

Evaluation Tool for Assessing Completeness and Robustness of Human Systems Integration (HSI) Products

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Agenda

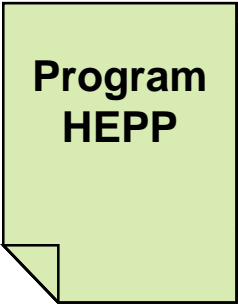
- Introduction
- Purpose of the Evaluation Tool
- HSI CDRL Evaluation Process
- HEPP Evaluation Tool
- Evaluation Tool Benefits
- Summary

CDRL – Contract Data Requirements List
HEPP – Human Engineering Program Plan
HSI – Human Systems Integration

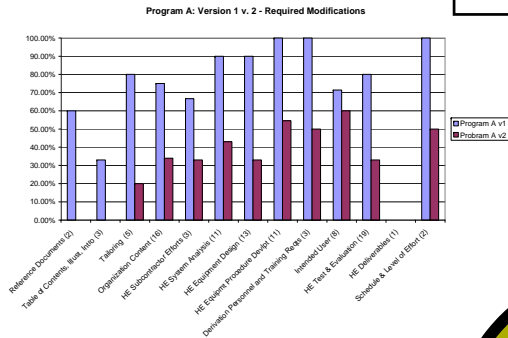
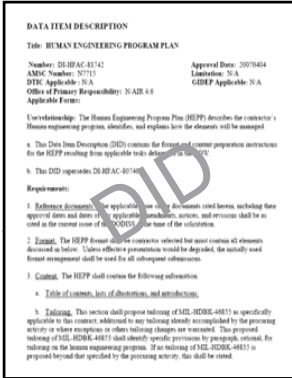
Introduction

- As technical experts, The Aerospace Corporation is often tasked with evaluating the content and quality of contractor deliverables, which must be approved by the government.
- We have developed a tool to aid in this process of evaluating contractor deliverables related to HSI:
 - *Human Engineering Program Plan (HEPP)*
 - *Human Engineering System Analysis Report (HESAR)*
 - *Human Engineering Design Approach Document - Operator (HEDAD-O)*
 - *Human Engineering Design Approach Document - Maintainer (HEDAD-M)*
 - *Human Engineering Test Plan (HETP)*
 - *Human Engineering Test Report (HETR)*

Evaluation Tool Purpose



- Evaluates completeness and technical quality of the CDRL content
- Ensures all requirements in the Data Item Description (DID) are addressed adequately
- Provides means for collecting metrics to evaluate improvement
- Does not replace required knowledge and technical expertise of reviewers



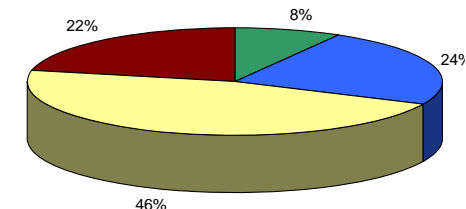
Internal HSI CDRL Evaluation Process

- **Experienced HSI personnel** perform evaluation using the matrix



- Evaluations are consolidated into a single matrix based on discussions of individual ratings to create **inter-rater reliability** (normalizing the ratings)

- Final evaluation matrix produces automated **charts showing overall content quality and specific risk areas** that require modification to the CDRL



- Comment sections in the matrix are used to produce **comments for official CRM** that is delivered to the contractor

CDRL A0XX: [Name]							
Comments Response Matrix to CDA No.:							
Comm ent #	Page	Section	Para	Comment	Requested Text	Rationale	Change Complete ? Type (C/S/A) Y/N



HEPP Evaluation Matrix

Contractor Name and Program

Instructions

[Insert Contractor Name Here]

Human Engineering Program Plan (HEPP) Evaluation Matrix

This matrix provides a form to evaluate document number: A0XX

Doc Number

Brief instructions:

Para/Sec No. reflects the paragraph and/or section number in the HEPP in which the topic area is found.
Eval Complete? [Col A] refers to whether or not the evaluation of that topic was completed by the CDRL reviewer places initials in box when completed.
CDRL column refers to the section number in the HEPP CDRL that corresponds to the HEPP section number.
Content columns [Col E] vary in title and reflect the titles given in the HEPP.
Yes/No/Modify refers to whether or not the topic is included in the HEPP. Marking "?" indicates the reviewer is unsure.
Quality & Completeness describes how well the contract met HEPP standards using a drop down list with the following options: Exceptional, Adequate, Change Required, or Deficient.
Comment column is to elaborate on the previous two parts. Why current criteria is not met. Possible areas for modification. Etc.

Inclusion in CDRL?

Need Modification?

Detailed Comments

Para/Sec No.	DID Sec.	ID	Reference Document Content	Yes	No	?	Modify	Quality & Completeness	Comment
g.	1	1	Reference document citations	X				Exceptional	
		2	Approval dates, ammendment dates, notice dates, and revisions	X				Exceptional	
h.	1	1	Table of Contents	X				Exceptional	
		2	List of Illustrations	X				Exceptional	
		3	Introduction	X				Exceptional	
i.	1	1	Proposed/Accepted tailoring of MIL-HDBK-46855A	X				Exceptional	
		2	Specifics by paragraph	X			X	Adequate	
		3	Tailoring rationale	X			X	Exceptional	
		4	Effects of tailoring on HFE program	X			X	Adequate	
		5	Specify if no tailoring	X				Exceptional	
j.	1	1	Identify & describe HFE organization	X				Exceptional	

DID Doc Sections & Associated Requirement Language

Scoring of Quality
 -Exceptional
 -Adequate
 -Change Required
 -Deficient

Worksheet Tab in MS Excel



HEPP Evaluation Matrix (cont)

[Insert Contractor Name Here]

Para/ Sec No.	CDRL Sec.	ID	Derivation Personnel and Training Requirements Content	Yes	No	?	Modify	Quality 8
	o.	1	Operator personnel reqts based on human performance reqts from system analysis	X				
		2	Maintainer personnel reqts based on human performance reqts from system analysis		X		X	
		3	Training reqts based on human performance reqts from system analysis	X				
Para/ Sec No.	CDRL Sec.	ID	Intended User Content	Yes	No	?	Mod	
	p.	1	Describe Operator populations	X			X	
		2	Describe Maintainer populations	X			X	
		3	Describe user knowledge		X		X	
		4	Describe user skills		X		X	
		5	Describe user limitations		X		X	
		6	Describe user experience		X		X	
		7	Identify military job codes	X			X	
		8	Other user-specific factors impacting task(s)		X		X	
Para/ Sec No.	CDRL Sec.	ID	HE Test & Evaluation Content	Yes	No	?	Mod	
	q.	1	Describe HFE T&E as integrated with entire T&E program (TEMP)		X		X	
		2	Describe how & when T&E guidance applied from MIL-HDBK-46855A		X		X	
		3	Identify design milestones to assess human performance reqts		X		X	
		4	Identify design milestones to assess personnel aptitude & skill reqts		X		X	
		5	Identify design milestones to assess training requirements		X		X	
		6	Identify design milestones to assess eqpmnt design of hardware interfaces		X		X	
		7	Identify design milestones to assess eqpmnt design of software interfaces		X		X	
		8	Identify major test & demonstration objectives	X			X	Change Required
		9	Describe proposed test methods	X				Adequate
		10	Identify human performance measures (ANSI/AIAA) -					

- HEPP DID Categories:**
- References
 - Table of Contents, Illustrations
 - Tailoring
 - Organization
 - Human Engineering in Subcontractor Efforts
 - Human Engineering in System Analysis
 - Human Engineering in Equipment Detail Design
 - Human Engineering in Equipment Procedure Development
 - Derivation of Personnel and Training Requirements
 - Intended User
 - Human Engineering in Test and Evaluation
 - Human Engineering Deliverable Data Products
 - Time Phased Schedule and Level of Effort

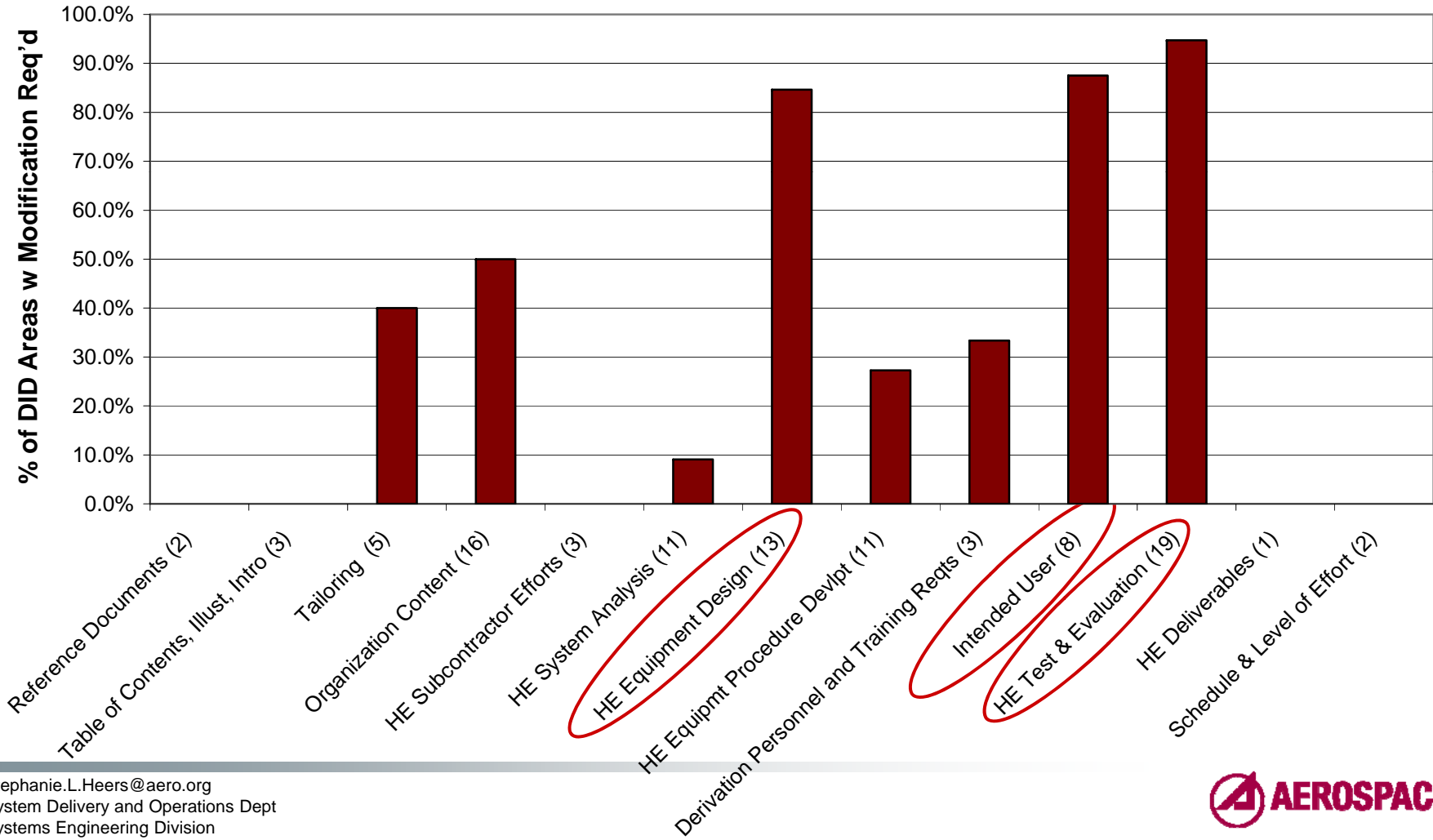
Can be tailored to any document review process!



Evaluation Tool Benefits

Determine Risk Areas Requiring Further Development

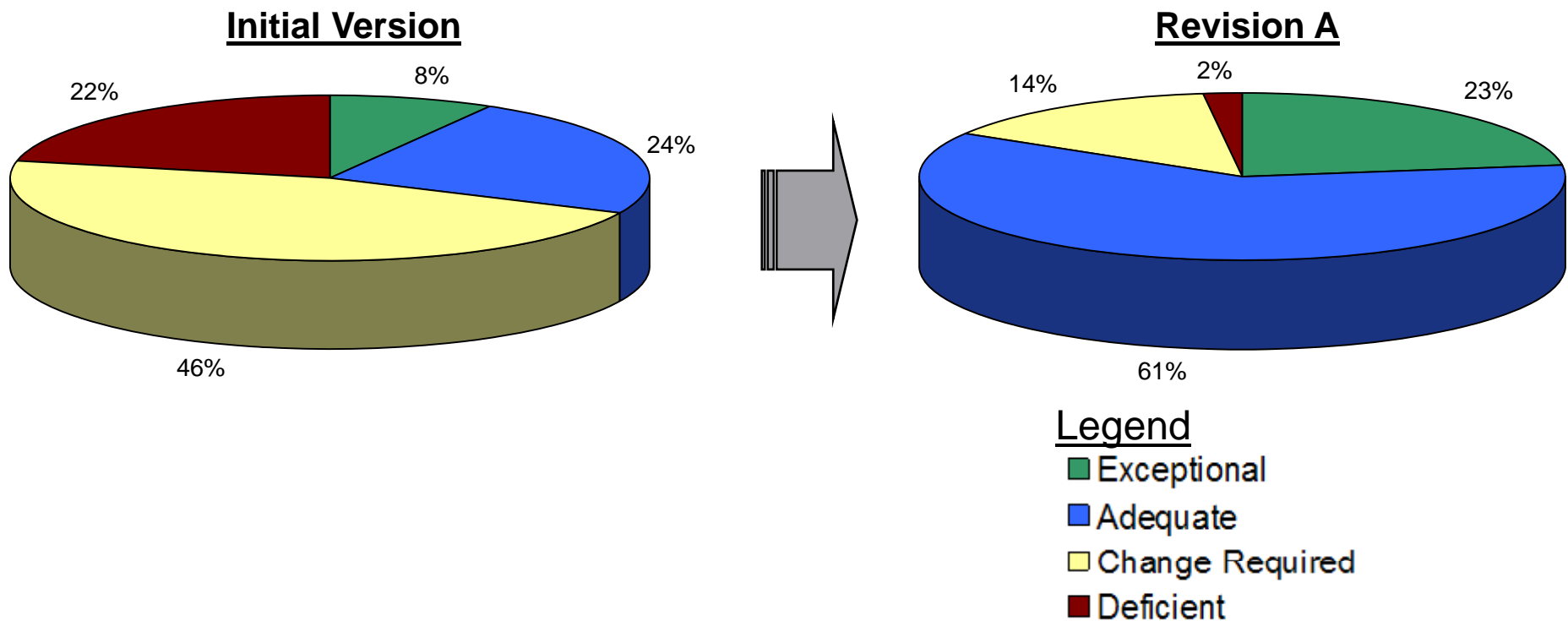
Hypothetical Program 'A'
Areas in Need of Modification



Evaluation Tool Benefits

Compare Versions and Measure Improvement

- Significant improvement was made from first to second delivery of the HEPP deliverable.
- Matrix provides a method for measuring the improvement.

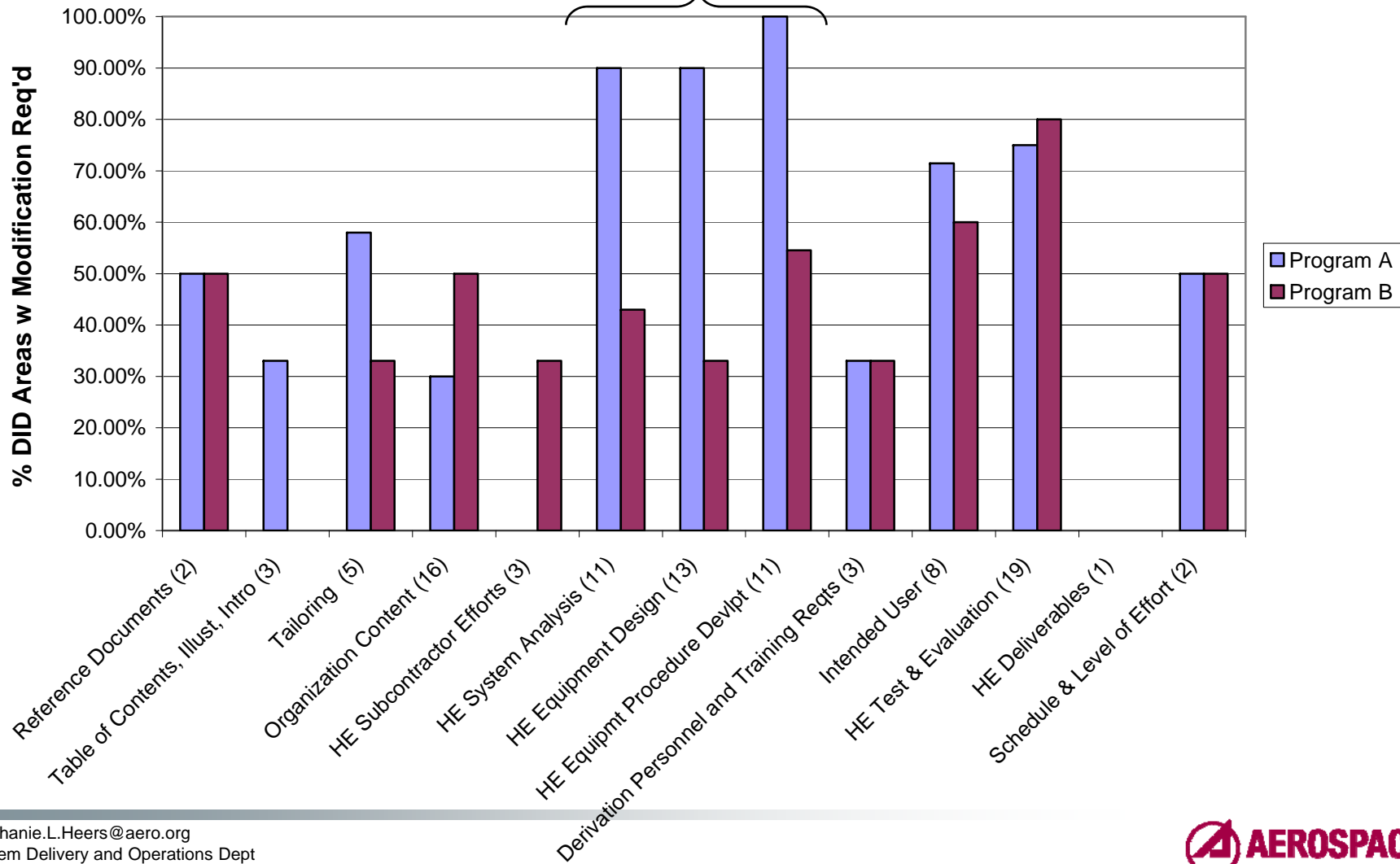


Evaluation Tool Benefits

Compare Different Programs

Discriminators

Program A v. Program B - Required Modifications



Summary

- CDRL Evaluation Tool provides:
 - *Consistent approach for CDRL evaluations*
 - *Method for tracking metrics to compare CDRLs – from version to version, or program to program*
 - *Ability to easily identify areas requiring further development (risk areas)*
- Deliverable reviews still require technical expertise in order to obtain valid results

The CDRL Evaluation Tool is a tool to aid the CDRL evaluation process, not a checklist to replace the technical review!

Questions?

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Back Up

- Link to CDRL Evaluation Tool:



CDRL Evaluation
Tool

- Original Abstract:

– *This presentation describes a tool developed to support the assessment and completeness and quality of HSI products. The evaluation matrix tool provides the capability for automatic chart generation based on the assessment inputs of the individual reviewer and the requirements of the individual product. This streamlined approach saves times developing charts for each individual review and allows the team to provide metrics charts that can be used to prioritize resources and reduce overall system risk. A discussion of how the tool supports metrics on the product reviewed and then used to track where the areas requiring change or deficient may impact product quality downstream in the acquisition process will be presented.*