

73rd MORSS CD Cover Page

UNCLASSIFIED DISCLOSURE FORM CD Presentation

712CD

For office use only 41205

21-23 June 2005, at US Military Academy, West Point, NY

Please complete this form 712CD as your cover page to your electronic briefing submission to the MORSS CD. Do not fax to the MORS office.

Author Request (To be completed by applicant) - The following author(s) request authority to disclose the following presentation in the MORSS Final Report, for inclusion on the MORSS CD and/or posting on the MORS web site.

Name of Principal Author and all other author(s):
Bruce H. Wardlow

Principal Author's Organization and address:
United States Army Operational Test Command
Aviation Test directorate
91012 Station Road
Fort Hood, Texas 76544

Phone: (254) 288-6281

Fax: (254) 288-1924

Email: bruce.wardlow@otc.army.mil

Original title on 712 A/B: Advanced Precision Kill Weapon System (APKWS) Acceptable Risk:
Experimental Pilots and Aircraft in Operational Testing

Revised title: N/A

Presented in (input and Bold one): (**WG_25** CG____, Special Session ____, Poster, Demo, or Tutorial):

This presentation is believed to be:
UNCLASSIFIED AND APPROVED FOR PUBLIC RELEASE

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE 22 JUN 2005		2. REPORT TYPE N/A		3. DATES COVERED -	
4. TITLE AND SUBTITLE Advanced Precision Kill Weapon System(APKWS)Acceptable Risk:Experimental Pilots and Aircraft in Operational Testing				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) United States Army Operational Test Command Aviation Test directorate 91012 Station Road Fort Hood, Texas 76544				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release, distribution unlimited					
13. SUPPLEMENTARY NOTES See also ADM201946, Military Operations Research Society Symposium (73rd) Held in West Point, NY on 21-23 June 2005. , The original document contains color images.					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT UU	18. NUMBER OF PAGES 14	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			



Advanced Precision Kill Weapon System (APKWS)

Acceptable Risk:

Experimental Pilots and Aircraft in
Operational Testing

73rd MORS Symposium 22 JUN 05

Operational Test Command



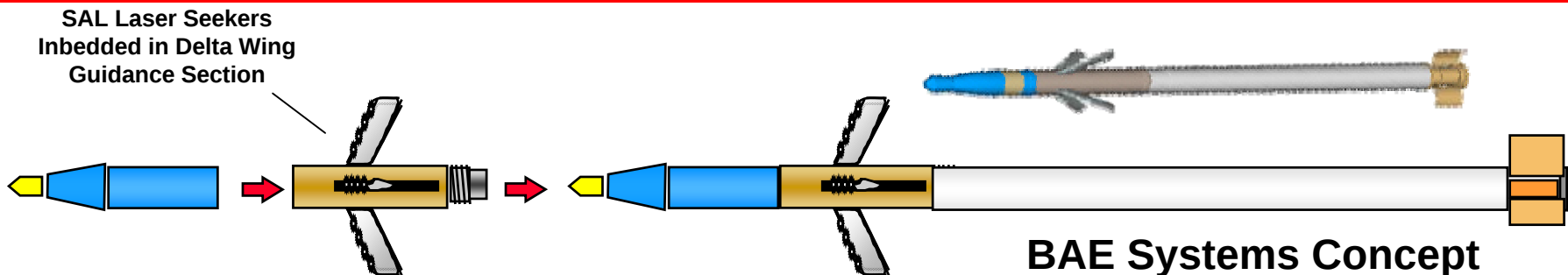
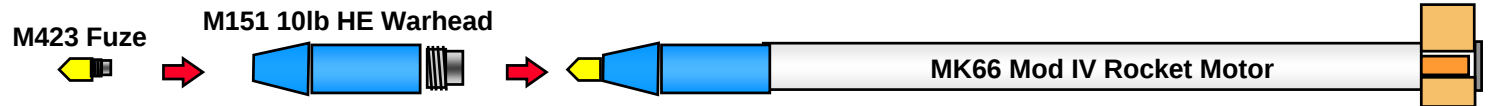
Tried and True Hydra-70





APKWS

Hydra-70, 2.75-inch rocket system comprised of launchers, system management electronics (weapon control unit), upgraded fire control software, a MK66 rocket motor, laser detection and guidance section, and warhead.



Operational Test Command



Traditional Test Path

- **Test Schedule and Review Committee (TSARC) coordinates with US FORCES COMMAND (FORSCOM) upon review of requested operational unit test player composition and targeted test dates.**
- **FORSCOM reviews potential units for availability of requested test unit composition and then availability of unit during requested testing dates.**
- **Test location determined.**
- **Training conducted**
- **Test executed.**



Why Did Different Choices have to be Considered?



- **Army Aircraft Usage.**
- **FORSCOM aviation unit operations tempo (OPTEMPO).**
- **Flexibility of unit to adapt to emerging development test results and test schedule changes (acceleration/slippage).**
- **Desire to have development test and a limited user test (operational test) back to back with only three working days between tests.**



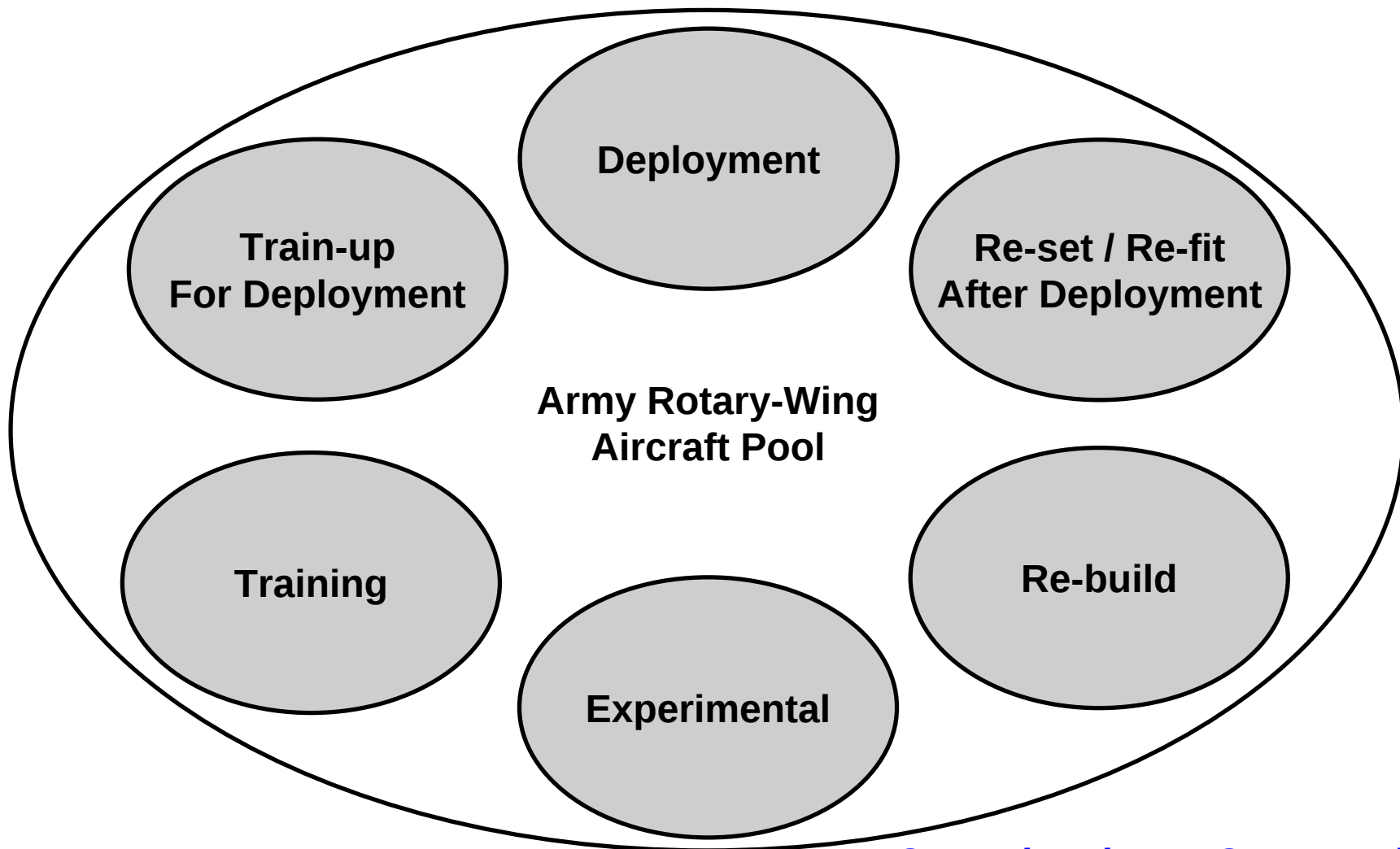
Army Aircraft Usage is UP



- **Number of available aircraft for test has diminished over the last three years due to active theaters:**
 - Korea
 - Afghanistan
 - Iraq
- **Non-deployed aviation assets committed:**
 - Training
 - Flying proficiency flights
 - Homeland security flights
 - VIP transport flights
 - Aircraft maintenance flights
- **Aircraft out of circulation:**
 - Aircraft upgrades
 - Aircraft Re-builds (forecasted and battle damage)
 - Transition of aircraft between elements for modularity



Army Rotary-Wing Aircraft OPTEMPO



Operational Test Command



What is Considered Experimental Aircraft

- For the Aviation Technical Test Center, an experimental aircraft is an aerial vehicle used for developmental flight testing and airworthiness qualification testing.
- Developmental flight testing of aircraft systems, subsystems, aircraft allied equipment and aviation life support equipment to influence the material acquisition decision making process.
- Airworthiness qualification testing focuses on assessing the handling qualities of the aerial vehicle and its performance (e.g., flight, hover, autorotation, etc) and flight in icing conditions.



Operational Test Command



Experimental Aircraft



- **PROs:**
 - Configured with on-board instrumentation.
 - Latest upgrades completed.
 - Robust maintenance data due to on-going reliability, availability, and maintenance (RAM) data collection.
- **CONs:**
 - No longer in an operationally fielded configuration.
 - Flight may be characteristics changed due to upgrades.



Who are Experimental Pilots?

- Graduates of the United States Naval Test Pilot School
 - 48 week course.
 - Conducted twice a year.
- Fixed-wing, rotary-wing, and airborne systems curriculums provide instruction in academics, flight test preparation, flight test conduct, data collection, data reduction, and test report preparation



Operational Test Command



Golden Crew

- For an AH-64D a golden crew is two experimental pilots.
- PROs of a golden crew:
 - Are the “best of the best”.
 - Highly adaptive to schedule change.
 - Disciplined in creating and maintaining conditions for data collection.
 - Keen sense of situational awareness.
- CONs of a golden crew:
 - In quest of data collection, create highly structure scenarios not reflecting the operational environment.
 - Absence of mistakes made by new pilots



Type III Error

Solving the wrong problem precisely is a type III error.

- **A type III can easily occur using experimental aircraft and pilots if two conditions are not managed:**
 - **The first condition is not using the same aircraft configuration as operational units.**
 - **Golden crews' skill and experience can prevent conditions from surfacing (key operational aspect) that new or lesser experienced pilots could encounter.**
- **Mitigation of these condition can be done by:**
 - **Returning experimental aircraft to operational configuration.**
 - **Mixed crews (experimental pilot and FORSCOM pilot).**



Conclusions

- **Experimental aircraft can be used once the aircraft are returned to a normally fielded configuration along with a certifying statement reflecting the configuration and noting any impact from leaving instrumentation in place.**
- **A mixed crew consisting of a FORSCOM pilot and an experimental pilot:**
 - **Capitalizes on data collection discipline.**
 - **Maintains newer (younger) pilot perspective.**
 - **Captures the broad spectrum of skills from new pilot to seasoned pilot.**
- **It is an acceptable risk to use experimental aircraft and pilots for a limited users operational test.**