



Management Systems/Processes

Part I: Contractor Management Systems

Prepared for NASA
by OPM and BDM Federal, Inc.

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Student Notes

Module Training Objectives



- **Recognize the Major Functional Management Systems and Processes at the Overview Level**
 - Contract Management
 - Quality Assurance
 - Safety
 - Design Engineering/Reliability
 - Government Property
 - Purchasing/Subcontracting Management
 - Manufacturing Operation
 - Data Management
- **Understand the Roles of Key Contractor and Government Players**
- **Recognize General Criteria Used to Measure the Satisfactory Operation of a Contractor Management System**
- **Be Able to Identify Examples of Typical System Activities, Events, and Products**



Student Notes

Outline



- **Overview** **30 Minutes**
- **Contractor Management Systems** **3 1/4 Hours**
 - **Right of Disapproval**
 - **Typical Functional Management Systems**
- **Summary** **15 Minutes**

Student Notes



Overview

- **Who Is in Attendance?**
- **Typical Contractor Practices**
- **What Is a Management System?**

Student Notes

Overview

Who Is in Attendance?



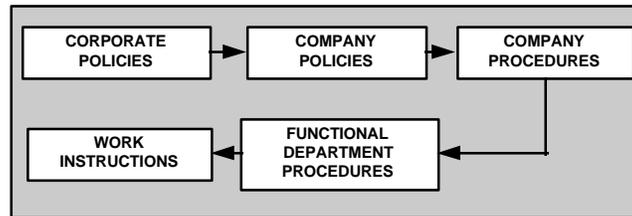
- **This Training Intended for NASA Personnel Conducting In-plant Surveillance**
- **Now Let's Find out Your Background!**

Student Notes

Typical Contractor Practices



- Operate through Established, Written Management Policies and Procedures
- Hierarchy of Policies and Procedures

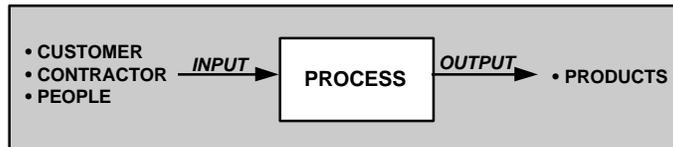


Student Notes

What Is a Management System?



- **Definition: A Network of Company-wide Objectives and Policies, together with the Corresponding Assignments of Authority and Responsibility, Passed by the Chief Operating Official (COO) to Functional Area Managers**
- **Think of a Process**



- **Example: A Quality System (ISO 9000)**

Student Notes



Contractor Management Systems

- **Overview of Government Rights**
- **Typical Functional Management Systems**
 - **Contract Management**
 - **Quality Assurance**
 - **Safety**
 - **Design Engineering**
 - **Government Property**
 - **Purchasing/Subcontract Management**
 - **Manufacturing Operations**
 - **Data Management**

Student Notes

Overview of Government Rights



- **Basis Is Government Access to Data**
 - **Contract "Inspection Clause"**
 - **Contract/Federal Acquisition Regulation**
- **Selected Systems Require Explicit Approval**
- **Key Point -- Government Reserves the Right of Disapproval**

Student Notes

Overview of Government Rights (Concluded)



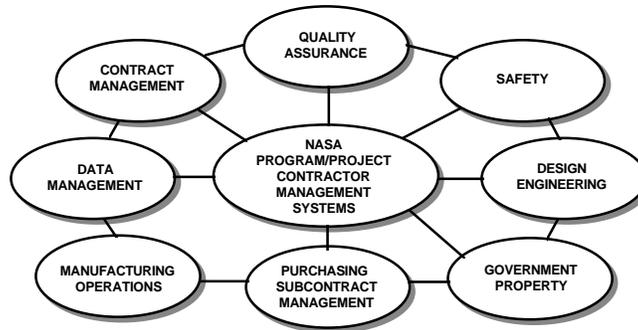
- **Systems Subject to Approval**
 - **Purchasing System**
 - **Property Management System**
- **Systems Subject to Disapproval**
 - **Actual Practice Review and Assessment of Existence, Adequacy, and Compliance to Contract**
 - **Identification and Initiation of Corrective Actions for Noted Deficiencies**
 - **Unresolved or Major Deficiencies Disapproved by Contracting Officer**

Student Notes

Typical Functional Management Systems



- Also Referred to as Management Processes
- Key Functional Areas

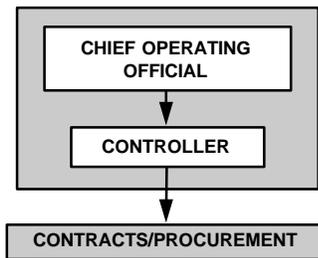


Student Notes

Description



- **Contractor Management for Contract Administration Matters**
 - Focus for Government Contracting Officers
 - Company Organizational Structure



Student Notes

Areas of Functional Responsibility



- **Contract Administration** ➡ **Business/Administrative Management of Contracts**
- **Performance Measurement** ➡ **Track Cost and Schedule**
- **Estimating** ➡ **Generate Proposals**
- **Forward Pricing** ➡ **Generate Labor and Overhead Rates**
- **Indirect Cost Control** ➡ **Control of Incurred Indirect Costs**

Student Notes

Typical Functional Management Systems: Contract Management
Key Players



Government	Contractor
<ul style="list-style-type: none">• Contracting Officer(s)• Contract Administrator or Buyer• Program/Project Office• DCMC/DCAA	<ul style="list-style-type: none">• Controller• Contracting Officer• Procurement Staff

Student Notes

Satisfactory System Criteria



- **Contract Administration:** ➡
 - **Integrated, Systematic Set of Instructions to Satisfy Contract**
 - **Ensures Complete, Timely Notification of Contract Matters to External/Internal Parties**

- **Performance Measurement:** ➡
 - **Should Provide Evidence of:**
 - **Baseline Control and Adjustments**
 - **Accuracy of Variance Analysis**
 - **Effectivity of Corrective Actions**
 - **Use of Management Reserve**
 - **Impacts of Changes to Budgets and Schedules**

Student Notes

Typical Functional Management Systems: Contract Management
Satisfactory System Criteria (Continued)



- **Estimating:** ➡ • **Provide Detailed Guidance on Development, Support, and Submission of Proposals**
 - **Provide Timely Correction of Deficiencies**
 - **Submit Timely Proposals Using Reliable Standards**

- **Forward Pricing:** ➡ • **Identify/Provide and Explain Pricing Data**
 - **Provide Well-defined Policies and Procedures**
 - **Provide Orderly Collection of Data to Establish Forward Pricing Rates**
 - **Conduct Internal Evaluations of Functions**

Student Notes

Typical Functional Management Systems: Contract Management
Satisfactory System Criteria (Concluded)



Indirect Cost Control: →

- **Provide Well-defined Policies and Procedures to Manage and Control Indirect Costs per Contract**
- **Provide Costs Certified as Allowable**
- **Meet Cost Accounting Standards**

Student Notes

Typical Functional Management Systems: Contract Management
Examples of System Activities and/or Products



- **Contract Proposals**
- **Cost Proposals and Supporting Rationale**
- **Contract Changes**
- **Contract Negotiations**
- **Cost Performance Reports and Analysis**
- **Estimating System Reviews**
- **Progress Payment Claims**
- **Labor and Overhead Rates**
- **Overhead Claims**
- **Post-award Conferences**
- **Company Contract Positions**

Student Notes

Description



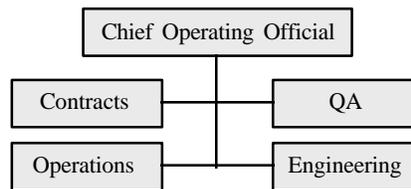
- **ISO Definition of Quality Assurance**
“The Process, Organizational Structure, Procedures, and Resources that Manufacturers and Suppliers Use to Control... Variables to Produce a Product of Consistent Quality Which Meets Defined Specifications.”
- **DOD Definition of Quality Assurance**
“A Planned and Systematic Pattern of All Actions to Provide Adequate Confidence that Adequate Technical Requirements Are Established; Products and Services Conform to Established Technical Requirements; and Satisfactory Performance Is Achieved.”

Student Notes

Description (Concluded)



- **Contractor Focal Point for Product Quality**
 - **Focus for Government QA Managers**
 - **Definition of Quality System (ISO 9000)**
 - **Organizational Structure -- Independence**



Student Notes

Typical Functional Management Systems: Quality Assurance
Areas of Functional Responsibility



- **QA Management** ➡ **Manage Company QA System**
- **Quality Control Planning** ➡ **Provide Effective Planning for Inspection/Testing**
- **Work Instructions/Records** ➡ **Ensure Use of Work Instructions/Planning**
- **Control of Nonconforming Supplies** ➡ **Manage Nonconforming Supplies**

Student Notes

Typical Functional Management Systems: Quality Assurance
Areas of Functional Responsibility (Concluded)



- **Detection/Correction of Nonconforming Supplies** ⇒ **Ensure the Detection and Correction of Nonconforming Supplies**
- **Supplier Quality Assurance** ⇒ **Ensure Supplies Conform**
- **Metrology/Calibration and Tooling** ⇒ **Provide Effective Metrology and Calibration**
- **Monitor Materials, Treatments, and Processes** ⇒ **Monitor Materials, Treatments, and Processes**
- **Inspection and Testing** ⇒ **Perform Inspection and Test**

Student Notes

Key Players



Government	Contractor
<ul style="list-style-type: none">• Project Quality Manager• Resident Management Office SR&MA Representatives• Resident Management Office Project Monitors• Program/Project Office• DCMC/DCAA (If Delegated)	<ul style="list-style-type: none">• VP of Quality• Project Quality Manager• Lead Quality Engineer• MRB Chairman• CAB Chairman• Test Manager• Quality Inspectors and Operators

Student Notes

Satisfactory System Criteria



- QA Management** →
- **Provide Established, Adequate, Written Procedures**
 - **Define Responsibilities**
 - **Have Clear Authority and Freedom**
 - **Have System for Training/Updating Skills**
 - **Plan and Conduct Internal Audits**
 - **Collect and Use Quality Cost Data**
 - **Communicate with Other Functions**

Student Notes

Typical Functional Management Systems: Quality Assurance
Satisfactory System Criteria (Continued)



Control of Nonconforming Supplies →

- **Assign Responsibility and Authority for MRB and Corrective Action**
- **Provide Positive Identification, Detention, and Segregation of Nonconformances**
- **Ensure Proper Documentation of Dispositions**
- **Assure Government Notification and Approval as Required by Contract**

Student Notes

Typical Functional Management Systems: Quality Assurance
Satisfactory System Criteria (Continued)



**Detection and Correction
of Nonconforming
Supplies**



- **Analyze and Trend Quality Data**
- **Establish Methods for Detecting, Preventing, and Recording Defects**
- **Review and Monitor Corrective Actions**
- **Provide Deficiency Data to Others**

Student Notes

Typical Functional Management Systems: Quality Assurance
Satisfactory System Criteria (Continued)



**Quality Assurance of
Supplier/Subcontractor by
Prime Contractor**



- **Provide Procedures for Receiving and Inspecting Suppliers'/Subcontractors' Supplies; Contract Flowdown**
- **Ensure Supplier/Subcontractor Control of Critical/Registered Components**
- **Maintain Source Inspection and Functional Testing per Specifications for Suppliers/Subcontractors**
- **Ensure Supplier/Subcontractor Corrective Action**

Student Notes

Typical Functional Management Systems: Quality Assurance
Satisfactory System Criteria (Continued)



**Metrology/Calibration
and Processes**



- **Use Certified Standards and Equipment**
- **Have Provisions for Recall and Periodic Calibration; Control Environments**
- **Trace Standards to Acceptable Reference; Control Accuracy**
- **Maintain Records**

Student Notes

Typical Functional Management Systems: Quality Assurance
Satisfactory System Criteria (Continued)



**Monitor Materials, Treatments,
and Processes**



- **Monitor Materials, Treatments and Processes**
- **Ensure Correction of Improper Methods**

Student Notes

Typical Functional Management Systems: Quality Assurance
Satisfactory System Criteria (Concluded)



Inspection and Testing →

- **Ensure Inspection and Test Operations Are Established and Performed under Controlled Conditions**
- **Ensure Testing and Inspection Results Are Documented for Traceability**
- **Ensure Positive Identification of Test Status**
- **Promptly Correct Improper Methods**
- **Ensure Adequate Preparation of Deliverable Data**
- **Ensure Items Submitted to Government Comply with Contract**

Student Notes

Typical Functional Management Systems: Quality Assurance
Examples of System Activities and/or Products



- **Quality Plan**
- **Internal Audits**
- **Work Force Training**
- **Work Instructions**
- **Inspection/Sampling Plans**
- **Inspection/Test Planning and Inspection Points**
- **Nonconformance Identification, Segregation, and Disposition**
- **Material Review Board**
- **Corrective Action**
- **Quality Cost Data and Records**
- **Stamp Control**
- **Supplier QA**
- **Metrology/Calibration**
- **Process Control**

Student Notes

Description



- **Two Interrelated Aspects of Safety**
 - **Industrial Safety Program for Loss Prevention Management Is Required to Comply with Federal, State, and Local Codes as well as NASA Contract Provisions**
 - **System Safety Applies Engineering Principles to Identify and Prevent Program System Hazards**
- **Focal Point for Government Safety Managers**
- **Aspects May Be Organizationally Different**
 - **Safety Manager Varies among Companies**
 - **System Safety Normally Part of Engineering**

Student Notes

Areas of Functional Responsibility



- **Loss Prevention Management** ⇒ • **Manage Programs to Provide Safe and Healthful Environment, Prevent Accidents, and Ensure Employee Safety Compliance (Includes Industrial, Aviation, Fire, Hazardous Materials, and Health)**
- **Fire Prevention** ⇒ • **Discrete Loss Prevention for Catastrophes such as Fire and Aerospace Vehicle Crash**
- **System Safety Engineering** ⇒ • **Use Engineering to Specify, Predict, and Evaluate Safety of the System**

Student Notes

Key Players



Government	Contractor
<ul style="list-style-type: none">• Resident Management Office SR&MA and Project Coordinators• Program Manager• Project Safety Manager• Project System Safety Manager• Project System Safety Engineer• DCMC/DCAA (If Delegated)	<ul style="list-style-type: none">• Company Safety Manager• Chief Fire Protection• Project Safety Focal Point• Project System Safety Engineer• Chief Engineer

Student Notes

Satisfactory System Criteria



Loss Prevention Management



- **Adequately Document Responsibilities and Methods for Loss Prevention**
- **Identify, Conduct, and Certify Training**
- **Identify Employee Hazards and Cautions**
- **Perform Internal Audits and Evaluations**
- **Prepare Emergency Preparedness Plan**
- **Ensure Safety Flowdown to Suppliers**
- **Establish Procedures for Mishap Reports, Accident Investigations, and Remedies**
- **Ensure Compliance of NASA Facilities**
- **Provide Satisfactory Safety Program Plan**

Student Notes

Satisfactory System Criteria (Continued)



Fire Prevention →

- **Adequately Document Fire Prevention Responsibilities**
- **Conduct Training**
- **Conduct Fire Prevention Audits**
- **Ensure Equipment Readiness**

Student Notes

Satisfactory System Criteria (Concluded)



System Safety Engineering →

- **Establish Organizational Lines of Communication for External and Internal System Safety Interfaces**
- **Generate Satisfactory Safety Program Plan**
- **Provide Effective Hazard Identification and Risk Assessment**
- **Identify and Eliminate/Control Unacceptable System Hazards**

Student Notes

Typical Functional Management Systems: Safety
Examples of System Activities and/or Products



- **Safety Program Plan**
- **Internal Audits**
- **Work Force Training**
- **Company Safety Procedures**
- **Mishap Reports/Accident Investigation Reports**
- **Failure Modes and Effects Analysis**
- **Preliminary Hazard Analysis**
- **System Hazard Analysis**
- **Subsystem Hazard Analysis**
- **Operating and Support Hazard Analysis**
- **Integrated Hazard Analysis**
- **Software Safety Analysis**
- **Human Factors Engineering Analysis**
- **Fault Tree Analysis**
- **Other System Safety Engineering Techniques**

Student Notes

Typical Functional Management Systems: Design Engineering
Description



- **Focal Point for Contractor Design Efforts**
 - **Focus for Government Project Engineers**
 - **Engineers May Be Assigned as Project Team or Functionally Matrix**
 - **Engineering Is Defined as "The Application of Science and Mathematics by Which the Properties of Matter ...Are Made Useful to People in ...Systems and Processes." (Ref: Webster's Collegiate Dictionary)**
 - **Design Management Is the Systematic Orchestration of All Engineering and Technical Efforts Needed to Transform a NASA Requirement into a Coordinated and Approved Description of the Hardware or Software Item to Be Produced**

Student Notes

Typical Functional Management Systems: Design Engineering
Areas of Functional Responsibility



- **Design Management** ➡ • **Manage Elements of System Design, Configuration, and Test**
- **System Safety Engineering** ➡ • **Apply Engineering Principles to Prevent or Control System Hazards**
- **Configuration Management** ➡ • **Manage and Control the Functional and Physical Characteristics of an Item**
- **Reliability and Maintainability** ➡ • **Assure the Achievement of System Reliability Goals and Ensure that Design and Development Consider System Maintenance**

Student Notes

Areas of Functional Responsibility (Concluded)



- **Test Management** ⇒ • **Provide Management of System Tests**
- **Integrated Logistics Support** ⇒ • **Provide Management and Technical Process for Early Integration of Logistics into System Design**

Student Notes

Key Players



Government	Contractor
<ul style="list-style-type: none">• Resident Management Office Project Coordinators• Program Manager• Project Manager• Project Chief Engineer• Project Functional Engineer(s)• DCMC/DCAA (If Delegated)	<ul style="list-style-type: none">• VP of Engineering• Chief Design Engineer• Project Chief Engineer• Functional Engineers• Component Engineers• Project System Safety Engineer

Student Notes

Satisfactory System Criteria



Design Management →

- **Adequately Document Responsibilities and Methods for Design Management**
- **Provide Design Visibility to All Engineering Functions**
- **Integrate Design Disciplines and Ensure Functional Coordination Exists with Quality and Manufacturing**
- **Document Internal Design Review Process and Assign Responsibilities**
- **Perform Internal Audits and Evaluations**
- **Flow Design Requirements to Suppliers**

Student Notes

Satisfactory System Criteria (Continued)



- **System Safety Engineering** → • **Discussed under Safety**
- **Configuration Management** → • **Assign and Document Configuration Management Policies**
 - **Identify and Document Functional and Physical Design Characteristics**
 - **Identify Organization Assignments**
 - **Describe Configuration Identification, Control, Accounting, and Verification**
 - **Assign Configuration Change Board**

Student Notes

Satisfactory System Criteria (Continued)



Reliability and Maintainability



- **Assign and Document Reliability and Maintainability Procedures**
- **Describe and Apply Techniques to Achieve Reliability Goals**
- **Monitor Reliability Goals**
- **Establish Closed-loop Feedback to Quality and Manufacturing**
- **Ensure Reliability and Maintainability Requirements Are Integrated into Design**
- **Ensure Design Analyses Are Conducted per Procedures and Meet Contract Terms**
- **Assure Procedures Outline Parts Selection**

Student Notes

Typical Functional Management Systems: Design Engineering
Satisfactory System Criteria (Continued)



Test Management →

- **Assign and Document Test Procedures Including Responsibilities**
- **Ensure Procedures Address Test Management of Development, Qualification, and Acceptance**
- **Provide Adequate Closed-loop Feedback to Design Engineers**
- **Ensure Procedures Address Controlling Test Data and Documentation and Anomalies**
- **Cover Test Configuration Management and Control**
- **Define Test Planning and Describe Procedures**

Student Notes

Typical Functional Management Systems: Design Engineering
Satisfactory System Criteria (Concluded)



**Integrated Logistics
Support (ILS)**



- **Assign and Document ILS Procedures and Responsibilities**
- **Establish Procedures to Ensure Elements of ILS Are Addressed in The Design Cycle**
- **Ensure Procedures Cover Requirements for Conducting Logistic Support Analysis**
- **Ensure Logistics Engineers Have Visibility into Design Processes**
- **Coordinate Design Changes with ILS Engineers**
- **Assure Logistics Support Analysis Meets Project Requirements**

Student Notes

Examples of System Activities and/or Products



- **Project Drawings**
- **Project System and Component Specifications**
- **Internal and Project Design Reviews (e.g., CDR, PDR, and SRR)**
- **Engineering Plans (e.g., Reliability Plan)**
- **Configuration Management Plan**
- **Configuration Audits**
- **Configuration Change Boards**
- **Class I Design Changes**
- **Class II Design Changes**
- **Major Waiver/Deviation**
- **Minor Deviation**
- **Design Studies**
- **Engineering Analysis (e.g., Reliability, FMEA)**
- **Failure Analysis Reports**
- **Test Reports**

Student Notes

Description



- **Focal Point for Government Property**
 - Focus for Government Property Administrators
 - The Contractor's Property Management System Is Required to Control, Protect, Preserve, and Maintain All Government Property in Its Possession. Property Can Be the Following:
 - Material
 - Special Tooling
 - Special Test Equipment
 - Facilities and Plant Equipment
 - System Normally Requires Government Approval
 - Usually Separate Department; May Be Part of Material Management
- **FAR Part 45 Definition of Government Property**
 - "All property owned by or leased to the Government or acquired by the Government under the terms of the contract."

Student Notes

Areas of Functional Responsibility



- **Property Administration** ⇒ • **Contractor Management Activities to Control, Protect, Preserve, and Maintain All Government Property in Its Possession**
- **Property Clearance** ⇒ • **Contractor Activities to Report and Dispose of Excess Contractor Inventory Owned by the Government**

Student Notes

Key Players



Government	Contractor
<ul style="list-style-type: none">• Resident Management Office SR&MA and Project Focal Points• Property Administrator• Plant Clearance Officer• Contracting Officer• Quality Assurance Specialists• DCMC/DCAA (If Delegated)	<ul style="list-style-type: none">• Property VP/Manager• Property Administrators• Quality Assurance Inspectors

Student Notes

Satisfactory System Criteria



**Property
Administration**



- **Policy and Procedures Delineate and Document Responsibilities for Controlling Government Assets**
- **System Ensures Material for Contract Is Based on Valid Need**
- **Procedures Ensure Written Records for Receipt and Acquisition**
- **Accountable Property Records Reflect Activities of All Property**
- **System Must Include Utilization and Consumption Procedures**
- **Preventive Maintenance Must be Ensured**
- **Property Located with Subcontractors or at Other Alternate Locations Must be Controlled by the Prime Contractor**

Student Notes

Typical Functional Management Systems: Government Property
Satisfactory System Criteria (Concluded)



**Plant
Clearance**



- **Policies and Procedures Delineate and Document Responsibilities for Disposition or Transfer**
- **Procedures Ensure Loss, Damage, and Destruction Are Reported to NASA**
- **Support Claims of Excess for Property Acquired for Contract**
- **Procedures Ensure Reporting and Disposing of Excess Inventory of Government Property**
- **System Must Address Reutilization prior to Disposition**

Student Notes

Typical Functional Management Systems: Government Property
Examples of System Activities and/or Products



- **Records of Property to Show Value and Types**
- **Inventory Records and Surveys of Government Types**
- **Excess Property Analysis**
- **Disposition Inventory and Audit Trails**
- **Records of Loss, Damage, and Destruction**
- **Preventive Maintenance Records and Requirements**
- **Property Management System Procedures**
- **Supplier Government Property Records**

Student Notes

Typical Functional Management Systems: Purchasing/Subcontract Management
Description



- **Focal Point for Contractor Purchasing Activities**
 - **Focus for Government Interests in the Contractor's Subcontract Acquisition Activities**
 - **Manages the Contractor's Purchasing Activities with Subcontractors and Suppliers**
 - **Government Will Normally Approve Contractor's Purchasing System for Contracts**
 - **Usually a Department within the Organization**

Student Notes



Areas of Functional Responsibility

- **Subcontract Acquisition Management** ⇒ • **Contractor Management Efforts to Manage All Phases of Purchase Material and Services Acquisition**
- **Subcontract Planning** ⇒ • **Contractor Activities to Integrate Requirements with Procurement Planning**
- **Subcontract Award** ⇒ • **The Award and Negotiation of All Subcontracts**
- **Subcontract Administration** ⇒ • **Administration of the Subcontract to Ensure Contract Compliance**

Student Notes

Typical Functional Management Systems: Purchasing/Subcontract Management
Key Players



Government	Contractor
<ul style="list-style-type: none">• Resident Management Office Project Focal Points• SR&MA Personnel Monitoring Purchase Orders• Program/Project Manager• Contracting Officer• Small Business Manager• DCMC/DCAA (If Delegated)	<ul style="list-style-type: none">• Director/VP of Purchasing• Quality Assurance Inspectors• Subcontract Buyers• Contractor Source Representatives• Project Manager• Component Managers

Student Notes

Satisfactory System Criteria



**Subcontract
Management**



- **Policy and Procedures Define and Document Functional Responsibilities and Authority for All Phases of Purchasing**
- **Policies and Procedures Address Contractor Supervising and Auditing of Purchases**
- **System Ensures Clear Functional Lines of Authority and Communication**

Student Notes

Typical Functional Management Systems: Purchasing/Subcontract Management
Satisfactory System Criteria (Continued)



**Subcontract
Planning**



- **System Addresses Determining and Controlling Pre-contractual Actions**
- **Procedures Require Integration of Customer Requirements with Procurement Planning**
- **System Includes Using Competition, Small/Disadvantaged Business**

Student Notes

Satisfactory System Criteria (Continued)



**Subcontract
Award**



- **Policy and Procedures Address Award Criteria and Check Adherence**
- **Procedures Require Thorough Cost and Price Analysis**
- **Adequate Documentation Is Required to Support Negotiation and Award**

Student Notes

Typical Functional Management Systems: Purchasing/Subcontract Management
Satisfactory System Criteria (Concluded)



**Subcontract
Administration**



- **Procedures Address Post-award Administration to Verify Compliance with Subcontract Terms and Conditions**
- **System Ensures Visibility into Cost/Schedule/Performance of Subcontractor**

Student Notes

Typical Functional Management Systems: Purchasing/Subcontract Management
Examples of System Activities and/or Products



- **Government Contractor Purchasing System Review**
- **Subcontract Purchase Orders and Folders/Records**
- **Subcontract Metrics (e.g., Small Business)**
- **Contractor Vendor Reviews**
- **Consent-to-issue Review Case Files**
- **DCMC/DCAA Purchase Order Reviews**
- **Contractor Audit Reports and Correspondence**
- **Vendor Rating System and Files**

Student Notes

Description



- **Focal Point for Contractor Manufacturing and Fabrication Activities**
 - **Focus for Government Interests in the Contractor's Manufacturing Activities**
 - **Manages the Translation of Design Requirements into Product Form through Work Instructions, Tooling, and Facilities**
 - **Definition: The Conversion of Raw Materials into Products ... through a Series of ... Procedures and Processes (Ref: Defense Manufacturing Management Guide)**
 - **Usually a Distinct Department within the Organization**

Student Notes

Areas of Functional Responsibility



- **Manufacturing Management** ⇒ • **Contractor Efforts to Manage the Overall Manufacturing and Traffic Management Operations**
- **Manufacturing Engineering** ⇒ • **Manufacturing Engineering Provides the Basic Identification and Selection of Methods to Produce the Design of the End Item**

Student Notes

Typical Functional Management Systems: Manufacturing Operations
Areas of Functional Responsibility (Continued)



- **Manufacturing Planning** ⇒ • **Integrates the People, Materials, Equipment, Tools, and Processes Needed to Make the End Item**
- **Facility Management** ⇒ • **Involves Optimization of the Plant Layout, Equipment Use, and Material Handling**
- **Work Measurement** ⇒ • **Measures Effective Use of Labor Resources**

Student Notes

Typical Functional Management Systems: Manufacturing Operations
Areas of Functional Responsibility (Concluded)



- **Production Scheduling and Control** ⇒ • **Scheduling to Systematically Distribute Workloads to Plans and Capabilities**
- **Traffic Management** ⇒ • **Documenting, Tracing, and Routing Activities to Prepare and Arrange for Shipping per Contract Requirements**
- **Packaging, Handling and Transportability** ⇒ • **Ensuring the Transportability and Packaging of End Items**

Student Notes

Key Players



Government	Contractor
<ul style="list-style-type: none">• Resident Management Office Project Focal Points• SR&MA Personnel• Project Manufacturing Engineers, Industrial Engineers, and Specialists• Government Transportation Officer(s)• DCMC/DCAA (If Delegated)	<ul style="list-style-type: none">• VP of Manufacturing or Production• Manufacturing Engineers• Manufacturing Operators• Quality Assurance Inspectors• Project Manager• Component Managers

Student Notes

Satisfactory System Criteria



**Manufacturing
Management**



- **The System Is Completely and Adequately Described in Written Policies and Procedures**
- **Policies and Procedures Address Contractor Authorities and Responsibilities Related to Management Functions such as Planning, Organizing, Directing, Controlling, and Integrating**
- **Internal Audit Practices Are Designed to Identify Deficiencies and Require Corrective Action**

Student Notes

Satisfactory System Criteria (Continued)



Manufacturing Engineering



- **Procedures Ensure Every Consideration Is Given to the Production-to-Design Interface**
- **System Ensures that the Proper Equipment, Software, Machines, Tools, Methods, and Processes Are Defined and Adequate to Convert Designs into Products**
- **Manufacturing Engineering Is Integrated with Overall Systems Engineering Efforts, including Design, Reliability, Safety, Make or Buy, etc.**
- **System Ensures Manufacturing Engineering Is Accomplished Concurrently with Design Engineering**

Student Notes



Manufacturing Planning



- **Manufacturing Planning Addresses All Aspects of Integrating the Program Master Production Plans into the Plant-wide Production Plan**
- **Planning Identifies All Critical Paths of Product Flow, Prepares the Flow Paths, and Documents Tasks**
- **Work Instructions Are Current, Clear, and Adequately Detailed**
- **Work Instructions Are Periodically Reviewed and Are Traceable to Approved Documentation**

Student Notes



**Facility
Management**



- **Contractor's System Should Address the Achievement of Optimum Plant Layout, Material Handling, and Equipment Use**
- **Procedures Should Address Reduction of Costs and Increased Productivity**
- **Work Instructions Are Assessed to Ensure Consideration of Facilities' Responsiveness to Production Needs**
- **Work Instructions Address Material Handling Processes to Minimize Risks and Costs**

Student Notes

Typical Functional Management Systems: Manufacturing Operations
Satisfactory System Criteria (Continued)



**Work
Measurement**



- **Focus Is on Effective Use of Labor Resources through the Measurement of Performance and Correction of Inefficiencies**
- **Procedures Require Recognized Industrial Engineering Techniques to Establish Labor Standards**
- **System Includes a Cost-Effective Methods Improvement Program**
- **Performance Goals Are Established, Analyzed, and Reviewed by Management**
- **Procedures Integrate Results with Estimating and Scheduling**

Student Notes



**Production
Scheduling
and Control**



- **System Adequately Forecasts, Schedules, and Controls Workloads**
- **Documented Procedures Address Routing, Dispatching, Expediting, and Scheduling**
- **System Distributes and Releases Workloads to Manufacturing Shops Consistent with Known Manpower, Material, and Equipment Capabilities**
- **Procedures Properly Measure and Allocate Personnel Resources and Material into a Daily Time Frame**

Student Notes

Typical Functional Management Systems: Manufacturing Operations
Satisfactory System Criteria (Concluded)



Traffic Management



- **System Assigns Responsibilities and Procedures for Managing Inbound and Outbound Transportation**
- **Specific Abilities and Performance Are Assessed to Ensure Contract Compliance**

Packaging, Handling, and Transportability



- **Procedures Require Transportability and Packaging Interfaces with Other Functions**
- **Subcontract Packaging Aspects Are Covered**
- **Procedures Ensure Adequate Provisions to Meet Contract Packaging Conditions**

Student Notes

Typical Functional Management Systems: Manufacturing Operations
Examples of System Activities and/or Products



- **Contract Deliverable End Items and Data**
- **Master Plan**
- **Work Measurement System and Data**
- **Bill of Materials**
- **Line of Balance**
- **Make-or-Buy Plan**
- **Production Plan and Schedules**
- **Engineering Labor Standards**
- **Operator Work Instructions**
- **Capital Investment Plan**
- **Statistical Process Control, Control Charts, “Fishbone” Diagrams, etc.**
- **Yield Rates for Components**

Student Notes

Typical Functional Management Systems: Manufacturing Operations
Examples of System Activities and/or Products (Concluded)



- **Lead-time Analysis**
- **Tool Proofing**
- **First Article Inspection**
- **Facility Planning and Layouts**
- **Material Requirements Planning**
- **Training Plans**
- **Manufacturing/Drawings**
- **Computer-aided Manufacturing**
- **Producibility/Capability Analyses**
- **Traffic Management Surveys**
- **Production Readiness Reviews**
- **Parts Travelers/Folders**

Student Notes



Description



- **Focal Point for Contractor Deliverable Data Activities**
- **Focus for Government Interests in Formal Contract Data Items**
 - **Data Is Defined to Be that Information Required for Delivery per the Contract such as:**
 - **Program/Project Plans**
 - **Specifications**
 - **Drawings**
 - **Technical Manuals**
 - **Financial Data and Reports**
 - **Data Management Is Not Always a Separate Organizational Function**

Student Notes



Areas of Functional Responsibility

- **Data Management** → • **Contractor Management Efforts to Manage All Phases of Deliverable Data**
- **Data Planning** → • **Contractor Activities to Plan and Prepare Data for Delivery**
- **Data Inspection and Acceptance** → • **Administration of the Subcontract to Ensure Contract Compliance**

Student Notes



Key Players



Government	Contractor
<ul style="list-style-type: none">• Resident Management Office Project Focal Points• SR&MA Personnel• Program/Project Data Manager• Program/Project Office Data Item Focal Point• Contracting Officer• DCMC/DCAA (If Delegated)	<ul style="list-style-type: none">• Data Manager• Director/VP of Quality Assurance• Quality Assurance Inspectors• Project Manager• Component Managers

Student Notes



Satisfactory System Criteria

**Data
Management** →

- **Policy and Procedures Define and Document Functional Responsibilities and Authority for Producing Deliverable Data**
- **Policies and Procedures Address Inspection and Control of the Quality of Deliverable Data and Effective Corrective Action**
- **System Addresses Data Validation Demonstrations Including Suppliers**
- **System Ensures Government Access to Supporting Data Per Contract**

Student Notes



Satisfactory System Criteria (Continued)

**Data
Planning**



- **Ensure Data Conforms to Contract Preparation Requirements (e.g., Electronic Media)**
- **System Verifies Contract Changes Are Incorporated prior to Acceptance**
- **Procedures Should Ensure Restrictive Data Markings (e.g., Limited Rights or Proprietary) Conform to Contract**
- **Procedures Should Ensure Data Originals (e.g., Reproduces) Are Properly Packaged**
- **System Should Address Procedures for Advance Government Approvals**

Student Notes



Satisfactory System Criteria (Concluded)

**Data Inspection
and Acceptance**



- **Procedures Require In-process and Final Inspection to Ensure Conformance to Contract Data Requirements**
- **Procedures Should Compare Deliverable Data to Production and Engineering Data**
- **Procedures Address Inspection of Data Validation Demonstrations for Technical Data (e.g., Manuals)**
- **Procedures Address Support for Government Verification Activities**

Student Notes

Examples of System Activities and/or Products



- **Contract Data Delivery and Acceptance**
- **Program/Project “Data Call” Reviews**
- **Data Item Descriptions (DIDs)**
- **Contract Data Requirements List (CDRL)**
- **Data Validation Reviews**
- **Government Data Verification Reviews**

Student Notes



Summary

- **What Have We Covered?**
 - **Simple Definition of Management System**
 - **Government Right of Approval and Disapproval**
 - **Discussion of Key Areas of Typical Contractor Functional Systems**
 - **Descriptions**
 - **Key Players**
 - **Satisfactory Criteria**
 - **Sample Activities**
- **Wrap-up Comments**

Student Notes



Where to Obtain More Information

- **References**

- **NHB 1700.1 (IV-B) NASA Safety Policy and Requirements Document**
- **NHB 5300.4 (2B-2) Management of Government Quality Assurance Functions for NASA Contracts**
- **NHB 5300.4 (1B-1) Quality Program Provisions for Aeronautical and Space Systems**
- **NHB 7120.5 Management of Major System Programs and Projects**
- **AFCMD Regulation 178-4, Integrated Contractor Assessment Program**
- **DLAM 8200.5, In-plant Quality Evaluation (IQUE)**
- **DSMC Defense Manufacturing Management Guide (Dated April 1989)**
- **ISO 9000 Standard Series**

Student Notes