



# Integration of Cost History with Project Management Data for Improved Cost Estimates

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for

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# Purpose of Presentation

Explain and demo the use of the SmartPages application for electronic transmission and interfacing of EVM Contract Performance Report (CPR) and Cost Analysis Requirement (CADRe) information for improving cost estimates for enhanced project management



# Why Use SmartPages?

- Wanted the implementation of an application:
  - That made CPR's more easily available from contractors electronically
  - That minimized manual preparation of CADRe information
  - That facilitated electronic transmission of CPR actual cost data into CADRe Part C (LCCE)
  - That facilitated communication between personnel involved with integrated cost risk activities



# Integrated Cost Risk at NASA

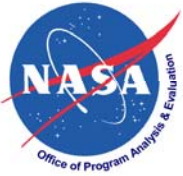
(Draft NPR 8000.4B)

- Focus is Category I & II space flight programs and projects
- Objective: Continuously determine the rolled-up risk impact on the cost of the program/project by organizing, obtaining and using cost-risk information
- Stakeholder interest in integrated cost-risk was codified in June and July 2006
  - Circular A-11, Part 7 and the Supplement to Part 7 (Capital Planning Guide)
  - Update of the FAR (FAR Case 2004-019)
- These updates require the creation and management of risk adjusted budgets
  - This supplemented GAO interest in better NASA cost-risk management as documented in the May 2004 GAO report on NASA cost estimating



# Integrated Cost Risk at NASA

- Integrated cost-risk analysis integrates
  - NASA Continuous Risk Management (CRM)
  - Cost estimating
  - Cost-risk assessment/analysis
    - Utilizing the identified risks in the project risk list and top-down WBS-based uncertainty analysis
  - EVM
  - Procurement
  - Cost data collection
  - Cost data analysis

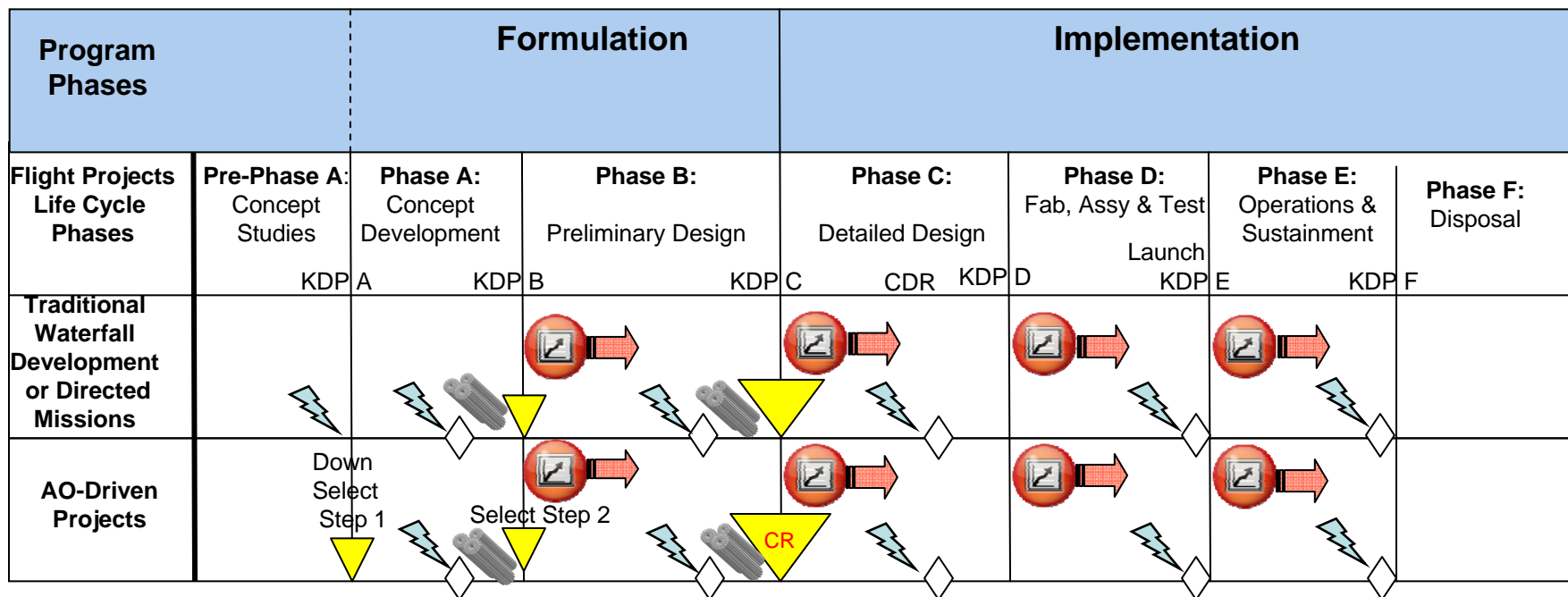


# Integrated Cost Risk at NASA

- Three activities make up integrated cost-risk:
  - Identify and Quantify Cost-Risk
    - Identify and assess risk
    - Translate risk assessment into cost impact
    - Perform “S”-curve and CRM scenario-based cost-risk
    - Incorporate CRM scenario-based and “S”-curve cost-risk in CADRe (Part C) Life Cycle Cost Estimate (LCCE)
  - Establish Cost-Risk Reporting
    - Develop RFP CADRe & EVM Data Requirements Description (DRD’s) and equivalent project plan requirements
    - Evaluate EVM and CADRe DRD’s in proposals/project plans
    - Do Integrated Baseline Review
  - Manage Cost-Risk Using Reported Data
    - Do EVM performance measurement & CADRe “S”-curve analysis
    - Compile end-of-contract cost-risk data for database updates, data evaluation and analysis and cost-risk algorithm updates



# When Integrated Cost-Risk is Required



Legend

- Id & Quantify Cost-Risk
- CADRe's
- Establish Cost-Risk Reporting
- GPMC Mission Decision Review/ICR
- Manage Cost-Risks Using Reported Data

5/8/2007

Graham/Walkovitz 07 SCEA  
SmartPages Demo Briefing



# First AIDE/SmartPages





# SmartPages Vision

A computing environment that enables computer users with little or no computer technical knowledge to do what they want on the computer without technical support



# SmartPages Paradigm

## User Activities

- Create Pages/Fields
  - Anything that can be entered on a Paper Page
  - Also audio and video files
- Connect Fields
- Use Fields

## Results

- Data Structure Created, Maintained, Optimized Automatically
- Pages Automatically Web Compliant
- Automatic Analytical Collaboration
  - Real-time, on-line updates
  - Updates even if not on-line
  - Proprietary data USED but NOT seen
- User Environment Totally Dynamic, Totally Integrated



# SmartPages Benefits

- Development by Users Who Need Not be Technical

## Who Can

- Deploy in a Fraction of Typical Time

## With

- Collaboration that Meets Your Security, Analytical, and Timing Demands



# Implementing Integrated Cost-Risk with SmartPages

## SmartPages Demo



# Integrated Cost-Risk with SmartPages

- **Identify & Quantify Cost Risk**
  - Near-end or end-of-contract or phase CADRe and CPR data in SmartPages can be electronically available to:
    - Update cost models
    - Update cost-risk algorithms and techniques
  - After-contract risk-driven trends available electronically through SmartPages data searches can be analyzed for impacts to CER's for subsequent CADRe's or projects
    - Using SmartPages' database sorting capabilities on CADRe Part C documentation. This would be a key word search for technical risk-driven or external risk-driven explanations of why costs have grown.
    - These explanations also help in improving cost estimating for new projects



# Integrated Cost-Risk with SmartPages

- **Identify and Quantify Cost-Risk** (cont)
  - Electronically available CADRe updates can inform preparation of other project estimates underway
    - Electronic availability of CADRe Part C can help estimators working on other estimates with similar S/C and payload costing (e.g., actual cost behavior of similar risks)
  - Can improve risk-to-cost impact algorithms with electronically available SmartPages stored cost-growth explanation data
  - Electronic availability of CPR data in SmartPages allows estimator to view CPR data on a high-risk element from EVM analyst to help in the cost-risk quantification for a new estimate with same risk



# Integrated Cost-Risk with SmartPages

- **Establish Cost-Risk Reporting**
  - Electronic availability of SmartPages' compiled CADRe and CPR data can help past performance evaluations in source selections
  - Risk and cost-risk info contained in pre-contract award government cost estimate electronically available in SmartPages can inform IBR team of what to look for with respect to risky element planning and mitigation plans during the IBR



# Integrated Cost-Risk with SmartPages

- **Establish Cost-Risk Reporting**
  - Near-end or end-of-contract or phase CADRe and CPR data in SmartPages can be electronically available to inform
    - The preparation of DRD's on new efforts as to what similar risks to highlight
    - What risks to pay attention to during IBR's
    - Past performance during source selections





# Integrated Cost-Risk with SmartPages

- **Manage Cost-Risk Using Reported Data**
  - Database capability of SmartPages allows CPR analyst to search CPR data for trends
  - Electronic availability of CADRe in SmartPages allows CPR analyst to see original estimates of risky WBS elements from estimator to compare to CPR trend-driven cost-risk projections



# Integrated Cost-Risk with SmartPages

- **Manage Cost-Risk Using Reported Data (cont)**
  - Electronic availability of CPR's using SmartPages allows a CPR analyst to inform a cost estimator that due to a negative trend in an element, a B/C trade may have to be performed which may prompt the cost estimator to update Part C of the CADRe for a requirement or performance level changes, which may ripple into an adjustment to the basic CADRe LCCE
    - May happen in between normal CADRe reporting thus making containment of CPR's and CADRe's in same electronic environment handy for keeping CADRe updated prior to required delivery at next milestone and assisting project management in keeping costs under control



# Integrated Cost-Risk with SmartPages

- **Manage Cost-Risk Using Reported Data**  
**(cont)**

- Ongoing risk-driven trends available electronically through SmartPages data searches can be analyzed for subsequent CADRe Part C LCCE impacts and/or updates to CER's for subsequent CADRe's or projects
  - Using SmartPages' database sorting capabilities on CADRe Part C documentation. This would be a key word search for technical risk-driven or external risk-driven explanations of why costs have grown.



# Integrated Cost-Risk with SmartPages

- **Manage Cost-Risk Using Reported Data**  
**(cont)**
  - Electronic availability of S-curves through time of SDR, PDR, CDR and post-launch CADRe Part C estimates can be used to inform
    - CPR analyst has insight into progress in retiring risks to help decide what risks to drop from CPR Format 1 tracking requirements
    - Cost estimator on comparisons between the original 70% CL estimate and updated 70% CL



# Integrated Cost-Risk with SmartPages

- **Manage Cost-Risk Using Reported Data (cont)**
  - Near-end or end-of-contract or phase CADRe and CPR data in SmartPages can be electronically available to inform
    - Update cost-risk algorithms and techniques