CMMI® Technology
Conference

November 15-18, 2004
Denver, CO

"ABB Training of
Internal CMMI Class
'B' & 'C' Appraisal
Team Members"

CMMI

ASPI ABB SOFTWARE PROCESS INITIATIVE

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Presentation Format

- Introduction

- Why We Developed Our Own Internal Appraisal Team Training

- ABB Appraisal History / Appraisal Accuracy

- ABB Appraisal Team Training Description

- Lessons Learned

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- ABB is a leader in power and automation technologies that enable utility and industry customers to improve performance while lowering environmental impact. The ABB Group of companies operates in more than 100 countries and employs around 120,000 people.

- ABB became the first company in the world to sell 100,000 robots. ABB robots are used in a wide range of applications - including car production plants, and the food, pharmaceutical and consumer electronics industries and also in chocolate making.

- ABB Software Process Initiative (ASPI)

- ASPI is composed of members from 4 ABB Corporate Research Centers (CRCs):

    - United States: Raleigh (NCSU Campus)

    - Sweden: Vasteras

    - Switzerland: Baden

    - Germany: Ladenburg

- Responsible for: Development of appraisal and improvement methodologies, evaluation and deployment of pilots within ABB for CMMI transition, PSP/TSP, etc..

My Background

- 8 years USN

- 14 years Xerox R&D

- 3 years GTE Government Systems / General Dynamics

- 5 years ABB United States Corporate Research Center

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Benefits of this presentation

- Authorized Lead Appraisers may learn some new ideas / techniques on how to better train their appraisal teams.

- Organizations can better understand the benefits of appropriate appraisal team training.

- To those just starting their CMMI journey, to demonstrate with that with creativity, applied experience, and continual efforts to ensure compliance with SEI directions, their internal appraisal teams can become more competent and productive, resulting in more accurate and complete appraisal findings.

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Why We Developed Our Own Training

- If you are an SEI Authorized Lead Appraiser please hold up your hand.

- If you're holding up your hand please stand.

- If you're standing please raise your right arm and point with your right index finger straight at the ceiling.

- Close your eyes and bring your right index finger to the tip of your nose.

- Open your eyes, you are now pointing at the person that has the responsibility to ensure that a SCAMPI "A" appraisal team is sufficiently trained.

- Thanks, please sit down.

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SCAMPI MDD

The SCAMPI Method Description Document (MDD) Section 1.3.3; "Prepare Team" states:

- The appraisal team leader is responsible for ensuring the appraisal team members are sufficiently prepared for performing the planned appraisal activities. This includes:
  - Familiarity with the reference model
  - SCAMPI
  - The appraisal plan
  - Organizational data and characteristics
  - Tools and Techniques to be used during the appraisal
- I would suggest that this also extends to SCAMPI Class "B" and Class "C' appraisals conducted by or under the "guidance" of an Authorized Lead Appraiser.

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However

- What if you are an organization that does not (yet) have an Authorized Lead Appraiser?

- What if you want to conduct (and reap the benefits of) SCAMPI Class 'B' and/or Class 'C' appraisals and have no (current) intention of ever demonstrating a Maturity / Capability Level(s)?

- How do you go about providing training for your appraisal teams without access to an Authorized Lead Appraiser?

- How do you create a 'pool' of potential candidates to participate as productive appraisal team members?

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Top Down vs Bottom Up

- Top-Down: Start with an Authorized Lead Appraiser, who then should be capable of providing training of team members for all SCAMPI Class 'A', 'B' and 'C' appraisals.

- Bottom-Up: An organization that is just starting with CMMI, and is interested primarily in conducting internal 'B' and 'C' appraisals, and as necessary will contract an external Authorized Lead Appraiser to conduct any Class 'A' appraisals.

"Necessity is the Mother of Invention"

- ABB found themselves in the Bottom-Up situation. Although absent of any internal Authorized Lead Appraisers, we do have internal resources that included:

  - An SEPG Lead and SPSC member from General Dynamics

  - SEPG members from General Dynamics and Xerox R&D

  - All of the above are SEI trained (Intro to SW-CMM, Intro to CMMI, Intermediate Concepts of the CMMI, Consulting Skills, Managing Technological Change, etc..)

  - All of the above have participated in Class 'A' appraisals, and numerous Class 'B' appraisals.

- ABB has documented CMMI Class 'B' and Class 'C' appraisal methodologies which (we believe) are ARC 1.1 compliant.

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CMMI Appraisal History

- First CMMI (Class 'B')appraisal was conducted in January of 2002 in Rochester, NY.

- Since that time 13+ additional Class 'B' and 'C' appraisals have been conducted within ABB, including the following locations:

  - Cleveland, Ohio

  - Santa Clara, CA

  - Allentown, PA

  - Vasteras, Sweden

  - Malmo, Sweden

  - Baden, Switzerland

  - Banaglore, India

  - Ladenburg, Germany

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A Word About Appraisal Accuracy

- Successful completion of an appraisal is dependent on the accuracy and completeness of the resultant findings.

- A successful appraisal outcome requires the selection and training of appropriate appraisal team members.

- An appraisal team should be comprised of appropriately skilled and experienced team members; usually a mix of very skilled / experienced, and adequately skilled / experienced.

- At ABB, we take appraisal team training very seriously, because we know that lack of sufficient training will result in less-than-successful appraisal outcomes.

Effective Training

"The mind will absorb only what the rear-end can endure"

Training is most effective if it offers an opportunity for attendees to not only absorb, but also to practice what they've learned.

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ABB Internal Appraisal Team Training

- Scope: Training includes attendees both from within ASPI and also the various business units to be appraised.

- Pre-requisites:

  - All attendees are required to participate in a 3-day formal Introduction to CMMI class prior to appraisal team training.

  - All attendees are required to review and be familiar with the ABB CMMI appraisal methodologies prior to the appraisal team training.

  - All attendees receive pre-work that must be completed prior to the appraisal team training. (ABB Tahiti)

ABB Internal Appraisal Team Training

- ABB Appraisal Team Training is <u>not</u> a replacement for training required within the 60 days prior to an appraisal as recommended in the SCAMPI Method Definition Document (MDD version 1.1, Section 1.3.3)

- ABB Appraisal Team Training is specifically provided as a means by which those that have been identified as potential appraisal team members can gain experience and practice in conducting an internal ABB Class 'B' and/or 'C' CMMI appraisal, using our defined methodologies that are ARC 1.1 compliant.

ABB Appraisal Team Training Description
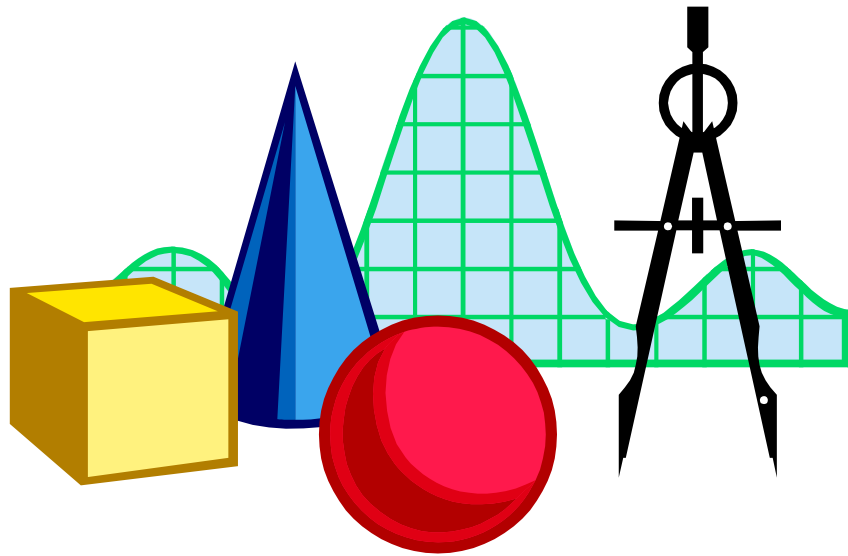
- Pre-Work

- Mini-team Approach

- Document Review

- Tagging Notes

- Consolidation of Observations

- Generation of Findings

- Presentation of Findings

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Pre-work

- Each participant is asked to create and present an appraisal plan and an Opening Meeting Presentation. Each participant is provided 15 minutes the first day of the workshop to share these to the rest of the group. Each participant is also expected to have a signed-off Confidentiality Agreement prior to their Opening Meeting Presentation.

- Each attendee is also asked to compile a list of questions that they plan to ask interviewees during an appraisal for assigned Process Areas (2 PAs are assigned to each). Attendees are expected to generate sufficient questions to cover all SPECIFIC practices within the assigned PAs.

Pre-work

- In order to accomplish the pre-work, each attendee is provided:

  - A copy of the ABB CMMI Class 'B' Appraisal Methodology

  - Copies of ABB CMMI Confidentiality Agreement, Appraisal Planning and Opening Meeting templates.

  - Copies of ABB Observation Forms (1 per PA)

  - Assigned PAs for which questions are to be generated

  - Sponsor contact information for ABB Tahiti.

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Pre-work

- **Attendees are <u>not</u> given:**
  - Specific site-specific information for ABB Tahiti
    - Org Chart
    - Project Profiles
    - Appraisal Scope (project or PAs)
    - Logistics
    - Process Mapping
  - Appraisal Team membership
- For the above site information they must contact the ABB Tahiti Sponsor.

ABB Tahiti Materials Prepared (not provided)

- Detailed Organizational Chart

- Project Profiles

- Process Map

- Site Description

- 30+ pages of interview notes*

- Tahiti site documentation list

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A Bit of Fun

Visit Tahiti and her islands, get sun all year through !

French Polynesia is a tropical destination with lots of sun all year through and just enough rain for its luxuriant vegetation and its colorful flowers.
It receives in average **2,500 to 2,900 of sunshine per year**. (ie : 8 hours of sun per day). **Temperatures range between 24°C and 30°C** all year through and lagoon **water temperature** varies between 23°C and 26°C.

Travel guide of Tahiti & her islands

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A Bit of Fun – and Realism
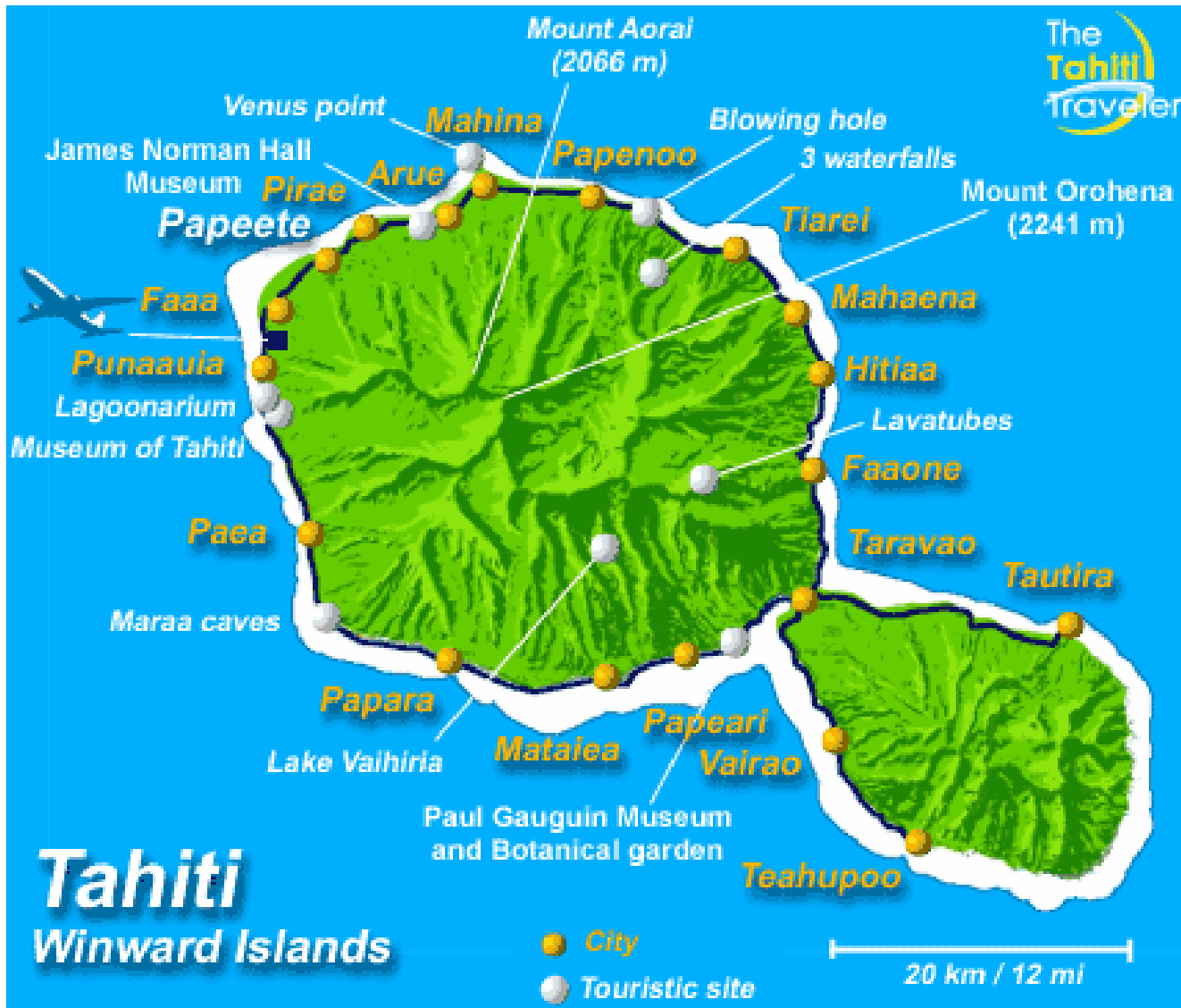
Workshop Schedule

Day 1

8:00 - 9:30	Opening - Overview of Class 'B' Appraisal Process
9:30 - 9:45	Break
9:45 - 11:10	Presentation of Pre-Work (Plan, Opening. Questions)
11:10 - 12:00	Interview / Note-taking Practice Exercise
12:00 - 1:00	Lunch
1:00 - 1:30	Overview of min-team concepts
1:30 - 2:00	Breakout 1 - Selection of Lead Appraisers, Mini-Teams
2:00 - 2:10	Presentation of Mini-Teams
2:10 - 3:00	Breakout 2 - Initial Document Review, 1st pass Observation forms
3:00 - 3:15	Break
3:15 - 4:00	Overview of conducting interviews, tagging notes, handout of interview notes.

Workshop Schedule

Day 2

8:00 - 8:15	Opening - Interview Notes (cont)
8:15 - 10:00	<u>Breakout 3</u> - tag Interview notes, 2nd pass Observation Forms
10:00 - 10:15	Break
10:15 - 10:45	Overview of consolidation of observations
10:45 - 2:00	<u>Breakout 4</u> - Generate team observations
12:00 - 1:00	Lunch
2:00 - 2:15	Overview of generation of findings
2:15 - 4:30	<u>Breakout 5</u> - Generate final findings & presentation
4:30 - 5:00	Presentation of Findings
5:00 - 5:15	Wrap-up - Workshop evaluation

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Purpose / Opportunity - why all this work?

- The prerequisite coursework (Intro to CMMI) provides the attendees the fundamental knowledge needed to understand the model to be used for a CMMI Class 'B' Appraisal.

- The pre-work provided allows the participants to experience / practice the planning in preparation for a Class 'B' Appraisal, and

- This 2 day CMMI Workshop provides opportunity for the attendees to experience and practice those skills needed in participating in a ABB Class 'B' CMMI Appraisal.

Understanding the CMMI - a short quiz

- During the introduction to the workshop I administer to the attendees a short CMMI quiz. The purpose of the quiz is to ensure a basic understanding of the fundamental concepts of the model.

- For example:

  - List the PAs in Level 2 of the Staged Representation of the CMMI

  - Explain what the difference between a 'Specific' and a 'Generic' Goal statement

  - List some <u>Required</u>, <u>Expected</u> & <u>Informative</u> CMMI Model Components

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Successful Lead Appraiser Characteristics

- Knowledgeable in the Appraisal methodology and the model. Recognized by both the Appraisal team and the assessed organization as competent / capable.

- Able to handle conflict / confrontation professionally.

- Able to lead Appraisal team to consensus.

- Able to defend team findings in a sometimes 'hostile' environment, and to maintain credibility of the team, and the findings in the process, and

- Willing to 'stay the course' and not negotiate findings when confronted; yet to maintain the respect and support of the team and the organization in the process.

Verification vs Discovery

- To minimize time onsite (especially true with the expansion of the model represented by the CMMI), effort should be planned to collect and distribute information to the Appraisal team as soon as possible. This is a critical part of the pre-Appraisal planning process.

- The actual onsite Appraisal time should maximize verification vs 'discovery' of information.

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Repeatability

- Planning and performing a Class 'B' Appraisal is a disciplined process.

- By following a disciplined process this enables repeatability; that is that the results of the activity should be the same for another Appraisal team following the same process.

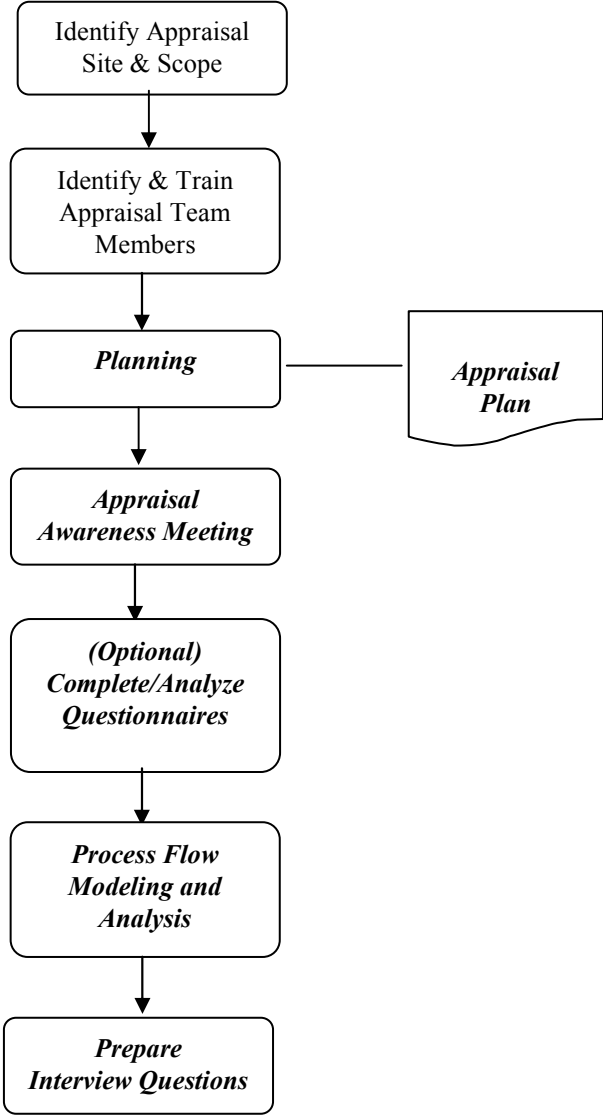**ABB**

Ref Documentation Covered in Workshop

- ## SEI:

  - SCAMPI 1.1 Method Definition Document (MDD)

  - Appraisal Requirements for CMMI (ARC) 1.1 Description

- ## ABB Internal:

  - Guidelines for ABB CMMI Class 'B' Appraisals 2.45

  - Management Overview of ABB Class 'B' 2.33

  - Guidelines for ABB CMMI Class 'C' Appraisals 1.19

  - Management Overview of ABB Class 'C' 1.15

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Confidentiality Agreement

‣ The appraisal team will handle all appraisal information with the utmost discretion to avoid any compromise.

    ‣ All information gathered through or derived from maturity questionnaire responses, process modeling and analysis, document review, project leader discussions, middle manager discussions, and practitioner group discussions will be treated by the appraisal team as appraisal confidential and will not be reported to anyone outside of the appraisal team with attribution to individuals or projects.

    ‣ All appraisal results (e.g., findings, recommendations, final report) will be documented and presented without attribution to individuals or specific projects.

‣ All appraisal participants (appraisal team members, project leaders, and practitioners) agree not to discuss information they share or learn from appraisal confidential meetings with anyone other that the appraisal team.

‣ **Members of the ABB Corporate Research project ASPI team can maintain appraisal findings for historical and internal team training purposes, but can not disclose any appraisal findings external to the ASPI team with out the documented approval of the appraisal sponsor, _____ .**

‣ All Appraisal results are proprietary to ABB _____ and may not be distributed or discussed in any forum outside of ABB _____ without the approval of the Appraisal sponsor, _____ .

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Overview of ABB CMMI Class 'B' Appraisal Process - Pre Appraisal Activities

```
┌─────────────────────┐
│  Identify Appraisal │
│     Site & Scope    │
└─────────────────────┘
          │
          ▼
┌─────────────────────┐
│   Identify & Train  │
│   Appraisal Team    │
│      Members        │
└─────────────────────┘
          │
          ▼
┌─────────────────────┐        ┌─────────────────┐
│      Planning       │────────│    Appraisal    │
│                     │        │      Plan       │
└─────────────────────┘        └─────────────────┘
          │
          ▼
┌─────────────────────┐
│     Appraisal       │
│  Awareness Meeting  │
└─────────────────────┘
          │
          ▼
┌─────────────────────┐
│     (Optional)      │
│   Complete/Analyze  │
│    Questionnaires   │
└─────────────────────┘
          │
          ▼
┌─────────────────────┐
│    Process Flow     │
│    Modeling and     │
│      Analysis       │
└─────────────────────┘
          │
          ▼
┌─────────────────────┐
│      Prepare        │
│  Interview Questions│
└─────────────────────┘
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Overview of ABB CMMI Class 'B' Appraisal Process - Onsite Appraisal Activities
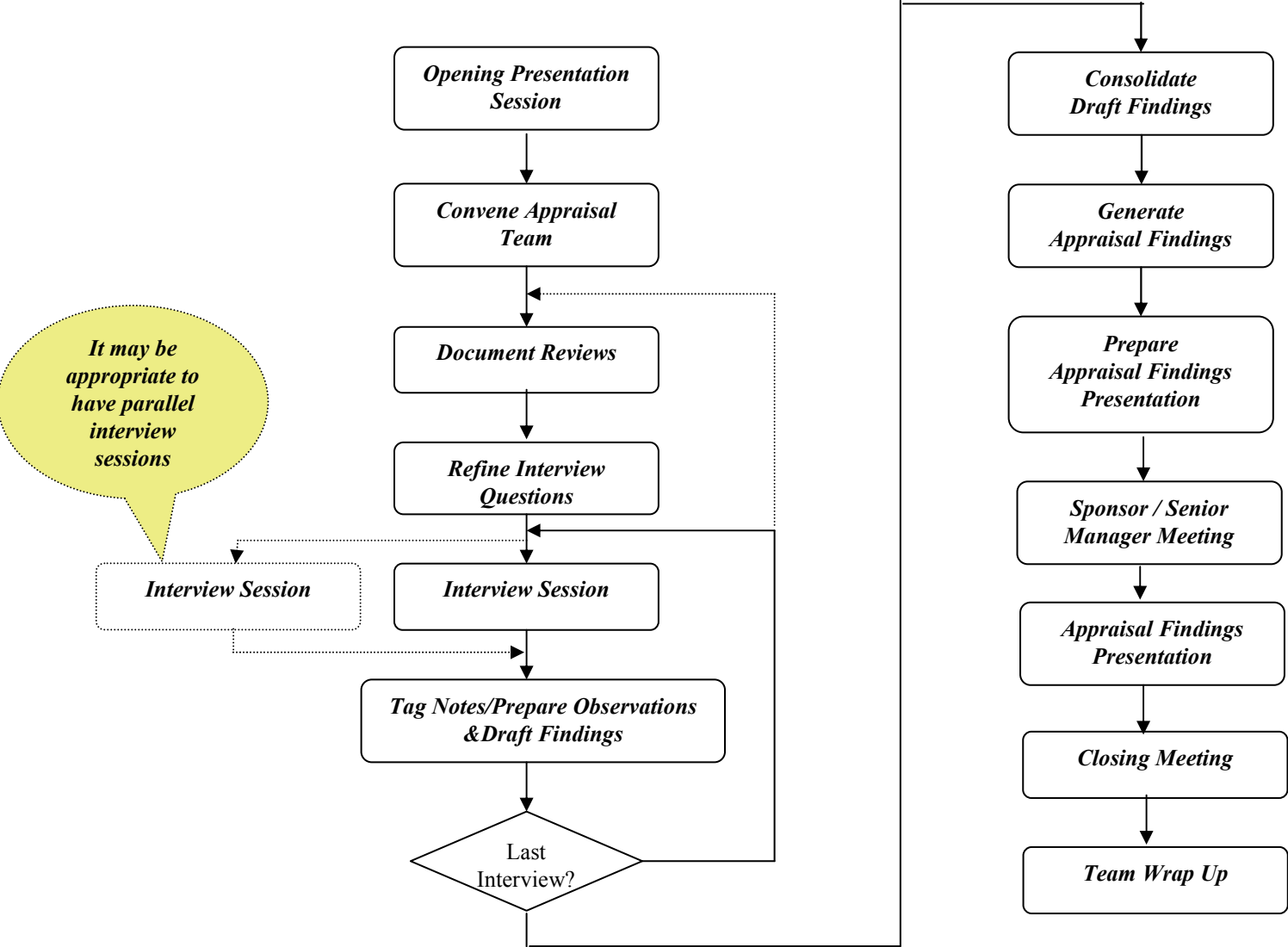
Process Modeling
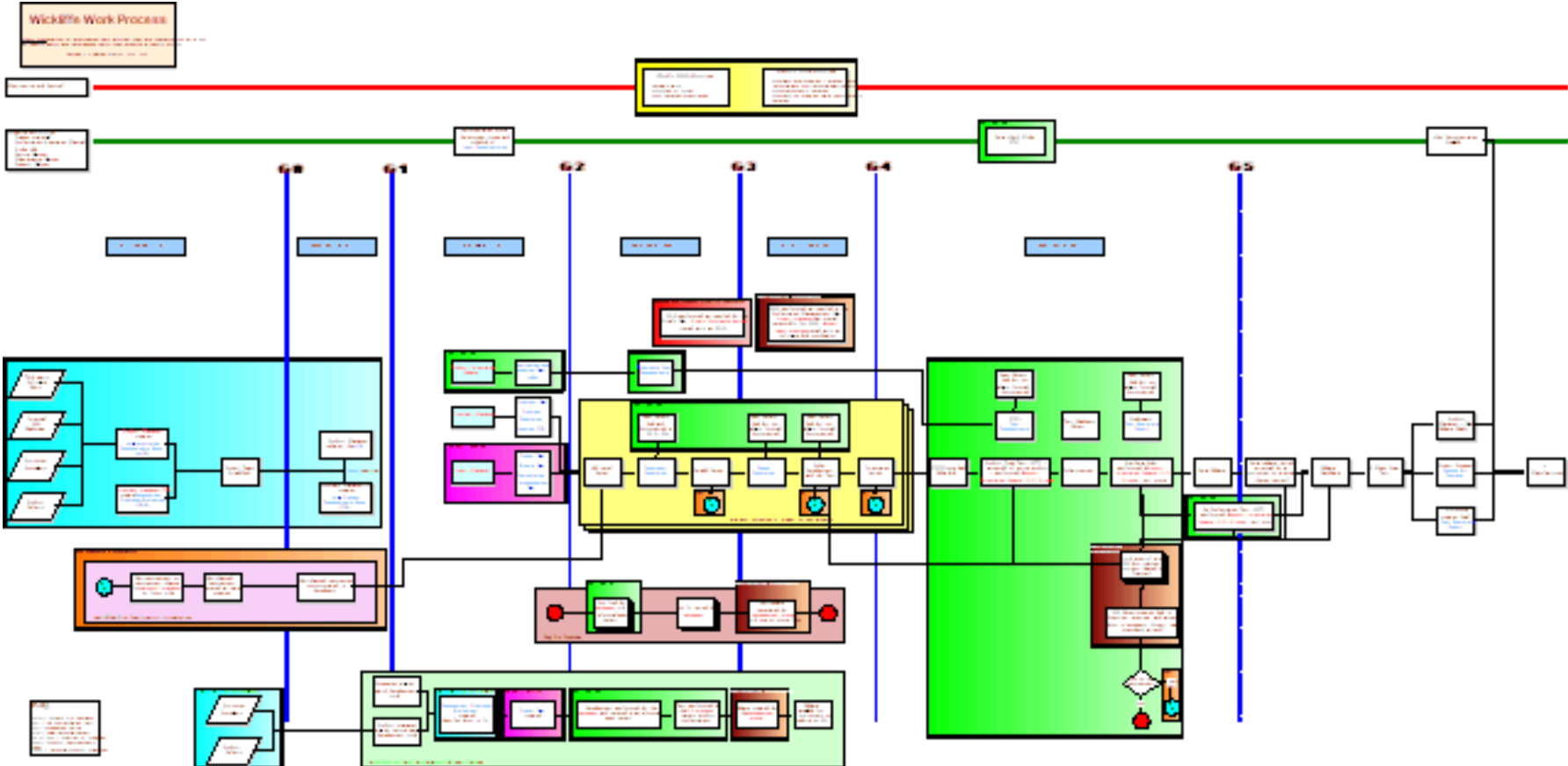
Overview of Mini-Team Concepts

- The Importance of "Divide and Conquer" ! (use of mini-teams)

- How to do a document review w/mini-teams

- How to use the observation forms during the documentation review.

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Mini-Teams

Workshop Facilitator: Dennis Brantly

Team BMW (Z8)

Jan Hoglund

Ulf Westblom

Catharina Blom

Team Mercedes (SL500R)

Christina Wallin

Manfred Schoelzke

Johanna Stahlberg

Observation Forms

Goal	Item	Goal & Practice Statements	+/-	Source	Comments
GG3	Generic Goal	The process is institutionalized as a defined process.			
	GP 2.1 (CO 1)	Establish and maintain an organizational policy for planning and performing the requirements development process.			
	GP 3.1 (AB 1)	Establish and maintain the description of a defined requirements development process.			
	GP 2.2 (AB 2)	Establish and maintain the plan for performing the requirements development process.			
	GP 2.3 (AB 3)	Provide adequate resources for performing the requirements development process, developing the work products and providing the services of the process.			

Documentation Review

Goal	Item	Goal & Practice Statements	+/-	Source	Comments
GG3	Generic Goal	The process is institutionalized as a defined process.			
	GP 2.1 (CO 1)	**Establish and maintain an organizational policy for planning and performing the requirements development process.**		**E42035-01**	**Policy exists, last revised 1/2/2001**
	GP 3.1 (AB 1)	Establish and maintain the description of a defined requirements development process.			
	GP 2.2 (AB 2)	Establish and maintain the plan for performing the requirements development process.			
	GP 2.3 (AB 3)	Provide adequate resources for performing the requirements development process, developing the work products and providing the services of the process.			

Documentation Review

Goal	Item	Goal & Practice Statements	+/-	Source	Comments
GG3	Generic Goal	The process is institutionalized as a defined process.			
	GP 2.1 (CO 1)	**Establish and maintain an organizational policy for planning and performing the requirements development process.**			**Policy does not exist**
	GP 3.1 (AB 1)	Establish and maintain the description of a defined requirements development process.			
	GP 2.2 (AB 2)	Establish and maintain the plan for performing the requirements development process.			
	GP 2.3 (AB 3)	Provide adequate resources for performing the requirements development process, developing the work products and providing the services of the process.			

Tagging notes

- Attendees are provided a collection of notes taken during an interview session with ABB Tahiti.

- Each participant reviews these notes and 'tags' observations (concentration is on the PAs they have been assigned, however they can do more!)

    PA/PR/(W,S,IA)

    examples: RD/GP2.1/S   and RD/GP2.3/W

- At the start of Day 2 the 'observations' are entered on the mini-team's observation form.

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Interview Notes

Goal	Item	Goal & Practice Statements	+/-	Source	Comments
GG3	Generic Goal	The process is institutionalized as a defined process.			
	GP 2.1 (CO 1)	**Establish and maintain an organizational policy for planning and performing the requirements development process.**		**E42035-01**	**Policy exists, last revised 1/2/2001. L.Manfred in the Managers interview confirmed**
	GP 3.1 (AB 1)	Establish and maintain the description of a defined requirements development process.			
	GP 2.2 (AB 2)	Establish and maintain the plan for performing the requirements development process.			
	GP 2.3 (AB 3)	Provide adequate resources for performing the requirements development process, developing the work products and providing the services of the process.			**Alice Gentry in the managers interview said they could use more people.**

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+ & -'s

Goal	Item	Goal & Practice Statements	+/-	Source	Comments
GG3	Generic Goal	The process is institutionalized as a defined process.			
	GP 2.1 (CO 1)	**Establish and maintain an organizational policy for planning and performing the requirements development process.**	**+**	E42035-01	**Policy exists, last revised 1/2/2001.** **L.Manfred in the Managers interview confirmed**
	GP 3.1 (AB 1)	Establish and maintain the description of a defined requirements development process.	**+**	E42035-22	**Description exists, last revised 1/30/2002. Ted in Management interview uses it**
	GP 2.2 (AB 2)	Establish and maintain the plan for performing the requirements development process.	**+**	E42035-32	**Plan exists, last revised 1/30/2002.**
	GP 2.3 (AB 3)	Provide adequate resources for performing the requirements development process, developing the work products and providing the services of the process.	**—**		**Alice Gentry in the managers interview said they could use more people.**

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Overview - Generation of Findings

- Each team reviews their 'team' observation forms to determine if there is a finding.

- They words the findings, collect by PA, and prepare to present.

- The teams work to ensure they have consensus on the findings. These findings are not the findings of the team lead, these are the team's findings!

- The findings reflect what they have seen or heard, they are not allowed to speculate!

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Findings Category Listing

- Strength - Indicates a characteristic of the process that is robust and institutionalized

    - will contribute to goal satisfaction

    - achieved by effective implementation of the Process Area's key practices (i.e., documented, enforced, trained, measured, and able to improve)

- Weakness - Characteristic of the process that may increase risk

    - Process Area's key practices are not effectively implemented

    - potentially impacts a Process Area's goal from being achieved

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Findings Terminology

- **Terms used:**

  - No evidence of practice: "lack of"

  - Some evidence of practice:

    - "insufficient" - not enough of

    - "inadequate" - not good enough

    - "inconsistent" - some do, some don't, some do sometimes

Requirements Development (example)

- Strengths:

    - Responsibilities are assigned for performing requirements development activities

    - MRS and PRS are placed under configuration management.

    - Product component requirements are developed and documented in the PRS & FD

- Weaknesses:

    - No defined process or organizational policy for requirements development

    - Lack of evidence that sufficient resources to perform requirements development activities exist

    - Insufficient training provided in requirements development methodologies / techniques

Presentation of final findings

Day 2

4:30 - 5:00

- Team BMW

- Team Mercedes

Each Team critiques the other!

Lessons Learned

- By providing pre-work this forced participants to review and have fundamental understanding of our internal appraisal methodology prior to attending the workshop.

- Planning for an appraisal brought attendees to the realization that being the team lead is a lot of work and has increased their appreciation for the person that fills that role.

- By participating in appraisal team activities during the workshop, attendees have a much better understanding of what will be expected of them as (new) team members during an internal ABB appraisal.

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Lessons Learned

- The findings presented by the attendees have been for the most part accurate, however not complete. This was due mostly to lack of sufficient time. (another lessons learned for the attendees, don't rush an appraisal!)

- Feedback has indicated that we need to lengthen the workshop from 2 days to 3 days.

- ABB Tahiti has been such a hit that there are those in ABB that think that it actually exists! ;-)

Contact Information

Dennis Brantly

ABB USCRC

1021 Main Campus Drive

Raleigh, NC 27606

phone: (919) 856-3925

email:
dennis.brantly@us.abb.com

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