BUILDING STRONG®

US Army Corps of Engineers

BUILDING STRONG®

BUILDER™ Sustainment Management System

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USACE-SWF

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US Army Corps of Engineers
BUILDING STRONG®
Bottom Line Up Front

- **Tactical guidance** for facility managers to execute
- **Key Performance Indicators** on portfolio to upper echelon decision makers
- **Gathers the right data at the right time at the right level** for the information needed to make **informed investment decisions**.
# Sustainment Management System Applications

<table>
<thead>
<tr>
<th>Application</th>
<th>Description</th>
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<tbody>
<tr>
<td>BUILDER</td>
<td>for Building Components Program Management</td>
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<tr>
<td>PAVER</td>
<td>for Airfields and Roads</td>
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<tr>
<td>RAILER</td>
<td>for Track</td>
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<tr>
<td>ROOFER*</td>
<td>for Roofing Project Management</td>
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*New FUELER module is under development with DLA funding*

* Integrated with BUILDER enterprise system
Federal BUILDER Users

- **US Marine Corps**
  - Enterprise standard; ~105M GSF, ~360K assets

- **Navy**
  - Enterprise standard; ~400M GSF, ~470K assets

- **DLA**
  - Enterprise standard; 250M GSF, ~63K assets

- **Air Force**
  - Enterprise standard, conducting second round of implementation
  - ~400M GSF, ~880K assets completed so far

- **Defense Health Agency (formerly Tri-Care Medical Activity)**
  - Enterprise standard, 3 year implementation schedule (14-16)

- **Army**
  - 2 Pilots completed in FY13, 5 sites in FY14, forming enterprise standards for full impl.

- **Department of Defense**
  - OSD adopts SMS as assessment standard (Q4 FY13) for entire Department

- **NNSA (DoE)**
  - Pursuing BUILDER adoption in FY15

- **Additional agencies evaluating or pursuing BUILDER adoption**
USACE Support to Federal Agencies Implementing BUILDER

- DLA – Real Property Inventory and Assessment Program
  - Real Property Inventory, Facility Condition Assessments, and Environmental Audits
  - 500 Sites, 800 locations world-wide
  - USACE personnel develop and manage SRM Projects from FCA results

- Air Force – Sustainable Infrastructure Assessment (SIA)
  - Real Property Validation, Space Utilization, Energy Audits, Facility Condition Assessments, Real Property Installed Equipment Inventory
  - FY12-14 funding for >200M SF

- Defense Health Agency
  - Tri-Service BUILDER Implementation – contracting and QA

- Army
  - IMCOM - contracting assistance and QA/QC

- NNSA
  - Technical support, data migration tools, product improvements, and training
Facility Managers’ Need

**Engineered Asset Lifecycle Management Tools**

Provide investment guidance to:

- **Objectively** assess infrastructure across the enterprise
- **Consistently** analyze investment requirements and prioritize scarce resources
- **Track** investments to ensure key stakeholder requirements are addressed
- **Forecast** the investment requirements for budget defense and course of action analysis

**Assessment**
- Determine Condition of Asset Portfolio

**Analysis**
- Compare current condition against mission requirements

**Execution**
- Based upon priorities and availability, fund and execute.

**Prioritization**
- Invest to ensure mission readiness and maximize ROI
Process

Inventory
- Real Property Inventory
- Component Inventory

Assessment
- Condition Assessment
- Functionality Assessment

Prediction
- CI Prediction

Work Planning
- Work Generation
- Work Prioritization

Forecasting
- Course of Action (COA) Analysis
Inventory

- Performed once, with initial assessment
- Supports DPW tactical actions (e.g. replace roof, repair doors, replace HVAC, etc.)
- Group assets for lifecycle investment management, reduces assessment requirements
- Immediately supports asset performance predictions

Example Building Hierarchy

- Building
  - System
    - Component
      - Section

Example System Components:
- (B20) Exterior Closure
- (B20) Walls
- (B20) Doors
- (D30) Services
- (D30) Heating
- Masonry
- Metal Panel
- Curtain Wall
- Boiler(s)
Condition Assessment

Capture the lifecycle rating of an asset

- [Performance] Requirements may change, but measurement should be constant
- Inspectors are “human sensor” and do not provide opinion/interpretation
- Models the rating given by an expert based upon engineering principles for consistency across an organization
- Assessment frequency and level-of-detail are tailored to mission risk and lifecycle condition (Knowledge Based Inspections)

Traditional

Deficiency:
Re-point brick retaining wall

Work Quantity:
200 SF

Scoping Estimate:
$4400

Urgency/Priority:
3

Distress Type(s):
Deteriorated and Cracked

Severity Level(s):
Low and Med

Quantity/Density:
200 SF and 12 LF

Condition Index (calc.):
72

Work is the input

Work is the output

Traditional        vs.   SMS
Functionality Assessment

- Modernization inspection addresses issues of:
  - Capacity (too little or too much)
  - Configuration
  - Change in user requirements
  - Technical obsolescence
  - Regulatory/code compliance
  - Etc.
- Available at building, space, and component levels
- Can simulate mission change to determine investment requirements for future occupants

<table>
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<th>Last Assessment</th>
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<tr>
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<td>Structural Adequacy</td>
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<tr>
<td>Efficiency and Obsolescence</td>
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<td>Environmental/Health</td>
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<td>02/21/2007</td>
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<tr>
<td>Missing or Improper Components</td>
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<td>Aesthetics</td>
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<tr>
<td>Maintainability</td>
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<tr>
<td>Cultural Resources</td>
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Condition Prediction

Adaptive model predicts performance of each unique asset; identifies best time to invest.
Work (Requirements) Generation

- Work is automatically created based upon Enterprise-defined rules that capture acceptable levels of risk for differing assets.
- System evaluates work options to optimize Return on Investment.
- Work is generated using objective ratings AND a defensible set of enterprise policies, eliminating subjective judgment and gaming of the system.

Enterprise-defined rules generate consistent requirements Service-wide.
Work requirements are **automatically generated** when condition falls below enterprise policy levels.
Requirements Prioritization

- Balance multiple, competing criteria for determination of the best SRM investment strategy
  - Tool includes metrics which express [cost] effectiveness, risk, and consequence factors
  - Commander’s override available for must-do items

Uniform prioritization of requirements across organization enforces consistent investment guidance.
Actionable Work Plan

Work is for specific assets; establishes transparency, traceability and accountability.
CI Metric

BUILDER-derived value is consistent and repeatable

► Work is now generated using objective ratings AND an defensible set of enterprise policies, rather than subjective judgment

► Prioritization scheme can leverage metrics to focus resources on greatest need (risk, impact, financial ROI, etc.).

FCI computation is based upon objective assessment methods and consistent work rules.
Forecasting

What-If capability allows changing inventory, policies, prioritization, funding, and forecast period to determine different outcomes. Supports:

- Budget Creation
- Budget Defense
- Course Of Action Analysis
- Out-year strategic condition trends
  - Will levels meet current mission requirements?
  - Will levels meet future mission requirements?

Actionable intelligence built from the asset up
Forecasting Results

Impact on Portfolio of Funding at 90%, 70% and 50% of the Requirement

Impact on Systems of Funding 50% of Requirement

- HVAC
- Electrical
- Roofing

Functioning
High Risk
Failure
THE RESULTS

Engineering-based investment plan

✓ Provides decision support to all echelons of the organization
✓ Highlights investment opportunities to stretch limited SRM resources
✓ Balances mission and economic priorities based on mission requirements
✓ Provides course of action analysis
  • Avoidance of big ticket item failure (Future Shock)
  • Awareness of the consequences of today’s decisions (Law of Unintended Consequences)

All at costs 25% of traditional, deficiency-based facility audits
The BENEFIT$$$

✓ Reduced assessment costs
✓ Avoidance of missed opportunity costs
✓ Avoidance of stale information costs
✓ Adaptability to additional assessment protocols
✓ Sustained product improvements through R&D
Conclusion

- BUILDER provides consistent, objective, efficient decision support and reporting on facility conditions and investment requirements from the installation to the HQ level
- DoD is adopting BUILDER as standardized condition assessment process and tool for all components
- USACE is supporting implementation efforts for many DoD agencies
More Information

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http://sms.cecer.army.mil

- SMS Resources

http://www.erdc.usace.army.mil

- Installation Operations (more products and expertise from the Engineer Research & Development Center)