U.S. Department of Energy's
Office of Science

Management Principles for HPC & Leadership Computer Acquisitions

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Goal of Management Principles

- Apply tailored set of formal project management principles to SC High Performance Computing Facilities:
  - Formalize and document successful existing best practices;
  - Share lessons learned;
  - Manage risk;
  - Fulfill DOE (Order 413.3) and OMB requirements

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DOE Order 413.3: Project Management (http://www.science.doe.gov/opa/)

- Formal 5 Step Process for managing projects including external reviews.
  - Critical Decision (CD) 0: Approve Mission Need
  - CD-1: Approve Alternative Selection and Cost Range
  - CD-2: Approve Performance Baseline, (Earned Value Management Reporting Begins)
  - CD-3: Approve Start of Construction
  - CD-4: Approve start of Operation or Project Completion, (Earned Value Management Reporting Ends)

Independent Project Review

Operational Readiness Assessment

Background and Context

- High Performance Computing Facilities share many characteristics with other Office of Science Facilities
  - Goal is to enable science by users who are mostly not employed by the facility;
  - Scientific Projects chosen through peer review;
  - Upgrades go through similar stages:
    - Justification/Planning
    - Acquisition/Site Prep/Acceptance
    - Transition to Operations

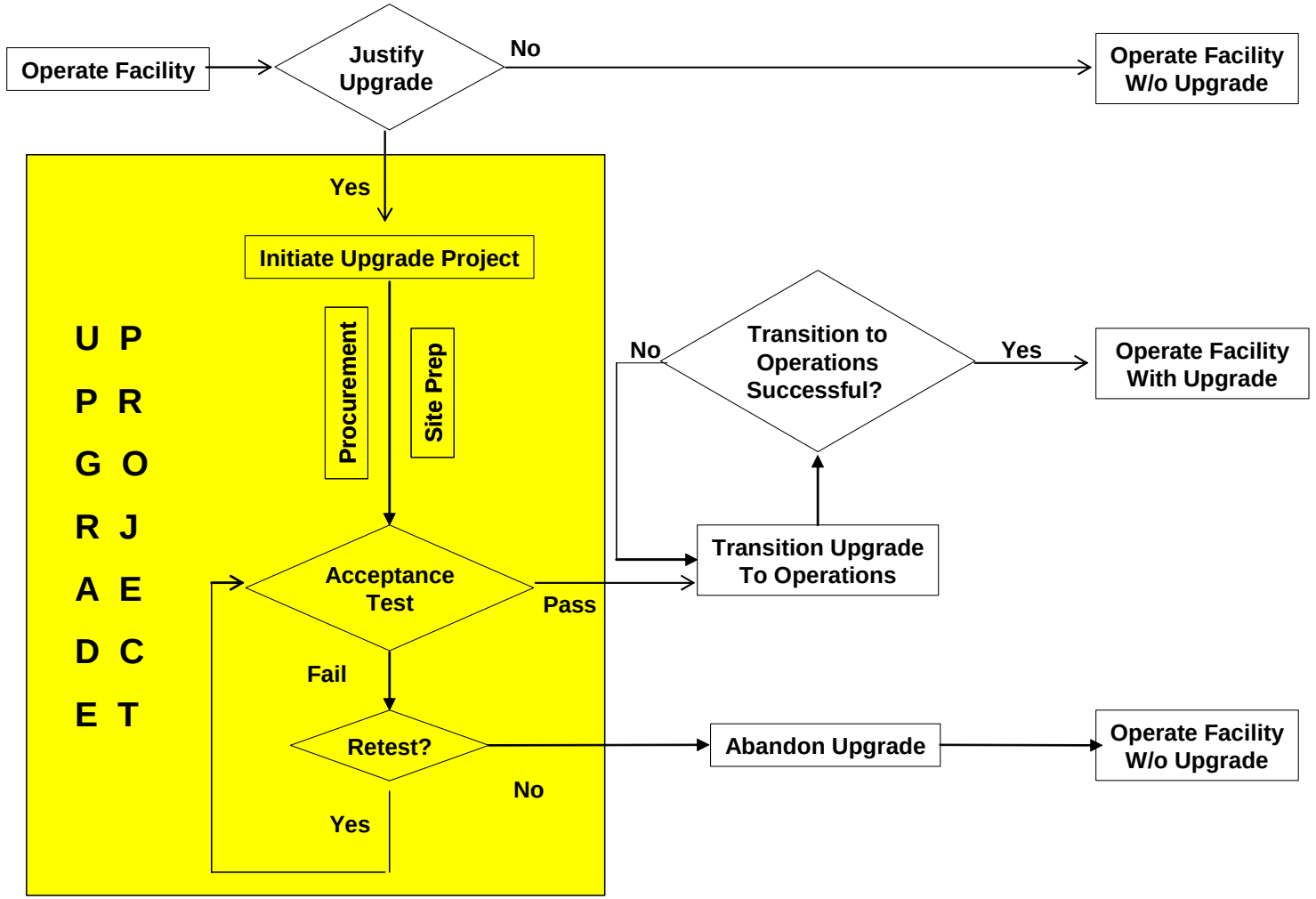
Development of Tailored Principles

- ASCR (in collaboration with BER) has tailored project management principles. (http://www.sc.doe.gov/ascr/ProgramDocuments/ProgDocs.html)
- We have tested these principles through External reviews of OLCF and ALCF and BER (MSCF at PNNL)
- Document reflects comments of reviewers from multiple federal agencies and multiple organizations within SC.

Background and Context (2)

- High Performance Computing Facilities are different from other Office of Science Facilities
  - Time Scale for Upgrade is short (<2 yrs);
  - Upgrades occur frequently due to availability of improved technology and cost to maintain old technology;
  - Upgrades focused around firm fixed price contracts with computer vendors;

Top Level Facility Timeline



Required Plans

- Facility Operations including procedures for deciding when upgrade is needed:
- Each upgrade project has:
  - Project Execution Plan
  - Acquisition Strategy
  - Acceptance Plan
- Project phase terminates at Acceptance of Computer.
- Upgrade projects also have Transition to Operations plans but these are NOT part of the Project.

Roles and Responsibilities

Operations

- Acquisition Executive
- Federal Program Manager
- Federal Site Office Liaison
  - Initiates development and implementation of key facility documentation
  - Reviews and concurs with cost, schedule, and performance baselines
  - Evaluates and verifies reported progress; makes projections of progress and identifies trends
  - Serves as the Contracting Officer's Representative, as determined by the Contracting Officer
- Laboratory Facility Manager

Upgrade Project

- Acquisition Executive
- Federal Program Manager
- Federal Upgrade Project Director
  - Initiates development and implementation of key Upgrade Project documentation
  - Reviews and concurs with project cost, schedule, performance, and scope baselines
  - Evaluates and verifies reported progress; makes projections of progress and identifies trends
  - Serves as the Contracting Officer's Representative, as determined by the Contracting Officer
  - Approves changes in compliance with the approved change control process documented in the Upgrade Project Execution Plan
- Laboratory Project Manager