Software Cost Estimating Data Initiatives

Software Resources Data Reporting (SRDR) Working Group Results

SRDR WG Membership: Cross-Agency Team of Software Cost Estimating Experts- OSD (CAPE, R&E), Air Force (AFCAA, LCMC, SMC), Army (ODASA-CE, ARDEC, CECOM), Navy (NCCA, NAVAIR, SPAWAR), MDA, IC (NRO, DNI)

Presented by:

Mrs. Ranae Woods, AFCAA

at PSM

Feb 2016

SRDR WG Members

Chair: Ranae Woods, AFCAA

Team Members:

- **OSD**
  - **Bill Raines – OSD CAPE**
  - **Rob Bailey – CTR, OSD CAPE (DCARC)**
  - **Jim McCurley – CTR, OSD(R&E)**
  - **Dave Zubrow – CTR, OSD(R&E)**
  - **Brad Clark – CTR, OSD(R&E)**
  - **Joel Rudy – CTR, OSD(R&E)**
- **Navy**
  - **Corinne Wallshein – NCCA**
  - **Nick Lanham – NCCA**
  - **Ken Hunt – Navy**
  - **Steve Cox – CTR, Navy**
  - **Scott Washel – NAVAIR 4.2.1**
  - **Mike Popp – CTR, NAVAIR 4.2**
  - **Jeremiah Hayden – SPAWAR**

Team Members:

- **Army**
  - **James Doswell – ODASA-CE**
  - **Cheryl Jones – US ARMY ARDEC**
  - **Tim Baker – US ARMY CECOM**
- **Air Force**
  - **Peter Braxton – CTR, AFCAA**
  - **JC Kassab – CTR, AFCAA**
  - **Vanessa Welker – CTR, AFCAA**
  - **Sarah Green – AFCAA/FMS**
  - **Ethan Henry – AFCAA/FM**
  - **Jim Otte – AFLCMC/FZC (WPAFB)**
  - **Brian Fersch – AFLCMC/FMC (Hanscom)**
  - **Bruce Kraft – AFLCMC/FZC (Hanscom)**
  - **Chinson Yew – SMC/FMC**
  - **Bruce Johnson – SMC/FMC**
- **MDA**
  - **Dan Strickland – MDA/DOC**
- **Intelligence Community**
  - **Michal Bohn (NRO)**
  - **Brian Wells (DNI CAIG)**

SRDR Background

- **Software (SW) development/support cost is significant**
- **Quality data underpins quality SW cost estimate**
- **Data collection via SRDRs began in 2004**
  - Size and Effort focus, but collect over 170+ data fields
  - Inconsistent/non-standard data and formats
  - SRDRs available from DCARC but manually input in various “databases” (e.g. NAVAIR Excel spreadsheet)
- **Data widely used by cost community but in need of more standardization and quality improvement**
  - ~ 40% of data to-date is “good” for primary cost analysis use
  - ~ 20% of data is good for growth analysis (i.e. initial & final)

SRDRs – A success story ready for its next chapter…

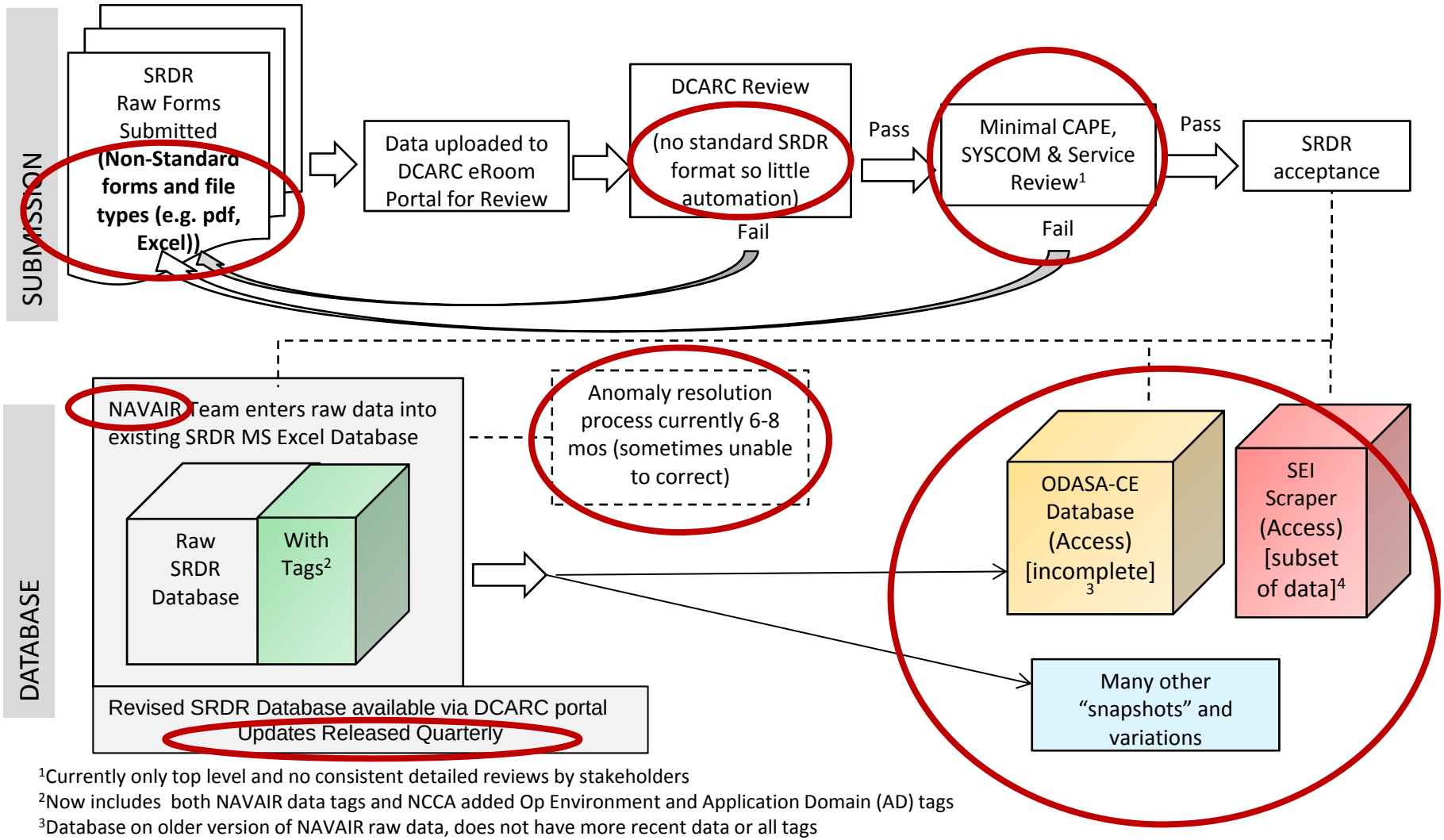
SRDR WG
Vision and Recommendations

One OSD-hosted, central, user-friendly, authoritative, real-time software cost, technical, programmatic database and tool

Recommendation		Benefit
1. Revised SRDR Development Data Item Description (DID)	⇨	1. Reduces inconsistency, lack of visibility, complexity, and subjectivity in reporting
2. New SRDR Maintenance DID	⇨	2. Aligned w/ dev. but w/ unique data/metrics for maintenance phase
3. Joint Validation & Verification (V&V) Guide, Team, and Process	⇨	3. Higher quality, less duplication - ONE central vs many distributed; 1 joint team & guide gives early, consistent feedback to contractors
4. CADE Software Database Design and Implementation	⇨	4. Avoids duplication, variations - ONE central vs many distributed; Based on surveyed best practices and user expectations

Current Software Cost Data Process

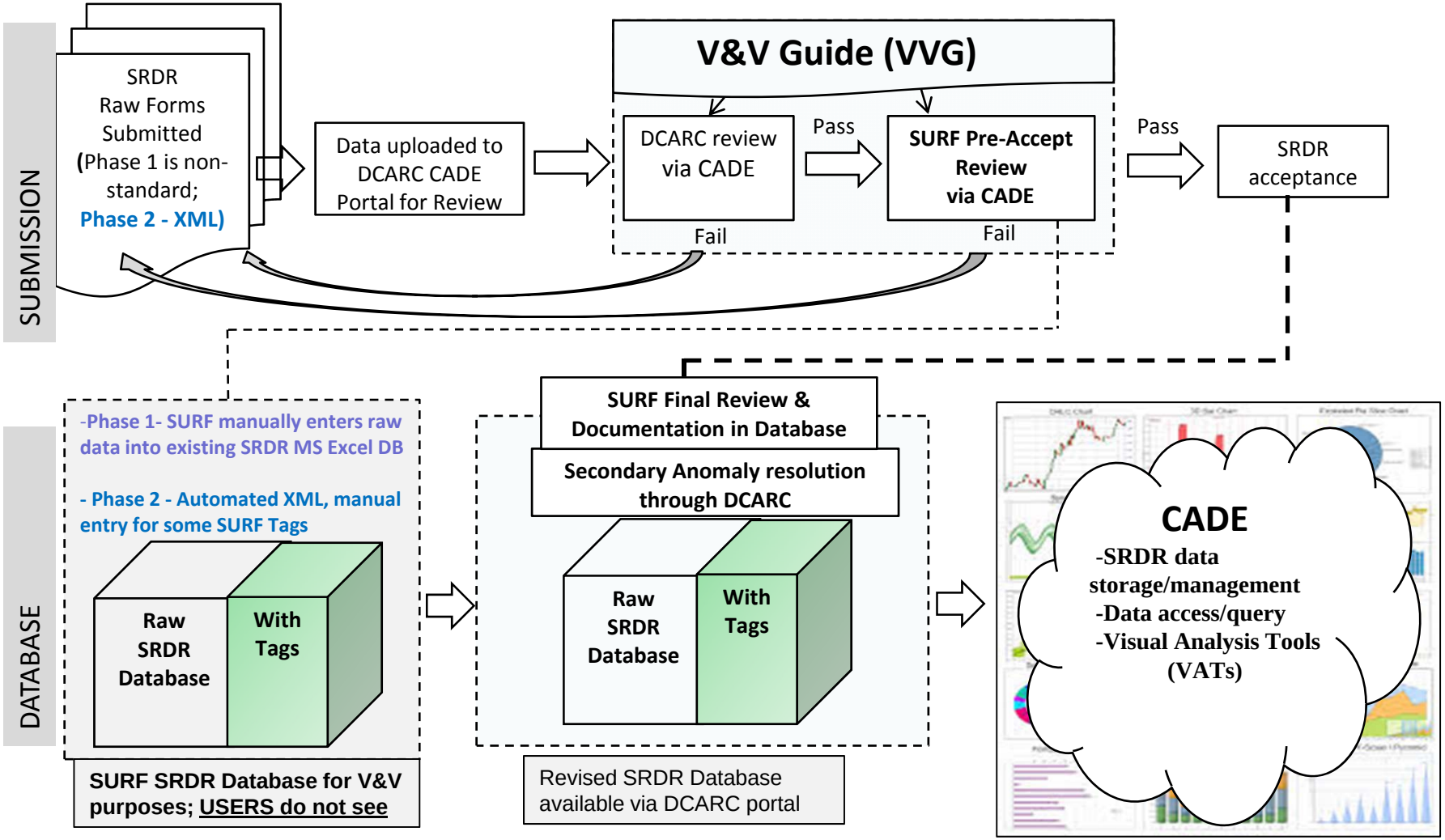
Using Existing SRDR Submission Format and NAVAIR upload



[1]Currently only top level and no consistent detailed reviews by stakeholders
[2]Now includes both NAVAIR data tags and NCCA added Op Environment and Application Domain (AD) tags
[3]Database on older version of NAVAIR raw data, does not have more recent data or all tags
[4]Scraper tool currently not able to scrape all formats of SRDR submissions

Proposed Future Process - Phase 1&2

Phase 1: Using Existing SRDR Submission Format, new V&V process, NAVAIR Excel approach upload
Phase 2: New SRDR DID, XML, new V&V process, CADE database



Software Resource Data Reports (SRDRs)

Initial & Final (Old) vs Development & Mx (New)

SRDR Initial & Final (Old)

- Software size, effort, and schedule
- Data dictionary (Descriptions)
- Initial Developer Report- Due at beginning of project increment (estimates)
- Final Developer Report- Due at completion of project increment (actuals)

SRDR Development (New)

- Part 1: Software size, technical parameters, descriptions, and schedule
- Part 2: Effort -actuals, EACs, and time phased (tie to 1921-1)
- Specific Release Level and CSCI Level Reporting
- Initial (estimates), Interim (actuals to-date/estimates), and Final (actuals, monthly) Reporting

SRDR Maintenance (New)

- Part 1: Software size, technical parameters, descriptions, and schedule
- Part 2: Effort (actuals, time-phased) (tie to 1921-5)
- Release Level Reporting
- Annual (actuals) Reporting

UNCLASSIFIED

Crosswalk - Development SRDR

Cost Estimating Need	Current SRDR Issue	New SRDR Requirement
Estimate by CSCI (SW Size, Effort, Description, Schedule)	Lack of Visibility	CSCI-Level Reporting
Standard size measures based on different system types (MDAP vs ERP)	Inconsistency	ERPs RICE-FW, all else SLOC
Consistent logical DSLOC data by language to support Size and Effort	Inconsistency	Use *Aerospace* Unified Code Count (UCC), standard code counter; Use IFPUG for Function Points (FPs)
Requirements as Size/Effort driver	Inconsistency	Standard, clear Requirements counts
Understanding of degree of effort for reused code relative to new code	Inconsistency	DM/CM/IM % or AAFs
Ability to estimate "full-up" SW effort	Lack of Visibility	Prototype vs Production Representative Use ISO 12207:2008 Activities
Accurately time-phase SW Dev estimates	Lack of Visibility	Report Monthly Effort in Final SRDR
Phasing, Software Growth relationships	Lack of Visibility	Require Interim Reports
Stratify software efforts by Complexity, a key driver of effort (Productivity)	Too Complex	Reduce Application Domains from 119 to 17
Capture Analyst Capability Productivity Impact	Subjective/Little Value	Remove Experience requirement

Changes Enhance all Cost/Effort, Size, and Schedule Estimating Approaches: Analogy, Parametric, Commercial Models

Industry Impact

- ✓ Low Impact (Reduced Reqt)
- ✓ Medium Impact
- ✓ Significant Impact

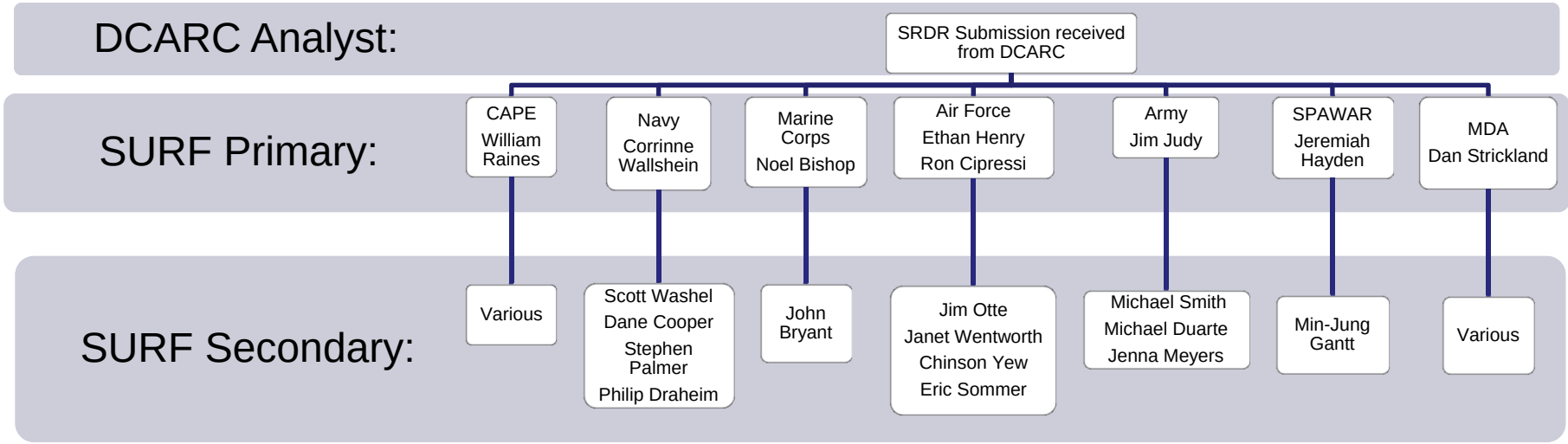
New Maintenance SRDR DID - Final

- ✓ Aligned with Development DID, where appropriate
- ✓ Top-Level Data and Release-Level Data
- ✓ Annual Reporting (Final Release details)
- ✓ Software Change Count
- ✓ Release/Baseline/OPTEMPO information
- ✓ Platform/Operating Environment/Super-Domain (if possible, Application Domain)
- ✓ Software License information
- ✓ Effort by Support Activity (including License Management, C&A, Sustaining Engineering, FSE, etc.)

Industry Impact	
	✓ Low Impact
	✓ Medium Impact
	✓ Significant Impact

SURF V&V Structure

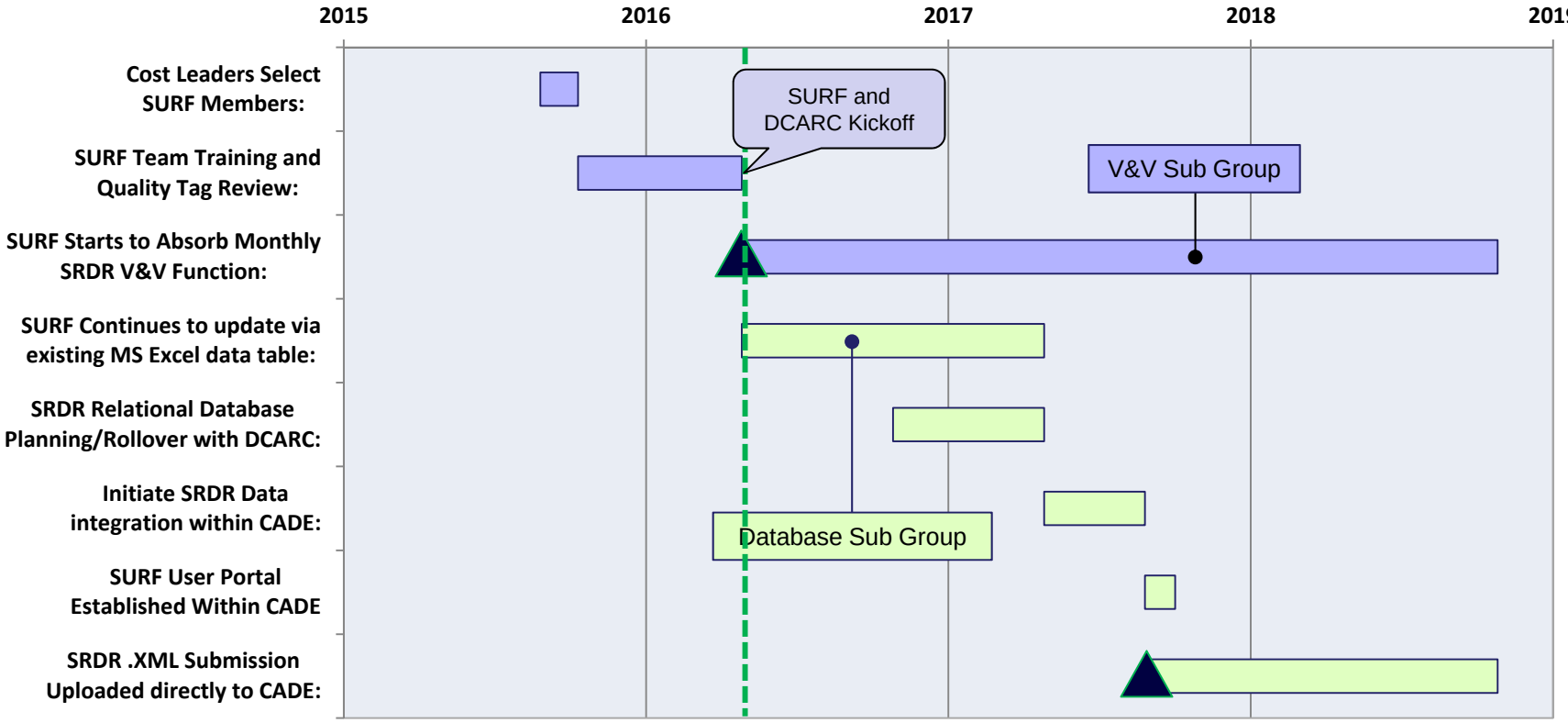
- **SURF Team:**



- **Performs pre and post SRDR acceptance V&V w/ DCARC**
- **Uses a detailed first-ever published *joint* V&V guide**
  - Training guide and used to determine SRDR quality tags for database
- **Submits distributed amongst SURF mbrs to balance workload**

Timely & Consistent V&V prior to Acceptance

SURF Team Status
Where are we now?



– Simple process that leverages planning between two, critical SRDRWG sub teams (i.e. V&V and Database Planning)

On Target for IOC 2QFY16 and FOC 3QFY16

SRDR Database Solution

Phased Implementation of User Expectations

Phase 1 - NAVAIR-like CADE hosted Excel database
Phase 2 - CADE full service

- **Retains Original SRDR submission data (***Raw Data)*
- **Provides link to source documents (URLs)**
- **Provides mapping/normalization insights and filter capability (data tags)**
  - Ex. Roll-up, interim report, pairing initial & final, allocations, etc.
- **Provides quality review (i.e., red flags marking problems or errors in the submission data, quality tags via V&V guide)**
  - Ex. child elements don't sum to parent, illogical activity dates, missing data, two contracts to add to get to total development, terminated program, etc.
- **Provides a dropdown menu of Service ESLOC factors to select (option to input custom ESLOC factors)**
  - Enhances ease of use, quick benchmarking/comparisons, etc.

Status: Testing initial CADE full service version

Software Data Initiatives
Summary & Way Ahead

- **New SRDR for Development and Maintenance: Spring 2016**
- **V&V process: Joint V&V guide available & SURF FOC 3Q16**
- **CADE Database: Excel Data Sheet available & CADE relational database available for testing/use**
- **WG Way Ahead**
  - **Continue to evaluate need for ERP specific DID (MAIS WG)**
  - **Improve government organization SRDR reporting**
  - **Implement standard CDRL language recommendations**
  - **Work potential thresholds for SRDR MX DID**

Delivering Improved Quality & Access to Software Data Critical to Enhanced DOD SW Cost Estimating!

Questions?