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Innovation. In all domains.

The ABC's of Class C's, B's, and A's

Metrics and Lessons Learned
from Appraisal Event Scheduling

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Outline

- Introduction
- Managed Information
- Planning Tactics
- Operating Plan Data
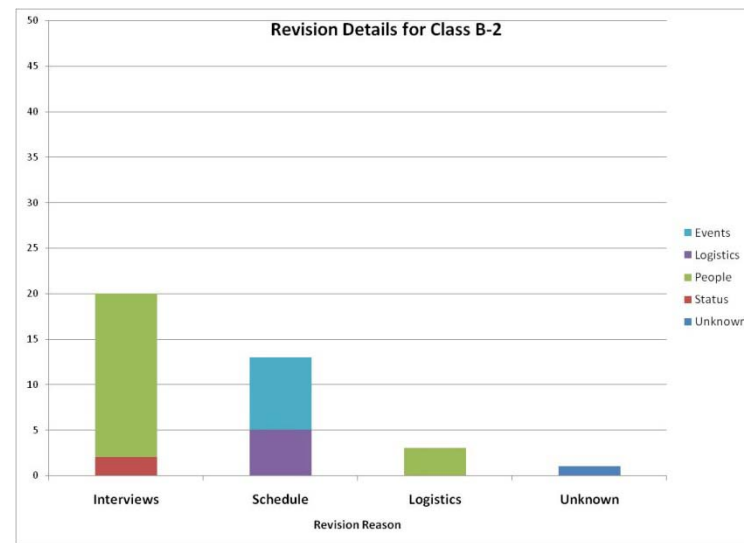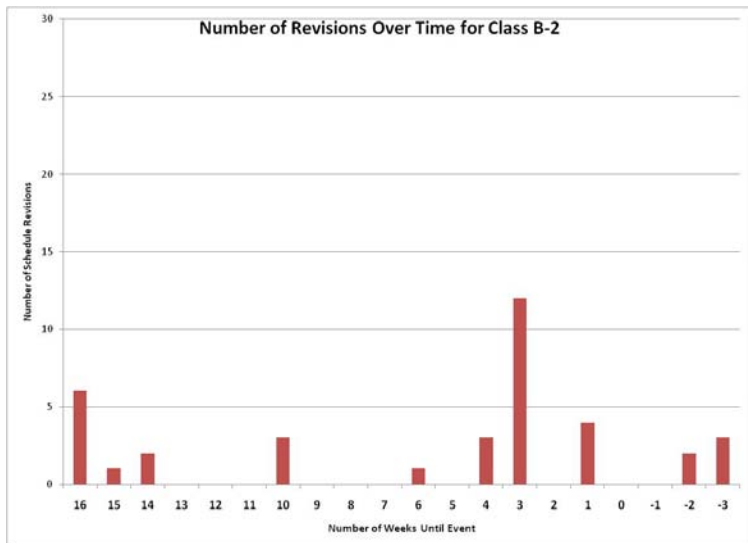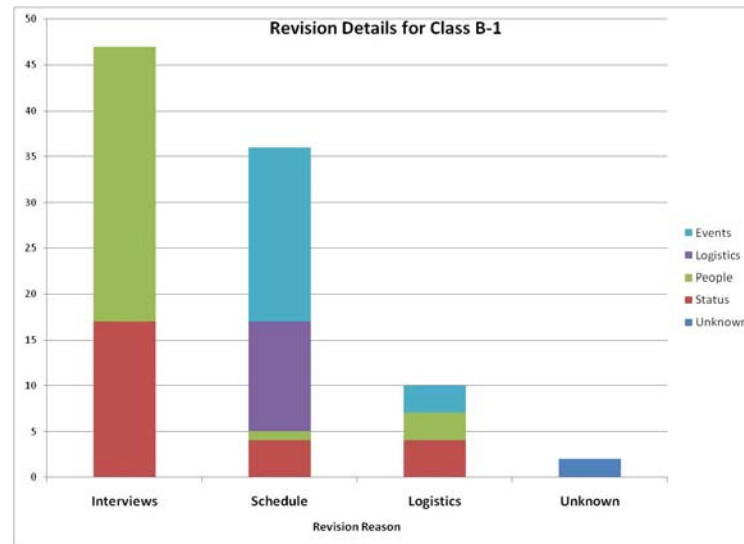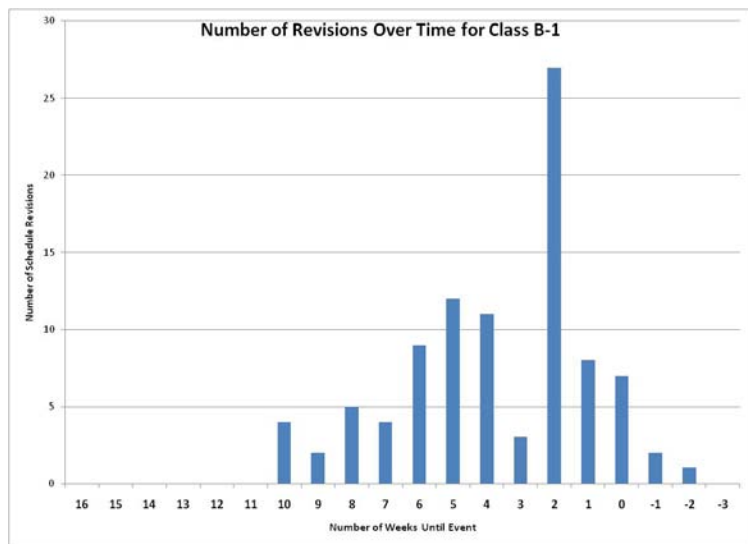- Lessons
- Summary

Introduction

- Raytheon Missile Systems, Tucson, AZ conducted a CMMI® Maturity Level 5 appraisal during 2008-2009

- Scheduling and managing CMMI events is a large effort in hours and people resources
  - 20-25 interviews, 50-75 interviewees per event
- Flexibility and consideration for business goals essential during planning
- Events more likely to be successful if planned well

- Metrics and lessons were kept regarding changes to integrated operating plans for the two Class B and Class A appraisal events
- Good, robust planning allows easier handling of problems and changes

Managed Information

Appraisal Operating Plan contained:
- – Two-year appraisal events calendar
- – Detailed calendar for each Class C, Class B, and Class A event
- – Participants (interviewees, demonstrators, and back-ups)
- – Interviews matrix
- – Appraisal mini-teams and the PA assignments
- – Participating projects matrix for current and prior appraisal
- – Points of contact for programs with phone numbers and e-mail addresses
- – A list of charge codes for this event, its preparation, and related after-work

Appraisal Operating Plan lacked:
- – Appraisal team contact information

| SCAMPI						AIM-9X			EKV CE2		
Interview	Role	Topics	Time / Date	Partici pants	Back ups	Primary	Secondary	Role	Primary	Secondary	Role
21K	IV&V	PI, VER, VAL	Tues, Aug 26, 9:00AM-Noon	4	2						
51O	EPG / PMX	Org + IPPD	Tues, Aug 26, 9:00AM-Noon	2	2						

Planning Tactics

- Appraisal operating plan/schedule revisions stored in repository
  - Utilized configuration management to track revisions
  - Revisions to plan made by appraisal team members and by lead appraiser
- Revisions to operating plan tracked to analyze planning areas in need of improvement
- Revisions were assigned a "reason" and "sub-reason" to document the revision's basis:
  - Reasons:
    - Interview changes, schedule changes, logistical changes, or unknown
  - Sub-reasons:
    - Changes due to people, events, status, logistics, or unknown
- Revisions were also analyzed in relation to time (weeks until appraisal event)
- Data displayed trends
  - Root cause analysis was used to explain the data in order to implement an appropriate improvement plan
  - Planning was then improved to decrease the number of plan revisions and to create an optimal appraisal operating plan for both the appraisal team and the appraisal participants

Operating Plan Data

Lesson 1: Plan the Big Stuff Early

- Plan early for the big aspects of the events
  - Plan specific details as event nears
- Do not capture too many details too early
  - Interviewees change and conflicts arise often
- Apply lessons you learn during one event immediately to the planning for the next event
- Expect volatility to decline over time
  - Less dramatic changes in focus, personnel, etc.
  - Impossible to eliminate volatility entirely


Class B-2 Revision Snap Shot
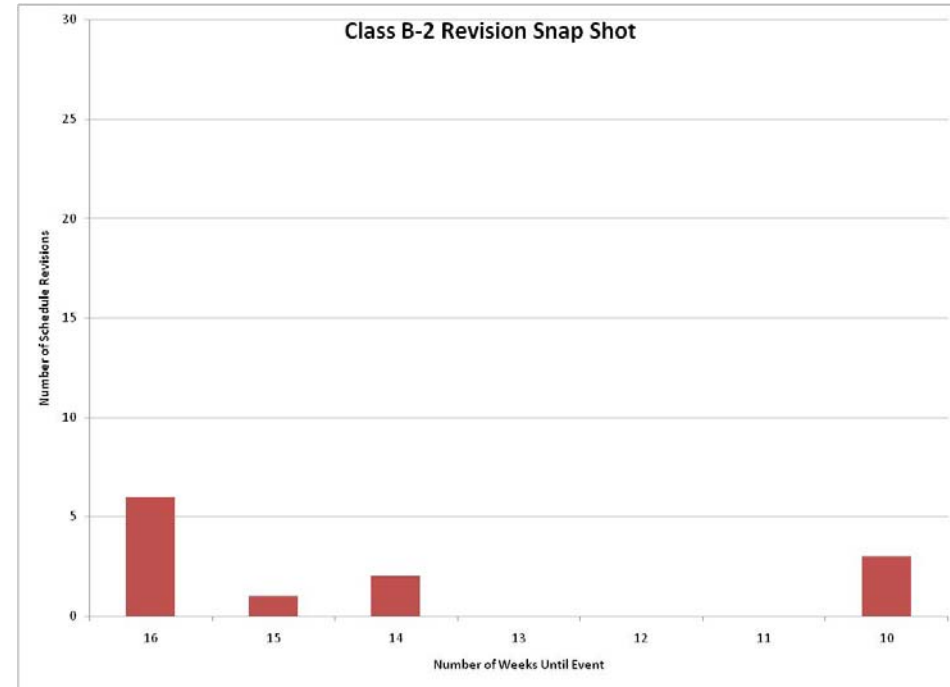
- Scheduling for Class B-2 began during the Class B-1
  - Schedule created 16 weeks before actual event

Plan early, but do not plan in excess!

Lesson 2: Late Planning Leads to More Last Minute Changes

- "Don't wait until the last moment to be fully prepared"
  - Schedule calendar events far in advance
  - Trained or experienced interviewees more likely to hold to the schedule of future events
- Identify risk factors, such as:
  - Interviewees who participate in multiple interviews
  - Appraisal team members who want to attend related mini-team interviews
  - Interviews that are likely to bring up many questions


Close-up of Weeks Before Appraisal Event
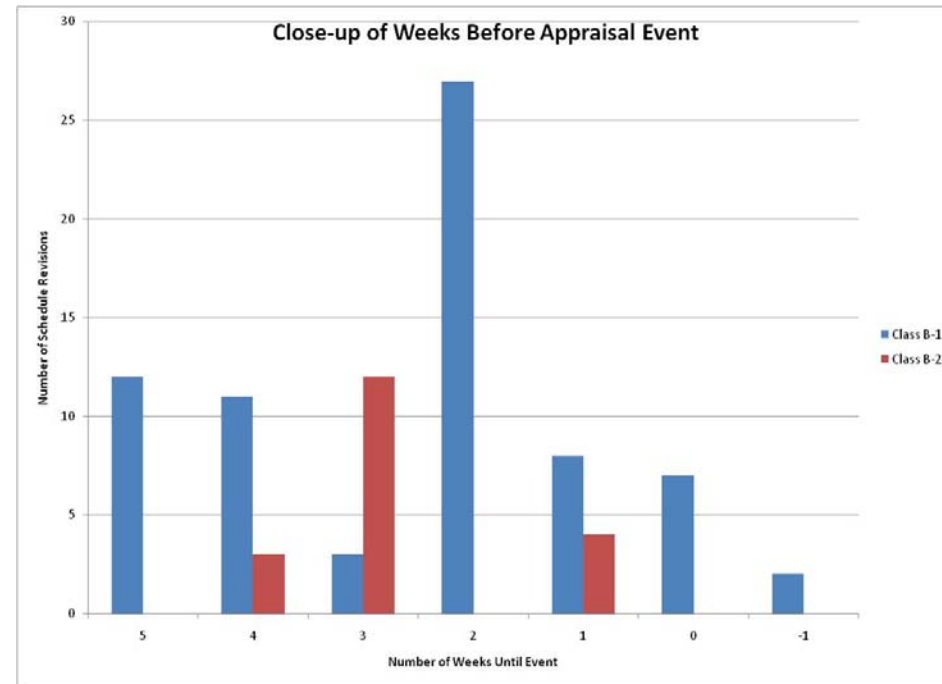
- Changes to operating plan peaked 2-3 weeks before events
  - Peak for B-2 significantly lower than B-1 due to earlier planning

Identify risks early that could affect your schedule!

Lesson 3: Appraisal Participants Introduce the Most Changes

- Make CMMI "easy" for programs and participants
  - Work around major program events and milestones
  - Schedule interviewees at times and locations convenient for programs
  - Meet early or late if necessary
  - Risk-based approach: deal with higher risk items first

- "Mock Interview" training
  - Prepare participants
  - Reduce "scare factor"

Schedule Revisions by Sub-Reasons
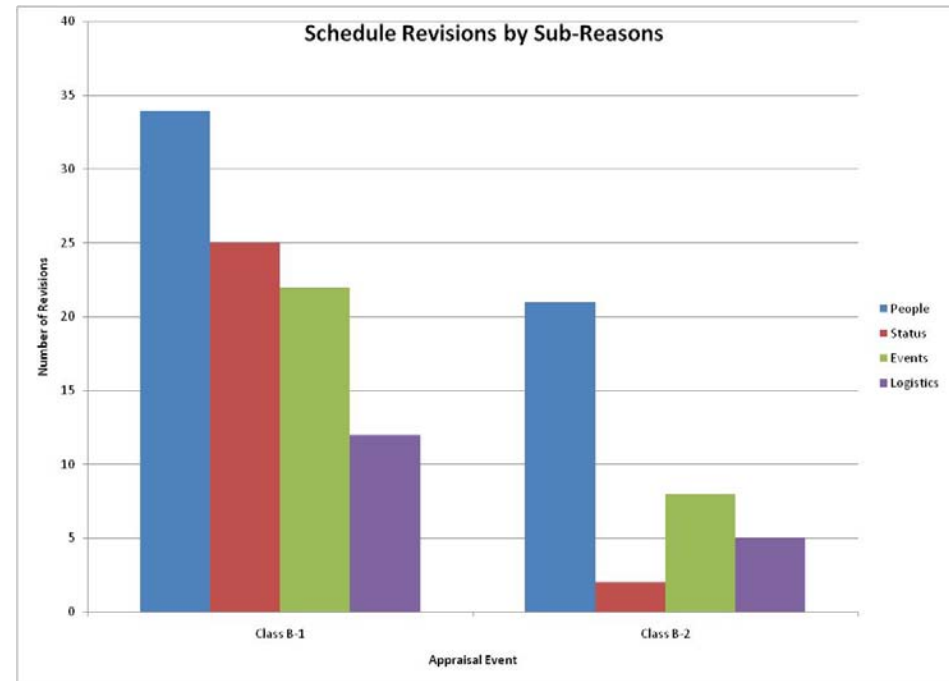
- In both events, appraisal participants had greatest impact on schedule revisions
  - Class B-2 focused more on scheduling to the program vs. to the appraisal, thus less revisions

Our business is supporting the warfighter—not performing appraisals!

General Lessons

Early Infrastructure Identification

- Schedule conference rooms as early as possible
  - Reserve large rooms for appraisal team work area and big interviews
  - Schedule rooms and time slots for "make-up" interviews
- Ensure proper network bandwidth for meeting rooms
- Create seating charts for events
  - Collocate related mini-teams, make information flow easy
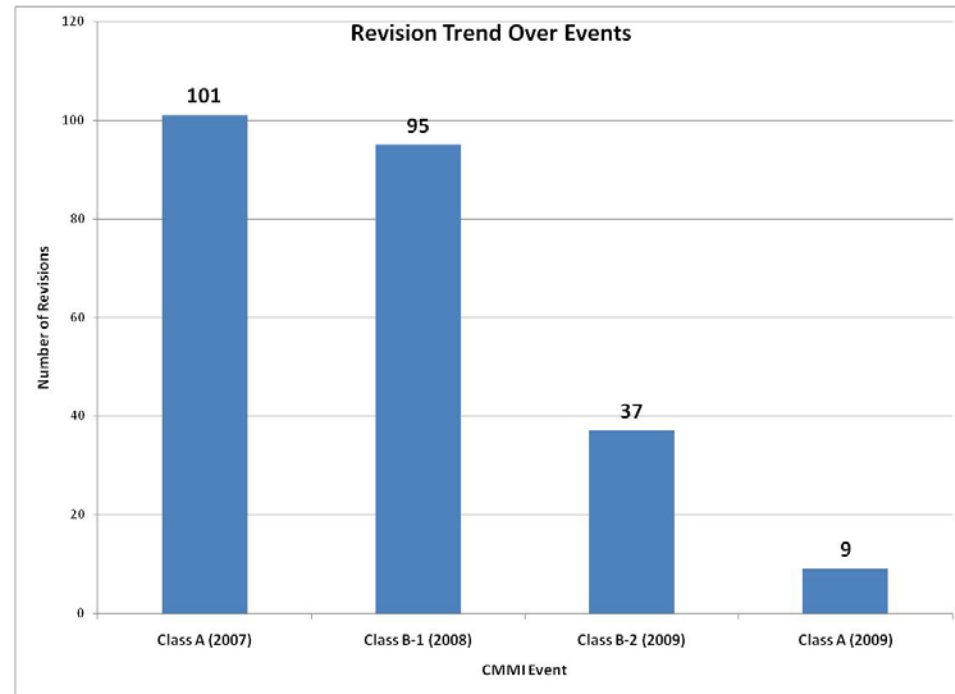
Make Process as Easy as Possible

- Find a person not on the appraisal team to send invitations to interviewees and to receive responses
  - Hard to process responses and participate on appraisal team
  - Follow e-mail invitations with calls and personal visits
- Don't make interview titles or numbers too complicated
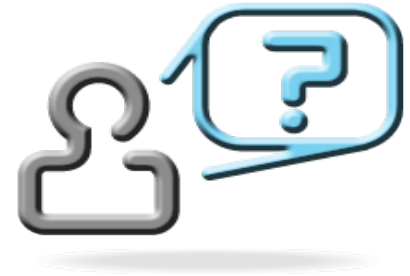 - Let interview #9 happen before interview #1

Summary

- Plan the big stuff early
- Late planning leads to more last minute changes
- Appraisal participants introduce the most changes to an operating plan
- Identify essential appraisal infrastructure early
- Make appraisal and planning process as easy as possible

- Through root cause analysis and process improvement, the plan revisions decreased dramatically by the completion of the Level 5 Class A

Revision Trend Over Events

CMMI Event	Number of Revisions
Class A (2007)	101
Class B-1 (2008)	95
Class B-2 (2009)	37
Class A (2009)	9

Questions and Answers

Presenter Biographies

- **Courtney Walsh is a recent graduate of Rochester Institute of Technology in Rochester, New York. She graduated with a B.S. and M.E. in Mechanical Engineering with a concentration in Aerospace. After graduating, she came to work for Raytheon Missile Systems in Tucson, Arizona in the fall of 2008. Courtney works in the Quality & Mission Assurance's Enterprise Performance Advancement group aiding in CMMI Level 5 activities as well as conducting AS-9100 internal audits. During her studies, Courtney was privileged to work for National Semiconductor as an etch development engineer running experiments in the fabrication laboratory, for Sikorsky Aircraft Corporation as a systems engineer on the S-76D helicopter, and for Delphi Corporation as a development engineer in the variable valve actuation group. At Sikorsky, she contributed in the re-engineering of the emergency blow-down equipment for the S-76D. Courtney may be reached at +1.520.794.1883 or Courtney.Walsh@raytheon.com.**

- **Brad Bittorf is currently responsible for CMMI appraisal logistics at Raytheon Missile Systems in Tucson, Arizona. Brad is a member of Quality & Mission Assurance's Enterprise Performance Advancement group. His ten years at Raytheon have been centered on process deployment and process improvement, with a little bit of software mixed in. (That follows 16 years as a software and systems engineer at Rockwell Automation and E.F. Johnson Company, where he was a resistor of change.) Brad holds a B.S. in Applied Computer Systems from the University of Wisconsin at River Falls. He shares three patents for redundant and robust industrial control and communication systems. Brad has served as a member of CMMI and SW-CMM appraisal teams. He serves on the board of the International Lilac Society, and is a frequent science fair judge. Brad may be reached at +1.520.545.8035 or bjbittorf@raytheon.com.**