



OUTLINE

REGULATORY COMPLIANCE APPROACH

SYSTEM ENGINEERING PROCESS

MISSION STATEMENT

FUNCTIONAL ANALYSIS APPROACH

DEVELOPMENT OF ESF TECHNICAL REQUIREMENTS

BASELINE DOCUMENT EVOLUTION

QUALITY ASSURANCE CONTROLS

TRANSITION OF REQUIREMENTS FOR ESF DESIGN



REGULATORY COMPLIANCE APPROACH

- **COMMITTED TO QUALITY ASSURANCE**
 - **FULLY SUPPORT QA IMPLEMENTATION**
 - **ASSURE ADEQUATE CONTROLS FOR DEVELOPMENT OF REQUIREMENTS & DESIGN ACTIVITIES**
- **NRC LICENSED**
- **FULLY DOCUMENTED & TRACEABLE RECORDS**
- **LONG TERM PROGRAM; PERSONNEL TURNOVER**

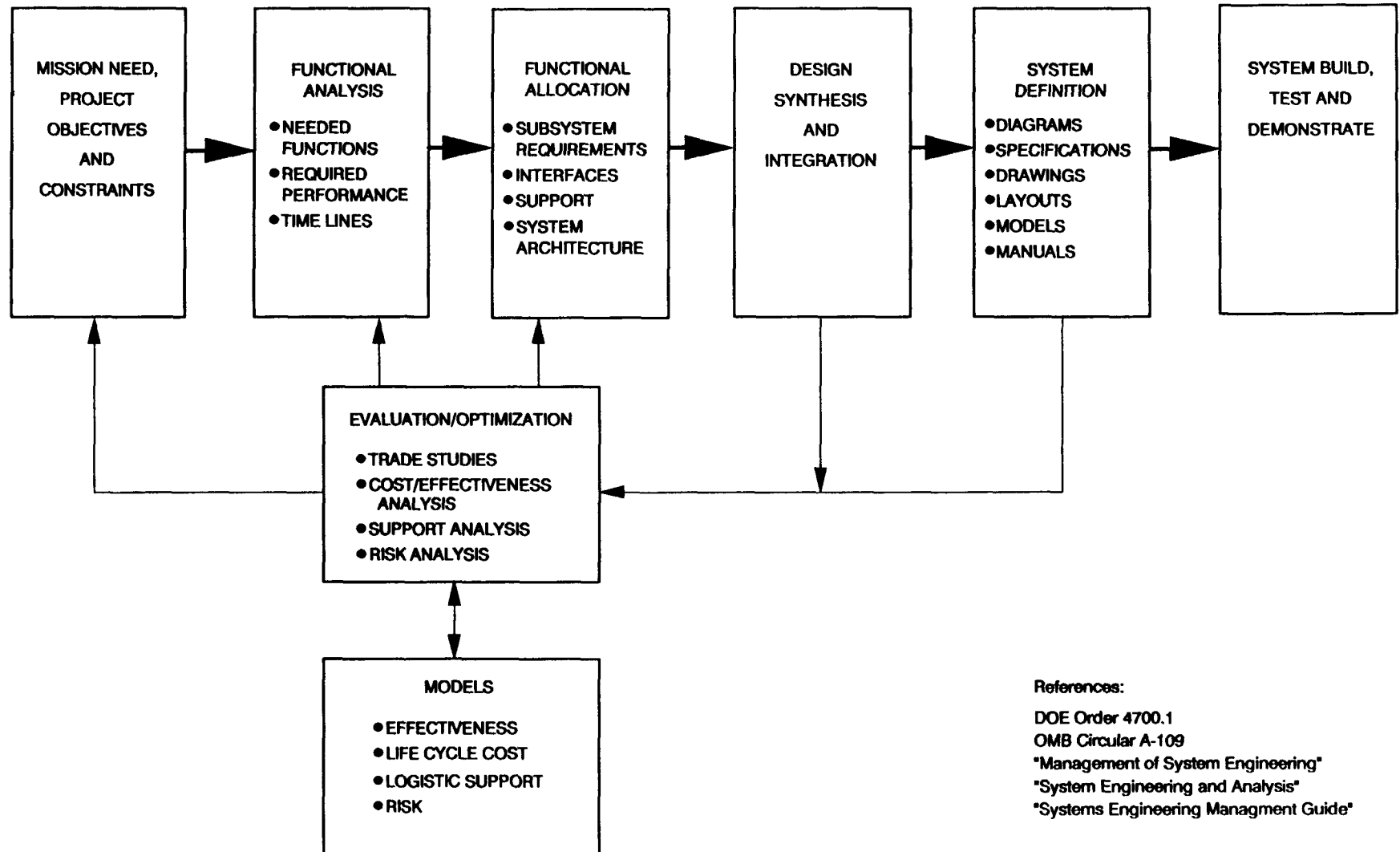


REGULATORY COMPLIANCE APPROACH (CONTINUED)

- **BENEFITS**
 - **COMPLY WITH REGULATIONS (OBTAIN LICENSE)**
 - **LOGICAL, DEFENSIBLE, DOCUMENTED PROCESS FOR CHARACTERIZATION & REPOSITORY DEVELOPMENT**
 - **ENHANCES TECHNICAL CREDIBILITY & PUBLIC ACCEPTANCE**
 - **SYSTEMATIC APPROACH REDUCES LIKELIHOOD OF MAJOR REDESIGN & RETROFIT**



SYSTEMS ENGINEERING PROCESS



References:

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



MISSION STATEMENT

"TO PERMANENTLY ISOLATE SPENT NUCLEAR FUEL AND HIGH-LEVEL RADIOACTIVE WASTE IN A GEOLOGIC REPOSITORY IN A MANNER THAT PROTECTS THE HEALTH AND SAFETY OF THE PUBLIC AND MAINTAINS THE QUALITY OF THE ENVIRONMENT"

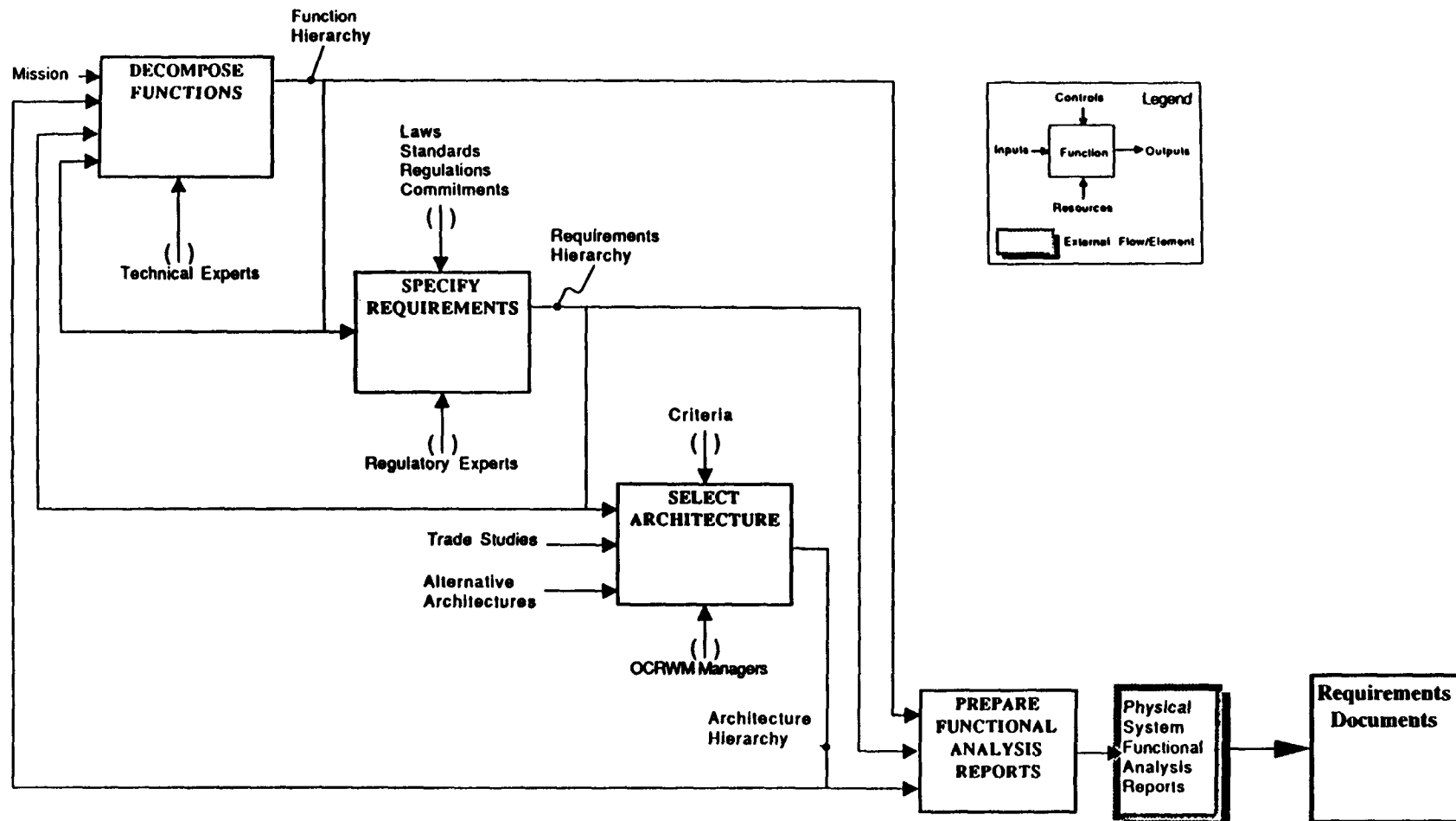


CONSTRAINTS (EXAMPLES)

- **MISSION PLAN**
- **10 CFR 60 "DISPOSAL OF HIGH-LEVEL RADIOACTIVE WASTE IN GEOLOGIC REPOSITORIES"**
- **10 CFR 72 "LICENSING REQUIREMENTS FOR THE INDEPENDENT STORAGE OF SPENT NUCLEAR FUEL AND HIGH-LEVEL RADIOACTIVE WASTE"**
- **10 CFR 960 "GENERAL GUIDELINES FOR THE RECOMMENDATION OF SITES FOR NUCLEAR WASTE REPOSITORIES"**
- **40 CFR 191 "ENVIRONMENTAL RADIATION PROTECTION STANDARDS FOR MANAGEMENT AND DISPOSAL OF SPENT NUCLEAR FUEL, HIGH-LEVEL AND TRANSURANIC RADIOACTIVE WASTE"**
- **DOE ORDERS**
- **EXECUTIVE ORDERS**

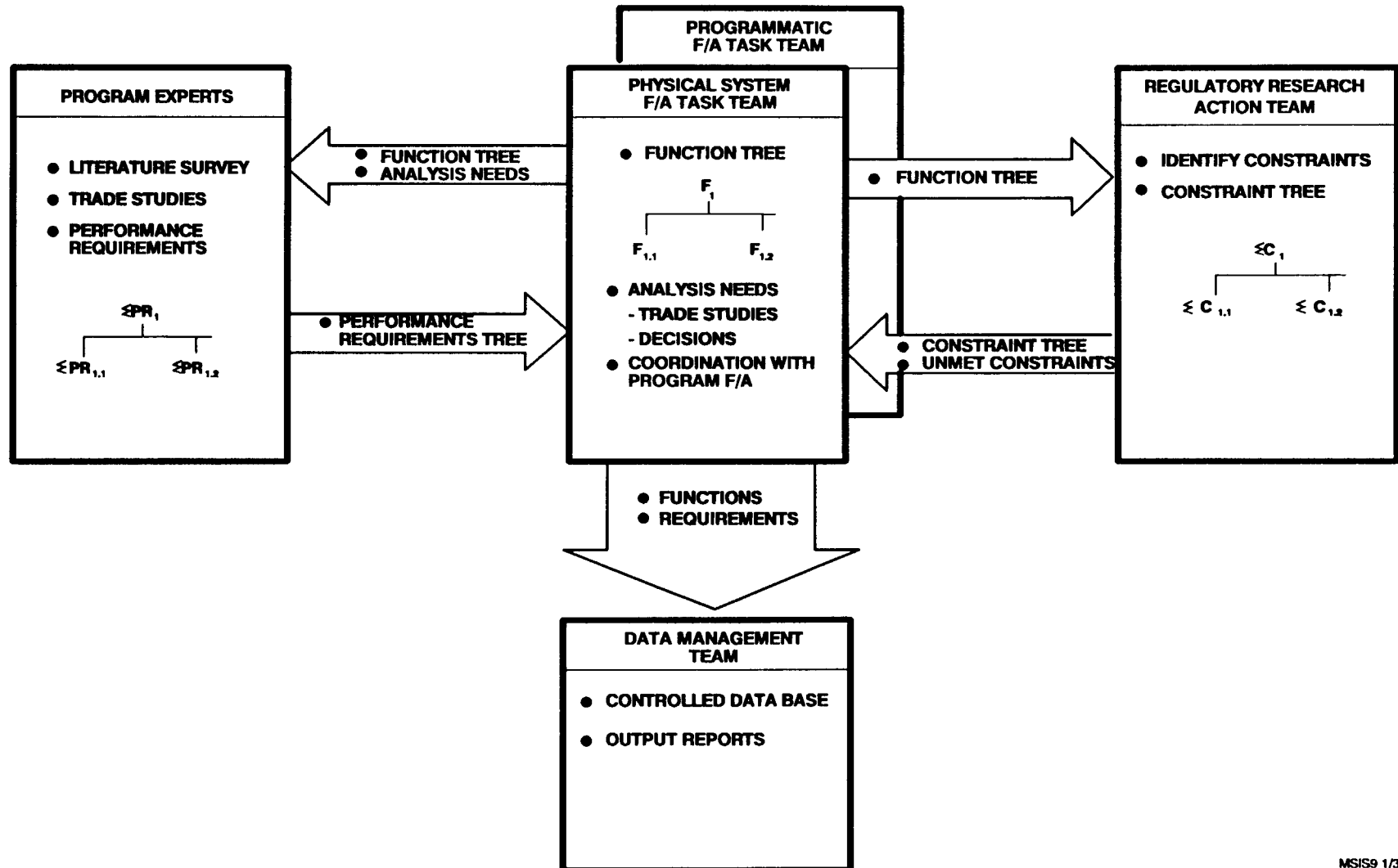


PHYSICAL SYSTEM FUNCTIONAL ANALYSIS APPROACH



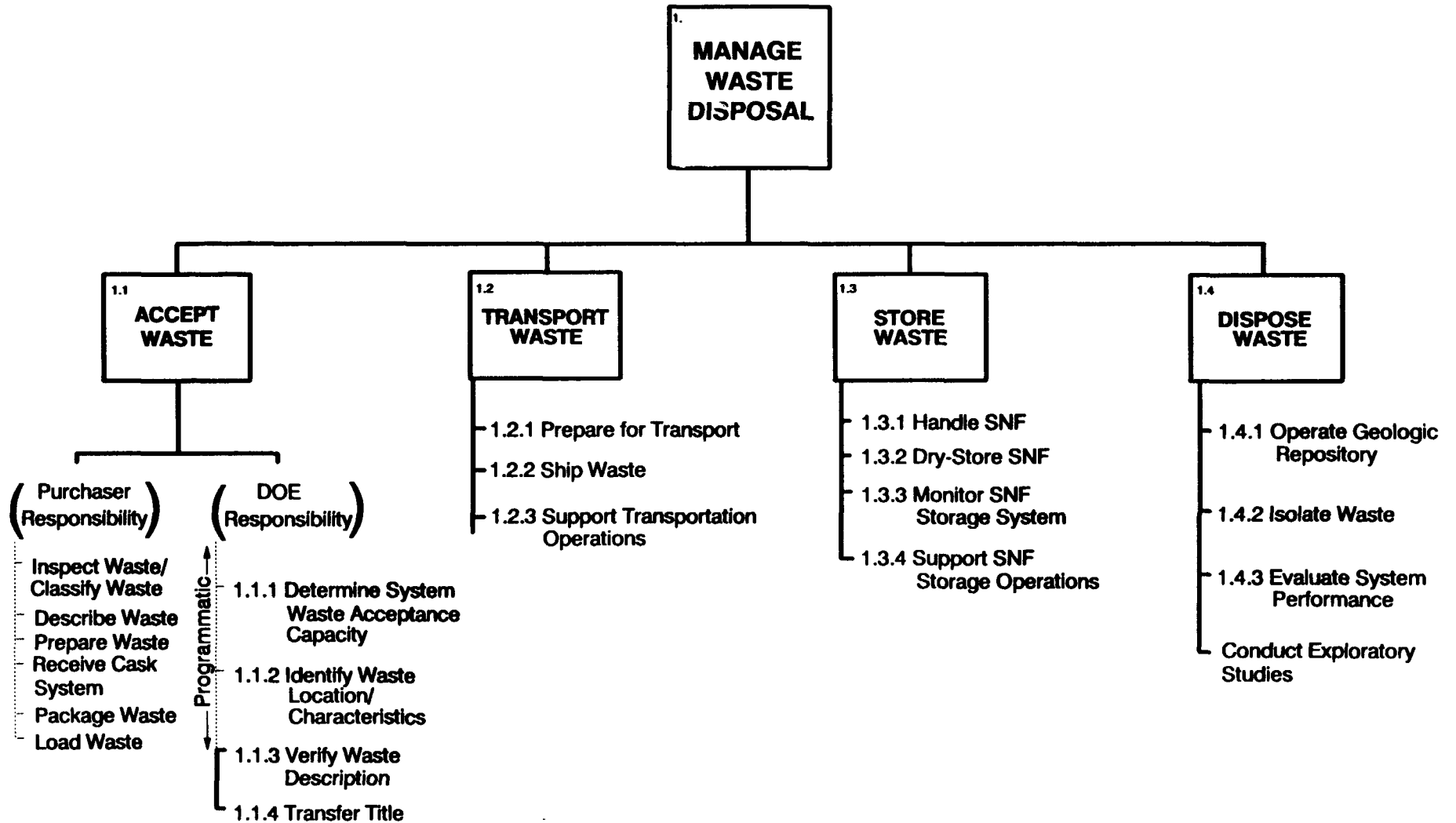


FUNCTIONAL ANALYSIS APPROACH



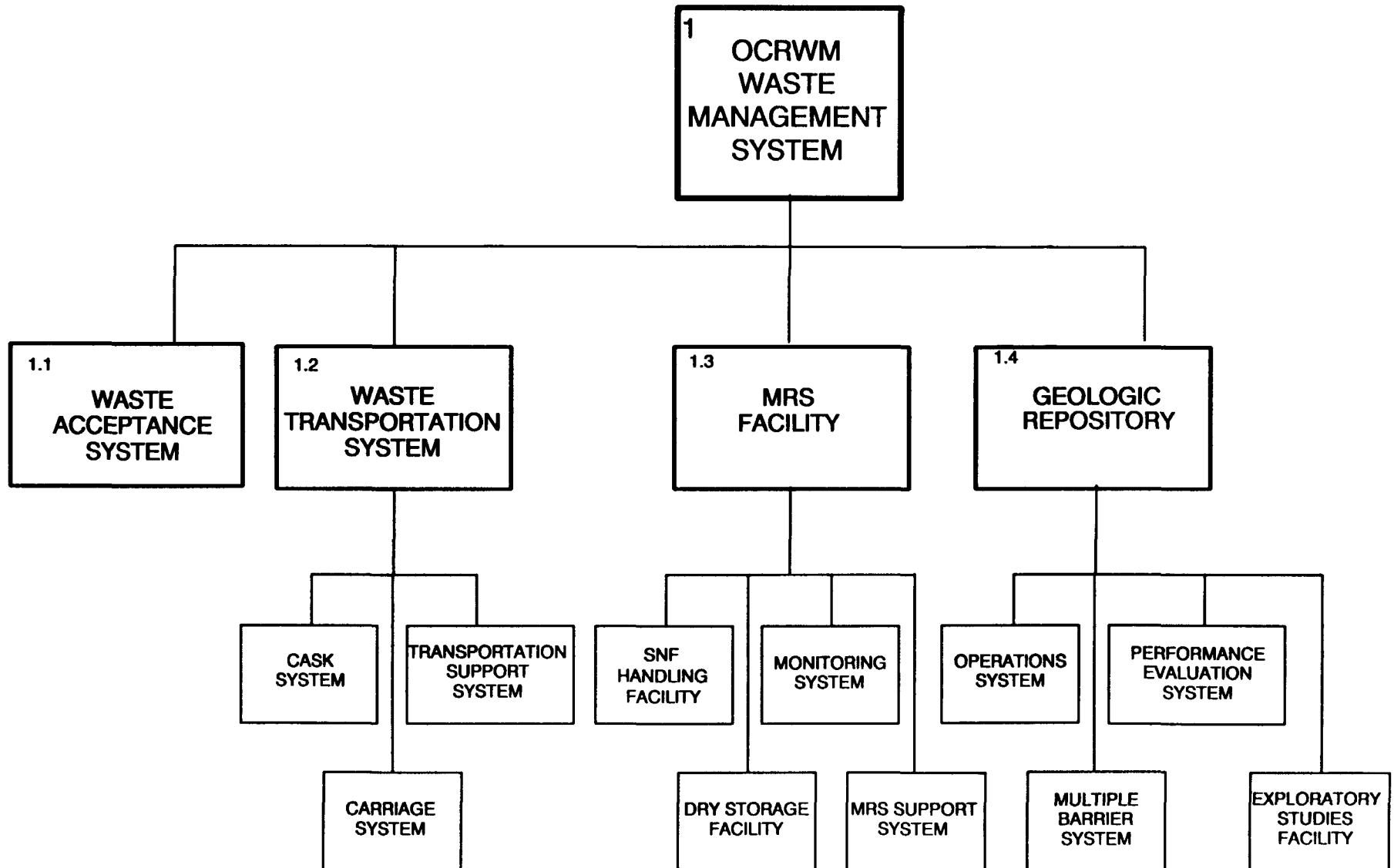


FUNCTION TREE DESCRIPTION



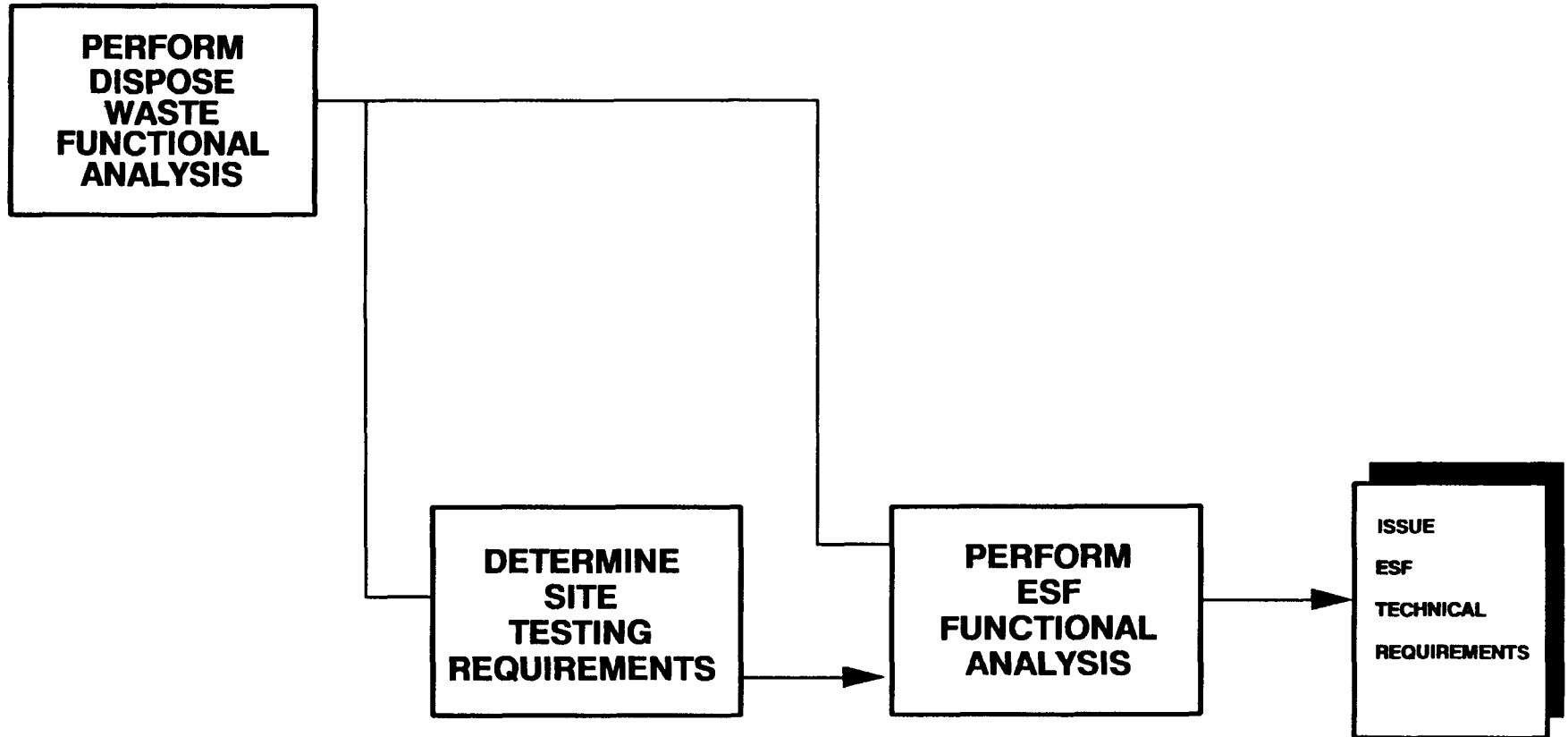


PHYSICAL SYSTEM ARCHITECTURE DESCRIPTION





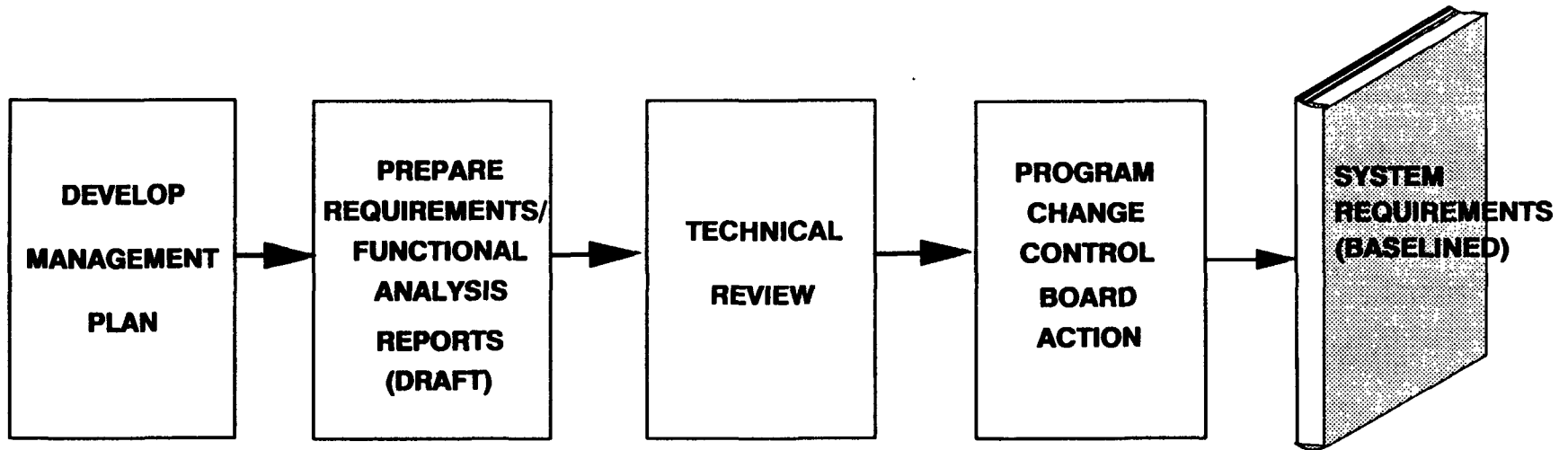
DEVELOPMENT OF ESF TECHNICAL REQUIREMENTS



- DEFINE PERFORMANCE MEASURES
- DESCRIBE METHODOLOGY
- SPECIFY DATA NEEDS
- DEFINE TESTS
- SPECIFY FACILITY CAPABILITIES



BASELINE DOCUMENT EVOLUTION



CONTENTS:

- INTRODUCTION
- FUNCTIONS & REQUIREMENTS
- ARCHITECTURE DESCRIPTION
- INTERFACES



QUALITY ASSURANCE CONTROLS

- **QUALIFIED PERSONNEL**
- **INDOCTRINATION & TRAINING**
- **MANAGEMENT PLAN FOR DOCUMENT DEVELOPMENT**
- **INPUT CONTROL ON SOURCE DOCUMENTS**
- **CONTROL OF INTERFACES**
- **TECHNICAL REVIEW**
- **PROGRAM CHANGE CONTROL BOARD**
- **RECORDS MAINTAINED**
- **PROCUREMENT OF SERVICES CONTROLLED**



TRANSITION OF REQUIREMENTS FOR ESF DESIGN

EXISTING REQUIREMENTS

- WMSR
- ESFDR
- SCP

COMPLETE ESF ALTERNATIVE STUDY

UPDATE REQUIREMENTS (CONTROLLED)

ESF DESIGN STUDY

R
E
V
I
E
W

NEW REQUIREMENTS

- OVERALL
- DISPOSE
- ESF

PREPARE NEW SYSTEM TECHNICAL REQUIREMENTS (BASELINED)

UPDATE TITLE I DESIGN SUMMARY

CONDUCT TITLE II DESIGN

JANUARY

JULY

SEPTEMBER