# ENGINEERING ESTIMATING

GIAL KAEGI

ENGINEERING ESTIMATING & CONTROL
A&WSI - ORG. 7A770

526-4381

## THE ENGINEERING ESTIMATING PROCESS USED BY BMAC

### APPLIES TO

- ALL MILITARY PROGRAMS

### RESULTS FROM

- CUSTOMER COMPLAINTS
- GENERAL CHUBB TO L.D. ALFORD, A.M.S. 600

### DATA GENERATED

- IS REQUIRED BY PUBLIC LAW 87-653
- FOLLOWS A LOGICAL FLOW AND IS STANDARDIZED
- PROVIDES TRACEABILITY
- IS MATHMATICALLY CORRECT AND IS SUMMARIZED
- IS LIKED BY THE CUSTOMER

### METHOD USED

- THE COMPANY HAS CHOSEN BMAC OPERATING PROCEDURE 8000-11 \*\*\*
'ENGINEERING PROPOSAL ESTIMATE' AND D3-11666-1
'USERS GUIDE TO PROPOSAL MANAGEMENT'

\*\*\* OP 8000-11 IS NOW INCORPORATED AS SECTION III OF OPERATING PROCEDURE 61

6-651

\*\*\* OP 3000-11 IS NOW INCORPORATED AS SECTION III OF OPERATING PROCEDURE 61.

star unable to provide the detail supporting the factored rate. from "actual plenning and support experience" on three different programs. bequieves hours were said to be based on a 15.4 percent factor developed

(b) Contract F33657-81-C-0242, CCP 1780-034;

bearding statements of the work to be performed. defective pricing finding was that the task sheets contained incorrect or task direct estimates were challenged during our postaward audit as Task sheet descriptions

duplicating effort proposed as factored cost elements. BMAC'S rebuttal to the (a) Contract F33557-83-C-2008:

(3) The following are specific examples of these deficiencies:

followed by the various engineering organizations. Estimate, which covers task sheet preparation, is not baing consistently

(2) BHAC Operating Procedure 8000-11, Engineering Proposal experience used as a basis for estimates.

reference specific OU 10 (d) incomplete

estimates; 141 description

(c) Inadequate

(b), insdequate or no support for detail estimates;

; einemetate toerrooni (6)

include:

DY BHAC estimators occasionally (1) Tesk sheets prepered

Condition:

Tesk sheets.

estinating system.

required effort.

the person making the estimate.

p-e51

\*\*\* OP 8000-11 IS NOW INCORPORATED AS SECTION III OF OPERATING PROCEDURE 61

to ensure that task direct work does not duplicate factored cost estimates. (1) BHAC finance managers should review task sheet descriptions

Recommendations.

guidance. guidance; however, engineering personnel aust ensure that they follow that

(5) BHAC Operating Procedure 8009-11 is considered adequate

support the rate. However, the item count and labor hours from which the rate

upon request and after an extended period of time, data was submitted to

ering task sheet called for "A rate of 1.62 manhours per item to accomplish the

experience referred to in the task sheets was the knowledge and expertise of

requesting the data, we were told that verifiable data was not available. The

experience," "previous OAS/CHI experience," or "similar programs."

and besed sew estails ent that the satinate was based on

Task sheet descriptions aust accurately describe the pro-

There was no support in the proposal for this rate but,

(d) CCP 498-017, Spares Provisioning Proposal: The engine-

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(4) The above examples illustrate a serious deficiency in BMAC's

.nolisilogen bns nolisuleve posed effort in sufficient and accurate enough detail to perait effective

.was calculated could not be verified to any accounting records.

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### FURTHER ACTION BY EEC

### A. BCS Estimates

Op 8000-11 shows an example of a BCS task sheet and a BCS Computer Work Estimate (CWE) sheet on how to properly fill out the CWE sheet.

The intent of 8000-11 is that the BCS task sheet will be completed under the same task format, rules and regulations as the Engineering task sheets, although this is not explicitly stated.

EEC will revise 8000-11 to state that BCS task sheets will follow the same procedures and requisations as great state that

procedures and regulations as Engineering task sheets. EEC analysts will also make sure that the BCS representatives for the engineering organization making the estimate; approve the estimate (See approval block on CWE sheet).

### B. EEC Checklist

The EEC organization will develop an internal checklist for its analyst to use to insure all the 8000-ii procedures and AF auditing concerns are adhered to.

This checklist will be developed by 2.11.-87.

The checklist will be periodically revised and updated and will include:

DET 34/DCAA ON FRIDAY 13 FEBRUARY 1987.

\*\*\* OP 3000-11 IS NOW INCORPORATED AS SECTION III OF OPERATING PROCEDURE 61,

8651

RECOMMENDATIONS

RESPONSIBILITY

PAGE 1

1.1 BMAC finance managers should review task estimates. (p.2) direct work does not duplicate factored cost sheets descriptions to ensure that task

Kastl/Kaegi

1.2 BMAC finance managers should selectively of proposed estimates to ensure that the appropriate for projection purposes. (p.3) descriptions are accurate and the history is review the history cited as being the basis

!OTE: OP 8000-11 AS USED HEREIN. INCORPORATED AS SECTION !!! OF OPERATING PROCEDURE 61. NON SI

### CONDITION:

- 00.00 00.00 Procedure 8000\*11 not consistently followed. Factored effort direct estimated.

  - No supporting detail or not verifable actuals.
- "Procedure 8000-11 is considered adequate guidance".. (for engineering).

### RESPONSE/STATUS:

Organization will continue to monitor rationale and history as a part of the cost proposal BMAC will institute the use of a checklist in Engineering Estimating Controls to insure compliance with Procedure 8000-11. Training on revisions to the procedure have been checklist. incorporated into Lead Engineers Training and new supervisors training. BMAC Pricing

RESPONSE SUBMITTED BY (DATE)

RESPONSE AGREED TO (DATE)

RECOMMENDATION CURTERE

PRICING & ESTIMATING MANAGER (DATE)

AF REPRESENTATIVE (DATE)

AF REPRESENTATIVE (DATE)

FUNCTIONAL MANAGER

(DATE)

DCAA REPRESENTATIVE (DATE)

### ENCINEERING PROPOSAL CHECKLIST

/W3	YRKS:	
	Иате Пате	
•	Engineering Proposal Estimate Management Approval:	
	Иате Date	
•	Engineering Estimating Analyst Completing Checklist:	
	Estimate Submitted to Finance Pricing.	Date:_
	Final Engineering Estimate Approvals.	Date:_
	Estimate Summaries For Finance Pricing Completed.	Date:_
	E. BCS (Boeing Computer Services) Computer Work Estimate Sheets Complete With All Necessary Signatures.	Date:_
	D. Acronyms Spelled Out If Not On Approved List.	Date:
	C. Calculations Complete and Mathematically Correct.	Date:_
	B. Task Rationale Correct and Complete Per OP 61-SEC. III	Date:_
	A. Task Sheet Definitions Correct as Per EWS/SOW/WBS	Date:_
	Task Sheet Review and Correction Cycle:	
	Due Date: Actual Date:	
	Task Sheets to EEC (Engineering Estimating and Control):	
		ate:
	EWS (Engineering Work Statement) Due Date: Actual	Date:_
	RFE Releases: Original Date: Revision Data:	
	RFE (Request for Estimate) Kickoff Meeting Held: Date:	
Ð	INEERING ESTIMATE/PROPOSAL NUMBER:	

Mote: This page is for example purposes only and does not necessarily correspond to any previous task sheet.

BOEING MILITARY AIRPLANE COMPANY 0011 100 09

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March 6, 1987	мяіз 🗶	1	Boons 🔘		O PLANNING

RECOMMENDATIONS

RESPONSIBILITY

PAGE 39

### 24. Boeing Computer Services (BCS) Costs

24.1 BMAC should furnish adequate support and and CWA/Work Order Cross Reference Table when it is the basis of the estimate. costs, including copies of the MDI report required explanations for proposed BCS (p.43)

Garrison/Kaegi

Note: OP 8000-11 as used herein is now Operating Procedure 61. incorporated as Section III of

### CONDITION:

- a) Task sheets only contained general statements of the effort, but not support or rationale.
   b) MDI report used for estimate but not disclosed.

### RESPONSE/STATUS:

Procedure 8000-11 requires rationale for BCS estimates. Compliance to Procedure 8000-11 will be monitored by Engineering Estimating Controls and Finance Pricing and Estimating through the use of the checklist. The defection of the box of the support

UBKITTED BY (DATE)

RESPONSE AGREED TO (DATE)

RECOMMENDATION COMPLETE

AF REPRESENTATIVE (DATE)

ESTIMATING MANAGER (DATE

AF REPRESENTATIVE (DATE)

FUNCTIONAL MANAGER

(DATE)

DCAA REPRESENTATIVE (DATE)

# \*\*\* ASSET AND OP 8000-11 METHOD PROVIDES

### SUMMARIES

- TASK LEVEL
- MBS LEVEL
- ORGANIZATION LEVEL

OP 8000-11 IS NOW INCORPORATED AS SECTION III OF OPERATING PROCEDURE 61.

### SPREADS

- FUNCTION LEVEL

- MANHOLIRS OR MANMONTHS BY MONTH OR QUARTER

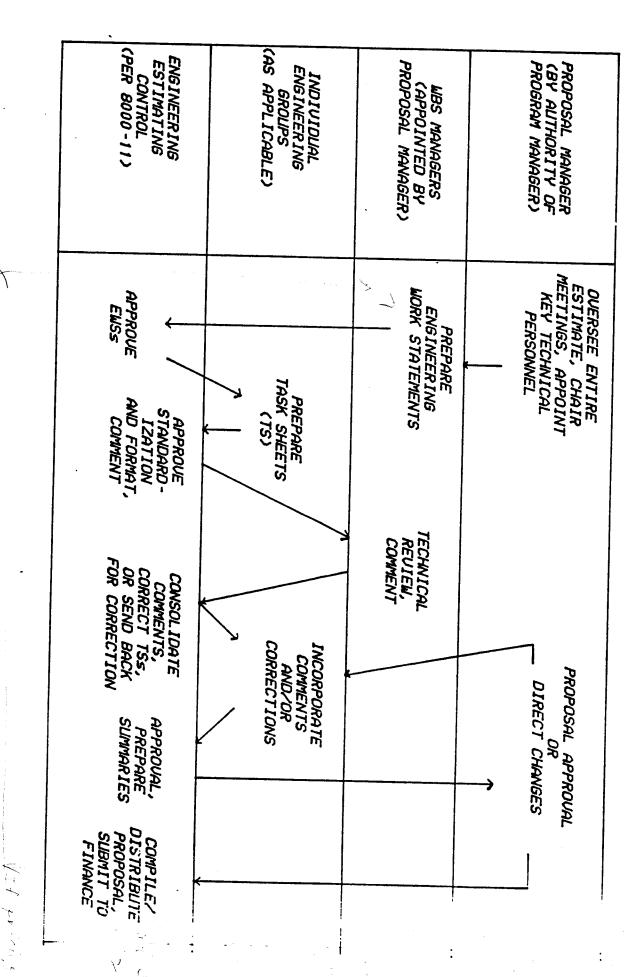
## ENGINEERING WORK STATEMENTS (EWSs)

- MILESTONES
- TASKS TRACEABLE TO THE SOW TASKS

### TASK SHEETS

- TASKS TRACEABLE TO EWS TASKS
- STANDARDIZED FORMAT

### ENGINEERING ESTIMATE (SIMPLIFIED FLOW)



- . PROPOSAL MANAGER FOCAL POINT DOCUMENT D3-11666-1
- A. ASSIGNS PRIME ENGINEER
- B. CHAIRS PROPOSAL TEAM
- C. ASSIGNS WAS MANAGER FOR EACH MAJOR WAS ELEMENT

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WBS MANAGER IAW 8000-11 (NOW INCORPORATED AS SECTION III OF OP 61).

- Þ WRITE EWS, OBTAIN REQUIRED REVIEW APPROVAL AND ENSURE ADEQUATE TIMELY DISTRIBUTION THROUGH ENGINEERING ESTIMATING CONTROL
- Ġ ENSURE TIMELY RECEIPT OF TASK SHEETS FROM ALL AFFECTED ORGANIZATIONS
- ? REVIEW TASK SHEETS, AS SCHEDULED BY EEC, TO ENSURE TASK REQUIREMENTS ARE COVERED WITHOUT DUPLICATION AND THAT TASK DEFINITIONS AND RATIONALE IS LOGICAL, COMPLETE AND WILL SUPPORT NEGOTIATIONS
- EEC IAW 8000-11 (NOW INCORPORATED AS SECTION III OF g P 61).

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- REVIEW AND APPROVE EWS PRIOR TO RELEASE AND RELEASE THROUGH RELEASE GROUP
- ENSURE COMPLIANCE WITH THE PROCEDURE

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- ? PREPARE ESTIMATE SUMMARIES REQUIRED BY FINANCE FOR PRICING ENGINEERING LABOR AND MANMONTH SUMMARIES THAT CONTRIBUTE TO EXPENDITIOUS ANALYSIS OF THE MAGNITUDE OF EACH WBS/TASK IN THE ENGINEERING SUPPORT PACKAGE
- D. COORDINATE ENGINEERING COST PACKAGE FOR REQUIRED APPROVALS
- Ш COMPLETE ENGINEERING ESTIMATE CHECKLIST AND FORWARD TO FINANCE PRICING WITH COST PACKAGE

### WHY WE WRITE TASK SHEETS

DATA REQUIRED BY 'TRUTH IN NEGOTIATIONS ACT' PUBLIC LAW 87-653.

IMPORTANCE OF ESTIMATING PROCEDURES.

TO COMPLY WITH THE REQUIREMENTS, IT IS REQUIRED THAT CONTRACTORS ORGANIZE THEIR ESTIMATING PROCEDURES SO THAT THE FINAL COST ESTIMATE CAN BE READILY TRACED BACK TO THE LOWEST COST LEVEL INPUT ON WHICH IT IS BASED. COST DATA MUST BE FURNISHED SO THAT THE FACTUAL DATA CAN BE IDENTIFIED FROM THE ESTIMATES.

### IMPLEMENTATION OF PUBLIC LAW 87-653

PUBLIC LAW PROVIDES THAT A CONTRACTOR MUST SUBMIT EITHER FACTUALLY, OR BY SPECIFIC IDENTIFICATION IN WRITING, COST OR PRICING DATA, AND CERTIFY THAT TO THE BEST OF HIS KNOWLEDGE AND BELIEF, THE COST OR PRICING DATA HE HAS SUBMITTED WAS ACCURATE, COMPLETE AND CURRENT.

## DEFINITION OF COST OR PRICING DATA - (FAR 15.801)

COST OR PRICING DATA CONSISTS OF ALL THE FACTS EXISTING UP TO THE TIME OF AGREEMENT ON PRICE WHICH PRUDENT BUYERS AND SELLERS WOULD REASONABLY EXPECT TO HAVE A SIGNIFICANT EFFECT ON THE PRICE NEGOTIATIONS.

IN SHORT, COST OR PRICING DATA ARE MORE THAN HISTORICAL ACCOUNTING DATA, THEY CONSIST OF ALL THE FACTS WHICH CAN REASONABLY BE EXPECTED TO CONTRIBUTE TO SOUND ESTIMATES OF FUTURE COSTS, AS WELL AS TO THE VALIDITY OF COSTS ALREADY INCURRED.

# WHY WE WRITE TASK SHEETS (Continued)

### WHY DATA MUST BE SUBMITTED

THE REGULATIONS PROVIDE THAT THE CONTRACTOR IS EXPECTED TO MAKE DISCLOSURE OF EXISTING VERIFIABLE DATA AND JUDGEMENTAL FACTORS APPLIED IN PROJECTING FROM KNOWN DATA TO THE ESTIMATE, AS WELL AS CONTINGENCIES USED IN THE PROPOSED PRICE. SUCH TERM DOES NOT INCLUDE INFORMATION THAT IS JUDGEMENTAL, BUT DOES INCLUDE THE FACTUAL INFORMATION FROM WHICH A JUDGEMENT IS BASED. IN SHORT, THE CONTRACTOR'S ESTIMATING PROCESS ITSELF NEEDS TO BE DISCLOSED.

## AUTHORITY TO REQUIRE COST OR PRICING DATA

AGENCY IF THE HEAD OF THE AGENCY DETERMINES THAT SUCH DATA ARE NECESSARY FOR THE EVALUATION BY THE AGENCY OF THE REASONABLENESS OF THE PRICE OF THE CONTRACT OR WHEN COST OR PRICING DATA ARE NOT REQUIRED TO BE SUBMITTED BY CONTRACTUAL EXCLUSION SUCH DATA MAY NEVERTHELESS BE REQUIRED TO BE SUBMITTED BY THE HEAD OF THE SUBCONTRACT.

## YOUR ROLE

# SUPERUISION/MANAGEMENT/LEAD ENGINEER

- CONUEY TO YOUR ORGANIZATION THE IMPORTANCE OF PROUIDING GOOD PROPOSALS AND COMPLYING WITH OPERATING PROCEDURE 8000-11. \*\*\*\*
- Ņ WHEN YOU ARE A PROPOSAL/WBS MANAGER, SELECT GREAT CARE. THE TASKS AND WRITE THE REQUIREMENTS WITH
- ζω WHEN YOU REVIEW YOUR ORGANIZATION'S TASK SHEETS:
- A. BE SURE YOU KNOW THE FORMAT AND TECHNICAL WRITING REQUIREMENTS WELL ENOUGH TO ENSURE COMPLIANCE.
- B. READ THE WORDS AS IF YOU WERE AN AF FINANCE TYPE - -WOULD YOU UNDERSTAND AND BUY YOUR PRICE?
- C. CAN YOU PROVE WHAT YOU STATE IN THE TASK RATIONALE?

\*\*\*\*

### **PREPARERS**

- WRITE THE TASK DEFINITION/ESTIMATE RATIONALE FOR AN AF FINANCE TYPE WHO DOESN'T UNDERSTAND WHAT IS REQUIRED TO ACCOMPLISH THE TASK
- Ņ FOLLOW THE FORMAT/TECHNICAL WRITING REQUIREMENTS OF THE PROCEDURE.
- ω PUT ALL DESCRIPTION OF YOUR EFFORT UNDER TASK DEFINITION AND BE PRECISE.
- 4 UNDER ESTIMATE RATIONALE, EXPLAIN AND JUSTIFY EVERY NUMBER IN THE CALCULATION AND THE UNITS FOR EACH.
- Ń UNDER CALCULATION, USE ONLY NUMBERS/UNITS COUERED BY ESTIMATE RATIONALE AND BE SURE UNITS EQUAL MH.
- ġ MAKE SURE SPREAD ADDS UP TO TOTAL MANHOURS OR MANMONTHS UNLESS BETA DISTRIBUTION FROM ASSET IS USED.

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Spiral Strange

## TASK REQUIREMENTS OF EWSS

RESPONSIBILITY OF PROPOSAL MANAGER AND WBS MANAGERS.

PREPARE AT HIGHEST SOW LEVEL WHICH IS FEASIBLE AND LOGICAL.

KEEP NUMBER OF TASKS TO A MINIMUM. OMIT SUBTASKS IF POSSIBLE:

DO NOT DEFINE ORGANIZATIONAL EFFORTS

- PROVIDE REQUIREMENTS AND LET EACH GROUP DEFINE ITS EFFORT ON ITS TASK SHEETS.
- -- DEFINE MEETING DURATION AND SUCH THINGS AS NUMBER OF EXPECTED ACTION ITEMS.

## ENGINEERING WORK STATEMENT (EWS)

SEPARATE EWSS WITH SECTIONS FOR MAJOR WBS ELEMENTS

PART OF CECM/SECTION III OR DISTRIBUTED UNDER SEPARATE COVER

MILESTONES

NUMBERED TASKS

### INITIAL EMPHASIS

- 1. PRECISE FORMAT
- 2. GOOD TECHNICAL WRITING
- ADEQUATE TASK DEFINITION/ACCURATE ESTIMATE RATIONALE
- USE OF QUALIFIED PERSONNEL IN THE ESTIMATING PROCESS

### NEXI SIEF -

- '. COLLECT SOLID STATISTICAL DATA ON WHAT MH ARE REQUIRED FOR SPECIFIC TASKS.
- 2. REFINE TASK DEFINITIONS.
- 3. MAKE USE OF GOOD RATIONALE SECOND NATURE AND GOOD TECHNICAL WRITING A HABIT.

SEZOISE ECP 999-99 CHANGE NO. BOEING NO IV > 1988 ے LOT 1 WBS NO. 6.2.0 > တ 0 z 0 (<u>a</u> Z 8 > <u>ک</u> S TITLE: Configuration Identification WBS MGR. (PHONE): W. Wallet (6-5472) (6) 0 N D TASK REQUIREMENTS X X L A S (WBS PAGE\_ 0 z 0 10f 2) Z <u>ح</u> WORK STATEMENT 1991 ENGINEERING S ō

power, cooling and hydraulics. capability/capacity and allocation to current development programs will be provided for Task 2. Develop Prime Item Development Specifications (PIDS) (SOW 6.2.1.1.2)

(range, operational weight and center-of-gravity). Approved mission and threat will be incorporated when provided by the procuring agency. A baseline aircraft configuration will

be established by calling out incorporated Engineering Change Proposals (ECPs). Baseline

Weapon system Design Handbooks will provide aircraft level performance characteristics

Separate volumes will be developed for the B-52G and B-52H aircraft as follows: The

Task 1. Develop Weapon System Design Handbooks (SOW 6.2.1.1.1)

TASKS TO BE PERFORMED:

accordance with DI-E-000. These eight areas have been selected for pricing purposes; actual update items will be determined as a result of analyses to be performed under this contract. Radar and Warning Receiver/Processor and Threat Display improvements will be developed in Control systems (ECSs), Forward-Looking Infrared (FLIR), AN/ALR-20 Receiver, Fire Control PIDS for Forward-Looking Radar (FLR), Autopilot, Electrical Power System, Environmental The FLR PIDS will address the following three functions:

ECP 999-99 CHANGE NO. BOEING WBS NO. 6.2.0 હ TITLE: Configuration Identification WBS MGR. (PHONE): W. Wallet (6-5472) (6) TASK REQUIREMENTS (WBS PAGE\_ 20f 2 WORK STATEMENT **ENGINEERING** 

TASKS TO BE PERFORMED:

antenna, etc.) R/M/S improvements plus improved resolution, and modifications for terrain Reliability/Maintainability/Supportability (R/M/S) improvements only (new power supply, following. Separate volumes are to be developed for Group A and B segments. (9)

b. The Autopilot PIDS will address the following three functions: R/M/S improvements only, R/M/S improvements plus Built-In Test (BIT) capabilities and R/M/S improvements plus modifications for manual/automatic terrain following.

Task 3. Supporting Analyses (SOW 6.2.1.1.2)

Analyses required to support the development of specifications delineated under Task 2. are to be identified and priced under this task. Analyses so identified will be included in proposed amendments to Statement of Work paragraph 6.2.1.1.2.

Task 4. Safety (SOW 6.2.8)

eight analyses will be conducted, corresponding to the eight Prime Item Development 5.5.1.1, to assess safety impact of approved configuration changes to the B-52G/H aircraft. Specifications (PIDS) developed under SOW 6.2.1.1.2. PHAs will be conducted at the direction of the customer. For pricing purposes, assume that Develop Preliminary Hazard Analyses (PHA) in accordance with MIL-STD-882A, paragraph

Task 5. Computer Resources (SOW 6.2.2.2)

Computing support will be required to maintain system specifications and provide configuration identification, control and accounting.

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PAGE 1 OF 2	WBS 6.2.0	CHANGE ECP 999-99	NAME Engineering Preparation	ORG. Engi		79911
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		ed)	Develop Weapon System Design Handbooks (SOW 6.2.1.1.1) (continued)	-
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### POPULATION DATA INITIAL DESIGN HOURS AVIONICS AND COMPLEX SUPPORT EQUIPMENT WBS

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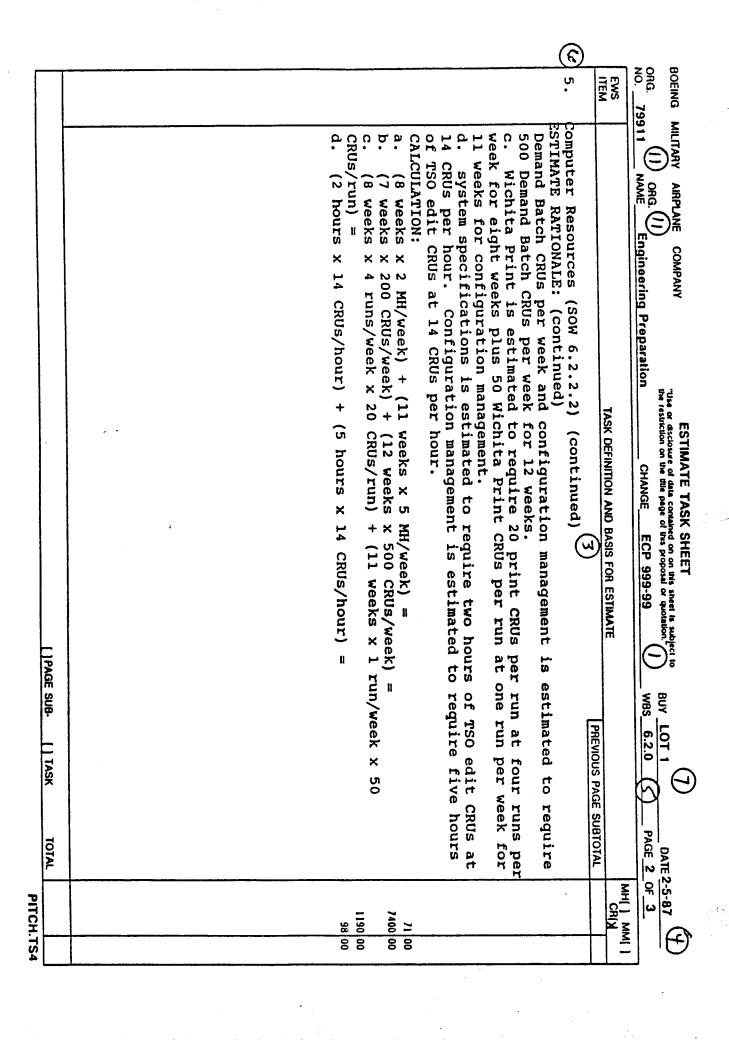
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<u>,                                     </u>	require one engineer for three days per trip.  (2) Identification of deficiencies and candidate improvements is estimated to require one engineer five days for each of the two FCSs.  (3) Prediction of candidate improvements performance is estimated to require two engineers six days each for each of the two FCSs.  (4) To study configurations and identify Group A requirements is estimated to require two engineers 10 days each for each of the two FCSs.  CALCULATION:	
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HANGE NO. PROGRAM CODE VBS TITLE Configuration Identification  1988  F RESOURCE UNIT 1 2 3 4 1 2 3  FIGURE Labor Hr. 40 40 100 20							:	Ŧ.	Business Labor
HANGE NO. PROGRAM CODE VBS TITLE Configuration Identification 1989 3 4 1 2 3 4 1 2 3 4 1 2 3				<b>20</b>	100	6	40		Scientific Labor
heet File # PITCH.TS4  NAME NO. PROGRAM CODE VBS TITLE 9-99  Configuration Identification	-	1990		-	w	1988	-	:	TYPE OF RESOURCE
heet file # PITCH.TS4	•	DATE W	6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	dication	on Iden	BS TITLE onfigurat	36	PROGRA	ВМАС СНАИGE NO. ЕСР 999-99
	i	3.3	20 C C				.124	# PITCH	2

### REPORT UTILITY

HP LaserJet - Rev 5.0 - 10 Oct 85 (c) Boeing Computer Services, 1984,1985

Enter Your Selection:

Note: This is an actual example and does not necessarily correspond to any previous task sheet example.

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13870312 ENGINEERING LABOR HOURS ESTIMATE BY FUNCTION BY ORGANIZATION CHANGE: ECP 0014 BUY/LOT: PRODUCTION - 8-18 SSP COMPANION CHANGE

PAGE

ORGANIZATION: L-11772 LABOR HRS TOTAL FOR 1.01: PRODUCTION GRP: ENPGMH LABOR HRS TOTAL FOR ORG: L-H772 LABOR HRS TOTAL FOR WBS: 1.8.4 LABOR HRS TOTAL FOR TASK: 02. LBR HRS = - TEST AND EVALUATION 4704.0 4704.0 8686.0 4868.0 4704.0 87 88 88 89 88 89 1176.0 1176.0 1176.0 1176.0 1441.0 364.0 0.0 0.0 0.0 0.0 JAN 0.0 NAL JAK HAL HAG 1441.0 1176.0 1176.0 1176.0 WBS: 1.8.4 1176.0 110.0 0.0 0.0 0.0 FEB FEB 0.0 0.0 FEB FEB MGR: R. STRIEGEL 0.0 O.O 0.0 0.0 0.0 0.0 MAR - SYSTEM ASSEMBLY, INSTALLATION & CHECKOUT (ON-SITE) 110.0 0.0 APR APR 0.0 0.0 APR APR 0.0 APR 110.0 0.0 MAY 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 MAY X ¥Α FUNCTION: ENPOHH 174.0 0.0 0.0 0.0 0.0 0.0 0.0 Ę Ĕ Ē Ĕ 140.0 125.0 ٦ 0.0 0.0 0.0 0.0 0.0 يَا Ę ياد 165.0 125.0 55.0 **AU6** 0.0 AUG 0.0 0.0 0.0 0.0 λ A ફ 320.0 110.0 55.0 SEP 0.0 SEP 0.0 0.0 0.0 0.0 SEP SEP SEP 319.0 110.0 54.0 DCT 0.0 8 8 2 8 1049.0 245.0 784.0 784.0 784.0 784.0 0.0 NO. ¥0 Ş NO V **M** 0.0 0.0 1568.0 1568.0 1568.0 1568.0 270.0 DEC 0.0 230 0.0 0.0 DEC 030 0.0 DEC

HOTE: This is an actual example and does not necessarily correspond to any previous task sheet example.

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# ENGINEERING LABOR HOURS ESTIMATE BY WBS BY TASK BY ORG

PAGE 1

WBS: 1.1.1 - 8-18 WST					MGR:	<i>.</i>								
TA!	TASK: 01.	- REQUIRI	- REQUIREMENTS COORDINATION	ROINATION										
ORG: L-H723 LBR HRS =	36.0	87	JAN 0.0	FEB 0.0	MAR 0.0	0.0	0.0	0.0	JUL 0.0	AUG 0.0	SEP 0.0	0.0	36.0	DEC 0.0
LABOR HRS TOTAL FOR	36.0	87	JAN 0.0	FEB .	HAR 0.0	APR	0.0	0.0	JUL 0.0	AUG 0.0	SEP 0.0	0.0	36.0	DEC 0.0
TA	TASK: 02.	- DRAWING	- DRAWING REVISIONS	s										
			NAL	FEB .	MAR	APR	НАҮ	NUC	JUL	AUG	SEP	OCT	VOK	DEC
ORG: L-H721 LBR HRS *	84.0	87	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	84.0	0.0	0.0
LABOR HRS TOTAL FOR TASK: 02.	84.0	87	JAN 0.0	FEB 0.0	MAR 0.0	APR	0.0	0.0	JUL 0.0	AUG 0.0	SEP 0.0	0CT 84.0	0.0	0.0
LABOR HRS TOTAL FOR WBS: 1.1.1	120.0	87	JAN 0.0	FEB 0.0	HAR 0.0	APR 0.0	0.0	0.0	JUL 0.0	AUG 0.0	SEP 0.0	0CT 84.0	96.0	0.0

HOTE: This is an actual example and does not necessarily correspond to any previous task sheet example.

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# ENGINEERING LABOR HOURS ESTIMATE MATRIX BY WBS BY TASK CHANGE: ECP 0014 BUY/LOT: DEVELOPMENT - 8-18 SSP COMPANION CHANGE

PAGE 1

WRS: 1.1.12	WAS: 1.1.12 - COMPUTER PROGRAM/COMPUTER DATA INTEGRATION	COMPUTER DATA I	NTEGRATION	MGR:					
ORG	TOTAL TASK 01.	TOTAL TASK 02.	TOTAL TASK 03.	TOTAL TASK 04.	TOTAL TASK 06.	TOTAL Task 07.	TOTAL TASK 08.	TOTAL TASK 09.	TOTAL W8S 1.1.12
-н713	•	•	•	~ i	60.0			•	60.0
1-11/34	•	•	•	•	1550.0	560.0	1080.0	r	3190.0
I · H/35		1	•	•	•	ı	ŧ	160.0	160.0
L-H736	240.0	960.0	304.0	304.0	•	•	•	•	1808.0
TOTAL	240.0	960.0	304.0	304.0	1610.0	560.0	1080.0	160.0	5218.0

PAGE 2

19870312		NOTE:
		This is an actua
CHANGE: ECP 0014		NOTE: This is an actual example and does not necessarily correspond to any previous task sinest
CHANGE: ECP 0014  BUY/LOT: DEVELOPMENT - 8-18 ST	CECE DOLLOS ESTI	necessarily correspond
BUY/LOT: DEVELOPMENT - B-1B SSP COMPANION CHANGE	MATE MATRIY BY WRS	TO BITY PIEVIOUS COSK
t	/RS	133115

67488.8	1810.0	7304.0	5234.0	840.0	6130.0	40.0	120.0	TOTAL
6954.0			160.0	840.0	5834.0	40.0	•	L-11/72
296.0	•	•	•	•	296.0	ı	•	∟-н762
2940.0	•	2940.0	•	•	•	•	•	L-11754
7830.0	•	•	•	•	•		•	L-11752
3124.0	•	3124.0	•	•	•		•	L-H743
3200.0	•	•	•		•		٠	L-H737
12144.3	1120.0	•	208.0	•	•			L-11736
240.0	80.0	•	ŧ	•	•		•	111735
25212.5	•	1240.0	832.0	•	•			L-H734
1400.0	•	•	736.0	•	•	•		L-11733
3298.0	ā	•	3298.0	•		•	•	L-11731
72.0	•	•		•			36.0	L-H723
168.0	•	•	•	•	•		84.0	1-11721
610.0	610.0	1	•	1	•	ı	•	3-7111
TOTAL PROGRAM	TOTAL WBS	TOTAL WBS	TOTAL WBS	TOTAL WBS	TOTAL WBS 1.5.4	TOTAL WBS	TOTAL WBS	ORG

Note: This is an actual example and does not necessarily correspond to previous task sheet examples.

0.0	QUARTER 4 0.0	QUARTER 3 0.0	QUARTER 2 0.0	QUARTER 1 1240.0	87	1240.0	LABOR HRS TOTAL FOR FCT: ENPGMH
0. A	QUARTER 4	QUARTER 3 0.0	QUARTER 2 0.0	QUARTER 1 1240.0	87	1240.0	LABOR HRS TOTAL FOR TASK: 17.
							ORG: L-H734
							FCT: ENPGMH
0.0	-	376.0	628.0	676.0	88		
692.0	69;	568.0	0.0	0.0	87	2940.0	FCT: ENILSH =
R •	QUARTER 4	QUARTER 3	QUARTER 2	QUARTER 1			LABOR HRS TOTAL FOR
0.0		376.0	628.0	676.0	88		
692.0	69:	568.0	0.0	0.0	87	2940.0	TASK: 16.
<b>20</b>	OUARTER 4	OUARTER 3	OUARTER 2	OHARTER 1			I AROD HOS TOTAL FOR
							ORG: L-H754
							FCT: ENILSH
142.0	14	852.0	710.0	852.0	88		
568.0	56.	. 0.0	0.0	0.0	87	3124.0	FCT: ENPGMH ==
<b>7</b> 0	QUARTER 4	QUARTER 3	QUARTER 2	QUARTER 1			LABOR HRS TOTAL FOR
142.0	14	852.0	710.0	852.0	88		
568.0	56	0.0	0.0	0.0	87	3124.0	IASK: 01.
<b>7</b> 0	QUARTER 4	QUARTER 3	QUARTER 2	QUARTER 1			I ABOR HRS TOTAL FOR
							ORG: L-H743
							FCT: ENPGNH
							NBS: 1.6.2
7.00		- 8-18 SSP COMPANION CHANGE	ECP 0014 BUY/LOT: DEVELOPMENT - B.		ה אברא	CHANGE	19870312
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