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**Raytheon**

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# Logistics and Lessons Learned in Conducting a CMMI® ML3 SE/SW/IPPD/SS Enterprise-Level Appraisal

**NDIA CMMI Conference 2007: #5371**

**Raytheon  
Intelligence and Information Systems  
Enterprise Process Team**

***Kathryn Kirby  
John Miller  
Carolyn Hickey***



Kathy has 22 years experience as a multi-discipline engineer and project manager, Raytheon Six Sigma™ Expert, Assessment Lead for Raytheon Intelligence and Information Systems (IIS) Enterprise Process Team (EPT), and member of the Raytheon Technology and Process Councils. She is a Technology Award winner, an Operational Excellence Award winner, and a Space Systems Process Improvement Award winner. Kathy holds degrees in Physics, Astronomy, Mathematics, and Music.

Kathryn H. Kirby  
Raytheon IIS EPT CMMI Team  
Lead  
[khkirby@raytheon.com](mailto:khkirby@raytheon.com)

John has performed activities related to training, appraisals, and consulting for many years in the areas of program and project management, systems engineering, and process improvement. He has degrees in business, physics, and engineering.

John is an SEI Authorized High-Maturity SCAMPI Lead Appraiser as well as an authorized SEI Instructor.

John B. Miller  
SEI Authorized High-Maturity  
Lead Appraiser  
IIS EPT CMMI Expert  
[jbmiller@raytheon.com](mailto:jbmiller@raytheon.com)

Carolyn is the IIS EPT Process Architect, developed the vision for an IIS-wide Common Process Architecture, and was key to the success of the IIS Enterprise CMMI SE/SW/IPPD/SS ML3 rating in 2006. She established a successful architecture for Aurora's pursuit of a CMMI (SE/SW/IPPD) Level 3 rating in 2004; unique in that Aurora was the only Raytheon site to earn the IPPD distinction, was a Peak Performer winner in 2004, and has proven that defined processes lead to better business. Her vision for a Common Process Architecture across IIS is now a reality.

Carolyn B Hickey  
IIS EPT Process Architect  
CMMI Appraiser  
[cbhickey@raytheon.com](mailto:cbhickey@raytheon.com)

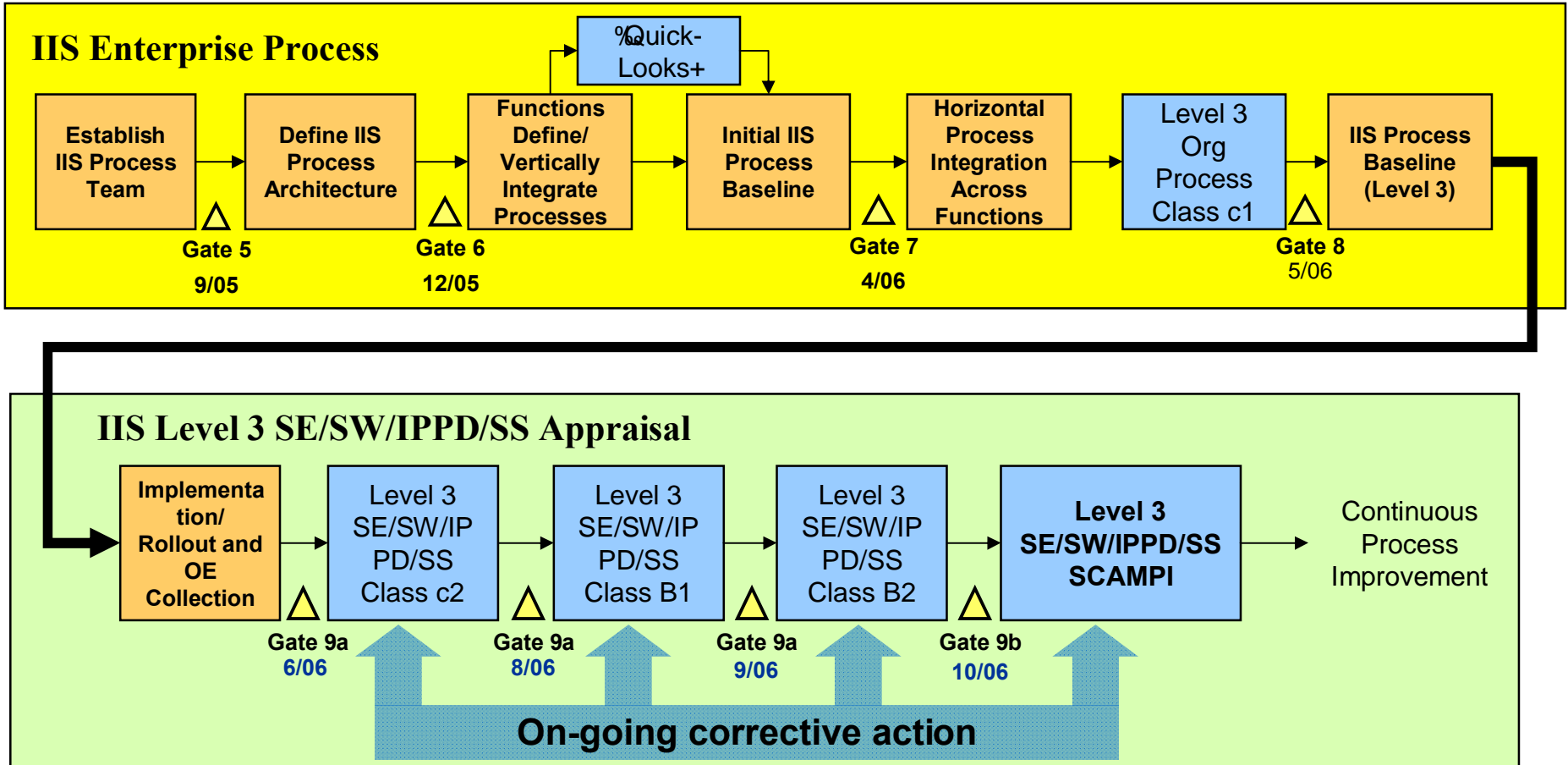
- Overview of the Raytheon IIS Enterprise
- Key Considerations and Objectives in the Appraisal Approach
- Critical Path to the IIS Enterprise Level ML3 SE/SW/IPPD/SS SCAMPI
- Appraisal and Support Teams
- Representative Sample
- Objectives and Scope of the Appraisals
- Run Rules, Roles & Responsibilities, and Expectations
- Managing and Preparing the Objective Evidence
- Orchestrating and Conducting In-briefs and Interviews
- Managing the appraisal schedule, input, plan, and the new SAS

# Raytheon Intelligence and Systems (IIS) Enterprise

- **CMMI v1.1 ML3 SE/SW/IPPD/SS 12/01/2006, ADS v1.2**
  - Team of 9, including 1 SEI High Maturity Lead Appraiser + 3 SEI Lead Appraisers
  - 5 weeks on-site for Class A, 138 interviewees
- **IIS has over 300 programs in five major product lines, with 8,000 employees (additional 1800 in IT services unit not included in this appraisal).**
- **Work is performed at six primary sites, and multiple secondary and customer sites around the world.**
- **Programs and product lines span multiple work sites, but not all programs or product lines are represented at all work sites.**
- **There is a mix of classified and unclassified programs at each site and within product lines.**
- **Programs range from a few engineers maintaining small systems or prototyping new capabilities, to hundreds of engineers working in a multi-site, integrated development environment to create and deliver complex mission systems.**
- **IIS programs are not production systems, such as aircraft, appliances, or missiles, so program characteristics of the organization or a product line can change significantly in relatively short periods of time to meet customers' changing needs.**



- Clearly defined business needs and objectives.
- Perform appraisal preparation activities concurrent with the integration of the IIS Enterprise Common Process.
- Incorporate Lessons Learned related to enterprise-level appraisals.
- Perform assessments of processes and programs as early as feasible.
- Reduce risk by scheduling multiple preparatory appraisals with clear objectives.
- Identify internal best practices to be used to plan, manage, and execute the appraisal effort.
  - Integrate the Raytheon Gate Review Process with the Appraisal Readiness Review process to ensure readiness for the next step.
  - Use Raytheon Six Sigma™ process improvement methodology.



**Multiple Events with Clear Objectives Combined with Raytheon's Gate Review Process Helps Gauge Appraisal Readiness.**

# Support Teams

Teams	Work Site	Appraiser Lead	Site POC	Program POC (OE Team Lead)	OE Team	Session Monitors	Appraisal Mini-Team
Program 1	Primary Work Site 1 (other sites)	Appraiser assigned to Program 1	Site x POC (other sites)	Program 1 POC	OE Team Program 1	Session Monitor Lead (session monitors)	Mini-team Lead Member #2
Program 2	Primary Work Site 1 (other sites)	Appraiser assigned to Program 2	Site y POC (other sites)	Program 2 POC	OE Team Program 2	Session Monitor Lead (session monitors)	Mini-team Lead Member #2
...	...	...	...	...	...	...	...

- To maintain objectivity, the Appraiser Lead for a program was not on the Mini-team for the Class B or SCAMPI Appraisals.
- The Appraisal Coordinator was also the Appraisal Lead and the Designated Agent for the Lead Appraiser in the new SEI SAS tool: able to keep all areas in-step.
- Defining the skills needed for OE collectors is crucial, but very difficult.
  - *We would love to learn from your examples!*

***The Right Person Makes a World of Difference. This Applies to All Positions, not Just to Your OE Teams.***

***The use of Four SEI Authorized Lead Appraisers on the Nine-person Appraisal Team was Critical to Executing an Appraisal of this Magnitude to Schedule.***

## representative Sample\*

- Identified the characteristics of programs in the Enterprise using Org charts, program and function review requirements, business plans and financial targets, etc.
- Characterized the IIS enterprise using statistical tools and underlying concepts of a Design of Experiments (DOE).
- Identified 178 programs that were viable programs for assessment. Ex. Eliminated programs ending before 9/06, capital sales.
- Analyzed the program characteristics to determine the most appropriate Enterprise Key Factors.
- Compared the 178 programs versus Enterprise Key Factors to down-select to 20 programs to be further analyzed for consideration.
- Rated the 20 programs using a QFD and reviewed the results with the Product Line Vice Presidents to identify risks or potential issues.
- Identified 14 program which were then summarized and reviewed with the Appraisal Team.
- The appraisal team selected seven programs as the enterprise representative sample for the appraisal.

***A Solid Analysis to Select and Use Enterprise Key Factors is a Viable Method for Selecting Representative Programs.***



## Scope of the Appraisals

	<b>Objective</b>	<b>Scope</b>	<b>Dur</b>	<b>Comments</b>
<b>Class c1</b> (not to MDD)	<ul style="list-style-type: none"> <li>“ Ensure IIS level policies and procedures are complete</li> <li>“ Ensure IIS procedures are compliant with the CMMI.</li> </ul>	<ul style="list-style-type: none"> <li>“ All policies and procedures at IIS level for all CMMI process areas.</li> <li>“ OE for OPF/OPD</li> </ul>	- 3 days per function	<ul style="list-style-type: none"> <li>- Raytheon-only assessment team</li> <li>- No Interviews</li> <li>- Function will not proceed to Gate 8 until all issues are addressed.</li> </ul>
<b>Class B1</b>	<ul style="list-style-type: none"> <li>“ Focused review of 11 Process Areas</li> <li>“ Use appraisal procedures to identify necessary improvements</li> <li>“ Determine readiness for Class A SCAMPI</li> </ul>	<ul style="list-style-type: none"> <li>“ Enterprise processes and procedures</li> <li>“ All SCAMPI Target Programs</li> <li>“ Program tailoring, program processes and program procedures</li> <li>“ Direct and Indirect Objective Evidence</li> <li>“ Interviews related to B1 Process Areas</li> </ul>	- 2 weeks	<ul style="list-style-type: none"> <li>- Lead Appraiser and full Appraisal team</li> <li>- Will proceed like a Class A, but without determining goal satisfaction</li> </ul>

***The Objectives and Scope of each Appraisal were Defined to Meet the Specific Business Needs and Objectives Defined in our Appraisal Approach.***

- Define early, use early, use often, repeat yourself constantly, and update based on lessons learned:
  - Objective Evidence Standards, Practices, and Management
  - SCAMPI Program Expectations and Responsibilities
  - SCAMPI Participants Expectations and Responsibilities
  - Executive Management Expectations and Responsibilities
  - Independent Review Team/Gate Review Team Overview, Gate Scope, Summary Status
  - Process and Run Rules for Data Requests
  - Run Rules for Appraisal Sessions
    - Lesson learned from the B1 appraisal led us to add Session Monitors to all activities: in-briefs, out-briefs, interviews, findings
  - Appraisal Team Member Information Package
  - Appraisal Support (IS, POCs, ) and Programs Contact Information

***Items not Defined Formally, Well Enough, or Soon Enough, Cost us Schedule and Budget.***

- Established OE color code status and run-rules based on separate phases in our appraisal lifecycle:
  - Initial OE population and review by the appraiser
  - Class C Appraiser Review
  - Update of the OE after C Appraisals
  - Class B Appraisals
  - Update of OE after Class B Appraisals
  - OE review as part of the Class A (in accordance with the SEI MDD)
- Document, train, and enforce OE process
  - Currently improving our process based on lessons learned

***Just like a Program, as Your Life-cycle Changes, the Way You Status and Manage Must Change As Well.***

***Trying to Merge OE Mgmt from Multiple Places into One Enterprise“Make Everyone Happy” Model Yields a Non-Standard That Meets No Need Well.***

## ■ Session Monitors:

- Assigned at each site for each session
- Initiated the telecon and web conference sessions
- Confirmed attendance
- Held attendee electronic devices or other items
- Remained outside the conference room
- Ensured all parties were ready, turned the session over to the appraisers, and left the room.

## ■ The Interviewee's perspective:

- In the room: better via telecon; less pressure and more comfortable.
- On the phone: better in the room for body language and feedback.

***Sessions Can Be Successfully Conducted using Web/teleconferencing and tools, but Ensure You Meet the Strictures of the Model and the Requirements of your Lead Appraiser and Appraisal Team.***

***Don't use the same Telecon number for Back-to-Back Sessions, or Use a Telecon Number Commonly Used for Other Meetings.***

- Created, managed, and controlled the Appraisal Input and Plan outside of the SEI Appraisal System (SAS).
  - Information had to be highly condensed to fit the SAS text field limits.
  - SAS-external documents simplified mgmt review and sponsor approval.
- We used three schedules to manage our appraisal events.
  - A program Integrated Master Schedule (IMS) with EVMS.
  - A general distribution day-to-day schedule showing session titles, dates, times, and sites involved.
  - A restricted access detailed schedule that added the participant names, appraisers, session monitors, conference rooms, and telecon numbers.
  - + *All employees had insight and maintained involvement without violating confidentiality.*
  - *Appraisal Coordinator, Appraisal Team, Site POCs, Program POCs, & Session Monitors had to manage to multiple schedules.*

***Seek Ways to Manage using One Detailed Schedule with a Restricted Distribution, but be able to Quickly Extract a “Clean” Version.***



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A collage of grayscale images including a satellite, a person working on a circuit board, and a computer keyboard, overlaid with binary code and a grid pattern.

**Questions?**