FUSION ENGINEERING DESIGN CENTER

CONF-8706215--1-Vugraphs

SIX MONTHS R&D REVIEW FOR WBS K

- K*01 FASTENERS, FLANGES, CONNECTORS
- KA01 GENERAL PURPOSE MANIPULATOR

CONF-8706215--1-Vugraphs

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WBS K: EX-VESSEL REMOTE MAINTENANCE

WORK PACKAGE K*01: REMOTE FASTENERS, FLANGES, CONNECTORS

STATUS: JANUARY - MARCH 1987

THE FOCUS OF THIS ACTIVITY IS TO DEVELOP A DRAFT OF THE CIT REMOTE MAINTENANCE DESIGN GUIDEBOOK, SUPPORT MOCKUP DEMO #1, AND DEVELOP MOCKUP DEMO #2.

- REVIEWED ORNL/FRD MANUAL AND EARLY DRAFT OF JET MANUAL
- STUDIED ACCESS REQUIREMENTS AND PRELIMINARY HARDWARE FOR DIAGNOSTIC VACUUM PIPES
  - REVISED UPPER IGLOO SHIELD CONFIGURATION
- ELECTRICAL CONNECTORS
  - LEMO (JET)
- MOCKUP DEMO #2 WAS TO DEMONSTRATE REMOTE HANDLING OF THE HYDRAULIC JACK TEST ASSEMBLY
  - ALTERNATE DEMONSTRATIONS WERE CONSIDERED

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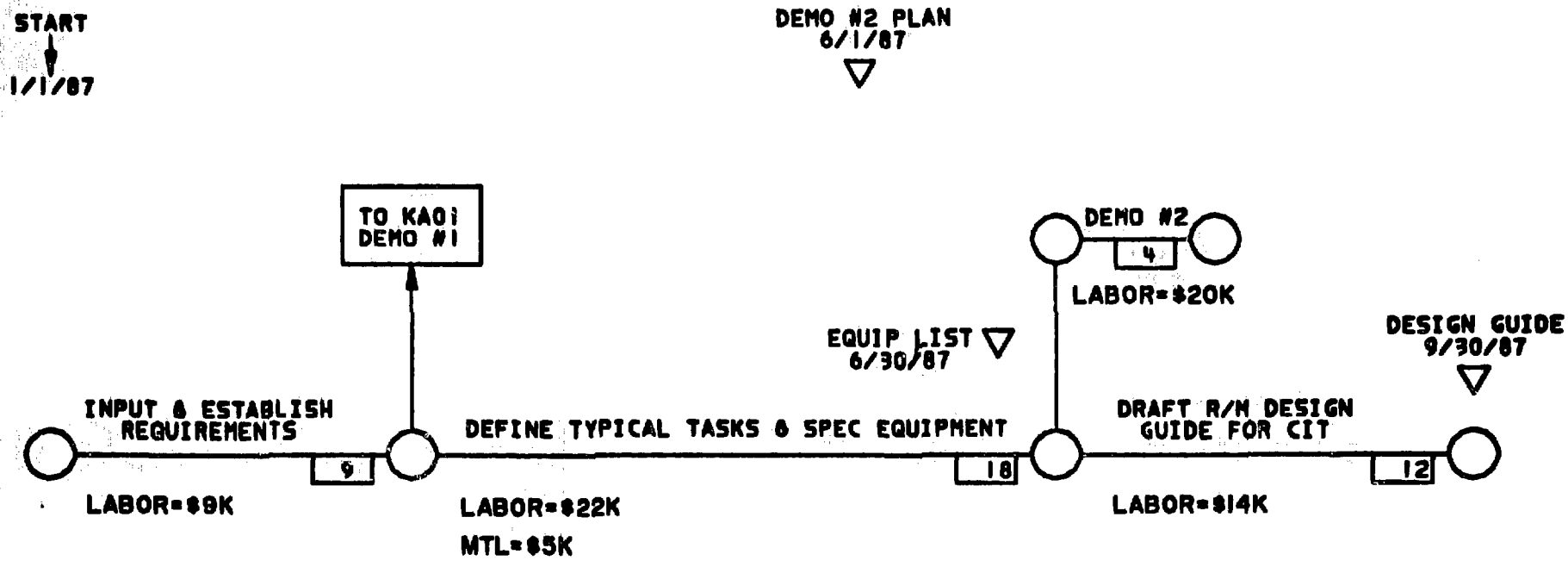
8182 COST CENTER | K*01 WORK PACKAGE | 1002 JOB NUMBER

CIT
JOB ESTIMATE PROPOSAL
NETWORK AND RESOURCE PLAN

SHEET C
PAGE 1 OF 1
DATE: 1/9/87

REMOTE MAINTENANCE FASTENERS, FLANGES AND CONNECTORS



WORK PACKAGE K*01: REMOTE FASTENERS, FLANGES, CONNECTORS (CONTINUED)

PLANS: APRIL - SEPTEMBER 1987

- ISSUE FIRST DRAFT OF R/M DESIGN GUIDEBOOK (9/87)
  - MODELLED AFTER JET
  - EMPHASIS ON CONNECTIONS AND MANIPULATORS
- DESIGN AND FABRICATE MOCKUP DEMO #2
  - ADD IGLOO FRAMES AND SHIELD MODULE TO DEMO #1 FOR REACH AND VIEWING STUDIES; DESIGN COMPLETED 5/87
  - MODIFIED VACUUM FLANGE TO STUDY ALIGNMENT AND SEAL POSITIONING; INCLUDES VACUUM TESTS
  - SCHEDULED FOR FIRST AND LAST WEEKS OF JULY; ISSUE REPORT
- PROCURE CEFILAC COUPLINGS/SEALS FOR 2" AND 4" PIPES

PROBLEM:

- MOST OF THE MARCH COSTS SHOULD HAVE BEEN CHARGED TO KA01

WORK PACKAGE KA01: GENERAL PURPOSE FORCE-REFLECTING SERVO-MANIPULATORS

STATUS: JANUARY - MARCH 1987

THE FOCUS OF THIS ACTIVITY IS TO DEFINE THE PERFORMANCE LIMITS OF MANIPULATORS AND THE IMPACT TO MACHINE AND COMPONENT DESIGNS. TWO MOCKUP DEMONSTRATIONS USING THE ORNL M-2 MANIPULATOR ARE PLANNED.

- REVIEWED COMMERCIALLY AVAILABLE MANIPULATOR EQUIPMENT
- MORE THAN ONE TEST CELL SYSTEM IS NEEDED FOR FULL COVERAGE
- MODELLED M-2, ASM, RM-10 MANIPULATORS INTO CATIA GRAPHICS
- DESIGNED/FABRICATED DEMO #1 MOCKUP OF UPPER MACHINE QUADRANT, INCLUDING DIAGNOSTIC VACUUM PIPES
- DEVELOPED PLANS FOR DEMO #3 MOCKUP OF RF MODULE AND MIDPLANE PORT

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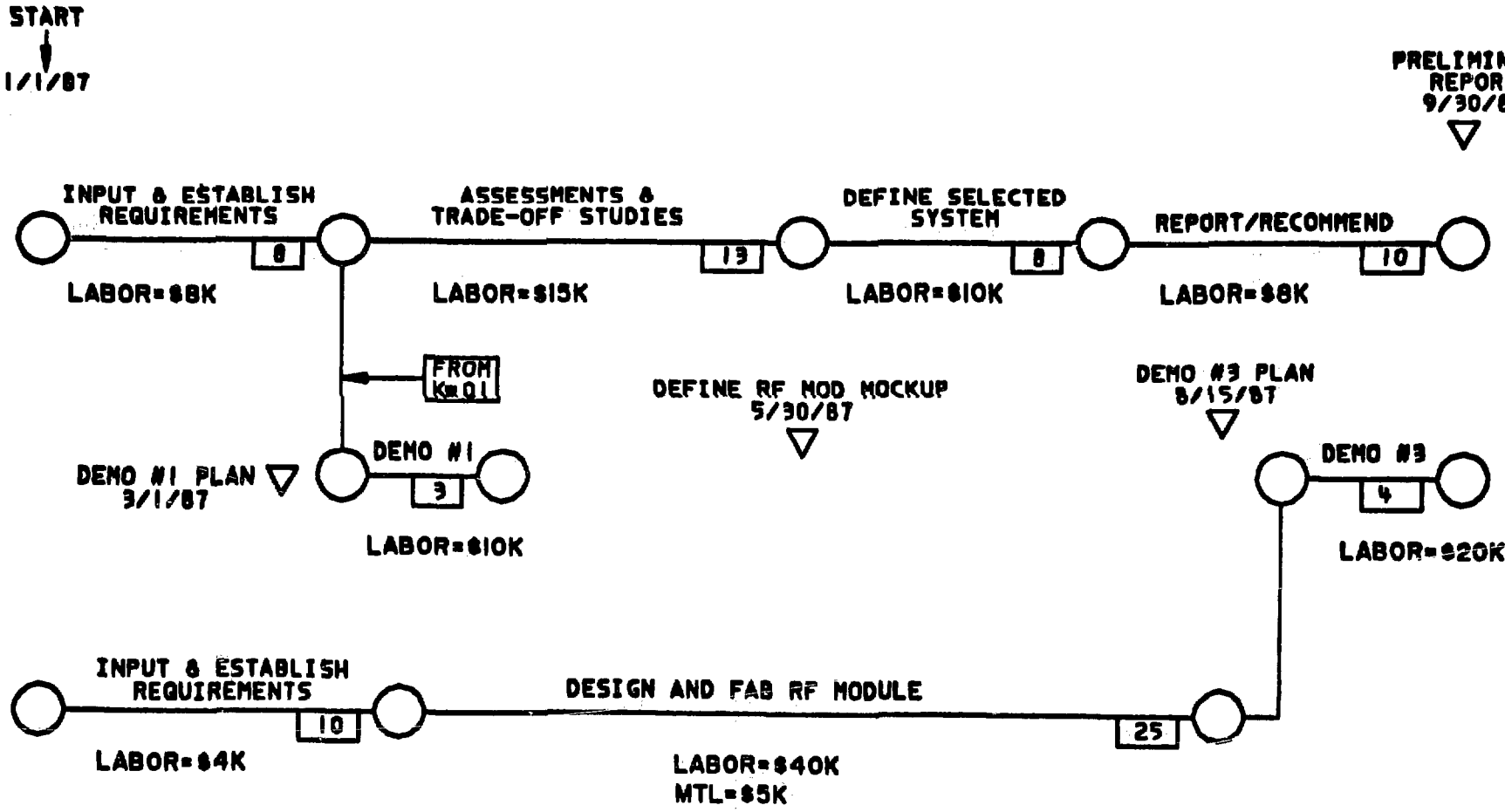
GENERAL PURPOSE FORCE-REFLECTING SERVO-MANIPULATORS



WORK PACKAGE KA01: GENERAL PURPOSE FORCE-REFLECTING SERVO-MANIPULATORS (CONT)

PLANS: APRIL - SEPTEMBER 1987

- DEMO #1
  - ASSEMBLY/DISASSEMBLY OF VACUUM PIPES AT ORNL FACILITY IN APRIL
  - ISSUE REPORT IN MAY
  - PROVIDE INPUT TO DEMO #2

- DEMO #3
  - DESIGN AND FABRICATE RF MODULE AND SUPPORT STAND
  - DESIGN AND FABRICATE MIDPLANE PORT AND THERMAL SHIELD
  - DEMONSTRATE ASSEMBLY/DISASSEMBLY IN SEPTEMBER; ISSUE REPORT

- ESTABLISH PRELIMINARY REQUIREMENTS FOR TEST CELL MANIPULATOR SYSTEM

6 MONTHS COST PERFORMANCE DATA FOR WBS H AND K

WORK PKG. NO.	TITLE	BCWS	BCWP	ACWP	6 MOS. COMMIT.	FY 87 BUDGET	SCH VAR	SPI	COST VAR	CPI
H*01	HYD. PRESS	44	4	1	1	120	-40	0.09	3	2.86
K*01	REM. FAST., FLGS, CONN.	15	15	37	37	70	0	1.00	-23	0.40
KA01	G.P. MANIP.	33	17	21	21	120	-16	0.52	-4	0.81

SCH. VAR. = BCWP - BCWS

SPI = BCWP BCWS (SCHEDULE PERFORMANCE INDEX)

COST VAR. = BCWP - ACWP

CPI = BCWP ACWP (COST PERFORMANCE INDEX)

CIT/WBS K R&D ACTIVITIES FOR FY 1987

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
K*01 (Jan. 19 doc.)	4.4	4.0	6.3	6.6	6.3	6.6	22.8	7.9	51
Cumulative		8.4	15.1	21.7	28.0	34.6	57.4	65.3	70.4
KA01 (Jan. 19 doc.)	6.2	7.0	19.4	13.0	12.4	13.4	10.9	24.2	24.2
Cumulative		13.2	32.6	45.6	58.0	71.4	84.8	95.7	119.9
Combined K*01, KA01	10.6	11.0	25.7	19.6	18.7	20.0	36.2	18.8	29.3
Cumulative		21.6	47.3	66.9	85.6	105.6	141.8	160.6	189.8
ORNL Estimate	10.5	10.5	20.2	30.2	27.2	24.2	31.0	8.0	28.0
Cumulative		21.0	41.2	71.4	98.6	122.8	153.8	161.8	189.8

Reported Costs

K*01	3.8	3.6	29.8	5.3	6.4
		7.4	37.2	42.5	48.9
KA01	8.6	5.3	6.8	3.2	7.0
		13.9	20.7	23.9	30.9
Combined	12.4	8.9	36.6	8.5	13.4
		21.3	57.9	66.4	79.8