FINAL REPORT

BACK-UP .DATA.
for

TEMPORARY STAGING
for
SHIPYARDS

Prepared for

SNAME Panel SP-B
MarAd Task ES-8-15
Under direction of
H.B. Haynard & Co.

Prepared by:

Industrial Engineering- Department
Bethlehem Steel Corporation.
Marine Construction.Group
Sparrows Point, Mtislmnd
July, 1983
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FINAL REPORT

BACK-UP DATA
for
TEMPORARY STAGING
for
SHIYARDS

Prepared for
SNAME Panel SP-8
HarAd Task ES-8-I5
Under direction of
H.B. Maynard & Co.

Prepared by
Industrial Engineering Department
Bethlehem Steel Corporation:
Marine Construction Group
Sparrous Point-Maryland
July, 1983
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#### 5.1 SUMMARY
- CENTER TANK
- WING TANK
- TANK STAGING PLATFORM
- EXTERIOR SHELL
- PIPE STAGING

#### 5.2 SYNTHESIS AND ANALYSIS
- CENTER TANK
- WING TANK
- TANK STAGING PLATFORM
- EXTERIOR SHELL
- PIPE STAGING

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SECTION 1
FINAL REPORT - BACK-UP DATA

1.1 SCOPE

This manual covers the back-up data necessary for the final report on temporary staging. Areas included are (1) center tanks, (2) wing tanks, (3) tank staging platform, (4) exterior shell, and (5) pipe staging.
SECTION 2
JOB LAYOUT - WORK AREAS

2.1 WORK AREAS

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TOOLS:
- WRENCH-1, CARP-1
- HAMMER-1, CARP-1
- STEEL-TAPE-1, CARP-1

OBJECTS:
JOB LAYOUT - WORK AREAS

BRKT 
STAN 
BOARDS 
HANDRAIL 
LADR 
NUT 
BOLT 
SCLIP 
LCLIP 

EQUIPMENT:
CRANE 

OPERATORS:
CARP-1 
CARP-2 
CARP-3 
C-OPER 

CARRIERS:
TOOLBOX-1 
TOOLBOX-1 
TOOLBOX-2 
TOOLBOX-2 

From | To | Steps
--- | --- | ---
BRKT-1 | BRKT-2 | 7
ERKT-1 | BULKHEAD | 0
BRKT-1 | TANKTOP | 0
BRKT-1 | CR-1 | 11
BRKT-1 | BIN-1 | 11
BRKT-1 | BIN-2 | 13
BRKT-1 | LU-PILE | 17
RRKT-1 | HR-PILE | 14
BRKT-1 | LDR-PILE | 24
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EIRKT-2 | TANKTOP | 0
BRKT-2 | CR-1 | 11
BRKT-2 | BIN-1 | 11
BRKT-2 | BIN-2 | 13
BRKT-2 | LU-PILE | 17
BRKT-2 | HR-PILE | 14
BRKT-2 | LDR-PILE | 24
BRKT-2 | TANKTOP | 0

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OBJECTS:
JOB LAYOUT - WORK AREAS

BRKT  BIN-1  FRAG
STAN  BIN-2  FRAG
BOARDS  LU-PILE  FRAG
HANDRAIL  HR-PILE  FRAG
LADR  LDR-PILE  FRAG
NUT  TOOLBOX-1  FRAG
BOLT  TOOLBOX-1  FRAG
SCLIP  TOOLBOX-2  FRAG
LCLIP  TOOLBOX-2  FRAG
MIRE-ROPE  TOOLBOX-2  FRAG

EQUIPMENT:
CRANE  CR-1  80P

OPERATORS:
CARP-1  TANKTOP  25,15
CARP-2  TANKTOP  45,15
CARP-3  BIN-1  12,1 B
C-OPER  CR-1  5,1

CARRIERS:
TOOLBOX-1  BIN-1  12,3
TOOLBOX-1  BIN-1  12,3
TOOLBOX-2  BULKHEAD  35,19
TOOLBOX-2  BULKHEAD  35,19

From  To  Steps
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JOB LAYOUT - WORK AREAS

WORKPLACES:
- BRKT-1: 20,15  0,5
- BRKT-2: 50,15  0,5
- BULKHEAD: 0,20  71,0
- TANKTOP: 0,0  71,21
- BRKT-PILE: 0,18  10,2  BEND
- HATL-PILE: 15,5  10,3  BEND
- BD-PILE: 30,5  10,3  BEND
- LDR-PILE: 45,5  10,3  BEND
- BTRUTH: 30,16  10,3
- KENHOLE: 5,10  10,5
- LDR: 22,20  0,0

TOOLS:
- WRENCH-1
- PLIER-1

OBJECTS:
- BRKT
- BOARD

Page 8
JOB LAYOUT - WORK AREAS

STAN       BULKHEAD       FRAG
HANDRAIL   BULKHEAD       FRAG
LADR       BULKHEAD       FRAG
NUT        BULKHEAD       FRAG
BOLT       BULKHEAD       FRAG
LCLIP      BULKHEAD       FRAG
HIRE-ROPE  BULKHEAD       FRAG
TORCH      BULKHEAD       FRAG
CABLE      BTRWTH          FRAG

EQUIPMENT:
WINCH-FREE  BTFWTH         0.38 M
WINCH-UP     BTRWTH         1.5 M
WINCH-DOWN   BTRUTH         0.5 M

OPERATORS:
CARP-1       BULKHEAD       25,15
CARP-2       BULKHEAD       45,15
CARP-3       MATL-PILE      10.6
WINCH-OPER    BTRWTH         35,18

CARRIERS:
TOOLBOX-1    MATL-PILE      10,8
TOOLBOX-1    MATL-PILE      10,8

From ------------ To ------------- steps
----------- ------------ ---

BRKT-1     BRKT-2        7
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BRKT-1     TANKTOP      0
BRKT-1     BRKT-PILE    7
RRKT-1     MATL-PILE    0
BRKT-1     BD-PILE      0
BRKT-1     LDR-PILE     0
BRKT-1     BTRWTH       0
BRKT-1     MENHOLE      0
BRKT-1     LDR          1
BRKT-1     BULKHEAD     0
BRKT-2     TANKTOP      0
BRKT-2     BRKT-PILE    14
BRKT-2     MATL-PILE    0
BRKT-2     BD-PILE      0
BRKT-2     LDR-PILE     0
BRKT-2     BTRUTH       0
BRKT-2     MENHOLE      0
JOB LAYOUT - WORK AREAS

BRKT-2 TANKTOP LDR 6
RULKHEAD TANKTOP 0
BULKHEAD BRKT-PILE 0
BULKHEAD MATL-PILE 0
BULKHEAD BD-PILE 0
BULKHEAD LDM-PILE 0
BULKHEAD BTRWTH 0
BULKHEAD MENHOLE 0
BULKHEAD LDR 0
TANKTOP BRKT-PILE 0
TANKTOP MATL-PILE 0
TANKTOP BD-PILE 0
TANKTOP LDR-PILE 0
TANKTOP BTRWTH 0
TANKTOP MENHOLE 0
TANKTOP LDR 0
BRKT-PILE MATL-PILE 0
BRKT-PILE BD-PILE 0
BRKT-PILE LDR-PILE 0
BRKT-PILE BTRUTH 0
BRKT-PILE MENHOLE 0
BRKT-PILE LDR 0
MATL-PILE BD-PILE 0
MATL-PILE LDR-PILE 16
MATL-PILE BTRUTH 0
MATL-PILE MENHOLE 0
MATL-PILE LDR 0
BD-PILE LDR-PILE 8
BD-PILE BTRUTH 0
BD-PILE MENHOLE 0
BD-PILE LDR 0
LDR-PILE BTRWTH 0
LDR-PILE MENHOLE 0
LDR-PILE LDR 0
BTRWTH MENHOLE 0
BTRWTH LDR 0
MENHOLE LDR 0
WORKPLACES:
BRKT-1
BRKT-2
BULKHEAD
TANKTOP
BRKT-FILE
MATL-PILE
BD-PILE
LDR-PILE
BTRWTH
MENHOLE
TOOLS:
WRENCH-1
PLIER-1
OBJECTS:
BRKT
BOARD

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PLIER-1: CARP-1
BRKT: BULKHEAD
BOARD: BULKHEAD

FRAG
JOB LAYOUT - WORK AREAS

STAN  
MANDRAIL  
LADR  
NUT  
BOLT  
LCLIP  
WIRE-ROPE  
TORCH  
CABLE  

BULKHEAD  
FRAG  
BULKHEAD  
FRAG  
BULKHEAD  
FRAG  
BULKHEAD  
FRAG  
BULKHEAD  
FRAG  
BULKHEAD  
FRAG  

EQUIPMENT:
WINCH-FREE
WINCH-UP
WINCH-DOWN

MENHOLE  
0.38 M  
MENHOLE  
1.5 M  
MENHOLE  
0.5 M  

OPERATORS:
CARP-1  
CARP-2  
CARP-3  
WINCH-OPER

BULKHEAD  
25,15 B  
BULKHEAD  
45,15  
HATL-FILE  
10,6  
MENHOLE  
10,14  

CARRIERS:
TOOLBOX-1  
TOOLBOX-1

HATL-PILE  
10,8  
HATL-PILE  
10,8  

From  
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To  
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Steps  
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BRKT-1
BRKT-1  
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BRKT-1
BRKT-1  
BRKT-1
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BRKT-2
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BRKT-2  
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BRKT-2  
RRKT-2

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### JOB LAYOUT - WORK AREAS

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JOB LAYOUT - WORK AREAS

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## JOB LAYOUT - WORK AREAS

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### BASIN

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## TOOLS:

- WRENCH-1: CARP-1
- HAMMER-1: CARP-1
- STEEL-TAPE-1: CARP-1
JOB LAYOUT - WORK AREAS

PLIER-1

OBJECTS:
BRKT  BIN-1  FRAG
STAN  BIN-2  FRAG
BOARD  LU-PILE  FRAG
HANDRAIL  HR-PILE  FRAG
LADR  LDR-PILE  FRAG
NUT  TOOLBOX-1  FRAG
BOLT  TOOLBOX-1  FRAG
SCLIP  TOOLBOX-2  FRAG
LCLIP  TOOLBOX-2  FRAG
WIREROPE  TOOLBOX-2  FRAG

EQUIPMENT:
CRANE  CR-1  01P

OPERATORS:
CARP-1  WING-TANK  25,10
CARP-2  WING-TANK  45,10
CARP-3  BIN-1  12,1 B
C-OPER  CR-1  5,1

CARRIERS:
TOOLBOX-1  BIN-1  12,3
TOOLBOX-1  BIN-1  12,3
TOOLBOX-2  BULKHEAD  35,8
TOOLBOX-2  BULKHEAD  35,8

From  To  Steps
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BASIN  BULKHEAD  0
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BASIN  LDR  0
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BASIN  HR-PILE  0
BASIN  LDR-PILE  0
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PAGE 19
JOB LAYOUT - WORK AREAS

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HAMMER-1     CARP-1
STEEL-TAPE-1 CARP-1
PLIER-1      CARP-1

OBJECTS:
BRKT         BIN-1    FRAG
STAN         BIN-2    FRAG
BOARD        LU-PILE  FRAG
HANDRAIL     HR-PILE  FRAG
LADR         LDR-PILE FRAG
NUT          TOOLBOX-1 FRAG
BOLT         TOOLBOX-1 FRAG
SCLIP        TOOLBOX-2 FRAG
LCLIP        TOOLBOX-2 FRAG
WIREROPE     TOOLBOX-2 FRAG

EQUIPMENT:
CRANE        CR-1     0

OPERATORS:
CARP-1       WING-TANK 25,10
CARP-2       WING-TANK 45,10
CARP-3       BIN-1     12,1 B
C-OPER       CR-1     5,1

CARRIERS:
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CR-2 60,0 10,2
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PLATFORM 0,18 0,0
35-X-20-FT 0,17 0,0

TOOLS:
BROOM STORE-2
WRENCH CARP-1
HAMMER CARP-1
STEEL-TAPE CARP-1
MARKER CARP-1
PRINT CARP-1

OBJECTS:
PALLETS STORE-1
BINS STORE-1
ANGLES STORE-2
I-BEAM STORE-2
BOARDS LUMBER-PILE
FIN-PLATFORM TANK-STAGING-PLATFORM
NUTS TOOLBOX-1
BOLTS TOOLBOX-1
MASHERS TOOLBOX-1
BLOCKS TOOLBOX-2

EQUIPMENT:
CRANE-1 CR-1 01P
CRANE-2 CR-2 01P

OPERATORS:
CARP-1 I-6 4,10
CARP-2 I-6 7,10
HOOKER-ON CR-1 12,3

CARRIERS:
TOOLBOX-1 I-1 10,10
TOOLBOX-1 I-1 10,10
TOOLBOX-2 LUMBER-PILE 65,13
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From ------------ To _________ Steps ________
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| CABLE-SLEEVE   | MENHOLE  | FRAG         |
| CABLE          | MENHOLE  | FRAG         |
| SHACKLE        | TOOLBOX-1| FRAG         |
| NUT            | TOOLBOX-1| FRAG         |
**JOB LAYOUT - WORK AREAS**

**BOLT**

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- CARP-1
- CARP-2
- CARP-3
- CARP-4

**CARRIERS:**
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| (X) | TYPICAL | SHIP |

#### ROAD

| (X) | CR-1 | S-7 |

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- HAMMER: CARP-1

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- I-BEAMS: TANK-STAGING-PLATFORM FRAG
- BOARDS: TANK-STAGING-PLATFORM FRAG
- FIN-PLATFORM: TANK-STAGING-PLATFORM FRAG
- NUTS: TOOLBOX-1 FRAG
- BOLTS: TOOLBOX-1 FRAG
- WASHERS: TOOLBOX-1 FRAG
- BLOCKS: TOOLBOX-2 FRAG

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- CARP-1: I-1 4910 B
- CARP-2: I-6 7,10

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- TOOLBOX-1: I-1 10,10
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TANK-STAGING-PLATFORM

TYPICAL

PLATFORM

35-X-20-FT

CENTER-TANK

TANK-TOP

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TANK-STAGING-PLATFORM

TYPICAL

PLATFORM

35-X-20-FT

CENTER-TANK

TANK-TOP
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### JOB LAYOUT - WORK AREAS

#### MENHOLE
- AFT-BHD
- FWD-BHD
- LUMBER-PILE

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- ANGLES
- I-BEAMS
- BOARDS
- CABLE

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- WINCH-UF
- WINCH-DOWN
- WINCH-FREE

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- CARP-2
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Note: The table above represents the job layout and work areas for a specific project or site. Each cell indicates the presence or absence of a particular feature or area, with numerical values indicating the quantity or specific details as required by the project specifications.
## JOB LAYOUT - WORK AREAS

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JOB LAYOUT - WORK AREAS

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JOB LAYOUT - WORK AREAS

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TANK-STAGING-PLATFORM  TANK-Top  0
TANK-STAGING-F'LATFORH  MENHOLE  0
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TANK-STAGING-PLATFORM  FWD-BHD  0
TANK-STAGING-PLATFORM  LUMBER-PILE  0
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TYPICAL  TANK-Top  0
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PLATFORM  LUMBER-PILE  0
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CENTER-TANK  MENHOLE  0
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CENTER-TANK  FWD-BHD  0
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TANK-Top  MENHOLE  0
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TANK-Top  FWD-BHD  0
TANK-Top  LUMBER-PILE  0
MENHOLE  AFT-BHD  0
MENHOLE  FWD-BHD  0
MENHOLE  LUMBER-PILE  0
AFT-BHD  FWD-BHD  0
AFT-BHD  LUMBER-PILE  0
FWD-BHD  LUMBER-PILE  0
JOB LAYOUT - WORK AREAS

---

LAD ---- STAR-BHD ---

BRKT-1    BRKT-2

---

TYPICAL CENTER-TANK

AFT-BHD

FWD-BHD    PLATFORM

PORT-BHD

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TOOLS:

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HAMMER-1    CARP-1
WRENCH-2    CARP-2
HAMMER-2    CARP-2

OBJECTS:

BOARDS    PLATFORM    FRAG
JOB LAYOUT - WORK AREAS

STANCHION  STAR-BHD  FRAG
HANDRAIL   STAR-BHD  FRAG
NAILS      TOOLBOX-1  FRAG

EQUIPMENT:
TORCH      PLATFORM  1 M

OPERATORS:
CARP-1     PLATFORM  15,12
CARP-2     PLATFORM  20,12
CARP-3     PLATFORM  25,12

CARRIERS:
TOOLBOX-1  PLATFORM  20.5
TOOLBOX-1  PLATFORM  20.5

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JOB LAYOUT - WORK AREAS

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STAR-BHD: BRKT-2 0
PORT-BHD: AFT-BHD 0
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AFT-BHD: BRKT-2 0
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FWD-BHD: BRKT-1 0
FWD-BHD: BRKT-2 0
LAD: BRKT-1 3
LAD: BRKT-2 3
BRKT-1: BRKT-2 6
**JOB LAYOUT - WORK AREAS**

--- LAD --- STAR-BHD ---

BRKT-1  BRKT-2

TYPICAL
CENTER-TANK
PLATFORM
AFT-BH
FWD-BHD

Name | Location | Body/Frag/1
--- | --- | ---
WORKPLACES:
TYPICAL | 50,12 | 0,0
CENTER-TANK | 50,11 | 0,0
PLATFORM | 5,2 | 30,16
STAR-BHD | 0,20 | 70,0
PORT-BHD | 0,0 | 70,0
AFT-BHD | 70,0 | 1,20
FWD-BHD | 0,0 | 1,20
LAD | 16,20 | 0,0
BRKT-1 | 10,19 | 0,0
BRKT-2 | 20,19 | 0,0

TOOLS:
PRYBAR | STAR-BHD
HAMMER-1 | CARP-1
WRENCH-1 | CARP-1
HAMMER-2 | CARP-2
WRENCH-2 | CARP-2

OBJECTS:
## JOB LAYOUT - WORK AREAS

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#### EQUIPMENT:

| TORCH        | PLATFORM      | 1 M           |

#### OPERATORS:

| CARP-1       | PLATFORM      | 15,12         |
| CARP-2       | PLATFORM      | 20,12         |
| CARP-3       | PLATFORM      | 25,12 B       |

#### CARRIERS:

| TOOLBOX-1    | PLATFORM      | 20,5          |
| TOOLBOX-1    | PLATFORM      | 20,5          |

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| STEEL-TAPE-1    | CARP-1     |
| WRENCH-2        | CARP-2     |
JOB LAYOUT - WORK AREAS

HAMMER-2
STEEL-TAPE-2

OBJECTS:
BRKT
STAN
BOARD
HANDRAIL
LARD
PLATFORM
NUT
BOLT
SCLIP
LCLIP

EQUIPMENT:
CRANE

OPERATORS:
C-OPER
CARP-1
CARP-2
CARP-3

CARRIERS:
TOOLBOX-1
TOOLBOX-2
TOOLBOX-2
TOOLBOX-2

From
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To

steps

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CR-1

CR-1
BRKT-1
BRKT-2
BIN-1

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50,8
35,14

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9,12
9,12

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12

PAGE 61
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| CR-1    | SIDE-SHELL | 60 |
| P-REST  | SIDE-SHELL | 46 |
### JOB LAYOUT - WORK AREAS

---

**BASIN**

---

**ROAD**

---

**BERM**

---

**BIN-1** | **BIN-2** | **BD-PILE** | **HR-PILE** | **LDR-PILE**
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SECTION 2
JOB LAYOUT - WORK AREAS

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JOB LAYOUT - WORK AREAS

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SIDE-SHELL

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(X)                         (X)

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!SECTION-1!                !SECTION-2!

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WAY

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(X)                         (X)

---

! BRACE-PILE

---

! CR-1!

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! END-PC-RACK

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! BD-PILE!                  ! BIN-2!

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! HR-PILE

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PAGE 69
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- CRANE: CR-1

**OPERATORS:**
- CARF-1: SECTION-1 20,15 B
- CARP-2: SECTION-2 50,15
- CARP-3: END-PC-RACK 12,5
- C-OPER: CR-1 5,4

**CARRIERS:**
- TOOLBOX-1: BIN-2
- TOOLBOX-1: BIN-2

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**From** | **To** | **Steps**
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SECTION-1 | UAY | 0
SECTION-1 | CR-1 | 180
SECTION-1 | END-PC-RACK | 22
SECTION-1 | BRACE-PILE | 19
SECTION-1 | BD-PILE | 20
SECTION-1 | BIN-2 | 24
SECTION-1 | HR-PILE | 28
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JOB LAYOUT - WORK AREAS

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SIDE-SHELL

END-PC-1  END-PC-2  END-PC-3
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--- WAY ---

(X)  !MATL-PILE!

(X)  !BRACE-PILE

(X)  !CR-1

(X)  END-PC-RACK  !BD-PILE!  !BIN-2!  !HR-PILE!
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WRENCH-2  CARP-2

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TORCH  SIDE-SHELL  FRAG
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- Crane: CR-1

**OPERATORS:**

- CARP-1
- CARP-2
- CARP-3
- C-OPER

**CARRIERS:**

- TOOLBOX-1
- TOOLBOX-1

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SECTION 3
MANUAL METHODS

435. WELD STAGING BRACKET (CLIP) ON BULKHEAD (OR ANY STRUCTURE) WITH STICK ELECTRODE AT ANY TANKS AND VOIDS (SHIP) WELDING
PER 100 CLIPS OFG: 3
WELD TO MEET SAFETY REQUIREMENTS. RATE PER 100 CLIPS. RATE INCLUDES MANUAL ELEMENTS.

1 WELD VERTICAL 3/8" FILLET WELD (10" PER CLIP) WITH 10% OVERWELD USING 6011 3/16 ELECTRODE OR COMPARABLE (7018 5/32).

438. WELD LADDER (CLIP) (SECURES LADDER) ON BULKHEAD (OR ANY STRUCTURE) WITH STICK ELECTRODE AT ANY TANKS AND VOIDS (SHIP) WELDING
PER 100 LADDERS OR 400 CLIPS OFG: 3
WELD TO MEET SAFETY REQUIREMENTS. RATE PER 100 LADDERS (400 CLIPS).
RATE INCLUDES MANUAL ELEMENTS.

1 WELD VERTICAL 3/8" FILLET WELD (4" PER CLIP) WITH 10% OVERWELD USING 6011 3/16 ELECTRODE OR COMPARABLE (7018 5/32).

440. WELD HANDRAIL (CONNECTIONS) ON STANCHION WITH STICK ELECTRODE AT ANY TANKS AND VOIDS (SHIP) WELDING
PER 100 PIECES OF HANDRAIL OFG: 3
WELD TO MEET SAFETY REQUIREMENTS. RATE PER 100 PIECES OF AHNDRAIL (AVG. 1 CONNECTION EACH). RATE INCLUDES MANUAL ELEMENTS.

1 WELD HORIZONTAL 1/4" FILLET WELD (5" PER CONNECTION) USING 6011 3/16 ELECTRODE OR COMPARABLE (7018 5/32).
MANUAL METHODS

378. TRANSPORT STAGING BRACKET WITH (GROVE CRANE) AT TANK (OR WAY) CAR
PER STAGING BRACKET OFG: 3 02-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS TRANSPORTING BRACKETS FROM...
* ...BIN-1 TO BULKHEAD
* DISTANCES FROM CRANE-REST TO BIN-1 AND..
* ...FROM BIN-1 TO BULKHEAD ARE AVERAGE...
* ...DISTANCES IN A CENTER TANK 98'X50'
* MAXIMUM NUMBER OF BRKTS IN LIFT = 6
C-OPER BEGINS AT CR-1

1 TRANSPORT BRKT FROM BIN-1 USING CRANE WITH HOOK+SLING TO BULKH
BTWN BRKTS ) PLACE+ADJUST RETURN TO CR-1 F 1 / 6

381, TRANSPORT LADDERS WITH (GROVE CRANE) AT TANK CARPENTER
PER LADDER. OFG: 3 03-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS TRANSPORTING LADDERS FROM....
* ...LDR-PILE TO BULKHEAD
* DISTANCES FROM CRANE-REST TO LDR-PILE...
* ...AND FROM LDR-PILE TO BULKHEAD ARE...
* ...AVERAGE DISTANCES IN A CENTER TANK...
* ...98'X50'
* MAXIMUM NUMBER OF LADDERS IN LIFT = 3
C-OPER BEGINS AT CR-1

1 TRANSPORT LADR FROM LDR-PILE USING CRANE WITH HOOK+SLING TO BUI
( AT. LDR PLACE+ADJUST RETURN TO CR-1 F 1 / 3
MANUAL METHODS

384. POSITION (SECURE) (ACCESS) LADDER FOR BULKHEAD WITH HAMMER (AND LADDER CLIPS) AT TANK CARPENTER

PER LADDER OFG: 3 03-FEB-82

REPRESENTS ELAPSED TIME

* REPRESENTS SECURING A LADDER TO THE.....
* .....BULKHEAD USING 4 LADDER CLIPS
* WELDING OF CLIPS WILL BE DONE IN A.....
* .....SEPARATE SUB OPERATION

CARP-1 BEGINS AT LDR

1 CARP-1 LOOSEN 4 PAINT ON BHD AT LDR 4 STRIKES USING HAMMER-1 ASIDE TO CARP-1
2 CARP-2 GET+PLACE WITH BEND 4 LCLIPS FROM TOOLBOX-2 TO LDR ( TACKING UPON PLACEMENT ) PF 4 ( 6 )

387. TRANSPORT STAGING PLANK WITH (GROVE CRANE) AT TANK CARPENTER.

PER STAGING PLANK OFG: 3 03-FEB-82

REPRESENTS ELAPSED TIME

* REPRESENTS TRANSPORTING BOARDS FROM+*,+*
* .....LU-PILE TO BULKHEAD
* .....DISTANCES FROM CRANE-REST TO LU-PILE AND
* .....FROM LU-PILE TO BULKHEAD ARE AVERAGE
* .....DISTANCES IN A CENTER TANK 98’X50’
* MAXIMUM NUMBER OF BOARDS IN LIFT = 3

C-OPER BEGINS AT CR-1

1 TRANSPORT BOARD FROM LU-PILE USING CRANE WITH HOOK+SLING TO BULKHEAD ( BTWN BRKTS ) PLACE+MANEUVER RETURN TO CR-1 F 1 / 3
MANUAL METHODS

392. TRANSPORT STANCHION WITH (GROVE CRANE) AT TANK CARPENTER
PER STANCHION OFG: 3 02-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS TRANSPORTING STANCHION FROM...
* ....BIN-2 TO BULKHEAD
* DISTANCES FROM CRANE-REST TO BIN-2 AND...
* ....FROM BIN-2 TO BULKHEAD ARE AVERAGE..
* ...DISTANCES IN A CENTER TANK 98'X50'
* MAXIMUM NUMBER OF STANCHIONS IN LIFT = 6
C-OPER BEGINS AT CR-1

1 TRANSPORT STAN FROM BIN-2 USING CRANE WITH HOOK+SLING TO BULKHEA
BTWN BRKTS ) PLACE+ADJUST RETURN TO CR-1 F 1 / 6

395. TRANSPORT HANDRAIL WITH (GROVE CRANE) AT TANK CARPENTER
PER HANDRAIL OFG: 3 02-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS TRANSPORTING HANDRAIL FROM....
* ....HR-PILE TO BULKHEAD
* DISTANCES FROM CRANE-REST TO HR-PILE AND
* ....FROM HR-FILE TO BULKHEAD ARE AVERAGE
* ...DISTANCES IN A CENTER TANK 98'X50'
* MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6
C-OPER BEGINS AT CR-1

1 TRANSPORT HANDR FROM HR-PILE USING CRANE WITH HOOK+SLING TO
BULKHEAD ( BTW BRKTS ) PLACE+ADJUST RETURN TO CR-1 F 1 / 6
MANUAL METHODS

404. (CLIMB UP AND DOWN) DOWN OPERATOR (ON LADDER) ON BULKHEAD AT ANY TANKS AND VOIDS CARPENTER
PER LADDER OFG: 3 05-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS CARPENTERS CLIMBING UP AND....
* ....DOWN LADDERS TO REMOVE STAGING.
* AVERAGE LADDER SIZE = 12 RUNGS.
CARP-1 BEGINS AT LDR

1 CARP-1 SLIDE ( CLIMB-UP ) LADDER AT LDR ( 12 RUNGS ) PF 12 ( 1 ) PF 12 ( 34 )
2 CARP-1 PULL ( CLIMB-DOWN ) LADDER AT LDR ( 12 RUNGS ) PF 12 ( 1 ) PF 12 ( 34 )

407. REMOVE HANDRAIL ON (MATERIAL-PILE) WITH WINCH AT ANY TANKS AND VOIDS CARPENTER
PER HANDRAIL OFG: 3 08-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF HANDRAIL FROM MALT
* ....PILE ON TANKTOP TO DECK (GOING THRU ....MASNHOLE).
* MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6
CARP-3 BEGINS AT TANKTOP

1 CARP-3 GET+SLIDE HANDRAIL ( ONTO BOLSTER ) AT MATL-PILE
2 WINCH-OPER PUSH WINCH-DOWN PROCESS ( TO TANKTOP ) F 1 / 6
3 WINCH-OPER LOOSEN ( =SWING ) CABLE WITH BEND AT MENHOLE 5
   ARM-STROKES USING HANDS F 1 / 6
4 WINCH-OPER THROW CABLE FROM MENHOLE TO CARP-3 F 1 / 6
3 CARP-3 GET+MANIPULATE WITH BEND CABLE AT MATL-PILE ( HOOK AROUND
   HANDRAIL ) F 1 / 6
6 WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES ) F 1 / 6
7 WINCH-OPER PUSH WINCH-UP PROCESS ( TO MENHOLE ) F 1 / 6
MANUAL METHODS

408. REMOVE STANCHION ON (MATERIAL PILE) WITH WINCH AT ANY TANKS AND VOI CARPENTER

PER STANCHION (OFG: 3 08-FEB-82
- REPRESENTS ELAPSED TIME
  * REPRESENTS REMOVAL OF STANCHION FROM.....
  * ....MATL-PILE ON TANKTOP TO DECK (GOING
  * ....THRU MANHOLE).
  * MAXIMUM NUMBER OF STANCHION IN LIFT = 6
CARP-3 BEGINS AT MATL-PILE

1 CARP-3 GET+PLACE WITH BEND STAN FROM MATL-PILE TO MATL-PILE WITH BEND
2 WINCH-OPER PUSH WINCH-DOWN PROCESS ( TO TANKTOP) F 1 / 6
3 WINCH-OPER LOOSEN (=SWING) CABLE WITH BEND AT MENHOLE 5
   ARM-STROKES USING HANDS F 1 / 6
4 WINCH-OPER THROW CABLE FROM MENHOLE TO CARP-3 F 1 / 6
5 CARP-3 GET+MANIPULATE WITH BEND CABLE AT MATL-PILE ( HOOK AROUND STANCHION ) F 1 / 6
6 WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES ) F 1 / 6
7 WINCH-OPER PUSH WINCH-UP PROCESS ( TO MENHOLE ) F 1 / 6

409. REMOVE STAGING BRACKET ON (MATERIAL PILE) WITH WINCH AT ANY TANKS AVOIDS CARPENTER

PER STAGING BRACKET OFG: 3 05-FEB-82
- REPRESENTS ELAPSED TIME
  * REPRESENTS REMOVAL OF BRACKET FROM MATL
  * .... PILE ON TANKTOP TO DECK (GOING THRU
  * ...MANHOLE).
  * MAXIMUM NUMBER OF BRACKET IN LIFT = 3
CARP-3 BEGINS AT MATL-PILE

1 CARP-3 GET+PLACE WITH BEND BRKT FROM MATL-PILE TO MATL-PILE WITH BEND
2 WINCH-OPER PUSH WINCH-DOWN PROCESS ( TO TANKTOP ) F 1 / 3
3 WINCH-OPER LOOSEN (=SWING) CABLE WITH BEND AT MENHOLE 5
   ARM-STROKES USING HANDS F 1 / 3
4 WINCH-OPER THROW CABLE FROM MENHOLE TO CARP-3 F 1 / 3
5 CARP-3 GET+MANIPULATE WITH BEND CABLE AT MATL-PILE ( HOOK AROUND BRACKET ) F 1 / 3
   WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES ) F 1 / 3
6 WINCH-OPER PUSH WINCH-IJP PROCESS ( TO MENHOLE ) F 1 / 3

PAGE 83
MANUAL METHODS

410. REMOVE STAGING PLANK ON (BOARD PILE) WITH WINCH AT ANY TANKS AND Voids
CARPENTER
PER STAGING PLANK OFG: 3 08-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENT REMOVING BOARDS FROM BOARD...
* ...PILE ON TANKTOP TO DECK (GOES THRU...
* ....MANHOLE),
* MAXIMUM NUMBER OF BOARDS IN LIFT = 3
CARP-3 BEGINS AT MATL-PILE

1 CHP-3 GET+SLIDE BOARD ( ONTO BOLSTER ) AT BD-PILE AND ADJUST
2 WINCH-OPER PUSH WINCH-DOWN PROCESS ( TO TANKTOP ) F 1 / 3
3 WINCH-OPER LOOSEN ( =SWING ) CABLE WITH BEND AT MENHOLE 5
   ARM-STROKES USING HANDS F 1 / 3
4 WINCH-OPER THROW CABLE FROM MENHOLE TO CARP-3 F 1 / 3
5 CARP-3 GET+MANIPULATE WITH BEND CABLE AT BD-PILE ( HOOK AROUND
   BOARDS ) ( ALLOW FOR 2 ATTEMPTS ) F 2 / 3
6 WINCH-C)PER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES ) F 1 / 3
7 WINCH-OPER PUSH WINCH-UP PROCESS ( TO MENHOLE ) F 1 / 3

411. REMOVE LADDER ON (LADDER-PILE) WITH WINCH AT ANY TANKS AND Voids
CARPENTER
PER LADDER OFG: 3 08-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENT REMOVING LADDERS FROM LADDER
* ....PILE ON TANKTOP TO DECK (GOES THRU...
* ....MANHOLE).
* MAXIMUM NUMBER OF LADDERS IN LIFT = 3
CARP-3 BEGINS AT BD-PILE

1 CHP-3 GET+SLIDE LADR ( ONTO BOLSTER ) AT LDR-PILE AND ADJUST
2 WINCH-OPER PUSH WINCH-DOWN PROCESS ( TO TANKTOP ) F 1 / 3
3 WINCH-OPER LOOSEN ( =SWING ) CABLE WITH BEND AT MENHOLE 5
   ARM-STROKES USING HANDS F 1 / 3
4 WINCH-OPER THROW CABLE FROM MENHOLE TO CARP-3 F 1 / 3
5 CARP-3 GET+MANIPULATE WITH BEND CABLE AT LDR-PILE ( HOOK AROUND
   LADDERS. ) ( ALLOW FOR 2 ATTEMPTS ) F 2 / 3
6 WINCH-C)PER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES ) F 1 / 3
7 WINCH-OPER PUSH WINCH-UP PROCESS ( TO MENHOLE ) F 1 / 3
MANUAL METHODS

412. REMOVE TOOLBOX ON (MATERIAL PILE) WITH WINCH AT ANY TANKS AND VOIDS CARPENTER
PER TOOLBOX OFG: 3 08-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS REMOVING TOOLBOX FROM MATL...
* ...PILE ON TANKTOP TO DECK (GOES THRU....
* ...MANHOLE).
( TOOLBOX CONTAINS:
* ...28 BOLTS
* ...28 NUTS
* ...28 LADDER CLIPS
CARP-3 BEGINS AT LDR-PILE

1 CARP-3 GET+PLACE 7 NUTS AND 7 BOLTS FROM MALT-PILE TO TOOLBOX-I
    BEND ( TOTAL OF 28 ) PF 4 ( 2 3 4 5 6 )
2 CARP-3 GET+PLACE WITH BEND 4 LCLIPS FROM MALT-PILE TO TOOLBOX-I
    BEND ( TOTAL OF 28 ) F 7
3 WINCH-OPER PUSH WINCH-DOWN PROCESS ( TO TANKTOP )
4 WINCH-OPER LOOSEN ( =SWING ) CABLE WITH BEND AT MENHOLE 5
    ARM-STROKES USING HANDS
5 WINCH-OPER THROW CABLE FROM MENHOLE TO CARP-3
6 CARP-3 GET+MANIPULATE WITH BEND CABLE AT MATL-PILE ( HOOK AROUND TOOLBOX )
7 WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES )
8 WINCH-OPER PUSH WINCH-UP PROCESS ( TO MENHOLE )

431. (WALK UP OR DOWN) MOVE OPERATOR (ON INCLINED STAIRS) ON BULKHEAD AT TANKS AND VOIDS CARPENTER
PER SET OF INCLINED STAIRS OFG: 4 10-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS CARPENTER WALKING UP OR DOWN
* ...A SET OF INCLINED STAIRS, AVERAGE
* ...NUMBER OF TREADS IN A SET OF INCLINED
* ...STAIRS = 16.
* CARPENTERS ARE WALKING UP OR DOWN STAIRS
* AT THE SAME TIME.
CARP-1 BEGINS AT LEVEL-1

1 CARP-1 WALK TO LEVEL-2
2 CARP-2 WALK TO LEVEL-2 SIMO
MANUAL METHODS

132. COMBINED SUB-OP

HOOK-UP/UNHOOK AND IGNITE/EXTINGUISH TORCH FOR BURNING WITH HAND
AT TANK CARPENTER

CREW SIZE = 6 (3 CARPS ABOVE DECK AND 3 BELOW). RATE IN ELAPSED TIME.
MULT BY 6 TO OBTAIN TOTAL TIME.

PER 8-HR SHIFT AND (1) CUT OFG: 4 20-NOV-81

* THE FOLLOWING IS INCLUDED IN THIS SUBOP:
* --2 HOOK-UPS AND 2 UNHOOKS PER (1), ...
* ...8-HR SHIFT
* --(1) OCCURRENCE FOR IGNITE AND ........
* ...EXTINGUISH TORCH
* --TO DETERMINE THE FREQ OF THE SUB-OP...
* ...FRO NUMBER OF CUTS >1, USE THE ....
* ....FORHULA: FREQ = 1+ C(N-1) X .23 ....
* ...WHERE "N" = THE NUMBER OF CUTS(BURNS)

Combined sub-operation elements
-----------------------------------------------------------------

9. HOOK-UP AND UNHOOK TORCH ON MANIFOLD WITH WRENCH AT SHIP

10. IGNITE AND EXTINGUISH TORCH FOR BURNING WITH HAND AT TANK

376. SET-UP (STAGING CLIP) ON BULKHEAD WITH HAMMER (AND STEEL-TAPE) AT TANK
CARPENTER

PER STAGING CLIP OFG: 4 01-FEB-82

REPRESENTS ELAPSED TIME

REPRESENTS PUTTING UP A STAGING CLIP ON
* ...THE BULKHEAD
* WELDING OF THE CLIP WILL BE DONE IN A...
* ...SEPARATE SUB OPERATION

CARP-1 BEGINS AT TANKTOP

1 CARP-1 MEASURE AT BRKT-1 USING STEEL-TAPE-1 ASIDE TO CARP-1
2 CARP-1 LOOSEN PAINT ON BHD AT BRKT-1 4 STRIKES USING HAMMER-1 ASIDE TO CARP-1
3 CARP-1 GET+PLACE WITH BEND SCLIP FROH TOOLBOX-2 TO BRKT-1 ( TACKING UPON PLACEMENT )
MANUAL METHODS

377. MAKE READY STAGING BRACKET FOR (TRANSPORTING) WITH HAND AT TANK (OR MAY) CARPENTER
PER STAGING BRACKET OFG: 3 02-FEB-82.
REPRESENTS ELAPSED TIME
* REPRESENTS GETTING BRACKET READY TO BE...
* ...TRANSPORTED TO TANK OR BULKHEAD
* CARPENTER IS LOCATED EITHER ON THE WAY...
* ...OR IN TANK AT THE MATERIAL (BIN-1)
CARP-3 BEGINS AT BIN-1

1. CARP-3 GET+PLACE WITH BEND BRKT FROM BIN-1 TO BIN-1
2. CARP-3 GET+PLACE WITH BEND BOLT FROM TOOLBOX-1 TO BIN-1 AND INSERT BOLT IN BRKT
3. CARP-3 FASTEN NUT AT BIN-1 4 WRIST-TURNS USING HANDS
4. CARP-3 GET+PLACE BRKT FROM BIN-1 TO BIN-1 (PILE UP BRKTS FOR TRANSFORMATION)

379. SET-UP STAGING BRACKETS ON BULKHEAD WITH WRENCH AT TANK CARPENTER
PER STAGING BRACKET OFG: 3 01-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING UP A BRACKET ON AN...
* ...EXISTING STAGING CLIP
CARP-1 BEGINS AT TANKTOP

1. CARP-1 GET+HOLD WITH BEND BRKT FROM TANKTOP TO CARP-1
2. CARP-1 LOOSEN NUT AT BRKT-1 4 WRIST-TURNS USING HANDS
3. CARP-1 REMOVE BOLT FROM BRKT-1 (BRKT.) TO CARP-1
4. CARP-1 GET+PLACE BRKT FROM CARP-1 TO BRKT-1 AND INSERT BOLT
5. CARP-1 FASTEN NUT AT BRKT-1 13 WRIST-TURNS USING HANDS
6. CARP-1 FASTEN NUT AT BRKT-I 4 ARM-STROKES USING WRENCH-1 ASIDE TO CARP-1
7. CARP-1 WALK TO BRKT-2 (TO DO NEXT BRKT)
MANUAL METHOD

380. HAKE READY LADDER FOR (TRANSPORTING) WITH HAND AT TANK (OR WAY)
CARPENTER
PER LADUER OFG: 3 01-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS GETTING LADDER ON BOLSTERS SO
* THAT THE CRANE CAN TRANSPORT IT.
CARP-3 BEGINS AT BIN-1

1 CARP-3 GET+SLIDE LADR AT LDR-PILE AND ADJUST ( ON BOLSTERS )

382. SET-UP LADDER ON BULKHEAD (AT BRACKET LOCATION) WITH HAND AT TANK
CARPENTER
PER LADDER OFG: 4 03-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING UP A LADDER AT A....
* BRACKET LOCATION SO THE CARPENTER CAN
* PUT UP A BRACKET APPLIES ONLY FOR...
* FIRST LEVEL OF STAGING. CARPENTER IS
* WORKING FROM THE TANKTOP.
* ALSO INCLUDES CLIMBING UP & DOWN LADDER
CARP-1 BEGINS AT BRKT-1

1 CARP-1 GET+PLACE WITH BEND LADR FROM TANKTOP TO BRKT-1
2 CARP-1 SLIDE ( CLIMB-UP ) LADDER AT BRKT-1 ( 4 RUNGS ) PF 4 ( 1 ) PF 4(34)
3 CARP-1 PULL ( CLIHB-DOWN ) LADDER AT BRKT-1 ( 4 RUNGS ) PF 4 ( 1 ) PF 4 ( 34 )
4 CARP-1 GET+PLACE LADR FROM BRKT-1 TO TANKTOP WITH BEND
MANUAL METHODS

383. SET-UP (ACCESS) LADDER ON BULKHEAD WITH HAND AT TANK CARPENTER
PER LADDER OFG: 3 01-FEB-82
  * REPRESENTS ELAPSED TIME
  * REPRESENTS PUTTING UP AN ACCESS LADDER,,
  * ...ON THE BULKHEAD SO THAT THE CARPENTER
  * ...CAN CLIMB TO THE NEXT LADDER,**
  * ALSO INCLUDES CLIMBING UP AND DOWN THE..
  * ..LADDER.
  * AVERAGE NUMBER OF RUNGS = 12
CARP-1 BEGINS AT TANKTOP

1 CARP-1 GET+PLACE WITH BEND LADR FROM TANKTOP TO LDR
2 CARP-1 SLIDE ( CLimb-UP ) LADDER AT LDR ( 12 RUNGS ) PF 12 ( 1 )
12 ( 34 )
3 CARP-1 PULL ( CLIMB-DOWN ) LADDER AT LDR ( 12 RUNGS ) PF 12 ( 1 )
12 ( 34 )

385. POSITION (SECURE) (ACCESS) LADDER FOR BRACKET STAGING WITH PLIER (AN
  WIRE ROPE) AT TANK CARPENTER
PER LADDER OFG: 4 03-FEB-82
  * REPRESENTS ELAPSED TIME
  * REPRESENTS SECURING LADDER TO STAGING...
  * ...BOARIS USING WIRE ROPE
CARP-1 BEGINS AT LDR

1 CARP-1 GET+HANIPULATE WIRE-ROPE AT LDR ( PUT AROUNII BOARDS AND
LADDER,)
2 CARP-1 TWIST WIRE-ROPE AT LDR USING PLIER-1 ASIDE TO CARP-1

386. MAKE READY STAGING PLANK FOR (TRANSPORTING) WITH HAND AT TANK (OR WA
  CARPENTER
PER STAGING PLANK OFG: 3 02-FEB-82
  * REPRESENTS ELAPSED TIME
  * REPRESENTS GETTING BOARD ON BOLSTERS SO
  * ...THAT THE CRANE CAN TRANSPORT IT
CARP-3 BEGINS AT BIN-1

1 CARP-3 GET+SLIDE BOARD AT LU-PILE AND ADJUST ( ON BOLSTERS )
MANUAL METHODS

388. SET-UP STAGING PLANK ON STAGING BRACKET WITH HAND AT TANK CARPENTER
PER BOARD OFG: 3 02-FEB-82
  REPRESENTS ELAPSED TIME
* REPRESENTS SETTING UP BOARDS BETWEEN....
* ....BRACKETS
* TWO MAN OPERATION:
* CARPENTERS ARE LOCATED AT TWO DIFFERENT
  * ..BRACKETS* THEY BOTH LIFT THE BOARD....
* ..TOGETHER AND SLIDE IT INTO POSITION,
  * IN THIS ANALYSIS CARPENTERS ARE LOCATED
* ...ON THE LEVEL BELOW THE BOARDS.
CARP-1 BEGINS AT BRKT-1

1 CARP-1+CARP-2 GET+SLIDE WITH 1 STEP BOARD AT BRKT-1 AND ALIGN
2 CARP-1 WALK TO BRKT-2 ( TO DO NEXT SECTION OF BOARDS, CARP2 ALSO
  MOVES TO ANOTHER BRACKET )

389. SET-UP STAGING PLANK ON STAGING BRACKET WITH HAND AT TANK CARPENTER
PER BOARD OFG: 3 02-FEB-82
  REPRESENTS ELAPSED TIME
* REPRESENTS SETTING UP BOARDS BETWEEN....
* ....BRACKETS.
* TWO MAN OPERATION:
* CARPENTERS ARE LOCATED AT TWO DIFFERENT
  * ..BRACKETS. THEY BOTH PICK-UP THE BOARD
  * ..TOGETHER AND SLIDE IT INTO POSITION.
* IN THIS ANALYSIS CARPENTERS ARE LOCATED
  * ...ON THE SAME LEVEL AS THE BOARDS.
CARP-1 BEGINS AT BRKT-1

1 CARP-1+CARP-2 GET+SLIDE WITH BEND WITH 1 STEP BOARD AT BRKT-1 AND
  ALIGN
2 CARP-1 WALK TO BRKT-2 ( TO DO NEXT SECTION OF BOARDS, CARP2 ALSO
  MOVES TO ANOTHER BRACKET )
MANUAL METHODS

390. SET-UP STAGING PLANK ON STAGING BRACKET WITH HAND AT TANK CARPENTER
PER STAGING PLANK OFG: 4 02-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS SETTING UP BOARDS BETWEEN....
* ...BRACKETS,
* ONE MAN OPERATION:
* USUALLY OCCURS WHEN CRANE CANNOT PLACE..
* ...BOARD ON BRACKETS.
CARP-1 BEGINS AT BRKT-1

1 CARP-1 GET+HANIPULATE WITH BEND BOARD AT BRKT-2 AND ALIGN RETURN
BRKT-1
2 CARP-1 GET+POSITION WITH BEND BOARD FROM TANKTOP TO BRKT-1 AND SE

391. MAKE READY STANCHION FOR (TRANSPORTING) WITH HAND AT TANK (OR WAY)
CARPENTER
PER STANCHION OFG: 3 02-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS GETTING STANCHION READY TO BE
* ...TRANSPORTED.
CARP-3 BEGINS AT LU-PILE

1 CARP-3 GET+PLACE WITH BEND STAN FROM BIN-2 TO BIN-2

393. SET-UP STANCHION IN STAGING BRACKET WITH HAND AT TANK CARPENTER
PER STANCHION OFG: 3 02-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING STANCHION IN THE.....
* ...BRACKET SLEEVE.
CARP-1 BEGINS AT BRKT-1

1 CARP-1 GET+PLACE WITH BEND STAN FROM TANKTOP TO BRKT-1 AND INSERT
2 CARP-1 WALK TO BRKT-2 ( DO NEXT STANCHION )
MANUAL METHODS

394. MAKE READY HANDRAIL FOR (TRANSPORTING) WITH HAND AT TANK (OR WAY) CARPENTER
   PER HANDRAIL OFG: 3 02-FEB-82
   REPRESENTS ELAPSED TIME
   * REPRESENTS GETTING HANDRAIL ON BOLSTERS
   * ...SO THAT THE CRANE CAN TRANSPORT IT
   CARP-3 BEGINS AT BIN-2

   1 CARP-3 GET+SLIDE HANDRAIL AT HR-PIL.E AND ADJUST ( ON BOLSTERS )

396. SET-UP HANDRAIL ON STANCHION WITH HAND AT TANK CARPENTER
   PER HANDRAIL OF13: 3 02-FEB-82
   REPRESENTS ELAPSED TIME
   * REPRESENTS PUTTING HANDRAIL INTO THE....
   * ...EYELETS ON THE STANCHION
   * INCLUDES ACTION DISTANCES NEEDED FOR.....
   * ...ALIGNING THE HANDRAIL
   * WELDING OF THE HANDRAIL CONNECTIONS WILL
   * ...BE DONE IN A SEPARATE SUB OPERATION
   CARP-1 BEGINS AT BRKT-1

   1 CARP-1 GET+SLIDE WITH BEND HANDRAIL AT BRKT-2 AND ALIGN ( THRU 2
   EYELETS ON THE STANCHIONS AT, BRKT1 & BRKT2 ) RETURN TO BRKT-1 PF 2
   ( 4 5 6 )

   2 CARP-1 WALK TO BRKT-2 ( DO NEXT SECTION )
397. SET-UP HANDRAIL (END PIECES) ON HANDRAIL (AND BULKHEAD) WITH HAND A TANK CARPENTER
PER HANDRAIL OFG: 4 02-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING HANDRAIL (END PIECES)
* ...AT THE END OF A STAGING LEVEL
* WELDING OF THE HANDRAIL (END PIECES)....
* ...CONNECTIONS WILL BE DONE IN A........
* ...SEPARATE SUB OPERATION
CARP-1 BEGINS AT BRKT-1

1 CARP-1 GET+HOLD WITH BEND HANDRAIL FROM TANKTOP TO CARP-1
2 PTIME 1.02 M ( CUT HANDRAIL INTO 2 PIECES WITH ELECTRODE )
3 CARP-2 GET+PLACE 2 HANDRAIL ( END PIECES ) FROM CARP-1 TO BRKT-1

398. TEAR DOWN HANDRAIL ON BULKHEAD WITH TORCH AT (CENTER) MID TANKS AND Voids CARPENTER
PER HANDRAIL OFG: 3 04-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS TEARING DOWN HANDRAIL IN A...
* ...CENTER TANK. HANDRAIL IS THROWN TO A
* ...MATERIAL PILE ON THE TANKTOP.
* CARPENTERS REMOVE 2 HANDRAIL BEFORE.....
* ...MOVING TO NEXT SECTION.
CARP-1 BEGINS AT BULKHEAD

1 CARP-1 PULL TORCH FROM BULKHEAD TO BRKT-1
2 CARP-1 OPERATE TORCH AT BRKT-1 PTIME 0.26 M ( BURN OFF HANDRAIL
3 CARP-2 GET+HOLD HANDRAIL FROM BRKT-1 TO CARP-2 SIHO
4 CARP-2 HOLD+THROW HANDRAIL FROM CARP-2 TO MATL-PILE
5 CARP-1 AND CARP2 WALK TO BRKT-2 F 1 / 2
MANUAL METHODS

399. TEAR DOWN HANURAIL ON BULKHEAD WITH TORCH (AND WINCH) AT (WING) TANKS AND VOIDS CARPENTER

PER HANDRAIL OFG: 3 04-FEB-82

* REPRESENTS ELAPSED TIME

* REPRESENTS TEARING DOWN HANDRAIL IN A...

* ...

* TANK IS TO SHALL FOR THE HANDRAIL TO

* BE THROWN.

* CARPENTERS REMOVE 2 HANDRAIL BEFORE......

* MOVING TO THE NEXT SECTION.

* MAXIMUM NUMBERS OF HANDRAIL IN LIFT = 6

CARP-1 BEGINS AT BULKHEAD

1 CARP-1 PULL TORCH FROM BULKHEAD TO BRKT-1
2 CARP-1 OPERATE TORCH AT BRKT-1 PTIME 0.26 M ( BURN OFF HANDRAIL )
3 CARP-2 GET+HOLD HANDRAIL FROM BRKT-1 TO BRKT-1 SIMO
4 CARP-2 HOLD+PLACE HANDRAIL FROM BRKT-1 TO BRKT-PILE
5 WINCH-OPER LOOSEN ( = SWING ) CABLE WITH BEND AT MENHOLE 5
   ARM-STROKES USING HANDS F 1 / 6
6 WINCH-OPER THROW CABLE FROM MENHOLE TO CARP-2 F 1 / 6
7 CARP-2 GET+HANIPULATE WITH BEND CARLE AT BRKT-PILE E ( HOOK CABLE AROUND HANDRAIL ) F 1 / 6
8 WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES ) F 1 / 6
9 WINCH-OPER PUSH WINCH-DOWN PROCESS ( TO MATL PILE ) F 1 / 6
10 WINCH-OPER PUSH WINCH-UP PROCESS ( TO HENHOLE ) F 1 / 6
11 CARP-2 AND CARP1 WALK TO BRKT-2 F 1 / 2

400. TEAR DOWN STANCHION ON BULKHEAD WITH HAND AT (CENTER) MID TANKS AND VOIDS CARPENTER

PER STANCHION OFG: 3 04-FEB-82

* REPRESENTS ELAPSED TIME

* REPRESENTS REMOVING STANCHION FROM.....

* STAGING BRACKETS IN A CENTER TANK,

* STANCHION IS THROWN TO A MATERIAL....

* PILE ON THE TANKTOP

CARP-2 BEGINS AT BRKT-1

1 CARP-2 LOOSEN STAN AT BRKT-1 4 ARM-STROKES USING HANDS
2 CARP-2 HOLD+THROW STAN FROM BRKT-1 TO MATL-PILE
3 CARF-2 WALK TO BRKT-2
MANUAL METHODS

402. TEAR DOWN STAGING PLANK ON STAGING BRACKET WITH HAND (AND WINCH) AT TANKS AND Voids CARPENTER
PER STAGING FLANK OFG: 3 04-FER-82
REPRESENTS ELAPSED TIME
* REPRESENTS REMOVING BOARDS FROM ANY TANK
* ...WINCH IS USED TO LOWER BOARD TO......
* ...BD-PILE ON TANKTOP.
* MAXIMUM NUMBER OF BOARDS IN LIFT = 3
CARP-1 BEGINS AT BULKHEAD

1 CARP-1 AND CARP2 GET+HANIPULATE WITH BEND BOARD AT BRKT-1 ( FLIP BOARDS ONTO 3RD BOARD )
2 WINCH-OPER LOOSEN ( =SWING ) WITH BEND CABLE AT BTRWTH 5 ARM-STR USING HANDS F 2 / 3
3 WINCH-OPER THROW CABLE FROM BTRWTH TO CARP-1 WITH BEND F 1 / 3
4 CARP-1 GET+MANIPULATE WITH BEND CABLE AT BRKT-1 ( HOOK CABLE ARrtl BOARD ALLOW FOR 2 ATTEMPTS ) F 2 / 3
S WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES ) F 1 / 3
6 WINCH-OPER PUSH WINCH-DOUN PROCESS ( TO BD PILE ) F 1 / 3
7 WINCH-OPER PUSH WINCH-IJP PROCESS ( TO BTRWTH ) F 1 / 3
8 CARP-1 AND CARP2 WALK TO BRKT-2
MANUAL METHODS

403. TEAR DOWN LADDER (AND LADDER CLIPS) ON BULKHEAD WITH TORCH (AND WINCH) AT ANY TANKS AND VOIDS CARPENTER
PER LADDER OFG: 3 05-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS REMOVING LADDER FROM BULKHEAD
* ...THERE ARE 4 LADDER CLIPS PER LADDER.
* ...LADDER LOUERED TO LDR-PILE BY WINCH
* ...LADDER CLIPS THROWN TO MATL-PILE.
CARP-1 BEGINS AT BRKT-2

1 CARP-1 PULL TORCH AT LDR
2 CARP-1 OPERATE TORCH AT LDR PTIME 0.47 M F 4 ( BURN OFF 4 CLIPS )
3 CARP-1 GET+THROW 4 LDLIPS FROM LDR TO MATL-PILE WITHOUT BEND F 4
4 CARP-2 GET+POSITION LADR FROM LDR TO BRKT-2 WITH BEND ( LAY DOWN ON BOARDS )
5 WINCH-OPER LOOSEN ( =SWING ) CABLE WITH BEND AT BTRWTH 5 ARM-STROKES USING HANDS
6 WINCH-OPER THROW CABLE FROM BTRWTH TO CARP-2 WITH BEND
7 CARP-2 GET+MANIPULATE WITH BEND CABLE AT BRKT-2 ( HOOK AROUND LADR )
8 WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES )
9 WINCH-OPER PUSH WINCH-DOWN PROCESS ( TO LDR PILE )
10 WINCH-OPER PUSH WINCH-UP PROCESS ( TO BTRWTH )
11 CARP-1 WALK TO BRKT-2
MANUAL METHODS

405. TEAR DOWN LADDER (AND WIRE ROPE) ON BULKHEAD WITH PLIER (AND WINCH)
ANY TANKS AND VOIDS CARPENTER
PER LADDER OFG: 4 05-FEB-82
* REPRESENTS ELAPSED TIME
* ...THERE IS 1 WIRE ROPE PER LADDER.
* ...LADDER LOWERED TO LDR-PILE BY WINCH
* ...WIRE-ROPE IS THROWN TO MATL-PILE.
CARP-1 BEGINS AT BRKT-2

1 CARP-1 TWIST WIRE-ROPE AT LDR USING PLIER-1 ASIDE TO CARP-1
2 CARP-1 GET+MANIPULATE WIRE-ROPE AT LDR ( PULL. WIRE ROPE OFF BOA
AND LADDER. )
3 CARP-1 HOLD+THROW WIRE-ROPE FROM LDR TO MATL-PILE WITHOUT BEND
4 CARP-2 GET+POSITION LADR FROM LDR TO BRKT-2 WITH BEND ( LAY DOWN
BOARDS )
5 WINCH-OPER LOOSE ( =SWING ) CABLE WITH BEND AT BTRWTH 5 ARM-STR
USING HANDS
6 WINCH-OPER THROW CABLE FROM BTRWTH TO CARP-2 WITH BENII
7 CARP-2 GET+MANIPULATE WITH BEND CABLE AT BRKT-2 ( HOOK AROUND
8 WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES )
9 WINCH-OPER PUSH WINCH-DOWN PROCESS ( TO LDR PILE )
10 WINCH-OPER PUSH WINCH-UP PROCESS ( TO BTRWTH )
11 CARP-1 WALK TO BRKT-2
MANUAL METHODS

406. TEAR DOWN STAGING BRACKET ON BULKHEAD WITH WRENCH AT ANY TANKS AND VOID CARPENTER

PER STAGING BRACKET OFG: 3 05-FEB-82

* REPRESENTS ELAPSED TIME
* REPRESENTS TEARING DOWN STAGING BRACKET
* ...IN ANY TANK. BRACKETS ARE LOWERED TO
* ...MATL-PILE BY WINCH.
* MAXMUH NUMBER OF BRACKETS IN LIFT = 3
CARF-1 BEGINS AT BRKT-2

1 CARP-1 LOOSEN NUT AT BRKT-1 1 ARM-STROKE USING WRENCH-1 AND HOLD
2 CARP-1 HOLD+LOOSEN NUT AT BRKT-1 13 WRIST-STROKES USING WRENCH-1
   ASIDE TO CARP-1
3 CARP-1 GET+REMOVE BOLT FROM BRKT-1 TO CARP-1
4 CARP-1 THROW NUT AND BOLT FROM CARP-1 TO MATL-PILE WITHOUT BEND
5 CARP-2 GET+PLACE BRKT FROM BRKT-I TO BRKT-PILE
6 WINCH-OPER LOOSEN ( =SWING ) CABLE WITH BEND AT BTRWTH 5 ARM-STROKES
   USING HANDS F 1 / 3
7 WINCH-OPER THROW CABLE FROM BTRWTH TO CARP-2 F 1 / 3
8 CARP-2 GET+MANIPULATE WITH BEND CABLE AT BRKT-PILE ( HOOK AROUND
   BRACKETS ) F 1 / 3
9 WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES ) F 1 / 3
10 WINCH-OPER PUSH WINCH-DOWN PROCESS ( TO MATL PILE ) F 1 / 3
11 WINCH-OPER PUSH WINCH-UP PROCESS ( TO BTRWTH ) F 1 / 3
12 CARP-2 AND CARP1 WALK TO BRKT-2
SECTION 3
MANUAL METHODS

435. WELD STAGING BRACKET (CLIP) ON BULKHEAD (OR ANY STRUCTURE) WITH S ELECTRODE AT ANY TANKS AND VOIDS (SHIP) WELDING
PER 100 CLIPS OFG: 3
WELD TO MEET SAFETY REQUIREMENTS. RATE PER 100 CLIPS. RATE IN MANUAL ELEMENTS.
1 WELD VERTICAL 3/8”FILLET WELD (10 PER CLIP) WITH 10% OVERWELD USING 6011 3/16 ELECTRODE OR COMPARABLE (7018 5/32).

438. WELD LADDER (CLIP) (SECURES LADDER) ON BULKHEAD (OR ANY STRUCTURE STICK ELECTRODE AT ANY TANKS AND VOIDS (SHIP) WELDING
PER 100 LADDERS OR 400 CLIPS OFG: 3
WELD TO MEET SAFETY REQUIREMENTS. RATE PER 100 LADDERS (400 C RATE INCLUDES MANUAL ELEMENTS.
1 WELD VERTICAL 3/8”FILLET WELD (4”PER CLIP) WITH 10% OVERWELD 6011 3/16 ELECTRODE OR COMPARABLE (7018 5/32).

440. WELD HANDRAIL (CONNECTIONS) ON STANCHION WITH STICK ELECTRODE AT A TANKS AND VOIDS (SHIP) WELDING
PER 100 PIECES OF HANDRAIL OFG: 3
WELD TO MEET SAFETY REQUIREMENTS. RATE PER 100 PIECES OF AHNDR (AVG. 1 CONNECTION EACH). RATE INCLUDES MANUAL ELEMENTS.
1 WELD HORIZONTAL 1/4”FILLET WELD (5”PER CONNECTION) USING 601 ELECTRODE OR COMPARABLE (7018 3/32).
MANUAL METHODS

404. (CLIMB UP AND DOWN) MOVE OPERATOR (ON LADDER) ON BULKHEAD AT ANY TANKS AND VOIDS CARPENTER
PER LADDER OFG: 3 05-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS CARPENTERS CLIMBING UP AND...
* ...DOWN LADDERS TO REMOVE STAGING.
* AVERAGE LADDER SIZE = 12 RUNGS.
CARP-1 BEGINS AT LDR

1 CARP-1 SLIDE (CLIMB-UP) LADDER AT LDR (12 RUNGS) PF 12 (1) PF 12 (34)
2 CARP-1 PULL (CLIMB-DOWN) LADDER AT LDR (12 RUNGS) PF 12 (1) PF 12 (34)

407. REMOVE HANDRAIL ON (MATERIAL-PILE) WITH WINCH AT ANY TANKS AND VOIDS CARPENTER
PER HANDRAIL OFG: 3 08-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF HANDRAIL FROM MATL...
* ...PILE ON TANKTOP TO DECK (GOING THRU...
* ...MANHOLE).
* MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6
CARP-3 BEGINS AT TANKTOP

1 CARP-3 GET+SLIDE HANDRAIL (ONTO BOLSTER) AT MATL-PILE
2 WINCH-OPER PUSH WINCH-DOWN PROCESS (TO TANKTOP) F 1 / 6
3 WINCH-OPER LOosen (=SWING) CABLE WITH BEND AT HENHOLE 5
   ARM-STROKES USING HANDS F 1 / 6
4 WINCH-OPER THROW CABLE FROM MENHOLE TO CARP-3 F 1 / 6
5 CARP-3 GET+MANIPULATE WITH BEND CABLE AT MATL-FILE (HOOK AROUND HANDRAIL) F 1 / 6
6 WINCH-OPER PUSH WINCH-FREE PROCESS (CLEAR OBSTACLES) F 1 / 6
7 WINCH-OPER PUSH WINCH-UP PROCESS (TO MENHOLE) F 1 / 6
MANUAL METHODS

408. REMOVE STANCHION ON (MATERIAL PILE) WITH WINCH AT ANY TANKS AND V CARPENTER
PER STANCHION OFG: 3 08-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF STANCHION FROM...
* ...MATL-PILE ON TANKTOP TO DECK (GOING
* ...THRU MANHOLE).
* MAXIMUM NUMBER OF STANCHION IN LIFT = 6
CARP-3 BEGINS AT MATL-PILE

1 CARP-3 GET+PLACE WITH BEND STAN FROM MATL-FILE TO MATL-PILE WI BEND
2 WINCH-OPER PUSH WINCH-DOWN PROCESS ( TO TANKTOP ) F 1 / 6
3 WINCH-OPER LOOSEN ( =SWING ) CABLE WITH BEND AT MENHOLE 5
   ARM-STROKES USING HANDS F 1 / 6
4 WINCH-OPER THROW CABLE FROM MENHOLE TO CARP-3 F 1 / 6
5 CARP-3 GET+MANIPULATE WITH BEND CABLE AT MATL-PILE ( HOOK AROUN STANCHION ) F 1 / 6
6 WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES ) F 1 / 6
7 WINCH-OPER PUSH WINCH-UP PROCESS ( TO MENHOLE ) F 1 / 6

409. REMOVE STAGING BRACKET ON (MATERIAL PILE) WITH WINCH AT ANY TANKS Voids Carpenter
PER STAGING BRACKET OFG: 3 05-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF BRACKET FROM MATL
* ... PILE ON TANKTOP TO DECK (GOING THRU
* ...MANHOLE).
* MAXIMUM NUMBER OF BRACKET IN LIFT = 3
CARP-3 BEGINS AT MATL-PILE

1 CARP-3 GET+PLACE WITH BEND BRKT FROM MATL-FILE TO MATL-PILE WI BEND
2 WINCH-OPER PUSH WINCH-DOWN PROCESS ( TO TANKTOP ) F 1 / 3
3 WINCH-OPER LOOSEN ( =SWING ) CABLE WITH BEND AT MENHOLE 5
   ARM-STROKES USING HANDS F 1 / 3
4 WINCH-OPER THROW CABLE FROM MENHOLE TO CARP-3 F 1 / 3
5 CARP-3 GET+MANIPULATE WITH BEND CABLE AT MATL-PILE ( HOOK AROUN BRACKET ) F 1 / 3
6 WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES ) F 1 / 3
7 WINCH-OPER PUSH WINCH-UP PROCESS ( TO MENHOLE ) F 1 / 3
MANUAL METHODS

410. REMOVE STAGING FLANK ON (BOARD PILE) WITH WINCH AT ANY TANKS AND VOIDS
CARPENTER
PER STAGING PLANK OFG: 3 08-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENT REMOVING BOARDS FROM BOARD...
* ...PILE ON TANKTOP TO DECK (GOES THRU...
* ...MANHOLE).
* MAXIMUM NUMBER OF BOARDS IN LIFT = 3
CARP-3 BEGINS AT MATL-PILE

1 CARF-3 GET+SLIDE BOARD (ONTO BOLSTER) AT BD-PILE AND ADJUST
2 WINCH-OPER PUSH WINCH-DOWN PROCESS (TO TANKTOP) F 1 / 3
3 WINCH-OPER LOOSEN (=SWING) CABLE WITH BEND AT MENHOLE 5
   ARM-STROKES USING HANDS F 1 / 3
4 WINCH-OPER THROW CABLE FROM MENHOLE TO CARP-3 F 1 / 3
3 CARP-3 GET+MANIPULATE WITH BEND CARLE AT BD-PILE (HOOK AROUND
   BOARDS) (ALLOW FOR 2 ATTEMPTS) F 2 / 3
6 WINCH=OPER PUSH WINCH-FREE PROCESS (CLEAR OBSTACLES) F 1 / 3
7 WINCH-OPER PUSH WINCH-UP PROCESS (TO MENHOLE) F 1 / 3

411. REMOVE LADDER ON (LADDER-PILE) WITH WINCH AT ANY TANKS AND VOIDS
CARPENTER
PER LADDER OFG: 3 08-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENT REMOVING LADDERS FROM LADDER
* ...PILE ON TANKTOP TO DECK (GOES THRU...
* ...MANHOLE).
* MAXIMUM NUMBER OF LADDERS IN LIFT = 3
CARP-3 BEGINS AT BD-PILE

1 CARF-3 GET+SLIDE LADR (ONTO BOLSTER) AT LDR-PILE AND ADJUST
2 WINCH-OPER PUSH WINCH-DOWN PROCESS (TO TANKTOP) F 1 / 3
3 WINCH-OPER LOOSEN (=SWING) CABLE WITH BEND AT MENHOLE 5
   ARM-STROKES USING HANDS F 1 / 3
4 WINCH-OPER THROW CABLE FROM MENHOLE TO CARF-3 F 1 / 3
3 CARP-3 GET+MANIPULATE WITH BEND CABLE AT LDR-PILE (HOOK AROUND
   LADDERS) (ALLOW FOR 2 ATTEMPTS) F 2 / 3
6 WINCH-OPER PUSH WINCH-FREE PROCESS (CLEAR OBSTACLES) F 1 / 3
7 WINCH-OPER PUSH WINCH-UP PROCESS (TO MENHOLE) F 1 / 3
MANUAL METHODS

412. REMOVE TOOLBOX ON (MATERIAL FILE) WITH WINCH AT ANY TANKS AND Voids

Carpenter

PER TOOLBOX OFG: 3 08-FER-82

* REPRESENTS ELAPSED TIME
* ...REMOVING TOOLBOX FROM MATL...
* ...PILEON TANKTOP TO DECK (GOES THRU...
* ...MANHOLE),

* TOOLBOX CONTAINS:
* ...28 BOLTS
* ...28 NUTS
* ...28 LADDER CLIPS

CARP-3 BEGINS AT LDR-PILE

1 CARP-3 GET+PLACE 7 NUTS AND 7 BOLTS FROM MATL-PILE TO TOOLBOX-1 WITH BEND (TOTAL OF 28 ) PF 4 (2 3 4 5 6)
2 CARP-3 GET+PLACE WITH BEND 4 LCLIPS FROM MATL-PILE TO TOOLBOX-1 WITH BEND (TOTAL OF 28 ) F 7
3 WINCH-OPER PUSH WINCH-DOWN PROCESS (TO TANKTOP)
4 WINCH-OPER LOOSEN ( =SWING ) CABLE WITH REND AT MENHOLE 5 ARM-STROKES USING HANDS
5 WINCH-OPER THROW CABLE FROM MENHOLE TO CARP-3
6 CARP-3 GET+MANIPULATE WITH BEND CABLE AT MATL-PILE (HOOK AROUND TOOLBOX)
7 WINCH-OPER PUSH WINCH-FREE PROCESS (CLEAR OBSTACLES)
8 WINCH-OPER PUSH WINCH-UP PROCESS (TO MENHOLE)

431. (WALK UP OR DOWN) MOVE OPERATOR (ON INCLINED STAIRS) ON BULKHEAD AT TANKS AND Voids

Carpenter

PER SET OF INCLINED STAIRS OFG: 4 10-FEB-82

* REPRESENTS ELAPSED TIME
* ...REPRESENTS CARPENTER WALKING UP OR DOWN
* ...A SET OF INCLINED STAIRS. AVERAGE NUMBER OF TREADS IN A SET OF INCLINED
* ...STAIRS = 16.
* ...CARPENTERS ARE WALKING UP OR DOWN STAIRS AT THE SAME TIME.

CARP-1 BEGINS AT LEVEL-1

1 CARP-1 WALK TO LEVEL-2
2 CARP-2 WALK TO LEVEL-2 SIMO
MANUAL METHODS

563. TRANSPORT STAGING BRACKET WITH (TOUER CRANE) AT (WING) TANKS AND VOIDS
CARPENTER
PER STAGING BRACKET OFG: 3 23-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS TRANSPORTING BRACKETS FROM...
* ...BIN-1 TO BULKHEAD
* DISTANCES FROM CRANE-REST TO BIN-1 AND...
* ...FROM BIN-1 TO BULKHEAD ARE AVERAGE...
* ...DISTANCES FROM THE SIDE OF A BASIN
* ...1200’ X 200’
* MAXIMUM NUMBER OF BRKTS IN LIFT = 6
C-OPER BEGINS AT CR-1

1 TRANSPORT BRKT FROM BIN-1 USING CRANE WITH HOOK+SLING TO BULKHEAD
   (BTWN BRKTS) PLACE+ADJUST RETURN TO CR-1 F 1 / 6

564. TRANSPORT LADDER WITH (TOUER CRANE) AT (WING) TANKS AND VOIDS CARPENTER
PER LADDER OFG: 3 23-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS TRANSPORTING LADERS FROM
* ...LDR-PILE TO BULKHEAD
* DISTANCES FROM CRANE-REST TO LDR-PILE
* ...AND FROM LDR-PILE TO BULKHEAD ARE
* ...AVERAGE DISTANCE FROM SIDE OF BASIN
* ...1200’ X 200’
* MAXIMUM NUMBER OF LADDERS IN LIFT = 3
C-OPER BEGINS AT CR-1

1 TRANSPORT LADR FROM LDR-PILE USING CRANE WITH HOOK+SLING TO BULKHEAD
   (AT, LDR) PLACE+ADJUST RETURN TO CR-1 F 1 / 3
565. TRANSPORT STAGING PLANK WITH (TOWER CRANE) AT (WING) TANKS AND VOID
CARPENTER

PER STAGING PLANK OFG: 3 23-MAY-83

* REPRESENTS ELAPSED TIME
* ...LU-PILE TO BULKHEAD
* ...DISTANCES FROM CRANE-REST TO LU-PILE AND
* ...FROM LU-PILE TO BULKHEAD ARE AVERAGE
* ...DISTANCES FROM THE SIDE OF A BASIN
* ...1200’X200’
* MAXIMUM NUMBER OF BOARDS IN LIFT = 3

C-OPER BEGINS AT CR-1

1 TRANSPORT BOARD FROM LU-FILE USING CRANE WITH HOOK+SLING TO BULK
( BTWN BRKTS ) PLACE+MANEUVER RETURN TO CR-1 F 1 / 3

566. TRANSPORT STANCHION WITH (TOWER CRANE) AT (WING) TANKS AND voids
CARPENTER

PER STANCHION OFG: 3 23-MAY-83

* REPRESENTS ELAPSED TIME
* ...BIN-2 TO BULKHEAD
* ...DISTANCES FROM CRANE-REST TO BIN-2 AND...
* ...FROM BIN-2 TO BULKHEAD ARE AVERAGE...
* ...DISTANCES FROM THE SIDE OF A BASIN
* ...1200’X200’
* MAXIMUM NUMBER OF STANCHIONS IN LIFT = 6

C-OPER BEGINS AT CR-1

1 TRANSPORT STAN FROM BIN-2 USING CRANE WITH HOOK+SLING TO BULKHEA
BTWN BRKTS ) PLACE+ADJUST RETURN TO CR-1 F 1 / 6
MANUAL METHODS

567. TRANSPORT HANDRAIL WITH (TOWER CRANE) AT (WING) TANKS ANU VOIBS CARPENTER
PER HANDRAIL OFG: 3 23-MAY-83
  * REPRESENTS ELAPSED TIME
  * REPRESENTS TRANSPORTING HANDRAIL FROM...
  * ...HR-PILE TO BULKHEAD
  * DISTANCES FROM CRANE-REST TO HR-PILE AND
  * ...FROM HR-PILE TO BULKHEAD ARE AVERAGE
  * ...DISTANCES FROM THE SIDE OF A BASIN
  * ...1200' X 200'
  * MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6
C-OPER BEGINS AT CR-1

1 TRANSPORT HANDRAIL FROM HR-PILE USING CRANE WITH HOOK+SLING TO
BULKHEAD ( BTUN BRKTS ) PLACE+ADJUST RETURN TO CR-1 F 1 / 6

132. COMBINED SUB-OP

HOOK-UP/UNHOOK AND IGNITE/EXTINGUISH TORCH FOR BURNING WITH HAND
AT TANK CARPENTER
CREW SIZE = 6 (3 CARPS ABOVE DECK ANB 3 BELOW). RATE IN ELAPSED TIME,
MULT BY 6 TO OBTAIN TOTAL TIME,
PER 8-HR SHIFT ANII (1) CUT OFG: 4 20-NOV-81
  * THE FOLLOWING IS INCLUDED IN THIS SUBOP:
  * --2 HOOK-UPS ANLI 2 UNHOOKS PER (1)......
  * ...8-HR SHIFT
  * --(1) OCCURRENCE FOR IGNITE AND ........
  * ...EXTINGUISH TORCH
  * --TO BETERNINE THE FREQ OF THE SUB-OP...
  * ...FRO NUMBER OF CUTS >1, USE THE ......
  * ...FORMULA:  FREQ = 1+ [(N-1) X .231 ....
  * ...UHERE 'N' = THE NUMBER OF CUTS(BURNS)

  Combined sub-operation elements
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  9, HOOK-UP AND UNHOOK TORCH ON MANIFOLD WITH WRENCH AT SHIP

  10. IGNITE AND EXTINGUISH TORCH FOR BURNING WITH HAND AT TANK
376. SET-UP (STAGING CLIP) ON BULKHEAD WITH HAMMER (AND STEEL-TAPE) AT T
CARPENTER
PER STAGING CLIP OFG: 4 01-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING UP A STAGING CLIP ON
* ...THE BULKHEAD
* WELDING OF THE CLIP WILL BE DONE IN A...
* ...SEPARATE SUB OPERATION
CARP-1 BEGINS AT TANKTOP

1 CARP-1 MEASURE AT BRKT-1 USING STEEL-TAPE-1 ASIDE TO CARP-1
2 CARP-1 LOOSEN PAINT ON BHD AT BRKT-1 4 STRIKES USING HAMMER-1 A
TO CARP-1
3 CARP-1 GET+PLACE WITH BEND SCLIP FROM TOOLBOX-2 TO BRKT-1 ( TACK
UPON PLACEMENT )

377. MAKE READY STAGING BRACKET FOR (TRANSPORTING) WITH HAND AT TANK (OR
WAY) CARPENTER
PER STAGING BRACKET OFG: 3 02-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS GETTING BRACKET READY TO BE...
* ...TRANSPORTED TO TANK OR RULKIHEAD
* CARPENTER IS LOCATED EITHER ON THE WAY...
* ...OR IN TANK AT THE MATERIAL (BIN-1)
CARP-3 BEGINS AT BIN-1

1 CARP-3 GET+PLACE WITH BEND BRKT FROM BIN-I TO BIN-1
2 CARP-3 GET+PLACE WITH BEND BOLT FROM TOOLBOX-1 TO BIN-1 AND INSE
BOLT IN BRKT
3 CARP-3 FASTEN NUT AT BIN-1 4 WRIST-TURNS USING HANDS
4 CARP-3 GET+PLACE BRNT FROM BIN-1 TO BIN-1 ( PILE UP BRKTS FOR
TRANSPORTATION )
383. SET-UP (ACCESS) LADDER ON BULKHEAD WITH HAND AT TANK CARPENTER
PER LADDER OFG: 3 01-FEB-82

REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING UP AN ACCESS LADDER.. 
* ....ON THE BULKHEAD SO THAT THE CARPENTER 
* ...CAN CLIMB TO THE NEXT LADDER. 
* ALSO INCLUDES CLIMBING UP AND DOWN THE.. 
* ...LADDER. 
* AVERAGE NUMBER OF RUNGS = 12
CARP-1 BEGINS AT TANKTOP

1 CARP-1 GET+PLACE WITH BEND LADR FROM TANKTOP TO LDR 
2 CARP-1 SLIDE ( CLIMB-UP ) LADDER AT LDR ( 12 RUNGS ) PF 12 ( 1 ) PF 12 ( 34 ) 
3 CARP-1 PULL ( CLIMB-DOWN ) LADDER AT LDR ( 12 RUNGS ) PF 12 ( 1 ) PF 12 ( 34 ) 

384. POSITION (SECURE) (ACCESS) LADDER FOR BULKHEAD WITH HAMMER (AND LADDER CLIPS) AT TANK CARPENTER
PER LADDER OFG: 3 03-FEB-82

REPRESENTS ELAPSED TIME
* REPRESENTS SECURING A LADDER TO THE..... 
* ...BULKHEAXI USING 4 LADDER CLIPS 
* WELDING OF CLIPS WILL BE DONE IN A...... 
* ...SEPARATE SUB OPERATION
CARP-1 BEGINS AT LDR

1 CARP-1 LOOSEN 4 PAINT ON BHD AT LDR 4 STRIKES USING HAMMER-1 ASIDE TO CARP-1 
2 CARP-2 GET+PLACE WITH BEND 4 LCLIPS FROM TOOLBOX-2 TO LDR ( TACKING UPON PLACEMENT ) PF 4 ( 6 )
MANUAL METHODS

388. SET-UP STAGING PLANK ON STAGING BRACKET WITH HAND AT TANK CARPENTER
PER BOARD OFG: 3 02-FEB-82
* REPRESENTS ELAPSED TIME
  * REPRESENTS SETTING UP BOARDS BETWEEN....
  * ...BRACKETS.
  * TWO MAN OPERATION:
  * CARPENTERS ARE LOCATED AT TWO DIFFERENT
  * ..BRACKETS, THEY BOTH LIFT THE BOARD....
  * ..TOGETHER AND SLIDE IT INTO POSITION,
  * IN THIS ANALYSIS CARPENTERS ARE LOCATED
  * ...ON THE LEVEL BELOW THE BOARDS,
CARP-1 BEGINS AT BRKT-1

1 CARF-1+CARF-2 GET+SLIDIE WITH 1 STEP BOARD AT BRKT-1 AND ALIGN
2 CARF-1 WALK TO BRKT-2 ( TO DO NEXT SECTION O BOARDs, CARP2 ALSO
  MOVES TO ANOTHER BRACKET )

393. SET-UP STANCHION IN STAGING BRACKET WITH HAND AT TANK CARPENTER
PER STANCHION OFG: 3 02-FEB-82
* REPRESENT'S ELAPSED TIME
  * REPRESENTS PUTTING STANCHION IN THE.....
  * ...BRACKET SLEEVE.
CARP-1 BEGINS AT BRKT-1

1 CARP-I GET+PLACE WITH BEND STAN FROM TANKTOP TO BRKT-1 AND INSEF
2 CARP-1 WALK TO BRKT-2 (NO NEXT STANCHION )
MANUAL METHODS

396. SET-UP HANDRAIL ON STANCHION WITH HAND AT TANK CARPENTER
PER HANDRAIL OFG: 3 02-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING HANDRAIL INTO THE....
* ...EYELETS ON THE STANCHION
* INCLUDES ACTION DISTANCES NEEDED FOR....
* ...ALIGNING THE HANDRAIL
* WELDING OF THE HANDRAIL CONNECTIONS WILL
* ...BE DONE IN A SEPARATE SUB OPERATION
CARP-1 BEGINS AT BRKT-1

1 CARP-1 GET+SLIEIIE WITH BEND HANDRAIL AT BRKT-2 ANSI ALIGN ( THRU 2
EYELETS ON THE STANCHIONS AT RRKT1 & BRKT2 ) RETURN TO BRKT-1 PF 2
( 4 5 6 )
2 CARP-1 WALK TO BRKT-2 ( DO NEXT SECTION )

397. SET-UP HANBRAIL (END PIECES) ON HANDRAIL (AND BULKHEAD) WITH HAND AT
TANK CARPENTER
PER HANDRAIL OFG: 4 02-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING HANDRAIL (END PIECES)
* ...AT THE END OF A STAGING LEVEL
* WELDING OF THE HANDRAIL (END PIECES)....
* ...CONNECTIONS WILL BE DONE IN A........
* ...SEPARATE SUB OPERATION
CARP-1 BEGINS AT BRKT-1

1 CARP-1 GET+HOLD WITH BEND HANDRAIL FROM TANKTOP TO CARP-1
2 PTIME 1.02 K ( CUT HANDRAIL INTO 2 PIECES WITH ELECTRODE )
3 CARP-1 GET+PLACE 2 HANDRAIL ( END PIECES ) FROM CARP-I TO BRKT-1 F 2
MANUAL METHODS

399. TEAR DOWN HANDRAIL ON BULKHEAD WITH TORCH (AND WINCH) AT (WING) TAI AND VOIDS CARPENTER

PER HANDRAIL OFG: 3 04-FEB-82

* REPRESENTS ELAPSED TIME
* WING TANK, HANDRAIL IS LOWERED TO THE
* MATL-PILE WITH A WINCH BECAUSE THE...
* TANK IS TO SMALL FOR THE HANDRAIL TO...
* BE THROWN.
* CARPENTERS REMOVE 2 HANDRAIL BEFORE.....
* MOVING TO THE NEXT SECTION.
* MAXIMUM NUMBERS OF HANDRAIL IN LIFT = 6

CARF-1 BEGINS AT BULKHEAD

1 CARP-1 PULL TORCH FROM BULKHEAD TO BRKT-1
2 CARP-1 OPERATE TORCH AT BRKT-1 PTINE 0.26 M (BURN OFF HANDRAIL
3 CARP-2 GET+HOLD HANDRAIL FROM BRKT-1 TO BRKT-1 SIMO
4 CARP-2 HOLD+PLACE HANDRAIL FROM BRKT-1 TO BRNT-PILE
5 WINCH-OPER LOOSEN (SWING) CABLE WITH BEND AT MENHOLE 5
  ARM-STROKES USING HANDS F 1 / 6
6 WINCH-OPER THROW CABLE FROM MENHOLE TO CARP-2 F 1 / 6
7 CARP-2 GET+MANIPULATE-WITH BEND CARLE AT BRKT-PILE (HOOK CABLE
  AROUND HANDRAIL) F 1 / 6
8 WINCH-OPER PUSH WINCH-FREE PROCESS (CLEAR OBSTACLES) F 1 / 6
9 WINCH-OPER PUSH WINCH-DOWN PROCESS (TO MATL PILE) F 1 / 6
10 WINCH-OPER PUSH WINCH-UP PROCESS (TO MENHOLE) F 1 / 6
11 CARP-2 AND CARP1 WALK TO BRKT-2 F I / 2
MANUAL METHODS

401. TEAR DOWN STANCHION ON BULKHEAD WITH HAND (AND WINCH) AT (WING) TANKS
ANII VOIDS CARPENTER
PER STANCHION QFG: 3 04-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS TEARING DOWN STANCHION IN A.. ..WING TANK. STANCHION IS LOWERED TO...
* ...THE MATL-PILE WITH A WINCH BECAUSE...
* ...THE TANK IS TO SHAL FOR THE........
* ...STANCHION TO BE THROWN.
* MAXIMUM NUMBER OF STANCHIONS IN LIFT = 6
CARP-2 BEGINS AT BRKT-PILE

1  CARP-2 LOOSEN STAN AT BRKT-1  4 ARM-STROKES USING HANUS
2  CARP-2 HOLD+PLACE STAN FROM BRKT-1 TO BRKT-PILE
3  WINCH-OPER LOOSEN ( =SWING ) CABLE WITH BEND AT BENGOLE 5
   ARM-STROKES USING HANDS F 1 / 6
4  WINCH-OPER THROW CABLE FROM MENHOLE TO CARP-2 F 1 / 6
5  CARP-2 GETH+MANIPULATE WITH BEND CABLE AT BRKT-PILE ( HOOK CABLE
   AROUND STANCHIONS ) F 1 / 6
6  WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES ) F 1 / 6
7  WINCH-OPER PUSH WINCH-DOWN PROCESS ( TO MATL PILE ) F 1 / 6
8  WINCH-OPER PUSH WINCH-UP PROCESS ( TO MENHOLE ) F 1 / 6
9  CARP-2 WALK TO BRKT-2
MANUAL METHODS

402. TEAR DOWN STAGING PLANK ON STAGING BRACKET WITH HAND (AND WINCH) AT TANKS AND VOIDS CARPENTER

PER STAGING PLANK OFG: 3 04-FEB-82

* REPRESENTS ELAPSED TIME

* REPRESENTS REMOVING BOARDS FROM ANY TANK

* ...WINCH IS USED TO LOWER ROARU TO......

* ...BD-PILE ON TANKTOP.

* MAXIMUM NUMBER OF BOARDS IN LIFT = 3

CARP-1 BEGINS AT BULKHEAD

1. CARP-1 AND CARP2 GET+MANIPULATE WITH BEND BOARD AT BRKT-1 (FLIP BOARDS ONTO 3RD BOARD)

2. WINCH-OPER LOOSEN (=SWING) WITH BEND CABLE AT BTRWTH 5 ARM-STR USING HANDS F 1 / 3

3. WINCH-OPER THROW CABLE FROM BTRWTH TO CARP-1 WITH BEND F 1 / 3

4. CARP-1 GET+MANIPULATE WITH BEND CABLE AT BRKT-I (HOOK CABLE AROUND BOARD ALLOW FOR 2 ATTEMPTS) F 2 / 3

5. WINCH-OPER PUSH WINCH-FREE PROCESS (CLEAR OBSTACLES) F 1 / 3

6. WINCH-OPER PUSH WINCH-DOWN PROCESS (TO BD PILE) F 1 / 3

7. WINCH-OPER PUSH WINCH-UP PROCESS (TO BTRWTH) F 1 / 3

8. CARP-1 AND CARP2 WALK TO BRKT-2
MANUAL METHODS

403. TEAR DOWN LADDER (AND LADDER CLIPS) ON BULKHEAKI WITH TORCH (AND WINCH
AT ANY TANKS AND VOIDS CARPENTER
PER LADDER OFG: 3 05-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS REMOVING LADDER FROM BULKHEAD
* THERE ARE 4 LADDER CLIPS PER LADDER,
* LADDER LOWERED TO LDR-PILE BY WINCH
* LADDER CLIPS THROWN TO MATL-PILE.
CARP-1 BEGINS AT BRKT-2

1. CARP-1 PULL TORCH AT LDR
2. CARP-1 OPERATE TORCH AT LDR PTIME 0.47 N F 4 ( BURN OFF 4 CLIPS )
3. CARP-1 GET+THROW 4 LCLIPS FROM LDR TO MATL-PILE WITHOUT BEND F 4
4. CARP-2 GET+POSITION LADR FROM LDR TO BRKT-2 WITH BEND ( LAY DOWN ON
BOARDS )
5. WINCH-OPER LOOSEN ( =SWING ) CABLE WITH BEND AT BTRWTH 5 ARM-STROKES
USING HANDS
6. WINCH-OPER THROW CABLE FROM BTRWTH TO CARP-2 WITH BEND
7. CARP-2 GET+MANIPULATE WITH BEND CABLE AT BRKT-2 ( HOOK AROUND LADR )
8. WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES )
9. WINCH-OPER PUSH WINCH-DOWN PROCESS ( TO LDR PILE )
10. WINCH-OPER PUSH WINCH-UP PROCESS ( TO BTRWTH )
11. CARP-1 WALK TO BRKT-2
MANUAL METHODS

406. TEAR DOUN STAGING BRACKET ON BULKHEAD WITH WRENCH AT ANY TANKS ANII VOIDS CARPENTER

PER STAGING BRACKET OFG: 3 05-FEB-82

* REPRESENTS ELAPSED TIME
* REPRESENTS TEARING DOWN STAGING BRACKET
* ...IN ANY TANK BRACKETS ARE LOWERED TO
* ...MATL-PILE BY WINCH.
* MAXIMUM NUMRER OF BRACKETS IN LIFT = 3
CARP-1 BEGINS AT BRKT-2

1. CARP-1 LOOSEN NUT AT BRKT-1 1 ARM-STROKE USING WRENCH-1 AND HOLD
2. CARP-1 HOLD+LOOSEN NUT AT BRKT-1 13 WRIST-STROKES USING WRENCH-ASIDE TO CARP-1
3. CARP-1 GET+REMOVE BOLT FROM BRKT-1 TO CARP-1
4. CARP-1 THROW NUT AND BOLT FROM CARP-1 TO MATL-PILE WITHOUT BEND
5. CARP-2 GET+PLACE BRKT FROM BRKT-1 TO BRKT-PILE
6. WINCH-OF'ER LOOSEN (=SWING) CABLE WITH BEND AT BTRWTH 5 ARM-STROKE USING HANDS F 1 / 3
7. WINCH-OPER THROW CABLE FROM BTRWTH TO CARP-2 F 1 / 3
8. CARP-2 GET+MANIPULATE WITH BEND CABLE AT BRKT-PILE ( HOOK AROUND BRACKETS ) F 1 / 3
9. WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES ) F 1 / 3
10. WINCH-OPER PUSH WINCH-DOWN PROCESS ( TO MATL PILE ) F 1 / 3
11. WINCH-OPER PUSH WINCH-UP PROCESS ( TO BTRWTH ) F 1 / 3
12. CARP-2 AND CARP1 WALK TO BRKT-2
MANUAL METHODS

426. MAKE READY STAGING BRACKET FOR (TRANSPORTING) WITH HAND AT ANY WAYS CARPENTER
    PER STAGING BRACKET OFG: 3 10-FEB-82
    REPRESENTS ELAPSED TIME
    * REPRESENTS GETTING BRACKET READY TO BE...
    * ...TRANSPORTED TO TANK OR BULKHEAD
    * CARPENTER IS LOCATED EITHER ON THE WAY...
    * ...OR IN TANK AT THE MATERIAL (BIN-1)
    CARP-3 BEGINS AT BIN-1
    1 CARP-3 GET+PLACE WITH BEND BRKT FROM BIN-1 TO BIN-1
    2 CARP-3 GET+PLACE WITH BEND BOLT FROM TOOLBOX-1 TO BIN-1 AND INSERT BOLT IN BRKT
    3 CARP-3 FASTEN NUT AT BIN-1 4 WRIST-TURNS USING HANDS
    4 CARP-3 GET+PLACE BRKT FROM BIN-1 TO BIN-1 (PILE UP BRKTS FOR TRANSPORTATION)

427. MAKE READY LADDER FOR (TRANSPORTING) WITH HAND AT ANY WAYS CARPENTER
    PER LADDER OFG: 3 10-FEB-82
    REPRESENTS ELAPSED TIME
    * REPRESENTS GETTING LADDER ON BOLSTERS SO
    * ...THAT THE CRANE CAN TRANSPORT IT,
    CARP-3 BEGINS AT BIN-1
    1 CARP-3 GET+SLIDE LADR_ AT LDR-PILE AND ADJUST (ON BOLSTERS)

428. MAKE READY STAGING PLANK FOR (TRANSPORTING) WITH HAND AT ANY WAYS CARPENTER
    PER STAGING PLANK OFG: 3 10-FEB-82
    REPRESENTS ELAPSED TIME
    * REPRESENTS GETTING BOARD ON BOLSTERS SO
    * ...THAT THE CRANE CAN TRANSPORT IT
    CARP-3 BEGINS AT BIN-1
    1 CARP-3 GET+SLIDE BOARD AT LU-PILE AND ADJUST (ON BOLSTERS)
MANUAL METHODS

429 MAKE READY STANCHION FOR (TRANSPORTING) WITH HAND AT ANY WAYS CARPEN PER STANCHION OFG: 3 10-FEB-82

* REPRESENTS ELAPSED TIME
* REPRESENTS GETTING STANCHION READY TO BE
* ...TRANSPORTED,
CARP-3 BEGINS AT LU-PILE

1 CARP-3 GET+PLACE WITH BEND STAN FROM BIN-2 TO BIN-2

430 MAKE READY HANDRAIL FOR (TRANSPORTING) WITH HAND AT ANY WAYS CARPEN PER HANDRAIL OFG: 3 10-FEB-82

* REPRESENTS ELAPSED TIME
* REPRESENTS GETTING HANDRAIL ON BOLSTERS
* ...SO THAT THE CRANE CAN TRANSPORT IT
CARP-3 BEGINS AT BIN-2

1 CARP-3 GET+SLIDE HANDRAIL AT HR-PILE AND ADJUST ( ON BOLSTERS )

569. SET-UP STAGING BRACNET ON WEB FRAME WITH WRENCH AT ( WING ) TANKS A VOIDS CARPENTER
PER STAGING BRACKET OFG: 4 24-MAY-83

* REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING UP A STAGING BRACKET
* ...ON A EXISTING STAGING CLIP ( LOCATED
* ...ON A WEB FRAME )
CARP-1 BEGINS AT WING-TANK

1 CARP-1 GET+HOLD WITH BEND BRKT FROM WING-TANK TO CARP-1
2 CARP-1 LOOSEN NUT AT WEB-1 4 WRIST-TURNS USING HANDS
3 CARP-1 REMOVE BOLT FROM WEB-1 ON BRKT TO CARF-1
4 CARP-1 GET+PLACE BRKT FROM CARP-1 TO WEB-1 AND INSERT BOLT
5 CARP-1 FASTEN NUT AT WEB-I 13 WRIST-TURNS USING HANDS
6 CARP-1 FASTEN NUT AT WEB-1 4 ARM-STROKES USING WRENCH-1 ASIDE TO CARP-I
7 CARP-1 WALK TO WEB-2 ( TO 110 NEXT BRKT )
MANUAL METHODS

570. SET-UP (ACCESS) LADDER ON (INBOARD OR OUTBOARD) BULKHEAD WITH HAND AT (WING) TANKS AND VOIDS CARPENTER
PER LADDER OFG: 4 24-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING UP AN ACCESS LADDER
* ...ON THE INBOARD OR OUTBOARD BULKHEAD
* ...SO THAT THE CARPENTER CAN CLIMB TO
* ...THE NEXT LEVEL OF STAGING
* ALSO INCLUDES CLIMBING UP AND DOWN THE
* ...LADDER
CARP'-1 BEGINS AT WING-TANK

1 CARP-1 GET+PLACE WITH BEND LADR FROM MING-TANK TO LDR
2 CARP-1 SLIDE (CLIME-UP) LADDER AT LDR (12 RUNGS) PF 12 (1) PF 12 (34)
3 CARP-1 PULL (CLIMB-DOWN) LADDER AT LDR (12 RUNGS) PF 12 (1) PF 12 (34)

571. POSITION (SECURE) (ACCESS) LADDER ON (INBOARD OR OUTBOARD) BULKHEAD WITH HAMMER AT (WING) TANKS AND VOIDS CARPENTER
PER LADDER OFG: 4 24-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS SECURING A LADDER TO THE
* ...INBOARD OR OUTBOARD BULKHEAD USING
* ...FOUR LADDER CLIPS
* WELDING OF CLIPS WILL BE DONE IN A
* ...SEPARATE SUB OPERATION
CARP-1 BEGINS AT LDR

1 CARP-1 LOOSEN 4 PAINT ON (INBOARD OR OUTBOARD) BULKHEAD AT LDR 4 STRIKES USING HAMMER-1 ASIDE TO CARP-1
2 CARP-2 GET+PLACE WITH BEND 4 LCLIPS FROM TOOLBOX-2 TO LDR (TACKING UPON PLACEMENT) PF 4 (6)
MANUAL METHODS

573. SET-UP STAGING PLANK ON STAGING BRACKET WITH HAND AT ( MING ) TANKS
VOIDS CARPENTER
PER STAGING FLANK OFG: 4 24-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS SPREADING BOARDS BETWEEN WEBS
* 2 MAN OPERATION:
* CARPENTERS ARE LOCATED AT TWO DIFFERENT
* ...WEBS+ THEY BOTH PICK UP THE BOARD
* ...TOGETHER AND SLIDE IT INTO POSITION,
* IN THIS ANALYSIS CARPENTERS ARE LOCATED
* ...ON THE SAME LEVEL AS THE BOARDS.
CARP-1 BEGINS AT WEB-1

1 CARP-1 AND CARP2 GET+SLIDE WITH BEND WITH 1 STEP BOARD AT WEB-1
ALIGN
2 CARP-1 WALK TO WEB-2 ( TO DO NEXT SECTION OF BOARDS, CARP2 ALSO
MOVES TO ANOTHER BRACKET )

575. SET-UP STAGING PLANK ON ( EXISTING ) BRACKET STAGING WITH HAND AT ( MING ) TANKS AND Voids CARPENTER
PER STAGING FLANK OFG: 4 24-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS SPREADING BOARDS BETWEEN
* ...EXISTING STAGING AND INBOARD OR
* ...OUTBOARD BULKHEAD
* 2 MAN OPERATION:
* CARPENTERS ARE LOCATED AT DIFFERENT WEBS
* ...EACH CARPENTER SPREADS TWO BOARDS
* ...SIMULTANEOUSLY
* IN THIS ANALYSIS CARPENTERS ARE LOCATED
* ...ON THE SAME LEVEL AS THE BOARDS.
CARP-1 BEGINS AT WEB-1

1 CARP-1 GET-I-MANIPULATE ( FLIP ) WITH BEND WITH 1 STEP BOARD AT WE
AND ALIGN
2 CARP-1 WALK TO WEB-2
MANUAL METHODS

577. SET-UP STANCHION IN STAGING BRACKET WITH HAND AT ( WING ) TANKS AND VOIDS CARPENTER
PER STANCHION CFG: 4 24-MAY-83
* REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING STANCHION IN THE STAGING BRACKET SLEEVE IN A WING TANK
CARP-1 BEGINS AT WEB-1

1 CARP-1 GET+PLACE WITH BEND STANCHION FROM WING-TANK TO WEB-1 AND INSERT
2 CARP-1 WALK TO WEB-2 ( TO DO NEXT STANCHION )

573. SET-UP HANDRAIL IN STANCHION WITH HAND AT ( WING ) TANKS AND VOIDS CARPENTER
PER HANDRAIL CFG: 4 24-MAY-83
* REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING HANDRAIL INTO THE STANCHION
* INCLUDES ACTION DISTANCES NEEDED FOR ALIGNING THE HANDRAIL
* WELDING OF THE HANDRAIL WILL BE DONE IN A SEPARATE SUB OPERATION
CARP-1 BEGINS AT WEB-1

1 CARP-1 GET+SLIDE WITH BEND HANDRAIL AT WEB-2 AND ALIGN ( THRU 2 EYELETS IN THE STANCHIONS AT. WER AND WEB2 ) RETURN TO WEB-1 PF 2 4 5 6
2 CARP-1 WALK TO WEB-2 ( TO DO NEXT SECTION OF HANDRAIL )
579. SET-UP HANDRAIL (END PIECES) ON (HAND`RAIL AND) BULKHEAD WITH HA AT (WING ) TANKS AND VOIDS CARPENTER PER HANDRAIL OFG: 4 24-MAY-83

REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING HANDRAIL (END PIECES)
* ...AT THE END OF A STAGING LEVEL
* WELDING OF THE HANDRAIL (END PIECES)
* ...CONNECTIONS WILL BE DONE IN A
* ...SEPARATE SUB OPERATION
CARP-1 BEGINS AT WEB-1

1 CARP-1 GET+HOLD WITH BEND HANDRAIL FROM WING-TANK TO CARP-1
2 FTIME 1,02 M (CUT HANDRAIL INTO 2 PIECES WITH ELECTRODE)
3 CARP-1 GET+PLACE 2 HANDRAIL (END PIECES) FROM CARP-1 TO WEB-1

568. SET-UP (STAGING CLIP) ON WEB FRAME WITH HAMMER (AND STEEL-TAPE) (WING) TANKS AND VOIDS CARPENTER PER STAGING CLIP OFG: 4 24-MAY-83

REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING UP A STAGING CLIP ON
* ...A WEB FRAME.
* WELDING OF THE CLIP WILL BE DONE IN A.
* ...SEPARATE SUB OPERATION.
CARP-1 BEGINS AT WING-TANK

1 CARP-1 MEASURE AT WEB-1 USING STEEL-TAPE-1 ASIDE TO CARP-1
2 CARP-1 LOOSEN PAINT ON WEB AT WEB-1 4 STRIKES USING HAMMER-1 ASIDE TO CARP-1
3 CARP-1 GET+PLACE WITH BEND SCLIP FROM TOOLBOX-2 TO WEB-1 (TACKI UPON PLACEMENT)
SECTION 3
MANUAL METHODS

545. ASSEMBLE I-BEAMS FOR TANK STAGING PLATFORM WITH WRENCH AT ANY FLATEN CARPENTER
PER PLATFORM OFG: 4 02-FEB-83
REPRESENTS ELAPSED TIME
* CARPENTER WORKS ALONE BOLTING I-BEAMS
* STEPS:
* 1-4 ARE FOR THE CONNECTIONS OF I-6 & I-7
* ...AT I-1,1-2,I-3,I-4, AND I-5
* 3-6 ARE FOR MOVEMENT OF THE CARPENTER
* ...BETWEEN THE CONNECTIONS
CARP-1 BEGINS AT TANK-STAGING-PLATFORM

1 CARP-1 GET+POSITION 4 BOLTS FROM TOOLBOX-1 TO 1-1 WITH BEND AND INSERT BOLT PF 4 (456 7)F 10
2 CARP-1 GET+POSITION WITH BEND 4 WASHERS AND NUTS FROM TOOLBOX-1 TO 1-1 WITH BEND PF 8 (456)F10
3 CARP-1 FASTEN 4 NUTS AT 1-1 13 SPINS DIFFICULT USING FINGERS F 10
4-CARP-1 FASTEN 4 NUTS AT I-1 13 WRIST-STROKES DIFFICULT USING WRENCH ASIDE TO CARP-1 F 10
5 CARP-1 GET+PLACE WITH CLIMB-OBJECT TOOLBOX-1 FROM I-1 TO 10 PF 10 (2 PF10 (56)
6 CARP-1 GET+PLACE WITH BEND TOOLBOX-1 FROM I-5 (AT. I-6) TO I-5 (AT. I-7) WITH 10 STEPS WITH BEND
MANUAL METHODS

546. ASSEMBLE ANGLE-EARS FOR TANK STAGING PLATFORM WITH WRENCH AT ANY PL
CARPENTER
PER FLAT FORM OFG: 4 02-FEB-83
REPRESENTS ELAPSED TIME
* CARPENTER WORKS ALONE ASSEMBLING ANGLES
* STEPS:
  * 1-6 ARE FOR CONNECTIONS OF A-4 AND A-1
    * ...AT I-1,I-2,I-3, I-4, AND I-5
  * 7-13 ARE FOR CONNECTIONS OF
    * ...A-3 AT I-5,I-4, AND I-3 AND
    * ...A-I AT I-3,I-2, AND I-1
  * 14-20 ARE FOR CONNECTIONS OF A-5 AND A-6
    * ...AT I-1,I-2,I-3,I-4, AND I-5
CARP-1 BEGINS AT TANK-STAGING-SHIFT:

1 CARP-1 GET+POSITION ANGLE FROM A-4 TO I-1 WITHOUT BEND F 10
2 CARP-1 GET+POSITION WITH BEND 2 BOLTS FROM TOOLBOX-1 TO I-1 WITH
   BEND AND INSERT BOLT PF 2 ( 4 5 6 7 ) F 10
3 CARP-1 GET+POSITION WITH BEND 2 WASHERS AND NUTS FROM TOOLBOX-1
   TO I-1 WITH BEND PF 2 ( 4 5 6 ) F 10
4 CARP-1 FASTEN 2 NUTS AT I-1 13 SPINS DIFFICULT USING FINGERS F 1
5 CARP-1 FASTEN 2 NUTS AT I-1 13 WRIST-STROKES DIFFICULT USING WREN
   ASIDE TO CARP-1 F 10
6 CARP-1 GET+PLACE WITH CLIMB-OBJECT TOOLBOX-1 FROM I-1 TO I-5 WITH
   STEPS PF 10 ( 2 ) PF 10 ( 56 )
7 CARP-1 GET+POSITION ANGLE FROM A-3 TO I-5 WITHOUT BEND F 6
8 CARP-1 GET+POSITION WITH BEND 2 BOLTS FROM TOOLBOX-1 TO I-5 WITH
   BEND AND INSERT BOLT PF 2 ( 4 5 6 7 ) F 6
9 CARP-1 GET+POSITION WITH BEND 2 WASHERS AND NUTS FROM TOOLBOX-1
   TO I-3 WITH BEND PF 2 ( 4 5 6 ) F 4
10 CARP-1 FASTEN 2 NUTS AT I-5 13 SPINS DIFFICULT USING FINGERS F
11 CARP-1 FASTEN 2 NUTS AT I-5 13 WRIST-STROKES DIFFICULT USING WREN
   ASIDE TO CARP-1 F 6
12 CARP-1 GET+PLACE WITH CLIMB-OBJECT TOOLBOX-1 FROM I-5 TO I-3 WI
   10 STEPS PF 3 ( 2 ) PF 3 ( 56 )
13 CARP-1 GET+PLACE WITH CLIMB-OBJECT TOOLBOX-1 FROM I-3 TO I-1 WI
   10 STEPS PF 3 ( 2 ) PF 3 ( 5 6 )
14 CARP-1 GET+POSITION ANGLE FROM A-4 TO I-1 ( AT+ A-6 ) F 10
15 CARP-1 GET+POSITION WITH BEND 2 BOLTS FROM TOOLBOX-1 TO I-1 WITH
   BEND AND INSERT BOLT PF 2 ( 4 5 6 7 ) F 10
16 CARP-1 GET+PLACE WITH BEND 2 WASHERS AND NUTS FROM TOOLBOX-1 TO
   I-1 WITH BEND PF 2 ( 4 5 6 ) F 10
17 CARP-1 FASTEN 2 NUTS AT I-1 13 SPINS DIFFICULT USING FINGERS F
18 CARP-1 FASTEN 2 NUTS AT I-1 13 WRIST-STROKES DIFFICULT USING WREN
   ASIDE TO CARP-1 F 10
19 CARP-1 GET+PLACE WITH BEND TOOLBOX-1 FROM I-1 TO I-5 PF 10 ( 2
   10 ( 56 )
MANIJAL METHODS

20 CARP-1 GET+PLACE WITH BEND TOOLBOX-1 FROM I-5 ( AT. A-6 ) TO I-5 ( AT+ A-5 ) WITH 10 STEPS WITH BEND

539. READ MATERIAL LIST (PRINT) FOR TANK STAGING PLATFORM WITH (EYES) AT ANY PLATEN CARPENTER
PER PLATFORM OFG: 4 02-FEB-83
REPRESENTS ELAPSED TIME
* CARPENTER READS PRINT BEFORE LAYING OUT
* ...TABLE. READS 48 DIGITS PER LOCATION
CARP-I BEGINS AT TANK-STAGING-PLATFORM

1 CARP-1 OPEN+SHUT PRINT F 6
2 CARP-1 READ 12 DIGITS F 24
3 CARP-1 HOLD+PLACE PRINT TO CARP-1 ( IN POCKET ) F 6

540. MEASURE (PLATEN) FOR TANK STAGING PLATFORM WITH (STEEL) TAPE AT ANY PLATEN CARPENTER
PER PLATFORM OFG: 4 31-JAN-83
REPRESENTS ELAPSED TIME
* REPRESENTS MEASURING TABLE FOR LAYOUT
* ANALYSIS INCLUDES ALL THE WALKING....
* ...DISTANCES FOR THE LAYOUT.
* STEPS:
* 2,3,4 ARE FOR I-1,1-2,1-3,I-4, AND 1-5
* ...AT A-5 AND A-6.
* 5,6,7 ARE FOR A-5,I-7,A-4,A-3,A-1,I-6,
* ...AND 6-6 AT I-5
* 5,6,7 ARE FOR A-5,I-7,A-4,A-2,A-1,1-6,
* ...AND A-6 AT I-1
* 9,10,11 ARE FOR A-2 AND A-3 AT I-3
CARP-1 BEGINS AT STORE-2

1 CARP-1 WALK TO TANK-STAGING-PLATFORM ( AT. I-1 ) WITH CLimb ( ON TABLE )
2 CARP-1 MEASURE AT I-1 USING STEEL-TAPE ASIDE TO CARP-1 F 10
3 CARP-1 WALK TO 1-5 WITHOUT BEND F 2
4 CARP-1 WALK TO I-1 WITHOUT BEND AND RETURN TO I-5 WITHOUT BEND F 2
5 CARP-1 MEASURE AT A-5 USING STEEL-TAPE ASIDE TO CARP-1 F 14
6 CARP-1 WALK TO A-6 WITHOUT BEND F 2
7 CARP-1 WALK TO A-5 WITHOUT BEND AND RETURN TO A-6 WITHOUT BEND F 2
8 CARP-1 WALK TO I-3 WITH 6 STEPS WITHOUT BEND
9 CARP-1 MEASURE WITH 8 STEPS AT A-2 USING STEEL-TAPE ASIDE TO CARP-1
10 CARP-1 MEASURE AT A-3 USING STEEL-TAPE ASIDE TO CARP-1
MANUAL METHODS

11 CARP-1 WALK TO STORE-2 WITH DESCEND (OFF TABLE)

541. MARK (PLATEN) FOR TANK STAGING PLATFORM WITH MARKER AT ANY PLATEN CARPENTER
PER PLATFORM OFG: 4 02-FEB-83
REPRESENTS ELAPSED TIME
* REPRESENTS MARKING THE LAYOUT FOR A TANK
* ..STAGING PLATFORM AND INSPECTING WORK.
* THE FOLLOWING PLACES ARE LAID OUT:
* ...AT A-5 AND A-6:
  * ...L-1,L-2,1-3,1-4, AND 1-5
* ...AT L-1 AND L-5:
  * ...A-6,1-6,A-1,A-4,1-7, AND A-5
* ...A-2 IS LAID OUT AT L-3 AND L-1
* ...A-3 IS LAID OUT AT L-3 AND 1-5
CARP-1 BEGINS AT TANK-STAGING-PLATFORM

1 CARP-1 MARK AT 1-1 5 DIGITS USING MARKER ASIDE TO CARP-1 F 25
2 CARP-1 INSPECT 5 POINTS F 25

542. TRANSPORT PALLET (I-BEAMS AND ANGLES) FOR TANK STAGING PLATFORM WITH (CRANE) AT ANY PLATEN CARPENTER
PER PLATFORM OFG: 4 02-FEB-83
REPRESENTS ELAPSED TIME
* MATERIAL NEEDED FOR ONE PLATFORM:
* ...I-BEAMS - 7
* ...ANGLES - 6
HOOKER-ON BEGINS AT CR-1

1 HOOKER-ON TRANSPORT PALLET FROM STORE-1 USING CRANE-1 WITH 2 HOOK+SLING TO STORE-2 PLACE+ADJUST RETURN TO CR-1
MANUAL METHODS

547. TRANSPORT STAGING FLANKS FOR TANK STAGING PLATFORM WITH (CRANE) AT ANY PLATEN CARPENTER

PER PLATFORM OFG: 4 02-FEB-83

REPRESENTS ELAPSED TIME

* BOARDS ARE TRANSPORTED FROM LUMBER PILE

* WHICH IS LOCATED ON THE PLATEN,

* TOTAL NUMBER OF BOARDS IN LIFT = 64

* TOTAL LIFTS = 2 (PORT AND STARBOARD)

HOOKER-ON BEGINS AT STORE-2

1 HOOKER-ON TRANSPORT BOARDS FROM LUMBER-FILE USING CRANE-2 WITH 2 HOOK+SLING TO TANK-STAGING-PLATFORM (AT+ A-5) PLACE+MANEUVER

RN CRANE-2 TO CR-2 RETURN HOOKER-ON TO STORE-2 F 2

549. TRANSPORT (FINISHED) TANK STAGING PLATFORM WITH (CRANE) AT ANY PLATEN CARPENTER

PER PLATFORM OFG: 4 02-FEB-83

REPRESENTS ELAPSED TIME

* TRANSPORT FINISHED PLATFORM TO A STORAGE

* ...PILE

HOOKER-ON BEGINS AT STORE-2

1 HOOKER-ON TRANSPORT FIN-PLATFORM FROM TANK-STAGING-PLATFORM USING CRANE-2 WITH 2 HOOK+SLING TO FIN-PILE PLACE+MANEUVER RETURN CRANE-2 TO CR-2 AND RETURN HOOKER-ON TO STORE-2
MANUAL METHODS

555. POSITION (RAISE) TANK STAGING PLATFORM WITH (CRANE) AT MID TANKS AN VOIDS CARPENTER PER PLATFORM OFG: 4 17-MAY-83

REPRESENTS ELAPSED TIME
* REPRESENTS RAISING TYPICAL PLATFORM IN A
* CENTER TANK AND SECURING IT TO THE
* MAIN DECK
* 2 carpenters WORK SIMULTANEOUSLY ON THE
* MAIN DECK
* 2 CARPENTERS WORK SIMULTANEOUSLY IN THE
* CENTER TANK ON THE PLATFORM
* STEPS:
* 1-4 FEEDING 4 CABLES THROUGH BUTTERWORTH
* HOLES ON MAIN DECK
* 7-12 CONNECTION OF SHACKLES ON PLATFORM
* 14-19 CONNECTION OF SUSPENSION CABLES ON
* PLATFORM AND MAIN DECK
* 21-26 REMOVING SHACKLES FROM PLATFORM
* 27-29 REMOVING CABLES FROM CENTER TANK

CARP-3 BEGINS AT MENHOLE
1 CARP-3 GET+PLACE WITH BEND CABLE-SLEEVE FROM MENHOLE TO BTRWTH4 INSERT
2 CARP-3 GET+PLACE CABLE-SLEEVE FROM MENHOLE TO BTRWTH2 AND INSERT
3 CARP-3 GET+MANIPULATE CABLE AT BTRWTH4 AND ADJUST
4 CARP-3 GET+MANIPULATE CABLE AT BTRWTH2 AND ADJUST
5 WAIT 5 M ( CRANE LOWERS 4 CABLES TO PLATFORM )
6 CARP-1 AND CARP2 WALK TO PLATFORM WITH 24 STEPS WITH CLIMB-OBJEC
7 CARP-1 LOOSEN NUT ( ON SHACKEL ) AT BTRWTH4 8 WRIST-TURNS USING HANDS F 2
8 CARP-1 GET+REMOUE BOLT FROM BTRWTH4 TO CARP-1 F 2
9 CARP-1 GET+MANIPULATE WITH BEND SHACKLE AT BTRWTH4 AND ALIGN F 2
10 CARP-1 GET+POSITION BOLT FROM CARP-1 TO BTRWTH4 AND INSERT F 2
11 CARP-1 FASTEN NUT AT BTRWTH4 8 WRIST-TURNS USING HANDS F 2
12 CARP-1 WALK TO BTRWTH2 WITHOUT BEND
13 WAIT 15 M ( CRANE RAISES PLATFORM JUST BELOW MAIN DECK )
14 CARP-1 LOOSEN WITH BEND+STAND NUT ( ON SUSPENSION CABLE SHACKE AT BTRWTH2 8 WRIST-TURNS USING HANDS F 4
15 CARP-1 GET+REMOVE BOLT FROM BTRWTH2 TO CARP-1 F 4
16 CARP-1 GET+MANIPULATE WITH BEND+STAND SUSPENSION-CABLE AT BTRW1 AND ALIGN F 4
17 CARP-1 GET+POSITION BOLT FROM CARP-1 TO BTRWTH2 F 4
18 CARP-1 FASTEN WITH BEND+STAND NUT AT BTRWTH2 8 WRIST-TURNS USING HANDS F 4
19 CARP-1 WALK TO BTRWTH4 WITH FLAT-CRAWL
20 WAIT 1 H ( CRANE TO LOWER PLATFORM TO TIGHTEN SLACK ON SUSPENS CABLE )
MANUAL METHODS

21 CARP-1 LOOSEN NUT WITH BEND (ON SHACKEL) AT BTRWTH4 8 WRIST-URNS USING HANDS F 2
22 CARP-1 GET+REMOVE BOLT FROM BTRWTH4 TO CARP-1 F 2
23 CARP-1 GET+PICKUP WITH BEND SHACKLE FROM PLATFORM F 2
24 CARP-1 GET+PLACE BOLT FROM CARP-1 TO BTRWTH4 AND INSERT F 2
23 CARP-1 FASTEN NUT AT BTRWTH4 8 WRIST-URNS USING HANDS F 2
26 CARP-1 WALK TO BTRUTH2 WITH FLAT-CRAWL
27 WAIT 5 M (CRANE RAISES 4 CARLES OUT OF THE CENTER TANK)
28 CARF-3 GET+PLACE CABLE-SLEEVE FROM BTRWTH4 TO MENHOLE
29 CARP-3 GET+PLACE CABLE-SLEEVE FROM BTRWTH2 TO MENHOLE

554. POSITION (LOWER) TANK STAGING PLATFORM WITH (CRANE) AT MID TANKS AND VOIDS CARPENTER
PER PLATFORM OFG: 4 17-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS LOWERING TYPICAL PLATFORM IN
  * ...A CENTER TANK AND REMOVING IT FROM
  * ...THE MAIN DECK,
  * 2 CARPENTERS WORK SIMULTANEOUSLY ON THE
  * ...MAIN DECK
  * 2 CARPENTERS WORK SIMULTANEOUSLY IN THE
  * ...CENTER TANK ON THE PLATFORM
  * STEPS:
    * 1-4 FEEDING 4 CABLES THROUGH BUTTERWORTH
    * ...HOLES ON MAIN DECK
    * 6-11 CONNECTION OF SHACKLES ON PLATFORM
    * 13-18 REMOVAL OF SUSPENSION CABLES FROM
      * ...PLATFORM AND MAIN DECK
    * 23-28 REMOVING SHACKLES FROM PLATFORM
    * 29-31 REMOVING CABLES FROM CENTER TANK
CARP-3 BEGINS AT MENHOLE
1 CARP-3 GET+PLACE WITH BEND CABLE-SLEEVE FROM MENHOLE TO BTRUTH4 AND INSERT
2 CARP-3 GET+PLACE CABLE-SLEEVE FROM MENHOLE TO BTRWTH2 AND INSERT
3 CARP-3 GET+MANIPULATE CABLE AT BTRWTH4 AND ADJUST
4 CARP-3 GET+MANIPULATE CABLE AT BTRWTH2 AND ADJUST
5 WAIT 3 M (CRANE LOWERS 4 CABLES TO PLATFORM)
6 CARP-1 LOOSEN NUT (ON SHACKEL) AT BTRWTH4 8 WRIST-URNS USING HANDS F 2
7 CARP-1 GET+REMOVE BOLT FROM BTRWTH4 TO CARP-1 F 2
8 CARP-1 GET+MANIPULATE WITH BEND SHACKLE AT BTRWTH4 AND ALIGN F 2
9 CARP-1 GET+POSITION BOLT FROM CARP-1 TO BTRWTH4 AND INSERT F 2
10 CARP-1 FASTEN NUT AT BTRWTH4 8 WRIST-URNS USING HANDS F 2
11 CARP-1 WALK TO BTRWTH2 WITH FLAT-CRAWL
MANUAL METHODS

12 WAIT 1 H ( CRANE RAISES PLATFORM JUST ENOUGH TO PUT SLACK ON SUSPENSION CABLES )
13 CARP-1 LOOSEN WITH BEND+STAND NUT ( ON SUSPENSION CABLE SHACKEL AT BTRWTH2 8 WRIST-TURNS USING HANDS F 4
14 CARP-1 GET+REMOVE BOLT FROM BTRWTH2 TO CARP-1 F 4
15 CARP-1 GET+MANIPULATE WITH BEND+STAND SUSPENSION-CABLE AT BTRWT AND ALIGN F 4
16 CARP-1 GET+POSITION BOLT FROM CARP-1 TO BTRWTH2 F 4
17 CARP-1 FASTEN WITH BEND+STAND NUT AT BTRWTH2 8 WRIST-TURNS USING HANDS F 4
18 CARP-1 WALK TO BRWTH4 WITH FLAT-CRAUL
19 WAIT 15 M ( CRANE TO LOWER PLATFORM TO APPROXIMATELY 3 FEET ABOVE THE TANK-TOP )
20 CARP-1 AND CARP2 WALK TO MENHOLE WITH CLIMB-OBJECT
21 CARP-1 GET+MANIPULATE BLOCK FROM MENHOLE TO PLATFORM WITH 12 ST AND ADJUST F 2
22 WAIT 1 M ( CRANE LOWERS PLATFORM ON 4 WOODEN BLOCKS )
23 CARP-1 LOOSEN NUT WITH CLIMB-OBJECT ( ON SHACNEL ) AT BTRWTH4 8 WRIST-TURNS USING HANDS F 2
24 CARP-1 GET+REMOVE BOLT FROM BTRWTH4 TO CARP-1 F 2
25 CARP-1 GET+PICKUP WITH BEND SHACKLE FROM PLATFORM F 2
26 CARP-1 GET+PLACE BOLT FROM CARP-1 TO BTRWTH4 AND INSERT F 2
27 CARP-1 FASTEN NUT AT BTRWTH4 8 WRIST-TURNS USING HANDS F 2
28 CARP-1 WALK TO ETRWTH2 WITHOUT BEND
29 WAIT 5 H ( CRANE RAISES 4 CABLES OUT OF THE CENTER TANK )
30 CARP-3 GET+PLACE CABLE-SLEEVE FROM BTRWTH4 TO MENHOLE
31 CARP-3 GET+PLACE CABLE-SLEEVE FROM BTRWTH2 TO MENHOLE
32 CARP-1 AND CARP2 WALK TO MENHOLE WITH CLIMB-OBJECT
MANUAL METHODS

557. POSITION (PLACE) TANK STAGING PLATFORM (AND BOARDS) IN (TYPICAL TANK) WITH (CRANE) AT ANY SHIP CARPENTER

PER PLATFORM OFG: 4 17-MAY-83

* REPRESENTS ELAPSED TIME
* REPRESENTS SETTING TANK STAGING PLATFORM
* ...IN A TYPICAL TANK ON THE SHIP. ALSO
* ...THE BOARDS NEED TO EXTEND THE
* ...PLATFORM UNDER THE MAIN DECK,
* 2 HOOKER-ONS: ONE AT THE MATERIAL AND
* ...ONE ON THE SHIP IN THE TANK.
* TOTAL OF 280 FOR TYPICAL TANK
* 7 LIFTS (40 BOARDS PER LIFT)

HOOKER-ON1 BEGINS AT S-7

1 TRANSPORT TANK-STAGING-PLATFORM FROM S-7 USING CRANE-1 WITH 2-HOOK+SLING TO TANK POSITION+MANEUVER RETURN TO S-7 PF 4 (3)
2 TRANSPORT BOARDS FROM S-7 USING CRANE-1 WITH HOOK+SLING TO TANK PLACE+ADJUST RETURN TO S-7 F 6
3 TRANSPORT BOARDS FROM S-7 USING CRANE-1 WITH HOON+SLING TO TANK PLACE+ADJUST RETURN TO CR-1

343. SET-UP I-BEAMS FOR TANK STAGING PLATFORM WITH (CRANE) AT ANY PLATEN CARPENTER

PER PLATFORM OFG: 4 02-FEB-83

* REPRESENTS ELAPSED TIME
* CARPENTER WORKS SIMULTANEOUSLY WITH THE
* ...HOOKER-ON
* STEP 3 INCLUDES SPREADING I-BEAMS AT:
* ...I-2, I-3, I-4, AND I-5

HOOKER-ON BEGINS AT STORE-2

1 HOOKER-ON TRANSPORT I-READ FROM STORE-2 USING CRANE-2 WITH HOOK+SLING TO I-6 PLACE+MANEUVER RETURN TO STORE-2
2 HOOKER-ON TRANSPORT I-BEAM FROM STORE-2 USING CRANE-2 WITH HOOK+SLING TO I-7 PLACE+ MANEUVER RETURN TO STORE-2
3 HOOKER-ON TRANSPORT I-BEAM FROM STORE-2 USING CRANE-2 WITH HOOK+SLING TO I-1 PLACE-I-MANEUVER RETURN TO STORE-2 F 5
MANUAL METHODS

544. SET-UP ANGLE-BARS FOR TANK STAGING PLATFORM WITH (CRANE) AT ANY PL
CARPENTER
PER PLATFORM OFG: 4 02-FEB-83
* CARPENTER WORKS SIMULTANEOUSLY WITH THE
* HOOKER-ON
* STEP 1 INCLUDES SPREADING ANGLES AT:
* ...A-6, A-1, AND A-2
* STEP 2 INCLUDES SPREADING ANGLES AT:
* ...A-3,A-4, AND A-5
HOOKER-ON BEGINS AT STORE-2

1 HOOKER-ON TRANSPORT ANGLE FROM STORE-2 USING CRANE-2 WITH HOOK+
TO A-6 PLACE+MANEUVER RETURN TO STORE-2 F 3
2 HOOKER-ON TRANSPORT ANGLE FROM STORE-2 USING CRANE-2 WITH HOOK+
TO A-4 PLACE+MANEUVER RETURN TO STORE-2 F 3

548. SET-UP STAGING PLANKS ON TANK STAGING PLATFORM WITH HANDS AT ANY PL
CARPENTER
PER PLATFORM OFG: 4 02-FEB-83
* CARPENTERS SPREAD BOARDS SIMULTANEOUSLY
* BOARDS ARE SPREAD ON PORT SIDE FIRST....
* ...THEN STARBOARD SIDE.
* TOTAL BOARDS PER SIDE = 32
* STEPS:
* 2-5 SPREAD BOARDS BETWEEN A-6 & I-6 P/S
* 6-8 SPREAD BOARDS BETWEEN I-6 & A-1 P/S
* 9-11 SPREAD BOARDS BETWEEN A-1 & A-3 S
* ...AND A-1 & A-2 P
* 12-14 SPREAD BOARDS BETWEEN A-3 & A-4 S
* ...AND A-2 & A-4 P
* 15-17 SPREAD BOARDS BTWN A-4 & I-7 P/S
* 18-20 SPREAD BOARDS BTWN I-7 & A-5 P/S
* 21-22 SPREAD BOARD AT A-5 P/S
CARP-I BEGINS AT STORE-2

1 CARP-1+CARP-2 WALK TO TANK-STAGING-PLATFORM WITH CLIMB ( ONTO
PLATFORM )
2 CARP-1+CARP-2 GET+POSITION 2 BOARDS FROM A-5 TO A-6 F 2
3 CARF-1+CARP-2 GET+POSITION 2 BOARDS FROM A-5 TO A-6 F 6
4 CARP-1+CARF-2 GET+SLIDE WITH BEND BOARD AT A-6 AND ALIGN F 8
5 CARP-1+CARP-2 GET+PLACE 2 BLOCKS FROM CARP-1 AND CARP2 TO A-6 WI
BEND F 16
6 CARP-1+CARP-2 GET+POSITION 2 BOARDS FROM A-5 TO I-6 F 2

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MANUAL METHODS

7 CARP-1+CARP-2 GET+SLIDE WITH BEND BOARD AT I-6 AND ALIEN F 2
8 CARP-1+CARP-2 GET+PLACE 2 BLOCKS FROM CARP-1 AND CARP2 TO 1-6 WITH BEND F 4
9 CARP-1+CARP-2 GET+POSITION 2 BOARDS FROM A-5 TO A-1 F 8
10 CARP-1+CARP-2 GET+SLIDE WITH BEND BOARD AT A-1 AND ALIGN F 8
11 CARP-1+CARP-2 GET+PLACE 2 BLOCKS FROM CARP-1 AND CARP2 TO A-1 WITH BEND F 16
12 CARP-1+CARP-2 GET+POSITION 2 BOARDS FROM A-5 TO A-3 (PORT OR A-2 STAR) F 6
13 CARP-1+CARP-2 GET+SLIDE WITH BEND BOARD AT A-3 (PORT OR A-2 STAR) AND ALIGN WITH BEND F 6
14 CARP-1+CARP-2 GET+PLACE 2 BLOCKS FROM CARP-1 AND CARP2 TO A-3 (PORT OR A-2 STAR) WITH BEND F 12
15 CARP-1+CARP-2 GET+POSITION 2 BOARDS FROM A-5 TO A-4 F 6
16 CARP-1+CARP-2 GET+SLIDE WITH BEND BOARD AT A-4 AND ALIGN F 6
17 CARP-1+CARP-2 GET+PLACE 2 BLOCKS FROM CARP-1 AND CARP2 TO A-4 WITH BEND F 12
18 CARP-1+CARP-2 GET+POSITION 2 BOARDS FROM A-5 TO I-7 F 2
19 CARP-1+CARP-2 GET+SLIDE WITH BEND BOARD AT I-7 AND ALIGN F 2
20 CARP-1+CARP-2 GET+PLACE 2 BLOCKS FROM CARP-1 AND CARP2 TO I-7 WITH BEND F 4
21 CARP-1+CARP-2 GET+SLIDE BOARD AT A-5 AND ALIGN F 2
22 CARP-1+CARP-2 GET+PLACE 2 BLOCKS FROM CARP-1 AND CARP2 TO A-5 WITH BEND F 4
23 CARP-1+CARP-2 WALK TO STORE-2 WITH DESCEND (OFF PLATFORM)
MANUAL METHODS

550. TEAR DOWN ANGLES ON TANK STAGING PLATFORM WITH WRENCH AT MID TANKS A
VOIDS CARPENTER
PER PLATFORM OFG: 4 11-MAY-83
REPRESENTS ELAPSED TIME
* CARPENTER WORKS ALONE UNBOLTING ANGLES
* STEPS:
  * 1-5 ARE FOR REMOVING BOLTS ON A-4 2 A-1
  * ...AT I-1, I-2, I-3, I-4, AND I-5
  * 7-11 ARE FOR REMOVING BOLTS
  * ...ON A-3 AT I-1, I-2, & I-3
  * ...ON A-1 AT I-3, I-4, & I-5
  * 14-18 FOR REMOVING BOLTS ON A-5 & A-6
  * ...AT I-1, I-2, I-3, I-4 & I-3
CARP-1 BEGINS AT I-1

1 CARP-1 LOOSEN 2 NUTS AT I-1 1 WRIST-TURNS DIFFICULT USING WRENCH ASIDE TO CARP-1 F 10
2 CARP-1 LOOSEN 2 NUTS AT I-1 20 SPINS USING FINGERS F 10
3 CARP-1 GET+PLACE 2 NUTS AND WASHERS FROM I-1 TO TOOLBOX-1 WITH BEND F 20
4 CARP-1 LOOSEN 2 BOLTS AT I-1 3 STRIKES USING HAMMER ASIDE TO CARP-1 F 10
5 CARP-1 GET+PLACE 2 BOLTS FROM I-1 TO TOOLBOX-1 WITH BEND F 20
6 CARP-1 GET+PLACE WITH CLIMB-OBJECT TOOLBOX-1 FROM I-1 TO I-5 WITH STEPS PF 10 (2) PF 10 (56)
7 CARP-1 LOOSEN 2 NUTS AT I-5 5 WRIST-TURNS DIFFICULT USING WRENCH ASIDE TO CARP-1 F 6
8 CARP-1 LOOSEN 2 NUTS AT I-5 20 SPINS USING FINGERS F 6
9 CARP-1 GET+PLACE NUTS AND WASHERS FROM I-5 TO TOOLBOX-1 WITH BEND F 12
10 CARP-1 LOOSEN 2 BOLTS AT I-5 3 STRIKES USING HAMMER ASIDE TO CARP-1 F 6
11 CARP-1 GET+PLACE 2 BOLTS FROM I-5 TO TOOLBOX-1 WITH BEND F 12
12 CARP-1 GET+PLACE WITH CLIMB-OBJECT TOOLBOX-1 FROM I-5 TO I-3 WITH STEPS PF 3 (2) PF 3 (56)
13 CARP-1 GET+PLACE WITH CLIMB-OBJECT TOOLBOX-1 FROM I-3 TO I-1 WITH STEPS PF 3 (2) PF 3 (56)
14 CARP-1 LOOSEN 2 NUTS AT I-1 5 WRIST-TURNS DIFFICULT USING WRENCH ASIDE TO CARP-1 F 10
15 CARP-1 LOOSEN 2 NUTS AT I-1 20 SPINS USING FINGERS F 10
16 CARP-1 GET+PLACE 2 NUTS AND WASHERS FROM I-1 TO TOOLBOX-1 WITH BEND F 20
17 CARP-1 LOOSEN 2 BOLTS AT I-1 3 STRIKES USING HAMMER ASIDE TO CARP-1 F 10
18 CARP-1 GET+PLACE BOLTS FROM I-1 TO TOOLBOX-1 WITH BEND F 20
19 CARP-1 GET+PLACE WITH CLIMB-OBJECT TOOLBOX-1 FROM I-1 TO I-5 WITH STEPS PF 10 (2) PF 10 (56)
MANUAL METHODS

551. TEAR DOWN I-BEAMS ON TANK STAGING PLATFORM WITH WRENCH AT MID TANKS AND VOIDS CARPENTER
PER PLATFORM OFG: 4 11-MAY-83
REPRESENTS ELAPSED TIME
* CARPENTER WORKS ALONE UNBOLTING I-BEAMS
* STEPS:
* I-5 ARE FOR REMOVING BOLTS ON I-6 & I-7
* ...AT I-1, I-2, I-3, I-4, AND I-5
* 6, 7 ARE FOR MOVEMENT OF THE CARPENTER
* ...BETWEEN THE CONNECTIONS
CARP-1 BEGINS AT I-1

1 CARP-1 LOOSEN 4 NUTS AT I-1 5 WRIST-TURNS DIFFICULT USING WRENCH ASIDE TO CARP-1 F 10
2 CARP-1 LOOSEN 4 NUTS AT I-1 20 SPINS USING FINGERS F 10
3 CARP-1 GET+PLACE 4 NUTS AND MASHERS FROM I-1 TO TOOLBOX-1 WITH BEND F 40
4 CARP-1 LOOSEN 4 BOLTS AT I-1 3 STRIKES USING HAMMER ASIDE TO CARP-1 F 10
5 CARP-1 GET+PLACE 4 BOLTS FROM I-1 TO TOOLBOX-1 WITH BEND F 40
6 CARP-1 GET+PLACE WITH CLIMB-OBJECT TOOLBOX-1 FROM I-1 TO I-5 WITH 1. STEPS PF 10 ( 2 ) PF 10 ( 5 6 )
7 CARP-1 GET+PLACE WITH BEND TOOLBOX-1 FROM I-5 ( AT, I-6 ) TO I-5 ( AT. I-7 ) WITH 10 STEPS WITH BEND
MANUAL METHODS

552. TEAR DOWN STAGING PLANKS ON TANK STAGING PLATFORM WITH WINCH AT MID TANKS AND VOIDS CARPENTER
PER PLATFORM OFG: 4 18-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF BOARDS ON A TANK
* ...STAGING PLATFORM (IN A CENTER TANK)
* TOTAL BOARDS = 64 (22 LIFTS)
* 2 CARPENTERS MOVE BOARDS FROM THE TANK
* ...STAGING PLATFORM TO A LUMBER-PILE
* ...LOCATED NEAR A MANHOLE. A WINCH
* ...OPERATOR AND A CARPENTER REMOVE THE
* ...BOARDS FROM THE TANK. THERE ARE 2
* ...CARPENTERS WHO RECEIVE AND STACK THE
* ...BOARDS ON THE DECK, THEIR TIME IS
* ...INTERNAL TO THE WINCH PROCESS TIME.
CARP-1 BEGINS AT I-5

1 CARP-1 AND CARP2 LOOSEN BOARD AT I-5 WITH BEND 2 ARM-STROKES USING HANDS F 32
2 CARP-1 AND CARP2 GET+MANIPULATE BOARD WITH CLIMB-OBJECT AT LUMBER-PILE ALIGN AND RETURN TO I-5 WITH CLIMB-OBJECT F 32
3 CARP-1 AND CARP2 WALK TO 1-3 WITH CLIMB-OBJECT
4 CARP-1 AND CARP2 LOOSEN BOARD AT I-3 WITH BEND 2 ARM-STROKES USING HANDS F 32
5 CARP-1 AND CARP2 GET+MANIPULATE WITH CLIMB-JECT BOARD AT LUMBER-PILE ALIGN AND RETURN TO I-3 WITH CLIMB-OBJECT F 32
6 CARP-3 GET+SLIDE WITH BEND BOARD ( ONTO BOLSTER ) AT LUMBER-PILE ADJUST F 64
7 WINCH-OPER PUSH WINCH-DOWN PROCESS ( TO TANKTOP ) F 22
8 WINCH-OPER LOOSEN ( = SWING ) CABLE WITH BEND AT MENHOLE 5 ARM-STROKES USING HANDS F 22
9 WINCH-OPER THROW CABLE FROM MENHOLE TO CARP-3 F 22
10 CARP-3 GET+MANIPULATE WITH BEND CABLE AT LUMBER-FILE ( HOOK AROUND BOARDS ) ( ALLOW FOR 2 ATTEMPTS ) F 44
11 WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES ) F 22
12 WINCH-OPER PUSH WINCH-UP PROCESS ( TO MENHOLE ) F 22
MANUAL METHODS

553. TEAR DOWN ANGLES ON TANK STAGING PLATFORM WITH WINCH AT MID TANKS AND Voids Carpenter

PER PLATFORM OFG: 4 11-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF ANGLES ON A TANK
* ...STAGING PLATFORM (IN A CENTER TANK)
* TOTAL ANGLES = 6 (1 LIFT)
* 1 CARPENTER MOVES ANGLES TO ONE AREA ON
* ...THE TANK STAGING PLATFORM
* ...LOCATED NEAR A MANHOLE. A WINCH
* ...OPERATOR AND A CARPENTER REMOVE THE
* ...ANGLES FROM THE TANK, THERE ARE 2
* ...CARPENTERS WHO RECEIVE AND STACK THE
* ...ANGLES ON THE DECK, THEIR TIME IS
* ...INTERNAL TO THE WINCH PROCESS TIME.

CARP-3 BEGINS AT LUMMR-PILE

1. CARP-3 WALK TO A-5 WITH 12 STEPS WITH CLIMB-OBJECT
2. CARP-3 GET+MANIPULATE ANGLE WITH BEND+CLIMB-STEP AT A-6 ALIGN AND RETURN TO A-4 WITH CLIME-STEP
3. CARP-3 GET+MANIPULATE WITH BEND+CLIMB-STEP ANGLE AT A-6 ALIGN AND RETURN TO A-3 WITH CLIMB-STEP
4. CARP-3 GET+MANIPULATE WITH BEND+CLIMB-STEP ANGLE AT A-6 ALIGN AND RETURN TO A-2 WITH CLIMB-STEP
5. CARP-3 GET+MANIPULATE WITH BEND+CLIMB-STEP ANGLE AT A-6 ALIGN AND RETURN TO A-1 WITH CLIMB-STEP
6. CARP-3 GET+MANIPULATE WITH BEND+CLIMMII-STEP ANGLE AT A-6 ALIGN
7. WINCH-OPER PUSH WINCH-DOWN PROCESS ( TO TANKTOP )
8. WINCH-OPER LOOSEN ( = SWING ) CABLE WITH BEND AT MENHOLE 5 ARM-STROKES USING HANDS
9. WINCH-OPER THROW CABLE FROM MENHOLE TO CARP-3
10. CARP-3 GET+MANIPULATE WITH BEND CABLE AT A-6 ( HOOK AROUND ANGLES ( ALLOW FOR 2 ATTEMPTS ) ) F 2
11. WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES )
12. WINCH-OPER PUSH WINCH-up PROCESS ( To MENHOLE )
MANUAL METHODS

554. TEAR DOWN I-BEAMS FOR TANK STAGING PLATFORM WITH WINCH AT MID TANKS Voids Carpenter

PER PLATFORM OFG: 4 11-MAY-83
* REPRESENTS ELAPSED TIME
* ...TANK STAGING PLATFORM
* TOTAL I-BEAMS = 7 (7 LIFTS)
* A CARPENTER AND WINCH OPERATOR REMOVE
* ...THE I-BEAMS FROM THE TANK. THERE ARE
* ...2 CARPENTERS WHO RECEIVE AND STACK
* ...THE I-BEAMS ON THE BECK, THEIR TIME
* ...IS INTERNAL TO THE WINCH PROCESS TIME

CARP-3 BEGINS AT A-6

1 CARP-3 WALK TO 1-5 WITH & STEPS WITH CLIMB-STEP PF 4 (2)
2 WINCH-OPER PUSH WINCH-DOWN PROCESS F 7
3 WINCH-OPER LOOSEN (SWING) CABLE WITH BEND AT, MENHOLE 5 ARM-STROKES USING HANDS F 7
4 WINCH-OPER THROW CABLE FROM MENHOLE TO CARP-3 F 7
5 CARP-3 GET+MANIPULATE WITH BEND CABLE AT 1-5 (HOOK AROUND I-BEAM
   (ALLOW FOR 2 ATTEMPTS) PF 2 (2 3 4)
6 CARP-3 GET+MANIPULATE CABLE AT 1-4 (HOOK AROUND I-BEAM) (ALLOW
   FOR 2 ATTEMPTS) FOR 2 (2 3 4)
7 CARP-3 GET+MANIPULATE CABLE AT I-3 (HOOK AROUND I-BEAM) (ALLOW
   FOR 2 ATTEMPTS) PF 2 (2 3 4)
8 CARP-3 GET+MANIPULATE CABLE AT I-2 (HOOK AROUND I-BEAM) (ALLOW
   FOR 2 ATTEMPTS) PF 2 (2 3 4)
9 CARP-3 GET+MANIPULATE CABLE AT I-1 (HOOK AROUND I-BEAM) (ALLOW
   FOR 2 ATTEMPTS) PF 2 (2 3 4)
10 CARP-3 GET+MANIPULATE WITH 13 STEPS CABLE AT I-7 (HOOK AROUND
    I-BEAM) (ALLOW FOR 2 ATTEMPTS) PF 2 (2 3 4)
11 CARP-3 GET+MANIPULATE CABLE AT I-6 (HOOK AROUND I-BEAM) (ALLOW
   FOR 2 ATTEMPTS) PF 2 (2 3 4)
12 WINCH-OPER PUSH WINCH-FREE PROCESS (CLEAR OBSTACLES) F 7
13 WINCH-OPER PUSH WINCH-UP PROCESS (TO MENHOLE) F 7
MANUAL METHODS

538. (BRUSH) CLEAN (PLATEN) FOR TANK STAGING PLATFORM WITH BROOM AT ANY PLATEN CARPENTER
PER PLATFORTf OFG: 4 31-JAN-83
REPRESENTS ELAPSED TIME
* REPRESENTS CLEANING THE TABLE BEFORE THE TANK STAGING PLATFORM IS ASSEMBLED.
* SQUARE FOOTAGE OF AREA CLEANEE = 700
CARP-1 BEGINS AT STORE-2

1 CARP-1 BRUSHCLEAN TANK-STAGING-PLATFORM ( TABLE ) WITH CLimb ( ON TABLE ) 7 SQ.FT. USING BROOM RETURN TO STORE-2 WITH DESCEND ( OFF B L E ) P F 9 9 ( 7 )

559. SET-UP STAGING PLANKS FOR TANK STAGING PLATFORM WITH HAMMER AT MID TANKS AND VOIDS CARPENTER
PER STAGING PLANK OFG: 4 20-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS SPREADING BOARDS FROM A TANK
* ...STAGING PLATFORM TO EXISTING STAGING
* ...ON THE BULKHEADS.
* 2 CARPENTERS WHO ARE NOT WORKING
* ...SIMULTANEOUSLY.
CARP-1 BEGINS AT STAR-BHD

1 CARP-2 GET+MANEUVER WITH BEND BOARD AT STAR-BHD AND RETURN TO PLATFORM
2 CARP-1 GET+MANIPULATE WITH 1 STEP WITH BEND BOARD AT STAR-BHD AND ALIGN
3 CARP-2 GET+PLACE WITH 6 STEPS WITH BEND NAILS FROM TOOLBOX-1 TO CARP-2 WITH 6 STEPS ( POCKET )
4 CARP-1 GET+PLACE WITH BEND NAILS FROM TOOLBOX-1 TO CARP-1 ( POCKET )
5 CARP-2 GET+POSITION WITH 1 STEP 3 NAILS FROM CARP-2 TO PLATFORM ( 0 BOARDS ) WITH BEND PF 3 ( 2 3 4 5 6 7 )
6 CARP-1 GET+POSITION WITH 1 STEP 3 NAILS FROM CARP-1 TO STAR-BHD ( 01 BOARDS ) WITH BEND PF 3 ( 2 3 4 5 6 7 )
7 CARP-2 FASTEN 3 NAILS AT PLATFORM 16 STRIKES USING HAMMER-2 ASIDE TO CARP-2 F 2
8 CARP-1 FASTEN 3 NAILS AT STAR-BHD 16 STRIKES USING HAMMER-1 ASIDE TO CARP-I F 2
MANUAL METHODS

560. TEAR DOWN HANDRAIL ( AND STANCHION ) ON ( LONGITUDINAL ) BULKHEAD TORCH AT MID TANKS AND VOIDS CARPENTER
PER ASSEMBLY OFG; 4 20-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF HANDRAIL FROM TOP
* ...LEVEL OF BULKHEAD STAGING IN A CENTER
* ...TANK, THIS IS DONE AFTER BOARDS HAVE
* ...BEEN SPREAD TO TANK STAGING PLATFORM
* CARPENTER WORKS ALONE
* HOOKUP, IGNITE AND EXTINGUISH TORCH ARE
* ...IN A SEPARATE SUB-OP
CARP-3 BEGINS AT PLATFORM

1 CARP-3 GET+MOVE WITH BEND TORCH FROM PLATFORM TO BRKT-1
2 CARP-3 OPERATE TORCH FROM BRKT-1 TO BRKT-2 AND BURN OFF 2 HANDR PROCESS PF 4 ( 5 )
3 CARP-3 HULD+PLACE TORCH FROM BRNT-2 TO STAR-BHD
4 CARP-3 GET+MANIPULATE 2 HANDRAIL AT STAR-BHD F 2
5 CARP-3 HOLD+PLACE 2 HANDRAIL FROM STAR-BHD TO PLATFORM WITH BEN RETURN TO STAR-BHD
6 CARP-3 LOOSEN 2 STANCHIONS AT STAR-BHD WITH 6 STEPS ( AT. BRKT1 BRKT2 ) 4 ARM-STROKES USING HANDS
7 CARP-3 GET+PLACE 2 STANCHIONS FROM STAR-BHD TO PLATFORM WITH BEN RETURN TO STAR-BHD PF 2 ( 1 2 3 )
9 CARP-3 GET+MOVE WITH BEND TORCH FROM STAR-BHD TO PLATFORM WITH
MANUAL METHODS

561. SET-UP STAGING BRACKETS FOR (BETWEEN) TANK STAGING PLATFORM WITH WRENCH AT MID TANKS AND VOIDS CARPENTER PER CENTER TANK OFG: 4 23-MAY-83

* REPRESENTS ELAPSED TIME
* REPRESENTS SETTING UP BRACKETS ON 2 TANK...STAGING PLATFORMS, BOARDS ARE SPREAD
* BETWEEN THE BRACKETS.
* THIS ASSEMBLY IS USED TO CONNECT THE TWO...TANK STAGING PLATFORMS.
* 2 CARPENTERS WORKING SIMULTANEOUSLY EACH...WORKING ON A DIFFERENT PLATFORM.

STEPS:
* 1-6 REPRESENTS SETTING UP BRACKETS AT...BR-1, BR-2, AND BR-3
* 7 REPRESENTS SPREADING BOARDS BETWEEN...BR-1 AND BR-2; BR-2 AND BR-3

CARP-1 BEGINS AT PLFM1

1 CARP-1 GET+HOLD WITH BEND BRKT FROM PLFM1 TO CARP-1 F 3
2 CARP-1 LOOSEN NUT AT PLFH1 4 WRIST-TURNS USING HANDS F 3
3 CARP-1 GET+POSITION BRKT FROM CARP-1 TO BR-1 AND INSERT BOLT F 3
4 CARP-1 FASTEN NUT AT BR-1 13 WRIST-TURNS USING HANDS F 3
5 CARP-1 FASTEN NUT AT BR-1 4 ARM-TURNS USING WRENCH-1 ASIDE TO CARP-1 F 3
6 CARP-1 WALK TO PLFM1 F 3
7 CARP-1 GET+MANEUVER 3 BOARBS AT BR-1 AND ALIGN RETURN TO PLFM1 WITH BEND F 6
MANUAL METHODS

562. SET-UP STAGING PLANKS FOR (BETWEEN) TANK STAGING PLATFORMS WITH HAMM
AT HID TANKS AND VOIDS CARPENTER
PER STAGING PLANK OFG: 4 23-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS SPREADING BOARDS BETWEEN TWO
* ...TANK STAGING PLATFORMS
* 2 CARPENTERs ARE NOT WORKING
* ...SIMULTANEOUSLY
CARP-1 BEGINS AT PLFM1

1 CARP-1 GET+MANEUVER WITH BEND BOARD AT CARP-2 RETURN TO PLFM1
2 CARP-2 GET+MANIFULATE WITH 1 STEP WITH BEND BOARD AT PLFM2
3 CARP-1 GET+PLACE NAILS FROM TOOLBOX-1 TO CARP-1
4 CARP-2 GET+PLACE NAILS FROM TOOLBOX-2 TO CARP-2
5 CARP-1 GET+POSITION WITH 1 STEP 3 NAILS FROM CARP-1 TO PLFM1 ( O
BOARD ) WITH REND PF 3 ( 2 3 4 5 6 7 )
6 CARP-2 GET+POSITION WITH 1 STEP 3 NAILS FROM CARP-2 TO PLFM2 ( O
BOARD ) WITH BEND PF 3 ( 2 3 4 5 6 7 )
7 CARP-1 FASTEN 3 NAILS AT PLFM1 16 STRIKES USING HAMMER-1 ASIDE T
CARP-1 F 2
8 CARP-2 FASTEN 3 NAILS AT PLFM2 16 STRIKES USING HAMMER-2 ASIDE
CARP-2 F 2

9. HOOK-UP AND UNHOOK TORCH ON MANIFOLD WITH WRENCH AT SHIP
PER EA OFG: 1 31-JUL-81
* TORCH AND HOSE LOCATED AT MANIFOLD
* UNHOOK IS THE REVERSE OF HOOKUP
CARP4 BEGINS AT HOOK-UP

1 FASTEN HOSE TO MANIFOLD 4 SPINS USING FINGERS
2 FASTEN HOSE TO MANIFOLD 2 WRIST-STROKES USING WRENCH4 AND ASIDE
MANUAL METHODS

10. IGNITE AND EXTINGUISH TORCH FOR BURNING WITH HAND AT TANK
PER EA OFG: 1 03-AUG-81
* HOOK-UP NOT INCLUDED
FITTER BEGINS AT JOB

1 LOosen 2 KNOBS ON TORCH AT JOB CLOSE 1 SPIN USING FINGERS
2 PRESS STRIKER AT TORCH FOR IGNITING AND CLEAR
3 PULL GOGGLES AT SELF OVER EYES
4 TURN KNOB AT TORCH AND ADJUST FLAME F 3
5 HOLD+PLACE TORCH ON TO JOB WITH BEND
6 FASTEN 2 KNOBS AT TORCH CLOSE 1 SPIN USING FINGERS
7 PULL GOGGLES AT SELF OFF EYES

582. TEAR DOWN STAGING PLANK FOR TANK STAGING PLATFORM WITH (PRYRAR) AND
HAND AT HID TANKS AND VOIDS CARPENTER
PER STAGING PLANK OFG: 4 31-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS REMOVING BOARDS FROM BELOW
* ...THE MAIN DECK. BOARDS ARE CONNECTED
* ...TO THE TANK STAGING PLATFORM AND THE
* ...EXISTING PERIMETER STAGING BY NAILS.
* 2 NAN OPERATION: (WORKING SIMULTANEOUSLY)
* ...CARPENTERS LOOSEN THE NAILS ON EACH.
* ...END OF THE BOARD, THEN PICK UP THE.
* ...BOARD AND PLACE IT ON A FILE ON THE
* ...TANK STAGING PLATFORM.
CARP-1 BEGINS AT STAR-BHD

1 CARP-1 PUSH AND LOCATE PRYBAR WITH 1 STEP AT STAR-BHD UNDER BOARD
2 CARP-1 LOOSEN 3 NAILS AT STAR-BHD 3 ARM-STROKES USING PRYBAR AND
   ASIDE TO STAR-BHD
3 CARP-1 LOOSEN BOARD WITH BEND AT STAR-BHD 3 ARM-STRONES USING HAND
4 CARP-1 GET+MANIPULATE WITH REND BOARD AT PLATFORM AND ADJUST RETU
   TO STAR-BHD
MANUAL METHODS

583. TEAR DOWN STAGING PLANK FOR ( BETWEEN ) TANK STAGING PLATFORM WITH PRYBAR ) AND HAND AT MID TANKS AND VOIDS CARPENTER PER STAGING PLANK OFG: 4 31-MAY-83

* REPRESENTS ELAPSED TIME
* REPRESENTS REMOVING BOARDS FROM BETWEEN THE TWO TANK STAGING PLATFORMS, THE BOARDS ARE CONNECTED TO THE PLATFORMS BY NAILS.
* 2 MAN OPERATION: (WORKING SIMULTANEOUSLY)
* CARPENTERS LOOSEN THE NAILS ON EACH END OF THE BOARD, THEN PICK UP THE BOARD AND PLACE IT ON APILE ON ONE OF THE TANK STAGING PLATFORMS.

CARP-1 BEGINS AT PLFM1

1 CARP-1 PUSH AND LOCATE PRYBAR WITH 1 STEP AT PLFM1 (UNDER BOARD)
2 CARP-1 LOOSEN 3 NAILS AT PLFM1 3 ARM-STROKES USING PRYBAR AND AS
3 CARP-1 LOOSEN BOARD WITH BEND AT PLFM1 3 ARM-STROKES USING HANDS
4 CARP-1 GET+MANIPULATE WITH BEND BOARD AT PLFM2 AND ADJUST RETURN PLFM1
MANUAL METHODS

584. TEAR DOWN STAGING BRACKETS ON TANK STAGING PLATFORM WITH WRENCH AT HID TANKS AND VOIDS CARPENTER
PER CENTER TANK OFG: 4 31-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF BRACKETS ON 2 TANK
* ...STAGING PLATFORMS. ALSO REMOVAL OF
* ...BOARDS THAT ARE SPREAD BETWEEN THE
* ...BRACKETS.
* 2 CARPENTERS WORKING SIMULTANEOUSLY EACH
* ...WORKING ON A DIFFERENT PLATFORM.
* STEPS:
* 1 REPRESENTS REMOVAL OF BOARDS BETWEEN
* ...BR-1 AND RR-2; BR-2 AND BR-3
* 2-5 REPRESENTS REMOVAL OF BRACKETS FROM
* ...BR-1, BR-2 AND BR-3, BRACKETS ARE
* ...PLACED ON A PILE ON THE PLATFORM.
CARP-1 BEGINS AT BR-1

1 CARP-1 GET+MANEUVER WITH BEND BOARD AT PLFM1. AND ADJUST RETURN TO BR-1 F 6
2 CARP-1 LOOSEN NUT AT BR-1 1 -ARM-STROKE USING WRENCH-1 AND HOLD F 3
3 CARP-1 HOLD+LOOSEN NUT AT BR-1 13 WRIST-TURNS USING WRENCH-1 ASIDE TO CARP-1 F 3
4 CARP-1 GET+PLACE WITH BEND BRKT FROM BR-1 TO PLFMI WITH BEND RETURN TO BR-1 WITHOUT BEND F 3
5 CARP-1 GET+PLACE NUT AND BOLT FROM CARP-1 TO TOOLBOX-1 F 3
SECTION 3
MANUAL METHODS

435. WELD STAGING BRACKET (CLIP) ON BULKHEAD (OR ANY STRUCTURE) WITH STICK ELECTRODE AT ANY TANKS AND VOIDS (SHIP) WELDING PER 100 CLIPS OFG: 3
WELD TO MEET SAFETY REQUIREMENTS. RATE PER 100 CLIPS. RATE INCLUDES MANUAL ELEMENTS.

1 WELD VERTICAL 3/8" FILLET WELD (10' PER CLIP) WITH 10% OVERWELD USING 6011 3/16 ELECTRODE OR COMPARABLE (7018 5/32)

438. WELD LADDER (CLIP) (SECURES LADDER) ON BULKHEAD (OR ANY STRUCTURE) WITH STICK ELECTRODE AT ANY TANKS AND VOIDS (SHIP) WELDING PER 100 LADDERS OR 400 CLIPS OFG: 3
WELD TO MEET SAFETY REQUIREMENTS. RATE PER 100 LADDERS (400 CLIPS) INCLUDES MANUAL ELEMENTS.

1 WELD VERTICAL 3/8" FILLET WELD (4' PER CLIP) WITH 10% OVERWELD USING 6011 3/16 ELECTRODE OR COMPARABLE (7018 5/32)

440. WELD HANDRAIL (CONNECTIONS) ON STANCHION WITH STICK ELECTRODE AT ANY TANKS AND VOIDS (SHIP) WELDING PER 100 PIECES OF HANDRAIL OFG: 3
WELD TO MEET SAFETY REQUIREMENTS. RATE PER 100 PIECES OF HANDRAIL (AVG+ 1 CONNECTION EACH). RATE INCLUDES MANUAL ELEMENTS.

1 WELD HORIZONTAL 1/4. FILLET WELD (5' PER CONNECTION) USING 6011 3/16 ELECTRODE OR COMPARABLE (7018 5/32)

516. TRANSPORT AERIAL PLATFORM FOR SIDE SHELL (STAGING) WITH (CRANE) AT ANY WAY CARPENTER PER AERIAL-PLATFORM OFG: 4 18-MAR-S2
REPRESENTS ELAPSED TIME
* REPRESENTS MOVING AERIAL PLATFORM FROM A
* ...WAY TO A SECTION OF SIDE SHELL
C-OPER BEGINS AT CR-1

1 C-OPER TRANSPORT PLATFORM FROM P-REST USING CRANE WITH 2-HOOK+SLIN TO AERIAL-PLATFORM POSITION+MANEUVER PF 2 ( 3 )
MANUAL METHODS

521. 0(CLIMB UP AND DOWN) MOVE OPERATOR (ON LADDER) ON SIDE SHELL AT ANY WAY
CARPENTER
PER LADDER OFG: 4 17-MAR-82
REPRESENTS ELAPSED TIME
* REPRESENTS CARPENTERS CLIMBING UP AND
* ...DOWN LADDERS TO GET ON AND OFF
* ...STAGING AT OUTSIDE SIDE SHELL.
* CARPENTERS ARE WORKING ON AN AERIAL
* ...PLATFORM.
CARP-1 BEGINS AT BRKT-1

1 CARP-1 SLIDE (CLIMB-UP) LADDER AT BRKT-1 (12 RUNGS) PF 12 (1)
PF 12 (34)
2 CARP-1 PULL (CLIMB-DOWN) LADDER AT BRKT-1 (12 RUNGS) PF 12 (1)
PF 12 (34)

529. TRANSPORT AERIAL PLATFORM FOR SIDE SHELL (STAGING) WITH CRANE AT ANY
WAY. CARPENTER
PER AERIAL PLATFORM OFG: 4 18-MAR-82
REPRESENTS ELAPSED TIME
* REPRESENTS MOVING AERIAL PLATFORM
* ...FROM A SECTION OF THE SIDE SHELL
* ...TO A WAY,
C-OPER BEGINS AT CR-1

1 C-OPER TRANSPORT PLATFORM FROM AERIAL-PLATFORM USING CRANE TO P-REST
POSITION+MANEUVER RETURN TO CR-1
MANUAL METHODS

580. LOAD (STAGING MATERIAL) ON AERIAL PLATFORM WITH (CRANE) AT ANY PLATE
Carpenter

Per Aerial Platform OFG: 4 27-MAY-83
Represents elapsed time
* Represents spreading material on an
* ...aerial platform
* Aerial platform can hold enough staging
* ...material for 3 levels of staging:
* ...5 brackets per level
* Total material:
  * Matl Quantity
  * BRKTS 15
  * STANS 15
  * BOARDS 36
  * HANDRAIL 24
  * LADDERS 5

Carpenter begins at P-REST

1. Carpenter get+place 15 brackets from bin-1 to bin-1 (pile up brackets) F 15 (2 3 4 5 6)
2. C-operator transport 15 brackets from bin-1 using crane with hook+sling P-REST place+adjust return to bin-2
3. Carpenter get+place 15 stands from bin-2 to bin-2 and return to BD-Pile without bend PF 15 (2 3 4 5 6)
4. C-operator transport 15 stands from bin-2 using crane with hook+sling P-REST place+adjust return to BD-Pile
5. Carpenter get+slide with bend 36 boards from BD-Pile to BD-Pile with steps and adjust (on bolsters) PF 2 (2 3 4 5 6) F 36
6. C-operator transport 36 boards from BD-Pile using crane with 2-hook+sling to P-REST place+maneuver return to HR-Pile
7. Carpenter get+slide 24 handrail at HR-Pile and adjust (on bolsters and return to LDR-Pile without bend PF 24 (2 3 4 5 6)
8. C-operator transport 24 handrail from HR-Pile using crane with 2-hook+sling to P-REST place+adjust return to LDR-Pile
9. Carpenter get+slide with bend 5 ladders from LDR-Pile to LDR-Pile with steps and adjust (on bolsters) PF 2 (2 3 4 5 6) F 5
10. C-operator transport 5 ladders from LDR-Pile using crane with 2-hook+sling to P-REST place+maneuver return to CR-1
11. Carpenter get+place toolbox-1 from bin-1 to P-REST with bend+climb-step
12. Carpenter get+place toolbox-2 from bin-2 to P-REST with bend+climb-step
MANUAL METHODS

581. UNLOAD (STAGING MATERIAL) ON AERIAL PLATFORM WITH (CRANE) AT ANY PLATEN CARPENTER

PER AERIAL PLATFORM OFG: 4 27-MAY-83

* REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF MATERIAL FROM AN AERIAL PLATFORM
* AERIAL PLATFORM CAN HOLD ENOUGH STAGING
* MATERIAL FOR 3 LEVELS (IF STAGING: 5 BRACKETS PER LEVEL)
* TOTAL MATERIAL:
  * MATL   QUANTITY
  * BRKTS   15
  * STANS   15
  * BOARDS  36
  * HANDRAIL 24
  * LADDERS  5

C-OPER BEGINS AT CR-1

1 C-OPER TRANSPORT 15 HRKTS FROM P-REST USING CRANE WITH HOOK+SLING TO BIN-1 PLACE+ADJUST RETURN TO P-REST
2 CARP-1 GET+PLACE 15 BRKTS FROM BIN-1 TO BIN-1 ( PUT INTO BIN ) PF 15 ( 2 3 4 5 6 )
3 C-OPER TRANSPORT 15 STANS FROM P-REST USING CRANE WITH HOOK+SLING TO BIN-2 PLACE+ADJUST RETURN TO P-REST
4 CARP-1 GET+PLACE 15 STANS FROM BIN-2 TO BIN-2 ( PUT INTO BIN ) RETURN TO RB-PILE WITHOUT BEND PF 15 ( 2 3 4 5 6 )
5 C-OPER TRANSPORT 36 BOARDS FROM P-REST USING CRANE WITH 2-HOOK+SLING TO BD-PILE PLACE+MANEUVER ( ONTO BOLSTERS ) RETURN TO P-REST
6 CARP-1 GET+SLIDE WITH BEND 36 BOARDS FROM BD-PILE TO BD-PILE WITH 8 STEPS AND ADJUST ( ONTO PILE ) PF 2 ( 2 3 4 5 6 ) F 36
7 C-OPER TRANSPORT 24 HANDRAIL FROM P-REST USING CRANE WITH 2-HOOK+SLING TO HR-PILE PLACE+ADJUST RETURN TO P-REST
8 CARP-1 GET+SLIDE 24 HANDRAIL AT HR-PILE AND ADJUST ( ON PILE ) RETURN TO LDR-PILE WITHOUT BEND OF 24 ( 2 3 4 5 6 )
9 C-OPER TRANSPORT 5 LADRS FROM P-REST USING CRANE WITH 2-HOOK+SLING TO LDR-PILE PLACE+MANEUVER ( ONTO BOLSTERS ) RETURN TO CR-1
10 CARP-1 GET+SLIDE WITH BEND 15 LADRS FROM LDR-PILE TO LDR-PILE WITH 5 STEPS AND ADJUST ( ONTO PILE ) PF 2 ( 2 3 4 5 6 ) F 5
11 CARP-1 GET+PLACE WITH BEND+CLIMB-STEP TOOLBOX1 FROM P-REST TO BIN-1
12 CARP-1 GET+PLACE WITH BEND+CLIMB-STEP TOOLBOX2 FROM P-REST TO BIN-2

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MANUAL METHODS

132. COMBINED SUB-OP

HOOK-UP/UNHOOK AND IGNITE/EXTINGUISH TORCH FOR BURNING WITH HAND AT TANK CARPENTER

CREW SIZE = 6 (3 CARPS ABOVE DECK AND 3 BELOW)+ RATE IN ELAPSED MULT BY 6 TO OBTAIN TOTAL TIME,
PER 8-HR SHIFT AND (1) CUT OFG: 4 20-NOV-81
* THE FOLLOWING IS INCLUDED IN THIS SUBOP:
* --2 HOOK-UPS AND 2 UNHOOKS PER (1) 4* ......
* ...8-HR SHIFT
* --(1) OCCURRENCE FOR IGNITE ANIJ .........
* ...EXTINGUISH TORCH
* --TO, DETERMINE THE FREQ OF THE SUB-OP...
* ...FRO NUMBER OF CUTS >1 USE THE .......
* ...FORMULA: FREQ = 1+ [(N-1) X .233 . . . .
* ....WHERE ‘N’ = THE NUMBER OF CUTS(BURNS)

Combined sub-operation elements
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9. HOOK-UP AND UNHOOK TORCH ON MANIFOLD WITH WRENCH AT SHIP

10. IGNITE AND EXTINGUISH TORCH FOR BURNING WITH HAND AT TANK

517. SET-UP (STAGING CLIP) ON SIDE SHELL WITH HAMMER AT ANY WAY CARPENTER

PER STAGING CLIP OFG: 3 16-MAR-82

REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING UP A STAGING CLIP ON
* ...THE SIDE SHELL.
* CARPENTERS ARE WORKING FROM AN AERIAL
* ...PLATFORM,
* WELDING OF THE CLIP IS DONE IN A
* ...SEPERATE SUB OPERATION,
CARP-1 BEGINS AT BRKT-2

1 CARP-1 MEASURE AT BRKT-1 USING STEEL-TAPE-1 ASIDE TO CARP-1
2 CARP-1 LOOSEN PAINT ON SIDE SHELL AT BRKT-1 4 STRIKES USING HAMM ASIDE TO CARP-1
3 CARP-1 GET+PLACE SCLIP FROM TOOLBOX-2 TO BRKT-1 ( TACKING UPON PLACEMENT )
MANUAL METHODS

518. SET-UP STAGING BRACKET ON SIDE SHELL WITH WRENCH AT ANY WAY CARPENTER
PER STAGING BRACKET OFG: 3 16-MAR-82
REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING UP A BRACKET ON THE
* ...SIDE SHELL.
* CARPENTERS ARE WORKING FROM AN AERIAL
* ...PLATFORH
CARP-1 BEGINS AT BRKT-1
1 CARP-1 GET+PICKUP NUT AND BOLT FROM TOOLBOX-1 TO SELF ( IN POCKET )
2 CARP-1 GET+PLACE WITH BEND BRKT FROM BIN-1 TO BRKT-1
3 CARP-1 PLACE BOLT FROM CARP-1 TO BRKT-1 AND INSERT
4 CARP-1 FASTEN NUT AT BRKT-1 13 WRIST-TURNS USING HANDS
5 CARP-I FASTEN NUT AT BRKT-1 4 ARM-STROKES USING WRENCH-1 ASIDE TO CARP-1

519. SET-LIP STAGING PLANK FOR SIDE SHELL WITH HAND AT ANY MAY CARPENTER
PER STAGING PLANK OFG: 3 17-MAR-82
REPRESENTS ELAPSED TIME
* REPRESENTS SETTING BOARDS UP BETWEEN TWO
* ...STAGING BRACKETS,
* CARPENTERS ARE WORKING ON AN AERIAL
* ...PLATFORH AND THEY ARE WORKING
* ...SIMULTANEIOUSLY,
CARP-3 BEGINS AT BIN-1
1 CARP-3 GET+SLIDE BOARDS FROM BD-PILE TO ED-PILE WITH 8 STEPS ( ON BOLSTERS ) AND ADJUST
2 CARP-1 AND CARP 2 GET+MANEUVER BOARDS FROM BD-PILE TO BRKT-1 SPANNING BRKT2 AND ALIGN
MANUAL METHODS

520. SET-UP (ACCESS) LADDER ON SIDE SHELL WITH HAND AT ANY WAY CARPENT PER ACCESS LAKIUE OFG: 3 17-MAR-82
REPRESENTS ELAPSED TIME
* REPRESENTS SETTING UP A LADDER ON THE
* ...SIDE SHELL*
* CARPENTERS ARE WORKING ON AN AERIAL.
* ...PLATFORM, BUT ARE NOT WORKING.
* ...SIMULTANEOUSLY.
* WELDING DONE IN A SEPERATE
* ...SUB OPERATION,
CARP-3 BEGINS AT ED-PILE

1 CARP-3 GET+SLIDE LADR FROM LDR-PILE TO LDR-PILE WITH 5 STEPS ( ROLSTER ) AND ADJUST
2 CARP-1 GET+PLACE LADR FROM LDR-PILE TO BRKT-1
3 CARP-2 LOOSEN 4 PAINT ON SIDE SHELL AT BRKT-1 4 STRIKES USING HAMMER-2 ASIDE TO CARP-2
4 CARP-2 GET+PLACE 4 LCLIPS FROM TOOLBOX-2 TO BRKT-1 ( TACKING UP PLACEMENT ) PF 4 ( 6 )

522. SET-UP STANCHION FOR SIDE SHELL WITH HAND AT ANY WAY CARPENTER PER STANCHION OFG: 3 17-MAR-82
REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING STANCHION IN STAGING
* ...EIRACKETS.
* TWO CARPENTERS ARE ON THE STAGING? ONE
* ...REMAINS ON THE AERIAL PLATFORM.
CARP-3 BEGINS AT LDR-PILE

1 CARP-3 GET+PLACE STAN FROM BIN-2 TO BRKT-1
2 CARP-1 GET+PLACE WITH BEND STAN FROM BRKT-1 TO BRKT-1 AND INSE
MANUAL METHODS

S23. SET-UP HANDRAIL FOR SIDE SHELL WITH HAND AT ANY WAY CARPENTER
PER HANBRAIL OFG: 3 17-MAR-82
* REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING UP HANDRAIL AT THE
* ...SIDE SHELL.
* TWO CARPENTERS ARE ON THE STAGINGS ONE
* ...REMAINS ON THE AERIAL PLATFORM.
* WELDING IS DONE IN A SEPERATE SUB
* ...OPERATION,
CARP-3 BEGINS AT BIN-2

1 CARP-3 GET+SLIDE HANDRAIL FROM HR-PILE TO CARP-1
2 CARP-1 GET+SLIDE HANDRAIL FROM BRKT-1 TO BRKT-2 AND ALIGN ( THRU 2 STANCHION SLEEVES ) PF 2 (4 5 6 )

524. TEAR DOWN HANDRAIL ON SIDE SHELL WITH TORCH AT ANY WAY CARPENTER
PER HANBRAIL OFG: 2 18-MAR-82
* REPRESENTS ELAPSED TIME
* REPRESENTS TEARING DOWN HANDRAIL ON THE
* ...SIDE SHELL.
* TWO CARPENTERS ARE ON THE STAGING? ONE
* ...REHAINS ON THE AERIAL PLATFORM.
* THE CARPENTERS ARE NOT WORKING
* ...SINULTANEOUSLY.
CARP-1 BEGINS AT BRKT-2

1 CARP-1 GET+PULL TORCH FROM BRKT-2 TO BRKT-1
2 CARP-1 OPERATE TORCH AT BRKT-1 PTIME 426 M ( BURN OFF HANDRAIL )
3 CARP-2 GET+SLIDE HANDRAIL FROM BRKT-2 TO CARP-2
4 CARP-2 HOLD+MOVE HANDRAIL FROM CARP-2 TO CARP-3
5 CARP-3 GET+PLACE HANDRAIL FROM BRKT-2 TO HR-PILE
MANUAL METHODS

525. TEAR DOWN STANCHION FOR SIDE SHELL WITH HAND AT ANY WAY CARPENTER PER STANCHION OFG: 3 18-MAR-82

REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF STANCHION FROM * ...SIDE SHELL.
* TWO CARPENTERS ARE ON THE STAGING? ONE * ...REHAINS ON AERIAL PLATFORM.
* THE CARPENTERS DO NOT WORK * ...SIMULTANEously,
Carp-3 Begins at BRKT-1

1 CarP-1 LOOSEN STAN AT BRKT-1 4 ARM-STROKES USING HANDS
2 CarP-1 HOLD+HOVE STAN FROM CARP-1 TO CARP-3
3 CarP-3 GET+PLACE STAN FROM BRKT-1 TO BIN-2

526. TEAR DOWN STAGING PLANK FOR SIDE SHELL WITH HAND AT ANY WAY CARPENTER PER STAGING PLANK OFG: 3 18-MAR-82

REPRESENTS ELAPSED TIME
* REPRESENTS TEARING DOWN BOARDS ON THE * ...SIDE SHELL.
* CARPENTERS ARE WORKING ON AN AERIAL * ...PLATFORM.
* THE CARPENTERS ARE WORKING * ...SIMULTANEOUSLY.
Carp-1 Begins at BRKT-1

1 CarP-1 AND CarP 2 GET+MANIPULATE BOARD FROM BRKT-1 ( CarP 2 AT BRKT2 ) TO BD-PILE
MANUAL METHODS

527. TEAR DOWN (ACCESS) LADDER ON SIDE SHELL WITH TORCH AT ANY WAY CARPENTERD
PER LADDER OFG: 2 18-MAR-82
  * REPRESENTS ELAPSED TIME
  * REPRESENTS REMOVAL OF LADDER FROM SIDE
  * CARPENTERS ARE WORKING ON AN AERIAL PLATFORM.
  * THE CARPENTERS ARE NOT WORKING
  * SIMULTANEOUSLY.
CARP-1 BEGINS AT BRKT-2

1 CARP-1 GET+PULL TORCH FROM BRKT-2 TO BRKT-1
2 CARP-1 OPERATE TORCH AT BRKT-1 PTIME 0.47 M ( BURN OFF 4 CLIPS ) F 4
3 CARP-1 GET+PLACE 4 LCLIPS FROM BRKT-1 TO TOOLBOX-2 PF 4 ( 1 2 3 )
4 CARP-2 GET+POSITION LADR FROM BRKT-1 TO LDR-PILE

528. TEAR DOWN STAGING BRACKET ON SIDE SHELL WITH WRENCH AT ANY WAY CARPENTER
PER STAGING BRACKET OFG: 3 18-MAR-82
  * REPRESENTS ELAPSED TIME
  * REPRESENTS REMOVAL OF BRACKETS FROM SIDE SHELL.
  * CARPENTERS ARE WORKING ON AN AERIAL PLATFORM.
CARP-1 BEGINS AT BRKT-1

1 CARP-1 LOOSEN NUT AT BRKT-1 1 ARM-STROKE USING WRENCH-1 AND HOLD
2 CARP-1 HOLD+LOOSEN NUT AT BRKT-1 13 WRIST-STROKES USING WRENCH-1 ASIDE TO CARP-1
3 CARP-1 GET+REMOVE BOLT FROH BRKT-1 TO CARP-1
4 CARP-1 PLACE NUT AND BOLT FROM BRKT-1 TO TOOLBOX-1
MANUAL METHODS

530. TEAR DOWN (STAGING CLIP) ON SIDE SHELL WITH TORCH AT ANY WAY CARPEN
PER STAGING CLIP OFG: 3 18-MAR-82
代表性 elapsed time
* Represents removing staging clips from
* ...the side shell.
* Carpenters are working on an aerial
* Platform.
Carp-1 begins at Brkt-2

1 Carp-1 Get+pull torch from Brkt-2 to Brkt-1
2 Carp-1 Operate torch at Brkt-1 Ptime .55 M (burn off staging c
3 Carp-1 Get+place sclip from Brkt-1 to Toolbox-2
SECTION 3
MANUAL METHODS

446. WELD HANDRAIL (CONNECTIONS) ON STANCHION WITH STICK ELECTRODE AT ANY PLATEN (SHOP) WELDING PER 100 PIECES OF HANDRAIL OFG: 3 WELD TO MEET SAFETY REQUIREMENTS. RATE PER 100 PIECES OF HANDRAIL (AUG. 1 CONNECTION EACH). RATE INCLUDES MANUAL ELEMENTS.

1 WELD HORIZONTAL 1/4' FILLET WELD (5' PER CONNECTION) USING 6011 3/16 ELECTRODE OR COMPARABLE (7018 5/32).

454. (CLIMB UP AND DOWN) MOVE OPERATOR (ON PIPE STAGING) FOR SIDE SHELL AT ANY WAYS CARPENTER PER PIPE STAGING SECTION (16' LONG) OFG: 3 11-FEB-82 REPRESENTS ELAPSED TIME
* REPRESENTS CARPENTER CLIMBING UP AND ...
* AVERAGE NUMBER OF STEPS NEEDED = 6.
CARP-1 BEGINS AT END-PC-1

1 CARP-1 SLIDE (CLIMB-UP) LADDER (END PIECE) AT END-PC-1 (6 STEPS.) PF6 (1) PF 6 (34)
2 CARP-1 PULL (CLIMB-DOWN) LADDER (END PIECE) AT END-PC-1 (6 STEPS.) PF6 (1) PF 6 (34)

456. TRANSPORT STAGING" PLANK FOR PIPE STAGING (AT SIDE SHELL) WITH (TOWER CRANE) AT ANY WAYS CARPENTER PER STAGING PLANK OF(3: 3 11-FEB-82 REPRESENTS ELAPSED TIME
* REPRESENTS TRANSPORTING BOARDS FROM ...
* ...DISTANCES FROM CRANE-REST TO BD-PILE AND ...
* ...MAXIMUM NUMBER OF BOARDS IN LIFT = 4
C-OPER BEGINS AT CR-1

1 TRANSPORT BOARD FROM BD-PILE USING CRANE WITH HOOK+SLING TO SIDE-SHELL (ON PIPE STAGING SECTION (16' LONG)) PLACE+MANEUVER ETURN TO CR-1 F 1 / 4
MANUAL METHODS

459. TRANSPORT STANCHION FOR PIPE STAGING (AT SIDE SHELL) WITH (TOWER CRANE AT ANY WAYS CARPENTER
PER STANCHION OFG: 3 12-FEB-82
* REPRESENTS ELAPSED TIME.
* ...BIN-2 TO SIDE SHELL.
* DISTANCES FROM CRANE-REST TO BIN-2 AND.
* ...FROM BIN-2 TO SIDE SHELL ARE AVERAGE
* ...DISTANCES FROM A WAY 740’X120’
* MAXIMUM NUMBER OF STANCHIONS IN LIFT = 6
C-OPER BEGINS AT CR-1

1 TRANSPORT STAN FROM BIN-2 USING CRANE WITH HOOK+SLING TO SIDE-SHELL
( ON PIPE STAGING ) PLACE+ADJUST RETURN TO CR-1 F 1 / 6

461. TRANSPORT HANDRAIL FOR PIPE STAGING (AT SIDE SHELL) WITH (TOWER CRANE AT ANY WAYS CARPENTER
PER SECTION (16’LONG) OF PIPE STAGING OFG: 3 12-FEB-82
* REPRESENTS ELAPSED TIME,
* ...HR-PILE TO SIDE SHELL.
* DISTANCES FROM CRANE-REST TO HR-PILE AND
* ...FROM HR-PILE TO SIDE SHELL ARE
* ...AVERAGE DISTANCES FROM WAY 740’X120’
* MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6
C-OPER BEGINS AT CR-1

1 TRANSPORT HANDRAIL FROM HR-PILE USING CRANE WITH HOOK+SLING TO
SIDE-SHELL ( ON PIPE STAGING ) PLACE+ADJUST RETURN TO CR-1 F 1 /
MANUAL METHODS

463. TRANSPORT STAGING PLANK FOR SIDE SHELL (BTWN 2 PIPE STAGING SECTIONS) WITH (TOWER CRANE) AT ANY WAYS CARPENTER
PER STAGING PLANK OFG: 3 12-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS TRANSPORTING BOARDS FROM
* ...RD-PILE TO SIDE SHELL.
* DISTANCES FROM CRANE-REST TO BD-PILE AND
* ...FROM BD-PILE TO SIDE SHELL ARE
* ...AVERAGE DistANCES FROM WAY 740’X120’
* MAXIMUM NUMBER OF BOARDS IN LIFT = 4
C-OPER BEGINS AT CR-1

1 TRANSPORT BOARD FROM BD-PILE USING CRANE WITH HOOK+SLING TO
SIDE-SHELL (BTWN 2 PIPE STAGING SECTIONS ) PLACE+MANEUVER RETURN

465. TRANSPORT HANDRAIL FOR SIDE SHELL (BTWN 2 PIPE STAGING SECTIONS) WITH
(TOWER CRANE) AT ANY WAYS CARPENTER
PER HANDRAIL OFG: 3 12-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS TRANSPORTING HANDRAIL FROM
* ...HR-PILE TO SIDE SHELL.
* DISTANCES FROM CRANE-REST TO HR-PILE AND
* ...FROM HR-PILE TO SIDE SHELL ARE
* ...AVERAGE DistANCES FROM WAY 740’X120’
* MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6
C-OPER REGINS AT CR-1

1 TRANSPORT HANDRAIL FROM HR-PILE USING CRANE WITH HOOK+SLING TO
SIDE-SHELL; ( BTWN 2 PIPE STAGING SECTIONS ) PLACE+ADJUST RETURN TO
MANUAL METHODS

476. REMOVE HANDRAIL ON (MATERIAL PILE) WITH (TOWER CRANE) AT ANY WAYS CARPENTER
PER HANDRAIL OEG: 3 16-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF HANDRAIL FROM
* ...MATERIAL PILE AT WAY TO HANDRAIL PILE
* ...DISTANCES ARE AVERAGE DISTANCES FOR A
* ...WAY 740'X120'.
* MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6
* TOWER CRANE IS USED FOR REMOVAL.
CARP-3 BEGINS AT MAIL-PILE

1 CARP-3 GET+SLIDE WITH BEND HANDRAIL ( ONTO BOLSTER ) AT MAIL-PILE
2 C-OPER TRANSPORT HANDRAIL FROM MAIL-PILE USING CRANE WITH HOOK+S
   TO HR-PILE PLACE+ADJUST RETURN TO CR-1 F 1 / 6

477. REMOVE STANCHION ON (MATERIAL PILE) WITH (TOWER CRANE) AT ANY WAYS CARPENTER
PER STANCHION OEG: 3 16-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF STANCHION FROM
* ...MATERIAL PILE AT WAY TO BIN-2
* ...DISTANCES ARE AVERAGE DISTANCES FOR A
* ...WAY 740'X120'.
* MAXIMUM NUMBER OF STANCHION IN LIFT = 6
* TOWER CRANE IS USED FOR REMOVAL.
CARP-3 BEGINS AT MATL-PILE

1 CARP-3 GET+PLACE WITH BEND STAN FROM MATL-PILE TO MATL-PILE ( S' UP FOR TRANSPORTING )
2 C-OPER TRANSPORT STAN FROM MATL-PILE USING CRANE WITH HOOK+SLING
   BIN-2 PLACE+ADJUST RETURN TO CR-1 F 1 / 6
MANUAL METHODS

478. REMOVE STAGING PLANK ON PIPE STAGING (AT SIDE SHELL) WITH (TOWER CRANE) AT ANY WAYS CARPENTER
PER STAGING PLANK OFG: 3 16-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF BOARDS FROM PIPE
* ...STAGING AT SIDE SHELL TO BOARD PILE
* ...DISTANCES ARE AVERAGE DISTANCES FOR A WAY 740'X120'.
* MAXIMUM NUMBER OF BOARDS IN LIFT = 4
* TOWER CRANE IS USED FOR REMOVAL,
C-OPER BEGINS AT CR-1
1 C-OPER TRANSPORT BOARD FROM SIDE-SHELL USING CRANE WITH HOOK+S1.ING TO BD-PILE PLACE+MANEUVER RETURN TO CR-1 F 1 / 4

479. REMOVE BRACE ON (MATERIAL PILE) WITH (TOWER CRANE) AT ANY WAYS CARPENTER
PER BRACE OFG: 3 16-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS REMOVING BRACES FROM MATERIAL
* ...PILE AT WAY TO BRACE PILE.
* ...DISTANCES ARE AVERAGE DISTANCES FOR A WAY 740'X120'.
* MAXIMUM NUMBER OF BRACES IN LIFT = 6.
* TOWER CRANE IS USED FOR REMOVAL.
CARP-3 BEGINS AT MATL-PILE
1 CARP-3 GET+SLIDE WITH BEND BRACE ( ONTO BOLSTER ) AT MATL-PILE
2 C-OPER TRANSPORT BRACE FROM MATL-PILE USING CRANE WITH HOOK+SLING TO BRACE-PILE PLACE+ADJUST RETURN TO CR-1 F 1 / 6
MANUAL METHODS

480. REMOVE END RAIL (END PIECE) ON (MATERIAL PILE) WITH (TOWER CRANE) ANY WAYS CARPENTER
PER END RAIL (END PIECE) OGF: 3 6-FEB-82
  REPRESENTS ELAPSED TIME
X REPRESENTS REMOVING END PIECES FROM MATERIAL PILE AT WAY TO END-PC-RACK.
  * DISTANCES ARE AVERAGE DISTANCES FOR A WAY 740'X 120'.
  * MAXIMUM NUMBER OF END PIECES IN LIFT = 3
  * TOWER CRANE IS USED FOR REMOVAL.
CARP-3 BEGINS AT MATL-PILE
1 C-OPER TRANSPORT END-PIECE FROM END-PC-RACK USING CRANE WITH HOOK+SLING TO MATL-PILE PLACE+ADJUST RETURN TO CR-1 / 6
2 C-OPER TRANSPORT END-PIECE FROM END-PC-RACK USING CRANE WITH HOOK+SLING TO MATL-PILE PLACE+ADJUST RETURN TO CR-1 / 6
3 C-OPER TRANSPORT END-PIECE FROM END-PC-RACK TO MATL-PILE PLACE+ADJUST RETURN TO CR-1 / 6

486. TRANSPORT END RAIL (END PIECE) ON (END-PIECE RACK) WITH (TOWER CRANE) ANY WAYS CARPENTER
PER END RAIL (END PIECE) OGF: 3 18-FEB-82
  REPRESENTS ELAPSED TIME
  REPRESENTS TRANSPORTING END PIECES FROM END-PC-RACK TO MATL-PILE.
  DISTANCES FROM CRANE REST TO END-PC-RACK.
  AND FROM END-PC-RACK TO MATL-PILE ARE AVERAGE DISTANCES ON A WAY 740'X 120'.
  MAXIMUM NUMBER END-PCS IN LIFT = 3
  THERE ARE 2 LIFTS DONE PER SECTION OF PIPE STAGING (16’LONG).
C-OPER BEGINS AT CR-1
1 C-OPER TRANSPORT END-PIECE FROM END-PC-RACK USING CRANE WITH HOOK+SLING TO MATL-PILE PLACE+ADJUST RETURN TO END-PC-RACK / 6
2 C-OPER TRANSPORT END-PIECE FROM END-PC-RACK USING CRANE WITH HOOK+SLING TO MATL-PILE PLACE+ADJUST RETURN TO CR-1 / 6

MANUAL METHODS

1320 COMBINED SUB-OP

HOOK-UP/UNHOOK AND IGNITE/EXTINGUISH TORCH FOR BURNING WITH HAND AT TANK CARPENTER

CREW SIZE = 6 (3 CARPS ABOVE DECK AND 3 BELOW) * RATE IN ELAPSED TIME.

MULT BY 6 TO OBTAIN TOTAL TIME,

PER 8-HR SHIFT AND (1) CUT OFG: 4 20-NOV-81

* THE FOLLOWING IS INCLUDED IN THIS SUBOP:

* --2 HOOK-UPS AND 2 UNHOOKS PER (1)..........  
* ...8-HR SHIFT
* ...(1) OCCURRENCE FOR IGNITE AND ........
* ...EXTINGUISH TORCH
* --TO DETERMINE THE FREQ OF THE SUB-OP...
* ...FRO NUMBER OF CUTS >1, USE THE . . ....
* ...FORMULA: FREQ = 1+ [(N-1) X .23] ....
* ..WHERE 'N' = THE NUMBER OF CUTS(BURNS)

Combined sub-operation elements 
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9. HOOK-UP AND UNHOOK TORCH ON MANIFOLD WITH WRENCH AT SHIP

10. IGNITE AND EXTINGUISH TORCH FOR BURNING WITH HAND AT TANK

455. MAKE READY STAGING PLANK FOR (TRANSPORTING) WITH HAND AT ANY WAYS CARPENTER

PER STAGING PLANK OFG: 3 11-FEB-82

REPRESENTS ELAPSED TIME

* REPRESENTS GETTING BOARD ON BOLSTERS SO
* ...THAT THE CRANE CAN TRANSPORT IT

CARP-3 BEGINS AT SIDE-SHELL

1 CARP-3 GET+SLIDE BOARD AT BD-PILE AND ADJUST ( ON BOLSTERS )
457. SET UP STAGING PLANK ON PIPE STAGING (AT SIDE SHELL) WITH HAND AT ANY WAYS CARPENTER PER STAGING FLANK OFG: 3 12-FEB-82
REPRESENTS ELAPSED TIME.
* REPRESENTS CARPENTERS SPREADING BOARDS
* ...ON PIPE STAGING SECTION (16' LONG).
* ...CARPENTERS HAVE TO CLIMB UP AND DOWN
* ...THE PIPE STAGING TO SPREAD THE BOARDS
* ... (SEE SEPARATE ANALYSIS FOR CLIMBING)
CARP-1 BEGINS AT END-PC-1

1 CARP-1 AND CARP 2 GET+SLIDE WITH BEND WITH 1 STEP BOARD AT SIDE-SHELL AND ALIGN

458. MAKE READY STANCHION FOR (TRANSPORTING) WITH HAND AT ANY WAYS CARPENTER PER STANCHION OFG: 3 12-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS GETTING STANCHION READY TO BE ...
* ...TRANSPORTED.
CARP-3 BEGINS AT BD-PILE

1 CARP-3 GET+PLACE STAN FROM BIN-2 TO BIN-2
MANUAL METHODS

460. SET UP STANCHION ON PIPE STAGING (AT SIDE SHELL) WITH WRENCH AT ANY WAYS CARPENTER
PER SECTION (16' LONG) OF PIPE STAGING OFG: 3 12-FEB-82
* REPRESENTS ELAPSED TIME.
* REPRESENTS SETTING UP STANCHIONS ON PIPE
* ...STAGING.
* ...CARPENTERS INSTALL SIMULTANEOUSLY.
* ...CARPENTERS ARE STILL ON PIPE STAGING
CARP-1 BEGINS AT END-PC-1

1 CARP-1 GET+PLACE WITH BEND STAN FROM END-PC-2 TO END-PC-3 AND INSERT ( INTO END PIECE )
2 CARP-2 GET+PLACE WITH BEND WITH 3 STEPS STAN FROM END-PC-2 TO END-PC-3 AND INSERT ( INTO END PIECE ) SIMO
3 CARP-1 GET+PLACE 2 BOLTS FROM CARP-1 TO END-PC-1 WITH KNEEL AND INSERT BOLT ( INTO STANCHION ) PF 2 ( 6 7 )
4 CARP-2 GET+PLACE 2 BOLTS FROM CARP-2 TO END-PC-3 WITH KNEEL AND INSERT BOLT ( INTO STANCHION ) PF 2 ( 6 7 ) SIMO
5 CARP-1 FASTEN 2 NUTS AT END-PC-1 13 WRIST-TURNS USING HANDS
6 CARP-1 FASTEN 2 NUTS AT END-PC-1 4 ARM-STROKES USING WRENCH-1 ASIDE TO CARP-1
7 CARP-2 FASTEN 2 NUTS AT END-PC-3 13 WRIST-TURNS USING HANDS SIMO
8 CARP-2 FASTEN 2 NUTS AT END-PC-3 4 ARM-STROKES USING WRENCH-2 ASIDE TO CARP-2 SIMO

462. SET UP HANDRAIL ON PIPE STAGING (AT SIDE SHELL) WITH HAND AT ANY WAYS CARPENTER
PER SECTION (16’ LONG) OF PIPE STAGING OFG: 3 12-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS CARPENTERS INSTALLING
* HANDRAIL THRU EYELETS IN STANCHIONS.
* CARPENTERS DON’T WORK SIMULTANEOUSLY.
* WELDING DONE IN A SEPARATE SUB-OP.
CARP-1 BEGINS AT END-PC-1

1 CARP-1 GET+SLIDE WITH BEND HANDRAIL AT END-PC-3 AND ALIGN ( THRU 2 STANCHION EYELETS ) PF 2 ( 4 5 6 7 )
2 CARP-2 GET+SLIDE WITH BEND HANDRAIL AT END-PC-1 AND ALIGN ( THRU 2 STANCHION EYELETS ) PF 2 ( 4 5 6 7 )
MANUAL METHODS

464. SET UP STAGING PLANK FOR SIDE SHELL (BTWN 2 PIPE STAGING SECTIONS) WITH HAND AT ANY WAYS CARPENTER
PER STAGING PLANK OFG: 3 12-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS CARPENTERS SPREADING BOARDS
* ...BETWEEN PIPE STAGING SECTIONS.
* ...THERE IS A 16’ GAP BETWEEN SECTIONS.
* ...CARPENTERS HAVE TO CLIMB UP AND DOWN
* ...THE PIPE STAGING TO SPREAD THE BOARDS
* ... (SEE SEPARATE ANALYSIS FOR CLIMBING)
CARP-1 BEGINS AT SECTION-1

1 CARP-1 AND CARP 2 GET+SLIDE WITH BEND WITH 1 STEP BOARD AT SIDE-SHELL AND ALIGN

466. SET UP HANDRIL FOR SIDE SHELL (BTWN 2 PIPE STAGING SECTIONS) WITH HAND AT ANY WAYS CARPENTER
PER SECTION OFG: 3 12-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS CARPENTERS INSTALLING
* ...HANDRAIL ON EXISTING HANDRAIL.
* ...CARPENTERS DON’T WORK SIMULTANEOUSLY.
* ...WELDING DONE IN A SEPARATE SUB-OF.
CARP-1 BEGINS AT SECTION-1

1 CARP-1 GET+PLACE WITH BEND HANDRAIL FROM SECTION-1 TO SECTION-2
RETURN TO SECTION-1 ( TACKING DONE UPON PLACEMENT ) PF 2 ( 6 )
2 CARP-2 GET+PLACE WITH BEND HANDRAIL FROM SECTION-2 TO SECTION-1
RETURN TO SECTION-2 ( TACKING DONE UPON PLACEMENT ) PF 2 ( 6 )
MANUAL METHODS

469. TEAR DOWN HANDRAIL FOR SIDE SHELL (BTWN 2 PIPE STAGING SECTIONS) WITH TORCH AT ANY WAYS CARPENTERS
PER SECTION OFG: 3 15-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS TEARING DOWN HANDRAIL ON PIPE
* ...STAGING (BTWN 2 SECTIONS) + A TORCH IS USED TO BURN THE HANDRAIL OFF. THE
* ...HANDRAIL IS THROWN TO THE MATERIAL
* ...PIECE. CARPENTERS REMOVE 2 HANDRAIL
* ...PIECE BEFORE MOVING TO NEXT SECTION.
CARP-1 BEGINS AT SECTION-1

1 CARP-1 PULL TORCH AT SECTION-1
2 CARP-I OPERATE TORCH AT SECTION-1 PTIME 0426 H (BURN OFF HANDRAIL:
   2 CONNECTIONS PER HANDRAIL) F 4
3 CARP-2 GET+HOLD HANDRAIL FROM SECTION-2 TO CARP-2 F 2 SIMO
4 CARP-2 HOLD+THROW HANDRAIL FROM CARP-2 TO MATL-PILE F 2
5 CARP-1 PULL TORCH AT SECTION-2

470. TEAR DOWN HANDRAIL FOR PIPE STAGING (AT SIDE SHELL) WITH HAND AT ANY WAYS CARPENTER
PER SECTION (16’LONG) OF PIPE STAGING OFG: 3 15-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS TEARING DOWN HANDRAIL ON PIPE
* ...STAGING (BTWN 2 STANCHIONS). THE
* ...HANDRAIL IS THROWN TO THE MATERIAL
* ...PILE, CARPENTERS REMOVE 2 HANDRAIL
* ...PIECE BEFORE MOVING TO NEXT SECTION,
CARP-1 BEGINS AT END-PC-1

1 CARP-1 GET+SLIDE HANDRAIL AT END-PC-3 (OUT OF 2 STANCHION SLEEVES)
   AND ADJUST PF 2 (4 5 6 7)
2 CARP-1 HOLE+THROW HANDRAIL FROM CARP-I TO MATL-PILE
3 CARP-2 GET+SLIDE, HANDRAIL AT END-PC-1 (OUT OF 2 STANCHION SLEEVES)
   AND ADJUST PF 2 (4 5 6 7)
4 CARP-2 HOLD+THROW HANDRAIL FROM CARP-2 TO HATL-PILE
471. TEAR DOWN STANCHION ON PIPE STAGING (AT SIDE SHELL) WITH WRENCH AT ANYWAYS CARPENTER PER SECTION (16' LONG) OF PIPE STAGING OFG: 3 16-FEB-82

* REPRESENTS ELAPSED TIME
* ...SECTION OF PIPE STAGING (16' LONG).
* ...Carpenters work simultaneously.
* ...Stanchions are thrown to material.
* ...PILE.

Carp-1 begins at End-PC-1

1 Car-1 loosen with kneel 2 nuts at End-PC-1 1 arm-stroke using wrench-1 and hold
2 Car-1 hold+loosen 2 nuts at End-PC-1 13 wrist-turns using wrench aside to Carp-1
3 Car-2 loosen with kneel 2 nuts at End-PC-3 1 arm-stroke using wrench-2 and hold simo
4 Car-2 hold+loosen 2 nuts at End-PC-3 13 wrist-turns using wrench aside to Carp-2 simo
5 Car-1 get+remove 2 bolts from End-PC-1 to Carp-1 f 2
6 Car-2 get+remove 2 bolts from End-PC-3 to Carp-2 f 2 simo
7 Car-1 throw 2 nuts and bolts from Carp-1 to matl-PILE without be simo
8 Car-2 throw 2 nuts and bolts from Carp-2 to matl-PILE without be simo
9 Car-1 get+throw stanchion from End-PC-1 to matl-PILE without bend
10 Car-2 get+throw stanchion from End-PC-3 to matl-PILE without bend si

472. TEAR DOWN STAGING PLANK FOR SIDE SHELL (BTWN 2 PIPE STAGING SECTIONS WITH HAND AT ANYWAYS CARPENTER)

Per Staging plank ofg: 3 16-FEB-82

* REPRESENTS ELAPSED TIME
* ...Pipe staging sections. There is a 16’
* ...GAP BETWEEN SECTIONS. BOARDS ARE
* ...STACKED SO THE CRANE CAN TRANSPORT
* ...THEH, CARPENTERS WORK SIMULTANEOUSLY.

Carp-1 begins at section-1

1 Car-1 and Carp-2 get+manipulate. With bend with 1 step board at section-1 (stack boards)
MANUAL METHODS

473. TEAR DOWN STAGING PLANK ON PIPE STAGING (AT SIDE SHELL) WITH HAND AT ANY WAYS CARPENTER
PER STAGING PLANK OGF: 3 16-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS TEARING DOWN BOARDS ON PIPE
* ...STAGING SECTION (16’LONG). BOARDS ARE
* ...STACKED SO THE CRANE CAN TRANSPORT
* ...THEM CARPENTERS WORK SIMULTANEOUSLY.
CARP-1 BEGINS AT END-PC-1

1 CARP-1 AND CARP 2 GET+MAINPULATE WITH BEND WITH 1 STEP BOARD AT
END-PC-1 ( STACK BOARDS )

474. TEAR DOWN PIPE STAGING (END PCS AND BRACES) FOR SIDE SHELL WITH WRENCH
AT ANY WAYS CARPENTER
PER SECTION (16’LONG) OF PIPE STAGING OGF: 3 16-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS TEARING DOWN END PIECES AND
* ...BRANCES ON PIPE STAGING (2ND LEVEL),
* ...END PIECES ARE BOLTED TO END PIECES
* ...ON 1ST LEVEL, BRACES ARE HELD ON BY A
* ...LOCKING PIN. CARPENTERS WORK
* ...SIMULTANEOUSLY. CARPENTER-1 HANDLES
* ...REMOVAL AT END-PC-1 AND END-PC-2.
* ...MATERIAL IS THROWN OR PLACED AT THE
* ...MATERIAL PILE.
CARP-1 BEGINS AT END-PC-1

1 CARP-1 AND CARP 2 GET+SLIDE ( REMOVE ) WITH CLimb 2 BRACES AT
END-pc-2 ( ALSO AT. END-PC-1 ) AND ADJUST ( LOCKING PIN ) F 2
2 CARP-1 GET+PLACE WITH DESCEND 4 BRACES FROM END-PC-2 TO MATL-PILE PF
4 (3 ) PF4 ( 6 )
3 CARP-2 AND CARP 1 GET+SLIDE ( REMOVE ) WITH CLIMB 2 BRACES AT
END-PC-2 ( ALSO AT. END-PC-3 ) AND ADJUST ( LOCKING PIN ) F 2
4 CARP-2 GET+PLACE WITH DESCEND 4 BRACES FROM END-PC-2 TO MATL-PILE PF
4 (3) PF4 ( 6 )
5 CARP-1 LOOSEN 2 NUTS AT END-PC-1 1 ARM-STROKE USING WRENCH-1 AND
HOLD ( ALSO AT. END-PC-2 ) F 2
6 CARP-1 HOLD+LOOSEN 2 NUTS AT END-PC-1 13 WRIST-TURNS USING WRENCH-1
ASIDE TO CARP-1 ( ALSO AT. END-PC-2 ) F 2
7 CARP-2 LOOSEN 2 NUTS AT END-PC-3 1 ARM-STROKE USING WRENCH-2 AND
HOLD SIMO
8 CARP-2 HOLD+LOOSEN 2 NUTS AT END-PC-3 13 WRIST-TURNS USING WRENCH-2
ASIDE TO CARP-2 SIMO
9 CARP-1 GET+REMOVE 2 BOLTS FROM END-PC-2 TO CARP-1 ( ALSO AT.

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MANUAL METHODS

END-PC-1 ) F 4
10 CARP-2 GET+REMOVE 2 BOLTS FROM END-PC-3 TO CARP-2 F 2 SIMO
11 CARP-1 HOLD+THROW 4 NUTS AND BOLTS FROM CARP-1 TO MATL-PILE
12 CARP-2 HOLD+THROW 2 NUTS AND BOLTS FROM CARP-2 TO MATL-PILE SIM-
13 CARP-1 GET+PLACE END-PIECE FROM END-PC-1 TO MATL-PILE ( ALSO FF
END-PC-2 ) RETURN TO END-PC-1 F 2
14 CARP-2 GET+PLACE END-PIECE FROM END-PC-3 TO MATL-PILE RETURN TO
END-PC-3 SIMO

475. TEAR DOWN PIPE STAGING (END PCS AND BRACES) FOR SIDE SHELL WITH HAN
ANY WAYS CARPENTER
PER SECTION (16’LONG) OF PIPE STAGING OFG: 3 16-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS TEARING DOWN END PIECES AND
* ...BRACES ON PIPE STAGING (1ST LEVEL),
* ...BRACES ARE HELD ON BY A LOCKING PIN
* ...CARPENTERS WORK SIMULTANEOUSLY.
* ...CARPENTER-I HANDLES REMOVAL AT
* ...END-PC-1 AND END-PC-2, MATERIAL IS
* ...THROWN OR PLACED AT THE MATERIAL
* ...PILE.
CARP-1 BEGINS AT END-PC-1

1 CARP-1 AND CARP 2 GET+SLIDE ( REMOVE ) 2 BRACES AT END-PC-2 ( AL
AT, END-PC-1 ) AND ADJUST ( LOCKING PIN ) F 2
2 CARP-1 GET+PLACE 4 BRACES FROM END-PC-2 TO MATL-PILE PF 4 ( 3 ) !
( 6 )
3 CARP-2 AND CARP 1 GET+SLIDE ( REMOVE ) 2 BRACES AT END-PC-2 ( AL
AT. END-PC-3 ) AND ADJUST ( LOCKING PIN ) F 2
4 CARP-2 GET+PLACE 4 BRACES FROM END-PC-2 TO MATL-PILE PF 4 ( 3 )
( 6 )
5 CARP-1 GET+PLACE END-PIECE FROM END-PC-1 TO MATL-PILE ( ALSO FRO
END-PC-2 ) RETURN TO END-PC-1 F 2
6 CARP-2 GET+PLACE END-PIECE FROM END-PC-3 TO MATL-PILE RETURN TO
END-PC-3 SIMO
MANUAL METHODS

487. MAKE READY END RAIL (END PIECE) FOR (TRANSPORTING) AT ANY WAYS CARPENTER
PER END RAIL (END PIECE) OFG: 3 18-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS GETTING END PIECES ON BOLSTER
* ...SO THAT CRANE CAN TRANSPORT IT.
CARP-3 BEGINS AT END-PC-RACK

1 CARP-3 GET+PLACE END-PIECE FROM END-PC-RACK TO END-PC-RACK WITH BEND

4880 SET-UP PIPE STAGING (END PCS AND BRACES) FOR SIDE SHELL WITH HAND AT ANY WAYS CARPENTER
PER SECTION (16’ LONG) OF PIPE STAGING OFG: 3 18-FEB-82
* REPRESENTS ELAPSED TIME.
* REPRESENTS SETTING UP 1ST LEVEL OF A 16’
* ...LONG SECTION OF PIPE STAGING. SECTION
* ...INCLUDES 3 END PIECES AND 8 BRACES
* ...WHICH ARE HELD IN PLACE BY A LOCKING PIN.
* CARP-1 AND CARP-2 ARE WORKING
* ...SIMULTANEOUSLY IN PUTTING UP THE END PIECES AND BRACES.
CARP-1 BEGINS AT END-PC-1

1 CARP-1 GET+PLACE ENF-PIECE FROM MATL-PILE TO END-PC-1
2 CARP-2 GET+PLACE ENF-PIECE FROM MATL-PILE TO END-PC-2 SIMO
3 CARP-3 GET+PLACE 4 BRACES FROM BRACE-PILE TO MATL-PILE
4 CARP-1 AND CARP 2 GET+SLIDE WITH BEND 2 BRACES AT END-PC-2 ( ALSO AT+ END-PC-1. ) AND ADJUST ( LOCKING PIN ) F 4
5 CARP-1 GET+PLACE END-PIECE FROM MATL-PILE TO END-PC-3
6 CARP-3 GET+PLACE 4 BRACES FROM BRACE-PILE TO MATL-PILE
7 CARP-1 AND CARP 2 GET+SLIDE WITH BEND 2 BRACES AT END-PC-2 ( ALSO AT. END-PC-3. ) AND ADJUST ( LOCKING PIN ) F 4
489. SET-UP PIPE STAGING (END PCS AND BRACES) FOR SIDE SHELL WITH WRENCH ANY WAYS CARPENTER
PER SECTION (16’ LONG) OF PIPE STAGING OFG: 3 18-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS SETTING UP 2ND LEVEL OF A 16’
* ...LONG SECTION OF PIPE STAGING. SECTION
* ...INCLUDES 3 END PIECES AND 8 BRACES
* ...WHICH ARE HELD IN PLACE BY A LOCKING PIN. END PIECES ARE BOLTED TO 1ST LEVEL END PIECES.
* CARP-1 AND CARP-2 ARE WORKING SIMULTANEOUSLY IN PUTTING UP THE END PIECES AND BRACES,
CARP-1 BEGINS AT END-PC-1

1 CARP-1 GET+MANIPULATE WITH BEND WITH 2 STEPS ( FROM MATL PILE )
   END-PIECE AT END-PC-1 AND ALIGN
2 CARP-2 GET+MANIPULATE WITH BEND WITH 2 STEPS ( FROM MATL PILE )
   END-PIECE AT END-PC-2 AND ALIGN SIMO
3 CARP-1 GET+PLACE 2 BOLTS FROM TOOLBOX-1 TO END-PC-1 AND INSERT (67)
4 CARP-2 GET+PLACE 2 BOLTS FROM TOOLBOX-1 TO END-PC-2 AND INSERT (67) SIMO
5 CARP-1 FASTEN 2 NUTS AT END-PC-1 13 WRIST-TURNS USING HANDS
5 CARP-1 FASTEN 2 NUTS AT END-PC-1 4 ARM-STROKES USING WRENCH-1 ASIDE TO CARP-1
7 CARP-2 FASTEN 2 NUTS AT END-PC-2 13 WRIST-TURNS USING HANDS SIMO
8 CARP-2 FASTEN 2 NUTS AT END-PC-2 4 ARM-STROKES USING WRENCH-2 TO CARP-2 SIMO
9 CARP-3 GET+PLACE 4 BRACES FROM BRACE-PILE TO MATL-PILE
10 CARP-1 AND CARP 2 GET+SLIDE WITH CLIMB 2 RRACES AT END-PC-2 (AT, END-PC-1) AND ADJUST (LOCKING PIN) F 4
11 CARP-1 GET+MANIPULATE WITH DESCEND END-PIECE ( FROM MATL PILE END-PC-3 AND ALIGN
12 CARP-1 GET+PLACE 2 BOLTS FROM CARP-1 TO END-PC-3 AND INSERT PF 67
13 CARP-1 FASTEN 2 NUTS AT END-PC-3 13 WRIST-TURNS USING HANDS
14 CARP-1 FASTEN 2 NUTS AT END-PC-3 4 ARM-STROKES USING WRENCH-1 TO CARP-1
15 CARP-3 GET+PLACE 4 BRACES FROM BRACE-PILE TO MATL-PILE
16 CARP-1 AND CARP 2 GET+SLIDE WITH CLIMB 2 RRACES AT END-PC-2 (AT+ END-PC-3+) AND ADJUST (LOCKING PIN) F 4
SECTION 4
STANDARD TIME CALCULATION

4.1 TITLE SHEETS

SET-UP AND TEAR DOWN BRACKET STAGING MID TANKS AND VOIDS CAR

Titlesheet Organization List
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Join
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435. WELD STAGING BRACKET (CLIP) ON BULKHEAD (OR ANY STRUCTURE) WITH STICK ELECTRODE AT ANY TANKS AND VOIDS (SHIP) WELDING
    WELD TO MEET SAFETY REQUIREMENTS. RATE PER 200 CLIPS. RATE INCLUDES MANUAl ELEMENTS,

438. WELD LADDER (CLIP) (SECURES LADDER) ON BULKHEAD (OR ANY STRUCTURE) WITH
    STICK ELECTRODE AT ANY TANKS AND VOIDS (SHIP) WELDING
    WELD TO MEET SAFETY REQUIREMENTS. RATE PER 100 LADDERS (400 CLIPS).
    RATE INCLUDES MANUAL ELEMENTS.

440. WELD HANDRAIL (CONNECTIONS) ON STANCHION WITH STICK ELECTRODE AT ANY
    TANKS AND VOIDS (SHIP) WELDING
    WELD TO MEET SAFETY REQUIREMENTS. RATE PER 100 PIECES OF AHNDRAIL
    (AVG. 1 CONNECTION EACH). RATE INCLUDES MANUAL ELEMENTS.

Move
----

378. TRANSPORT STAGING BRACKET WITH (GROVE CRANE) AT TANK (OR WAY) CARPENTER
    REPRESENTS ELAPSED TIME

381. TRANSPORT LADDERS WITH (GROVE CRANE) AT TANK CARPENTER
    REPRESENTS ELAPSED TIME

384. POSITION (SECURE) (ACCESS) LADDER FOR BULKHEAD WITH HAMHER (AND LADDER
    CLIPS) AT TANK CARPENTER
    REPRESENTS ELAPSED TIME

387. TRANSPORT STAGING PLANK WITH (GROVE CRANE) AT TANK CARPENTER
    REPRESENTS ELAPSED TIME

392. TRANSPORT STANCHION WITH (GROVE CRANE) AT TANK CARPENTER
    REPRESENTS ELAPSED TIME

395. TRANSPORT HANDRAIL WITH (GROVE CRANE) AT TANK CARPENTER
    REPRESENTS ELAPSED TIME

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STANDARD TIME CALCULATION

404. (CLIMB UP AND DOWN) MOVE OPERATOR (ON LADDER) ON BULKHEAD AT ANY TANK AND VOIDS CARPENTER
REPRESENTS ELAPSED TIME

407. REMOVE HANDRAIL ON (MATERIAL-PILE) WITH WINCH AT ANY TANKS AND VOID:
CARPENTER
REPRESENTS ELAPSED TIME

408. REMOVE STANCHION ON (MATERIAL PILE) WITH WINCH AT ANY TANKS AND VOID
CARPENTER
REPRESENTS ELAPSED TIME

409. REMOVE STAGING BRACKET ON (MATERIAL PILE) WITH WINCH AT ANY TANKS AND VOID
CARPENTER
REPRESENTS ELAPSED TIME

410. REMOVE STAGING PLANK ON (BOARD PILE) WITH WINCH AT ANY TANKS AND VOID
CARPENTER
REPRESENTS ELAPSED TIME

411. REMOVE LADDER ON (LADDER-PILE) WITH WINCH AT ANY TANKS AND VOID
CARPENTER
REPRESENTS ELAPSED TIME

412. REMOVE TOOLBOX ON (MATERIAL PILE) WITH WINCH AT ANY TANKS AND VOID
CARPENTER
REPRESENTS ELAPSED TIME

432. (WALK WP OR DOWN) MOVE OPERATOR (ON INCLINED STAIRS) ON BULKHEAD AT TANKS AND VOIDS
CARPENTER
REPRESENTS ELAPSED TIME

OPERATE

132. COMBINED SWB-OP

HWOK-WP/WNHOOK AND IGNITE/EXTINGUISH TORCH FOR BURNING WITH HAND AT TANK CARPENTER
CREW SIZE = 6 (3 CARP ON DECK AND 3 BELOW)+ RATE IN ELAPSED TIME
WLT BY 6 TO OBTAIN TOTAL TIME.

PREPARE

376. SET-UP (STAGING CLIP) ON BULKHEAD WITH HAMMER (AND STEEL-TAPE) AT TF CARPENTER
STANDARD TIME CALCULATION

REPRESENTS ELAPSED TIME

377. MAKE READY STAGING BRACKET FOR (TRANSPORTING) WITH HAND AT TANK (OR WAY) CARPENTER
   REPRESENTS ELAPSED TIME

379. SET-WP STAGING BRACKETS ON BWLKHEAD WITH WRENCH AT TANK CARPENTER
   REPRESENTS ELAPSED TIME

380. MAKE READY LADDER FOR (TRANSPORTING) WITH HAND AT TANK (OR WAY) CARPENTER
   REPRESENTS ELAPSED TIME

382. SET-WP LADDER ON BWLKHEAD (AT BRACKET LOCATION) WITH HAND AT TANK CARPENTER
   REPRESENTS ELAPSED TIME

383. SET-WP (ACCESS) LADDER ON BWLKHEAD WITH HAND AT TANK CARPENTER
   REPRESENTS ELAPSED TIME

385. POSITION (SECWRE) (ACCESS) LADDER FOR BRACKET STAGING WITH PLIER (AND WIRE ROPE) AT TANK CARPENTER
   REPRESENTS ELAPSED TIME

386. MAKE READY STAGING PLANK FOR (TRANSPORTING) WITH HAND AT TANK (OR WAY) CARPENTER
   REPRESENTS ELAPSED TIME

388. SET-WP STAGING PLANK ON STAGING BRACKET WITH HAND AT TANK CARPENTER
   REPRESENTS ELAPSED TIME

389. SET-WP STAGING PLANK ON STAGING BRACKET WITH HAND AT TANK CARPENTER
   REPRESENTS ELAPSED TIME

390. SET-WP STAGING PLANK ON STAGING BRACKET WITH HAND AT TANK CARPENTER
   REPRESENTS ELAPSED TIME

391. MAKE READY STANCHION FOR (TRANSPORTING) WITH HAND AT TANK (OR WAY) CARPENTER
   REPRESENTS ELAPSED TIME

393. SET-WP STANCHION IN STAGING BRACKET WITH HAND AT TANK CARPENTER
   REPRESENTS ELAPSED TIME

394. MAKE READY HANDRAIL FOR (TRANSPORTING) WITH HAND AT TANK (OR WAY) CARPENTER
   REPRESENTS ELAPSED TIME
STANDARD TIME CALCULATION

396. SET-WP HANDRAIL ON STANCHION WITH HAND AT TANK CARPENTER
    REPRESENTS ELAPSED TIME

397. SET-WP HANDRAIL (END PIECES) ON HANDRAIL (AND BWLKHEAD) WITH HAND AT TANK CARPENTER
    REPRESENTS ELAPSED TIME

398. TEAR DOWN HANDRAIL ON BULKHEAD WITH TORCH AT (CENTER) MID TANKS AND VOIDS CARPENTER
    REPRESENTS ELAPSED TIME

399. TEAR DOWN HANDRAIL ON BWLKHEAD WITH TORCH (AND WINCH) AT (WING) TANK AND VOIDS CARPENTER
    REPRESENTS ELAPSED TIME

400. TEAR DOWN STANCHION ON BWLKHEAD WITH HAND AT (CENTER) MID TANKS AND VOIDS CARPENTER
    REPRESENTS ELAPSED TIME

402. TEAR DOWN STAGING PLANK ON STAGING BRACKET WITH HAND (AND WINCH) AT ANY TANKS AND VOIDS CARPENTER
    REPRESENTS ELAPSED TIME

403. TEAR DOWN LADDER (AND LADDER CLIPS) ON BWLKHEAD II WITH TORCH (AND WINCH AT ANY TANKS AND VOIDS CARPENTER
    REPRESENTS ELAPSED TIME

405. TEAR DOWN LADDER (AND WIRE ROPE) ON BULKHEAD WITH PLIER (AND WINCH) ANY TANKS AND VOIDS CARPENTER
    REPRESENTS ELAPSED TIME

406. TEAR DOWN STAGING BRACKET ON BWLKHEAD WITH WRENCH AT ANY TANKS AND VOIDS CARPENTER
    REPRESENTS ELAPSED TIME
SECTION 4
STANDARD TIME CALCULATION

4.1 TITLE SHEETS

SET-UP AND TEAR DOWN BRACKET STAGING (WING) TANKS AND VOIDS

Join

435. WELD STAGING BRACKET (CLIP) ON BWLKHEAD (OR ANY STRWCTtJRE) WITH STICK ELECTRODE AT ANY TANKS AND VOIDS (SHIP) WELDING WELD TO MEET SAFETY REQUIREMENTS. RATE PER 100 CLIPS. RATE INCLUDES MANWAL ELEMENTS.

438. WELD LADDER (CLIP) (SECWRES LADDER) ON BULKHEAD (OR ANY STRWCTtJRE) WITH STICK ELECTRODE AT ANY TANKS AND VOIDS (SHIP) WELDING WELD TO MEET SAFETY REQUIREMENTS. RATE PER 100 LADDERS (400 CLIPS). RATE INCLUDES MANWAL ELEMENTS.

440. WELD HANDRAIL (CONNECTIONS) ON STANCHION WITH STICK ELECTRODE AT ANY TANKS AND VOIDS (SHIP) WELDING WELD TO MEET SAFETY REQUIREMENTS RATE PER 100 PIECES OF AHNDRAIL (AVG. 1 CONNECTION EACH). RATE INCLUDES HANWAL ELEMENTS.

Move

404. (CLIMB WP AND KOWN) MOVE OPERATOR (ON LADDER) ON BWLKHEAD AT ANY TANKS AND voIDs CARPENTER REPRESENTS ELAPSED TIME

407. REMOVE HANDRAIL ON (MATERIAL-PILE) WITH WINCH AT ANY TANKS AND VOIDS CARPENTER REPRESENTS ELAPSED TIME

408. REMOVE STANCHION ON (MATERIAL PILE) WITH WINCH AT ANY TANKS AND VOIDE CARPENTER REPRESENTS ELAPSED TIME

409. REMOVE STAGING BRACKET ON (MATERIAL PILE) WITH WINCH AT ANY TANKS AND WOIJIS CARPENTER REPRESENTS ELAPSED TIME

410. REMOVE STAGING PLANK ON (BOARD FILE) WITH WINCH AT ANY TANKS AND VOIDS CARPENTER REPRESENTS ELAPSED TIME
STANDARD TIME CALCULATION

411. REMOVE LADDER ON (LADDER-PILE) WITH WINCH AT ANY TANKS AND VOIDS CARPENTER
REPRESENTS ELAPSED TIME

412. REMOVE TOOLBOX ON (MATERIAL PILE) WITH WINCH AT ANY TANKS AND VOIDS CARPENTER
REPRESENTS ELAPSED TIME

431. (WALK UP OR DOWN) MOVE OPERATOR (ON INCLINED STAIRS) ON BWLKHEAD AT .
TANKS AND VOIDS CARPENTER
REPRESENTS ELAPSEW TIME

563 . TRANSPORT STAGING BRACKET WITH (TOWER CRANE) AT (WING) TANKS AND VOI
CARPENTER
REPRESENTS ELAPSED TIME

564. TRANSPORT LADDER WITH (TOWER CRANE) AT (WING) TANKS AND VOIDS CARPEN
REPRESENTS ELAPSED TIME

565. TRANSPORT STAGING PLANK WITH (TOWER CRANE) AT (WING) TANKS AND VODIS
CARPENTER
REPRESENTS ELAPSED TIME

566. TRANSPORT STANCHION WITH (TOWER CRANE) AT (WING) TANKS AND VOIDS
CARPENTER
REPRESENTS ELAPSED TIME

567. TRANSPORT HANDRAIL WITH (TOWER CRANE) AT (WING) TANKS AND VODIS
CARPENTER
REPRESENTS ELAPSED TIME

Operete

132. COMBINED SUB-OP

HOOK-UP/UNHOOK AND IGNITE/EXTINGUISH TORCH FOR BURNING WITH HAND
AT TANK CARPENTER
CREDJ SIZE = 6 (3 CARPS ABOVE DECK AND 3 BELOW). RATE IN ELAPSED TIMI
ULT BY 6 TO OBTAIN TOTAL TIME.

Prepare

376. SET-UP (STAGING CLIP) ON BWLKHEAD WITH HAMMER (AND STEEL-TAPE) AT TAI
CARPENTER
STANDARD TIME CALCULATION

REPRESENTS ELAPSED TIME

377. MAKE READY STAGING BRACKET FOR (TRANSPORTING) WITH HAND AT TANK (OR WAY) CARPENTER
REPRESENTS ELAPSED TIME

383. SET-UP (ACCESS) LADDER ON BULKHEAD WITH HAND AT TANK CARPENTER
REPRESENTS ELAPSED TIME

384. POSITION (SECURE) (ACCESS) LADDER FOR BULKHEAD WITH HAMMER (AND LADDER CLIPS) AT TANK CARPENTER
REPRESENTS ELAPSED TIME

388. SET-UP STAGING PLANK ON STAGING BRACKET WITH HAND AT TANK CARPENTER
REPRESENTS ELAPSED TIME

393. SET-UP STANCHION IN STAGING BRACKET WITH HAND AT TANK CARPENTER
REPRESENTS ELAPSED TIME

394. SET-UP HANDRAIL ON STANCHION WITH HAND AT TANK CARPENTER
REPRESENTS ELAPSED TIME

397. SET-UP HANDRAIL (END PIECES) ON HANDRAIL (AND BULKHEAD) WITH HAND AT TANK CARPENTER
REPRESENTS ELAPSED TIME

399. TEAR DOWN HANDRAIL ON BULKHEAD WITH TORCH (AND WINCH) AT (WING) TANKS AND VODE CARPENTER
REPRESENTS ELAPSED TIME

401. TEAR DOWN STANCHION ON BULKHEAD WITH HAND (AND WINCH) AT (WING) TANKS AND VODE CARPENTER
REPRESENTS ELAPSED TIME

402. TEAR DOWN STAGING PLANK ON STAGING BRACKET WITH HAND (AND WINCH) AT ANY TANKS AND VODE CARPENTER
REPRESENTS ELAPSED TIME

403. TEAR DOWN LADDER (AND LADDER CLIPS) ON BULKHEAD WITH TORCH (AND WINCH) AT ANY TANKS AND VODE CARPENTER
REPRESENTS ELAPSED TIME

406. TEAR DOWN STAGING BRACKET ON BULKHEAD WITH WRENCH AT ANY TANKS AND VODE CARPENTER
REPRESENTS ELAPSED TIME

426. MAKE READY STAGING BRACKET FOR (TRANSPORTING) WITH-HAND AT ANY WAYS
STANDARD TIME CALCULATION

CARPENTER REPRESENTS ELAPSED TIME

427. MAKE READY LADDER FOR (TRANSPORTING) WITH HAND AT ANY WAYS CARPENTER REPRESENTS ELAPSED TIME

428. MAKE READY STAGING PLANK FOR (TRANSPORTING) WITH HAND AT ANY WAYS CARPENTER REPRESENTS ELAPSED TIME

429. MAKE READY STANCHION FOR (TRANSPORTING) WITH HAND AT ANY WAYS CARPENTER REPRESENTS ELAPSED TIME

430. MAKE READY HANDRAIL FOR (TRANSPORTING) WITH HAND AT ANY WAYS CARPENTER REPRESENTS ELAPSED TIME

569. SET-WP STAGING BRACKET ON WEB FRAME WITH WRENCH AT (WING) TANKS AND Voids CARPENTER REPRESENTS ELAPSED TIME

570. SET-WP (ACCESS) LADDER ON (INBOARD OR 0WT130ARIJ) BWLKHEAD WITH HAND AT (WING) TANKS AND Voids CARPENTER REPRESENTS ELAPSED TIME

571. POSITION (SECWRE) (ACCESS) LADDER ON (INBOARD OR OUTBOARD) BWLKHEAD WITH HAMMER AT (WING) TANKS AND Voids CARPENTER REPRESENTS ELAPSED TIME

573. SET-WP STAGING PLANK ON STAGING BRACKET WITH HAND AT (WING) TANKS AND Voids CARPENTER REPRESENTS ELAPSED TIME

575. SET-UP STAGING PLANK ON (EXISTING) BRACKET STAGING WITH HAND AT (WING) TANKS AND Voids CARPENTER REPRESENTS ELAPSED TIME

577. SET-WP STANCHION IN STAGING BRACKET WITH HAND AT (WING) TANKS AND Voids CARPENTER REPRESENTS ELAPSED TIME

578. SET-WP HANDRAIL IN STANCHION WITH HAND AT (WING) TANKS AND Voids CARPENTER REPRESENTS ELAPSED TIME

579. SET-WP HANDRAIL (END PIECES) ON (HANDRAIL AND) BWLKHEAD WITH HAND AT (WING) TANKS AND Voids CARPENTER REPRESENTS ELAPSED-TIME
STANDARD TIME CALCULATION

568. SET-UP (STAGING CLIP) ON WEB FRAME WITH HADHER (AND STEEL-TAPE) AT (WING) TANKS AND VOIDS CARPENTER REPRESENTS ELAPSED TIME
SECTION 4
STANDARD TIME CALCULATION

4.1 TITLE SHEETS

SET UP AND TEAR DOWN TANK STAGING PLATFORM AT ANY SHIPYARD C

Titlesheet Organization List

Assemble/Disassemble

545. ASSEMBLE I-BEAMS FOR TANK STAGING PLATFORM WITH WRENCH AT ANY PLATEN CARPENTER
REPRESENTS ELAPSED TIME

546. ASSEMBLE ANGLE-EARS FOR TANK STAGING PLATFORM WITH WRENCH AT ANY PLATEN CARPENTER
REPRESENTS ELAPSED TIME

Examine

539. READ MATERIAL LIST (PRINT) FOR TANK STAGING PLATFORM WITH (EYES) AT ANY PLATEN CARPENTER
REPRESENTS ELAPSED TIME

540. MEASURE (PLATEN) FOR TANK STAGING PLATFORM WITH (STEEL) TAPE AT ANY PLATEN CARPENTER
REPRESENTS ELAPSED TIME

541. MARK (PLATEN) FOR TANK STAGING PLATFORM WITH MARKER AT ANY PLATEN CARPENTER
REPRESENTS ELAPSED TIME

Move

542. TRANSPORT PALLET (I-BEAMS AND ANGLES) FOR TANK STAGING PLATFORM WITH (CRANE) AT ANY PLATEN CARPENTER
REPRESENTS ELAPSED TIME

547. TRANSPORT STAGING PLANKS FOR TANK STAGING PLATFORM WITH (CRANE) AT ANY PLATEN CARPENTER
REPRESENTS ELAPSED TIME

549. TRANSPORT (FINISHED) TANK STAGING PLATFORM WITH (CRANE) AT ANY PLATEN CARPENTER
REPRESENTS ELAPSED TIME
STANDARD TIME CALCULATION

555. POSITION (RAISE) TANK STAGING PLATFORM WITH (CRANE) AT MID TANKS AND VOIDS CARPENTER
REPRESENTS ELAPSED TIME

556. POSITION (LOWER) TANK STAGING PLATFORM WITH (CRANE) AT MID TANKS AND VOIDS CARPENTER
REPRESENTS ELAPSED TIME

557. POSITION (PLACE) TANK STAGING PLATFORM (AND BOARDS) IN (TYPICAL TANK)
WITH (CRANE) AT ANY SHIP CARPENTER
REPRESENTS ELAPSED TIME

Operate

9. HOOK-WP AND WNHook TORCH ON MANIFOLD WITH WRENCH AT SHIP
10. IGNITE AND EXTINGWISH TORCH FOR BURNING WITH HAND AT TANK

Prepare

543. SET-WP I-BEAMS FOR TANK STAGING PLATFORM WITH (CRANE) AT ANY PLATEN
CARPENTER
REPRESENTS ELAPSED TIME

544. SET-WP ANGLE-BARS FOR TANK STAGING PLATFORM WITH (CRANE) AT ANY PLATEN
CARPENTER
REPRESENTS ELAPSED TIME

548. SET-WP STAGING PLANKS ON TANK STAGING PLATFORM WITH HANDS AT ANY PLATEN
CARPENTER
REPRESENTS ELAPSED TIME

550. TEAR DOWN ANGLES ON TANK STAGING PLATFORM WITH WRENCH AT MID TANKS AND
VOIDS CARPENTER
REPRESENTS ELAPSED TIME

551. TEAR DOWN I-BEAMS ON TANK STAGING PLATFORM WITH WRENCH AT MID TANKS AND
VOIDS CARPENTER
REPRESENTS ELAPSED TIME

552. TEAR DOWN STAGING PLANKS ON TANK STAGING PLATFORM WITH WINCH AT MID
TANKS AND VOIDS CARPENTER
REPRESENTS ELAPSED TIME
553. TEAR DOWN ANGLES ON TANK STAGING PLATFORM WITH WINCH AT MID TANKS AND VOIDS CARPENTER
REPRESENTS ELAPSED TIME

554. TEAR DOWN I-BEAMS FOR TANK STAGING PLATFORM TDTH WINCH AT KID TANKS AI VOIDS CARPENTER
REPRESENTS ELAPSED TIME

559. SET-WP STAGING PLANKS FOR TANK STAGING PLATFORM WITH HAMMER AT MID TANKS AND VOIDS CARPENTER
REPRESENTS ELAPSED TIME

560. TEAR DOWN HANWRAIL (AND STANCHION) ON (LONGITWDINAL) BWLKHEAD WIT TORCH AT MID TANKS AND VOIDS CARPENTER
REPRESENTS ELAPSED TIME

561. SET-WP STAGING BRACKETS FOR (BETWEEN) TANK STAGING PLATFORM WITH WRENCH AT MID TANKS AND VOIDS CARPENTER
REPRESENTS ELAPSED TIME

562. SET-UP STAGING PLANKS FOR (BETWEEN) TANK STAGING PLATFORMS WITH HAMMER AT MID TANKS AND VOIDS CARPENTER
REPRESENTS ELAPSED TIME

582. TEAR DOWN STAGING PLANK FOR TANK STAGING PLATFORM WITH (PRYBAR) AND HAND AT MID TANKS AND VOIDS CARPENTER
REPRESENTS ELAPSED TIME

583. TEAR DOWN STAGING PLANK FOR (BETWEEN) TANK STAGING PLATFORM WITH (PRYBAR) AND HAND AT MID TANKS AND VOIDS CARPENTER
REPRESENTS ELAPSED TIME

584. TEAR DOWN STAGING BRACKETS ON TANK STAGING PLATFORM WITH WRENCH AT MID TANKS AND VOIDS CARPENTER
REPRESENTS ELAPSED TIME

Surface Treat

538. (BRWSH) CLEAN (PLATEN) FOR TANK STAGING PLATFORM WITH BROOM AT ANY PLATEN CARPENTER
REPRESENTS ELAPSED TIME
4.1 TITLE SHEETS

SET-UP AND TEAR DOWN PIPE STAGING AT SIDE SHELL AND/OR PLATE

Titlesheet Organization List

Join

446. WELD HANDRAIL (CONNECTIONS) ON STANCHION WITH STICK ELECTRODE AT ANY PLATEN (SHOP) WELDING WELD TO MEET SAFETY REQUIREMENTS. RATE PER 100 PIECES OF HANDRAIL (AVG. 1 CONNECTION EACH). RATE INCLUDES HANDRAIL ELEMENTS.

Move

454. (CLIMB WP AND DOWN) MOVE OPERATOR (ON PIPE STAGING) FOR SIDE SHELL AT ANY WAYS CARPENTER REPRESENTS ELAPSED TIME

456. TRANSPORT STAGING PLANK FOR PIPE STAGING (AT SIDE SHELL) WITH (TOWER CRANE) AT ANY WAYS CARPENTER REPRESENTS ELAPSED TIME”

459. TRANSPORT STANCHION FOR PIPE STAGING (AT SIDE SHELL) WITH (TOWER CRANE) AT ANY WAYS CARPENTER REPRESENTS ELAPSED TIME.

461. TRANSPORT HANDRAIL FOR PIPE STAGING (AT SIDE SHELL) WITH (TOWER CRANE) AT ANY WAYS CARPENTER REPRESENTS ELAPSED TIME.

463. TRANSPORT STAGING PLANK FOR SIDE SHELL (BTWN 2 PIPE STAGING SECTIONS) WITH (TOWER CRANE) AT ANY WAYS CARPENTER REPRESENTS ELAPSED TIME

465. TRANSPORT HANDRAIL FOR SIDE SHELL (BTWN 2 PIPE STAGING SECTIONS) WITH (TOWER CRANE) AT ANY WAYS CARPENTER REPRESENTS ELAPSED TIME

476. REMOVE HANDRAIL ON (MATERIAL PILE) WITH (TOWER CRANE) AT ANY WAYS CARPENTER REPRESENTS ELAPSED TIME

477. REMOVE STANCHION ON (MATERIAL PILE) WITH (TOWER CRANE) AT ANY WAYS CARPENTER REPRESENTS ELAPSED TIME
STANDARD TIME CALCULATION

CARPENTER
REPRESENTS ELAPSED TIME

478. REMOVE STAGING PLANK ON PIPE STAGING (AT SDIE SHELL) WITH (TOWER, CRANE) AT ANY WAYS CARPENTER
REPRESENTS ELAPSED TIME

479. REMOVE BRACE ON (MATERIAL PILE) WITH (TOWER CRANE) AT ANY WAYS CARPENTER
REPRESENTS ELAPSED TIME

480. REMOVE END RAIL (END PIECE) ON (MATERIAL FILE) WITH (TOWER CRANE) AT ANY WAYS CARPENTER
REPRESENTS ELAPSED TIME

486. TRANSPORT END RAIL (END PIECE) ON (END-PIECE RACK) WITH (TOWER CRANE) AT ANY WAYS CARPENTER
REPRESENTS ELAPSED TIME

Operate --------

132, COMEDNED SUB-OP

HOCIK-WF/WHOOK AND IGNITE/EXTINGUISH TORCH FOR BURNING WITH HAND AT TANK CARPENTER
CREW SIZE = 6 (3 CARPS ABOVE DECK AND 3 BELOW) C RATE IN ELAPSED TIME
WLT BY 6 TO OBTAIN TOTAL TIME,

Prepare --------

455. MAKE READY STAGING PLANK FOR (TRANSPORTING) WITH HAND AT ANY WAYS CARPENTER
REPRESENTS ELAPSED TIME

457. SET WP STAGING PLANK ON PIPE STAGING (AT SDIE SHELL) WITH HAND AT ANY WAYS CARPENTER
REPRESENTS ELAPSED TIME.

458. MAKE READY STANCHION FOR (TRANSPORTING) WITH HAND AT ANY WAYS CARPENTER
REPRESENTS ELAPSED TIME

460. SET WF STANCHION ON PIPE STAGING (AT SDIE SHELL) WITH WRENCH AT ANY WAYS CARPENTER
REPRESENTS ELAPSED TIME,
STANDARD TIME CALCULATION

462. SET UP HANDRAIL ON PIPE STAGING (AT SIDE SHELL) WITH HAND AT ANY WAYS CARPENTER
REPRESENTS ELAPSED TIME

464. SET UP STAGING PLANK FOR SIDE SHELL (BTWN 2 PIPE STAGING SECTIONS) WITH HAND
AT ANY WAYS CARPENTER
REPRESENTS ELAPSED TIME

466. SET UP HANDRAIL FOR SIDE SHELL (BTWN 2 PIPE STAGING SECTIONS) WITH HAND
AT ANY WAYS CARPENTER
REPRESENTS ELAPSED TIME

469. TEAR DOWN HANDRAIL FOR SIDE SHELL (BTWN 2 PIPE STAGING SECTIONS) WITH TORCH
AT ANY WAYS CARPENTERS
REPRESENTS ELAPSED TIME

470. TEAR DOWN HANDRAIL FOR PIPE STAGING (AT SIDE SHELL) WITH HAND AT ANY
WAYS CARPENTER
REPRESENTS ELAPSED TIME

471. TEAR DOWN STANCHION ON PIPE STAGING (AT SIDE SHELL) WITH WRENCH AT ANY
WAYS CARPENTER
REPRESENTS ELAPSED TIME

472. TEAR DOWN STAGING PLANK FOR SIDE SHELL (BTWN 2 PIPE STAGING SECTIONS)
WITH HAND AT ANY WAYS CARPENTER
REPRESENTS ELAPSED TIME

473. TEAR DOWN STAGING PLANK ON PIPE STAGING (AT SIDE SHELL) WITH HAND AT ANY
WAYS CARPENTER
REPRESENTS ELAPSED TIME

474. TEAR DOWN PIPE STAGING (END PCS AND BRACES) FOR SIDE SHELL WITH WRENCH
AT ANY WAYS CARPENTER
REPRESENTS ELAPSED TIME

475. TEAR DOWN PIPE STAGING (END PCS AND BRACES) FOR SIDE SHELL WITH HAND AT ANY
WAYS CARPENTER
REPRESENTS ELAPSED TIME

487. MAKE READY END RAIL (END PIECE) FOR (TRANSPORTING) AT ANY WAYS CARPENTER
REPRESENTS ELAPSED TIME

480. SET-UP PIPE STAGING (END PCS AND BRACES) FOR SIDE SHELL WITH HAND AT ANY
WAYS CARPENTER
REPRESENTS ELAPSED TIME.
STANDARD TIME CALCULATION

489. SET-UP PIPE STAGING (END PCS AND BRACES) FOR SDJE SHELL WITH WRENCH ANY WAYS CARPENTER REPRESENTS ELAPSED TIME

490. SET UP PIPE STAGING (END-PCS & BRACES) FOR (8’ LONG) SECTION WITH HAND AT ANY PLATEN CARPENTER REPRESENTS ELAPSED TIME

491. SET UP (PIPE STAGING) ASSEMBLY FOR PIPE STAGING (1ST LEVEL) WITH (TO CRANE) AT ANY PLATEN CARPENTER REPRESENTS ELAPSED TIME

492. SET UP (PIPE STAGING) ASSEMBLY FOR PIPE STAGING (ADDL LEVELS) WITH (TOWER CRANE) AT ANY PLATEN CARPENTER REPRESENTS ELAPSED TIME

496. TEAR DOWN (PIPE STAGING) ASSEMBLY FOR PIPE STAGING (ADDL- LEVELS) WITH WRENCH (AND TOWER CRANE) AT ANY PLATEN CARPENTER REPRESENTS ELAPSED TIME

497. TEAR DOWN (PIPE STAGING) ASSEMBLY FOR PIPE STAGING (FIRST LEVEL) WITH (TOWER CRANE) AT ANY PLATEN CARPENTER REPRESENTS ELAPSED TIME

498. TEAR DOWN PIPE STAGING (END PCS 2 BRACES) FOR (8’ LONG) SECTION WITH HAND AT ANY PLATEN CARPENTER REPRESENTS ELAPSED TIME

510. MAKE READY HANDRAIL FOR (TRANSPORTING) WITH HAND AT ANY WAYS CARPENTER REPRESENTS ELAPSED TIME
4.1 TIME SHEETS

SET-UP AND TEAR DOWN BRACKET STAGING (EXTERIOR) SHELL CARPEN

Join

435. WELD STAGING BRACKET (CLIP) ON BULKHEAD (OR ANY STRUCTURE) WITH STICK ELECTRODE AT ANY TANKS AND Voids (SHIP) WELDING
WELD TO MEET SAFETY REQUIREMENTS. RATE PER 100 CLIPS. RATE INCLUDES MANUAL ELEMENTS.

438. WELD LADDER (CLIP) (SECURES LADDER) ON BULKHEAD (OR ANY STRUCTURE) WITH STICK ELECTRODE AT ANY TANKS AND Voids (SHIP) WELDING
WELD TO MEET SAFETY REQUIREMENTS, RATE PER 100 LADDERS (400 CLIPS) RATE INCLUDES MANUAL ELEMENTS.

440. WELD HANDRAIL (CONNECTIONS) ON STANCHION WITH STICK ELECTRODE AT ANY TANKS AND Voids (SHIP) WELDING
WELD TO MEET SAFETY REQUIREMENTS, RATE PER 100 PIECES OF AHNDRAIL (AVG, 1 CONNECTION EACH), RATE INCLUDES MANUAL ELEMENTS

Move

516. TRANSPORT AERIAL PLATFORM FOR SIDE SHELL (STAGING) WITH (CRANE) AT ANY WAY CARPENTER
REPRESENTS ELAPSED TIME

521. (CLIMB UP AND DOWN) MOVE OPERATOR (ON LADDER) ON SIDE SHELL AT ANY WAY CARPENTER
REPRESENTS ELAPSED TIME

529. TRANSPORT AERIAL PLATFORM FOR SIDE SHELL (STAGING) WITH CRANE AT ANY WAY CARPENTER
REPRESENTS ELAPSED TIME

580. LOAD (STAGING MATERIAL) ON AERIAL PLATFORM WITH (CRANE) AT ANY PLATEN CARPENTER
REPRESENTS ELAPSED TIME

581. UNLOAD (STAGING MATERIAL) ON AERIAL PLATFORM WITH (CRANE) AT ANY PLATEN CARPENTER
REPRESENTS ELAPSED TIME
STANDARD TIME CALCULATION

Operate

132. COMBINED SUB-OP

HOOK-UP/UNHOOK AND IGNITE/EXTINGUISH TORCH FOR BURNING WITH HAND AT TANK CARPENTER
Crew size = 6 (3 Carps above deck and 3 below) rate in elapsed time
mult by 6 to obtain total time.

Prepare

517. SET-UP (STAGING CLIP) ON SIDE SHELL WITH HAMMER AT ANY WAY CARPENTER
REPRESENTS ELAPSED TIME

518. SET-UP STAGING BRACKET ON SIDE SHELL WITH WRENCH AT ANY WAY CARPENTER
REPRESENTS ELAPSED TIME

519. SET-UP STAGING PLANK FOR SIDE SHELL WITH HAND AT ANY WAY CARPENTER
REPRESENTS ELAPSED TIME

520. SET-UP (ACCESS) LADDER ON SIDE SHELL WITH HAND AT ANY WAY CARPENTER
REPRESENTS ELAPSED TIME

522. SET-UP STANCHION FOR SIDE SHELL WITH HAND AT ANY WAY CARPENTER
REPRESENTS ELAPSED TIME

523. SET-UP HANDRAIL FOR SIDE SHELL WITH HAND AT ANY WAY CARPENTER
REPRESENTS ELAPSED TIME

524. TEAR DOWN HANDRAIL ON SIDE SHELL WITH TORCH AT ANY WAY CARPENTER
REPRESENTS ELAPSED TIME

525. TEAR DOWN STANCHION FOR SIDE SHELL WITH HAND AT ANY WAY CARPENTER
REPRESENTS ELAPSED TIME

526. TEAR DOWN STAGING PLANK FOR SIDE SHELL WITH HAND AT ANY WAY CARPENTER
REPRESENTS ELAPSED TIME

527. TEAR DOWN (ACCESS) LADDR ON SIDE SHELL WITH TORCH AT ANY WAY CARPENTER
REPRESENTS ELAPSED TIME

528. TEAR DOWN STAGING BRACKET ON SIDE SHELL WITH WRENCH AT ANY WAY CARPENTER
REPRESENTS ELAPSED TIME

530. TEAR DOWN (STAGING CLIP) ON SIDE SHELL WITH TORCH AT ANY WAY CARPENTER
REPRESENTS ELAPSED TIME
4.2 HOW TO CALCULATE TIME STANDARDS

M O S T OPERATION TIME CALCULATION

DETAIL/UNIT/PART x _______ ________ REV. LTR/DATE x ________________

PROCESS/OPER CODE SET UP x _______ ________ STANDARD CODE x ________________

PART NAME 2 BOARD BRACKET STAGING ________________

SHIP CLASS x ____________ HULL x ________________

COST CLASS/JOB 131 ____________ TRADE CARPENTER ________________

GROUP (UNIT/ZONE) x ____________ WORK AREA x ________________

SUB-GROUP x ____________ WORK ZONE x ________________

SUB-SUB-GROUP x ____________ WORK CENTER x ________________

CREW/MACHINE 3 CARPENTERS ASSET/MACHINE x ________________

ITEM 131-3 ____________ SUB-ITEM 131-3-1 ________________

GEN. DRAWING 131 ____________ WORK ORDER x ________________

DET, DRAWING x _______ _______ SHEET 1 ________________

WORK PACKAGE x ____________ APPLICATOR PA ________________

OPER. DESCRIPTION SET UP BRACKET STAGING-ON A SMOOTH BULKHEAD ________________

PER 100 LINEAR FEET ________________

DATE 08-JUN-83 ISSUE # 1 ________________

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<td>SET-UP (STAGING CLIP) ON BULKHEAD WITH HAMMER (( 376)</td>
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* REPRESENTS PUTTING UP A STAGING CLIP ON
* THE BULKHEAD
* WELDING OF THE CLIP WILL BE MINE IN A...
* SEPARATE SUB OPERATION
STANDARD TIME CALCULATION

2 WELD STAGING BRACKET (CLIP) ON BULKHEAD (OR ANY STRUCTURE) WITH

3 MAKE READY STAGING BRACKET FOR (TRANSPORTING) WITH HAND

* REPRESENTS GETTING BRACKET READY TO BE...
* ...TRANSPORTED TO TANK OR BULKHEAD
* CARPENTER IS LOCATED EITHER ON THE WAY...
* ...OR IN TANK AT THE MATERIAL (BIN-1)

4 TRANSPORT STAGING BRACKET WITH (GROVE CRANE) ( 378 ) 6

* REPRESENTS TRANSPORTING BRACKETS FROM...
* ...BIN-1 TO BULKHEAD
* DISTANCES FROM CRANE-REST TO BIN-1 AND...
* ...FROM BIN-1 TO BULKHEAD ARE AVERAGE...
* ...DISTANCES IN A CENTER TANK 98’X 50’
* MAXIMUM NUMBER OF BRKTS IN LIFT = 6

5 SET-UP STAGING BRACKETS ON BULKHEAD WITH WRENCH ( 379 ) 3

* REPRESENTS PUTTING UP A BRACKET ON AN...
* ...EXISTING STAGING CLIP

6 MAKE READY STAGING PLANK FOR (TRANSPORTING) WITH HAND ( 386 ) 10

* REPRESENTS GETTING BOARD ON BOLSTERS SO...
* ...THAT THE CRANE CAN TRANSPORT IT

7 TRANSPORT STAGING PLANK WITH (GROVE CRANE) ( 387 ) 10

* REPRESENTS TRANSPORTING BOARDS FROM.....
* ......LU-PILE TO BULKHEAD
* DISTANCES FROM CRANE-REST TO LU-PILE AND
* ...FROM LU-PILE TO BULKHEAD ARE AVERAGE
* ...DISTANCES IN A CENTER TANK 98’X 50’
* MAXIMUM NUMBER OF BOARDS IN LIFT = 3

8 SET-UP STAGING PLANK ON STAGING BRACKET WITH HAND ( 388 ) 5

* REPRESENTS SETTING UP BOARDS BETWEEN...
* ......BRACKETS.
* TWO MAN OPERATION:
* CARPENTERS ARE LOCATED AT TWO DIFFERENT
* ......BRACKETS. THEY BOTH LIFT THE BOARD....
* ......TOGETHER AND SLIDE IT INTO POSITION.
* IN THIS ANALYSIS CARPENTERS ARE LOCATED
* ......ON THE LEVEL BELOW THE BOARDS.

9 MAKE READY STANCHION FOR (TRANSPORTING) WITH HAND ( 391 ) 6

* REPRESENTS GETTING STANCHION READY TO BE
STANDARD TIME CALCULATION

* ...TRANSFORTED.
10 TRANSPORT STANCHION WITH (GROVE CRANE) ( 392) -
* REPRESENTS TRANSPORTING STANCHION FROM...
* ...BIN-2 TO BULKHEAD
* DISTANCES FROM CRANE-REST TO BIN-2 AND...
* ...FROM BIN-2 TO BULKHEAD ARE AVERAGE...
* ...DISTANCES IN A CENTER TANK 98’X 50’
* MAXIMUM NUMBER OF STANCHIONS IN LIFT = 6
11 SET-UP STANCHION IN STAGING BRACKET WITH HAND ( 393) 3
* REPRESENTS PUTTING STANCHION IN THE....
* ...BRACKET SLEEVE,
12 MAKE READY HANDRAIL FOR (TRANSPORTING) WITH HAN( 394) 12
D
* REPRESENTS GETTING HANDRAIL ON BOLSTERS
* ...SO THAT THE CRANE CAN TRANSPORT IT
13 TRANSPORT HANDRAIL WITH (GROVE CRANE) ( 395) 12
* REPRESENTS TRANSPORTING HANDRAIL FROM...
* ...HR-PILE TO BDLKHEAD
* DISTANCES FROM CRANE-REST TO HR-PILE AND
* ...FROM HR-PILE TO BULKHEAD ARE AVERAGE
* ...DISTANCES IN A CENTER TANK 98’X50’
* MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6
14 SET-UP HANDRAIL ON STANCHION WITH HAND ( 396) 12
* REPRESENTS PUTTING HANDRAIL INTO THE...
* ...EYELETS ON THE STANCHION
* INCLUDES ACTION DISTANCES NEEDED FOR...
* ...ALIGNING THE HANDRAIL
* WELDING OF THE HANDRAIL CONNECTIONS WILL
* ...BE DONE IN A SEPARATE SDB OPERATION
15 SET-UP HANDRAIL (END PIECES) ON HANDRAIL (AND B( 397)
BULKHEAD) WITH HAND
* REPRESENTS PUTTING HANDRAIL (END PIECES)
* ...AT THE END OF A STAGING LEVEL
* WELDING OF THE HANDRAIL (END PIECES)+OO+
* ...CONNECTIONS WILL BE DONE IN A.....
* ...SEPARATE SUB OPERATION
16 WELD HANDRAIL (CONNECTIONS) ON STANCHION WITH S( 440) 1 2
TICK ELECTRODE
17 MAKE READY LADDER FOR (TRANSPORTING) WITH HAND ( 380) 2
* REPRESENTS GETTING LADDER ON BOLSTERS SO
* ...THAT THE CRANE CAN TRANSPORT IT.
18 TRANSPORT LADDERS WITH (GROVE CRANE) ( 381) 2
* REPRESENTS TRANSPORTING LADDERS FROM....+
* ...LRD-PILE TO BULKHEAD

PAGE 192
STANDARD TIME CALCULATION

* DISTANCES FROM CRANE-REST TO LDR-PILE...
* ...AND FROM LDR-PILE TO BULKHEAD ARE....
* ....AVERAGE DISTANCES IN A CENTER TANK...
* ...98’X 50’
* MAXIMUM NUMBER OF LADDERS IN LIFT = 3

19 SET-UP (ACCESS) LADDER ON BULKHEAD WITH HAND  (383)  2
* REPRESENTS PUTTING UP AN ACCESS LADDER..
* ...ON THE BULKHEAD SO THAT THE CARPENTER
* ...CAN CLimb TO THE NEXT LADDER,
* ALSO INCLUDES CLIMBING UP AND DOWN THE..
* ...LADDER.
* AVERAGE NUMBER OF RUNGS = 12

20 POSITION (SECURE) (ACCESS) LADDER FOR BULKHEAD  (384)  2
WITH

* REPRESENTS SECURING A LADDER TO THE.....
* ...BULKHEAD USING 4 LADDER CLIPS
* WELDING OF CLIPS WILL BE DONE IN A....
* ...SEPARATE SUB OPERATION

21 WELD LADDER (CLIP) (SECURES LADDER) ON BULKHEAD(438)  .02
(OR ANY STRUCTURE)
### STANDARD TIME CALCULATION

#### HOST OPERATION TIME CALCULATION

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**MANUAL TIME (TMU)**

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**ACTUAL PROCESS TIME (TMU)**

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**FACTORED PROCESS TIME (TMU)**

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**TOTAL INTERNAL TIME (TMU)**

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**TITLE SHEET USED IN SETTING STANDARD:**

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Engineered Operation Time Calculation

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# STANDARD TIME CALCULATION

## M O S T OPERATION TIME CALCULATION

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**Step** | **Method Instruction** | **Freq**
---|------------------------|-----
1 | **SET-UP (STAGING CLIP) ON BULKHEAD WITH HAMMER (X 376) AND STEEL-TAPE** | 3

* REPRESENTS PUTTING UP A STAGING CLIP ON
* ...THE BULKHEAD
* WELDING OF THE CLIP WILL BE DONE IN A...
* ...SEPARATE SUB OPERATION

2 | **WELD STAGING BRACKET (CLIP) ON BULKHEAD (OR ANY( 435) STRUCTURE) WITH** | .06

---

Page 196
STANDARD TIME CALCULATION

3 MAKE READY STAGING BRACKET FOR (TRANSPORTING) WITH HAND

* REPRESENTS GETTING BRACKET READY TO BE...
* ...TRANSPORTED TO TANK OR BULKHEAD
* CARPENTER IS LOCATED EITHER ON THE WAY...
* ...OR IN TANK AT THE MATERIAL (BIN-1)

4 TRANSPORT STAGING BRACKET WITH (GROVE CRANE) (378)

* REPRESENTS TRANSPORTING BRACKETS FROM....
* ...BIN-1 TO BULKHEAD
* DISTANCES FROM CRANE-REST TO BIN-1 AND...
* ...FROM BIN-1 TO BULKHEAD ARE AVERAGE...
* ...DISTANCES IN A CENTER TANK 98’50’
* MAHIMUH NUMBER OF BRKTS IN LIFT = 6

5 SET-UP STAGING BRACKETS ON BULKHEAD WITH WRENCH (379)

* REPRESENTS PUTTING UP A BRACKET ON AN...
* ,+,E*ISTING STAGING CLIP

6 MAKE READY STAGING PLANK FOR (TRANSPORTING) WITH HAND

* REPRESENTS GETTING BOARD ON BOLSTERS SO...
* ...THAT THE CRANE CAN TRANSPORT IT

7 TRANSPORT STAGING PLANK WITH (GROVE CRANE) (387)

* REPRESENTS TRANSPORTING BOARDS FROM...
* ...LU-PILE TO BULKHEAD
* DISTANCES FROM CRANE-REST TO LU-PILE AND...
* ...FROM LU-PILE TO BULKHEAD ARE AVERAGE
* ...DISTANCES IN A CENTER TANK 98’50’
* MAHIMUH NUMBER OF BOARDS IN LIFT = 3

8 SET-UP STAGING PLANK ON STAGING BRACKET WITH HAND

* REPRESENTS SETTING UP BOARDS BETWEEN......
* ...BRACKETS.
* TWO MAN OPERATION:
* CARPENTERS ARE LOCATED AT TWO DIFFERENT
* ...BRACKETS. THEY BOTH PICK-UP THE BOARD
* ...TOGETHER AND SLIDE IT INTO POSITION.
* IN THIS ANALYSIS CARPENTERS ARE LOCATED
* ...ON THE SAME LEVEL AS THE BOARDS.

9 MAKE REALLY STANCHION FOR (TRANSPORTING) WITH HAND

* REPRESENTS GETTING STANCHION READY TO BE...
* ...TRANSPORTED,

10 TRANSPORT STANCHION WITH (GROVE CRANE) (392)

PAGE 197
STANDARD TIME CALCULATION

* REPRESENTS TRANSPORTING STANCHION FROM.. 
* ...BIN-2 TO BULKHEAD 
* DISTANCES FROM CRANE-REST TO BIN-2 AND.. 
* ...FROM BIN-2 TO BULKHEAD ARE AVERAGE... 
* ...DISTANCES IN A CENTER TANK 98’X 50’ 
* MAXIMUM NUMBER OF STANCHIONS IN LIFT = 6 

11 SET-UP STANCHION IN STAGING BRACKET WITH HAND  (393)  3 
* REPRESENTS PUTTING STANCHION IN THE.... 
* ....BRACKET SLEEVE. 

12 MAKE READY HANDRAIL FOR (TRANSPORTING) WITH HAND  (394)  12 

D 

* REPRESENTS GETTING HANDRAIL ON BOLSTERS 
* ...SO THAT THE CRANE CAN TRANSPORT IT 

13 TRANSPORT HANDRAIL WITH (GROVE CRANE)  (395)  12 
* REPRESENTS TRANSPORTING HANDRAIL FROM... 
* ...HR-PILE TO BULKHEAD 
* DISTANCES FROM CRANE-REST TO HR-PILE AND 
* ...FROM HR-PILE TO BULKHEAD ARE AVERAGE 
* ...DISTANCES IN A CENTER TANK 98’X50’ 
* MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6 . 

14 SET-UP HANDRAIL ON STANCHION WITH HAND  (396)  12 
* REPRESENTS PUTTING HANDRAIL INTO THE.... 
* ...EYELETS ON THE STANCHION 
* INCLUDES ACTION DISTANCES NEEDED FOR.... 
* ...ALIGNING THE HANDRAIL 
* WELDING OF THE HANDRAIL CONNECTIONS WILL 
* ...BE DONE IN A SEPARATE SUB OPERATION 

15 SET-UP HANDRAIL (END PIECES) ON HANDRAIL (AND E( 397)  2 
ULKHEAD) WITH HAND 

* REPRESENTS PUTTING HANDRAIL (END PIECES) 
* ...AT THE END OF A STAGING LEVEL 
* WELDING OF THE HANDRAIL (END PIECES) . . . . 
* ...CONNECTIONS WILL BE DONE IN A........ 
* ...SEPARATE SUB OPERATION 

16 WELD HANDRAIL (CONNECTIONS) ON STANCHION WITH S( 440 )  12 
TICK ELECTRODE 

17 MAKE READY LADDER FOR (TRANSPORTING) WITH HAND  (380)  2 
* REPRESENTS GETTING LADDER ON BOLSTERS SO 
* ...THAT THE CRANE CAN TRANSPORT IT. 

18 TRANSPORT LADDERS WITH (GROVE CRANE)  (381)  2 
* REPRESENTS TRANSPORTING LADDERS FROM.... 
* ...LDR-PILE TO BULKHEAD 
* DISTANCES FROM CRANE-REST TO LDR-PILEa.. 
* ..*AND FROM LDR-PILE TO BULKHEAD AREe..o
STANDARD TIME CALCULATION

* ...AVERAGE DISTANCES IN A CENTER TANK...
* ...98’*50’
* MAXIMUM NUMBER OF LADDERS IN LIFT = 3
19 SET-UP (ACCESS) LADDER ON BULKHEAD WITH HAND (383)
* REPRESENTS PUTTING UP AN ACCESS LADDER...
* ...ON THE BULKHEAD SO THAT THE CARPENTER
* ...CAN CLIMB TO THE NEXT LADDER.
* ALSO INCLUDES CLIMBING UP AND DOWN THE...
* ...LADDER E
* AVERAGE NUMBER OF RUNGS = 12
20 POSITION (SECURE) (ACCESS) LADDER FOR BULKHEAD (384)
WITH
* REPRESENTS SECURING A LADDER TO THE***...
* ...BULKHEAD USING 4 LADDER CLIPS
* WELDING OF CLIPS WILL BE DONE IN A......
* ...SEPARATE SUB OPERATION
21 WELD LADDER (CLIP) (SECURES LADDER) ON BULKHEAD (438)
(OR ANY STRUCTURE)

PAGE 199
### Standard Time Calculation

#### Host Operation Time Calculation

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**Factored Process Time (TMU)**

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**Total Internal Time (TMU)**

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**Title Sheet Used in Setting Standard:**

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## STANDARD TIME CALCULATION

### HOST OPERATION TIME CALCULATION

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STANDARD TIME CALCULATION

M O S T OPERATION TIME CALCULATION

DETAIL/UNIT/PART X

PROCESS/OPER CODE SET UP

PART NAME 2 BOARD BRACKET STAGING

SHIP CLASS X

COST CLASS/HOBD # 131

GROUP (UNIT/ZONE) X

SUB-GROUP X

SUB-SUB-GROUP X

CREW/MACHINE 3 CARPENTERS

ITEM 131-3

GEN. DRAWING 131

DET. DRAWING X

WORK PACKAGE X

ITEM 131-3-1

SUB-ITEM 131-3-1

WORK ORDER X

SHEET 1

APPLICATOR PP

OPER. DESCRIPTION SET UP OF BRACKET STAGING AT THE FLOOR LEVEL OF A TRANSVERSE BULKHEAD PER 100 LINEAR FEET

DATE 08-JUN-83

ISSUE # 1

---

Step Method Instruction Freq

1 SET-UP (STAGING CLIP) ON BULKHEAD WITH HAMMER (( 376) 3

AND STEEL-TAPE)

* REPRESENTS PUTTING UP A STAGING CLIP ON
* ...THE BULKHEAD
* WELDING OF THE CLIP WILL BE DONE IN A...
* ...SEPARATE SUB OPERATION

2 WELD STAGING BRACKET (CLIP) ON BULKHEAD (OR ANY ( 435) .06

STRUCTURE) WITH

---

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STANDARD TIME CALCULATION

3 MAKE READY STAGING BRACKET FOR (TRANSPORTING) WITH HAND
   * REPRESENTS GETTING BRACKET READY TO BE...
   * ...TRANSPORTED TO TANK OR BULKHEAD
   * CARPENTER IS LOCATED EITHER ON THE WAY...
   * ...OR IN TANK AT THE MATERIAL (BIN-1)

4 TRANSPORT STAGING BRACKET WITH (GROVE CRANE) ( 378 )
   * REPRESENTS TRANSPORTING BRACKETS FROM BIN-1 TO BULKHEAD
   * DISTANCES FROM CRANE-REST TO BIN-1 AND...
   * ...FROM BIN-1 TO BULKHEAD ARE AVERAGE...
   * DISTANCES IN A CENTER TANK 98’X 50’
   * MAXIMUM NUMBER OF BRKTS IN LIFT = 6

5 SET-UP STAGING BRACKETS ON BULKHEAD WITH WRENCH ( 379 )
   * REPRESENTS PUTTING UP A BRACKET ON AN...
   * ...EXISTING STAGING CLIP

6 MAKE READY STAGING PLANK FOR (TRANSPORTING) WITH HAND
   * REPRESENTS GETTING BOARD ON BOLSTERS SO THAT THE CRANE CAN TRANSPORT IT

7 TRANSPORT STAGING PLANK WITH (GROVE CRANE) ( 387 )
   * REPRESENTS TRANSPORTING BOARDS FROM LU-PILE TO BULKHEAD
   * DISTANCES FROM CRANE-REST TO LU-PILE AND...
   * ...FROM LU-PILE TO BULKHEAD ARE AVERAGE
   * DISTANCES IN A CENTER TANK 98’X 50’
   * MAXIMUM NUMBER OF BOARDS IN LIFT = 3

8 SET-UP STAGING PLANK ON STAGING BRACKET WITH HAND
   * REPRESENTS SETTING UP BOARDS BETWEEN...
   * ...BRACKETS
   * TWO MAN OPERATION:
   * CARPENTERS ARE LOCATED AT TWO DIFFERENT
   * ...BRACKETS. THEY BOTH LIFT THE BOARD ...
   * ...TOGETHER AND SLIDE IT INTO POSITION.
   * IN THIS ANALYSIS CARPENTERS ARE LOCATED
   * ...ON THE LEVEL BELOW THE BOARDS.

9 MAKE READY STANCHION FOR (TRANSPORTING) WITH HAND
   * REPRESENTS GETTING STANCHION READY TO BE...
   * ...TRANSPORTED.

10 TRANSPORT STANCHION WITH (GROVE CRANE)
   * MAXIMUM NUMBER OF STANCHIONS IN LIFT = 12

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STANDARD TIME CALCULATION

* REPRESENTS TRANSPORTING STANCHION FROM...
  * BIN-2 TO BULKHEAD
  * DISTANCES FROM CRANE-REST TO BIN-2 ARE AVERAGE
  * DISTANCES IN A CENTER TANK 98’X 50’
  * MAXIMUM NUMBER OF STANCHIONS IN LIFT = 6

11 SET-UP STANCHION IN STAGING BRACKET WITH HAND (393) 6
  * I REPRESENTS PUTTING STANCHION IN THE......
  * ......BRACKET SLEEVE.

12 MAKE READY HANDRAIL FOR (TRANSPORTING) WITH HAND (394) 12

  * REPRESENTS GETTING HANDRAIL ON BOLSTERS
  * ...SO THAT THE CRANE CAN TRANSPORT IT

13 TRANSPORT HANDRAIL WITH (GROVE CRANE) (395) 12
  * REPRESENTS TRANSPORTING HANDRAIL FROM....
  * HR-PILE TO BULKHEAD
  * DISTANCES FROM CRANE-REST TO HR-PILE AND
  * FROM HR-PILE TO BULKHEAD ARE AVERAGE
  * DISTANCES IN A CENTER TANK 98’X 50’
  * MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6

14 SET-UP HANDRAIL ON STANCHION WITH HAND (396) 12
  * REPRESENTS PUTTING HANDRAIL INTO THE...;
  * ....EYELETS ON THE STANCHION
  * INCLUDES ACTION DISTANCES NEEDED FOR....
  * ...ALIGNING THE HANDRAIL
  * WELDING OF THE HANDRAIL CONNECTIONS WILL
  * ...BE DONE IN A SEPARATE SUB OPERATION

15 SET-UP HANDRAIL (END PIECES) ON HANDRAIL (AND BULKHEAD) WITH HAND (397) 6
  * REPRESENTS PUTTING HANDRAIL (END PIECES)
  * AT THE END (IF A STAGING LEVEL
  * WELDING OF THE HANDRAIL (END PIECES)......
  * ...CONNECTIONS WILL BE DONE IN A........
  * ...SEPARATE SUB OPERATION

16 WELD HANDRAIL (CONNECTIONS) ON STANCHION WITH S(440) .12
  * TICK ELECTRODE

17 (WALK UP OR DOWN) MOVE OPERATOR (ON INCLINED STAIRS) ON BULKHEAD (431) 1
  * REPRESENTS CARPENTER WALKING UP OR DOWN
  * ...A SET OF INCLINED STAIRS. AVERAGE
  * ...NUMBER OF TREADS IN A SET OF INCLINED
  * ...STAIRS = 16.
  * CARPENTERS ARE WALKING UP OR DOWN STAIRS
STANDARD TIME CALCULATION

* AT THE SAME TIME.
### STANDARD TIME CALCULATION

#### HOST OPERATION TIME CALCULATION

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**ACTUAL PROCESS TIME (TMU)**

0. 04

**FACTORED PROCESS TIME (TMU)**

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**TOTAL INTERNAL TIME (TMU)**

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**TITLE SHEET USED IN SETTING STANDARD:**
STANDARD TIME CALCULATION

HOST OPERATION TIME CALCULATION

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STANDARD TIME CALCULATION

M O S T  OPERATION TIME CALCULATION

DETAIL/UNIT/PART X ---------------------------------- REV. LTR/DATE X

PROCESS/OPER CODE SET UP ---------------------------------- STANDARD CODE X

PART NAME 2 BOARD BRACKET STAGING

SHIP CLASS X ---------------------------------- HULL X

COST CLASS JOB # 131 ---------------------------------- TRADE CARPENTER

GROUP (UNIT/ZONE) X ---------------------------------- WORK AREA X

SUB-GROUP X ---------------------------------- WORK ZONE X

SUB-SUB-GROUP X ---------------------------------- WORK CENTER X

CREW/MACHINE 3 CARPENTERS ---------------------------------- ASSET/MACHINE X

ITEM 131-3 ---------------------------------- SUB-ITEM 131-3-1

GEN. DRAWING 131 ---------------------------------- WORK ORDER X

DET. DRAWING X ---------------------------------- SHEET 1

WORK PACKAGE X ---------------------------------- APPLICATOR PP

OPER. DESCRIPTION SET UP OF BRACKET STAGING BELOW THE FLOOR LEVEL OF

A TRANSVERSE BULKHEAD PER 100 LINEAR FEET

DATE 08-JUN-83 ---------------------------------- ISSUE # 1

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STANDARD TIME CALCULATION

3 MAKE READY STAGING BRACKET FOR (TRANSPORTING) WITH HAND

* REPRESENTS GETTING BRACKET READY TO BE...
* ...TRANSPORTED TO TANK OR BULKHEAD
* CARPENTER IS LOCATED EITHER ON THE WAY...
* ...OR IN TANK AT THE MATERIAL (BIN-1)

TRANSPORT STAGING BRACKET WITH (GROVE CRANE) (378)

* REPRESENTS TRANSPORTING BRACKETS FROM...
* ...BIN-1 TO BULKHEAD
* DISTANCES FROM CRANE-REST TO BIN-1 AND...
* ...FROM BIN-1 TO BULKHEAD ARE AVERAGE...
* ...DISTANCES IN A CENTER TANK 98‘X50’
* MAXIMUM NUMBER OF BRKTs IN LIFT = 6

5 SET-UP STAGING BRACKETS ON BULKHEAD WITH WRENCH (379)

* REPRESENTS PUTTING UP A BRACKET ON AN...
* ...EXISTING STAGING CLIP

6 MAKE READY STAGING PLANK FOR (TRANSPORTING) WITH HAND

* REPRESENTS GETTING BOARD ON BOLSTERS SO...
* ...THAT THE CRANE CAN TRANSPORT IT

7 TRANSPORT STAGING PLANK WITH (GROVE CRANE) (387)

* REPRESENTS TRANSPORTING BOARDS FROM....
* ...LU-PILE TO BULKHEAD
* DISTANCES FROM CRANE-REST TO LU-PILE AND...
* ...FROM LU-PILE TO BULKHEAD ARE AVERAGE...
* ...DISTANCES IN A CENTER TANK 98‘X50’
* MAXIMUM NUMBER OF BOARDS IN LIFT = 3

8 SET-UP STAGING PLANK ON STAGING BRACKET WITH HAND (388)

* REPRESENTS SETTING UP BOARDS BETWEEN....
* ...BRACKETS.
* TWO MAN OPERATION:
* CARPENTERS ARE LOCATED AT TWO DIFFERENT
* ...BRACKETS. THEY BOTH LIFT THE BOARD.
* ...TOGETHER AND SLIDE IT INTO POSITION.
* IN THIS ANALYSIS CARPENTERS ARE LOCATED
* ...ON THE LEVEL BELOW THE BOARDS.

9 SET-UP STAGING PLANK ON STAGING BRACKET WITH HAND (390)

* REPRESENTS SETTING UP BOARDS BETWEEN.....
* ...BRACKETS...
* ONE MAN OPERATION:
STANDARD TIME CALCULATION

* USUALLY OCCURS WHEN CRANE CANNOT PLACE...
* ...BOARD ON BRACKETS.

10 MAKE READY STANCHION FOR (TRANSPORTING) WITH HAND (391)

. REPRESENTS GETTING STANCHION READY TO BE
. ...TRANSPORTED.

11 TRANSPORT STANCHION WITH (GROVE CRANE) (392) 8

. REPRESENTS TRANSPORTING STANCHION FROM...
. . .BIN-2 TO BULKHEAD
. DISTANCES FROM CRANE-REST TO BIN-2 ANDD...
* . . .FROM BIN-2 TO BULKHEAD ARE AVERAGE...
* . . .DISTANCES IN A CENTER TANK 98’X 50’
* MAXIMUM NUMBER OF STANCHIONS IN LIFT = 6

12 SET-UP STANCHION IN STAGING BRACKET WITH HAND (393) 4

* REPRESENTS PUTTING STANCHION IN THE......
* . . .BRACKET SLEEVE.

13 MAKE READY HANDRAIL FOR (TRANSPORTING) WITH HAND (394) 12

* REPRESENTS GETTING HANDRAIL ON BOLSTERS
. . . .SO THAT THE CRANE CAN TRANSPORT IT

14 TRANSPORT HANDRAIL WITH (GROVE CRANE) (395) 12

* REPRESENTS TRANSPORTING HANDRAIL FROM...
* . . .HR-PILE TO BULKHEAD
* DISTANCES FROM CRANE-REST TO HR-PILE AND
* . . .FROM HR-PILE TO BULKHEAD ARE AVERAGE
* . . .DISTANCES IN A CENTER TANK 98’X50’
* MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6

15 SET-UP HANDRAIL ON STANCHION WITH HAND (396) 12

* REPRESENTS PUTTING HANDRAIL INTO THE . . .
* . . .EYELETS ON THE STANCHION
* INCLUDES ACTION DISTANCES NEEDED FOR....
* . . .ALIGNING THE HANDRAIL
* WELDING OF THE HANDRAIL CONNECTIONS WILL
* . . .BE DONE IN A SEPARATE SUB OPERATION

16 SET-UP HANDRAIL (END PIECES) ON HANDRAIL (AND BULKHEAD) WITH HAND

* REPRESENTS PUTTING HANDRAIL (END PIECES)
* . . .AT THE END OF A STAGING LEVEL
* WELDING OF THE HANDRAIL (END PIECES)....
* . . .CONNECTIONS WILL BE DONE IN A......
* . . .SEPARATE SUB OPERATION

17 WELD HANDRAIL (CONNECTIONS) ON STANCHION WITH S (440) 14

TICK ELECTRODE
STANDARD TIME CALCULATION

18 MAKE READY LADDER FOR (TRANSPORTING) WITH HAND ( 380)
   * REPRESENTS GETTING LADDER ON BOLSTERS SO
   * ...THAT THE CRANE CAN TRANSPORT IT.
19 TRANSPORT LADDERS WITH (GROVE CRANE) ( 381)
   * REPRESENTS TRANSPORTING LADDERS FROM...
   * ...LDR-PILE TO BULKHEAD
   * DISTANCES FROM CRANE-REST TO LDR-PILE...
   * ...AND FROM LDR-PILE TO BULKHEAD ARE...
   * ...AVERAGE DISTANCES IN A CENTER TANK...
   * ...98'X50'
   * MAXIMUM NUMBER OF LADDERS IN LIFT = 3
20 SET-UP (ACCESS) LADDER ON BULKHEAD WITH HAND ( 383)
   * REPRESENTS PUTTING UP AN ACCESS LADDER...
   * ...ON THE BULKHEAD SO THAT THE CARPENTER
   * ...CAN CLIMB TO THE NEXT LADDER.
   * ALSO INCLUDES CLIMBING UP AND DOWN THE...
   * ...LADDER.
   * AVERAGE NUMBER OF RUNGS = 12
21 POSITION (SECURE) (ACCESS) LADDER FOR BRACKET S( 385)
   TAGING WITH
   * REPRESENTS SECURING LADDER TO STAGING...
   * ...BOARDS USING WIRE ROPE
22 (WALK UP OR DOWN) MOVE OPERATOR (ON INCLINED ST( 431)
   AIRS) ON BULKHEAD
   * REPRESENTS CARPENTER WALKING UP OR DOWN
   * ...SET OF INCLINED STAIRS, AVERAGE
   * ...NUMBER OF TREADS IN A SET OF INCLINED
   * ...STAIRS = 16.
   * CARPENTERS ARE WALKING UP OR DOWN STAIRS
   * AT THE SAME TIME.
### STANDARD TIME CALCULATION

#### MOST OPERATION TIME CALCULATION

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Factored Process Time (THU) 0.

Total Internal Time (THU) 0.

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STANDARD TIME CALCULATION

M O S T  OPERATION TIME CALCULATION

DETAIL/UNIT/PART X  REV. LTR/DATE X
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PROCESS/OPER CODE REMOVE  STANDARD CODE X
-----------------------------------------------
PART NAME 2 BOARD BRACKET STAGING
-----------------------------------------------
SHIP CLASS X  HULL X
-----------------------------------------------
COST CLASS/JOB # 131  TRADE CARPENTER
-----------------------------------------------
GROUP (UNIT/ZONE) X  WORK AREA X
-----------------------------------------------
SUB-GROUP X  WORK ZONE X
-----------------------------------------------
SUB-SUB-GROUP X  WORK CENTER X
-----------------------------------------------
CREW/MACHINE 6 CARPENTERS  ASSET/MACHINE X
-----------------------------------------------
ITEM 131-3  SUB-ITEM 131-3-3
-----------------------------------------------
GEN. DRAWING 131  WORK ORDER X
-----------------------------------------------
DET. DRAWING X  SHEET 1
-----------------------------------------------
WORK PACKAGE X  APPLICATOR PP
-----------------------------------------------
OPER. DESCRIPTION TEAR DOWN AND REMOVE BRACKET STAGING ON A SMOOTH
BULKHEAD CENTER TANK PER 100 LINEAR FEET
-----------------------------------------------
DATE 08-JUN-83  ISSUE # 1
-----------------------------------------------

Step  Method Instruction
-----------------------------------------------
1 TEAR DOWN HANDRAIL ON BULKHEAD WITH TORCH ( 398) 14
* REPRESENTS TEARING DOWN HANDRAIL IN A...
* CENTER TANK. HANDRAIL IS THROWN TO A
* MATERIAL FILE ON THE TANKTOP.
* CARPENTERS REMOVE 2 HADNRAIL BEFORE.....
* MOVING TO NEXT SECTION.
2 TEAR DOWN STANCHION ON BULKHEAD WITH HAND ( 400) 3
* REPRESENTS REMOVING STANCHION FROM.....
* STAGING BRACKETS IN A CENTER TANK.

PAGE 214
STANDARD TIME CALCULATION

* ...STANCHION IS THROWN TO A MATERIAL... * ...FILE ON THE TANKTOP

3 TEAR DOWN STAGING PLANK ON STAGING BRACKET WITH (402) 10
   HAND (AND WINCH)

* REPRESENTS REMOVING BOARDS FROM ANY TANK
* ...WINCH IS USED TO LOWER BOARD TO....
* ...BD-PILE ON TANKTOP.
* MAXIMUM NUMBER OF BOARDS IN LIFT = 3

4 (CLIMB UP AND DOWN) MOVE OPERATOR (ON LADDER) ON BULKHEAD (404)
   N BULKHEAD

* REPRESENTS CARPENTERS CLIMBING Up AND...
* ...DOWN LADDERS TO REMOVE STAGING.
* AVERAGE LADDER SIZE = 12 RUNGS.

5 TEAR DOWN LADDER (AND LADDER CLIPS) ON BULKHEAD (403)
   WITH

* REPRESENTS REMOVING LADDER FROM BULKHEAD
* ...THERE ARE 4 LADDER CLIPS PER LADDER.
* ...LADDER LOWERD TO LDR-PILE BY WINCH
* ...LADDER CLIPS THROWN TO MATL-PILE.

6 TEAR DOWN STAGING BRACKET ON BULKHEAD WITH WREN (406)
   CH

* REPRESENTS TEARING DOWN STAGING BRACKET
* ...IN ANY TANK. BRACKETS ARE LOWERED TO
* ...MATL-PILE BY WINCH.
* MAXIMUM NUMBER OF BRACKETS IN LIFT = 3

7 REMOVE HANDRAIL ON (MATERIAL-PILE) WITH WINCH (407) 14
   * REPRESENTS REMOVAL OF HANDRAIL FROM MATL
   * ...PILE ON TANKTOP TO DECK (GOING THRU
   * ...MANHOLE).
   * MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6

a REMOVE STANCHION ON (MATERIAL PILE) WITH WINCH (408) 6
   * REPRESENTS REMOVAL OF STANCHION FROM ...
   * ...MATL-PILE ON TANKTOP TO DECK (GOING
   * ...THRU MANHOLE).
   * MAXIMUM NUMBER OF STANCHION IN LIFT = 6

9 REMOVE STAGING PLANK ON (BOARD PILE) WITH WINCH (410) 10
   * REPRESENT REMOVING BOARDS FROM BOARD...
   * ...PILE ON TANKTOP TO DECK (GOES THRU...
   * ...MANHOLE)
   * MAXIMUM NUMBER OF BOARDS IN LIFT = 3

10 REMOVE LADDER ON (LADDER-PILE) WITH WINCH (411) 2
   * REPRESENT REMOVING LADDERS FROM LADDER
   * ....FILE ON TANKTOP TO DECK (GOES THRU..
STANDARD TIME CALCULATION

* ...HANHOLE).
* MAXIMUM NUMBER OF LADDERS IN LIFT = 3
11 REMOVE STAGING BRACKET ON (MATERIAL PILE) WITH ( 409) 6
WINCH
* REPRESENTS REMOVAL OF BRACKET FROM MATL
* ... FILE ON TANKTOP TO DECK (GOING THRU
* ...HANHOLE).
* MAXIMUM NUMBER OF BRACKET IN LIFT = 3
12 REMOVE TOOLBOX ON (MATERIAL PILE) WITH WINCH ( 412) 1
* REPRESENTS REMOVING TOOLBOX FROM MATL...
* ...PILEON TANKTOP TO DECK (GOES THRU...
* ...MANHOLE).
* TOOLBOX CONTAINS:
* ...28 BOLTS
* ...28 NUTS
* ...28 LADDER CLIPS
### H O S T OPERATION TIME CALCULATION

#### INTERNAL EXTERNAL LOC

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**FACTORED PROCESS TIME (TMU)**

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**TOTAL INTERNAL TIME (TMU)**

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**TITLE SHEET USED IN SETTING STANDARD:**

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**STANDARD TIME CALCULATION**

**HOST OPERATION TIME CALCULATION**

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**Engineered Operation Time Calculation**

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STANDARD TIME CALCULATION

MOST OPERATION TIME CALCULATION

DETAIL/UNIT/PART X REV. LTR/DATE X
PROCESS/OPER CODE REMOVE STANDARD CODE X
PART NAME 3 BOARD BRACKET STAGING
SHIP CLASS X HULL X
COST CLASS/JOB # 131 TRADE CARPENTER
GROUP (UNIT/ZONE) X WORK AREA X
SUB-GROUP X WORK ZONE X
SUB-SUB-GROUP X WORK CENTER X
CREW/MACHINE 6 CARPENTERS ASSET/MACHINE X
ITEM 131-3 SUB-ITEM 131-3-3
GEN. DRAWING 131 WORK ORDER X
DET. DRAWING X SHEET 1
WORK PACKAGE X APPLICATOR PP
OPER. DESCRIPTION TEAR DOWN AND REMOVE BRACKET STAGING ON A SMOOTH BULKHEAD CENTER TANK PER 100 LINEAR FEET
DATE 08-JUN-83 ISSUE # 1

Step Method Instruction

1 TEAR DOWN HANDRAIL ON BULKHEAD WITH TORCH ( 398) 14
* REPRESENTS TEARING DOWN HANDRAIL IN A...
* ...CENTER TANK. HANDRAIL IS THROWN TO A
* ...MATERIAL PILE ON THE TANKTOP.
* CARPENTERS REMOVE 2 HANDRAIL BEFORE.....
* ...MOVING TO NEXT SECTION.
2 TEAR DOWN STANCHION ON BULKHEAD WITH HAND ( 400) 3
* REPRESENTS REMOVING STANCHION FROM.....
* ...STAGING BRACKETS IN A CENTER TANK.
STANDARD TIME CALCULATION

3 TEAR DOWN STAGING PLANK ON STAGING BRACKET WITH (HAND AND WINCH) (402) 15

* REPRESENTS REMOVING BOARDS FROM ANY TANK
* ...WINCH IS USED TO LOWER BOARD TO....
* .....BD-PILE ON TANKTOP,
* MAXIMUM NUMBER OF BOARDS IN LIFT = 3

4 (CLIMB UP AND DOWN) MOVE OPERATOR (ON LADDER) ON BULKHEAD (404) 2

* REPRESENTS CARPENTERS CLIMBING UP AND...
* .....DOWN LADDERS TO REMOVE STAGING.
* AVERAGE LADDER SIZE = 12 RUNGS.

5 TEAR DOWN LADDER (AND LADDER CLIPS) ON BULKHEAD (403) 2

* REPRESENTS REMOVING LADDER, FROM BULKHEAD
* ...THERE ARE 4 LADDER CLIPS PER LADDER.
* .....LADDER LOWERED TO LDR-PILE BY WINCH
* .....LADDER CLIPS THROWN TO MATL-PILE.

6 TEAR DOWN STAGING BRACKET ON BULKHEAD WITH WREN (406) 6

* REPRESENTS TEARING DOWN STAGING BRACKET
* .....IN ANY TANK. BRACKETS ARE LOWERED TO
* .....MATL-PILE BY WINCH,
* MAXIMUM NUMBER OF BRACKETS IN LIFT = 3

7 REMOVE HANDRAIL ON (MATERIAL-PILE) WITH WINCH (407) 14

* REPRESENTS REMOVAL OF HANDRAIL FROM MATL
* .....PILE ON TANKTOP TO DECK (GOING THRU
* .....HANHOLE),
* MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6

8 REMOVE STANCHION ON (MATERIAL PILE) WITH WINCH (408) 6

* REPRESENTS REMOVAL OF STANCHION FROM ....
* .....MATL-PILE ON TANKTOP TO DECK (GOING
* .....THRU MANHOLE).
* MAXIMUM NUMBER OF STANCHION IN LIFT = 6

9 REMOVE STAGING PLANK ON (BOARD PILE) WITH WINCH (410) 15

* REPRESENT REMOVING BOARDS FROM BOARD....
* .....PILE ON TANKTOP TO DECK (GOES THRU..
* .....MANHOLE),
* MAXIMUM NUMBER OF BOARDS IN LIFT = 3

10 REMOVE LADDER ON (LADDER-FILE) WITH WINCH (411) 2

* REPRESENT REMOVING LADDERS FROM LADDER
* .....PILE ON TANKTOP TO DECK <GOES THRU..
STANDARD TIME CALCULATION

* ....MANHOLE)
* MAXIMUM NUMBER OF LADDERS IN LIFT = 3

11 REMOVE STAGING BRACKET ON (MATERIAL PILE) WITH ( 409 ) 6
WINCH

* REPRESENTS REMOVAL OF BRACKET FROM MTL
* ...PILE ON TANKTOP TO DECK (GOING THRU
* ...MANHOLE).
* MAXIMUM NUMBER OF BRACKET IN LIFT = 3

12 REMOVE TOOLBOX ON (MATERIAL PILE) WITH WINCH ( 412)
* REPRESENTS REMOVING TOOLBOX FROM MATL...
* ...PILE ON TANKTOP TO DECK (GOES THRU..
* ...MANHOLE).
* TOOLBOX CONTAINS:
* ....28 BOLTS
* ....28 NUTS
* ...28 LADDER CLIPS
### STANDARD TIME CALCULATION

**M O S T OPERATION TIME CALCULATION**

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**ACTUAL PROCESS TIME (TMU)**

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**FACTORED PROCESS TIME (TMU)**

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**TOTAL INTERNAL TIME (TMU)**

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**TITLE SHEET USED IN SETTING STANDARD:**

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# STANDARD TIME CALCULATION

## HOST OPERATION TIME CALCULATION

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Page 224
STANDARD TIME CALCULATION

* ...STANCHION IS THROWN TO A MATERIAL....
* ...PILE ON THE TANKTOP
3 TEAR DOWN STAGING PLANK ON STAGING BRACKET WITH( 402) 12
   HAND (AND WINCH)
   * REPRESENTS REMOVING BOARDS FROM ANY TANK
   * ...WINCH IS USED TO LOWER BOARD TO.....
   * ...BD-PILE ON TANKTOP.
   * MAXIMUM NUMBER OF BOARDS IN LIFT = 3
4 TEAR DOWN STAGING BRACKET ON BULKHEAD WITH WREN( 406) 6
   CH
   * REPRESENTS TEARING DOWN STAGING BRACKET
   * ...IN ANY TANK, BRACKETS ARE LOWERED TO
   * ....MATL-PILE BY WINCH.
   * MAXIMUM NUMBER OF BRACKETS IN LIFT = 3
5 REMOVE HANDRAIL ON (MATERIAL-PILE) WITH WINCH ( 407) 18
   * REPRESENTS REMOVAL OF HANDRAIL FROM MATL
   * ...PILE ON TANKTOP TO DECK (GOING THRU
   * ...MANHOLE).
   * MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6
6 REMOVE STANCHION ON (MATERIAL PILE) WITH WINCH ( 408) 12
   * REPRESENTS REMOVAL OF STANCHION FROM . .
   * ...MATL-PILE ON TANKTOP TO DECK (GOING
   * ...THRU HANHOLE).
   * MAXIMUM NUMBER OF STANCHION IN LIFT = 6
7 REMOVE STAGING PLANK ON (BOARD PILE) WITH WINCH( 410) 12
   * REPRESENT REMOVING BOARDS FROM BOARD...
   * ...-PILE ON TANKTOP TO DECK (GOES THRU..
   * ...MANHOLE).
   * MAXIMUM NUMBER OF BOARDS IN LIFT = 3
8 REMOVE STAGING BRACKET ON (MATERIAL PILE) WITH ( 409 ) 6
   WINCH
   * REPRESENTS REMOVAL OF BRACKET FROM MATL
   * ... PILE ON TANKTOP TO DECK (GOING THRU
   * ...MANHOLE).
   * MAXIMUM NUMBER OF BRACKET IN LIFT = 3
9 REMOVE TOOLBOX ON (MATERIAL PILE) WITH WINCH ( 412) 1
   * REPRESENTS REMOVING TOOLBO* FROM MATL...
   * ...-PILEON TANKTOP TO DECK (GOES THRU...
   * ...HANHOLE).
   * TOOLBOX CONTAINS:
   * ...28 BOLTS
   * ...28 NUTS
   * ...20 LADDER CLIPS
10 (WALK UP OR DOWN) MOVE OPERATOR (ON INCLINED ST( 431) 1
STANDARD TIME CALCULATION

AIRS) ON BULKHEAD

* REPRESENTS CARPENTER WALKING UP OR DOWN
* ...A SET OF INCLINED STAIRS. AVERAGE
* ..NUMBER OF TREADS IN A SET OF INCLINED
* ...STAIRS = 16
* CARPENTERS ARE WALKING UP OR DOWN STAIRS
* AT THE SAME TIME.
STANDARD TIME CALCULATION

HOST OPERATION TIME CALCULATION

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MANUAL TIME (TMU) 0. 1289717.

ACTUAL PROCESS TIME (TMU) 0. 0.

FACTORED PROCESS TIME (TMU) 0.

TOTAL INTERNAL TIME (TMU) 0.

TITLE SHEET USED IN SETTING STANDARD:
ENGINEERED OPERATION TIME CALCULATION

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## Standard Time Calculation

**H O S T Operation Time Calculation**

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### Step Method Instruction

1. **Teardown** Handrail on Bulkhead with Torch
   - Represents tearing down handrail in a...
   - ...center tank. Handrail is thrown to a
   - ...material pile on the tanktop.
   - Carpenters remove 2 handrail before...
   - ...moving to next section.

2. **Teardown** Stanchion on Bulkhead with Hand
   - Represents removing stanchion from...
   - ...staging brackets in a center tank.

---

**Note:** The page number is 229.
STANDARD TIME CALCULATION

* ...STANCHION IS THROWN TO A MATERIAL....
* ...PILE ON THE TANKTOP
3 TEAR DOWN STAGING PLANK ON STAGING BRACKET WITH (402)   14
   HAND (AND WINCH)
   * REPRESENTS REMOVING BOARDS FROM ANY TANK
   * ...WINCH IS USED TO LOWER BOARD TO....
   * ...BD-PILE ON TANKTOP.
   * MAXIMUM NUMBER OF BOARDS IN LIFT = 3
4 TEAR DOWN STAGING BRACKET ON BULKHEAD WITH WREN(406)
   * REPRESENTS TEARING DOWN STAGING BRACKET
   * ...IN ANY TANK, BRACKETS ARE LOWERED TO
   * ...MATL-PILE BY WINCH.
   * MAXIMUM NUMBER OF BRACKETS IN LIFT = 3
5 TEAR DOWN LADDER (AND WIRE ROPE) ON BULKHEAD WI(405)
   TH
   * REPRESENTS REMOVING LADDER FROM BULKHEAD
   * ...THERE IS 1 WIRE ROPE PER LADDER.
   * ...LADDER LOWERED TO LDR-PILE BY WINCH
   * ...WIRE-ROP-E IS THROWN TO MATL-PILE.
6 REMOVE HANDRAIL ON (MATERIAL-PILE) WITH WINCH (407)   14
   * REPRESENTS REMOVAL OF HANDRAIL FROM MATL
   * ... PILE ON TANKTOP TO DECK (GOING THRU
   * ...HANHOLE),
   * MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6
7 REMOVE STANCHION ON (MATERIAL PILE) WITH WINCH (408)   8
   * REPRESENTS REMOVAL OF STANCHION FROM . . .
   * ...MATL-PILE ON TANKTOP TO DECK (GOING
   * ...THRU MANHOLE).
   * MAXIMUM NUMBER OF STANCHION IN LIFT = 6
8 REMOVE STAGING PLANK ON (BOARD PILE) WITH WINCH(410)   14
   * REPRESENT REMOVING BOARDS FROM BOARD...
   * ...PILE ON TANKTOP TO DECK (GOES THRU.
   * ...MANHOLE).
   * MAXIMUM NUMBER OF BOARDS IN LIFT = 3
9 REMOVE STAGING BRACKET ON (MATERIAL PILE) WITH (409)   8
   WINCH
   * REPRESENTS REMOVAL OF BRACKET FROM MATL
   * ... PILE ON TANKTOP TO DECK (GOING THRU
   * ...MANHOLE).
   * MAXIMUM NUMBER OF BRACKET IN LIFT = 3
1.0 REMOVE LADDER ON (LADDER-PILE) WITH WINCH (411)
   * REPRESENT REMOVING LADDERS FROM LADDER
STANDARD TIME CALCULATION

* ...-PILE ON TANKTOP TO DECK (GOES THRU...
 * ...HANHOLE).
 * MAXIMUM NUMBER OF LADDERS IN LIFT = 3
11 REMOVE TOOLBOX ON (MATERIAL PILE) WITH WINCH (412) 1
 * REPRESENTS REMOVING TOOLBOX FROM MATL.....
 * ...-PILEON TANKTOP TO DECK (GOES THRU...
 * ...HANHOLE)
 * TOOLBOX CONTAINS:
 * ...28 BOLTS
 * ...28 NUTS
 * ...28 LADDER CLIPS

12 (WALK UP OR DOWN) HOVE OPERATOR (ON INCLINED ST(431)) 1
AIRS) ON BULKHEAD

* REPRESENTS CARPENTER WALKING UP OR DOWN
 * ...A SET OF INCLINED STAIRS. AVERAGE
 * ...NUMBER OF TREADS IN A SET OF INCLINED
 * ...STAIRS = 16.
 * CARPENTERS ARE WALKING UP OR DOWN STAIRS
 * AT THE SAME TIME.
## STANDARD TIME CALCULATION

### HOST OPERATION TIME CALCULATION

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- **ACTUAL PROCESS TIME (TMU):**
  - 0.00

- **FACTORED PROCESS TIME (TMU):**
  - 0.00

- **TOTAL INTERNAL TIME (TMU):**
  - 0.00

**TITLE SHEET USED IN SETTING STANDARD:**

0
STANDARD TIME CALCULATION

HOST OPERATION TIME CALCULATION

Engineered Operation Time Calculation

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4.2 HOW TO CALCULATE TIME STANDARDS

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Step | Method Instruction | Freq |
---|--------------------|------|
1  | SET-UP (STAGING CLIP) ON WEB FRAME WITH (568) | 3    |
   | * REPRESENTS PUTTING UP A STAGING CLIP ON   |      |
   | * A WEB FRAME                              |      |
   | * WELDING OF THE CLIP WILL BE DONE IN A   |      |
   | * ...SEPARATE SUB OPERATION                |      |
2  | WELD STAGING BRACKET (CLIP) ON BULKHEAD (OR ANY 435) | .06  |
STANDARD TIME CALCULATION

3 MAKE READY STAGING BRACKET FOR (TRANSPORTING) WITH HAND (426) 6

* REPRESENTS GETTING BRACKET READY TO BE...
* ...TRANSPORTED TO TANK OR BULKHEAD
* CARPENTER IS LOCATED EITHER ON THE WAY++
* ...OR IN TANK AT THE MATERIAL (BIN-1)

4 TRANSPORT STAGING BRACKET WITH (TOWER CRANE) (563)
* REPRESENTS TRANSPORTING BRACKETS FROM...
* ...BIN-1 TO BULKHEAD
* DISTANCES FROM CRANE-REST TO BIN-1 AND...
* t...from 1 TO BULKHEAD ARE AVERAGE*.C
* ...DISTANCES FROM THE SIDE OF A BASIN
* ...1200’X200’
* MAXIMUM NUMBER OF BRKTS IN LIFT = 6

5 SET-UP STAGING BRACKET ON WEB FRAME WITH WRENCH (569) 3

* REPRESENTS PUTTING UP A STAGING BRACKET
* ...ON A EXISTING STAGING CLIP ( LOCATED
* ...ON A WEB FRAME )

6 MAKE READY STAGING PLANK FOR (TRANSPORTING) WITH HAND (428) 34

* REPRESENTS GETTING BOARD ON BOLSTERS SO
* ...THAT THE CRANE CAN TRANSPORT IT

7 TRANSPORT STAGING PLANK WITH (TOWER CRANE) (565) 34

* REPRESENTS TRANSPORTING BOARDS FROM
* ...L-U-PILE TO BULKHEAD
* DISTANCES FROM CRANE-REST TO L-U-PILE AND
* ...FROM L-U-PILE TO BULKHEAD ARE AVERAGE
* ...DISTANCES FROM THE SIDE OF A BASIN
* ...1200’X200’
* MAXIMUM NUMBER OF BOARDS IN LIFT = 3

8 SET-UP STAGING PLANK ON STAGING BRACKET WITH HAND (573) 5

* REPRESENTS SPREADING BOARDS BETWEEN WEBS
* 2 MAN OPERATION:
* CARPENTERS ARE LOCATED AT TWO DIFFERENT
* ...WEBS. THEY BOTH PICK UP THE BOARD
* ...TOGETHER AND SLIDE IT INTO POSITION.
* IN THIS ANALYSIS CARPENTERS ARE LOCATED
* ...ON THE SAME LEVEL AS THE BOARDS.

9 SET-WP STAGING PLANK ON (EXISTING) BRACKET STAGE WITH HAND (575) 12

* REPRESENTS SPREADING BOARDS BETWEEN
STANDARD TIME CALCULATION

* EXISTING STAGING AND INBOARD OR
* OUTBOARD BULKHEAD
* 2 MAN OPERATION:
* CARPENTERS ARE LOCATED AT DIFFERENT WEBS
* EACH CARPENTER SPREADS TWO BOARDS
* SIMULTANEOUSLY
* IN THIS ANALYSIS CARPENTERS ARE LOCATED
* ON THE SAME LEVEL AS THE BOARDS.

10 MAKE READY STANCHION FOR (TRANSPORTING) WITH HAND (429) 6

* REPRESENTS GETTING STANCHION READY TO BE
* TRANSPORTED.

11 TRANSPORT STANCHION WITH (TOWER CRANE) (566) 6
* REPRESENTS TRANSPORTING STANCHION FROM...
* BIN-2 TO BULKHEAD
* DISTANCES FROM CRANE-REST TO BIN-2 AND...
* FROM BIN-2 TO BULKHEAD ARE AVERAGES...
* DISTANCES FROM THE SIDE OF A BASIN
* ..1200' X 200'
* MAXIMUM NUMBER OF STANCHIONS IN LIFT = 6

12 SET-UP STANCHION IN STAGING BRACKET WITH HAND (577) 6
* REPRESENTS PUTTING STANCHION IN THE
* BRACKET SLEEVE IN A WING TANK

13 MAKE READY HANDRAIL FOR (TRANSPORTING) WITH HAND (430) 12

* REPRESENTS GETTING HANDRAIL ON BOLSTERS
* SO THAT THE CRANE CAN TRANSPORT IT

14 TRANSPORT HANDRAIL WITH (TOWER CRANE) (567) 12
* REPRESENTS TRANSPORTING HANDRAIL FROM...
* HR-PILE TO BULKHEAD
* DISTANCES FROM CRANE-REST TO HR-PILE AND
* FROM HR-PILE TO BULKHEAD ARE AVERAGE
* DISTANCES FROM THE SIDE OF A BASIN
* 1200' X 200'
* MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6

15 SET-UP HANDRAIL IN STANCHION WITH HAND (578) 12
* REPRESENTS PUTTING HANDRAIL INTO THE
* EYELETS ON THE STANCHION
* INCLUDES ACTION DISTANCES NEEDED FOR
* GS, ALIGNING THE HANDRAIL
* WELDING OF THE HANDRAIL WILL BE DONE IN
* A SEPARATE SUB OPERATION

16 SET-UP HANDRAIL (END PIECES) ON (HANDRAIL AN (579) 12
* D) RULKHEAD WITH

PAGE 236
STANDARD TIME CALCULATION

* REPRESENTS PUTTING HANDRAIL (END PIECES) AT THE END OF A STAGING LEVEL
* WELDING OF THE HANDRAIL (END PIECES)
* CONNECTIONS WILL BE DONE IN A SEPARATE SUB OPERATION

17 WELD HANDRAIL (CONNECTIONS) ON STANCHION WITH S( 440 ) 1 2 TCK ELECTRODE

18 MAKE READY LADDER FOR (TRANSPORTING) WITH HAND (427)
* REPRESENTS GETTING LADDER ON BOLSTERS SO THAT THE CRANE CAN TRANSPORT IT.

19 TRANSPORT LADDER WITH (TOWER CRANE) (564)
* REPRESENTS TRANSPORTING LADDERS FROM LDR-PILE TO BULKHEAD
* DISTANCES FROM CRANE-REST TO LDR-PILE AND FROM LDR-PILE TO BULKHEAD ARE AVERAGE DISTANCE FROM SIDE OF BASIN
* ...1200’ X 200’
* MAXIMUM NUMBER OF LADDERS IN LIFT = 3

20 SET-UP (ACCESS) LADDER ON (INBOARD OR OUTBOARD) BULKHEAD WITH
* REPRESENTS PUTTING UP AN ACCESS LADDER ON THE INBOARD OR OUTBOARD BULKHEAD
* ...SO THAT THE CARPENTER CAN CLIMB TO THE NEXT LEVEL OF STAGING
* ...ALSO INCLUDES CLIMBING UP AND DOWN THE LADDER

21 POSITION (SECURE) (ACCESS) LADDER ON (571)
* REPRESENTS SECURING A LADDER TO THE INBOARD OR OUTBOARD BULKHEAD USING FOUR LADDER CLIPS
* WELDING OF CLIPS WILL BE DONE IN A SEPARATE SUB OPERATION

22 WELD LADDER (CLIP) (SECURES LADDER) ON BULKHEAD(438) 0 1 (OR ANY STRUCTURE)
### STANDARD TIME CALCULATION

#### MOST OPERATION TIME CALCULATION

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**ACTUAL PROCESS TIME(TMU)**

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**FACTORED PROCESS TIME(TMU)**

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**TOTAL INTERNAL TIME(TMU)**

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**TITLE SHEET USED IN SETTING STANDARD:**

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### Engineered Operation Time Calculation

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STANDARD TIME CALCULATION

M 0 S T OPERATION TIME CALCULATION

DETAIL/UNIT/PART x REVT. LTR/DATE x

PROCESS/OPER CODE SET UP STANDARD CODE x x---------------

PART NAME 2 BOARD BRACKET STAGING

SHIP CLASS x ------------------------------ HULL x

COST CLASS/JOB 131 TRADE CARPENTER

GROUP (UNIT/ZONE) x ------------------------------ CORK AREA x

SUB-GROUP x ------------------------------ WORK ZONE x

SUB-SUE-GROUP x ------------- WORK CENTER x

CREW/MACHINE 3 CARPENTERS ASSET/MACHINE x

ITEM 131-3 SUB-ITEM 131-3-1

GEN. DRAWING 131 WORK ORDER x

DET. DRAWING x SHEET 1

WORK PACKAGE x ------------------------------ APPLICATOR PA

OPER. DESCRIPTION SET UP BRACKET STAGING ON SMOOTH BULKHEAD WING

TANK PER 100 LINEAR FEET

DATE 08-JUN-83 ISSUE # 1

Step Method Instruction Free

1 SET-UP (STAGING CLIP) ON BULKHEAD WITH HAMMER (( 376 ) 3

AND STEEL-TAPE)

* REPRESENTS PUTTING UP A STAGING CLIP ON
* THE RULKHEAD
* WELDING OF THE CLIP WILL BE DONE IN A...

2 WELD STAGING BRACKET (CLIP) ON BULKHEAD (OR ANY( 435) .06

STRUCTURE) WITH

PAGE 240
STANDARD TIME CALCULATION

3 MAKE READY STAGING BRACKET FOR (TRANSPORTING) WITH HAND 426
* REPRESENTS GETTING BRACKET READY TO BE TRANSPORTED TO TANK OR BULKHEAD
* CARPENTER IS LOCATED EITHER ON THE WAY...
* OR IN TANK AT THE MATERIAL (BIN-1)

4 TRANSPORT STAGING BRACKET WITH (TOUER CRANE) 563
* REPRESENTS TRANSPORTING BRACKETS FROM...
* BIN-1 TO BULKHEAD
* DISTANCES FROM CRANE-REST TO BIN-1 AND...
* FROM BIN-1 TO BULKHEAD ARE AVERAGE...
* DISTANCES FROM THE SIDE OF A BASIN
* 1200' x 200'
* MAXIMUM NUMBER OF BRKTS IN LIFT = 6

5 MAKE READY STAGING BRACKET FOR (TRANSPORTING) WITH HAND 377
* REPRESENTS GETTING BRACKET READY TO BE TRANSPORTED TO TANK OR BULKHEAD
* CARPENTER IS LOCATED EITHER ON THE WAY...
* OR IN TANK AT THE MATERIAL (BIN-1)

6 MAKE READY STAGING PLANK FOR (TRANSPORTING) WITH HAND 428
* REPRESENTS GETTING BOARD ON BOLSTERS SO THAT THE CRANE CAN TRANSPORT IT

7 TRANSPORT STAGING PLANK WITH (TOUER CRANE) 565
* REPRESENTS TRANSPORTING BOARDS FROM LU-PILE TO BULKHEAD
* DISTANCES FROM CRANE-REST TO LU-PILE AND...
* FROM LU-PILE TO BULKHEAD ARE AVERAGE
* DISTANCES FROM THE SIDE OF A BASIN
* 1200' x 200'
* MAXIMUM NUMBER OF BOARDS IN LIFT = 3

8 SET-UP STAGING PLANK ON STAGING BRACKET WITH HAND 388
* REPRESENTS SETTING UP BRACKETS.
* TWO MAN OPERATION:
* CARPENTERS ARE LOCATED AT TWO DIFFERENT BRACKETS. THEY BOTH LIFT THE BOARD...
* TOGETHER AND SLIDE IT INTO POSITION.
* IN THIS ANALYSIS CARPENTERS ARE LOCATED...
* ON THE LEVEL BELOW THE BOARDS.
STANDARD TIME CALCULATION

9 MAKE READY STANCHION FOR (TRANSPORTING) WITH HAND (429)  6
   * REPRESENTS GETTING STANCHION READY TO BE
     ...TRANSPORTED.

10 TRANSPORT STANCHION WITH (TOWER CRANE) (566)  6
   * REPRESENTS TRANSPORTING STANCHION FROM...
     * ...RIN-2 TO BULKHEAD
     * ...DISTANCES FROM CRANE-REST TO BIN-2 AND..
     * ...FROM BIN-2 TO BULKHEAD ARE AVERAGE...
     * ...DISTANCES FROM THE SIDE OF A BASIN
     * ...1200’ X 200’
   * MAXIMUM NUMBER OF STANCHIONS IN LIFT = 6

11 SET-UP STANCHION IN STAGING BRACKET WITH HAND (393)  3
   * REPRESENTS PUTTING STANCHION IN THE...
     * ...BRACKET SLEEVE.

12 MAKE READY HANDRAIL FOR (TRANSPORTING) WITH HAND (430)  14
   * REPRESENTS GETTING HANDRAIL ON BOLSTERS
     * ...SO THAT THE CRANE CAN TRANSPORT IT

13 TRANSPORT HANDRAIL WI WITH (TOWER CRANE) (567)  14
   * REPRESENTS TRANSPORTING HANDRAIL FROM...
     * ...HR-PILE TO BULKHEAD
     * ...DISTANCES FROM CRANE-REST TO HR-PILE AND
     * ...FROM HR-PILE TO BULKHEAD ARE AVERAGE
     * ...DISTANCES FROM THE SIDE OF A BASIN
     * ...1200’ X 200’
   * MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6

14 SET-UP HANDRAIL ON STANCHION WITH HAND (396)  14
   * REPRESENTS PUTTING HANDRAIL INTO THE...
     * ...EYELETS ON THE STANCHION
     * INCLUDES ACTION DISTANCES NEEDED FOR...
     * ...ALIGNING THE HANDRAIL
     * WELDING OF THE HANDRAIL CONNECTIONS WILL
     * ...BE DONE IN A SEPARATE SUB OPERATION

15 SET-UP HANDRAIL (END PIECES) ON HANDRAIL (AND BULKHEAD) WITH HAND (3971)  4
   * REPRESENTS PUTTING HANDRAIL (END PIECES)
     * ...AT THE END OF A STAGING LEVEL
     * WELDING OF THE HANDRAIL (END PIECES)...
     * ...CONNECTIONS WILL BE DONE IN A.....
     * ...SEPARATE SUB OPERATION

16 WELD HANDRAIL (CONNECTIONS) ON STANCHION WITH S(440)  14
   * TICK ELECTRODE
STANDARD TIME CALCULATION

17 MAKE READY LADDER FOR (TRANSPORTING) WITH HAND (427)
   * REPRESENTS GETTING LADDER ON BOLSTERS SO
   * ... THAT THE CRANE CAN TRANSPORT IT,

18 TRANSPORT LADDER WITH (TOUER CRANE) (564)
   * REPRESENTS TRANSPORTING LADDERS FROM
   * ... LDR-PILE TO BULKHEAD
   * DISTANCES FROM CRANE-REST TO LDR-PILE
   * ... AND FROM LDR-PILE TO BULKHEAD ARE
   * ... AVERAGE DISTANCE FROM SIDE OF BASIN
   * 1200’ x 200’
   * MAXIMUM NUMBER OF LADDERS IN LIFT = 3

19 SET-UP (ACCESS) LADDER ON BULKHEAD WITH HAND (383)
   * REPRESENTS PUTTING UP AN ACCESS LADDER...
   * ... ON THE BULKHEAD SO THAT THE CARPENTER
   * ... CAN CLIMB TO THE NEXT LADDER,
   * ALSO INCLUDES CLIMBING UP AND DOWN THE...
   * ... LADDER
   AVERAGE NUMBER OF RUNGS = 12

20 POSITION (SECURE) (ACCESS) LADDER FOR BULKHEAD (384)
   WITH
   * REPRESENTS SECURING A LADDER TO THE....
   * ... BULKHEAD USING 4 LADDER CLIPS
   * WELDING OF CLIPS WILL BE DONE IN A.....
   * ... SEPARATE SUB OPERATION

21 WELD LADDER (CLIP) (SECURES LADDER) ON BULKHEAD (438) .01
   (OR ANY STRUCTURE)
STANDARD TIME CALCULATION

M O S T OPERATION TIME CALCULATION

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ACTUAL PROCESS TIME(TMU) 0. 0.
FACTORED PROCESS TIME(TMU) 0.
TOTAL INTERNAL TIME(TMU) 0.

TITLE SHEET USED IN SETTING STANDARD: 0
### Engineered Operation Time Calculation

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STANDARD TIME CALCULATION

MOST OPERATION TIME CALCULATION

DETAIL/UNIT/PART × REV. LTR/DATE X

PROCESS/OPERATION CODE SET UP STANDARD CODE X

PART NAME 2 BOARD BRACKET STAGING

SHIP CLASS × HULL ×

COST CLASS/JOB # 131 TRADE CARPENTER

GROUP (UNIT/ZONE) × WORK AREA X

SUB-GROUP × WORK ZONE X

SUB-SUB-GROUP × WORK CENTER X

CREW/MACHINE 3 CARPENTERS ASSET/MACHINE X

ITEM 131-3 SUB-ITEM 131-3-1

GEN. DRAWING. 131 WORK ORDER X

DET. DRAWING × SHEET 1

WORK PACKAGE × APPLICATOR PA

OPER. DESCRIPTION SET UP BRACKET STAGING AT FLOOR LEVEL TRANSVERSE BULKHEAD WING TANK PER 100 LINEAR FEET

DATE 08-JUN-83 ISSUE # 1

Stem Method Instruction FreQ

1 SET-UP (STAGING CLIP) ON BULKHEAD WITH HAMMER ((376) 3 AND STEEL-TAPE)

* REPRESENTS PUTTING UP A STAGING CLIP ON THE BULKHEAD
* WELDING OF THE CLIP WILL BE DONE IN A...
* .SEPARATE SUB OPERATION

2 WELD STAGING BRACKET (CLIP) ON BULKHEAD (OR ANY(435) .06 STRUCTURE) WITH
STANDARD TIME CALCULATION

3 MAKE READY STAGING BRACKET FOR (TRANSPORTN6) WITH HAND

* REPRESENTS GETTING BRACKET READY TO BE...
* TRANSPORTED TO TANK OR BULKHEAD
* CARPENTER IS LOCATED EITHER ON THE WAY...
* OR IN TANK AT THE MATERIAL (BIN-1)

4 TRANSPORT STAGING BRACKET WITH (TOWER CRANE) (563)

* REPRESENTS TRANSPORTING BRACKETS FROM...
* BIN-1 TO BULKHEAD
* DISTANCES FROM CRANE-REST TO BIN-1 AND...
* ...FROM BIN-1 TO BULKHEAD ARE AVERAGE...
* ...DISTANCES FROM THE SIDE OF A BASIN
* ...1200' X 200'
* MAXIMUM NUMBER OF BRKTS IN LIFT = 6

5 SET-UP STAGING BRACKET ON WEB FRAME WITH WRENCH(569)

* REPRESENTS PUTTING UP A STAGING BRACKET...
* ...ON A EXISTING STAGING CLIP ( LOCATED...
* ...ON A WEB FRAME )

6 MAKE READY STAGING PLANK FOR (TRANSPORTING) WITH HAND

* REPRESENTS GETTING BOARD ON BOLSTERS SO...
* ...THAT THE CRANE CAN TRANSPORT IT

7 TRANSPORT STAGING PLANK WITH (TOWER CRANE) (565)

* REPRESENTS TRANSPORTING BOARDS FROM...
* ...LU-PILE TO BULKHEAD
* ...DISTANCES FROM CRANE-REST TO LU-PILE AND...
* ...FROM LU-PILE TO BULKHEAD ARE AVERAGE...
* ...DISTANCES FROM THE SIDE OF A BASIN
* ...1200' X 200'
* MAXIMUM NUMBER OF BOARDS IN LIFT = 3

8 SET-UP STAGING PLANK ON STAGING BRACKET WITH HAND (573)

* REPRESENTS SPREADING BOARDS BETWEEN WEBS...
* 2 MAN OPERATION:
* CARPENTERS ARE LOCATED AT TWO DIFFERENT...
* ...WEBS. THEY BOTH PICK UP THE BOARD...
* ...TOGETHER AND SLIDE IT INTO POSITION.
* IN THIS ANALYSIS CARPENTERS ARE LOCATED...
* ...ON THE SAME LEVEL AS THE BOARDS.

9 SET-UP STAGING PLANK ON (EXISTING) BRACKET STAGING WITH HAND (575)

* REPRESENTS SPREADING BOARDS BETWEEN

PAGE 247
STANDARD TIME CALCULATION

* ...EXISTING STAGING AND INBOARD OR OUTBOARD BULKHEAD
* 2 MAN OPERATION:
* CARPENTERS ARE LOCATED AT DIFFERENT WEBS
* EACH CARPENTER SPREADS TWO BOARDS
* SIMULTANEOUSLY
* IN THIS ANALYSIS CARPENTERS ARE LOCATED ON THE SAME LEVEL AS THE BOARDS.

10 MAKE READY STANCHION FOR (TRANSPORTING) WITH HA (429)

* REPRESENTS GETTING STANCHION READY TO BE TRANSPORTED

11 TRANSPORT STANCHION WITH (TOWER CRANE) (566)

* REPRESENTS TRANSPORTING STANCHION FROM...
* BIN-2 TO BULKHEAD
* DISTANCES FROM CRANE-REST TO BIN-2 AND...
* FROM BIN-2 TO BULKHEAD ARE AVERAGE...
* DISTANCES FROM THE SIDE OF A BASIN...
* 1200'X200'
* MAXIMUM NUMBER OF STANCHIONS IN LIFT = 6

12 SET-UP STANCHION IN STAGING BRACKET WITH HAND (577)

* REPRESENTS PUTTING STANCHION IN THE...
* BRACKET SLEEVE IN A WING TANK

13 MAKE READY HANDRAIL FOR (TRANSPORTING) WITH MAN (430)

* REPRESENTS GETTING HANDRAIL ON BOLSTERS
* SO THAT THE CRANE CAN TRANSPORT IT

14 TRANSPORT HANDRAIL WITH (TOWER CRANE) (567)

* REPRESENTS TRANSPORTING HANDRAIL FROM...
* HR-PILE TO BULKHEAD
* DISTANCES FROM CRANE-REST TO HR-PILE AND...
* FROM HR-PILE TO BULKHEAD ARE AVERAGE...
* DISTANCES FROM THE SIDE OF A BASIN...
* 1200'X200'
* MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6

15 SET-UP HANDRAIL IN STANCHION WITH HAND (578)

* REPRESENTS PUTTING HANDRAIL INTO THE...
* EYELETS ON THE STANCHION
* INCLUDES ACTION DISTANCES NEEDED FOR...
* ALIGNING THE HANDRAIL
* WELDING OF THE HANDRAIL WILL BE DONE IN...
* A SEPARATE SUB OPERATION

16 WELD HANDRAIL (CONNECTIONS) ON STANCHION WITH STICK ELECTRODE

PAGE 248
STANDARD TIME CALCULATION

17 (WALK UP OR DOWN) MOVE OPERATOR (ON INCLINED STAIRS) ON BULKHEAD

* REPRESENTS CARPENTER WALKING UP OR DOWN
* ...A SET OF INCLINED STAIRS. AVERAGE
* ...NUMBER OF TREADS IN A SET OF INCLINED
* ...STAIRS = 16.
* CARPENTERS ARE WALKING UP OR DOWN STAIRS
* AT THE SAME TIME.
### STANDARD TIME CALCULATION

#### W D S T OPERATION TIME CALCULATION

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**FACTORED PROCESS TIME (TMU)**  
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**TOTAL INTERNAL TIME (TMU)**  
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**TITLE SHEET USED IN SETTING STANDARD:**  
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STANDARD TIME CALCULATION

M O S T OPERATION TIME CALCULATION

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STANDARD TIME CALCULATION

M O S T OPERATION TIME CALCULATION

DETAIL/UNIT/PART X REVD. LTR/DATE X

PROCESS/OPER CODE SET UP STANDARD CODE X

PART NAME 2 BOARD BRACKET STAGING

SHIP CLASS X HULL X

COST CLASS/JOB # 131 TRADE CARPENTER

GROUP (UNIT/ZONE) X WORK AREA X

SUB-GROUP X WORK ZONE X

SUB-SUB-GROUP X WORK CENTER X

CREW/MACHINE 3 CARPENTERS ASSET/MACHINE X

ITEM 131-3 SUB-ITEM 131-3-1

GEN. DRAWING 131 WORK ORDER X

DET. DRAWING X SHEET 1

WORK PACKAGE X APPLICATOR PP

OPER. DESCRIPTION SET UP BRACKET STAGING BELOW FLOOR TRANSVERSE BULKHEAD WING TANK PER 100 LINEAR FEET

DATE 08-JUN-83 ISSUE # 1

Step Method Instruction Freq

1 SET-UP (STAGING CLIP) ON BULKHEAD WITH HAMMER ((376) AND STEEL-TAPE) 3

* REPRESENTS PUTTING UP A STAGING CLIP ON
* ...THE BULKHEAD
* WELDING OF THE CLIP WILL BE DONE IN A...
* ...SEPARATE SUB OPERATION

2 WELD STAGING BRACKET (CLIP) ON BULKHEAD (OR ANY (435) STRUCTURE) WITH .06
STANDARD TIME CALCULATION

3 MAKE READY STAGING BRACKET FOR (TRANSPORTING) WITH HAND (426) 6

* REPRESENTS GETTING BRACKET READY TO BE...
* ...TRANSPORTED TO TANK OR BULKHEAD
* CARPENTER IS LOCATED EITHER ON THE WAY...
* ...OR IN TANK AT THE MATERIAL (BIN-1)

4 TRANSPORT STAGING BRACKET WITH TOWER CRANE (563) 6

* REPRESENTS TRANSPORTING BRACKETS FROM...
* ...BIN-1 TO BULKHEAD
* DISTANCES FROM CRANE-REST TO BIN-1 AND...
* ...FROM BIN-1 TO BULKHEAD ARE AVERAGE...
* ...DISTANCES FROM THE SIDE OF A BASIN
* ...1200' X 200'
* MAXIMUM NUMBER OF BRKTS IN LIFT = 6

5 MAKE READY STAGING BRACKET FOR (TRANSPORTING) WITH HAND (377) 6

* REPRESENTS GETTING BRACKET READY TO BE...
* ...TRANSPORTED TO TANK OR BULKHEAD
* CARPENTER IS LOCATED EITHER ON THE WAY...
* ...OR IN TANK AT THE MATERIAL (BIN-1)

6 SET-UP STAGING BRACKET ON WEB FRAME WITH WRENCH (569) 2

* REPRESENTS PUTTING UP A STAGING BRACKET
* ...ON A EXISTING STAGING CLIP ( LOCATED
* ...ON A WEB FRAME )

7 MAKE READY STAGING PLANK FOR (TRANSPORTING) WITH HAND (428) 20

* REPRESENTS GETTING BOARD ON BOLSTERS SO
* ... THAT THE CRANE CAN TRANSPORT IT

8 TRANSPORT STAGING PLANK WITH TOWER CRANE (565) 20

* REPRESENTS TRANSPORTING BOARDS FROM
* ...LU-PILE TO BULKHEAD
* DISTANCES FROM CRANE-REST TO LU-PILE AND
* ...FROM LU-PILE TO BULKHEAD ARE AVERAGE
* ...DISTANCES FROM THE SIDE OF A BASIN
* ...1200' X 200'
* MAXIMUM NUMBER OF BOARDS IN LIFT = 3

9 SET-UP STAGING PLANK ON STAGING BRACKET WITH HX (573) 5

* REPRESENTS SPREADING BOARDS BETWEEN WEBS
* ... 2 MAN OPERATION!
* CARPENTERS ARE LOCATED AT TWO DIFFERENT
* ...WEBS. THEY BOTH PICK UP THE BOARD

PAGE 253
STANDARD TIME CALCULATION

* ...TOGETHER AND SLIDE IT INTO POSITION.
* IN THIS ANALYSIS CARPENTERS ARE LOCATED
* ...ON THE SAME LEVEL AS THE BOARDS.
10 SET-UP STAGING PLANK ON (EXISTING) BRACKET ST(575) AGING WITH HAND

* REPRESENTS SPREADING BOARDS BETWEEN
* ...EXISTING STAGING AND INBOARD OR
* ...OUTBOARD BULKHEAD
* 2 MAN OPERATION;
* CARPENTERS ARE LOCATED AT DIFFERENT WEBs
* ...EACH CARPENTER SPREADS TWO BOARDS
* ...SIMULTANEOUSLY
* IN THIS ANALYSIS CARPENTERS ARE LOCATED
* ...ON THE SAME LEVEL AS THE BOARDS.
11 MAKE READY STANCHION FOR (TRANSPORTING) WITH HA(429) ND

* REPRESENTS GETTING STANCHION READY TO BE
* ...TRANSPORTED.
12 TRANSPORT STANCHION WITH (TOWER CRANE) (566)

* REPRESENTS TRANSPORTING STANCHION FROM...
* ...BIN-2 TO BULKHEAD
* ...DISTANCES FROM CRANE-REST TO BIN-2 AND...
* ...FROM BIN-2 TO BULKHEAD ARE AVERAGE...
* ...DISTANCES FROM THE SIDE OF A BASIN
* ...1200′X200′
* MAXIMUM NUMBER OF STANCHIONS IN LIFT = 6
13 SET-UP STANCHION IN STAGING BRACKET WITH HAND (393)

* REPRESENTS PUTTING STANCHION IN THE.....
* ...BRACKET SLEEVE.
14 MAKE READY HANDRAIL FOR (TRANSPORTING) WITH HAN(430) D

* REPRESENTS GETTING HANDRAIL ON BOLSTERS
* ...SO THAT THE CRANE CAN TRANSPORT IT
15 TRANSPORT HANDRAIL WITH (TOWER CRANE) (567)

* REPRESENTS TRANSPORTING HANDRAIL FROM...
* ...HR-PILE TO BULKHEAD
* ...DISTANCES FROM CRANE-REST TO HR-PILE AND
* ...FROM HR-PILE TO BULKHEAD ARE AVERAGE
* ...DISTANCES FROM THE SIDE OF A BASIN
* ...1200′X200′
* MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6
16 SET-UP HANDRAIL ON STANCHION WITH HAND (396)

* REPRESENTS PUTTING HANDRAIL INTO THE.....
* ...EYELETS ON THE STANCHION
STANDARD TIME CALCULATION

* INCLUDES ACTION DISTANCES NEEDED FOR....
* ...ALIGNING THE HANDRAIL
* WELDING OF THE HANDRAIL CONNECTIONS WILL
* ...BE DONE IN A SEPARATE SUB OPERATION
17 WELD HANDRAIL (CONNECTIONS) ON STANCHION WITH S( 440) .10 TICK ELECTRODE

18 (WALK UP OR DOWN) MOVE OPERATOR (ON INCLINED ST( 431) AIRS) ON BULKHEAD

* REPRESENTS CARPENTER WALKING UP OR DOWN
* ...A SET OF INCLINED STAIRS AVERAGE
* ...NUMBER OF TREADS IN A SET OF INCLINED
* ...STAIRS = 16.
* CARPENTERS ARE WALKING UP OR DOWN STAIRS
* AT THE SAME TIME.
# Standard Time Calculation

## Most Operation Time Calculation

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**Actual Process Time (TMU)**

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**Factored Process Time (TMU)**

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**Total Internal Time (TMU)**

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**Title Sheet Used in Setting Standard:**

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**STANDARD TIME CALCULATION**

**MOST OPERATION TIME CALCULATION**

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**Engineered Operation Time Calculation**
### Standard Time Calculation

**MOST OPERATION TIME**

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### Step Method Instruction

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* REPRESENTS TEARING DOWN HANDRAIL IN A...
* ...WING TANK. HANDRAIL IS LOWERED TO THE MATL-PILE WITH A WINCH BECAUSE THE...
* ...TANK IS TO SMALL FOR THE HANDRAIL TO BE THROWN.
* CARPENTERS REMOVE 2 HANDRAIL BEFORE....
STANDARD TIME CALCULATION

* MOVING TO THE NEXT SECTION.
* MAXIMUM NUMBERS OF HANDRAIL IN LIFT = 6

2 TEAR DOWN STANCHION ON BULKHEAD WITH HAND (AND ( 401) 3
WINCH)

* REPRESENTS TEARING DOWN STANCHION IN A...
* "WING TANK, STANCHION IS LOWERED TO...
* "THE MATL-PILE WITH A WINCH BECAUSE...
* "THE TANK IS TO SMALL FOR THE.........
* "STANCHION TO BE THROWN.
* MAXIMUM NUMBER OF STANCHIONS IN LIFT = 6

3 TEAR DOWN STAGING PLANK ON STAGING BRACKET WITH( 402) 34
   HAND (AND WINCH)

* REPRESENTS REMOVING BOARDS FROM ANY TANK
* "WINCH IS USED TO LOWER BOARD TO......
* "BD-PILE ON TANKTOP.
* MAXIMUM NUMBER OF BOARDS IN LIFT = 3

4 TEAR DOWN STAGING BRACKET ON BULKHEAD WITH WREN( 406) 6
   CH

* REPRESENTS TEARING DOWN STAGING BRACKET
* "IN ANY TANK. BRACKETS ARE LOWERED TO
* "MATL-PILE BY WINCH.
* MAXIMUM NUMBER OF BRACKETS IN LIFT = 3

5 TEAR DOWN LADDER (AND LADDER CLIPS) ON BULKHEAD( 403) 1
   WITH

* REPRESENTS REMOVING LADDER FROM BULKHEAD
* "THERE ARE 4 LADDER CLIPS PER LADDER.
* "LADDER LOWERED TO LDR-PILE BY WINCH
* "LADDER CLIPS THROWN TO MATL-PILE.

6 (CLIMB UP AND DOWN) MOVE OPERATOR (ON LADDER) ON( 404) 1
   IN BULKHEAD

* REPRESENTS CARPENTERS CLIMBING UP AND...
* "DOWN LADDERS TO REMOVE STAGING.
* AVERAGE LADDER SIZE = 12 RUNGS.

7 REMOVE HANDRAIL ON (MATERIAL-PILE) WITH WINCH ( 407) 14
   * REPRESENTS REMOVAL OF HANDRAIL FROM MATL
   * "PILE ON TANKTOP TO DECK (GOING THRU
   * "MANHOLE).
   * MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6

8 REMOVE STANCHION ON (MATERIAL PILE) WITH WINCH ( 408) 6
   * REPRESENTS REMOVAL OF STANCHION FROM...
   * "MATL-PILE ON TANKTOP TO DECK (GOING
   * "THRU MANHOLE).
STANDARD TIME CALCULATION

9 REMOVE STAGING PLANK ON (BOARD PILE) WITH WINCH (410) 34
  * MAXIMUM NUMBER OF STANCHION IN LIFT = 6
  * REPRESENT REMOVING BOARDS FROM BOARD...
  * ...PILE ON TANKTOP TO DECK (GOES THRU...
  * ...MANHOLE):
  * MAXIMUM NUMBER OF BOARDS IN LIFT = 3
10 REMOVE STAGING BRACKET ON (MATERIAL PILE) WITH (409) 6
   WINCH
   * REPRESENTS REMOVAL OF BRACKET FROM MATL
   * ...PILE ON TANKTOP TO DECK (GOING THRU
   * ...MANHOLE):
   * MAXIMUM NUMBER OF BRACKET IN LIFT = 3
11 REMOVE LADDER ON (LADDER-PILE) WITH WINCH (411) 1
   * REPRESENT REMOVING LADDERS FROM LADDER
   * ...PILE ON TANKTOP TO DECK (GOES THRU...
   * ...MANHOLE):
   * MAXIMUM NUMBER OF LADDERS IN LIFT = 3
12 REMOVE TOOLBOX ON (MATERIAL PILE) WITH WINCH (412) 1
   * REPRESENTS REMOVING TOOLBOX FROM MATL...
   * ...PILE ON TANKTOP TO DECK (GOES THRU...
   * ...MANHOLE):
   * TOOLBOX CONTAINS:
   * ...28 BOLTS
   * ...28 NUTS
   * ...28 LADDER CLIPS
STANDARD TIME CALCULATION

M O S T OPERATION TIME CALCULATION

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MANUAL TIME (TMU) 0. 1405938.

ACTUAL PROCESS TIME (TMU) 0.

FACTORED PROCESS TIME (TMU) 0.

TOTAL INTERNAL TIME (TMU) 0.

TITLE SHEET USED IN SETTING STANDARD: 0
## STANDARD TIME CALCULATION

### MOST OPERATION TIME CALCULATION

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**Date: 08-Jun-83**  
**Issue #: 1**

### Step Method Instruction

1. **TEAR DOWN HANDRAIL ON BULKHEAD WITH TORCH (AND 399 WINCH)**

* $ REPRESENTS TEARING DOWN HANDRAIL IN A...
* ***WING TANK, HANDRAIL IS LOWERED TO THE***
* ***MATL-PILE WITH A WINCH BECAUSE THE***
* ***TANK IS TO SMALL FOR THE HANDRAIL TO***
* ***BE THROWN.***
* CARPENTERS REMOVE 2 HANDRAIL BEFORE.......

---

Page 263
STANDARD TIME CALCULATION

* MOVING TO THE NEXT SECTION.
* MAXIMUM NUMBERS OF HANDRAIL IN LIFT = 6

2 TEAR DOWN STANCHION ON BULKHEAD WITH HAND (AND ( 401) 3
WINCH)

* REPRESENTS TEARING DOWN STANCHION IN A...
* wing tank, stanchion is lowered to...
* the matl-PILE with a winch because...
* the tank is too small for the...........
* stanchion to be thrown.
* maximum number of stanchions in lift = 6

3 TEAR DOWN STAGING PLANK ON STAGING BRACKET WITH( 402) 10
HAND (AND WINCH)

* REPRESENTS REMOVING BOARDS FROM ANY TANK
* WING WINCH IS USED TO LOWER BOARD TO.....
* BD-PILE ON TANKTOP.
* maximum number of boards in lift = 3

4 TEAR DOWN STAGING BRACKET ON BULKHEAD WITH WREN( 406) 6
CH

* REPRESENTS TEARING DOWN STAGING BRACKET
* IN ANY TANK, BRACKETS ARE LOWERED TO
* MATL-PILE BY WINCH.
* maximum number of brackets in lift = 3

5 TEAR DOWN LADDER (AND LADDER CLIPS) ON BULKHEAD( 403) 1
WITH

* REPRESENTS REMOVING LADDER FROM BULKHEAD
* THERE ARE 4 LADDER CLIPS PER LADDER.
* LADDER LOWERED TO LDR-PILE BY WINCH
* LADDER CLIPS THROWN TO MATL-PILE.

6 (CLIMB UP AND DOWN) MOVE OPERATOR (ON LADDER) ON ( 404) 1
BULKHEAD

* REPRESENTS CARPENTERS CLIMBING UP AND...
* DOWN LADDERS TO REMOVE STAGING.
* AVERAGE LADDER SIZE = 12 RUNGS.

7 REMOVE HANDRAIL ON (MATERIAL-PILE) WITH WINCH ( 407) 14
* REPRESENTS REMOVAL OF HANDRAIL FROM MATL
* PIECE ON TANKTOP TO DECK (GOING THRU
* MANHOLE).
* maximum number of handrail in lift = 6

8 REMOVE STANCHION ON (MATERIAL PILE) WITH WINCH ( 408) 6
* REPRESENTS REMOVAL OF STANCHION FROM...
* MATL-PILE ON TANKTOP TO DECK (GOING
* THRU MANHOLE).
STANDARD TIME CALCULATION

* MAXIMUM NUMBER OF STANCHION IN LIFT = 6
9 REMOVE STAGING PLANK ON (BOARD PILE) WITH WINCH (410) 10
* REPRESENT REMOVING BOARDS FROM BOARD...
* ...PILE ON TANKTOP TO DECK (GOES THRU...
* ...MANHOLE).
* MAXIMUM NUMBER OF BOARDS IN LIFT = 3
10 REMOVE STAGING BRACKET ON (MATERIAL PILE) WITH (409) 6
WINCH
* REPRESENTS REMOVAL OF BRACKET FROM MATL
* ...PILE ON TANKTOP TO DECK (GOING THRU
* ...MANHOLE).
* MAXIMUM NUMBER OF BRACKET IN LIFT = 3
11 REMOVE LADDER ON (LADDER-PILE) WITH WINCH (411)
* REPRESENT REMOVING LADDERS FROM LADDER
* ...PILE ON TANKTOP TO DECK (GOES THRU...
* ...MANHOLE).
* MAXIMUM NUMBER OF LADDERS IN LIFT = 3
12 REMOVE TOOLBOX ON (MATERIAL PILE) WITH WINCH (412)
* REPRESENTS REMOVING TOOLBOX FROM MATL...
* ...PILE ON TANKTOP TO DECK (GOES THRU...
* ...MANHOLE).
* TOOLBOX CONTAINS:
* ...28 BOLTS
* ...28 NUTS
* ...28 LADDER CLIPS
STANDARD TIME CALCULATION

M O S T OPERATION TIME CALCULATION

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TOTAL INTERNAL TIME (TMU)  0.

TITLE SHEET USED IN SETTING STANDARD:  0
STANDARD TIME CALCULATION

M O S T OPERATION TIME CALCULATION

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PAGE 247
STANDARD TIME CALCULATION

M O S T OPERATION TIME CALCULATION

DETAIL/UNIT/PART X

PROCESS/OPER CODE REMOVE

PART NAME 2 BOARD BRACKET STAGING

SHIP CLASS X

COST CLASS/JOB $ 131

GROUP (UNIT/ZONE) X

SUB-GROUP X

SUB-SUB-GROUP X

CREW/MACHINE 6 CARPENTERS

ITEM 131-3

GEN. DRAWING 131

DET. DRAWING X

WORK PACKAGE X

OPER. DESCRIPTION TEAR DOWN AND REMOVE BRACKET STAGING AT FLOOR

TRANSVERSE BULKHEAD WING TANK PER 100 LIN FT

DATE 08-JUN-83 ISSUE # 1

Step Method Instruction Free

1 TEAR DOWN HANDRAIL ON BULKHEAD WITH TORCH (AND ( 399) 10
WINCH)

* REPRESENTS TEARING DOWN HANDRAIL IN A...
* ...WING TANK. HANDRAIL IS LOWERED TO THE
* ...MATL-PILE WITH A WINCH BECAUSE THE...
* ...TANK IS TO SMALL FOR THE HANDRAIL TO
* ...BE THROWN.
* CARPENTERS REMOVE 2 HANDRAIL BEFORE....
STANDARD TIME CALCULATION

1. MOVING TO THE NEXT SECTION.
2. TEAR DOWN STANCHION ON BULKHEAD WITH HAND (AND WINCH) - 3
3. TEAR DOWN STAGING PLANK ON STAGING BRACKET WITH (AND WINCH) - 40
4. TEAR DOWN STAGING BRACKET ON BULKHEAD WITH WREN (AND WINCH) - 6
5. (WALK UP OR DOWN) MOVE OPERATOR (ON INCLINED STAIRS) ON BULKHEAD - 431
6. REMOVE HANDRAIL ON (MATERIAL-PILE) WITH WINCH (AND WINCH) - 407
7. REMOVE STANCHION ON (MATERIAL-PILE) WITH WINCH (AND WINCH) - 408
8. REMOVE STAGING PLANK ON (BOARD PILE) WITH WINCH - 410

* REPRESENTS CARPENTER WALKING UP OR DOWN
* A SET OF INCLINED STAIRS, AVERAGE
* NUMBER OF TREADS IN A SET OF INCLINED
* STAIRS = 16.
* CARPENTERS ARE WALKING UP OR DOWN STAIRS
* AT THE SAME TIME.
* REPRESENTS REMOVAL OF HANDRAIL FROM MATL
* PILE ON TANKTOP TO DECK (GOING THRU MANHOLE).
* MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6
* REPRESENTS REMOVAL OF STANCHION FROM...
* MATL-PILE ON TANKTOP TO DECK (GOING THRU MANHOLE).
* MAXIMUM NUMBER OF STANCHIONS IN LIFT = 6
* REPRESENTS REMOVING BOARDS FROM BOARD...
* PILE ON TANKTOP TO DECK (GOES THRU..
STANDARD TIME CALCULATION

9 REMOVE STAGING BRACKET ON (MATERIAL PILE) WITH (409) WINCH

* MAXIMUM NUMBER OF BOARDS IN LIFT = 3

* REPRESENTS REMOVAL OF BRACKET FROM MATL PILE ON TANKTOP TO DECK (GOING THRU MANHOLE).

9 REMOVE STAGING BRACKET ON (MATERIAL PILE) WITH WINCH (409) 6

* MAXIMUM NUMBER OF BRACKET IN LIFT = 3

10 REMOVE TOOLBOX ON (MATERIAL PILE) WITH WINCH (412) 1

* REPRESENTS REMOVING TOOLBOX FROM MATL-PILE ON TANKTOP TO DECK (GOES THRU MANHOLE).

* TOOLBOX CONTAINS:
* ...28 BOLTS
* ...28 NUTS
* ...28 LADDER CLIPS
## STANDARD TIME CALCULATION

### MOST OPERATION TIME CALCULATION

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- MANUAL TIME(TMU): 0.1766827
- ACTUAL PROCESS TIME(TWJ): 0.0
- FACTORED PROCESS TIME(THU): 0.0
- TOTAL INTERNAL TIME(TMU): 0.0

TITLE SHEET USED IN SETTING STANDARD: 0

PAGE 271
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### Standard Time Calculation

#### MOST Operation Time Calculation

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**Oper. Description**

Tear down and remove bracket staging below floor

Transverse Bulkhead Wing Tank per 100 Lin Ft

**Date**

08-JUN-83

**Issue #**

1

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* Represents tearing down handrail in a...
* Wing tank, handrail is lowered to the...
* Matl-PILE with a winch because the...
* Tank is too small for the handrail to...
* Be thrown.
* Carpenters remove 2 handrail before.....
STANDARD TIME CALCULATION

* ...MOVING TO THE NEXT SECTION.
* MAXIMUM NUMBERS OF HANDRAIL IN LIFT = 6

2 TEAR DOWN STANCHION ON BULKHEAD WITH HAND (AND ( 401) 3 WINCH)

* REPRESENTS TEARING DOWN STANCHION IN A...
* WING TANK. STANCHION IS LOWERED TO...
* THE MATL-PILE WITH A WINCH BECAUSE...
* THE TANK IS TO SMALL FOR THE..........
* STANCHION TO BE THROWN.
* MAXIMUM NUMBER OF STANCHIONS IN LIFT = 6

3 TEAR DOWN STAGING PLANK ON STAGING BRACKET WITH( 402) 20 HAND (AND WINCH)

* REPRESENTS REMOVING BOARDS FROM ANY TANK
* WINCH IS USED TO LOWER BOARD TO......
* BD-PILE ON TANKTOP.
* MAXIMUM NUMBER OF BOARDS IN LIFT = 3

4 TEAR DOWN STAGING BRACKET ON BULKHEAD WITH WRENCH CH 406)

* REPRESENTS TEARING DOWN STAGING BRACKET
* IN ANY TANK. BRACKETS ARE LOWERED TO
* MATL-PILE BY WINCH.
* MAXIMUM NUMBER OF BRACKETS IN LIFT = 3

5 (WALK UP OR DOWN) MOVE OPERATOR (ON INCLINED STAIRS) ON BULKHEAD 431)

* REPRESENTS CARPENTER WALKING UP OR DOWN
* A SET OF INCLINED STAIRS. AVERAGE
* NUMBER OF TREADS IN A SET OF INCLINED
* STAIRS = 16.
* CARPENTERS ARE WALKING UP OR DOWN STAIRS
* AT THE SAME TIME.

6 REMOVE HANDRAIL ON (MATERIAL-PILE) WITH WINCH ( 407) 10

* REPRESENTS REMOVAL OF HANDRAIL FROM MATL
* PILE ON TANKTOP TO DECK (GOING THRU
* MANHOLE).
* MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6

7 REMOVE STANCHION ON (MATERIAL PILE) WITH WINCH ( 408) 6

* REPRESENTS REMOVAL OF STANCHION FROM...
* MATL-PILE ON TANKTOP TO DECK (GOING
* THRU MANHOLE).
* MAXIMUM NUMBER OF STANCHION IN LIFT = 6

8 REMOVE STAGING PLANK ON (BOARD PILE) WITH WINCH( 410) 20

* REPRESENT REMOVING BOARDS FROM BOARD...
* -PILE ON TANKTOP TO DECK (GOES THRU...
STANDARD TIME CALCULATION

* ...MANHOLE).
* MAXIMUM NUMBER OF BOARDS IN LIFT = 3
9 REMOVE STAGING BRACKET ON (MATERIAL PILE) WITH (409) WINCH

* REPRESENTS REMOVAL OF BRACKET FROM MAIL
* ...PILE ON TANKTOP TO DECK (GOING THRU
* ...MANHOLE)
* MAXIMUM NUMBER OF BRACKET IN LIFT = 3

10 REMOVE TOOLBOX ON (MATERIAL PILE) WITH WINCH (412)
* REPRESENTS REMOVING TOOLBOX FROM MAIL...
* ...PILE ON TANKTOP TO DECK (GOES THRU...
* ...MANHOLE).
* TOOLBOX CONTAINS:
* ...28 BOLTS
* ...28 NUTS
* ...28 LADDER CLIPS
STANDARD TIME CALCULATION

M O S T OPERATION TIME CALCULATION

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MANUAL TIME(TMU) 0.  1916573.

ACTUAL PROCESS TIME(TMU) 0.  0.

FACTORED PROCESS TIME(THU) 0.

TOTAL INTERNAL TIME(TMU) 0.

TITLE SHEET USED IN SETTING STANDARD: 0
### Engineered Operation Time Calculation

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**PIECES PER CYCLE**

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**STANDARD HOURS**

1.5
STANDARD TIME CALCULATION

4.2 HOW TO CALCULATE TIME STANDARDS

MOST OPERATION TIME CALCULATION

DETAIL/UNIT/PART x REV. LTR/DATE x
PROCESS/OPER CODE SET UP STANDARD CODE x
PART NAME TANK STAGING PLATFORM
SHIP CLASS x HULL x
COST CLASS/JOB # 131 TRADE CARPENTER
GROUP (UNIT/ZONE) x WORK AREA x
SUE-GROUP x WORK ZONE x
SUB-SUB-GROUP x WORK CENTER x
CREW/MACHINE 2 CARPENTERS ASSET/MACHINE x
ITEM 131-3 SUB-ITEM 131-3-3
GEN. DRAWING 131 WORK ORDER x
DET. DRAWING x SHEET 1
WORK PACKAGE x APPLICATOR PP

OPER. DESCRIPTION ASSEMBLE TANK STAGING PLATFORM, PLACE ON SHIP,
SECURE TO MAIN DECK PER 100 SQUARE FEET

DATE 18-MAY-83 ISSUE # 1

Step Method Instruction Freq
1 (BRUSH) CLEAN (PLATEN) FOR TANK STAGING PLATFORM (538) M WITH BROOM .14

* REPRESENTS CLEANING THE TABLE BEFORE THE
* ...TANK STAGING PLATFORM IS ASSEMBLED.
* SQUARE FOOTAGE OF AREA CLEANED = 700
2 READ MATERIAL LIST (PRINT) FOR TANK STAGING PLATFORM (539) .14

PAGE 278
STANDARD TIME CALCULATION

TFORM WITH (EYES)

* CARPENTER READS PRINT BEFORE LAYING OUT
* ...TABLE, READS 48 DIGITS PER LOCATION

3 MEASURE (PLATEN) FOR TANK STAGING PLATFORM WITH (STEEL) TAPE

* REPRESENTS MEASURING TABLE FOR LAYOUT
* ANALYSIS INCLUDES ALL THE WALKING....
* ...DISTANCES FOR THE LAYOUT.
* STEPS:
* 2,3,4 ARE FOR I-1,I-2,I-3,I-4,AND I-5
* ...AT A-5 AND A-6.
* 5,6,7 ARE FOR A-5,I-7,A-4,A-3,A-1,I-6,
* ...AND A-6 AT I-5
* 5,6,7 ARE FOR A-5,I-7,A-4,A-2,A-1,I-6,
* ...AND A-6 AT I-1
* 9,10,11 ARE FOR A-2 AND A-3 AT I-3

4 MARK (PLATEN) FOR TANK STAGING PLATFORM WITH MARKER

* REPRESENTS MARKING THE LAYOUT FOR A TANK
* ...STAGING PLATFORM AND INSPECTING WORK.
* THE FOLLOWING PLACES ARE LAID OUT:
* ...AT A-5 AND A-6:
* ...I-1,I-2,I-3,I-4, AND I-5
* ...AT I-1 AND I-5:
* ...A-6,I-6,A-1,A-4,I-7, AND A-5
* ...A-2 IS LAID OUT AT I-3 AND I-1
* ...A-3 IS LAID OUT AT I-3 AND I-5

5 TRANSPORT PALLETT (I-BEAMS AND ANGLES) FOR TANK STAGING PLATFORM

* MATERIAL NEEDED FOR ONE PLATFORM:
* ...I-BEAMS - 7
* ...ANGLES - 6

6 SET-UP I-BEAMS FOR TANK STAGING PLATFORM WITH (CRANE)

* CARPENTER WORKS SIMULTANEOUSLY WITH THE
* ...HOOK-ON
* STEP 3 INCLUDES SPREADING I-BEAMS AT:
* ...I-2,I-3,I-4, AND I-5

7 SET-UP ANGLE-BARS FOR TANK STAGING PLATFORM WITH (CRANE)

* CARPENTER WORKS SIMULTANEOUSLY WITH THE
STANDARD TIME CALCULATION

* **HOOKER-ON**
* **STEP 1 INCLUDES SPREADING ANGLES AT:**
  * **A-6, A-1, AND A-2**
* **STEP 2 INCLUDES SPREADING ANGLES AT:**
  * **A-3, A-4, AND A-5**

8 **ASSEMBLE I-BEAMS FOR TANK STAGING PLATFORM WITH**
   **WRENCH**

* **CARPENTER WORKS ALONE BOLTING I-BEAMS**
* **STEPS:**
  * 1-4 ARE FOR THE CONNECTIONS OF I-6 & I-7
  * **AT** I-1, I-2, I-3, I-4, AND I-5
  * 5-6 ARE FOR MOVEMENT OF THE CARPENTER
  * **BETWEEN THE CONNECTIONS**

9 **ASSEMBLE ANGLE-BARS FOR TANK STAGING PLATFORM W**
   **ITH WRENCH**

* **CARPENTER WORKS ALONE ASSEMBLING ANGLES**
* **STEPS:**
  * 1-6 ARE FOR CONNECTIONS OF A-4 AND A-1
  * **AT** I-1, I-2, I-3, I-4, I-5
  * 7-13 ARE FOR CONNECTIONS OF
  * **AT** I-5, I-4, AND I-3
  * **AT** I-3, I-2, AND I-1
  * 14-20 ARE FOR CONNECTIONS OF A-5 AND A-6
  * **AT** I-1, I-2, I-3, I-4, AND I-5

10 **TRANSPORT STAGING PLANKS FOR TANK STAGING PLATF**
    **ORM WITH (CRANE)**

* **BOARDS ARE TRANSPORTED FROM LUMBER PILE**
  * **WHICH IS LOCATED ON THE PLATEN.**
  * **TOTAL NUMBER OF BOARDS IN LIFT = 64**
  * **TOTAL LIFTS = 2 (PORT AND STARBOARD)**

11 **SET-UP STAGING PLANKS ON TANK STAGING PLATFORM (**
    **WITH HANDS**

* **CARPENTERS SPREAD BOARDS SIMULTANEOUSLY**
* **BOARDS ARE SPREAD ON PORT SIDE FIRST....**
  * **THEN STARBOARD SIDE.**
  * **TOTAL BOARDS PER SIDE = 32**
* **STEPS:**
  * 2-5 SPREAD BOARDS BETWEEN A-6 & I-6 P/S
  * 6-8 SPREAD BOARDS BETWEEN I-6 & A-1 P/S
  * 9-11 SPREAD BOARDS BETWEEN A-1 & A-3 S
  * **AND A-1 & A-2 P**
  * 12-14 SPREAD BOARDS BETWEEN A-3 & A-4 S
  * **AND A-2 & A-4 P**
STANDARD TIME CALCULATION

1. 15-17 SPREAD BOARDS BTWN A-4 & I-7 P/S
2. 18-20 SPREAD BOARDS BTWN I-7 & A-5 P/S
3. 21-22 SPREAD BOARD AT A-5 P/S
4. 12 TRANSPORT (FINISHED) TANK STAGING PLATFORM WITH (CRANE) (549)

5. TRANSPORT FINISHED PLATFORM TO A STORAGE PILE
6. 13 POSITION (PLACE) TANK STAGING PLATFORM (AND BOARDS) IN

7. REPRESENTS SETTING TANK STAGING PLATFORM
8. IN A TYPICAL TANK ON THE SHIP, ALSO
9. THE BOARDS NEEDED TO EXTEND THE PLATFORM UNDER THE MAIN DECK.
10. 2 HOOKERS-ONS: ONE AT THE MATERIAL AND ONE ON THE SHIP IN THE TANK.
11. TOTAL OF 280 FOR TYPICAL TANK
12. 7 LIFTS (40 BOARDS PER LIFT)
13. 14 POSITION (RAISE) TANK STAGING PLATFORM WITH (CRANE) (555)

14. REPRESENTS RAISING TYPICAL PLATFORM IN A CENTER TANK AND SECURING IT TO THE MAIN DECK.
15. 2 CARPENTERS WORK SIMULTANEOUSLY ON THE MAIN DECK
16. 2 CARPENTERS WORK SIMULTANEOUSLY IN THE CENTER TANK ON THE PLATFORM STEPS
17. 2-4 FEEDING 4 CABLES THROUGH BUTTERWORTH HOLES ON MAIN DECK
18. 7-12 CONNECTION OF SHACKLES ON PLATFORM
19. 14-19 CONNECTION OF SUSPENSION CABLES ON PLATFORM AND MAIN DECK
20. 21-26 REMOVING SHACKLES FROM PLATFORM
21. 27-29 REMOVING CABLES FROM CENTER TANK
STANDARD TIME CALCULATION

MOST OPERATION TIME CALCULATION

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TOTAL INTERNAL TIME(TMU) 0.

TITLE SHEET USED IN SETTING STANDARD: 0
STANDARD TIME CALCULATION

MOST OPERATION TIME CALCULATION

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#### M O S T  Operation Time Calculation

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* Represents lowering typical platform in
* ...A center tank and removing it from
* ...The main deck,
* 2 Carpenters work simultaneously on the
* ...Main deck
* 2 Carpenters work simultaneously in the

---

Page 284
STANDARD TIME CALCULATION

* ...CENTER TANK ON THE PLATFORM
* STEPS:
* 1-4 FEEDING 4 CABLES THROUGH BUTTERWORTH
* ...HOLES ON MAIN DECK
* 6-11 CONNECTION OF SHACKLES ON PLATFORM
* 13-18 REMOVAL OF SUSPENSION CABLES FROM
* ...PLATFORM AND MAIN DECK
* 23-28 REMOVING SHACKLES FROM PLATFORM
* 29-31 REMOVING CABLES FROM CENTER TANK
2 TEAR DOWN STAGING PLANKS ON TANK STAGING PLATFORM (552) .14
RM WITH WINCH

* REPRESENTS REMOVAL OF BOARDS ON A TANK
* ...STAGING PLATFORM (IN A CENTER TANK)
* TOTAL BOARDS = 64 (22 LIFTS)
* 2 CARPENTERS MOVE BOARDS FROM THE TANK
* ...STAGING PLATFORM TO A LUMBER-PILE
* ...LOCATED NEAR A MANHOLE. A WINCH
* ...OPERATOR AND A CARPENTER REMOVE THE
* ...BOARDS FROM THE TANK, THERE ARE 2
* ...CARPENTERS WHO RECEIVE AND STACK THE
* ...BOARDS ON THE DECK, THEIR TIME IS
* ...INTERNAL TO THE WINCH PROCESS TIME.
3 TEAR DOWN ANGLES ON TANK STAGING PLATFORM WITH (550) .14
WRENCH

* CARPENTER WORKS ALONE UNBOLTING ANGLES
* STEPS:
* 1-5 ARE FOR REMOVING BOLTS ON A-4 & A-1
* ...AT I-1, I-2, I-3, I-4, AND I-5
* 7-11 ARE FOR REMOVING BOLTS
* ...ON A-3 AT I-1, I-2, & I-3
* ...ON A-1 AT I-3, I-4, & I-5
* 14-18 FOR REMOVING BOLTS ON A-5 & A-6
* ...AT I-1, I-2, I-3, I-4 & I-5
4 TEAR DOWN I-BEAMS ON TANK STAGING PLATFORM WITH (551) .14
WRENCH

* CARPENTER WORKS ALONE UNBOLTING I-BEAMS
* STEPS:
* 1-5 ARE FOR REMOVING BOLTS ON I-6 & I-7
* ...AT I-1, I-2, I-3, I-4, AND I-5
* 6,7 ARE FOR MOVEMENT OF THE CARPENTER
* ...BETWEEN THE CONNECTIONS
5 TEAR DOWN ANGLES ON TANK STAGING PLATFORM WITH (553) .14
WINCH
STANDARD TIME CALCULATION

* REPRESENTS REMOVAL OF ANGLES ON A TANK
* ...STAGING PLATFORM (IN A CENTER TANK)
* TOTAL ANGLES = 6 (1 LIFT)
* 1 CARPENTER MOVES ANGLES TO ONE AREA ON
* ...THE TANK STAGING PLATFORM
* ...LOCATED NEAR A MANHOLE, A WINCH
* ...OPERATOR AND A CARPENTER REMOVE THE
* ...ANGLES FROM THE TANK. THERE ARE 2
* ...CARPENTERS WHO RECEIVE AND STACK THE
* ...ANGLES (IN THE DECK. THEIR TIME IS
* ...INTERNAL TO THE WINCH PROCESS TIME.

6 TEAR DOWN I-BEAMS FOR TANK STAGING PLATFORM WIT( 554 ) .14
H WINCH

* REPRESENTS REMOVAL OF I-BEAMS FROM THE
* ...TANK STAGING PLATFORM
* TOTAL I-BEAMS = 7 (7 LIFTS)
* A CARPENTER AND WINCH OPERATOR REMOVE
* ...THE I-BEAMS FROM THE TANK. THERE ARE
* ...2 CARPENTERS WHO RECEIVE AND STACK
* ...THE I-BEAMS ON THE DECK. THEIR TIME
* ...IS INTERNAL TO THE WINCH PROCESS TIME.
STANDARD TIME CALCULATION

MOST OPERATION TIME CALCULATION

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ACTUAL PROCESS TIME(TMU) 0. 0.

FACTORED PROCESS TIME(TMU) 0.

TOTAL INTERNAL TIME(TMU) 0.

TITLE SHEET USED IN SETTING STANDARD: 0
## Standard Time Calculation

### Most Operation Time Calculation

#### Engineered Operation Time Calculation

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STANDARD TIME CALCULATION

DETAIL/UNIT/PART  X
PROCESS/OPER CODE  SET UP
PART NAME  STAGING BOARDS AND REMOVE HANDRAIL
SHIP CLASS  X
COST CLASS/JOB #  131
GROUP (UNIT/ZONE)  X
SUB-GROUP  X
SUB-SUB-GROUP  X
CREW/MACHINE  2 CARPENTER
ITEM  131-3
GEN. DRAWING  131
DET. DRAWING  X
WORK PACKAGE  X
OPER. DESCRIPTION  SPREADING STAGING BOARDS AROUND PERIMETER OF A CENTER TANK (OFF TANK STAGING PLATFORM) PER 100 FT
DATE  25-MAY-83

Step  Method Instruction  Freq
1  SET-UP STAGING PLANKS FOR TANK STAGING PLATFORM (559) WITH HAMMER  100
* REPRESENTS SPREADING BOARDS FROM A TANK
* ...STAGING PLATFORM TO EXISTING STAGING
* ...ON THE BULKHEADS.
* 2 CARPENTERS WHO ARE NOT WORKING
* ...SIMULTANEOUSLY.
2  TEAR DOWN HANDRAIL (AND STANCHION) ON (LONGI (560)  6
STANDARD TIME CALCULATION

TUDINAL ) BULKHEAD

* REPRESENTS REMOVAL OF HANTRAIN FROM TOP
* ...LEVEL OF BULKHEAD STAGING IN A CENTER
* ...TANK. THIS IS DONE AFTER BOARDS HAVE
* ...BEEN SPREAD TO TANK STAGING PLATFORM
* CARPENTER WORKS ALONE
* HOOKUP, IGNITE AND EXTINGUISH TORCH ARE
* ...IN A SEPARATE SUB-OP

3 HOOK-UP AND UNHOOK TORCH ON MANIFOLD WITH WREENC(9) 6
H

* TORCH AND HOSE LOCATED AT MANIFOLD
* UNHOOK IS THE REVERSE OF HOOKUP

4 IGNITE AND EXTINGUISH TORCH FOR BURNING WITH HA(10) 6
ND

* HOOK-UP NOT INCLUDED
STANDARD TIME CALCULATION

MOST OPERATION TIME CALCULATION

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## Standard Time Calculation

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<tr>
<th>Oper. Description</th>
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<tr>
<td>Connect two tank staging platforms: using staging brackets and boards per 100 linear feet</td>
<td>25-May-83</td>
<td># 1</td>
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**Step Method Instruction**

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<th>Method Instruction</th>
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<tbody>
<tr>
<td>1</td>
<td>SET-UP STAGING BRACKETS FOR (BETWEEN) TANK STAGING PLATFORM WITH</td>
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</table>

* Represents setting up brackets on 2 tank staging platforms. Boards are spread between the brackets.
* This assembly is used to connect the two tank staging platforms.
* 2 Carpenters working simultaneously each
STANDARD TIME CALCULATION

* ...WORKING ON A DIFFERENT PLATFORM.
* STEPS:
  * 1-6 REPRESENTS SETTING UP BRACKETS AT
  * ...BR-1, BR-2, AND BR-3
  * 7 REPRESENTS SPREADING BOARDS BETWEEN
  * ...BR-I AND BR-2; BR-2 AND BR-3
  2 SET-UP STAGING PLANKS FOR (BETWEEN) TANK STAGING PLATFORMS WITH
  * REPRESENTS SPREADING BOARDS BETWEEN TWO
  * ...TANK STAGING PLATFORMS
  * 2 CARPENTERS ARE NOT WORKING
  * ...SIMULTANEOUSLY
### STANDARD TIME CALCULATION

### MOST OPERATION TIME CALCULATION

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**Actual Process Time (TMU)**

0. 0.

**Factored Process Time (TMU)**

0.

**Total Internal Time (TMU)**

0.

**Title Sheet Used in Setting Standard:**

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## Standard Time Calculation

### MOST Operation Time Calculation

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STANDARD TIME CALCULATION

MOST OPERATION TIME CALCULATION

DETAIL/UNIT/PART X
PROCESS/OPER CODE REMOVAL
PART NAME STAGING BOARDS
SHIP CLASS X
COST CLASSJOB $ 131
GROUP (UNIT/ZONE) X
SUB-GROUP X
SUB-SUB-GROUP X
CREW/MACHINE 2 CARPENTERS
ITEM 131-3
GEN. DRAWING 131
DET. DRAWING X
WORK PACKAGE X
OPER. DESCRIPTION REMOVAL OF BOARDS AROUND THE PERIMETER OF A CENTER

tank (Off tank staging platform) PER 100 LIN FT

DATE 31-MAY-83 ISSUE # 1

Step Method Instruction Freq
1 TEAR DOWN STAGING PLANK FOR TANK STAGING PLATFORM( 582) 100

* REPRESENTS REMOVING BOARDS FROM BELOW
* ...THE MAIN DECK, BOARDS ARE CONNECTED
* ...TO THE TANK STAGING PLATFORM AND THE
* ...EXISTING PERIMETER STAGING BY NAILS.
* 2 MAN OPERATION:(WORKING SIMULTANEOUSLY)
* ...CARPENTERS LOOSEN THE NAILS ON EACH
STANDARD TIME CALCULATION

* ...END OF THE BOARD, THEN PICK UP THE
* ...BOARD AND PLACE IT ON A PILE ON THE
* ...TANK STAGING PLATFORM.
### STANDARD TIME CALCULATION

#### MOST OPERATION TIME CALCULATION

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- **Actual Process Time (TMU):** 0, 0.
- **Factored Process Time (TWU):** 0.
- **Total Internal Time (TMU):** 0.

**Title Sheet Used in Setting Standard:** 0
### Standard Time Calculation

#### MOST Operation Time Calculation

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STANDARD TIME CALCULATION

M O S T  OPERATION TIME CALCULATION

DETAIL/UNIT/PART  X  REV. LTR/DATE X
PROCESS/OPER CODE  REMOVAL  STANDARD CODE X
PART NAME  BRACKETS AND BOARDS

SHIP CLASS  X  HULL  X
COST CLASS JOB  131  TRADE  CARPENTER
GROUP (UNIT/ZONE) X  WORK AREA  X
SUB-GROUP  X  WORK ZONE  X
SUB-SUB-GROUP  X  WORK CENTER  X
CREW/MACHINE  2 CARPENTERS ASSET/MACHINE  X
ITEM  131-3  SUB-ITEM  131-3-3.
GEN. DRAWING  131  WORK ORDER  X
DET. DRAWING  X  SHEET  1
WORK PACKAGE  X  APPLICATOR  PP

OPER. DESCRIPTION  DISCONNECT 2 TANK STAGING PLATFORMS; REMOVE
BRACKETS AND BOARDS PER 100 LINEAR FEET

DATE  31-MAY-83  ISSUE #  1

Step  Method Instruction  Freq
1  TEAR DOWN STAGING BRACKETS ON TANK STAGING PLAT( 584)  5
FORM WITH WRENCH

* REPRESENTS REMOVAL OF BRACKETS ON 2 TANK
* ...STAGING PLATFORMS. ALSO REMOVAL OF
* ...BOARDS THAT ARE SPREAD BETWEEN THE
* ...BRACKETS.
* 2 CARPENTERS WORKING SIMULTANEOUSLY EACH
* ...WORKING ON A DIFFERENT PLATFORM.
STANDARD TIME CALCULATION

* STEPS:
* 1 REPRESENTS REMOVAL OF BOARDS BETWEEN
* ...BR-1 AND BR-2; BR-2 AND BR-3
* 2-5 REPRESENTS REMOVAL OF BRACKETS FROM
* ...BR-1; BR-2 AND BR-3. BRACKETS ARE
* ...PLACED ON A PILE ON THE PLATFORM.

2 TEAR DOWN STAGING PLANK FOR ( BETWEEN ) TANK ST( 583) 100
AGING PLATFORM

* REPRESENTS REMOVING BOARDS FROM BETWEEN
* ...THE TWO TANK STAGING PLATFORMS. THE
* ...BOARDS ARE CONNECTED TO THE PLATFORMS
* ...BY NAILS.
* 2 MAN OPERATION:(WORKING SIMULTANEOUSLY)
* ...CARPENTERS LOOSEN THE NAILS ON EACH
* ...END OF THE BOARD, THEN PICK UP THE
* ...BOARD AND PLACE IT ON A PILE ON ONE
* ...OF THE TANK STAGING PLATFORMS.
### STANDARD TIME CALCULATION

#### MOST OPERATION TIME CALCULATION

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- ACTUAL PROCESS TIME(TMU): 0.
- FACTORED PROCESS TIME(TMU): 0.
- TOTAL INTERNAL TIME(TMU): 0.

**TITLE SHEET USED IN SETTING STANDARD:** 0
## STANDARD TIME CALCULATION

### MOST OPERATION TIME CALCULATION

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### Standard Time Calculation

#### 4.2 How to Calculate Time Standards

**M O S T Operation Time Calculation**

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**Oper. Description**

Set up bracket staging on exterior shell working off an aerial platform per 100 linear feet

**Date**

09-Jun-83

**Issue #**

1

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<td>Load (staging material) on aerial platform with (580) (crane)</td>
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* Represents spreading material on an aerial platform.
* Aerial platform can hold enough staging.
* Material for 3 levels of staging.
STANDARD TIME CALCULATION

* ...5 BRACKETS PER LEVEL.
* TOTAL MATERIAL:
* MATL QUANTITY
* BRKTS 15
* STANS 15
* BOARDS 36
* HANDRAIL 24
* LADDERS 5

2 TRANSPORT AREIAL PLATFORM FOR SIDE SHELL (STAGI( 516) 1
NG) WITH (CRANE)

* REPRESENTS MOVING AERIAL PLATFORM FROM A
* ...WAY TO A SECTION OF SIDE SHELL

3 SET-UP (STAGING CLIP) ON SIDE SHELL WITH HAMMER( 517) 8
* REPRESENTS PUTTING UP A STAGING CLIP ON
* ...THE SIDE SHELL.
* CARPENTERS ARE WORKING FROM AN AERIAL
* ...PLATFORM.
* WELDING OF THE CLIP IS DONE IN A
* ...SEPERATE SUB OPERATION.

4 WELD STAGING BRACKET (CLIP) ON BULKHEAD (OR ANY( 435) .08
STRUCTURE) WITH

5 SET-UP STAGING BRACKET ON SIDE SHELL WITH WRENCH( 518) .8
H

* REPRESENTS PUTTING UP A BRACKET ON THE
* ...SIDE SHELL.
* CARPENTERS ARE WORKING FROM AN AERIAL
* ...PLATFORM.

6 SET-UP STAGING PLANK FOR SIDE SHELL WITH HAND ( 519) 21
* REPRESENTS SETTING BOARDS UP BETWEEN TWO
* ...STAGING BRACKETS.
* CARPENTERS ARE WORKING ON AN AREIAL
* ...PLATFORM AND THEY ARE WORKING
* ...SIMULTANEUSLY.

7 SET-UP (ACCESS) LADDER ON SIDE SHELL WITH HAND ( 520) 1.8
* REPRESENTS SETTING UP A LADDER ON THE
* ...SIDE SHELL.
* CARPENTERS ARE WORKING ON AN AERIAL
* ...PLATFORM, BUT ARE NOT WORKING
* ...SIMULTANEUSLY.
* WELDING DONE IN A SEPERATE
* ...SUB OPERATION.

8 WELD LADDER (CLIP) (SECURES LADDER) ON BULKHEAD( 438) .018
(OR ANY STRUCTURE)
STANDARD TIME CALCULATION

9 (CLIMB UP AND DOWN) MOVE OPERATOR (ON LADDER) ON SIDE SHELL  0( 521)  1.8
* REPRESENTS CARPENTERS CLIMBING UP AND
* ...DOWN LADDERS TO GET ON AND OFF
* ...STAGING AT OUTSIDE SIDE SHELL.
* CARPENTERS ARE WORKING ON AN AERIAL
* ...PLATFORM.

10 SET-UP STANCHION FOR SIDE SHELL WITH HAND  ( 522)  8
* REPRESENTS PUTTING STANCHION IN STAGING
* ...BRACKETS.
* TOW CARPENTERS ARE ON THE STAGING, ONE
* ...REMAINS ON THE AERIAL PLATFORM.

11 SET-UP HANDRAIL FOR SIDE SHELL WITH HAND  ( 523)  14
* REPRESENTS PUTTING UP HANDRAIL AT THE
* ...SIDE SHELL.
* TWO CARPENTERS ARE ON THE STAGING, ONE
* ...REMAINS ON THE AERIAL PLATFORM.
* WELDING IS DONE IN A SEPERATE SUB
* ...OPERATION.

12 WELD HANDRAIL (CONNECTIONS) ON STANCHION WITH  440)  .14
TICK ELECTRODE
## STANDARD TIME CALCULATION

### M O S T OPERATION TIME CALCULATION

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**MANUAL TIME (TMU)**

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**ACTUAL PROCESS TIME (TMU)**

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**FACTORED PROCESS TIME (TMU)**

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**TOTAL INTERNAL TIME (TMU)**

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**TITLE SHEET USED IN SETTING STANDARD:**

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### Standard Time Calculation

#### MOST Operation Time Calculation

**Engineered Operation Time Calculation**

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**Standard Hours:** 2.9
## STANDARD TIME CALCULATION

**K O S T** OPERATION TIME CALCULATION

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### Step Method Instruction

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| 1    | TEAR DOWN HANDRAIL ON SIDE SHELL WITH TORCH (*) REPRESENTS TEARING DOWN HANDRAIL ON THE ***SIDE SHELL.  
* TWO CARPENTERS ARE ON THE STAGING, ONE ***REMAINS ON THE AERIAL PLATFORM.  
* THE CARPENTERS ARE NOT WORKING ***SIMULTANEOUSLY. |
| 2    | TEAR DOWN STANCHION FOR SIDE SHELL WITH HAND (*) REPRESENTS REMOVAL OF STANCHION FROM |
STANDARD TIME CALCULATION

* ...SIDE SHELL.
* TWO CARPENTERS ARE ON THE STAGING, ONE
* ...REMAINS ON AERIAL PLATFORM.
* THE CARPENTERS DO NOT WORK
* ...SIMULTANEOUSLY.

3 TEAR DOWN (ACCESS) LADDER ON SIDE SHELL WITH TO( 527) RCH

* REPRESENTS REMOVAL OF LADDER FROM SIDE
* ...SIDE SHELL.
* CARPENTERS ARE WORKING ON AN AERIAL
* ...PLATFORM.
* THE CARPENTERS ARE NOT WORKING
* ...SIMULTANEOUSLY.

4 (CLIMB UP AND DOWN) MOVE OPERATOR (ON LADDER) ON SIDE SHELL

* REPRESENTS CARPENTERS CLIMBING UP AND
* ...DOWN LADDERS TO GET ON AND OFF
* ...STAGING AT OUTSIDE SIDE SHELL.
* CARPENTERS ARE WORKING ON AN AERIAL
* ...PLATFORM.

5 TEAR DOWN STAGING PLANK FOR SIDE SHELL WITH HAN(, 526) D

* REPRESENTS TEARING DOWN BOARDS ON THE
* ...SIDE SHELL.
* CARPENTERS ARE WORKING ON AN AERIAL
* ...PLATFORM.
* THE CARPENTERS ARE WORKING
* ...SIMULTANEOUSLY.

6 TEAR DOWN STAGING BRACKET ON SIDE SHELL WITH WR( 528) ENCH

* REPRESENTS REMOVAL OF BRACKETS
* ...FROM SIDE SHELL.
* CARPENTERS ARE WORKING ON AN
* ...AERIAL PLATFORM.

7 TEAR DOWN (STAGING CLIP) ON SIDE SHELL WITH TOR( 530) CH

* REPRESENTS REMOVING STAGING CLIPS FROM
* ...THE SIDE SHELL.
* CARPENTERS ARE WORKING ON AN AERIAL
* ...PLATFORM.

8 TRANSPORT AERIAL PLATFORM FOR SIDE SHELL (STAGI( 529) NG) WITH CRANE
STANDARD TIME CALCULATION

* REPRESENTS MOVING AERIAL PLATFORM
* ...FROM A SECTION OF THE SIDE SHELL
* ...TO A WAY.

9 UNLOAD (STAGING MATERIAL) ON AERIAL PLATFORM W/ 581
TH (CRANE)

* REPRESENTS REMOVAL OF MATERIAL FROM AN
* ...AERIAL PLATFORM
* AERIAL PLATFORM CAN HOLD ENOUGH STAGING
* ...MATERIAL FOR 3 LEVELS OF STAGING:
* ...5 BRACKETS PER LEVEL.
* TOTAL MATERIAL:
* MTL QUANTITY
  * BRKTS 15
  * STANS 15
  * BOARDS 36
  * HANDRAIL 24
  * LADDERS 5
## STANDARD TIME CALCULATION

### HOST OPERATION TIME CALCULATION

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**ACTUAL PROCESS TIME (TMU)**

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**FACTORED PROCESS TIME (TMU)**

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**TOTAL INTERNAL TIME (TMU)**

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**TITLE SHEET USED IN SETTING STANDARD:**

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# STANDARD TIME CALCULATION

## MOST OPERATION TIME CALCULATION

### Engineered Operation Time Calculation

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STANDARD TIME CALCULATION

4.2 HOW TO CALCULATE TIME STANDARDS

MOST OPERATION TIME CALCULATION

DETAIL/UNIT/PART X

REV. LTR/DATE X

PROCESS/OPER CODE SET UP

STANDARD CODE X

PART NAME 96' SECTION OF TWO LEVEL PIPE STAGING

SHIP CLASS X

HULL X

COST CLASS/JOB # 131

TRADE CARPENTER

GROUP (UNIT/ZONE) X

WORK AREA X

SUB-GROUP X

WORK ZONE X

SUB-SUB-GROUP X

WORK CENTER X

CREW/MACHINE 3 CARPENTERS

ASSET/MACHINE X

ITEM 131-2

SUB-ITEM 131-2-1

GEN. DRAWING 131

WORK ORDER X

DET. DRAWING X

SHEET 1

WORK PACKAGE X

APPLICATOR PP

OPER. DESCRIPTION SET UP PIPE STAGING EXT SIDE SHELL (3-16' PIPE STAGING + 3-16' PLANKING TO SPAN PIPE SECTIONS)

DATE 16-JUN-83

ISSUE # 3

--- Method Instruction ---

1. MAKE READY END RAIL (END PIECE) FOR (TRANSORTI( 487)NG)

* REPRESENTS GETTING END PIECES ON BOLSTER
* ...SO THAT CRANE CAN TRANSPORT IT.

2. TRANSPORT END RAIL (END PIECE) ON (END-PIECE RA( 486) CK) WITH

Freq 18

---

PAGE 3/5
STANDARD TIME CALCULATION

* REPRESENTS TRANSPORTING END PIECES FROM END-PC-RACK TO MATL-PILE.
* DISTANCES FROM CRANE REST TO END-PC-RACK AND FROM END-PC-RACK TO HATL-PILE ARE AVERAGE DISTANCES ON A WAY 740'x120'
* MAXIMUM NUMBER END-PCS IN LIFT = 3
* THERE ARE 2 LIFTS DONE PER SECTION OF PIPE STAGING (16'LONG).

3 SET-UP PIPE STAGING (END PCS AND BRACES) FOR SI( 488) 3 DE SHELL WITH HAND

* REPRESENTS SETTING UP 1ST LEVEL OF A 16' LONG SECTION OF PIPE STAGING. SECTION INCLUDES 3 END PIECES AND 8 BRACES WHICH ARE HELD IN PLACE BY A LOCKING PIN.
* CARP-1 AND CARP-2 ARE WORKING SIMULTANEOUSLY IN PUTTING UP THE END PIECES AND BRACES.

4 SET-UP PIPE STAGING (END PCS AND BRACES) FOR SI( 489) 3 DE SHELL WITH WRENCH

* REPRESENTS SETTING UP 2ND LEVEL OF A 16' LONG SECTION OF PIPE STAGING. SECTION INCLUDES 3 END PIECES AND 8 BRACES WHICH ARE HELD IN PLACE BY A LOCKING PIN, END PIECES ARE BOLTED TO 1ST LEVEL END PIECES.
* CARP-1 AND CARP-2 ARE WORKING SIMULTANEOUSLY IN PUTTING UP THE END PIECES AND BRACES.

5 MAKE READY STAGING PLANK FOR (TRANSPORTING) WIT( 455) 24 H HAND

* REPRESENTS GETTING BOARD ON BOLSTERS SO THAT THE CRANE CAN TRANSPORT IT

6 TRANSPORT STAGING PLANK FOR PIPE STAGING (AT SI( 456) 12 DE SHELL) WITH

* REPRESENTS TRANSPORTING BOARDS FROM BP PILE TO SIDE SHELL
STANDARD TIME CALCULATION

* REPRESENTS CARPENTER CLIMBING UP AND
* . . . DOWN END PIECE OF PIPE STAGING.
* AVERAGE NUMBER OF STEPS NEEDED = 6.
8 SET UP STAGING PLANK ON PIPE STAGING (AT SIDE SHELL) WITH HAND

* REPRESENT'S CARPENTERS SPREADING BOARDS
* . . . ON PIPE STAGING SECTION (16' LONG).
* . . . CARPENTERS HAVE TO CLIMB UP AND DOWN
* . . . THE PIPE STAGING TO SPREAD THE BOARDS
* . . . (SEE SEPARATE ANALYSIS FOR CLIMBING)
9 MAKE READY STANCHION FOR (TRANSPORTING) WITH HAND

* REPRESENTS GETTING STANCHION READY TO BE
* . . . TRANSPORTED.
10 TRANSPORT STANCHION FOR PIPE STAGING (AT SIDE SHELL) WITH HAND

* REPRESENTS TRANSPORTING STANCHION FROM
* . . . BIN-2 TO SIDE SHELL.
* DISTANCES FROM CRANE-REST TO BIN-2 AND . .
* . . . FROM BIN-2 TO SIDE SHELL ARE AVERAGE
* . . . DISTANCES FROM A WAY 740' X 120'
* MAXIMUM NUMBER OF STANCHIONS IN LIFT = 6
11 SET UP STANCHION ON PIPE STAGING (AT SIDE SHELL) WITH WRENCH

* REPRESENTS SETTING UP STANCHIONS ON PIPE
* . . . STAGING
* . . . CARPENTERS INSTALL SIMULTANEOUSLY.
* . . . CARPENTERS ARE STILL ON PIPE STAGING
12 TRANSPORT HANDRAIL FOR PIPE STAGING (AT SIDE SHELL) WITH HAND

* REPRESENTS TRANSPORTING HANDRAIL FROM
* . . . HR-PILE TO SIDE SHELL.
* DISTANCES FROM CRANE-REST TO HR-PILE AND
* . . . FROM HR-PILE TO SIDE SHELL ARE
* . . . AVERAGE DISTANCES FROM WAY 740' X 120'
* MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6
13 SET UP HANDRAIL ON PIPE STAGING (AT SIDE SHELL) WITH HAND

* REPRESENTS CARPENTERS INSTALLING
STANDARD TIME CALCULATION

* . . . HANDRAIL THRU EYELETS IN STANCHIONS.
* . . . CARPENTERS DON'T WORK SIMULTANEOUSLY.
* WELDING DONE IN A SEPARATE SUB-OP.

14 TRANSPORT STAGING PLANK FOR
* REPRESENTS TRANSPORTING BOARDS FROM
* . . . BD-PILE TO SIDE SHELL.
* DISTANCES FROM CRANE-REST TO RD-PILE AND
* . . . FROM BD-PILE TO SIDE SHELL ARE
* . . . AVERAGE DISTANCES FROM WAY 740'X120'
* MAXIMUM NUMBER OF BOARDS IN LIFT = 4

15 SET UP STAGING PLANK FOR
* REPRESENTS CARPENTERS SPREADING BOARDS
* . . . BETWEEN PIPE STAGING SECTIONS.
* . . . THERE IS A 16' GAP BETWEEN SECTIONS.
* . . . CARPENTERS HAVE TO CLIMB UP AND DOWN
* . . . THE PIPE STAGING TO SPREAD THE BOARDS
* . . . (SEE SEPARATE ANALYSIS FOR CLIMBING)

16 TRANSPORT HANDRAIL FOR SIDE SHELL (BTWN 2 PIPE
STAGING SECTIONS)

* REPRESENTS TRANSPORTING HANDRAIL FROM
* . . . HR-PILE TO SIDE SHELL.
* DISTANCES FROM CRANE-REST TO HR-PILE AND
* . . . FROM HR-PILE TO SIDE SHELL ARE
* . . . AVERAGE DISTANCES FROM WAY 740'X120'
* MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6

17 SET UP HANDRAIL FOR SIDE SHELL (BTWN 2 PIPE STA( GING SECTIONS)

* REPRESENTS CARPENTERS INSTALLING
* . . . HANDRAIL ON EXISTING HANDRAIL
* . . . CARPENTERS DON'T WORK SIMULTANEOUSLY.
* . . . WELDING DONE IN A SEPARATE SUB-OP.

18 WELD HANDRAIL (CONNECTIONS) ON STANCHION WITH S( TICK ELECTRODE

PAGE 3/8
STANDARD TIME CALCULATION

M O S T  OPERATION TIME CALCULATION

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STANDARD TIME CALCULATION

MOST OPERATION TIME CALCULATION

DETAIL/UNIT/PART X REV. LTR/DATE X

PROCESS/OPER CODE REMOVAL STANDARD CODE X

PART NAME 96' SECTION OF TWO LEVEL PIPE STAGING

SHIP CLASS x HULL x

COST CLASS/JOB # 131 TRADE CARPENTER

GROUP (UNIT/ZONE) X WORK AREA x

SUB-GROUP x WORK ZONE x

SUB-SUB-GROUP x WORK CENTER X

CREW/MACHINE 3 CARPENTERS ASSET/MACHINE X

ITEM 131-2 SUB-ITEM 131-2-3

GEN. DRAWING 131 WORK ORDER X

DET, DRAWING x SHEET 1

WORK PACKAGE x APPLICATOR PP

OPER. DESCRIPTION TEAR DOWN PIPE STAGING EXT SIDE SHELL (3-16' PIPE STAGING +3-16' BOARD SPANS OF PIPE SECTIONS)

DATE 16-JUN-83 ISSUE # 2

Step Method Instruction FreQ
1 TEAR DOWN HANDRAIL FOR SIDE SHELL (BTWN 2 PIPE 469) 3

* REPRESENTS TEARING DOWN HANDRAIL ON PIPE
* ...STAGING (BTWN 2 SECTIONS). A TORCH IS
* ...USED TO BURN THE HANDRAIL OFF. THE
* ...HANDRAIL IS THROWN TO THE MATERIAL
* ...PILE. CARPENTERS REMOVE 2 HANDRAIL
* ...PIECES BEFORE MOVING TO NEXT SECTION.
STANDARD TIME CALCULATION

2 TEAR DOWN STAGING PLANK FOR (472) 12
* REPRESENTS TEARING DOWN BOARDS BETWEEN 2
* PIPE STAGING SECTIONS. THERE IS A 16'
* GAP BETWEEN SECTIONS. BOARDS ARE
* STACKED SO THE CRANE CAN TRANSPORT
* THEN. CARPENTERS WORK SIMULTANEOUSLY.

3 REMOVE STAGING PLANK ON PIPE STAGING (AT SIDE SHELL) WITH (478) 12
* REPRESENTS REMOVAL OF BOARDS FROM PIPE
* STAGING AT SIDE SHELL TO BOARD PILE
* DISTANCES ARE AVERAGE DISTANCES FOR A
* WAY 740'X120'.
* MAXIMUM NUMBER OF BOARDS IN LIFT = 4
* TOWER CRANE IS USED FOR REMOVAL.

4 TEAR DOWN HANDRAIL FOR PIPE STAGING (AT SIDE SHELL) WITH HAND (470) 3
* REPRESENTS TEARING DOWN HANDRAIL ON PIPE
* STAGING (BTWN 2 STANCHIONS). THE
* HANDRAIL IS THROWN TO THE MATERIAL
* PIECE. CARPENTERS REMOVE 2 HANDRAIL
* PIECES BEFORE MOVING TO NEXT SECTION.

5 TEAR DOWN STANCHION ON PIPE STAGING (AT SIDE SHELL) (471) 6
* REPRESENTS TEARING DOWN STANCHION ON
* SECTION OF PIPE STAGING (16'LONG).
* CARPENTERS WORK SIMULTANEOUSLY.
* STANCHIONS ARE THROWN TO MATERIAL
* PIECE.

6 TEAR DOWN STAGING PLANK ON PIPE STAGING (AT SIDE SHELL) WITH HAND (473) 12
* REPRESENTS TEARING DOWN BOARDS ON PIPE
* STAGING SECTION (16'LONG). BOARDS ARE
* STACKED SO THE CRANE CAN TRANSPORT
* THEN. CARPENTERS WORK SIMULTANEOUSLY.

7 (CLIMB UP AND DOWN) MOVE OPERATOR (ON PIPE STAGING) (454) 3
* REPRESENTS CARPENTER CLIMBING UP AND
* DOWN END PIECE OF PIPE STAGING.
* AVERAGE NUMBER OF STEPS NEEDED = 6.

8 REMOVE STAGING PLANK ON PIPE STAGING (AT SIDE SHELL) WITH (478) 12

PAGE 322
STANDARD TIME CALCULATION

* REPRESENTS REMOVAL OF BOARDS FROM PIPE
* ...STAGING AT SIDE SHELL TO BOARD PILE
* ...DISTANCES ARE AVERAGE DISTANCES FOR A
* ...WAY 740'X120'.
* MAXIMUM NUMBER OF BOARDS IN LIFT = 4
* TOWER CRANE IS USED FOR REMOVAL.

9 TEAR DOWN PIPE STAGING (END PCS AND BRACES) FOR (474) 3 SIDE SHELL WITH

* REPRESENTS TEARING DOWN END PIECES AND
* ...BRACES ON PIPE STAGING (2ND LEVEL).
* ...END PIECES ARE BOLTED TO END PIECES
* ...ON 1ST LEVEL, BRACES ARE HELD ON BY A
* ...LOCKING PIN. CARPENTERS WORK
* ...SIMULTANEOUSLY. CARPENTER-1 HANDLES
* ...REMOVAL AT END-PC-1 AND END-PC-2.
* ...MATERIAL IS THROWN OR PLACED AT THE
* ...MATERIAL PILE.

10 TEAR DOWN PIPE STAGING (END PCS AND BRACES) FOR (475) 3 SIDE SHELL WITH

* REPRESENTS TEARING DOWN END PIECES AND
* ...BRACES ON PIPE STAGING (1ST LEVEL).
* ...BRACES ARE HELD ON BY A LOCKING PIN
* ...CARPENTERS WORK SIMULTANEOUSLY.
* ...CARPENTER-1 HANDLES REMOVAL AT
* ...END-PC-1 AND END-PC-2. MATERIAL IS
* ...THROWN OR PLACED AT THE MATERIAL
* ...PILE.

11 REMOVE BRACE ON (MATERIAL PILE) WITH (TOWER CRA (479) 18 NE)

* REPRESENTS REMOVING BRACES FROM MATERIAL
* ...PILE AT WAY TO BRACE PILE.
* ...DISTANCES ARE AVERAGE DISTANCES FOR A
* ...WAY 740'X120'.
* MAXIMUM NUMBER OF BRACES IN LIFT = 6.
* TOWER CRANE IS USED FOR REMOVAL.

12 REMOVE END RAIL (END PIECE) ON (MATERIAL PILE) (480) 18 WITH (TOWER CRANE)

* REPRESENTS REMOVING END PIECES FROM
* ...MATERIAL PILE AT WAY TO END-PC-RACK.
* ...DISTANCES ARE AVERAGE DISTANCES FOR A
* ...WAY 740'X120'.
* MAXIMUM NUMBER OF END PIECES IN LIFT = 3
* TOWER CRANE IS USED FOR REMOVAL.
STANDARD TIME CALCULATION

13  REMOVE  HANDRAIL ON (MATERIAL PILE) WITH (TOWER ( 476) CRANE)

* REPRESENTS REMOVAL OF HANDRAIL FROM
*  ...MATERIAL PILE AT WAY TO HANDRAIL PILE
*  ...DISTANCES ARE AVERAGE DistANCES FOR A
*  ...WAY 740'X120'.
*  MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6
*  TOWER CRANE IS USED FOR REMOVAL.

14  REMOVE  STANCHION ON (MATERIAL PILE) WITH (TOWER( 477) CRANE)

* REPRESENTS REMOVAL OF STANCHION FROM
*  ...MATERIAL PILE AT WAY TO BIN-2
*  ...DISTANCES ARE AVERAGE DistANCES FOR A
*  ...WAY 740'X120'.
*  MAXIMUM NUMBER OF STANCHION IN LIFT = 6
*  TOWER CRANE IS USED FOR REMOVAL.
### STANDARD TIME CALCULATION

#### MOST OPERATION TIME CALCULATION

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**MANUAL TIME (TMU)**

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**ACTUAL PROCESS TIME (TMU)**

0. 0.

**FACTORED PROCESS TIME (TMU)**

0.

**TOTAL INTERNAL TIME (TMU)**

0.

**TITLE SHEET USED IN SETTING STANDARD:**

0
**STANDARD TIME CALCULATION**

**MOST OPERATION TIME CALCULATION**

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STANDARD TIME CALCULATION

4.3 MANNING AND CREW SIZE

A. CENTER TANK
   1. Set-up: 3 Carpenters
   2. Tear down: 6 Carpenters

B. WING TANK
   1. Set-up: 3 Carpenters
   2. Tear down: 6 Carpenters

C. TANK STAGING PLATFORM
   1. Set-up: 2 Carpenters
   2. Tear down: 6 Carpenters

D. EXTERIOR SHELL
   1. Set-up: 3 Carpenters
   2. Tear down: 3 Carpenters

E. PIPE STAGING
   1. Set-up: 3 Carpenters
   2. Tear down: 3 Carpenters
SECTION 5
DATA SYNTHESIS AND BACK-UP

5.1 SUMMARY

435. WELD STAGING BRACKET (CLIP) ON BULKHEAD (OR ANY STRUCTURE) WITH STICK ELECTRODE AT ANY TANKS AND VOIDS (SHIP) WELDING
   PER 100 CLIPS OF G: 3
   WELD TO MEET SAFETY REQUIREMENTS. RATE PER 100 CLIPS. RATE INCLUDES
   MANUAL ELEMENTS.

   TOTAL THU 1063356.

438. WELD LADDER (CLIP) (SECURES LADDER) ON BULKHEAD (OR ANY STRUCTURE) WITH
   STICK ELECTRODE AT ANY TANKS AND VOIDS (SHIP) WELDING
   PER 100 LADDERS OR 400 CLIPS OF G: 3
   WELD TO MEET SAFETY REQUIREMENTS. RATE PER 100 LADDERS (400 CLIPS).
   RATE INCLUDES MANUAL ELEMENTS.

   TOTAL THU 1701606.

440. WELD HANDRAIL (CONNECTIONS) ON STANCHION WITH STICK ELECTRODE AT ANY
   TANKS AND VOIDS (SHIP) WELDING
   PER 100 PIECES OF HANDRAIL OF G: 3
   WELD TO MEET SAFETY REQUIREMENTS. RATE PER 100 PIECES OF AHNDRAIL
   (AVG. 1 CONNECTION EACH). RATE INCLUDES MANUAL ELEMENTS.

   TOTAL THU 196090.
DATA SYNTHESIS AND BACK-UP

378. TRANSPORT STAGING BRACKET WITH (GROVE CRANE) AT TANK (OR WAY) CARPENTER
PER STAGING BRACKET OFG: 3 02-FEB-82
    REPRESENTS ELAPSED TIME
    * REPRESENTS TRANSPORTING BRACKETS FROM...
    * ...BIN-1 TO BULKHEAD
    * ...DISTANCES FROM CRANE-REST TO BIN-1 AND...
    * ...FROM BIN-1 TO BULKHEAD ARE AVERAGE...
    * ...DISTANCES IN A CENTER TANK '98'X50'
    * MAXIMUM NUMBER OF BRKTS IN LIFT = 6
    C-OPER BEGINS AT CR-1

TOTAL TMU 1067.

381, TRANSPORT LADDERS WITH (GROVE CRANE) AT TANK CARPENTER
PER LADDER OFG: 3 03-FEB-82
    REPRESENTS ELAPSED TIME
    * REPRESENTS TRANSPORTING LADDERS FROM...
    * ...LDR-PILE TO BULKHEAD
    * ...DISTANCES FROM CRANE-REST TO LDR-PILE...
    * ...AND FROM LDR-PILE TO BULKHEAD ARE...
    * ...AVERAGE DISTANCES IN A CENTER TANK...
    * ...98'X50'
    * MAXIMUM NUMBER OF LADDERS IN LIFT = 3
    C-OPER BEGINS AT CR-1

TOTAL TMU 2400.

384, POSITION (SECURE) (ACCESS) LADDER FOR BULKHEAD WITH HAMMER (AND LADDER CLIPS) AT TANK CARPENTER
PER LADDER OFG: 3 03-FEB-82
    REPRESENTS ELAPSED TIME
    * REPRESENTS SECURING A LADDER TO THE...
    * ...BULKHEAD USING 4 LADDER CLIPS
    * WELDING OF CLIPS WILL BE DONE IN A....
    * ...SEPARATE SUB OPERATION
    CARP-1 BEGINS AT LDR

TOTAL THU 710.
DATA SYNTHESIS AND BACK-UP

387. TRANSPORT STAGING PLANK WITH (GROVE CRANE) AT TANK CARPENTER
PER STAGING PLANK OFG: 3 03-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS TRANSPORTING BOARDS FROM...
* ...LU-PILE TO BULKHEAD
* DISTANCES FROM CRANE-REST TO LU-PILE AND
* ...FROM LU-PILE TO BULKHEAD ARE AVERAGE
* ...DISTANCES IN A CENTER TANK 98'X50'
* MAXIMUM NUMBER OF BOARDS IN LIFT = 3
C-OPER BEGINS AT CR-1

TOTAL THU 2567.

392. TRANSPORT STANCHION WITH (GROVE CRANE) AT TANK CARPENTER
PER STANCHION OFG: 3 02-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS TRANSPORTING STANCHION FROM...
* ...BIN-2 TO BULKHEAD
* DISTANCES FROM CRANE-REST TO BIN-2 AND...
* ...FROM BIN-2 TO BULKHEAD ARE AVERAGE...
* ...DISTANCES IN A CENTER TANK 98'X50'
* MAXIMUM NUMBER OF STANCHIONS IN LIFT = 6
C-OPER BEGINS AT CR-1

TOTAL THU 1067.

395. TRANSPORT HANDRAIL WITH (GROVE CRANE) AT TANK CARPENTER
PER HANDRAIL OFG: 3 02-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS TRANSPORTING HANDRAIL FROM...
* ...HR-PILE TO BULKHEAD
* DISTANCES FROM CRANE-REST TO HR-PILE AND
* ...FROM HR-PILE TO BULKHEAD ARE AVERAGE
* ...DISTANCES IN A CENTER TANK 98'X50'
* MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6
C-OPER BEGINS AT CR-1

TOTAL THU 1067.
DATA SYNTHESIS AND BACK-UP

404. (CLIMB UP AND DOWN) MOVE OPERATOR (ON LADDER) ON BULKHEAD AT ANY TANK AND VOIDS CARPENTER
PER LAIDDER OFG: 3 05-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS CARPENTERS CLIMBING UP AND...
* ...DOWN LADDERS TO REMOVE STAGING.
* AVERAGE LADDER SIZE = 12 RUNGS.
CARP-1 BEGINS AT LDR

TOTAL TMU 1280.

407. REMOVE HANDRAIL ON (MATERIAL-PILE) WITH WINCH AT ANY TANKS AND VOIDS CARPENTER
PER HANDRAIL OFG: 3 08-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF HANDRAIL FROM MATL
* ...PILE ON TANKTOP TO DECK (GOING THRU MANHOLE).
* MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6
CARP-3 BEGINS AT TANKTOP

TOTAL TMU 918.

408. REMOVE STANCHION ON (MATERIAL PILE) WITH WINCH AT ANY TANKS AND VOIDS CARPENTER
PER STANCHION OFG: 3 08-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF STANCHION FROM ...
* ...MATL-PILE ON TANKTOP TO DECK (GOING THRU MANHOLE).
* MAXIMUM NUMBER OF STANCHION IN LIFT = 6
CARP-3 BEGINS AT MATL-PILE

TOTAL TMU 988.
DATA SYNTHESIS AND BACK-UP

409. REMOVE STAGING BRACKET ON (MATERIAL PILE) WITH WINCH AT ANY TANKS AND VOIDS CARPENTER
PER STAGING BRACKET OGF: 3 05-FEB-82
   REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF BRACKET FROM MATL
* ... PILE ON TANKTOP TO DECK (GOING THRU
* ... MANHOLE).
* MAXIMUM NUMBER OF BRACKET IN LIFT = 3
CARP-3 BEGINS AT MATL-PILE

TOTAL TMU 1777.

410. REMOVE STAGING PLANK ON (BOARD PILE) WITH WINCH AT ANY TANKS AND VOIDS CARPENTER
PER STAGING PLANK OGF: 3 08-FEB-82
   REPRESENTS ELAPSED TIME
* REPRESENT REMOVING BOARDS FROM BOARD...
* ... PILE ON TANKTOP TO DECK (GOES THRU..
* ... MANHOLE).
* MAXIMUM NUMBER OF BOARDS IN LIFT = 3
CARP-3 BEGINS AT MATL-PILE

TOTAL TMU 1983.

411. REMOVE LADDER ON (LADDER-PILE) WITH WINCH AT ANY TANKS AND VOIDS CARPENTER
PER LADDER OGF: 3 08-FEB-82
   REPRESENTS ELAPSED TIME
* REPRESENT REMOVING LADDERS FROM LADDER
* ... PILE ON TANKTOP TO DECK (GOES THRU..
* ... MANHOLE).
* MAXIMUM NUMBER OF LADDERS IN LIFT = 3
CARP-3 BEGINS AT BD-PILE

TOTAL TMU 1983.
DATA SYNTHESIS AND BACK-UP

412. REMOVE TOOLBOX ON (MATERIAL PILE) WITH WINCH AT ANY TANKS AND Voids
CARPENTER
PER TOOLBOX OFG: 3 08-FEB-82
* REPRESENTS ELAPSED TIME
* ...-PILEON TANKTOP TO DECK (GOES THRU...
* ...MANHOLE).
* TOOLBOX CONTAINS:
* ...28 BOLTS
* ...28 NUTS
* ...28 LADDER CLIPS
CARP-3 BEGINS AT LDR-PILE

TOTAL THU 7210.

431. (WALK UP OR DOWN) MOVE OPERATOR (ON INCLINED STAIRS) ON BULKHEAD AT
TANKS AND Voids CARPENTER
PER SET OF INCLINED STAIRS OFG: 4 10-FEB-82
* REPRESENTS ELAPSED TIME
* ...A SET OF CARPENTER WALKING UP OR DOWN
* ...NUMBER OF TREADS IN A SET OF INCLINED
* ...STAIRS = 16.
* CARPENTERS ARE WALKING UP OR DOWN STAIRS
* AT THE SAME TIME.
CARP-1 BEGINS AT LEVEL-1

TOTAL THU 320.
DATA SYNTHESIS AND BACK-UP

132. COMBINED SUB-OP

HOOK-UP/UNHOOK AND IGNITE/EXTINGUISH TORCH FOR BURNING WITH HAND
AT TANK CARPENTER
CREW SIZE = 6 (3 CARPS AROSE DECK AND 3 BELOW). RATE IN ELAPSED TIME.
MULT BY 6 TO OBTAIN TOTAL TIME.
PER 8-HR SHIFT AND (1) CUT OFG: 4 20-NOV-81
* THE FOLLOWING IS INCLUDED IN THIS SUBOP:
* --2 HOOK-UPS AND 2 UNHOOKS PER (1)......
* ...8-HR SHIFT
* --(1) OCCURRENCE FOR IGNITE AND ........
* ...EXTINGUISH TORCH
* --TO DETERMINE THE FREQ OF THE SUB-OP......
* ...FRO NUMBER OF CUTS >1, USE THE ........
* ...FORMULA: FREQ = 1 + [(N-1) X .23] .....;
   * ...WHERE "N" = THE NUMBER OF CUTS(BURNS)

TOTAL THU 2900.0

376. SET-UP (STAGING CLIP) ON BULKHEAD WITH HAMMER (AND STEEL-TAPE) AT TANK
CARPENTER
PER STAGING CLIP OFG: 4 01-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING UP A STAGING CLIP ON
* ...THE BULKHEAD
* WELDING OF THE CLIP WILL BE DONE IN A...
* ...SEPARATE SUB OPERATION
CARP-1 BEGINS AT TANKTOP

TOTAL THU 670.

377. MAKE READY STAGING BRACKET FOR (TRANSPORTING) WITH HAND AT TANK (OR
WAY) CARPENTER
PER STAGING BRACKET OFG: 3 02-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS GETTING BRACKET READY TO BE...
* ...TRANSPORTED TO TANK OR BULKHEAD
* CARPENTER IS LOCATED EITHER ON THE WAY...
* ...OR IN TANK AT THE MATERIAL (BIN-1)
CARP-3 BEGINS AT BIN-1

TOTAL THU 510.

PAGE 384
DATA SYNTHESIS AND BACK-UP

379. SET-UP STAGING BRACKETS ON BULKHEAD WITH WRENCH AT TANK CARPENTER
PER STAGING BRACKET OFG: 3 01-FEB-82
   REPRESENTS ELAPSED TIME
   * REPRESENTS PUTTING UP A BRACKET ON AN...
   * ...EXISTING STAGING CLIP
   CARP-1 BEGINS AT TANKTOP

   TOTAL THU  1080

380. MAKE READY LADDER FOR (TRANSPORTING) WITH HAND AT TANK (OR WAY)
     CARPENTER
PER LADDER OFG: 3 01-FEB-82
   REPRESENTS ELAPSED TIME
   * REPRESENTS GETTING LADDER ON BOLSTERS SO
   * ...THAT THE CRANE CAN TRANSPORT IT.
   CARP-3 BEGINS AT BIN-1

   TOTAL THU  600

382. SET-UP LADDER ON BULKHEAD (AT BRACKET LOCATION) WITH HAND AT TANK
     CARPENTER
PER LADDER OFG: 4 03-FEB-82
   REPRESENTS ELAPSED TIME
   * REPRESENTS PUTTING UP A LADDER AT A.....
   * ...BRACKET LOCATION SO THE CARPENTER CAN
   * ...PUT UP A BRACKET. APPLIES ONLY FOR...
   * ...FIRST LEVEL OF STAGING. CARPENTER IS
   * ...WORKING FROM THE TANKTOP.
   * ALSO INCLUDES CLIMBING UP & DOWN LADDER
   CARP-1 BEGINS AT BRKT-1

   TOTAL THU  920
DATA SYNTHESIS AND BACK-UP

383. SET-UP (ACCESS) LADDER ON BULKHEAD WITH HAND AT TANK CARPENTER
PER LADDER OFG: 3 01-FEB-82
* REPRESENTS ELAPSED TIME
* ...PUTTING UP AN ACCESS LADDER...
* ...ON THE BULKHEAD SO THAT THE CARPENTER
* ...CAN CLIMB TO THE NEXT LADDER...
* ALSO INCLUDES CLIMBING UP AND DOWN THE...
* ...LADDER...
* AVERAGE NUMBER OF RUNGS = 12
CARP-1 BEGINS AT TANKTOP

TOTAL TMU 1420.

385. POSITION (SECURE) (ACCESS) LADDER FOR BRACKET STAGING WITH PLIER (AND WIRE ROPE) AT TANK CARPENTER
PER LADDER OFG: 4 03-FEB-82
* REPRESENTS ELAPSED TIME
* ...SECURING LADDER TO STAGING...
* ...BOARDS USING WIRE ROPE
CARP-1 BEGINS AT LDR

TOTAL TMU 280.

386. MAKE READY STAGING PLANK FOR (TRANSPORTING) WITH HAND AT TANK (OR WAY) CARPENTER
PER STAGING PLANK OFG: 3 02-FEB-82
* REPRESENTS ELAPSED TIME
* ...GETTING BOARD ON BOLSTERS SO THAT THE CRANE CAN TRANSPORT IT
CARP-3 BEGINS AT BIN-1

TOTAL TMU 420.
DATA SYNTHESIS AND BACK-UP

388. SET-UP Staging plank on staging bracket with hand at tank carpenter
PER BOARD OFG: 3 02-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS SETTING UP BOARDS BETWEEN....
* ...BRACKETS.
* TWO MAN OPERATION:
* CARPENTERS ARE LOCATED AT TWO DIFFERENT
* ...BRACKETS. THEY BOTH LIFT THE BOARD....
* ...TOGETHER AND SLIDE IT INTO POSITION.
* IN THIS ANALYSIS CARPENTERS ARE LOCATED
* ...ON THE LEVEL BELOW THE BOARDS.
CARP-1 BEGINS AT BRKT-1

TOTAL TMU 290

389. SET-UP Staging plank on staging bracket with hand at tank carpenter
PER BOARD OFG: 3 02-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS SETTING UP BOARDS BETWEEN....
* ...BRACKETS.
* TWO MAN OPERATION:
* CARPENTERS ARE LOCATED AT TWO DIFFERENT
* ...BRACKETS. THEY BOTH PICK-UP THE BOARD
* ...TOGETHER AND SLIDE IT INTO POSITION.
* IN THIS ANALYSIS CARPENTERS ARE LOCATED
* ...ON THE SAME LEVEL AS THE BOARDS.
CARP-1 BEGINS AT BRKT-1

TOTAL TMU 350

PAGE 337
DATA SYNTHESIS AND BACK-UP

390. SET-UP STAGING PLANK ON STAGING BRACKET WITH HAND AT TANK CARPENTER
PER STAGING PLANK OFG: 4 02-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS SETTING UP BOARDS BETWEEN...
* ...BRACKETS.
* ONE MAN OPERATION:
* USUALLY OCCURS WHEN CRANE CANNOT PLACE..
* ...BOARD ON BRACKETS.
CARP-1 BEGINS AT BRKT-1

TOTAL TMU 670.

391. MAKE READY STANCHION FOR (TRANSPORTING) WITH HAND AT TANK (OR WAY)
CARPENTER
PER STANCHION OFG: 3 02-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS GETTING STANCHION READY TO BE
* ....TRANSPORTED.
CARP-3 BEGINS AT LU-PILE

TOTAL TMU 550.

393. SET-UP STANCHION IN STAGING BRACKET WITH HAND AT TANK CARPENTER
PER STANCHION OFG: 3 02-FEB-82
* REPRESENTS ELAPSED THE
* REPRESENTS PUTTING STANCHION IN THE....
* ...BRACKET SLEEVE.
CARP-1 BEGINS AT BRKT-1

TOTAL TMU 250.
DATA SYNTHESIS AND BACK-UP

394. MAKE READY HANDRAIL FOR (TRANSPORTING) WITH HAND AT TANK (OR WAY)
CARPENTER
PER HANDRAIL OFG: 3 02-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS GETTING HANDRAIL ON BOLSTERS
* ...SO THAT THE CRANE CAN TRANSPORT IT
CARP-3 BEGINS AT BIN-2

TOTAL TMU 500

396. SET-UP HANDRAIL ON STANCHION WITH HAND AT TANK CARPENTER
PER HANDRAIL OFG: 3 02-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING HANDRAIL INTO THE....
* ...EYELETS ON THE STANCHION
* INCLUDES ACTION DISTANCES NEEDED FOR....
* ...ALIGNING THE HANDRAIL
* WELDING OF THE HANDRAIL CONNECTIONS WILL
* ...BE DONE IN A SEPARATE SUB OPERATION
CARP-1 BEGINS AT BRKT-1

TOTAL TMU 650

397. SET-UP HANDRAIL (END PIECES) ON HANDRAIL (AND BULKHEAD) WITH HAND A
TANK CARPENTER
PER HANDRAIL OFG: 4 02-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING HANDRAIL (END PIECES)
* ...AT THE END OF A STAGING LEVEL
* WELDING OF THE HANDRAIL (END PIECES)....
* ...CONNECTIONS WILL BE DONE IN A........
* ...SEPARATE SUB OPERATION
CARP-1 BEGINS AT BRKT-1

TOTAL TMU 1970
DATA SYNTHESIS AND BACK-UP

398. TEAR DOWN HANDRAIL ON BULKHEAD WITH TORCH AT (CENTER) MID TANKS AND
VOIDS CARPENTER
PER HANDRAIL OFG: 3 04-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS TEARING DOWN HANDRAIL IN A...
* CENTER TANK, HANDRAIL IS THROWN TO A
* MATERIAL PILE ON THE TANKTOP.
* CARPENTERS REMOVE 2 HANDRAIL BEFORE....
* MOVING TO NEXT SECTION.
CARP-1 BEGINS AT BULKHEAD

TOTAL THU 600.

399. TEAR DOWN HANDRAIL ON BULKHEAD WITH TORCH (AND WINCH) AT (WING) TANKS
AND VOID CARPENTER
PER HANDRAIL OFG: 3 04-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS TEARING DOWN HANDRAIL IN A...
* WING TANK, HANDRAIL IS LOWERED TO THE
* MATERIAL PILE WITH A WINCH BECAUSE THE...
* TANK IS TO SMALL FOR THE HANDRAIL TO
* BE THROWN.
* CARPENTERS REMOVE 2 HANDRAIL BEFORE.....
* MOVING TO THE NEXT SECTION.
* MAXIMUM NUMBERS OF HANDRAIL IN LIFT = 6
CARP-1 BEGINS AT BULKHEAD

TOTAL THU 1638.
DATA SYNTHESIS AND BACK-UP

400. TEAR DOWN STANCHION ON BULKHEAD WITH HAND AT (CENTER) MID TANKS AND VOIDS CARPENTER
PER STANCHION OGF: 3 04-FEB-82
* REPRESENTS ELAPSED TIME
* ...STANCHION IS THROWN TO A MATERIAL....
* ...PILE ON THE TANKTOP
CARP-2 BEGINS AT BRKT-1

TOTAL TMU 390.

402. TEAR DOWN STAGING PLANK ON STAGING BRACKET WITH HAND (AND WINCH) AT TANKS AND VOIDS CARPENTER
PER STAGING PLANK OGF: 3 04-FEB-82
* REPRESENTS ELAPSED TIME
* ...STANDING BRACKET IS THROWN TO CENTER OF TANK...
* ...WINCH IS USED TO LOWER BOARD TO.......
* ...BD-PILE ON TANKTOP.
* MAXIMUM NUMBER OF BOARDS IN LIFT = 3
CARP-1 BEGINS AT BULKHEAD

TOTAL TMU 1943.

403. TEAR DOWN LADDER (AND LADDER CLIPS) ON BULKHEAD WITH TORCH (AND WINCH AT ANY TANKS AND VOIDS CARPENTER
PER LADDER OGF: 3 05-FEB-82
* REPRESENTS ELAPSED TIME
* ...LADDER IS LOWERED TO LDR-PILE BY WINCH
* ...LADDER CLIPS THROWN TO MATL-PILE.
CARP-1 BEGINS AT BRKT-2

TOTAL TMU 8970.
DATA SYNTHESIS AND BACK-UP

405. TEAR DOWN LADDER (AND WIRE ROPE) ON BULKHEAD WITH PLIER (AND WINCH) AT ANY TANKS AND Voids CARPENTER
   PER LADDER OFG: 4 05-FEB-82
   **REPRESENTS ELAPSED TIME**
   * REPRESENTS REMOVING LADDER FROM BULKHEAD
   * ... THERE IS 1 WIRE ROPE PER LADDER.
   * ... LADDER LOWERED TO LDR-PILE BY WINCH
   * ... WIRE-ROPE IS THROWN TO MATL-PILE.
   CARP-1 BEGINS AT BRKT-2

   TOTAL TMU 5470.

406. TEAR DOWN STAGING BRACKET ON BULKHEAD WITH WRENCH AT ANY TANKS AND Voids CARPENTER
   PER STAGING BRACKET OFG: 3 05-FEB-82
   **REPRESENTS ELAPSED TIME**
   * REPRESENTS TEARING DOWN STAGING BRACKET
   * ... IN ANY TANK, BRACKETS ARE LOWERED TO
   * ... MATL-PILE BY WINCH.
   * MAXIMUM NUMBER OF BRACKETS IN LIFT = 3
   CARP-1 BEGINS AT BRKT-2

   TOTAL TMU 2797.
SECTION 5
DATA SYNTHESIS AND BACK-UP

5.1 SUMMARY

435. WELD STAGING BRACKET (CLIP) ON BULKHEAD (OR ANY STRUCTURE) WITH STICK
ELECTRODE AT ANY TANKS AND VOIDS (SHIP) WELDING
PER 100 CLIPS 0FG: 3
WELD TO MEET SAFETY REQUIREMENTS. RATE PER 100 CLIPS. RATE INCLUDES
MANUAL ELEMENTS.

TOTAL TMU 1063356.

438. WELD LADDER (CLIP) (SECURES LADDER) ON BULKHEAD (OR ANY STRUCTURE) W
STICK ELECTRODE AT ANY TANKS AND VOIDS (SHIP) WELDING
PER 100 LADDERS OR 400 CLIPS 0FG: 3
WELD TO MEET SAFETY REQUIREMENTS. RATE PER 100 LADDERS (400 CLIPS
RATE INCLUDES MANUAL ELEMENTS.

TOTAL TMU 1701606.

440. WELD HANDRAIL (CONNECTIONS) ON STANCHION WITH STICK ELECTRODE AT ANY
TANKS AND VOIDS (SHIP) WELDING
PER 100 PIECES OF HANDRAIL 0FG: 3
WELD TO MEET SAFETY REQUIREMENTS. RATE PER 100 PIECES OF HANDRAIL
(AVG. 1 CONNECTION EACH). RATE INCLUDES MANUAL ELEMENTS.

TOTAL TMU 196090.

404. (CLIMB UP AND DOWN) MOVE OPERATOR (ON LADDER) ON BULKHEAD AT ANY TAN
AND VOIDS CARPENTER
PER LADDER 0FG: 3 05-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS CARPENTERS CLIMBING UP AND...
* ...DOWN LADDERS TO REMOVE STAGING.
* AVERAGE LADDER SIZE = 12 RUNGS.
CARP-1 BEGINS AT LDR

TOTAL TMU 1280.
DATA SYNTHESIS AND BACK-UP

407. REMOVE HANDRAIL ON (MATERIAL-PILE) WITH WINCH AT ANY TANKS AND VOIDS
CARPENTER
PER HANDRAIL OGF: 3 08-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF HANDRAIL FROM MATL
* ... PILE ON TANKTOP TO DECK (GOING THRU
* ... MANHOLE).
* MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6
CARP-3 BEGINS AT TANKTOP

TOTAL THU 918.

408. REMOVE STANCHION ON (MATERIAL PILE) WITH WINCH AT ANY TANKS AND VOIDS
CARPENTER
PER STANCHION OGF: 3 08-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF STANCHION FROM ...
* ... MATL-PILE ON TANKTOP TO DECK (GOING
* ... THRU MANHOLE).
* MAXIMUM NUMBER OF STANCHION IN LIFT = 6
CARP-3 BEGINS AT MATL-PILE

TOTAL THU 988.

409. REMOVE STAGING BRACKET ON (MATERIAL PILE) WITH WINCH AT ANY TANKS AND
VOIDS CARPENTER
PER STAGING BRACKET OGF: 3 05-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF BRACKET FROM MATL
* ... PILE ON TANKTOP TO DECK (GOING THRU
* ... MANHOLE).
* MAXIMUM NUMBER OF BRACKET IN LIFT = 3
CARP-3 BEGINS AT MATL-PILE

TOTAL THU 1777.
410. REMOVE STAGING PLANK ON (BOARD PILE) WITH WINCH AT ANY TANKS AND VOID CARPENTER
PER STAGING PLANK OFG: 3 08-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENT REMOVING BOARDS FROM BOARD...
* ...PILE ON TANKTOP TO DECK (GOES THRU... MANHOLE).
* MAXIMUM NUMBER OF BOARDS IN LIFT = 3
CARP-3 BEGINS AT HATL-PILE

TOTAL TMU  1983.

411. REMOVE LADDER ON (LADDER-PILE) WITH WINCH AT ANY TANKS AND VOIDS CARPENTER
PER LADDER OFG: 3 08-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENT REMOVING LADDERS FROM LADDER...
* ...PILE ON TANKTOP TO DECK (GOES THRU... MANHOLE).
* MAXIMUM NUMBER OF LADDERS IN LIFT = 3
CARP-3 BEGINS AT BD-PILE

TOTAL TMU  1983.

412. REMOVE TOOLBOX ON (MATERIAL PILE) WITH WINCH AT ANY TANKS AND VOIDS CARPENTER
PER TOOLBOX OFG: 3 08-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS REMOVING TOOLBOX FROM MATL...
* ...PILE ON TANKTOP TO DECK (GOES THRU... MANHOLE),
* TOOLBOX CONTAINS:
* ...28 BOLTS
* ...428 NUTS
* ...28 LADDER CLIPS
CARP-3 BEGINS AT LDR-PILE

TOTAL TMU  7210.
DATA SYNTHESIS AND BACK-UP

431. (WALK UP OR DOWN) MOVE OPERATOR (ON INCLINED STAIRS) ON BULKHEAD AT ANY TANKS AND VOIDS CARPENTER
PER SET OF INCLINED STAIRS OFG: 4 10-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS CARPENTER WALKING UP OR DOWN
* ...A SET OF INCLINED STAIRS. AVERAGE
* ...NUMBER OF TREADS IN A SET OF INCLINED
* ..STAIRS = 16.
* CARPENTERS ARE WALKING UP OR DOWN STAIRS
* AT THE SAME TIME.
CARP-1 BEGINS AT LEVEL-1

TOTAL TMU 320.

563. TRANSPORT STAGING BRACKET WITH (TOWER CRANE) AT (WING) TANKS AND VOIDS CARPENTER
PER STAGING BRACKET OFG: 3 23-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS TRANSPORTING BRACKETS FROM..
* ..BIN-1 TO BULKHEAD
* DISTANCES FROM CRANE-REST TO BIN-1 AND..
* .... FROM BIN-1 TO BULKHEAD ARE AVERAGE..
* ..DISTANCES FROM THE SIDE OF A BASIN
* ..12 00 ’X 2 00’
* MAXIMUM NUMBER OF BRKTS IN LIFT = 6
C-OPER BEGINS AT CR-1

TOTAL TMU 1800.
DATA SYNTHESIS AND BACK-UP

564. TRANSPORT LADDER WITH (TOWER CRANE) AT (WING) TANKS AND VOIDS CARPENTER
PER LADDER OFG: 3 23-MAY-83
* REPRESENTS ELAPSED TIME
* ...LDR-PILE TO BULKHEAD
* DISTANCES FROM CRANE-REST TO LDR-PILE
* ...AND FROM LDR-PILE TO BULKHEAD ARE
* ...AVERAGE DISTANCE FROM SIDE OF BASIN
* ...1200'X200'
* MAXIMUM NUMBER OF LADDERS IN LIFT = 3
C-OPER BEGINS AT CR-1

TOTAL TMU 3600.

565. TRANSPORT STAGING PLANK WITH (TOWER CRANE) AT (WING) TANKS AND VOIDS CARPENTER
PER STAGING PLANK OFG: 3 23-MAY-83
* REPRESENTS ELAPSED TIME
* ...LU-PILE TO BULKHEAD
* DISTANCES FROM CRANE-REST TO LU-PILE AND
* ...FROM LU-PILE TO BULKHEAD ARE AVERAGE
* ...DISTANCES FROM THE SIDE OF A BASIN
* ...1200'X200'
* MAXIMUM NUMBER OF BOARDS IN LIFT = 3
C-OPER BEGINS AT CR-1

TOTAL TMU 4033.
DATA SYNTHESIS AND BACK-UP

566. TRANSPORT STANCHION WITH (TOWER CRANE) AT (WING) TANKS AND Voids CARPENTER
PER STANCHION OFG: 3 23-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS TRANSPORTING STANCHION FROM...
* ...BIN-2 TO BULKHEAD
* ...DISTANCES FROM CRANE-REST TO BIN-2 AND...
* ...FROM BIN-2 TO BULKHEAD AVERAGE...
* ...DISTANCES FROM THE SIDE OF A BASIN
* ...1200'x200'
* MAXIMUM NUMBER OF STANCHIONS IN LIFT = 6
C-OPER BEGINS AT CR-1

TOTAL THU 1800.

567. TRANSPORT HANDRAIL WITH (TOWER CRANE) AT (WING) TANKS AND Voids CARPENTER
PER HANDRAIL OFG: 3 23-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS TRANSPORTING HANDRAIL FROM...
* ...HR-PILE TO BULKHEAD
* ...DISTANCES FROM CRANE-REST TO HR-PILE AND
* ...FROM HR-PILE TO BULKHEAD AVERAGE
* ...DISTANCES FROM THE SIDE OF A BASIN
* ...1200'x200'
* MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6
C-OPER BEGINS AT CR-1

TOTAL THU 1800.
DATA SYNTHESIS AND BACK-UP

132. COMBINED SUB-OP

HOOK-UP/UNHOOK AND IGNITE/EXTINGUISH TORCH FOR BURNING WITH HAND AT TANK CARPENTER

CREW SIZE = 6 (3 CARPS ABOVE DECK AND 3 BELOW). RATE IN ELAPSED TIME MULT BY 6 TO OBTAIN TOTAL TIME.

PER 8-HR SHIFT AND (1) CUT OFG: 4 20-NOV-81
* THE FOLLOWING IS INCLUDED IN THIS SUBOP:
* --2 HOOK-UPS AND 2 UNHOOKS PER (1)......
* ...8-HR SHIFT
* --(1) OCCURRENCE FOR IGNITE AND ........
* ...EXTINGUISH TORCH
* --TO DETERMINE THE FREQ OF THE SUB-OP...
* ...FRO NUMBER OF CUTS >1, USE THE ....
* ...FORMULA: FREQ = 1+ [(N-1) X .23] ....
* ...WHERE "N" = THE NUMBER OF CUTS(BURNS)

TOTAL TMU 2900.0

376. SET-UP (STAGING CLIP) ON BULKHEAD WITH HAMMER (AND STEEL-TAPE) AT TA CARPENTER

PER STAGING CLIP OFG: 4 01-FEB-82

REPRESENTS ELAPSED TIME

* REPRESENTS PUTTING UP A STAGING CLIP ON
* ...THE BULKHEAD
* WELDING OF THE CLIP WILL BE DONE IN A...
* ...SEPARETE SUB OPERATION
CARP-1 BEGINS AT TANKTOP

TOTAL TMU 670.

377. MAKE READY STAGING BRACKET FOR (TRANSPORTING) WITH HAND AT TANK (OR WAY) CARPENTER

PER STAGING BRACKET OFG: 3 02-FEB-82

REPRESENTS ELAPSED TIME

* REPRESENTS GETTING BRACKET READY TO BE...
* ...TRANSPORTED TO TANK OR BULKHEAD
* CARPENTER IS LOCATED EITHER ON THE WAY...
* ...OR IN TANK AT THE MATERIAL (BIN-1)
CARP-3 BEGINS AT BIN-1

TOTAL TMU 510.
DATA SYNTHESIS AND BACK-UP

383. SET-UP (ACCESS) LADDER ON BULKHEAD WITH HAND AT TANK CARPENTER
   PER LADDER OFG: 3 01-FEB-82
   REPRESENTS ELAPSED TIME
   * REPRESENTS PUTTING UP AN ACCESS LADDER..
   * ..ON THE BULKHEAD SO THAT THE CARPENTER
   * ..CAN CLIMB TO THE NEXT LADDER.
   * ALSO INCLUDES CLIMBING UP AND DOWN THE..
   * ...LADDER.
   * AVERAGE NUMBER OF RUNGS = 12
   CARP-1 BEGINS AT TANKTOP

   TOTAL TMU 1420.

384. POSITION (SECURE) (ACCESS) LADDER FOR BULKHEAD WITH HAMMER (AND LADDER CLIPS) AT TANK CARPENTER
   PER LADDER OFG: 3 03-FEB-82
   REPRESENTS ELAPSED TIME
   * REPRESENTS SECURING A LADDER TO THE....
   * ...BULKHEAD USING 4 LADDER CLIPS
   * WELDING OF CLIPS WILL BE DONE IN A....
   * ...SEPARATE SUB OPERATION
   CARP-1 BEGINS AT LDR

   TOTAL TMU 710.

388. SET-UP STAGING PLANK ON STAGING BRACKET WITH HAND AT TANK CARPENTER
   PER BOARD OFG: 3 02-FEB-82
   REPRESENTS ELAPSED TIME
   * REPRESENTS SETTING UP BOARDS BETWEEN...
   * ... BRACKETS.
   * TWO MAN OPERATION:
   * CARPENTERS ARE LOCATED AT TWO DIFFERENT
   * ..BRACKETS. THEY BOTH LIFT THE BOARD...
   * ..TOGETHER AND SLIDE IT INTO POSITION,
   * IN THIS ANALYSIS CARPENTERS ARE LOCATED
   * ..ON THE LEVEL BELOW THE BOARDS*
   CARP-1 BEGINS AT BRKT-1

   TOTAL TMU 290.
DATA SYNTHESIS AND BACK-UP

393. SET-UP STANCHION IN STAGING BRACKET WITH HAND AT TANK CARPENTER
PER STANCHION OFG: 3 02-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING STANCHION IN THE.....
* ...BRACKET SLEEVE.
CARP-1 BEGINS AT BRKT-1

TOTAL TMU 250.

396. SET-UP HANDRAIL ON STANCHION WITH HAND AT TANK CARPENTER
PER HANDRAIL OFG: 3 02-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING HANDRAIL INTO THE....
* ...EYELETS ON THE STANCHION
* INCLUDES ACTION DISTANCES NEEDED FOR....
* ...ALIGNING THE HANDRAIL
* WELDING OF THE HANDRAIL CONNECTIONS WILL
* ...BE DONE IN A SEPARATE SUB OPERATION
CARP-1 BEGINS AT BRKT-1

TOTAL TMU 650.

397. SET-UP HANDRAIL (END PIECES) ON HANDRAIL (AND BULKHEAD) WITH HAND AT TANK CARPENTER
PER HANDRAIL OFG: 4 02-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING HANDRAIL (END PIECES)
* ...AT THE END OF A STAGING LEVEL
* WELDING OF THE HANDRAIL (END PIECES)....
* ...CONNECTIONS WILL BE DONE IN A........
* ...SEPARATE SUB OPERATION
CARP-1 BEGINS AT BRKT-1

TOTAL TMU 1970.
DATA SYNTHESIS AND BACK-UP

399. TEAR DOWN HANDRAIL ON BULKHEAD WITH TORCH (AND WINCH) AT (WING) TANKS AND VOIDS CARPENTER
PER HANDRAIL OFG: 3 04-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS TEARING DOWN HANDRAIL IN A...
* .....WING TANK, HANDRAIL IS LOWERED TO THE
* .....HATL-PILE WITH A WINCH BECAUSE THE...
* .....TANK IS TOO SMALL FOR THE HANDRAIL TO
* .....BE THROWN.
* CARPENTERS REMOVE 2 HANDRAIL BEFORE.....
* .....MOVING TO THE NEXT SECTION.
* MAXIMUM NUMBERS OF HANDRAIL IN LIFT = 6
CARP-1 BEGINS AT BULKHEAD

TOTAL TMU 1638.

401. TEAR DOWN STANCHION ON BULKHEAD WITH HAND (AND WINCH) AT (WING) TANKS AND VOIDS CARPENTER
PER STANCHION OFG: 3 04-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS TEARING DOWN STANCHION IN A...
* .....WING TANK, STANCHION IS LOWERED TO...
* .....THE HATL-PILE WITH A WINCH BECAUSE...
* .....THE TANK IS TOO SMALL FOR THE..........
* .....STANCHION TO BE THROWN.
* MAXIMUM NUMBER OF STANCHIONS IN LIFT = 6
CARP-2 BEGINS AT BRKT-PILE

TOTAL TMU 1588.
DATA SYNTHESIS AND BACK-UP

402. TEAR DOWN STAGING PLANK ON STAGING BRACKET WITH HAND (AND WINCH) AT TANKS AND VOIDS CARPENTER
PER STAGING PLANK OFG: 3 04-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS REMOVING BOARDS FROM ANY TANK
* ....WINCH IS USED TO LOWER BOARD TO......
* ....BD-PILE ON TANKTOP.
* MAXIMUM NUMBER OF BOARDS IN LIFT = 3
CARP-1 BEGINS AT BULKHEAD

TOTAL TMU 1943.

403. TEAR DOWN LADDER (AND LADDER CLIPS) ON BULKHEAD WITH TORCH (AND WINC AT ANY TANKS AND VOIDS CARPENTER
PER LADDER OFG: 3 05-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS REMOVING LADDER FROM BULKHEAD
* ....THERE ARE 4 LADDER CLIPS PER LADDER.
* ....LADDER LOWERED TO LDR-PILE BY WINCH
* ....LADDER CLIPS THROWN TO MATL-PILE.
CARP-1 BEGINS AT BRKT-2

TOTAL TMU 8970.

406. TEAR DOWN STAGING BRACKET ON BULKHEAD WITH WRENCH AT ANY TANKS AND VOIDS CARPENTER
PER STAGING BRACKET OFG: 3 05-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS TEARING DOWN STAGING BRACKET
* ....IN ANY TANK. BRACKETS ARE LOWFRED TO
* ....MATL-PILE BY WINCH.
* MAXIMUM NUMBER OF BRACKETS IN LIFT = 3
CARP-1 BEGINS AT BRKT-2

TOTAL TMU 2797.
DATA SYNTHESIS AND BACK-UP

426. MAKE READY STAGING BRACKET FOR (TRANSPORTING) WITH HAND AT ANY WAYS
   CARPENTER
   PER STAGING BRACKET OFG: 3 10-FEB-82
   REPRESENTS ELAPSED TIME
   * REPRESENTS GETTING BRACKET READY TO BE...
   * ...TRANSPORTED TO TANK OR BULKHEAD
   * CARPENTER IS LOCATED EITHER ON THE WAY...
   * ..OR IN TANK AT THE MATERIAL (BIN-1)
   CARP-3 BEGINS AT BIN-1

   TOTAL TMU  510.

427. MAKE READY LADDER FOR (TRANSPORTING) WITH HAND AT ANY WAYS CARPENTER
   PER LADDER OFG: 3 10-FEB-82
   REPRESENTS ELAPSED TIME
   * REPRESENTS GETTING LADDER ON BOLSTERS SO
   * ...THAT THE CRANE CAN TRANSPORT IT.
   CARP-3 BEGINS AT BIN-1

   TOTAL TMU  720.

428. MAKE READY STAGING PLANK FOR (TRANSPORTING) WITH HAND AT ANY MAYS
   CARPENTER
   PER STAGING PLANK OFG: 3 10-FEB-82
   REPRESENTS ELAPSED TIME
   * REPRESENTS GETTING BOARD ON BOLSTERS SO
   * ...THAT THE CRANE CAN TRANSPORT IT
   CARP-3 BEGINS AT BIN-1

   TOTAL TMU  500.
DATA SYNTHESIS AND BACK-UP

429. MAKE READY STANCHION FOR (TRANSPORTING) WITH HAND AT ANY WAYS CARPENTER
PER STANCHION OFG: 3 10-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS GETTING STANCHION READY TO BE
  TRANSPORTED
CARP-3 BEGINS AT LU-PILE

TOTAL TMU 290.

430, MAKE READY HANDRAIL FOR (TRANSPORTING) WITH HAND AT ANY WAYS CARPENTER
PER HANDRAIL OFG: 3 10-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS GETTING HANDRAIL ON BOLSTERS
  SO THAT THE CRANE CAN TRANSPORT IT
CARP-3 BEGINS AT BIN-2

TOTAL TMU 500.

569. SET-UP STAGING BRACKET ON WEB FRAME WITH WRENCH AT (WING) TANKS A
VOIDS CARPENTER
PER STAGING BRACKET OFG: 4 24-MAY-83
* REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING UP A STAGING BRACKET
  ON A EXISTING STAGING CLIP (LOCATED
  ON A WEB FRAME)
CARP-1 BEGINS AT WING-TANK

TOTAL TMU 1080.
DATA SYNTHESIS AND BACK-UP

570. SET-UP ( ACCESS ) LADDER ON ( INBOARD OR OUTBOARD ) BULKHEAD WITH HAND AT ( WING ) TANKS AND VOIDS CARPENTER
   PER LADDER OFG: 4 24-MAY-83
   * REPRESENTS ELAPSED TIME
   * ...ON THE INBOARD OR OUTBOARD BULKHEAD
   * ...SO THAT THE CARPENTER CAN CLimb TO
   * ...THE NEXT LEVEL OF STAGING
   * ALSO INCLUDES CLIMBING UP AND DOWN THE
   * ...LADDER
   CARP-1 BEGINS AT WING-TANK

   TOTAL TMU 1420.

571. POSITION ( SECURE ) ( ACCESS ) LADDER ON ( INBOARD OR OUTBOARD )
   BULKHEAD WITH HAMMER AT ( WING ) TANKS AND VOIDS CARPENTER
   PER LADDER OFG: 4 24-MAY-83
   * REPRESENTS ELAPSED TIME
   * REPRESENTS SECURING A LADDER TO THE
   * ...INBOARD OR OUTBOARD BULKHEAD USING
   * ...FOUR LADDER CLIPS
   * WELDING OF CLIPS WILL BE DONE IN A
   * ...SEPARATE SUB OPERATION
   CARP-1 BEGINS AT LDR

   TOTAL TMU 710.
DATA SYNTHESIS AND BACK-UP

573. SET-UP STAGING PLANK ON STAGING BRACKET WITH HAND AT ( WING ) TANKS Voids Carpenter
PER STAGING PLANK OFG: 4 24-MAY-83
* REPRESENTS ELAPSED TIME
* 2 MAN OPERATION:
* CARPENTERS ARE LOCATED AT TWO DIFFERENT
* *WEBs. THEY BOTH PICK UP THE BOARD
* *TOGETHER AND SLIDE IT INTO POSITION.
* IN THIS ANALYSIS CARPENTERS ARE LOCATED
* *ON THE SAME LEVEL AS THE BOARDS.
CARP-1 BEGINS AT WEB-1

TOTAL THU 350.

575. SET-UP STAGING PLANK ON ( EXISTING ) BRACKET STAGING WITH HAND AT ( WING ) TANKS AND Voids Carpenter
PER STAGING PLANK OFG: 4 24-MAY-83
* REPRESENTS ELAPSED TIME
* *EXISTING STAGING AND INBOARD OR
* *OUTBOARD BULKHEAD
* 2 MAN OPERATION:
* CARPENTERS ARE LOCATED AT DIFFERENT WEBs
* *EACH CARPENTER SPREADS TWO BOARDS
* *SIMULTANEOUSLY
* IN THIS ANALYSIS CARPENTERS ARE LOCATED
* *ON THE SAME LEVEL AS THE BOARDS.
CARP-1 BEGINS AT WEB-1

TOTAL THU 420.
DATA SYNTHESIS AND BACK-UP

577. SET-UP STANCHION IN STAGING BRACKET WITH HAND AT (WING) TANKS AND VOIDS CARPENTER
PER STANCHION OFG: 4 24-MAY-83
* REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING STANCHION IN THE
* BRACKET SLEEVE IN A WING TANK
CARP-1 BEGINS AT WEB-1

TOTAL TMU 250

578. SET-UP HANDRAIL IN STANCHION WITH HAND AT (WING) TANKS AND VOIDS CARPENTER
PER HANDRAIL OFG: 4 24-MAY-83
* REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING HANDRAIL INTO THE
* EYELETS ON THE STANCHION
* INCLUDES ACTION DISTANCES NEEDED FOR
* ALIGNING THE HANDRAIL
* WELDING OF THE HANDRAIL WILL BE DONE IN
* A SEPARATE SUB OPERATION
CARP-1 BEGINS AT WEB-1

TOTAL TMU 650

579. SET-UP HANDRAIL (END PIECES) ON (HANDRAIL AND) BULKHEAD WITH HAND AT (WING) TANKS AND VOIDS CARPENTER
PER HANDRAIL OFG: 4 24-MAY-83
* REPRESENTS ELAPSED TIME-
* REPRESENTS PUTTING HANDRAIL (END PIECES)
* AT THE END OF A STAGING LEVEL
* WELDING OF THE HANDRAIL (END PIECES)
* CONNECTIONS WILL BE DONE IN A
* SEPARATE SUB OPERATION
CARP-1 BEGINS AT WEB-1

TOTAL TMU 1970.
DATA SYNTHESIS AND BACK-UP

568. SET-UP (STAGING CLIP) ON WEB FRAME WITH HAMMER (AND STEEL-TAPE) A (WING) TANKS AND VOIDS CARPENTER
PER STAGING CLIP OFG: 4 24-MAY-83
* REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING UP A STAGING CLIP ON
* ..A WEB FRAME
* WELDING OF THE CLIP WILL BE DONE IN A
* ..SEPARATE SUB OPERATION
CARP-1 BEGINS AT WING-TANK

TOTAL TMU 670.
SECTION 5
DATA SYNTHESIS AND BACK-UP

5.1 SUMMARY

545. ASSEMBLE I-BEAMS FOR TANK STAGING PLATFORM WITH WRENCH AT ANY PLATEN CARPENTER
PER PLATFORM OFG: 4 02-FEB-83
* REPRESENTS ELAPSED TIME
* CARPENTER WORKS ALONE BOLTING I-BEAMS
* STEPS:
* 1-4 ARE FOR THE CONNECTIONS OF I-6 & I-7
* ... AT I-1, I-2, I-3, I-4, AND I-5
* 5,6 ARE FOR MOVEMENT OF THE CARPENTER
* ... BETWEEN THE CONNECTIONS
CARP-1 BEGINS AT TANK-STAGING-PLATFORM

TOTAL TMU 536504

546. ASSEMBLE ANGLE-BARS FOR TANK STAGING PLATFORM WITH WRENCH AT ANY PLATEN CARPENTER
PER PLATFORM OFG: 4 02-FEB-83
* REPRESENTS ELAPSED TIME
* CARPENTER WORKS ALONE ASSEMBLING ANGLES
* STEPS:
* 1-6 ARE FOR CONNECTIONS OF A-4 AND A-1
* ... AT I-1, I-2, I-3, I-4, AND I-5
* 7-13 ARE FOR CONNECTIONS OF
* ... A-3 AT 1-5, 1-4, AND 1-3 AND
* ... A-1 AT 1-3, 1-2, AND 1-1
* 14-20 ARE FOR CONNECTIONS OF A-S AND A-6
* ... AT I-1, I-2, I-3, I-4, AND I-5
CARP-1 BEGINS AT TANK-STAGING-PLATFORM

TOTAL TMU 74030.
DATA SYNTHESIS AND BACK-UP

539. READ MATERIAL LIST (PRINT) FOR TANK STAGING PLATFORM WITH (EYES) AT PLATEN CARPENTER
PER PLATFORM OFG: 4 02-FEB-83
* CARPENTER READS PRINT BEFORE LAYING OUT
* ...TABLE, READS 48 DIGITS PER LOCATION
CARP-1 BEGINS AT TANK-STAGING-PLATFORM

TOTAL TMU 3120.

540. MEASURE (PLATEN) FOR TANK STAGING PLATFORM WITH (STEEL) TAPE AT ANY PLATEN CARPENTER
PER PLATFORM OFG: 4 31-JAN-83
* REPRESENTS ELAPSED TIME
* REPRESENTS MEASURING TABLE FOR LAYOUT
* ANALYSIS INCLUDES ALL THE WALKING...
* ...DISTANCES FOR THE LAYOUT.
* STEPS:
* 2,3,4 ARE FOR I-1, I-2,I-3,1-4,AND 1-5
* ...AT A-5 AND A-6,
* 5,6,7 ARE FOR A-5, I-7,A4,A-3,A-1,I-6,
* ....AND A-6 AT 1-5
* 5,6,7 ARE FOR A-5,1-7,A-4,A-2,A-1,I-6,
* ...AND A-6 AT 1-1
* 9,10,11 ARE FOR A-2 AND A-3 AT I-3
CARP-1 BEGINS AT STORE-2

TOTAL TMU 15460.
541. MARK (PLATEN) FOR TANK STAGING PLATFORM WITH MARKER AT ANY PLATEN CARPENTER

PER PLATFORM OFG: 4 02-FEB-83

* REPRESENTS ELAPSED TIME
* REPRESENTS MARKING THE LAYOUT FOR A TANK
* ...STAGING PLATFORM AND INSPECTING WORK.
* THE FOLLOWING PLACES ARE LAID OUT:
  * ...AT A-S AND A-6:
  * ...I-1, I-2, I-3, I-4, AND I-S
  * ...AT I-1 AND I-5:
  * ...A-6, I-6, I-6, A-1, A-4, I-7 AND A-5
  * ...A-2 IS LAID OUT AT I-3 AND I-1
  * ...A-3 IS LAID OUT AT I-3 AND I-5

CARP-1 BEGINS AT TANK-STAGING-PLATFORM

TOTAL TMU 8500

542. TRANSPORT PALLETS (I-BEAMS AND ANGLES) FOR TANK STAGING PLATFORM WITH (CRANE) AT ANY PLATEN CARPENTER

PER PLATFORM OFG: 4 02-FEB-83.

* MATERIAL NEEDED FOR ONE PLATFORM:
  * ...I-BEAMS - 7
  * ...ANGLES - 6

HOOKER-ON BEGINS AT CR-1

TOTAL TMU 7800

547. TRANSPORT STAGING PLANKS FOR TANK STAGING PLATFORM WITH (CRANE) AT ANY PLATEN CARPENTER

PER PLATFORM OFG: 4 02-FEB-83

* BOARDS ARE TRANSPORTED FROM LUMBER PILE
* ...WHICH IS LOCATED ON THE PLATEN.
* TOTAL NUMBER OF BOARDS IN LIFT = 64
* TOTAL LIFTS = 2 (PORT AND STARBOARD)

HOOKER-ON BEGINS AT STORE-2

TOTAL TMU 26000
DATA SYNTHESIS AND BACK-UP

549. TRANSPORT (FINISHED) TANK STAGING PLATFORM WITH (CRANE) AT ANY PLATEN CARPENTER
PER PLATFORM OFG: 4 02-FEB-83
* REPRESENTS ELAPSED TIME
* TRANSPORT FINISHED PLATFORM TO A STORAGE
* ...PILE
HOOKER-ON BEGINS AT STORE-2

TOTAL THU 12600.

555. POSITION (RAISE) TANK STAGING PLATFORM WITH (CRANE) AT MID TANKS AND VOIDS CARPENTER
PER PLATFORM OFG: 4 17-MAY-83
* REPRESENTS ELAPSED TIME
* REPRESENTS RAISING TYPICAL PLATFORM IN A
* ...CENTER TANK AND SECURING IT TO THE
* ...MAIN DECK,
* 2 CARPENTERS WORK SIMULTANEOUSLY ON THE
* ...MAIN DECK
* 2 CARPENTERS WORK SIMULTANEOUSLY IN THE
* ...CENTER TANK ON THE PLATFORM
* STEPS:
* 1-4 FEEDING 4 CABLES THROUGH BUTTERWORTH
* ...HOLES ON MAIN DECK
* 7-12 CONNECTION OF SHACKLES ON PLATFORM
* 14-19 CONNECTION OF SUSPENSION CABLES ON
* ...PLATFORM AND MAIN DECK
* 21-26 REMOVING SHACKLES FROM PLATFORM
* 27-29 REMOVING CABLES FROM CENTER TANK
CARP-3 BEGINS AT MONSEHOLE

TOTAL THU 57652.

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DATA SYNTHESIS AND BACK-UP

556. POSITION (LOWER) TANK STAGING PLATFORM WITH (CRANE) AT MID TANKS AND Voids Carpenter
PER PLATFORM DOC: 4 17-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS LOWERING TYPICAL PLATFORM IN
* ...A CENTER TANK AND REMOVING IT FROM
* ...THE MAIN DECK.
* 2 CARPENTERS WORK SIMULTANEOUSLY ON THE
* ...MAIN DECK
* 2 CARPENTERS WORK SIMULTANEOUSLY IN THE
* ...CENTER TANK ON THE PLATFORM
* STEPS:
* 1-4 FEEDING 4 CABLES THROUGH BUTTERWORTH
* ...HOLES ON MAIN DECK
* 6-11 CONNECTION OF SHACKLES ON PLATFORM
* 13-18 REMOVAL OF SUSPENSION CABLES FROM
* ...PLATFORM AND MAIN DECK
* 23-28 REMOVING SHACKLES FROM PLATFORM
* 29-31 REMOVING CABLES FROM CENTER TANK
CARP-3 BEGINS AT MENHOLE

TOTAL TMU 61219.

557. POSITION (PLACE) TANK STAGING PLATFORM (AND BOARDS) IN (TYPICAL TANK)
   WITH (CRANE) AT ANY SHIP CARPENTER
PER PLATFORM DOC: 4 17-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS SETTING TANK STAGING PLATFORM
* ...IN A TYPICAL TANK ON THE SHIP. ALSO
* ...THE BOARDS NEEDED TO EXTEND THE
* ...PLATFORM UNDER THE MAIN DECK.
* 2 HOOKER-ONS: ONE AT THE MATERIAL AND
* ...ONE ON THE SHIP IN THE TANK.
* TOTAL OF 280 FOR TYPICAL TANK
* 7 LIFTS (40 BOARDS PER LIFT)
HOOKER-ON1 BEGINS AT 6-7

TOTAL TMU 69700.

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543. SET-UP I-BEAMS FOR TANK STAGING PLATFORM WITH (CRANE) AT ANY PLATEN CARPENTER
PER PLATFORM OGF: 4 02-FEB-83
REPRESENTS ELAPSED TIME
* CARPENTER WORKS SIMULTANEOUSLY WITH THE
* ...HOOKER-ON
* STEP 3 INCLUDES SPREADING I-BEAMS AT:
* ...I-2, I-3, I-4, AND I-5
HOOKER-ON BEGINS AT STORE-2

TOTAL TMU 43600.

544. SET-UP ANGLE-BARS FOR TANK STAGING PLATFORM WITH (CRANE) AT ANY PLATE CARPENTER
PER PLATFORM OGF: 4 02-FEB-83
REPRESENTS ELAPSED TIME
* CARPENTER WORKS SIMULTANEOUSLY WITH THE
* ...HOOKER-ON
* STEP 1 INCLUDES SPREADING ANGLES AT:
* ...A-6, A-1, AND A-2
* STEP 2 INCLUDES SPREADING ANGLES AT:
* ...A-3, A-4, AND A-5
HOOKER-ON BEGINS AT STORE-2

TOTAL TMU 46800.
DATA SYNTHESIS AND BACK-UP

548. SET-UP STAGING PLANKS ON TANK STAGING PLATFORM WITH HANDS AT ANY PLATEN CARPENTER
PER PLATFORM OFG: 4 02-FEB-83
REPRESENTS ELAPSED TIME
* CARPENTERS SPREAD BOARDS SIMULTANEOUSLY
* BOARDS ARE SPREAD ON PORT SIDE FIRST....
* ...THEN STARBOARD SIDE.
* TOTAL BOARDS PER SIDE = 32
* STEPS:
  * 2-5 SPREAD BOARDS BETWEEN A-6 & I-6 P/S
  * 6-8 SPREAD BOARDS BETWEEN I-6 & A-1 P/S
  * 9-11 SPREAD BOARDS BETWEEN A-1 & A-3 S
  * ...AND A-1 & A-2 P
  * 12-14 SPREAD BOARDS BETWEEN A-3 & A-4 S
  * ...AND A-2 & A-4 P
  * 15-17 SPREAD BOARDS BTWN A-4 & I-7 P/S
  * 18-20 SPREAD BOARDS BTWN I-7 & A-5 P/S
  * 21-22 SPREAD BOARD AT A-5 P/S
CARP-1 BEGINS AT STORE-2

TOTAL THU 36020.

550. TEAR DOWN ANGLES ON TANK STAGING PLATFORM WITH WRENCH AT MID TANKS AND VOIDS CARPENTER
PER PLATFORM OFG: 4 11-MAY-83
REPRESENTS ELAPSED TIME
* CARPENTER WORKS ALONE UNBOLTING ANGLES
* STEPS:
  * 1-5 ARE FOR REMOVING BOLTS ON A-4 & A-1
  * ...AT I-1,I-2,I-3,I-4,AND I-5
  * 7-11 ARE FOR REMOVING BOLTS
  * ...ON A-3 AT I-1,I-2, & I-3
  * ...ON A-1 AT I-3,I-4, & I-5
  * 14-18 FOR REMOVING BOLTS ON A-5 & A-6
  * ...AT I-1,I-2,I-3,I-4 & I-5
CARP-1 BEGINS AT I-1

TOTAL THU 56860.

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DATA SYNTHESIS AND BACK-UP

551, TEAR DOWN I-BEAMS ON TANK STAGING PLATFORM WITH WRENCH AT MID TANKS AT VOIDS. CARPENTER
PER PLATFORM OFG: 4 11-HAY-83
REPRESENTS ELAPSED TIME
* CARPENTER WORKS ALONE UNBOLTING I-BEAMS
* STEPS:
  * 1-5 ARE FOR REMOVING BOLTS ON 1-6 & I-7
  * .... AT I-I, I-2, I-3, I-4, AND 1-5
  * 6, 7 ARE FOR MOVEMENT OF THE CARPENTER
  * ..BETWEEN THE CONNECTIONS
Carp-I begins at 1-1

TOTAL TMU 38530,

552, TEAR DOWN STAGING PLANKS ON TANK STAGING PLATFORM WITH WINCH AT MID TANKS AND VOIDS CARPENTER
PER PLATFORM OFG: 4 18-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF BOARDS ON A TANK
  * ...STAGING PLATFORM (IN A CENTER TANK)
  * TOTAL BOARDS = 64 (22 LIFTS)
  * 2 CARPENTERS MOVE BOARDS FROM THE TANK
  * ...STAGING Platform TO A LUMBER-PILE
  * ...LOCATED NEAR A MANHOLE. A WINCH
  * ...OPERATOR AND A CARPENTER REMOVE THE
  * ....BOARDS FROM THE TANK. THERE ARE 2
  * ...CARPENTERS WHO RECEIVE AND STACK THE
  * ..BOARDS ON THE DECK. THEIR TIME IS
  * ..INTERNAL TO THE WINCH PROCESS TIME,
Carp-1 begins at 1-5

TOTAL TNU 215080.
DATA SYNTHESIS AND BACK-UP

553. TEAR DOWN ANGLES ON TANK STAGING PLATFORM WITH WINCH AT MID TANKS AND VOIDS CARPENTER

PER PLATFORM OFG: 4 11-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF ANGLES ON A TANK
* ...STAGING PLATFORM (IN A CENTER TANK)
* TOTAL ANGLES = 6 (1 LIFT)
* 1 CARPENTER MOVES ANGLES TO ONE AREA ON
* ...THE TANK STAGING PLATFORM
* ...LOCATED NEAR A MANHOLE. A WINCH
* ...OPERATOR AND A CARPENTER REMOVE THE
* ...ANGLES FROM THE TANK. THERE ARE 2
* ...CARPENTERS WHO RECEIVE AND STACK THE
* ...ANGLES ON THE DECK. THEIR TIME IS
* ...INTERNAL TO THE WINCH PROCESS TIME.
CARP-3 BEGINS AT LUMBER-FILE

TOTAL TMU 9240.

554. TEAR DOWN I-BEAMS FOR TANK STAGING PLATFORM WITH WINCH AT MID TANKS AND VOIDS CARPENTER

PER PLATFORM OFG: 4 11-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF I-BEAMS FROM THE
* ...TANK STAGING PLATFORM
* TOTAL I-BEAMS = 7 (7 LIFTS)
* A CARPENTER AND WINCH OPERATOR REMOVE
* ...THE I-BEAMS FROM THE TANK. THERE ARE
* ...2 CARPENTERS WHO RECEIVE AND STACK
* ...THE I-BEAMS ON THE DECK. THEIR TIME
* ...IS INTERNAL TO THE WINCH PROCESS TIME
CARP-3 BEGINS AT A-6

TOTAL TMU 35540.
DATA SYNTHESIS AND BACK-UP

538. (BRUSH) CLEAN (PLATEN) FOR TANK STAGING PLATFORM WITH BROOM AT ANY
PLATEN CARPENTER
PER PLATFORM OFG: 4 31-JAN-83
* REPRESENTS ELAPSED TIME
* ...TANK STAGING PLATFORM IS ASSEMBLED.
* SQUARE FOOTAGE OF AREA CLEANED = 700
CARP-1 BEGINS AT STORE-2

TOTAL THU 42580.

559. SET-UP STAGING PLANKS FOR TANK STAGING PLATFORM WITH HAMMER AT MID
TANKS AND Voids CARPENTER
PER STAGING PLANK OFG: 4 20-MAY-83
* REPRESENTS ELAPSED TIME
* ...SPREADING BOARDS FROM A TANK
* ...STAGING PLATFORM TO EXISTING STAGING
* ...ON THE BULKHEADS.
* ...2 CARPENTERS WHO ARE NOT WORKING
* ...SIMULTANEOUSLY.
CARP-1 BEGINS AT STAR-BHD

TOTAL THU 6730.

560. TEAR DOWN HANDRAIL ( AND STANCHION ) ON ( LONGITUDINAL ) BULKHEAD WITH
TORCH AT MID TANKS AND Voids CARPENTER
PER ASSEMBLY OFG: 4 20-MAY-83
* REPRESENTS ELAPSED TIME
* ...REMOVAL OF HANDRAIL FROM TOP
* ...LEVEL OF BULKHEAD STAGING IN A CENTER
* ...TANK, THIS IS DONE AFTER BOARDS HAVE
* ...BEEN SPREAD TO TANK STAGING PLATFORM
* CARPENTER WORKS ALONE
* HOOKUP, IGNITE AND EXTINGUISH TORCH ARE
* ...IN A SEPARATE SUB-OP
CARP-3 BEGINS AT PLATFORM

TOTAL THU 9560.

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DATA SYNTHESIS AND BACK-UP

561. SET-UP STAGING BRACKETS FOR (BETWEEN) TANK STAGING PLATFORM WITH WRENCH AT MID TANKS AND VOIDS CARPENTER
PER CENTER TANK OFG: 4 23-MAY-83
* REPRESENTS ELAPSED TIME
* REPRESENTS SETTING UP BRACKETS ON 2 TANK
* ...STAGING PLATFORMS. BOARDS ARE SPREAD
* ...BETWEEN THE BRACKETS.
* THIS ASSEMBLY IS USED TO CONNECT THE TWO
* ...TANK STAGING PLATFORMS.
* 2 CARPENTERS WORKING SIMULTANEOUSLY EACH
* ...WORKING ON A DIFFERENT PLATFORM
* STEPS:
* 1-6 REPRESENTS SETTING UP BRACKETS AT
* ...BR-1, BR-2, AND BR-3
* 7 REPRESENTS SPREADING BOARDS BETWEEN
* ...BR-1 AND BR-2; BR-2 AND BR-3
CARP-1 BEGINS AT PLFM1

TOTAL TMU 6540.

562. SET-UP STAGING PLANKS FOR (BETWEEN) TANK STAGING PLATFORMS WITH HAMMER AT MID TANKS AND VOIDS CARPENTER
PER STAGING PLANK OFG: 4 23-MAY-83
* REPRESENTS ELAPSED TIME
* REPRESENTS SPREADING BOARDS BETWEEN TWO
* ...TANK STAGING PLATFORMS
* 2 CARPENTERS ARE NOT WORKING
* ...SIMULTANEOUSLY
CARP-1 BEGINS AT PLFM1

TOTAL TMU 6830.

9. HOOK-UP AND UNHOOK TORCH ON MANIFOLD WITH WRENCH AT SHIP
PER EA OFG: 1 31-JUL-81
* TORCH AND HOSE LOCATED AT MANIFOLD
* UNHOOK IS THE REVERSE OF HOOKUP
CARP4 BEGINS AT HOOK-UP

TOTAL TMU 280.
DATA SYNTHESIS AND BACK-UP

10. IGNITE AND EXTINGUISH TORCH FOR BURNING WITH HAND AT TANK
PER EA OFG: 1 03-AUG-81
* HOOK-UP NOT INCLUDED
FITTER BEGINS AT JOB

TOTAL TMU 660

582. TEAR DOWN STAGING PLANK FOR TANK STAGING PLATFORM WITH (PRYBAR) AND
HAND AT MID TANKS AND VOIDS CARPENTER
PER STAGING PLANK OFG: 4 31-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS REMOVING BOARDS FROM BELOW
* . . . THE MAIN DECK, BOARDS ARE CONNECTED
* . . . TO THE TANK STAGING PLATFORM AND THE
* . . . EXISTING PERIMETER STAGING BY NAIL.
* 2 MAN OPERATION! (WORKING SIMULTANEOUSLY)
* . . . CARPENTERS LOOSEN THE NAILS ON EACH
* . . . END OF THE BOARD, THEN PICK UP THE
* . . . BOARD AND PLACE IT ON A FILE ON THE
* . . . TANK STAGING PLATFORM.
CARP-1 BEGINS AT STAR-BHD

TOTAL TMU 1530

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DATA SYNTHESIS AND BACK-UP

583. TEAR DOWN STAGING PLANK FOR ( BETWEEN ) TANK STAGING PLATFORM WITH ( PRYBAR ) AND HAND AT MID TANKS AND VOIDS CARPENTER

PER STAGING PLANK OFG: 4 31-MAY-83

* REPRESENTS ELAPSED TIME
* ...REPRESENTING REMOVING BOARDS FROM BETWEEN
* ...THE TWO TANK STAGING PLATFORMS. THE
* ...BOARDS ARE CONNECTED TO THE PLATFORMS
* ...BY NAILS.
* 2 MAN OPERATION! (WORKING SIMULTANEOUSLY)
* ...CARPENTERS LOOSEN THE NAILS ON EACH
* ...END OF THE BOARD, THEN PICK UP THE
* ...BOARD AND PLACE IT ON A PILE ON ONE
* ...OF THE TANK STAGING PLATFORMS.
CARP-1 BEGINS AT PLFM1

TOTAL THU 1850.

584. TEAR DOWN STAGING BRACKETS ON TANK STAGING PLATFORM WITH WRENCH AT MID TANKS AND VOIDS CARPENTER

PER CENTER TANK OFG: 4 31-MAY-83

* REPRESENTS ELAPSED TIME
* ...REPRESENTS REMOVAL OF BRACKETS ON 2 TANK
* ...STAGING PLATFORMS. ALSO REMOVAL OF
* ...BOARDS THAT ARE SPREAD BETWEEN THE
* ...BRACKETS.
* 2 CARPENTERS WORKING SIMULTANEOUSLY EACH
* ...WORKING ON A DIFFERENT PLATFORM.
* STEPS:
* 1 REPRESENTS REMOVAL OF BOARDS BETWEEN
* ...BR-1 AND BR-2; BR-2 AND BR-3
* 2-5 REPRESENTS REMOVAL OF BRACKETS FROM
* ...BR-1, BR-2 AND BR-3. BRACKETS ARE
* ...PLACED ON A PILE ON THE PLATFORM.
CARP-1 BEGINS AT BR-1

TOTAL THU 5640.
SECTION 5
DATA SYNTHESIS AND BACK-UP

5.1 SUMMARY

435. WELD STAGING BRACKET (CLIP) ON BULKHEAD (OR ANY STRUCTURE) WITH STICK ELECTRODE AT ANY TANKS AND VOIDS (SHIP) WELDING
PER 100 CLIPS OFG: 3
WELD TO MEET SAFETY REQUIREMENTS. RATE PER 100 CLIPS. RATE INCLUDES
MANUAL ELEMENTS.

TOTAL TMU 1063356.

438. WELD LADDER (CLIP) (SECURES LADDER) ON BULKHEAD (OR ANY STRUCTURE) WITH STICK ELECTRODE AT ANY TANKS AND VOIDS (SHIP) WELDING
PER 100 LADDERS OR 400 CLIPS OFG: 3
WELD TO MEET SAFETY REQUIREMENTS. RATE PER 100 LADDERS (400 CLIPS)
RATE INCLUDES MANUAL ELEMENTS.

TOTAL TMU 1701606.

440. WELD HANDRAIL (CONNECTIONS) ON STANCHION WITH STICK ELECTRODE AT ANY TANKS AND VOIDS (SHIP) WELDING
PER 100 PIECES OF HANDRAIL OFG: 3
WELD TO MEET SAFETY REQUIREMENTS. RATE PER 100 PIECES OF HANDRAIL
(AVG. 1 CONNECTION EACH). RATE INCLUDES MANUAL ELEMENTS.

TOTAL TMU 196090.

516. TRANSPORT AREIAL PLATFORM FOR SIDE SHELL (STAGING) WITH (CRANE) AT ANY WAY CARPENTER
PER AERIAL-PLATFORM OFG: 4 18-MAR-82
REPRESENTS ELAPSED TIME
* REPRESENTS MOVING AERIAL PLATFORM FROM A WAY TO A SECTION OF SIDE SHELL
C-OPER BEGINS AT CR-1

TOTAL TMU 13100.
DATA SYNTHESIS AND BACK-UP

521. (CLIMB UP AND DOWN) MOVE OPERATOR (ON LADDER) ON SIDE SHELL AT ANY WAY CARPENTER
PER LADDER OFG: 4 17-MAR-82
* REPRESENTS ELAPSED TIME
* ...DOWN LADDERS TO GET ON AND OFF
* ...STAGING AT OUTSIDE SIDE SHELL.
* CARPENTERS ARE WORKING ON AN AERIAL
* ...PLATFORM.
CARP-1 BEGINS AT BRKT-1

TOTAL THU  1280.

529. TRANSPORT AERIAL PLATFORM FOR SIDE SHELL (STAGING) WITH CRANE AT ANY WAY CARPENTER
PER AERIAL PLATFORM OFG: 4 18-MAR-82
* REPRESENTS ELAPSED TIME
* ...MOVING AERIAL PLATFORM
* ...FROM A SECTION OF THE SIDE SHELL
* ...TO A WAY.
C-OPER BEGINS AT CR-1

TOTAL THU  9900.
580. LOAD (STAGING MATERIAL) ON AERIAL PLATFORM WITH (CRANE) AT ANY PLATEN CARPENTER
PER AERIAL PLATFORM OFG: 4 27-MAY-83
* REPRESENTS ELAPSED TIME
* AERIAL PLATFORM
* AERIAL PLATFORM CAN HOLD ENOUGH STAGING
* MATERIAL FOR 3 LEVELS OF STAGING:
* 5 BRACKETS PER LEVEL.
* TOTAL MATERIAL:
* MATERIAL QUANTITY
* BRKTS 15
* STANS 15
* BOARDS 36
* HANDRAIL 24
* Ladders 5
C-OPER BEGINS AT P-REST

TOTAL THU 61870.

581. UNLOAD (STAGING MATERIAL) ON AERIAL PLATFORM WITH (CRANE) AT ANY PLATE CARPENTER
PER AERIAL PLATFORM OFG: 4 27-MAY-83
* REPRESENTS ELAPSED TIME
* AERIAL PLATFORM
* AERIAL PLATFORM CAN HOLD ENOUGH STAGING
* MATERIAL FOR 3 LEVELS OF STAGING:
* 5 BRACKETS PER LEVEL.
* TOTAL MATERIAL:
* MATERIAL QUANTITY
* BRKTS 15
* STANS 15
* BOARDS 36
* HANDRAIL 24
* Ladders 5
C-OPER BEGINS AT CR-1

TOTAL THU 61150.
DATA SYNTHESIS AND BACK-UP

132. COMBINED SUB-OP

HOOK-UP/UNHOOK AND IGNITE/EXTINGUISH TORCH FOR BURNING WITH HAND AT TANK CARPENTER

CREW SIZE = 6 (3 CARPS ABOVE DECK AND 3 BELOW), RATE IN ELAPSED TIME.
MULT BY 6 TO OBTAIN TOTAL TIME.

PER 8-HR SHIFT AND (1) CUT OFG: 4 20-NOV-81
* THE FOLLOWING IS INCLUDED IN THIS SUBOP:
  * --2 HOOK-UPS AND 2 UNHOOKS PER (1) ....
  * ...8-HR SHIFT
  * --(1) OCCURRENCE FOR IGNITE AND ........
  * ...EXTINGUISH TORCH
  * --TO DETERMINE THE FREQ OF THE SUB-DP...
  * ...FORMULA: FREQ = 1 + [(N-1) X .233 ....
    * .... WHERE ‘N’ = THE NUMBER OF CUTS(BURNS)

TOTAL TMU 2900.0

517. SET-UP (STAGING CLIP) ON SIDE SHELL WITH HAMMER AT ANY WAY CARPENTER

PER STAGING CLIP OFG: 3 16-HAR-82

REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING UP A STAGING CLIP ON
  * ...THE SIDE SHELL.
* CARPENTERS ARE WORKING FROM AN AERIAL
  * ...PLATFORM.
* WELDING OF THE CLIP IS DONE IN A
  * ...SEPERATE SUB OPERATION.
CARP-1 BEGINS AT BRKT-2

TOTAL TMU 940.

518. SET-UP STAGING BRACKET ON SIDE SHELL WITH WRENCH AT ANY WAY CARPENTER

PER STAGING BRACKET OFG: 3 16-MAR-82

REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING UP A BRACKET ON THE
  * ...SIDE SHELL.
* CARPENTERS ARE WORKING FROM AN AERIAL
  * ...PLATFORM.
CARP-1 BEGINS AT BRKT-1

TOTAL TMU 1220.
DATA SYNTHESIS AND BACK-UP

519. SET-UP STAGING PLANK FOR SIDE SHELL WITH HAND AT ANY WAY CARPENTER PER STAGING PLANK 0FG: 3 17-MAR-82
   REPRESENTS ELAPSED TIME
   * REPRESENTS SETTING BOARDS UP BETWEEN TWO
   * ...STAGING BRACKETS.
   * CARPENTERS ARE WORKING ON AN AREIAL
   * ...PLATFORM AND THEY ARE WORKING
   * ...SIMULTANEOUSLY.
   CARP-3 BEGINS AT BIN-1

   TOTAL TMU 1210.

520. SET-UP (ACCESS) LADDER ON SIDE SHELL WITH HAND AT ANY WAY CARPENTER PER ACCESS LADDER 0FG: 3 17-MAR-82
   REPRESENTS ELAPSED TIME
   * REPRESENTS SETTING UP A LADDER ON THE
   * ...SIDE SHELL.
   * CARPENTERS ARE WORKING ON AN AERIAL
   * ...PLATFORM BUT ARE NOT WORKING
   * ...SIMULTANEOUSLY.
   * WELDING DONE IN A SEPERATE
   * ...SUB OPERATION.
   CARP-3 BEGINS AT BD-PILE

   TOTAL TMU 1970.

522. SET-UP STANCHION FOR SIDE SHELL WITH HAND AT ANY WAY CARPENTER PER STANCHION 0FG: 3 17-MAR-82
   REPRESENTS ELAPSED TIME
   * REPRESENTS PUTTING STANCHION IN STAGING
   * ...BRACKETS.
   * TWO CARPENTERS ARE ON THE STAGING, ONE
   * ...REMAINS ON THE AERIAL PLATFORM.
   CARP-3 BEGINS AT LDR-PILE

   TOTAL TMU 610.

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DATA SYNTHESIS AND BACK-UP

523. SET-UP HANDRAIL FOR SIDE SHELL WITH HAND AT ANY WAY CARPENTER
PER HANDRAIL OFG: 3 17-MAR-82
* REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING UP HANDRAIL AT THE
* ...SIDE SHELL.
* TWO CARPENTERS ARE ON THE STAGING, ONE
* ...REMAINS ON THE AERIAL PLATFORM.
* WELDING IS DONE IN A SEPERATE SUB
* ...OPERATION.
CARP-3 BEGINS AT BIN-2

TOTAL THU 1000.

524. TEAR DOWN HANDRAIL ON SIDE SHELL WITH TORCH AT ANY WAY CARPENTER
PER HANDRAIL OFG: 2 19-MAR-82
* REPRESENTS ELAPSED TIME
* REPRESENTS TEARING DOWN HANDRAIL ON THE
* ...SIDE SHELL.
* TWO CARPENTERS ARE ON THE STAGING, ONE
* ...REMAINS ON THE AERIAL PLATFORM.
* THE CARPENTERS ARE NOT WORKING
* ...SIMULTANEOUSLY.
CARP-1 BEGINS AT BRKT-2

TOTAL THU 1560.

525. TEAR DOWN STANCHION FOR SIDE SHELL WITH HAND AT ANY WAY CARPENTER
PER STANCHION OFG: 3 18-MAR-82
* REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF STANCHION FROM
* ...SIDE SHELL.
* TWO CARPENTERS ARE ON THE STAGING, ONE
* ...REMAINS ON AERIAL PLATFORM.
* THE CARPENTERS DO NOT WORK
* ...SIMULTANEOUSLY.
CARP-3 BEGINS AT BRKT-1

TOTAL THU 530.
DATA SYNTHESIS AND BACK-UP

526. TEAR DOWN STAGING PLANK FOR SIDE SHELL WITH HAND AT ANY WAY CARPENTER
PER STAGING PLANK OFG: 3 18-MAR-82
  REPRESENTS ELAPSED TIME
  * REPRESENTS TEARING DOWN BOARDS ON THE
    * SIDE SHELL.
  * CARPENTERS ARE WORKING ON AN AERIAL
    * PLATFORM.
  * THE CARPENTERS ARE WORKING
    * SIMULTANEOUSLY.
CARP-1 BEGINS AT BRKT-1

TOTAL TMU 440.

527. TEAR DOWN (ACCESS) LADDER ON SIDE SHELL WITH TORCH AT ANY WAY CARPENTER
PER LADDER OFG: 2 18-MAR-82
  REPRESENTS ELAPSED TIME
  * REPRESENTS REMOVAL OF LADDER FROM SIDE
    * SHELL.
  * CARPENTERS ARE WORKING ON AN AERIAL
    * PLATFORM.
  * THE CARPENTERS ARE NOT WORKING
    * SIMULTANEOUSLY.
CARP-1 BEGINS AT BRKT-2

TOTAL TMU 4550.

528. TEAR DOWN STAGING BRACKET ON SIDE SHELL WITH WRENCH AT ANY WAY CARPENTER
PER STAGING BRACKET OFG: 3 18-MAR-82
  REPRESENTS ELAPSED TIME
  * REPRESENTS REMOVAL OF BRACKETS
    * FROM SIDE SHELL.
  * CARPENTERS ARE WORKING ON AN
    * AERIAL PLATFORM
CARP-1 BEGINS AT BRKT-1

TOTAL TMU 900.

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SECTION 5
DATA SYNTHESIS AND BACK-UP

5.1 SUMMARY

446. WELD HANDRAIL (CONNECTIONS) ON STANCHION WITH STICK ELECTRODE AT ANY PLATEN (SHOP) WELDING PER 100 PIECES OF HANDRAIL OFG: 3 WELD TO MEET SAFETY REQUIREMENTS* RATE PER 100 PIECES OF HANDRAIL (AVG. 1 CONNECTION EACH). RATE INCLUDES MANUAL ELEMENTS.

TOTAL TMU 186012.

454. (CLIMB UP AND DOWN) MOVE OPERATOR (ON PIPE STAGING) FOR SIDE SHELL AT ANY WAYS CARPENTER PER PIPE STAGING SECTION (16’ LONG) OFG: 3 11-FEB-82 REPRESENTS ELAPSED TIME* REPRESENTS CARPENTER CLIMBING UP AND * ...DOWN END PIECE OF PIPE STAGING. * AVERAGE NUMBER OF STEPS NEEDED = 6. CARP-1 BEGINS AT END-PC-1

TOTAL TMU 800.

456. TRANSPORT STAGING PLANK FOR PIPE STAGING (AT SIDE SHELL) WITH (TOWER CRANE) AT ANY WAYS CARPENTER PER STAGING PLANK OFG: 3 11-FEB-82 REPRESENTS ELAPSED TIME* REPRESENTS TRANSPORTING BOARDS FROM * ...BD-PILE TO SIDE SHELL. * DISTANCES FROM CRANE-REST TO BD-PILE AND * ...FROM BD-PILE TO SIDE SHELL ARE * ...AVERAGE DISTANCES FROM WAY 740’X120’ * MAXIMUM NUMBER OF BOARDS IN LIFT = 4 C-OPER BEGINS AT CR-1

TOTAL TMU 3275.
DATA SYNTHESIS AND BACK-UP

459. TRANSPORT STANCHION FOR PIPE STAGING (AT SIDE SHELL) WITH (TOWER CRANE AT ANY WAYS CARPENTER)
PER STANCHION OFG: 3 12-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS TRANSPORTING STANCHION FROM
* ...BIN TO SIDE SHELL.
* DISTANCES FROM CRANE-REST TO BIN-2 AND...
* ...FROM BIN-2 TO SIDE SHELL ARE AVERAGE
* ...DISTANCES FROM A WAY 740'X120'
* MAXIMUM NUMBER OF STANCHIONS IN LIFT = 6
C-OPER BEGINS AT CR-1

TOTAL TMU 1967.

461. TRANSPORT HANDRAIL FOR PIPE STAGING (AT SIDE SHELL) WITH (TOWER CRANE AT ANY WAYS CARPENTER)
PER SECTION (16'LONG) OF PIPE STAGING OFG: 3 12-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS TRANSPORTING HANDRAIL FROM
* ...HR-PILE TO SIDE SHELL.
* DISTANCES FROM CRANE-REST TO HR-PILE AND.
* ...FROM HR-PILE TO SIDE SHELL ARE
* ...AVERAGE DISTANCES FROM WAY 740'X120'
* MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6
C-OPER BEGINS AT CR-1

TOTAL TMU 2033.
DATA SYNTHESIS AND BACK-UP

463. TRANSPORT STAGING PLANK FOR SIDE SHELL (BTWN 2 PIPE STAGING SECTIONS) WITH (TOWER CRANE) AT ANY WAYS CARPENTER
   PER STAGING PLANK OFG: 3 12-FEB-82
   * REPRESENTS ELAPSED TIME
   * ...BD-PILE TO SIDE SHELL
   * DISTANCES FROM CRANE-REST TO BD-PILE AND
   * ...FROM BD-PILE TO SIDE SHELL ARE
   * ...AVERAGE DISTANCES FROM WAY 740’X120’
   * MAXIMUM NUMBER OF BOARDS IN LIFT = 4
   C-OPER BEGINS AT CR-1

   TOTAL TMU 3275

465. TRANSPORT HANDRAIL FOR SIDE SHELL (BTWN 2 PIPE STAGING SECTIONS) WITH (TOWER CRANE) AT ANY WAYS CARPENTER
   PER HANDRAIL OFG: 3 12-FEB-82
   * REPRESENTS ELAPSED TIME
   * ...HR-PILE TO SIDE SHELL
   * DISTANCES FROM CRANE-REST TO HR-PILE AND
   * ...FROM HR-PILE TO SIDE SHELL ARE
   * ...AVERAGE DISTANCES FROM WAY 740’X120’
   * MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6
   C-OPER BEGINS AT CR-1

   TOTAL TMU 2033
DATA SYNTHESIS AND BACK-UP

476. REMOVE HANDRAIL ON (MATERIAL PILE) WITH (TOWER CRANE) AT ANY WAYS CARPENTER
PER HANDRAIL OFG: 3 16-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF HANDRAIL FROM
* ...MATERIAL PILE AT WAY TO HANDRAIL PILE
* ...DISTANCES ARE AVERAGE DISTANCES FOR A
* ...WAY 740'x120'.
* MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6
* TOWER CRANE IS USED FOR REMOVAL.
CARP-3 BEGINS AT MATL-PILE

TOTAL THU 2163.

477. REMOVE STANCHION ON (MATERIAL PILE) WITH (TOWER CRANE) AT ANY WAYS CARPENTER
PER STANCHION OFG: 3 16-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF STANCHION FROM
* ...MATERIAL PILE AT WAY TO BIN-2
* ...DISTANCES ARE AVERAGE DISTANCES FOR A
* ...WAY 740'x120'.
* MAXIMUM NUMBER OF STANCHION IN LIFT = 6
* TOWER CRANE IS USED FOR REMOVAL.
CARP-3 BEGINS AT MATL-PILE

TOTAL THU 2107.
DATA SYNTHESIS AND BACK-UP

478. REMOVE STAGING PLANK ON PIPE STAGING (AT SIDE SHELL) WITH (TOWER CRANE) AT ANY WAYS CARPENTER
PER STAGING PLANK QFG: 3 16-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF BOARDS FROM PIPE
* ...STAGING AT SIDE SHELL TO BOARD PILE
* ...DISTANCES ARE AVERAGE DISTANCES FOR A
* ...WAY 740'X120'.
* MAXIMUM NUMBER OF BOARDS IN LIFT = 4
* TOWER CRANE IS USED FOR REMOVAL.
C-OPER BEGINS AT CR-1

TOTAL TMU 3275.

479. REMOVE BRACE ON (MATERIAL PILE) WITH (TOWER CRANE) AT ANY WAYS CARPENTER
PER BRACE QFG: 3 16-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL BRACES FROM MATERIAL
* ...PILE AT WAY TO BRACE PILE.
* ...DISTANCES ARE AVERAGE DISTANCES FOR A
* ...WAY 740'X120'.
* MAXIMUM NUMBER OF BRACES IN LIFT = 6.
* TOWER CRANE IS USED FOR REMOVAL.
CARP-3 BEGINS AT MATL-PILE

TOTAL TMU 2097.
DATA SYNTHESIS AND BACK-UP

480. REMOVE END RAIL (END PIECE) ON (MATERIAL PILE) WITH (TOWER CRANE) AT ANY WAYS CARPENTER
PER END RAIL (END PIECE) OFG: 3 16-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS REMOVING END PIECES FROM
* MATERIAL PILE AT WAY TO END-PC-RACK.
* DISTANCES ARE AVERAGE DISTANCES FOR A
* WAY 740’X120’,
* MAXIMUM NUMBER OF END PIECES IN LIFT = 3
* TOWER CRANE IS USED FOR REMOVAL,
CARP-3 BEGINS AT MATL-PILE

TOTAL TMU 4873

486, TRANSPORT END RAIL (END PIECE) ON (END-PIECE RACK) WITH (TOWER CRANE) AT ANY WAYS CARPENTER
PER END RAIL (END PIECE) OFG: 3 18-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS TRANSPORTING END PIECES FROM
* END-PC-RACK TO MATL-PILE.
* DISTANCES FROM CRANE REST TO END-PC-RACK
* AND FROM END-PC-RACK TO MATL-PILE ARE
* AVERAGE DISTANCES ON A WAY 740’X120’
* MAXIMUM NUMBER END-PCS IN LIFT = 3
* THERE ARE 2 LIFTS DONE PER SECTION OF
* PIPE STAGING (16’LONG).
C-OPER BEGINS AT CR-1

TOTAL TMU 2517.
DATA SYNTHESIS AND BACK-UP

132. COMBINED SUB-OP

HOOK-UP/UNHOOK AND IGNITE/EXTINGUISH TORCH FOR BURNING WITH HAND AT TANK CARPENTER
CREW SIZE = 6 (3 CARPS ABOVE DECK AND 3 BELOW). RATE IN ELAPSED TIME.
MULT BY 6 TO OBTAIN TOTAL TIME.
PER 8-HR SHIFT AND (1) CUT OFG: 4 20-NOV-81
* THE FOLLOWING IS INCLUDED IN THIS SUB-OP:
* --2 HOOK-UPS AND 2 UNHOOKS PER (1)......
* ...8-HR SHIFT
* --(1) OCCURRENCE FOR IGNITE AND ...........
* ...EXTINGUISH TORCH
* --TO DETERMINE THE FREQUENCY OF THE SUB-OP...
* ...FORMULA: FREQ = 1+[(N-1) X .23] ....
* ...WHERE "N" = THE NUMBER OF CUTS(BURNS)......
TOTAL TMU 2900.0

455. MAKE READY STAGING PLANK FOR (TRANSPORTING) WITH HAND AT ANY WAYS CARPENTER
PER STAGING PLANK OFG: 3 11-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS GETTING BOARD ON BOLSTERS SO
* ...THAT THE CRANE CAN TRANSPORT IT
CARP-3 BEGINS AT SIDE-SHELL

TOTAL TMU 500.

457. SET UP STAGING PLANK ON PIPE STAGING (AT SIDE SHELL) WITH HAND AT ANY WAYS CARPENTER
PER STAGING PLANK OFG: 3 12-FEB-82
REPRESENTS ELAPSED TIME.
* REPRESENTS CARPENTERS SPREADING BOARDS
* ...ON PIPE STAGING SECTION (16' LONG).
* ...CARPENTERS HAVE TO CLIMB UP AND DOWN
* ...THE PIPE STAGING TO SPREAD THE BOARDS
* ...SEE SEPARATE ANALYSIS FOR CLIMBING
CARP-1 BEGINS AT END-PC-1

TOTAL TMU 250.
DATA SYNTHESIS AND BACK-UP

458. MAKE READY STANCHION FOR (TRANSPORTING) WITH HAND AT ANY GEY WAYS CARPENTER
PER STANCHION OOG: 3 12-FEB-82
* REPRESENTS ELAPSED TIME
* ...TRANSPORTED
CARP-3 BEGINS AT BD-PILE

TOTAL TMU 290

460. SET UP STANCHION ON PIPE STAGING (AT SIDE SHELL) WITH WRENCH AT ANY GEY WAYS CARPENTER
PER SECTION (16' LONG) OF PIPE STAGING OOG: 3 12-FEB-82
* REPRESENTS ELAPSED TIME
* ...STANCIONS ON PIPE
* ...STAGING
* ...CARPENTERS INSTALL SIMULTANEOUSLY
* ...CARPENTERS ARE STILL ON PIPE STAGING
CARP-1 BEGINS AT END-PC-1

TOTAL TMU 1680

462. SET UP HANDRAIL ON PIPE STAGING (AT SIDE SHELL) WITH HAND AT ANY WAYS CARPENTER
PER SECTION (16' LONG) OF PIPE STAGING OOG: 3 12-FEB-82
* REPRESENTS ELAPSED TIME
* ...HANDRAIL THRU EYELETS IN STANCHIONS
* ...CARPENTERS DON'T WORK SIMULTANEOUSLY
* ...WELDING DONE IN A SEPARATE SUB-OP
CARP-1 BEGINS AT END-PC-1

TOTAL TMU 900

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464. SET UP STAGING PLANK FOR SIDE SHELL (BTWN 2 PIPE STAGING SECTIONS) WITH HAND AT ANY WAYS CARPENTER
PER STAGING PLANK OFG: 3 12-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS CARPENTERS SPREADING BOARDS
* ......THERE IS A 16' GAP BETWEEN SECTIONS.
* ....CARPENTERS HAVE TO CLIMB UP AND DOWN
* ......THE PIPE STAGING TO SPREAD THE BOARDS
* ......(SEE SEPARATE ANALYSIS FOR CLIMBING)
CARP-1 BEGINS AT SECTION-1

TOTAL TMU 250.

466. SET UP HANDRAIL FOR SIDE SHELL (BTWN 2 PIPE STAGING SECTIONS) WITH HAND AT ANY WAYS CARPENTER
PER SECTION OFG: 3 12-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS CARPENTERS INSTALLING
* ......HANDRAIL ON EXISTING HANDRAIL.
* ......CARPENTERS DON'T WORK SIMULTANEOUSLY.
* ......WELDING DONE IN A SEPARATE SUB-OP.
CARP-1 BEGINS AT SECTION-1

TOTAL TMU 720.

469. TEAR DOWN HANDRAIL FOR SIDE SHELL (BTWN 2 PIPE STAGING SECTIONS) WITH TORCH AT ANY WAYS CARPENTERS
PER SECTION OFG: 3 15-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS TEARING DOWN HANDRAIL ON PIPE
* ......STAGING (BTWN 2 SECTIONS). A TORCH IS
* ......USED TO BURN THE HANDRAIL OFF. THE
* ......HANDRAIL IS THROWN TO THE MATERIAL
* ......PILE. CARPENTERS REMOVE 2 HANDRAIL
* ......PIECES BEFORE MOVING TO NEXT SECTION.
CARP-1 BEGINS AT SECTION-1

TOTAL TMU 2170.

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DATA SYNTHESIS AND BACK-UP

470. TEAR DOWN HANDRAIL FOR PIPE STAGING (AT SIDE SHELL) WITH HAND AT ANY WAYS CARPENTER
PER SECTION (16' LONG) OF PIPE STAGING OFG: 3 15-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS TEARING DOWN HANDRAIL ON PIPE
* ...STAGING (BTWN 2 STANCHIONS), THE
* ...HANDRAIL IS THROWN TO THE MATERIAL
* ...PILE, CARPENTERS REMOVE 2 HANDRAIL
* ...PIECES BEFORE MOVING TO NEXT SECTION.
CARP-1 beginnings AT END-PC-1

TOTAL THU 640.

471. TEAR DOWN STANCHION ON PIPE STAGING (AT SIDE SHELL) WITH WRENCH AT A WAYS CARPENTER
PER SECTION (16' LONG) OF PIPE STAGING OFG: 3 16-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS TEARING DOWN STANCHION ON
* ...SECTION OF PIPE STAGING (16' LONG).
* ...CARPENTERS WORK SIMULTANEOUSLY.
* ...STANCHIONS ARE THROWN TO MATERIAL
* ...PILE,
CARP-1 begins AT END-PC-1

TOTAL THU 1100.

472. TEAR DOWN STAGING PLANK FOR SIDE SHELL (BTWN 2 PIPE STAGING SECTIONS WITH HAND AT ANY WAYS CARPENTER
PER STAGING PLANK OFG: 3 16-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS TEARING DOWN BOARDS BETWEEN 2
* ...PIPE STAGING SECTIONS, THERE IS A 16'
* ...GAP BETWEEN SECTIONS, BOARDS ARE
* ...STACKED SO THE CRANE CAN TRANSPORT
* ...THEN, CARPENTERS WORK SIMULTANEOUSLY.
CARP-1 begins AT SECTION-1

TOTAL THU 220.
DATA SYNTHESIS AND BACK-UP

473. TEAR DOWN STAGING PLANK ON PIPE STAGING (AT SIDE SHELL) WITH HAND AT ANY WAYS CARPENTER
PER STAGING PLANK OFG: 3 16-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS TEARING DOWN BOARDS ON PIPE
* ...STAGING SECTION (16' LONG), BOARDS ARE STACKED SO THE CRANE CAN TRANSPORT
* ...THEM. CARPENTERS WORK SIMULTANEOUSLY.
CARP-1 BEGINS AT END-PC-1

TOTAL TMU 220.

474. TEAR DOWN PIPE STAGING (END PCS AND BRACES) FOR SIDE SHELL WITH WRENCH AT ANY WAYS CARPENTER
PER SECTION (16' LONG) OF PIPE STAGING OFG: 3 16-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS TEARING DOWN END PIECES AND
* ...BRACES ON PIPE STAGING (2ND LEVEL).
* ...END PIECES ARE BOLTED TO END PIECES
* ...ON 1ST LEVEL. BRACES ARE HELD ON BY A
* ...LOCKING PIN. CARPENTERS WORK
* ...SIMULTANEOUSLY. CARPENTER-1 HANDLES
* ...REMOVAL AT END-PC-1 AND END-PC-2.
* ...MATERIAL IS THROWN OR PLACED AT THE
* ...MATERIAL PILE.
CARP-1 BEGINS AT END-PC-1

TOTAL TMU 4930.
DATA SYNTHESIS AND BACK-UP

475. TEAR DOWN PIPE STAGING (END PCS AND BRACES) FOR SIDE SHELL WITH HAN ANY WAYS CARPENTER PER SECTION (16' LONG) OF PIPE STAGING OFG: 3 16-FEB-82 REPRESENTS ELAPSED TIME
* REPRESENTS TEARING DOWN END PIECES AND
* .....BRACES ON PIPE STAGING (1ST LEVEL).
* .....BRACES ARE HELD ON BY A LOCKING PIN
* .....CARPENTERS WORK SIMULTANEOUSLY.
* .....CARPENTER-2 HANDLES REMOVAL AT
* .....END-PC-1 AND END-PC-2, MATERIAL IS
* .....THROWN OR PLACED AT THE MATERIAL
* .....PILE.
CARP-1 BEGINS AT END-PC-1

TOTAL TMU 182

487, MAKE READY END RAIL (END PIECE) FOR (TRANSPORTING) AT ANY WAYS CARPENTER PER END RAIL (END PIECE) OFG: 3 18-FEB-82 REPRESENTS ELAPSED TIME
* REPRESENTS GETTING END PIECES ON BOLSTER
* .....SO THAT CRANE CAN TRANSPORT IT.
CARP-3 BEGINS AT END-PC-RACK

TOTAL TMU 140
DATA SYNTHESIS AND BACK-UP

488. SET-UP PIPE STAGING (END PCS AND BRACES) FOR SIDE SHELL WITH HAND AT ANY WAYS CARPENTER
PER SECTION (16' LONG) OF PIPE STAGING OFG: 3 18-FEB-82
REPRESENTS ELAPSED TIME.
* REPRESENTS SETTING UP 1ST LEVEL OF A 16'
* ....LONG SECTION OF PIPE STAGING. SECTION
* ......INCLUDES 3 END PIECES AND 8 BRACES
* ......WHICH ARE HELD IN PLACE BY A LOCKING
* ......PIN.
* CARP-1 AND CARP-2 ARE WORKING
* ......SIMULTANEOUSLY IN PUTTING UP THE END
* ......PIECES AND BRACES.
CARP-1 BEGINS AT END-PC-1

TOTAL TMU 3760.

489, SET-UP PIPE STAGING (END PCS AND BRACES) FOR SIDE SHELL WITH WRENCH AT ANY WAYS CARPENTER
PER SECTION (16'LONG) OF PIPE STAGING OFG: 3 18-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS SETTING UP 2ND LEVEL OF A 16'
* ....LONG SECTION OF PIPE STAGING SECTION
* ......INCLUDES 3 END PIECES AND 8 BRACES
* ......WHICH ARE HELD IN PLACE BY A LOCKING
* ......PIN END PIECES ARE BOLTED TO 1ST
* ......LEVEL END PIECES,
* CARP-I AND CARP-2 ARE WORKING
* ......SIMULTANEOUSLY IN PUTTING UP THE END
* ......PIECES AND BRACES.
CARP-1 BEGINS AT END-PC-1

TOTAL TMU 8390,
5.2 SYNTHESIS AND ANALYSIS

435. WELD STAGING BRACKET (CLIP) ON BULKHEAD (OR ANY STRUCTURE) WITH STICK ELECTRODE AT ANY TANKS AND VOIDS (SHIP) WELDING PER 100 CLIPS X: 3 WELD TO MEET SAFETY REQUIREMENTS. RATE PER 100 CLIPS. RATE INCLUDES MANUAL ELEMENTS.

1 WELD VERTICAL 3/8" FILLET WELD (10" PER CLIP) WITH 10% OVERWELD USING 6011 3/16 ELECTRODE OR COMPARABLE (7018 5/32).

TOTAL TMU 1063356.

438. WELD LADDER (CLIP) (SECURES LADDER) ON BULKHEAD (OR ANY STRUCTURE) WITH STICK ELECTRODE AT ANY TANKS AND VOIDS (SHIP) WELDING PER 100 LADDERS OR 400 CLIPS X: 3 WELD TO MEET SAFETY REQUIREMENTS. RATE PER 100 LADDERS (400 CLIPS). RATE INCLUDES MANUAL ELEMENTS.

1 WELD VERTICAL 3/8" FILLET WELD (4" PER CLIP) WITH 10% OVERWELD USING 6011 3/16 ELECTRODE OR COMPARABLE (7018 5/32).

TOTAL TMU 1701606.

440. WELD HANDRAIL (CONNECTIONS) ON STANCHION WITH STICK ELECTRODE AT ANY TANKS AND VOIDS (SHIP) WELDING PER 100 PIECES OF HANDRAIL X: 3 WELD TO MEET SAFETY REQUIREMENTS. RATE PER 100 PIECES OF AHNDRAIL (AVG, 1 CONNECTION EACH). RATE INCLUDES MANUAL ELEMENTS.

1 WELD HORIZONTAL 1/4" FILLET WELD (5" PER CONNECTION) USING 6011 3/16 ELECTRODE OR COMPARABLE (7018 5/32).

TOTAL TMU 196090.
DATA SYNTHESIS AND BACK-UP

378. TRANSPORT STAGING BRACKET WITH (GROVE CRANE) AT TANK (OR WAY) CARPENTER
PER STAGING BRACKET OFG: 3 02-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS TRANSPORTING BRACKETS FROM...
* ...BIN-1 TO BULKHEAD
* DISTANCES FROM CRANE-REST TO BIN-1 AND...
* ...FROM BIN-1 TO BULKHEAD ARE AVERAGE...
* ....DISTANCES IN A CENTER TANK 98’X50’
* MAXIMUM NUMBER OF BRKTS IN LIFT = 6
C-OPER BEGINS AT CR-1

1 TRANSPORT BRKT FROM BIN-1 USING CRANE WITH HOOK+SLING TO BULKHEAD (BTWN BRKTS) PLACE+ADJUST RETURN TO CR-1 F 1 / 6
AI T1O K24 T16 P3 TIO AO 0.17 1067.

TOTAL TMU 1067.

381. TRANSPORT LADDERS WITH (GROVE CRANE) AT TANK CARPENTER
PER LADDER OFG: 3 03-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS TRANSPORTING LADDERS FROM....
* ....LDR-PILE TO BULKHEAD
* ....DISTANCES FROM CRANE-REST TO LDR-PILE..
* ....AND FROM LDR-PILE TO BULKHEAD ARE..
* ....AVERAGE DISTANCES IN A CENTER TANK....
* ....0098’X50’
* MAXIMUM NUMBER OF LADDERS IN LIFT = 3
C-OPER BEGINS AT CR-1

1 TRANSPORT LADR FROM LDR-PILE USING CRANE WITH HOOK+SLING TO BULKHEAD (AT. LDR) PLACE+ADJUST RETURN TO CR-1 F 1 / 3
AI TIO K24 T24 P3 TIO AO 0.33 2400

TOTAL TMU 2400
DATA SYNTHESIS AND BACK-UP

384. POSITION (SECURE) (ACCESS) LADDER FOR BULKHEAD WITH HAMMER (AND LADD CLIPS) AT TANK CARPENTER
PER LADDER OGF: 3 03-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS SECURING A LADDER TO THE......
* ...BULKHEAD USING 4 LADDER CLIPS
* WELDING OF CLIPS WILL BE DONE IN A....... 
* ...SEPARATE SUB OPERATION
CARP-1 BEGINS AT LDR

1 CARP-1 LOOSEN 4 PAINT ON BHD AT LDR 4 STRIKES USING HAMMER-1 ASID TO CARP-1
A1 B0 G1 A0 B0 (P0 A1 L10 )A1 B0 P1 A0 (4) 1.00 480,
2 CARP-2 GET+PLACE WITH BEND 4 LCLIPS FROM TOOLBOX-2 TO LDR ( TACKI UPON PLACEMENT ) PF 4 ( 6 )
A1 B6 G3 A1 B0 (P3 )A0 (4) 1.00 230.

TOTAL THU 710.

387. TRANSPORT STAGING PLANK WITH (GROVE CRANE) AT TANK CARPENTER
PER STAGING PLANK OGF: 3 03-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS TRANSPORTING BOARDS FROM......
* ...LU-PILE TO BULKHEAD
* ...DISTANCES FROM CRANE-REST TO LU-PILE AND
* ...FROM LU-PILE TO BULKHEAD ARE AVERAGE
* ...DISTANCES IN A CENTER TANK 9B'X50'
* MAXIMUM NUMBER OF BOARDS IN LIFT = 3
C-OPER BEGINS AT CR-1

1 TRANSPORT BOARD FROM LU-PILE USING CRANE WITH HOOK+SLING TO BULKH ( BTWN BRKTS ) PLACE+MANEUVER RETURN TO CR-1 F 1 / 3
A1 T10 K24 T16 P16 T10 A0 0.33 2567.

TOTAL THU 2567.

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DATA SYNTHESIS AND BACK-UP

392. TRANSPORT STANCHION WITH (GROVE CRANE) AT TANK CARPENTER
PER STANCHION OFG: 3 02-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS TRANSPORTING STANCHION FROM...
* ...BIN-2 TO BULKHEAD
* DISTANCES FROM CRANE-REST TO BIN-2 AND ..
* ...FROM BIN-2 TO BULKHEAD ARE AVERAGE ...
* ...DISTANCES IN A CENTER TANK 98’X50’
* MAXIMUM NUMBER OF STANCHIONS IN LIFT = 6
C-OPER BEGINS AT CR-1

1 TRANSPORT STAN FROM BIN-2 USING CRANE WITH HOOK+SLINGING TO BULKHEAD( BTWN BRKTS ) PLACE+ADJUST RETURN TO CR-1 F 1 / 6
A1 T10 K24 T16 P3 T10 AO 0.17 1067.

TOTAL TMU 1067.

395. TRANSPORT HANDRAIL WITH (GROVE CRANE) AT TANK CARPENTER
PER HANDRAIL OFG: 3 02-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS TRANSPORTING HANDRAIL FROM...
* ...HR-PILE TO BULKHEAD
* DISTANCES FROM CRANE-REST TO HR-PILE AND
* ...FROM HR-PILE TO BULKHEAD ARE AVERAGE
* ...DISTANCES IN A CENTER TANK 98’X50’
* MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6
C-OPER BEGINS AT CR-1

1 TRANSPORT HANDRAIL FROM HR-PILE USING CRANE WITH HOOK+SLING TO BULKHEAD ( BTWN BRKTS ) PLACE+ADJUST RETURN TO CR-1 F 1 / 6
A1 T10 K24 T16 P3 T10 AO 0.17 1067.

TOTAL TMU 1067.
DATA SYNTHESIS AND BACK-UP

404. (CLIMB UP AND DOWN) MOVE OPERATOR (ON LADDER) ON BULKHEAD AT ANY TAN AND VOIDS CARPENTER
PER LADDER OFG: 3 05-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS CARPENTERS CLIMBING UP AND *
* DOUN LADDERS TO REMOVE STAGING.
* AVERAGE LADDER SIZE = 12 RUNGS.
CARP-1 BEGINS AT LDR

1 CARP-1 SLIDE (CLIMB-UP) LADDER AT LDR (12 RUNGS) PF 12 (1) 12 (3 4)
(A1 )B16(G1 M3 )XO IO AO (12) 1.00 760.
2 CARP-1 PULL (CLIMB-DOWN) LADDER AT LDR (12 RUNGS) PF 12 (1) 12 (3 4)
(A1 )B16(G1 M1 )XO IO AO (12) 1.00 520.

TOTAL TMU 1280.

407. REMOVE HANDRAIL ON (MATERIAL-PILE) WITH WINCH AT ANY TANKS AND) VOIDS CARPENTER
PER HANDRAIL OFG: 3 08-FEB-82
* REPRESENTS REMOVAL OF HANDRAIL FROM MATL
* ...PILE ON TANKTOP TO DECK (GOING THRU
* ...MANHOLE).
* MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6
CARP-3 BEGINS AT TANKTOP

1 CARP-3 GET+SLIDE HANDRAIL (ONTO BOLSTER) AT MATL-PILE
A1 B6 G3 M3 XO IO AO 1.00 130.
2 WINCH-OPER PUSH WINCH-11OUN PROCESS (TO TANKTOP) F 1/6
A1 BO G1 M1 X81 IO AO 0.17 140.
3 WINCH-OPER LOOSEN (= SWING) CABLE WITH BEND AT MENHOLE 5
ARM-STROKES USING HANDS F 1/6
A1 B6 G1 A1 BO P1 L32 AO BO PO AO 0.17 70.
4 WINCH-OPER THROW CABLE FROM HENHOLE TO CARP-3 F 1/6
A1 BO G1 A1 B6 PO AO 0.17 15.
5 CARP-3 GET+MANIPULATE WITH BEND CABLE IN MATL-PILE (HOOK AROUND
HANDRAIL) F 1/6
A1 B6 G3 M10 XO IO AO 0.17 .33
6 WINCH-OPER PUSH WINCH-FREE PROCESS (CLEAR OBSTACLES) F 1/6
A1 BO G1 M1 X67 IO AO 0.17 117.
7 WINCH-OPER PUSH WINCH-UP PROCESS (TO HENHOLE) F 1/6
A1 BO G1 M1 X24510 AO 0.17 413.
DATA SYNTHESIS AND BACK-UP

TOTAL TMU 918

408. REMOVE STANCHION ON (MATERIAL PILE) WITH WINCH AT ANY TANKS AND Voids
CARPENTER
PER STANCHION OFG: 3 08-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF STANCHION FROM . . .
* ... MATL-PILE ON TANK TOP TO DECK (GOING
* ... THRU MANHOLE).
* MAXIMUM NUMBER OF STANCHION IN LIFT = 6
CARP-3 BEGINS AT MATL-PILE

1 CARP-3 GET+PLACE WITH BEND STAN FROM MAIL-PILE TO MATL-PILE WITH BEND
   A1 B6 G3 A1 B6 P3 A0 1.00 200.

2 WINCH-OPER PUSH WINCH-DOWN PROCESS ( TO TANKTOP ) F 1 / 6
   A1 BO G1 M1 X81 IO AO 0.17 140.

3 WINCH-OPER LOOSEN ( =SWING ) CABLE WITH BEND AT MENHOLE 5
   ARM-STROKES USING HANDS F 1 / 6
   A1 B6 G1 A1 BO P1 L32 AO BO PO AO 0.17 70.

4 WINCH-OPER THROW CABLE FROM MENHOLE TO CARP-3 F 1 / 6
   A1 BO G1 A1 B6 PO AO 0.17 15.

5 CARP-3 GET+MANIPULATE WITH BEND CABLE AT MATL-PILE ( HOOK AROUND STANCHION ) F 1 / 6
   A1 B6. G3 M10 XO IO AO 0.17 33.

6 WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES ) F 1 / 6
   A1 BO G1 M1 X67 IO FI0 0.17 117.

7 WINCH-OPER PUSH WINCH-TO过程 ( TO MENHOLE ) F 1 / 6
   A1 BO G1 M1 X245 IO AO 0.17 413.

TOTAL TMU 988.
409. REMOVE STAGING BRACKET ON (MATERIAL PILE) WITH WINCH AT ANY TANKS AT Voids Carpenter
PER STAGING BRACKET OGF: 3 05-DEC-82
* REPRESENTS ELAPSED TIME
* ... PILE ON TANKTOP TO DECK (GOING THRU MANHOLE).
* MAXIMUM NUMBER OF BRACKET IN LIFT = 3
CARP-3 BEGINS AT MATL-PILE

1 CARP-3 GET+PLACE WITH BEND BRKT FROM MATL-PILE TO MATL-PILE WITH BEND
   A1 B6 G3 A1 B6 P3  A0 1.00  200.
2 WINCH-OPER push WINCH-DOWN PROCESS (TO TANKTOP) F 1 / 3
   A1 B0 G1 M1 X81 IO  A0 0.33  280.
3 WINCH-OPER LOOSEN (=SWING) CABLE WITH REM AT MENHOLE 5 ARM-STROKES USING HANDS F 1 / 3
   M B6 G1 A1 B0 P1 L32 A0 B0 P0  A0 0.33  140.
4 WINCH-OPER THROW CABLE FROM MENHOLE TO CARP-3 F 1 / 3
   A1 B0 G1 A1 B6 P0  A0 0.33  30.
5 CARP-3 GET+MANIPULATE WITH BEND CABLE AT MATL-PILE (HOOK AROUND BRACKET) F 1 / 3
   A1 B6 G3 M1O XO IO AO 0.33  67.
6 WINCH-OPER push WINCH-FREE PROCESS (CLEAR OBSTACLES) F 1 / 3
   A1 B0 G1 M1 X67 IO  A0 0.33  233.
7 WINCH-OPER push WINCH-UP PROCESS (TO MENHOLE) F 1 / 3
   A1 B0 G1 M1 X24510 A0 0.33  827.

TOTAL TMU 1777.
DATA SYNTHESIS AND BACK-UP

410. REMOVE STAGING PLANK ON (BOARD PILE) WITH WINCH AT ANY TANKS AND VOIDS
Carpenter

PER STAGING PLANK OFG: 3 08-FEB-82

* REPRESENTS ELAPSED TIME
* REPRESENT REMOVING BOARDS FROM BOARDS...
* ...PILE ON TANKTOP TO DECK (GOES THRU...
* ...MANHOLE)*

* MAXIMUM NUMBER OF BOARDS IN LIFT = 3

Carp-3 begins at matl-PILE

1  CARP-3 GET+SLIDE BOARD ( ONTO BOLSTER ) AT BD-PILE AND ADJUST
   A16 B6 G3 M3 X0 I6 A0 1.00 340.

2  WINCH-OPER PUSH WINCH-DOWN PROCESS ( TO TANKTOP ) F 1 / 3
   A1 B0 G1 M1 X81 I0 40 0.33 280.

3  WINCH-OPER LOOSEN ( =SWING ) CABLE WITH BEND AT MENHOLE 5
   ARM-STROKES USING HANDS F 1 / 3
   A1 B6 G1 A1 B0 P1 L32 A0 B0 PO A0 0.33 140.

4  WINCH-OPER THROW CABLE FROM MENHOLE TO CARP-3 F 1 / 3
   A1 B0 G1 A1 B6 PO A0 0.33 30,

5  CARP-3 GET+MANIPULATE WITH BEND CABLE AT BD-PILE ( HOOK AROUND
   BOARDS ) ( ALLOW FOR 2 ATTEMPTS ) F 2 / 3
   A1 B6 G3 H10 X0 I0 A0 0, 67 133.

6  WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES ) F 1 / 3
   A1 B0 G1 M1 X67 I0 A0 0.33 233.

7  WINCH-OPER PUSH WINCH-UP PROCESS ( TO MENHOLE ) F 1 / 3
   A1 BO G1 M1 X24510 A0 0.33 827

TOTAL TMU 1983.
DATA SYNTHESIS AND BACK-UP

411. REMOVE LADDER ON (LADDER-PILE) WITH WINCH AT ANY TANKS AND VOIDS

CARPENTER

PER LADDER OFG: 3 08-FEB-82

* REPRESENT ELAPSED TIME
* REPRESENT REMOVING LADDERS FROM LADDER
* ...-PILE ON TANKTOP TO DECK (GOES THRU**
* ...MANHOLE).
* MAXIMUM NUMBER OF LADDERS IN LIFT = 3

CARP-3 BEGINS AT BD-PILE

1. **CARP-3 GET+SLIDE LADR ( ONTO BOLSTER ) AT LDR-PILE AND ADJUST**
   A16 B6 G3 M3 X0 I6 A0 1.00 340.

2. **WINCH-OPER PUSH WINCH-DOWN PROCESS ( TO TANKTOP ) F 1 / 3**
   A1 B0 G1 M1 X81 I0 A0 0.33 280.

3. **WINCH-OPER LOODSEN ( =SWING ) CABLE WITH BEND AT MENHOLE 5**
   ARM-STROKES USING HANDS F 1 / 3.
   A1 B6 G1 A1 B0 F1 L32 A0 B0 P0 A0 0.33 140.

4. **WINCH-OPER THROW CABLE FROM MENHOLE TO CARP-3 F 1 / 3**
   A1 R6 G1 A1 B6 P0 A0 0.33 30.

5. CARP-3 GET+MANIPULATE WITH BEND CABLE AT LDR-PILE ( HOOK AROUND
   LADDERS. ) ( ALLOW FOR 2 ATTEMPTS ) F 2/3
   A1 R6 G3 M10 M10 X0 I0 A0 0.67 133.

6. **WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES ) F 1 / 3**
   A1 B0 G1 M1 X67 I0 A0 0.33 233.

7. **WINCH-OPER PUSH WINCH-UP PROCESS ( TO MENHOLE ) F 1 / 3**
   A1 B0 G1 M1 X245I0 A0 0.33 827.

TOTAL TMU 1983
DATA SYNTHESIS AND BACK-UP

412. REMOVE TOOLBOX ON (MATERIAL FILE) WITH WINCH AT ANY TANKS AND VOIDS CARPENTER
PER TOOLBOX OFG: 3 08-FEB-82
* REPRESENTS ELAPSED TIME
* ...-PILEON TANKTOP TO DECK (GOES THRU...
* ...MANHOLE).
* TOOLBOX CONTAINS:
* ...28 BOLTS
* ...28 NUTS
* ...28 LADDER CLIPS
CARP-3 BEGINS AT LDR-PILE

1 CARP-3 GET+PLACE 7 NUTS AND 7 BOLTS FROM MATL-PILE TO TOOLBOX-1 WITH BEND ( TOTAL OF 20 ) PF 4 ( 2 3 4 5 6 )
   A32 (B6 G3 A1 B6 P3 )AO (4) 1.00 1080.
2 CARP-3 GET+PLACE WITH BEND 4 LCLIPS FROM MATL-PILE TO TOOLBOX-1 WITH BEND ( TOTAL OF 20 ) F 7
   A1 B6 G3 A1 B6 P3 AO 7.00 1400.
3 WINCH-OPER PUSH WINCH-DOWN PROCESS ( TO TANKTOP )
   A1 B0 G1 M1 X81 IO AO 1.00 840.
4 WINCH-OPER LOOSEN (=SWING) CABLE WITH BEND AT MENHOLE 5 ARM-STROKES USING HANDS
   A1 B6 G1 A1 B0 P1 L32 AO B0 PO AO 1.00 420.
5 WINCH-OPER THROW CABLE FROM MENHOLE TO CARP-3
   A1 B0 G1 A1 B6 PO AO 1.00 90.
6 CARP-3 GET+MANIPULATE WITH BEND CABLE AT MATL-PILE (_HOOK AROUND TOOLBOX )
   A1 B6 G3 M10 X0 IO AO 1.00 200.
7 WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES )
   A1 B0 G1 M1 X67 IO AO 1.00 700.
8 WINCH-OPER PUSH WINCH-UP PROCESS ( TO MENHOLE )
   A1 B0 G1 M1 X24510 AO 1.00 2480.

TOTAL THU 7210.
DATA SYNTHESIS AND BACK-UP

431. (WALK UP OR DOWN) MOVE OPERATOR (ON INCLINED STAIRS) ON BULKHEAD AT TANKS AND VOIDS CARPENTER
PER SET OF INCLINED STAIRS OFG: 4 10-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS CARPENTER WALKING UP OR DOWN
* ...A SET OF INCLINED STAIRS, AVERAGE
* ...NUMBER OF TREADS IN A SET OF INCLINED
* ...STAIRS = 16.
* CARPENTERS ARE WALKING UP OR DOWN STAIRS
* AT THE SAME TIME.
CARP-1 BEGINS AT LEVEL-1

1 CARP-1 WALK TO LEVEL-2
   A32 BO GO AO BO PO AO  1.00  320
2 CARP-2 WALK TO LEVEL-2 SIMO
   <A32BO GO AO BO PO AO >  1.00  

TOTAL TMU 320

132. COMBINED SUB-OP

HOOK-UP/UNHOOK AND IGNITE/EXTINGUISH TORCH FOR BURNING WITH HAND AT TANK CARPENTER
Crew Size = 6 (3 Carps Above Deck and 3 Below). Rate in Elapsed 1 Mult By 6 To Obtain Total Time.
PER 8-HR SHIFT AND (1) CUT OFG: 4 20-NOV-81
* THE FOLLOWING IS INCLUDED IN THIS SUBOP:
* --2 HOOK-UPS AND 2 UNHOOKS PER (1).....
* ...8-HR SHIFT
* --(1) OCCURRENCE FOR IGNITE AND .........
* ...EXTINGUISH TORCH
* --TO DETERMINE THE FREQ OF THE SUB-OP...
* ...FRO NUMBER OF CUTS >1, USE THE ........
* ...FORMULA: FREQ = 1 + [(N-1) X .23] ....
* ...WHERE "N" = THE NUMBER OF CUTS(BURNS).

TOTAL TMU 2900.0

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<th>Combined sub-operation elements</th>
<th>Freq.</th>
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9. HOOK-UP AND UNHOOK TORCH ON MANIFOLD WITH WRENCH AT SHIP

10. IGNITE AND EXTINGUISH TORCH FOR BURNING WITH HAND AT TANK
DATA SYNTHESIS AND BACK-UP

1.00  660.0
----   ----
Total THU       2900.0

376. SET-UP (STAGING CLIP) ON BULKHEAD WITH HAMMER (AND STEEL-TAPE) AT TANK CARPENTER
PER STAGING CLIP OFG: 4 01-FEB-82
* REPRESENTS ELAPSED TIME
* WELDING OF THE CLIP WILL BE DONE IN A...
* ...SEPARATE SUB OPERATION
CARP-1 BEGINS AT TANKTOP

1 CARP-1 MEASURE AT BRKT-1 USING STEEL-TAPE-1 ASIDE TO CARP-1
   A1 B0 G1 A1 B0 P1 M32 A1 B0 P1 A0         1.00    380.
2 CARP-1 LOOSE PAINT ON BHD AT BRKT-1 4 STRIKES USING HAMMER-1 ASIDE
   TO CARP-1
   A1 B0 G1 A1 B0 P0 L10 A1 B0 P1 A0         1.00    150.
3 CARP-1 GET+PLACE WITH BEND SCLIP FROM TOOLBOX-2 TO BRKT-1 ( TACKING
   UPON PLACEMENT.)
   A1 B6 G3 A1 B0 P3 A0         1.00    140.

TOTAL THU       670.

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DATA SYNTHESIS AND BACK-UP

377. MAKE READY STAGING BRACKET FOR (TRANSPORTING) WITH HAND AT TANK (OR WAY) CARPENTER
PER STAGING BRACKET OFG: 3 02-FEB-82
* REPRESENTS ELAPSED TIME
  * REPRESENTS GETTING BRACKET READY TO BE...
  * TRANSPORTED TO TANK OR BULKHEAD
  * CARPENTER IS LOCATED EITHER ON THE WAY...
  * OR IN TANK AT THE MATERIAL (BIN-1)
CARP-3 BEGINS AT BIN-1

1 CARP-3 GET+PLACE WITH BEND BRKT FROM BIN-1 TO BIN-1
   A1 B6 G3 A1 B0 P3 AO  1.00  140.
2 CARP-3 GET+PLACE WITH BEND BOLT FROM TOOLBOX-1 TO BIN-1 AND INSET BOLT IN BRKT
   A1 B6 G3 A1 B0 P3 A1  1.00  150.
3 CARP-3 FASTEN NUT AT BIN-1 4 WRIST-TURNS USING HANDS
   A1 BO G1 A1 BO P1 F10 AO BO PO AO  1.00  140.
4 CARP-3 GET+PLACE BRKT FROM BIN-1 TO BIN-1 (PILE UP BRKTS FOR TRANSPORTATION )
   A1 BO G3 A1 BO P3 AO  1400  80+

TOTAL TMU  510
DATA SYNTHESIS AND BACK-UP

379. SET-UP STAGING BRACKETS ON BULKHEAD WITH WRENCH AT TANK CARPENTER
PER STAGING BRACKET. OFG: 3 01-FEB-82
REPRESENTS ELAPSED TIME
* ...EXISTS PUTTING UP A BRACKET ON AN...
CARP-1 BEGINS AT TANKTOP

1. CARP-1 GET+HOLD WITH BEND BRKT FROM TANKTOP TO CARP-1
   A1 B6 S3 A1 BO PO AO 1.00 110.
2. CARP-1 LOOSEN NUT AT BRKT-1 4 WRIST-TURNS USING HANDS
   A1 BO G1 A1 BO PI L10 AO BO PO AO 1.00 140.
3. CARP-1 REMOVE BOLT FROM BRKT-1 ( BRKT. ) TO CARP-1
   A1 BO G1 A1 BO P1 AO 1.00 40.
4. CARP-1 GET+PLACE BRKT FROM CARP-1 TO BRKT-1 AND INSERT BOLT
   A1 BO G3 A1 RO P3 A1 1.00 90.
5. CARP-1 FASTEN NUT AT BRKT-1 13 WRIST-TURNS USING HANDS
   A1 BO G1 A1 BO PI F24 AO BO PO AO 1.00 2806
6. CARP-1 FASTEN NUT AT BRKT-1 4 ARM-STROKES USING WRENCH-1 ASIDE TO
   CARP-1
   A1 BO G1 A1 BO P3 F24 A1 BO P1 AO 1.00 320.
7. CARP-1 WALK TO BRKT-2 ( TO 110 NEXT BRKT )
   A10 BO GO AO BO PO AO 1.00 100.

TOTAL THU 1080,

380. MAKE READY LADDER FOR (TRANSPORTING) WITH HAND AT TANK (OR WAY)
CARPENTER
PER LADDER OFG: 3 01-FEB-82
REPRESENTS ELAPSED TIME
* ...THAT THE CRANE CAN TRANSPORT IT.
CARP-3 BEGINS AT BIN-1

1. CARP-3 GET+SLIDE LADR AT LDR-PILE ANU ADJUST ( ON BOLSTERS )
   A42 B6 G3 M3 XO 16 AO 1.00 600,

TOTAL TMU 6004

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DATA SYNTHESIS AND BACK-UP

382. SET-UP LADDER ON BULKHEAD (AT BRACKET LOCATION) WITH HAND AT TANK
Carpenter
Per ladder OFG: 4 03-FEB-82
Represents elapsed time
* Represents putting up a ladder at a..... .
* ...Bracket location so the carpenter can
* ...Put up a bracket applies only for...
* ...First level of staging. Carpenter is
* ...Working from the tanktop.
* Also includes climbing up & down ladder
Carper-1 begins at brkt-1

1 Carper-1 get+place with bend ladr from tanktop to brkt-1
   A1 B6 G3 A1 B0 P3 A0  1.00  140.
2 Carper-1 slide (climb-up) ladder at brkt-1 (4 rungs) PF 4 (1)
   4 (3 4)
   (A1 )B16(G1 M3 )XO IO AO (4)  1.00  360.
3 Carper-1 pull (climb-down) ladder at brkt-1 (4 rungs) PF 4 (1)
   PF 4 (3 4)
   (A1 )B16(G1 M1 )XO IO AO (4)  1.00  280.
4 Carper-1 get+place ladr from brkt-1 to tanktop with bend
   A1 BO G3 A1 B6 P3 A0  1.00  140.

Total TMU  920.
DATA SYNTHESIS AND BACK-UP

383. SET-UP (ACCESS) LADDER ON BULKHEAD WITH HAND AT TANK CARPENTER
PER LADDER OFG: 3 01-FEB-82

REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING UP AN ACCESS LADDER..
* ....ON THE BULKHEAD SO THAT THE CARPENTER
* ...CAN CLIMB TO THE NEXT LADDER..
* ALSO INCLUDES CLIMBING UP AND DOWN THE..
* ...LADDER..
* AVERAGE NUMBER OF RUNGS = 12
CARP-1 BEGINS AT TANKTOP

1 CARP-1 GET+PLACE WITH BEND LAIN? FROM TANKTOP TO LDR
   A1 B6 G3 A1 BO P3 AO 1.00 140.
2 CARP-1 SLIDE (CLIMB-UP) LADDER AT LDR (12 RUNGS) PF 12 (1) PF 12 (34)
   (A1 )B16(G1 M3 )XO IO AO (12) 1.00 760.
3 CARP-1 PULL (CLIMB-DOWN) LADDER AT LDR (12 RUNGS) PF 12 (1) PF 12 (34)
   (A1 )B16(G1 M1 )XO IO AO (12) 1.00 520.

TOTAL TMU. 1420.

385. POSITION (SECURE) (ACCESS) LADDER FOR BRACKET STAGING WITH PLIER (AND
WIRE ROPE) AT TANK CARPENTER
PER LADDER OFG: 4 03-FEB-82

REPRESENTS ELAPSED TIME
* REPRESENTS SECURING LADDER TO STAGING...
* ...BOARDS USING WIRE ROPE
CARP-1 BEGINS AT LDR

1 CARP-1 GET+MANIPULATE WIRE-ROPE AT LDR (PUT AROUND BOARDS AND
LADDER.)
   A1 BO G3 M10 XO IO AO 1.00 140.
2 CARP-1 TWIST WIRE-ROPE AT LDR USING PLIER-1 ASIDE TO CARP-1
   A1 BO G1 A1 BO P3 C6 A1 BO Pi AO 1.00 140.

TOTAL TMU 280
DATA SYNTHESIS AND BACK-UP

386. MAKE READY STAGING PLANK FOR (TRANSPORTING) WITH HAND AT TANK (OR WP)
CARPENTER
PER STAGING PLANK OFG: 3 02-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS GETTING BOARD ON BOLSTERS SO)
* ...THAT THE CRANE CAN TRANSPORT IT
CARP-3 BEGINS AT BIN-1

1 CARP-3 GET+SLIDE BOARD AT LU-PILE AND ADJUST ( ON BOLSTERS )
   424 B6 G3 M3 XO I6 AO 1.00 420.

TOTAL TMU 420,

388. SET-UP STAGING PLANK ON STAGING BRACKET WITH HAND AT TANK CARPENTER
PER BOARD OFG: 3 02-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS SETTING UP BOARDS BETWEEN....
* ...BRACKETS.
* TWO MAN OPERATION:
* CARPENTERS ARE LOCATED AT TWO DIFFERENT
* ...BRACKETS. THEY BOTH LIFT THE BOARD....
* ...TOGETHER AND SLIDE IT INTO POSITION.
* IN THIS ANALYSIS CARPENTERS ARE LOCATED
* ...ON THE LEVEL BELOW THE BOARDS.
CARP-1 BEGINS AT BRKT-1

1 CARP-1+CARP-2 GET+SLIDE WITH 1 STEP BOARD AT BRKT-1 AND ALIGN
   A3 BO G3 H3 X() I10 AO 1.00 190.
2 CARP-1 WALK TO BRKT-2 ( TO DO NEXT SECTION OF BOARDS? CARP2 ALSO
   MOVES TO ANOTHER BRACKET )
   A10 BO GO 40 BO PO AO 1.00 100.

TOTAL TMU 290.
DATA SYNTHESIS AND BACK-UP

389. SET-UP STAGING PLANK ON STAGING BRACKET WITH HAND AT TANK CARPENTER
PER BOARD OFG: 3 02-FEB-82
  REPRESENTS ELAPSED TIME
  * REPRESENTS SETTING UP BOARDS BETWEEN....
  * ...BRACKETS.
  * TWO MAN OPERATION:
  * CARPENTERS ARE LOCATED AT TWO DIFFERENT
  * ...BRACKETS. THEY BOTH PICK-UP THE BOARD
  * ...TOGETHER AND SLIDE IT INTO POSITION.
  * IN THIS ANALYSIS CARPENTERS ARE LOCATED
  * ...ON THE SAME LEVEL AS THE BOARDS.
CARP-1 BEGINS AT BRKT-1

1 CARP-1+CARP-2 GET+SLIDE WITH BEND WITH 1 STEP BOARD AT BRKT-1 AND
  ALIGN
     A3     B6     G3     M3     X0     I10     A0     1.00     250.
2 CARP-1 WALK TO BRKT-2 ( TO DO NEXT SECTION OF BOARDS, CARP2 ALSO
  MOVES TO ANOTHER BRACKET )
     A10     B0     G0     A0     B0     P0     A0     1.00     100.

TOTAL THU 350.

390. SET-UP STAGING PLANK ON STAGING BRACKET WITH HAND AT TANK CARPENTER
PER STAGING PLANK OFG: 4 02-FEB-82
  REPRESENTS ELAPSED TIME
  * REPRESENTS SETTING UP BOARDS BETWEEN....
  * ...BRACKETS.
  * ONE MAN OPERATION:
  * USUALLY OCCURS WHEN CRANE CANNOT PLACE...
  * ...BOARD ON BRACKETS.
CARP-1 BEGINS AT BRKT-1

1 CARP-1 GET+MANIPULATE WITH BEND BOARD AT BRKT-2 AND ALIGN RETURN TO
  BRKT-1
     A10     B6     G3     M10     X0     I10     A10    1.00     490.
2 CARP-1 GET+POSITION WITH BEND BOARD FROM TANKTOP TO BRKT-1 AND SEAT
     A1     B6     G3     A1     B0     P6     A1    1.00     180.

TOTAL THU 670.
DATA SYNTHESIS AND BACK-UP

391. MAKE READY STANCHION FOR (TRANSPORTING) WITH HAND AT TANK (OR WAY)
CARPENTER

PER STANCHION OFG: 3 02-FEB-82

* REPRESENTS ELAPSED TIME
* REPRESENTS GETTING STANCHION READY TO BE
* ...TRANSPORTED,
CARP-3 BEGINS AT LU-PILE

1 CARP-3 GET+PLACE WITH BEND STAN FROM BIN-2 TO BIN-2

| A42 B6 G3 A1 B0 P3 AO | 1.00 | 550 |

TOTAL TMU 550.

393. SET-UP STANCHION IN STAGING BRACKET WITH HAND AT TANK CARPENTER

PER STANCHION OFG: 3 02-FEB-82

* REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING STANCHION IN THE.....
* ...BRACKET SLEEVE
CARP-1 BEGINS AT BRKT-1

1 CARP-1 GET+PLACE WITH BEND STAN FROM TANKTOP TO BRKT-1 AND INSERT

| 41 B6 G3 A1 BO P3 A1 | 1.00 | 150. |

2 CARP-1 WALK TO BRKT-2 (1(0 NEXT STANCHION )

| A10 BO GO AO BO PO AO | 1.00 | 100 |

TOTAL TMU 250.

394. MAKE READY HANDRAIL FOR (TRANSPORTING) WITH HAND AT TANK (OR WAY)
CARPENTER

PER HANDRAIL OFG: 3 02-FEB-82

* REPRESENTS ELAPSED TIME
* REPRESENTS GETTING HANDRAIL ON BOLSTERS
* ...SO THAT THE CRANE CAN TRANSPORT IT
CARP-3 BEGINS AT BIN-2

1 CARP-3 GET+SLIDE HANDRAIL AT HR-PILE AND ADJUST (ON BOLSTERS )

| A32 B6 G3 )43 XO 16 AO | 1.00 | 500 |

TOTAL TMU 500.
DATA SYNTHESIS AND BACK-UP

396. SET-UP HANDRAIL ON STANCHION WITH HAND AT TANK CARPENTER
PER HANDRAIL OFG: 3 02-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING HANDRAIL INTO THE....
* ...EYELETS ON THE STANCHION
* INCLUDES ACTION DISTANCES NEEDED FOR,....
* ...ALIGNING THE HANDRAIL
* WELDING OF THE HANDRAIL CONNECTIONS WILL
* ...BE DONE IN A SEPARATE SUB OPERATION
CARP-1 BEGINS AT SRKT-1
1 CARP-1 GET+SLIDE WITH BEND HANDRAIL AT BRKT-2 AND ALIGN ( THRU 2
EYELETS ON THE STANCHIONS AT BRKT1 & BRKT2 ) RETURN TO BRKT-1 PF 2
(4 5 6)
   A10 B6 G3 (H3 XO 110 )A10 (2) 1.00 5504
2 CARP-1 WALK TO BRKT(T-2 ( DO NEXT SECTION )
   A10 BO GO AO BO PO AO 1.00 100.

TOTAL TMU 650,

397, SET-UP HANDRAIL (END PIECES) ON HANDRAIL (AND BULKHEAD) WITH HAND AT
TANK CARPENTER
PER HANDRAIL OFG: 4 02-FEB-82
REPRESENTS ELAPSED TIMEEE
* REPRESENTS PUTTING HANDRAIL (END PIECES)
* ...AT THE END-OF A STAGING LEVEL
* WELDING OF THE HANDRAIL (END PIECES)***+
*...CONNECTIONS WILL BE DONE IN A.....
* ...SEPARATE SUB OPERATION
CARP-1 BEGINS AT BRKT-I
1 CARP-1 GET+HOLD WITH BEND HANDRAIL FROM TANKTOP TO CARP-1
   A1 B6 G3 A1 R() P0 AO 1.00 110.
2 PTIME 1.02 M ( CUT HANDRAIL INTO 2 PIECES WITH ELECTRODE )
   1.00 1700.
3 CARP-1 GET+PLACE 2 HANDRAIL ( END PIECES ) FR(Jf1 CARP-1 TO BRKT-1 F 2
   A1. BO G3 A1 BO P3 AO 2.00 160.

TOTAL TMU 1970.

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DATA SYNTHESIS AND BACK-UP

398. TEAR DOWN HANDRAIL ON BULKHEAD WITH TORCH AT (CENTER) MID TANKS AND Voids CARPENTER

PER HANDRAIL OFG: 3 04-FEB-82

* REPRESENTS ELAPSED TIME
* REPRESENTS TEARING DOWN HANDRAIL IN A...
* ...CENTER TANK, HANDRAIL IS THROWN TO A
* ...MATERIAL PILE ON THE TANKTOP.
* CARPENTERS REMOVE 2 HANDRAIL BEFORE......
*...MOVING TO NEXT SECTION.
CARP-1 BEGINS AT BULKHEAD

1 CARP-1 PULL TORCH FROM BULKHEAD TO BRKT-1
   A1 BO G1 HI XO 10 A1  1.00  40.
2 CARP-1 OPERATE TORCH AT BRKT-1 PTIME 0.26 M ( BURN OFF HANDRAIL )
   A1 RO G1 H6 X42 IO AO  1.00  500.
3 CARP-2 GET+HOLD HANDRAIL FROM BRKT-1 TO CARP-2 SIMO
   <A1 BO G3 A1 BO PO AO >  1.00  0.
4 CARP-2 HOLD+THROW HANDRAIL FROM CARP-2 TO MATL-PILE
   AO RO GO A1 BO PO AO  1.00  10.
5 CARP-1 AND CARP2 WALK TO BRKT-2 F 1 / 2
   A10 BO GO AO BO PO AO  0.50  50.

TOTAL TMU  600.
DATA SYNTHESIS AND BACK-UP

399. TEAR DOWN HANTIRAIL ON BULKHEAD WITH TORCH (AND WINCH) AT (WING) TANKS AND VOIDS CARPENTER
PER HANDRAIL OFG: 3 04-FEB-82

REPRESENTS ELAPSED TIME
* REPRESENTS TEARING DOWN HANDRAIL IN A...
* ... WING TANK. HANDRAIL IS LOWERED TO THE...
* ... MATL-PILE WITH A WINCH BECAUSE THE...
* ... TANK IS TO SMALL FOR THE HANDRAIL TO...
* ... BE THROWN.
* CARPENTERS REMOVE 2 HANDRAIL BEFORE...+
* ... MOVING TO THE NEXT SECTION*
* MAXIMUM NUMBERS OF HANDRAIL IN LIFT = 6
CARP-1 BEGINS AT BULKHEAD

1 CARP-1 PULL TORCH FROM BULKHEAD TO BRKT-1
A1 BO G1 HI XO IO A1 1.00 40.

2 CARP-1 OPERATE TORCH AT BRKT-1 PTIME 0.26 M (BURN OFF HANDRAIL )
A1 BO G1 H6 X42 IO AO 1.00 500.

3 CARP-2 GET+HOLD HANDRAIL FROM BRKT-1 TO RRKT-1 SIMO
< A1 BO G3 A1 BO PO AO > 1.00 0.

4 CARP-2 HOLD+PLACE HANDRAIL FROM BRKT-1 TO BRKT-PILE
AO BO GO A10 B6 P3 AO 1.00 190.

5 WINCH-C)PER LOOSEN ( = SUING ) CABLE WITH BEND AT MENHOLE 5
ARM-STROKES USING HANDS F 1 / 6
A1 B6 G1 A1 BO P1 L32 AO BO PO AO 0.17 70*

6 WINCH-OPER THROW CABLE FROM HENHOLE TO CARP-2 F 1 / 6
A1 BO G1 A1 B& PO AO a.17 15.

7 CARP-2 GET+HANIPULATE WITH BEND CABLE AT BRKT-PI1.E (HOOK CABLE
AROUND HANDRAIL ) F 1 / 6
A1 B6 G3 M10 XO IO AO 0.17 33*

8 WINCH-OPER PUSH WINCH-FREE PROCESS (CLEAR OBSTACLES ) F 1 / 6
A1 BO E1 H1 X67 IO AO 0.17 117.

9 WINCH-OPER PUSH WINCH-DOWN PROCESS (TO MATL PILE ) F 1 / 6
A1 BO G1 M1 X81 IO AO 0.17 140.

10 WINCH-OPER PUSH WINCH-UP PROCESS (TO HENHOLE ) F 1 / 6
A1 BO G1 HI X24!510 AO 0.17 413.

11 CARP-2 AND CARP1 WALK TO BRKT-2 F 1 / 2
A24 BO GO AO BO PO AO 0.50 120.

TOTAL TMU 1638.
DATA SYNTHESIS AND BACK-UP

400. TEAR DOWN STANCHION ON BULKHEAD WITH HAND AT (CENTER) MID TANKS AND VOIDS CARPENTER

PER STANCHION DFG: 3 04-FEB-82

REPRESENTS ELAPSED TIME

* REPRESENTS REMOVING STANCHION FROM.....
* ...STAGING BRACKETS IN A CENTER TANK.
* ...STANCHION IS THROWN TO A MATERIAL...
* ...PILE ON THE TANKTOP

CARP-2 BEGINS AT BRKT-1

1 CARP-2 LOOSEN STAN AT ERKT-1 4 ARM-STROKES USING HANDS
   A1 B0 G1 A1 BO P1 L24 AO B0 PO AO 1.00 280 1
2 CARP-2 HOLD+THROW STAN FROM BRKT-1 TO MATL-PILE
   AO B0 GO A1 BO PO AO 1.00 10.
3 CARP-2 WALK TO BRKT-2
   A10 BO GO AO BO PO AO 1.00 100.

TOTAL TMU

390.

402. TEAR DOWN STAGING PLANK ON STAGING BRACKET WITH HAND (AND WINCH) AT ALL TANKS AND VOIDS CARPENTER

PER STAGING PLANK OFG: 3 04-FEB-82

REPRESENTS ELAPSED TIME

* REPRESENTS REMOVING BOARDS FROM ANY TANK
* ...WINCH IS USED TO LOWER BOARD TO......
* ...BD-PIL.E ON TANKTOP.
* MAXIMUM NUMBER OF BOARDS IN LIFT = 3

CARP-1 BEGINS AT BULKHEAD

1 CARP-1 AND CARP2 GET+MANIPULATE WITH BEND BOARD AT BRKT-1 ( FLIP 2 BOARDS ONTO 3RD BOARD )
   A1 B6 G3 M10 XO IO AO 1.00 200.
2 WINCH-OPER LOOSEN ( -SWING ) WITH BEND CABLE AT BTRWTH 5 ARM-STROKI
   USING HANDS F 1 / 3
   A1 B6 G1 A1 BO P1 L32 AO BO PO AO 0.33 140.
3 WINCH-OPER THROW CABLE FROM BTRWTH TO CARP-1 WITH BEND F 1 / 3
   A1 BO G1 A1 B6 PO AO 0.33 30.
4 CARP-1 GET+MANIPULATE WITH BEND CABLE AT BRKT-1 ( HOOK CABLE AOUNI
   BOARD ALLOW FOR 2 ATTEMPTS ) F 2 / 3
   A1 B6 G3 M10 XO IO AO 0.67 133.
5 WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES ) F 1 / 3
   A1 BO G1 MI X67 IO AO 0.33 233.
6 WINCH-OPER PUSH WINCH-DOWN PROCESS ( TO BD PILE ) F 1 / 3
   A1 BO G1 MI X81 IO AO 0.33 280.
7 WINCH-OPER PUSH WINCH-UP PROCESS ( TO BTRWTH ) F 1 / 3
   A1 BO G1 M1 X245IO AO 0.33 827.
DATA SYNTHESIS AND BACK-UP

8 CARP-1 AND CARP2 WALK TO BRKT-2
A10 BO GO AO BO PO AO 1.00 100.

TOTAL TMU 1943.

403. TEAR DOWN LADDER (AND LADDER CLIPS) ON BULKHEAD WITH TORCH (AND WINCH) AT ANY TANKS AND VOIDS CARPENTER
PER LADDER OFG: 3 05-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS REMOVING LADDER FROM BULKHEAD
* ...THERE ARE 4 LADDER CLIPS PER LADDER.
* ...LADDER LOWERED TO LDR-PILE BY WINCH
* ...LADDER CLIPS THROWN TO MATL-PILE.
CARP-1 BEGINS AT BRKT-2

1 CARP-1 PULL TORCH AT LDR
A10 BO G1 M1 XO IO AO 1.00 120.

2 CARP-1 OPERATE TORCH AT LDR PTIME 0.47 M F 4 ( BURN OFF 4 CLIPS )
A1 BO G1 H6 X81 IO AO 4.00 3560.

3 CARP-1 GET+THROW 4 LCLIPS FROM LDR TO MATL-PILE WITHOUT BEND F 4
A1 BO G3 A1 BO PO AO 4.00 200.

4 CARP-2 GET+POSITION LADR FROM LDR TO BRKT-2 WITH BEND ( LAY DOWN ON BOARDS )
A1 BO G3 A10 B6 P6 AO 1.00 260.

5 WINCH-OPER LOOSEN (=SWING) CABLE WITH BEND AT BTRWTH 5 ARM-STROKES USING HANDS
A1 B6 G1 A1 BO P1 L32 AO BO PO AO 1.00 420.

6 WINCH-OPER THROW CABLE FROM BTRWTH TO CARP-2 WITH BEND
A1 BO G1 A1 B6 PO AO 1.00 90.

7 CARP-2 GET+MANIPULATE WITH BEND CABLE AT BRKT-2 ( HOOK AROUND LADR )
A1 B6 G3 M10 XO IO AO 1.00 200.

8 WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES )
A1 BO G1 M1 X67 IO AO 1.00 700.

9 WINCH-OPER PUSH WINCH-DOWN PROCESS ( TO LDR PILE )
A1 BO G1 M1 X81 IO AO 1.00 840.

10 WINCH-OPER PUSH WINCH-UP PROCESS ( TO BTRWTH )
A1 BO G1 M1 X245IO AO 1.00 2480.

11 CARP-1 WALK TO BRKT-2
A10 BO GO AO BO PO AO 1.00 100.

TOTAL TMU 8970.
DATA SYNTHESIS AND BACK-UP

405. TEAR DOWN LADDER (AND WIRE ROPE) ON BULKHEAD WITH PLIER (AND WINCH) A
   ANY TANKS AND VOIDS CARPENTER
   PER LADDER OFG: 4 05-FEB-82
   REPRESENTS ELAPSED TIME
   * REPRESENTS REMOVING LADDER FROM BULKHEAD
   * ...THERE IS 1 WIRE ROPE PER LADDER.
   * ...LADDER LOWERED TO LDR-PILE BY WINCH
   * ...WIRE-ROPE IS THROWN TO MATL-PILE.
   CARP-1 BEGINS AT BRKT-2

1 CARP-1 TWIST WIRE-ROPE AT LDR USING PLIER-1 ASIDE TO CARP-1
   A1 BO G1 A10 B0 P3 C6 A1 Bo PI Ao 1.00 230.
2 CARP-1 GET+MANIPULATE WIRE-ROPE AT LDR ( PULL. WIRE ROPE OFF BOARD
   AND LADDER. )
   A1 BO G3 M10 HO IO AO 1.00 140.
3 CARP-1 HOLD+THROW WIRE-ROPE FROM LDR TO MATL-PILE WITHOUT BEND
   A0 BO GO A1 BO PO AO 1.00 10.
4 CARP-2 GET+POSITION LADR FROM LDR TO BRKT-2 WITH BEND ( LAY DOWN C
   BOARDS )
   A1 BO G3 A10 B6 P6 AO 1.00 260.
5 WINCH-OPER LOOSEN ( =SWING ) CABLE WITH BEND AT BTRWTH 5 ARM-STROK
   USING HANDS
   A1 B6 G1 A1 BO P1 L32 AO BO PO AO 1.00 420.
6 WINCH-OPER THROW CABLE FROM BTRWTH TO CARP-2 WITH BEND
   A1 BO G1 A1 B6 Po Ao 1.00 90.
7 CARP-2 GET+MANIPULATE WITH BEND CABLE AT BRKT-2 ( HOOK AROUND LADR
   A1 B6 G3 M10 XO IO AO 1.00 200.
8 WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES )
   A1 BO G1 M1 X67 IO AO 1.00 700.
9 WINCH-OPER PUSH WINCH-DOWN PROCESS ( TO LDR PILE )
   A1 BO G1 M1 X81 IO AO 1.00 840.
10 WINCH-OPER PUSH WINCH-UP PROCESS ( TO BTRWTH )
    A1 BO G1 M1 X245t0 AO 1.00 2480.
11 CARP-1 WALK TO BRKT-2
    A10 BO GO AO BO PO AO 1.00 100.

TOTAL TMU 5470.
DATA SYNTHESIS AND BACK-UP

406. TEAR DOWN STAGING BRACKET ON BULKHEAD WITH WRENCH AT ANY TANKS AND VOIDS CARPENTER

PER STAGING BRACKET OFG: 3 05-FEB-82

* REPRESENTS ELAPSED TIME
* REPRESENTS TEARING DOWN STAGING BRACKET
* ...IN ANY TANK. BRACKETS ARE LOWERED TO
* ...MATL-PILE BY WINCH.
* MAXIMUM NUMBER OF BRACKETS IN LIFT = 3
CARP-1 BEGINS AT BRKT-2

1 CARP-1 LOOSEN NUT AT BRKT-1 1 ARM-STROKE USING WRENCH-1 AND HOLD
A1 BO G1 A10 BO P3 L3 AO BO PO AO 1.00 180.
2 CARP-1 HOLD+LOOSEN NUT AT BRKT-1 13 WRIST-STROKES USING WRENCH-1
   ASIDE TO CARP-1
AO BO GO A1 BO P3 L42 A1 BO P1 AO 1.00 480.
3 CARP-1 GET+REMOVE BOLT FROM BRKT-1 TO CARP-1
   A1 BO G3 A1 BO P1 AO 1.00 60.
4 CARP-1 THROW NUT AND BOLT FROM CARP-1 TO MATL-PILE WITHOUT BEND
   A1 BO G1 A1 BO PO AO 1.00 30.
5 CARP-2 GET+PLACE BRKT FROM BRKT-1 TO BRKT-PILE
   A1 BO G3 A10 B6 P3 AO 1.00 230.
6 WINCH-OPER. LOOSEN ( =SWING ) CABLE WITH BEND AT BTRWTH 5 ARM-STROKES USING HANDS F 1 / 3
   A1 B6 G1 A1 BO P1 L32 AO BO PO AO 0.33 140.
7 WINCH-OPER THROW CABLE FROM BTRUTH TO CARP-2 F 1 / 3
   A1 BO G1 A1 B6 PO AO 0.33 30.
8 CARP-2 GET+MANIPULATE WITH BEND CABLE AT BRKT-PILE ( HOOK AROUND BRACKETS ) F 1 / 3
   A1 B6 G3 M10 XO I0 AO 0.33 67.
9 WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES ) F 1 / 3
   A1 BO G1 M1 X67 I0 AO 0.33 233.
10 WINCH-OPER PUSH WINCH-DOWN PROCESS ( TO MATL PILE ) F 1 / 3
    A1 BO G1 M1 X81 I0 AO 0.33 280.
11 WINCH-OPER PUSH WINCH-UP PROCESS ( TO BTRWTH ) F 1 / 3
    A1 BO G1 M1 X245 I0 AO 0.33 827.
12 CARP-2 AND CARP1 WALK TO BRKT-2
   A24 BO Go Ao Bo po Ao 1.00 240.

TOTAL TMU 2797.
5.2 SYNTHESIS AND ANALYSIS

435. WELD STAGING BRACKET (CLIP) ON BULKHEAD (OR ANY STRUCTURE) WITH STICK ELECTRODE AT ANY TANKS AND VOID S (SHIP) WELDING
   PER 100 CLIPS OFG: 3
   WELD TO MEET SAFETY REQUIREMENTS. RATE PER 100 CLIPS. RATE INCLUDES MANUAL ELEMENTS.

1 WELD VERTICAL 3/8’ FILLET WELD (10’ PER CLIP) WITH 10% OVERWELD USING 6011 3/16 ELECTRODE OR COMPARABLE (7018 5/32).

TOTAL TMU 1063356.

438. WELD LADDER (CLIP) (SECURES LADDER) ON BULKHEAD (OR ANY STRUCTURE) WITH STICK ELECTRODE AT ANY TANKS AND VOIDS (SHIP) WELDING
   PER 100 LADDERS OR 400 CLIPS OFG: 3
   WELD TO MEET SAFETY REQUIREMENTS. RATE PER 100 LADDERS (400 CLIPS) INCLUDES MANUAL ELEMENTS.

1 WELD VERTICAL 3/8’ FILLET WELD (4’ PER CLIP) WITH 10% OVERWELD USING 6011 3/16 ELECTRODE OR COMPARABLE (7018 5/32).

TOTAL TMU 1701606.

440. WELD HANDRAIL (CONNECTIONS) ON STANCHION WITH STICK ELECTRODE AT ANY TANKS AND VOIDS (SHIP) WELDING
   PER 100 PIECES OF HANDRAIL OFG: 3
   WELD TO MEET SAFETY REQUIREMENTS. RATE PER 100 PIECES OF HANDRAIL (AVERAGE 1 CONNECTION EACH) INCLUDES MANUAL ELEMENTS.

1 WELD HORIZONTAL 1/4’ FILLET WELD (5’ PER CONNECTION) USING 6011 3/16 ELECTRODE OR COMPARABLE (7018 5/32).

TOTAL TMU 196090.
DATA SYNTHESIS AND BACK-UP

404. (CLIMB UP AND DOWN) MOVE OPERATOR (ON LADDER) ON BULKHEAD AT ANY TANKS AND VOIDS CARPENTER
PER LADDER OFG: 3 05-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS CARPENTERS CLIMBING UP AND...
* ...DOWN LADDERS TO REMOVE STAGING.
* AVERAGE LADDER SIZE = 12 RUNGS.
CARP-1 BEGINS AT LDR

1 CARP-1 SLIDE (CLIMB-UP) LADDER AT LDR (12 RUNGS) PF 12 (1) PF 12 (34) (A1) B16(G1 M3)XO IO AO (12) 1.00 760.
2 CARP-1 PULL (CLIMB-DOWN) LADDER AT LDR (12 RUNGS) PF 12 (1) PF 12 (34) (A1) B16(G1 M1)XO IO AO (12) 1.00 520.

TOTAL TMU 1280.

407. REMOVE HANDRAIL ON (MATERIAL-PILE) WITH WINCH AT ANY TANKS AND VOIDS CARPENTER
PER HANDRAIL OFG: 3 08-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF HANDRAIL FROM MATL
* ... PILE ON TANKTOP TO DECK (GOING THRU
* ..MANHOLE).
* MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6
CARP-3 BEGINS AT TANKTOP

1 CARP-3 GET+SLIDE HANDRAIL (ONTO BOLSTER) AT MATL-PILE
A1 B6 G3 M3 XO IO AO 1.00 130.
2 WINCH-OPER PUSH WINCH-DOWN PROCESS (TO TANKTOP) F 1/6
A1 BO G1 M1 X81 IO AO 0.17 140.
3 WINCH-OPER LOOSEN (=SWING) CABLE WITH BEND AT MENHOLE 5 ARM-STROKES USING HANDS F 1/6
A1 B6 G1 A1 BO P1 L32 AO BO PO AO 0.17 70.
4 WINCH-OPER THROW CABLE FROM MENHOLE TO CARP-3 F 1/6
A1 BO G1 A1 B6 PO AO 0.17 15.
5 CARP-3 GET+MANIPULATE WITH BEND CABLE AT MATL-PILE (HOOK AROUND HANDRAIL) F 1/6
A1 B6 G3 M10 XO IO AO 0.17 33.
6 WINCH-OPER PUSH WINCH-FREE PROCESS (CLEAR OBSTACLES) F 1/6
A1 BO G1 M1 X67 IO AO 0.17 117.
7 WINCH-OPER PUSH WINCH-UP PROCESS (TO MENHOLE) F 1/6
A1 BO G1 M1 X245 I0 AO 0.17 413.
DATA SYNTHESIS AND BACK-UP

TOTAL TMU 918.

408. REMOVE STANCHION ON (MATERIAL PILE) WITH WINCH AT ANY TANKS AND Voids
CARPENTER
PER STANCHION OFG: 3 08-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF STANCHION FROM...
* ...MATL-PILE ON TANKTOP TO DECK (GOING
* ...THRU MANHOLE).
* MAXIMUM NUMBER OF STANCHION IN LIFT = 6
CARP-3 BEGINS AT MATL-PILE

1  CARP-3 GET+PLACE WITH BEND STAN FROM MATL-PILE TO )MATL-PILE WITH BEND

2  WINC-OPER PUSH WINCH-DOWN PROCESS ( TO TANKTOP ) F 1 / 6
    A1  B6  G3  A1  B6  P3  A0  1.00  200.

3  WINCH-OPER LOOSEN ( =SWING ) CABLE WITH BEND AT MENHOLE 5
    ARM-STROKES USING HANDS F 1 / 6
    A1  B6  G1  A1  Bo  P1  L32  A0  Bo  PO  AO  0.17  140.

4  WINCH-OPER THROW CABLE FROM MENHOLE TO CARP-3 F 1 / 6
    A1  Bo  G1  A1  B6  Po  Ao  0.17  15.

5  CARP-3 GET+MANIPULATE WITH BEND CABLE AT MATL-PILE ( HOOK AROUND STANCHION ) F 1 / 6
    A1  B6  G3  M10  X0  I0  Ao  0.17  33.

6  WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES ) F 1 / 6
    A1  Bo  G1  M1  X67  I0  Ao  0.17  117.

7  WINCH-OPER PUSH WINCH-UP PROCESS ( TO MENHOLE ) F 1 / 6
    A1  Bo  G1  M1  X245I0  Ao  0.17  413.

TOTAL TMU 988.

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409. REMOVE STAGING BRACKET ON (MATERIAL PILE) WITH WINCH AT ANY TANKS AND UOID'S CARPENTER

PER STAGING BRACKET OFG: 3 05-FEB-82

* REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF BRACKET FROM MATL
* ... PILE ON TANKTOP TO DECK (GOING THRU MANHOLE).
* MAXIMUM NUMBER OF BRACKET IN LIFT = 3
CARP-3 BEGINS AT MATL-PILE

1 CARP-3 GET+PLACE WITH BEND BRKT FROM MATL-PILE TO MATL-PILE WITH BEND

2 WINCH-OPER PUSH WINCH-DOWN PROCESS ( TO TANKTOP ) F 1 / 3

3 WINCH-OPER LOOSEN (=SWING) CABLE WITH BEND AT MENHOLE 5

4 WINCH-OPER THROW CABLE FROM MENHOLE TO CARP-3 F 1 / 3

5 CARP-3 GET+MANIPULATE WITH BEND CABLE AT MATL-PILE ( HOOK AROUND BRACKET ) F 1 / 3

6 WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES ) F 1 / 3

7 WINCH-OPER PUSH WINCH-UP PROCESS ( TO MENHOLE ) F 1 / 3

TOTAL TMU 1777.
DATA SYNTHESIS AND BACK-UP

410. REMOVE STAGING PLANK ON (BOARD PILE) WITH WINCH AT ANY TANKS AND VOID CARPENTER
PER STAGING PLANK OFG: 3 08-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENT REMOVING BOARDS FROM BOARDS...
* ...-PILE ON TANKTOP TO DECK (GOES THRU...
* ...MANHOLE).
* MAXIMUM NUMBER OF BOARDS IN LIFT = 3
CARP-3 BEGINS AT MATL-PILE

1 CARP-3 GET+SLIDE BOARD ( ONTO BOLSTER ) AT BD-PILE AND ADJUST
   A16 B6 63 M3 XO I6 AO  1.00  340.
2 WINCH-OPER PUSH WINCH-DOWN PROCESS ( TO TANKTOP ) F 1 / 3
   A1 BO G1 M1 X81 IO AO  0.33  280.
3 WINCH-OPER LOOSEN ( =SWING ) CABLE WITH BEND AT MENHOLE 5
   ARM-STROKES. USING HANDS F 1 / 3
   A1 B6 G1 A1 BO P1 L32 AO BO PO AO  0.33  140.
4 WINCH-OPER THROW CABLE FROM MENHOLE TO CARP-3 F 1 / 3
   A1 BO G1 A1 B6 PO AO  0.33  30.
5 CARP-3 GET+MANIPULATE WITH BEND CABLE AT BD-PILE ( HOOK AROUND
   BOARDS ) ( ALLOW FOR 2 ATTEMPTS ) F 2 / 3
   A1 B6 G3 M10 XO IO AO  0.67  133.
6 WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES ) F 1 / 3
   A1 BO G1 MI X67 IO AO  0.33  233.
7 WINCH-OPER PUSH WINCH-UP PROCESS ( TO MENHOLE ) F 1 / 3
   A1 BO G1 M1 X24510 AO  0.33  827.

TOTAL TMU  1983.
DATA SYNTHESIS AND BACK-UP

411. REMOVE LADDER ON (LADDER-PILE) WITH WINCH AT ANY TANKS AND VOIDS
    CARPENTER
    PER LADDER OFG: 3 08-FEB-82
    REPRESENTS ELAPSED TIME
    * REPRESENT REMOVING LADDERS FROM LADDER
    * ...-PILE ON TANKTOP TO DECK (GOES THRU...
    * ...MANHOLE).
    * MAXIMUM NUMBER OF LADDERS IN LIFT = 3
    CARP-3 BEGINS AT BD-PILE

    1 CARP-3 GET+SLIDE LADR ( ONTO BOLSTER ) AT LDR-PILE AND ADJUST
        A16 B6 G3 M3 XO 16 AO  1.00  340.
    2 WINCH-OPER PUSH WINCH-DOWN PROCESS ( TO TANKTOP ) F 1 / 3
        A1 BO G1 M1 X81 IO AO  0.33  280.
    3 WINCH-OPER LOOSEN ( =SWING ) CABLE WITH BEND AT MENHOLE 5
        ARM-STROKES USING HANDS F 1 / 3
        A1 B6 G2 A1 BO P1 L32 A0 BO PO AO  0.33  140.
    4 WINCH-OPER THROW CABLE FROM MENHOLE TO CARP-3 F 1 / 3
        A1 BO G1 A1 B6 PO AO  0.33  30.
    5 CARP-3 GET+MANIPULATE WITH BEND CABLE AT LDR-PILE ( HOOK AROUND
        LADDERS. ) ( ALLOW FOR 2 ATTEMPTS ) F 2 / 3
        A1 B6 G3 M10 XO IO AO  0.67  133.
    6 WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES ) F 1 / 3
        A1 BO G1 M1 X67 IO A0  0.33  233.
    7 WINCH-OPER PUSH WINCH-UP PROCESS ( TO MENHOLE ) F 1 / 3
        A1 BO G1 M1 X24510 AO  0.33  827.

    TOTAL TMU  1983.

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DATA SYNTHESIS AND BACK-UP

412. REMOVE TOOLBOX ON (MATERIAL PILE) WITH WINCH AT ANY TANKS AND VOIDS
CARPENTER
PER TOOLBOX OFG: 3 08-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS REMOVING TOOLBOX FROM MATL...
* ...PILE ON TANKTOP TO DECK (GOES THRU...
* ...MANHOLE).
* TOOLBOX CONTAINS:
* ...28 BOLTS
* ...28 NUTS
* ...28 LADDER CLIPS
CARP-3 BEGINS AT LDR-PILE

1 CARP-3 GET+PLACE 7 NUTS AND 7 BOLTS FROM MATL-PILE TO TOOLBOX-1 WI
BEND (TOTAL OF 28) PF 4 (23456)
   A32 (B6 G3 A1 B6 P3 )AO (4) 1.00 1080.
2 CARP-3 GET+PLACE WITH BEND 4 LCLIPS FROM MATL-PILE TO TOOLBOX-1 WI
BEND ( TOTAL OF 28 ) F 7
   A1 B6 G3 A1 B6 P3 AO 7.00 1400.
3 WINCH-OPER PUSH WINCH-DOWN PROCESS ( TO TANKTOP )
   A1 BO G1 M1 X81 IO AO 1.00 840.
4 WINCH-OPER LOOSEN ( =SWING ) CABLE WITH BEND AT MENHOLE 5
   ARM-STROKES USING HANDS
   A1 B6 G1 A1 BO P1 L32 A0 BO PO AO 1.00 4204.
5 WINCH-OPER THROW CABLE FROM MENHOLE TO CARP-3
   A1 BO G1 A1 B6 PO AO 1.00 90.
6 CARP-3 GET+MANIPULATE WITH BEND CABLE AT MATL-PILE ( HOOK AROUND
TOOLBOX )
   A1 B6 G3 M10 XO IO AO 1.00 200.
7 WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES )
   A1 BO G1 M1 X67 IO AO 1.00 700.
8 WINCH-OPER PUSH WINCH-UP PROCESS ( TO MENHOLE )
   A1 BO G1 M1 X245IO AO 1.00 2480.

TOTAL TMU 7210
DATA SYNTHESIS AND BACK-UP

431. (WALK UP OR DOWN) MOVE OPERATOR (ON INCLINED STAIRS) ON BULKHEAD AT ANY TANKS AND Voids CARPENTER PER SET OF INCLINED STAIRS OFG: 4 10-FEB-82
* REPRESENTS ELAPSED TIME
* ...A SET OF INCLINED STAIRS. AVERAGE
* ...NUMBER OF TREADS IN A SET OF INCLINED
* ...STAIRS = 16.
* CARPENTERS ARE WALKING UP OR DOWN STAIRS
* AT THE SAME TIME.
CARP-1 BEGINS AT LEVEL-1

1 CARP-1 WALK TO LEVEL-2
   A32 B0 B0 A0 B0 P0 A0 1.00  320.
2 CARP-2 WALK TO LEVEL-2 SIMO
   <A32B0 B0 A0 B0 P0 A0 > 1.00   0.

TOTAL TMU    320.

563. TRANSPORT STAGING BRACKET WITH (TOWER CRANE) AT (WING) TANKS AND Voids . CARPENTER PER STAGING BRACKET OFG: 3 23-MAY-83
* REPRESENTS ELAPSED TIME
* ...BIN-1 TO BULKHEAD
* ...DISTANCES FROM CRANE-REST TO BIN-1 AND...
* ...FROM BIN-1 TO BULKHEAD ARE AVERAGE...
* ...DISTANCES FROM THE SIDE OF A BASIN
* ...1200'X200'
* MAXIMUM NUMBER OF BKRTS IN LIFT = 6
C-OPER BEGINS AT CR-1

1 TRANSPORT BRKT FROM BIN-1 USING CRANE WITH HOOK+SLING TO BULKHEAD (BTWN BKRTS ) PLACE+ADJUST RETURN TO CR-1 F 1 / 6
   A1 T32 K24 T16 P3 T32 A0 . 0.17  1800.

TOTAL TMU    1800.
DATA SYNTHESIS AND BACK-UP

564. TRANSPORT LADDER WITH (TOWER CRANE) AT (WING) TANKS AND VOIDS CARPENT.
PER LADDER OFG: 3 23-MAY-83

* REPRESENTS ELAPSED TIME
* ...LDR-PILE TO BULKHEAD
* ...DISTANCES FROM CRANE-REST TO LDR-PILE
* ...AND FROM LDR-PILE TO BULKHEAD ARE
* ...AVERAGE DISTANCE FROM SIDE OF BASIN
* ...1200'x200'
* MAXIMUM NUMBER OF LADDERS IN LIFT = 3
C-OPER BEGINS AT CR-1

1 TRANSPORT LADR FROM LDR-PILE USING CRANE WITH HOOK+SLING TO BULKHE
( AT. LDR ) PLACE+ADJUST RETURN TO CR-1 F 1 / 3
A1 T32 K24 T16 P3 T32 AO 0.33 3600.

TOTAL TMU 3600.

565. TRANSPORT STAGING PLANK WITH (TOWER CRANE) AT (WING) TANKS AND VOIDS
CARPENTER
PER STAGING PLANK OFG: 3 23-HAY-83

* REPRESENTS ELAPSED TIME
* ...LU-PILE TO BULKHEAD
* ...DISTANCES FROM CRANE-REST TO LU-PILE AND
* ...FROM LU-PILE TO BULKHEAD ARE AVERAGE
* ...DISTANCES FROM THE SIDE OF A BASIN
* ...1200'x200'
* MAXIMUM NUMBER OF BOARDS IN LIFT = 3
C-OPER BEGINS AT CR-1

1 TRANSPORT BOARD FROM LU-PILE USING CRANE WITH HOOK+SLING TO BULKHE
( BTWN BRKTS ) PLACE+MANEUVER RETURN TO CR-1 F 1 / 3
A1 T32 K24 T16 P16 T32 AO 0.33 4033.

TOTAL TMU 4033.
DATA SYNTHESIS AND BACK-UP

566. TRANSPORT STANCHION WITH (TOWER CRANE) AT (WING) TANKS AND VOIDS
CARPENTER
PER STANCHION OFG: 3 23-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS TRANSPORTING STANCHION FROM...
* ...BIN-2 TO BULKHEAD
* DISTANCES FROM CRANE-REST TO BIN-2 AND...
* ...FROM BIN-2 TO BULKHEAD ARE AVERAGE...
* ...DISTANCES FROM THE SIDE OF A BASIN
* ...1200'X200'
* MAXIMUM NUMBER OF STANCHIONS IN LIFT = 6
C-OPER BEGINS AT CR-1

1 TRANSPORT STANCH FROM BIN-2 USING CRANE WITH HOOK+SLING TO BULKHEAD (BTWN BRKTS) PLACE+ADJUST RETURN TO CR-1 F 1 / 6
A1 T32 K24 T16 P3 T32 A0 0.17 1800.

TOTAL TMU 1800.

567. TRANSPORT HANDRAIL WITH (TOWER CRANE) AT (WING) TANKS AND VOIDS
CARPENTER
PER HANDRAIL OFG: 3 23-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS TRANSPORTING HANDRAIL FROM...
* ...HR-PILE TO BULKHEAD
* DISTANCES FROM CRANE-REST TO HR-PILE AND
* ...FROM HR-PILE TO BULKHEAD ARE AVERAGE
* ...DISTANCES FROM THE SIDE OF A BASIN
* ...1200'X200'
* MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6
C-OPER BEGINS AT CR-1

1 TRANSPORT HANDRAIL FROM HR-PILE USING CRANE WITH HOOK+SLING TO BULKHEAD (BTWN BRKTS) PLACE+ADJUST RETURN TO CR-1 F 1 / 6
A1 T32 K24 T16 P3 T32 A0 0.17 1800.

TOTAL TMU 1800.

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132. COMBINED SUB-OP

HOOK-UP/UNHOOK AND IGNITE/EXTINGUISH TORCH FOR BURNING WITH HAND AT TANK CARPENTER

Crew Size = 6 (3 Carps Above Deck and 3 Below). Rate in elapsed time Mult by 6 to Obtain Total Time,

Per 8-Hr Shift and (1) Cut OfG: 4 20-NOV-81

* The Following is Included in This Subop:

* --2 Hook-ups and 2 Unhooks Per (1) ......
* ...8-Hr Shift
* --(1) Occurrence for Ignite and.........
* ....Extinguish Torch
* --To Determine the Freq of the Sub-op...
* ...Freq Number of Cuts >1 Use the....... *
* ...Formula: Freq = 1+ [(N-1) X .23]....
* ...Where 'N' = The Number of Cuts(Burns)

TOTAL TMU 2900.0

Combined sub-operation elements

<table>
<thead>
<tr>
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<th>Freq,</th>
<th>TMU</th>
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<tr>
<td>9. Hook-up and unhook torch on manifold with wrench at ship</td>
<td>8.00</td>
<td>2240</td>
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<tr>
<td>10. Ignite and extinguish torch for burning with hand at tank</td>
<td>1.00</td>
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Total TMU 2900.
376. SET-UP (STAGING CLIP) ON BULKHEAD WITH HAMMER (AND STEEL-TAPE) AT TANK CARPENTER
PER STAGING CLIP OFG: 4 01-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING UP A STAGING CLIP ON
* THE BULKHEAD
* WELDING OF THE CLIP WILL BE DONE IN A ...
* SEPARATE SUB OPERATION
CARP-1 BEGINS AT TANKTOP

1 CARP-1 MEASURE AT BRKT-1 USING STEEL-TAPE-1 ASIDE TO CARP-1
   A1 BO G1 A1 BO P1 M32 A1 BO P1 AO 1.00 380.
2 CARP-1 LOOSEN PAINT ON BHD AT BRKT-1 4 STRIKES USING HAMMER-1 ASIDE TO CARP-1
   A1 BO G1 A1 BO PO L10 A1 BO P1 AO 1.00 150.
3 CARP-1 GET+PLACE WITH BEND SCLIP FROM TOOLBOX-2 TO BRKT-1 (TACKING UPON PLACEMENT)
   A1 B6 G3 A1 BO P3 AO 1.00 140.

TOTAL TMU 670.

377. MAKE READY STAGING BRACKET FOR (TRANSPORTING) WITH HAND AT TANK (OR WAY) CARPENTER
PER STAGING BRACKET OFG: 3 02-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS GETTING BRACKET READY TO BE...
* TRANSPORTED TO TANK OR BULKHEAD
* CARPENTER IS LOCATED EITHER ON THE WAY...
* OR IN TANK AT THE MATERIAL (BIN-1)
CARP-3 BEGINS AT BIN-1

1 CARP-3 GET+PLACE WITH BEND BRKT FROM BIN-1 TO BIN-1
   A1 B6 G3 A1 BO P3 AO 1.00 140.
2 CARP-3 GET+PLACE WITH BEND BOLT FROM TOOLBOX-1 TO BIN-1 AND INSERT BOLT IN BRKT
   A1 B6 G3 A1 BO P3 A1 1.00 150.
3 CARP-3 FASTEN NUT AT BIN-1 4 WRIST-TURNS USING HANDS
   A1 BO G1 A1 BO P1 F10 AO BO PO AO 1.00 140.
4 CARP-3 GET+PLACE BRKT FROM BIN-1 TO BIN-1 (PILE UP BRKTS FOR TRANSPORTATION)
   A1 BO G3 A1 BO P3 AO 1.00 80.

TOTAL TMU 510.
DATA-SYNTHESIS AND BACK-UP

383. SET-UP (ACCESS) LADDER ON BULKHEAD WITH HAND AT TANK CARPENTER

PER LADDER OFG: 3 01-FEB-82

REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING UP AN ACCESS LADDER...
* ...ON THE BULKHEAD SO THAT THE CARPENTER
* ...CAN CLIMB TO THE NEXT LADDER.
* ALSO INCLUDES CLIMBING UP AND DOWN THE...
* ...LADDER.
* AVERAGE NUMBER OF RUNGS = 12

CARP-1 BEGINS AT TANKTOP

1 CARP-1 GET+PLACE WITH BEND LADR FROM TANKTOP TO LDR
   B6 G3 A1 B0 P3 AO 1.00  140.

2 CARP-1 SLIDE (CLIMB-Up) LADDER AT LDR (12 RUNGS) PF 12 (1) 12 (34)
   (A1 )B16(G1 M3 )XO IO AO (12) 1.00  760.

3 CARP-1 PULL (CLIMB-DOWN) LADDER AT LDR (12 RUNGS) PF 12 (1) 12 (34)
   (A1 )B16(G1 M1 )XO IO AO (12) 1.00  520.

TOTAL TMU  1420.

384. POSITION (SECURE) (ACCESS) LADDER FOR BULKHEAD WITH HAMMER (AND LADDCLIPS) AT TANK CARPENTER

PER LADDER OFG: 3 03-FEB-82

REPRESENTS ELAPSED TIME
* REPRESENTS SECURING A LADDER TO THE....
* ...BULKHEAD USING 4 LADDER CLIPS
* WELDING OF CLIPS WILL BE DONE IN A....
* ...SEPARATE SUB OPERATION

CARP-1 BEGINS AT LDR

1 CARP-1 LOOSEN 4 PAINT ON BHD AT LDR 4 STRIKES USING HAMMER-1 ASID
TO CARP-1
   A1 B0 G1 AO B0 (PO A1 L10 )A1 B0 P1 A0 (4) 1.00  480.

2 CARP-2 GET+PLACE WITH BEND 4 LCLIPS FROM TOOLBOX-2 TO LDR (TACKI
UPON PLACEMENT) PF 4 (6)
   A1 B6 G3 A1 B0 (P3 )AO (4) 1.00  230.

TOTAL TMU  710.

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DATA SYNTHESIS AND BACK-UP

388. SET-UP STAGING PLANK ON STAGING BRACKET WITH HAND AT TANK CARPENTER
PER BOARD OFG: 3 02-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS SETTING UP BOARDS BETWEEN....
* ...BRACKETS.
* TWO MAN OPERATION:
* CARPENTERS ARE LOCATED AT TWO DIFFERENT
* ..BRACKETS, THEY BOTH LIFT THE BOARD....
* ..TOGETHER AND SLIDE IT INTO POSITION.
* IN THIS ANALYSIS CARPENTERS ARE LOCATED
* ...ON THE LEVEL BELOW THE BOARDS.
CARP-1 BEGINS AT BRKT-1

1 CARP-1+CARP-2 GET+SLIDE WITH 1 STEP BOARD AT BRKT-1 AND ALIGN
   A3 BO G3 M3 XO I1O AO 1.00 190.
2 CARP-1 WALK TO BRKT-2 ( TO DO NEXT SECTION OF BOARDS, CARP2 ALSO
   MOVES TO ANOTHER BRACKET )
   A10 BO GO AO BO PO AO 1.00 100.

TOTAL TMU 290.

393. SET-UP STANCHION IN STAGING BRACKET WITH HAND AT TANK CARPENTER
PER STANCHION OFG: 3 02-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING STANCHION IN THE.....
*....BRACKET SLEEVE.
CARP-1 BEGINS AT BRKT-1

1 CARP-1 GET+PLACE WITH BEND STAN FROM TANKTOP TO BRKT-1 AND INSERT
   A1 B6 G3 A1 BO P3 A1 1.00 150.
2 CARP-1 WALK TO BRKT-2 ( DO NEXT STANCHION )
   A10 BO GO AO BO PO AO 1.00 100.

TOTAL TMU 250.
DATA SYNTHESIS AND BACK-UP

396. SET-UP HANDRAIL ON STANCHION WITH HAND AT TANK CARPENTER
   PER HANDRAIL OGF: 3 02-FEB-82
   REPRESENTS ELAPSED TIME
   * REPRESENTS PUTTING HANDRAIL INTO THE....
   * ....EYELETS ON THE STANCHION
   * INCLUDES ACTION DISTANCES NEEDED FOR....
   * ....ALIGNING THE HANDRAIL
   * WELDING OF THE HANDRAIL CONNECTIONS WILL
   * ....BE DONE IN A SEPARATE SUB OPERATION
   CARP-1 BEGINS AT BRKT-1

1 CARP-1 GET+SLIDE WITH BEND HANDRAIL AT BRKT-2 AND ALIGN ( THRU 2
   EYELETS ON THE STANCHIONS AT. BRKT1 & BRKT2 ) RETURN TO BRKT-1 P1
   ( 4 5 6 )
   A10 B6 G3 (M3 X0 I10 )A10 (2) 1.00 550.
   2 CARP-1 WALK TO BRKT-2 ( DO NEXT SECTION )
   A10 B0 G0 A0 B0 P0 A0 1.00 100.
   TOTAL TMU 650.

397. SET-UP HANDRAIL (END PIECES) ON HANDRAIL (AND BULKHEAD) WITH HAND AT
   TANK CARPENTER
   PER HANDRAIL OGF: 4 02-FEB-82
   REPRESENTS ELAPSED TIME
   * REPRESENTS PUTTING HANDRAIL (END PIECES)
   * ...AT THE END OF A STAGING LEVEL
   * WELDING OF THE HANDRAIL (END PIECES)....
   * ...CONNECTIONS WILL BE DONE IN A.........
   * ...SEPARATE SUB OPERATION
   CARP-1 BEGINS AT BRKT-1

1 CARP-1 GET+HOLD WITH BEND HANDRAIL FROM TANKTOP TO CARP-1
   A1 B6 G3 A1 B0 P0 A0 1.00 110.
   2 PTIME 1.02 M ( CUT HANDRAIL INTO 2 PIECES WITH ELECTRODE )
     1.00 1700.
   3 CARP-1 GET+PLACE 2 HANDRAIL ( END PIECES ) FROM CARP-1 TO BRKT-1
   A1 B0 G3 A1 B0 P3 A0 2.00 160.
   TOTAL TMU 1970.

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DATA SYNTHESIS AND BACK-UP

399. TEAR DOWN HANDRAIL ON BULKHEAD WITH TORCH (AND WINCH) AT (WING) TANKS AND VOIDS CARPENTER

PER HANDRAIL OFG: 3 04-FEB-82

REPRESENTS ELAPSED TIME

* REPRESENTS TEARING DOWN HANDRAIL IN A...
* ...WING TANK, HANDRAIL IS LOWERED TO THE...
* ...MATL-PILE WITH A WINCH BECAUSE THE...
* ...TANK IS TO SMALL FOR THE HANDRAIL TO...
* ...BE THROWN.
* CARPENTERS REMOVE 2 HANDRAIL BEFORE.....
* ...MOVING TO THE NEXT SECTION.
* MAXIMUM NUMBERS OF HANDRAIL IN LIFT = 6

CARP-1 BEGINS AT BULKHEAD

1 CARP-1 PULL TORCH FROM BULKHEAD TO BRKT-1
    A1 BO G1 M1 XO IO A1 1.00 40.

2 CARP-1 OPERATE TORCH AT BRKT-1 PTIME 0.26 ) ( BURN OFF HANDRAIL )
    A1 BO G1 M6 X42 IO AO 1.00 500.

3 CARP-2 GET+HOLD HANDRAIL FROM BRKT-1 TO BRKT-1 SIMO
    <A1 BO G3 A1 BO PO AO > 1.00 0.

4 CARP-2 HOLD+PLACE HANDRAIL FROM BRKT-1 TO BRKT-PILE
    A0 BO GO A10 B6 P3 AO 1.00 190.

5 WINCH-OPER LOOSEN ( = SWING ) CABLE WITH BEND AT MENHOLE 5
    ARM-STROKES USING HANDS F 1 / 6
    A1 B6 G1 A1 BO P1 L32 AO BO PO AO 0.17 70.

6 WINCH-OPER THROW CABLE FROM MENHOLE TO CARP-2 F 1 / 6
    A1 BO G1 A1 BO PO AO 0.17 15.

7 CARP-2 GET+MANIPULATE WITH BEND CABLE AT BRKT-PILE ( HOOK CABLE
    AROUND HANDRAIL ) F 1 / 6
    A1 B6 G3 M10 XO IO AO 0.17 33.

8 WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES ) F 1 / 6
    A1 BO G1 M1 X67 IO AO 0.17 117.

9 WINCH-OPER PUSH WINCH-DOWN PROCESS ( TO MATL PIE ) F 1 / 6
    A1 BO G1 M1 X81 IO AO 0.17 140.

10 WINCH-OPER PUSH WINCH-UP PROCESS ( TO MENHOLE ) F 1 / 6
    A1 BO G1 M1 X24510 AO 0.17 413.

11 CARP-2 AND CARP1 WALK TO BRKT-2 F 1 / 2
    A24 BO GO AO BO PO AO 0.50 120.

TOTAL TMU 1638•
DATA SYNTHESIS AND BACK-UP

401. TEAR DOWN STANCHION ON BULKHEAD WITH HAND (AND WINCH) AT (WING) TANK AND VOIDS CARPENTER
PER STANCHION OFG: 3 04-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS TEARING DOWN STANCHION IN A...
* ...WING TANK, STANCHION IS LOWERED TO...
* ...THE MATL-PILE WITH A WINCH BECAUSE...
* ...THE TANK IS TO SMALL FOR THE........
* ...STANCHION TO BE THROWN.
* MAXIMUM NUMBER OF STANCHIONS IN LIFT = 6
CARP-2 BEGINS AT BRKT-PILE

1 CARP-2 LOOSEN STAN AT BRKT-1 4 ARM-STROKES USING HANDS
   A1 B0 G1 A10 B0 P1 L24 A0 B0 P0 h0 1.00 370.
2 CARP-2 H0BJ+PLACE STAN FROM BRKT-1 TO BRKT-PILE
   A0 R0 G0 A10 B6 P3 A0  1*00 190.
3 WINCH-OPER LOOSEN ( =SWING ) CABLE WITH BEND AT MENHOLE 5
   ARM-STROKES USING HANDS F 1 / 6
   A1 B6 G1 A1 B0 P1 L32 A0 B0 P0 A0 0.17 70.
4 WINCH-OPER THROW CABLE FROM MENHOLE TO CARP-2 F 1 / 6
   A1 B0 G1 A1 B6 P0 A0 0.17 15.
5 CARP-2 GET+MANIPULATE WITH BEND CABLE AT BRKT-PILE ( HOOK CABLE AROUND STANCHIONS ) F 1 / 6
   A1 B6 G3 M10 X0 I0 A0 0.17 3
6 WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES ) F 1 / 6
   A1 B0 G1 M1 X67 I0 A0 0.17 117.
7 WINCH-OPER PUSH WINCH-DOWN PROCESS ( TO MATL PILE ) F 1 / 6
   A1 B0 G1 M1 X81 I0 A0 0.17 140.
8 WINCH-OPER PUSH WINCH-UP PROCESS ( TO MENHOLE ) F 1 / 6
   A1 D0 G1 M1 X245I0 A0 0.17 413.
9 CARP-2 WALK TO BRKT-2
   A24 B0 Go A0 B0 P0 A0 1.00 240.

TOTAL TMU 1588.
DATA SYNTHESIS AND BACK-UP

402. TEAR DOWN STAGING PLANK ON STAGING BRACKET WITH HAND (AND WINCH) AT ANY TANKS AND VOIDS CARPENTER
PER STAGING PLANK OFG: 3 04- FEB-82
* REPRESENTS ELAPSED TIME
* ...WINCH IS USED TO LOWER BOARD TO......
* ...BD-PILE ON TANKTOP.
* MAXIMUM NUMBER OF BOARDS IN LIFT = 3
CARP-1 BEGINS AT BULKHEAD

1 CARP-1 AND CARP2 GET+MANIPULATE WITH BEND BOARD AT BRKT-1 (FLIP 2 BOARDS ONTO 3RD BOARD)
   A1 B6 G3 M10 X0 I0 A0 1.00 200
2 WINCH-OPER LOOSEN (=SWING) WITH BEND CABLE AT BTRWTH 5 ARM-STROKES USING HANDS F 1 / 3
   A1 B6 G1 A1 B0 P1 L32 A0 B0 P0 A0 0.33 140
3 WINCH-OPER THROW CABLE FROM BTRWTH TO CARP-1 WITH BEND F 1 / 3
   A1 B0 G1 A1 B6 P0 A0 0.33 30
4 CARP-1 GET+MANIPULATE WITH BEND CABLE AT BRKT-1 (HOOK CABLE AROUND BOARD ALLOW FOR 2 ATTEMPTS ) F 2 / 3
   A1 B6 G3 M10 X0 I0 A0 0.67 133
5 WINCH-OPER PUSH WINCH-FREE PROCESS (CLEAR OBSTACLES) F 1 / 3
   A1 B0 G1 M1 X67 I0 A0 0.33 233
6 WINCH-OPER PUSH WINCH-DOWN PROCESS (TO BD PILE) F 1 / 3
   A1 B0 G1 M1 X81 I0 A0 0.33 280
7 WINCH-OPER PUSH WINCH-UP PROCESS (TO BTRWTH) F 1 / 3
   A1 B0 G1 M1 X24510 A0 0.33 827
8 CARP-1 AND CARP2 WALK TO BRKT-2
   A10 B0 B0 AO B0 P0 A0 1.00 100

TOTAL TMU 1943.
DATA SYNTHESIS AND BACK-UP

403. TEAR DOWN LADDER (AND LADDER CLIPS) ON BULKHEAD WITH TORCH (AND WINCH) AT ANY TANKS AND VOIDS CARPENTER
PER LADDER 0FG: 3 05-FEB-82

* REPRESENTS ELAPSED TIME
* REPRESENTS REMOVING LADDER FROM BULKHEAD
* ...THERE ARE 4 LADDER CLIPS PER LADDER.
* ...LADDER LOWERED TO LDR-PILE BY WINCH
* ...LADDER CLIPS THROWN TO MATL-PILE.
CARP-1 BEGINS AT BRKT-2

1 CARP-1 PULL TORCH AT LDR
   A10 B0 G1 M1 X0 I0 A0 1.00 120.

2 CARP-1 OPERATE TORCH AT LDR PTIME 0.47 M F 4 ( BURN OFF 4 CLIPS )
   A1 B0 G1 M6 X81 I0 A0 4.00 3560.

3 CARP-1 GET+THROW 4 LCLIPS FROM LDR TO MATL-PILE WITHOUT BEND F 4
   - A1 B0 G3 A1 B0 P0 A0 4.00 200.

4 CARP-2 GET+POSITION LADR FROM LDR TO BRKT-2 WITH BEND ( LAY DOWN C BOARDS )
   A1 B0 G3 A10 B6 P6 A0 1.00 260.

5 WINCH-OPER LOOSEN ( =SWING ) CABLE WITH BEND AT BTRWTH 5 ARM-STROK USING HANDS
   A1 B6 G1 A1 B0 P1 L32 A0 B0 P0 A0 1.00 420.

6 WINCH-OPER THROW CABLE FROM BTRWTH TO CARP-2 WITH BEND
   A1 B0 G1 A1 B6 P0 A0 1.00 90.

7 CARP-2 GET+MANIPULATE WITH BEND CABLE AT BRKT-2 ( HOOK AROUND LADR
   A1 B6 G3 M10 X0 I0 A0 1.00 200.1

8 WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES )
   A1 B0 G1 M1 X67 I0 A0 1.00 700.

9 WINCH-OPER PUSH WINCH-DOWN PROCESS ( TO LDR PILE )
   A1 B0 G1 M1 X81 I0 A0 1.00 840.

10 WINCH-OPER PUSH WINCH-UP PROCESS ( TO BTRWTH )
    A1 B0 G1 M1 X24510 A0 1.00 2480.

11 CARP-1 WALK TO BRKT-2
   A10 B0 G0 A0 B0 P0 A0 1.00 100.

TOTAL TMU 8970.

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DATA SYNTHESIS AND BACK-UP

406. TEAR DOWN STAGING BRACKET ON BULKHEAD WITH WRENCH AT ANY TANKS AND VOIDS CARPENTER
PER STAGING BRACKET OGF: 3 05-FEB-82
* REPRESENTS ELAPSED) TIME
* REPRESENTS TEARING DOWN STAGING BRACKET
* ...IN ANY TANK BRACKETS ARE LOWERED TO
* ...MATL-PILE BY WINCH.
* MAXIMUM NUMBER OF BRACKETS IN LIFT = 3
CARP-1 BEGINS AT BRKT-2

1 CARP-1 LOOSEN NUT AT BRKT-1 1 ARM-STROKE USING WRENCH-1 AND HOLD
AO BO G1 A10 BO P3 L3 AO BO PO 40 1.00 180+
2 CARP-1 HOLD+LOOSEN NUT AT BRKT-1 13 WRIST-STROKES USING WRENCH-1
ASIDE TO CARP-1
AO BO GO A1 BO P3 L42 A1 BO P1 AO 1.00 480.
3 CARP-1 GET+REMOVE BOLT FROM BRKT-1 TO CARP-1
AO BO G3 A1 BO PO P1 AO 1.00 60.
4 CARP-1 THROW NUT AND BOLT FROM CARP-1 TO MATL-PILE WITHOUT BEND
AO BO G1 A1 BO PO AO 1.00 30.
5 CARP-2 GET+PLACE BRKT FROM BRKT-1 TO BRKT-PILE
AO BO G3 A10 BO P3 AO 1.00 230.
6 WINCH-OPER LOOSEN ( =SWING ) CABLE WITH BEND AT BTRWTH 5 ARM-STROKES
USING HANDS F 1 / 3
AO BO G1 A1 BO P1 L32 AO BO PO AO 0.33 140.
7 WINCH-OPER THROW CABLE FROM BTRWTH TO CARP-2 F 1 / 3
AO BO G1 A1 BO P6 PO AO 0.33 30.
8 CARP-2 GET+MANIPULATE WITH BEND CABLE AT BRKT-PILE ( HOOK AROUND BRACKETS ) F 1 / 3
AO BO G3 M10 XO IO AO 0.33 67.
9 WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES ) F 1 / 3
AO BO G1 M1 X67 IO AO 0.33 233.
10 WINCH-OPER PUSH WINCH-DOWN PROCESS ( TO MATL PILE ) F 1 / 3
AO BO G1 M1 X81 IO AO 0.33 280.
11 WINCH-OPER PUSH WINCH-UP PROCESS ( TO BTRWTH ) F 1 / 3
AO BO G1 M1 X24510 AO 0.33 827.
12 CARP-2 AND CARP1 WALK TO BRKT-2
AO BO GO AO BO PO AO 1.00 240.

TOTAL TMU 2797.
DATA SYNTHESIS AND BACK-UP

426. MAKE READY STAGING BRACKET FOR (TRANSPORTING) WITH HAND AT ANY WAYS CARPENTER

PER STAGING BRACKET OGF: 3 10-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS GETTING BRACKET READY TO BE...
* ...TRANSPORTED TO TANK OR BULKHEAD
* CARPENTER IS LOCATED EITHER ON THE WAY...
* ...OR IN TANK AT THE MATERIAL (BIN-1)
CARP-3 BEGINS AT BIN-1

1 CARP-3 GET+PLACE WITH BEND BRKT FROM BIN-1 TO BIN-1
   A1 B6 G3 A1 B0 F3 A0 1.00 140.

2 CARP-3 GET+PLACE WITH BEND BOLT FROM TOOLBOX-1 TO BIN-1 AND INSR BOLT IN BRKT
   A1 B6 G3 A1 B0 F3 A1 1.00 150.

3 CARP-3 FASTEN NUT AT BIN-1 4 WRIST-TURNS USING HANDS
   A1 B0 G1 A1 B0 P1 F10 A0 B0 P0 A0 1.00 140.

4 CARP-3 GET+PLACE BRKT FROM BIN-1 TO BIN-1 (PILE UP BRKTS FOR TRANSPORTATION )
   A1 B0 G3 A1 B0 F3 A0 1.00 80.

   TOTAL TMU     510.

427. MAKE READY LADDER FOR (TRANSPORTING) WITH HAND AT ANY WAYS CARPENTER

PER LADDER OGF: 3 10-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS GETTING LADDER ON BOLSTERS SO
* ...THAT THE CRANE CAN TRANSPORT IT.
CARP-3 BEGINS AT BIN-1

1 CARP-3 GET+SLIDE LADR AT LDR-PILE AND ADJUST ( ON BOLSTERS )
   A54 B6 G3 M3 X0 I6 A0 1.00 720.

   TOTAL TMU     720.
DATA SYNTHESIS AND BACK-UP

428. MAKE READY STAGING PLANK FOR (TRANSPORTING) WITH HAND AT ANY WAYS CARPENTER
PER STAGING PLANK OFG: 3 10-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS GETTING BOARD ON BOLSTERS SO
* "...THAT THE CRANE CAN TRANSPORT IT
CARP-3 BEGINS AT BIN-1

1 CARP-3 GET+SLIDE BOARD AT LU-PILE AND ADJUST ( ON BOLSTERS )
A32 B6 G3 M3 X0 I6 A0 1.00 500.

TOTAL TMU 500.

429. MAKE READY STANCHION FOR (TRANSPORTING) WITH HAND AT ANY WAYS CARPENTER
PER STANCHION OFG: 3 10-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS GETTING STANCHION READY TO BE
* "TRANSPORTED,
CARP-3 BEGINS AT LU-PILE

1 CARP-3 GET+PLACE WITH BEND STAN FROM BIN-2 TO BIN-2
A16 B6 G3 A1 B0 P3 A0 1.00 290.

TOTAL TMU 290.

430. MAKE READY HANDRAIL FOR (TRANSPORTING) WITH HAND AT ANY WAYS CARPENTER
PER HANDRAIL OFG: 3 10-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS GETTING HANDRAIL ON BOLSTERS
* "...SO THAT THE CRANE CAN TRANSPORT IT
CARP-3 BEGINS AT BIN-2

1 CARP-3 GET+SLIDE HANDRAIL AT HR-PILE AND ADJUST ( ON BOLSTERS )
A32 B6 G3 M3 X0 I6 A0 1.00 500.

TOTAL TMU 500.
DATA SYNTHESIS AND BACK-UP

569. SET-UP STAGING BRACKET ON WEB FRAME WITH WRENCH AT (WING) TANKS AND Voids Carpenter
PER STAGING BRACKET OFG: 4 24-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING UP A STAGING BRACKET
* ...ON A EXISTING STAGING CLIP (LOCATED
* ...ON A WEB FRAME)
CARP-1 BEGINS AT WING-TANK

1 CARP-1 GET+HOLD WITH BEND BRKT FROM WING-TANK TO CARP-1
   A1 B6 G3 A1 B0 P0 A0  1.00  110.
2 CARP-1 LOOSEN NUT AT WEB-1 4 WRIST-TURNS USING HANDS
   A1 B0 G1 A1 B0 P1 L10 A0 B0 P0 A0  1.00  140.
3 CARP-1 REMOVE BOLT FROM WEB-1 ON BRKT TO CARP-1
   A1 R0 G1 A1 R0 P1 A0  1.00  40.
4 CARP-1 GET+PLACE BRKT FROM CARP-1 TO WEB-1 AND INSERT BOLT
   A1 B0 G3 A1 B0 P3 A1  1.00  90.
5 CARP-1 FASTEN NUT AT WEB-1 13 WRIST-TURNS USING HANDS
   A1 B0 G1 A1 B0 P1 F24 A0 B0 P0 A0  1.00  280.
6 CARP-1 FASTEN NUT AT WEB-1 4 ARM-STROKES USING WRENCH-1 ASIDE TO
   CARP-1
   A1 B0 G1 A1 B0 P3 F24 A1 B0 P1 A0  1.00  320.
7 CARP-1 WALK TO WEB-2 (TO DO NEXT BRKT)
   A10 B0 G0 A0 B0 P0 A0  1.00  100.

TOTAL TMU  1080.
DATA SYNTHESIS AND BACK-UP

570. SET-UP ( ACCESS ) LADDER ON ( INBOARD OR OUTBOARD ) BULKHEAD WITH HAND AT ( WING ) TANKS AND VOIDS CARPENTER
   PER LADDER OFG: 4 24-MAY-83
   * REPRESENTS ELAPSED TIME
   * REPRESENTS PUTTING UP AN ACCESS LADDER
   * ...ON THE INBOARD OR OUTBOARD BULKHEAD
   * ...SO THAT THE CARPENTER CAN CLIMB TO
   * ...THE NEXT LEVEL OF STAGING
   * ALSO INCLUDES CLIMBING UP AND DOWN THE
   * ...LADDER
   CARP-1 BEGINS AT WING-TANK

1 CARP-1 GET+PLACE WITH BEND LADR FROM WING-TANK TO LDR
   A1 B6 G3 A1 B0 P3 A0 1.00 140.
2 CARP-1 SLIDE ( CLIMB-UP ) LADDER AT LDR ( 12 RUNGS ) PF 12 ( 1 ) PF
   12 ( 3 4 )
   (A1 )B16(G1 M3 )X0 I0 AO (12) 1.00 760.
3 CARP-1 PULL ( CLIMB-DOWN ) LADDER AT LDR ( 12 RUNGS ) PF 12 ( 1 ) PF
   12 ( 3 4 )
   (A1 )B16(G1 M1 )X0 I0 AO (12) 1.00 520.

   TOTAL TMU 1420.

571. POSITION ( SECURE ) ( ACCESS ) LADDER ON ( INBOARD OR OUTBOARD ) BULKHEAD WITH HAMMER AT ( WING ) TANKS AND VOIDS CARPENTER
   PER LADDER OFG: 4 24-MAY-83
   * REPRESENTS ELAPSED TIME
   * REPRESENTS SECURING A LADDER TO THE
   * ...INBOARD OR OUTBOARD BULKHEAD USING
   * ...FOUR LADDER CLIPS
   * WELDING OF CLIPS WILL BE DONE IN A
   * ...SEPARATE SUB OPERATION
   CARP-1 BEGINS AT LDR

1 CARP-1 LOOSEN 4 PAINT ON ( INBOARD OR OUTBOARD ) BULKHEAD AT LDR 4
   STRIKES USING HAMMER-1 ASIDE TO CARP-1
   A1 B0 G1 A0 B0 (P0 A1 L10 )A1 B0 P1 A0 (4) 1.00 480.
2 CARP-2 GET+PLACE WITH BEND 4 LCLIPS FROM TOOLBOX-2 TO LDR ( TACKING
   UPON PLACEMENT ) PF 4 ( 6 )
   A1 B6 G3 A1 B0 (F3 )AO (4) 1.00 230.

   TOTAL TMU 710.
DATA SYNTHESIS AND BACK-UP

573. SET-UP STAGING PLANK ON STAGING BRACKET WITH HAND AT ( WING ) TANKS AND VOIDS CARPENTER
PER STAGING FLANK OFG: 4 24-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS SPREADING BOARDS BETWEEN WEBS
* 2 MAN OPERATION:
* CARPENTERS ARE LOCATED AT TWO DIFFERENT
*...WEBS, THEY BOTH PICK UP THE BOARD
*...TOGETHER AND SLIDE IT INTO POSITION.
* IN THIS ANALYSIS CARPENTERS ARE LOCATED
*...ON THE SAME LEVEL AS THE BOARDS.
CARP-1 BEGINS AT WEB-1

1 CARP-1 AND CARP2 GET+SLIDE WITH BEND WITH 1 STEP BOARD AT WEB-1 AT ALIGN

A3 B6 G3 H3 *(I I10 A0 1400 250.

2 CARP-1 WALK TO WEB-2 ( TO DO NEXT SECTION OF BOARDSS CARP2 ALSO MOVES TO ANOTHER BRACKET )

A10 BO AO BO PO AO 1.00 100.

TOTAL TMU 350.

575. SET-UP STAGING PLANK ON ( EXISTING ) BRACKET STAGING WITH HAND AT ( WING ) TANKS AND VOIDS CARPENTER
PER STAGING PLANK OFG: 4 24-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS SPREADING BOARDS BETWEEN
*...EXISTING STAGING AND INBOARD OR
*...OUTBOARD BULKHEAD
* 2 MAN OPERATION:
* CARPENTERS ARE LOCATED AT DIFFERENT WEBS
*...EACH CARPENTER SPREADS TWO BOARDS
*...SIMULTANEOUSLY
* IN THIS ANALYSIS CARPENTERS ARE LOCATED
*...ON THE SAME LEVEL AS THE BOARDS.
CARP-1 BEGINS AT WEB-1

1 CARP-1 GET+MANIPULATE ( FLIP ) WITH BEND WITH 1 STEP BOARD AT WEB-
AND ALIGN

A3 B6 G3 M10 XO I10 A0 1.00 320.

2 CARP-1 WALK TO WEB-2

A10 BO GO AO BO PO AO 1.00 100.

TOTAL TMU 420.
DATA SYNTHESIS AND BACK-UP

577. SET-UP STANCHION IN STAGING BRACKET WITH HAND AT ( WING ) TANKS AND Voids CARPENTER
PER STANCHION OFG: 4 24-MAY-83
* REPRESENTS ELAPSED TIME
* ...BRACKET SLEEVE IN A WING TANK
CARP-1 BEGINS AT WEB-1

1 CARP-1 GET+PLACE WITH BEND STANCHION FROM WING-TANK TO WEB-1 AND INSERT
   A1 B6 G3 A1 B0 P3 A1 1.00 150.
2 CARP-1 WALK TO WEB-2 ( TO DO NEXT STANCHION )
   A10 B0 G0 A0 B0 P0 A0 1.00 100.

TOTAL TMU 250.

578. SET-UP HANDRAIL IN STANCHION WITH HAND AT ( WING ) TANKS AND Voids CARPENTER
PER HANDRAIL OFG: 4 24-MAY-83
* REPRESENTS ELAPSED TIME
* ...EYELETS ON THE STANCHION
* INCLUDES ACTION DISTANCES NEEDED FOR
* ...ALIGNING THE HANDRAIL
* WELDING OF THE HANDRAIL WILL BE DONE IN
* ...A SEPARATE SUB-OERATION
CARP-1 BEGINS AT WEB-1

1 CARP-1 GET+SLIDE WITH BEND HANDRAIL AT WEB-2 AND ALIGN ( THRU 2 EYELETS ON THE STANCHIONS AT. WEB1 AND WEB2 ) RETURN TO WEB-1 PF 2 4 5 6
   A10 B6 G3 (M3 X0 I10 )A10 (2) 1.00 550.
2 CARP-1 WALK TO WEB-2 ( TO DO NEXT SECTION OF HANDRAIL )
   A10 B0 G0 A0 B0 P0 A0 1.00 100.

TOTAL TMU 650.

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DATA SYNTHESIS AND BACK-UP

579. SET-UP HANDRAIL ( END PIECES ) ON ( HANDRAIL AND ) BULKHEAD WITH HANDRAIL AT ( WING ) TANKS AND VOIDS CARPENTER
PER HANDRAIL OFG: 4 24-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING HANDRAIL (END PIECES)
* ...AT THE END OF A STAGING LEVEL
* WELDING OF THE HANDRAIL (END PIECES)
* ...CONNECTIONS WILL BE DONE IN A
* ...SEPARATE SUB OPERATION
CARP-1 BEGINS AT WEB-1

1 CARP-1 GET+HOLD WITH BEND HANDRAIL FROM WING-TANK TO CARP-1
   A1 B6 G3 A1 BO PO AO  1.00  110.
2 PTIME 1.02 M ( CUT HANDRAIL INTO 2 PIECES WITH ELECTRODE )
   1.00  1700.
3 CARP-1 GET+PLACE 2 HANDRAIL ( END PIECES ) FROM CARP-1 TO WEB-1 F
   A1 B0 G3 A1 BO P3 AO  2.00  160.

TOTAL TMU  1970

568. SET-UP ( STAGING CLIP ) ON WEB FRAME WITH HAMMER ( AND STEEL-TAPE ) AND WING TANKS AND VOIDS CARPENTER
PER STAGING CLIP OFG: 4 24-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING UP A STAGING CLIP ON
* ...A WEB FRAME
* WELDING OF THE CLIP WILL BE DONE IN A
* ...SEPARATE SUB OPERATION
CARP-1 BEGINS AT WING-TANK

1 CARP-1 MEASURE AT WEB-1 USING STEEL-TAPE-1 ASIDE TO CARP-1
   A1 BO G1 A1 Bo. P1 M32 A1 BO P1 AO  1.00  380.
2 CARP-1 LOOSEN PAINT ON WEB AT WEB-1 4 STRIKES USING HAMMER-1 ASIDE TO CARP-1
   A1 BO G1 A1 BO PO L10 A1 BO P1 AO  1.00  150.
3 CARP-1 GET+PLACE WITH BEND SCLIP FROM TOOLBOX-2 TO WEB-1 ( TACKING UPON PLACEMENT )
   A1 B6 G3 A1 BO P3 AO  1.00  140.

TOTAL TMU  670.
5.2 SYNTHESIS AND ANALYSIS

545. ASSEMBLE I-BEAMS FOR TANK STAGING PLATFORM WITH WRENCH AT ANY PLATEN CARPENTER
PER PLATFORM OFG: 4 02-FEB-83
REPRESENTS ELAPSED TIME
* CARPENTER WORKS ALONE BOLTING I-BEAMS
* STEPS:
* 1-4 ARE FOR THE CONNECTIONS OF I-6 & I-7
* ...AT I-1, I-2, I-3, I-4, AND I-5
* 5, 6 ARE FOR MOVEMENT OF THE CARPENTER
* ...BETWEEN THE CONNECTIONS
CARP-1 BEGINS AT TANK-STAGING-PLATFORM

1 CARP-1 GET+POSITION 4 BOLTS FROM TOOLBOX-1 TO I-1 WITH BEND AND INSERT BOLT PF 4 (4 5 6 7)F10
2 CARP-1 GET+POSITION WITH BEND 4 WASHERS AND NUTS FROM TOOLBOX-1 TO I-1 WITH BEND PF 8 (4 5 6) F 10
A1 B6 G3 (A1 B6 P6 )AO (8) 10.00 11400.
3 CARP-1 FASTEN 4 NUTS AT I-1 13 SPINS DIFFICULT USING FINGERS F 10
A1 BO G1 AO BO (P6 A1 F16 )AO BO PO AO (4) 10.00 9400.
4 CARP-1 FASTEN 4 NUTS AT I-1 13 WRIST-STROKES DIFFICULT USING WRENCH ASIDE TO CARP-1 F 10
A1 BO G1 AO BO (P10 A1 F 42 )A1 BO P1 AO (4) 10.00 21600.
5 CARP-1 GET+PLACE WITH CLIMB-OBJECT TOOLBOX-1 FROM I-1 TO I-5 PF 10 (2 ) PF10 ( 56 )
A1 (B32 )G3 A16 (B6 P3 )AO (10) 1.00 4300.
6 CARP-1 GET+PLACE WITH BEND TOOLBOX-1 FROM I-5 (AT, I-6) TO I-5 (AT, I-7) WITH 10 STEPS WITH BEND
A1 B6 G3 A16 B6 P3 AO 1.00 350.

TOTAL TMU 53650.
DATA SYNTHESIS AND BACK-UP

546. ASSEMBLE ANGLE-BARS FOR TANK STAGING PLATFORM WITH WRENCH AT ANY PL.
CARPENTER
PER PLATFORM OGF: 4 02-FEB-83
REPRESENTS ELAPSED TIME
* CARPENTER WORKS ALONE ASSEMBLING ANGLES
* STEPS:
* 1-6 ARE FOR CONNECTIONS OF A-4 AND A-1
* ...AT I-1;I-2;I-3;I-4; AND I-5
* 7-13 ARE FOR CONNECTIONS OF
* ...A-3 AT I-5;I-4; AND I-3 AND
* ...A-1 AT I-3;I-2; AND I-1
* 14-20 ARE FOR CONNECTIONS OF A-5 AND A-6
* ...AT I-1;I-2;I-3;I-4; AND I-5
CARP-1 BEGINS AT TANK-STAGING-PLATFORM

1 CARP-1 GET+POSITION ANGLE FROM A-4 TO I-1 WITHOUT BEND F 10
   A1 B6 G3 A1 B0 P6 A0 10.00 1700.
2 CARP-1 GET+POSITION WITH BEND 2 BOLTS FROM TOOLBOX-1 TO I-1 WITH
   BEND AND INSERT BOLT PF 2 ( 4 5 6 7 ) F 10
3 CARP-1 GET+POSITION WITH BEND 2 WASHERS AND NUTS FROM TOOLBOX-1 T
   I-1 WITH BEND PF 2 ( 4 5 6 ) F 10
   A1 B6 G3 (A1 B6 P6 )A0 (2) 10.00 3600.
4 CARP-1 FASTEN 2 NUTS AT I-1 13 SPINS DIFFICULT USING FINGERS F 10
   A1 B0 G1 A0 B0 (P6 A1 F16 )A0 B0 P0 A0 (2) 10.00 4800.
5 CARP-1 FASTEN 2 NUTS AT I-1 13 WRIST-STROKES DIFFICULT USING WREN
   ASIDE TO CARP-1 F 10
   A1 B0 G1 A0 B0 (P10 A1 F42 )A1 B0 P1 A0 (2) 10.00 11000.
6 CARP-1 GET+PLACE WITH CLIMB-OBJECT TOOLBOX-1 FROM I-1 TO I-5 WITH
   STEPS PF 10 ( 2 ) PF 10 ( 5 6 )
   A1 (B32 )G3 A24 (B6 P3 )A0 (10) 1.00 4380.
7 CARP-1 GET+POSITION ANGLE FROM A-3 TO I-5 WITHOUT BEND F 6
   A1 B6 G3 A1 B0 P6 A0 6.00 1020.
8 CARP-1 GET+POSITION WITH BEND 2 BOLTS FROM TOOLBOX-1 TO I-5 WITH
   BEND AND INSERT BOLT PF 2 ( 4 5 6 7 ) F 6
   A1 B6 G3 (A1 B6 P6 A1 ) 6.00 2280.
9 CARP-1 GET+POSITION WITH BEND 2 WASHERS AND NUTS FROM TOOLBOX-1 T
   I-5 WITH BEND PF 2 ( 4 5 6 ) F 6
   A1 B6 G3 (A1 B6 P6 )A0 (2) 6.00 2160.
10 CARP-1 FASTEN 2 NUTS AT I-5 13 SPINS DIFFICULT USING FINGERS F 6
    A1 B0 G1 A0 B0 (P6 A1 F16 )A0 B0 P0 A0 (2) 6.00 2880.
11 CARP-1 FASTEN 2 NUTS AT I-5 13 WRIST-STROKES DIFFICULT USING WREN
   ASIDE TO CARP-1 F 6
    A1 B0 G1 A0 B0 (P10 A1 F42 )A1 B0 P1 A0 (2) 6.00 6600.
12 CARP-1 GET+PLACE WITH CLIMB-OBJECT TOOLBOX-1 FROM I-5 TO I-3 WITH
   10 STEPS PF 3 ( 2 ) PF 3 ( 5 6 )
    A1 (B32 )G3 A16 (B6 P3 )A0 (3) 1.00 1430.

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13 CARP-1 GET+PLACE WITH CLIMB-OBJECT TOOLBOX-1 FROM I-3 TO I-1 WITH 10 STEPS PF3(2)PF3 (56) A1 (B32 )G3 A16 (B6 P3 )AO (3) 1.00 1430.
14 CARP-1 GET+POSITION ANGLE FROM A-6 TO I-1 ( AT. A-6 ) F 10 A1 B6 G3 A1 B6 P6 AO 10.00 2300.
15 CARP-1 GET+POSITION WITH BEND 2 BOLTS FROM TOOLBOX-1 TO I-1 WITH BEND AND INSERT BOLT PF 2 ( 4 5 6 7 ) F 10 A1 B6 G3 (A1 B6 P6 A1 ) 10.00 3800.
16 CARP-1 GET+PLACE WITH BEND 2 WASHERS AND NUTS FROM TOOLBOX-1 TO ( I-1 WITH BEND PF2 (4 5 6) F10 A1 B6 G3 (A1 B6 P3 )AO (2) 10.00 3000.
17 CARP-1 FASTEN 2 NUTS AT I-1 13 SPINS DIFFICULT USING FINGERS F 10 A1 BO G1 AO BO (P6 A1 F16 )AO BO PO AO (2) 10.00 4800.
18 CARP-1 FASTEN 2 NUTS AT I-1 13 WRIST-STROKES DIFFICULT USING WRENCH ASIDE TO CARP-1 F 10 A1 BO G1 AO BO (P10 A1 F42 )A1 BO P1 AO (2) 10.00 11000.
19 CARP-1 GET+PLACE WITH BEND TOOLBOX-1 FROM I-1 TO I-5 PF 10 ( 2 ) PF 10 ( 5 6 ) A1 (B6 )G3 A16 (B6 P3 )AO (10) 1.00 1700.
20 CARP-1 GET+PLACE WITH BEND TOOLBOX-1 FROM I-5 (AT* A-6 ) TO I-5 ( AT, A-S ) WITH 10 STEPS WITH BEND A1 B6 G3 A16 B6 P3 AO 1.00 350.

TOTAL TMU 74030.

539. READ MATERIAL LIST (PRINT) FOR TANK STAGING PLATFORM WITH (EYES) AT ANY PLATEN CARPENTER PER PLATFORM OFG: 4 02-FEB-83 REPRESENTS ELAPSED TIME
* CARPENTER READS PRINT BEFORE LAYING OUT
* ...TABLE, READS 48 DIGITS PER LOCATION
CARP-1 BEGINS AT TANK-STAGING-PLATFORM

1 CARP-1 OPEN+SHUT PRINT F 6 A1 BO G1 M6 XO 10 AO 6.00 480.
2 CARP-1 READ 12 DIGITS F 24 AO BO GO AO BO PO T10 AO BO PO AO 24• 00 2400.
3 CARP-1 HOLD+PLACE PRINT TO CARP-1 ( IN POCKET ) F 6 AO BO GO A1 BO P3 AO 6.00 240.

TOTAL TMU 3120.
540. MEASURE (PLATEN) FOR TANK STAGING PLATFORM WITH (STEEL) TAF’E AT ANY PLATEN CARPENTER
PER PLATFORM OFG: 4 31-JAN-83
REPRESENTS ELAPSED TIME
* REPRESENTS MEASURING TABLE FOR LAYOUT.
* ANALYSIS INCLUDES ALL THE WALKING.
* ...DISTANCES FOR THE LAYOUT.
* STEPS:
* 2, 3, 4 ARE FOR I-1, I-2, I-3, I-4, AND I-5
* ...AT A-5 AND A-6.
* 5, 6, 7 ARE FOR A-5, I-7, A-4, A-3, A-1, I-6,
* ...AND A-6 AT I-5
* 5, 6, 7 ARE FOR A-5, I-7, A-4, A-2, A-1, *-6v
* ...AND A-6 AT I-1
* 9, 10, 11 ARE FOR A-2 AND A-3 AT I-3
CARP-1 BEGINS AT STORE-2

1 CARP-1 WALK TO TANK-STAGING-PLATFORM (AT I-1) WITH CLIMB (ON TABLE)
   A32 B16 GO AO BO PO AO 1.00 480.
2 CARP-1 MEASURE AT I-1 USING STEEL-TAPE ASIDE TO CARP-1 F 10
   A1 BO G1 A1 B6 P1 M32 A1 BO P1 AO 10.00 4400.
3 CARP-1 WALK TO I-5 WITHOUT BEND F 2
   A16 BO GO AO BO PO AO 2.00 320.
4 CARP-1 WALK TO I-1 WITHOUT BEND AND RETURN TO I-5 WITHOUT BEND F 2
   A16 BO GO AO BO PO A16 2.00 640.
5 CARP-1 MEASURE AT A-5 USING STEEL-TAPE ASIDE TO CARP-1 F 14
   A1 BO G1 A1 B6 P1 M32 A1 BO P1 AO 14.00 6160.
6 CARP-1 WALK TO A-6 WITHOUT BEND F 2
   A24 BO GO AO BO PO A24 2.00 960.
7 CARP-1 WALK TO A-5 WITHOUT BEND AND RETURN TO A-6 WITHOUT BEND F 2
   A24 BO GO AO BO PO A24 2.00 960.
8 CARP-1 WALK TO I-3 WITH 6 STEPS WITHOUT BEND
   A10 BO GO AO BO PO AO 1.00 100.
9 CARP-1 MEASURE WITH 8 STEPS AT A-2 USING STEEL-TAPE ASIDE TO CARP-
   A16 BO G1 A1 B6 P1 M32 A1 BO P1 AO 1.00 590.
10 CARP-1 MEASURE AT A-3 USING STEEL-TAPE ASIDE TO CARP-1
   A1 BO G1 A32 B6 P1 M32 A1 BO P1 AO 1.00 750.
11 CARP-1 WALK TO STORE-2 WITH DESCEND (OFF TABLE)
   A42 B16 GO AO BO PO AO 1.00 580.

TOTAL THU 15460.
DATA SYNTHESIS AND BACK-UP

541. MARK (PLATEN) FOR TANK STAGING PLATFORM WITH MARKER AT ANY PLATEN CARPENTER
PER PLATFORM OFG: 4 02-FEB-83
* REPRESENTS ELAPSED TIME
* MARKING THE LAYOUT FOR A TANK
* STAGING PLATFORM AND INSPECTING WORK
* THE FOLLOWING PLACES ARE LAID OUT:
* A-5 AND A-6
* I-1, I-2, I-3, I-4, AND I-5
* I-1 AND I-5
* A-2 IS LAID OUT AT I-3 AND I-1
* A-3 IS LAID OUT AT I-3 AND I-5
CARP-1 BEGINS AT TANK-STAGING-PLATFORM

1 CARP-1 MARK AT I-1 5 DIGITS USING MARKER ASIDE TO CARP-1 F 25
A1  B0  G1  A1  B6  P1  R16  A1  B0  P1  A0  25.00  7000.
2 CARP-1 INSPECT 5 POINTS F 25
A0  B0  GO  A0  B0  PO  T6  A0  B0  PO  A0  25.00  1500.

TOTAL TMU 8500.

542. TRANSPORT PALLET (I-BEAMS AND ANGLES) FOR TANK STAGING PLATFORM WITH (CRANE) AT ANY PLATEN CARPENTER
PER PLATFORM OFG: 4 02-FEB-83
* REPRESENTS ELAPSED TIME
* MATERIAL NEEDED FOR ONE PLATFORM:
* 1-BEAMS - 7
* ANGLES - 6
HOOKER-ON BEGINS AT CR-1

1 HOOKER-ON TRANSPORT PALLET FROM STORE-1 USING CRANE-1 WITH 2
HOOK+SLING TO STORE-2 PLACE+ADJUST RETURN TO CR-1
A1  T10  K24  T16  P3  T24  A0  1.00  7800.

TOTAL TMU 7800.
DATA SYNTHESIS AND BACK-UP

547. TRANSPORT STAGING PLANKS FOR TANK STAGING PLATFORM WITH (CRANE) AT A1 PLATEN CARPENTER

PER PLATFORM OFG: 4 02-FEB-83

REPRESENTS ELAPSED TIME
* BOARDS ARE TRANSPORTED FROM LUMBER PILE
* ... WHICH IS LOCATED (IN THE PLATEN.
* TOTAL NUMBER OF BOARDS IN LIFT = 64
* TOTAL LIFTS = 2 (PORT AND STARBOARD)

HOOKER-ON BEGINS AT STORE-2

1 HOOKER-ON TRANSPORT BOARDS FROM LUMBER-PILE USING CRANE-2 WITH 2 HOOK+SLING TO TANK-STAGING-PLATFORM (AT A-5) PLACE+MANEUVER RN CRANE-2 TO CR-2 RETURN HOOKER-ON TO STORE-2 F 2 A16 T10 K24 T24 P16 T24 A16 2.00 26000.

TOTAL TMU 26000.

549. TRANSPORT (FINISHED) TANK STAGING PLATFORM WITH (CRANE) AT ANY PLATEN CARPENTER

PER PLATFORM OFG: 4 02-FEB-83

REPRESENTS ELAPSED TIME
* TRANSPORT FINISHED PLATFORM TO A STORAGE
* ...PILE

HOOKER-ON BEGINS AT STORE-2

1 HOOKER-ON TRANSPORT FIN-PLATFORM FROM TANK-STAGING-PLATFORM USING CRANE-2 WITH 2 HOOK+SLING TO FIN-PILE PLACE+MANEUVER RETURN CRANE TO CR-2 AND RETURN HOOKER-ON TO STORE-2 A16 T24 K24 T6 P16 T24 A16 1.00 12600.

TOTAL TMU 12600.
DATA SYNTHESIS AND BACK-UP

555. POSITION (RAISE) TANK STAGING PLATFORM WITH (CRANE) AT MID TANKS AND VOIDS CARPENTER
PER PLATFORM OFG: 4 17-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS Raising TYPICAL PLATFORM IN A
* ...CENTER TANK AND SECURING IT TO THE
* ...MAIN DECK.
* 2 CARPENTERS WORK SIMULTANEOUSLY ON THE
* ...MAIN DECK
* 2 CARPENTERS WORK SIMULTANEOUSLY IN THE
* ...CENTER TANK ON THE PLATFORM
* STEPS:
* 1-4 FEEDING CABLES THROUGH BUTTERWORTH
* ...HOLES ON MAIN DECK
* 7-12 CONNECTION OF SHACKLES ON PLATFORM
* 14-19 CONNECTION OF SUSPENSION CABLES ON
* ...PLATFORM AND MAIN DECK
* 21-26 REMOVING SHACKLES FROM PLATFORM
* 27-29 REMOVING CABLES FROM CENTER TANK
CARP-3 BEGINS AT MENHOLE

1 CARP-3 GET+PLACE WITH BEND CABLE-SLEEVE FROM MENHOLE TO BTRWTH4 AND INSERT
A1 B6 G3 A32 B6 P3 A1 1.00 520.

2 CARP-3 GET+PLACE CABLE-SLEEVE FROM MENHOLE TO BTRWTH2 AND INSERT
A32 B6 G3 A16 B6 P3 A1 1.00 670.

3 CARP-3 GET+MANIPULATE CABLE AT BTRWTH4 AND ADJUST
A24 B6 G3 M10 X0 I6 A0 1.00 490.

4 CARP-3 GET+MANIPULATE CABLE AT BTRWTH2 AND ADJUST
A24 B6 G3 M10 X0 I6 A0 1.00 490.

5 WAIT 5 M ( CRANE LOWERS CABLES TO PLATFORM )

6 CARP-1 AND CARP2 WALK TO PLATFORM WITH 24 STEPS WITH CLIMB-OBJECT
A42 B32 G0 A0 B0 P0 A0 1.00 740.

7 CARP-1 LOOSEN NUT ( ON SHACKEL ) AT BTRWTH4 8 WRIST-TURNS USING HANDS F 2
A1 B0 G1 A1 B6 P1 L16 A0 B0 P0 A0 2.00 520.

8 CARP-1 GET+REMOVE BOLT FROM BTRWTH4 TO CARP-1 F 2
A1 B0 G3 A1 B0 P1 A0 2.00 120.

9 CARP-1 GET+MANIPULATE WITH BEND SHACKLE AT BTRWTH4 AND ALIGN F 2
A1 B6 G3 M10 X0 I10 A0 2.00 600.

10 CARP-1 GET+POSITION BOLT FROM CARP-1 TO BTRWTH4 AND INSERT F 2
A1 B0 G3 A1 B0 P6 A1 2.00 240.

11 CARP-1 FASTEN NUT AT BTRWTH4 8 WRIST-TURNS USING HANDS F 2
A1 B0 G1 A1 B0 P1 F16 A0 B0 P0 A0 2.00 400.

12 CARP-1 WALK TO BTRWTH2 WITHOUT BEND
A24 B0 G0 A0 B0 P0 A0 1.00 240.
DATA SYNTHESIS AND BACK-UP

13 WAIT 15 M (CRANE RAISES PLATFORM JUST BELOW MAIN DECK) 1.00 25005.

14 CARP-1 LOOSEN WITH BEND+STAND NUT (ON SUSPENSION CABLE SHACKLES AT BTRWTH2) 8 WRIST-TURNS USING HANDS F 4 A1 B16 G1 A1 BO P1 L16 AO BO PO AO 4.00 1440.

15 CARP-1 GET+REMOVE BOLT FROM BTRWTH2 TO CARP-1 F 4 A1 BO G3 A1 BO P1 AO 4.00 240.

16 CARP-1 GET+MANIPULATE WITH BEND+STAND SUSPENSION-CABLE AT BTRWTH2 AND ALIGN F 4 A1 B16 G3 M10 XO I10 AO 4.00 1600.

17 CARP-1 GET+POSITION BOLT FROM CARP-1 TO BTRWTH2 F 4 A1 BO G3 A1 BO F6 AO 4.00 440.

18 CARP-1 FASTEN WITH BEND+STAND NUT AT BTRWTH2 8 WRIST-TURNS USING HANDS F 4 A1 B16 G1 A1 BO P1 F16 AO BO PO AO 4.00 1440.

19 CARP-1 WALK TO BTRWTH4 WITH FLAT-CRAWL A24 B42 GO AO BO PO AO 1.00 660.

20 WAIT 1 M (CRANE TO LOWER PLATFORM TO TIGHTEN SLACK ON SUSPENSION CABLE) 1.00 1667.

21 CARP-1 LOOSEN NUT WITH BEND (ON SHACKEL) AT BTRWTH4 8 WRIST-TURNS USING HANDS F 2 A1 B6 G1 A1 BO P1 L16 AO BO PO AO 2.00 520.

22 CARP-1 GET+REMOVE BOLT FROM BTRWTH4 TO CARP-1 F 2 A1 BO G3 A1 BO P1 AO 2.00 120.

23 CARP-1 GET+PICKUP WITH BEND SHACKLE FROM PLATFORM F 2 A1 B6 G3 A1 BO PO AO 2.00 220.

24 CARP-1 GET+PLACE BOLT FROM CARP-1 TO BTRWTH4 AND INSERT F 2 A1 BO G3 A1 B6 P3 A1 2.00 300.

25 CARP-1 FASTEN NUT AT BTRWTH4 8 WRIST-TURNS USING HANDS F 2 A1 BO G1 A1 RO P1 F16 AO BO PO AO 2.00 400.

26 CARP-1 WALK TO BTRWTH2 WITH FLAT-CRAWL A24 B42 GO AO BO PO AO 1.00 660.

27 WAIT 5 M (CRANE RAISES 4 CABLES OUT OF THE CENTER TANK) 1.00 8335.

28 CARP-3 GET+PLACE CABLE-SLEEVE FROM BTRWTH4 TO MENHOLE A24 B6 G3 A32 B6 P3 AO 1.00 740.

29 CARP-3 GET+PLACE CABLE-SLEEVE FROM BTRWTH2 TO MENHOLE A16 B6 G3 A16 R6 P3 AO 1.00 500.

TOTAL TMU 57652.
DATA SYNTHESIS AND BACK-UP

POSITION (LOWER) TANK STAGING PLATFORM WITH (CRANE) AT MID TANKS AND VODDS CARPENTER
PER PLATFORM DFG: 4 17-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS LOWERING TYPICAL PLATFORM IN
* ...A CENTER TANK AND REMOVING IT FROM
* ...THE MAIN DECK.
* 2 CARPENTERS WORK SIMULTANEOUSLY ON THE
* ...MAIN DECK
* 2 CARPENTERS WORK SIMULTANEOUSLY IN THE
* ...CENTER TANK ON THE PLATFORM
* STEPS:
  * 1-4 FEEDING 4 CABLES THROUGH BUTTERWORTH
  * ...HOLES ON MAIN DECK
  * 6-11 CONNECTION OF SHACKLES ON PLATFORM
  * 13-18 REMOVAL OF SUSPENSION CABLES FROM
  * ...PLATFORM AND MAIN DECK
  * 23-28 REMOVING SHACKLES FROM PLATFORM
  * 29-31 REMOVING CABLES FROM CENTER TANK
CARP-3 BEGINS AT MENHOLE

1 CARP-3 GET+PLACE WITH BEND CABLE-SLEEVE FROM MENHOLE TO BTRWTH4 AND INSERT
   A1 B6 G3 A32 B6 P3 A1 1.00 520.
2 CARP-3 GET+PLACE CABLE-SLEEVE FROM MENHOLE TO BTRWTH2 AND INSERT
   A32 B6 G3 A16 B6 P3 A1 1.00 670.
3 CARP-3 GET+MANIPULATE CABLE AT BTRWTH4 AND ADJUST
   A24 B6 G3 M10 X0 I6 A0 1.00 490.
4 CARP-3 GET+MANIPULATE CABLE AT BTRWTH2 AND ADJUST
   A24 B6 G3 M10 X0 I6 A0 1.00 490.
5 WAIT 5 M ( CRANE LOWERS 4 CABLES TO PLATFORM )
   1.00 8335.
6 CARP-1 LOOSEN NUT ( ON SHACKEL ) AT BTRWTH4 8 WRIST-TURNS USING HANDS F.2
   A1 B0 G1 A1 B6 P1 L16 A0 B0 P0 A0 2.00 520.
7 CARP-1 GET+REMOVE BOLT FROM BTRWTH4 TO CARP-1 F 2
   A1 B0 G3 A1 B0 P1 A0 2.00 120.
8 CARP-1 GET+MANIPULATE WITH BEND SHACKLE AT BTRWTH4 AND ALIGN F 2
   A1 B6 G3 M10 X0 I10 A0 2.00 600.
9 CARP-1 GET+POSITION BOLT FROM CARP-1 TO BTRWTH4 AND INSERT F 2
   A1 B0 G3 A1 B0 P6 A1 2.00 240.
10 CARP-1 FASTEN NUT AT BTRWTH4 8 WRIST-TURNS USING HANDS F 2
    A1 B0 G1 A1 B0 P1 F16 A0 B0 P0 A0 2.00 400.
11 CARP-1 WALK TO BTRWTH2 WITH FLAT-CRAWL
    A24 B42 B0 A0 B0 P0 A0 1.00 660.
12 WAIT 1 M ( CRANE RAISES PLATFORM JUST ENOUGH TO PUT SLACK ON SUSPENSION CABLES )
DATA SYNTHESIS AND BACK-UP

13 CARP-1 LOOSEN WITH BEND+STAND NUT ( ON SUSPENSION CABLE SHACKELS AT BTRWTH2 8 WRIST-TURNS USING HANDS F 4
   A1 B16 G1 41 BO P1 L16 AO RO PO AO 4*00 1440.

14 CARP-1 GET+REMOVE BOLT FROM BTRWTH2 TO CARP-1 F 4
   A1 Bo G3 Al Ro P1 Ao 4.00 240.

15 CARP-1 GET+MANIPULATE WITH BEND+STAND SUSPENSION-CABLE AT BTRUTH2 AND ALIGN F 4
   A1 B16 G3 M10 XO 110 AO 4.00 1600.

16 CARP-1 GET+POSITION BOLT FROM CARP-1 TO BTRUTH2 F 4
   A1 BO G3 A1 BO P6 AO 4.00 440.

17 CARP-1 FASTEN WITH BEND+STAND NUT AT BTRWTH2 8 WRIST-TURNS USING HANDS F 4
   A1 B16 G1 Al BO P1 F16 AO BO PO AO 4*00 1440.

18 CARP-1 WALK TO BTRWTH4 WITH FLAT-CRAWL
   A24 B42 Go Ao Bo po Ao 1.00 660.

19 WAIT 15 M ( CRANE TO LOWER PLATFORM TO APPROXIMATELY 3 FEET ABOVE THE TANK-TOP )
   1.00 25005.

20 CARP-1 AND CARP2 WALK TO MENHOLE WITH CLIMB-OBJECT
   A32 B32 Go AO BO PO AO 1.00 640.

21 CARP-1 GET+MANIPULATE BLOCK FROM MENHOLE TO PLATFORM WITH 12 STEP AND ADJUST F 2
   A1 BO G3 H10 XO 16 A24 2.00 880

22 WAIT 1 M ( CRANE LOWERS PLATFORM ON 4 WOODEN BLOCKS )
   1.00 1667.

23 CARP-1 LOOSEN NUT WITH CLIMB-OBJECT ( ON SHACKEL ) AT BTRWTH4 8 WRIST-TURNS USING HANDS F 2
   A1 B32 G1 A1 B6 P1 L16 AO BO PO AO 2.00 11600.

24 CARP-1 GET+REMOVE BOLT FROM BTRWTH4 TO CARP-1 F 2
   A1 BO G3 A1 BO P1 AO 2400 1204

25 CARP-1 GET+PICKUP WITH BEND SHACKLE FROM PLATFORM F 2
   A1 R6 G3 A1 BO PO AO 2.00 2204

26 CARP-1 GET+PLACE BOLT FROM CARP-1 TO BTRWTH4 AND INSERT F 2
   A1 BO G3 A1 BA P3 A1 2.00 300.

27 CARP-1 FASTEN NUT AT BTRWTH4 8 WRIST-TURNS USING HANDS F 2
   A1 BO G1 A1 BO P1 F16 AO BO PO AO 2.00 400.

28 CARP-1 WALK TO BTRWTH2 WITHOUT BEND
   A24 Bo Go AO BO PO AO 1.00 240.

29 WAIT 5 M ( CRANE RAISES 4 CABLES OUT OF THE CENTER TANK )
   1400 8335

30 CARP-3 GET+PLACE CABLE-SLEEVE FROM BTRWTH4 TO MENHOLE
   A24 B6 G3 A32 B6 P3 AO 1.00 740.

31 CARP-3 GET+PLACE CABLE-SLEEVE FROM BTRWTH2 TO MENHOLE
   A16 B6 G3 A16 B6 P3 AO 1.00 500.

32 CARP-1 AND CARP2 WALK TO MENHOLE WITH CLIMB-OBJECT
   A16 B32 Go AO BO PO AO 1.00 480.
DATA SYNTHESIS AND BACK-UP

TOTAL TMU 61219.

557. POSITION (PLACE) TANK STAGING PLATFORM ( AND BOARDS ) IN ( TYPICAL TANK ) WITH ( CRANE ) AT ANY SHIP CARPENTER
   PER PLATFORM CFG: 4 17-MAY-83
   REPRESENTS ELAPSED TIME
   * REPRESENTS SETTING TANK STAGING PLATFORM
   * ...IN A TYPICAL TANK ON THE SHIP. ALSO
   * ...THE BOARDS NEEDED TO EXTEND THE
   * ...PLATFORM UNDER THE MAIN DECK.
   * 2 HOOKER-ONS: ONE AT THE MATERIAL AND
   * ...ONE ON THE SHIP IN THE TANK.
   * TOTAL OF 280 FOR TYPICAL TANK
   * 7 LIFTS ( 40 BOARDS PER LIFT )
HOOKER-ON1 BEGINS AT S-7

1 TRANSPORT TANK-STAGING-PLATFORM FROM S-7 USING CRANE-1 WITH
   2-HOOK+SLING TO TANK POSITION+MANEUVER RETURN TO S-7 PF 4 ( 3 )
   A24 T32 (K32 )T16P24 T16 A0 (4) 1.00 24000.
2 TRANSPORT BOARDS FROM S-7 USING CRANE-1 WITH HOOK+SLING TO TANK
   PLACE+ADJUST RETURN TO S-7 F 6
   A1 T3 K24 T16 P3 T16 A0 6.00 37800.
3 TRANSPORT BOARDS FROM S-7 USING CRANE-1 WITH HOOK+SLING TO TANK
   PLACE+ADJUST RETURN TO CR-1
   A1 T3 K24 T16 P3 T32 A0 1.00 7900.

TOTAL TMU 69700.

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543. SET-UP I-BEAMS FOR TANK STAGING PLATFORM WITH (CRANE) AT ANY PLATEN CARPENTER
PER PLATFORM OGF: 4-02-FEB-83
REPRESENTS ELAPSED TIME
* CARPENTER WORKS SIMULTANEOUSLY WITH THE
* ...HOOKER-ON
* STEP 3 INCLUDES SPREADING I-BEAMS AT:
* ...I-2, I-3, I-4, AND I-5
HOOKER-ON BEGINS AT STORE-2

1 HOOKER-ON TRANSPORT I-BEAM FROM STORE-2 USING CRANE-2 WITH
HOOK+SLING TO I-6 PLACE+MANEUVER RETURN TO STORE-2
  A16 T24 K24 T16 T16 A0  1.00  10000.

2 HOOKER-ON TRANSPORT I-BEAM FROM STORE-2 USING CRANE-2 WITH
HOOK+SLING TO I-7 PLACE+MANEUVER RETURN TO STORE-2
  A1 T3 K24 T16 T16 T6 A0  1.00  5600.

3 HOOKER-ON TRANSPORT I-BEAM FROM STORE-2 USING CRANE-2 WITH
HOOK+SLING TO I-1 PLACE+MANEUVER RETURN TO STORE-2 F 5
  A1 T3 K24 T6 T16 T16 A0  5.00  28000.

TOTAL THU 43600.

544. SET-UP ANGLE-BARS FOR TANK STAGING PLATFORM WITH (CRANE) AT ANY PLATE CARPENTER
PER PLATFORM OGF: 4-02-FEB-83
REPRESENTS ELAPSED TIME
* CARPENTER WORKS SIMULTANEOUSLY WITH THE
* **HOOKER-ON
* STEP 1 INCLUDES SPREADING ANGLES AT:
* ...A-6, A-1, AND A-2
* STEP 2 INCLUDES SPREADING ANGLES AT:
* ...A-3, A-4, AND A-5
HOOKER-ON BEGINS AT STORE-2

1 HOOKER-ON TRANSPORT ANGLE FROM STORE-2 USING CRANE-2 WITH HOOK+SLLI
TO A-6 PLACE+MANEUVER RETURN TO STORE-2 F 3
  A16 T24 K24 T16 T16 A0  3.00  30000.

2 HOOKER-ON TRANSPORT ANGLE FROM STORE-2 USING CRANE-2 WITH HOOK+SLLI
TO A-4 PLACE+MANEUVER RETURN TO STORE-2 F 3
  A1 T3 K24 T6 T16 T16 A0  3.00  16800.

TOTAL THU 46800.
DATA SYNTHESIS AND BACK-UP

548. SET-UP STAGING PLANKS ON TANK STAGING PLATFORM WITH HANDS AT ANY PLATEN CARPENTER
PER PLATFORM DTF: 4 02-FEB-83
REPRESENTS ELAPSED TIME

* CARPENTERS SPREAD BOARDS SIMULTANEOUSLY
* BOARDS ARE SPREAD ON PORT SIDE FIRST...
* ...THEN STARBOARD SIDE.
* TOTAL BOARDS PER SIDE = 32
* STEPS:
* 2-5 SPREAD BOARDS BETWEEN A-6 & 1-6 F/s
* 6-8 SPREAD BOARDS BETWEEN I-6 & A-1 P/S
* 9-11 SPREAD BOARDS BETWEEN A-1 & A-3 S
* ...AND A-1 & A-2 P
* 12-14 SPREAD BOARDS BETWEEN A-3 & A-4 S
* ...AND A-2 & A-4 P
* 15-17 SPREAD BOARDS BTWN A-4 & I-7 P/S
* 18-20 SPREAD BOARDS BTWN I-7 & A-5 p/s
* 21-22 SPREAD BOARD AT A-5 P/S
CARP-1 BEGINS AT STORE-2

1 CARP-1+CARP-2 WALK TO TANK-STAGING-PLATFORM WITH CLIMB ( ONTO PLATFORM )

   A32 B16 GO AO BO PO AO 1.00 4804

2 CARP-1+CARP-2 GET+POSITION 2 BOARDS FROM A-5 TO A-6 F 2
A1 B6 G3 A24 B6 P6 AO 2.00 920.

3 CARP-1+CARP-2 GET+POSITION 2 BOARDS FROM A-5 TO A-6 F 6
A24 B6 G3 A24 B6 P6 AO 6.00 4140.

4 CARP-1+CARP-2 GET+SLIDE WITH BEND BOARD AT A-6 AND ALIGN F 8
A1 B6 G3 M3 XO I10 AO 8.00 1840.

5 CARP-1+CARP-2 GET+PLACE 2 BLOCKS FROM CARP-1 AND CARP2 TO A-6 WITH BEND F 16
A1 B6 G3 A1 B6 P3 AO 16.00 2240.

6 CARP-1+CARP-2 GET+POSITION 2 BOARDS FROM A-5 TO I-6 F 2
A24 B6 G3 A24 B6 P6 AO 2.00 1380.

7 CARP-1+CARP-2 GET+SLIDE WITH BEND BOARD AT I-6 AND ALIGN F 2
A1 B6 G3 M3 XO I10 AO 2.00 460.

8 CARP-1+CARP-2 GET+PLACE 2 BLOCKS FROM CARP-1 AND CARP2 TO 1-6 WITH BEND F 4
A1 B6 G3 A1 B6 P3 AO 4.00 560.

9 CARP-1+CARP-2 GET+POSITION 2 BOARDS FROM A-5 TO A-1 F 8
A24 B6 G3 A16 B6 P6 AO 8.00 4880.

10 CARP-1+CARP-2 GET+SLIDE WITH BEND BOARD AT A-1 AND ALIGN F 8
A1 B6 G3 M3 XO I10 I10 8.00 1840.

11 CARP-1+CARP-2 GET+PLACE 2 BLOCKS FROM CARP-1 AND CARP2 TO A-1 WITH BEND F 16
A1 B6 G3 A1 B6 P3 AO 16.00 2240.

12 CARP-1+CARP-2 GET+POSITION 2 BOARDS FROM A-5 TO A-3 ( PORT OR A-2
DATA SYNTHESIS AND BACK-UP

13 CARP-1+CARP-2 GET+SLIDE WITH BEND BOARD AT A-3 ( PORT OR A-2 STAR AND ALIGN WITH BEND F 6
   A1 B6 G3 A1 B6 P6 A0 6.00 3180.
A1 B6 G3 M3 X0 I10 A0 6.00 1380.
14 CARP-1+CARP-2 GET+PLACE 2 BLOCKS FROM CARP-1 AND CARP2 TO A-3 ( PORT OR A-2 STAR ) WITH BEND F 12
   A1 B0 G3 A1 B6 P3 A0 12.00 1680.
15 CARP-1+CARP-2 GET+POSITION 2 BOARDS FROM A-5 TO A-4 F 6
   A16 B6 G3 A6 B6 P6 A0 6.00 2580.
A1 B6 G3 M3 X0 I10 A0 6.00 1380.
16 CARP-1+CARP-2 GET+SLIDE WITH BEND BOARD AT A-4 AND ALIGN F 6
   A1 B6 G3 M3 X0 I10 A0 6.00 1380.
17 CARP-1+CARP-2 GET+PLACE 2 BLOCKS FROM CARP-1 AND CARP2 TO A-4 WI
   BEND F 12
   A1 B0 G3 A1 B6 P3 A0 12.00 1680.
18 CARP-1+CARP-2 GET+POSITION 2 BOARDS FROM A-5 TO I-7 F 2
   A6 B6 G3 A3 B6 P6 A0 2.00 600.
19 CARP-1+CARP-2 GET+SLIDE WITH BEND BOARD AT I-7 AND ALIGN F 2
   A1 B6 G3 M3 X0 I10 A0 2.00 460.
20 CARP-1+CARP-2 GET+PLACE 2 BLOCKS FROM CARP-1 AND CARP2 TO I-7 WI
   BEND F 4
   A1 B0 G3 A1 B6 P3 A0 4.00 560.
21 CARP-1+CARP-2 GET+SLIDE BOARD AT A-5 AND ALIGN F 2
   A3 B6 G3 M3 X0 I10 A0 2.00 500.
22 CARP-1+CARP-2 GET+PLACE 2 BLOCKS FROM CARP-1 AND CARP2 TO A-5 WI
   BEND F 4
   A1 B0 G3 A1 B6 P3 A0 4.00 560.
23 CARP-1+CARP-2 WALK TO STORE-2 WITH DESCEND ( OFF PLATFORM )
   A32 B16 G0 A0 B0 P0 A0 1.00 480.

TOTAL THU 36020.
DATA SYNTHESIS AND BACK-UP

550. TEAR DOWN ANGLES ON TANK STAGING PLATFORM WITH WRENCH AT MID TANKS AND VOIDS CARPENTER
PER PLATFORM OFG! 4 11-MAY-83
REPRESENTS ELAPSED TIME
* CARPENTER WORKS ALONE UNBOLTING ANGLES
* STEPS:
* 1-5 ARE FOR REMOVING BOLTS ON A-4 & A-1
* ...AT I-1, I-2, I-3, I-4, AND I-5
* 7-11 ARE FOR REMOVING BOLTS
* ...ON A-3 AT I-1, I-2, & I-3
* ...ON A-1 AT I-3, I-4, & I-5
* 14-18 FOR REMOVING BOLTS ON A-5 & A-6
* ...AT I-1, I-2, I-3, I-4 & I-5
CARP-1 BEGINS AT I-1

1 CARP-1 LOOSEN 2 NUTS AT I-1 5 WRIST-TURNS DIFFICULT USING WRENCH ASIDE TO CARP-1 F 10
A1 B0 G1 A0 B0 (P10 A1 L10 )A1 B0 P1 A0 (2) 10.00 4600.
2 CARP-1 LOOSEN 2 NUTS AT I-1 20 SPINS USING FINGERS F 10
A1 B0 G1 A0 B0 (P1 A1 L24 )A0 B0 P0 A0 (2) 10.00 5400.
3 CARP-1 GET+PLACE 2 NUTS AND WASHERS FROM I-1 TO TOOLBOX-1 WITH BEND F 20
A1 B0 G3 A1 B6 P3 A0 20.00 2800.
4 CARP-1 LOOSEN 2 BOLTS AT I-1 3 STRIKES USING HAMMER ASIDE TO CARP-1 F 10
A1 B0 G1 A0 B0 (P0 A1 L6 )A1 B0 P1 A0 (2) 10.00 1800.
5 CARP-1 GET+PLACE 2 BOLTS FROM I-1 TO TOOLBOX-1 WITH BEND F 20
A1 B0 G3 A1 B6 P3 A0 20.00 2800.
6 CARP-1 GET+PLACE WITH CLIMB-OBJECT TOOLBOX-1 FROM I-1 TO I-5 WITH 14 STEPS PF 10 ( 2 ) PF 10 ( 5 6 )
A1 (B32 )G3 A24 (B6 P3 )A0.(10) 1.00 4380.
7 CARP-1 LOOSEN 2 NUTS AT I-5 5 WRIST-TURNS DIFFICULT USING WRENCH ASIDE TO CARP-1 F 6
A1 B0 G1 A0 B0 (P10 A1 L10 )A1 B0 P1 A0 (2) 6.00 2760.
8 CARP-1 LOOSEN 2 NUTS AT I-5 20 SPINS USING FINGERS F 6
A1 B0 G1 A0 B0 (P1 A1 L24 )A0 B0 P0 A0 (2) 6.00 3240.
9 CARP-1 GET+PLACE NUTS AND WASHERS FROM I-5 TO TOOLBOX-1 WITH BEND F 12
A1 B0 G3 A1 B6 P3 A0 12.00 1680.
10 CARP-1 LOOSEN 2 BOLTS AT I-5 3 STRIKES USING HAMMER ASIDE TO CARP-1 F 6
A1 B0 G1 A0 B0 (P0 A1 L6 )A1 B0 P1 A0 (2) 6.00 1080.
11 CARP-1 GET+PLACE 2 BOLTS FROM I-5 TO TOOLBOX-1 WITH BEND F 12
A1 B0 G3 A1 B6 P3 A0 12.00 1680.
12 CARP-1 GET+PLACE WITH CLIMB-OBJECT TOOLBOX-1 FROM I-5 TO I-3 WITH 10 STEPS PF 3 ( 2 ) PF 3 ( 5 6 )
A1 (B32 )G3 A16 (B6 P3 )A0 (3) 1.00 1430.
DATA SYNTHESIS AND BACK-UP

13 CARP-1 GET+PLACE WITH CLIMB-OBJECT TOOLBOX-1 FROM I-3 TO I-1 WITH
10 STEPS PF 3(2)PF3 (5 6)
A1 (B32 )G3 A16 (B6 P3 )AO (3) 1.00 1430.
14 CARP-1 LOOSEN 2 NUTS AT I-1 5 WRIST-TURNS DIFFICULT USING WRENCH
ASIDE TO CARP-1 F 10
A1 BO G1 AO BO (P1O A1 L1O )A1 BO P1 AO (2) 10.00 4600.
15 CARP-1 LOOSEN 2 NUTS AT I-1 20 SPINS USING FINGERS F 10
A1 BO G1 AO BO (P1 A1 L24 )AO B6 PO AO (2) 10000 5400
16 CARP-1 GET+PLACE 2 NUTS AND WASHERS FROM I-1 TO TOOLBOX-1 WITH B1
F 20
A1 BO G3 A1 B6 P3 A0 20.00 2800
17 CARP-1 LOOSEN 2 BOLTS AT I-1 3 STRIKES USING HAMMER ASIDE TO CARP-
F 10
A1 BO G1 AO BO (PO A1 L6 )A1 BO P1 AO (2) 10.00 1800+
18 CARP-1 GET+PLACE BOLTS FROM I-1 TO TOOLBOX-1 WITH BEND F 20
A1 BO G3 A1 B6 P3 AO 20.00 2800.
19 CARP-1 GET+PLACE WITH CLIMB-OBJECT TOOLBOX-1 FROM I-1 TO I-5 WITH
14 STEPS PF 10 ( 2 ) PF 10 ( 5 6 )
A1 (B32 )G3 A24 (B6 P3 )40 (10) 1.00 4380.

TOTAL TMU 56860.

551. TEAR DOWN I-BEAMS ON TANK STAGING PLATFORM WITH WRENCH AT MID TANKS ;
VOIDS CARPENTER
PER PLATFORM OFG: 4 11-MAY-83
REPRESENTS ELAPSED TIME
* CARPENTER WORKS ALONE UNBOLTING I-BEAMS
* STEPS:
* 1-5 ARE FOR REMOVING BOLTS ON I-6 & I-7
* ...AT I-1,I-2, I-3,I-4,AND I-5
* 6,7 ARE FOR MOVEMENT OF THE CARPENTER
* ...BETWEEN THE CONNECTIONS
CARP-1 BEGINS AT I-1

1 CARP-1 LOOSEN 4 NUTS AT I-1 5 WRIST-TURNS DIFFICULT USING WRENCH
ASIDE TO CARP-1 F 10
A1 BO G1 AO BO (P1O A1 L1O )A1 BO P1 AO (4) 10.00 8800.
2 CARP-1 LOOSEN 4 NUTS AT I-1 20 SPINS USING FINGERS F 10
A1 BO G1 AO EO (P1 A1 L24 )AO B6 PO AO (4) 10.00 10600.
3 CARP-1 GET+PLACE 4 NUTS AND WASHERS FROM I-1 TO TOOLBOX-1 WITH BEND
F 40
A1 BO G3 A1 B6 P3 A0 40.00 5600.
4 CARP-1 LOOSEN 4 BOLTS AT I-1 3 STRIKES USING HAMMER ASIDE TO CARP-
F 10
A1 BO G1 AO BO (PO A1 L6 )A1 BO P1 AO (4) 10*OO 3200.
5 CARP-1 GET+PLACE 4 BOLTS FROM I-1 TO TOOLBOX-1 WITH BEND F 40

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DATA SYNTHESIS AND BACK-UP

A1 B0 G3 A1 B6 P3 A0  40.00  5600.

6 CARP-1 GET+PLACE WITH CLIMB-OBJECT TOOLBOX-1 FROM I-1 TO I-5 WITH 14 STEPS PF 10 (2) PF 10 (5,6)
   A1 (B32) G3 A24 (B6 P3) A0 (10)  1.00  4380.

7 CARP-1 GET+PLACE WITH BEND TOOLBOX-1 FROM I-5 (AT, I-7) TO I-5 (AT, I-6) WITH 10 STEPS WITH BEND
   A1 B6 G3 A16 B6 P3 A0  1.00  350.

TOTAL THU 38530.

552. TEAR DOWN STAGING PLANKS ON TANK STAGING PLATFORM WITH WINCH AT MID TANKS AND Voids CARPENTER
PER PLATFORM OFG1 4 18-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF BOARDS ON A TANK
* ...STAGING PLATFORM (IN A CENTER TANK)
* TOTAL BOARDS = 64 (22 LIFTS)
* 2 CARPENTERS MOVE BOARDS FROM THE TANK
* ...STAGING PLATFORM TO A LUMBER-PILE
* ...LOCATED NEAR A MANHOLE, A WINCH
* ...OPERATOR AND A CARPENTER REMOVE THE
* ...BOARDS FROM THE TANK. THERE ARE 2
* ...CARPENTERS WHO RECEIVE AND STACK THE
* ...BOARDS ON THE DECK. THEIR TIME IS
* ...INTERNAL TO THE WINCH PROCESS TIME.
CARP-1 BEGINS AT I-5

1 CARP-1 AND CARP2 LOOSEN BOARD AT I-5 WITH BEND 2 ARM-STROKES USING HANDS F 32
   A1 B0 G1 A1 B6 P1 L10 A0 B0 P0 A0  32.00  6400.

2 CARP-1 AND CARP2 GET+MANIPULATE BOARD WITH CLIMB-OBJECT AT LUMBER-PILE ALIGN AND RETURN TO I-5 WITH CLIMB-OBJECT F 32
   A24 B32 G3 H10 X0 I10 A24 B32 32.00  43200.

3 CARP-1 AND CARP2 WALK TO I-3 WITH CLIMB-OBJECT
   A6 B32 G0 A0 B0 P0 A0  1.00  380.

4 CARP-1 AND CARP2 LOOSEN BOARD AT I-3 WITH BEND 2 ARM-STROKES USING HANDS F 32
   A1 B0 G1 A1 B6 P1 L10 A0 B0 P0 A0  32.00  6400.

5 CARP-1 AND CARP2 GET+MANIPULATE WITH CLIMB-OBJECT BOARD AT LUMBER-PILE ALIGN AND RETURN TO I-3 WITH CLIMB-OBJECT F 32
   A16 B32 G3 H10 X0 I10 A16 B32 32.00  38080.

6 CARP-3 GET+SLIDE WITH BEND BOARD (ONTO BOLSTER) AT LUMBER-PILE AND ADJUST F 64
   A1 B6 G3 M3 X0 I6 A0  64.00  12160.

7 WINCH-OPER PUSH WINCH-DOWN PROCESS (TO TANKTOP) F 22
   A1 B0 G1 M1 X81 I0 A0  22.00  18480.

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8 WINCH-OPER LOOSEN ( = SWING ) CABLE WITH BEND AT MENHOLE 5
ARM-STROKES USING HANDS F 22
A1 B6 G1 A1 B0 P1 L32 A0 B0 P0 A0 22.00 9240.

9 WINCH-OPER THROW CABLE FROM MENHOLE TO CARP-3 F 22
A1 B0 G1 A1 B6 P0 A0 22.00 1980.

10 CARP-3 GET+MANIPULATE WITH BEND CABLE AT LUMBER-PILE ( HOOK AROUND
BOARDS ) ( ALLOW FOR 2 ATTEMPTS ) F 44
A1 B6 G3 M10 X0 I0 A0 44.00 8800.

11 WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES ) F 22
A1 B0 G1 M1 X67 I0 A0 22.00 15400.

12 WINCH-OPER PUSH WINCH-UP PROCESS ( TO MENHOLE ) F 22
A1 B0 G1 M1 X245 I0 A0 22.00 54560.

TOTAL TMU 215080.

553. TEAR DOWN ANGLES ON TANK STAGING PLATFORM WITH WINCH AT MID TANKS AN
VOIDS CARPENTER
PER PLATFORM CFG: 4 11-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF ANGLES ON A TANK
* ...STAGING PLATFORM (IN A CENTER TANK)
* TOTAL ANGLES = 6 (1 LIFT)
* 1 CARPENTER MOVES ANGLES TO ONE AREA ON
* ...THE TANK STAGING PLATFORM
* ...LOCATED NEAR A MANHOLE. A WINCH
* ...OPERATOR AND A CARPENTER REMOVE THE
* ...ANGLES FROM THE TANK. THERE ARE 2
* ...CARPENTERS WHO RECEIVE AND STACK THE
* ...ANGLES ON THE DECK. THEIR TIME IS
* ...INTERNAL TO THE WINCH PROCESS TIME.
CARP-3 BEGINS AT LUMBER-PILE

1 CARP-3 WALK TO A-5 WITH 12 STEPS WITH CLIMB-OBJECT
A24 B32 G0 A0 B0 P0 A0 1.00 560.

2 CARP-3 GET+MANIPULATE ANGLE WITH BEND+CLIMB-STEP AT A-6 ALIGN AND
RETURN TO A-4 WITH CLIMB-STEP
A24 B16 G3 M10 X0 I10 A16 B10 1.00 890.

3 CARP-3 GET+MANIPULATE WITH BEND+CLIMB-STEP ANGLE AT A-6 ALIGN AND
RETURN TO A-3 WITH CLIMB-STEP
A16 B16 G3 M10 X0 I10 A16 B10 1.00 810.

4 CARP-3 GET+MANIPULATE WITH BEND+CLIMB-STEP ANGLE AT A-6 ALIGN AND
RETURN TO A-2 WITH CLIMB-STEP
A16 B16 G3 M10 X0 I10 A16 B10 1.00 810.

5 CARP-3 GET+MANIPULATE WITH BEND+CLIMB-STEP ANGLE AT A-6 ALIGN AND
RETURN TO A-1 WITH CLIMB-STEP
A16 B16 G3 M10 X0 I10 A10 B10 1.00 750.

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6 CARP-3 GET+MANIPULATE WITH BEND+CLIMB-STEP ANGLE AT A-6 ALIGN
   A10 B16 G3 H10 X0 110 AO  1.00  490.

7 WINCH-OPER PUSH WINCH-DOWN PROCESS ( TO TANKTOP )
   A1 BO G1 M1 X81 I0 AO  1.00  840.

8 WINCH-OPER LOOSEN ( = SWING ) CABLE WITH BEND AT MENHOLE 5
   ARM-STROKES USING HANDS
   A1 B6 G1 A1 BO P1 L32 AO BO PO AO  1.00  420.

9 WINCH-OPER THROW CABLE FROM MENHOLE TO CARP-3
   A1 BO G1 A1 B6 PO AO  1.00  90.

10 CARP-3 GET+MANIPULATE WITH BEND CABLE AT A-6 ( HOOK AROUND. ANGLES )
    ( ALLOW FOR 2 ATTEMPTS ) F 2
   A1 B6 G3 M10 X0 I0 AO  2.00  400.

11 WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES )
   A1 BO G1 M1 X67 I0 AO  1.00  700.

12 WINCH-OPER PUSH WINCH-UP PROCESS ( TO MENHOLE )
   A1 BO G1 M1 X245I0 AO  1.00  2480.

TOTAL TMU  9240

554. TEAR DOWN I-BEAMS FOR TANK STAGING PLATFORM WITH WINCH AT MID TANKS AND
       Voids Carpenter
       PER PLATFORM OFG: 4 11-MAY-83
       REPRESENTS ELAPSED TIME
       *  REPRESENTS REMOVAL OF I-BEAMS FROM THE
       *  ...TANK STAGING PLATFORM
       *  TOTAL I-BEAMS = 7 (7 LIFTS)
       *  A CARPENTER AND WINCH OPERATOR REMOVE
       *  ...THE I-BEAMS FROM THE TANK. THERE ARE
       *  ...2 CARPENTERS WHO RECEIVE AND STACK
       *  ...THE I-BEAMS ON THE DECK. THEIR TIME
       *  ...IS INTERNAL TO THE WINCH PROCESS TIME
       CARP-3 BEGINS AT A-6

1 CARP-3 WALK TO I-5 WITH 8 STEPS WITH CLIMB-STEP PF 4 ( 2 )
   A16 (B10 )80 AO BO PO AO (4)  1.00  560.

2 WINCH-OPER PUSH WINCH-DOWN PROCESS F 7
   A1 BO G1 M1 X81 I0 AO  7.00  5880.

3 WINCH-OPER LOOSEN ( = SWING ) CABLE WITH BEND AT MENHOLE 5
   ARM-STROKES USING HANDS F 7
   A1 B6 G1 A1 BO P1 L32 AO BO PO AO  7.00  2940.

4 WINCH-OPER THROW CABLE FROM MENHOLE TO CARP-3 F 7
   A1 BO G1 A1 B6 PO AO  7.00  630.

5 CARP-3 GET+MANIPULATE WITH BEND CABLE AT I-5 ( HOOK AROUND I-BEAM )
   ( ALLOW FOR 2 ATTEMPTS ) PF 2 ( 2 3 4 )
   A1 (B6 G3 M10 )X0 I0 AO (2)  1.00  390.

6 CARP-3 GET+MANIPULATE CABLE AT I-4 ( HOOK AROUND I-BEAM ) ( ALLOW
DATA SYNTHESIS AND BACK-UP

FOR 2 ATTEMPTS  ) PF 2 ( 2 3 4 )
A3 (B6 G3 M10 )X0 I0 A0 (2) 1.00 410.
7 CARP-3 GET+MANIPULATE CABLE AT I-3 ( HOOK AROUND I-BEAM ) ( ALLOW
FOR 2 ATTEMPTS ) PF 2 ( 2 3 4 )
A3 (B6 G3 M10 )X0 I0 A0 (2) 1.00 410.
8 CARP-3 GET+MANIPULATE CABLE AT I-2 ( HOOK AROUND I-BEAM ) ( ALLOW
FOR 2 ATTEMPTS ) PF 2 ( 2 3 4 )
A3 (B6 G3 M10 )X0 I0 A0 (2) 1.00 410.
9 CARP-3 GET+MANIPULATE CABLE AT I-1 ( HOOK AROUND I-BEAM ) ( ALLOW
FOR 2 ATTEMPTS ) PF 2 ( 2 3 4 )
A3 (B6 G3 M10 )X0 I0 A0 (2) 1.00 410.
10 CARP-3 GET+MANIPULATE WITH 13 STEPS CABLE AT I-7 ( HOOK AROUND
I-BEAM ) ( ALLOW FOR 2 ATTEMPTS ) PF 2 ( 2 3 4 )
A24 (B6 G3 M10 )X0 I0 A0 (2) 1.00 620.
11 CARP-3 GET+MANIPULATE CABLE AT I-6 ( HOOK AROUND I-BEAM ) ( ALLOW
FOR 2 ATTEMPTS ) PF 2 ( 2 3 4 )
A24 (B6 G3 M10 )X0 I0 A0 (2) 1.00 620.
12 WINCH-OPER PUSH WINCH-FREE PROCESS ( CLEAR OBSTACLES ) F7
A1 B0 G1 M1 X67 I0 A0 7.00 4900.
13 WINCH-OPER PUSH WINCH-UP PROCESS ( TO MENHOLE ) F7
A1 B0 G1 M1 X24510 A0 7.00 17360.

TOTAL TMU 35540.

538. (BRUSH) CLEAN (PLATEN) FOR TANK STAGING PLATFORM WITH BROOM AT ANY
PLATEN CARPENTER
PER PLATFORM DPG: 4 31-JAN-83
REPRESENTS ELAPSED TIME
* REPRESENTS CLEANING THE TABLE BEFORE THE
* ...TANK STAGING PLATFORM IS ASSEMBLED.
* SQUARE FOOTAGE OF AREA CLEANED = 700
CARP-1 BEGINS AT STORE-2

1 CARP-1 BRUSHCLEAN TANK-STAGING-PLATFORM ( TABLE ) WITH CLIMB ( ON
TABLE ) 7 SQ.FT. USING BROOM RETURN TO STORE-2 WITH DESCEND ( OFF
TABLE ) PF 99 (7 )
A1 B0 G1 A32 B16 P1 (S42 )A32B16 P1 A0 (99) 1.00 42580.

TOTAL TMU 42580.

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559. SET-UP STAGING PLANKS FOR TANK STAGING PLATFORM WITH HAMMER AT MID TANKS AND VOIDS CARPENTER
PER STAGING PLANK OFG: 4-20-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS SPREADING BOARDS FROM A TANK
* STAGING PLATFORM TO EXISTING STAGING
* ON THE BULKHEADS.
* 2 CARPENTERS WHO ARE NOT WORKING
* SIMULTANEOUSLY.
CARP-1 BEGINS AT STAR-BHD

1 CARP-2 GET+MANEUVER WITH BEND BOARD AT STAR-BHD AND RETURN TO PLATFORM
   A16 B6 G3 M10 X0 I0 A16 1.00 510.

2 CARP-1 GET+MANIPULATE WITH 1 STEP WITH BEND BOARD AT STAR-BHD AND ALIGN
   A3 B6 G3 M10 X0 I10 A0 1.00 320.

3 CARP-2 GET+PLACE WITH 6 STEPS WITH BEND NAILS FROM TOOLBOX-1 TO CARP-2 WITH 6 STEPS (POCKET)
   A10 B6 G3 A10 B0 P3 A0 1.00 320.

4 CARP-1 GET+PLACE WITH BEND NAILS FROM TOOLBOX-1 TO CARP-1 (POCKET)
   A16 B6 G3 A16 B0 P3 A0 1.00 440.

5 CARP-2 GET+POSITION WITH 1 STEP 3 NAILS FROM CARP-2 TO PLATFORM (ON BOARDS) WITH BEND PF 3 (2 3 4 5 6 7)
   A3 (B0 G3 A1 B6 P6 A0 ) 1.00 510.

6 CARP-1 GET+POSITION WITH 1 STEP 3 NAILS FROM CARP-1 TO STAR-BHD (ON BOARDS) WITH BEND PF 3 (2 3 4 5 6 7)
   A3 (B0 G3 A1 B6 P6 A0 ) 1.00 510.

7 CARP-2 FASTEN 3 NAILS AT PLATFORM 16 STRIKES USING HAMMER-2 ASIDE TO CARP-2 F 2
   A1 B0 G1 A0 B0 (P0 A1 F32) A1 B0 P1 A0 (3) 2.00 2060.

8 CARP-1 FASTEN 3 NAILS AT STAR-BHD 16 STRIKES USING HAMMER-1 ASIDE TO CARP-1 F 2
   A1 B0 G1 A0 B0 (P0 A1 F32) A1 B0 P1 A0 (3) 2.00 2060.

TOTAL TMU 6730.
DATA SYNTHESIS AND BACK-UP

560. TEAR DOWN HANDRAIL (AND STANCHION) ON (LONITUDINAL) BULKHEAD WITH TORCH AT MID TANKS AND VOIDS CARPENTER PER ASSEMBLY OFG: 4-20-MAY-83

REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF HANDRAIL FROM TOP
* ...LEVEL OF BULKHEAD STAGING IN A CENTER
* ...BEEN SPREAD TO TANK STAGING PLATFORM
* CARPENTER WORKS ALONE
* HOOKUP, IGNITE AND EXTINGUISH TORCH ARE
* ...IN A SEPARATE SUB-DP

CARP-3 BEGINS AT PLATFORM

1 CARP-3 GET+MOVE WITH BEND TORCH FROM PLATFORM TO BRKT-1
   A1 B6 G3 A16 B0 P1 A0 1.00 270.

2 CARP-3 OPERATE TORCH FROM BRKT-1 TO BRKT-2 AND BURN OFF 2 HANDRAIL
   PROCESS PF 4 (5)
   A1 B0 G1 M6 (X173)I0 A10 (4) 1.00 7100.

3 CARP-3 HOLD+PLACE TORCH FROM BRKT-2 TO STAR-BHD
   A0 B0 G0 A1 B0 P3 A0 1.00 40.

4 CARP-3 GET+MANIPULATE 2 HANDRAIL AT STAR-BHD F 2
   A1 B0 G3 M10 X0 I0 A0 2.00 280.

5 CARP-3 HOLD+PLACE 2 HANDRAIL FROM STAR-BHD TO PLATFORM WITH BEND
   RETURN TO STAR-BHD
   A0 B0 G0 A16 B6 P3 A16 1.00 410.

6 CARP-3 LOOSEN 2 STANCHIONS AT STAR-BHD WITH 6 STEPS (AT BRKT1 A
   BRKT2) 4 ARM-STROKES USING HANDS
   A1 B0 G1 A10 B0 (P1 A1 L24) A0 B0 P0 A0 (2) 1.00 640.

7 CARP-3 GET+PLACE 2 STANCHIONS FROM STAR-BHD TO PLATFORM WITH BEND
   RETURN TO STAR-BHD PF 2 (1 2 3)
   (A1 B0 G3) A16 B6 P3 A16 (2) 1.00 490.

8 CARP-3 GET+MOVE WITH BEND TORCH FROM STAR-BHD TO PLATFORM WITH BEND
   A1 B6 G3 A16 B6 P1 A0 1.00 330.

TOTAL THU 9560.

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561. SET-UP STAGING BRACKETS FOR (BETWEEN) TANK STAGING PLATFORM WITH WRENCH AT MID TANKS AND VOIDS CARPENTER PER CENTER TANK QFG: 4 23-MAY-83

REPRESENTS ELAPSED TIME

* REPRESENTS SETTING UP BRACKETS ON 2 TANK
* ...STAGING PLATFORMS. BOARDS ARE SPREAD
* ...BETWEEN THE BRACKETS.
* THIS ASSEMBLY IS USED TO CONNECT THE TWO
* ...TANK STAGING PLATFORMS.
* 2 CARPENTERS WORKING SIMULTANEOUSLY EACH
* ...WORKING ON A DIFFERENT PLATFORM.

STEPS:

1-6 REPRESENTS SETTING UP BRACKETS AT
**BR-1, BR-2, AND BR-3

7 REPRESENTS SPREADING BOARDS BETWEEN
**BR-1 AND BR-2; BR-2 AND BR-3

CARP-1 BEGINS AT PLFM1

1 CARP-1 GET+HOLD WITH BEND BRKT FROM PLFM1 TO CARP-1 F 3
   A1 b6 g3 a1 b0 p0 a0 3.00 330.

2 CARP-1 LOOSEN NUT AT PLFM1 4 WRIST-TURNS USING HANDS F 3
   A1 b0 g1 a1 b0 p1 l10 a0 b0 p0 a0 3.00 420.

3 CARP-1 GET+POSITION BRKT FROM CARP-1 TO BR-1 AND INSERT BOLT F 3
   A1 b0 g3 a10 b6 p6 a1 3.00 810.

4 CARP-1 FASTEN NUT AT BR-1 13 WRIST-TURNS USING HANDS F 3
   A1 b0 g1 a1 b0 p1 f24 a0 b0 p0 a0 3.00 840.

5 CARP-1 FASTEN NUT AT BR-1 4 ARM-TURNS USING WRENCH-1 ASIDE TO CARP-1 F 3
   A1 b0 g1 a1 b0 p3 f10 a1 b0 p1 a0 3.00 540.

6 CARP-1 WALK TO PLFM1 F 3
   a10 b0 g0 a0 b0 p0 a0 3.00 300.

7 CARP-1 GET+MANEUVER 3 BOARDS AT BR-1 AND ALIGN RETURN TO PLFM1 WITH BEND F 6
   a10 b6 g3 m10 x0 i10 a10 b6 6.00 3300.

TOTAL TMU 6540.
DATA SYNTHESIS AND BACK-UP

562. SET-UP STAGING PLANKS FOR (BETWEEN) TANK STAGING PLATFORMS WITH HAMM
AT MID TANKS AND VOIDS CARPENTER
PER STAGING PLANK OFG: 4 23-MAY-83
* REPRESENTS ELAPSED TIME
* * * TANK STAGING PLATFORMS
* 2 CARPENTERS ARE NOT WORKING
* * * SIMULTANEOUSLY
CARP-1 BEGINS AT PLFM1

1 CARP-1 GET+MANEUVER WITH BEND BOARD AT CARP-2 RETURN TO PLFM1
   A32 B6 G3 M10 X0 I0 A32 1.00 830.
2 CARP-2 GET+MANIPULATE WITH 1 STEP WITH BEND BOARD AT PLFM2
   A3 B6 G3 M10 X0 I0 A0 1.00 220.
3 CARP-1 GET+PLACE NAILS FROM TOOLBOX-1 TO CARP-1
   A10 B6 G3 A10 B0 P3 A0 1.00 320.
4 CARP-2 GET+PLACE NAILS FROM TOOLBOX-2 TO CARP-2
   A10 B6 G3 A10 B0 P3 A0 1.00 320.
5 CARP-1 GET+POSITION WITH 1 STEP 3 NAILS FROM CARP-1 TO PLFM1 (ON
   BOARD ) WITH BEND PF 3 ( 2 3 4 5 6 7 )
   A3 (B0 G3 A1 B6 P6 A0 ) 1.00 510.
6 CARP-2 GET+POSITION WITH 1 STEP 3 NAILS FROM CARP-2 TO PLFM2 (ON
   BOARD ) WITH BEND PF 3 ( 2 3 4 5 6 7 )
   A3 (B0 G3 A1 B6 P6 A0 ) 1.00 510.
7 CARP-1 FASTEN 3 NAILS AT PLFM1 16 STRIKES USING HAMMER-1 ASIDE TO
   CARP-1 F 2
   A1 B0 G1 A0 B0 (P0 A1 F32 )A1 B0 P1 A0 (3) 2.00 2060.
8 CARP-2 FASTEN 3 NAILS AT PLFM2 16 STRIKES USING HAMMER-2 ASIDE TO
   CARP-2 F 2
   A1 B0 G1 A0 B0 (P0 A1 F32 )A1 B0 P1 A0 (3) 2.00 2060.

TOTAL THU 6830.
DATA SYNTHESIS AND BACK-UP

9. HOOK-UP AND UNHOOK TORCH ON MANIFOLD WITH WRENCH AT SHIP
PER EA OFG: 1 31-JUL-81
* TORCH AND HOSE LOCATED AT MANIFOLD
* UNHOOK IS THE REVERSE OF HOOKUP
CARP4 BEGINS AT HOOK-UP

1 FASTEN HOSE TO MANIFOLD 4 SPINS USING FINGERS
   A1 B0 G1 A1 B0 P1 F10 A0 B0 P0 A0 1.00 140.
2 FASTEN HOSE TO MANIFOLD 2 WRIST-STROKES USING WRENCH4 AND ASIDE
   A1 B0 G1 A1 B0 P3 F6 A1 B0 P1 A0 1.00 140.

TOTAL TMU 280.

10. IGNITE AND EXTINGUISH TORCH FOR BURNING WITH HAND AT TANK
PER EA OFG: 1 03-AUG-81
* HOOK-UP NOT INCLUDED
FITTER BEGINS AT JOB

1 LOOSEN 2 KNOBS ON TORCH AT JOB CLOSE 1 SPIN USING FINGERS
   A1 B0 G1 A0 BO (P1 L1 )A0 B0 P0 A0 (2) 1.00 60.
2 PRESS STRIKER AT TORCH FOR IGNITING AND CLEAR
   A1 B0 G1 M3 X0 I0 A0 1.00 50.
3 PULL GOGGLES AT SELF OVER EYES
   A1 B0 G1 M1 X0 I0 A0 1.00 30.
4 TURN KNOB AT TORCH AND ADJUST FLAME F 3
   A1 B0 G1 M3 X0 I6 A0 3.00 330.
5 HOLD+PLACE TORCH ON TO JOB WITH BEND
   A0 B0 GO A1 B6 P3 A0 1.00 100.
6 FASTEN 2 KNOBS AT TORCH CLOSE 1 SPIN USING FINGERS
   A1 B0 G1 A0 BO (P1 F1 )A0 B0 P0 A0 (2) 1.00 60.
7 PULL GOGGLES AT SELF OFF EYES
   A1 B0 G1 M1 X0 I0 A0 1.00 30.

TOTAL TMU 660.
DATA SYNTHESIS AND BACK-UP

582. TEAR DOWN STAGING PLANK FOR TANK STAGING PLATFORM WITH (PRYBAR) AND HAND AT MID TANKS AND VOIDS CARPENTER.
PER STAGING PLANK OGF: 4 31-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS REMOVING BOARDS FROM BELOW
* THE MAIN DECK. BOARDS ARE CONNECTED
* TO THE TANK STAGING PLATFORM AND THE
* EXISTING PERIMETER STAGING BY NAILS.
* 2 MAN OPERATION: (WORKING SIMULTANEOUSLY)
* CARPENTERS LOOSEN THE NAILS ON EACH
* END OF THE BOARD, THEN PICK UP THE
* BOARD AND PLACE IT ON A FILE ON THE
* TANK STAGING PLATFORM.

CARP-1 BEGINS AT STAR-BHD

1 CARP-1 PUSH AND LOCATE PRYBAR WITH 1 STEP AT STAR-BHD ( UNDER BOA )
   A3 B0 G1 M1 X0 I1 A0 1.00 60.
2 CARP-1 LOOSEN 3 NAILS AT STAR-BHD 3 ARM-STROKES USING PRYBAR AND ASIDE TO STAR-BHD
   A1 B0 G1 A0 B0 (P3 A1 L16 )A1 B0 P1 A0 (3) 1.00 640.
3 CARP-1 LOOSEN BOARD WITH BEND AT STAR-BHD 3 ARM-STROKES USING HAN
   A1 B6 G1 A1 B0 P1 L16 A0 B0 P0 A0 1.00 260.
4 CARP-1 GET+MANIPULATE WITH BEND BOARD AT PLATFORM AND ADJUST RETU
   TO STAR-BHD
   A16 B6 G3 M10 X0 I6 A16 1.00 570.

TOTAL THU 1530.
DATA SYNTHESIS AND BACK-UP

583. TEAR DOWN STAGING PLANK FOR (BETWEEN) TANK STAGING PLATFORM WITH (PRYBAR) AND HAND AT MID TANKS AND VOIDS CARPENTER
PER STAGING PLANK OFG: 4 31-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS REMOVING BOARDS FROM BETWEEN
* ...THE TWO TANK STAGING PLATFORMS. THE
* ...BOARDS ARE CONNECTED TO THE PLATFORMS
* ...BY NAILS.
* 2 MAN OPERATION:(WORKING SIMULTANEOUSLY)
* ...CARPENTERS LOOSEN THE NAILS ON EACH
* ...END OF THE BOARD, THEN PICK UP THE.
* ...BOARD AND PLACE IT ON A PILE ON ONE
* ...OF THE TANK STAGING PLATFORMS.
CARP-1 BEGINS AT PLFM1

1 CARP-1 PUSH AND LOCATE PRYBAR WITH 1 STEP AT PLFM1 (UNDER BOARD )
A3 B0 G1 M1 X0 I1 A0 1.00 60.

2 CARP-1 LOOSEN 3 NAILS AT PLFM1 3 ARM-STROKES USING PRYBAR AND ASIDE TO PLFM1
A1 B0 G1 A0 B0 (P3 A1 L16 )A1 B0 P1 A0 (3) 1.00 640.

3 CARP-1 LOOSEN BOARD WITH BEND AT PLFM1 3 ARM-STROKES USING HANDS
A1 B6 G1 A1 B0 P1 L16 A0 B0 P0 A0 1.00 260.

4 CARP-1 GET+MANIPULATE WITH BEND BOARD AT PLFM2 AND ADJUST RETURN TO PLFM1
A32 B6 G3 H10 X0 I6 A32 1.00 890.

TOTAL TMU 1850.
DATA SYNTHESIS AND BACK-UP

584. TEAR DOWN STAGING BRACKETS ON TANK STAGING PLATFORM WITH WRENCH AT MTANKS AND VOIDS CARPENTER
PER CENTER TANK OGF: 4 31-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF BRACKETS ON 2 TANK.
* ...STAGING PLATFORMS. ALSO REMOVAL OF
* ...BOARDS THAT ARE SPREAD BETWEEN THE
* ...BRACKETS.
* 2 CARPENTERS WORKING SIMULTANEOUSLY EACH
* ...WORNING ON A DIFFERENT PLATFORM.
* STEPS:
* 1 REPRESENTS REMOVAL OF BOARDS BETWEEN
* ...BR-1 AND BR-2; BR-2 AND BR-3
* 2-5 REPRESENTS REMOVAL OF BRACKETS FROM
* ...BR-1, BR-2 AND BR-3. BRACKETS ARE
* ...PLACED ON A PILE ON THE PLATFORM.
CARP-1 BEGINS AT BR-1

1 CARP-1 GET+MANEUVER WITH BEND BOARD AT PLFM1 AND ADJUST RETURN TO BR-1 F 6
   A10 B6 G3 M10 X0 I6 A10 B6 6.00 3060.
2 CARP-1 LOOSEN NUT AT BR-1 1 ARM-STROKE USING WRENCH-1 AND HOLD F
   A1 B0 G1 A1 B0 F3 L3 A0 B0 P0 A0 3.00 270.
3 CARP-1 HOLD+LOOSEN NUT AT BR-1 13 WRIST-TURNS USING WRENCH-1 ASID
   TO CARP-1 F 3
   A0 B0 G0 A1 B0 P3 L24 A1 B0 P1 A0 3.00 900.
4 CARP-1 GET+PLACE WITH BEND BRKT FROM BR-1 TO PLFM1 WITH BEND RETU
   TO BR-1 WITHOUT BEND F 3
   A1 B6 G3 A10 B6 P3 A10 3.00 1170.
5 CARP-1 GET+PLACE NUT AND BOLT FROM CARP-1 TO TOOLBOX-1 F 3
   A1 B0 G3 A1 B0 P3 A0 3.00 240.

TOTAL TMU 5640.
5.2 SYNTHESIS AND ANALYSIS

435. WELD STAGING BRACKET (CLIP) ON BULKHEAD (OR ANY STRUCTURE) WITH STICK ELECTRODE AT ANY TANKS AND VOIDS (SHIP) WELDING
PER 100 CLIPS OGF: 3
WELD TO MEET SAFETY REQUIREMENTS. RATE PER 100 CLIPS. RATE INCLUDES MANUAL ELEMENTS.

1 WELD VERTICAL 3/8" FILLET WELD (10" PER CLIP) WITH 10% OVERWELD USING 6011 3/16 ELECTRODE OR COMPARABLE (7018 5/32).

TOTAL TMU 1063356.

438. WELD LADDER (CLIP) (SECURES LADDER) ON BULKHEAD (OR ANY STRUCTURE) WITH STICK ELECTRODE AT ANY TANKS AND VOIDS (SHIP) WELDING
PER 100 LADDERS OR 400 CLIPS OGF: 3
WELD TO MEET SAFETY REQUIREMENTS. RATE PER 100 LADDERS (400 CLIPS).
RATE INCLUDES MANUAL ELEMENTS.

1 WELD VERTICAL 3/8" FILLET WELD (4" PER CLIP) WITH 10% OVERWELD USING 6011 3/16 ELECTRODE OR COMPARABLE (7018 5/32).

TOTAL TMU 1701606.

440. WELD HANDRAIL (CONNECTIONS) ON STANCHION WITH STICK ELECTRODE AT ANY TANKS AND VOIDS (SHIP) WELDING
PER 100 PIECES OF HANDRAIL OGF: 3
WELD TO MEET SAFETY REQUIREMENTS. RATE PER 100 PIECES OF AHNDRAIL (AVG. 1 CONNECTION EACH). RATE INCLUDES MANUAL ELEMENTS.

1 WELD HORIZONTAL 1/4" FILLET WELD (5" PER CONNECTION) USING 6011 3/16 ELECTRODE OR COMPARABLE (7018 5/32).

TOTAL TMU 196090.
DATA SYNTHESIS AND BACK-UP

516. TRANSPORT AERIAL PLATFORM FOR SIDE SHELL (STAGING) WITH (CRANE) AT ANY WAY CARPENTER
PER AERIAL-PLATFORM OFG: 4 18-MAR-82
* REPRESENTS ELAPSED TIME
* ...WAY TO A SECTION OF SIDE SHELL
C-OPER BEGINS AT CR-1

1 C-OPER TRANSPORT PLATFORM FROM P-REST USING CRANE WITH 2-HOOK+SLING TO AERIAL-PLATFORM POSITION+MANEUVER PF 2 (3)
A1 T32 (K32) TIOP24 TO AO (2) 1.00 13100.

TOTAL TMU 13100.

521. (CLIMB UP AND DOWN) MOVE OPERATOR (ON LADDER) ON SIDE SHELL AT ANY WAY CARPENTER
PER LADDER OFG: 4 17-MAR-82
* REPRESENTS ELAPSED TIME
* ...DOWN LADDER TO GET ON AND OFF
* ...STAGING AT OUTSIDE SIDE SHELL
* CARPENTERS ARE WORKING ON AN AERIAL
CARP-1 BEGINS AT BRKT-1

1 CARP-1 SLIDE (CLIMB-UP) LADDER AT BRKT-1 (12 RUNGS) PF 12 (.1 PF 12 (3 4)
(A1) B16(G1 M1) X0 I0 AO (12) 1.00 760.
2 CARP-1 PULL (CLIMB-DOWN) LADDER AT BRKT-1 (12 RUNGS) PF 12 (.1 PF 12 (3 4)
(A1) B16(G1 M1) X0 I0 AO (12) 1.00 520.

TOTAL TMU 1280.
DATA SYNTHESIS AND BACK-UP

529. TRANSPORT AERIAL PLATFORM FOR SIDE SHELL (STAGING) WITH CRANE AT ANY WAY CARPENTER

PER AERIAL PLATFORM OFG: 4 18-MAR-82

* REPRESENTS ELAPSED TIME
* ...FROM A SECTION OF THE SIDE SHELL
* ...TO A WAY.

C-OPER BEGINS AT CR-1

1 C-OPER TRANSPORT PLATFORM FROM AERIAL-PLATFORM USING CRANE TO P-REST POSITION+MANEUVER RETURN TO CR-1

A1 T32 KO T10 P24 T32 40 1 00 9900.

TOTAL TMU 9900.

580. LOAD (STAGING MATERIAL) ON AERIAL PLATFORM WITH (CRANE) AT ANY PLATEN CARPENTER

PER AERIAL PLATFORM OFG: 4 27-MAY-83

* REPRESENTS SPREADING MATERIAL ON AN AERIAL PLATFORM
* AERIAL PLATFORM CAN HOLD ENOUGH STAGING
* ...MATERIAL FOR 3 LEVELS OF STAGING:
* ...5 BRACKETS PER LEVEL.
* TOTAL MATERIAL:
* MATL QUANTITY
  * BRKTS 15
  * STANS 15
  * BOARDS 36
  * HANDRAIL 24
  * LADDERS 5

CARP-1 BEGINS AT P-REST

1 CARP-1 GET+PLACE 15 BRKTS FROM BIN-1 TO BIN-1 (PILE UP BRKTS) PF 15 (2 3 4 5 6)

A32 (B6 G3 A1 BO P3 )AO (15) 1.00 2270.

2 C-OPER TRANSPORT 15 BRKTS FROM BIN-1 USING CRANE WITH HOOK+SLING TO P-REST PLACE+ADJUST RETURN TO BIN-2

A1 T16 K24 T6 P3 T6 AO 1.00 5600.

3 CARP-1 GET+PLACE 15 STANS FROM BIN-2 TO BIN-2 AND RETURN TO BIT-PILE WITHOUT BEND PF 15 (2 3 4 5 6)

A16 (B6 G3 A1 BO P3 )A16 1.00 2270.

4 C-OPER TRANSPORT 15 STANS FROM BIN-2 USING CRANE WITH HOOK+SLING TO P-REST PLACE+ADJUST RETURN TO BD-PILE

A1 T3 K24 T6 P3 T6 AO 1.00 4300.

5 CARP-1 GET+SLIDE WITH BEND 36 ROARDS FROM BD-PILE TO BD-PILE WITH 8
DATA SYNTHESIS AND BACK-UP

STEPS AND ADJUST (ON BOLSTERS) PF 2 (2 3 4 5 6) F 36
A1 (B6 G3 M3 XO 16) A16 (2) 36.00 19080.

6 C-OPER TRANSPORT 36 BOARDS FROM BD-PILE USING CRANE WITH
  2-HOOK+SLING TO P-REST PLACE+MANEUVER RETURN TO HR-PILE
  A1 T3 K32 T6 P16 T6 AO 1.00 6400.

7 CARP-1 GET+SLIDE 24 HANDRAIL AT HR-PILE AND ADJUST (ON BOLSTERS)
  AND RETURN TO LDR-PILE WITHOUT BEND PF 24 (2 3 4 5 6)
  A16 (B6 G3 M3 XO 16) A16 1.00 4640.

8 C-OPER TRANSPORT 24 HANDRAIL FROM HR-PILE USING CRANE WITH
  2-HOOK+SLING TO P-REST PLACE+ADJUST RETURN TO LDR-PILE
  A1 T3 K32 T6 P3 T6 AO 1.00 5100.

9 CARP-1 GET+SLIDE WITH BEND 5 LADRS FROM LDR-PILE TO LDR-PILE WITH 5
  STEPS AND ADJUST (ON BOLSTERS) PF 2 (2 3 4 5 6) F 5
  A1 (B6 G3 M3 XO 16) A16 (2) 5.00 2350.

10 C-OPER TRANSPORT 5 LADRS FROM LDR-PILE USING CRANE WITH 2
    HOOK+SLING TOP-REST PLACE+MANEUVER RETURN TO CR-1
    A1 T3 K32 T10 P16 T16 AO 1.00 7800.

11 CARP-1 GET+PLACE TOOL BOX-1 FROM BIN-1 TO P-REST WITH B
    END+CLIMB-STEP
    A54 B6 G3 A32 B16 P3 AO 1.00 1140.

12 CARP-1 GET+PLACE TOOL BOX-2 FROM BIN-2 TO P-REST WITH B
    END+CLIMB-STEP
    A32 B6 G3 A32 B16 P3 AO 1.00 920.

TOTAL TMU 61870.
581. UNLOAD (STAGING MATERIAL) ON AERIAL PLATFORM WITH (CRANE) AT ANY PLATEN
CARPENTER
PER AERIAL PLATFORM OFG: 4 27-MAY-83
REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF MATERIAL FROM AN
* AERIAL PLATFORM
* AERIAL PLATFORM CAN HOLD ENOUGH STAGING
* MATERIAL FOR 3 LEVELS OF STAGING:
* 5 BRACKETS PER LEVEL.
* TOTAL MATERIAL:
* MATL QUANTITY
* BRKTS 15
* STANS 15
* BOARDS 36
* HANDRAIL 24
* LADDERS 5
C-OPER BEGINS AT CR-1

1 C-OPER TRANSPORT 15 BRKTS FROM P-REST USING CRANE WITH HOOK+SLING TO
BIN-1 PLACE+ADJUST RETURN TO P-REST
A1 T16 K24 T6 P3 T6 AO 1.00 5600.

2 CARP-1 GET+PLACE 15 BRKTS FROM BIN-1 TO BIN-1 (PUT INTO BIN) PF 15
(2 3 4 5 6)
A32 (B6 G3 A1 BO P3 )AO (15) 1.00 2270.

3 C-OPER TRANSPORT 15 STANS FROM P-REST USING CRANE WITH HOOK+SLING TO
BIN-2 PLACE+ADJUST RETURN TO P-REST
A1 T3 K24 T6 P3 T6 AO 1.00 4300.

4 CARP-1 GET+PLACE 15 STANS FROM BIN-2 TO BIN-2 (PUT INTO BIN)
RETURN TO BD-PILE WITHOUT BEND PF 15 (2 3 4 5 6)
A16 (B6 G3 A1 BO P3 )A16 1.00 2270.

5 C-OPER TRANSPORT 36 BOARDS FROM P-REST USING CRANE WITH 2-HOOK+SLING
TO BD-PILE PLACE+MANEUVER (ONTO BOLSTERS) RETURN TO P-REST
A1 T3 K32 T6 P16 T6 AO 1.00 6400.

6 CARP-1 GET+SLIDE WITH BEND 36 BOARDS FROM BD-PILE TO BD-PILE WITH 8
STEPS AND ADJUST (ONTO PILE) PF 2 (2 3 4 5 6) F 36
A16 (B6 G3 M3 XO I6 )A16 (2) 36.00 19080,

7 C-OPER TRANSPORT 24 HANDRAIL FROM P-REST USING CRANE WITH
2-HOOK+SLING TO HR-PILE PLACE+ADJUST RETURN TO P-REST
A1 T3 K32 T6 P3 T6 AO 1.00 5100.

8 CARP-1 GET+SLIDE 24 HANDRAIL AT HR-PILE AND ADJUST (ON PILE)
RETURN TO LDR-PILE WITHOUT BEND PF 24 (2 3 4 5 6)
A16 (B6 G3 M3 XO 16 )A16 1.00 4640.

9 C-OPER TRANSPORT 5 LADRS FROM P-REST USING CRANE WITH 2-HOOK+SLING
TO LDR-PILE PLACE+MANEUVER (ONTO BOLSTERS) RETURN TO CR-1
A1 T3 K32 T10 P16 T10 AO 1.00 7200.

10 CARP-1 GET+SLIDE WITH BEND 5 LADRS FROM LDR-PILE TO LDR-PILE WITH 5
STEPS AND ADJUST (ONTO PILE) PF 2 (2 3 4 5 6) F 5
### DATA SYNTHESIS AND BACK-UP

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<tr>
<th>A1 (B6 G3 M3 XO I6 )A10 (2)</th>
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<td>11 CARP-1 GET+PLACE WITH BEND+CLIMB-STEP TOOLBOX1 FROM P-REST TO BI</td>
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**TOTAL TMU** 61150.

### 132. COMBINED SUB-OP

**HOOK-UP/UNHOOK AND IGNITE/EXTINGUISH TORCH FOR BURNING WITH HAND AT TANK CARPENTER**

- CREW SIZE = 6 (3 CARPS ABOVE DECK AND 3 BELOW). RATE IN ELAPSED TIME.

- PER 8-HR SHIFT AND (1) CUT OFG: 4 20-NOV-81

- * THE FOLLOWING IS INCLUDED IN THIS SUBOP:
  - --2 HOOK-UPS AND 2 UNHOOKS PER (1)....
  - ...8-HR SHIFT
  - --(1) OCCURRENCE FOR IGNITE AND ........
  - ...EXTINGUISH TORCH
  - --TO DETERMINE THE FREQ OF THE SUB-OP ...
  - ...FRO NUMBER OF CUTS >1, USE THE ......

- * FORMULA: FREQ = 1+ [(N-1) X . 231 ....
  - ....WHERE ‘N’ = THE NUMBER OF CUTS(BURNS)

| TOTAL TMU 2900.0 |

**Combined sub-operation elements**  Free.  TM

### 9. HOOK-UP AND UNHOOK TORCH ON MANIFOLD WITH WRENCH AT SHIP

| 8.00 | 2240 |

### 10. IGNITE AND EXTINGUISH TORCH FOR BURNING WITH HAND AT TANK

| 1.00 | 660 |

**Total TMU** 2900
517. SET-UP (STAGING CLIP) ON SIDE SHELL WITH HAMMER AT ANY WAY CARPENTER
PER STAGING CLIP OFG: 3 16-MAR-82
* REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING UP A STAGING CLIP ON
* THE SIDE SHELL.
* CARPENTERS ARE WORKING FROM AN AERIAL
* PLATFORM.
* WELDING OF THE CLIP IS DONE IN A
* SEPARATE SUB OPERATION.
Carp-1 begins at Brkt-2

1 CARP-1 MEASURE AT BRKT-1 USING STEEL-TAPE-1 ASIDE TO CARP-1
   A1 BO G1 A10 BO P1 M32 A1 BO P1 AO 1.00 470.
2 CARP-1 LOOSEN PAINT ON SIDE SHELL AT BRKT-1 4 STRIKES USING HAMMER-1
   ASIDE TO CARP-1
   A1 BO G1 A1 BO PO L10 A1 BO P1 AO 1.00 150.
3 CARP-1 GET+PLACE SCLIP FROM TOOLBOX-2 TO BRKT-1 ( TACKING UPON
   PLACEMENT )
   A10 B6 G3 A10 BO P3 AO 1.00 320.

TOTAL TMU 940.

518. SET-UP STAGING BRACKET ON SIDE SHELL WITH WRENCH AT ANY WAY CARPENTER
PER STAGING BRACKET OFG: 3 16-MAR-82
* REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING UP A BRACKET ON THE
* SIDE SHELL.
* CARPENTERS ARE WORKING FROM AN AERIAL
* PLATFORM.
Carp-1 begins at Brkt-1

1 CARP-1 GET+PICKUP NUT AND BOLT FROM TOOLBOX-1 TO SELF ( IN POCKET )
   A16 B6 G3 A1 BO PO AO 1.00 260.
2 CARP-1 GET+PLACE WITH BEND BRKT FROM BIN-1 TO BRKT-1
   A1 B6 G3 A16 BO P3 AO 1000 290.
3 CARP-1 PLACE BOLT FROM CARP-1 TO BRKT-1 AND INSERT
   A1 BO G1 A1 BO P3 A1 1.00 70.
4 CARP-1 FASTEN NUT AT BRKT-1 13 WRIST-TURNS USING HANDS
   A1 BO G1 A1 BO P1 F24 AO BO PO AO 1.00 280.
5 CARP-1 FASTEN NUT AT BRKT-1 4 ARM-STROKES USING WRENCH-1 ASIDE TO
   CARP-1
   A1 BO G1 A1 BO P3 F24 A1 BO P1 AO 1.00 320.

TOTAL TMU 1220.
519. SET-UP STAGING PLANK FOR SIDE SHELL WITH HAND AT ANY WAY CARPENTER PER STAGING PLANK OFG: 3 17-MAR-82 
REPRESENTS ELAPSED TIME 
* REPRESENTS SETTING BOARDS UP BETWEEN TUNK 
* ...STAGING BRACKETS. 
* CARPENTERS ARE WORKING ON AN AREIAL 
* ...PLATFORM AND THEY ARE WORKING 
* ...SINTULTENEWORKING. 
CARP-3 BEGINS AT BIN-1

1 CARP-3 GET+SLIDE BOARDS FROM BD-PILE TO BD-PILE UITH 8 STEPS ( O| BOLSTERS ) AND ADJUST 
A10 B6 G3 H3 XO 14 A16 1.00 440. 
2 CARP-1 AND CARP 2 GET+MANEUVER BOARDS FROM BD-PILE TO BRKT-1 SPANNING BRKT2 AND ALIGN 
A24 B6 G3 M10 XO 110 A24 1.00 770. 

TOTAL TMU 1210.

520. SET-UP (ACCESS) LADDER ON SIDE SHELL WITH HAND AT ANY WAY CARPENTER PER ACCESS LADDER OFG: 3 17-MAR-82 
REPRESENTS ELAPSED TIME 
* REPRESENTS SETTING UP A LADDER ON THE 
* ...SIDE SHELL. 
* CARPENTERS ARE WORKING ON AN AERIAL 
* ...PLATFORMS BUT ARE NOT WORKING 
* ...SIMULTANEOUSLY. 
* WELDING DONE IN A SEPERATE 
* ...SUB OPERATION. 
CARP-3 BEGINS AT BD-PILE

1 CARP-3 GET+SLIDE LDR FROM LDR-PILE TO LIIR-PILE WITH 5 STEPS ( O| BOLSTERS ) AND ADJUST 
A10 B6 G3 M3 XO 14 A16 1.00 380. 
2 CARP-1 GET+PLACE LADR FROM LDR-PILE To BRKT-1 
A24 B6 G3 A24 Bo P3 Ao 1.00 600. 
3 CARP-2 LOOSEN 4 PAINT ON SIDE SHELL AT BRKT-1 4 STRIKES USING HAMMER-2 ASIDE TO CARP-2 
A1 BO G1 A10 BO (PO A1 L1O )A1 BO P1 AO (4) 1.00 580. 
4 CARP-2 GET+PLACE 4 LCLIPS FROM TOOLBOX-2 TO RRKT-1 ( TACKING UPON PLACEMENT ) PF 4 ( 6 ) 
A10 B& G3 A10 BO (P3 )AO (4) 1.00 410. 

TOTAL TMU 1970.
DATA SYNTHESIS AND BACK-UP

522. SET-UP STANCHION FOR SIDE SHELL WITH HAND AT ANY DAY CARPENTER
PER STANCHION OFF3: 3 17-MAR-82
- REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING STANCHION IN STAGING
* e. BRACKETS,
* TWO CARPENTERS ARE ON THE STAGING, ONE
* ... REMAINS ON THE AERIAL PLATFORM.
CARP-3 BEGINS AT LDR-PILE

1 CARP-3 GET+PLACE STAN FROM BIN-2 TO BRKT-1
   A24 B6 G3 A10 BO P3 A0 1.00 460.
2 CARP-1 GET+PLACE WITH BEND STAN FROM BRKT-1 TO BRKT-1 AND INSERT
   A1 B6 G3 A1 BO P3 A1 1.00 150.

TOTAL TMU 610.

523. SET-UP HANDRAIL FOR SIDE SHELL WITH HAND AT ANY WAY CARPENTER
PER HANDRAIL OFG: 3 17-MAR-82
- REPRESENTS ELAPSED TIME
* REPRESENTS PUTTING UP HANDRAIL AT THE
* ... SIDE SHELL.
* TWO CARPENTERS ARE ON THE STAGING, ONE
* ... REMAINS ON THE AERIAL PLATFORM.
* WELDING IS DONE IN A SEPERATE SUB
* ... OPERATION,
CARP-3 BEGINS AT BIN-2

1 CARP-3 GET+SLIDE HANDRAIL FROM HR-PILE TO CARP-1
   A24 B6 G3 M3 X0 I0 A24 1.00 60 00.1
2 CARP-1 GET+SLIDE HANDRAIL FROM BRKT-1 TO BRKT-2 AND ALIGN (THRU 2
   STANCHION SLEEVES ) PF 2 ( 4 5 6 )
   A1 BO G3 (H3 XO 110 )A10 (2) 1.00 400.

TOTAL TMU 1000.
524. TEAR DOWN HANDRAIL ON SIDE SHELL WITH TORCH AT ANY WAY CARPENTER
   PER HANDRAIL OFG: 2 18-MAR-82
   * REPRESENTS ELAPSED TIME
   * REPRESENTS TEARING DOWN HANDRAIL ON THE
   * ... SIDE SHELL.
   * TWO CARPENTERS ARE ON THE STAGING, ONE
   * ... REMAINS ON THE AERIAL PLATFORM.
   * THE CARPENTERS ARE NOT WORKING
   * ... SIMULTANEOUSLY.
CARP-1 BEGINS AT BRKT-2

1 CARP-1 GET+PULL TORCH FROM BRKT-2 TO BRKT-1
   A1 B0 G3 HI X0 I0 A10 1.00 150.
2 CARP-1 OPERATE TORCH AT BRKT-1 PTIME .26 M ( BURN OFF HANDRAIL )
   A1 B0 G1 M6 X42 I0 A0 1.00 500.
3 CARP-2 GET+SLIDE HANDRAIL FROM BRKT-2 TO CARP-2
   A1 B0 G3 M3 X0 I0 A1 1.00 80.
4 CARP-2 HOLD+MOVE HANDRAIL FROM CARP-2 TO CARP-3
   A0 B0 G0 A24 B6 P1 A0 1.00 310.
5 CARP-3 GET+PLACE HANDRAIL FROM BRKT-2 TO HR-PILE
   A24 B0 G3 A16 B6 P3 A0 1.00 520.

   TOTAL TMU 1560.

525. TEAR DOWN STANCHION FOR SIDE SHELL WITH HAND AT ANY WAY CARPENTER
   PER STANCHION OFG: 3 18-MAR-82
   * REPRESENTS ELAPSED TIME
   * REPRESENTS REMOVAL OF STANCHION FROM
   * ... SIDE SHELL.
   * TWO CARPENTERS ARE ON THE STAGING, ONE
   * ... REMAINS ON AERIAL PLATFORM.
   * THE CARPENTERS DO NOT WORK
   * ... SIMULTANEOUSLY.
CARP-3 BEGINS AT BRKT-1

1 CARP-1 LOOSEN STAN AT BRKT-1 4 ARM-STROKES USING HANDS
   A1 B0 G1 A1 B0 P1 L24 A0 B0 P0 A0 1.00 280.
2 CARP-1 HOLD+MOVE STAN FROM CARP-1 TO CARP-3
   A0 B0 GO A1 B0 P1 A0 1.00 20.
3 CARP-3 GET+PLACE STAN FROM BRKT-1 TO BIN-2
   A1 B0 G3 A10 B6 P3 A0 1.00 230.

   TOTAL TMU 530.
DATA SYNTHESIS AND BACK-UP

526. TEAR DOWN STAGING PLANK FOR SIDE SHELL WITH HAND AT ANY WAY CARPENTER
PER STAGING PLANK OFG: 3 18-MAR-82
* REPRESENTS ELAPSED TIME
* . . . SIDE SHELL.
* CARPENTERS ARE WORKING ON AN AERIAL
* . . . PLATFORM.
* THE CARPENTERS ARE WORKING
* . . . SIMULTANEOUSLY.
CARP-1 BEGINS AT BRKT-1

1 CARP-1 AND CARP 2 GET+MANIPULATE BOARD FROM BRKT-1 ( CARP 2 AT. BRKT2 ) TO BD-PILE
A1 B0 G3 M10 X0 I0 A24 B6 1.00 440.

TOTAL TMU 440.

527. TEAR DOWN (ACCESS) LADDER ON SIDE SHELL WITH TORCH AT ANY WAY CARPENTER
PER LADDER OFG: 2 18-MAR-82
* REPRESENTS REMOVAL OF LADDER FROM SIDE
* . . . SHELL.
* CARPENTERS ARE WORKING ON AN AERIAL
* . . . PLATFORM.
* THE CARPENTERS ARE NOT WORKING
* . . . SIMULTANEOUSLY.
CARP-1 BEGINS AT BRKT-2

1 CARP-1 GET+PULL TORCH FROM BRKT-2 70 BRKT-1
A1 B0 G3 M1 X0 I0 A10 1.00 150.
2 CARP-1 OPERATE TORCH AT BRKT-1 PTIME 0.47 M( BURN OFF 4 CLIPS ) F 4
A1 B0 G1 M6 X81 I0 A0 4.00 3560.
3 CARP-1 GET+PLACE 4 LCLIPS FROM BRKT-1 TO TOOLBOX-2 PF 4 ( 1 2 3 )
(A1 B0 G3 )A1OB6 P3 A0 (4) 1.00 350.1
4 CARP-2 GET+POSITION LADR FROM BRKT-1 TO LDR-PILE
A10 B0 G3 A24 B6 P6 A0 1.00 490.

TOTAL TMU 4550.
DATA SYNTHESIS AND BACK-UP

528. TEAR DOWN STAGING BRACKET ON SIDE SHELL WITH WRENCH AT ANY WAY CARPENTER
PER STAGING BRACKET OFG: 3 18-MAR-82
REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF BRACKETS
* . . . FROM SIDE SHELL.
* CARPENTERS ARE WORKING ON AN
* . . . AERIAL PLATFORM.
CARP-1 BEGINS AT BRKT-1

1 CARP-1 LOOSEN NUT AT BRKT-1 1 ARM-STROKE USING WRENCH-1 AND HOLD
A1 B0 G1 A1 B0 P3 L3 A0 B0 P0 A0 1.00  90.
2 CARP-1 HOLD+LOOSEN NUT AT BRKT-1 13 WRIST-STROKES USING WRENCH-1
ASIDE TO CARP-1
A0 R0 G0 A1 B0 P3 L42 A1 B0 P1 A0 1.00  480.
3 CARP-1 GET+REMOVE BOLT FROM BRKT-1 TO CARP-1
A1 B0 63 A1 B0 P1 A0 1.00  60.
4 CARP-1 PLACE NUT AND BOLT FROM BRKT-1 TO TOOLBOX-1
A1 B0 G1 A16 B6 P3 A0 1.00  270.

TOTAL TMU 900.

530. TEAR DOWN (STAGING CLIP) ON SIDE SHELL WITH TORCH AT ANY WAY CARPENTER
PER STAGING CLIP OFG: 3 18-MAR-82
REPRESENTS ELAPSED TIME
* REPRESENTS REMOVING STAGING CLIPS FROM
* . . . THE SIDE SHELL.
* CARPENTERS ARE WORKING ON AN AERIAL
* . . . PLATFORM.
CARP-1 BEGINS AT BRKT-2

1 CARP-1 GET+PULL TORCH FROM BRKT-2 TO BRKT-1
A1 B0 G3 M1 X0 I0 A10 1.00  150.
2 CARP-1 OPERATE TORCH AT BRKT-1 PTIME .55 M ( BURN OFF STAGING CLIP
A1 B0 G1 M6 X96 I0 A 1*00  1040.
3 CARP-1 GET+PLACE SCLIP FROM BRKT-1 TO TOOLBOX-2
A1 B0 G3 A10 B6 P3 A0 1.00  230.

TOTAL TMU 1420.

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DATA SYNTHESIS AND BACK-UP

530. TEAR DOWN (STAGING CLIP) ON SIDE SHELL WITH TORCH AT ANY WAY CARPENTER
PER STAGING CLIP OFG: 3 18-MAR-82
  REPRESENTS ELAPSED TIME
  * REPRESENTS REMOVING STAGING CLIPS FROM
  * . . . THE SIDE SHELL,
  * CARPENTERS ARE WORKING ON AN AERIAL
  * . . . PLATFORM.
CARP-1 BEGINS AT BRKT-2

TOTAL TMU  1420.
5.2 SYNTHESIS AND ANALYSIS

446. WELD HANDRAIL (CONNECTIONS) ON STANCHION WITH STICK ELECTRONE AT ANY PLATEN (SHOP) WELDING
PER 100 PIECES OF HANDRAIL OFG: 3
WELD TO MEET SAFETY REQUIREMENTS. RATE PER 100 PIECES OF HANDRAIL (AVG, 1 CONNECTION EACH). RATE INCLUDES MANUAL ELEMENTS.

1 WELD HORIZONTAL 1/4' FILLET WELD (5' PER CONNECTION) USING 6011 3/8 ELECTRODE (OR COMPARABLE (7018 5/32).

TOTAL TMU 186012.

454. (CLIMB UP AND DOWN) MOVE OPERATOR (ON PIPE STAGING) FOR SIDE SHELL AT ANY WAYS CARPENTER
PER PIPE STAGING SECTION (16' LONG) OFG: 3 11-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS CARPENTER CLIMBING UP AND
* . . . DOWN END PIECE OF PIPE STAGING.
* AVERAGE NUMBER OF STEPS NEEDED = 6.
CARP-1 BEGINS AT END-PC-1

1 CARP-1 SLIDE (CLIMB-UP) LADDER (END PIECE) AT END-PC-1 (6 STEPS, ) PF 6 (1) PF 6 (3 4 )
(A1 )B16(G1 M3 )X0 10 AO (6) 1.00 460.
2 CARP-1 PULL (CLIMB-DOWN) LADDER (END PIECE) AT END-PC-1 (6 STEPS.) PF6 (1) PF 6 (3 4)
(A1 )B16(G1 M1 )X0 10 AO (6) 1.00 340.

TOTAL TMU 800.
DATA SYNTHESIS AND BACK-UP

456. TRANSPORT STAGING PLANK FOR PIPE STAGING (AT SIDE SHELL) WITH (TOWER CRANE) AT ANY WAYS CARPENTER
PER STAGING PLANK OFG: 3 11-FEB-82
* REPRESENTS ELAPSED TIME
* . . . BD-PILE TO SIDE SHELL.
* . . . DISTANCES FROM CRANE-REST TO BD-PILE AND
* . . . FROM RD-PILE TO SIDE SHELL ARE
* . . . AVERAGE DISTANCES FROM WAY 740'X120'
* MAXIMUM NUMBER OF BOARDS IN LIFT = 4
C-OPER BEGINS AT CR-1

1 TRANSPORT BOARD FROM BD-PILE USING CRANE WITH HOOK+SLING TO
SIDE-SHELL ( ON PIPE STAGING SECTION ( 16' LONG ) ) PLACE+MANEUVER
RETURN TO CR-1 F 1 / 4
A1 T42 K24 T6 P16 T42 A0 0.25 3275.

TOTAL TMU 3275.

459. TRANSPORT STANCHION FOR PIPE STAGING (AT SIDE SHELL) WITH (TOWER CRANE) AT ANY WAYS CARPENTER
PER STANCHION OFG: 3 12-FEB-82
* REPRESENTS ELAPSED TIME.
* . . . BIN-2 TO SIDE SHELL.
* DISTANCES FROM CRANE-REST TO BIN-2 AND.
* . . . FROM BIN-2 TO SIDE SHELL ARE AVERAGE
* . . . DISTANCES FROM A WAY 740'X120'
* MAXIMUM NUMBER OF STANCHIONS IN LIFT = 6
C-OPER BEGINS AT CR-1

1 TRANSPORT STAN FROM BIN-2 USING CRANE WITH HOOK+SLING TO SIDE-SHELL
( ON PIPE STAGING ) PLACE+ADJUST RETURN TO CR-1 F 1 / 6
A1 T42 K24 T6 P3 T42 AO 0.17 1967.

TOTAL TMU 1967.
DATA SYNTHESIS AND BACK-UP

461. TRANSPORT HANDRAIL FOR PIPE STAGING (AT SIDE SHELL) WITH (TOWER CRANE AT ANY WAYS CARPENTER)
PER SECTION (16' LONG OF PIPE STAGING OFG: 3 12-FEB-82
REPRESENTS ELAPSED TIME.
* REPRESENTS TRANSPORTING HANDRAIL FROM
* . . . HR-PILE TO SIDE SHELL.
* DISTANCES FROM CRANE-REST TO HR-PILE AND
* . . . FROM HR-PILE TO SIDE SHELL ARE
* . . . AVERAGE DISTANCES FROM WAY 740'X120'
* MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6
C-OPER BEGINS AT CR-1

1 TRANSPORT HANDRAIL FROM HR-PILE USING CRANE WITH HOOK+SLING TO
SIDE-SHELL ( ON PIPE STAGING ) PLACE+ADJUST RETURN TO CR-1 F 1 /
A1 T42 K24 T10 P3 T42 A0 0.17 2033.

TOTAL TMU 2033.

463. TRANSPORT STAGING PLANK FOR SIDE SHELL (BTWN 2 PIPE STAGING SECTIONS)
WITH (TOWER CRANE) AT ANY WAYS CARPENTER
PER STAGING PLANK OFG: 3 12-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS TRANSPORTING BOARDS FROM
* . . . BD-PILE T0 SIDE SHELL.
* DISTANCES FROM CRANE-REST TO ED-PILE AND
* . . . FROM BD-PILE TO SIDE SHELL ARE
* . . . AVERAGE DISTANCES FROM WAY 740'X120'
* MAXIMUM NUMBER OF BOARDS IN LIFT = 4
C-OPER BEGINS AT CR-1

1 TRANSPORT BOARD FROM MI-PILE USING CRANE WITH HOOK+SLING TO
SIDE-SHELL ( BTWN 2 PIPE STAGING SECTIONS ) PLACE+MANEUVER RETURN
CR-1 F 1 / 4
A1 T42 K24 T6 P16 T42 A0 0.25 3275.

TOTAL TMU 3275.
DATA SYNTHESIS AND BACK-UP

465. TRANSPORT HANDRAIL FOR SIDE SHELL (BTWN 2 PIPE STAGING SECTIONS) WITH (TOWER CRANE) AT ANY WAYS CARPENTER

PER HANDRAIL OFG: 3 12-FEB-82

* REPRESENTS ELAPSED TIME

* REPRESENTS TRANSPORTING HANDRAIL FROM

* . . . HR-PILE TO SIDE SHELL.

* DISTANCES FROM CRANE-REST TO HR-PILE AND

* . . . FROM HR-PILE TO SIDE SHELL ARE

* . . . AVERAGE DISTANCES FROM WAY 740’X120’

* MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6

C-OPER REGINS AT CR-1

1 TRANSPORT HANDRAIL FROM HR-PILE USING CRANE WITH HOOK+SLING TO

SIDE-SHELL ( BTWN 2 PIPE STAGING SECTIONS ) PLACE+ADJUST RETURN

R-1 F 1 / 6

A1 T42 K24 T10 P3 T42 A0

0.17 2033

TOTAL TMU

2033.

476. REMOVE HANDRAIL ON (MATERIAL PILE) WITH (TOWER CRANE) AT ANY WAYS CARPENTER

PER HANDRAIL OFG: 3 16-FEB-82

* REPRESENTS ELAPSED TIME

* REPRESENTS REMOVAL OF HANDRAIL FROM

* . . . MATERIAL PILE AT WAY TO HANDRAIL PILE

* . . . DISTANCES ARE AVERAGE DISTANCES FOR A

* . . . WAY 740’X120’.

* MAXIMUM NUMBER OF HANDRAIL IN LIFT = 6

* TOWER CRANE IS USED FOR REMOVAL.

CARP-3 BEGINS AT HATL-PILE

1 CARP-3 GET+SLIDE WITH BEND HANDRAIL ( ONTO BOLSTER ) AT MATL-PILE

A1 B6 G3 M3 X0 I0 A0

1.00 130.

2 C-OPER TRANSPORT HANDRAIL FROM MATL-PILE USING CRANE WITH HOOK+SLING

TO HR-PILE PLACE+ADJUST RETURN TO CR-1 F 1 / .6

A1 T42 K24 T10 P3 T42 A0

0.17 2033.

TOTAL TMU

2163.
DATA SYNTHESIS AND BACK-UP

477. REMOVE STANCHION ON (MATERIAL PILE) WITH (TOWER CRANE) AT ANY WAYS CARPENTER
PER STANCHION OFG: 3 16-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF STANCHION FROM MATER FILE AT WAY TO BIN-2
* . . . DISTANCES ARE AVERAGE DISTANCES FOR A WAY 740'X120'.
* MAXIMUM NUMBER OF STANCHION IN LIFT = 6
* TOWER CRANE IS USED FOR REMOVAL,
CARP-3 BEGINS AT MATL-PILE
1 CARP-3 GET+PLACE WITH BEND STAN FROM MATL-PILE TO HATL-PILE ( STAC UP FOR TRANSPORTING )
   A1 B6 G3 A1 B0 P3 A0 1.00 140.
2 C-OPER TRANSPORT STAN FROM MATL-PILE USING CRANE WITH HOOK+SLING TO BIN-2 PLACE+ADJUST RETURN TO CR-1 F 1 / 6
   A1 T42 K24 T6 F3 T42 A0 0.17 1967.
   TOTAL TMU 2107.

478. REMOVE STAGING PLANK ON PIPE STAGING (AT SIDE SHELL) WITH (TOWER CRANE) AT ANY WAYS CARPENTER
PER STAGING PLANK OFG: 3 16-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS REMOVAL OF BOARDS FROM PIPE STAGING AT SIDE SHELL TO BOARD PILE
* . . . DISTANCES ARE AVERAGE DISTANCES FOR A WAY 740'X120'.
* MAXIMUM NUMBER OF BOARDS IN LIFT = 4
* TOWER CRANE IS USED FOR REMOVAL.
C-OPER BEGINS AT CR-1
1 C-OPER TRANSPORT BOARD FROM SIDE-SHELL USING CRANE WITH HOOK+SLING TO BD-PILE PLACE+MANEUVER RETURN TO CR-1 F 1 / 4
   A1 T42 K24 T6 P16 T42 A0 0.25 3275.
   TOTAL TMU 3275.
DATA SYNTHESIS AND BACK-UP

479. REMOVE BRACE ON (MATERIAL FILE) WITH (TOWER CRANE) AT ANY WAYS CARPENTER
PER BRACE OFG: 3 16-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS REMOVING BRACES FROM MATERIAL
* . . . PILE AT WAY TO BRACE PILE.
* . . . DISTANCES ARE AVERAGE DISTANCES FOR A WAY 740'X120'.
* MAXIMUM NUMBER OF BRACES IN LIFT = 60
* TOWER CRANE IS USED FOR REMOVAL.
CARP-3 BEGINS AT MATL-PILE

1 CARP-3 GET+SLIDE WITH BEND BRACE ( ONTO BOLSTER ) AT MATL-PILE
A1 B6 G3 M3 X0 I0 A0 1.00 1.30.

2 C-OPER TRANSPORT BRACE FROM MATL-PILE USING CRANE WITH HOOK+SLING TO
BRACE-PILE PLACE+ADJUST RETURN TO CR-1 F 1 / 6
A1 T42 K24 T6 P3 T42 A0 0.17 1967.

TOTAL TMU 2097.

480. REMOVE END RAIL (END PIECE) ON (MATERIAL PILE) WITH (TOWER CRANE) AT
ANY WAYS CARPENTER
PER END RAIL (END PIECE) OFG: 3 16-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS REMOVING END PIECES FROM
* . . . MATERIAL PILE AT WAY TO END-PC-RACK.
* . . . DISTANCES ARE AVERAGE DISTANCES FOR A WAY 740'X120'.
* MAXIMUM NUMBER OF END PIECES IN LIFT = 3
* TOWER CRANE IS USED FOR REMOVAL.
CARP-3 BEGINS AT MATL-PILE

1 CARP-3 GET+SLIDE WITH BEND END-F'IECE ( ONTO BOLSTER ) AT MATL-PILE
A1 B6 G3 M3 X0 I0 A0 1.00 130.

2 C-OPER TRANSPORT END-PIECE FROM MATL-PILE USING CRANE WITH HOOK+SLING TO
END-PC-RACK PLACE+MANEUVER RETURN TO CR-1 F 1 / 3
A1 T42 K24 T6 P16 T32 A0 0.33 4033.

3 CARP-3 GET+MANIPULATE WITH REND END-PIECE AT END-PC-RACK AND ALIGN
A42 B6 G3 M10 X0 I10 A0 1.00 710.

TOTAL TMU 4873.
DATA SYNTHESIS AND BACK-UP

486. TRANSPORT END RAIL (END PIECE) ON (END-PIECE RACK) WITH (TOWER CRANE) 
AT ANY WAYS CARPENTER 
PER END RAIL (END PIECE) OFG: 3 18-FEB-82 
REPRESENTS ELAPSED TIME 
* REPRESENTS TRANSPORTING END PIECES FROM 
* . . . END-PC-RACK TO MATL-PILE. 
* DISTANCES FROM CRANE REST TO END-PC-RACK 
* . . . AND FROM END-PC-RACK TO HATL-PILE ARE 
* . . . AVERAGE DISTANCES ON A WAY 740'X120' 
* MAXIMUM NUMBER END-PCS IN LIFT = 3 
* . . . THERE ARE 2 LIFTS DONE PER SECTION OF 
* . . . PIPE STAGING (16'LONG), 
C-OPER BEGINS AT CR-1 

1 C-OPER TRANSPORT END-PIECE FROM END-PC-RACK USING CRANE WITH 
HOOK+SLING TO HATL-PILE PLACE+ADJUST RETURN TO END-PC-RACK F 1 / 6 
A1 T32 K24 T6 P3 T6 A0 0.17 1200. 

2 C-OPER TRANSPORT END-PIECE FROM END-PC-RACK USING CRANE WITH 
HOOK+SLING TO HATL-PILE PLACE+ADJUST RETURN TO CR-1 F 1 / 6 
A1 T3 K24 16 P3 T42 A0 0.17 1317 

TOTAL TMU 2517.
132. **COMBINED SUB-OF**

HOOK-UF/UNHOOK AND IGNITE/EXTINGUISH TORCH FOR BURNING WITH HAND AT TANK CARPENTER

CREW SIZE = 6 (3 CARPS ABOVE DECK AND 3 BELOW). RATE IN ELAPSED TIME. HULT BY 6 TO OBTAIN TOTAL TIME.

PER 8-HR SHIFT AND (1) CUT OFG: 4 20-NOV-81

* THE FOLLOWING IS INCLUDED IN THIS SUBOP:
  * --2 HOOK-UPS AND 2 **UNHOOKS** PER (1) . . . .
  * . . . 8-HR SHIFT
  * --(1) OCCURRENCE FOR IGNITE AND . . . .
  * . . . EXTINGUISH TORCH
  * --TO DETERMINE THE FREQ OF THE SUB-OP . .
  * . . . FRO NUMBER OF CUTS >1, USE THE . . . .
  * . . . FORMULA: FREQ = 1+ [(N-1) X .231] . . .
  * . . . WHERE 'N' = THE NUMBER OF CUTS (BURNS)

TOTAL TMU 2900.0

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<th>Combined sub-operation elements</th>
<th>Freq.</th>
<th>TMU</th>
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<td>HOOK-UP AND UNHOOK TORCH ON MANIFOLD WITH WRENCH AT SHIP</td>
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455. **MAKE READY STAGING PLANK FOR (TRANSPORTING) WITH HAND AT ANY WAYS CARPENTER**

PER STAGING PLANK OFG: 3 11-FEB-82

* REPRESENTS ELAPSED TIME
* REPRESENTS GETTING BOARD ON BOLSTERS SO
* . . . THAT THE CRANE CAN TRANSPORT IT

CARP-3. BEGINS AT SIDE-SHELL

1 CARP-3 GET+SLIDE BOARD AT BD-PILE AND ADJUST (ON BOLSTERS)

| A32 B6 G3 M3 X0 I6 A0 | 1.00 | 500.0 |

**TOTAL TMU** 500.
DATA SYNTHESIS AND BACK-UP

457. SET UP STAGING PLANK ON PIPE STAGING (AT SIDE SHELL) WITH HAND AT ANY WAY CARPENTER
PER STAGING PLANK QFG: 3 12-FEB-82
* REPRESENTS ELAPSED TIME.
* REPRESENTS CARPENTERS SPREADING BOARDS
* . . . ON PIPE STAGING SECTION (16' LONG).
* . . . CARPENTERS HAVE TO CLIMB UP AND DOWN
* . . . THE PIPE STAGING TO SPREAD THE BOARDS
* . . . (SEE SEPARATE ANALYSIS FOR CLIMBING).
CARP-1 BEGINS AT END-PC-1

1 CARP-1 AND CARP 2 GET+SLIDE WITH BEND WITH 1 STEP BOARD AT SIDE-SHELL AND ALIGN
A3 B6 G3 M3 X0 I10 A0 1.00 250.

TOTAL TMU 250.

458. MAKE READY STANCHION FOR (TRANSPORTING) WITH HAND AT ANY WAYS CARPENTER
PER STANCHION QFG: 3 12-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS GETTING STANCHION READY TO BE
* . . . TRANSPORTED.
CARP-3 BEGINS AT BSI-PILE

1 CARP-3 GET+PLACE STAN FROM BIN-2 TO BIN-2
A16 B6 G3 A1 B0 P3 A0 1.00 290.

TOTAL TMU 290.
DATA SYNTHESIS AND BACK-UP

460. SET UP STANCHION ON PIPE STAGING (AT SIDE SHELL) WITH WRENCH AT ANY WAYST CARPENTER
PER SECTION (16' LONG) OF PIPE STAGING OFG: 3 12-FEB-82
REPRESENTS ELAPSED TIME.
* REPRESENTS SETTING UP STANCHIONS ON PIPE
* . . . STAGING.
* . . . CARPENTERS INSTALL SIMULTANEOUSLY.
* . . . CARPENTERS ARE STILL ON PIPE STAGING
CARP-1 BEGINS AT END-PC-1

1 CARP-1 GET+PLACE WITH BEND STAN FROM END-PC-2 TO END-PC-1 AND INSERT
( INTO END PIECE )
   A6 B6 G3 A6 B0 P3 A1 1.00 250.
2 CARP-2 GET+PLACE WITH BEND WITH 3 STEPS STAN FROM END-PC-2 TO
END-PC-3 AND INSERT ( INTO END PIECE ) SIMO
   <A6 B6 G3 A6 R0 P3 A1 > 1*00 0.
3 CARP-1 GET+PLACE 2 BOLTS FROM CARP-1 TO END-PC-1 WITH KNEEL AND
   INSERT BOLT ( INTO STANCHION ) PF 2 ( 6 7 )
   A1 B0 G3 A1 B16 (P3 A1 ) 1.00 290.
4 CARP-2 GET+PLACE 2 BOLTS FROM CARP-2 TO END-PC-3 WITH KNEEL AND
   INSERT BOLT ( INTO STANCHION ) PF 2 ( 6 7 ) SIMO
   <A1 B0 G3 A1 B16 (P3 A1 )> 1.00 0.
5 CARP-1 FASTEN 2 NUTS AT END-PC-1 13 WRIST-TURNS USING HANDS
   A1 )B0 G1 A0 B0 (P1 A1 F24 )A0 B0 P0 A0 (2) 1.00 540.
6 CARP-1 FASTEN 2 NUTS AT END-PC-1 4 ARM-STROKES USING WRENCH-1 ASIDE
   TO CARP-1
   A1 B0 G1 A0 B0 (P3 A1 F24 )A1 B0 P1 A0 (2) 1.00 600.
7 CARP-2 FASTEN 2 NUTS AT END-PC-3 13 WRIST-TURNS USING HANDS SIMO
   <A1 B0 G1 A0 B0 (P1 A1 F24 )A0 B0 P0 A0 > 1.00 0.
8 CARP-2 FASTEN 2 NUTS AT END-PC-3 4 ARM-STROKES USING WRENCH-2 ASIDE
   TO CARP-2 SIMO
   <A1 B0 G1 A0 B0 (P3 A1 F24 )A1 B0 P1 A0 > 1.00 0.

TOTAL THU 1680.
DATA SYNTHESIS AND BACK-UP

462. SET UP HANDRAIL (ON PIPE STAGING (AT SIDE SHELL) WITH HAND AT ANY WA' CARPENTER
PER SECTION (16' LONG) OF PIPE STAGING OFG: 3 12-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS CARPENTERS INSTALLING
* . . . HANDRAIL THRU EYELETS IN STANCHIONS.
* . . . CARPENTERS DON'T WORK SIMULTANEOUSLY.
* . . . WELDING DONE IN A SEPARATE SUB-OP.
CARP-1 BEGINS AT END-PC-1

1 CARP-1 GET+SLIDE WITH BEND HANDRAIL AT END-PC-3 AND ALIGN (THRU STANCHION EYELETS) PF 2 (4 5 6 7)
   A10 36 G3 (M3 X0 I10 A0 ) 1.00 450.
2 CARP-2 GET+SLIDE WITH BEND HANDRAIL AT END-PC-1 AND ALIGN (THRU STANCHION EYELETS) PF 2 (4 5 6 7)
   A10 B6 G3 (M3 X0 I10 A0 ) 1.00 450.

TOTAL TMU 900

464. SET UP STAGING PLANK FOR SIDE SHELL (BTWN 2 PIPE STAGING SECTIONS) WITH HAND AT ANY WAYS CARPENTER
PER STAGING PLANK OFG: 3 12-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS CARPENTERS SPREADING BOARDS
* . . . BETWEEN PIPE STAGING SECTIONS.
* . . . THERE IS A 16' GAP BETWEEN SECTIONS.
* . . . CARP'ENTERS HAVE TO CLIMB UP AND DOWN
* . . . THE PIPE STAGING TO SPREAD THE BOARDS
* . . . (SEE SEPARATE ANALYSIS FOR CLIMBING)
CARP-1 BEGINS AT SECTION-1

1 CARP-1 AND CARP 2 GET+SLIDE WITH BEND) WITH 1 STEP BOARD AT SIDE-SHELL AND ALIGN
   A3 B6 G3 H3 X0 I10 A0 1.00 250.

TOTAL TMU 250.
DATA SYNTHESIS AND BACK-UP

466. SET UP HANDRAIL FOR SIDE SHELL (BTWN 2 PIPE STAGING SECTIONS) WITH HAND AT ANY WAYS CARPENTER
PER SECTION OFG: 3 12-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS CARPENTERS INSTALLING
* . . . HANIIRAIL ON EXISTING HANDRAIL.
* . . . CARPENTERS DON'T WORK SIMULTANEOUSLY.
* . . . WELDING DONE IN A SEPARATE SUB-OP.
CARP-1 BEGINS AT SECTION-1

1 CARP-1 GET+PLACE WITH BEND HANDRAIL FROM SECTION-1 TO SECTION-2 AND RETURN TO SECTION-1 ( TACKING DONE UPON PLACEMENT ) PF 2 ( 6 )
A1 B6 G3 A10 B0 (P3 )A10 (2) 1.00 360.
2 CARP-2 GET+PLACE WITH BEND HANDRAIL FROM SECTION-2 TO SECTION-1 AND RETURN TO SECTION-2 ( TACKING DONE UPON PLACEMENT ) PF 2 ( 6 )
A1 B6 G3 A10 B0 (P3 )A10 (2) 1.00 360.

TOTAL TMU 720.

469. TEAR DOWN HANDRAIL FOR SIDE SHELL (BTWN 2 PIPE STAGING SECTIONS) WITH TORCH AT ANY WAYS CARPENTERS
PER SECTION OFG: 3 15-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS TEARING DOWN HANDRAIL ON PIPE
* . . . STAGING (BTMN 2 SECTIONS). A TORCH IS USED TO BURN THE HANDRAIL OFF. THE HANDRAIL IS THROWN TO THE HATERIAL PILE, CARPENTERS REMOVE 2 HANDRAIL PIECES BEFORE MOVING TO NEXT SECTION.
CARP-1 BEGINS AT SECTION-1

1 CARP-1 PULL TORCH AT SECTION-1
A1 B0 G1 M1 X0 I0 A0 1.00 30.
2 CARP-1 OPERATE TORCH AT SECTION-1 PTIME 0.26 M ( BURN OFF HANDRAIL: 2 CONNECTIONS PER HANDRAIL ) F 4
A1 B0 G1 M6 X42 I0 A0 4.00 2000.
3 CARP-2 GET+HOLD HANDRAIL FROM SECTION-2 TO CARP-2 F 2 SIMO
<A1 B0 G3 A1 B0 P0 A0 > 2.00 0.
4 CARP-2 HOLD+THROW HANDRAIL FROM CARP-2 TO HATL-PILE F 2
A0 B0 G0 A1 B0 P0 A0 2.00 20.
5 CARP-1 PULL TORCH AT SECTION-2
A10 B0 G1 M1 X0 I0 A0 1.00 120.

TOTAL TMU 2170.

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DATA SYNTHESIS AND BACK-UP

470. TEAR DOWN HANDRAIL FOR PIPE STAGING (AT SIDE SHELL) WITH HAND AT ANY
WAYS CARPENTER
PER SECTION (16' LONG) OF PIPE STAGING OFG: 3 15-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS TEARING DOWN HANDRAIL ON PIPE
* . . . STAGING (BTWN 2 STANCHIONS). THE
* . . . HANDRAIL IS THROWN TO THE MATERIAL
* . . . PILE, CARPENTERS REMOVE 2 HANDRAIL
* . . . PIECES BEFORE MOVING TO NEXT SECTION.
CARP-1 BEGINS AT END-PC-I

1 CARP-1 GET+SLIDE HANDRAIL AT END-PC-3 (OUT OF 2 STANCHION SLEEVES
AND ADJUST PF 2 (4 5 6 7)
A10 R0 G3 (H3 X0 16 A0 ) 1.00 310.

2 CARP-1 HOLD+THROW HANDRAIL FROM CARP-1 TO MATL-PILE
A0 B0 G0 A1 B0 P0 A0 1.00 10.

3 CARP-2 GET+SLIDE HANDRAIL AT END-PC-1 (OUT OF 2 STANCHION SLEEVES
AND ADJUST PF 2 (4 5 6 7)
A10 B0 G3 (H3 X0 16 A0 ) 1.00 310.

4 CARP-2 HOLD+THROW HANDRAIL FROM CARP-2 TO MATL-PILE
A0 B0 G0 A1 B0 P0 A0 1.00 10.

TOTAL TMU 640

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471. TEAR DOWN STANCHION ON PIPE STAGING (AT SIDE SHELL) WITH WRENCH AT ANY
WAYS CARPENTER
PER SECTION (16' LONG) OF PIPE STAGING OFG: 3 16-FER-82
REPRESENTS ELAPSED TIME
* REPRESENTS TEARING DOWN STANCHION ON
* . . . SECTION OF PIPE STAGING (16' LONG).
* . . . CARPENTERS WORK SIMULTANEOUSLY.
* . . . STANCHIONS ARE THROWN TO MATERIAL
* . . . PILE.
CARP-1 BEGINS AT END-PC-1

1 CARP-1 LOOSEN WITH KNEEL 2 NUTS AT END-PC-1 1 ARM-STROKE USING
WRENCH-1 AND HOLD
A1 B16 G1 A0 B0 (P3 A1 L3 )A0 B0 F0 A0 (2) 1.00 320.
2 CARP-1 HOLD+LOOSEN 2 NUTS AT END-PC-1 13 WRIST-Turns USING WRENCH-1
ASIDE TO CARP-1
A0 B0 G0 A0 B0 (P3 A1 L24 )A1 B0 P1 A0 (2) 1.00 580.
3 CARP-2 LOOSEN WITH KNEEL 2 NUTS AT END-PC-3 1 ARM-STROKE USING
WRENCH-2 AND HOLD SIMO
<A1 B16 G1 A0 B0 (P3 A1 L3 )A0 B0 P0 A0 > 1.00 0.
4 CARP-2 HOLD+LOOSEN 2 NUTS AT END-PC-3 13 WRIST-TURNS USING WRENCH-2
ASIDE TO CARP-2 SIMO
<A0 B0 G0 A0 B0 (P3 A1 L24 )A1 B0 P1 A0 > 1.00 0.
5 CARP-1 GET+REMOVE 2 BOLTS FROM END-PC-1 TO CARP-1 F 2
A1 30 G3 A1 B0 P1 A0 2.00 120.
6 CARP-2 GET+REMOVE 2 BOLTS FROM END-PC-3 TO CARP-2 F 2 SIMO
<A1 BO G3 A1 BO P1 A0 > 2.00 0.
7 CARP-1 THROW 2 NUTS AND BOLTS FROM CARP-1 TO MATL-PILE WITHOUT BEND
A1 B0 G1 A1 B0 P0 A0 1.00 30.
8 CARP-2 THROW 2 NUTS AND BOLTS FROM CARP-2 TO MATL-PILE WITHOUT BEND
SIMO
<A1 BO G0 A1 BO P0 A0 > 1.00 0.
9 CARP-1 GET+THROW STAN FROM END-PC-1 TO MATL-PILE WITHOUT BEND
A1 BO G3 A1 BO P0 A0 1.00 50.
10 CARP-2 GET+THROW STAN FROM END-PC-3 TO MATL-PILE WITHOUT BEND SIMO
<A1 B0 G3 A1 B0 P0 A0 > 1.00 0.

TOTAL TMU 1100.
DATA SYNTHESIS AND BACK-UP

472. TEAR DOWN STAGING PLANK FOR SIDE SHELL (BTWN 2 PIPE STAGING SECTIONS) WITH HAND AT ANY WAYS CARPENTER

PER STAGING PLANK OFG: 3 16-FEB-82

REPRESENTS ELAPSED TIME
* REPRESENTS TEARING DOWN BOARDS BETWEEN 2 PIPE STAGING SECTIONS. THERE IS A 16' GAP BETWEEN SECTIONS. BOARDS ARE STACKED SO THE CRANE CAN TRANSPORT THEM, CARPENTERS WORK SIMULTANEOUSLY.

CARP-1 BEGINS AT SECTION-1

1 CARP-1 AND CARP 2 GET+MANIPULATE WITH BEND WITH 1 STEP BOARD AT SECTION-1 (STACK BOARDS)

A3 B6 G3 M10 X0 IO A0 1.00 220.

TOTAL TMU 220.

473. TEAR DOWN STAGING PLANK ON PIPE STAGING (AT SIDE SHELL) WITH HAND AT ANY WAYS CARPENTER

PER STAGING PLANK OFG: 3 16-FEB-82

REPRESENTS ELAPSED TIME
* REPRESENTS TEARING DOWN BOARDS ON PIPE STAGING SECTION (16' LONG). BOARDS ARE STACKED SO THE CRANE CAN TRANSPORT THEM, CARPENTERS WORK SIMULTANEOUSLY.

CARP-1 BEGINS AT END-PC-1

1 CARP-1 AND CARP 2 GET+MANIPULATE WITH BEND WITH 1 STEP BOARD AT END-PC-1 (STACK BOARDS)

A3 B6 G3 M10 X0 -10 A0 1.00 220.

TOTAL TMU 220.
DATA SYNTHESIS AND BACK-UP

474. TEAR DOWN PIPE STAGING (END PCS AND BRACES). FOR SIDE-SHELL WITH WRENCH AT ANY WAYS CARPENTER PER SECTION (16' LONG) OF PIPE STAGING OFG: 3 16-FEB-82

* REPRESENTS TEARING DOWN END PIECES AND
* ...BRACES ON PIPE STAGING (2ND LEVEL).
* ...END PIECES ARE BOLTED TO END PIECES
* ...ON 1ST LEVEL. BRACES ARE HELD ON BY A
* ...LOCKING PIN. CARPENTERS WORK
* ...SIMULTANEOUSLY. CARPENTER-1 HANDLES
* ...REMOVAL AT END-PC-1 AND END-PC-2.
* ...MATERIAL IS THROWN OR PLACED AT THE
* ...MATERIAL PILE.
CARP-1 BEGINS AT END-PC-1

1 CARP-1 AND CARP 2 GET+SLIDE ( REMOVE ) WITH CLIMB 2 BRACES AT END-PC-2 ( ALSO AT, END-PC-1 ) AND ADJUST ( LOCKING PIN ) F 2
A6 B16 G3 M3 X0 I6 A0 2.00 680.

2 CARP-1 GET+PLACE WITH DESCEND 4 BRACES FROM END-PC-2 TO MATL-PILE PF 4 ( 3 ) PF 4 ( 6 )
A1 B16 (G3 ) A3 R6 (P3 ) A0 (4) 1.00 500.

3 CARP-2 AND CARP 1 GET+SLIDE ( REMOVE ) WITH CLIMB 2 BRACES AT END-PC-2 ( ALSO AT, END-PC-3 ) AND ADJUST ( LOCKING PIN ) F 2
A6 B16 G3 M3 X0 I6 A0 2.00 680.

4 CARP-2 GET+PLACE WITH DESCEND 4 BRACES FROM END-PC-2 TO MATL-PILE PF 4 ( 3 ) PF 4 ( 6 )
A1 B16 (G3 ) A3 B6 (P3 ) A0 (4) 1.00 500.

5 CARP-1 LOOSEN 2 NUTS AT END-PC-1 1 ARM-STROKE USING WRENCH-1 AND HOLD ( ALSO AT, END-PC-2 ) F 2
A1 B0 G1 A3 B0 (P3 A1 L3 ) A0 B0 P0 A0 (2) 2.00 380.

6 CARP-1 HOLD+LOOSEN 2 NUTS AT END-PC-1 13 WRIST-TURNS USING WRENCH-1 ASIDE TO CARP-1 ( ALSO AT, END-PC-2 ) F 2
A0 B0 G0 A0 B0 (P3 A1 L24 ) A1 B0 P1 A0 (2) 2.00 1160.

7 CARP-2 LOOSEN 2 NUTS AT END-PC-3 1 ARM-STROKE USING WRENCH-2 AND HOLD SIMD
A1 B0 G1 A3 B0 (P3 A1 L3 ) A0 B0 P0 A0 > 1.00 0.

8 CARP-2 HOLD+LOOSEN 2 NUTS AT END-PC-3 13 WRIST-TURNS USING WRENCH-2 ASIDE TO CARP-2 SIMD
A0 B0 G0 A0 B0 (P3 A1 L24 ) A1 B0 P1 A0 > 1.00 0.

9 CARP-1 GET+REMOVE 2 BOLTS FROM END-PC-2 TO CARP-1 ( ALSO AT, END-PC-1 ) F 4
A6 B0 G3 A6 B0 P1 A0 4.00 640.

10 CARP-2 GET+REMOVE 2 BOLTS FROM END-PC-3 TO CARP-2 F 2 SIMD
A1 B0 G3 A1 B0 P1 A0 > 2.00 0.

11 CARP-1 HOLD+THROW 4 NUTS AND BOLTS FROM CARP-1 TO MATL-PILE
A0 B0 G0 A1 B0 P0 A0 1.00 10.

12 CARP-2 HOLD+THROW 2 NUTS AND BOLTS FROM CARP-2 TO MATL-PILE SIMD
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13 CARP-1 GET+PLACE END-PIECE FROM END-PC-1 TO MATL-PILE (ALSO FROM END-PC-2) RETURN TO END-PC-1 F 2
   A1 B0 G3 A3 B6 P3 A3 2.00 380.
14 CARP-2 GET+PLACE END-PIECE FROM END-PC-3 TO MATL-PILE RETURN TO END-PC-3 SIMO
   A1 B0 G3 A3 B6 P3 A3 1.00 0.

TOTAL TMU 4930.

475. TEAR DOWN PIPE STAGING (END PCS AND BRACES) FOR SIDE SHELL WITH HAND.
ANY WAYS CARPENTER
PER SECTION (16' LONG) OF PIPE STAGING OF 6: 3 16-FEB-82
REPRESENTS ELAPSED TIME
* REPRESENTS TEARING DOWN END PIECES AND
* ...BRACES ON PIPE STAGING (1ST LEVEL).
* ...BRACES ARE HELD ON BY A LOCKING PIN
* ...CARPENTERS WORK SIMULTANEOUSLY.
* ...CARPENTER-1 HANDLES REMOVAL AT
* ...END-PC-1 AND END-PC-2. MATERIAL IS
* ...THROWN OR PLACED AT THE MATERIAL
* ...PILE.
CARP-1 BEGINS AT END-PC-1

1 CARP-1 AND CARP 2 GET+SLIDE (REMOVE) 2 BRACES AT END-PC-2 (ALSO AT END-PC-1) AND ADJUST (LOCKING PIN) F 2
   A6 B0 G3 M3 X0 I6 A0 2.00 360.
   A1 B0 (G3 A3 B6 (P3 A0 (4) 1.00 340.
2 CARP-1 GET+PLACE 4 BRACES FROM END-PC-2 TO MATL-PILE PF 4 (3) PF
   A6 B0 G3 M3 X0 I6 A0 2.00 360.
3 CARP-2 AND CARP 1 GET+SLIDE (REMOVE) 2 BRACES AT END-PC-2 (ALSO AT END-PC-3) AND ADJUST (LOCKING PIN) F 2
   A6 B0 G3 M3 X0 I6 A0 2.00 360.
4 CARP-2 GET+PLACE 4 BRACES FROM END-PC-2 TO MATL-PILE PF 4 (3) PF
   A1 B0 G3 M3 P3 A0 (4) 1.00 340.
5 CARP-1 GET+PLACE END-PIECE FROM END-PC-1 TO MATL-PILE (ALSO FROM END-PC-2) RETURN TO END-PC-1 F 2
   A3 B0 G3 A3 B6 P3 A3 2.00 420.
6 CARP-2 GET+PLACE END-PIECE FROM END-PC-3 TO MATL-PILE RETURN TO END-PC-3 SIMO
   A3 B0 G3 A3 B6 P3 A3 1.00 0.

TOTAL TMU 1820.

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DATA SYNTHESIS AND BACK-UP

487. MAKE READY END RAIL (END PIECE) FOR (TRANSPORTING) AT ANY WAYS
CARPENTER
PER END RAIL (END PIECE) OGF: 3 18-FEB-82
* REPRESENTS ELAPSED TIME
* REPRESENTS GETTING END-PIECES ON BOLSTER
* ...SO THAT CRANE CAN TRANSPORT IT.
CARP-3 BEGINS AT END-PC-RACK

1 CARP-3 GET+PLACE END-PIECE FROM END-PC-RACK TO END-PC-RACK WITH BEND
   A1 B0 G3 A1 B6 P3 A0 1.00 140.

TOTAL THU 140.

488. SET-UP PIPE STAGING (END PCS AND BRACES) FOR SIDE SHELL WITH HAND AT
ANY WAYS CARPENTER
PER SECTION (16' LONG) OF PIPE STAGING OGF: 3 18-FEB-82
* REPRESENTS ELAPSED TIME.
* REPRESENTS SETTING UP 1ST LEVEL OF A 16'
* ...LONG SECTION OF PIPE STAGING, SECTION
* ...INCLUDES 3 END PIECES AND 8 BRACES
* ...WHICH ARE HELD IN PLACE BY A LOCKING
* ...PIN.
* CARP-1 AND CARP-2 ARE WORKING
* ...SIMULTANEOUSLY IN PUTTING UP THE END
* ...PIECES AND BRACES.
CARP-1 BEGINS AT END-PC-1

1 CARP-1 GET+PLACE END-PIECE FROM MATL-PILE TO END-PC-1
   A3 B6 G3 A3 B0 P3 A0 1.00 180.
2 CARP-2 GET+PLACE END-PIECE FROM MATL-PILE TO END-PC-2 SIMO
   A3 B6 G3 A3 B0 P3 A0 1.00 0.
3 CARP-3 GET+PLACE 4 BRACES FROM BRACE-PILE TO MATL-PILE
   A16 B6 G3 A32 B6 P3 A0 1.00 660.
4 CARP-1 AND CARP 2 GET+SLIDE WITH BEND 2 BRACES AT END-PC-2 (ALSO
   AT END-PC-1.) AND ADJUST (LOCKING PIN ) F 4
   A6 B6 G3 M3 X0 I6 A0 4.00 960.
5 CARP-1 GET+PLACE END-PIECE FROM MATL-PILE TO END-PC-3
   A3 B6 G3 A3 B0 P3 A0 1.00 180.
6 CARP-3 GET+PLACE 4 BRACES FROM BRACE-PILE TO MATL-PILE
   A32 B6 G3 A32 B6 P3 A0 1.00 820.
7 CARP-1 AND CARP 2 GET+SLIDE WITH BEND 2 BRACES AT END-PC-2 (ALSO
   AT END-PC-3.) AND ADJUST (LOCKING PIN ) F 4
   A6 B6 G3 M3 X0 I6 A0 4.00 960.

TOTAL THU 3760.
DATA SYNTHESIS AND BACK-UP

489. SET-UP PIPE STAGING (END PCS AND BRACES) FOR SIDE SHELL WITH WRENCH A
ANY’WAYS CARPENTER

PER SECTION (16’LONG) OF PIPE STAGING OF B: 3.18-FEB-82
* REPRSENTS ELAPSED TIME
* * REPRESENTS SETTING UP 2ND LEVEL OF A 16’
* LONG SECTION OF PIPE STAGING
* INCLIDES 3 END PIECES AND 8 BRACES
* WHICH ARE HELD IN PLACE BY A LOCKING
* PIN. END PIECES ARE BOLTED TO 1ST
* LEVEL END PIECES.
* CARP-1 AND CARP-2 ARE WORKING
* SIMULTANEOUSLY IN PUTTING UP THE END
* PIECES AND BRACES.
CARP-1 BEGINS AT END-PC-1

1 CARP-1 GET+MANIPULATE WITH BEND WITH 2 STEPS ( FROM MATL PILE )
END-PIECE AT END-PC-1 AND ALIGN
A3 B6 G3 H10 X0 I10 A0 1.00 320.

2 CARP-2 GET+MANIPULATE WITH BEND WITH 2 STEPS ( FROM MATL PILE )
END-PIECE AT END-PC-2 AND ALIGN SIMO
<A3 B6 G3 H10 X0 I10 A0 > 1.00 0.

3 CARP-1 GET+PLACE 2 BOLTS FROM TOOLBOX-1 TO END-PC-1 AND INSERT PF
( 6 7 )
A42 B6 G3 A42 B0 <P3 A1 > 1.00 1010.

4 CARP-2 GET+PLACE 2 BOLTS FROM TOOLBOX-1 TO END-PC-2 AND INSERT PF
( 6 7 ) SIMO
<A42 B6 G3 A42 B0 > (P3 A1 >) 1.00 0.

5 CARP-1 FASTEN 2 NUTS AT END-PC-1 13 WRIST-TEURNS USING HANDS
A1 B0 G1 A0 B0 (P1 A1 F24 )A0 B0 P0 A0 (2) 1.00 540.

6 CARP-1 FASTEN 2 NUTS AT END-PC-1 4 ARM-STROKES USING WRENCH-1 AND
ASIDE TO CARP-1
A1 B0 G1 A0 B0 (P3 A1 F24 )A1 B0 P1 A0 (2) 1.00 600.

7 CARP-2 FASTEN 2 NUTS AT END-PC-2 13 WRIST-TEURNS USING HANDS SIMO
<a1 B0 G1 A0 B0 (P1 A1 F24 )A0 B0 P0 A0 > 1.00 0.

8 CARP-2 FASTEN 2 NUTS AT END-PC-2 4 ARM-STROKES USING WRENCH-2 ASIDE
TO CARP-2 SIMO
<a1 B0 G1 A0 B0 (P3 A1 F24 )A1 B0 P1 A0 > 1.00 0.

9 CARP-3 GET+PLACE 4 BRACES FROM BRACE-PILE TO MATL-PILE
A16 B0 G3 A32 B6 P3 A0 1.00 660.

10 CARP-1 AND CARP-2 GET+SLIDE WITH CLIMB 2 BRACES AT END-PC-2 ( ALS
AT END-PC-1. ) AND ADJUST ( LOCKING-PIN ) F 4
A6 B16 G3 H3 X0 I6 A0 4.00 1360.

11 CARP-1 GET+MANIPULATE WITH DESCEND END-PIECE ( FROM MATL PILE ) A
END-PC-3 AND ALIGN
A6 B16 G3 H3 X0 I10 A0 1.00 450.

12 CARP-1 GET+PLACE 2 BOLTS FROM CARP-1 TO END-PC-3 AND INSERT PF 2
DATA SYNTHESIS AND BACK-UP

67.

13 CARP-1 FASTEN 2 NUTS AT END-PC-3 13 WRIST-TURNS USING HANDS.
A1 B0 G1 AO B0 (P3 A1 F24 A0 B0 A1 A0 A0 C06 A30 F540)

14 CARP-1 FASTEN 2 NUTS AT END-PC-3 4 ARM-STROKES USING WRENCH-1 AS II
TO CARP-1
A1 B0 G1 AO B0 (P3 A1 F24 A1 B0 P1 AO C25 1.00 4.00 200)

15 CARP-3 GET+PLACE 4 BRACES FROM BRACE-PILE TO HATL-PILE.
A32 B6 G3 A32 B6 P3 AO 1.00 820.

16 CARP-1 AND CARP 2 GET+SLIDE WITH CLIMB 2 BRACES AT END-PC-2 (ALSO
AT END-PC-3) AND ADJUST (LOCKING PIN) F 4.
A6 B16 G3 M3 X0 I6 AO 4.00 1360.

TOTAL HNil 8390.

490. SET UP PIPE STAGING (END-PCS & BRACES) FOR (8' LONG) SECTION WITH HAND
AT ANY PLATEN CARPENTER
PER 8' LONG SECTION OFG: 3 22-FEB-B2
REPRESENTS ELAPSED TIME
* REPRESENTS THE ASSEMBLY OF ONE 8' LONG
* SECTION OF PIPE STAGING THESE 8' LONG
* SECTIONS CAN BE STACKED TO MAKE
* STAGING FOR HARD TO REACH OR HIGH
* AREAS. FINISHED 8' LONG SECTIONS ARE
* TRANSPORTED TO THE FIN-PILE BY THE
* CRANE.
* CARPENTERS WORK SIMULTANEOUSLY.

CARP-3 BEGINS AT END-PC-RACK

1 CARP-3 GET+PLACE 2 END-PIECES FROM END-PC-RACK TO END-PC-RACK WITH
BEND F 3
A1 B0 G3 A1 B6 P3 A0 3.00 420.

2 CARP-1 GET+PLACE END-PIECE FROM END-PC-RACK TO END-PC-1 SIMO
A16 B6 G3 A6 B0 P3 A0 1.00 0.

3 CARP-2 GET+PLACE END-PIECE FROM END-PC-RACK TO END-PC-2
A16 B6 G3 A16 B0 P3 AO 1.00 440.

4 CARP-3 GET+PLACE 4 BRACES FROM BRACE-PILE TO ASSEMBLY-AREA WITH BEI
PF 4 (3)
A3 B6 G3 B6 P3 AO (4) 1.00 360.

5 CARP-1 AND CARP 2 GET+SLIDE WITH BEND 2 BRACES AT END-PC-2 AND
ADJUST (LOCKING PIN) F 4.
A6 B6 G3 M3 X0 I6 A0 4.00 960.

6 CARP-2 AND CARP 1 GET+SLIDE WITH BEND 2 BRACES AT END-PC-1 AND
ADJUST (LOCKING PIN) F 4.
A6 B6 G3 M3 X0 I6 A0 4.00 960.

7 C-OPER TRANSPORT 8FT-SECTION FROM ASSEMBLY-AREA USING CRANE WITH