AVLIS Production Plant Work Breakdown Structure and Dictionary

Document APP-020
November 15, 1984

Reviewed by:

A.L. Lotts
A.L. Lotts, AVLIS Division
Director
Martin Marietta Energy Systems, Inc.

Reviewed by:

M.L. Spaeth
M.L. Spaeth, Laser Isotope Separation
Deputy Program Leader
Lawrence Livermore National Laboratory

Approved by:

J.I. Davis
J.I. Davis, Laser Isotope Separation
Program Leader
Lawrence Livermore National Laboratory

LAWRENCE LIVERMORE NATIONAL LABORATORY
University of California · Livermore, California · 94550

MARTIN MARIETTA ENERGY SYSTEMS, INC.
Oak Ridge, Tennessee, 37831

MARTIN MARIETTA

NOTICE

PORTIONS OF THIS REPORT ARE ILLEGIBLE.

It has been reproduced from the best available copy to permit the broadest possible availability.

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

MASTER

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

AVLIS Production Plant Work Breakdown Structure and Dictionary

MARTIN MARIETTA
Energy Systems

Prepared by the AVLIS Program with major
contributions from Bechtel National,
Incorporated.

**Bechtel National
Incorporated**

CONTENTS

	Page
1. Executive Summary	1
1.1 Purpose of Work Breakdown Structure	1
1.2 AVLIS Deployment Strategy Impact to the Work Breakdown Structure	4
1.2.1 Fully Activated AVLIS Production Plant	4
1.2.2 Greenfield Site AVLIS Production Plant	6
1.3 Integration of Work Breakdown Structure and Cost Estimates	6
1.4 Defining the Work	10
1.5 Development of Contract Work Breakdown Structure	12
1.5.1 Contract Work Breakdown Structure Development of Levels	12
1.6 Work Breakdown Structure Dictionary	14
2. Work Breakdown Structure Extension to Lower Level Details	15
2.1 Details for Initial Increment of Production Plant	15
2.2 Fully Activated Plant Supplement	23
2.3 Work Breakdown Structure--Greenfield Site	27
3. Work Breakdown Structure Dictionary--Part I Index	29
4. Work Breakdown Structure Dictionary--Part II Element Definition	30
5. Work Breakdown Structure Dictionary-- Functional Requirements	31
Addendum A--Index	32
Addendum B--Element Definition	52

LIST OF FIGURES

1-1	AVLIS Production Plant Work Breakdown Sturcture	2
1-2	Work Breakdown Structure Elements Impacted by Fully Activated Plant Supplement	5
1-3	Work Breakdown Structure Elements Impacted by Greenfield Site	7
1-4	Example of the Level of Detail in the Work Breakdown Structure	13
2-1	AVLIS Production Plant Work Breakdown Structure	17
2-2	Laser Systems Work Breakdown Structure	18
2-3	Separator System Work Breakdown Structure	19
2-4	Uranium Processing Work Breakdown Structure	22
2-5	Drawing Tree for Laser Systems	24
2-6	Drawing Tree for Separator Systems	25
2-7	Work Breakdown Structure Elements Impacted by the Fully Activated Plant	26
2-8	Work Breakdown Structure Elements Impacted by the Greenfield Site	28

LIST OF TABLES

1-1	AVLIS Work Breakdown Structure (Top Level 3)	3
1-2	Work Breakdown Structure - Level V/VI Detail (Laser and Separator)	8

1. EXECUTIVE SUMMARY

1.1. PURPOSE OF THE WORK BREAKDOWN STRUCTURE

The work breakdown structure has been prepared for the AVLIS Production Plant to define, organize, and identify the work efforts and is summarized in Fig. 1-1 for the top three project levels. The work breakdown structure itself is intended to be the primary organizational tool of the AVLIS Production Plant and is consistent with the overall AVLIS Program Work Breakdown Structure. It is designed to provide a framework for definition and accounting of all of the elements that are required for the eventual design, procurement, and construction of the AVLIS Production Plant. During the present phase of the AVLIS Project, the conceptual engineering phase, the work breakdown structure is intended to be the master structure and project organizer of documents, designs, and cost estimates. As the master project organizer, the key role of the work breakdown structure is to provide the mechanism for developing completeness in AVLIS cost estimates and design development of all hardware and systems. The work breakdown structure provides the framework for tracking, on a one-to-one basis, the component design criteria, systems requirements, design concepts, design drawings, performance projections, and conceptual cost estimates. It also serves as a vehicle for contract reporting.

The work breakdown structure will be used as the framework for displaying the subdivisions of work effort. A systems approach is used for the key technology areas (laser and separators). Other work breakdown structure listings (such as the second number construction account system), can be derived from the systems approach with appropriate help from computational sorting aids. The systems work breakdown structure format is most appropriate because of the parallelism that can be obtained between the work breakdown structure and the existing development organizational structure that is responsible for the design, procurement, and construction of the Laser Demonstration Facility and the Separator Demonstration Facility, the

Fig. 1-1. AVLIS Production Plant work breakdown structure.

operational prototypes of the plant systems. The work breakdown structure for the demonstration facilities is consistent with the respective plant systems. This parallelism improves the efficiency of our staff and provides the mechanism for definition of responsibility between operational prototype elements and plant systems on a one-to-one basis. It will be used to integrate the functional organizational structure into a Responsibility Assignment Matrix to establish responsibility for identified work tasks. In addition, the planning, scheduling, budgeting, work authorization, and cost accumulation subsystems will be integrated into planning and controlling the work.

The work breakdown structure is consistent with the DOE-HQ guidelines for a major systems acquisition. Level I is the complete project including all engineering, procurement, construction, pre-operational system checkout, project integration, and adequate contingency based on analysis. The work breakdown structure at Levels II and III reflects the process-specific nature of the AVLIS Plant but is similar (at Level II) to other enrichment projects, such as the Gas Centrifuge Enrichment Plant. The top levels of the AVLIS Plant work breakdown structure are summarized in Table 1-1.

Table 1-1. AVLIS work breakdown structure (Top Level 3).

Level I.

1.0 AVLIS Production Plant

Level II.

- 1.1 Process Building Conventional Facilities
- 1.2 Process Building Special Equipment
- 1.3 Uranium Processing Facilities
- 1.4 Plant Support Facilities
- 1.5 Project Integration

Level III.

Process Equipment (Example of work breakdown structure Level III detail)

- 1.2.1 Laser Systems
 - 1.2.2 Separator System
 - 1.2.3 Plant Control Data Acquisition System
 - 1.2.4 Process Electrical Systems
 - 1.2.5 Process Support
-

1.2. AVLIS DEPLOYMENT STRATEGY IMPACT TO THE WORK BREAKDOWN STRUCTURE

The enrichment capacity for the first increment of production will be approximately 5 million separative work units per year. It is planned that the plant capacity will be expanded by adding additional equipment and that improvement in the technology will be incorporated in the original equipment to increase the capacity, under fully activated conditions, to between 10 million and 13 million separative work units per year.

The AVLIS Production capacity will be deployed at two plant sites to minimize the potential of site related events impacting the complete U.S. production capacity. The first plant is located at the Oak Ridge Gaseous Diffusion Plant site, and the second plant is located at a generic Greenfield Site. The first plant is deployed in two distinct phases. The initial increment of production is based on current technology while more advanced performance hardware will be incorporated to fully activate the plant. The second plant will be based on the fully activated plant design and will also be incrementally activated to meet the DOE's projected enrichment demands.

The work breakdown structure presented previously, and emphasized in this document, focuses on the initial increment of production. Summaries of the fully activated plant and the greenfield site work breakdown structure follow.

1.2.1. Fully Activated AVLIS Production Plant Work Breakdown Structure

The fully activated plant work breakdown structure is identical to that used for the initial increment of production. The initial increment of production plant deployment consisted of six separators and three laser power-amplifier modules versus the fully activated plant deployment of eight separators and four laser amplifier modules and incorporates a performance upgrade of process hardware. The fully activated plant would also include the design, procurement, and construction of additional uranium processing facilities as well as other process and plant support facilities. Figure 1-2, work breakdown structure elements impacted by fully activated plant supplement, identifies those elements most affected by cost increases from the initial increment of production to a fully activated plant.

*Shaded WBS elements impacted by fully activated plant supplement

Fig. 1-2. Work breakdown structure elements impacted by fully activated plant supplement.

1.2.2. Greenfield Site AVLIS Production Plant Work Breakdown Structure

The Greenfield Site locates a fully activated AVLIS Production Plant at a stand-alone generic location. The major impact on the fully activated AVLIS Plant work breakdown structure is that numerous facilities, which currently exist at the Oak Ridge Gaseous Diffusion Plant and that are available at no capital cost increase to the initial AVLIS Plant, must be constructed at the Greenfield Site. The major additional facilities and systems for the Greenfield Site include the outside utilities, other structures, waste management facilities, and plant support facilities. The additions to the outside utilities include primary high-voltage power from an off-network supply to the AVLIS substation, raw water wells and treatment facilities, steam plant, and an air-supply plant. In the Greenfield plant support facilities, the additional building requirements include administration, cafeteria, security, fire protection, maintenance shops, and other support facilities. Figure 1-3 displays the AVLIS Production Plant Greenfield Site work breakdown structure with the additional work breakdown structure elements and those deleted or not applicable.

1.3 INTEGRATION OF WORK BREAKDOWN STRUCTURE AND COST ESTIMATES

The work breakdown structure is the structured format upon which the capital cost estimate is summarized. It provides visibility into the estimate to permit a reasonable evaluation during DOE reviews and audits. Through a normal engineering approach, adequate bounds on cost estimates for conventional facilities and support systems can be established without great detail in the work breakdown structure. However, capital cost of the special process equipment (laser and separator) requires more detail and emphasis to ensure complete and accurate cost estimating. The work breakdown structure detail reflects this approach. The level of detail to be included in the Capital Cost Estimate Summary Document is as follows:

Fig. 1-3. Work breakdown structure elements impacted by Greenfield site.

AVLIS Production Plants

- 1) Initial increment of deployment and fully activated plants
 - o Process facilities - Level 4
 - o Process equipment
 - Laser - Level 5/6
 - Separator - Level 5/6
 - Other Proc. Equip. - Level 4
 - o Uranium Processing - Level 4
 - o Process Support - Level 4
 - o Project Integration - Level 3
- 2) Greenfield Site Production Plant
 - o Supplemental detail will be provided for the Process Support Facilities and modifications to outside utilities

The actual backup estimates are extended to additional levels of detail to support these summary-level cost estimates.

The Data Package III cost estimate will place special emphasis on the high-leverage cost drivers, the separator, and laser systems. The work breakdown structure details for the laser and separator systems that will be summarized in the capital cost estimate are shown in Table 1-2 to highlight the structured work breakdown structure approach for those key process systems.

Table 1-2. Work breakdown structure-Level V/VI detail (laser and separator).a

III. <u>Laser Systems</u>	III. <u>Separator System</u>
IV. Copper Laser System <ul style="list-style-type: none"> V. Copper Laser Oscillator V. Copper Laser Amplifier <ul style="list-style-type: none"> -- Heads Mech.b -- Heads Optics -- Encl. Mech -- Encl. Elec. 	IV. Pod System <ul style="list-style-type: none"> V. Vaporizer system <ul style="list-style-type: none"> -- E Beam System -- Crucible Melt Beam Dump -- Feed/Reflex Dist. System -- Vaporizer Instrumentation and Control, Front End V. Carriage Assy.

- PPE Mech.
- PPE Elec.
- Gas/Vac. System Mech.
- Gas/Vac. System Elec.
- V. Herriott Cell
- IV. Dye Lasers
 - V. Dye Wave Form Generator
 - V. Wave Length Acq. & Stab.
 - V. Amplifier Chain Comp.
 - V. Dyes
- IV. Optical System
 - V. Copper Laser Comb./Trans.
 - V. Dye Comb./Trans.
 - V. Chamber Optics
 - V. Alignment System
- IV. Instrumentation and Controls
 - V. Beam Diagnostics
 - V. Pointing and Centering Electronics
 - V. Master Timing System
 - V. Computer Main Frame & Peripherals
 - V. Communication System
 - V. Real Time Controls
 - V. Fac./Inter./Safety
- IV. Refurbishment/Test
 - V. Copper Laser Refurb.
 - V. Optics/Dye Refurb. Equip.
 - V. Test/QA Equip.
 - V. I&C Refurb. & Test
- Frame Assy.
- Umbilical Bellow Seals
- Utility Dist. Manifolds
- V. Extractor Collector System
 - Enclosure Assy.
 - Ion Extractor
 - Withdrawl System
 - Alignment System
 - Thermal System
 - Ext./Coil, I&C, Front End
- IV. Separator Local Control System
 - V. Module Supv. Control
 - V. Hardware
 - V. Software
- IV. Module System
 - V. Vacuum Tankage
 - Process Vesse
 - Partition Panels
 - Rail System
 - Mag. Field Coils
 - Personnel Platforms
 - V. Cooling System
 - V. Vacuum System
 - V. Air Handling System
- IV. Refurbishment/Test
 - V. Separator Main Bay Equip.
 - V. Refurbishment Equip.
 - V. Test/QA Equip.
 - V. I&C Refurb./Test Area

^aAll estimates are further broken down into material and labor costs.

^bItems preceded by -- are Level 6.

The work breakdown structure is the structured format by which the contingency analysis is calculated to provide visibility to permit a reasonable evaluation during the estimate review and audits. The level of detail in the contingency analysis is as follows:

Contingency Analysis Detail to Include in Data Package III

AVLIS Production Plant

- o Process facilities - Level 3
- o Process equipment
 - Laser - Level 4/5
 - Separator - Level 4/5
 - Other Proc Equip - Level 3
- o Uranium Processing - Level 3
- o Process Support - Level 2
- o Project Integration - Level 3
- o Composite - Level 1

1.4. DEFINING THE WORK

Since a very important aspect of the AVLIS Production Plant is planning and controlling the work effort, it is necessary that the work breakdown structure tool be used for the proper definition of those work effort tasks. The work breakdown structure is simply a family-tree subdivision of plant, facilities, systems, subsystems, components, work tasks, and services required to achieve the successful and effective completion of the AVLIS Production Plant. For purposes of the Contractor Project Organization (Lawrence Livermore National Laboratory/Martin Marietta Energy Systems) reporting to the DOE, the work breakdown structure is structured to reflect the way work will actually be performed and costs will be collected and reported on. The construction of the work breakdown structure accommodates prior design and reporting activities, scheduling, configuration management, historical cost collection, and contract funding.

The top three levels of the contract work breakdown structure are usually developed by the government and negotiated with the contractor. The AVLIS Production Plant top three levels were developed by the Lawrence Livermore National Laboratory/Martin Marietta Energy Systems Project Team and have remained essentially the same for both the 1983 and 1984 design basis reports. These summary levels are planned to be included in the contract and could provide a useful structure for future contract reporting.

The contract work breakdown structure is the complete work breakdown structure developed by the Lawrence Livermore National Laboratory/Martin Marietta Energy Systems Project Team and extends the project summary work breakdown structure to the lowest level appropriate for the definition of the contract work. Individual work tasks specified at each level in the work breakdown structure are defined as work breakdown structure elements. Each element is a discrete portion of the work breakdown structure comprising either a facility, system, item of hardware, service, or data.

The contract work breakdown structure will be used to integrate the functional organization into a Responsibility Assignment Matrix to establish responsibility for identified work tasks at the work breakdown structure element. In addition the planning, scheduling, budgeting, work authorization, and cost accumulation subsystems will be integrated into planning and controlling the work.

The work breakdown structure serves as a useful tool for the DOE to perform audit functions to ensure that the project has:

- o All contract work included,
- o Management control systems integrated with the work breakdown structure,
- o Work breakdown structure and organizational structure integrated for cost and schedule performance,
- o A work breakdown structure time-phased budget baseline,
- o Data elements progressively summarized from the detail level to contract level.

1.5. DEVELOPMENT OF CONTRACT WORK BREAKDOWN STRUCTURE

The Lawrence Livermore National Laboratory/Martin Marietta Energy Systems Project Team developed the contract work breakdown structure by subdividing the project summary work breakdown structure (Level 3) into successive lower-level work breakdown structure elements to define all work elements for the Production Plant.

The contract work breakdown structure has subdivided the major AVLIS Production Plant level-three elements into the following element levels:

Title	Level
Process Building and Conventional Facilities	4
Laser Systems	6
Separator System	6
Uranium Processing	4
Plant Support Facilities	3
Project Integration	3

The contract work breakdown structure development defines, organizes, and identifies the work efforts to accomplish the overall management plan objectives. The lower level system and hardware elements represent logical cost accounts and manageable units of work. The contract work breakdown structure together with the work breakdown structure Dictionary provides the framework for assignment of responsibilities and for systematic planning and accounting for all plant elements. It also provides a uniform basis for scheduling, delineating objectives for monitoring progress, and providing contract visibility.

1.5.1. Contract Work Breakdown Structure Development of Levels

Figure 1-4, provides an example of the level of detail in the work breakdown structure by displaying the subdividing one element, laser systems, into successive lower-level system elements from Level 3 to Level 7 in the work breakdown structure.

Fig. 1-4. Example of the level of detail in the work breakdown structure.

1.6. WORK BREAKDOWN STRUCTURE DICTIONARY

The work breakdown structure Dictionary is used to document the contract work breakdown structure framework for the Contractor Project Organization. It provides guidance for work authorizations, developing estimates, and support subcontractors.

The work breakdown structure Dictionary is divided into two parts:

- o Part 1--Index provides a drawing-tree setback type listing by line item number. It specifies the various subdivisions of the work effort. Addendum A is the index for the AVLIS Production Plant.
- o Part 2--Element Definition provides the definition for all work breakdown structure elements listed in the index portion of the contract work breakdown structure Dictionary. The Dictionary is usually prepared when Cost/Schedule Control System reporting requirements are imposed. The Dictionary facilitates the preparation of an estimate and ensures that all work effort and costs are identified and accumulated to the proper contract work breakdown structure elements.

2. WORK BREAKDOWN STRUCTURE EXTENSION TO LOWER LEVEL DETAILS

2.1. WORK BREAKDOWN STRUCTURE DETAILS FOR THE INITIAL INCREMENT OF PRODUCTION PLANT

Since an important aspect of the AVLIS Production Plant is planning and controlling the work effort, the level three work breakdown structure has been further divided into discrete elements for the initial increment of Production Plant scenario as an aid in planning and controlling the contractor effort. The work breakdown structure for the initial increment of production is also used as the basis for the work breakdown structure for the fully activated plant and for the second AVLIS Plant, one located at a generic Greenfield Site that has a nameplate capacity similar to the fully activated plant.

The extension of the work breakdown structure to lower levels of details and the work breakdown structure element number are shown on the following figures:

Fig. 2-1

1.0	AVLIS Production Plant	Level 1
1.1	Process Building Convention Facilities	Level 4
1.2	Process building Special Equipment	Level 4
1.3	Uranium Processing Facilities	Level 4
1.4	Plant Support Facilities	Level 3
1.5	Project Integration	Level 3

Fig. 2-2

1.2.1	Laser Systems	Level 3
1.2.1.1	Copper Laser Systems	Level 6
1.2.1.2	Dye Lasers	Level 6
1.2.1.3	Optical System	Level 6
1.2.1.4	Instrumentation and Controls	Level 6
1.2.1.5	Refurbishment/Test	Level 6

Fig. 2-3

1.2.2	Separator System	Level 3
1.2.2.1	POD System	Level 7
1.2.2.2	Separator Local Control Systems	Level 7
1.2.2.3	Module System	Level 7
1.2.2.4	Refurbishment/Test	Level 7

Fig. 2-4

1.3	Uranium Processing Facilities	Level 3
1.3.1	Feed Conversion	Level 4
1.3.2	Feed Preparation	Level 4
1.3.3	Product Conversion	Level 4
1.3.4	Uranium Recovery	Level 4
1.3.5	Process Support	Level 4
1.3.6	Waste Management	Level 4

LEVEL

1

2

3

4

Fig. 2-1. AVLIS Production Plant work breakdown structure.

Levels

Fig. 2-2. Laser systems work breakdown structure.

Levels

3

4

5

6

Fig. 2-3. Separator system work breakdown structure.

- CPU
- Dia.
- Tape
- Printer/plotter
- Terminals
- Graphics
- Processor
- Network
- PDD processor
- CPU
- Disk
- Terminal
- I/O interface
- Man-machine interface
- Data base mgmt.
- Sys. configuration
- QA/RAM
- Processor generation
- Processor/workstation commun.
- Disk
- Terminal evaluation
- Data archive
- PDD optimization
- Process chamber
- Gas scattering chambers
- Optics chambers
- Vac. isolation valves
- Thermal liner panels
- Partition frame
- Panel heat exchangers
- Fixed panels
- Vac. isolation panels
- Regulate air (NA)
- NA hatch drives
- Process evaluation
- Data archive
- PDD optimization
- Longitudinal fixed mills
- Transverse fixed mills
- Drop mill drive sys.
- Longitudinal drive sys.
- Transverse drive sys.
- Partition drives
- Coil support brkts.
- Coil insulator
- Coil cooling sys.
- Diffusion pump valve access
- Umbilical access
- Optics chamber
- Diffusion pump valve access
- Sump piping
- LIW tank
- Processors
- Software
- I/O modules
- Roughing pumps
- Back pumps
- Hold pumps
- Processor
- Software
- I/O modules
- Process chamber
- Gas heating coil
- Optics chamber
- Gun pumping
- Thermo-couples
- Ion gauges

- PDD software
 - PDD algorithm processor
 - Processor/processor commun.
 - Fault correction
 - Data acc.
 - Batch control
 - Run-up
 - Shut down
- Facility control
 - Vacuum
 - Cooling
 - Acid
 - Laser
 - Interaction
 - Health
 - Physics
 - Uninterruptable pow.

Level

2

1.3

Uranium
processing
facilities

3

1.3.1

Feed
conversion

1.3.2

Feed
preparation

1.3.3

Product
conversion

1.3.4

Uranium
recovery

1.3.5

Process
support

1.3.6

Waste
management

4

- 1.3.1.1
 - UF₄ production
- 1.3.1.2
 - Derby production
- 1.3.1.3
 - Derby cleaning
- 1.3.1.4
 - Slag processing
- 1.3.1.5
 - HF recovery
- 1.3.1.6
 - H₂ generation
- 1.3.1.7
 - Magnesium storage
- 1.3.1.8
 - Building/services

- 1.3.2.1
 - Charge preparation
- 1.3.2.2
 - Crucible refurbishment
- 1.3.2.3
 - Melting-casting
- 1.3.2.4
 - Building/services

- 1.3.3.1
 - Size reduction
- 1.3.3.2
 - Oxidation
- 1.3.3.3
 - Fluorination
- 1.3.3.4
 - Purification
- 1.3.3.5
 - Blending
- 1.3.3.6
 - Building/services

- 1.3.4.1
 - Size reduction/oxidation
- 1.3.4.2
 - Fluorination
- 1.3.4.3
 - UF₆ withdrawal
- 1.3.4.4
 - Building/services

- 1.3.5.1
 - Toll facility
- 1.3.5.2
 - UF₆ feed
- 1.3.5.3
 - Fluorine generation
- 1.3.5.4
 - Tails management
- 1.3.5.5
 - KF conversion
- 1.3.5.6
 - Interfacility services
- 1.3.5.7
 - Office building

- 1.3.6.1
 - Shallow land burial site
- 1.3.6.2
 - Incineration
- 1.3.6.3
 - Concrete fixation
- 1.3.6.4
 - Neutralization
- 1.3.6.5
 - Classified burial
- 1.3.6.6
 - Decontamination (K-1420)
- 1.3.6.7
 - Transportation

Fig. 2-4. Uranium processing work breakdown structure.

A drawing tree type of display for the cost driver laser and separator systems are shown on Figs. 2-5 and 2-6, respectively.

The above figures have provided the framework for the design report, capital cost estimate, and schedules. They also will provide the framework for contract execution and for reporting cost, schedule, and technical performance. Each principal contractor associated with the AVLIS Production Plant will develop a contract work breakdown structure for work that they are assigned responsibility. The principal contractors will approve the contract work breakdown structure developed by DOE prime contractors. The contract work breakdown structure will serve as a management tool for identifying and defining work for which the contractor is responsible. It will serve to facilitate the planning and controlling of work and to monitor and report cost, schedule, and technical performance. The contract work breakdown structures, when joined together with the project summary work breakdown structure Level 3, formulates the total work breakdown structure for the AVLIS Production Plant Project. The work breakdown structure provides a consistent and visible structure that facilitates uniform planning, assignment of responsibilities, measurement of status, and reporting. The work breakdown Dictionary is used to document this framework for the contract and for support contractors.

2.2. WORK BREAKDOWN STRUCTURE - FULLY ACTIVATED PLANT SUPPLEMENT

The fully activated plant supplement is structured around the work breakdown structure framework used for the initial increment of Production Plant. The work breakdown structure elements that are impacted by the upgrade to a fully activated plant as a result of scope or capital cost estimate change are identified on Fig. 2-7. Those elements impacted are the process building conventional facilities including outside utilities and other structures; process building special equipment including laser systems, separator system, plant control data acquisition system and software, process electrical system, and process support; uranium processing facilities including feed conversion, feed preparation, product conversion, uranium recovery, process support and waste management; and lastly a project

Fig. 2-5. Drawing tree for driver laser.

Fig. 2-6. Drawing tree for separator system.

1

Fig. 2.7. Work breakdown structure elements impacted by the fully activated plant.

integration and its level three elements. The extension of the fully activated plant work breakdown structure to lower levels of details and the element number as shown on Fig. 2-7 is as follows:

1.0	AVLIS Production Plant	Level 1
1.1	Process Building Conventional Facilities	Level 4
1.2	Process Building Special Equipment	Level 4
1.3	Uranium Processing Facilities	Level 4
1.4	Plant Support Facilities	Level 3
1.5	Project Integration	Level 3

2.3. WORK BREAKDOWN STRUCTURE--GREENFIELD SITE

The Greenfield Site work breakdown structure also is structured around the work breakdown structure framework used for the initial increment of Production Plant. The Greenfield Site encompasses those work breakdown structure elements impacted by the fully activated plant supplement plus the additional infrastructure process support facilities that would be required to duplicate those facilities currently available at the Oak Ridge Gaseous Diffusion Plant site. Figure 2-8 identifies the scope and capital cost impacted elements affected by the fully activated plant supplement and provides itemized process support requirements necessary to locate the AVLIS Plant at a generic Greenfield Site. The extension of the Greenfield Site work breakdown structure to lower levels of details and the element number as shown on Fig. 2-8 is as follows:

1.0	AVLIS Production Plant	Level 1
1.1	Process Building Conventional Facilities	Level 4
1.2	Process Building Special Equipment	Level 4
1.3	Uranium Processing Facilities	Level 4
1.4	Plant Support Facilities	Level 3
1.5	Project Integration	Level 3

1

3. WORK BREAKDOWN STRUCTURE DICTIONARY--PART I INDEX

The Part I Index portion of the work breakdown structure Dictionary provides a drawing tree setback listing of the work breakdown structure elements by an indented level. It specifies the various subdivisions of the contracted work effort. The index has a line number for each element that is numbered consecutively starting with number 1 denoting the AVLIS Production Plant.

During the conceptual phase, the index is completed up through the contractor work breakdown structure code column. After authorization of Title I design, the index is expanded to include the budget and reporting classification, phase of project such as research, construction, operation, or production, and controlled by the dictionary sheet revision column, which could include the revision date of the Element Definition, Part II, page for the element, system design description number, configuration item number, or statement of work number.

The work breakdown structure Dictionary Index for the AVLIS Production Plant initial increment of production scenario is on an addendum to this section. The level of detail of the work breakdown structure that has been extended to a lower level of detail is as follows:

AVLIS Production Plant	Level 1
Process Building Special Equipment	Level 4
Process Building Special Equipment	Composite
-- Laser Systems	Level 6
-- Separator System	Level 6
-- Plant Control Data Acquisition System	Level 4
-- Process Electrical System	Level 4
-- Process Support	Level 4
Uranium Processing Facilities	Level 4
Plant Support Facilities	Level 3
Project Integration	Level 3

Addendum A is the AVLIS Production Plant work breakdown structure Dictionary--Part I--Index.

4. WORK BREAKDOWN STRUCTURE DICTIONARY--PART II ELEMENT DEFINITION

The Part II Element Definition provides a description of all the elements contained in the Index and their relationship to design and funding documents. The element definition portion of the work breakdown structure Dictionary facilitates the preparation of the the capital cost estimate and aids in ensuring that all work efforts and costs are identified and accumulated to the proper contract work breakdown structure element. The element definition is divided into three basic descriptions; cost content, technical content, and work statement.

The cost content describes the organizational entities and/or elements charged to the work breakdown structure element, e.g., engineering, procurement, construction, and contingency. The technical content section describes systems, subsystems, engineering disciplines, equipment, and components with reference to the Conceptual Design Report where the design descriptions are summarized. The work statement describes the functional activity or service necessary to accomplish the work objectives of the work breakdown structure element, e.g., designing, procuring, fabricating, constructing, integrating, testing, and operations.

The work breakdown structure Dictionary element definition for the AVLIS Production Plant initial increment of production scenario is on an addendum to this section. The level of detail of this work breakdown structure that has been extended to a lower level of detail is as follows:

AVLIS Production Plant	Level 1
Process Building Conventional Facilities	Level 3
Process Building Special Equipment	Composite
-- Laser Systems	Level 5
-- Separator System	Level 5
-- Plant Control Data Acquisition System	Level 3
-- Process Electrical System	Level 3
-- Process Support	Level 3
Uranium Processing Facilities	Level 3
Plant Support Facilities	Level 3
Project Integration	Level 3

Addendum B contains the element definition sheets for the Part I Index elements.

5. WORK BREAKDOWN STRUCTURE DICTIONARY--FUNCTIONAL REQUIREMENTS

The work breakdown structure Dictionary, Part II, Element Definition has been amplified to include a composite of the work breakdown structure element functional description, design concept and/or interfaces. The level of detail for the work breakdown structure elements functional requirements is as follows:

Level 1 AVLIS Production Plant

Level 3 Process Building Conventional Facilities
 Process Building Special Equipment
 Uranium Process Facilities
 Plant Support Facilities

Addendum C (to be published) contains the functional requirements for those level 3 elements listed above. Appropriate reference to the backup design document, where supplemental functional requirements are established for the various work breakdown structure elements, are included in the element definition.

ADDENDUM A

WORK BREAKDOWN STRUCTURE DICTIONARY - PART I - INDEX

Page 1 of 20

WORK BREAKDOWN STRUCTURE DICTIONARY PART I - INDEX											PROJECT/CONTRACTOR AVLIS Production Plant		CONTRACT NO.	DATE 9/7/84
LINE NO.	WBS ELEMENTS									TITLE	CONTRACTOR WBS CODE	BUDGET AND REPORTING CLASSIFICATION	PHASE	DICTIONARY SHEET REVISION #
	INDENTURE LEVEL													
	1	2	3	4	5	6	7	8	9					
1	X									AVLIS PROD. PLANT	1.0			
2		X								PROCESS BLDG. CONV. FACILI- TIES	1.1			
3			X							IMPROVEMENT TO LAND	1.1.1			
4				X						DEMOLITION	1.1.1.1			
5				X						CLEARING/ GRADING	1.1.1.2			
6				X						RELOCATING STRUCTURES/ UTILITIES	1.1.1.3			
7				X						ROADS/PARKING/ RAIL	1.1.1.4			
8				X						LANDSCAPE	1.1.1.5			
9				X						DYKE & FLOOD CONTROL	1.1.1.6			
10			X							OUTSIDE UTILITIES	1.1.2			
11				X						STEAM & CONDENSATE	1.1.2.1			
12				X						FIRE PROTEC- TION WATER	1.1.2.2			
13				X						POTABLE WATER	1.1.2.3			
14				X						STORM DRAIN	1.1.2.4			
15				X						SANITARY	1.1.2.5			
16				X						COOLING TOWER WATER	1.1.2.6			

WORK BREAKDOWN STRUCTURE DICTIONARY - PART I - INDEX

Page 2 of 20

WORK BREAKDOWN STRUCTURE DICTIONARY PART I - INDEX										PROJECT/CONTRACTOR AVLIS Production Plant		CONTRACT NO.	DATE 9/7/84
LINE NO.	WBS ELEMENTS									CONTRACTOR WBS CODE	BUDGET AND REPORTING CLASSIFICATION	PHASE	DICTIONARY SHEET REVISION #
	INDENTURE LEVEL												
	1	2	3	4	5	6	7	8	9				
17				X						COOLING WATER	1.1.2.7		
18				X						PROCESS CHILLED WATER	1.1.2.8		
19				X						PRIMARY PWR. SYS./SWITCH- YARD	1.1.2.9		
20				X						POWER TRANSFORMERS	1.1.2.10		
21				X						SECONDARY PWR. SYS.	1.1.2.11		
22				X						ELECTRICAL BLDG. TIES	1.1.2.12		
23				X						OTHERS	1.1.2.13		
24			X							BUILDING	1.1.3		
25			X							STRUCTURE	1.1.3.1		
26			X							HVAC	1.1.3.2		
27			X							FIRE PROTEC- TION/DETEC- TION	1.1.3.3		
28			X							PWR.-CONV. LOADS & OUT- LETS	1.1.3.4		
29			X							GROUNDING/ LIGHTNING PROTECTION	1.1.3.5		
30			X							LIGHTING	1.1.3.6		
31			X							PLUMBING	1.1.3.7		
32			X							DRAINS	1.1.3.8		
33													

WORK BREAKDOWN STRUCTURE DICTIONARY - PART I - INDEX

Page 3 of 20

WORK BREAKDOWN STRUCTURE DICTIONARY PART I - INDEX										PROJECT/CONTRACTOR AVLIS Production Plant		CONTRACT NO.	DATE 9/7/84
LINE NO.	WBS ELEMENTS									CONTRACTOR WBS CODE	BUDGET AND REPORTING CLASSIFICATION	PHASE	DICTIONARY SHEET REVISION #
	INDENTURE LEVEL												
	1	2	3	4	5	6	7	8	9				
33				X						MATERIAL HANDLING	1.1.3.9		
34				X						SAFETY	1.1.3.10		
35				X						COMMUNICATION	1.1.3.11		
36				X						SECURITY	1.1.3.12		
37		X								OTHER STRUCTURES	1.1.4		
38				X						SEPARATOR MECH. BLDG.	1.1.4.1		
39				X						LASER MECH. BLDG.	1.1.4.2		
40				X						DYE LASER PUMP HOUSE	1.1.4.3		
41				X						XFMR PADS	1.1.4.4		
42				X						CENTRAL CONTROL PADS	1.1.4.5		
43				X						COOLING TOWER	1.1.4.6		
44				X						COOLING TOWER PUMPHOUSE	1.1.4.7		
45				X						HOLDING POND	1.1.4.8		
46				X						DIESEL GEN. BLDG.	1.1.4.9		
47	X									PROCESS BLDG. SPECIAL EQUIPMENT	1.2		

WORK BREAKDOWN STRUCTURE DICTIONARY - PART I - INDEX

Page 4 of 20

WORK BREAKDOWN STRUCTURE DICTIONARY PART I - INDEX										PROJECT/CONTRACTOR AVLIS Production Plant	CONTRACT NO.	DATE 9/7/84	
LINE NO.	WBS ELEMENTS									CONTRACTOR WBS CODE	BUDGET AND REPORTING CLASSIFICATION	PHASE	DICTIONARY SHEET REVISION #
	INDENTURE LEVEL												
	1	2	3	4	5	6	7	8	9				
48			X							LASER SYSTEMS	1.2.1		
49				X						COPPER LASER SYSTEMS	1.2.1.1		
50					X					COPPER LASER OSCILLATOR	1.2.1.1.1		
51						X				HEAD MECH.	1.2.1.1.1.1		
52						X				HEAD OPTICS	1.2.1.1.1.2		
53						X				ENCL. MECH.	1.2.1.1.1.3		
54						X				ENCL. ELEC.	1.2.1.1.1.4		
55						X				ENCL. OPTICS	1.2.1.1.1.5		
56						X				PULSED PWR. ELECTRONICS MECH.	1.2.1.1.1.6		
57						X				PULSED PWR. ELECTRONICS ELEC.	1.2.1.1.1.7		
58						X				GAS/VAC SYS. MECH.	1.2.1.1.1.8		
59						X				GAS/VAC SYS. ELEC.	1.2.1.1.1.9		
60					X					COPPER LASER AMPLIFIER	1.2.1.1.2		
61						X				HEADS MECH.	1.2.1.1.2.1		
62						X				HEADS OPTICS	1.2.1.1.2.2		

35

WORK BREAKDOWN STRUCTURE DICTIONARY - PART I - INDEX

Page 5 of 20

Page 3 of 1

WORK BREAKDOWN STRUCTURE DICTIONARY PART I - INDEX										PROJECT/CONTRACTOR AVLIS Production Plant		CONTRACT NO.	DATE 9/7/84
LINE NO.	WBS ELEMENTS									CONTRACTOR WBS CODE	BUDGET AND REPORTING CLASSIFICATION	PHASE	DICTIONARY SHEET REVISION #
	INDENTURE LEVEL												
	1	2	3	4	5	6	7	8	9				
63						X				ENCL. MECH.	1.2.1.1.2.3		
64						X				ENCL. ELEC.	1.2.1.1.2.4		
65						X				PULSED PWR. ELECTRONICS MECH.	1.2.1.1.2.5		
66						X				PULSED PWR. ELECTRONICS ELEC.	1.2.1.1.2.6		
67						X				GAS/VAC SYS. MECH.	1.2.1.1.2.7		
68						X				GAS/VAC. SYS. ELEC.	1.2.1.1.2.8		
69					X					HERRIOTT CELL	1.2.1.1.3		
70						X				OPTICS	1.2.1.1.3.1		
71						X				CELL MECH.	1.2.1.1.3.2		
72						X				TABLE	1.2.1.1.3.3		
73			X							DYE LASERS	1.2.1.2		
74				X						DYE WAVE FORM GENERATOR	1.2.1.2.1		
75					X					DYE MASTER OSCILLATOR MECH.	1.2.1.2.1.1		
76						X				DYE MASTER OSCILLATOR ELEC.	1.2.1.2.1.2		
77						X				DYE MASTER OSCILLATOR OPTICS	1.2.1.2.1.2		

36

WORK BREAKDOWN STRUCTURE DICTIONARY - PART I - INDEX

Page 6 of 20

WORK BREAKDOWN STRUCTURE DICTIONARY PART I - INDEX										PROJECT/CONTRACTOR AVLIS Production Plant		CONTRACT NO.		DATE 9/7/84	
LINE NO.	WBS ELEMENTS									CONTRACTOR WBS CODE	BUDGET AND REPORTING CLASSIFICATION	PHASE	DICTIONARY SHEET REVISION #		
	INDENTURE LEVEL														
	1	2	3	4	5	6	7	8	9						
78						X				ELEC. OPTICS DEVICES & AS- TIGMATI SM CORREL FOR SLIT	1.2.1.2.1.4				
79						X				DYE MASTER OSCILLATOR PUMP LOOPS	1.2.1.2.1.5				
80						X				KINEMATIC MOUNT	1.2.1.2.1.6				
81					X					WAVE LENGTH ACQ. & STAB.	1.2.1.2.2				
82						X				MECH. STRUC- TURE	1.2.1.2.2.1				
83						X				OPTICAL	1.2.1.2.2.2				
84						X				ELECTRONICS	1.2.1.2.2.3				
85					X					AMPLIFIER CHAIN COMP.	1.2.1.2.3				
86						X				AMPLIFIERS	1.2.1.2.3.1				
87						X				TELESCOPES	1.2.1.2.3.2				
88						X				AMPLIFIER PUMP LOOPS	1.2.1.2.3.3				
89					X					DYES	1.2.1.2.4				
90						X				R6G	1.2.1.2.4.1				
91						X				R4	1.2.1.2.4.2				
92						X				R6	1.2.1.2.4.3				

37

WORK BREAKDOWN STRUCTURE DICTIONARY - PART I - INDEX

Page 7 of 20

Page 7 of 2

WORK BREAKDOWN STRUCTURE DICTIONARY PART I - INDEX										PROJECT/CONTRACTOR AVLIS Production Plant		CONTRACT NO.	DATE 9/7/84	
LINE NO.	WBS ELEMENTS									TITLE	CONTRACTOR WBS CODE	BUDGET AND REPORTING CLASSIFICATION	PHASE	DICTIONARY SHEET REVISION #
	INDENTURE LEVEL													
	1	2	3	4	5	6	7	8	9					
93						X				FLUORESCENCE SPECTRO.	1.2.1.2.4.4			
94						X				DYE SOLVENT	1.2.1.2.4.5			
95				X						OPTICAL SYSTEMS	1.2.1.3			
96					X					COPPER LASER COMBINER/ TRANSPORT	1.2.1.3.1			
97						X				OSCILLATOR COMBINER	1.2.1.3.1.1			
98						X				OSCILLATOR TRANSPORT	1.2.1.3.1.2			
99						X				AMPLIFIER COMBINER	1.2.1.3.1.3			
100						X				AMPLIFIER TRANSPORT	1.2.1.3.1.4			
101						X				AMPLIFIER DISTRIBUTION	1.2.1.3.1.5			
102					X					DYE COMBINER TRANSPORT	1.2.1.3.2			
103						X				DYE COMBINER	1.2.1.3.2.1			
104						X				DYE TRANSPORT	1.2.1.3.2.2			
105						X				DYE LASER WAVEFORM CORRECTION SYSTEM	1.2.1.3.2.3			
106					X					CHAMBER OPTICS	1.2.1.3.3			

38

WORK BREAKDOWN STRUCTURE DICTIONARY - PART I - INDEX

Page 8 of 20

WORK BREAKDOWN STRUCTURE DICTIONARY PART I - INDEX										PROJECT/CONTRACTOR AVLIS Production Plant		CONTRACT NO.	DATE 9/7/84
LINE NO.	WBS ELEMENTS									CONTRACTOR WBS CODE	BUDGET AND REPORTING CLASSIFICATION	PHASE	DICTIONARY SHEET REVISION #
	INDENTURE LEVEL												
	1	2	3	4	5	6	7	8	9				
107						X				CHAMBER OPTICS MECH.	1.2.1.3.3.1		
108							X			CHAMBER OPTICS-OPTICS	1.2.1.3.3.2		
109					X					ALIGNMENT SYS.	1.2.1.3.4		
110				X						INSTR.&CONTRL	1.2.1.4		
111					X					BEAM DIAGNOS.	1.2.1.4.1		
112						X				COPPER LASER DIAGNOSTICS	1.2.1.4.1.1		
113							X			DYE DIAGNOS.	1.2.1.4.1.2		
114							X			LINE-OF-SIGHT DIAGNOSTICS	1.2.1.4.1.3		
115							X			BEAM FORMATT- ING OPTICS DIAGNOSTICS	1.2.1.4.1.4		
116							X			CHAMBER OPTIC DIAGNOSTICS	1.2.1.4.1.5		
117					X					POINTING & CENTERING ELECTRONICS	1.2.1.4.2		
118						X				COPPER LASER EQUIPMENT	1.2.1.4.2.1		
119						X				LINE-OF-SIGHT EQUIPMENT	1.2.1.4.2.2		
120						X				BEAM FORMATT- ING OPTICS EQUIPMENT	1.2.1.4.2.3		
121						X				CHAMBER OPTICS EQUIP.	1.2.1.4.2.4		
122						X				DYE LASER EQUIPMENT	1.2.1.4.2.5		

WORK BREAKDOWN STRUCTURE DICTIONARY - PART I - INDEX

Page 9 of 20

WORK BREAKDOWN STRUCTURE DICTIONARY PART I - INDEX										PROJECT/CONTRACTOR AVLIS Production Plant		CONTRACT NO.	DATE 9/7/84
LINE NO.	WBS ELEMENTS									CONTRACTOR WBS CODE	BUDGET AND REPORTING CLASSIFICATION	PHASE	DICTIONARY SHEET REVISION #
	INDENTURE LEVEL												
	1	2	3	4	5	6	7	8	9				
123					X					MASTER TIMING SYS.	1.2.1.4.3		
124						X				TIMING SYS.	1.2.1.4.3.1		
125					X					COMPUTER MAIN FRAME & PERI- PHERALS	1.2.1.4.4		
126						X				VAX EQUIPMENT	1.2.1.4.4.1		
127						X				OCTOPORT EQUIPMENT	1.2.1.4.4.2		
128						X				PWR.DIST.SYS.	1.2.1.4.4.3		
129						X				RAM DISP.SYS.	1.2.1.4.4.4		
130						X				INVENTORY CONTROL HARD- WARE	1.2.1.4.4.5		
131						X				DEC. LAY PROD. LIC.	1.2.1.4.4.6		
132						X				INVEN. MNGMNT SOFTWARE	1.2.1.4.4.7		
133						X				TOOLS	1.2.1.4.4.8		
134						X				CORE SYSTEM DESIGN CON.	1.2.1.4.4.9		
135						X				ADV.MMF CON.	1.2.1.4.4.10		
136						X				COMM.SYS. INTERGRATION	1.2.1.4.4.11		
137						X				CONT. MAINT. & OPERATIONS	1.2.1.4.4.12		
138						X				RAM SYS. INTERGRATION	1.2.1.4.4.13		

40

WORK BREAKDOWN STRUCTURE DICTIONARY - PART I - INDEX

Page 10 of 20

WORK BREAKDOWN STRUCTURE DICTIONARY PART I - INDEX										PROJECT/CONTRACTOR AVLIS Production Plant		CONTRACT NO.	DATE 9/7/84
LINE NO.	WBS ELEMENTS									CONTRACTOR WBS CODE	BUDGET AND REPORTING CLASSIFICATION	PHASE	DICTIONARY SHEET REVISION #
	INDENTURE LEVEL												
	1	2	3	4	5	6	7	8	9				
139					X					COMM. SYSTEM	1.2.1.4.5		
140						X				ETHERNET INTERNALS & EQUIPMENT	1.2.1.4.5.1		
141						X				TERMINALS	1.2.1.4.5.2		
142						X				TERMINAL SVC.	1.2.1.4.5.3		
143						X				PORT SELEC- TOR	1.2.1.4.5.4		
144						X				VOICE/VIDEO COMM.	1.2.1.4.5.5		
145						X				NETWORK DIAGNOSTICS	1.2.1.4.5.6		
146					X					REAL TIME CONTROLS	1.2.1.4.6		
147						X				DYE FLOW CONTROLS	1.2.1.4.6.1		
148						X				EMBEDDED COPPER LASER CONTROL	1.2.1.4.6.2		
149						X				POINTING & CENTERING CONTROLLER	1.2.1.4.6.3		
150					X					FAC./INTER./ SAFETY	1.2.1.4.7		
151						X				COMP./DATA FAC(PE)	1.2.1.4.7.1		
152						X				LASER LOC. CONT. FAC (PE)	1.2.1.4.7.2		
153						X				CABLE	1.2.1.4.7.3		

41

WORK BREAKDOWN STRUCTURE DICTIONARY - PART I - INDEX

Page 11 of 20

WORK BREAKDOWN STRUCTURE DICTIONARY PART I - INDEX										PROJECT/CONTRACTOR AVLIS Production Plant		CONTRACT NO.	DATE 9/7/84
LINE NO.	WBS ELEMENTS									CONTRACTOR WBS CODE	BUDGET AND REPORTING CLASSIFICATION	PHASE	DICTIONARY SHEET REVISION #
	INDENTURE LEVEL												
	1	2	3	4	5	6	7	8	9				
154						X				RASKS/TERM. SIG. GEAR	1.2.1.4.7.4		
155						X				CENTRAL CONTROL RM. (PE)	1.2.1.4.7.5		
156						X				CENTRAL CONTROL RM. CONSOLE	1.2.1.4.7.6		
157				X						REFURB./TEST	1.2.1.5		
158					X					COPPER LASER REFURBISHMENT	1.2.1.5.1		
159						X				LASER WORK STA. MECH.	1.2.1.5.1.1		
160						X				LASER WORK STA. ELEC.	1.2.1.5.1.2		
161						X				SWITCHING PWR. SUPPLY TEST STANDS	1.2.1.5.1.3		
162						X				PULSED PWR. TEST STANDS	1.2.1.5.1.4		
163						X				DRY ROOM EQUIPMENT	1.2.1.5.1.5		
164					X					OPTICS/DYE REFURB. EQUIP.	1.2.1.5.2		
165						X				OPTICS CLEAN- ING & CLEAN ROOM	1.2.1.5.2.1		
166						X				MECH. REFURB. & CLEANING	1.2.1.5.2.2		
167						X				OPTICAL COMP. INSP. & TEST	1.2.1.5.2.3		

42

WORK BREAKDOWN STRUCTURE DICTIONARY - PART I - INDEX

Page 12 of 20

WORK BREAKDOWN STRUCTURE DICTIONARY PART I - INDEX										PROJECT/CONTRACTOR AVLIS Production Plant		CONTRACT NO.	DATE 9/7/84
LINE NO.	WBS ELEMENTS									CONTRACTOR WBS CODE	BUDGET AND REPORTING CLASSIFICATION	PHASE	DICTIONARY SHEET REVISION #
	INDENTURE LEVEL												
	1	2	3	4	5	6	7	8	9				
168						X				MECH. COMP. INSP. & TEST	1.2.1.5.2.4		
169						X				OPTICAL ASSY. EQUIPMENT	1.2.1.5.2.5		
170						X				DYE MO/AMP. ASSY. EQUIP.	1.2.1.5.2.6		
171						X				COMP. ALIGN. EQUIPMENT	1.2.1.5.2.7		
172						X				OPTICAL SYS. TEST & ALIGN.	1.2.1.5.2.8		
173						X				STORAGE & MAT'L CONTROL	1.2.1.5.2.9		
174					X					TEST/QA EQUIP	1.2.1.5.3		
175					X					I&C - REFURB/ TEST	1.2.1.5.4		
176			X							SEPARATOR SYS.	1.2.2		
177				X						POD SYS.	1.2.2.1		
178					X					VAPORIZER SUBSYSTEM	1.2.2.1.1		
179						X				E-BEAM SYS.	1.2.2.1.1.1		
180						X				CRUCIBLE MELT EAM DUMP SYS	1.2.2.1.1.2		
181						X				FEED/REFLEX DIST. SYS.	1.2.2.1.1.3		
182						X				VAPORIZER I&C FRONT ENDS	1.2.2.1.1.4		
183					X					CARRIAGE ASSY	1.2.2.1.2		
184						X				FRAME ASSY.	1.2.2.1.2.1		

43

WORK BREAKDOWN STRUCTURE DICTIONARY - PART I - INDEX

Page 13 of 20

WORK BREAKDOWN STRUCTURE DICTIONARY PART I - INDEX										PROJECT/CONTRACTOR AVLIS Production Plant		CONTRACT NO.	DATE 9/7/84
LINE NO.	WBS ELEMENTS									CONTRACTOR WBS CODE	BUDGET AND REPORTING CLASSIFICATION	PHASE	DICTIONARY SHEET REVISION #
	INDENTURE LEVEL												
	1	2	3	4	5	6	7	8	9				
185						X				UMBILICAL BELLOW SEALS	1.2.2.1.2.2		
186						X				UTILITY DIST. MANIFOLDS	1.2.2.1.2.3		
187					X					EXTRACTOR COLLECTOR/SYS	1.2.2.1.3		
188						X				ENCLOSURE ASSY.	1.2.2.1.3.1		
189						X				ION EXTRACTOR	1.2.2.1.3.2		
190						X				WITHDRAWAL SYS.	1.2.2.1.3.3		
191						X				ALIGNMENT SYS	1.2.2.1.3.4		
192						X				THERMAL SYS.	1.2.2.1.3.5		
193						X				EXT./COLL. I&C FRONT END	1.2.2.1.3.6		
194				X						SEPARATOR LOCAL CONTROL SYSTEM	1.2.2.2		
195					X					MODULE SUPER- VISORY CONTROL	1.2.2.2.1		
196						X				HARDWARE	1.2.2.2.1.1		
197						X				SOFTWARE	1.2.2.2.1.2		
198			X							MODULE SYSTEM	1.2.2.3		
199					X					VACUUM SYSTEM	1.2.2.3.1		
200						X				PROCESS VESSEL	1.2.2.3.1.1		

44

WORK BREAKDOWN STRUCTURE DICTIONARY -- PART I -- INDEX

Page 14 of 20

Page 14 of 20

WORK BREAKDOWN STRUCTURE DICTIONARY PART I - INDEX										PROJECT/CONTRACTOR AVLIC Production Plant		CONTRACT NO.	DATE 9/7/84
LINE NO.	WBS ELEMENTS									CONTRACTOR WBS CODE	BUDGET AND REPORTING CLASSIFICATION	PHASE	DICTIONARY SHEET REVISION #
	INDENTURE LEVEL												
	1	2	3	4	5	6	7	8	9				
201						X				PARTITION PANELS	1.2.2.3.1.2		
202						X				RAIL SYSTEM	1.2.2.3.1.3		
203						X				MAG. FIELD COILS	1.2.2.3.1.4		
204						X				PERSONNEL PLATFORMS	1.2.2.3.1.5		
205					X					COOLING SYS.	1.2.2.3.2		
206						X				DRAIN SYSTEM	1.2.2.3.2.1		
207						X				COOLING I&C FRONT END	1.2.2.3.2.2		
208					X					VACUUM SYSTEM	1.2.2.3.3		
209						X				MECH. PUMPS	1.2.2.3.3.1		
210						X				VACUUM I&C FRONT END	1.2.2.3.3.2		
211						X				HI VACUUM PUMPS	1.2.2.3.3.3		
212						X				COLD TRAPS	1.2.2.3.3.4		
213						X				VACUUM MONITOR	1.2.2.3.3.5		
214					X					AIR HNDL'G. SYSTEM	1.2.2.3.4		
215						X				FAN/FILTER UNITS	1.2.2.3.4.1		
216						X				DUCT WORK	1.2.2.3.4.2		

45

WORK BREAKDOWN STRUCTURE DICTIONARY - PART I - INDEX

Page 15 of 20

Page 15 of 20

WORK BREAKDOWN STRUCTURE DICTIONARY PART I - INDEX										PROJECT/CONTRACTOR AVLIS Production Plant	CONTRACT NO.	DATE 3/7/84	
LINE NO.	WBS ELEMENTS									CONTRACTOR WBS CODE	BUDGET AND REPORTING CLASSIFICATION	PHASE	DICTIONARY SHEET REVISION #
	INDENTURE LEVEL												
	1	2	3	4	5	6	7	8	9				
217				X						REFURB./TEST	1.2.2.4		
218					X					SEPARATOR MAIN BAY EQUIPMENT	1.2.2.4.1		
219						X				HANDLING/ TRANSPORT	1.2.2.4.1.1		
220					X					REFURB. EQUIP	1.2.2.4.2		
221						X				POD TRANSPOR- TER	1.2.2.4.2.1		
222						X				DISASSY. & STRIPPING	1.2.2.4.2.2		
223						X				COATING EQUIP	1.2.2.4.2.3		
224						X				ASSY. & INSP.	1.2.2.4.2.4		
225						X				ELEC. COMP. REFURB.	1.2.2.4.2.5		
226						X				MECH. COMP. REFURB.	1.2.2.4.2.6		
227						X				AIR HANDLING SYSTEM	1.2.2.4.2.7		
228				X						TEST/QA EQUIP.	1.2.2.4.3		
229					X					TOOLING	1.2.2.4.3.1		
230					X					TEST EQUIPMNT.	1.2.2.4.3.2		
231				X						T&C REFURB. & TEST AREA	1.2.2.4.4		

46

WORK BREAKDOWN STRUCTURE DICTIONARY - PART I - INDEX

Page 16 of 20

WORK BREAKDOWN STRUCTURE DICTIONARY PART I - INDEX										PROJECT/CONTRACTOR AVLIS Production Plant		CONTRACT NO.	DATE 9/7/84
LINE NO.	WBS ELEMENTS									CONTRACTOR WBS CODE	BUDGET AND REPORTING CLASSIFICATION	PHASE	DICTIONARY SHEET REVISION #
	INDENTURE LEVEL												
	1	2	3	4	5	6	7	8	9				
232			X							PLANT CONTROL DATA ACQUISITION SYSTEM	1.2.3		
233				X						HARDWARE	1.2.3.1		
234				X						SOFTWARE	1.2.3.2		
235			X							PROCESS ELEC. SYSTEMS	1.2.4		
236				X						ELEC. PWR. SYSTEM	1.2.4.1		
237				X						STANDBY PWR. SUPPLY	1.2.4.2		
238				X						120 VAC INST. INST. (CLEAN)	1.2.4.3		
239				X						UNINTERRUPTABLE PWR. SUPPLY	1.2.4.4		
240				X						DC SYSTEMS	1.2.4.5		
241			X							PROCESS SUPPORT	1.2.5		
242				X						ELEC. DIST. SYSTEM	1.2.5.1		
243				X						COOLING WATER	1.2.5.2		
244				X						VACUUM SYS.	1.2.5.3		
245				X						AIR/GAS SYS.	1.2.5.4		
246				X						WASTE SYSTEM	1.2.5.5		
247				X						URANIUM HANDLING	1.2.5.6		

WORK BREAKDOWN STRUCTURE DICTIONARY - PART I - INDEX

Page 17 of 20

WORK BREAKDOWN STRUCTURE DICTIONARY PART I - INDEX										PROJECT/CONTRACTOR AVLIS Production Plant		CONTRACT NO.	DATE 9/7/84
LINE NO.	WBS ELEMENTS									CONTRACTOR WBS CODE	BUDGET AND REPORTING CLASSIFICATION	PHASE	DICTIONARY SHEET REVISION #
	INDENTURE LEVEL												
	1	2	3	4	5	6	7	8	9				
248		X								URANIUM PRO- CESSING FA- CILITIES	1.3		
249			X							FEED CONVER- SION	1.3.1		
250				X						UF ₄ PRODUC- TION	1.2.1.1		
251				X						DERBY PRODUC- TION	1.3.1.2		
252				X						DERBY CLEAN- ING	1.3.1.3		
253				X						SLAG PROCESS- ING	1.3.1.4		
254				X						HF RECOVERY	1.3.1.5		
255				X						H ₂ GENERATION	1.3.1.6		
256				X						MAGNESIUM STORAGE	1.3.1.7		
257				X						BUILD./SVCS.	1.3.1.8		
258			X							FEED PREPARA- TION	1.3.2		
259				X						CHARGE PREP.	1.3.2.1		
260				X						CRUCIBLE	1.3.2.2		
261				X						MELTING/CAST- ING	1.3.2.3		
262				X						BUILD./ SERVICES	1.3.2.4		

48

WORK BREAKDOWN STRUCTURE DICTIONARY - PART I - INDEX

Page 18 of 20

WORK BREAKDOWN STRUCTURE DICTIONARY PART I - INDEX										PROJECT/CONTRACTOR AVLIS Production Plant		CONTRACT NO.	DATE 9/7/84
LINE NO.	WBS ELEMENTS									CONTRACTOR WBS CODE	BUDGET AND REPORTING CLASSIFICATION	PHASE	DICTIONARY SHEET REVISION #
	INDENTURE LEVEL												
	1	2	3	4	5	6	7	8	9				
263			X							PRODUCT CON- VERSION	1.3.3		
264				X						SIZE REDUC- TION	1.3.3.1		
265				X						OXIDATION	1.3.3.2		
266				X						FLUORINATION	1.3.3.3		
267				X						PURIFICATION	1.3.3.4		
268				X						BLENDING	1.3.3.5		
269				X						BUILD./SVCS.	1.3.3.6		
270			X							URANIUM RE- COVERY	1.3.4		
271				X						SIZE REDUC- TION/OXIDATION	1.3.4.1		
272				X						FLUORINATION	1.3.4.2		
273				X						UF ₆ WITHDRAW- AL	1.3.4.3		
274				X						BUILD./SVCS.	1.3.4.4		
275			X							PROCESS SUPP.	1.3.5		
276				X						TOLL FACILITY	1.3.5.1		
277				X						UF ₆ FEED	1.3.5.2		
278				X						FLUORINE GENERATION	1.3.5.3		

49

WORK BREAKDOWN STRUCTURE DICTIONARY - PART I - INDEX

Page 19 of 20

WORK BREAKDOWN STRUCTURE DICTIONARY PART I - INDEX										PROJECT/CONTRACTOR AVLIS Production Plant		CONTRACT NO.		DATE 9/7/84	
LINE NO.	WBS ELEMENTS									CONTRACTOR WBS CODE	BUDGET AND REPORTING CLASSIFICATION	PHASE	DICTIONARY SHEET REVISION #		
	INDENTURE LEVEL														
	1	2	3	4	5	6	7	8	9						
279				X						TAILS MANAGE- MENT	1.3.5.4				
280				X						KF CONVERSION	1.3.5.5				
281				X						INTERFACING SERVICES	1.3.5.6				
282				X						OFFICE BUILD.	1.3.5.7				
283			X							WASTE MANAGE- MENT	1.3.6				
284				X						SHALLOW LAND BURIAL SITE	1.3.6.1				
285				X						INCINERATION	1.3.6.2				
286				X						CONCRETE FIX- ATION	1.3.6.3				
287				X						NEUTRALIZATION	1.3.6.4				
288				X						CLASSIFIED BURIAL	1.3.6.5				
289				X						DECONTAMINA- TION (K-1420)	1.3.6.6				
290				X						TRANSPORTA- TION	1.3.6.7				
291		X								PLANT SUPPORT FACILITIES	1.4				
292			X							GRAPHITE SHOP	1.4.1				
293			X							ADMIN. BLDG.	1.4.2				
294			X							PORTALS/SECUR- ITY	1.4.3				

50

WORK BREAKDOWN STRUCTURE DICTIONARY -- PART I -- INDEX

Page 20 of 20

Page 20 of 20

WORK BREAKDOWN STRUCTURE DICTIONARY PART I - INDEX										PROJECT/CONTRACTOR AVLIS Production Plant	CONTRACT NO.	DATE 9/7/84	
LINE NO.	WBS ELEMENTS									CONTRACTOR WBS CODE	BUDGET AND REPORTING CLASSIFICATION	PHASE	DICTIONARY SHEET REVISION #
	INDENTURE LEVEL												
	1	2	3	4	5	6	7	8	9				
295			X							MISC. OFFICE LAB. & SVC. BLDG. MODS.	1.4.4		
296			X							WAREHOUSES	1.4.5		
297		X								PROJECT INTEGRATION	1.5		
298			X							PROJECT MANAGEMENT	1.5.1		
299			X							TITLE III ENGR.	1.5.2		
300			X							A/E REVIEW	1.5.3		
301			X							STUDIES & CRITERIA	1.5.4		
302			X							TECHNICAL SUPPORT	1.5.5		
303			X							SYSTEMS ENG'R.	1.5.6		
304			X							ASSESSMENTS	1.5.7		
305			X							OTHER SUPPORT	1.5.8		

51

ADDENDUM B

WORK BREAKDOWN STRUCTURE DICTIONARY -- PART II -- ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY		WBS ELEMENT CODE: 1.0	
PART II -- ELEMENT DEFINITION		TITLE: AVLIS Production Plant	
CONTRACTOR: LLNL/MMES			
INDEX LINE NO.	REVISION NO. AND AUTHORIZATION	DATE	
1	0	8/9/84	
APPROVED CHANGES			
N/A			
SYSTEM DESIGN DESCRIPTION		FUNDING DOCUMENTS	
NUMBER 1.0		N/A	
TITLE AVLIS Production Plant			
ELEMENT TASK DESCRIPTION			
<p>COST CONTENT</p> <p>ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY</p>			
<p>TECHNICAL CONTENT</p> <ul style="list-style-type: none"> o Project management & control at top level o Facilities o Systems o Subsystems o Equipment o Includes prime architect engineers (AEs) and construction managers o Interface with Department of Energy (DOE) project office <p>Additional functional descriptions are available in volume 6 of the Design Report</p>			
<p>WORK STATEMENT</p> <p>PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.</p>			

WORK BREAKDOWN STRUCTURE DICTIONARY - PART II - ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II - ELEMENT DEFINITION		WBS ELEMENT CODE: 1.1 TITLE: Process Building Conventional Facilities CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 2	REVISION NO. AND AUTHORIZATION 0	DATE 8/9/84	
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.1 TITLE Process Building Conventional Facilities		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT <ul style="list-style-type: none"> o Site Surveying o Geological Studies o Civil Work o Land Improvements o Outside Utilities <ul style="list-style-type: none"> - Underground - Above ground o Building Structures o Building Utilities <p>Additional functional descriptions are available in volume 6 of the Design Report.</p> WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY - PART II - ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II - ELEMENT DEFINITION		WBS ELEMENT CODE: 1.1.1 TITLE: Improvement to Land CONTRACTOR: LLNL/MMES	
INDEX LINE NO. <p style="text-align: center;">3</p>	REVISION NO. AND AUTHORIZATION <p style="text-align: center;">0</p>		DATE <p style="text-align: center;">8/9/84</p>
APPROVED CHANGES <p style="text-align: center;">N/A</p>			
SYSTEM DESIGN DESCRIPTION NUMBER 1.1.1 TITLE Improvement to Land		FUNDING DOCUMENTS <p style="text-align: center;">N/A</p>	
ELEMENT TASK DESCRIPTION <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>COST CONTENT</p> <p>ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY</p> <p>TECHNICAL CONTENT</p> <ul style="list-style-type: none"> o Demolition o Excavation o Grading/Clearing o Access o Security Perimeter (Fences & Guard Towers) o Roads, Walks & Paved Area o Parking o Railroad o Dyke & Flood Control o Landscaping o Storm Sewers & Ditches o Pump & Dewater o Relocate Structures/Utilities </div> <div style="width: 45%;"> <p>Additional functional descriptions are available in volume 6 of the Design Report.</p> </div> </div> <p>WORK STATEMENT</p> <p>PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.</p>			

WORK BREAKDOWN STRUCTURE DICTIONARY - PART II - ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II - ELEMENT DEFINITION:		WBS ELEMENT CODE: 1.1.2 TITLE: Outside Utilities CONTRACTOR: LLNL/MMES													
INDEX LINE NO. 10	REVISION NO. AND AUTHORIZATION 0		DATE 8/9/84												
APPROVED CHANGES N/A															
SYSTEM DESIGN DESCRIPTION NUMBER 1.1.2 TITLE Outside Utilities		FUNDING DOCUMENTS N/A													
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT o Includes following utility systems out to approximately five (5) feet from process building and support structures: <table border="0"> <tr> <td>Steam & Condensate</td> <td>Sanitary</td> <td>Secondary Power</td> </tr> <tr> <td>Fire Protection Water</td> <td>Cooling Water</td> <td>Electrical Bldg. Ties</td> </tr> <tr> <td>Potable Water</td> <td>Process Chilled Water</td> <td>Diesel Fuel Oil</td> </tr> <tr> <td>Storm Drains</td> <td>Primary Power</td> <td>Compressed Air</td> </tr> </table> o Power Transformers o Primary Power Switchyard o Relocate Utilities Additional functional descriptions are available in volume 6 of the Design Report.				Steam & Condensate	Sanitary	Secondary Power	Fire Protection Water	Cooling Water	Electrical Bldg. Ties	Potable Water	Process Chilled Water	Diesel Fuel Oil	Storm Drains	Primary Power	Compressed Air
Steam & Condensate	Sanitary	Secondary Power													
Fire Protection Water	Cooling Water	Electrical Bldg. Ties													
Potable Water	Process Chilled Water	Diesel Fuel Oil													
Storm Drains	Primary Power	Compressed Air													
WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.															

WORK BREAKDOWN STRUCTURE DICTIONARY – PART II – ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II – ELEMENT DEFINITION		WBS ELEMENT CODE: 1.1.3 TITLE: Building (process) CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 24	REVISION NO. AND AUTHORIZATION 0		DATE 9/9/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.1.3 TITLE Building (process)		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <ul style="list-style-type: none"> o Excavations o Grade & Below Grade Slabs o Equipment Foundations o Structural Framing Systems o Superstructures o Walls & Partitions (incl'd firewalls) o Supports o Roofing, Eaves & Drains o HVAC/Filtration System o Elevators/Cranes/Monorails o Interior Finishes & Trims <p>Additional functional descriptions are available in volume 6 of the Design Report.</p> </div> <div style="width: 48%;"> <ul style="list-style-type: none"> o Stairs, Stairwells, Ramps, Ladders & Work Platforms o Utilities in Direct Burial Under The Facility to Approx. Five (5) Feet From Bldg. o Insulation o Dynamic Seismic Analysis of Structure o Grounding/Lightning Protection o Access Control/Security o Plumbing & Drains o Mechanical Installations </div> </div> <p>WORK STATEMENT</p> <p>PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.</p>			

WORK BREAKDOWN STRUCTURE DICTIONARY - PART II - ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II - ELEMENT DEFINITION		WBS ELEMENT CODE: 1.1.4 TITLE: Other Structures CONTRACTOR: LLNL/MMES			
INDEX LINE NO. 37	REVISION NO. AND AUTHORIZATION 0		DATE 8/9/84		
APPROVED CHANGES N/A					
SYSTEM DESIGN DESCRIPTION NUMBER 1.1.4 TITLE Other Structures		FUNDING DOCUMENTS N/A			
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT <table border="0"> <tr> <td> <ul style="list-style-type: none"> o Excavations o Grade Slabs o Equipment Foundations o Structural Framing Systems o Walls & Partitions o Roofing, Eaves & Drains o Interior Finishes & Trims o Plumbing & Drains o Utilities in direct burial to approx. five (5) feet outside of structures o Grounding/Lightning Protection </td> <td> <ul style="list-style-type: none"> o Cooling Tower o Holding Pond o HVAC o Liquid Effluents o Storm & Sanitary Sewers o Potable Water o Communication o Electrical o Utilities </td> </tr> </table> <p>Additional functional descriptions are available in volume 6 of the Design Report.</p> WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.				<ul style="list-style-type: none"> o Excavations o Grade Slabs o Equipment Foundations o Structural Framing Systems o Walls & Partitions o Roofing, Eaves & Drains o Interior Finishes & Trims o Plumbing & Drains o Utilities in direct burial to approx. five (5) feet outside of structures o Grounding/Lightning Protection 	<ul style="list-style-type: none"> o Cooling Tower o Holding Pond o HVAC o Liquid Effluents o Storm & Sanitary Sewers o Potable Water o Communication o Electrical o Utilities
<ul style="list-style-type: none"> o Excavations o Grade Slabs o Equipment Foundations o Structural Framing Systems o Walls & Partitions o Roofing, Eaves & Drains o Interior Finishes & Trims o Plumbing & Drains o Utilities in direct burial to approx. five (5) feet outside of structures o Grounding/Lightning Protection 	<ul style="list-style-type: none"> o Cooling Tower o Holding Pond o HVAC o Liquid Effluents o Storm & Sanitary Sewers o Potable Water o Communication o Electrical o Utilities 				

WORK BREAKDOWN STRUCTURE DICTIONARY - PART II - ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II - ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2 TITLE: Process Building Special Equipment CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 47	REVISION NO. AND AUTHORIZATION 0		DATE 8/9/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2 TITLE Process Bldg. Special Equip.		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT o Process Systems o Process Support o Subsystems o Equipment Additional functional descriptions for the various level 3 elements are available in volume 3, 4 and 6.			
WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY - PART II - ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II - ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.1 TITLE: Laser Systems CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 48	REVISION NO. AND AUTHORIZATION 0		E. TE 8/9/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.1 TITLE Laser Systems		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT o Mechanical Systems o Optical System o Electrical Systems o I & C Systems o Diagnostic Systems o Gas/Vacuum System o Electronics Additional functional descriptions are available in volume 3 of the Design Report. WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY — PART II — ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II — ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.1.1 TITLE: Copper Laser System CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 49	REVISION NO. AND AUTHORIZATION 0		DATE 9/9/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.1.1 TITLE Copper Laser System		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT o Mechanical System o Electrical System o Optical System o Electronic System o Gas/Vacuum System Additional functional descriptions are available in volume 3 of the Design Report. WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY -- PART II -- ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II -- ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.1.1.1 TITLE: Copper Laser Oscillator CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 50	REVISION NO. AND AUTHORIZATION 0		DATE 8/9/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.1.1.1 TITLE Copper Laser Oscillator		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT o Mechanical System o Optical System o Gas/Vacuum System o Electrical System o Electronic System o Interfaces Are: - Copper Laser Amplifier Optics - CVL Support Systems - CVL Power Systems Additional functional descriptions are available in volume 3 of the Design Report. WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY - PART II - ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II - ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.1.1.2 TITLE: Copper Laser Amplifier CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 60	REVISION NO. AND AUTHORIZATION 0		DATE 8/9/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.1.1.2 TITLE Copper Laser Amplifier		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT o Mechanical System o Optical System o Electrical System o Electronic System o Gas/Vacuum System o Interfaces Are: - Copper Laser Oscillator - CVL Support Systems - CVL Power Systems Additional functional descriptions are available in volume 3 of the Design Report. WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY -- PART II -- ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II -- ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.1.1.3 TITLE: Herriott Cell CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 69	REVISION NO. AND AUTHORIZATION 0		DATE 8/9/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.1.1.3 TITLE Herriott Cell		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT o Mechanical System o Optical System o Interfaces Are: - Copper Laser Amplifier - Copper Laser Oscillator - CVL Support - CVL Power Systems Additional functional descriptions are available in volume 3 of the Design Report. WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY - PART II - ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II - ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.1.2 TITLE: Dye Lasers CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 73	REVISION NO. AND AUTHORIZATION 0		DATE 8/9/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.1.2 TITLE Dye Lasers		FUNDING DOCUMENTS	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT o Mechanical Systems o Electrical Systems o Optical System o Electronic System o Interfaces Are: - CVL Support Structure - Dye Beam Transport - Beam Quality Diagnostics - Local Controls - Equipment Controllers - Electro-Optics Devices - Dye Laser Facilities Additional functional descriptions are available in volume 3 of the Design Report. WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY - PART II - ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II - ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.1.2.1 TITLE: Dye Wave Form Generator CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 74	REVISION NO. AND AUTHORIZATION 0		DATE 8/9/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.1.2.1 TITLE Dye Wave Form Generator		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT o Mechanical System o Electrical System o Optical System o Electro-Optical System Additional functional descriptions are available in volume 3 of the Design Report. WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY - PART II - ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II - ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.1.2.2 TITLE: Wave Length CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 81	REVISION NO. AND AUTHORIZATION 0		DATE 8/9/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.1.2.2 TITLE Wave Length Acquisition & Stability		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT o Mechanical System o Optical System o Electronic System Additional functional descriptions are available in volume 3 of the Design Report.			
WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY -- PART II -- ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II -- ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.1.2.3 TITLE: Amplifier Chain Component CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 85	REVISION NO. AND AUTHORIZATION 0		DATE 8/9/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.1.2.3 TITLE Amplifier Chain Component		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT o Mechanical System o Electrical System Additional functional descriptions are available in volume 3 of the Design Report.			
WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY -- PART II -- ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II -- ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.1.2.4 TITLE: Dyes CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 89	REVISION NO. AND AUTHORIZATION 0		DATE 8/9/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.1.2.4 TITLE Dyes		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION: COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT o Mechanical System Additional functional descriptions are available in volume 3 of the Design Report.			
WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY - PART II - ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II - ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.1.3 TITLE: Optical Systems CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 95	REVISION NO. AND AUTHORIZATION 0		DATE 8/9/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.1.3 TITLE Optical System		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT o Mechanical System o Optical System o Diagnostic System o Interfaces Are: ~ Dye Laser Systems ~ CVL Mechanical System ~ I & C Systems ~ Optical System Facilities Additional functional descriptions are available in volume 3 of the Design Report WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY - PART II - ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II - ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.1.3.1 TITLE: Copper Laser Combiner/Transport CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 96	REVISION NO. AND AUTHORIZATION 0	DATE 8/9/84	
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.1.3.1 TITLE Copper Laser Combiner/Transport		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT o Mechanical System o Optical System o I & C System o Power System o Electrical System Additional functional descriptions are available in volume 3 of the Design Report. WORK STATEMENT: PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY - PART II - ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II - ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.1.3.2 TITLE: Dye Combiner/Transport CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 102	REVISION NO. AND AUTHORIZATION 0		DATE 8/9/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.1.3.2 TITLE Dye Combiner/Transport		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT <ul style="list-style-type: none"> o Mechanical System o Electrical System o Optical System o I & C system o Power System <p>Additional functional descriptions are available in volume 3 of the Design Report.</p>			
WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY – PART II – ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY		WBS ELEMENT CODE: 1.2.1.3.3	
PART II — ELEMENT DEFINITION		TITLE: Chamber Optics CONTRACTOR: LLNL/MMES	
INDEX LINE NO.	REVISION NO. AND AUTHORIZATION	DATE	
106	0	8/9/84	
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.1.3.3 TITLE Chamber Optics		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT o Mechanical System o Optical System Additional functional descriptions are available in volume 3 of the Design Report.			
WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY — PART II — ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY		WBS ELEMENT CODE: 1.2.1.3.4	
PART II - ELEMENT DEFINITION		TITLE: Alignment System	
		CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 109	REVISION NO. AND AUTHORIZATION 0		DATE 8/9/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.1.3.4 TITLE Alignment System		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT o Mechanical System o Optical System Additional functional descriptions are available in volume 3 of the Design Report.			
WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PPE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY - PART II - ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II - ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.1.4 TITLE: Instrumentation & Controls CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 110	REVISION NO. AND AUTHORIZATION 0	DATE 8/9/84	
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.1.4 TITLE Instrumentation & Controls		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT o Diagnostics System o Electronics o Computer Hardware & Software o Communication Systems - Voice - Video o Interfaces Are: - Operational Components - Central Control Room Additional functional descriptions are available in volume 3 of the Design Report.			
WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY - PART II - ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II - ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.1.4.1 TITLE: Beam Diagnostics CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 111	REVISION NO. AND AUTHORIZATION 0		DATE 8/9/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.1.4.1 TITLE Beam Diagnostics		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT <ul style="list-style-type: none"> o Instrumentation & Controls o Electrical Equipment o Mechanical Equipment o Diagnostics <p>Additional functional descriptions are available in volume 3 of the Design Report.</p> WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY - PART II - ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II - ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.1.4.2 TITLE: Pointing & Centering Electronics CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 117	REVISION NO. AND AUTHORIZATION 0		DATE 8/9/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.1.4.2 TITLE P&C Electronics		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT o Electrical Equipment o Mechanical Equipment o Instrumentation & Controls Additional functional descriptions are available in volume 3 of the Design Report.			
WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY --PART II -- ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II -- ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.1.4.3 TITLE: Master Timing System CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 123	REVISION NO. AND AUTHORIZATION 0		DATE 8/9/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.1.4.3 TITLE Master Timing System		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT o Electrical Equipment o Mechanical o Instrumentation & Controls Additional functional descriptions are available in volume 3 of the Design Report.			
WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY - PART II - ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II - ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.1.4.4 TITLE: Computer Main Frame and Peripherals CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 125	REVISION NO. AND AUTHORIZATION 0		DATE 8/9/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.1.4.4 TITLE Computer Main Frame & Peripherals		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT o Instrumentation & Controls o Electrical o Electronic Equipment & Software o Mechanical Equipment Additional functional descriptions are available in volume 3 of the Design Report.			
WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY — PART II — ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II — ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.1.4.5 TITLE: Communication System CONTRACTOR: LLN/ MMES	
INDEX LINE NO. 139	REVISION NO. AND AUTHORIZATION 0		DATE 8/9/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.1.4.5 TITLE Communication System		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT o Instrumentation & Controls o Electrical Equipment o Voice/Video Systems Additional functional descriptions are available in volume 3 of the Design Report.			
WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY – PART II – ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II - ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.1.4.6 TITLE: Real Time Controls CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 146	REVISION NO. AND AUTHORIZATION 0		DATE 8/9/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.1.4.6 TITLE Real Time Controls		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT o Instrumentation & Controls o Electrical o Mechanical Equipment Additional functional descriptions are available in volume 3 of the Design Report.			
WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY — PART II — ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II — ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.1.4.7 TITLE: Fac./Inter./Safety CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 150	REVISION NO. AND AUTHORIZATION 0		DATE 8/9/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.1.4.7 TITLE Fac./Inter./Safety		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT <ul style="list-style-type: none"> o Instrumentation & Controls (consoles) o Electrical Equipment (racks, cabinets, cables) o Mechanical Equipment <p>Additional functional descriptions are available in volume 3 of the Design Report.</p> WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY - PART II - ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II - ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.1.5 TITLE: Refurbishment/Test CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 157	REVISION NO. AND AUTHORIZATION 0		DATE 8/9/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.1.5 TITLE Refurbishment/Test		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT o Mechanical Equipment o Electrical Equipment o CVL Refurb. Work Stations: - Test Stands - Dry Room & Equipment o Diagnostic Equipment o Interfaces Are: - Process Bldg. Utilities - Material Handling Equipment - HVAC System - I & C Systems Additional functional descriptions are available in volume 3 of the Design Report. WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY — PART II — ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II — ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.2 TITLE: Separator System CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 176	REVISION NO. AND AUTHORIZATION 0		DATE 8/10/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.2 TITLE Separator System		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT o Mechanical Systems o Optical System o Electrical Systems o I & C system o Diagnostics o Electronics - Hardware - Software Additional functional descriptions are available in volume 4 of the Design Report. WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY - PART II - ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II - ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.2.1 TITLE: Pod System CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 177	REVISION NO. AND AUTHORIZATION 0		DATE 8/10/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.2.1 TITLE Pod System		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT o Mechanical Assembly o Electrical Installation o I & C Installation o Cooling Water Components o Electronics Installation Additional functional descriptions are available in volume 4 of the Design Report.			
WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY — PART II — ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II — ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.2.1.1 TITLE: Vaporizer Subsystem CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 178	REVISION NO. AND AUTHORIZATION 0		DATE 8/10/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.2.1.1 TITLE Vaporizer Subsystem		FINDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT <ul style="list-style-type: none"> o Mechanical o I & C System with Interlocks o Electrical <ul style="list-style-type: none"> - Power System o Cooling Water Components o Electronics <ul style="list-style-type: none"> - Processors - Software - Hardware <p>Additional functional descriptions are available in volume 4 of the Design Report.</p> WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY — PART II — ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II — ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.2.1.2 TITLE: Carriage Assembly CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 183	REVISION NO. AND AUTHORIZATION 0		DATE 8/10/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.2.1.2 TITLE Carriage Assembly		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT <ul style="list-style-type: none"> o Mechanical Assembly o Utility Component Installation. <ul style="list-style-type: none"> - Umbilical Panels - Distribution Manifolds <p>Additional functional descriptions are available in volume 4 of the Design Report.</p> WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY - PART II - ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II - ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.2.1.3 TITLE: Extractory/Collector System CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 187	REVISION NO. AND AUTHORIZATION 0		DATE 8/10/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.2.1.3 TITLE Extractor/Collector System		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT <ul style="list-style-type: none"> o Mechanical o Electrical o I & C System o Electronics <p>Additional functional descriptions are available in volume 4 of the Design Report.</p> WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY - PART II - ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II - ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.2.2 TITLE: Separator Local Control System CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 194	REVISION NO. AND AUTHORIZATION 0		DATE 8/10/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.2.2 TITLE Separator Local Control System		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT <ul style="list-style-type: none">o Electrical System & Equipmento Electronics<ul style="list-style-type: none">- Hardware- Software <p>Additional functional descriptions are available in volume 4 of the Design Report.</p> WORK STATEMENT <p>PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.</p>			

WORK BREAKDOWN STRUCTURE DICTIONARY - PART II - ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II - ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.2.2.1 TITLE: Module Supervisory Control CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 195	REVISION NO. AND AUTHORIZATION 0		DATE 8/10/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.2.3 TITLE Module Supervisory Control		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT <ul style="list-style-type: none"> o Mechanical o Personnel Platforms o Electrical o I & C o Electronics o Vacuum System o Air Handling System <p>Additional functional descriptions are available in volume 4 of the Design Report.</p> WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY -- PART II -- ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY		WBS ELEMENT CODE: 1.2.2.3	
PART II - ELEMENT DEFINITION		TITLE: Module System	
		CONTRACTOR: LLNL/MMES	
INDEX LINE NO.	REVISION NO. AND AUTHORIZATION	DATE	
198	0	8/10/84	
APPROVED CHANGES			
N/A			
SYSTEM DESIGN DESCRIPTION		FUNDING DOCUMENTS	
NUMBER 1.2.2.3		N/A	
TITLE Module System			
ELEMENT TASK DESCRIPTION			
COST CONTENT			
ENGINEERING			
PROCUREMENT			
CONSTRUCTION			
CONTINGENCY			
TECHNICAL CONTENT			
o Mechanical Systems & Equipment			
o Instrumentation & Controls			
o Electrical Systems & Equipment			
o Service Systems			
Additional functional descriptions are available in volume 4 of the Design Report.			
WORK STATEMENT			
PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY – PART II – ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY		WBS ELEMENT CODE: 1.2.2.3.1	
PART II - ELEMENT DEFINITION		TITLE: Vacuum Tankage	
		CONTRACTOR: LLNL/MMES	
INDEX LINE NO.	REVISION NO. AND AUTHORIZATION	DATE	
199	0	8/10/84	
APPROVED CHANGES			
N/A			
SYSTEM DESIGN DESCRIPTION		FUNDING DOCUMENTS	
NUMBER 1.2.2.3.1		N/A	
TITLE Vacuum Tankage			
ELEMENT TASK DESCRIPTION			
COST CONTENT			
ENGINEERING			
PROCUREMENT			
CONSTRUCTION			
CONTINGENCY			
TECHNICAL CONTENT			
o Mechanical Systems and Equipment			
o Personnel Platforms			
o Electrical Equipment			
Additional functional descriptions are available in volume 4 of the Design Report.			
WORK STATEMENT			
<p>PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.</p>			

WORK BREAKDOWN STRUCTURE DICTIONARY — PART II — ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II — ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.2.3.2 TITLE: Cooling Systems CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 205	REVISION NO. AND AUTHORIZATION 0		DATE 8/10/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.2.3.2 TITLE Cooling Systems		FUNCTIONING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT o Mechanical o I&C System o Service systems Additional functional descriptions are available in volume 4 of the Design Report.			
WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY - PART II - ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II - ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.2.3.3 TITLE: Vacuum System CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 208	REVISION NO. AND AUTHORIZATION 0		DATE 8/10/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.2.3.3 TITLE Vacuum System		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT o Mechanical System & Equipment (including pumps) o I&C o Monitoring System - Thermocouples - Ion Gauges Additional functional descriptions are available in volume 4 of the Design Report.			
WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY — PART II — ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II — ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.2.3.4 TITLE: Air Handling System CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 214	REVISION NO. AND AUTHORIZATION 0		DATE 8/10/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.2.3.4 TITLE Air Handling System		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT <ul style="list-style-type: none"> o Mechanical System & Equipment <ul style="list-style-type: none"> - Fan & Filter Units - Duct Work <p>Additional functional descriptions are available in volume 4 of the Design Report.</p> WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY -- PART II -- ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II -- ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.2.4 TITLE: Refurbishment/Test CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 217	REVISION NO. AND AUTHORIZATION 0		DATE 8/10/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.2.4 TITLE Refurbishment/Test		FUNDING DOCUMENTS	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT o Mechanical o Electrical o Electronics o Tooling/Fixtures o Test Equipment o Service Facilities <ul style="list-style-type: none"> - Disassembly/Assembly Areas - Oven - Grit Blaster - Preparation Lab. - Bakeout Furnaces - Spray Booth - Alignment Stations 			
- Wiring Harness Station Additional functional descriptions are available in volume 4 of the Design Report.			
WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY -- PART II -- ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II -- ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.3 TITLE: Plant Control Data Acquisition CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 232	REVISION NO. AND AUTHORIZATION 0		DATE 8/10/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.3 TITLE Plant Control Data Acquisition System		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT o Electrical o Electronics - Hardware - Software o I&C Additional functional descriptions are available in volume 6 of the Design Report.			
WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY - PART II - ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II - ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.4 TITLE: Process Electrical System CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 235	REVISION NO. AND AUTHORIZATION 0		DATE 8/10/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.4 TITLE Process Electrical System		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT o Electrical Systems <ul style="list-style-type: none"> - Power - Standby - Uninterruptable - DC Additional functional descriptions are available in volume 6 of the Design Report.			
WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY - PART II - ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II - ELEMENT DEFINITION		WBS ELEMENT CODE: 1.2.5 TITLE: Process Support CONTRACTOR: LLN'/MMES	
INDEX LINE NO. 241	REVISION NO. AND AUTHORIZATION 0	DATE 8/10/84	
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.2.5 TITLE Process Support		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT <ul style="list-style-type: none"> o Electrical Distribution o Cooling Water System o Vacuum System o Air/Gas System o Waste System o Mechanical Assembly o Spares <p>Additional functional descriptions are available in volume 6 of the Design Report.</p> WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

WORK BREAKDOWN STRUCTURE DICTIONARY - PART II - ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II - ELEMENT DEFINITION		WBS ELEMENT CODE: 1.3 TITLE: Uranium Processing Facility CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 248	REVISION NO. AND AUTHORIZATION 0		DATE 8/10/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.3 TITLE Uranium Processing Facility		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT <ul style="list-style-type: none"> o Site Surveying o Geological Studies o Land Improvements o Demolition o Outside Utilities <ul style="list-style-type: none"> - Underground - Above Ground o Building Structures o Building Utilities/Services o Equipment <p>Additional functional descriptions are available in volume 5 of the Design Report.</p> <p>WORK STATEMENT</p> <p>PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.</p>			

WORK BREAKDOWN STRUCTURE DICTIONARY — PART II — ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II — ELEMENT DEFINITION		WBS ELEMENT CODE: 1.3.1 TITLE: Feed Conversion CONTRACTOR: LLNL/MMES			
INDEX LINE NO. 249	REVISION NO. AND AUTHORIZATION 0		DATE 8/10/84		
APPROVED CHANGES N/A					
SYSTEM DESIGN DESCRIPTION NUMBER 1.3.1 TITLE Feed Conversion		FUNDING DOCUMENTS N/A			
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY Additional functional descriptions are available in volume 5 of the Design Report. TECHNICAL CONTENT <table border="0"> <tr> <td> <ul style="list-style-type: none"> o Excavations/Deinolition o Grade Slabs o Equipment Foundations o Structural Framing Systems o Superstructures/Supports o Walls & Partitions (including firewalls) o Process Piping/Elec.Pwr./Instrumentation o Roofing, Eaves & Drains o HVAC/Filtration System o Elevators/Cranes/Monorails/Conveyors o Process Utilities/Tanks o Interior Finishes & Trims o Stairs, Stairwells, Ramps, Ladders & Work Platforms </td> <td> <ul style="list-style-type: none"> o Insulation o Utilities in Direct Burial Under the facility to Approx. Five(5) Feet from Bldg. o Dynamic Seismic Analysis of Structure o Grounding/Lightning Protection o Access Control/Security o Plumbing & Drains o Mechanical Equipment and Installation </td> </tr> </table>				<ul style="list-style-type: none"> o Excavations/Deinolition o Grade Slabs o Equipment Foundations o Structural Framing Systems o Superstructures/Supports o Walls & Partitions (including firewalls) o Process Piping/Elec.Pwr./Instrumentation o Roofing, Eaves & Drains o HVAC/Filtration System o Elevators/Cranes/Monorails/Conveyors o Process Utilities/Tanks o Interior Finishes & Trims o Stairs, Stairwells, Ramps, Ladders & Work Platforms 	<ul style="list-style-type: none"> o Insulation o Utilities in Direct Burial Under the facility to Approx. Five(5) Feet from Bldg. o Dynamic Seismic Analysis of Structure o Grounding/Lightning Protection o Access Control/Security o Plumbing & Drains o Mechanical Equipment and Installation
<ul style="list-style-type: none"> o Excavations/Deinolition o Grade Slabs o Equipment Foundations o Structural Framing Systems o Superstructures/Supports o Walls & Partitions (including firewalls) o Process Piping/Elec.Pwr./Instrumentation o Roofing, Eaves & Drains o HVAC/Filtration System o Elevators/Cranes/Monorails/Conveyors o Process Utilities/Tanks o Interior Finishes & Trims o Stairs, Stairwells, Ramps, Ladders & Work Platforms 	<ul style="list-style-type: none"> o Insulation o Utilities in Direct Burial Under the facility to Approx. Five(5) Feet from Bldg. o Dynamic Seismic Analysis of Structure o Grounding/Lightning Protection o Access Control/Security o Plumbing & Drains o Mechanical Equipment and Installation 				
WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.					

WORK BREAKDOWN STRUCTURE DICTIONARY - PART II - ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II - ELEMENT DEFINITION		WBS ELEMENT CODE: 1.3.2 TITLE: Feed Preparation CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 258	REVISION NO. AND AUTHORIZATION 0		DATE 8/10/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.3.2 TITLE Feed Preparation		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p>COST CONTENT</p> <p>ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY</p> </div> <div style="width: 48%;"> <p>TECHNICAL CONTENT</p> <ul style="list-style-type: none"> o Excavations/Demolition o Grade Slabs o Equipment Foundations o Superstructures/Supports o Walls & Partitions (including firewalls) o Process Piping/Elec.Pwr./Instrumentation o Roofing, Eaves & Drains o HVAC o Process Utilities/Tanks o Insulation o Elevators/Cranes/Monorails/Conveyors o Interior Finishes & Trims o Stairs, Stairwells, Ramps, Ladders, & Work Platforms </div> </div> <div style="width: 48%; margin-top: 10px;"> <ul style="list-style-type: none"> o Utilities in Direct Burial Under the Facility to Approx. Five (5) Feet from Building o Dynamic Seismic Analysis of Structure o Grounding/Lightning Protection o Access Control/Security o Plumbing & Drains o Mechanical Equipment and Installation <p>Additional functional descriptions are available in volume 5 of the Design Report.</p> </div>			
<p>WORK STATEMENT</p> <p>PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.</p>			

WORK BREAKDOWN STRUCTURE DICTIONARY - PART II - ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II - ELEMENT DEFINITION		WBS ELEMENT CODE: 1.3.3 TITLE: Product Conversion CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 263	REVISION NO. AND AUTHORIZATION 0		DATE 8/10/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.3.3 TITLE Product Conversion		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p>COST CONTENT</p> <p>ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY</p> </div> <div style="width: 48%;"> <p>TECHNICAL CONTENT</p> <div style="display: flex;"> <div style="flex: 1;"> <ul style="list-style-type: none"> o Excavations/Demolition o Grade Slabs o Equipment Foundations o Superstructures/Supports o Walls & Partitions (Include Firewalls) o Process Piping/Elec.Pwr./Instrumentation o HVAC o Process Utilities o Interior Finishes & Trims o Stairs, Stairwells, Ramps, Ladders & Work Platforms o Utilities in Direct Burial Under the Facility to Approx. Five(5) Feet From Bldg. </div> <div style="flex: 1;"> <ul style="list-style-type: none"> o Dynamic Seismic Analysis of Structure o Grounding/Lightning Protection o Access Control/Security o Plumbing & Drains o Mechanical Equip.& Installation o Insulation o Elevators/Cranes/Monorails/Conveyors </div> </div> <p>Additional functional descriptions are available in volume 5 of the Design Report.</p> </div> </div>			
<p>WORK STATEMENT</p> <p>PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.</p>			

WORK BREAKDOWN STRUCTURE DICTIONARY - PART II - ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II - ELEMENT DEFINITION		WBS ELEMENT CODE: 1.3.4 TITLE: Uranium Recovery CONTRACTOR: LLNL/MMS			
INDEX LINE NO. 270	REVISION NO. AND AUTHORIZATION 0		DATE 8/10/84		
APPROVED CHANGES N/A					
SYSTEM DESIGN DESCRIPTION NUMBER 1.3.4 TITLE Uranium Recovery		FUNDING DOCUMENTS N/A			
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT <table border="0"> <tr> <td style="vertical-align: top;"> <ul style="list-style-type: none"> o Excavations/Demolition o Grade Slabs o Equipment Foundations o Superstructures/Supports o Walls & Partitions (Include Firewalls) o Process Piping/Elec.Pwr./Instrumentation o HVAC o Process Utilities o Interior Finishes & Trims o Stairs, Stairwells, Ramps, Ladders & Work Platforms o Utilities in Direct Burial Under the Facility to Approx. Five (5) Feet from Bldg. </td> <td style="vertical-align: top;"> <ul style="list-style-type: none"> o Dynamic Seismic Analysis of Structure o Grounding/Lightning Protection o Access Control/Security o Plumbing & Drains o Mechanical Equipment and Installation o Insulation o Elevators/Cranes/Monorails/Conveyors </td> </tr> </table> <p>Additional functional descriptions are available in volume 5 of the Design Report.</p>				<ul style="list-style-type: none"> o Excavations/Demolition o Grade Slabs o Equipment Foundations o Superstructures/Supports o Walls & Partitions (Include Firewalls) o Process Piping/Elec.Pwr./Instrumentation o HVAC o Process Utilities o Interior Finishes & Trims o Stairs, Stairwells, Ramps, Ladders & Work Platforms o Utilities in Direct Burial Under the Facility to Approx. Five (5) Feet from Bldg. 	<ul style="list-style-type: none"> o Dynamic Seismic Analysis of Structure o Grounding/Lightning Protection o Access Control/Security o Plumbing & Drains o Mechanical Equipment and Installation o Insulation o Elevators/Cranes/Monorails/Conveyors
<ul style="list-style-type: none"> o Excavations/Demolition o Grade Slabs o Equipment Foundations o Superstructures/Supports o Walls & Partitions (Include Firewalls) o Process Piping/Elec.Pwr./Instrumentation o HVAC o Process Utilities o Interior Finishes & Trims o Stairs, Stairwells, Ramps, Ladders & Work Platforms o Utilities in Direct Burial Under the Facility to Approx. Five (5) Feet from Bldg. 	<ul style="list-style-type: none"> o Dynamic Seismic Analysis of Structure o Grounding/Lightning Protection o Access Control/Security o Plumbing & Drains o Mechanical Equipment and Installation o Insulation o Elevators/Cranes/Monorails/Conveyors 				
WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.					

WORK BREAKDOWN STRUCTURE DICTIONARY - PART II - ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II - ELEMENT DEFINITION		WBS ELEMENT CODE: 1.3.5 TITLE: Process Support CONTRACTOR: LLNL/MMES	
INDEX LIKE NO. 275	REVISION NO. AND AUTHORIZATION 0		DATE 8/10/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.3.5 TITLE Process Support		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <ul style="list-style-type: none"> o Excavations/Demolition o Grade Slabs o Equipment Foundations o Superstructures/Supports o Walls & Partitions (Include Firewalls) o Process Piping/Elec.Pwr./Instrumentation o HVAC o Process Utilities o Interior Finishes & Trims o Stairs,Stairwells,Ramps,Ladders, & Work Platforms <p>Additional functional descriptions are available in volume 5 of the Design Report.</p> </div> <div style="width: 48%;"> <ul style="list-style-type: none"> o Utilities in Direct Burial Under the Facility to Approx. Five (5) Feet From Bldg. o Dynamic Seismic Analysis of Structure o Grounding/Lightning Protection o Access Control/Security o Plumbing & Drains o Mechanical Equip. & Installation o Insulation o Elevators/Cranes/Monorails/Conveyors o Spares </div> </div> <p>WORK STATEMENT</p> <p>PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.</p>			

WORK BREAKDOWN STRUCTURE DICTIONARY - PART II - ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II - ELEMENT DEFINITION		WBS ELEMENT CODE: 1.3.6 TITLE: Waste Management CONTRACTOR: LLNL/MMES			
INDEX LINE NO. 283	REVISION NO. AND AUTHORIZATION 0		DATE 8/10/84		
APPROVED CHANGES N/A					
SYSTEM DESIGN DESCRIPTION NUMBER 1.3.6 TITLE Waste Management		FUNDING DOCUMENTS N/A			
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT <table border="0"> <tr> <td style="vertical-align: top;"> <ul style="list-style-type: none"> o Excavations/Demolition o Grade Slabs o Equipment Foundations o Superstructures/Supports o Walls & Partitions (Include Firewalls) o Process Piping/Elec. Pwr./Instrumentation o HVAC o Process Utilities o Interior Finishes & Trims o Stairs, Stairwells, Ramps, Ladders & Work Platforms o Utilities in Direct Burial Facility to Approx. Five (5) Feet from Structure </td> <td style="vertical-align: top;"> <ul style="list-style-type: none"> o Dynamic Seismic Analysis of structure o Grounding/Lightning Protection o Access Control/Security o Plumbing & Drains o Mechanical Equipment and Installation o Insulation o Elevators/Cranes/Monorails/Conveyors </td> </tr> </table>				<ul style="list-style-type: none"> o Excavations/Demolition o Grade Slabs o Equipment Foundations o Superstructures/Supports o Walls & Partitions (Include Firewalls) o Process Piping/Elec. Pwr./Instrumentation o HVAC o Process Utilities o Interior Finishes & Trims o Stairs, Stairwells, Ramps, Ladders & Work Platforms o Utilities in Direct Burial Facility to Approx. Five (5) Feet from Structure 	<ul style="list-style-type: none"> o Dynamic Seismic Analysis of structure o Grounding/Lightning Protection o Access Control/Security o Plumbing & Drains o Mechanical Equipment and Installation o Insulation o Elevators/Cranes/Monorails/Conveyors
<ul style="list-style-type: none"> o Excavations/Demolition o Grade Slabs o Equipment Foundations o Superstructures/Supports o Walls & Partitions (Include Firewalls) o Process Piping/Elec. Pwr./Instrumentation o HVAC o Process Utilities o Interior Finishes & Trims o Stairs, Stairwells, Ramps, Ladders & Work Platforms o Utilities in Direct Burial Facility to Approx. Five (5) Feet from Structure 	<ul style="list-style-type: none"> o Dynamic Seismic Analysis of structure o Grounding/Lightning Protection o Access Control/Security o Plumbing & Drains o Mechanical Equipment and Installation o Insulation o Elevators/Cranes/Monorails/Conveyors 				
WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.					

WORK BREAKDOWN STRUCTURE DICTIONARY - PART II - ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II - ELEMENT DEFINITION		WBS ELEMENT CODE: 1.4 TITLE: Plant Support Facilities CONTRACTOR: LLNL/MMES			
INDEX LINE NO. 291	REVISION NO. AND AUTHORIZATION 0	DATE 8/10/84			
APPROVED CHANGES N/A					
SYSTEM DESIGN DESCRIPTION NUMBER 1.4 TITLE Plant Support Facilities		FUNDING DOCUMENTS N/A			
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY Additional functional descriptions are available in volume 6 of the Design Report. TECHNICAL CONTENT <table border="0"> <tr> <td> <ul style="list-style-type: none"> o Excavations o Demolition o Building Modifications o Grade Slabs o Equipment Foundations o Superstructures o Walls & Partitions (Include Firewalls) o Supports o HVAC o Bldg., Shop & Lab Utilities o Interior Finishes & Trims o Stairs, Stairwells, Ramps o Ladders & Work Platforms </td> <td> <ul style="list-style-type: none"> o Utilities in Direct Burial Under the Bldg. Shops or Labs to Approx. Five (5) Feet from Structure o Dynamic Seismic Analysis of Structures o Grounding/Lightning Protection o Portals/Security o Plumbing & Drains o Mechanical Equip. & Installation o Insulation o Bldg's., Shops, Offices, Labs & Warehouse o Equipment & Installation </td> </tr> </table>				<ul style="list-style-type: none"> o Excavations o Demolition o Building Modifications o Grade Slabs o Equipment Foundations o Superstructures o Walls & Partitions (Include Firewalls) o Supports o HVAC o Bldg., Shop & Lab Utilities o Interior Finishes & Trims o Stairs, Stairwells, Ramps o Ladders & Work Platforms 	<ul style="list-style-type: none"> o Utilities in Direct Burial Under the Bldg. Shops or Labs to Approx. Five (5) Feet from Structure o Dynamic Seismic Analysis of Structures o Grounding/Lightning Protection o Portals/Security o Plumbing & Drains o Mechanical Equip. & Installation o Insulation o Bldg's., Shops, Offices, Labs & Warehouse o Equipment & Installation
<ul style="list-style-type: none"> o Excavations o Demolition o Building Modifications o Grade Slabs o Equipment Foundations o Superstructures o Walls & Partitions (Include Firewalls) o Supports o HVAC o Bldg., Shop & Lab Utilities o Interior Finishes & Trims o Stairs, Stairwells, Ramps o Ladders & Work Platforms 	<ul style="list-style-type: none"> o Utilities in Direct Burial Under the Bldg. Shops or Labs to Approx. Five (5) Feet from Structure o Dynamic Seismic Analysis of Structures o Grounding/Lightning Protection o Portals/Security o Plumbing & Drains o Mechanical Equip. & Installation o Insulation o Bldg's., Shops, Offices, Labs & Warehouse o Equipment & Installation 				
WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.					

WORK BREAKDOWN STRUCTURE DICTIONARY - PART II - ELEMENT DEFINITION

WORK BREAKDOWN STRUCTURE DICTIONARY PART II - ELEMENT DEFINITION		WBS ELEMENT CODE: 1.5 TITLE: Project Integration CONTRACTOR: LLNL/MMES	
INDEX LINE NO. 297	REVISION NO. AND AUTHORIZATION 0		DATE 8/10/84
APPROVED CHANGES N/A			
SYSTEM DESIGN DESCRIPTION NUMBER 1.5 TITLE Project Integraton		FUNDING DOCUMENTS N/A	
ELEMENT TASK DESCRIPTION COST CONTENT ENGINEERING PROCUREMENT CONSTRUCTION CONTINGENCY TECHNICAL CONTENT <ul style="list-style-type: none"> o Project Planning, Direction and Control <ul style="list-style-type: none"> -Prepare and Maintain the Project Management Plan -Client Meetings, Reports, and Presentations -Project Integration with Martin Marietta Energy Systems and Lawrence Livermore National Laboratory -Preparation and Maintenance of Project Schedules -Prepare and Maintain Cost and Schedule Data Base -Prepare Monthly Reports for Client -Conduct Cost and Schedule Trend Analysis o Perform Construction (Title III) Engineering, A/E Product Deliverables, Review, Studies & Criteria, Systems Engineering and Assessments o Provide Technical Support and Other Consultant or Subcontract Support WORK STATEMENT PROVIDE THE LABOR AND MATERIAL NECESSARY TO DESIGN, PROCURE, CONSTRUCT, AND TEST THE FACILITIES/SYSTEMS/EQUIPMENT DESCRIBED ABOVE. PREPARE THE DESIGN CRITERIA FOR THE PRELIMINARY DESIGN (TITLE I) AND THE DEFINITIVE DESIGN (TITLE II) INCLUDING DRAWINGS, SPECIFICATIONS, SYSTEMS ENGINEERING, AND PROJECT SUPPORT NECESSARY TO COMPLETE THE ENGINEERING. PERFORM THE PROCUREMENT ACTIVITIES, THE FABRICATION, CONSTRUCTION, INSTALLATION, PRE-OPERATIONAL TESTING AND START-UP NECESSARY TO COMPLETE THE CAPITAL PROJECT AND PREPARE FOR A SMOOTH TRANSITION TO THE OPERATIONAL PHASE.			

INTERNAL DISTRIBUTION

J. I. Davis	L-466
E. R. Ault	L-463
A. R. Clodes	L-462
R. D. Dewitt	L-372
J. W. Dubrin	L-467
R. G. Finucane	L-462
T. J. Gilmartin	L-467
L. A. Hackel	L-459
M. P. Hacker	L-470
R. S. Hargrove	L-467
J. G. Harri	L-470
G. M. Heestand	L-470
J. L. Held	L-470
R. E. Menorickson	L-466
J. Z. Holtz	L-459
J. A. Horton	L-462
T. Kan	L-462
E. I. Moses	L-462
E. F. Oberst	L-440
R. W. O'Neil	L-462
Y. Oster	L-440
R. W. Patterson	L-462
T. A. Shepp	L-470
M. L. Spaeth	L-467
R. J. Tosetti (5)	L-439
R. K. Robinson (5)	L-438
J. I. Davis	
CLYA Files (20)	L-466
TID (15) L-658	

External Distribution

Dr. Lester Ettlinger (3)
The MITRE Corporation
METREK Division
1820 Dolley Madison Blvd.
McLean, VA 22102

Dr. James Rushton (3)
Program and Process Planning
Martin Marietta Energy Systems
P. O. Box P
Oak Ridge, TN 37831

Mr. Kenneth Sommerfeld (10)
Vice Pres., Enrichment
Martin Marietta Energy Systems
P. O. Box P
Oak Ridge, TN 37831

Mr. Richard Dierlam
U.S. Department of Energy
Advanced Technology Projects
Uranium Enrichment, NE-35
Office of Nuclear Energy
Washington, DC 20545

Mr. Don Erb
U.S. Department of Energy
Uranium Enrichment, NE-34
Office of Nuclear Energy
Washington, DC 20545

Process Evaluation Board (7)
c/o Dr. Kermit Laughon
PEB, Exec. Secretary
U.S. Department of Energy
Office of Nuclear Energy
Washington, D.C. 20545

Mr. Joseph W. Parks
U.S. Department of Energy
Oak Ridge Operations
P. O. Box E
Oak Ridge, TN 37830

W. M. Polansky
U.S. Department of Energy
Advanced Technology Projects
Uranium Enrichment, NE-35
Office of Nuclear Energy
Washington, DC 20545

J. K. Hancock (2)
(Project File for Congressional
Archives)
U.S. Department of Energy
Advanced Technology Projects
Uranium Enrichment, NE-35
Office of Nuclear Energy
Washington, DC 20545

J. R. Longenecker
U.S. Department of Energy
Office of Nuclear Energy
Washington, D.C. 20545

R. T. Ooten
U.S. Department of Energy
Oak Ridge Operations Office
P. O. Box E
Oak Ridge, TN 37830

J. Milloway
U.S. Department of Energy
Oak Ridge Operations Office
P. O. Box E
Oak Ridge, TN 37830

T. M. Ankham
D. F. Craig
M. O. Dixon
C. E. Frye
R. L. Hoglund
A. L. Lotts (2)
G. E. Michaels
J. S. Rayside
T. R. Smith
J. D. Stout

U.S. Department of Energy (27)
Technical Information Center
P. O. Box 62
Oak Ridge, TN 37830