



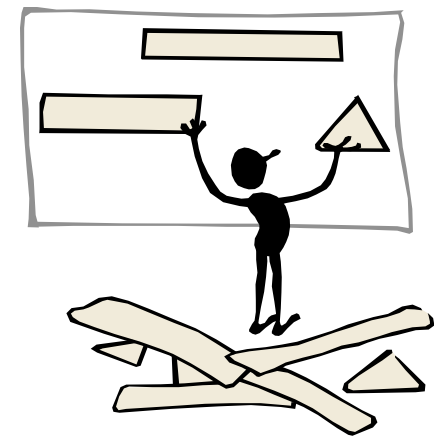
# Software Plans in Less Than a Week

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Abstract #1196

# Current Status

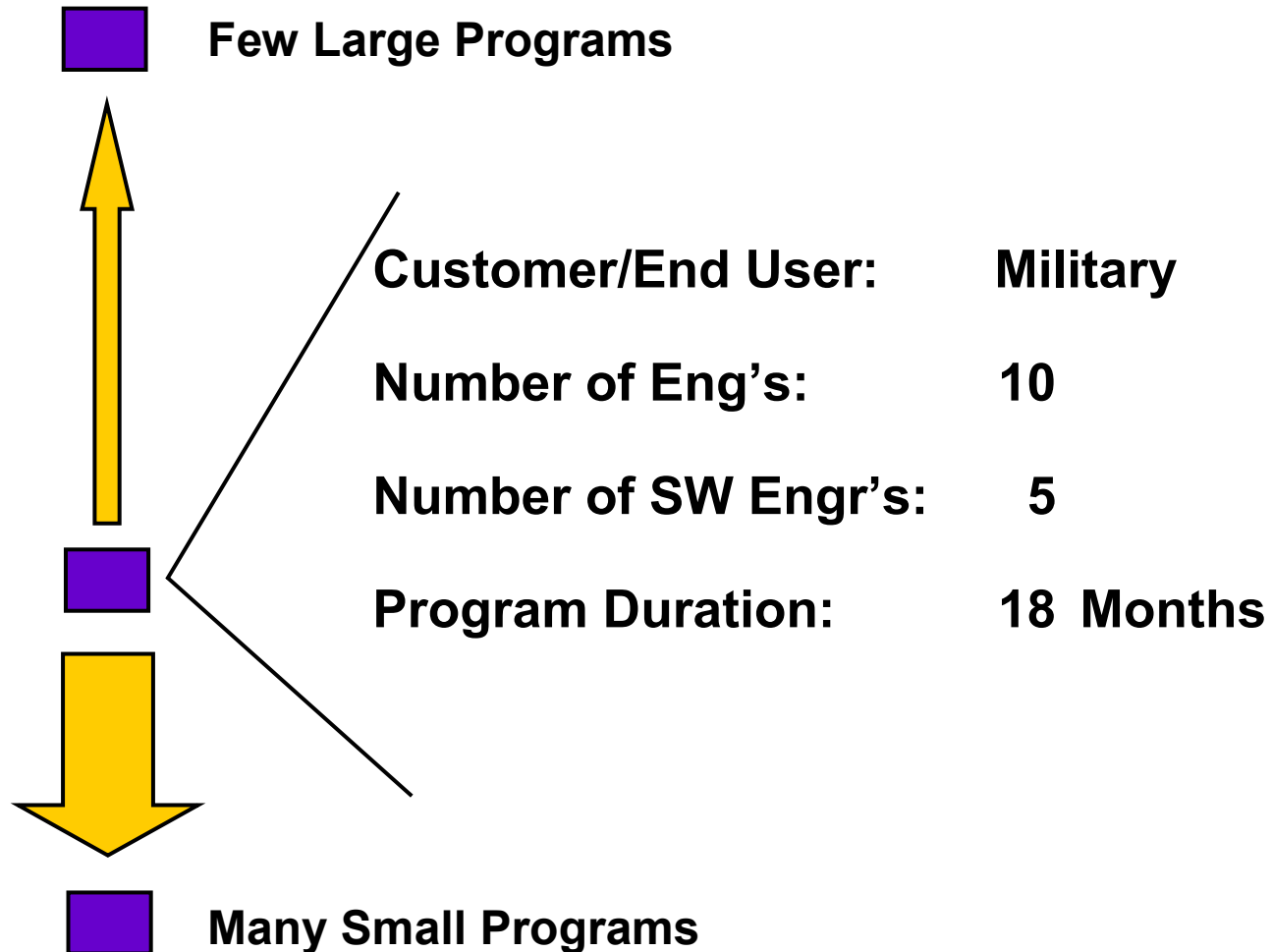
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- Raytheon Network Centric Systems and Space & Airborne Systems, Precision Strike and Attack Surveillance Software Engineering organizations were formally appraised at SEI CMMI Level 5 in September 2003



# North Texas Typical Software Program Structure

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# Strengths

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- The SCAMPI results for Program Planning were excellent and our strengths were in the following areas:
  - Incremental planning (on-line/web based)
  - Approvals (on-line/web based)
  - PowerPoint software plans



# Burning Platform

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- Our definition of “Planning” is:
  - Tailoring of CMMI and local organization requirements
  - Modifying procedures based on tailoring decisions
  - Developing the software plans
  - Getting stakeholder approval
- 40% of software non-compliances were from planning
- Average of 85 days to complete planning and get stakeholder approval



# Improve

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- Instituted an Incremental Planning approach to program tailoring
- Developed a set of software procedures compliant with CMMI Level 5 and local organization processes
  - All programs start with the latest released version of the software procedures and plan templates
  - Ensures programs are executing at CMMI Level 5



# Improve

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- Developed a set of software plan templates in PowerPoint that when completed comprise the Software Development Plan (SDP)



# Improve

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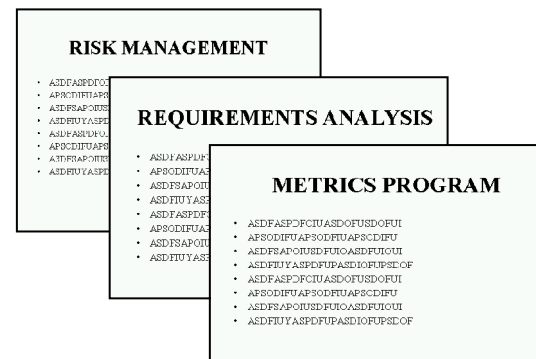
- Developed **I-Plan**, a web based planning tool that captures:
  - On-line Planning Strategy decisions at start of program
  - On-line tailoring of CMMI and organization requirements
  - On-line approvals of tailoring decision, plans, and procedures
  - Program unique plans and procedures





# Lean Planning Concept

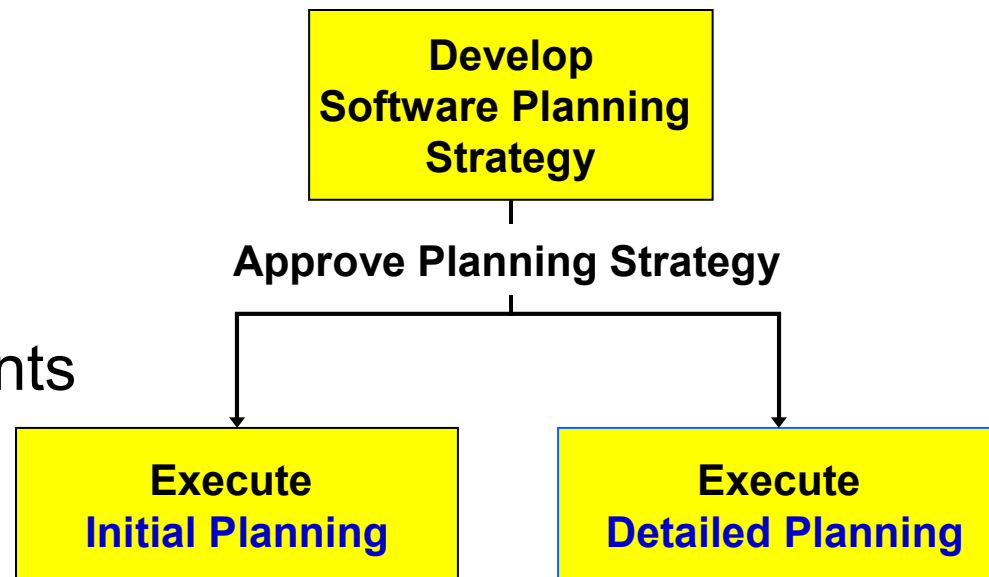
- Strategy for software planning defined up front
- Software planning is performed in increments throughout the life cycle
  - Everything is not known at the beginning of the program



# Incremental Planning

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- Develop a Planning Strategy
  - Identify planning stakeholders
  - Define incremental planning approach
  - Tailor local requirements



# Planning Stakeholders



## Identify the Planning Stakeholders

- Select Stakeholders for the current stage being planned
- Add, delete or edit the default list
- Stakeholders will review and approve Planning Strategy & Plans in accordance with their role
- Tailoring is approved as part of Planning Strategy

Stakeholder

Add New StakeHolder

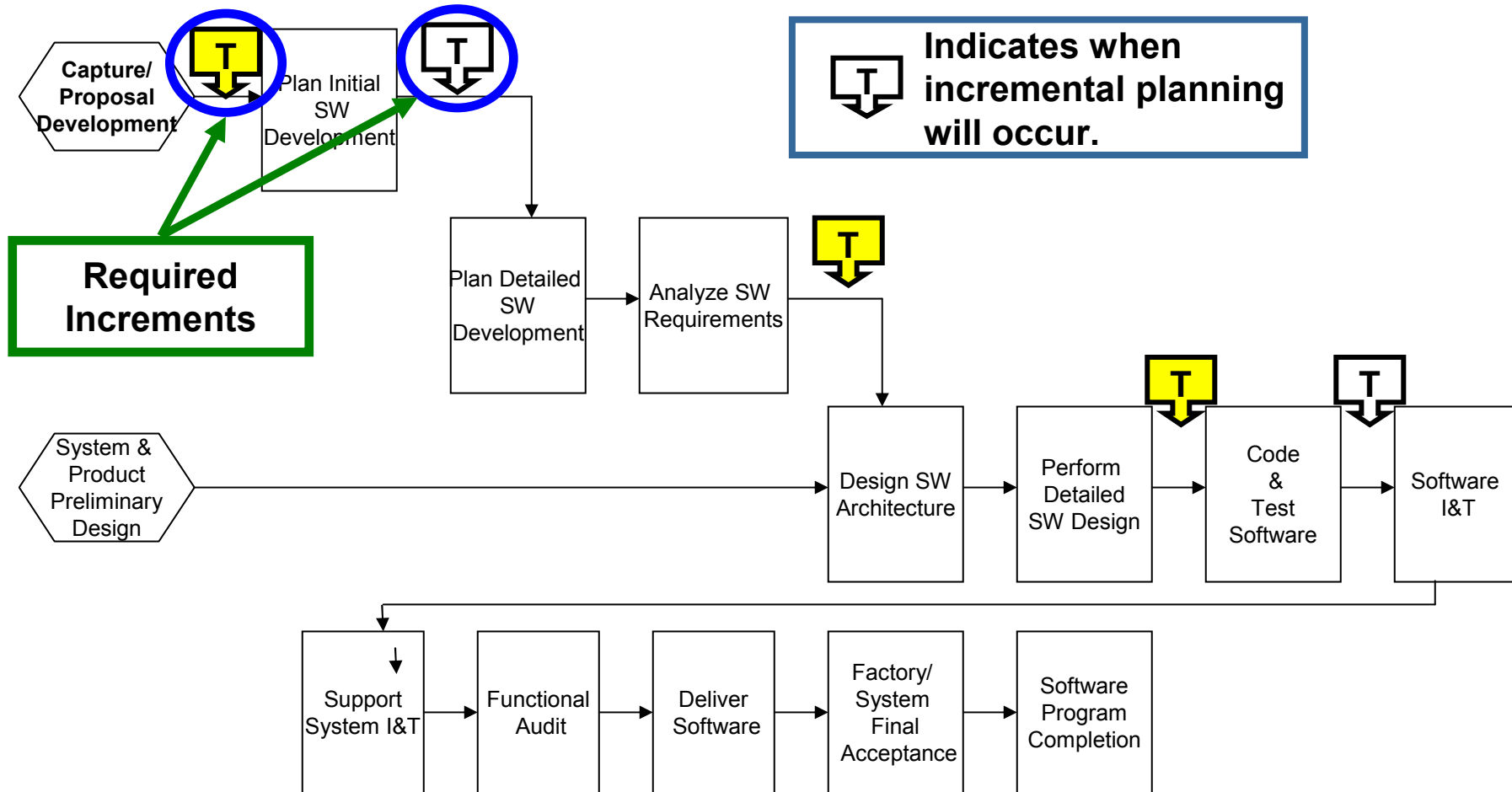
Function	Name	Role		
SW Planner		Responsible	Edit	Delete
SQE		Consult	Edit	Delete
SCM		Consult	Edit	Delete
SEPG		Consult	Edit	Delete
Lead SE		Consult	Edit	Delete
SW SE		Consult	Edit	Delete
SBAM		Approve	Edit	Delete
PM		Approve	Edit	Delete
SW Director*		Approve	Edit	Delete

SW Director\* - has final approve/disapprove authority

**Responsible** - responsible for task and/or implementation.  
**Approve** - "Yes" or "no" authority for an activity.  
**Consult** - must be consulted prior to a final decision or action.  
**Inform** - need to be informed after a decision or action.

The SW Planner identifies the appropriate Stakeholders for the Planning Increment

# Incremental Planning Strategy



# Benefits of Incremental Planning

- Improves planning cycle time
- Reduces rework (plans and procedure tailored when needed)
- Improves plan manageability



SCAMPI  
Strength

*Simile: Many individually-fired  
firecrackers, which are  
MANAGEABLE*

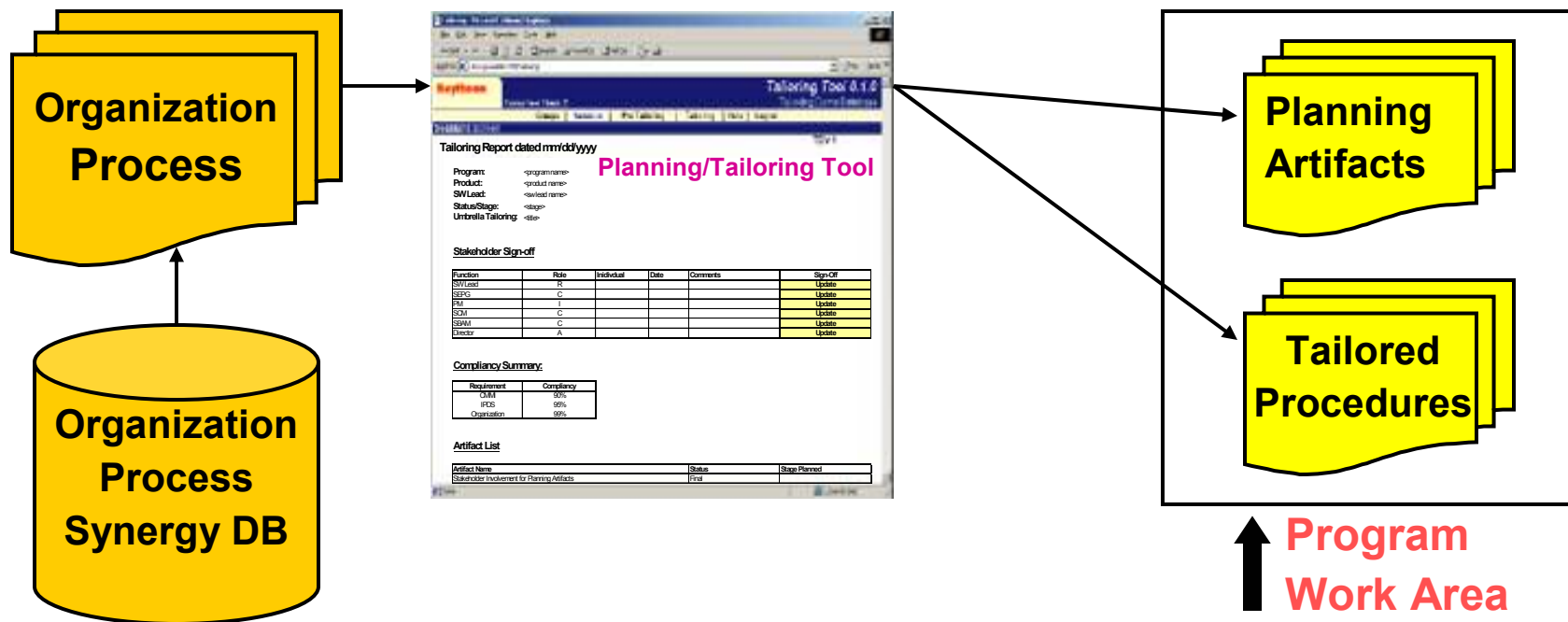
*instead of one big explosion,  
which creates CHAOS*



# Standard Procedures & Plans

## Process Artifact Work Area

- The standard procedures and plan templates are copied out to a program work area in I-Plan.



# Standard Procedures & Plans

## Tailoring Procedures

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- Programs can accept the standard procedures as-is or modify them as needed
  - > If the modifications do not change the intent of the procedure as defined by the IPDS and requirements mapped to it, then it is considered a minor change
  - > If the modifications change the intent of the procedure relative to its requirements, then it is considered a major change
  - > Programs can tailor out procedures they do not need to execute
- I-Plan keeps track of how much of the process is being utilized



# Process Tailoring

Review the [Process Utilization Screen](#) to quickly determine if any key requirements will be tailored

Procedure List: **Initial Planning (Proposals)**  
 Needs Approval: 1, Major: 1, Tailored Out: 1, Approved: 0, Total: 3  
 Copy Standard Procedure View: "Standard Procedure" Refresh Data  
 Save Data in "Initial Planning (Proposals)"

Copy	Subject	Procedure ID	Current Action	Reason	Needs Approval	Approved Action	Approved	Program Procedure	Standard Process Utilization	Notes
<input type="checkbox"/>	Create Prelim SW Arch	002P03VAR01			<input type="checkbox"/>		<input type="checkbox"/>	Create Preliminary SW Architecture Reqs	CMMLR06 PDS 414 Local 303	
<input type="checkbox"/>	SW Req for Est Prop	003P01VAR01	Major	Out of Scope	<input checked="" type="checkbox"/>		<input type="checkbox"/>	Understand SW Requirements Planning	CMMLR06 PDS 414 Local 314	No Thin Spec for this Product.
<input type="checkbox"/>							<input type="checkbox"/>	Resource Estimation Reqs	CMMLR06 PDS 111 Local 414	

Tailoring Name: Rollout  
 Procedure Subject: SW Req for Est Prop  
 Select All Deselect All Save Close

Standard Process Utilization

Utilized	Category	Requirement Number	Requirement
<input type="checkbox"/>	Local	003P01VAR03LR01	Update the requirements in the thin spec along with any associated assumptions and decisions.
<input checked="" type="checkbox"/>	Local	003P01VAR03LR02	Review and update the allocation of the software requirements to software products.
<input checked="" type="checkbox"/>	Local	003P01VAR03LR03	Use a team of senior engineers, including those empowered to make decisions when conflicts need to be resolved, to review and refine the list of software and interface requirements.
<input checked="" type="checkbox"/>	Local	003P01VAR03LR04	During detailed planning, review customer and internal artifacts to determine changes to the software requirements.
<input checked="" type="checkbox"/>	IPDS	003R001	Each software program shall: - assure the requirements are understood and allocated, that conflicts are resolved, and that the software program is prepared to meet the requirements.
<input checked="" type="checkbox"/>	IPDS	003R002	Each software program shall: - document the software requirements to be used for estimation purposes.



# Approving a Tailoring

Tailoring Captured 8/19/2003 12:13:00 PM  
SMEC Process Version At Time Of Capture: 1.4.0

Program: zzTest Program    Current Page: **Initial Planning (Proposals)\_01**    Subjective  
 Tailoring: Rollout    Options Book:    Register  
 Owner: Townsend, Clinton M    Review

**Stakeholder**  
 Display Tailoring Status:  
 Locked     Approved     Disapproved

View "Actual Approver"    Save Notes

Function	Name	Role	Date of Approved Action	Notes	Approved Action
SW Planner	Gonzalez, Robert A	Responsible			Agree    Disagree
SGE	Larier, Kelly L	Consult			Agree    Disagree
SCM	Denley, James P	Consult			Agree    Disagree
SEPO	Raymond, Nancy M	Consult			Agree    Disagree
SBAM	Ali, Steven T	Approve			Agree    Disagree
PM	Freley, Dennis J	Approve			Agree    Disagree
SW Director*	Barrak, Johnny M	Approve			Approve    Disapprove

SW Director\* - has final approve/disapprove authority.

Once the tailoring is captured, stakeholders Agree/Disagree in accordance with their role.

The following are approved at the Planning Strategy Review:

1. Planning Stakeholders
2. Incremental Planning Approach
3. Process Tailoring

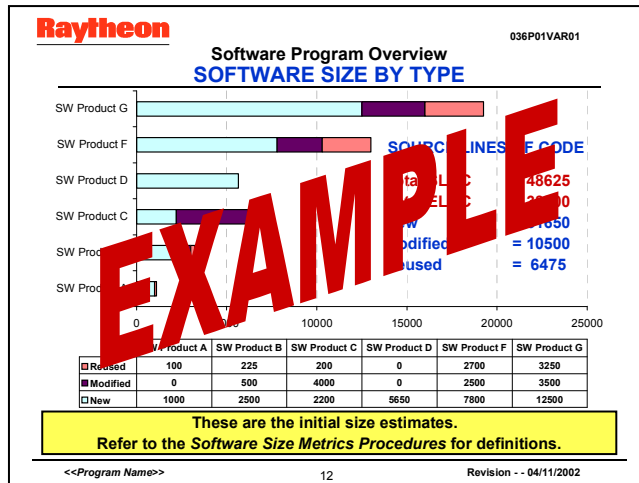
# Software Plans Template



- Software Plans Template Concept
  - Planning sections developed with PowerPoint slides
  - NTX provides standard software plans template
  - Used to support Just-In-Time training
  - Used for communication with Management and Customers



# Software Plans Template



Insert the “XYX” Plan here or insert the location of the plan in the slide.

Software Program Management Plans  
**SOFTWARE CONFIGURATION MANAGEMENT**

Refer to the *Software Configuration Management Plans* located at <<Location>>.

Replace slide with program specific slide. Notes Section identifies content.

Development, Maintenance, and Approval of SW Plans & Procedures  
**REVIEW/UPDATE OF SW PLANS AND PROCEDURES**

- The software plans and procedures shall be reviewed as part of the incremental planning process and updated as necessary.
- The software plans and procedures shall be reviewed and updated as necessary as a result of software re-planning activities.
- Program organization personnel shall receive notification of changes to the software plans and procedures.
- Program organization personnel shall have access to the software plans and procedures.

Refer to the *Review and Approval of Software Plans Procedure* for the software plans and procedures approval process.

Slide used as written. Modifications made in accordance with Notes Section. Some slides direct author to “Fill in bracketed, italicized (<<...>>) items”

## **Advantages**

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- Consistent software planning products
- All programs executing a tailored Level 5 CMMI process
- Succinct means of communicating project plans to customers and stakeholders
- Planning completed in a short time

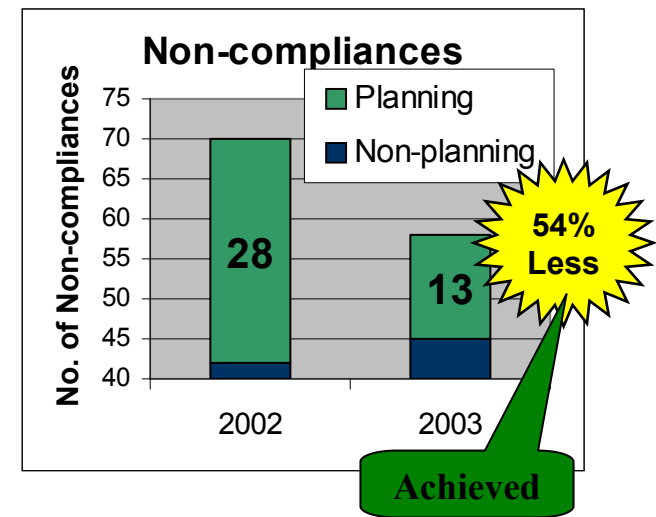
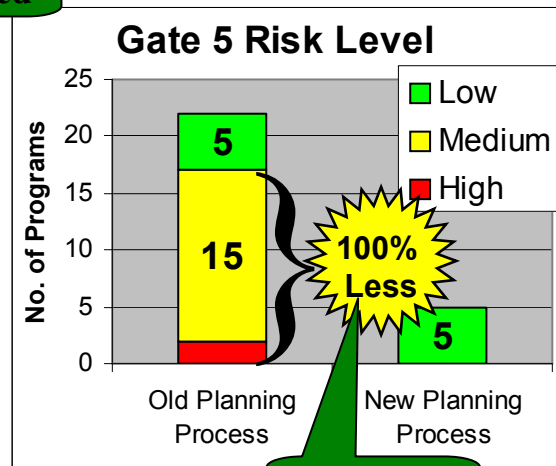
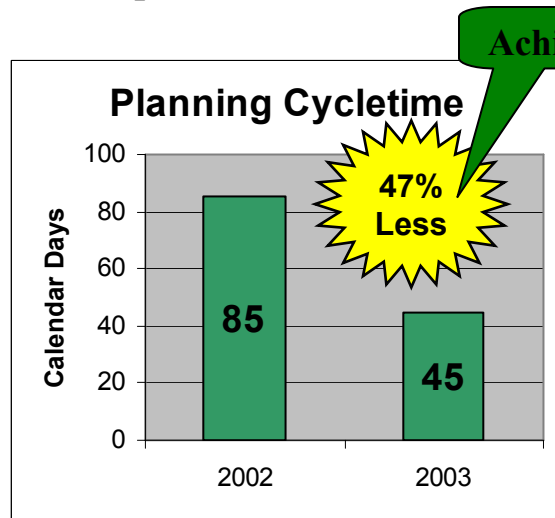
# Actual Results

Project Objectives	Before	Result
Increase planning consistency and <b>decrease cycle time</b>	<ul style="list-style-type: none"> <li>• <b>40%</b> of non-compliances are planning related</li> <li>• Planning averages <b>85 days</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>22%</b> of non-compliances are planning related</li> <li>• Planning averages <b>45 days</b></li> </ul>
<b>Improve usability</b> of plans	<ul style="list-style-type: none"> <li>• <b>Plans not used well</b> by engineering team, program management, or customers</li> <li>• <b>All planning elements are due</b> after contract award</li> </ul>	<ul style="list-style-type: none"> <li>• Standard Plans are <b>used by team, program management, and customer</b></li> <li>• “Incremental planning” elements <b>created just-in-time</b></li> </ul>

## Operational and Financial Results Achieved

- Improvements resulted in **\$752K cost avoidance**

“Incremental Planning and the PowerPoint Plans are organizational strengths.”  
**External CMMI Assessment Team**



# BIOGRAPHY

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## Melissa Olson

Melissa is a Senior Software Process Engineer for Raytheon in North Texas and provides support to the CMMI Level 5 programs being executed there.

Melissa has been with Raytheon for 3 years and before that she was with Hughes Aircraft in Fullerton, CA for 16 years.