BUILDER SUMMIT
FALL 2018

DAY 1

16 October 2018

National Academies of Sciences, Engineering, and Medicine
500 5th Street Northwest
Keck Center Room 100
Washington, DC 20001

ERDC
Engineer Research and Development Center

Innovative solutions for a safer, better world

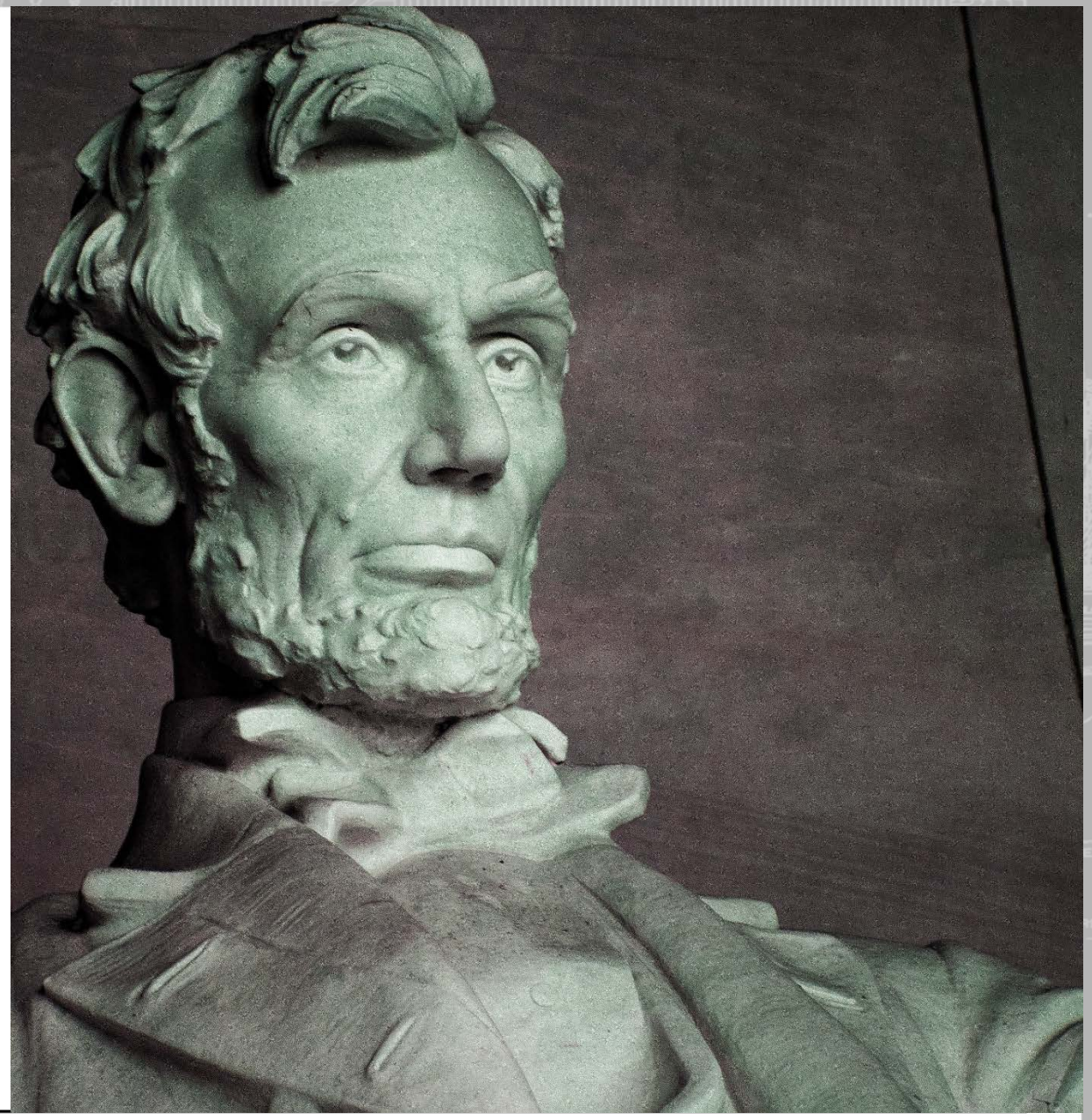
US Army Corps of Engineers®

U.S.ARMY®

Welcome

Matt Walters
USACE ERDC-CERL Research Engineer
Sustainment Management Systems (SMS) Project Manager
OSD SMS CSP BUILDER Working Committee Chair

Other CERLites in Attendance:
Lance Marrano – Director SMS TCX
Clint Wilson – SMS Program Manager
Christine Ansani – Research Engineer
Melinda Buckrop – Research Engineer
Mariangelica Carrasquillo-Mangual – Research Engineer
Juan Davila-Perez – Research Engineer
Kirsten Landers – Computer Engineer
Brenda Mehnert – Research Engineer
Ryan Smith – Research Engineer
Matt Werth – Research Engineer



Introduction

Welcome to the 3rd BUILDER Summit!

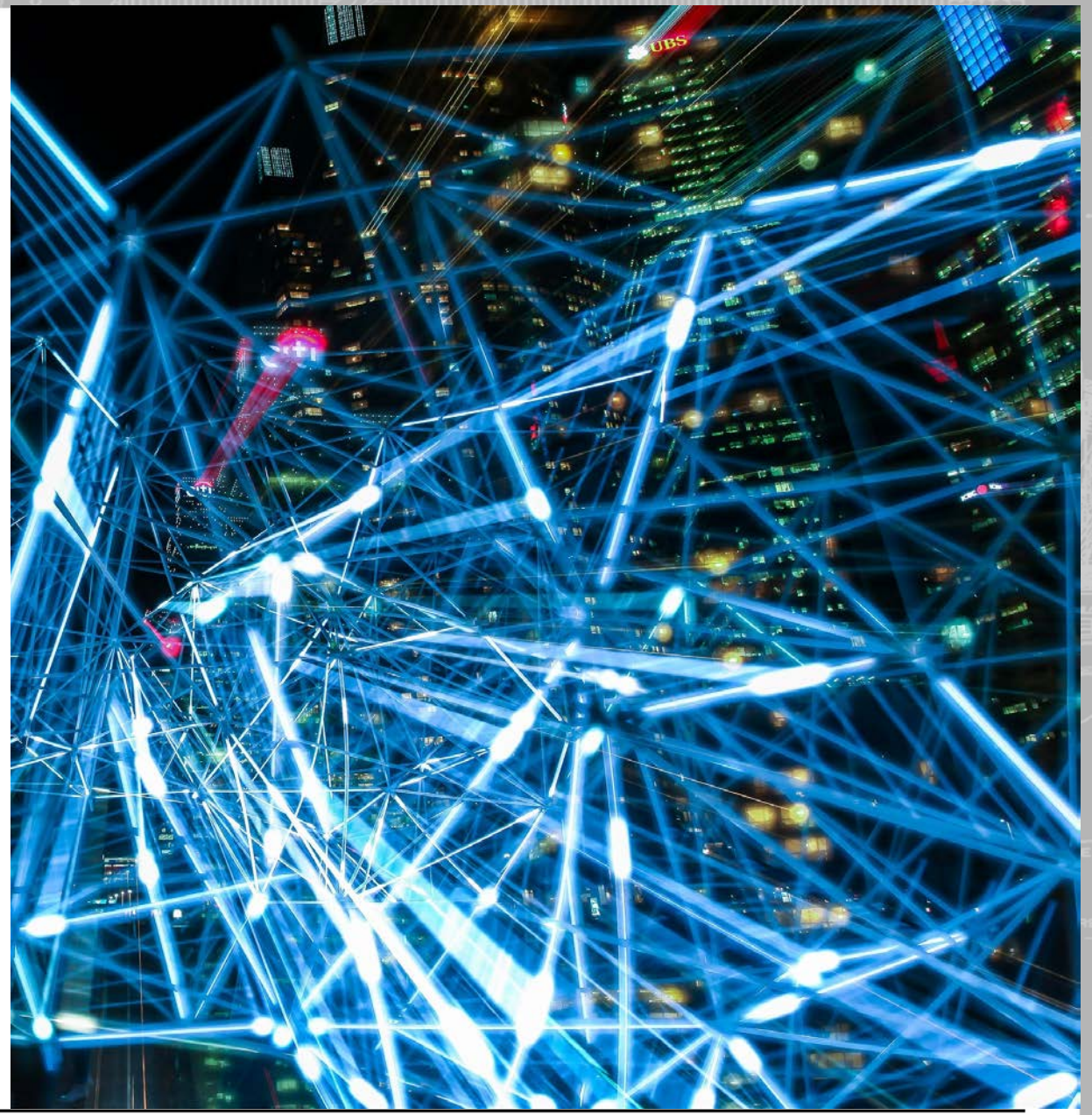
February 2017 – 1st BUILDER Summit with BUILDER Working Committee (WC)
1-Day format sharing select BUILDER user experiences and BUILDER feature requests
February 2018 – 2nd BUILDER Summit with BUILDER Working Committee
1-Day format sharing BUILDER development update

October 2018 – 3rd BUILDER Summit with BUILDER Working Committee
2-Day format with SMS/BUILDER development updates and breakout sessions

BUILDER WC

SMS Governance Panel (Configuration Support Panel (CSP))

- Buildings (BUILDER) chaired by: Matt Walters
- Pavements (PAVER) chaired by: James Allen (in coordination with PAVER users group)
- Rail (RAILER) chaired by: James Allen
- Fuels (FUELER) chaired by: Joe Karbarz
- Utilities (Utilities SMS) chaired by: Clint Wilson
- Inventory Catalog chaired by: Mike Grussing
- Functionality Assessments chaired by: (Louis) Buddy Bartels
- Integration chaired by: Bruce Rives



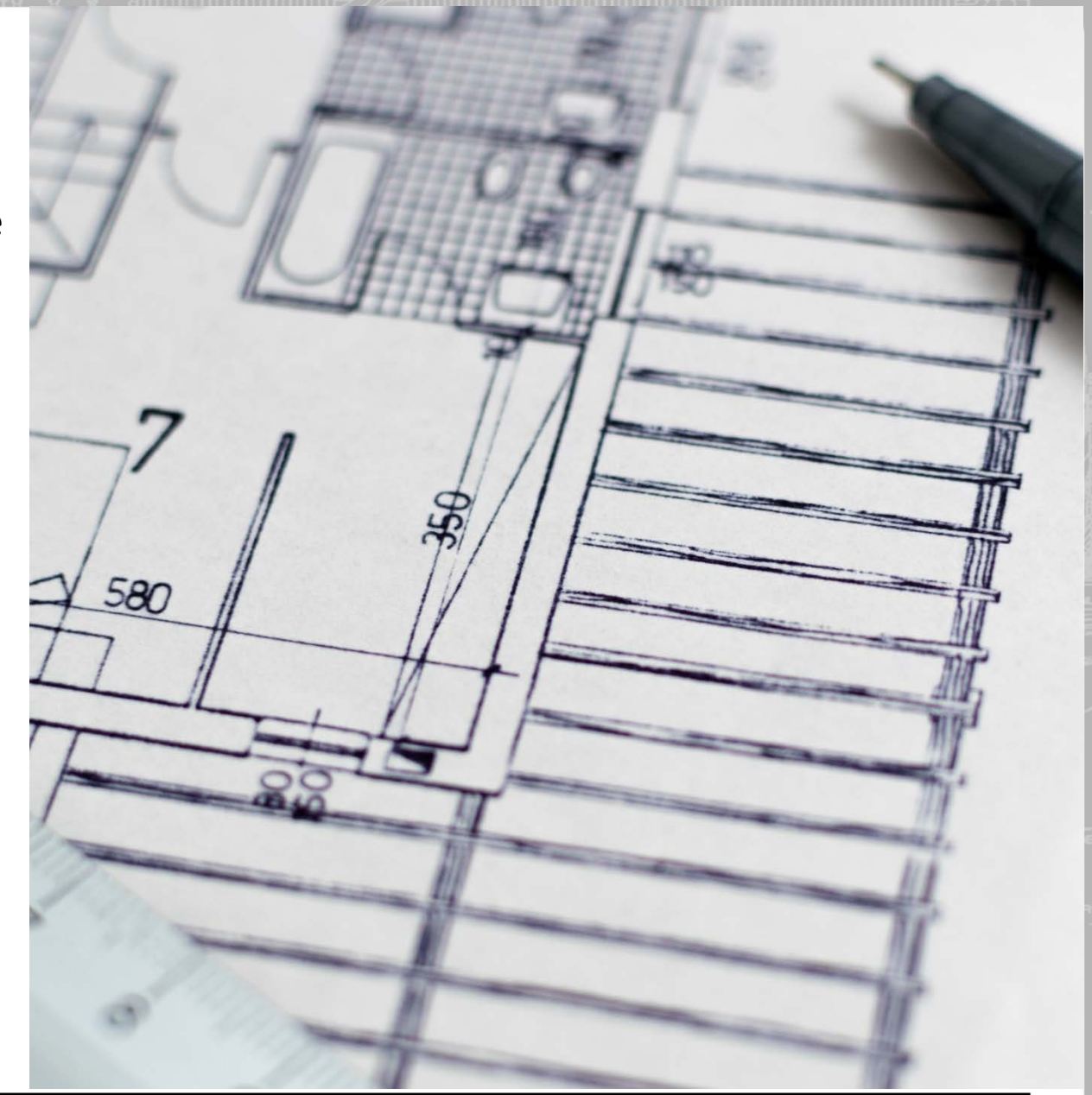
BUILDER WC (Mission & Vision)

- Community of BUILDER users sharing best practices and advocating for software and process improvement for more efficient and effective facility management from the perspective of both the laborer to the master planner.
- Cast Vision to the SMS Governance Panel for the improvement of the BUILDER/SMS process.
- Set the priority of BUILDER enhancements presented to the SMS Governance Panel

*First shared at the inaugural BUILDER Working Committee meeting at the 2017 BUILDER Summit.

Form & Function

- BUILDER Working Committee Chair: BUILDER advocate to the SMS Governance Panel, Working Committee facilitator, meeting notes distributor
- BUILDER Working Committee Members: Subject Matter Experts on all things facilities management, product enhancement designers, best practice collaborators, arbiters of enhancement priority



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Form & Function Cont.

BUILDER Enhancement/Change Process

1. Enhancement/Change proposed
2. Desirability voted on by all members
3. Absent unanimous agreement, enhancement/change spec'd as an optional opt-in feature
4. Enhancement/Change is ranked in priority order
5. Prioritized list sent to the SMS Governance Panel by Working Committee Chair for review
6. Development cycle Initiated with available funding

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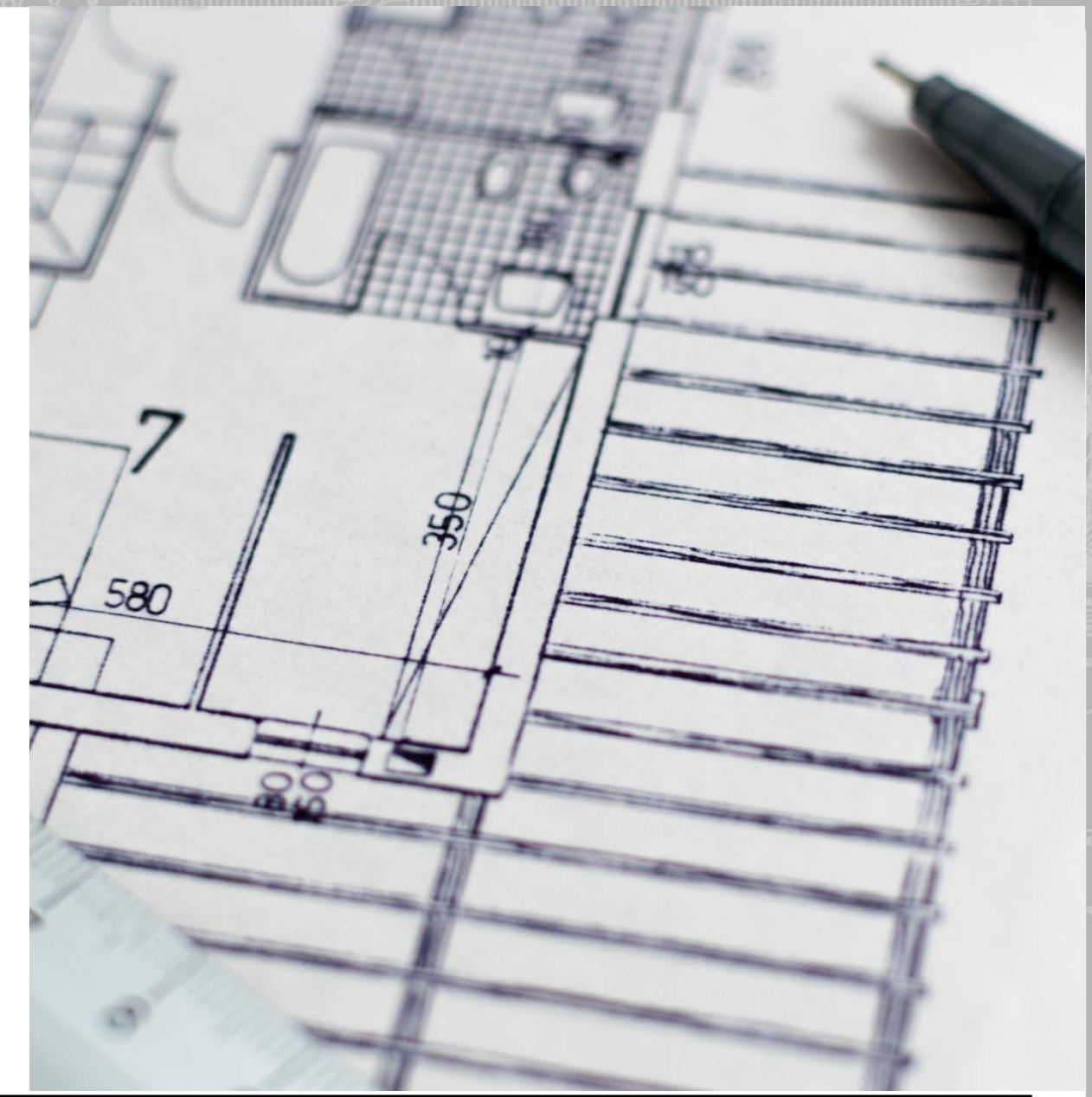

Agenda Review

Tuesday

MORNING SESSIONS

8:00 AM—8:30 AM Welcome Address, Introductions, and Agenda Review
8:30 AM—9:30 AM Software Development and Testing Improvement Progress
9:30 AM—9:45 AM BREAK
9:45 AM—10:30 AM Working Committee Feature Input Review
10:30 AM—11:30 AM BUILDER 3.4.1 Preview Demo
11:30 AM—1:00 PM LUNCH

AFTERNOON SESSIONS

1:00 PM—1:45 PM Enterprise SMS Update/Demonstrations
1:45 P.M—2:15 PM BUILDER vs. ESMS Investment Strategy
2:15 PM—2:30 PM BREAK
2:30 PM—3:00 PM SMS Program Sustainment Funding—Federal Only

BREAKOUT SESSIONS

Session 1A: 3:00 PM—5:00 PM Systems Integration—Successes and Challenges
Session 1B: 3:00 PM—5:00 PM Functionality—Current Strategies Service/Agency-Led
Session 1C: 3:00 PM—5:00 PM POM Planning with BUILDER

Agenda Review Cont.

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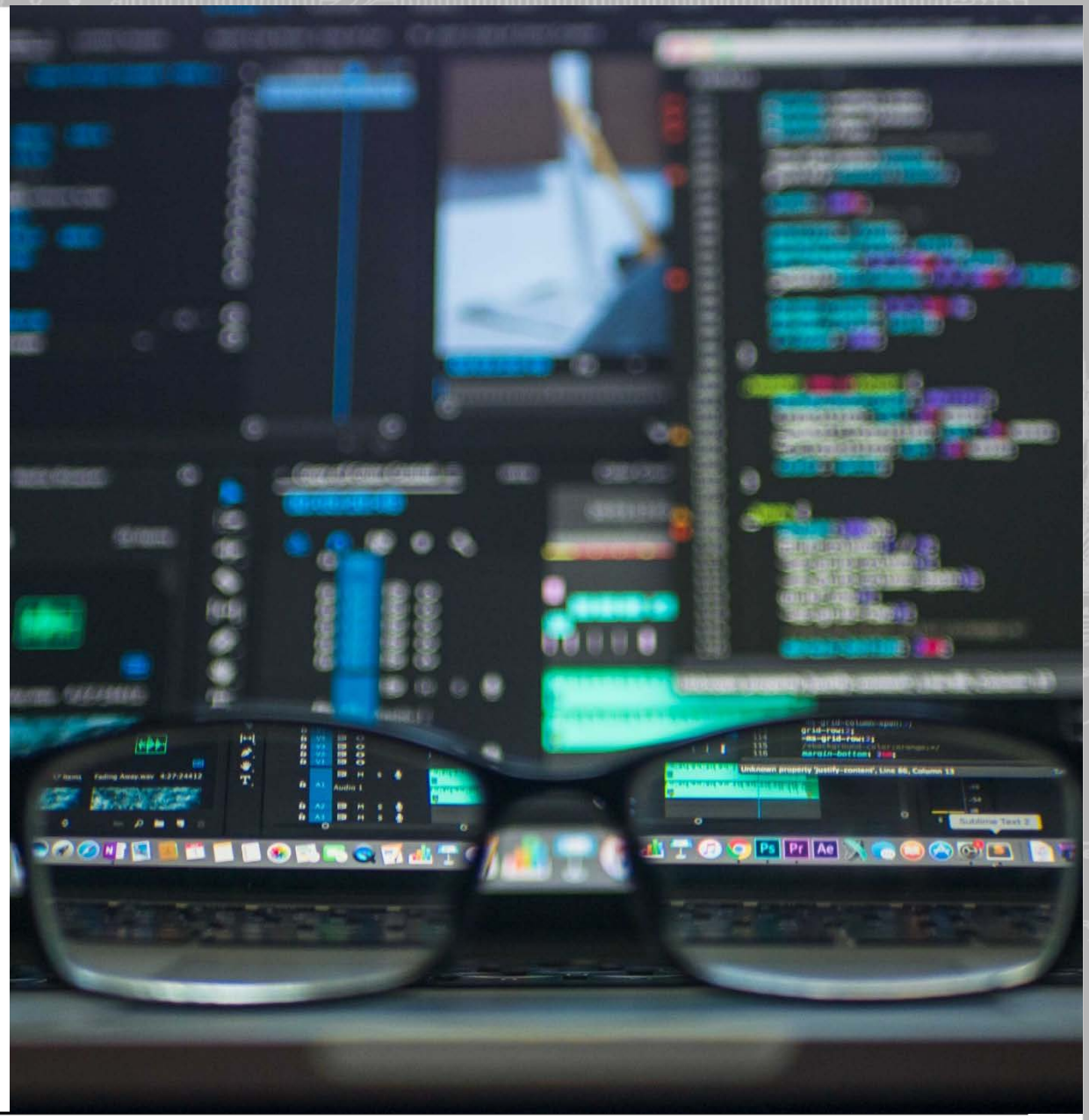
Software Dev Update

- Current Team
- Recruiting
- Contract Management
- Internal Development Tasks
- Planning
- Testing



Current Federal Software Development Team

SMS Fed Computer Scientist (CS) Resources

2 Full-Time

1 Part-Time (planning)

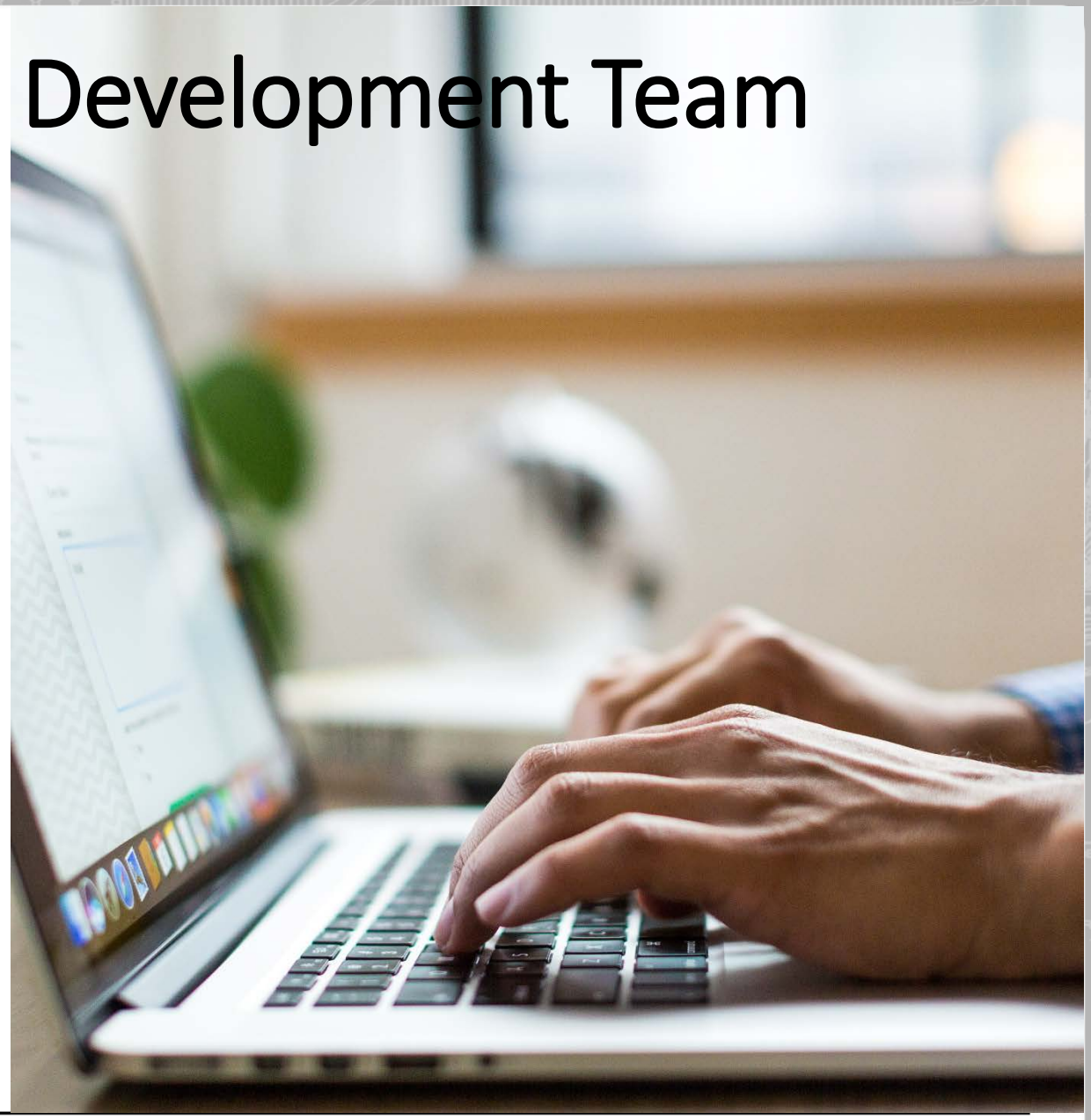
2 Undergraduate Interns

Challenges as Currently Staffed

- Under-staffed to meet current needs
- Talented yet young staff
- Difficulties in responsiveness to defects
- Tasking resources between BUILDER and ESMS development
- Responsiveness in planning

Addressing Current Challenges

- Approval granted to increase staff significantly
- Active recruiting to increasing Federal CS Staff
- Establishing intern recruiting program
- Intern pipeline to full-time employment



Contract Management

BUILDER Bug-Fix Contract – Contract concludes at end of CY

- Component Section Cost Book Edits
- Work Plan Delete All Items for Site
- BRED Images with Blank Titles
- Site PRV Calculation
- Work Plan Export
- Export Scenarios Analysis Grid to Excel
- Organization Work Items
- Functionality Attachments File Types
- Scenario Error Reporting
- Work Plan Prioritization
- Distress Survey Resetting to Low
- Add Section Name to Work Item Details
- Local/Select Inventory Unlock
- Warranty in Effect Indicator

Contract Management

BUILDER Bug-Fix Contract Part 2– Contract concludes at end of CY

- Blank Distress Survey saving
- Removal of unused database tables
- Tree refresh on Organization addition
- Attachment file name character issues
- Distress Surveys and Paint
- Facility Name special character error
- Funding Restrictions save
- Whole Building Replace Work Items
- Scenario Analysis graph corrections
- FCI update on nightly rollup
- Policy save function

Contract Management

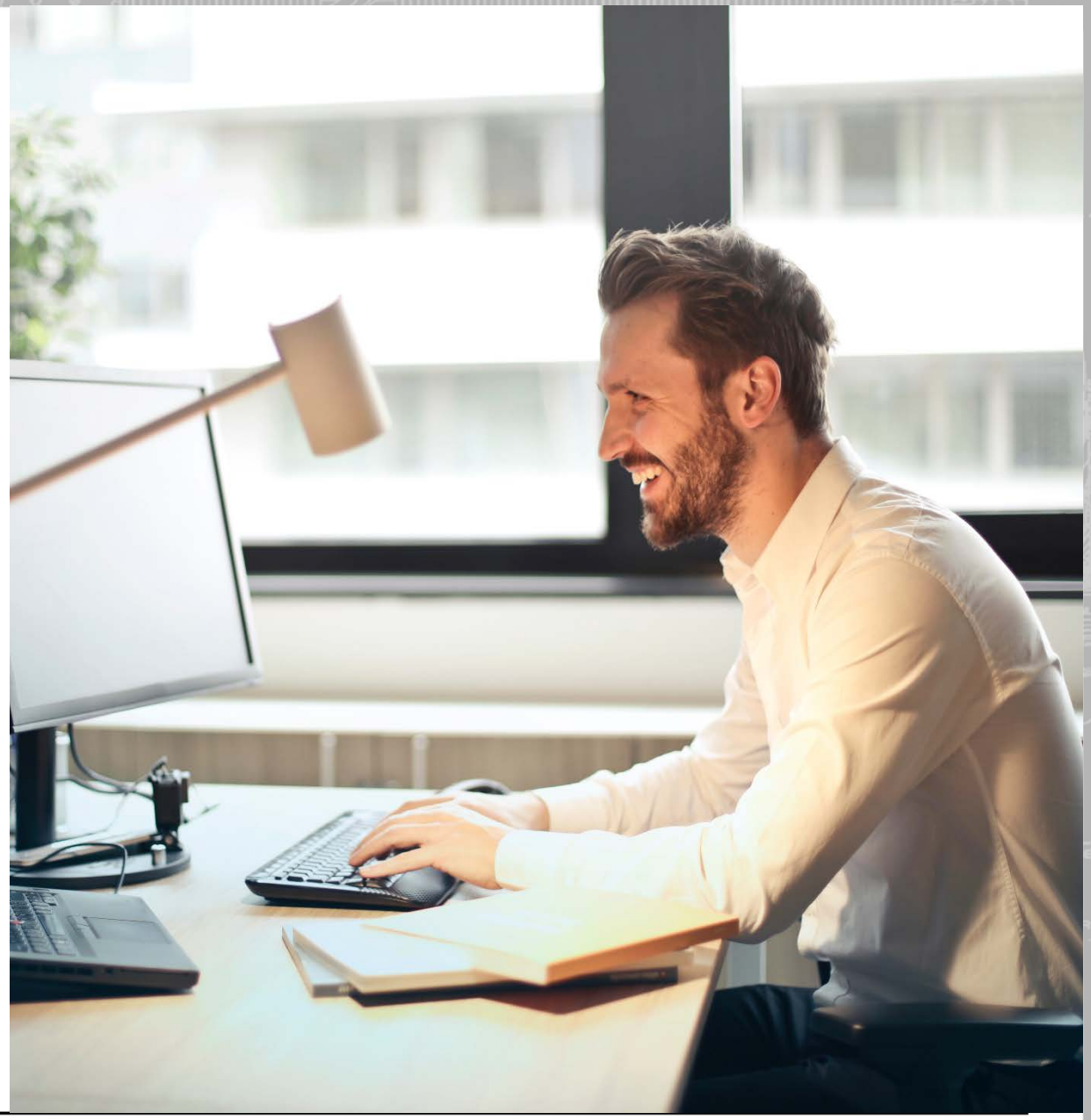
BUILDER Feature Contract – Contract concludes at end of CY

- Inventory Improvement Package
- Update Scenarios to Support POM
- Scenarios Trust Previous Fiscal Years
- Custom Report User Interface (PowerBI) Design – not a completed solution, but a design spec.

Contract Management

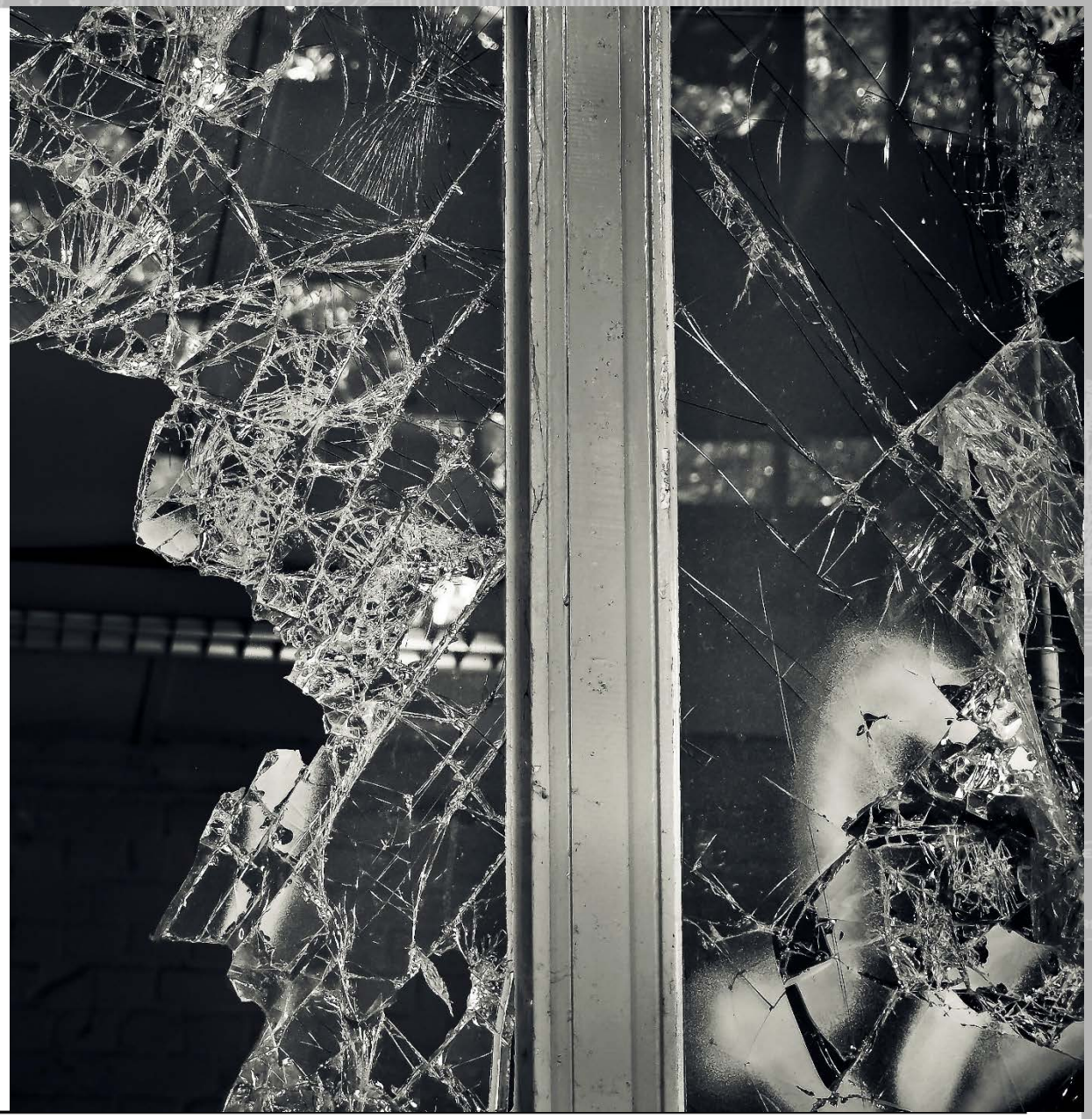
BUILDER Database SQL Server Optimization – Contract concludes at end of CY

- Contract to remediate BUILDER Database performance issues exposed by increased data volume
- Heavy documentation required to provide lessons learned guide for application within ESMS
- Result: further optimized database for better application responsiveness; faster BUILDER!



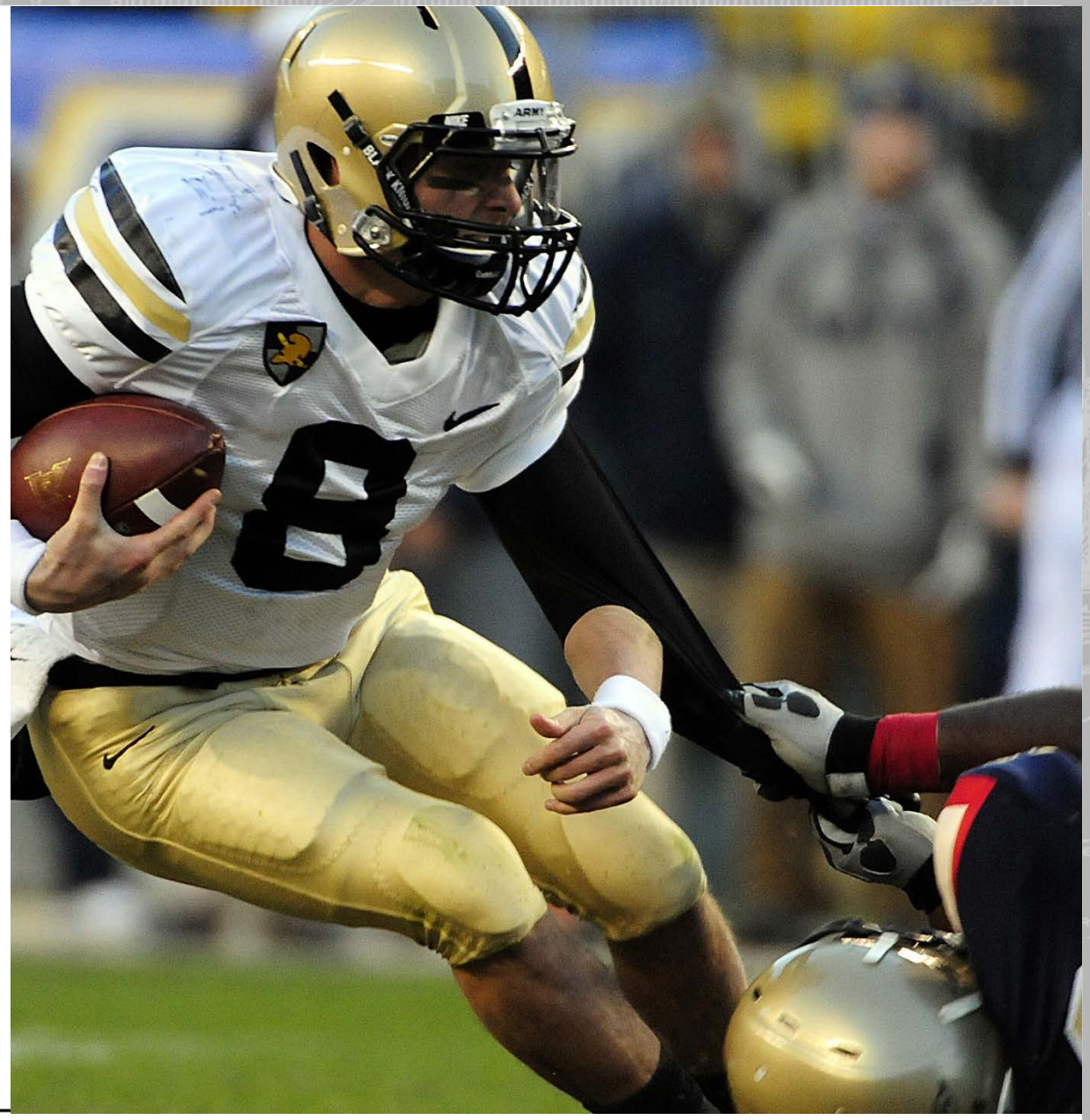
Internal Dev Tasks

- Silverlight Replacement with Angular
  - Scenarios Management
  - Functionality
  - Functionality Configuration (admin page)
- 3.4.1 Bug Fixes
  - Percent completion field for assessments isn't displaying in BUILDER
  - Historic flag is disabled in the building inventory screen
  - Facility does not roll up after section edit
  - General multiplier text box for the building doesn’t save in cost book



Planning

- Team-effort to improve development management and planning
- Improved code branching strategies
- AGILE development for more responsive development cycles
  - Integrate new bug and feature requests into current work plan
  - Team can quickly change direction to address high priority issues
  - Higher customer satisfaction from higher customer involvement
  - Quarterly releases for continual, incremental improvements



Testing

- CERL Engineers Acceptance Testing
  - Historically most prevalent form
  - Lacks comprehensiveness
  - Not sustainable or best solution
- Montana State University TechLink T-SEAL
  - Automated user interface test buildout for regression stability
  - Manual brute force testing
  - Current Process:
    - Send updated software to T-SEAL team for review; wait for results
    - Address any issues identified
  - Future Process:
    - Integrate automated testing into build process
    - Address any issues identified
  - Test suite still developing


BREAK
15
MINUTES

Working Committee Feature Input Review

Process Review

1. BUILDER Working Committee Chair Collects Software Change Requests
2. List of Change Requests and Descriptions Distributed to BUILDER Working Committee
3. Discussion and refining of list with BUILDER Working Committee (additions, revisions, removals)
4. Final list distributed to BUILDER Working Committee members.
5. BUILDER Working Committee members rank their top 10 items and assign a 0-100 score for everything else to gauge general interest.
6. Responses compiled, tallied, and distributed to BUILDER Working Committee members.
7. Change requests are written into software development contracts in priority order of “Top 10” occurrences. As much as can be funded is taken on.

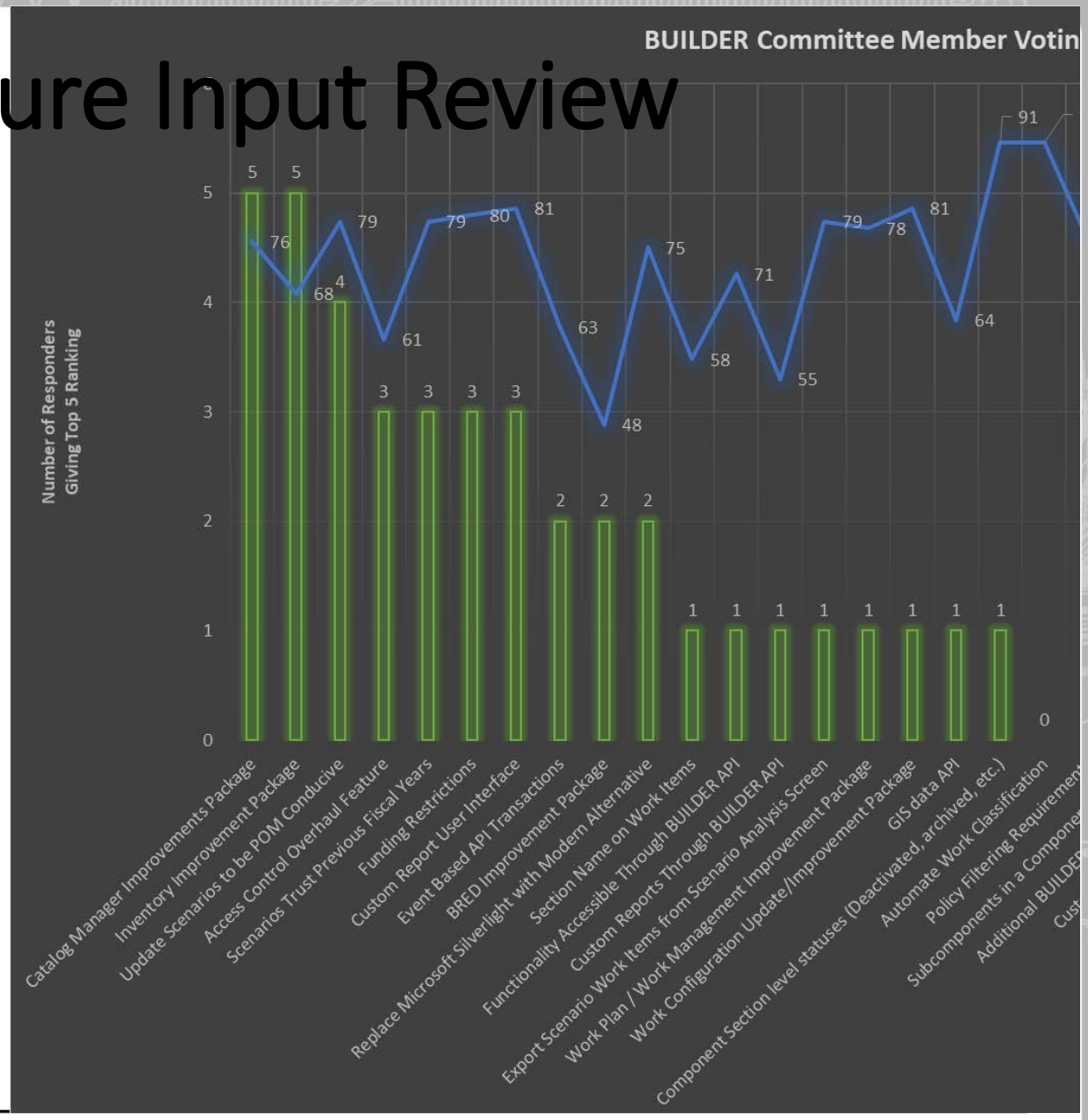
Working Committee Feature Input Review

Review of 2017 Funded Changes

- Inventory Improvement Package (Section Status field, Building Template additions, Building Summary additions, Add Sibling Organization ability, System/Component Auto-Populate, targeted inventory unlock)
- Program Objective Memorandum (POM) Targets in Scenarios
- Scenarios given visibility of “In Progress” work from previous years
- Catalog Manager Improvement Package (Service Life Book Data Structure, Cost Book Data Structure, Cost Book Import/Export, API Functions for Cost Data, Editable Component Importance Indexes (CII))
- PowerBI Integration Solution Design (feasibility analysis)

Additional BUILDER Work in 2017-2018

- SQL Server Database Optimization Work
- Remediation of 28 BUILDER Bugs
- Microsoft Silverlight replacement
- Custom Cost Modifier (sponsored by NNSA)

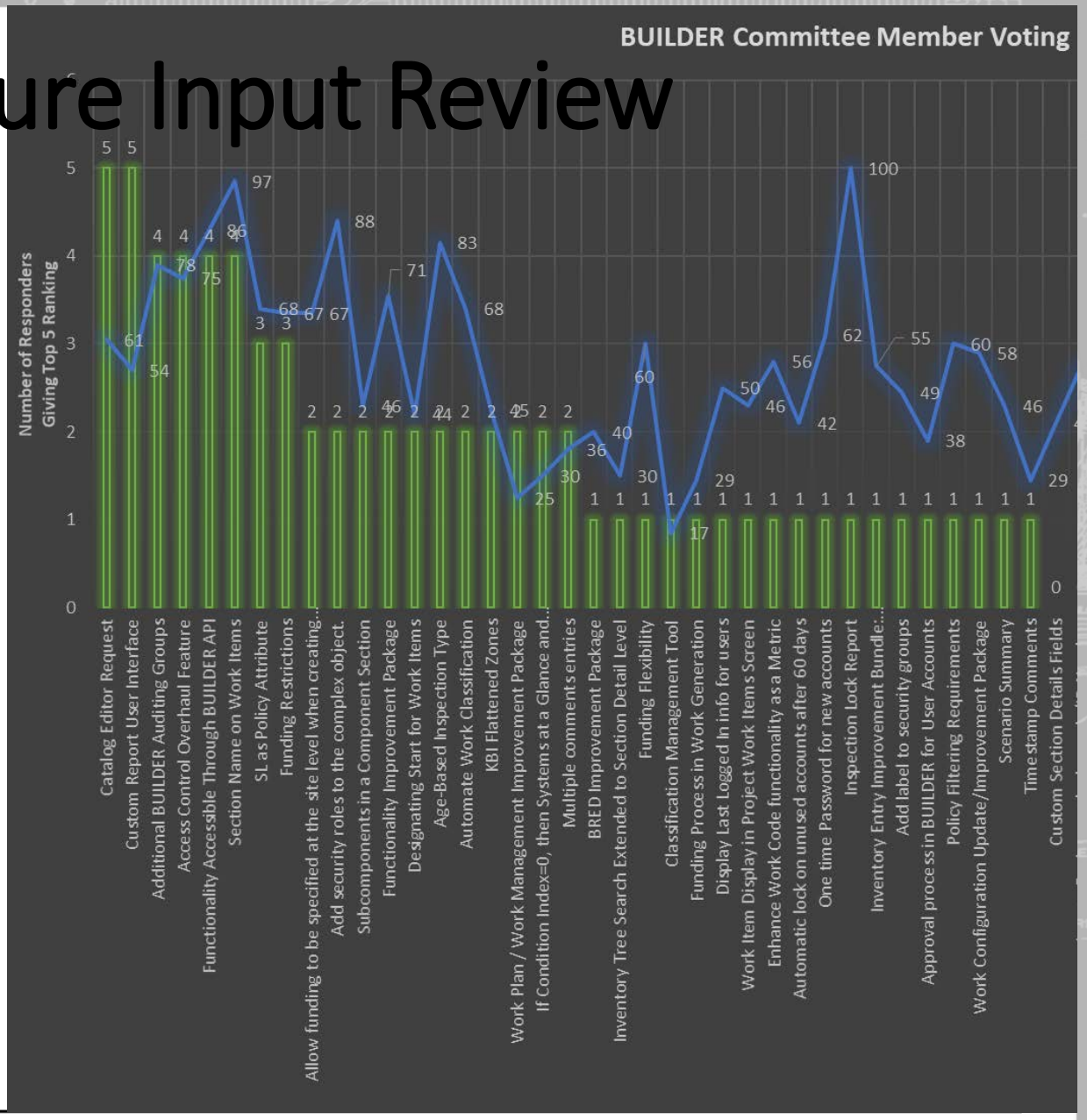


Working Committee Feature Input Review

Review of 2018 Requested Changes (Top 5)

- Catalog Editor Request
- Custom Report User Interface
- Additional BUILDER Auditing Groups
- Access Control Overhaul Feature
- Functionality Accessible Through BUILDER API
- Microsoft Silverlight replacement

Additional BUILDER Work in 2018-2019



BUILDER 3.4.X Preview Demos

- https://builder.cecer.army.mil/Builder34Preview/
- BUILDER 3.4.1 with Angular Scenarios

BREAK

LUNCH

Resume @ 01:00PM

Keck 100

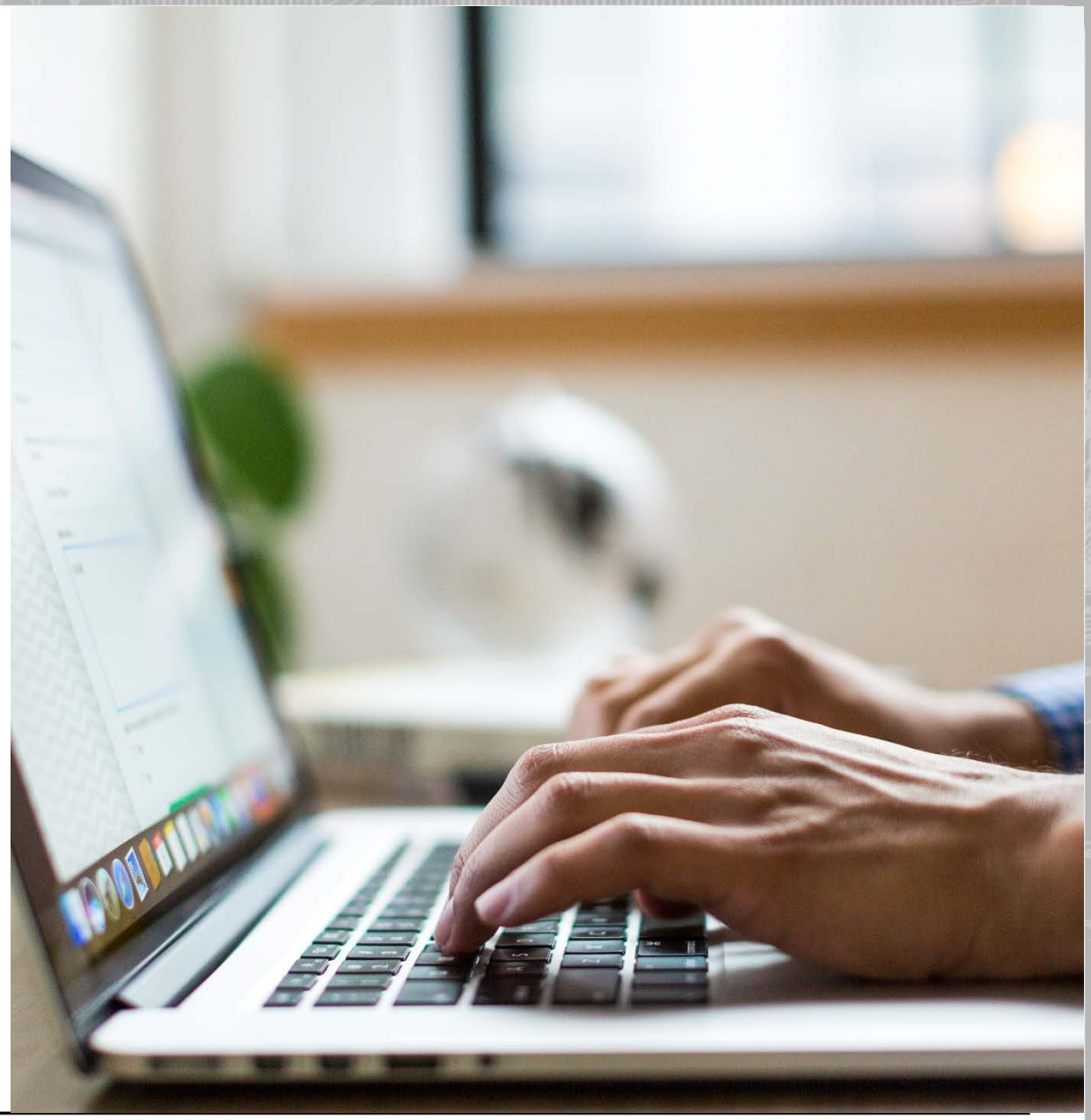
ESMS Development

Background

- Initiated by Fuels and Utility domains
- Single, flexible, modern platform for all SMS Domains
- Current applications showing age both aesthetically and technologically
- Provides a new framework for advanced data analytics, prediction, and optimization

Design Philosophy

- Common software architecture to accommodate all current SMS domains (buildings, rail, pavements, utilities, fuels)
- Abstract design to allow for rapid expansion to account for new domains
- All work completed on shared platform usable by every ESMS Domain



ESMS Update (software)

Nearing Milestones

- Optimized ESMS Desktop App
- Initial Long-Range Work Planning
- PowerBI Integration with ESMS Web

Short-Term Milestones

- BUILDER API Integration
- API Services for integration with other systems
- Workflow – work item lifecycle
- Long-Range Work Planning Funding
- User Interface Design Review

Long-Term Milestones

- BUILDER Feature Parity
- Advanced Analytics
- Work Planning Optimization

ESMS Update (engineering)

Nearing Milestones

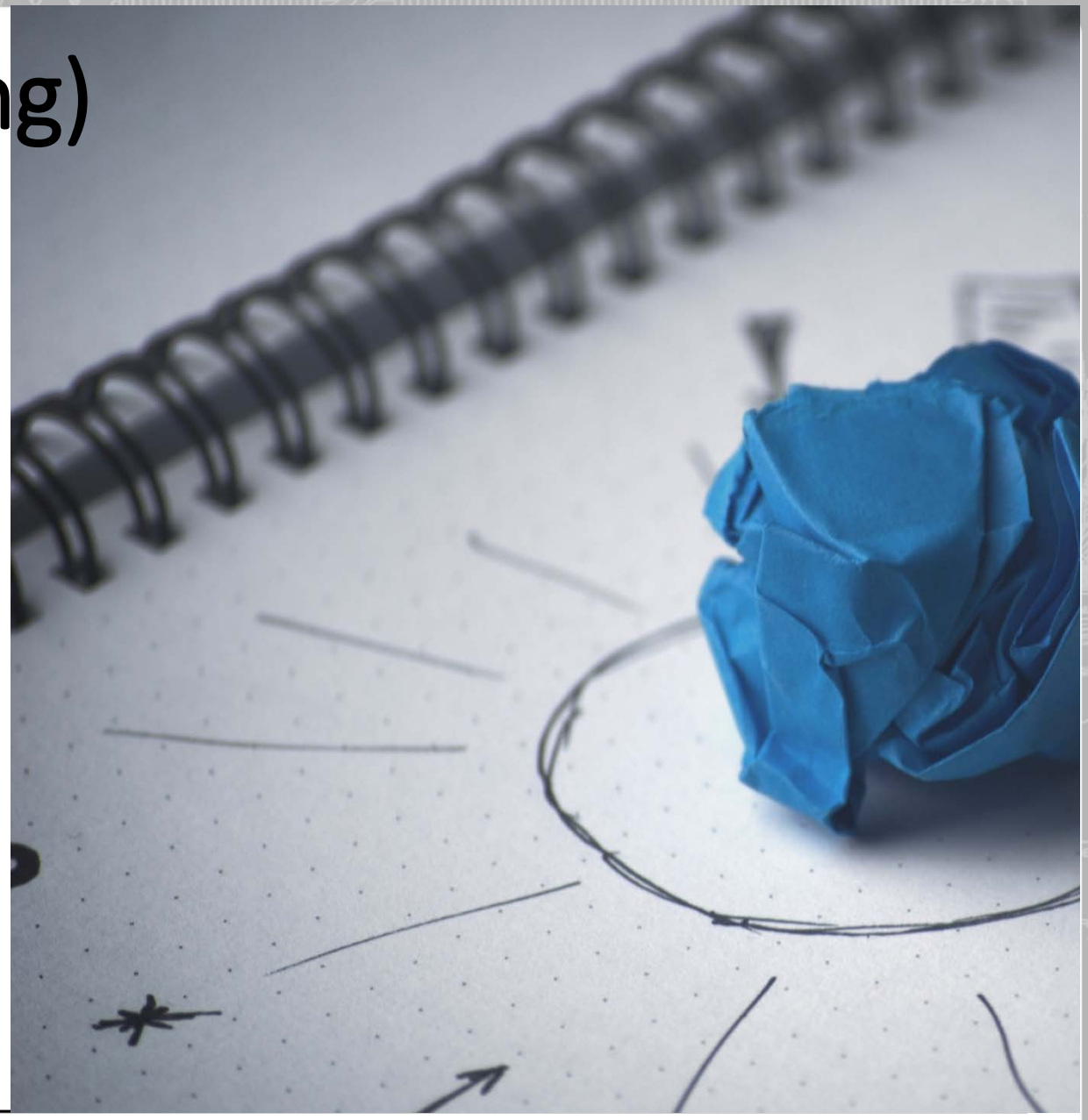
- Fuels Engineering Criteria via Functional Assessments
- Pilot Assessments at Offutt Air Force Base
- Engineering IDIQ MATOC award

Short-Term Milestones

- SMS engineering data peer-review/validation
- SMS engineering data gap analysis

Long-Term Milestones

- Lifecycle characteristics and modeling for remaining FACs



Enterprise SMS Demonstration

Link was removed as this is a dynamic testing environment.


BREAK
15
MINUTES

Breakout Session Format

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DAY 2

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Tuesday Recap

- Software Development and Testing Improvement Progress
- Working Committee Feature Input Review
- BUILDER 3.4.1 Preview Demo
- Enterprise SMS Update/Demonstrations
- BUILDER vs. ESMS Investment Strategy
- SMS Program Sustainment Funding—Federal Only

BREAKOUT SESSIONS Recap

Systems Integration—Successes and Challenges

Functionality—Current Strategies Service/Agency-Led

POM Planning with BUILDER

Agenda Review Cont.

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Inventory Catalog Management – Tools and Strategies

- Catalog Additions Tool – Demo and Review
- Cost Catalog Export/Update/Import feature
- Cost Catalog BUILDER API Extension
- Catalog Manager web-based API (adding catalog items)


BREAK
15
MINUTES

Cost Catalog Update Strategies

Federal (DoD) Cost Source

- Leverages Tri-Service Automated Cost Estimating System (TRACES)
- Uses TRACES DoD Costbook currently under development
- Replacement Assemblies being built based on BUILDER component catalog
- Status: In development – initial rollout targeted for June 2019 (USACE Huntsville to USACE CERL)

Commercial Cost Source

- Obtained via subscription license from RSMeans Construction Cost Data
- Uses proprietary industry cost data
- RSMeans Assemblies mapped to BUILDER component catalog
- Status: Available now - NNSA successfully implementing RSMeans catalog in BUILDER

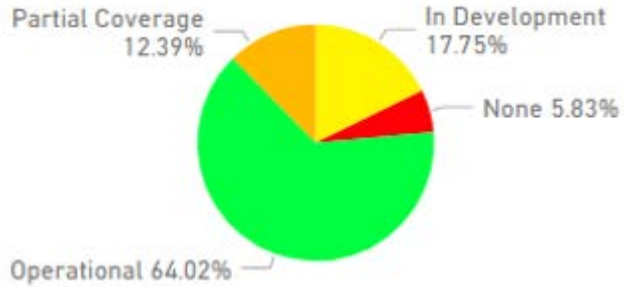
Integration Methods

- Manual database updates with database administrator
- Export/Import Cost Book feature nearing completion
- Update Cost Books via BUILDER API completed (to be deployed)

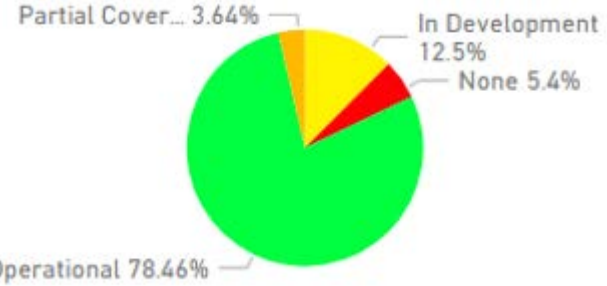
OSD Study Update – Other FACs in SMS

Asset Domain	FACs	SMS Status
Land	8	N/A-Excluded
Buildings	224	Operational
Pavement	21	Operational
Rail	3	Operational
Utilities	55	In Development
Fuels	17	In Development
Dams	9	In Development
Misc. Structure	56	Partial
Waterfront	15	None
Ranges	49	None
Grounds	23	None

Breakdown by Record Count



Breakdown by Total PRV



Study Complete – Draft Report being completed

BCI vs. FCI Calculation in BUILDER

Equation Review!

$$\text{B}uilding\ CI(BCI) = \frac{\sum_i^n CSCI_i * (Component\ Replacement\ Cost)_i}{\sum_i^n (Component\ Replacement\ Cost)_i}$$

$$\text{FCI} = \left[1 - \left(\frac{Deferred\ Work\ Cost}{Facility\ Plant\ Replacement\ Value}\right)\right] * 100$$

FCI Calculation Updates

- FRPC - FCI
- FASAB – Deferred Maintenance and Repair

FCI = 100 x (1 - Total Repair Needs / PRV)

- Repair Needs*: The non-recurring costs that reflect the amount necessary to ensure that a constructed asset is restored to a condition substantially equivalent to the originally intended and designed capacity, efficiency, or capability. This includes deferred maintenance, but excludes the actual repair expenditures reported under the FRPP "maintenance" data element. The total repair needs should be those documented at the time of the condition survey or parametric modeling exercise. Additionally, repair needs should exclude any consideration of the likelihood that the repair will actually be performed at any time before the asset's disposition. The amount must be adjusted for geographic location and reported in current year dollars (see below for appropriate inflation indices).
- Replacement Value*: The cost required to design, acquire and construct an asset to replace an existing asset of the same functionality, size, and in the same location using current costs, building codes, and standards. Neither the current condition of the asset nor the future need for the asset is a factor in the replacement value estimate.

*Federal Real Property Council – 2018 Guidance for real property inventory reporting

Inputs to FCI

FCI = 100* [1-(Total Repair Needs / PRV)]

- BUILDER calculates Total Repair Needs by:
  - Comparing component condition and service life to pre-established standards
  - Estimating replace/repair cost of each individual component in BUILDER inventory below standard
  - Summing cost of all current year work items in a facility
- PRV is pulled from Real Property database, primarily based on:
  - Facility type (FAC)
  - Facility size (UoM)

Alternate FCI Calculation Approach

- Calculate repair needs of each component section/system (based on current projected condition)
- Sum repair needs to determine asset repair needs
- Benefits:
  - Does not require work plan generation
  - Can be made independent of standards/policies/funding levels

Way Ahead *Further Review Required*

- Present interpretations and business rules at BUILDER Summit
- Refine FCI calculation approach
- Present interpretations and business rules to Executive CSP
- Reach agreement to proceed with Executive CSP
- Implement changes to SMS calculations as necessary
- Incorporate business rules into SMS documentation:
  - Training
  - Help documents
  - Online FAQs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LUNCH
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Keck 100

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Reconvene in Keck 100 at 03:00PM


BREAK
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MINUTES

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Breakout Session #2

Session 2A: 3:00 PM—4:50 PM Community of Practice Breakout Sessions

Breakout Session Recap

Session #1

- Inventory/Assessment Standards
- Inventory Catalog Management Committee
- PM BIM to BUILDER Integration

Session #2

- PM DoD Only Discussion
- Intel Community Discussion
- Other Federal Agencies Discussion


Wrap-Up / Closing Remarks