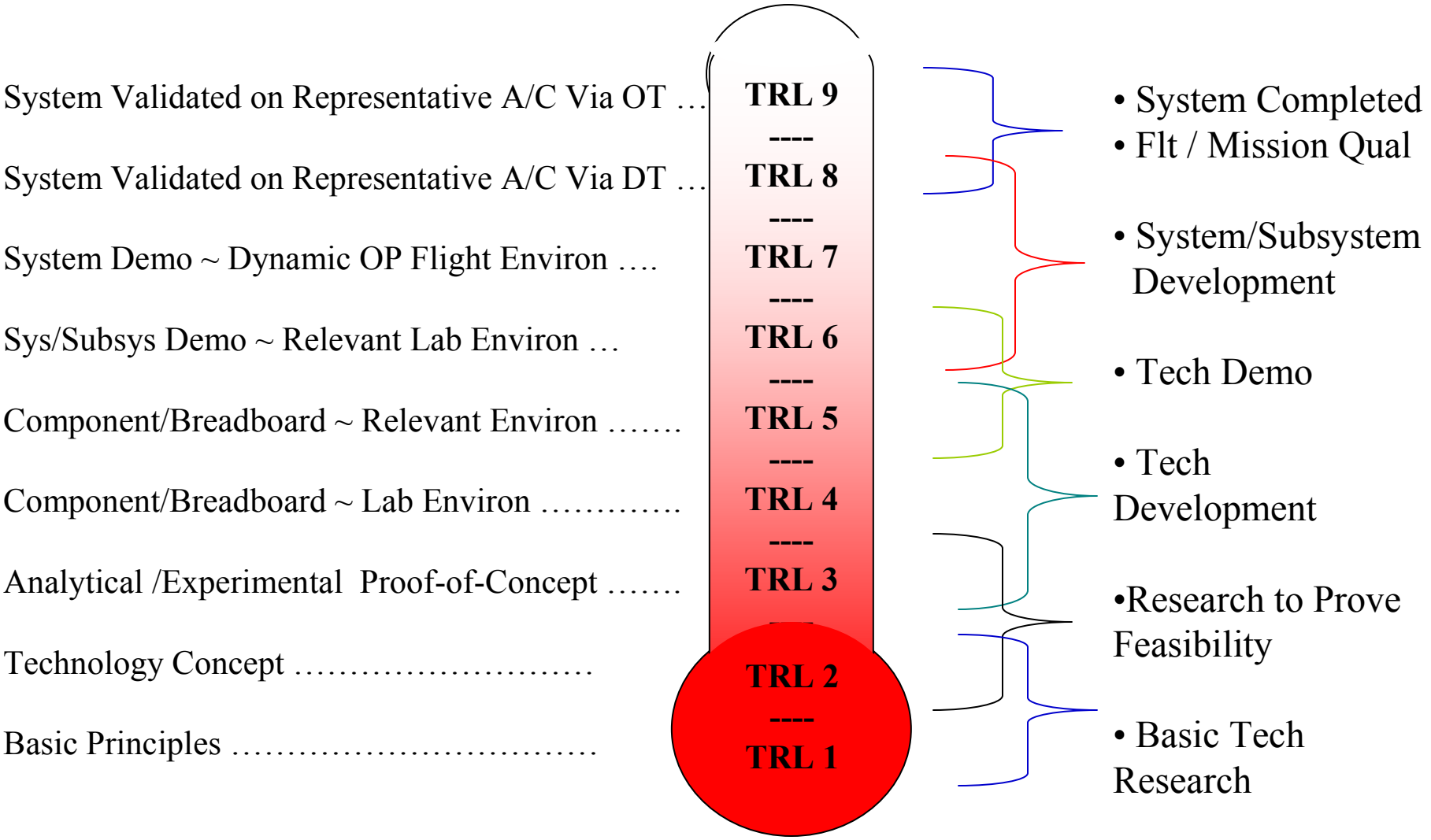
- Background of Logistics Readiness Level (LRL) concept
- LRL Defined
- LRL Excerpts
- Benefits
- Next Steps
- Questions
- NAVAIR Aging Aircraft Points of Contact

Background

- LRL concept initially based on the DOD 5000.2 mandated Technology Readiness Levels (TRL) assessment process

- TRLs provide:
  - Evaluation of critical technology maturity
  - Maturation plan (as needed)
  - Best practices/guidelines for each Milestone
    - MS B target is TRL = 6
    - MS C target is TRL = 7
    - MS C preferred is TRL = 8

Background: TRL Definitions



Background

- TRLs provide an understanding of the technical maturity without consideration of the sustainment of those technologies
  - TRLs were never intended to consider logistics
  - LRLs is a new concept with the intent to consider sustainment issues

- Logistics benchmark system was desirable
  - ~10 logistics elements that are often interdependent and parallel are required to successfully acquire, field, and support new technology
  - Aid in understanding what sustainment is required at different time phases

LRL Definition

- LRL intent:
  - Provide a methodology for assessing Logistic Element Readiness for technology
  - Establish benchmarks for programs at different phases in time
  - Provide a management tool to forecast logistics workload, manpower requirements, identify gaps, etc.
- NAVAIR Aging Aircraft convened a working group of engineers, logisticians, and program managers to draft an LRL concept
  - LRL concept is work in progress!!!
  - Initial phase was to focus on technology insertion for in-service (post MS C) aircraft platforms
  - LRL evaluated for project (vice platform)

Draft LRL

- LRL's considered at the project level (i.e. technology insertion) for an in service aircraft
- LRL's evaluated for 6 project phases:
  - Lab Test/R&D
  - Project Definition (Fleet Need/metrics/BCA/Decision to proceed)
  - Project Development /Implementation (Finalized analysis, change recommended, ECP development, Class II change development, RAMEC, LECP, other)
  - Engineering Validation
  - Fleet Verification
  - Fleet Use
- Answers question of what has to be done at each project phase for logistics

LRL Excerpt – Design Interface

Phase	Lab Test/R&D phase	Project Definition)	Project Development /Implementation	Engineering Validation	Fleet Verification	Fleet Use
Design Interface	Review and identify significant **design interface** impacts of project to existing system or platform (ex. available power, weight constraints, etc.) Create POAM to resolve any design interface issues.	Existing **Reliability and Maintainability** (RAM) metrics reviewed. Initial improvement predictions determined. **Design interface** issue resolution in work.	For new designs, **Reliability Centered Maintenance (RCM)** and **Failure Modes and Effects Analysis (FMECA)** completed to identify failure modes, failure frequency, effect on performance, and criticality. For modifications to existing design, RCM and FMECA reviewed for impacts. **Design interface** issues resolved.	Results of **RCM** and **FMECA** used to develop or modify existing condition based and schedule based maintenance tasks. Results of RCM and FMECA also used to update the Critical Items list as applicable. Technical data updates drafted and validated.	**Technical updates** (such as Maintenance Requirement Card changes) verified.	**Technical** updates completed and available.

LRL Excerpt – Training and Facilities

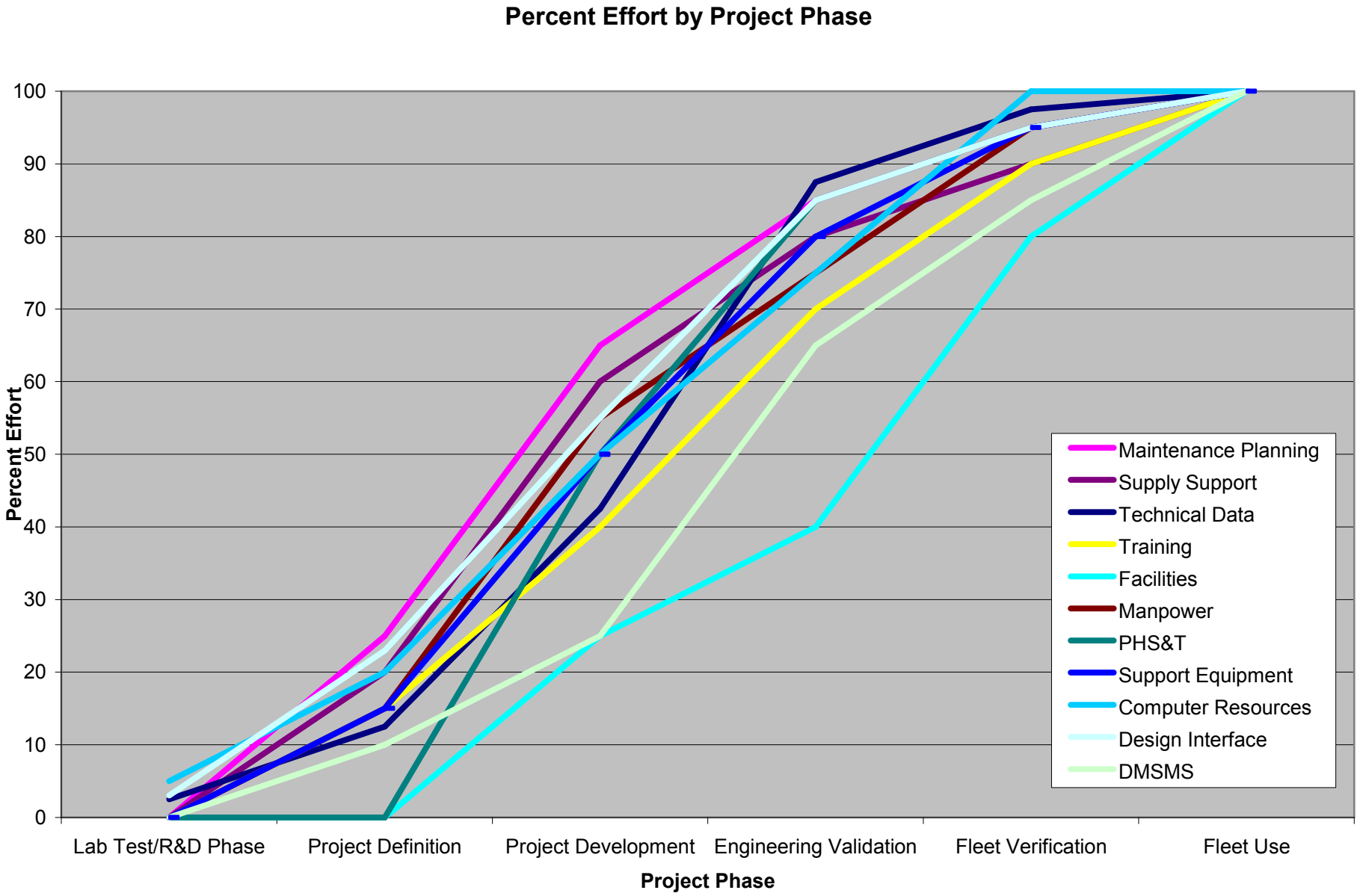
Phase	Lab Test R&D phase	Project Definition	Project Development /Implementation	Engineering Validation	Fleet Verification	Fleet Use
Training		Existing training procedures/curricula and training plan identified and reviewed.	Impacts to **Training** identified	**Training curricula** changes drafted. As required changes to **Naval Training Systems Plan (NTSP)** drafted.	**Training curricula** changes updated post validation/verification with changes as necessary. NTSP changes finalized. Changes submitted for approval.	**Trainining** curricula updated. **NTSP** updated.
Facilities			Current **Facilities** reviewed and impacts identified. When applicable, facilities modifications or new requirements are documented and analysis completed for (in) adequacy of existing facilities, trade studies for optimal new facility, funding requested.	As needed with funding available, **Facilities** modifications or new facilities projects in work.	**Facilities** project completed and approved.	New or modified **Facilities** completed .

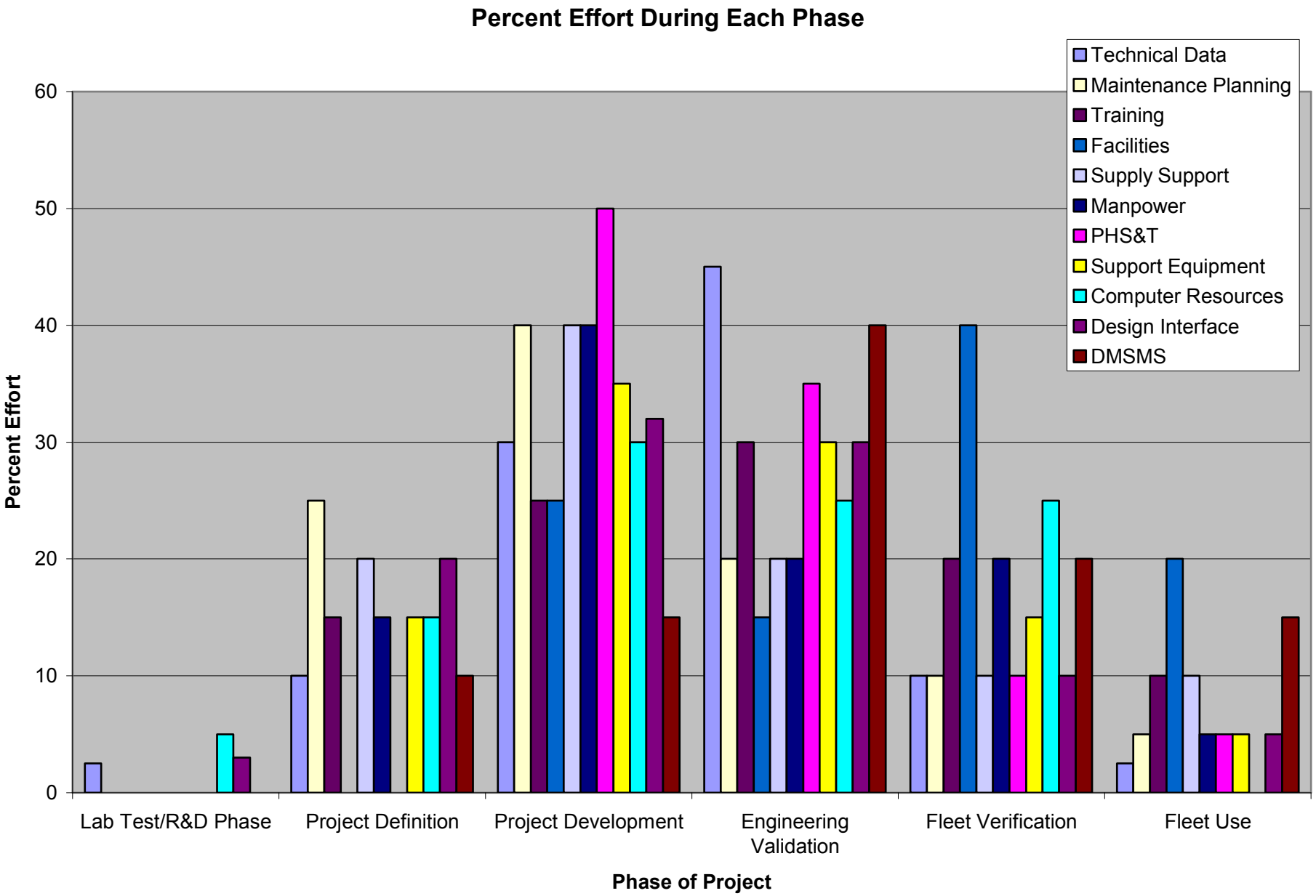
LRL Excerpt – DMSMS

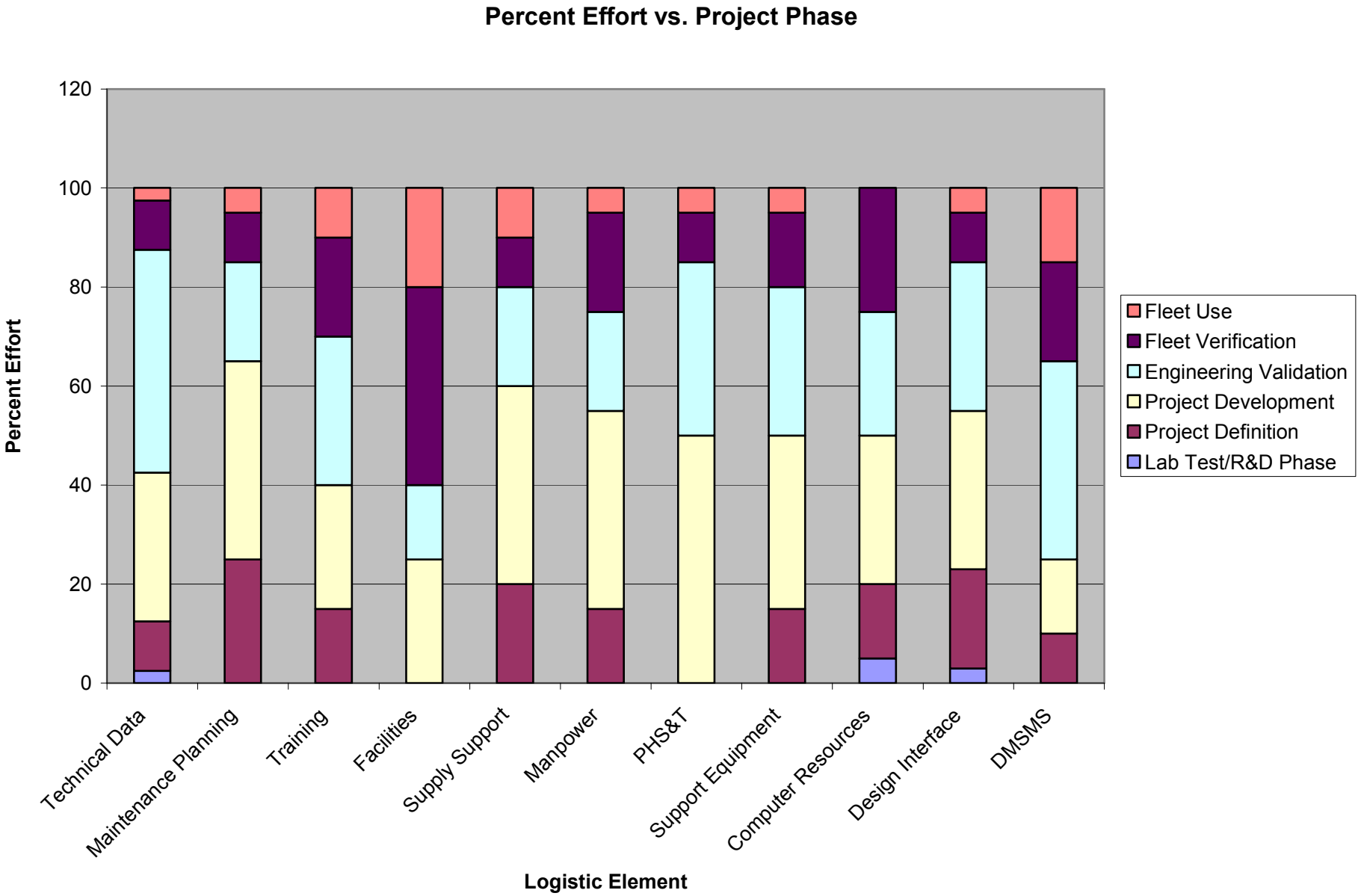
Phase	Lab Test R&D phase	Project Definition	Project Development /Implementation	Engineering Validation	Fleet Verification	Fleet Use
DMSMS		Existing **DMSMS program management plan** reviewed. Determine the **technical refresh strategy** (2 yr, 4 yr, spiral, etc.)	New technology evaluated to determine criticality as it relates to DMSMS. Assess components against the tech refresh strategy. **Impacts to DMSMS plan or metrics identified.**	**DMSMS forecasting** completed for new technology. Updates to DMSMS management plan drafted. Technical data package requirements drafted.	**DMSMS management plan** updated. Technical data package that supports DMSMS mitigation strategy available.	**Metrics** and usage monitored as required.

Draft LRL

- Evaluated percentage of total effort required at each phase
- Graphed percentage effort as a function of phase of the project
- Percent effort is subjective number based on efforts outlined in the LRL for each element at each phase
- Many other ways to depict data
  - 3 examples follow


Percent Effort by Project Phase
100
90
80
70
60
50
40
30
20
10
0
Percent Effort
Lab Test/R&D Phase
Project Definition
Project Development
Engineering Validation
Fleet Verification
Fleet Use
Project Phase
Maintenance Planning
Supply Support
Technical Data
Training
Facilities
Manpower
PHS&T
Support Equipment
Computer Resources
Design Interface
DMSMS


Percent Effort During Each Phase
Technical Data
Maintenance Planning
Training
Facilities
Supply Support
Manpower
PHS&T
Support Equipment
Computer Resources
Design Interface
DMSMS
Percent Effort
60
50
40
30
20
10
0
Lab Test/R&D Phase
Project Definition
Project Development
Engineering Validation
Fleet Verification
Fleet Use
Phase of Project


Percent Effort vs. Project Phase
Percent Effort
120
100
80
60
40
20
0
Technical Data
Maintenance Planning
Training
Facilities
Supply Support
Manpower
PHS&T
Support Equipment
Computer Resources
Design Interface
DMSMS
Logistic Element
Fleet Use
Fleet Verification
Engineering Validation
Project Development
Project Definition
Lab Test/R&D Phase

LRL Benefits

- Benefits include:
  - LRLs will be a template/benchmark to measure readiness by logistic element on a project level basis
  - Template can be utilized to train/mentor new logistics personnel (and engineering personnel) in sustainment requirements for tech insertion projects
  - LRLs will aid in planning manpower/funding/schedule requirements for projects as they mature from project concept to implementation
  - LRLs will dovetail with logistics risk assessments for another perspective

Next Steps

- Continue to collect input on Draft LRL concept
- Brief Draft LRL concept to solicit further input
- Update/change draft as needed
- Establish a working group to expand the scope to encompass aircraft in the entire lifecycle vice limiting to in-service aircraft
- Apply and test the process at NAVAIR AAIPT

Questions?

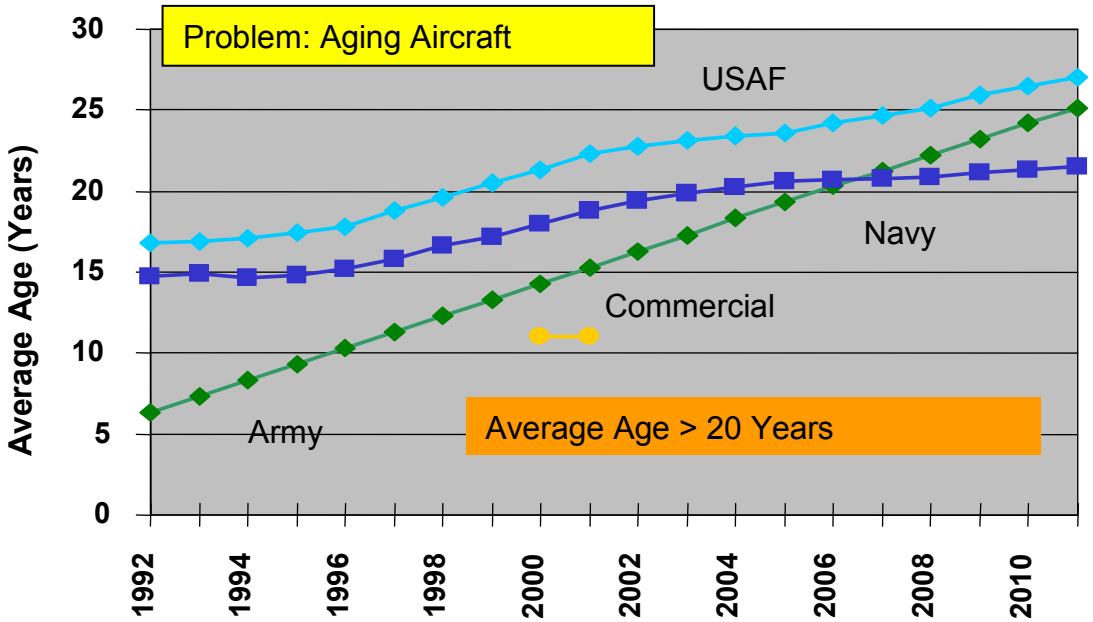
AAIPT Points of Contact

- AAIPT Lead, Bob Ernst, 301-342-2203, robert.ernst@navy.mil
- AAIPT Assistant Program Manager for Logistics, Harry Proffitt, 301-757-0868, melvin.proffitt@navy.mil
- AAIPT Air Vehicle IPT lead, Don Sheehan, 301-342-0131, donald.sheehan@navy.mil
- AAIPT Consultant, Elizabeth Broadus, 301-862-7049, broadus_elizabeth@bah.com

Backup Slides

AAIPT Organization

Why is an AAIPT needed?



AAIPT Vision:

- Identify Problems - Quantify Risk
- Provide **Information** to Program teams
- Advocate for **Enabling Technologies**
- Provide Standard **Risk & Cost Evaluation** Tools
- Focus Attention to Aging Aircraft problems
- Leveraged Funding to reduce cost

AAIPT Organization

AIR 1.0

AIR 3.0 / 6.0

AIR 4.0 / 5.0

AAIPT LEAD

STAFF FUNCTIONS

- Command Support Throughout NAVAIR
- Technical Expertise
- Adequately staffed to meet emergent needs (Triage)

WIRING & POWER

- On Board Diagonstics
- Off Board Diagonstics
- Circuit Protection
- Batteries
- Process Improvement

AIR VEHICLE

- Corrosion
- Hydraulics
- Transparencies
- Aeromachanics
- NDI / NDE
- Bearings
- Repair / Bonding
- Fire Extinguisher
- Structure Analysis

AVIONICS

- S & T
- Legacy
- Process

OBSOLESCENCE

- Policy
- Process / Tools
- "Hot Line"
- PMA Support

FASTRACK SUSTAINMENT (S.E.T.)

- Policy
- Process
- Products
  - H53
  - H-1
  - AV-8
  - H-46

ENVIRONMENT

LOGISTICS

COST

FINANCES

CONTRACTS

JCAA

Fleet Focus Teams

Fleet Focus Team

- Fleet Focus Teams (FFTs) identify, communicate, and leverage engineering solutions across Type Model Series and/or Service Boundaries

Simply Stated: