



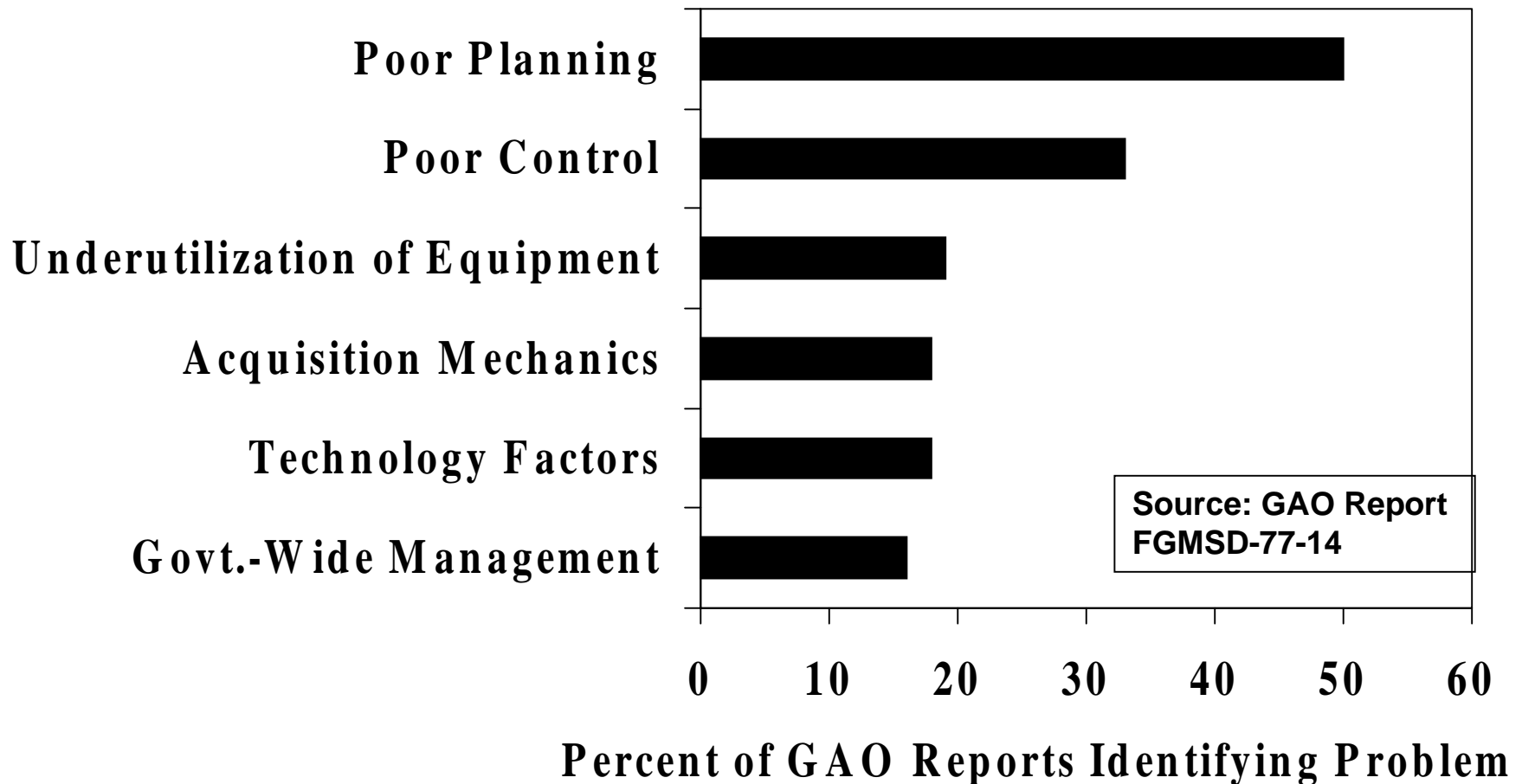
# Outline

## Software Planning Guidelines

- **Motivation**
- **Software Project Plans**
  - **General Outline**
  - **Content of Sections**

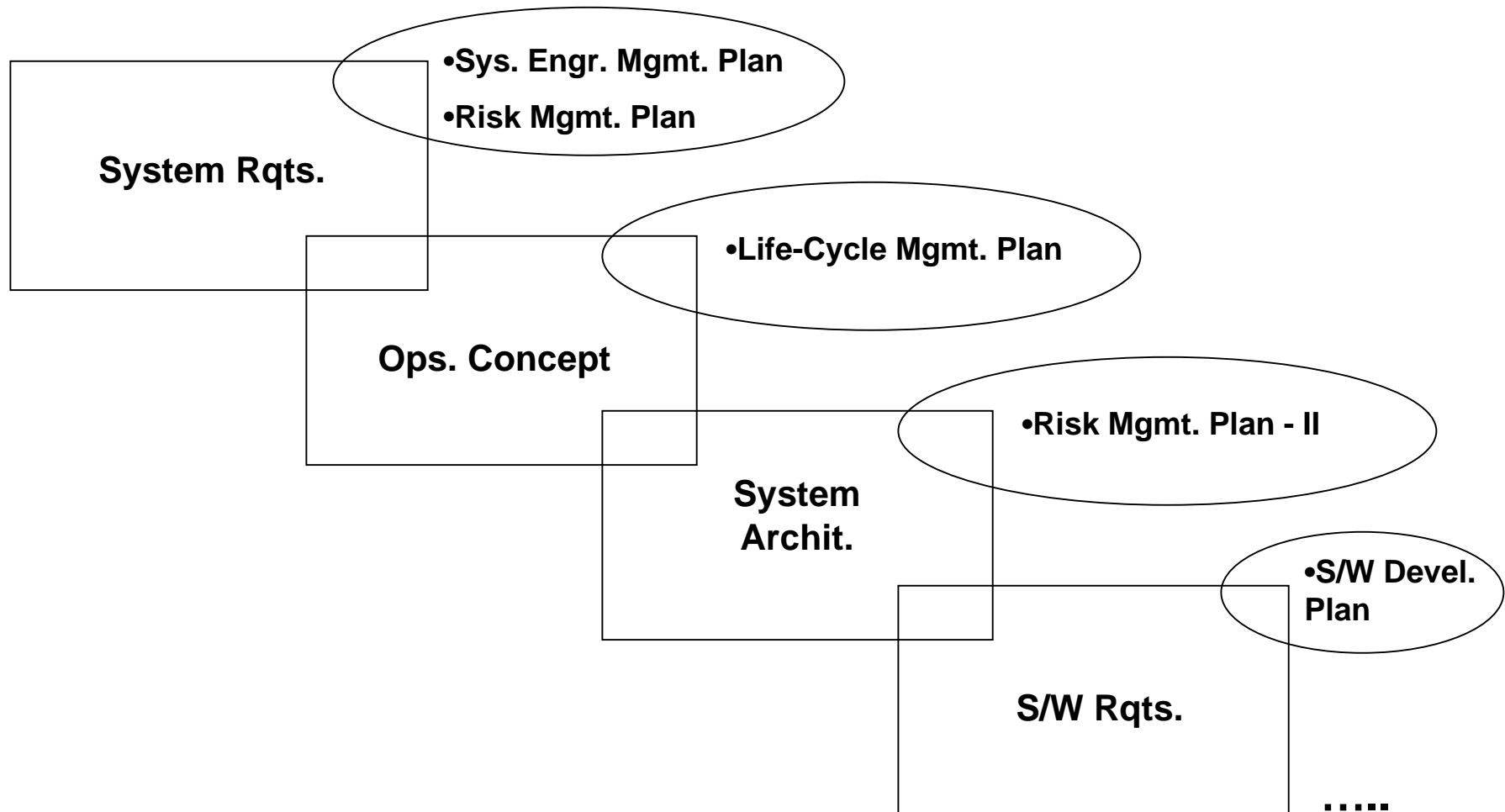


## Problems With Computer System Acquisition and Use in U.S. Government, 1965-1976





# Software Life-Cycle Plans





# Project Plans May Look Complicated, But They Aren't!

## •Just Answer the Simple Questions:

- Why?                      \_\_\_\_\_      Objectives
- What?                    >                      Milestones & Products
- When?                   >                      Milestones & Products
- Who?                     >                      Responsibilities
- Where?                   >                      Responsibilities
- How?                     \_\_\_\_\_      Approach
- How Much?             \_\_\_\_\_      Resources
- Whereas?               \_\_\_\_\_      Assumptions



# 1. Objectives (Why?)

- **Software Product Objectives**

- **Functions Performed**
- **Concept of Operation**
- **Expected User Benefits**

- **Development Plan Objectives**

- **Basis for Project Control**
- **Make Best Use of People, Resources**
- **Provide Evidence That Developers Know What They're Doing**



## 2. Milestones and Products (What? When?)

- **Overall Development Strategy**
- **Detailed Schedule of Deliverables**
- **Detailed Milestones and Schedules**

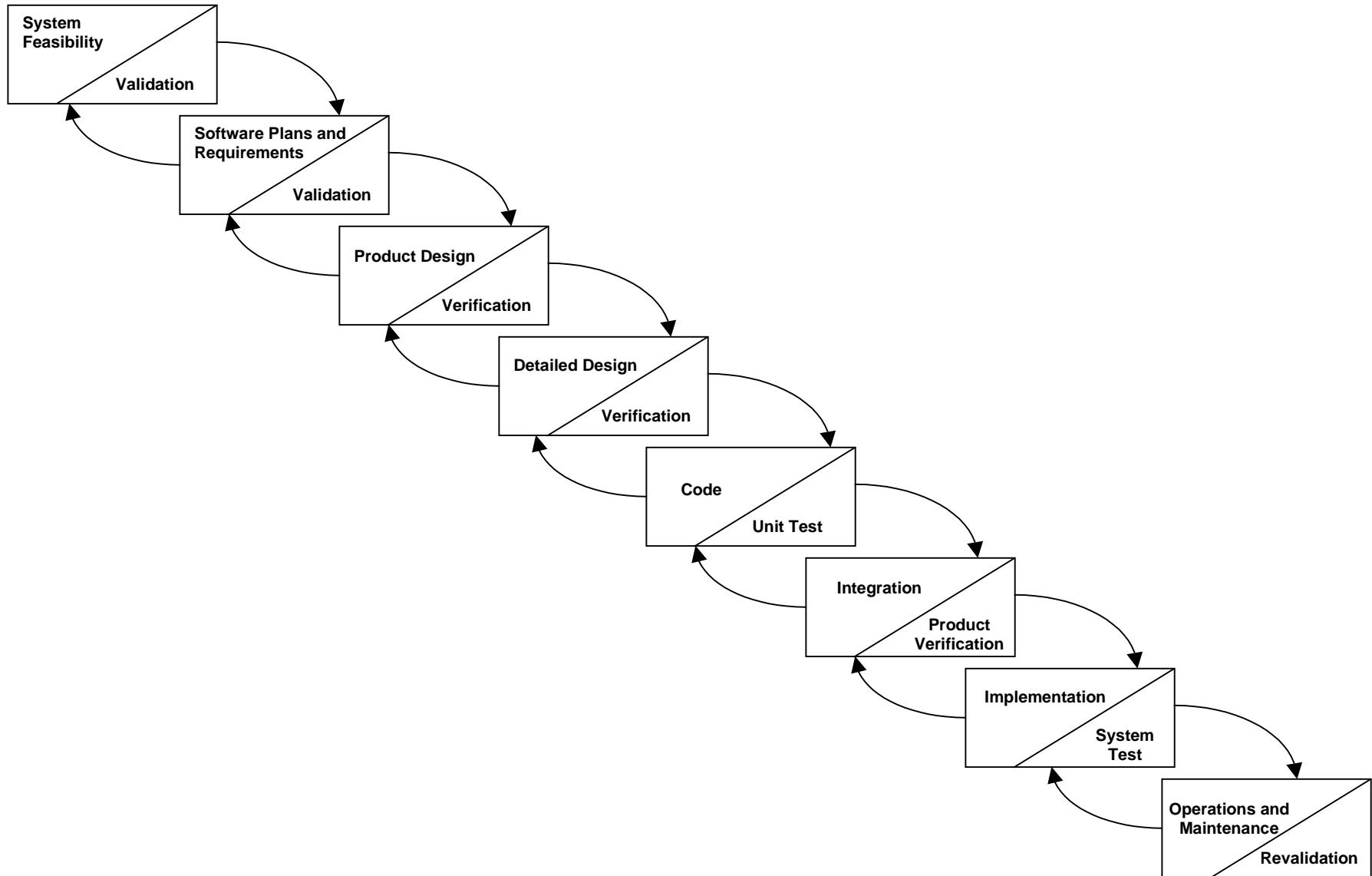


## 2.1 Overall Development Strategy

- **Major Phases and Milestones**
- **Nature and Phasing of Prototypes**
- **Nature and Phasing of Development Increments**
- **Other Departures From “Waterfall” Model**
- **Top-Level Milestones Charts, Activity Networks**



# The “Waterfall” Model of the Software Life Cycle





## 2.2. Detailed Schedule of Deliverables

### Deliverable Items

- Plans
- Specs
- Manuals
- Reports
- Code
- Data
- Equipment
- Facilities
- Training Materials
- Manhours, etc.

### Nature of Deliverables

- Name or Title
- Date Due
- Required Format
- Completion Criteria
  - Produced, Delivered, Received, Reviewed, Tested, ---
- Pointers to Contract Requirements



## **2.3. Detailed Milestones and Schedules**

- **More Detail Than Strategy Section**
  - **Overall Order of Integration**
  - **Intermediate Test Stages**
  - **Synchronization With Support S/W, H/W**
- **But Less Detail Than Full (Test) Plan**
  - **Integration Order-of-Build**
  - **Individual Test Descriptions**
  - **Requirements/Test Matrices**



## **3. Responsibilities (Who? Where?)**

### **3.1 Organizational Responsibilities**

#### **3.1.1 Global Org. Charts**

#### **3.1.2 Org. Commitment Responsibilities**

### **3.2 Development Responsibilities**

#### **3.2.1 Development Org. Charts**

#### **3.2.2 Staffing**

#### **3.2.3 Training**

- Internal**
- External**



# Life Cycle Plan - Basic Activities (I)

Phase Agent	Inception	Elaboration	Construction
Users	support definition of rqts., accept. plan review rqts. spec., acc. plan	support design trade studies, users' manual devel. review designs, users' manual	support user I/F devel., change control review updated users' manual
Customer	review + (dis) approve rqts. spec. project plan	monitor progress at milestones co-chair design review mtgs.	monitor progress at milestones
Developer	prepare rqts. spec. project plan	prepare designs test plans draft users' manual co-chair design review mtgs.	develop code and doc'n. perform unit testing integrate & test SW prepare IOC deliverables
Owner	support definition of rqts. review rqts. spec., acc. plan	prepare implem. plans review designs	prepare maint. plans
Interfacers	support definition of rqts., interface spec. review rqts. spec	support design I/F analysis review designs	support I/F devel., change control



# Life Cycle Plan - Basic Activities (II)

<b>Agent \ Phase</b>	<b>Transition</b>	<b>Operations + Maintenance</b>
<b>Users</b>	review accept. test proc.'s support accept. test support implem. activities	provide usage feedback to maintainer
<b>Customer</b>	manage acceptance activity formally accept product	review system performance
<b>Developer</b>	support/perform acceptance tests support implem. activities	support maint. activities
<b>Owner</b>	review deliverables, acceptance tests prepare detailed implem. and maintenance plans perform implem. activities: conversion, installation, evaluation	perform maint. activities
<b>Interfacers</b>	review & support accept. tests support implem. activities	support maint. activities



## **4. Approach (How?)**

**4.1 Risk Management**

**4.2 Development Phases**

**4.3 Reviews**

**4.4 Documentation**

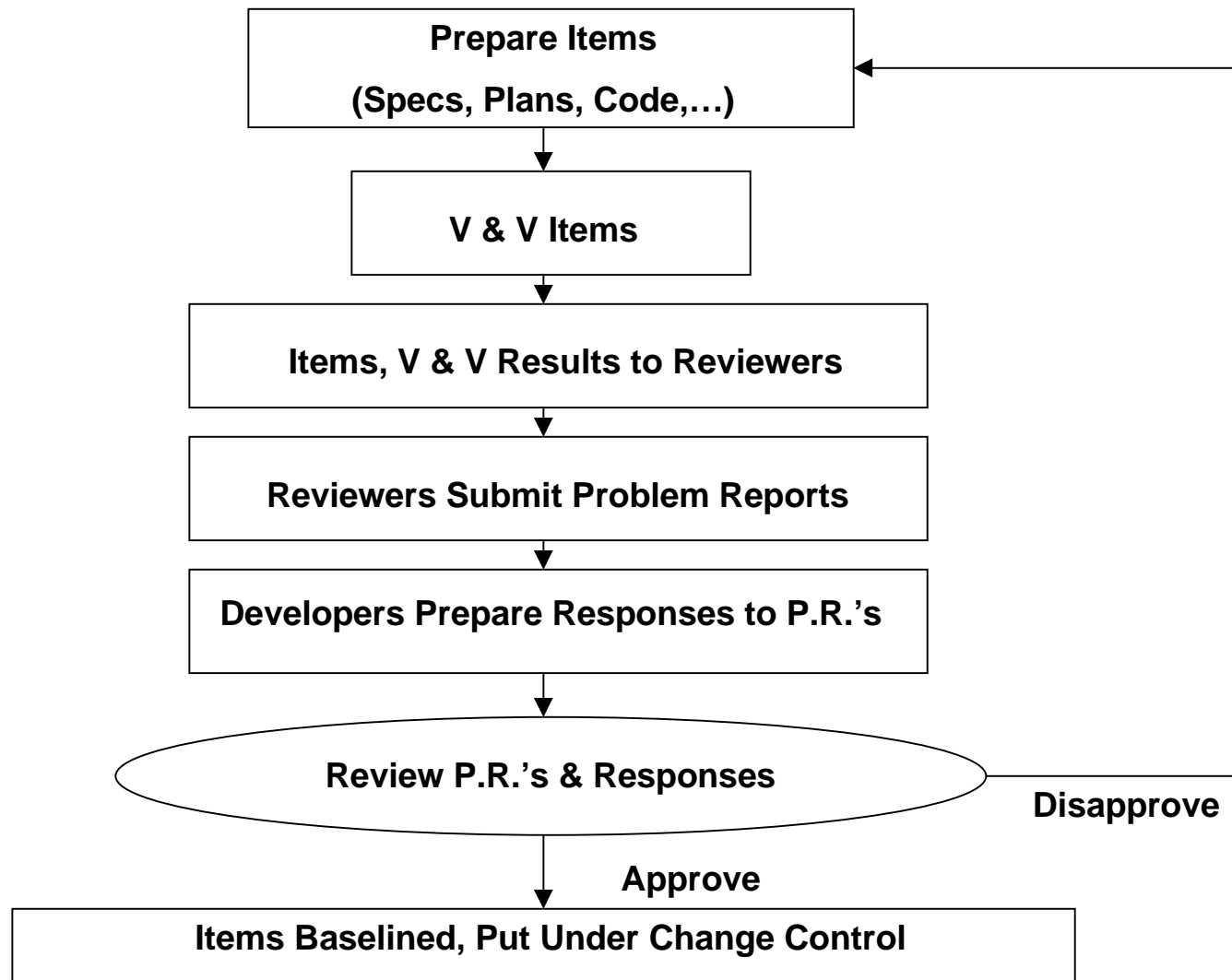
**4.5 Configuration Management**

**4.6 Quality Assurance**

**4.7 Facilities & Related Concerns**



# Review Sequence





# Why Write Documents?

- **To Stimulate Decisions**
- **To Record Decisions**
- **To Record Agreements**
- **To Facilitate Training**

**These Objectives Drive the Size, Form and Content of the Documentation**



# Configuration Management Purview

**Review,  
Baseline**

**Option  
Exploration**

---

- **Easy Changes**
- **Fluid Products**
- **Emphasis on Flexibility**



**Configuration  
Management**

---

- **Coordinated Changes**
- **Carefully Defined Products**
- **Emphasis on Control**



## 4.5 Configuration Management

### *Configuration Identification*

- Systematically Identify Each Product Component
  - Types, Hierarchy, Media, Versions

### *Change Control*

- Controlled Mechanism for Product Changes
  - Forms, Procedures, Approval Authority

### *Configuration Status Accounting*

- Keep Accurate Track of Product Status
  - Forms, Logs, Files, Reports

### *Configuration Audits*

- Verify Product Integrity

### *Project Library Management*

- Controlled Product Storage & Distribution



## 4.6 Quality Assurance Functions

- **Documentation and Code Standards**
- **Standards Compliance Monitoring**
- **Plans & Policies Compliance Monitoring**
- **Review & Test Monitoring**
- **Corrective Action Monitoring**



# Facilities Plans

- **Form: Similar to Project Plans**
- **Candidate Contents**
  - **Computer Rooms, Flooring, Power, Air Conditioning**
  - **Computers, Peripherals, Supplies**
  - **Data Communications**
  - **Office Space, Furniture, Utilities, etc.**
  - **Transportation, Parking, Employee Services**



## Related Concerns

- **Support Services**
- **Support Software**
- **Customer Furnished Facilities, etc.**
- **Security**
- **Subcontractor Operations**
- **Commercial Software**



# 5. Resources

## 5.1 Work Breakdown Structure (WBS)

## 5.2 Budgets

## 5.3 Status Monitoring & Control



# The Work Breakdown Structure (WBS)

- **Defines Project Jobs to be Done**
- **Associates Budgets With Work Packages**
- **Serves as Basis for Cost-vs.-Progress Monitoring and Control**



# Status Monitoring & Control

- **Progress: Milestones**
- **Budget: Expenditure Reports**
- **Schedule: PERT, Gantt Charts**
- **Combinations**
  - **Earned Value**
  - **Summary Task Planning Sheet**
  - **Budget-Schedule-Milestone**



## 6. Assumptions

- **Conditions Necessary to Meet Plans**
  - **Otherwise, Renegotiate**
- **Examples**
  - **Requirements Stability**
  - **Schedule Stability**
  - **Continuity of Funding**
  - **Customer-Furnished Items**
    - **On-Schedule, Acceptable**
  - **Customer Response Time on Approvals**