



U.S. ARMY COMBAT CAPABILITIES DEVELOPMENT COMMAND – AVIATION & MISSILE CENTER

Joint HELLFIRE Stockpile Reliability Program (SRP) Overview

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MISSION



Deliver collaborative and innovative aviation and missile capabilities for responsive and cost-effective research, development and life cycle engineering solutions.



PRIORITIES



#1: People

People are the Army's greatest strength and its most important weapon system.



#2: Readiness

The Army must be ready to defeat any adversary, anywhere, whenever called upon, under any condition.



#3: Modernization

The Army must modernize to remain lethal and ready to fight tomorrow, against increasingly capable adversaries and near-peer competitors.



#4: Reform

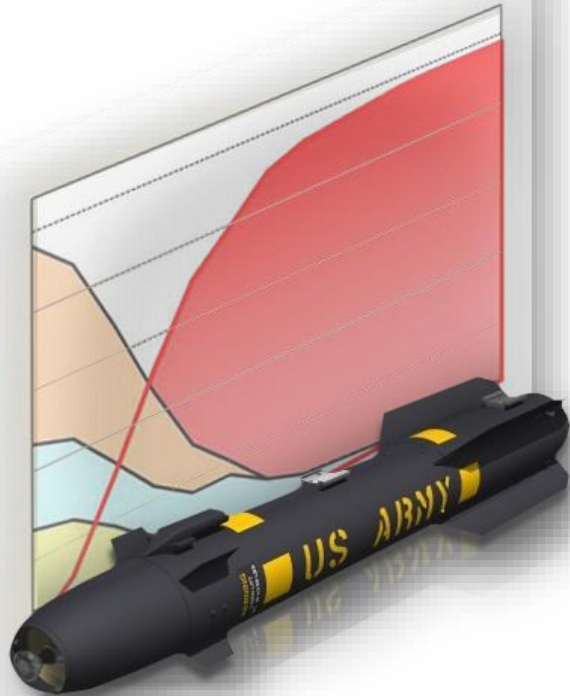
The Army will improve the way we do business, including how we implement our top priorities, to make the Army more lethal, capable, and efficient.





STOCKPILE RELIABILITY PROGRAM

PURPOSE



- “The SRP provides “**cradle to grave**” responsibilities, for monitoring the performance, reliability, and safety characteristics of ammunition items and Class V components.”
- “An Army program that continually measures stockpile reliability is **essential** for providing data to ensure that ammunition and ammunition components, available for issue and use, are **safe and reliable**.”
- “The SRP consists of the **surveillance program**, the **function test program**, and the **laboratory test program**. Depending on the type and nature of the ammunition item to be evaluated, any part or all of these programs will be used.”

SRP is an Army-Wide program that supports Army Readiness by monitoring the safety, reliability and performance of our missile systems as they age to ensure they achieve their maximum useful shelf life.



STOCKPILE RELIABILITY PROGRAM RESPONSIBILITIES



*Are these missiles still
safe and reliable?*



Challenges:

- ✓ Extreme storage and handling
- ✓ Manufacturing Defects
- ✓ Expiring Shelf Life

Missiles are exposed to a wide range of storage and handling environments. SRP continually monitors and evaluates the stockpile, providing data to decision makers to help missiles achieve longest life possible.

- Ensure high reliability and performance of aging inventory
 - ✓ Implement or recommend shelf life extension decisions
- Immediately identify and remove failing hardware and lower reliability missiles from the go-to-war stocks ensuring Army readiness.
- Provide data for logistic, engineering and programmatic actions to achieve longest life possible.
- Identify best storage and maintenance practices
 - ✓ Drives majority of changes to missile supply bulletins
- Decrease combat risk by detecting failures BEFORE they impact the mission or Soldier
 - ✓ Support missile malfunctions and failure investigations
- Adjust engagement or deployment tactics to offset degradation trends
- Reduces sustainment costs by avoiding new missile procurement



STOCKPILE RELIABILITY PROGRAM DATA ELEMENTS



COMPONENT TESTING

Sample of components tested in lab to ascertain essential performance parameters not available at all-up-round level.

- Almost all components are laboratory tested: Batteries, Motors, Warheads, Gyros/IMUs, Guidance Sections
- Critical data for trending/predicting performance PRIOR to the Soldier experiencing failures in the field

FLIGHT TESTING

A statistically representative sample of the tactical inventory is flown with flight test range controls and data collection.

- Flight testing is essential to measure system level reliability and identify failure modes that cannot be identified in the laboratory
- Determines if the system meets the user's in-flight reliability requirement

FIELD DATA

Firing and Malfunction Reports are required to be submitted by the user.

- Online entry system developed by CCDC Aviation and Missile Center has significantly improved reporting rates
- Analyzed for trends associated to manufacturing strata, age, firing scenario, etc.

SURVEILLANCE INSPECTIONS AND TESTING

Mobile capabilities allow us to non-destructively test over 1,000 HELLFIRE missiles worldwide annually.

- Provides valuable parametric data for trend analysis. Not able to test "one-shot" components (thermal batteries, motors, warheads, etc)
- Directly improves readiness: immediately segregates failing missiles from the go-to-war inventory.

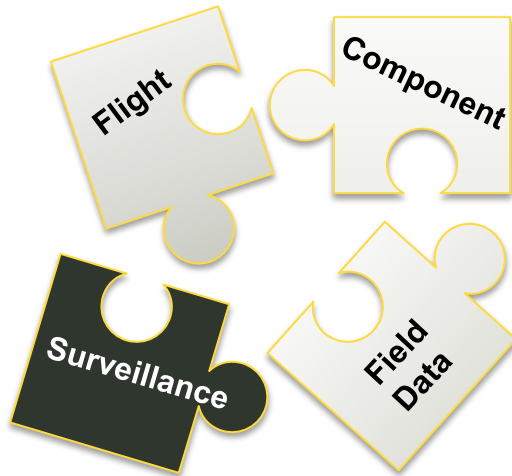




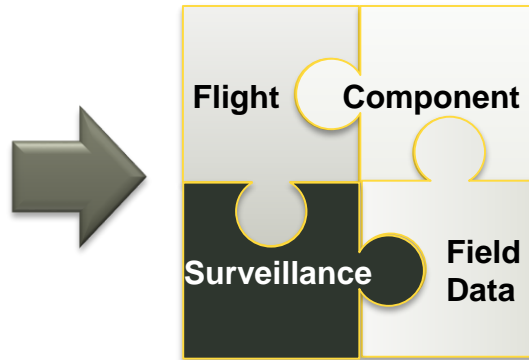
STOCKPILE RELIABILITY PROGRAM EXTENSION METHODOLOGY



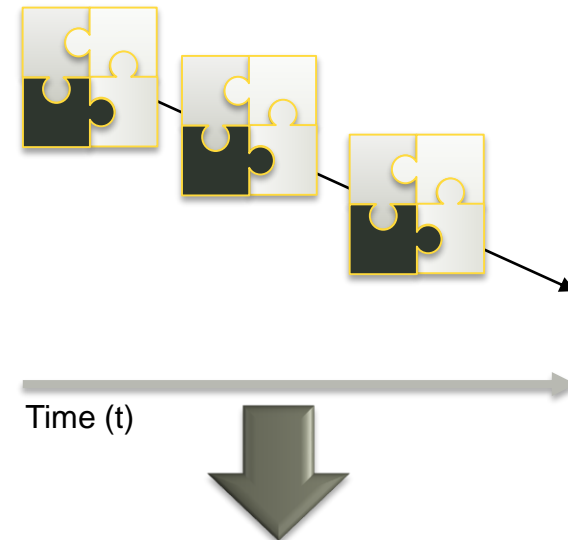
Data Collection



Data Analysis



Identify Trends



Shelf Life Extension or Recertification Decision

Satisfactory Results

Missile shelf life is extended for U.S. Army assets. *Extensions cannot be directly applied to Joint SRP inventories due to variations in storage/handling environments and manufacturing strata, but the U.S. Army can provide various levels of data, analysis and testing to support customers in their inventory management decisions.*

Unsatisfactory Results

U.S. Army expired missiles are placed in an unserviceable condition code, restricting them from issue or use. Alternative dispositions can be recommended:

- Demilitarization or repair
- Firing Restrictions (training use only)
- Adjust Inventory Management Strategy



JOINT STOCKPILE RELIABILITY PROGRAM CONCEPT

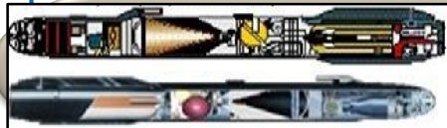


Foreign military services are responsible for making any extension decisions beyond the shelf life at delivery. However, the Joint SRP can be tailored to provide various levels of data, analysis, and testing to support and make shelf life recommendations to the FMS customer.

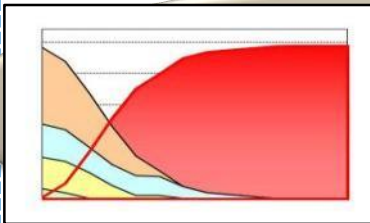
Included in Base and Full Support



**SHELF LIFE REPORTS
OR SRP PLANS**



**AS-BUILT AND
HISTORICAL DATA
RESEARCH**



**GENERAL TECHNICAL
SUPPORT ON SHELF
LIFE ISSUES**

Included in Full Support Only

VISUAL INSPECTIONS



**IN-COUNTRY, NON-
DESTRUCTIVE
TESTING**



**FLIGHT OR
COMPONENT
TESTING**

(only if inventory deemed statistically dissimilar)





JOINT STOCKPILE RELIABILITY PROGRAM

SUPPORT DETAILS



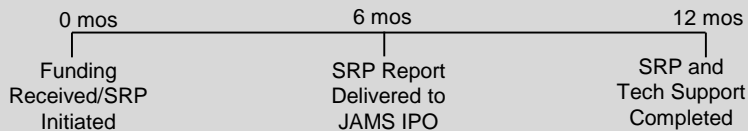
The Joint SRP offers two basic types of support options to FMS customers. However, both programs can be completely tailored to meet the needs of each individual FMS customer.

Base Support

Intended for customers who **DO NOT WANT** the U.S. Army SRP to make shelf life or inventory recommendations. Technical reference only.

Includes:

- As-built Research: Execute as-built research to compare the FMS customer's inventory to the U.S. Army inventory to identify applicable hardware
- Tailored copy of SRP Report: contains information pertaining to hardware in the country's inventory and is provided within 6 months of when funding is received. *Note: Information provided is a technical reference only. U.S. Army shelf life CANNOT be directly inferred to FMS inventories*
- Access to FMS-FIREIT
- Program Reviews and technical support on shelf life and reliability related issues is included for 12 months after funding is received.

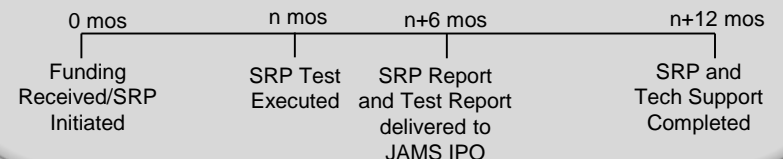


Full Support

Intended for customers who **WANT** the U.S. Army SRP to make shelf life or inventory recommendations.

Includes:

- Base Support deliverables
- Test and/or Inspection to prove that the FMS inventory is handled and stored IAW U.S. Army standards and that the FMS inventory is statistically similar to the U.S. Army inventory.
 - Non-destructive testing via surveillance vans OR if customer has USG Test Set and follows USG procedures, in-country test data can be used.
 - If the FMS inventory is dissimilar from the U.S. Army inventory, additional testing (potentially destructive) may be required.
 - Test report will be provided 6 months after test execution.
- Shelf Life and Inventory recommendations will be made to the customer; however, each customer is responsible for implementing extension decisions





JOINT STOCKPILE RELIABILITY PROGRAM

BENEFITS



The U.S. Army has large missile inventories and the most comprehensive Stockpile Reliability Program in the world. This provides Joint SRP customers the opportunity for significant leveraging of cost with increased data and confidence.

- Minimize or eliminate destructive testing to assess FMS customer inventory.
- Significant cost avoidance for development and maintenance of separate FMS test capabilities, facilities, and expertise
- Centralized U.S. Army organization (CCDC AvMC) for all missile SRP
- Employs the latest approaches to shelf life testing and analysis
- Data sharing between missile system SRP's supports identification of common manufacturer defects
- Technical support on ALL shelf life related issues

“When we assist other nations in meeting their defense requirements, we contribute to our own security.” - DoD 5105.38-M, Security Assistance Management Manual (SAMM), Oct 3, 2003



Back-Up



STOCKPILE RELIABILITY PROGRAM SURVEILLANCE VAN



PURPOSE

- Non-destructively test HELLFIRE missiles worldwide
- Electronically test over 1,000 HELLFIRE missiles each year
- Supports Joint Services and Foreign Military Sales customers

PROCESS

Visual inspection:

- Both missile and container are inspected IAW HELLFIRE Supply Bulletin

Functional test by experience staff:

- Utilizes the Modernized HELLFIRE Universal Test Set (MHUTS)
- Tests over 150 parameters of the missile
- All failures are reviewed by Subject Matter Experts through After Action Board process



PRODUCT

- Immediate identification and segregation of failing missiles
- Ensures unit readiness and inventory availability
- Data used with other SRP data to provide overall inventory analysis
- Analysis used to recommend shelf life extension to the customer





JOINT STOCKPILE RELIABILITY PROGRAM

ELECTRONIC MFDR – FMS FIREIT



U.S. Army HELLFIRE SRP created and fielded a secure online database for FMS customers who participate in the Joint SRP.

BENEFITS

- Provides field data to assess reliability, safety, and performance degradation of customer's inventory
 - ✓ Valuable one-shot data that the Joint SRP can analyze to support shelf life extension recommendations
- Joint SRP team will review and score all firing submitted in support of:
 - ✓ Shelf Life Extensions
 - ✓ Failure Analysis/Investigations
- Faster, easier and more accurate data entry
 - ✓ Serves as a tool to easily transmit data to the SRP team for analysis
- Users can have a centralized location to input data and track their firings
- Safe, secure site that only the customer and the JAMS/SRP team will have access to.

The screenshot displays the 'FIREIT - FMS' web application interface, titled 'HELLFIRE MISSILE FIRING INFORMATION TRACKING'. The main section is 'MISSILE FIRING DATA REPORT'. The interface is organized into several columns of input fields and dropdown menus:

- Military Unit:** Includes fields for Military Unit (dropdown), Gunner Grade/Rank, Gunner Name, Gunner Email, Gunner DSI, Pilot Name, and Pilot Email.
- Firing Location:** Includes fields for Firing Location (dropdown), Missile Serial No., Missile Lot No., Missile Type (dropdown), Launcher Serial No., Local M8 Time, and Date (MM/DD/YYYY).
- Ambient Conditions:** Includes fields for Ambient Temp (C/F), Wind Velocity (dropdown), Vector (Deg), Weather (dropdown), and Ceiling (ft).
- Visible Obscurants at Launch Point:** Includes a dropdown menu for obscurants.
- Firing Category:** Includes a 'Combat?' checkbox and a dropdown menu for category.
- Firing Agency:** Includes a dropdown menu for agency.
- Remote Designator:** Includes fields for Designator Offset (deg), Designator Range (km), A/C Tail No (if applicable), Code Confirmed (Yes/No/N/A), Target Offset (Deg) (Right/Left), Type of Launch (dropdown), and Firing Mode (dropdown).
- LOAL Delay Time:** Includes a field for LOAL Delay Time (Seconds after missile separation).
- Category of Target:** Includes radio buttons for Stationary and Moving - Speed (MPH).
- Target Information:** Includes fields for Target Type (dropdown), Target Size (ft), Target Condition (Solid/Perforated), Range From Launch Platform to Target (km), Designator Type (dropdown), Tracking Method (Manual/Auto), Boresight (dropdown), and Acquisition Sensor (dropdown).
- Backscatter Avoidance Techniques:** Includes radio buttons for Backscatter Avoidance Techniques Employed?
- Missile CCM Switch:** Includes radio buttons for Missile CCM Switch (Up/Down).
- AIRCRAFT DATA:** Includes fields for Altitude (FL AGL), Tail Number, Call Sign, Speed (KNOTS), Missile Location (dropdown), Cockpit Video Available? (Yes/No), Prelaunch Bit (Pass/Not Performed/Fail), Missile Launched? (Yes/No), Missile Impact (dropdown), Range from launch to impact (km), Warhead Detonation (Yes/No/Unobserved), Probable Cause if Missed (dropdown), Describe Flight Anomalies (text area), and Accurate Captive Carry Hours.

Navigation and utility buttons include 'Save', 'Clear Form', 'Security Notice', and 'Accessibility Notice'.



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