Cerberus Training Dataset

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Purpose / Agenda

Purpose:

- Bring awareness of the Cerberus Training Dataset to the cost estimating community.
- Encourage CADE Focus Group participates to utilize the Cerberus Training Dataset in their training, papers, when demoing, and developing cost estimating and analysis tools and techniques.

Agenda:

- The motivation behind the Cerberus Training Dataset
- Introduction to the “Cerberus Autonomous Vehicle Program”
- Files contained in “Cerberus Training Dataset”
- Samples of “Cerberus Training Dataset”
- Where to find/download the dataset
- Call to Action: “We built this and think you should use it!”

Motivation To Create The Cerberus Training Dataset

- Cost estimating and analysis regularly involves the use of proprietary or sensitive data.
  - Estimators often cannot share their results or provide meaningful examples of techniques or methods since doing so may disclose sensitive data to unauthorized personnel.
  - Replacing real data with fake data/noise might enable sharing but may remove the interesting finding that was meant to be shared.
- Historically, non-proprietary sample datasets have been smaller and less complex than what will be encountered in the real world.
  - "Small and simple" is a feature early in a training program but limits overall learning opportunities.
  - Sample datasets rarely, if ever, include multiple submissions over time or include multiple related files which can (or should) be cross-referenced against each other.
- Data science practitioners often share examples of their code or tools on well known datasets which have become ubiquitous in these communities.
  - When the underlying data is well known, it becomes easier to understand, train, or feature an interesting aspect of a new tool or technique.

```
> iris %>% tibble()
# A tibble: 150 x 5
   Sepal.Length Sepal.Width Petal.Length Petal.Width Species
          <dbl>       <dbl>        <dbl>       <dbl> <fct>
 1          5.1         3.5          1.4         0.2 setosa
 2          4.9         3            1.4         0.2 setosa
 3          4.7         3.2          1.3         0.2 setosa
 4          4.6         3.1          1.5         0.2 setosa
 5          5           3.6          1.4         0.2 setosa
 6          5.4         3.9          1.7         0.4 setosa
 7          4.6         3.4          1.4         0.3 setosa
 8          5           3.4          1.5         0.2 setosa
 9          4.4         2.9          1.4         0.2 setosa
10          4.9         3.1          1.5         0.1 setosa
# ... with 140 more rows
```

```
> mtcars %>% tibble()
# A tibble: 32 x 11
     mpg   cyl  disp    hp  drat    wt  qsec    vs    am  gear  carb
   <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl>
 1  21       6  160    110  3.9   2.62  16.5     0     1     4     4
 2  21       6  160    110  3.9   2.88  17.0     0     1     4     4
 3  22.8     4  108     93  3.85  2.32  18.6     1     1     4     1
 4  21.4     6  258    110  3.08  3.22  19.4     1     0     3     1
 5  18.7     8  360    175  3.15  3.44  17.0     0     0     3     2
 6  18.1     6  225    105  2.76  3.46  20.2     1     0     3     1
 7  14.3     8  360    245  3.21  3.57  15.8     0     0     3     4
 8  24.4     4  147.    62  3.69  3.19  20       1     0     4     2
 9  22.8     4  141.    95  3.92  3.15  22.9     1     0     4     2
10  19.2     6  168.   123  3.92  3.44  18.3     1     0     4     4
# ... with 22 more rows
```

Overall Goal: Create an equivalent to the `iris` or `mtcars` datasets for the cost estimating and analysis community.

Cerberus Program Overview

Fictional Program Information

- Service/Commodity: *Army Ground Vehicle Program*
- Acquisition Pathway: *Major Capability Acquisition (ACAT-I)*
- Program Timeframe:
  - *Engineering and Manufacturing Development (EMD)*
  - *Low-Rate Initial Production (LRIP)*
- Contract Overview:
  - *Single Award FAR 15 Indefinite Delivery / Indefinite Quantity (IDIQ)*
  - *Firm Fixed Price (FFP) design and production CLINs*
  - *Cost Plus Fixed Fee (CPFF) Total Package Fielding and Contractor Logistics Support CLINs*

Realistic Narrative

- Deliverables show cost growth between "Initial" and "Final" submissions. Cost growth can clearly be attributed to software development "issues discovered during program testing".

Inspiration Board

Credit: Kevin C Mcdevitt

Credit: Lance Cpl. Ujian Gosun

Credit: Markus Rauchenberger

Analogous Real Systems

Robotic Combat Vehicle – Medium

Size, Tracked, Autonomous

Joint Light Tactical Vehicle

Family of Vehicles, Appliqué Kits

Optionally Manned Fighting Vehicle

Multiple Main Armaments

The appearance of specific weapon systems does not imply or constitute OSD endorsement of a specific system, design, or contractor.

Cerberus Program Overview (cont.)

Why "Cerberus"?

- From Greek Mythology: Cerberus is Hades' three-headed guard dog of the underworld

- The Cerberus Autonomous Vehicle has three armaments
  - 30mm turret (provided as Government Furnished Equipment)
  - 50 cal Remote Weapon Station (RWS)
  - Anti-tank, fire-and-forget rocket (e.g., Javelin) mounted to RWS

CSCI ID	CSCI Nomenclature
C1	Sensor Processing
C2	Autonomous Navigation
C3	Vehicle Control
C4	Vehicle Simulator

Cerberus Prime Mission Product WBS

WBS Code	WBS Nomenclature
1.0	Cerberus Autonomous Vehicles
1.1	Family of Cerberus Autonomous Vehicle
1.1.1	Cerberus Autonomous Vehicle (CAV)
1.1.1.1	CAV Integration, Assembly, Test, and Checkout
1.1.1.2	Hull/Frame/Body/Cab
1.1.1.3	System Survivability
1.1.1.4	Turret Assembly
1.1.1.5	Suspension/Steering
1.1.1.6	Vehicle Electronics
1.1.1.7	Power Package/Drive Train
1.1.1.7.1	Power Package
1.1.1.7.1.1	Dressed Engine
1.1.1.7.1.1.1	Engine Block
1.1.1.7.1.1.2	Turbocharger
1.1.1.7.1.1.3	Other Dressed Engine
1.1.1.7.1.2	Transmission
1.1.1.7.2	Drive Train
1.1.1.8	Auxiliary Automotive
1.1.1.9	Fire Control
1.1.1.10	Armament
1.1.1.10.1	30mm Gun
1.1.1.10.2	Remote Weapon Station (RWS)
1.1.1.10.2.1	M2 50-cal / Mk19 Mount
1.1.1.10.2.2	Anti-Tank Missile
1.1.1.10.2.3	Other Remote Weapon Station (RWS)
1.1.1.10.3	Other Armament
1.1.1.11	Automatic Ammunition Handling
1.1.1.12	Navigation and Remote Piloting Systems
1.1.1.13	Special Equipment
1.1.1.14	Communications
1.1.1.15	CAV Software Release
1.1.1.15.1	Sensor Processing
1.1.1.15.2	Autonomous Navigation
1.1.1.15.3	Vehicle Control
1.1.1.16	Other CAV Subsystems

Cerberus Training Dataset Content

Cerberus Training Dataset

Available Within FACADE

CSDR Plan
DD Form 2794
- Attachment 04 - CSDR Plan (Z-99-C1(R2)).xls
- Cerberus_FlexFile_CSDR_Plan.cplan.xml

Overarching Reporting Requirements

Cost and Hour Report (FlexFile)
- Contract Award_flexfile.zip
- Annual Submission 2016_flexfile.zip
- Annual Submission 2016 rev 1_flexfile.zip
- EMD Phase Complete_flexfile.zip
- Annual Submission 2018_flexfile.zip
- Annual Submission 2019_flexfile.zip
- Contract Complete_flexfile.zip

Actual Cost Data & Forecast at Complete Estimates

Quantity Data Report (QDR)
- Contract Award_quantity.zip
- Annual Submission 2016_quantity.zip
- Annual Submission 2016 rev 1_quantity.zip
- EMD Phase Complete_quantity.zip
- Annual Submission 2018_quantity.zip
- Annual Submission 2019_quantity.zip
- Contract Complete_quantity.zip

System and Subsystem Quantities Delivered & In-Process

Software Development Report
DD Form 3026-1
- Cerberus SRDR DEV_(Contract Award).srdr_dev.xml
- Cerberus SRDR DEV_(Contract Award).xls(
- Cerberus SRDR DEV_(Annual Submission 2016).srdr_dev.xml
- Cerberus SRDR DEV_(Annual Submission 2016).xls
- Cerberus SRDR DEV_(Contract Complete).srdr_dev.xml
- Cerberus SRDR DEV_(Contract Complete).xls

Detailed Breakdown of Software Costs & Metrics (e.g., SLOC)

Technical Data Report
- 2 - Cerberus TDR Initial_Contract Award.xlsx
- 5 - Cerberus TDR Interim_Annual Submission 2016.xlsx
- 8 - Cerberus TDR Interim_EMD Phase Complete.xlsx
- 11 - Cerberus TDR Interim_Annual Submission 2018.xlsx
- 15 - Cerberus TDR Interim_Annual Submission 2019.xlsx
- 19 - Cerberus TDR Final_Contract Complete.xlsx

Planned & Actual System Performance Metrics

Maintenance and Repair Parts Data Report
- Cerberus_M&R_Report_(Contract Complete).xlsx

Contractor Performed Vehicle Maintenance

Selected Acquisition Report (SAR)
- CERBERUS ACE Build final.acex

Program Office Estimate Summary To Congress

Contractor Business Data Report
DD Form 1921-3
- Cerberus_1921-3_CBDR_2017.xlsx
- Cerberus_1921-3_CBDR_2019.xlsx

Labor & Overhead Rates Date

Resource Distribution Table (RDT)
- Program Resource Distribution Table
- Contract Resource Distribution Table

Anticipated Expenditure by Contractor, Subcontractor, etc.

To Be Added When DID is Finalized

Supporting Files

Available Within DTM-Hub

{cerberus} R Package
- cerberus_1.0.0.zip
- static_inputs-cerberus.xlsx
- dynamic_inputs-cerberus.xlsx
- replacement_inputs-2_0-cerberus.xlsx
- getting-started.Rmd
- reviewing-data.Rmd

R Code Used to Generate Some Cerberus Files

Cerberus Program Narrative
- Cerberus Narrative Bullets.docx

Notes on Cerberus Program and Deliverables

Cost Planning & Execution Tool (cPET)
- http://portal.tecolote.com/dcarc/cPetRequest.aspx

Software Tool To Convert JSON CSDR to Excel

Cerberus Scope of Work & CDRLs
- 2022-01-31_Cerberus_CSDR_SoW.docx
- 2022-01-31_CAV_Qty_CDRL.docx
- 2022-01-31_CAV_MR_CDRL.docx
- 2022-01-31_CAV_TDR_CDRL.docx
- 2022-01-31_CAV_SDR_CDRL.docx
- 2022-01-31_CAV_RDT_CDRL.docx
- 2022-01-31_CAV_FF_CDRL.docx
- 2022-01-31_CAV_CBDR_CDRL.docx

Example Contract Language

Sample Results via Cerberus Final Submission Event

Cerberus deliverables contain realistic time-phasing of costs/hours at all WBS levels

Total Contract Cost WBS 1.0 - Cerberus Autonomous Vehicles

Labor and overhead rates are consistent between FlexFile and DD Form 1921-3 submissions.

Cerberus End Item follow a realistic learning curves EMD to LRIP stepdown.

How To Access the Cerberus Training Dataset

The Cerberus Training Dataset is hosted within FACADE ("Fake CADE"), the training site for the "Cost Assessment Data Enterprise".

1. Navigate to https://cade.osd.mil/

2. Click the "FACADE" button in the top-right corner.

3. Login or signup.

4. For CSDR Plan, Contract Scope, CDRLs: Click "CSDR-SR" then "My CSDR", then "Program Planning", then "Search", and Type "Cerberus" into the "Program Name" field, click "Search Programs", click "Cerberus", click "Z-99-C1(R)", scroll down to "Documents", click an icon under "File" to download the given file.

5. For deliverables (e.g., FlexFile, QDR, SRDR), from "Portal Home", click "Data & Analytics", click "CSDR Browse", type "Cerberus" into the "Program Field", submissions will be listed an can be clicked on individually or downloaded in bulk using the various download or export buttons.

6. For SAR data, from "Portal Home", click "SAR Database", either search for "Cerberus" or find and click it under "Surface Vehicle".

Path Forward / Call To Action

CADE Training Team is in the process of updating various OSD CAPE offered classes to utilize the Cerberus Training Dataset.

Cerberus Training Dataset Updates

- **v1.1 (in process)**
  - Includes "Percent Allocation Methods" to FlexFile
  - Includes/adds "Program Resource Distribution Table" and "Contractor Resource Distribution Table" files
- **Backlog**
  - Add Excel version of FlexFile and QDR's to FACADE
  - Create and include a Subcontractor CSDR Plan
  - Create and include a Subcontractor CSDR deliverable submission(s)
  - Add additional details to WBS Dictionary
  - Create and include a SRDR-MX deliverable submission(s)

Beyond "Cerberus Autonomous Vehicle"

- Add additional commodities & programs
- Include/induce:
  - Loss Learning
  - Production Breaks
  - Metadata drift
  - Missing data (waiver, enforcement issue)
  - Block Upgrades / Overhaul
  - Antecedent vs. Successor Comparison

Send feature requests or bug notices on Cerberus Training Dataset here: cadesupport@tecolote.com

Recommend the community utilize the Cerberus Training Dataset to…
- Develop training
- Practice using FlexFile's & see relationships between deliverables
- Demo your own models and techniques
- Develop and practice using tools, visuals, plots, etc.

Acknowledgements

Cerberus CSDR Training Data Development Team

- *Contractor*
  - Zach Cole, Core Contributor
  - Caitlyn Pabst, Core Contributor
  - Peter Braxton, Technical SME
  - Adam James, Technical SME
  - Marc Stephenson, FlexFile SME
  - Peter Shmorhun, SAR Database SME
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  - Matthew Stahr, SRDR SME honorable mention

Photos Used in this Briefing:

- Kevin C Mcdevitt
- Lance Cpl. Ujian Gosun
- Markus Rauchenberger
- The Metropolitan Museum of Art (Antonio Tempesta (1555–1630))

Nonstandard R Packages

- `{readflexfile}` Benjamin Berkman, Justin Cooper, Adam James (2020). Copyright 2020 Technomics, Inc.

Datasets

- `mtcars`: 1974 *Motor Trend US* magazine
- `iris`: Fisher, R. A. (1936) “The use of multiple measurements in taxonomic problems.” *Annals of Eugenics*, 7, Part II, 179–188

Backup

Cerberus CSDR Plan

Cerberus Submission Events

14. CSDR SUBMISSION EVENTS			
a. EVENT ID	b. DATA REPORT(S)	c. SUBMISSION EVENT NAME	d. REPORT CYCLE
1	Cost and Hour Report (FlexFile), Quantity Data Report	Contract Award	Initial
2	Technical Data Report	Contract Award	Initial
3	SRDR Development	Contract Award	Initial
4	Cost and Hour Report (FlexFile), Quantity Data Report	Annual Submission 1	Interim
5	Technical Data Report	Annual Submission 1	Interim
6	SRDR Development	Annual Submission 1	Interim
7	SRDR Development	EMD Phase Complete	Interim
8	Cost and Hour Report (FlexFile), Quantity Data Report	EMD Phase Complete	Interim
9	Technical Data Report	EMD Phase Complete	Interim
10	Cost and Hour Report (FlexFile), Quantity Data Report	Annual Submission 2	Interim
11	Technical Data Report	Annual Submission 2	Interim
12	SRDR Development	Annual Submission 2	Interim
13	Maintenance and Repair Parts Data Report	Annual Submission 2	Interim
14	Cost and Hour Report (FlexFile), Quantity Data Report	Annual Submission 3 / Contract Complete	Final
15	Technical Data Report	Annual Submission 3 / Contract Complete	Final
16	SRDR Development	Annual Submission 3 / Contract Complete	Final
17	Maintenance and Repair Parts Data Report	Annual Submission 3 / Contract Complete	Final

Cerberus SRDR-Dev Requirements

COST AND SOFTWARE DATA REPORTING PLAN - SRDR DEVELOPMENT						
19. RELEASES						
a. ID	b. NAME	c. DATE				
1	CAV Software Release 1	20230930				
2...n	CAV Software Release 2...n (Specify)					
n + 1	Training Software Release 1	20230930				
20. CSCI'S						
a. ID	b. NAME					
C1	Sensor Processing					
C2	Autonomous Navigation					
C3	Vehicle Control					
C4	Vehicle Simulator					
C5	Other Training Software CSCI					
21. PRODUCT SIZE REPORTING ELEMENTS						
a. CODE	b. NAME	c. RELEASE ID	d. CSCI ID			
1.1.1.15.1	Sensor Processing	1	C1			
1.1.1.15.2	Autonomous Navigation	1	C2			
1.1.1.15.3	Vehicle Control	1	C3			
1.6.4.1	Vehicle Simulator	n + 1	C4			
1.6.4.2	Other Training Software CSCI	n + 1	C5			
22. PRODUCT SIZE SUBMISSIONS		c. RELEASE ID:		1	2...n	n + 1
a. NUMBER	b. NAME			Included?	Included?	Included?
3	Contract Award			x		x
6	Annual Submission 1			x		x
7	EMD Phase Complete			x	x	x
12	Annual Submission 2				x	
16	Annual Submission 3 / Contract Complete			x	x	x

Cerberus Tech Data Requirements

26. WBS ELEMENT CODE	27. WBS ELEMENT NAME	28. ITEM TYPE	a. PARAMETER NAME	b. UNIT OF MEASURE	c. UNIT OF MEASURE QUALIFIER	d. REPEA TABLE
1.1.1	Cerberus Autonomous Vehicle (CAV)	SurfaceVehicle	Length	Inches	Per Vehicle	
1.1.1	Cerberus Autonomous Vehicle (CAV)	SurfaceVehicle	Width	Inches	Per Vehicle	
1.1.1	Cerberus Autonomous Vehicle (CAV)	SurfaceVehicle	Height	Inches	Per Vehicle	
1.1.1	Cerberus Autonomous Vehicle (CAV)	SurfaceVehicle	Gross Vehicle Weight	Pounds	Per Vehicle	
1.1.1	Cerberus Autonomous Vehicle (CAV)	SurfaceVehicle	Curb Weight	Pounds	Per Vehicle	
1.1.1	Cerberus Autonomous Vehicle (CAV)	SurfaceVehicle	Top Speed	Miles per Hour (mph)		
1.1.1	Cerberus Autonomous Vehicle (CAV)	SurfaceVehicle	Vehicle Cone Index	Descriptor	Per Vehicle	
1.1.1	Cerberus Autonomous Vehicle (CAV)	SurfaceVehicle	Fuel Capacity	Gallons	Per Fuel Tank	
1.1.1	Cerberus Autonomous Vehicle (CAV)	SurfaceVehicle	Fuel Economy	Miles per Gallon		
1.1.1	Cerberus Autonomous Vehicle (CAV)	SurfaceVehicle	Cruise Range	Miles	Per Vehicle/Fuel Tank	
1.1.1	Cerberus Autonomous Vehicle (CAV)	SurfaceVehicle	Crew	Descriptor	Per Vehicle	
1.1.1	Cerberus Autonomous Vehicle (CAV)	SurfaceVehicle	Passengers	Descriptor	Per Vehicle	
1.1.1	Cerberus Autonomous Vehicle (CAV)	SurfaceVehicle	Ground Clearance	Inches	Per Vehicle	
1.1.1	Cerberus Autonomous Vehicle (CAV)	SurfaceVehicle	Fording Depth	Inches	Per Vehicle	
1.1.1	Cerberus Autonomous Vehicle (CAV)	SurfaceVehicle	Gap Crossing	Inches	Per Vehicle	
1.1.1	Cerberus Autonomous Vehicle (CAV)	SurfaceVehicle	Payload Capacity	Pounds	Per Vehicle	
1.1.1.1	CAV Variant Integration, Assembly, Test,	IA&T	Quantity Next Higher Assembly	Quantity	Per Vehicle	I
1.1.1.2	Hull/Frame/Body/Cab	PhysicalStruc	Quantity Next Higher Assembly	Quantity	Per Vehicle	I
1.1.1.2	Hull/Frame/Body/Cab	PhysicalStruc	Volume	Cubic Inches	Per Vehicle	
1.1.1.2	Hull/Frame/Body/Cab	PhysicalStruc	Weight	Pounds	Per Vehicle	
1.1.1.2	Hull/Frame/Body/Cab	PhysicalStruc	Length	Inches	Per Vehicle	
1.1.1.2	Hull/Frame/Body/Cab	PhysicalStruc	Width	Inches	Per Vehicle	
1.1.1.2	Hull/Frame/Body/Cab	PhysicalStruc	Depth	Inches	Per Vehicle	
1.1.1.3	System Survivability	Survivability	Quantity Next Higher Assembly	Quantity	Per Vehicle	I
1.1.1.3	System Survivability	Survivability	Integral Armor Weight	Pounds	Per Vehicle	
1.1.1.3	System Survivability	Survivability	Add-on Armor Weight	Pounds	Per Vehicle	
1.1.1.4	Turret Assembly	PhysicalStruc	Quantity Next Higher Assembly	Quantity	Per Vehicle	I
1.1.1.5	Suspension/Steering	Suspension	Quantity Next Higher Assembly	Quantity	Per Vehicle	I
1.1.1.5	Suspension/Steering	Suspension	Tracked	List		
1.1.1.5	Suspension/Steering	Suspension	Track Segments	Quantity	Per Suspension System	
1.1.1.5	Suspension/Steering	Suspension	Track Width	Inches	Per Suspension System	
1.1.1.5	Suspension/Steering	Suspension	Number of Torsion Bars	Quantity	Per Vehicle	
1.1.1.5	Suspension/Steering	Suspension	Number of Dampers	Quantity	Per Suspension System	
1.1.1.5	Suspension/Steering	Suspension	Number of Track Roller Wheels	Quantity	Per Suspension System	
1.1.1.6	Vehicle Electronics	ElectronicsSystems	Quantity Next Higher Assembly	Quantity	Per Vehicle	I
1.1.1.7	Power Package/Drive Train	SurfacePropulsion	Quantity Next Higher Assembly	Quantity	Per Vehicle	I
1.1.1.7	Power Package/Drive Train	SurfacePropulsion	Gross Horsepower	Horsepower	Per Engine	
1.1.1.7	Power Package/Drive Train	SurfacePropulsion	Displacement	Cubic Inches	Per Engine	
1.1.1.7	Power Package/Drive Train	SurfacePropulsion	Maximum Torque	Foot Pounds	Per Engine	
1.1.1.7	Power Package/Drive Train	SurfacePropulsion	Net Horsepower	Horsepower	Per Engine	
1.1.1.7	Power Package/Drive Train	SurfacePropulsion	Max Speed RPM	Revolutions per Minute	Per Engine	
1.1.1.7	Power Package/Drive Train	SurfacePropulsion	Total power generation capacity	Kilowatts per Hour	Per Vehicle	
1.1.1.8	Auxiliary Automotive	Other	Quantity Next Higher Assembly	Quantity	Per Vehicle	I
1.1.1.9	Fire Control	PhysicalOther	Quantity Next Higher Assembly	Quantity	Per Vehicle	I
1.1.1.10	Armament	PhysicalOther	Quantity Next Higher Assembly	Quantity	Per Vehicle	I
1.1.1.11	Automatic Ammunition Handling	PhysicalOther	Quantity Next Higher Assembly	Quantity	Per Vehicle	I
1.1.1.12	Navigation and Remote Piloting	Electronics	Quantity Next Higher Assembly	Quantity	Per Vehicle	I
1.1.1.13	Special Equipment	Other	Quantity Next Higher Assembly	Quantity	Per Vehicle	I
1.1.1.14	Communications	Electronics	Quantity Next Higher Assembly	Quantity	Per Vehicle	I
1.1.1.15	CAV Software Release	S/W	Quantity	Quantity	Per Vehicle	
1.1.1.16	Other CAV Subsystems	Other	Quantity Next Higher Assembly	Quantity	Per Vehicle	I
1.1.3	Equipment Kits	Other	Quantity Next Higher Assembly	Quantity	Per Vehicle	I
1.1.3	Equipment Kits	Other	Length	Inches	Per Kit	Y
1.1.3	Equipment Kits	Other	Cable Length	Inches	Per Kit	Y
1.1.3	Equipment Kits	Other	Width	Inches	Per Kit	Y
1.1.3	Equipment Kits	Other	Height	Inches	Per Kit	Y
1.1.3	Equipment Kits	Other	Weight	Pounds	Per Kit	Y
1.1.3	Equipment Kits	Other	Capacity	Pounds	Per Kit	Y

{reviewcsdr} R Package

- Includes **456** data validation test criteria which are run against each deliverable.

- Results of **456** data validation tests.
- Identifies combinations of, “Notes”, “Warnings”, and “Errors” to validation analysts.
- Identifies exactly which table, field, and cells are flagged for additional review.

Includes standard plots of data

1. Total cost over time by REC vs. NR
2. PMP cost over time by WBS
3. Common cost over time by WBS
4. Unit cost by end_item_id
5. Unit cost by overall sequence
6. Recurring unit cost by order_lot_id
7. Labor rate by functional category over time
8. Overhead rate by category over time

- The R package is passed CSDR submissions by the user via a single function call (i.e., very easy to run even with limited R knowledge).
- The package automatically utilizes the build-in validation-config, runs all included tests, and exports a validation report to Excel and standard plots to PowerPoint.

Requires limited knowledge of R to use.
Additionally tests and plots may be added over time.