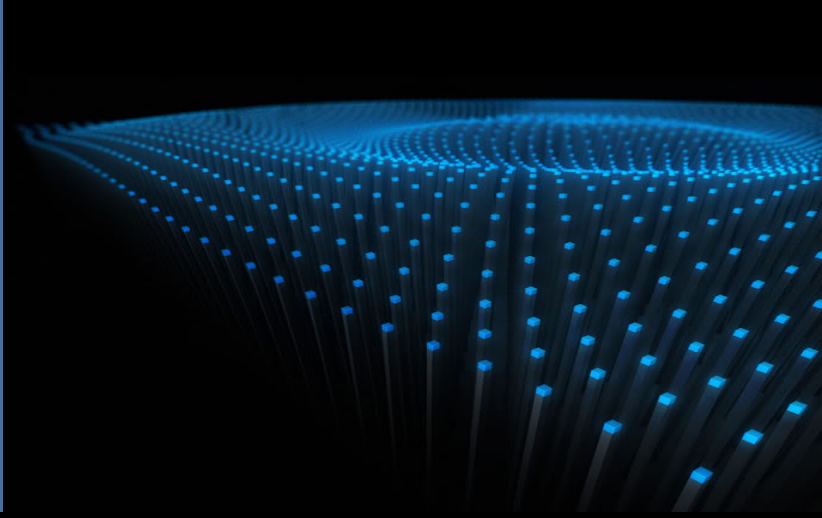
I LEAN PROJECT MANAGEMENT FORUM '10



Critical Chain Project Management: An Introduction

Rob Richards, Ph.D.
Project Manager
Stottler Henke Associates, Inc.

LEAN PROJECT SOLUTIONS By SYSTEM

SYSTEM® Value&Innovation

Stottler Henke Smarter Software Solutions

UAB

ALSTOM

Presentation Outline

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Smarter Software Solutions

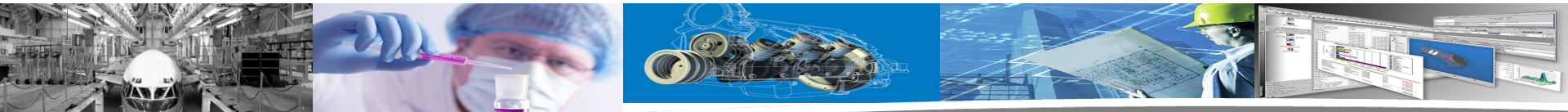
Motivation & Background

Problem [What to Change]

- Localized Risk Management
  - Task Level Insurance Policy
  - Student Syndrome
  - Parkinson's Law

Solution [What to Change to]

- Global Risk Management
  - Project Level Protection
  - Systems Perspective
  - Execution Control



Motivation

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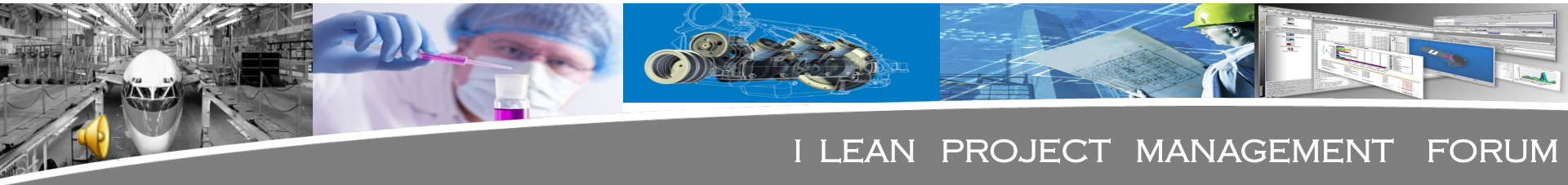
- < 45% of all projects finish on schedule or before
- < 17% software projects completed on-time / on-budget.
- IT related projects
  - 23%+ of projects will be canceled before they ever get completed. Further results indicate
  - 50%+ of projects cost > 150% original estimates
- Ref: www.it-cortex.com/Stat_Failure_Rate.htm
  www.pqa.net/ProdServices/ccpm/W05002001.html



Results:
Switching to Critical Chain

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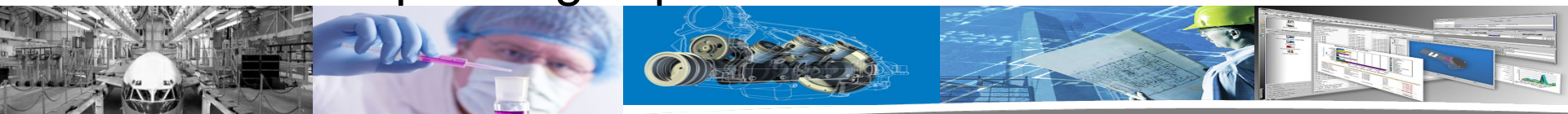
- Lucent Technologies
  - Outside Plant Fiber Optic Cable Business Unit reduced its product introduction interval by 50%, improved on-time delivery, and increased the organization's capacity to develop products.
- Seagate
  - Brings 1st 15,000 rpm disc drive to market ahead of its competition, causing all competition to pull out of the market. (circa 2000).
- Lord Corporation (high-end auto & aerospace OEM)
  - Capacity has increased, cycle time improved, and operating expense remained the same.



Are You a Responsible Person?

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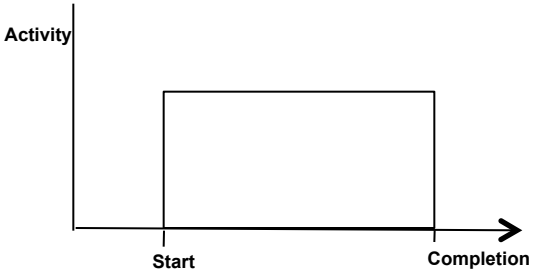
When asked for task estimate or **asking for one:**

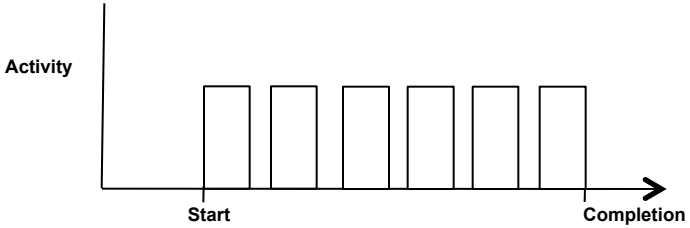
What do you supply?

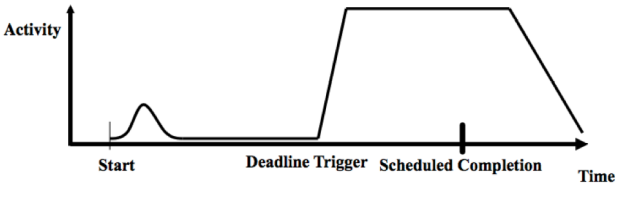
What do you assume is supplied?

How often is the "Three Point Estimation" used?

How do you work when assigned to a task?







Three-point Estimation of Task Times

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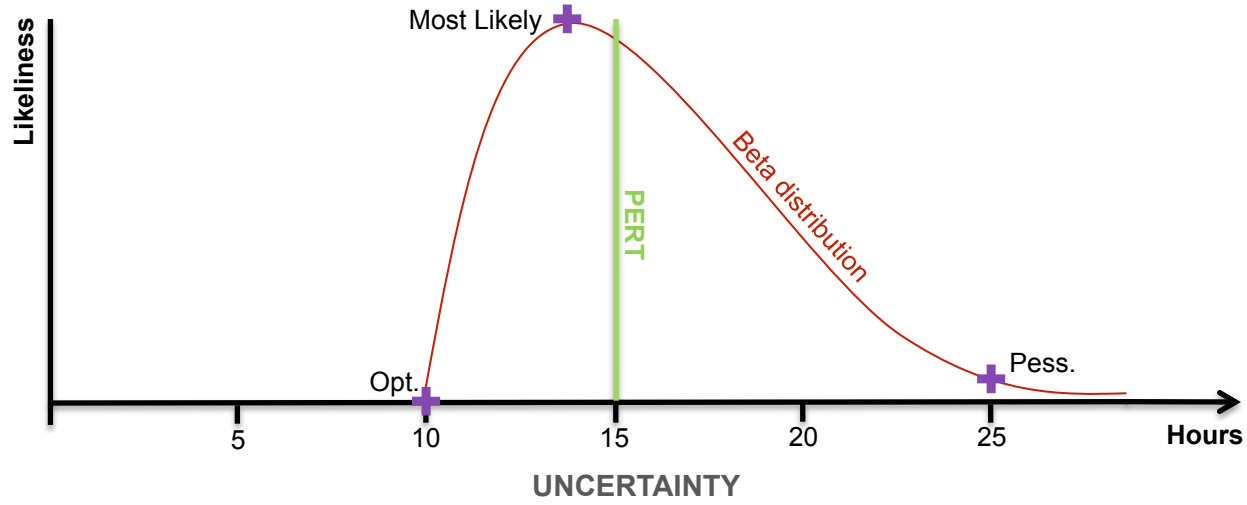
In three-point estimation, three figures are per task, based on prior experience or best guesses

a = the best-case estimate
m = the most likely estimate
b = the worst-case estimate

Do most projects ask for these three?
Which of the estimates is closest to the estimate most people report when asked?



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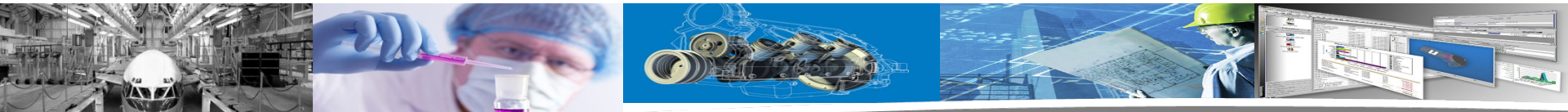

Problem: Localized Risk Management

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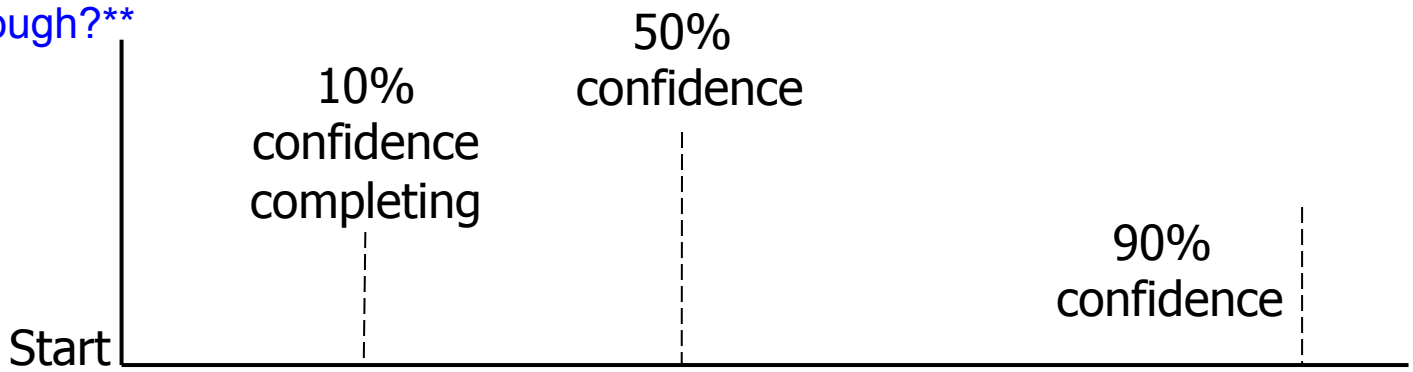
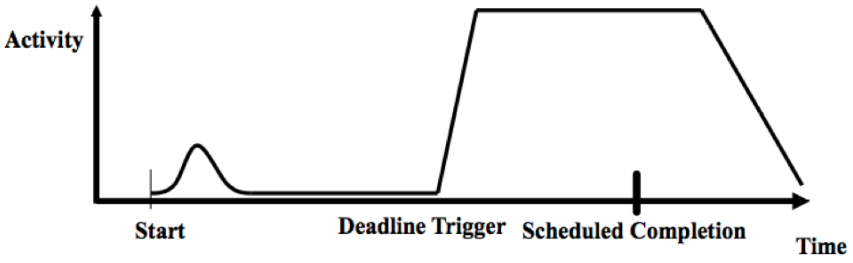
Task level insurance policy

** How safe is safe enough?**



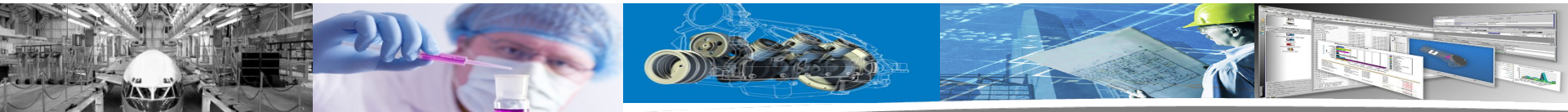
Student Syndrome



Parkinson's Law

Self-fulfilling prophecy [good estimating?]

Multi-tasking [absence of priorities]



Multi-tasking

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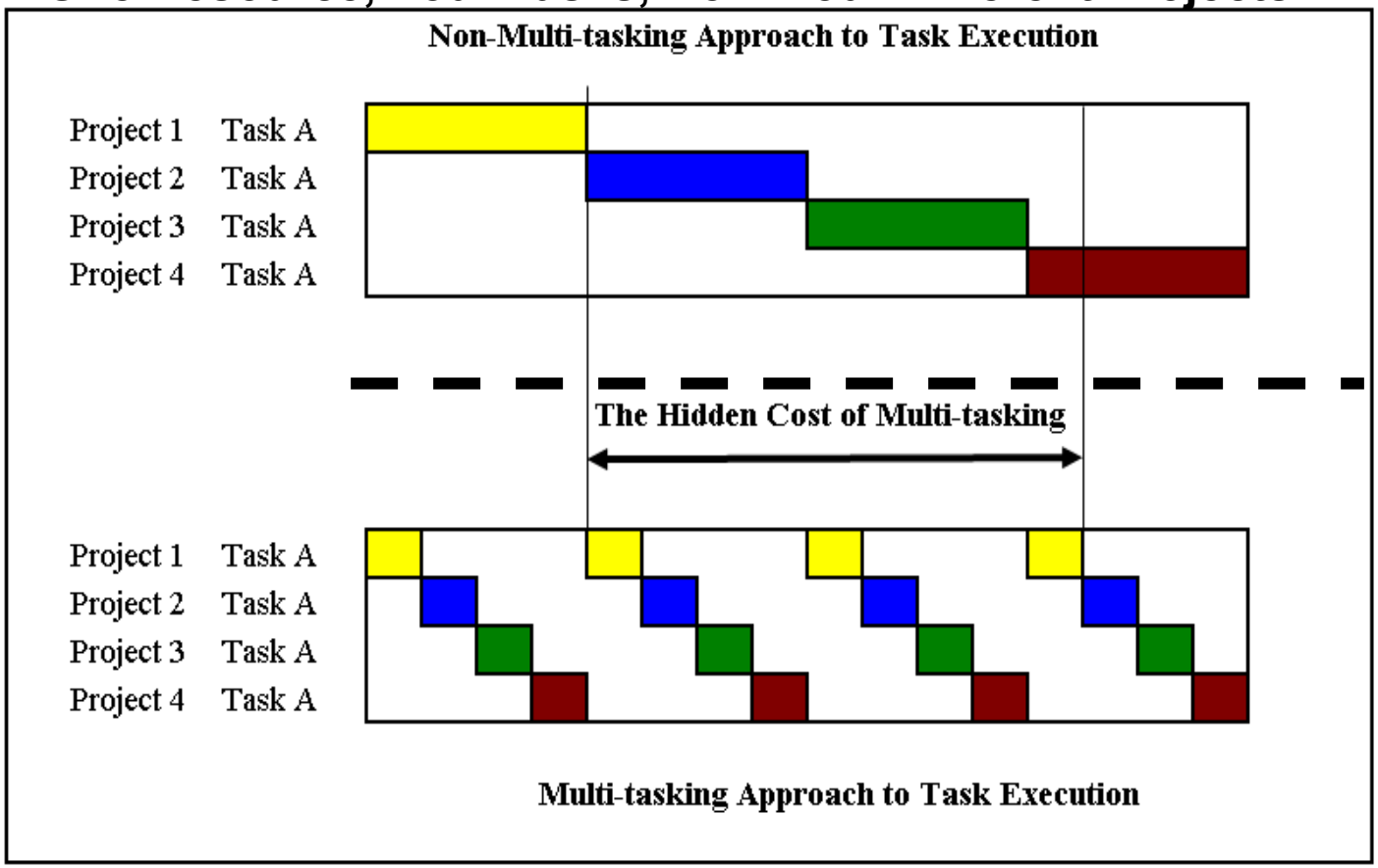
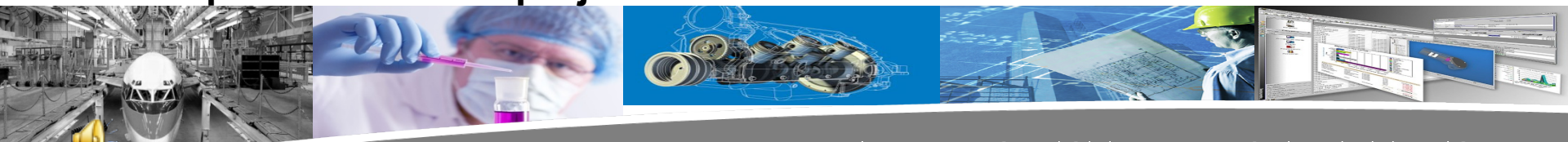
One Resource, Four Tasks, from Four Different Projects



Multi-tasking / task switching has overhead causing more delays to spread across all projects.



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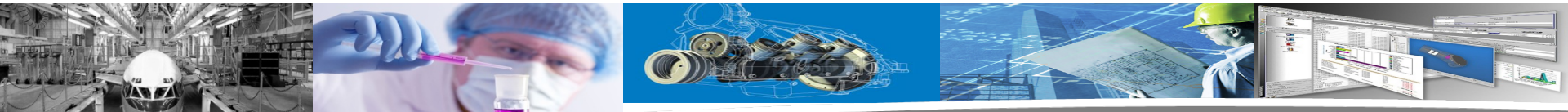


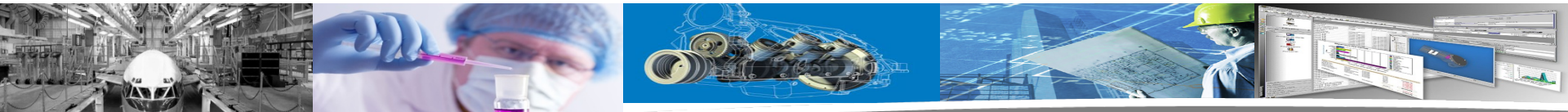
Solution

Governing Principle Behind *Critical Chain* is:

Aggregation of risk…

Benefits:

- Lower overall protection needed
- Higher degree of “coverage” achieved
- Leading to lower incidence of “failure”



Solution

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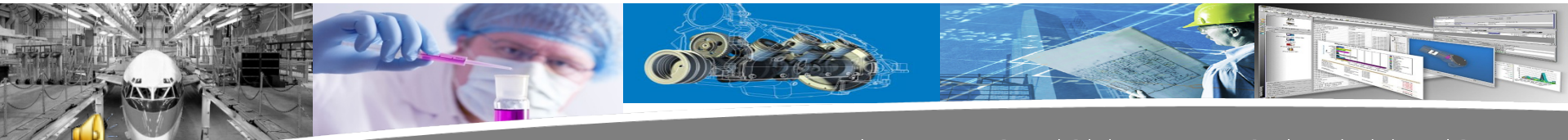
1. Planning
    1. Project Level vs. Task Level Protection
    2. Systems Perspective for Multiple Projects
        Pipeline projects with overlapping resources

2. Execution Control
    1. Promote and encourage team culture
    2. Controlled work queues
    3. No multi-tasking work rules
    4. Task assignment prioritization
    5. Management by Exception



Critical Chain Planning Process

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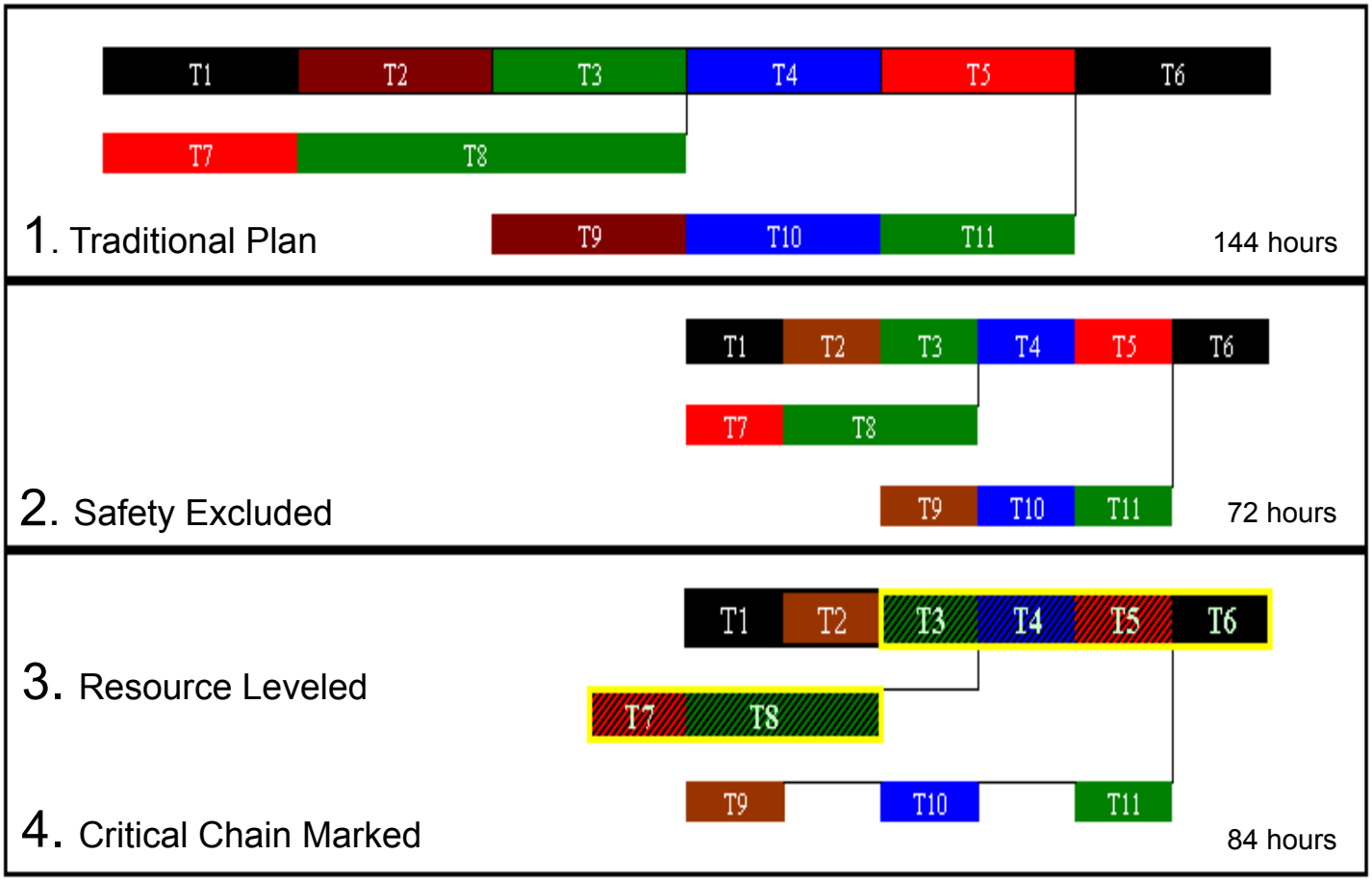
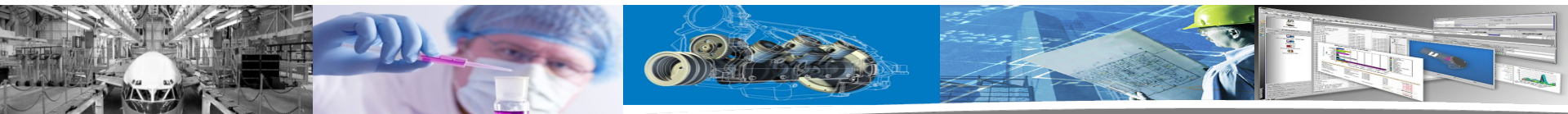
From Task to Project Protection





Critical Chain Planning Process: Gantt

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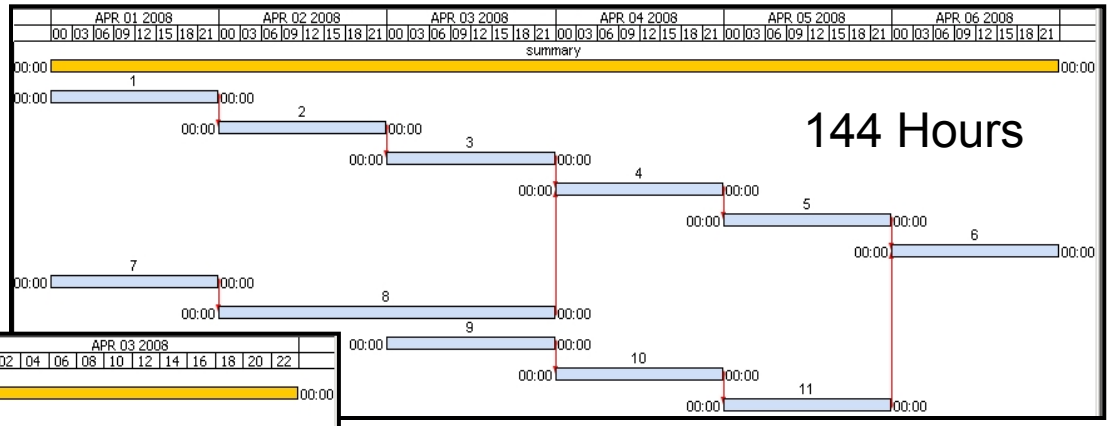
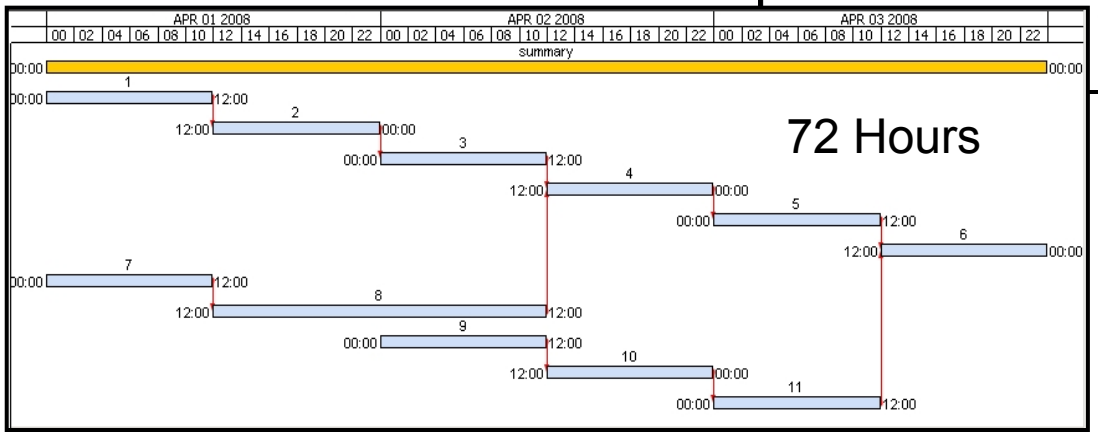
From Task to Project Protection

1. Traditional Plan

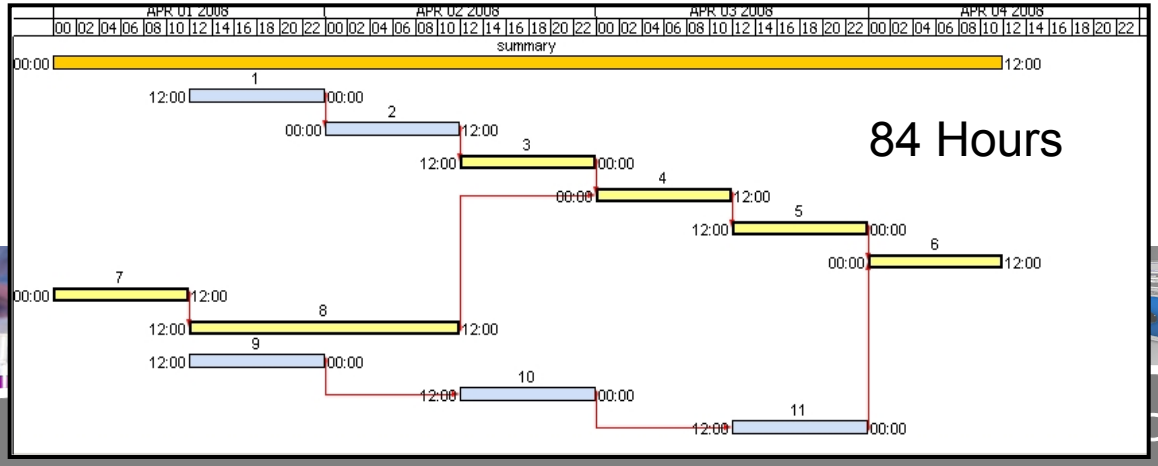


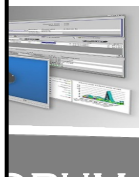


2. Safety Excluded

3. Resource Leveled

4. Critical Chain Marked in Yellow





Aggregation Principle

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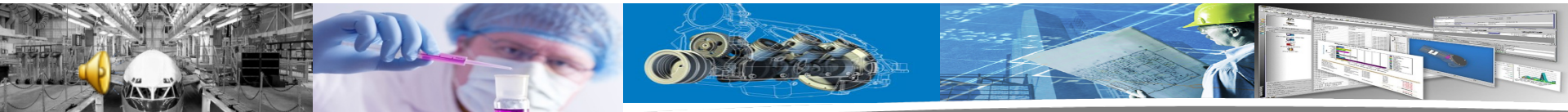
The Concept of Risk Pooling:

Health Care Insurance Example:

- Larger pool = Lower cost



Aggregation Principle (2)

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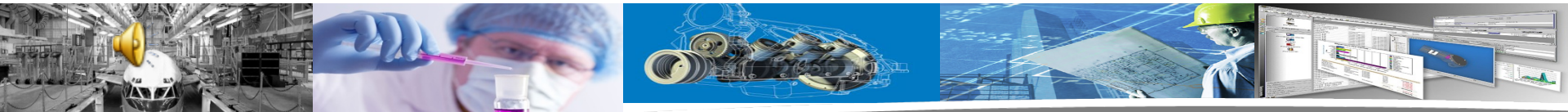
Insurance is designed to work by spreading costs across a large number of people. Premiums are based on the average costs for the people in an insured group. This risk-spreading function helps make insurance reasonably affordable for most people.

http://www.insurance.wa.gov/legislative/factsheets/PoolingRiskReducingCost.asp



Critical Chain Planning

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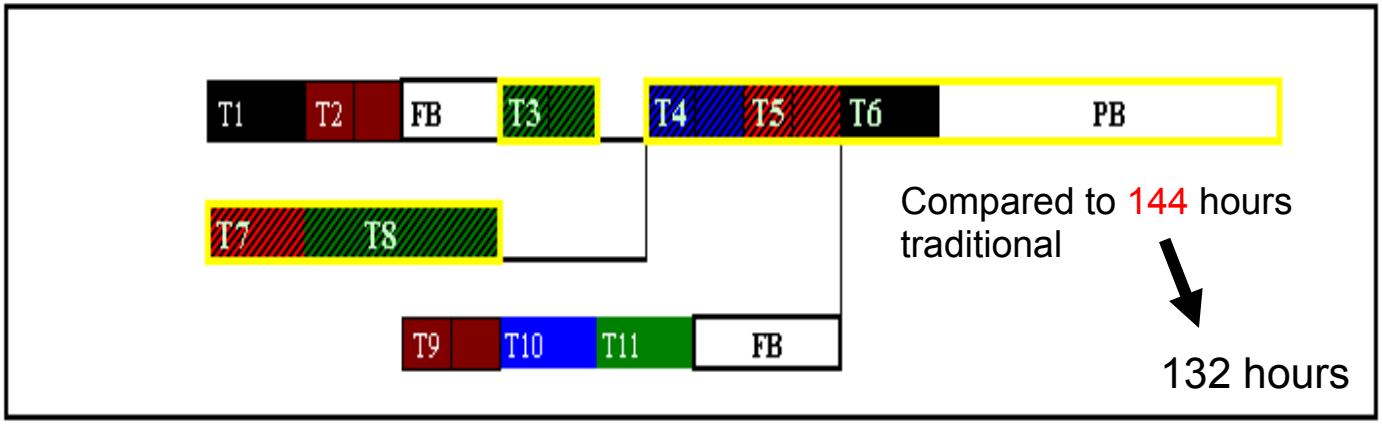
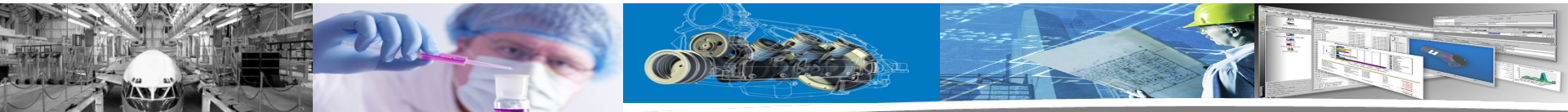


PB = Project Buffer FB = Feeding Buffer

Aggregation Principle [where did some of the safety go?]:

1. Pooled protection provides more coverage
2. Location is just as important as amount
3. Sizing Rule of Thumb → Buffer is ½ of preceding chain



Critical Chain Planning

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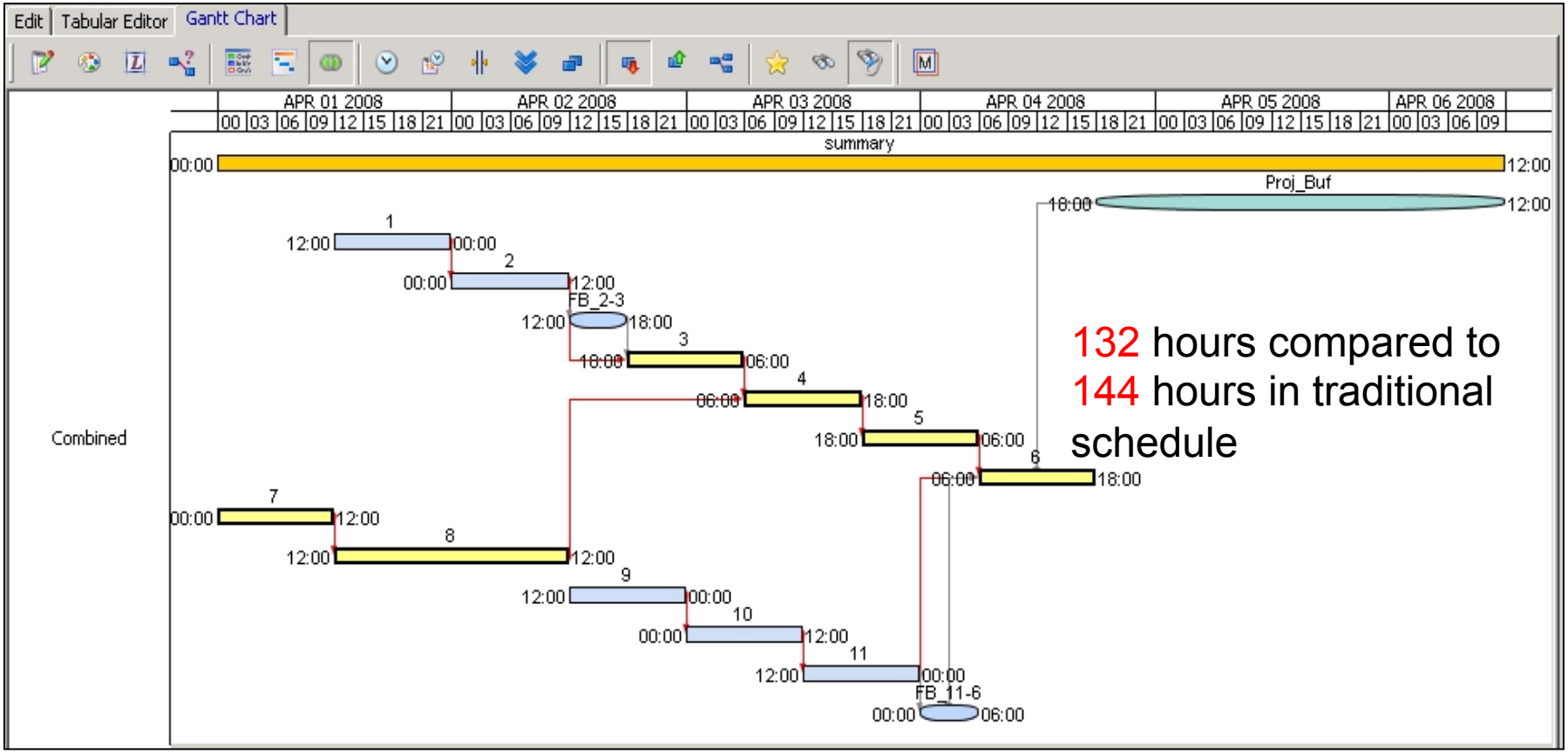
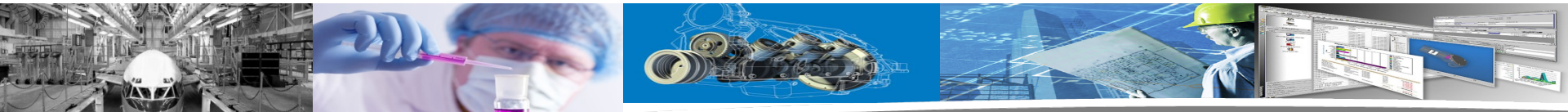
Schedule shown in Aurora



Proj_Buf = Project Buffer FB = Feeding Buffer



Critical Chain in Execution

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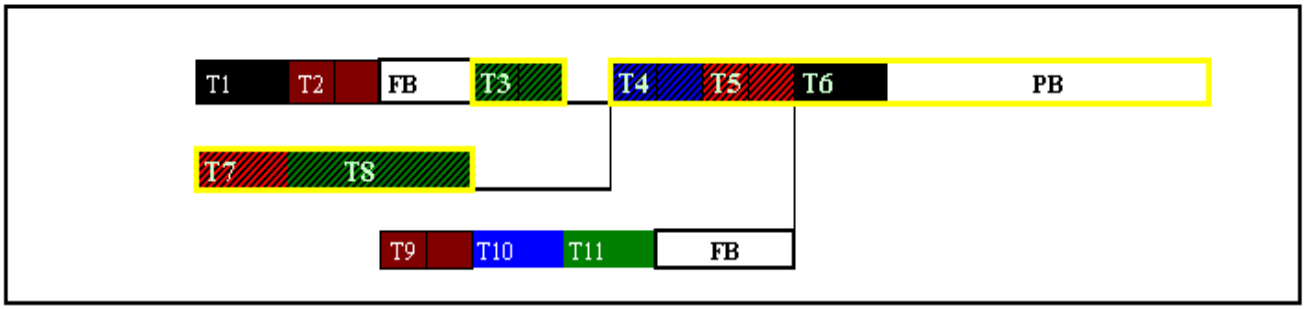
Schedule Before Execution Starts



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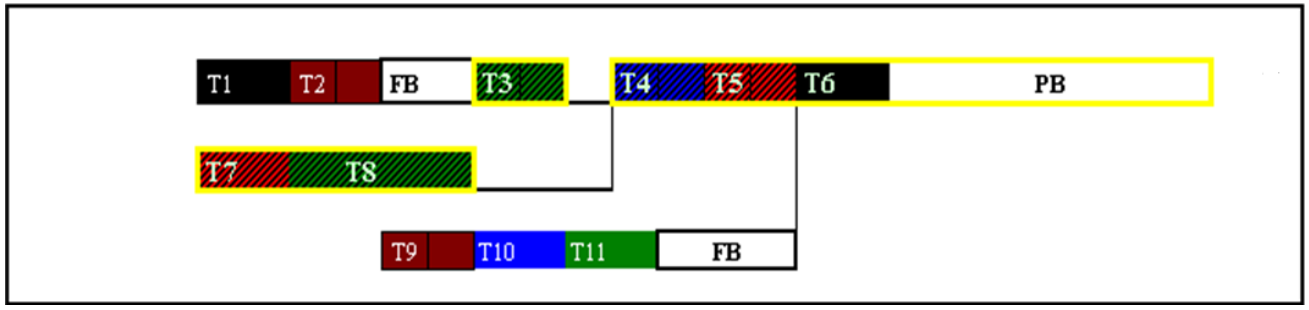
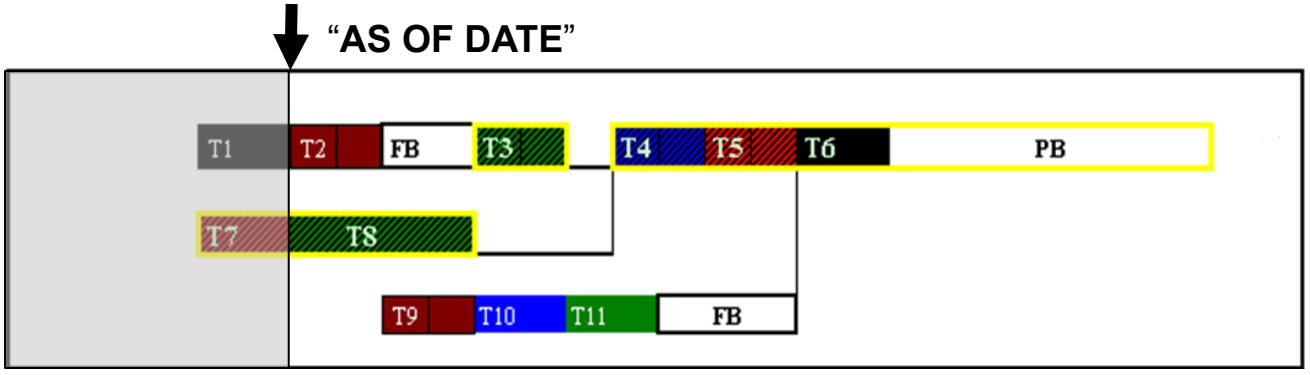
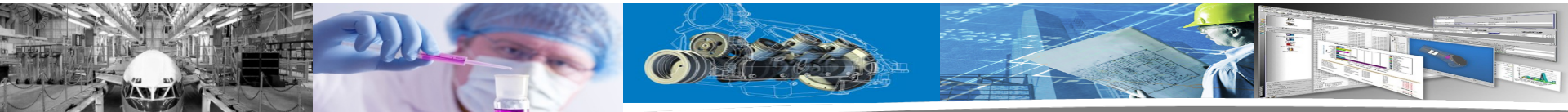




- T1 & T7 finish on time



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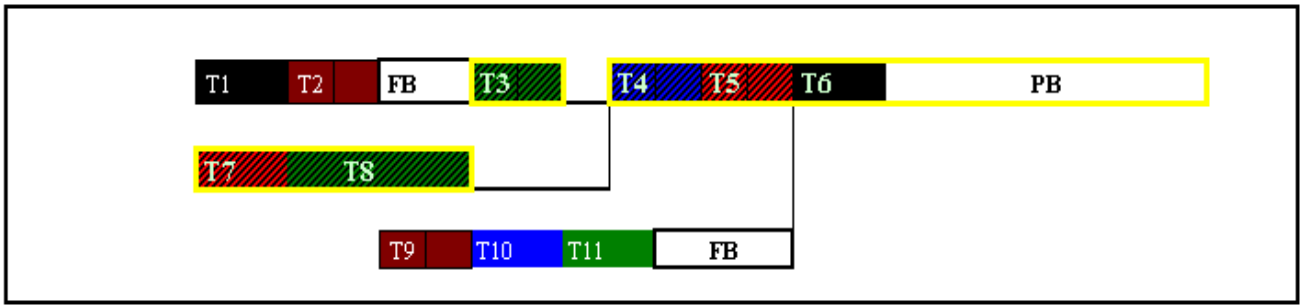
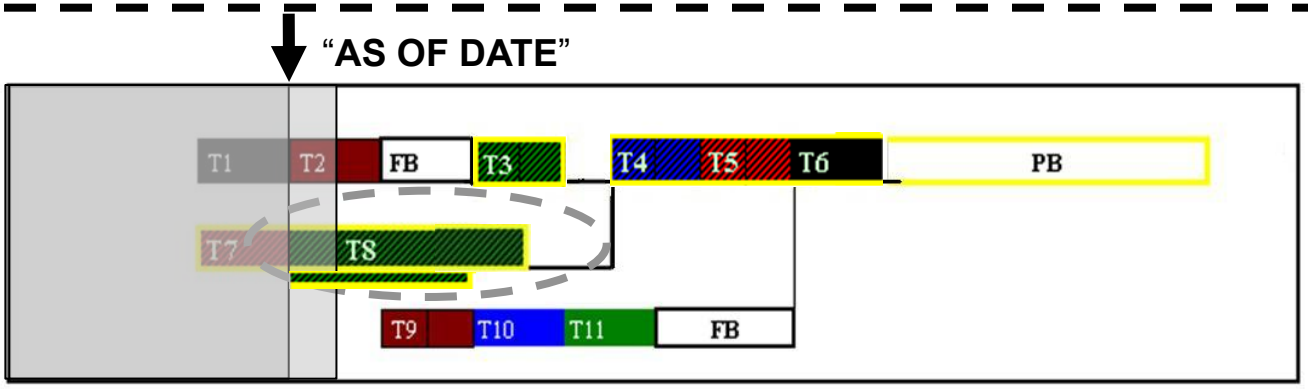
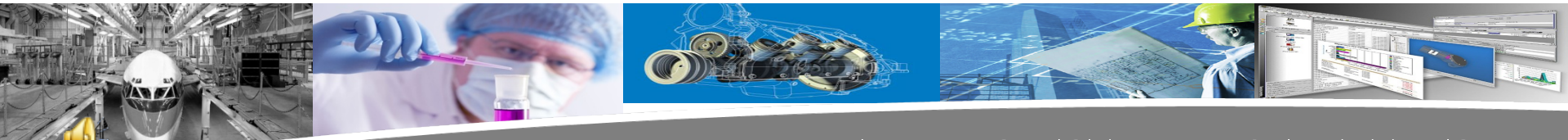




- T8 experiences increase in Scope or Delay
- First portion of delay absorbed by gap between T3 & T4

= Original T8 duration



Critical Chain in Execution

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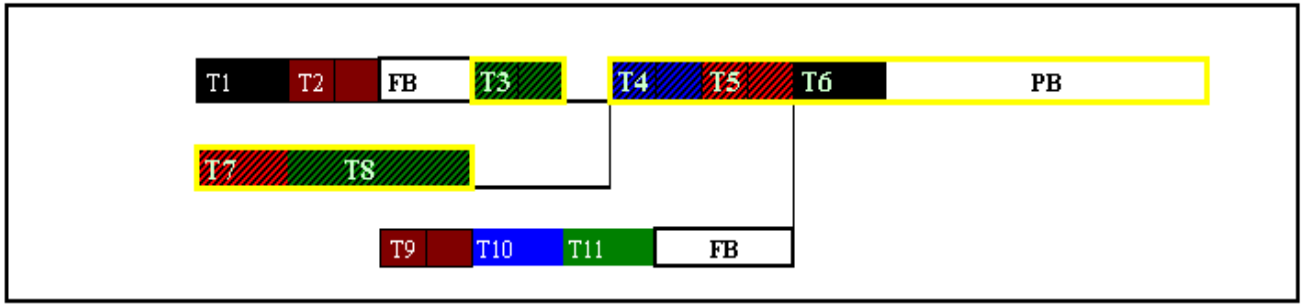
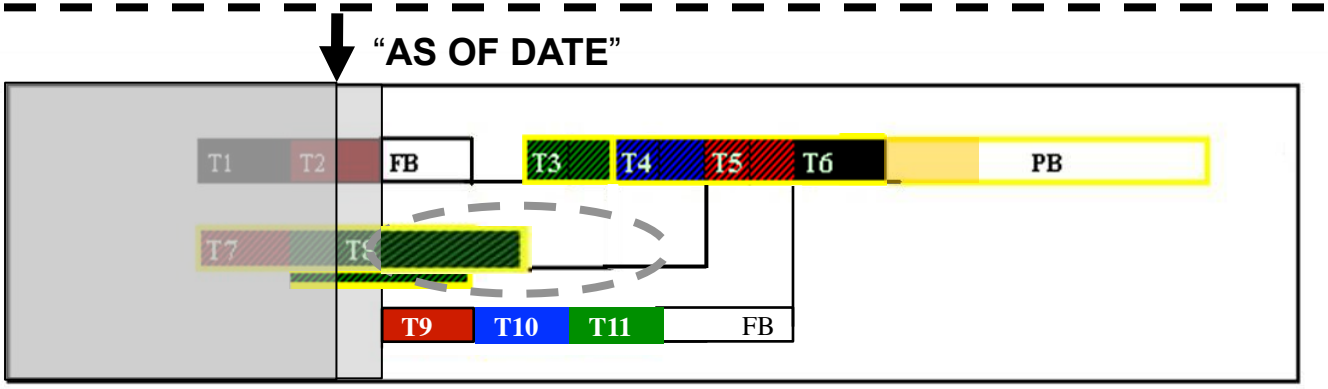
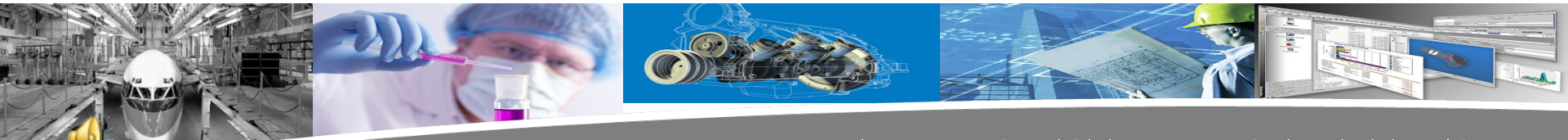




- Rest of delay impacts the project buffer
- T11 also affected due to resource constraint
- E.g., So as of the "As of Date" project may be → 7% Complete with 30% Buffer Consumed

= Original T8 duration = project buffer impact



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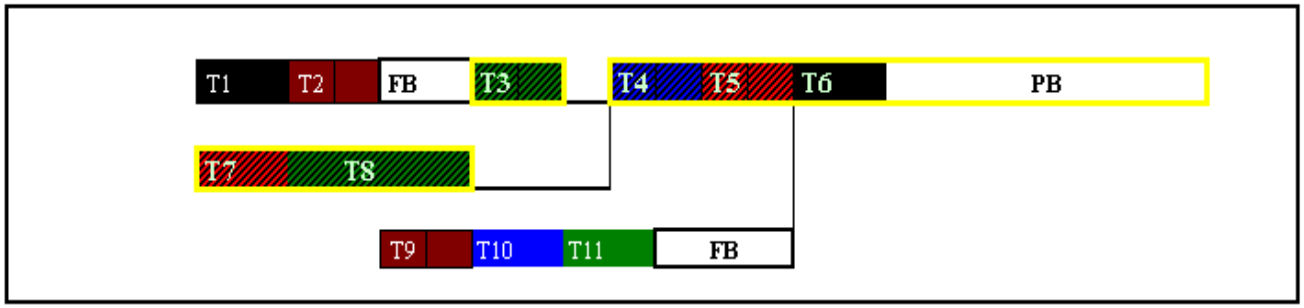
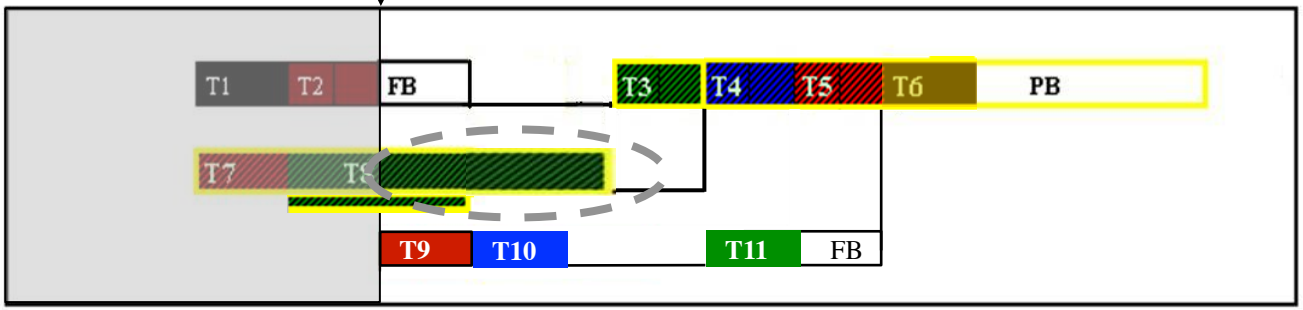


"AS OF DATE"



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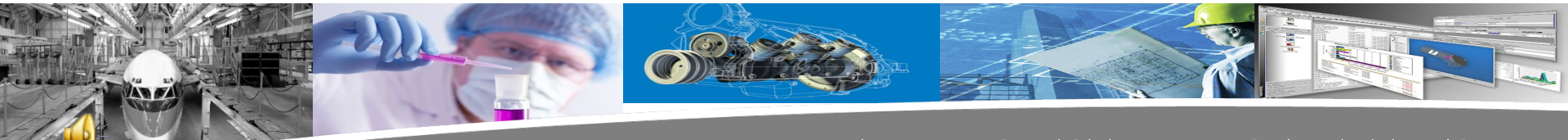

Perspectives on Buffers

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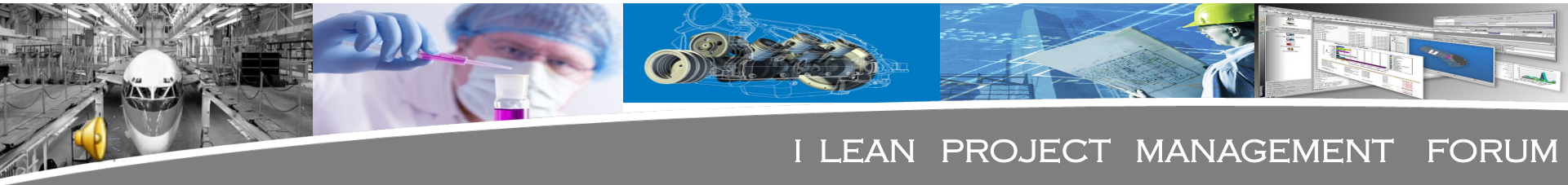
- Not “rear view mirror watching”
- Predictive/Preventative/Leading Indicator
- Mechanism to Promote and encourage Team Work
- Collaboration / Communication Incentive Mechanism
- Measuring device – Neutral, Normalized Metrics
- Real-time Risk Meter
- Encourages a holistic/goal oriented perspective



Critical Chain Priority Metric

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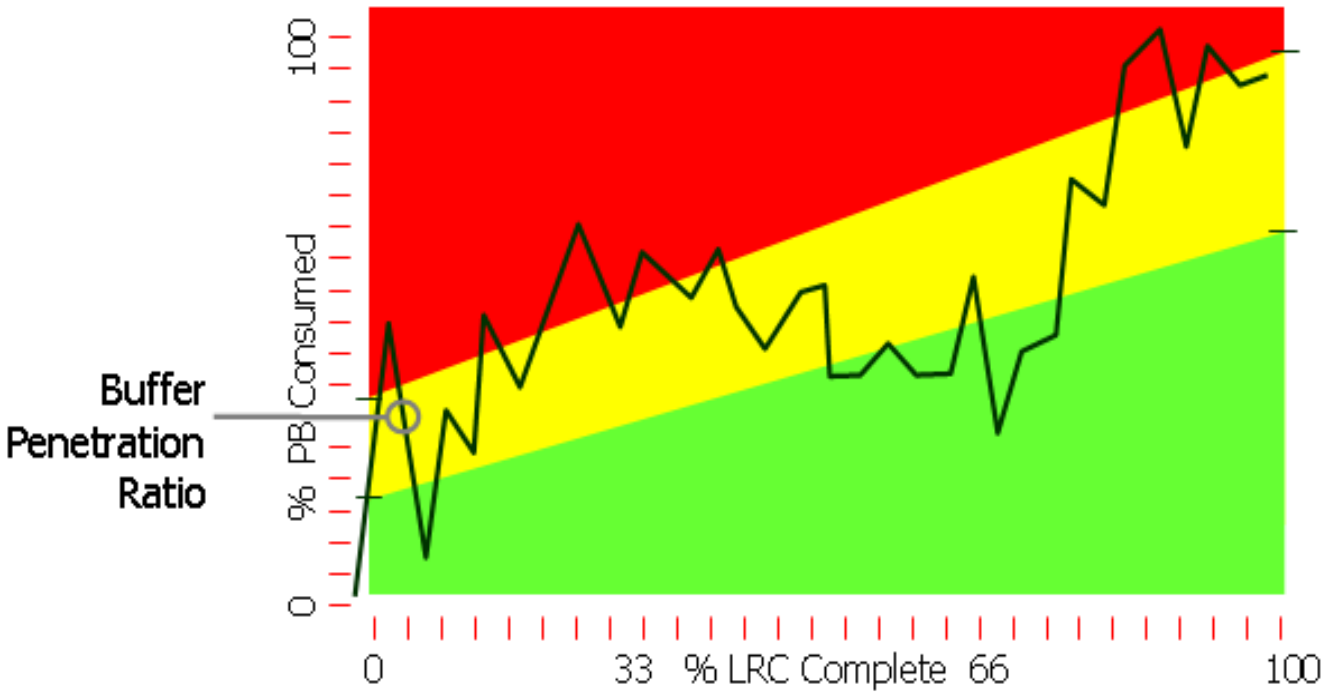
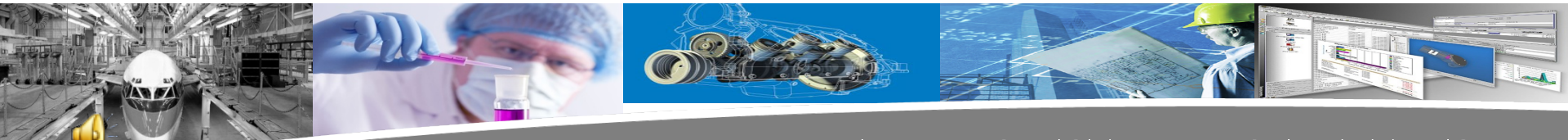


Project Status Trend Chart or "Fever" Chart



Project Status: Fever Chart

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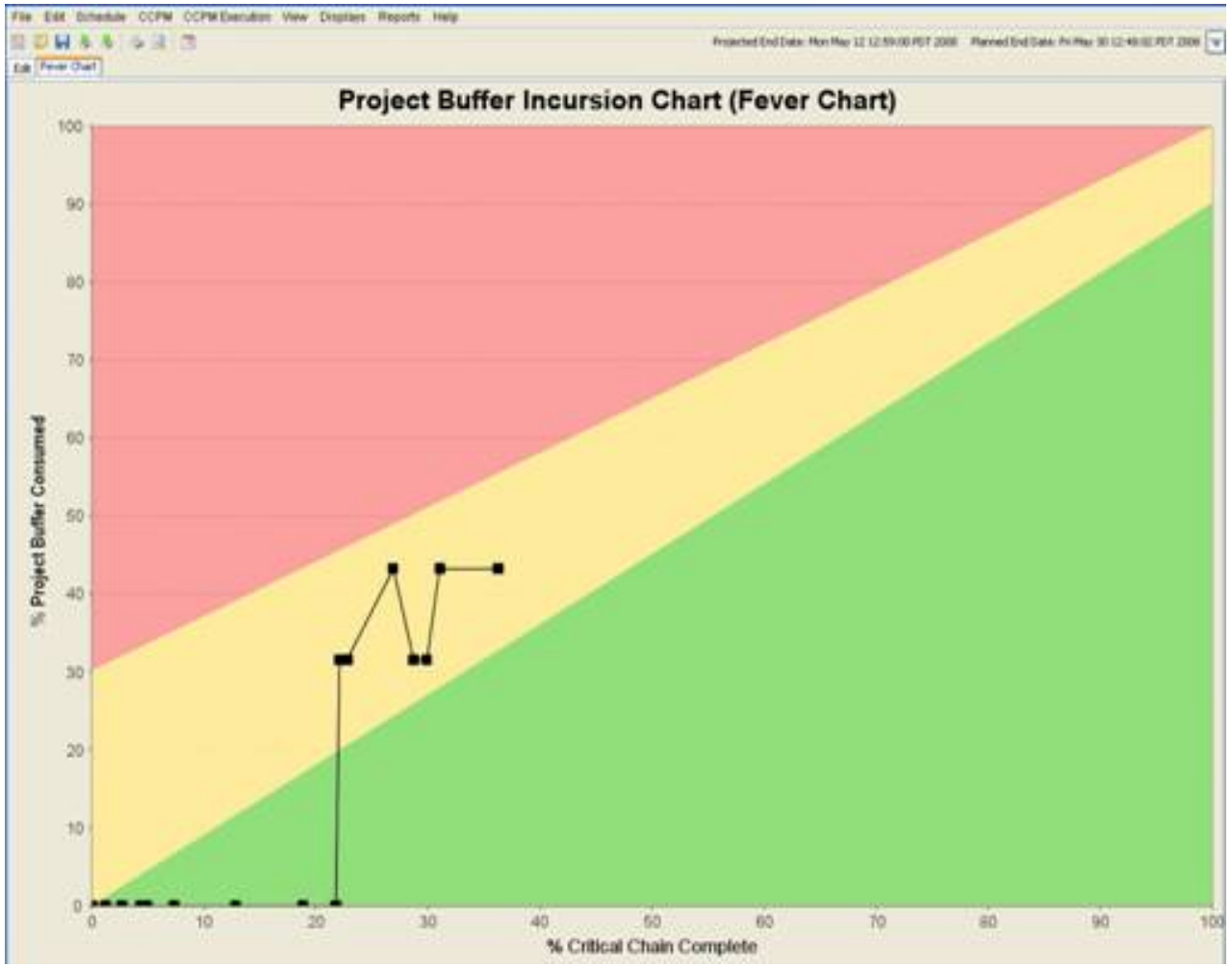

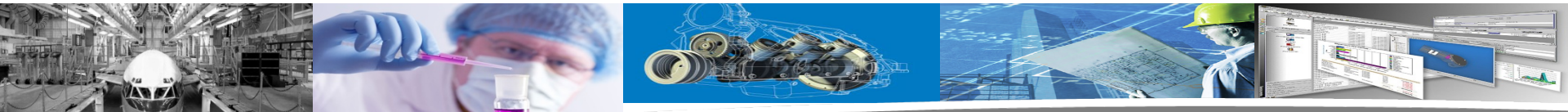

Results (2)

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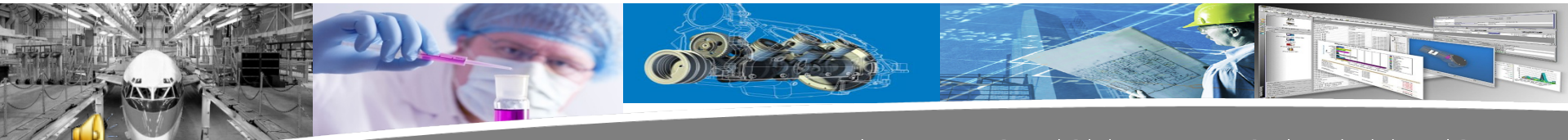
- Harris Corporation:
  - Construction of its $250 million wafer fabrication plant – 3 days ahead of 13 month schedule (original plan was for 18 months & 4% over budget at the start of the project).
- Balfour Beatty
  - Civil engineering projects ahead of schedule and under budget.
- FMC Energy Systems
  - Sub sea systems on-time performance went from < 50% to >90%.



Multi-Project Critical Chain

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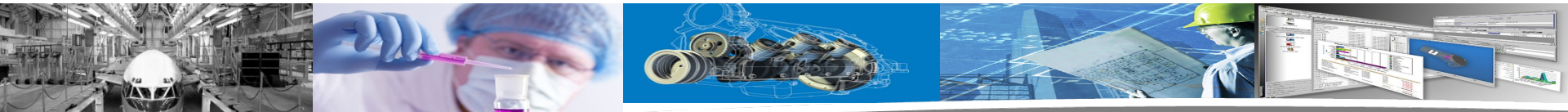
Systems Perspective for Multiple Projects

1. Should load for multiple projects be considered jointly?
   - Obviously
2. Why?
   - Prevent System Overload/Multi-tasking
3. How?
   - By taking a Systems Perspective



Creating a Multi-Project Schedule

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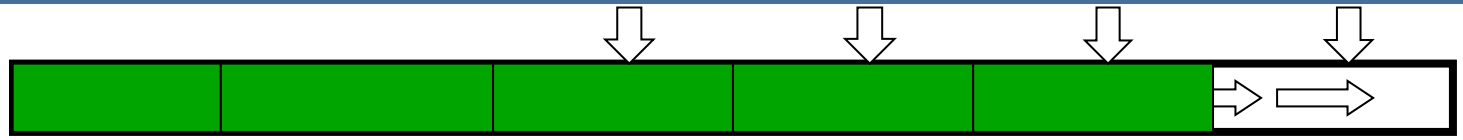
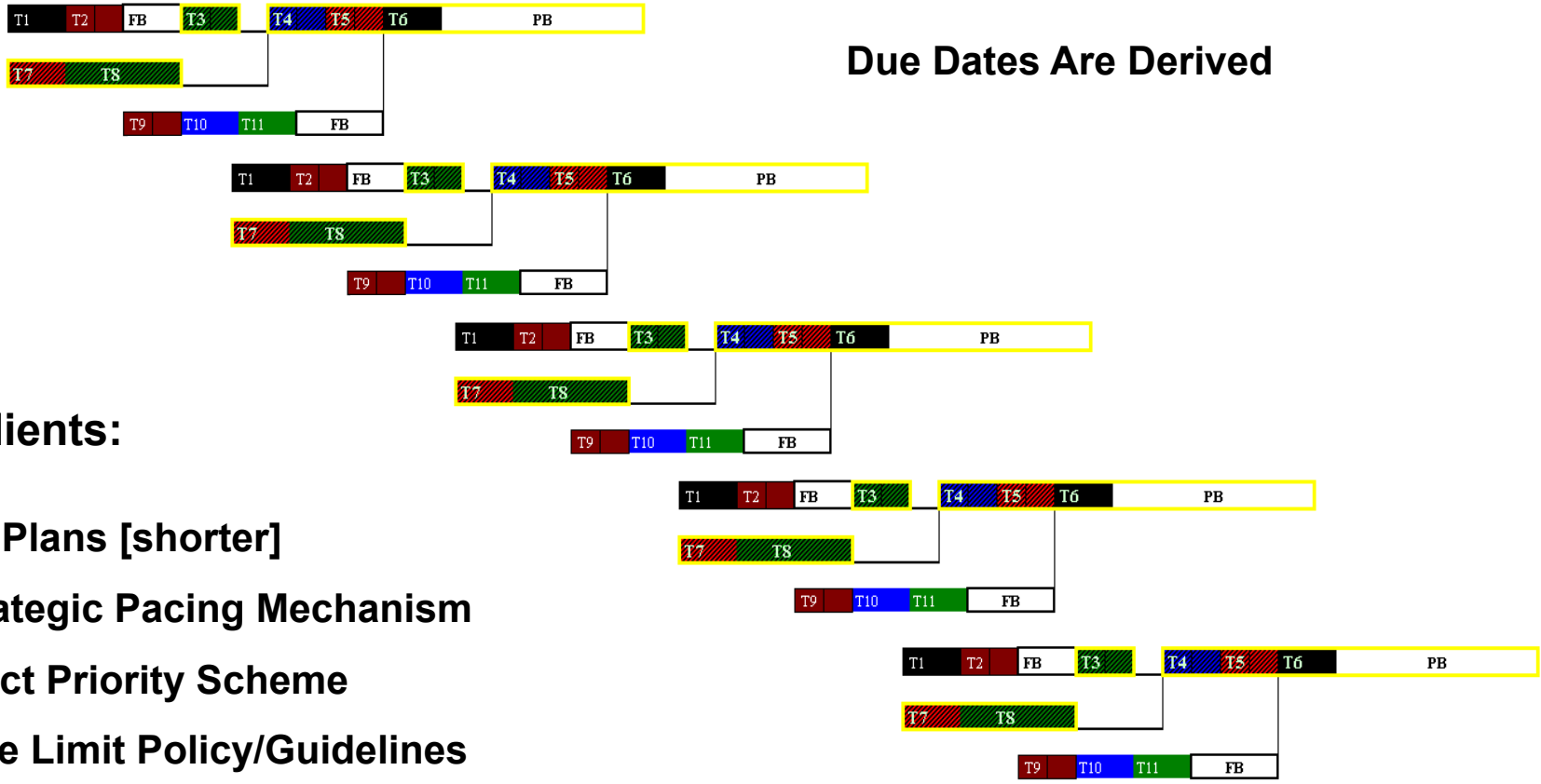
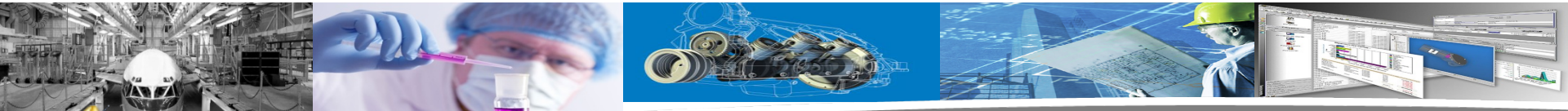




Due Dates Are Derived

Ingredients:

1. CC Plans [shorter]
2. Strategic Pacing Mechanism
3. Strict Priority Scheme
4. Rate Limit Policy/Guidelines



Multi-Project Execution Control
Pipeline Status Snap Shot

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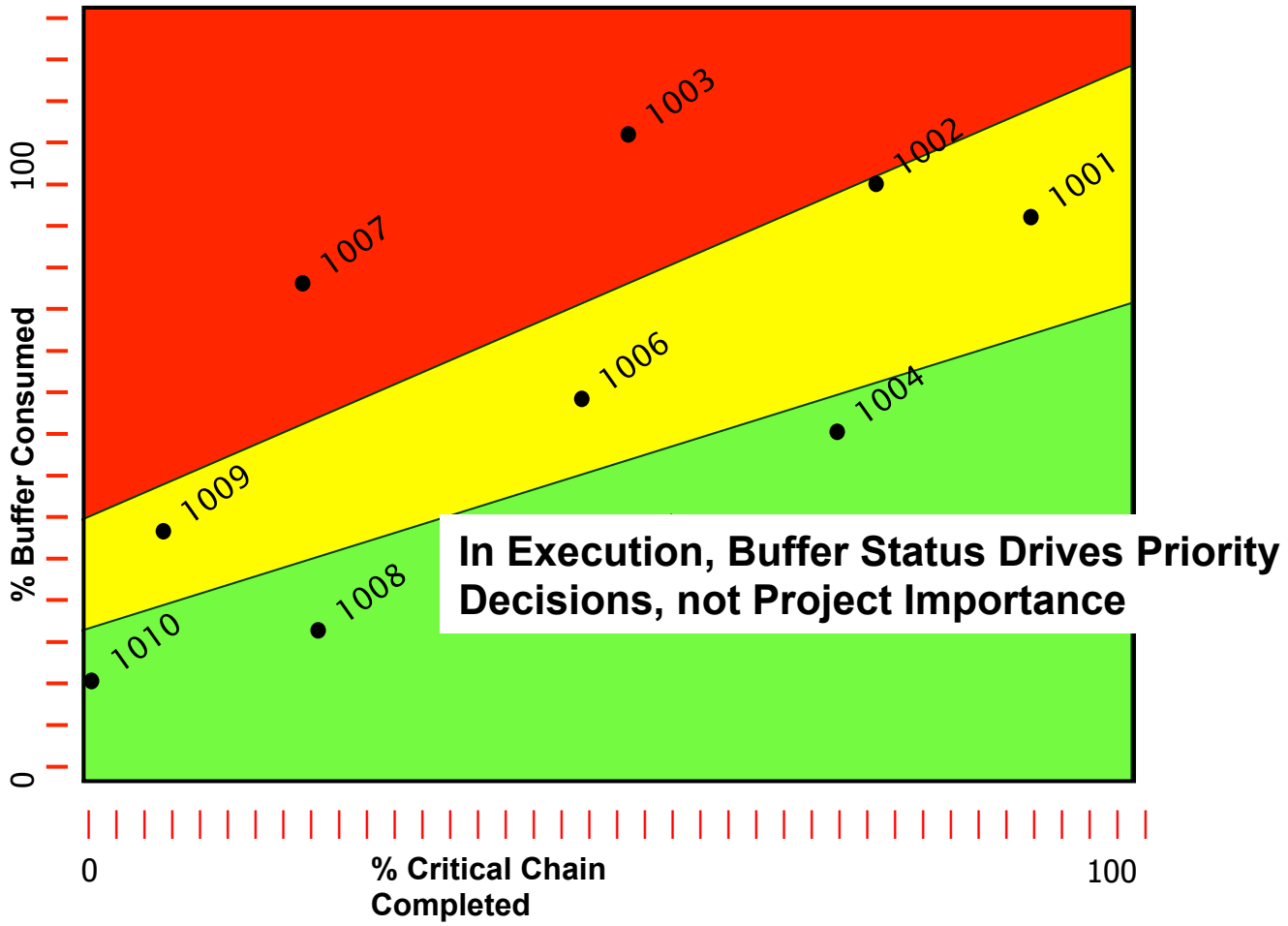
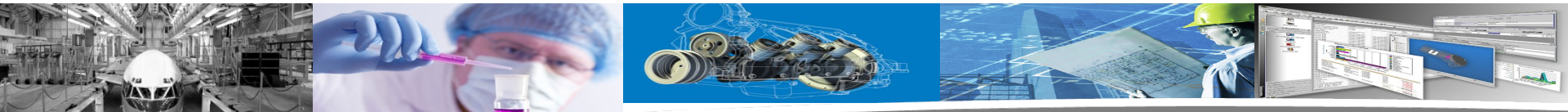
By Portfolio of Projects



In Execution, Buffer Status Drives Priority Decisions, not Project Importance



Overall Benefits & Challenges

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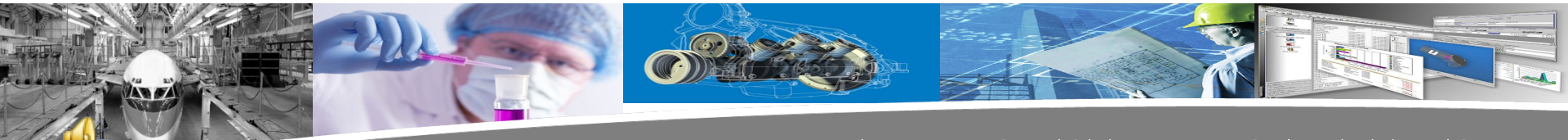
Benefits

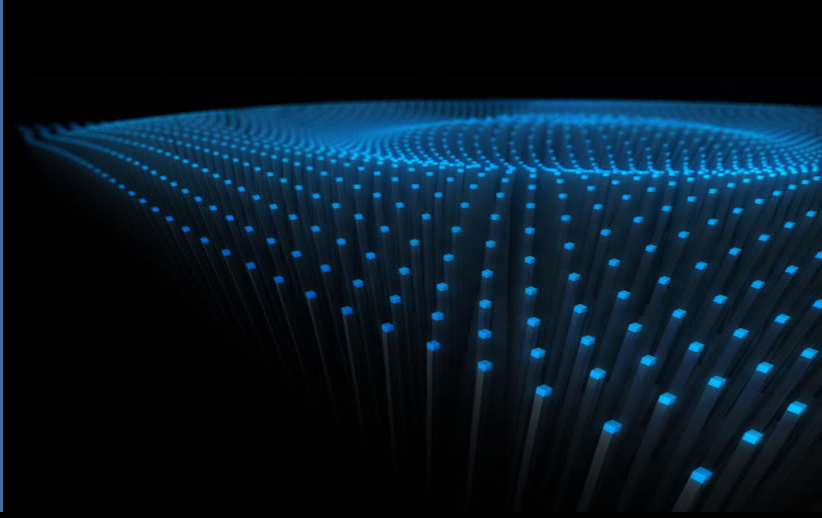
1. Operational Coherence – **Stability**
2. 20% Shorter Cycle-Times – **Speed**
3. On-time Performance – **Reliability**
4. More throughput – **Growth**

Challenges:

1. Simple but not easy to grasp – too simple?
2. Requires a change in mindset
3. Takes 120 days for typical 100 person team
4. We don't need that much improvement



I LEAN PROJECT MANAGEMENT FORUM '10



GRACIAS POR SU ATENCIÓN

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