Interface Management Energized Concurrent Engineering on Mega-Projects

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Interface Management Energized Concurrent Engineering on Mega-Projects

Today's discussion, . .

- Is about how the interface management influenced the concurrent engineering on mega projects
- Learn more on Interface Management process.. .
  - It's a phenomenon within the overall project management. . .
- Review the art of Concurrent Engineering.. .
  - It's multi-discipline designing performed concurrently. . .
- Some practical examples and pictorial presentations.. .
- Path Forward / LL's / Recommendations / Q & A Session?

Presentation Overview

Topics:

- General Introduction
- Three (3) keywords:
  - Interface Management
  - Concurrent Engineering
  - Mega-Projects
- Some Pictorial Illustrations to communicate the viewpoint, . . .

Key Messages:

- Interface Management process ensures prompt, regimented and documented mode of coordination amongst the disciplines & entities (WG's).
- Concurrent Engineering is a process of designing in parallel & concurrently, and the interface management has enhanced that objective.
- Ineffective Interface Management is one of the major root-causes of budget over-runs & schedule delays, and also impacting the Safety & Quality issues

Desired Outcomes:

- How interface management influenced the concurrent engineering, . . .
- This topic is ongoing on any projects, hence contribute in the Q & A session, . .
- And, any leftover or ongoing comments on RGF's LinkedIn website

Interface Management

Interface Management Energized Concurrent Engineering on Mega-Projects

Definition of Interface

An interface is the place at which independent systems meet or communicate with each other.

It is an interaction of cross-project Delivery Team members necessary to exploit the synergy that is possible by having the right people engaged in communication.

This dialogue is focused on ensuring that project identifies and implements the best solutions effectively.

PS: Interface Management in general is applicable to all mega-projects.

Main Entry:	amalgamate
Part of Speech:	*verb*
Definition:	blend
Synonyms:	admix, alloy, ally, coalesce, combine, come together, compound, consolidate, fuse, hook up with, incorporate, integrate, **interface** , intermix, join together, meld, merge, mingle, network, pool, team up, tie in, tie up, unite
Antonyms:	divide, separate

Courtesy : http://thesaurus.com

Courtesy : Rick Khadimally's previous PPT presentation - WISON Group - QMS

Interface Management Energized Concurrent Engineering on Mega-Projects

Interface Management

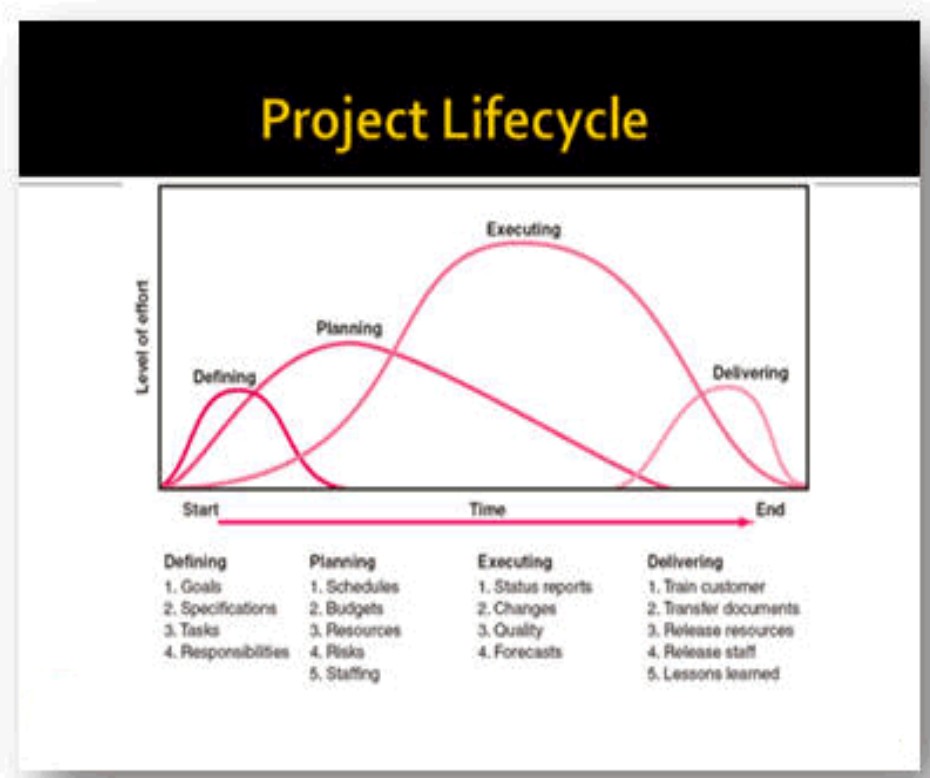
- Is an integral part of the overall project management, and mechanism to manage internal & external interfaces
- It is a phenomenon wherein the work-groups liaise, commit & interact within cross-project delivery team members to resolve interfaces needed for projects.

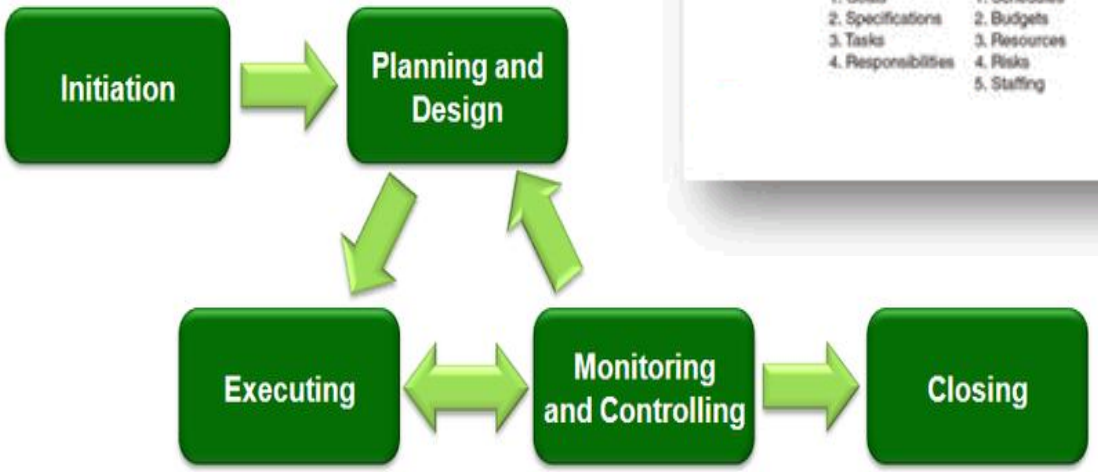
Interface Management Covers
All the nine (9) Facets of Project Management

1. Integration Management
2. Scope Management
3. Time Management
4. Cost Management
5. HESQR Management
6. HR Management
7. Communications Management
8. Risk Management
9. Procurement Management

Courtesy : PMI.org / PMBOK / Presentations

Interface Management Encompasses Entire Project Life-Cycle





Courtesy : PMI.org / PMBOK / Presentations

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Interface Categories

- **Internal Interfaces**
  - Occur within one work-group (WG's) and it's associated entities, such as Operator or the Contractor (and it's sub-contractor/s)
  - They allow flow of information, identify 'Requestor' and 'Responder'.
  - Ex: Occurs between the disciplines, e.g., Engineering, Construction, Quality, Procurement, Project Services, Commissioning, Ops-groups, etc.

- **External Interfaces**
  - Occur between differing entities (WG's), such as Client and the Contractor, or Contractor-A to Contractor-B assigned by the Client.
  - Outside of the Contractor's responsibility (As specified by the Client). Cross-boundaries scopes of two or more Delivery Teams and/or the Development Systems, (Ex. PL contractors for Export Lines, etc.)

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Interface Management Process

- Develop Interface Management Plan / Procedure
- Interfaces are initiated by 'Requestor' with Need Date
- 'Responder' responds to the Interface items
- Interface Manager facilitates the overall Interface Management process, weekly interface meetings, and as-needed breakout sessions amongst the SME's of various WG's to resolve the interfaces in a timely fashion or agreed revised due date.
- Once response is reviewed & acceptable, it is checked for:
  - Risk / MOC / Scope-Change = Y / N?
  - Safety & QAQC issues = Y / N?
- If any of above is 'Y', then respective action is taken prior to the close-out of interface, and stored in Document Control with any attachment.
  - If web-based Interface Management Module application is used, then it is automatically filed in the Closed-out section of the database.

Here's an example of lively Interface Meeting, . . Ha, ha, ha, . . .

No! Don't conduct these kind of Interface Meetings

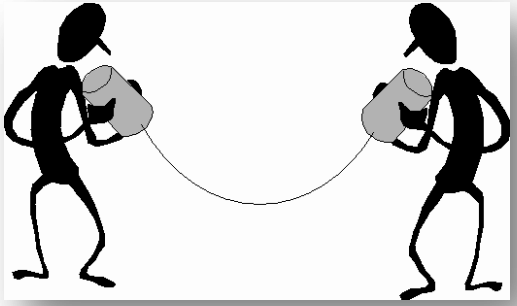
Rick Khadimally conducting an Interface Meeting, . . !

Courtesy : Internet – Cartoons / Rick Khadimally's previous PPT-presentations

Manage Interfaces via enhanced Communication

Interface Management message is to 'Communicate', it connects project teams across Continents, with varying cultures and languages, and in differing time-zones, it's colorful !

Communication is the key to Project Interface Management

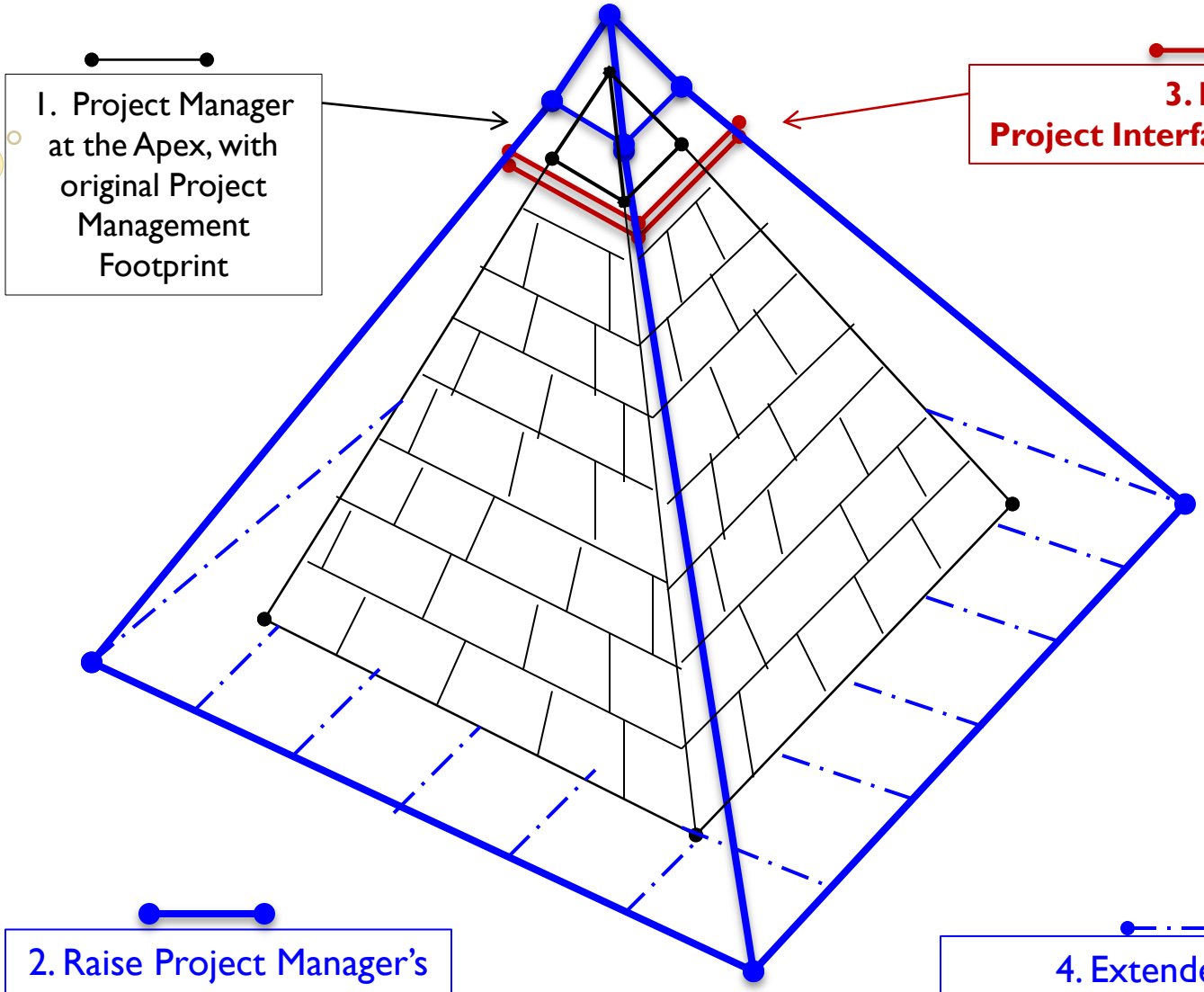


Develop friendly culture of communication among project teams!

Nope ! Not this way!

Courtesy : Internet – Cartoons / Rick Khadimally's previous PPT-presentations

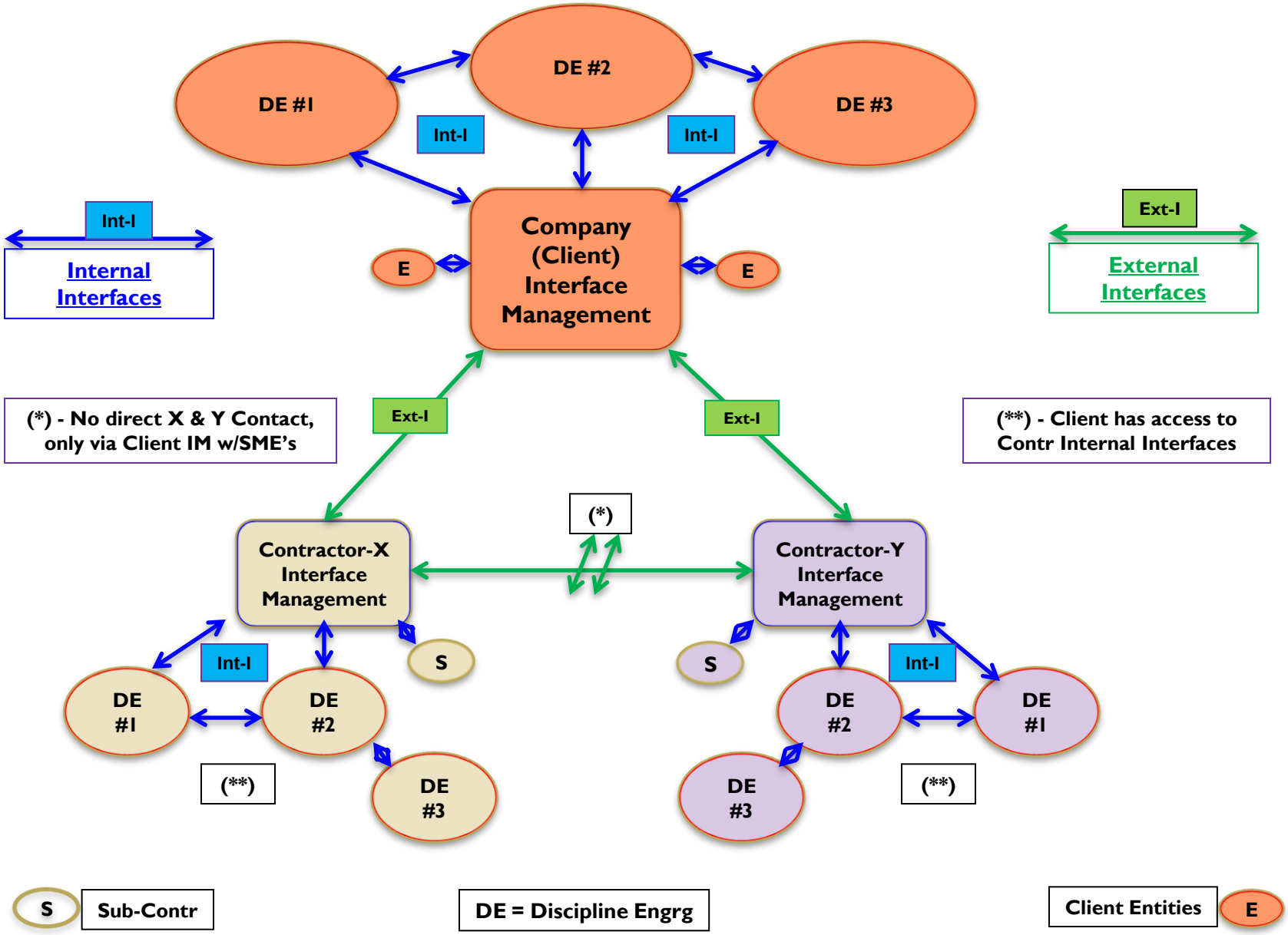
How Interface Management Enhanced the overall Project Management



Project Management (PM) Pyramid

*Narrate example of interviews

Typical - Interface Management Process



Mega Projects

Large Projects, or Programs that have several projects, . . .

Budgets varying from several $BB's plus, . .

Energy Projects / Infra-structure Projects / Oil & Gas Projects / Information Technology (IT) Projects, etc.

Infrastructure / Energy (Non-Oil & Gas) mega-Projects

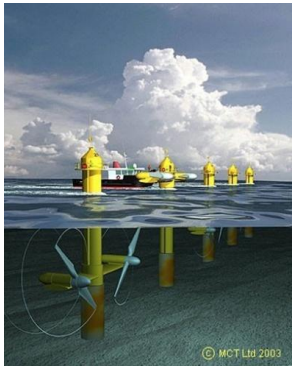
1

Mega renewable energy projects

2

High-Speed Train mega-Projects.

3



Alt-Energy Mega Projects

4

Space Programs - ESA

5

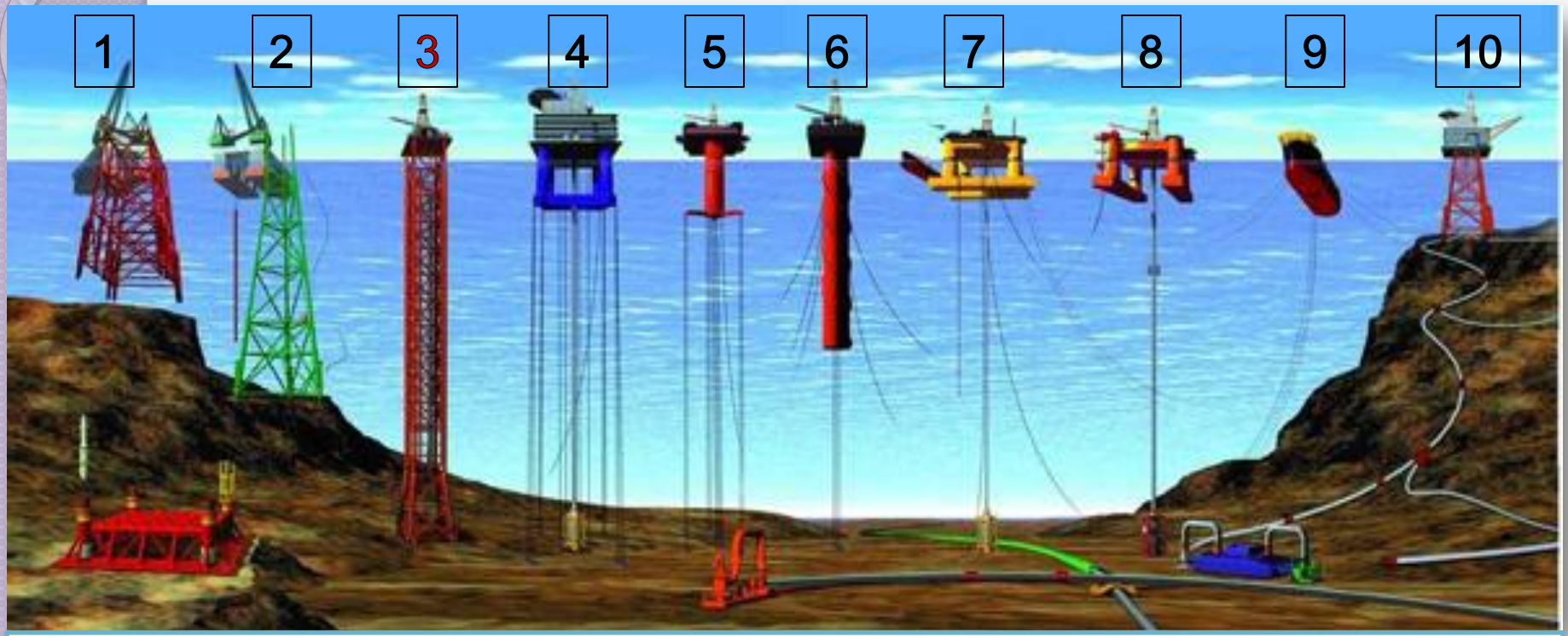
Mega-Defense Projects

6

Super Large Dams

Courtesy : 1. stelco.com / 2. thenewstribe.com / 3. pinterest.com / 4. actinnovation.com / 5. thebrigade.thechive.com / 6. rediff.com

Oil & Gas mega-Projects - (Typical Platforms & Production Systems)



Offshore Oil & Gas Projects

1, 2) Conventional Fixed Platforms; 3) Compliant Tower; 4, 5) Vertically Moored Tension Leg and mini-Tension Leg Platform (TLP); 6) Spar ; 7,8) Semi-Submersible Drilling & Production /FSO ; 9) Floating Production, Storage & Offloading Facility (FPSO); 10) Sub-Sea completion and tie-back to host facility.

Courtesy : Mineral Management Services www.mms.org

Concurrent Engineering

Interface Management Energized Concurrent Engineering on Mega-Projects

- **Concurrent Engineering (CE), . .**
- Is an art of, . . .
  - Performing the engineering tasks in parallel and concurrently, .
  - Interface Management has resonated this process, .
  - With the sole purpose to execute the projects
    - Ahead of the normal schedules,
    - Lower than the normal budgets, and
    - Conforming to the required Safety and QAQC Standards.

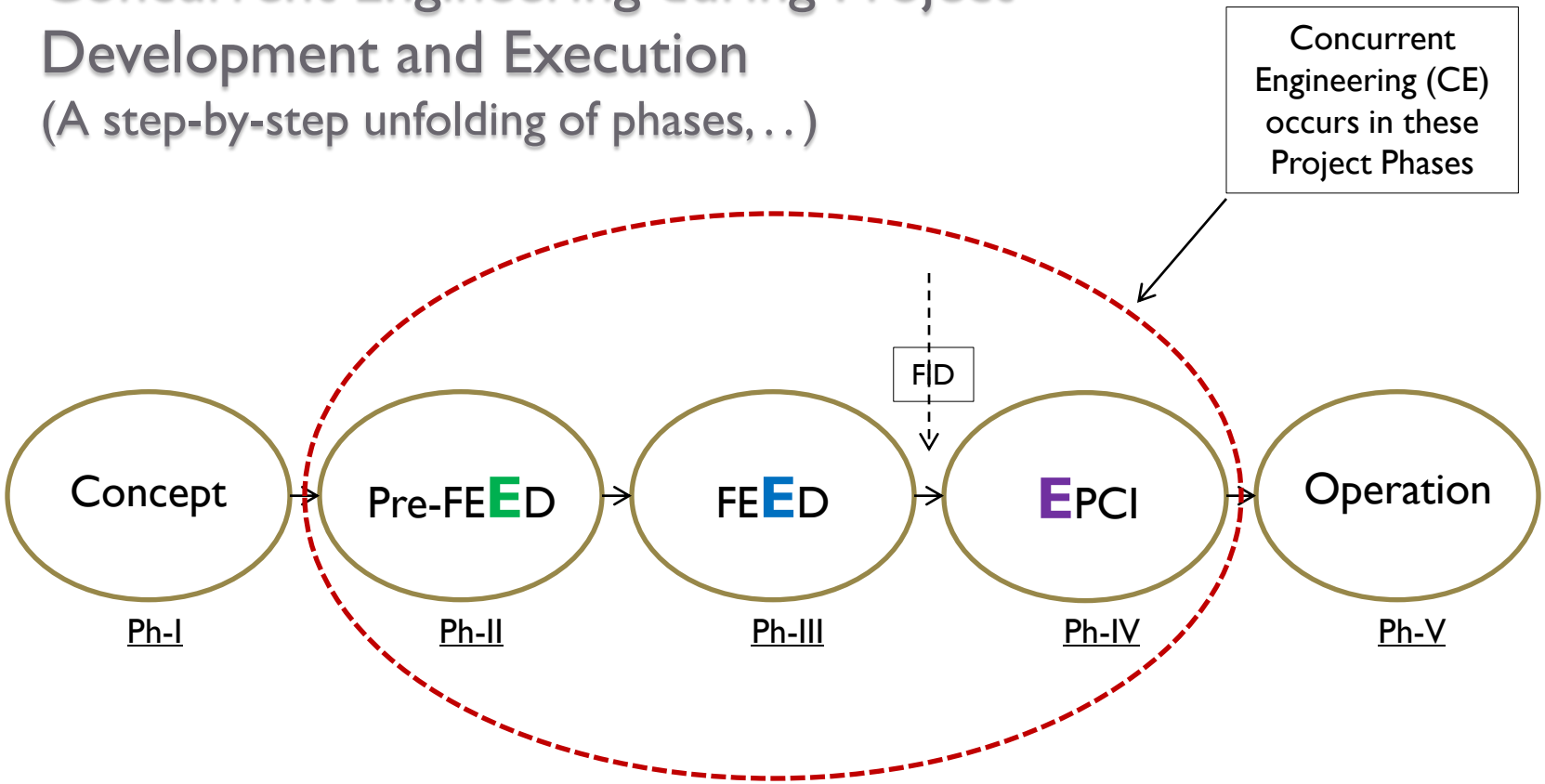
Interface Management Energized Concurrent Engineering on Mega-Projects

- **Concurrent Engineering(CE), . . .**
- Is equally a process, . . .
  - Wherein Engineering is applied with practical knowhow to convert a concept into reality, . .
    - It is a fit-to-purpose phenomenon to
    - Conceive / Invent / Define & redefine / Design / Modify
    - Build / Maintain, and improve the
    - Processes, Machines, Structures, Devices, Systems, &
    - Materials and for the betterment of environment economically, socially and with health & safety in mind

Concurrent Engineering is a Cost-Effective way and in least possible Time-Frame, . . . It's subjective and varies on case-by-case basis, . .

Concurrent Engineering during Project Development and Execution

(A step-by-step unfolding of phases, . .)



FID = Final Investment Decision

Review – from <u>Concept</u> to <u>Pre-FEED</u>, to **<u>FEED</u>**, to **<u>EPCI</u>**, the Mechanical Completion,. Then with **<u>Operations</u>** on Systems Completion involving Pre-Comm, & Commissioning, RFSU, Startup and Production

Phase-I: Review new *Project or concept, evaluate options for* merits, narrow down with an OME (order-of-the-magnitude cost estimate) prior to committing significant resources, etc. . .

Project development and execution, . .
A step-by-step unfolding, . .

Phase – 11

Pre-FE**E**D

Lets call this engineering as, . .

Develop a Preliminary front end engineering design, complete the basis for design (BOD), with various engineering disciplines including process, structural, mechanical & piping, electrical, instrumentation, Automation Controls systems, etc. with schedule & hi-level cost estimate, . . .

Concurrent engineering is ongoing, saving man-hours and schedule, . .

E_P

Project development and execution, . .
A step-by-step unfolding, . .

Phase – III

FE**E**D

Lets call this engineering as, . .

Develop a full front end engineering design, incorporate revisions to the basis for design (BOD), with various engineering disciplines including process, structural, mechanical & piping, electrical, instrumentation, Automation Controls systems, etc, with schedule & Level-III cost estimate, . . .

Ex: Brownfield project to an existing Facility with differing Specs

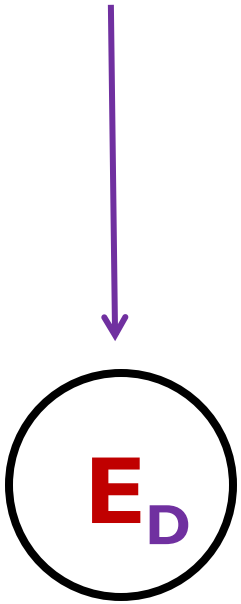
Concurrent engineering is ongoing, saving man-hours and schedule, ...

E_F

Project development and execution, . .
A step-by-step unfolding, . .

Phase - IV

Lets call this engineering as, . .



As FID is granted, award contract & proceed to detailed Engineering, procurement, construction and installation, develop 'Approved for Construction (AFC)' drawings with various engineering disciplines, etc, . . .

Concurrent engineering is ongoing, saving man-hours and schedule, ...

Project development and execution, . .
A step-by-step unfolding, . .

Phase - IV

EP**C**I

The letter 'C' for Construction has a built-in called Shop Engineering

Lets call this engineering as, . .

Generate shop-drawings, . . . the approved for construction (AFC) drawings are not enough to build and construct at the fabyards, we have Shop Engineering to develop shop drawings based on which we could build, . . .

Concurrent engineering is ongoing, saving man-hours and schedule, . . .

E_S

Project development and execution, . .
A step-by-step unfolding, . .

Phase - IV

EPC**I**

The letter 'I' for Installation has a built-in called T & I Engineering

Lets call this engineering as, . .

Generate T & I detailed procedures and drawings, . . . based on the AFC-status Sea-fastening, transportation & installation (T & I) Reports, Schematics & Analyses. These are not enough to transport & install. hence T & I Engineering is needed, . . .

Concurrent engineering is ongoing, saving man-hours and schedule, . . .

E_I

Project development and execution, . .
A step-by-step unfolding, . .

Over-Arching Phenomena

VE / LL's

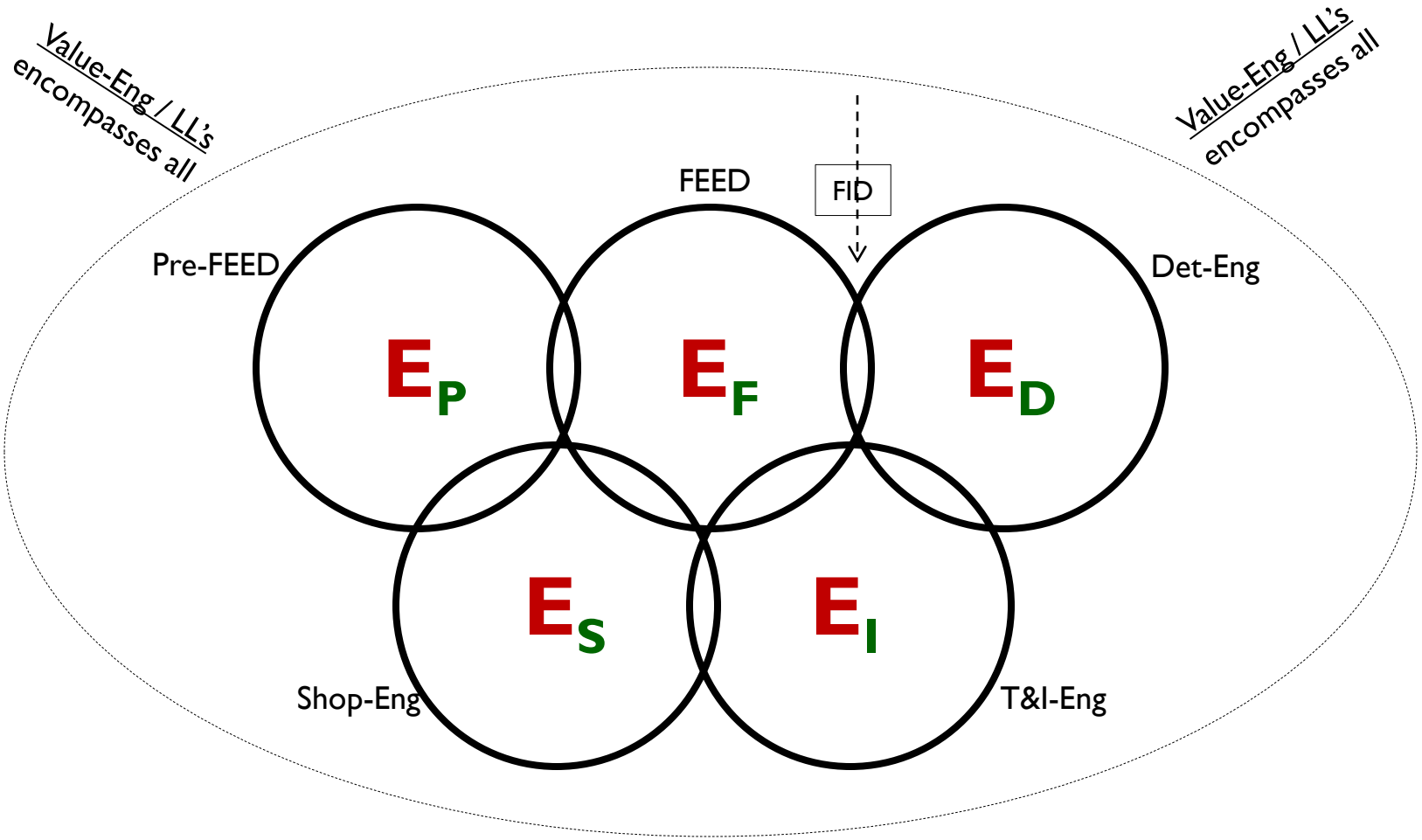
Lets call this engineering as, . .

Apply this over-arching & ongoing phenomena, this is Value Engineering (VE) based on the Lessons Learned (LL's) from previous projects and captured at every stage of engineering, ... So apply them, . .

Concurrent engineering is ongoing, saving man-hours and schedule, . . .

E_V

On a full-blown Project, it looks like, . . An 'Olympiad' of Concurrent Engineering



Ps: Concurrent engineering is occurring in each of the phases depending upon the nature of projects, . .

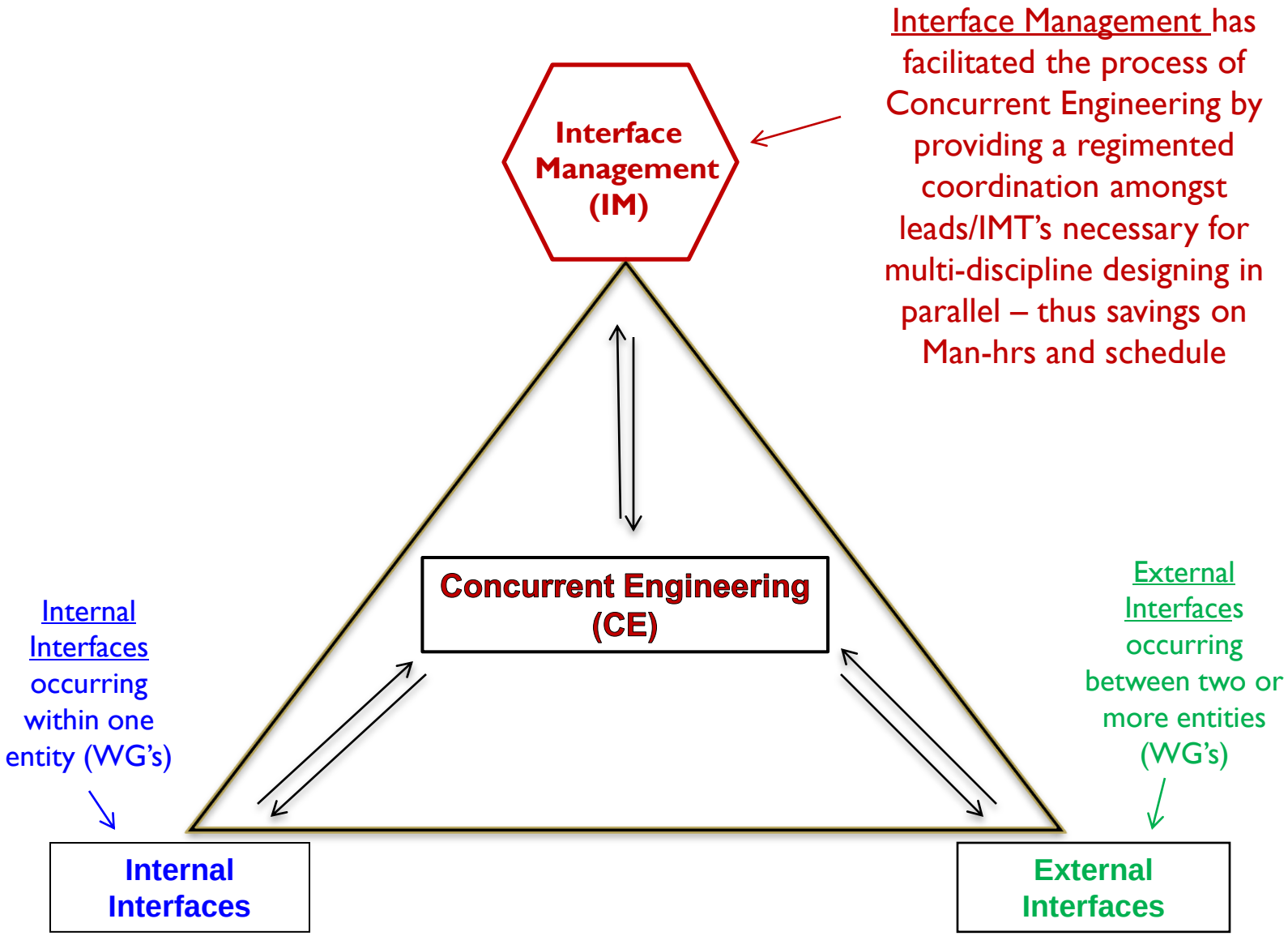
FID = Final Investment Decision

How Interface Management Energized Concurrent Engineering?

Typical Example

Saved the Schedules & Man-hrs

A pictorial presentation, . .

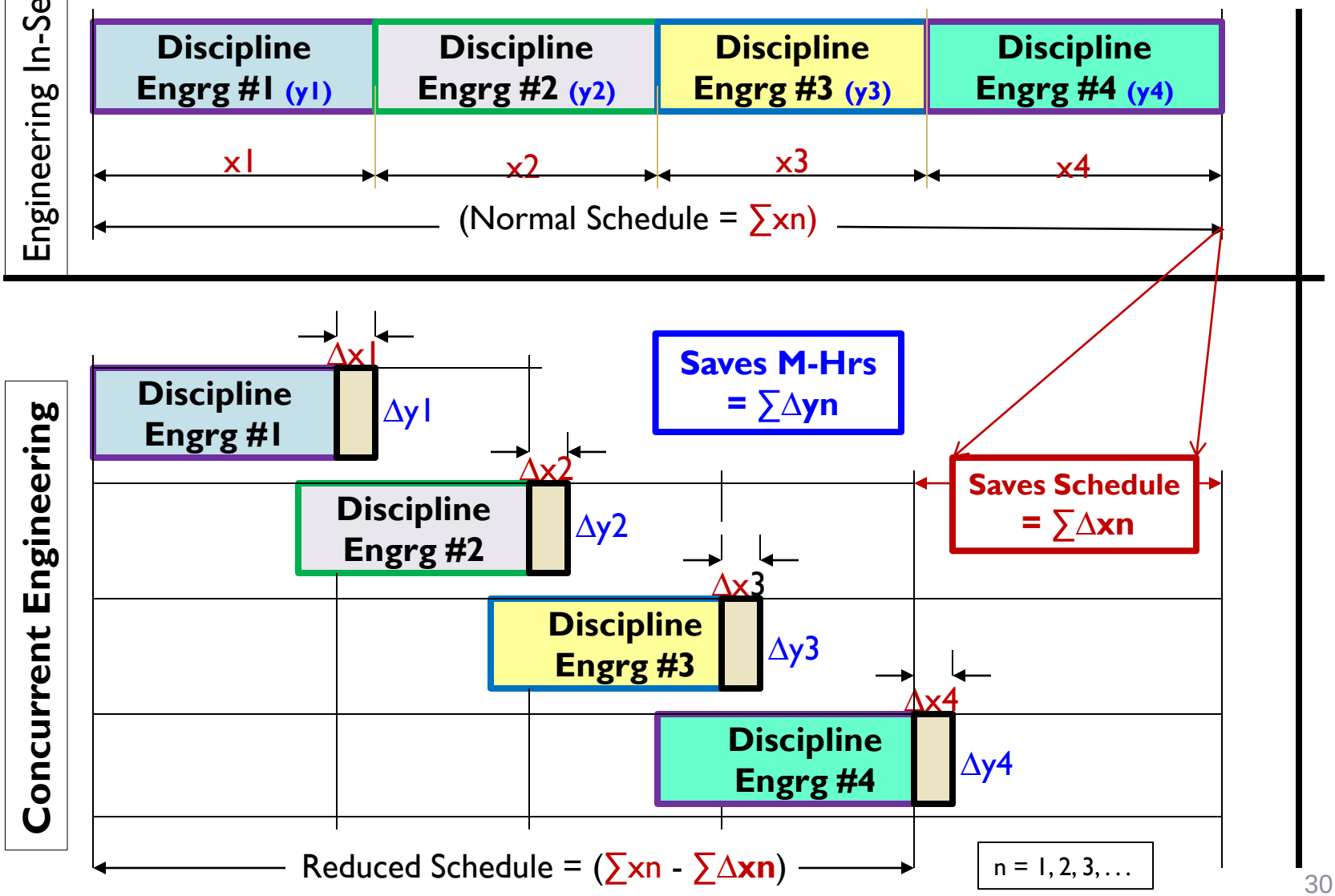


IMT = Interface Management Team, one SPOC from each work group (WG's)

A typical example
Concurrent Engineering (CE) saves
- Schedule (**x**), & Man-hrs (**y**)

Savings ~15-30%

Reduced Man-hrs
= ($\sum$yn - $\sum\Delta$**yn**)



Path Forward / LL's / Recommendations / Q & A Session?

- Train practically within the PM ranks the cadre of Interface Management, . . Example . . →→
- As concurrent Engineering is always occurring, acknowledge the continued important role of Interface Management, in executing mega-projects on web-based interface modules

- For our young Discipline Engineers, they may follow the path of Interface Management to be future Project / Program Managers, . .
- Out of three (3) probable routes for successful PM as below:
  - Project Engineering Manager
  - Project Controls Manager, and
  - Project Interface Manager, ... **Which is the most communicative?**

Courtesy : Internet Image – Mayan Pyramid

Q & A Sessions

Thank You !

About the Speaker :

Rafiq (Rick) Khadimally, PMP | Consultant - Interface Management

Rick has managed the crucial aspect of Interface Management on several major oil and gas projects. Throughout his career of nearly three decades of project management in USA and international, Rick has performed his role on Offshore Jacketed Platforms, TLP, Semisubmersible, SPAR, and Drilling Rig projects. Currently, Rick is serving as Consultant Interface Management on Chevron Malange Project for Angola. Additionally, Rick has served in the Project Management and Engineering capacities on several oil refinery projects. Rick holds an MBA degree in Global Energy from Bauer Business School (UH), a B.Sc. in Mechanical Engineering from the University of Engineering & Technology where he topped the list with two medals. Rick is also Project Management Professional certified as PMP. Finally, Rick is participative in the PMI chapter and delivered Worldwide PMI-webinar on 'Interface Management for Oil & Gas mega-Projects'.

9th January, 2015