

NASA Product Peer Review Process

Ken Jenks, Johnson Space Center

2009-02-24

Inspection/Peer Review at NASA

- Product Peer Reviews are used to discover defects, as a validation technique, and to prepare for formal reviews.
- Peer reviews/Inspections are part of the program/project management process and system engineering process
- Product Peer Reviews can be used on many different products at any phase in a project life cycle.
 - ❖ Peer reviews are often held prior to formal reviews on completed products.
 - ❖ The results of peer reviews may be addressed at formal document reviews.

Reasons for product peer reviews

- It is difficult for an individual Author or development team to spot every mistake or flaw in a complicated piece of work.
- This is not necessarily a reflection on the individuals concerned, but because with a new and perhaps eclectic subject, an opportunity for improvement may be more obvious to someone with special expertise or who simply looks at it with a fresh eye.
- Showing work to others increases the probability that weaknesses will be identified and improved.

Different types of peer reviews

- NASA uses two different types of peer review: scientific peer review (also known as refereeing) and Product Peer Review. This presentation describes only Product Peer Reviews.
- The JSC Engineering Directorate Product Peer Review process has been used for informal pilot studies, but has not been baselined yet.
 - ❖ Similar to the Goddard Space Flight Center's Engineering Peer Review process

The NASA requirements for peer reviews

- Peer reviews/Inspections are part of the program/project management process and system engineering process
 - ❖ NPR 7120.5D, NASA Space Flight Program and Project Management Requirements
 - ❖ NPR 7123.1A NASA Systems Engineering Processes and Requirements, Appendix G.20
 - ❖ NASA/SP-2007-6105, NASA Systems Engineering Handbook, Appendix N
 - ❖ NPR 7150.2, NASA Software Engineering Requirements, [SWE-087], [SWE-088], [SWE-089], [SWE-119]

Live Demonstration of a Product Peer Review

- The rest of this presentation gives a live demo
- Green slides are presented at the Kick-Off Meeting
- Red slides are presented at the Product Peer Review Panel Meeting
- Blue slides are part of the NASA PM Challenge presentation
- Volunteers from the audience will form our panel of Reviewers

Magic Cookie Caper Product Peer Review Kick-Off Meeting

Ken Jenks Moderator

2009-02-24

Agenda

- Purpose of today's meeting
- Purpose of this Product Peer Review
- Product Peer Review team introductions
- Expectations for the review meeting and process
- Product overview
- Procedures and tools used in this peer review
- Reviewer homework
- Defects
- Technical risks
- Closing the meeting

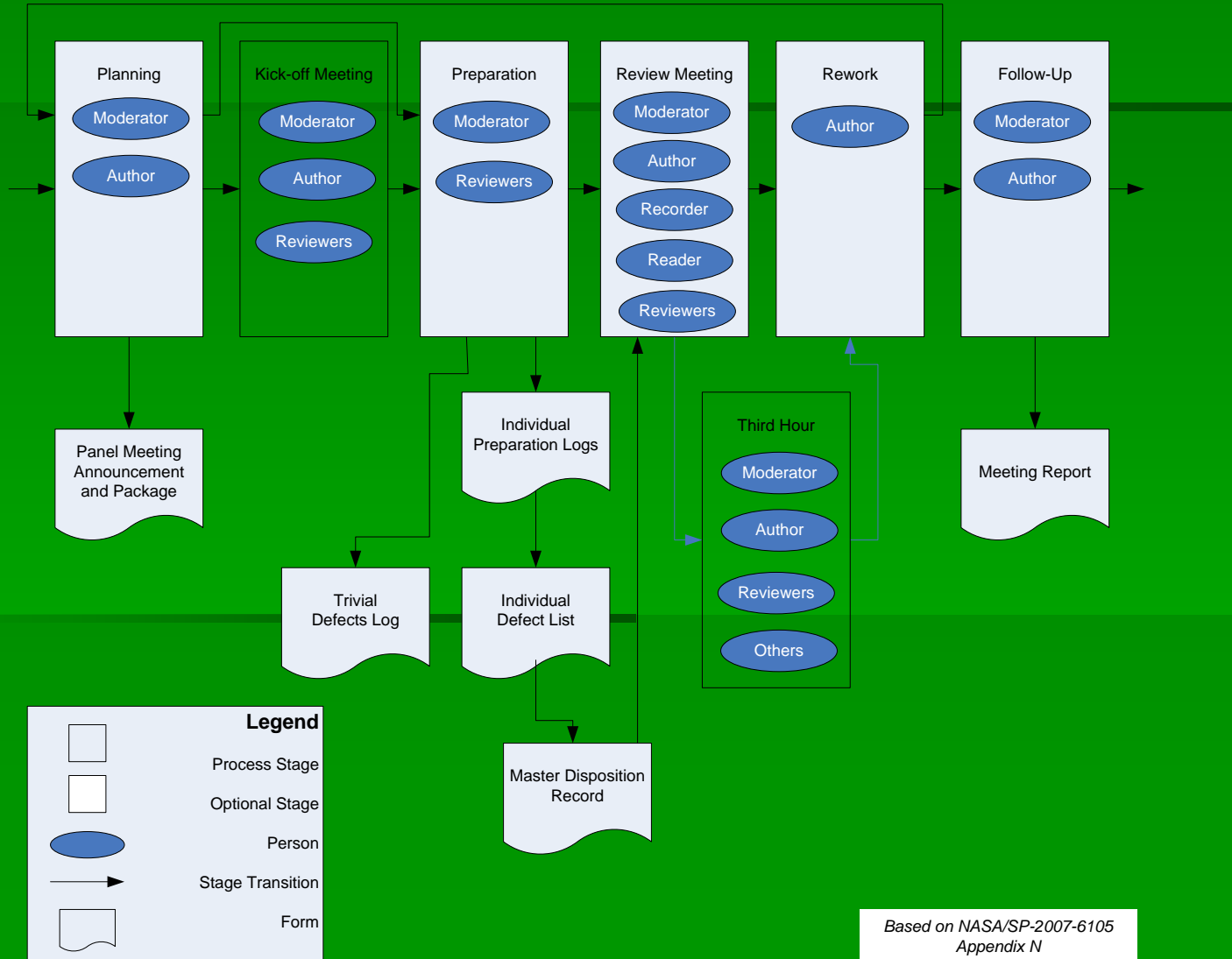
Kick-off Meeting Purposes

- The meeting today is a Kick-off Meeting intended to
 - Introduce members of the review team
 - Familiarize Reviewers with the product
 - Train the Reviewers on the Product Peer Review process

Purpose of this review

- This Product Peer Review is intended to improve the product
 - Compare the product against its requirements, standards and specifications, finding defects
 - Specific suggestions for product improvements
 - Often used to prepare for formal reviews
 - Used as a validation technique
 - Support the evolving design and development of the product
 - Provide technical insight needed to ensure product and process quality
 - Provide insight into technical risks
- The product under review:
 - *Product title, revision level*
 - *Stage in the project life cycle*
- The Author will correct all major defects
 - Minor and trivial defects are addressed as time permits
- At the end of this peer review process, the Moderator will prepare and distribute the Product Peer Review Report

Procedure flow



Based on NASA/SP-2007-6105
Appendix N

Peer Review Team Introductions

- Moderator
 - *Moderator name, organization, contact info*
- Author
 - *Author name, organization, contact info*
- Reviewers
 - *Reviewer 1, organization, expertise*
 - *Reviewer 2, organization, expertise*
- Reader
 - *Reader name, organization*
- Recorder
 - *Recorder name, organization*

Expectations

- You are expected to do your homework
- You are expected to find defects
 - Any complicated technical product will have defects
 - Finding zero defects is not acceptable
- You are expected to record basic metrics (effort, defect lists)
- You are expected to attend the Product Peer Review Panel Meeting
- Charge codes for this peer review effort
 - This meeting 1 hour, homework 3 hours, next meeting 2 hours
- Disclosure of vested interests, conflicts of interest
- Author's Line Management stays out of the room
 - Helps Reviewers be more objective

Expectations: Social Aspects

- Social dynamics between the Reviewers and the Author are a sensitive issue
- Reviewers
 - Not here to show that you're smarter than the Author
 - Not here to show that you're smarter than each other
 - Thoughtfully select the words you use to raise an issue
 - Comment about the product and not about the Author
- Author
 - Not here to justify every bit of the work product
 - Not here to rationalize away problems
 - Accept the comments graciously, even if you disagree
- We're all here to improve the product
- Nobody walks away mad

Product Background

- *The Reader presents the background*
- *These charts are usually supplied by the Author*
- *The product background includes*
 - ❖ *Who are the product stakeholders*
 - ❖ *How will the product be used*
 - ❖ *How does the product fit into its product architecture*
 - ❖ *When is the product needed*

Product Background

- “The Magic Cookie Caper” is a movie coming out next year. Our company is bidding to produce cookies to be sold in theaters as a movie tie-in.
- This batch of cookies is a prototype.
- Our company gives its pitch to the film distribution company next month.

Requirements, Standards and Specifications

- *The Reader presents these charts*
- *These charts are usually supplied by the Author*
- *Compliance checklists and traceability matrices are helpful*
- *It's common for Reviewers to find problems in the product's requirements, standards and specifications*
 - ❖ *Don't report those defects as product defects*
 - ❖ *Moderator should include a CR form in Data Package*

Requirements, Standards and Specifications

[MCP-00100]	There shall be 12 cookies in each batch.
[MCP-00200]	At least 5 cookies shall be sugar cookies.
[MCP-00300]	At least 5 cookies shall be chocolate chip.
[MCP-00400]	At least 4 cookies shall have pink sprinkles.
[MCP-00500]	At least 3 cookies shall have blue sprinkles.
[MCP-00600]	The cookies shall be round.
[MCP-00700]	The cookies shall be between 2 inches and 3 inches in diameter.

Product Information

- *The Reader presents the product information*
- *These charts are usually supplied by the Author*

Product Information

- This batch of cookies was prepared by our product development team, not a commercial kitchen
- We added the Oreos because we found that we can get a profitable cross-promotion deal with Nabisco

Product Discussion

- Reviewers are invited to ask question of the Author
 - About the product
 - About requirements
 - About the standards
 - About the specifications
 - About technical risks

Procedures and tools

- EA-WI-038 describes the procedure for this Product Peer Review
 - Moderator distributes forms to Reviewers
 - During the Product Peer Review Panel Meeting, the Recorder will record any additional defects discovered
- Moderator will use EA Action Item Database for action items
 - Track actions identified in the reviews until they are resolved
- Moderator will use Microsoft Exchange “Shared Tasks” for issue tracking

Reviewer Homework

- Inspect the product carefully
- Compare the product against its requirements, standards and specifications
- Record major and minor defects that you detect on the Individual Defect List
- Use the Trivial Defects Log for typos, grammatical changes, spelling errors, formatting problems or other trivia
- Take notes about questions you have or risks that you've identified
- Keep track of the effort spent performing these tasks
- Fill out the Individual Preparation Log
- Send your Individual Defect List and your Individual Preparation Log to the Moderator by the due date
- Bring your notes to the Product Peer Review Panel Meeting

Defects

- Defect: discrepancy or nonconformity to a requirement or specification
- Reviewers will identify defects in the product
 - Include assumptions made in determining defects

Severity	Description
Major	An error that would cause a malfunction or prevents attainment of an expected or specified result.
	Any error that would in the future result in an approved change request or failure report.
Minor	A violation of standards, guidelines, or rules that would not result in a deviation from requirements if not corrected but could result in minor difficulties in terms of operations, maintenance, or future development.
Trivial	Editorial errors such as spelling, punctuation, and grammar that do not cause errors or change requests. Recorded as redlines or in the electronic Trivial Defects Log. Presented directly to Author at the end of the meeting.

Technical Risks

- Discussions of defects and approaches will often reveal technical risks
- Author will record technical risks in the project risk list
 - Although a Product Peer Review may reveal risks, risk management is not part of the Product Peer Review process

Closing the Meeting

- Assignment for Reviewers
 - Review the product against its requirements
 - *Location of product and requirements*
 - Individual Preparation Log
 - Trivial Defects Log
 - Due date: *yyyy/mm/dd*
- Schedule for the Product Peer Review Panel meeting
 - *yyyy/mm/dd, hh:mm, location*

And then a week goes by

- A week between the Kick-Off Meeting and the Product Peer Review Panel Meeting gives the Reviewers time to do their homework and turn in their defect lists to the Moderator
- The Moderator collects the defects together, combining duplicates
- The Moderator and the Author can correct some defects
- Normally, the Product Peer Review Panel Meeting should be held in the same conference room or workstation cluster a week later

Magic Cookie Caper Product Peer Review Panel Meeting

TBD Moderator

yyyy/mm/dd

Agenda

- Purpose of this Product Peer Review
- Product Peer Review team
- Expectations
- Success criteria
- Closing the meeting

Purpose of this review

- Product Peer Reviews are used
 - to discover defects
 - as a validation technique
 - to prepare for formal reviews
- The product under review:
 - *Product title, revision level*
 - *Stage in the project life cycle*

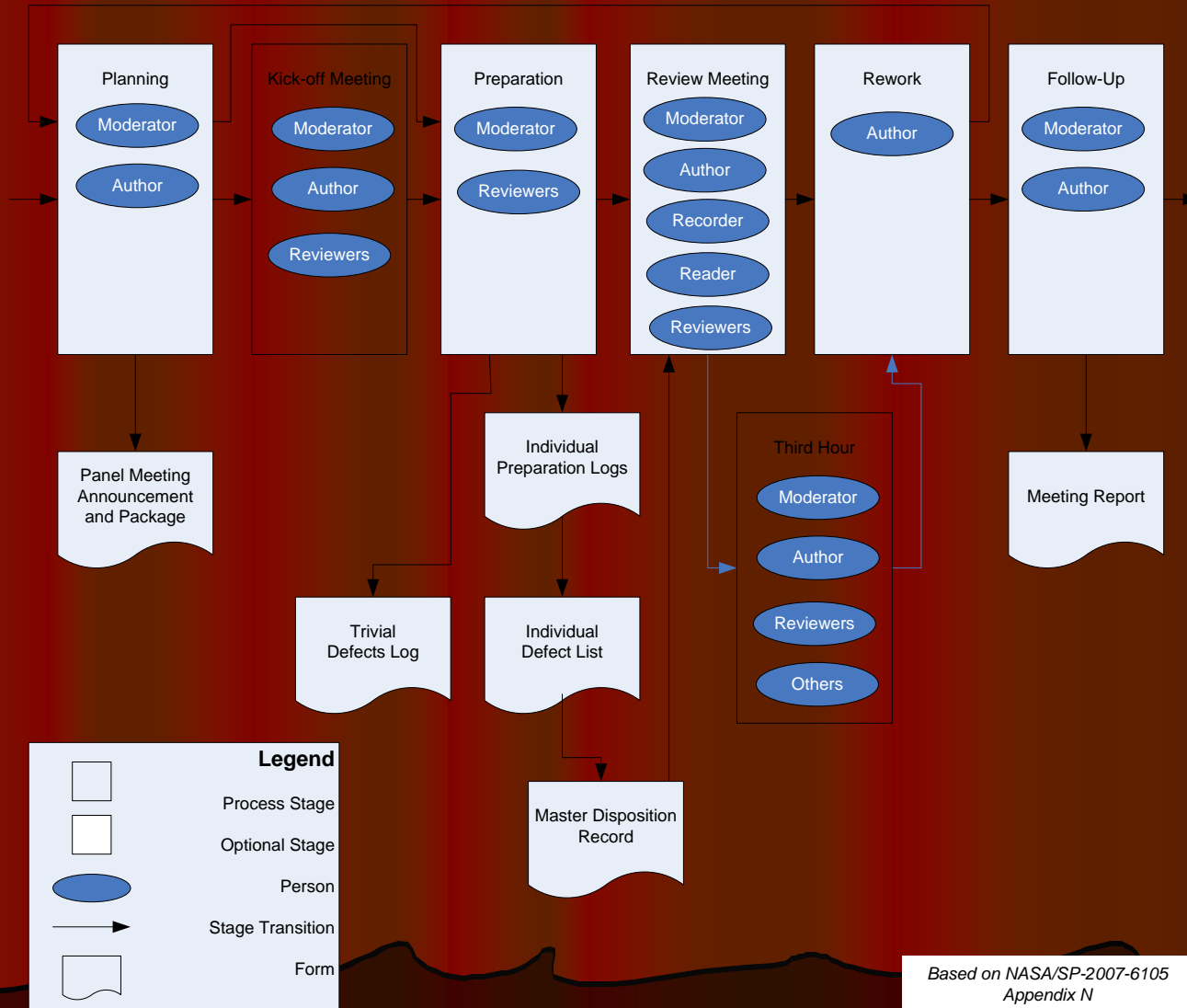
Peer Review Team

- Moderator
 - *Moderator name, organization, contact info*
- Author
 - *Author name, organization, contact info*
- Reviewers
 - *Reviewer 1, organization, expertise*
 - *Reviewer 2, organization, expertise*
- Reader
 - *Reader name, organization*
- Recorder
 - *Recorder name, organization*

Expectations

- This Product Peer Review is intended to improve the product
 - Compare the product against its requirements, standards and specifications, finding defects
 - Specific suggestions for product improvements
 - Gain insight into the technical risks
- Record basic metrics (effort, defect lists)
- Charge codes for this peer review
- Disclosure of vested interests, conflicts of interest
- Author's Line Management stays out of the room
 - Helps Reviewers be more objective

Procedure flow



Expectations: Social Aspects

- Social dynamics between the Reviewers and the Author are a sensitive issue
- Reviewers
 - Not here to show that you're smarter than the Author
 - Not here to show that you're smarter than each other
 - Thoughtfully select the words you use to raise an issue
 - Comment about the product and not about the Author
- Author
 - Not here to justify every bit of the work product
 - Not here to rationalize away problems
 - Accept the comments graciously, even if you disagree
- We're all here to improve the product
- Nobody walks away mad

Defect List

- *The Reader presents the major defects*
- *These charts are usually supplied by the Moderator*

Procedures and tools

- EA-WI-038 describes the procedure for this Product Peer Review
- Moderator will use EA Action Item Database for action items
- Moderator will use Microsoft Exchange "Shared Tasks" for issue tracking

Success criteria

Y	N	Criteria
		Is the product is complete?
		Does the product conform to the applicable regulations, standards, guidelines, plans, and procedures?
		Have changes to the product been properly implemented so that they affect only the specified areas?
		Is the product is suitable for its intended use?
		Is the product is ready for the next activity?
		Do any defects or discrepancies still exist?
		Are the defects and their recommended resolutions clearly identified?
		Has a list of action items been generated to resolve the defects?
		Do the Product Peer Review Panel members agree to the recommended resolutions of identified anomalies?
		Has the meeting been adequately documented?

Closing the Meeting

- Did the product pass its peer review?
- Determining the need for a Third Hour
- Schedule for the Product Peer Review Report

After the meeting

- The Author corrects all Major defects
 - ❖ Author may correct some or all Minor and Trivial defects
- The Moderator prepares the Product Peer Review Report
 - ❖ From a template



To obtain the EA Product Peer Review materials

- Contact Ken.Jenks@nasa.gov



Requirements
Magic Cookie Caper
Batch 3

[MCP-00100]	There shall be 12 cookies in each batch.
[MCP-00200]	At least 5 cookies shall be sugar cookies.
[MCP-00300]	At least 5 cookies shall be chocolate chip.
[MCP-00400]	At least 4 cookies shall have pink sprinkles.
[MCP-00500]	At least 3 cookies shall have blue sprinkles.
[MCP-00600]	The cookies shall be round.
[MCP-00700]	The cookies shall be between 2 inches and 3 inches in diameter.

Product Peer Review Panel Individual Preparation Log

Reviewer's Name:

Org:

Phone:

Email:

Other:

Review Product: Magic Cookie Caper - Trial Batch #3

Date Package Received:

Date Preparation Completed:

Hours Spent:

Date worked on	Time expended (in Hours)
Total Hours:	

The moderator needs to receive this form, or a copy, at least prior to the scheduled meeting. Please check the appropriate boxes below.

<input type="checkbox"/>	Reschedule peer review	<input type="checkbox"/>	Do not reschedule peer review
<input type="checkbox"/>	The work is not ready for peer review	<input type="checkbox"/>	I am prepared for my role in the peer review
<input type="checkbox"/>	I need more preparation time	<input type="checkbox"/>	I will be prepared in time for the peer review

Magic Cookie Caper Product Peer Review Individual Defect List

Major or Minor defects only. Trivial defects should be listed on the Trivial Defects Log.

Comment #	Severity	Defect Description

Severity	Description
Major	An error that would cause a malfunction or prevents attainment of an expected or specified result. Any error that would in the future result in an approved change request or failure report.
Minor	A violation of standards, guidelines, or rules that would not result in a deviation from requirements if not corrected but could result in minor difficulties in terms of operations, maintenance, or future development.
Trivial	Editorial errors such as spelling, punctuation, and grammar that do not cause errors or change requests. Recorded as redlines or in the electronic Trivial Defects Log. Presented directly to Author at the end of the meeting.

Page	Section	Comment #	Starting Line No.	From: Paste original wording here.	To: Enter Requested Modification / Addition / Deletion	Rationale	Mail Code	Submitter: Name / Phone
		1						
		2						
		3						
		4						
		5						
		6						
		7						
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						
		19						
		20						
		21						
		22						
		23						
		24						
		25						
		26						
		27						
		28						
		29						
		30						
		31						
		32						
		33						
		34						

Comment #	Starting Line No.	From: Paste original wording here.	Author's Notes	Author's Disposition	Author's Disposition Rationale	Follow Up?	Status	DCC Instructions
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								