

**U.S. DEPARTMENT OF ENERGY
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT**

**PRESENTATION TO
THE NUCLEAR WASTE TECHNICAL REVIEW BOARD**

SUBJECT: CONTROL OF DESIGN INPUT

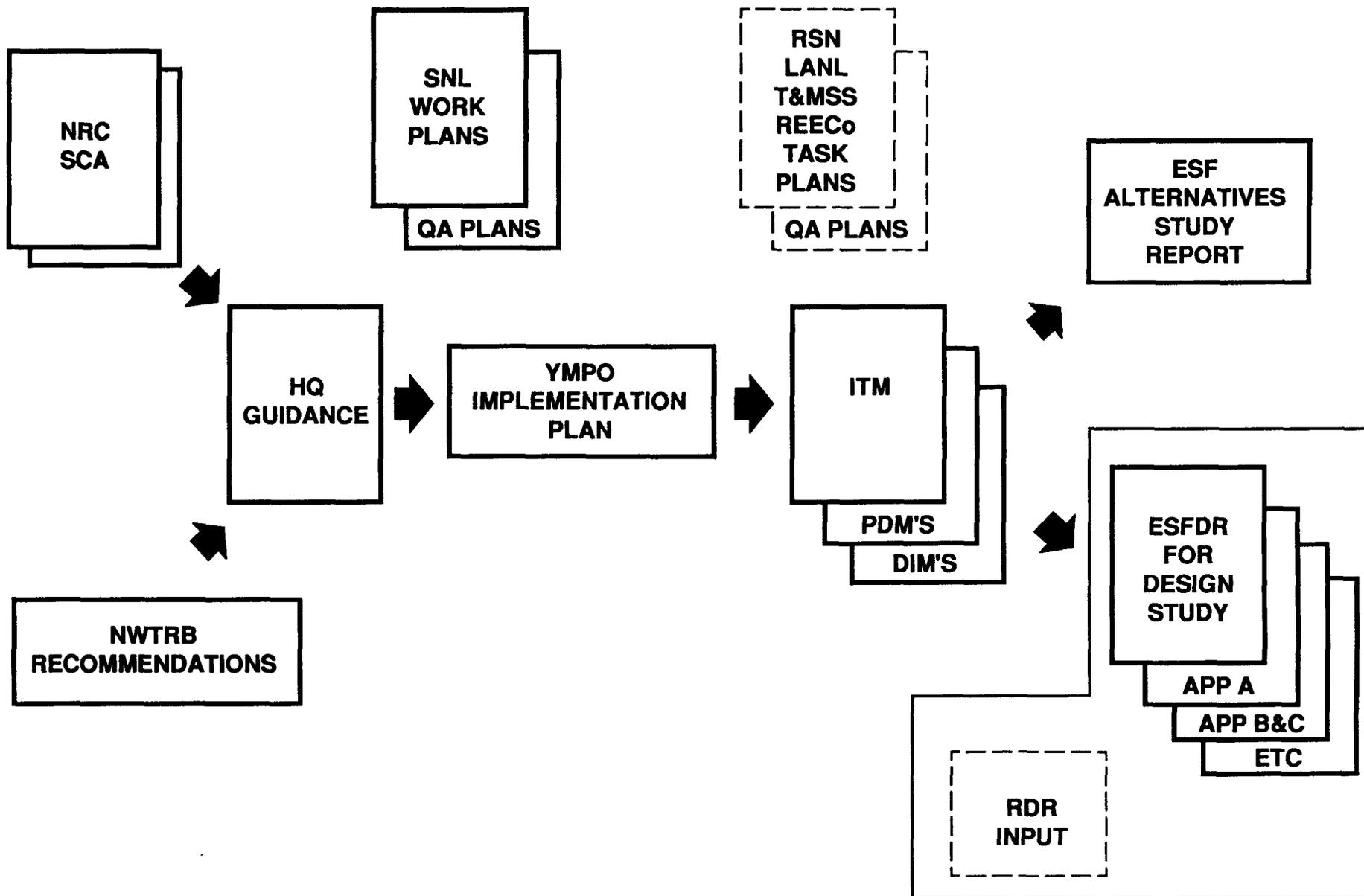
PRESENTER: DR. ALDRED L. STEVENS

**PRESENTER'S TITLE
AND ORGANIZATION: DIVISION SUPERVISOR
REPOSITORY ENGINEERING DIVISION
SANDIA NATIONAL LABORATORIES**

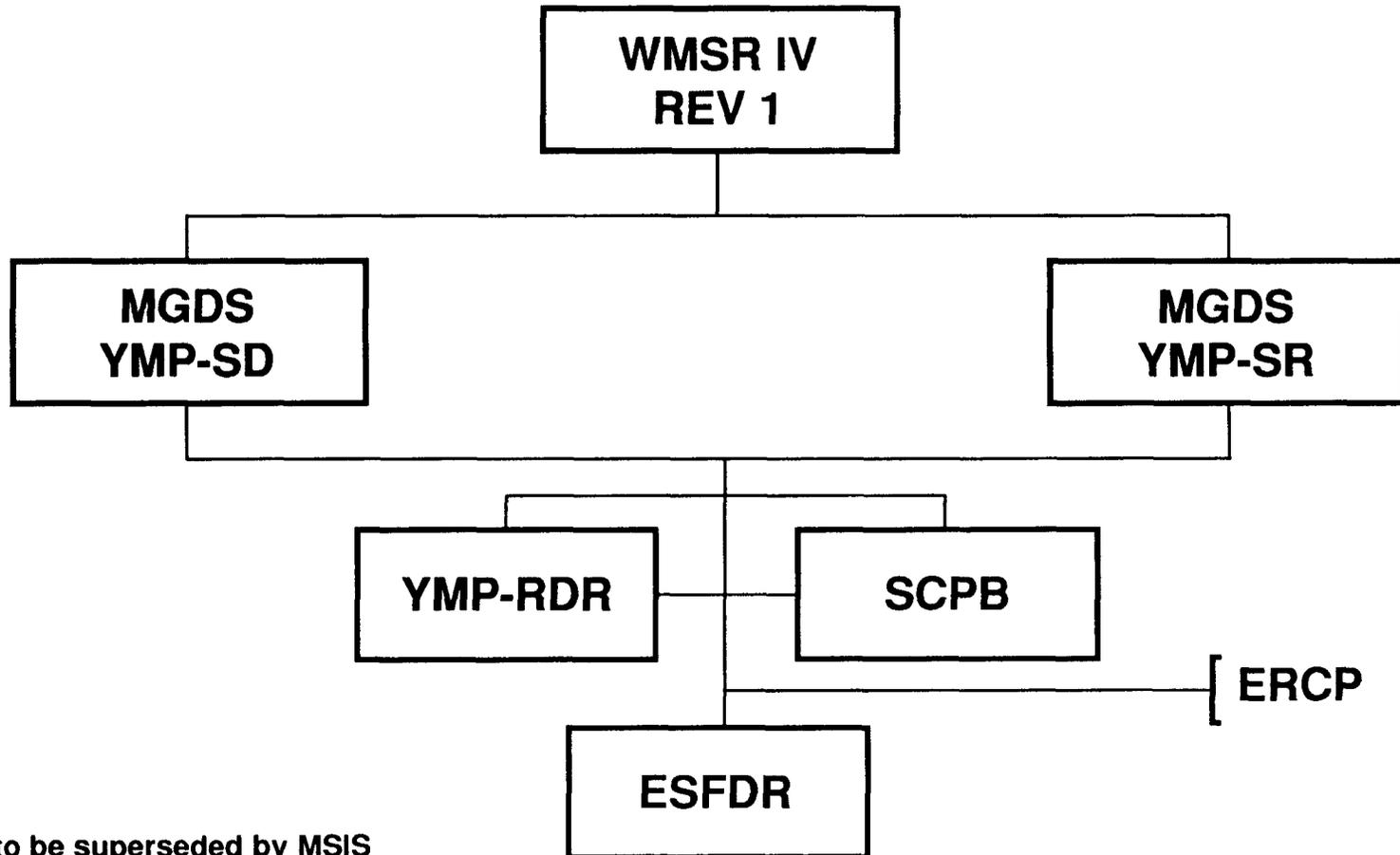
**PRESENTER'S
TELEPHONE NUMBER: (505) 844-1849**

MARCH 26, 1991

ESF ALTERNATIVES STUDY



***HIERARCHY OF TECHNICAL DOCUMENTS IN SUPPORT OF DESIGN STUDY**



* to be superseded by MSIS

CONTENT OF ESFDR FOR THE DESIGN STUDY

- **GENERAL EXPLORATORY STUDIES FACILITY**
- **ESF SITES(S)**
- **SURFACE UTILITIES**
- **SURFACE FACILITIES**
- **SHAFT ACCESS**
- **RAMP ACCESS**
- **UNDERGROUND EXCAVATIONS**
- **UNDERGROUND SUPPORT SYSTEMS**
- **UNDERGROUND TESTS**
- **ESF DECOMMISSIONING AND CLOSURE**

CONTENT OF ESFDR FOR THE DESIGN STUDY

- **REPOSITORY/EXPLORATORY STUDIES FACILITY INTERFACE**
- **ESF REQUIREMENTS FOR UNDERGROUND TESTS AND THE INTEGRATED DATA SYSTEM (IDS)**
- **ESF DRILLING REQUIREMENTS**
- **ESF RELATED REFERENCEABLE PROJECT DOCUMENTATION**
- **APPLICABLE REGULATIONS, CODES, STANDARDS, AND DOE ORDERS**
- **CROSS REFERENCE-WMSR APPENDIX E TO ESFDR, VOLUME 1**
- **CROSS REFERENCE-10 CFR 60 TO ESFDR, VOLUME 1**
- **ESF FUNCTIONAL ANALYSIS LOGIC TREE**
- **RESPONSIBILITY MATRIX**
- **ESF PERFORMANCE ASSESSMENT REQUIREMENTS**
- **ESF ENVIRONMENTAL REQUIREMENTS**
- **CORRELATION OF DAA CRITERIA WITH CORRESPONDING ESFDR CRITERIA**

IMPLEMENTATION OF QA CONTROLS FOR DEVELOPMENT OF ESF DESIGN STUDY REQUIREMENTS DOCUMENT

- **QUALIFIED PERSONNEL**
- **WORK PLANS**
- **IMPLEMENTING INSTRUCTIONS**
- **INTERFACE CONTROLS**
- **CONTROL OF INFORMATION INPUTS**
- **REVIEWS**
- **QA SURVEILLANCES OF THE PROCESS**

SNL QA STAFF INVOLVEMENT - ESF DESIGN INFORMATION

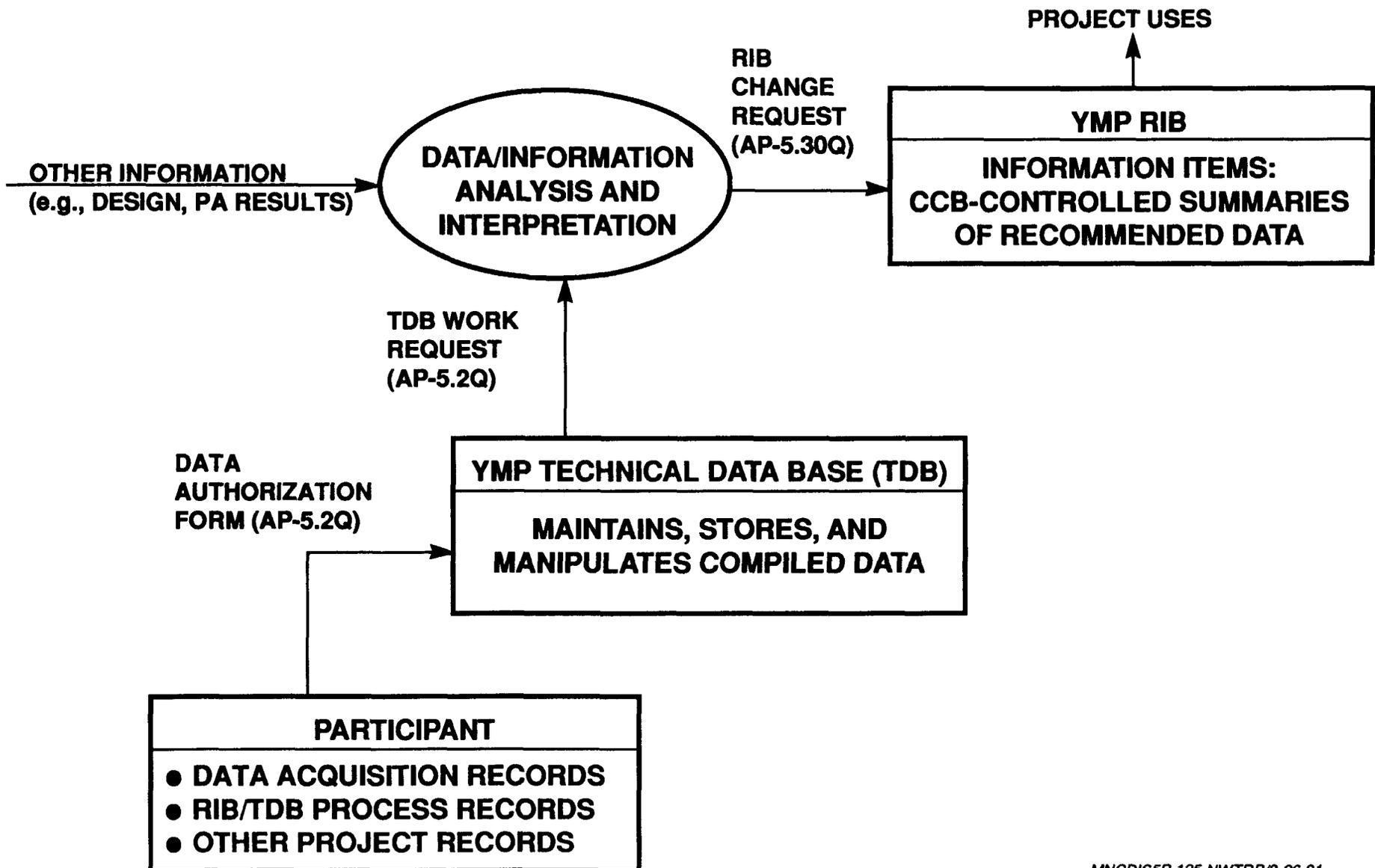
GENERAL

- **ESTABLISHMENT OF QA PROGRAM**
- **OVERALL VERIFICATION ACTIVITIES (e.g., AUDITING)**

DETAILED

- **REVIEWS OF PLANS, INTERFACE DOCUMENTS, AND IMPLEMENTING INSTRUCTIONS**
- **TASK-FOCUSED SURVEILLANCES**
- **FEEDBACK TO MANAGEMENT AND TECHNICAL STAFF**

SITE CHARACTERIZATION DATA FLOW



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**PRESENTATION TO
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**SUBJECT: CONTROL OF THE
ESF DESIGN PROCESS**

PRESENTER: DR. R.L. BULLOCK

**PRESENTER'S TITLE
AND ORGANIZATION: TECHNICAL PROJECT OFFICER
RAYTHEON SERVICES NEVADA**

**PRESENTER'S
TELEPHONE NUMBER: (702) 794-7014**

MARCH 26-27, 1991

CONTROL OF THE ESF DESIGN PROCESS

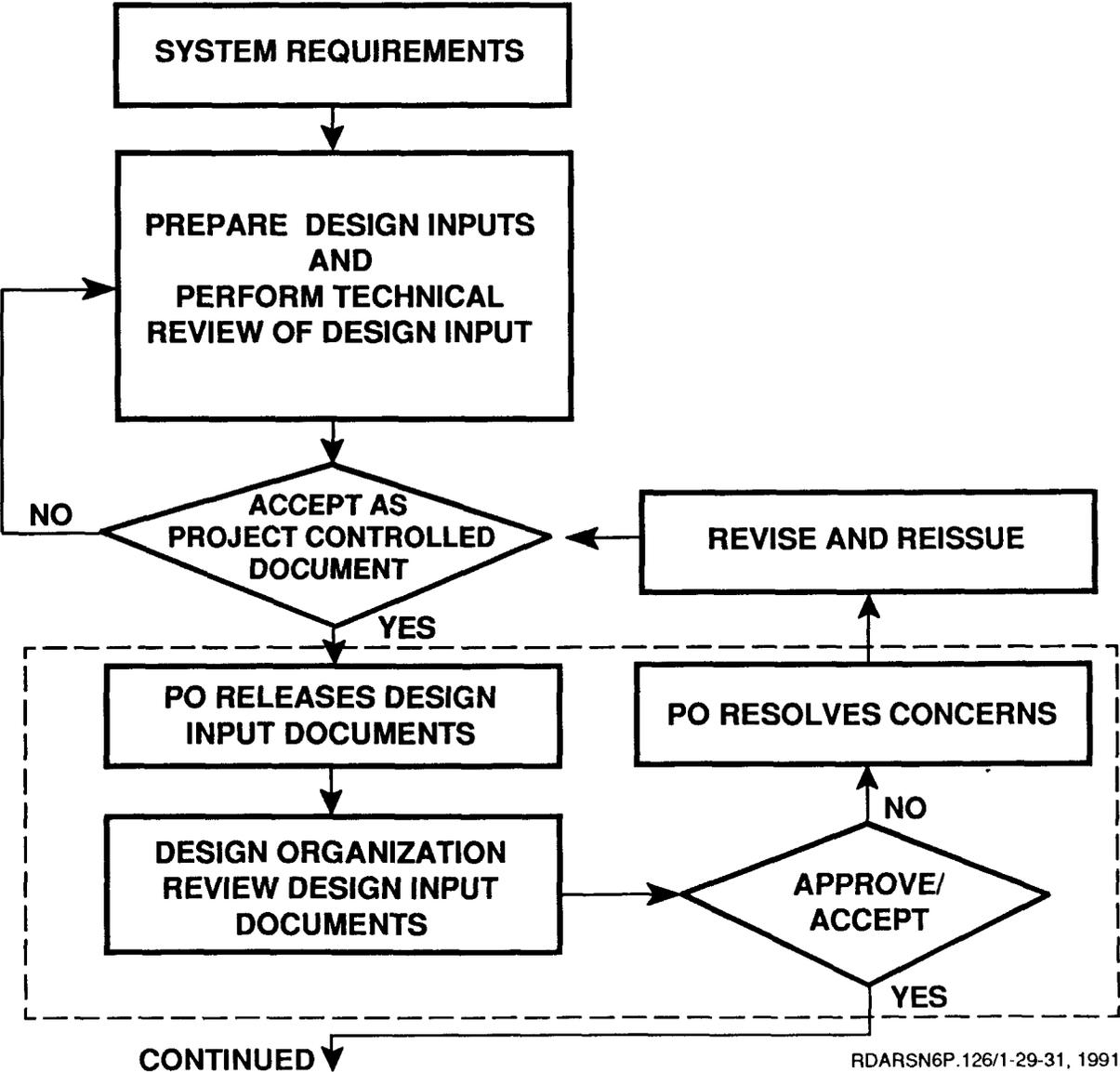
- **A/E QA CONTROLS FOR ESF DESIGN PROCESS ARE CONSISTENT WITH QARD AS REVIEWED AND APPROVED BY NRC**
- **DESIGN CONSIDERATIONS THAT ARE CONSISTENT WITH A/E APPROACH TO NUCLEAR FACILITY DESIGN**
 - **DESIGN ELEMENTS THAT MUST COMPLY WITH SYSTEM REQUIREMENTS THAT RELATE TO NRC REGULATIONS**
 - **DESIGN ELEMENTS THAT MUST COMPLY WITH QARD**
 - **DESIGN ELEMENTS THAT ARE AFFECTED BY INTERFACES**

PROJECT ESF DESIGN CONTROL

SHEET 1

PP-03-15
CONFIGURATION
IDENTIFICATION AND
DOCUMENTATION

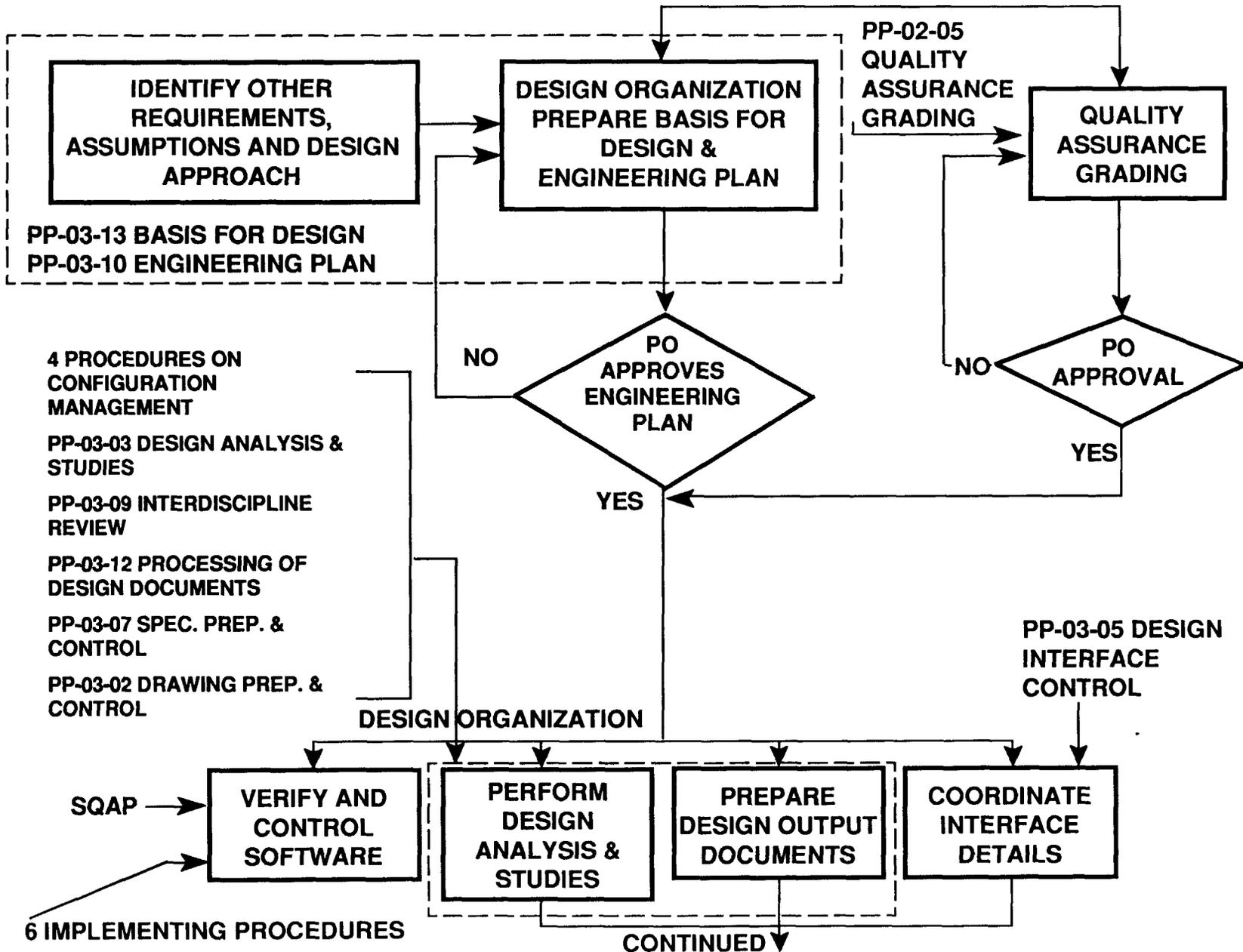
PP-03-02
DESIGN
METHODOLOGY



PROJECT ESF DESIGN CONTROL

SHEET 2

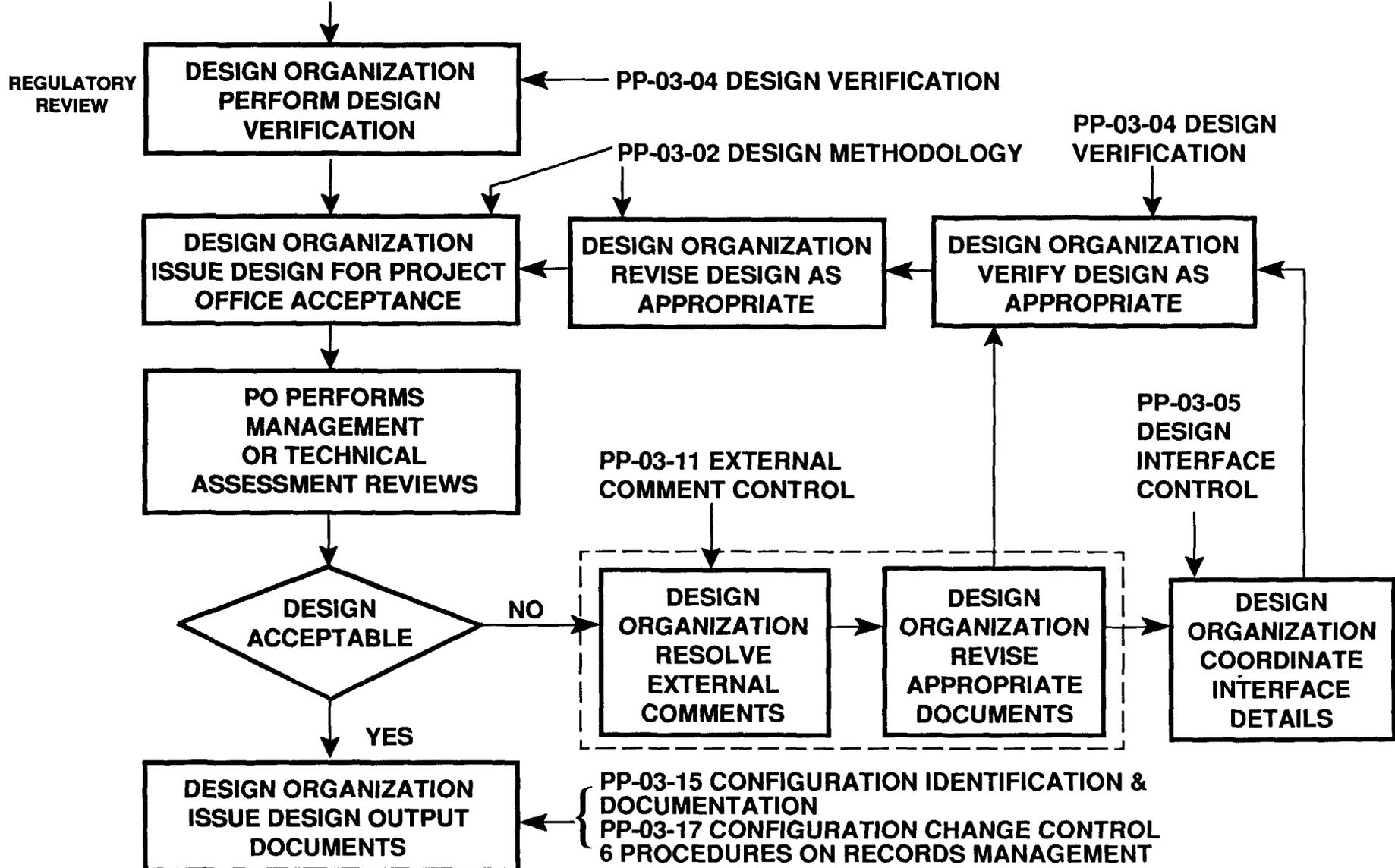
(CONTINUED FROM SHEET 1)



PROJECT ESF DESIGN CONTROL

SHEET 3

(CONTINUED FROM SHEET 2)



MAJOR ESF DESIGN CONSIDERATIONS THAT ARE CONSISTENT WITH ARCHITECT/ ENGINEERING APPROACH TO NUCLEAR FACILITY DESIGN

1. COMPLIANCE WITH SYSTEM REGULATORY REQUIREMENTS

- MUST NOT PRECLUDE THE POTENTIAL REPOSITORY FROM MEETING THE SYSTEM REGULATORY REQUIREMENTS SINCE THE ESF WILL BECOME A PART OF THE POTENTIAL REPOSITORY**
- MUST DESIGN THE ESF SO AS TO LIMIT IMPACT ON WASTE ISOLATION CAPABILITIES OF THE SITE**
- THE ESF WILL FUNCTION PRIMARILY FOR SITE CHARACTERIZATION ACTIVITIES, AND AS SUCH WILL ALLOW TESTING TO PROCEED WHILE LIMITING TEST TO TEST OR CONSTRUCTION TO TEST INTERFERENCE**

MAJOR ESF DESIGN CONSIDERATIONS

(CONTINUED)

1. COMPLIANCE WITH SYSTEM REGULATORY REQUIREMENTS

(CONTINUED)

- **THE ESF WILL BE DESIGNED, AS WILL THE POTENTIAL REPOSITORY, TO MEET THE STRUCTURAL STABILITY CRITERIA WITH SUPERIMPOSED THERMAL LOADING**
- **THE ESF WILL BE DESIGNED FROM VERY LIMITED DATA BUT THE DESIGN MUST NOT PRECLUDE THE CAPABILITY OF THE POTENTIAL REPOSITORY TO MEET THE SYSTEM REQUIREMENTS FOR WASTE ISOLATION**

MAJOR ESF DESIGN CONSIDERATIONS

(CONTINUED)

2. DESIGN UNDER A QUALITY ASSURANCE PROGRAM

- **CERTIFICATION OF QUALIFIED PERSONS PERFORMING WORK**
- **DETAILED PRECISE RECORDS REQUIRED**
- **QA GRADING**
- **DESIGN VERIFICATION**
- **TRACKING OF ALL DESIGN INPUT DATA TO DESIGN OUTPUT DELIVERABLES**
- **VERIFICATION AND VALIDATION OF COMPUTER SOFTWARE CODES (AS STATED IN QARD)**
- **TRAINING, RECORD KEEPING, AND COMPLIANCE MONITORING FOR ALL THE ABOVE**

MAJOR ESF DESIGN CONSIDERATIONS

(CONTINUED)

3. PLANNING AND COORDINATION OF INTERFACES WITH ALL PROJECT PARTICIPANTS

- **ESF DESIGN TO MESH WITH CONCEPTUAL POTENTIAL
REPOSITORY DESIGN**
- **ESF DESIGN TO MEET TESTING NEEDS OF RESEARCH
COMMUNITY WITH FLEXIBILITY TO ACCOMMODATE
CHANGES AND MODIFICATIONS**

QUALITY ASSURANCE INVOLVEMENT IN THE DESIGN PROCESS

1. REVIEW APPROVAL OF THE FOLLOWING TYPES OF DOCUMENTS:

- **ANALYSES AND STUDIES**
- **DRAWINGS**
- **TECHNICAL SPECIFICATIONS**
- **COMPUTER SOFTWARE**

2. AUDITS AND SURVEILLANCES