

PRESENTATION TO THE NUCLEAR WASTE TECHNICAL REVIEW BOARD



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for Systems and Compliance
Office of Civilian Radioactive Waste Management
U.S. Department of Energy
September 26, 1991**

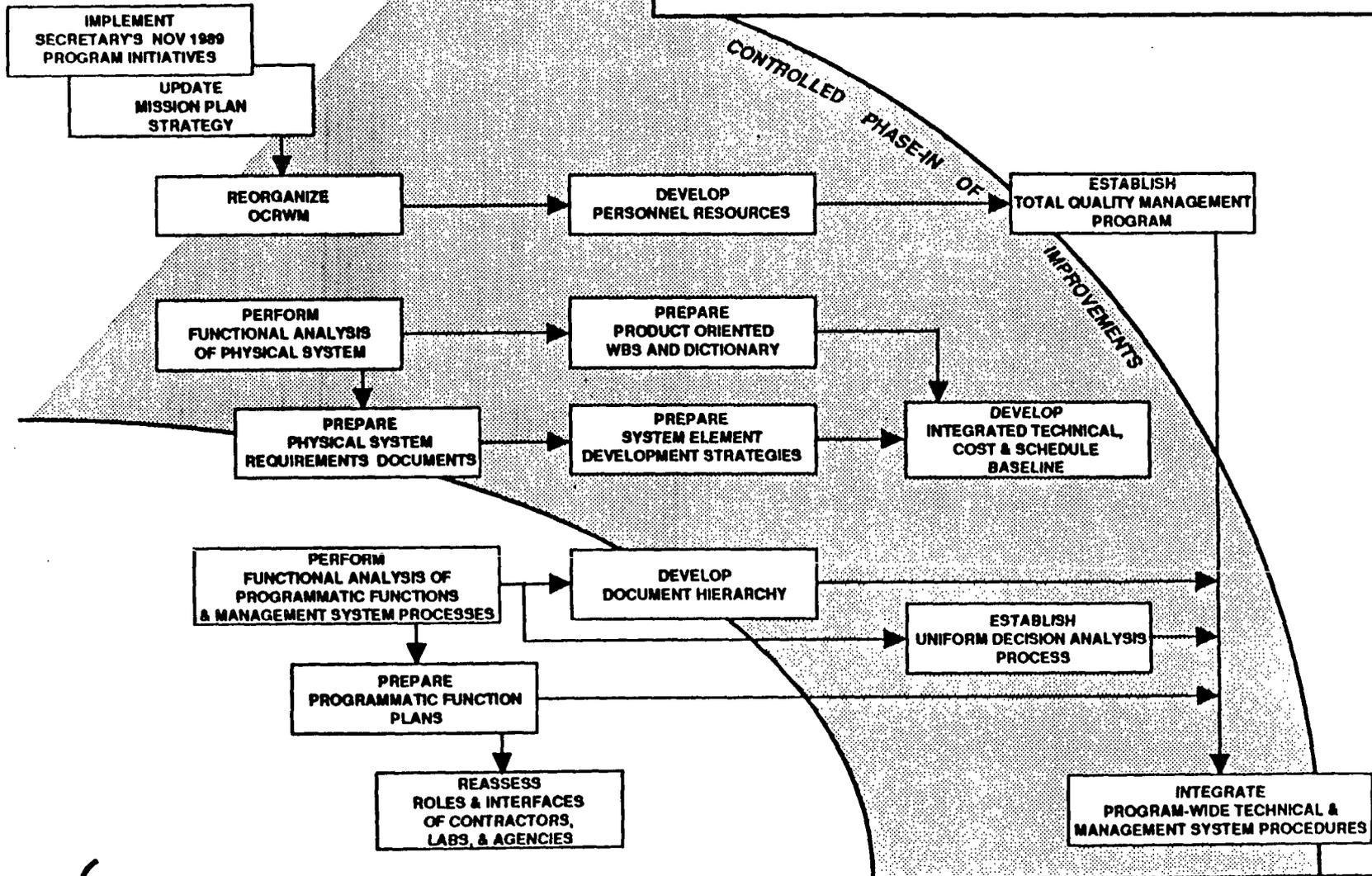
AGENDA

- . **NUCLEAR WASTE MANAGEMENT SYSTEM FUNCTIONAL ANALYSIS**
 - PHYSICAL SYSTEMS** - **W. LEMESHEWSKY - DOE**
 - PROGRAMMATIC** - **S. GOMBERG - DOE**
- . **REQUIREMENTS MANAGEMENT** - **T. WOODS - WESTINGHOUSE**
- . **NWMS SYSTEMS ANALYSIS AND TRADE OFF STUDIES** - **W. BAILEY - TRW**
- . **DECISION MAKING** - **T. WOODS - WESTINGHOUSE**

BRIEFING OBJECTIVES

- . OVERVIEW OF OCRWM SYSTEMS ENGINEERING PROCESS**
- . RESPOND TO THE BOARD'S QUESTIONS CONCERNING THE OCRWM SYSTEMS ENGINEERING PROGRAM**
- . PROVIDE A CURRENT STATUS OF FUNCTIONAL ANALYSIS EFFORT**
- . DESCRIBE THE REQUIREMENTS MANAGEMENT PROCEDURES AND THE PROCESS FOR IDENTIFICATION AND RESOLUTION OF CONFLICTS AMONG REGULATORY REQUIREMENTS**
- . DESCRIBE THE PLANNED SYSTEMS ANALYSIS EFFORT AND THE PLANS TO IMPLEMENT TRADE-OFF STUDIES AND SYSTEMS OPTIMIZATION**
- . DESCRIBE HOW A SYSTEMS ENGINEERING APPROACH WILL BE USED IN THE OCRWM DECISION MAKING PROCESS**

MANAGEMENT SYSTEMS IMPROVEMENT STRATEGY IMPLEMENTATION ACTIONS



ON-GOING CIVILIAN RADIOACTIVE WASTE MANAGEMENT PROGRAM

QUESTION 1

HOW DOES DOE JUSTIFY THE BIFURCATION OF THE FUNCTIONAL ANALYSIS EFFORT, I.E., THE PROGRAMMATIC FUNCTIONS ANALYSIS SEPARATE FROM THE PHYSICAL SYSTEMS FUNCTIONS ANALYSIS? WILL SUCH BIFURCATION AFFECT CONCURRENCY IN THE DEVELOPMENT OF FUNCTIONAL STRUCTURES ACROSS PROGRAMMATIC, PHYSICAL, AND MANAGEMENT AREAS?

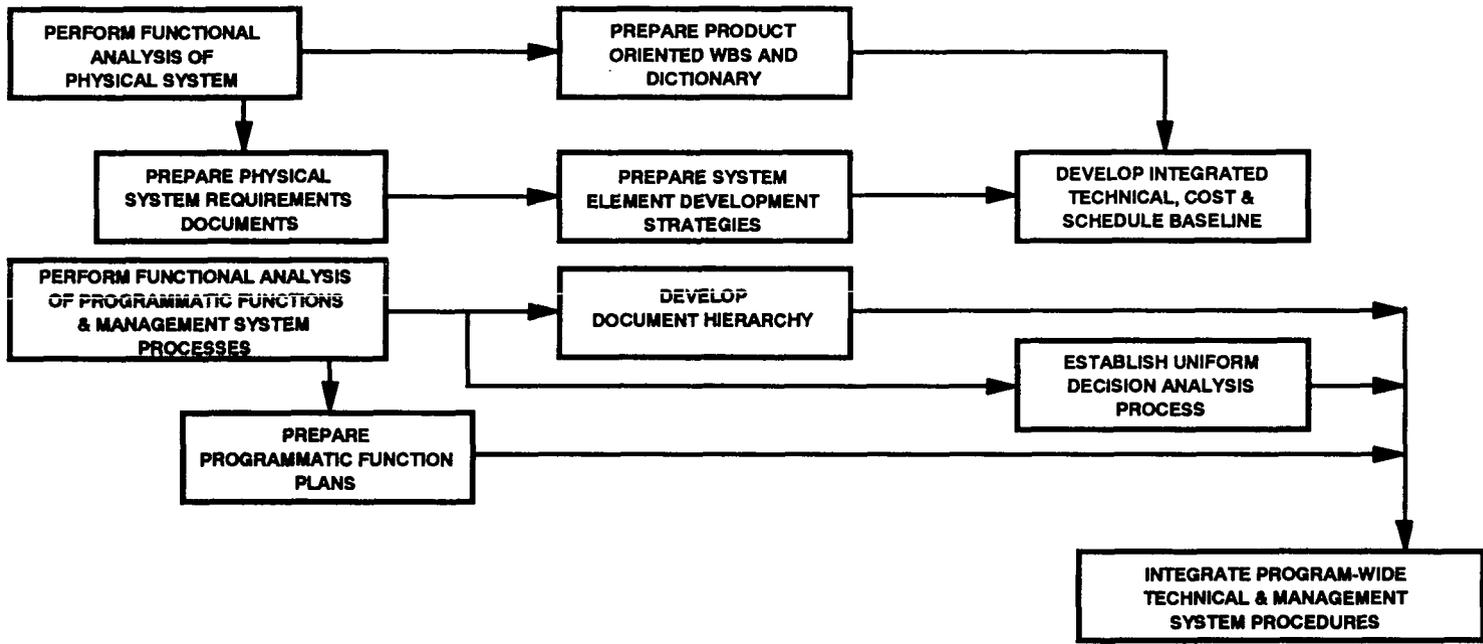
- OCRWM SEPARATED THE PROGRAMMATIC AND PHYSICAL SYSTEM FUNCTIONAL ANALYSIS EFFORTS BECAUSE OF THE SEPARATE MISSIONS OF EACH AREA**

PROGRAMMATIC FUNCTIONS:

PERTAIN TO OCRWM ACTIVITIES IN ORDER TO BRING THE NUCLEAR WASTE MANAGEMENT SYSTEM INTO BEING.

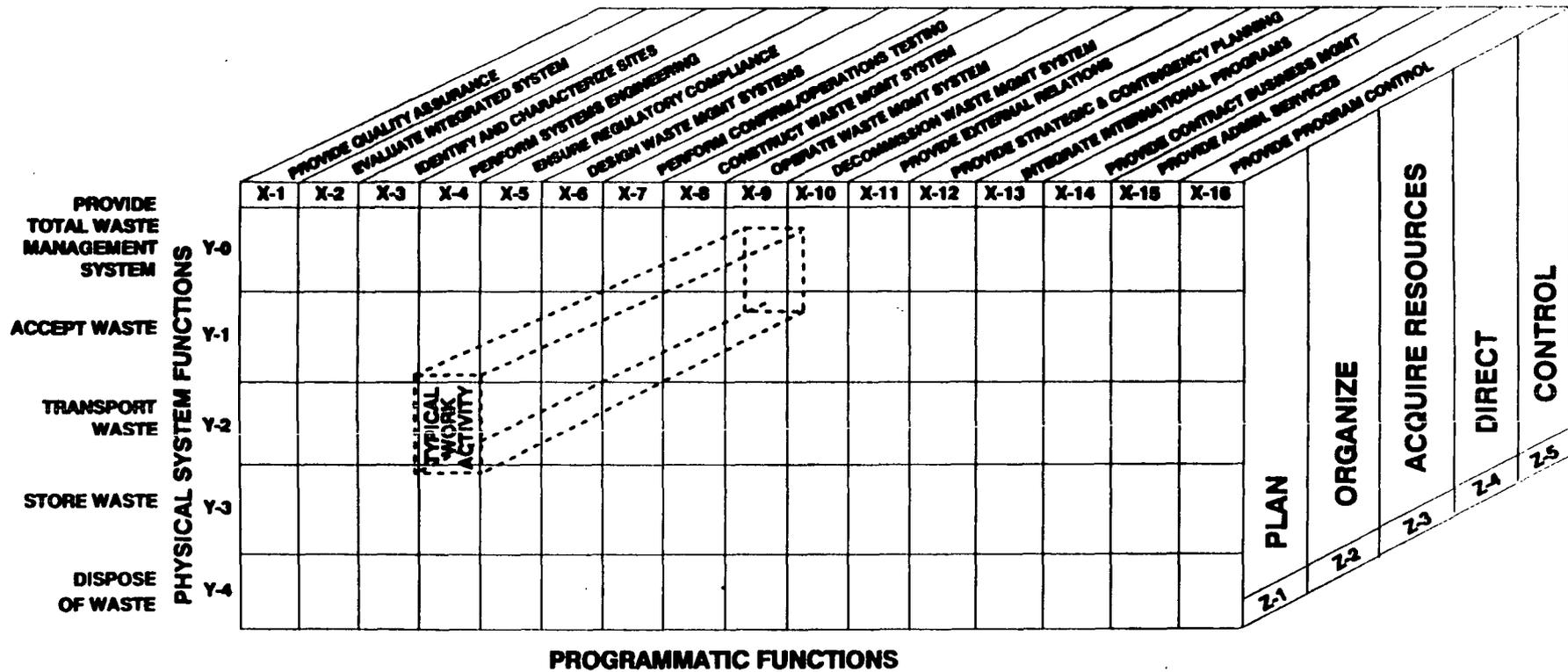
PHYSICAL SYSTEM FUNCTIONS:

PERTAIN TO THE PHYSICAL ELEMENTS OF THE NUCLEAR WASTE MANAGEMENT SYSTEM WHICH SATISFY THE WASTE MANAGEMENT AND DISPOSAL MISSION.



ON-GOING CIVILIAN RADIOACTIVE WASTE MANAGEMENT PROGRAM

A FRAMEWORK FOR INTEGRATION



QUESTION 2

GIVEN THE IDENTIFICATION OF APPROXIMATELY 6000 REQUIREMENTS, DOES THE DOE KNOW THAT THERE IS A FEASIBLE SOLUTION AS THE REQUIREMENTS AND REGULATIONS ARE NOW STATED?

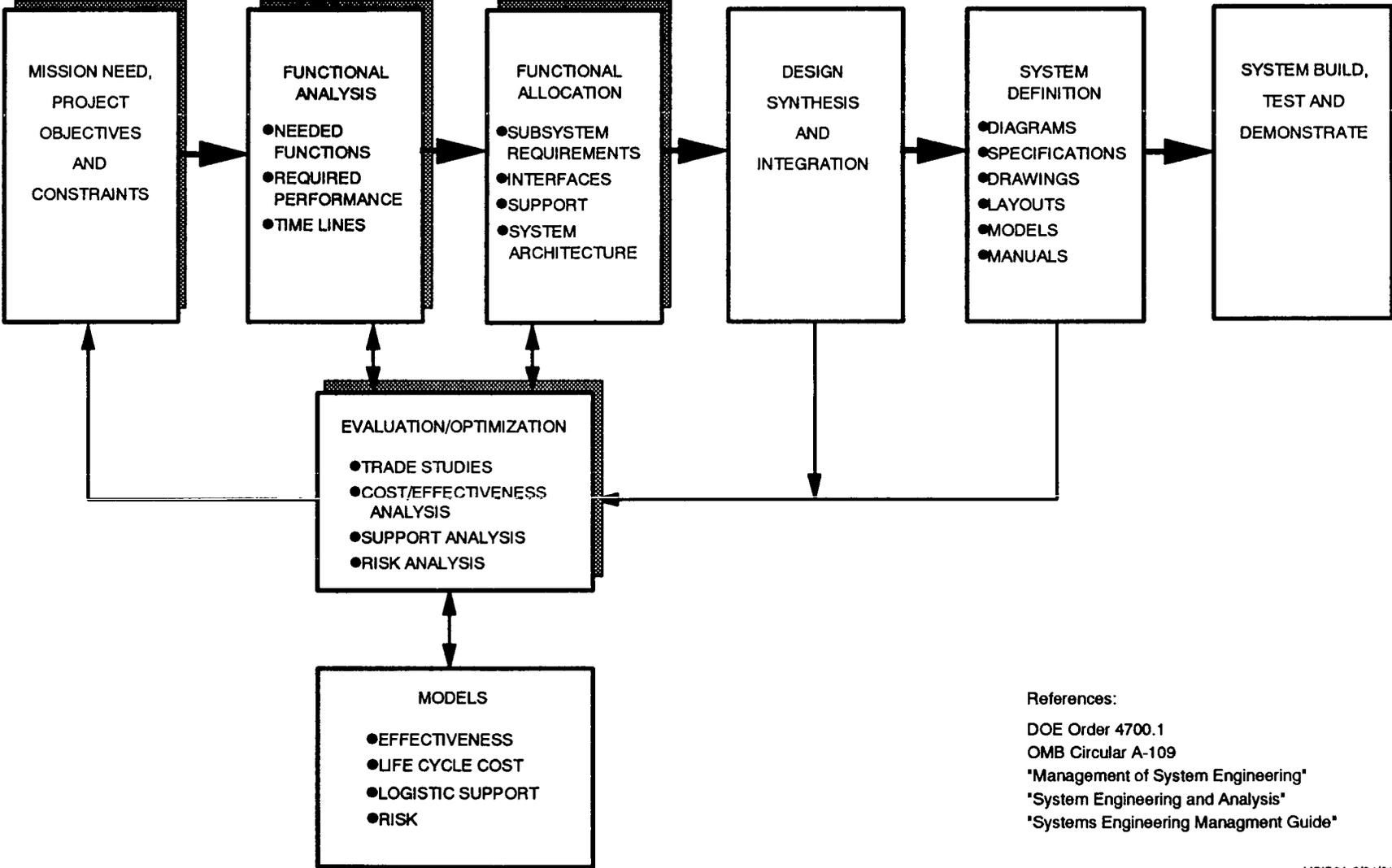
- ✓ **THE REQUIREMENTS RESEARCH AND FUNCTIONAL ALLOCATION PROCESS IS USED TO IDENTIFY REQUIREMENTS AT THE LOWEST FUNCTIONAL LEVEL**
- ✓ **REQUIREMENTS ANALYSIS AND SYSTEM MODELLING WILL BE USED TO IDENTIFY CONFLICTING REQUIREMENTS AND DETERMINE IF A FEASIBLE SOLUTION EXISTS**
- ✓ **CONFLICTING REGULATORY REQUIREMENTS ARE BEING IDENTIFIED ON AN ONGOING BASIS THROUGH REGULATORY ANALYSIS AS THE REGULATIONS ARE PROMULGATED OR REVISED**
- ✓ **TO PREVENT REGULATORY CONFLICTS, OCRWM PROVIDES COMMENTS ON PROPOSED RULES (E.G., 40 CFR 191) AND PROPOSES APPROACHES TO ADDRESS UNRESOLVED REGULATORY ISSUES (E.G. ACCIDENT DOSE CRITERIA 10 CFR 60)**

QUESTION 3

WILL THE DOE CONDUCT TIMELY SYSTEMS ENGINEERING TRADE-OFF STUDIES, THE GOAL OF WHICH IS TO OPTIMIZE (TO THE FULLEST EXTENT REASONABLY AVAILABLE) THE SPENT FUEL SYSTEM VIEWED FROM THE GENERATION OF SPENT FUEL AT THE UTILITY THROUGH FINAL STORAGE?

- ✓ **AS AN INTEGRAL PART OF THE ONGOING SYSTEMS ENGINEERING EFFORT, OCRWM WILL CONDUCT TRADE-OFF STUDIES TO SELECT APPROPRIATE DESIGN ALTERNATIVES.**
- ✓ **THE FUNCTIONAL ANALYSIS WILL BE USED TO IDENTIFY SYSTEM BOUNDARIES AND TOPICS FOR TRADE-OFF STUDIES.**
- **THE PROGRAM WILL PRIORITIZE AND SEQUENCE THE STUDIES SO THAT THEY ARE ACCOMPLISHED TO SUPPORT PROGRAMMATIC NEEDS.**

SYSTEMS ENGINEERING PROCESS



References:
 DOE Order 4700.1
 OMB Circular A-109
 "Management of System Engineering"
 "System Engineering and Analysis"
 "Systems Engineering Management Guide"

QUESTION 4

GIVEN THE STATE OF THE SYSTEM AS IT EXISTS TODAY, HOW WILL DOE ENSURE THE SYNCHRONIZATION OF DECISIONS BASED UPON A THOROUGH UNDERSTANDING OF NEEDS, FUNCTIONS, AND INTERFACES, PARTICULARLY AS THESE DECISIONS INVOLVE THE ACQUISITION OF MAJOR SYSTEMS OR SYSTEMS PARTS?

- . THE PROGRAM PRIORITY IS TO MOVE FORWARD WITH SITE CHARACTERIZATION, AND EARLY SITE SUITABILITY ACTIVITIES IN PARALLEL WITH REPOSITORY DESIGN DEVELOPMENT**
- . AS PART OF THE MANAGEMENT SYSTEM IMPROVEMENT STRATEGY, PROCESSES AND PROCEDURES FOR DECISION MAKING ARE BEING DEVELOPED AND WILL BE IMPLEMENTED**
- . THE ONGOING SYSTEMS ENGINEERING EFFORT WILL ADDRESS FUNCTIONAL DEPENDENCIES AND INTERFACES OF ALL SYSTEM ELEMENTS.**