"A sequence of discrete tasks/activities in the network that has the longest total duration through the contract or project….

…[with] the least amount of float/slack."

~IPMR DID
(DI-MGMT-81861A)

The Critical Path…

- …is made up of tasks with the least total float

- …starts at Timenow

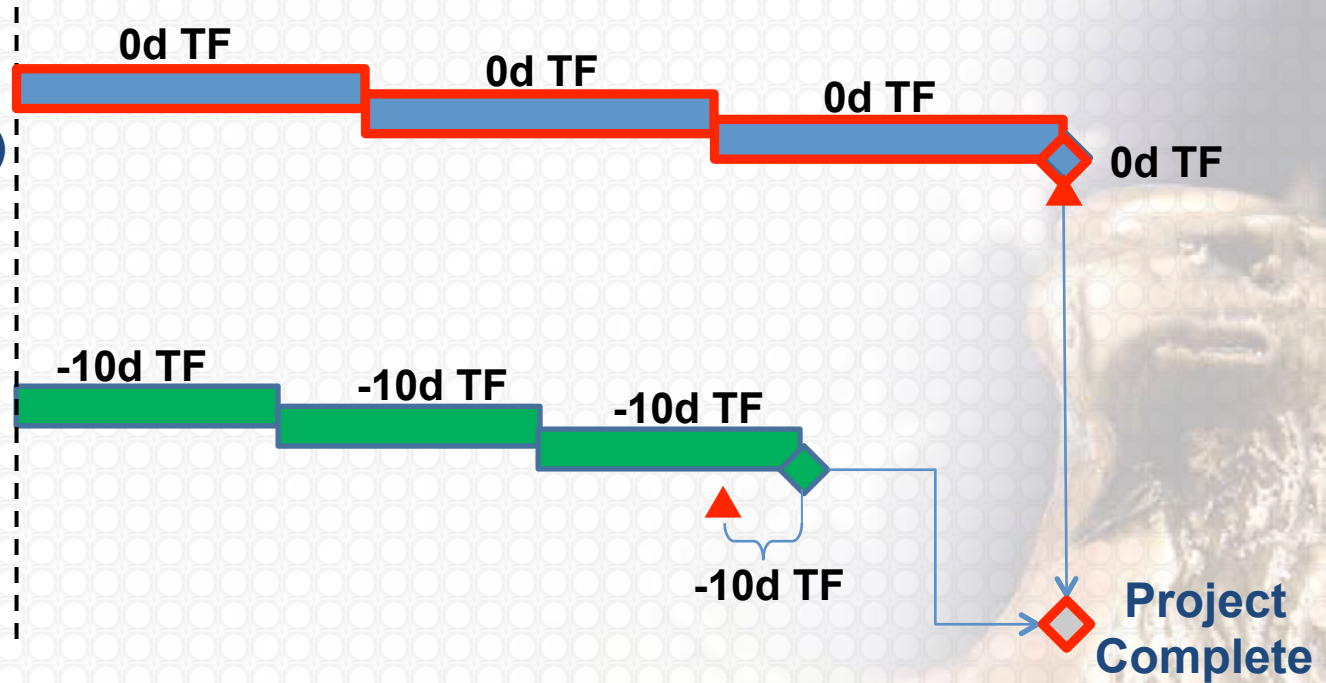- …is the longest path through the network

Total Float

"The amount of time a task/activity or milestone can slip before delaying contract completion or constraint date." ~IPMR DID

(imposed deadline)

Critical Path = Least Total Float ?

Critical Path
(drives project completion)

0d TF 0d TF 0d TF 0d TF

Path with Least Total Float (-10 d)

-10d TF -10d TF -10d TF -10d TF

Project Complete

Legend:
- Common Effort
- Helicopter Effort
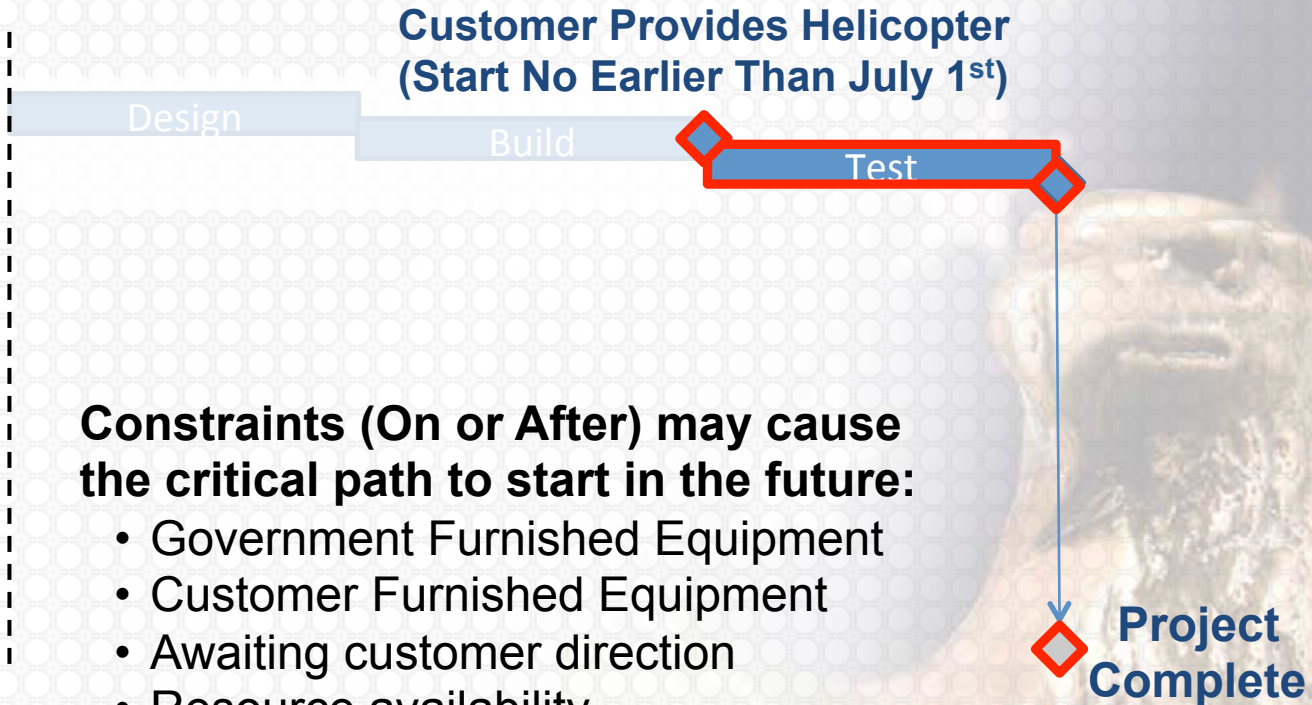- Tank Effort
- Critical Path
- ▲ Contract Deadline

In a network with a single deadline (for all deliverables), the path driving project completion will also have the least total float.

But when more than one deadline exists, the most delinquent deliverable (least float), is not always the last deliverable (critical path).

Critical Path starts at Timenow ?

Critical Path
(drives project completion)

**Customer Provides Helicopter
(Start No Earlier Than July 1st)**

Design

Build

Test

**Constraints (On or After) may cause
the critical path to start in the future:**
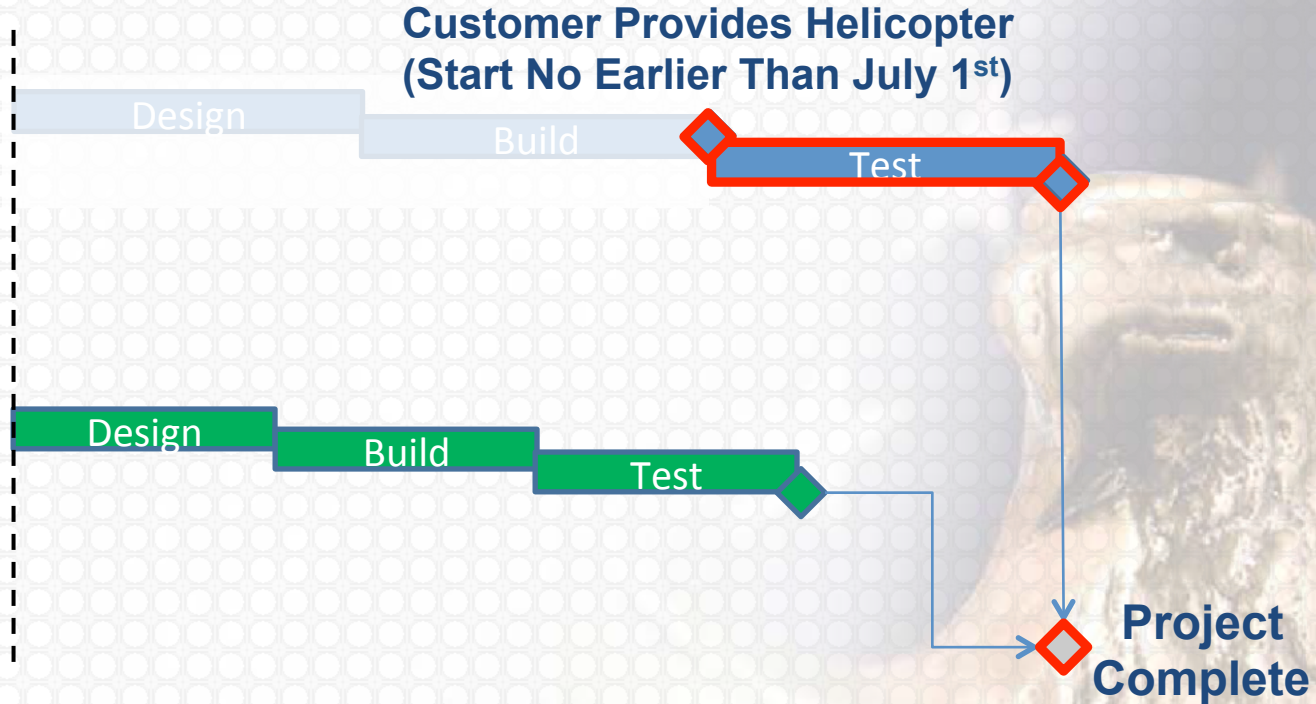- Government Furnished Equipment
- Customer Furnished Equipment
- Awaiting customer direction
- Resource availability
- Etc.

**Project
Complete**

▭	Common Effort
▭	Helicopter Effort
▭	Tank Effort
▭	Critical Path
▲	Contract Deadline

Critical Path = Longest Path ?

Critical Path
(drives project completion)

Customer Provides Helicopter
(Start No Earlier Than July 1st)

Design
Build
Test

Longest Path

Design
Build
Test

Project Complete

Common Effort
Helicopter Effort
Tank Effort
Critical Path
Contract Deadline

If the critical path starts in the future
(GFE, CFE, resource constraint, etc.),
the path driving project completion (critical path)
**may be shorter than other (non-driving) paths.**

The Critical Path…

- …is made up of tasks with the least total float
  (often…but not if other interim deadlines are more delinquent)

- …starts at Timenow
  (commonly…but not if the initial critical path task is driven by something outside the IMS network (external interface))

- …is the longest path through the network
  (maybe…but might not be if the Critical Path starts after Timenow)

> All of these characteristics may be true under ideal project conditions (or forced to be true by standard practices or scheduling tool), but none are absolute truths that define all Critical Paths

"Critical path is the longest continuous sequence chain of incomplete discrete tasks/activities/milestones and, if present, parallel chains in the schedule network that drive the forecast dates of the agreed to contract endpoint (i.e., last discrete task/activity or milestone)."

~IPMDAR DID Guide (Draft)

The longest continuous sequence of activities driving project completion

Final Project Event
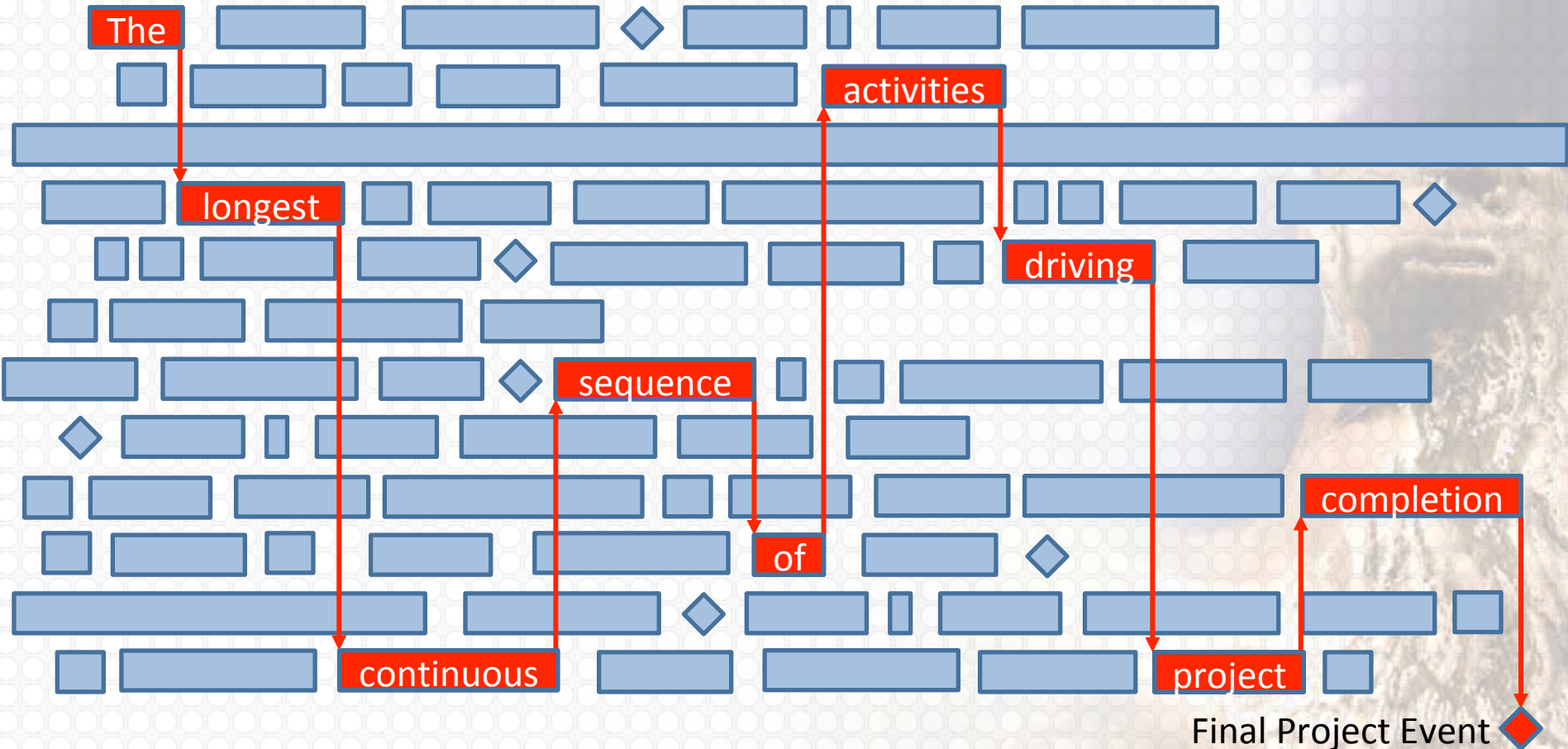
(the reason the project completion event cannot occur even one day sooner)

The takeaway from this presentation should **NOT** be:

~~*"All Critical Path's that have high float and are constrained to start in the future are compliant"*~~

Total Float on the Critical Path (and on all other discrete tasks) should be an accurate representation of execution flexibility against project targets.

All constraints should serve a valid and justifiable purpose (especially those on the Critical Path).

Thank You

Our Panelists...

- **Donna Holden**
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- **Erik Berg**
  - *Group Lead, Twin Cities EVMS Center, DCMA*

- **John "Scrappy" Scaparro**
  - *Subject Matter Expert, Government Scheduling and IPM, NAVAIR*

- **Jeff Lasky**
  - *Discipline Chief, Program Planning & Scheduling, Pratt & Whitney*

- **Brian Valenti**
  - *Senior Manager, Scheduling, Collins Aerospace*

- **Tom Terbush**
  - *Representative, Project Management & Planning Operations, Lockheed Martin Space Systems Company*

Backup

Complete Draft Critical Path Wording

Critical path is the longest continuous sequence chain of incomplete discrete tasks/ activities/milestones and, if present, parallel chains in the schedule network that drive the forecast dates of the agreed to contract endpoint (i.e., last discrete task/activity or milestone).

Clarification of "longest continuous sequence chain" means one should be able to trace the path through the connecting logic from start to end on all items on the chain without referring to any other tasking/milestones to continue the logic tracing from item to item. "Parallel chains", aka branches, refers to the condition in the Native file when more than one starting point exists for a continuous sequence of incomplete tasks/activities/ milestones that drive the forecast date of the agreed to contract endpoint. A chain's starting point is normally from time-now but can originate from a soft-constrained task/ milestone. "Drive the forecast dates" means the chain/chains prevents the agreed to endpoint from moving to an earlier forecast date.

Critical path identification is based on relationships, lead/lag times, durations, calendars, constraints, and status. Excessive constraints (i.e., 'constraint' selections and/or tool option settings that result in constraint like impacts to tasks/milestones) and incomplete, incorrect, or overly constrained logic shall be avoided because they can skew identification of the critical path.

~IPMDAR DID Guide (Draft)