KISSS – Keep it Simple, Smart, and Sustainable:
Agile Process Improvement

TERMA *T*

Oppenheimer Partners
Making CMMI Work For You

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SEPG-NA 2011 #1802

Terma North America
Our Heritage

Leading Danish Supplier of Aerospace Technology And Defense Products

Headquartered in Lystrup, Denmark Revenues $200+ million 1,700+ Employees Worldwide

Five Locations World-Wide

DENMARK
Lystrup, Grenaa, Birkerød, Tåstrup, Allerød

UNITED STATES
Washington, DC and Warner Robins, GA

GERMANY
Weiterstadt, ESOC, EPO

THE NETHERLANDS
Leiden, ESTEC

ITALY
Besozzo

1,070 Employees

Five Locations Worldwide

Terma North America
What we do

Aerostructures
Composite airframe & structural components

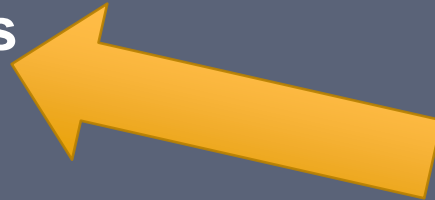**Airborne Systems**
Supporting pilots

Integrated Systems
Air defense, Electronic warfare
Combat management, Communication

Radar Systems
Airborne and Maritime Systems

Terma North America

Airborne Systems

Software Engineering Context

- Customized, embedded software
- Integrated with hardware at systems level
- Standards certification required
- Heavy DOD documentation requirements

- 1-2 developers per project
- Highly experienced electrical engineers

Drivers for Process Improvement

Customer bids and contracts:
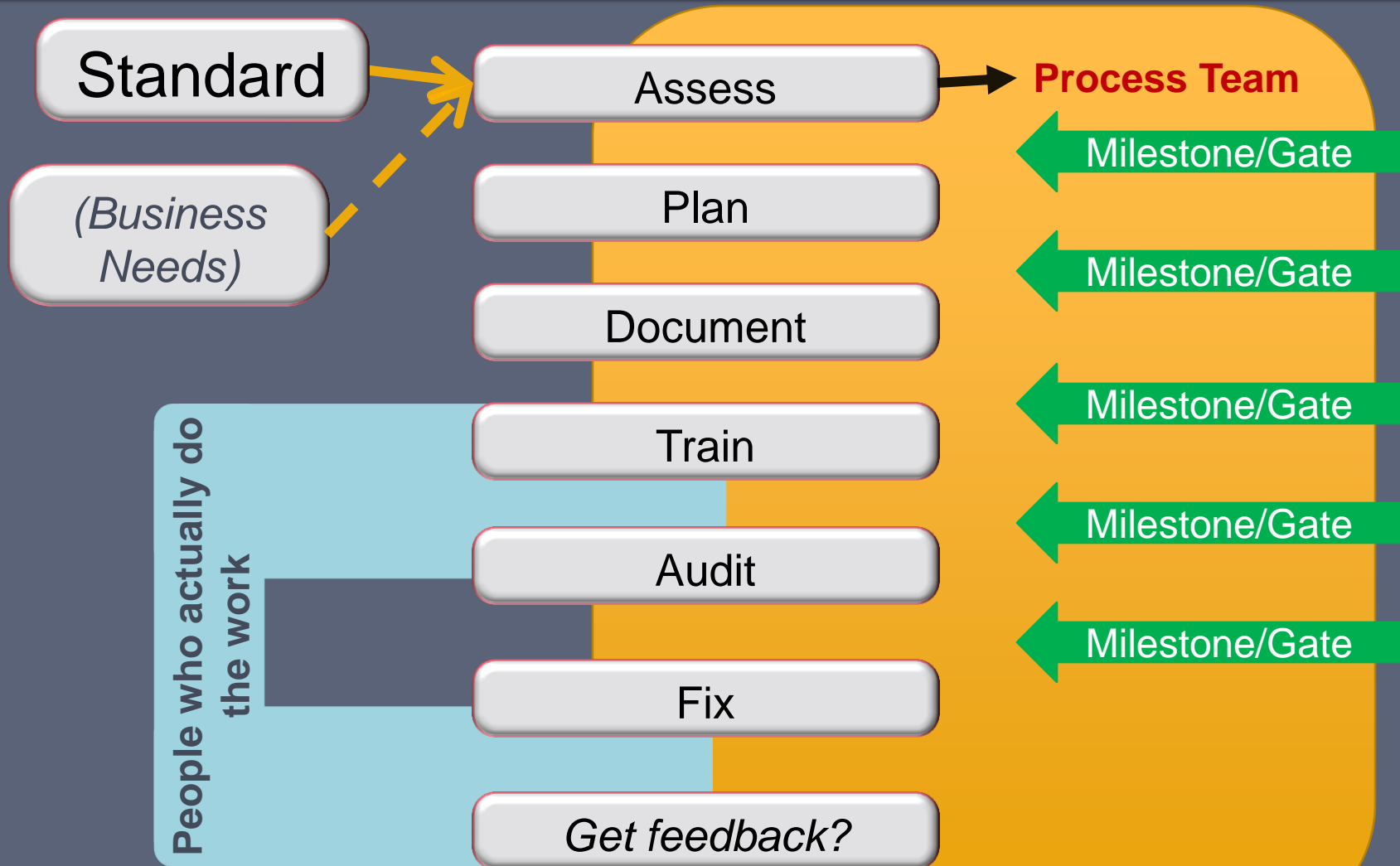"Software development process must be CMMI$^{®}$ for Development Maturity Level 3"

Functional group "stovepipes"

Opportunities for increased process effectiveness

$^{®}$ CMMI is registered in the U.S. Patent and Trademark Office by Carnegie Mellon University.
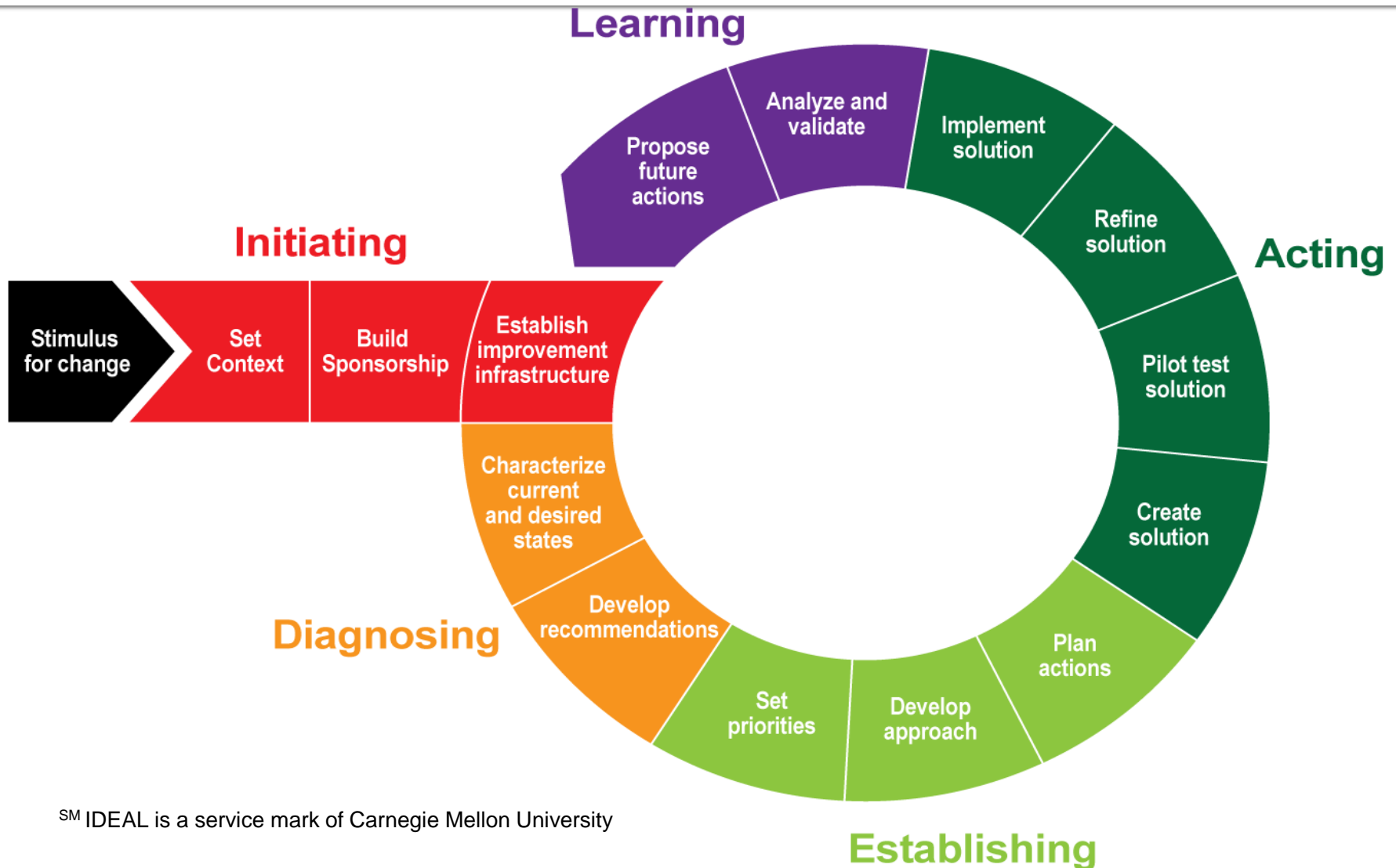^{SM} SCAMPI is a service mark of Carnegie Mellon University.

Waterfall Development Lifecycle

Needs → Plan

Project Management

| Plan |
| Requirements |
| Architecture |
| Design |
| Code |
| Unit Test |
| Integration |
| System Test |
| Delivery |
| Acceptance Test |

Milestone/Gate

Change
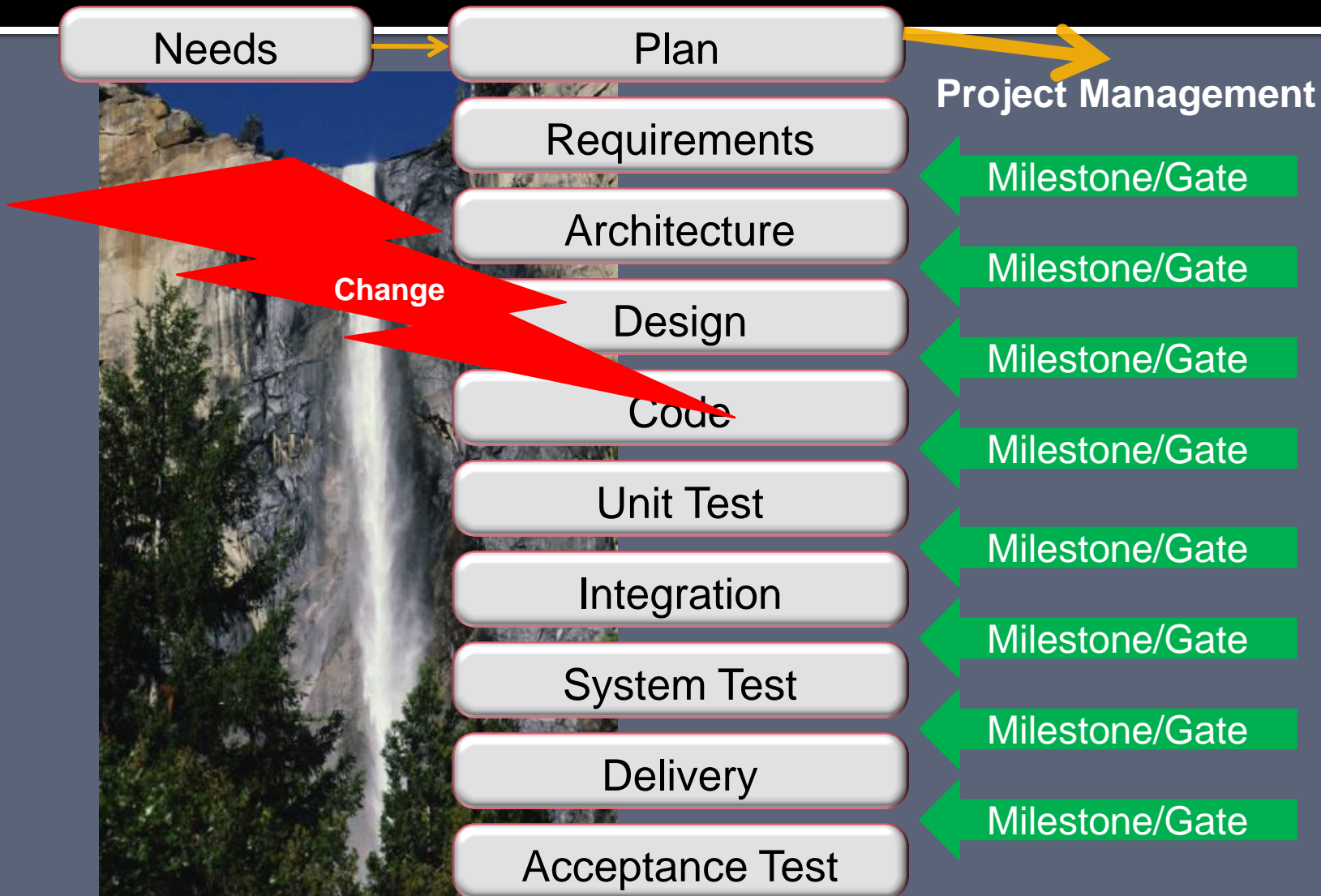
Process Improvement – Using Waterfall Lifecycle

Standard → Assess → **Process Team**

(Business Needs)

Milestone/Gate

Plan

Milestone/Gate

Document

Milestone/Gate

Train

Milestone/Gate

Audit

Milestone/Gate

Fix

People who actually do the work

Get feedback?

SEI IDEAL^{SM} Model

Our experience with waterfall process improvement lifecycle

- **Expensive** – Costs kept growing, final cost twice as much as current agile process improvement implementation
- **Slow** - Took more than a year and didn't see any results until the end
- **Quality** - 400 non-compliances, team members negative toward process
- **Scope** -Did not achieve CMMI ML2 rating

"Agile"

NOT
AD-HOC

Moving quickly and easily; nimbleness; quickness of motion;
e.g. strength, speed, and *agility* of body.

Agile Process Improvement??
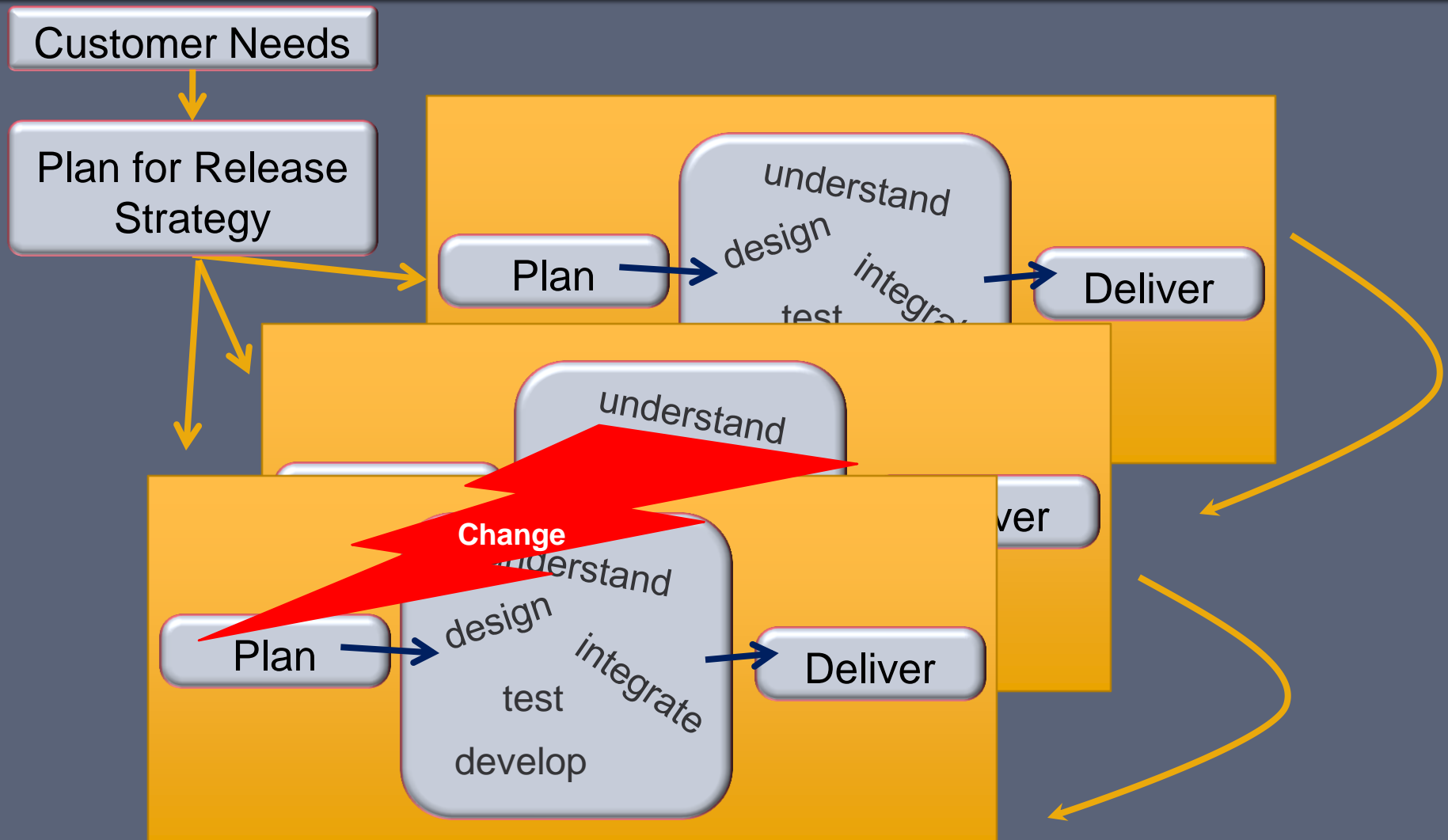
Agile Manifesto – 2011
Process Improvement

We are uncovering better ways *of improving processes by doing them and helping others do them.*

Through this work we have come to value:

- Individuals and interactions over processes and tools

- *Working process assets* over comprehensive documentation

- *Cross-team collaboration* over negotiation

- Responding to change over following a plan

That is, while there is value in the items on the right, we value the items on the left more.

Our Story

- How we stopped treating "process stuff" as overhead by applying Agile values and principles

- Lessons learned
  - Our perspective
  - Consultant's view

Agile Values
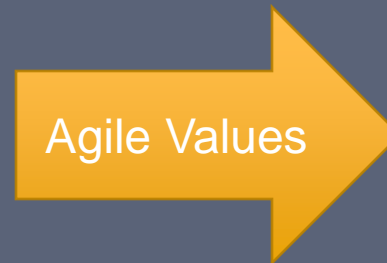
Applying Agile Principles
to Process Improvement

Agile Principle #1

Our highest priority is to satisfy the ~~customer~~ through early and continuous delivery of valuable ~~software~~.

OURSELVES AND OUR TEAM

PROCESS ASSETS

Agile Principle #2

Welcome **changing requirements**, even late in development. Agile processes harness change for the customer's competitive advantage.

OUR COMPANY'S

Risks / Issues: New Item

Attach File | Spelling...   * indicates a required field

Project # *   40105

Risk or Issue? *

If... *
If "x" happens...
(Something that COULD impact the project, but HAS NOT happened yet)

Then... *
If "x" happens, then how will impact the project?
(What will happen if the Risk happens?)

Title *

Submitted By

Status

Probability *
st be between 1 and 5
obability that the risk will occur?)

Impact   1
The value must be between 1 and 5
(What is the impact on the project if the risk occurs?)

Agile Principle #3

Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale
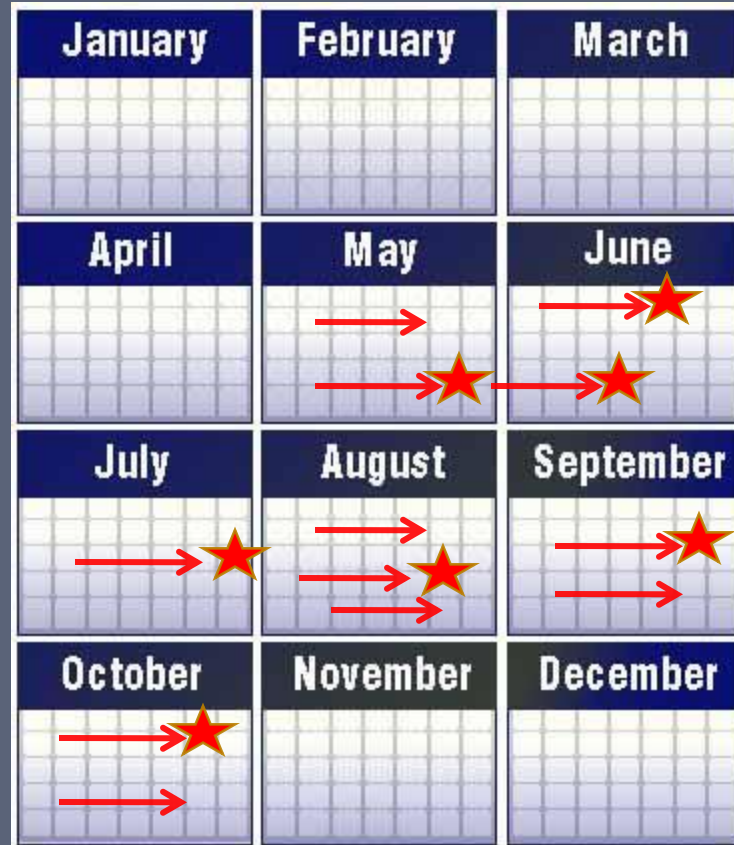
PROCESS ASSETS

Agile Principle #4

Business people and developers must work together daily throughout the project.

Project Management

Quality Assurance

Software Engineering

Bids & Proposals

ALL FUNCTIONAL GROUPS

Agile Principle #5

Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.
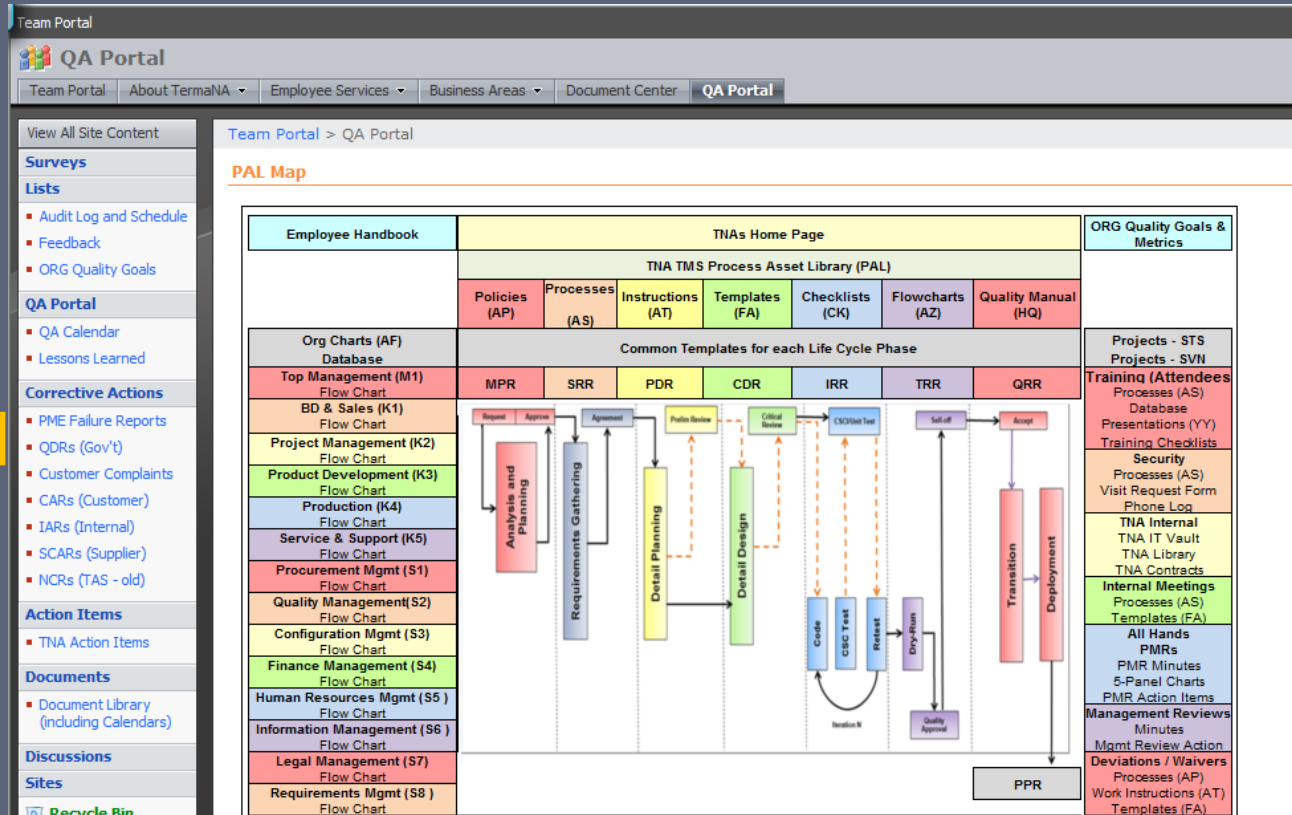
Agile Principle #6

The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.
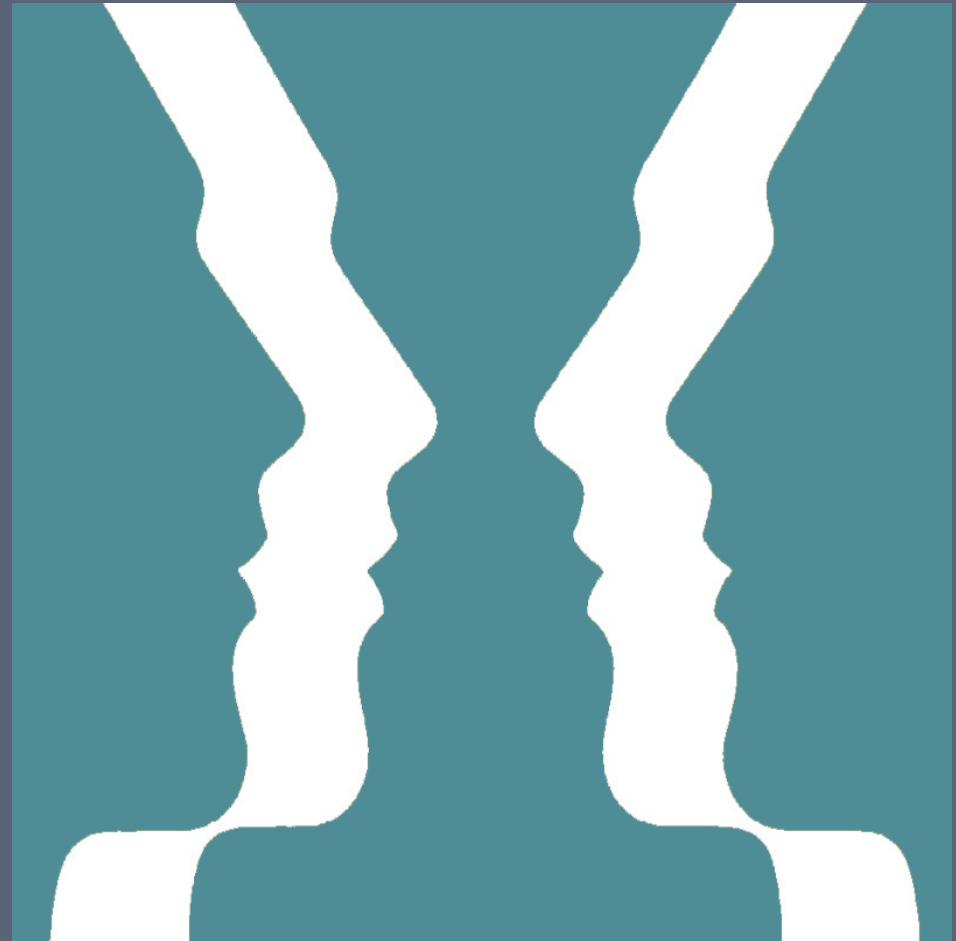
PROCESS IMPROVEMENT TEAM

Agile Principle #7

Working software is the primary measure of progress.

USEFUL AND USABLE PROCESS ASSETS

Agile Principle #8

Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.

PROCESS IMPROVEMENT

Agile Principle #9

Continuous attention to technical excellence and good design enhances agility.

interfaces

-illities

PROCESS ARCHITECTURE AND PROCESS ASSETS

Agile Principle #10

Simplicity--the art of maximizing the amount of work not done--is essential.

Agile Principle #11

The best architectures, requirements, and designs emerge from self-organizing teams.

FOR USEFUL AND USABLE PROCESSES AND RELATED ASSETS

Agile Principle #12

At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly.
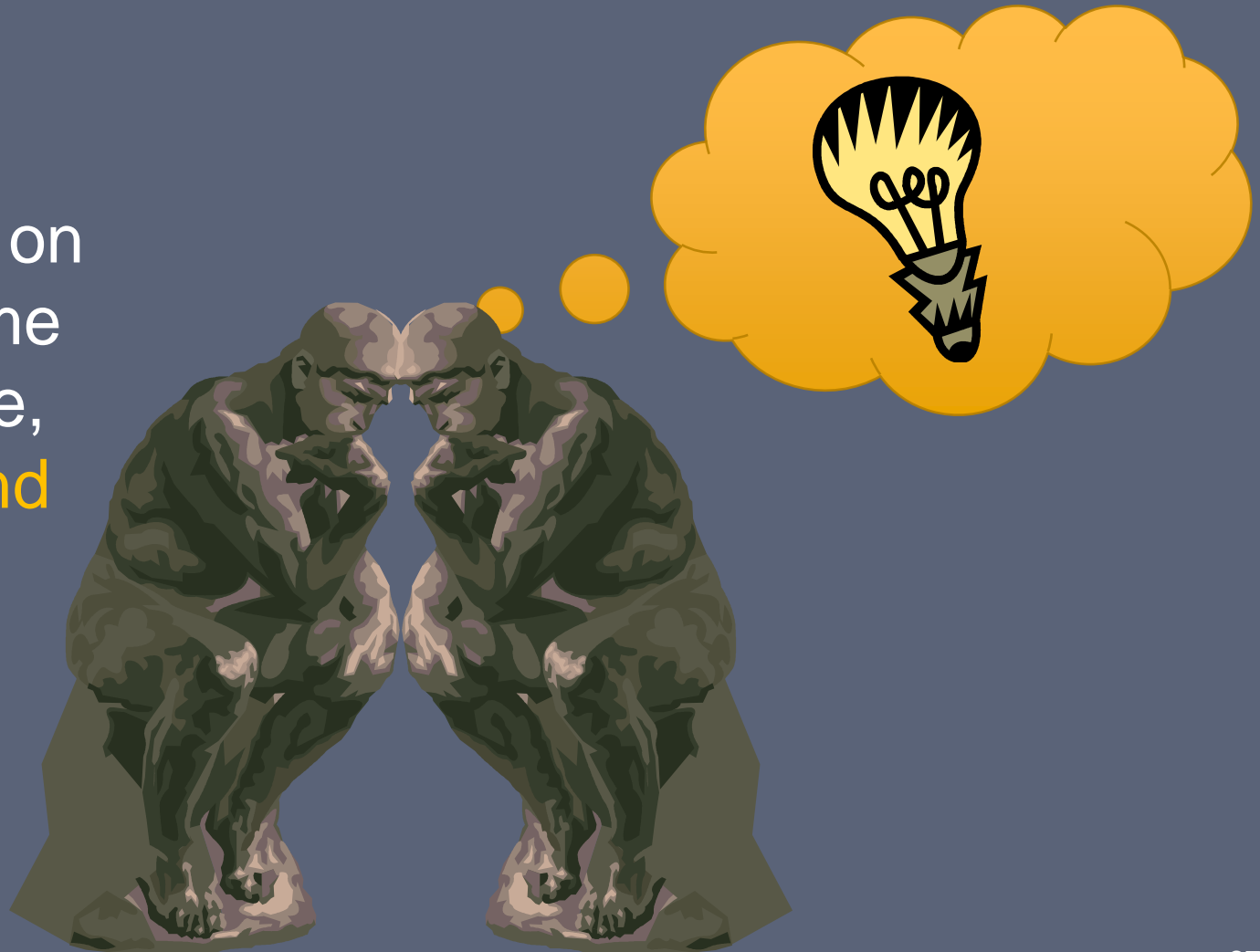
Visibility

Clear the path

Incremental & iterative releases

Eliminate waste

Continuous Integration

Test Driven Design

Refactoring

Pair programming

TERMA NA

Our Experience with Agile Process Improvement

- **Cost effective** – Stayed within budget (half of waterfall implementation)
- **Faster** – Less than a year, useful process improvements within two months.
- **Quality** – QA focused on process business value, rather than non-compliance; team members involved and enthusiastic
- **Scope** – we are on track to achieve CMMI ML2 rating within the next few weeks (stay tuned)

Bottom Line

- We stopped treating "Process Stuff" as wasteful overhead by applying agile values, principles, and techniques to process improvement.

- Our processes became leaner and more effective and still implemented all of the necessary CMMI goals and practices.

This changed both our attitude toward CMMI and our success in implementing Maturity Level 2 practices.

Questions?

Contact Information

TERMA

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Making CMMI Work For You

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SEIPartner

Brian Hood – BIO

Brian Hood is CTO and a founding member of the Terma North American International Group Location.

He is an Electrical Engineer with 12 years experience in airborne electronic warfare integration and embedded systems design. He has led multiple teams and projects from research and development to standard DOD acquisition programs.

Although he is known for directly leading development teams, he is currently focusing on the development of engineering capability infrastructure and organizational growth management. Using agile methodologies along with the CMMI model for lightweight, but robust processes has been key to extraordinary growth within our sector.

Heather Oppenheimer – BIO

Heather Oppenheimer is a Senior Partner in Oppenheimer Partners, LLC, a process improvement consulting company.

She is a Certified ScrumMaster and certified CMMI® instructor/SCAMPI^{SM} Lead Appraiser, with 20+ years experience in all areas of product development, service delivery, and software engineering. She is a member of the team that developed the new 3 day Introduction to CMMI-SVC course and corresponding Development Supplement.

Although she is known for her work with large, globally distributed development projects, she is currently focusing on the process improvement needs of very small service delivery and embedded software development organizations, applying agile methodologies along with the CMMI model for lightweight, but robust processes.

She has co-chaired workshops for the International Conference on Systems Engineering, reviews software engineering journals, and referees grants for the Natural Sciences and Engineering Research Council of Canada.