

**ADVANCED TOMAHAWK WEAPON CONTROL SYSTEM  
MODELING AND SIMULATION**

**LAYING THE FOUNDATION FOR THE FUTURE**



**PRESENTATION TO THE HONORABLE JOHN DOUGLAS  
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# OVERVIEW

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- JOINT PRECISION STRIKE DEMONSTRATION
- STRIKE WARFARE SYSTEM INTEGRATION LAB
- VIRTUAL DEVELOPMENT LAB



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# **JOINT PRECISION STRIKE DEMONSTRATION**



# JPSD OBJECTIVES

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## MISSION

DEMONSTRATE AND DELIVER TO US FORCES KOREA (USFK) A SIGNIFICANTLY ENHANCED CAPABILITY TO DEFEAT NORTH KOREAN 240 MM MULTIPLE ROCKET LAUNCHERS (MRLS).

## GOAL

EVOLVE OPTIMUM SOLUTIONS IN JOINT AND COMBINED EXPERIMENTS AND EXERCISES.



# THREAT OVERVIEW

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- 240 MM MOBILE MULTIPLE ROCKET LAUNCHERS HAVE BEEN IDENTIFIED BY THEATER CINC AS A MAJOR PROBLEM
  - NO EFFECTIVE COUNTER CURRENTLY IN THEATER
  - NUMBER AND LOCATION OF LAUNCHERS POSE MAJOR THREAT TO SEOUL AND FORCES ACROSS DMZ
- TARGET MRL STORAGE/RELOAD SITES TO DISRUPT OPERATIONAL TEMPO
  - TRAP MRLS IN CAVES OR PREVENT FROM RELOADING
  - PREVENT SUBSEQUENT SALVOS DURING INITIAL HOURS OF HOSTILITIES
  - PROVIDE TIME TO BRING ADDITIONAL COUNTER-MRL WEAPONS INTO THEATER



# NAVY PURPOSE

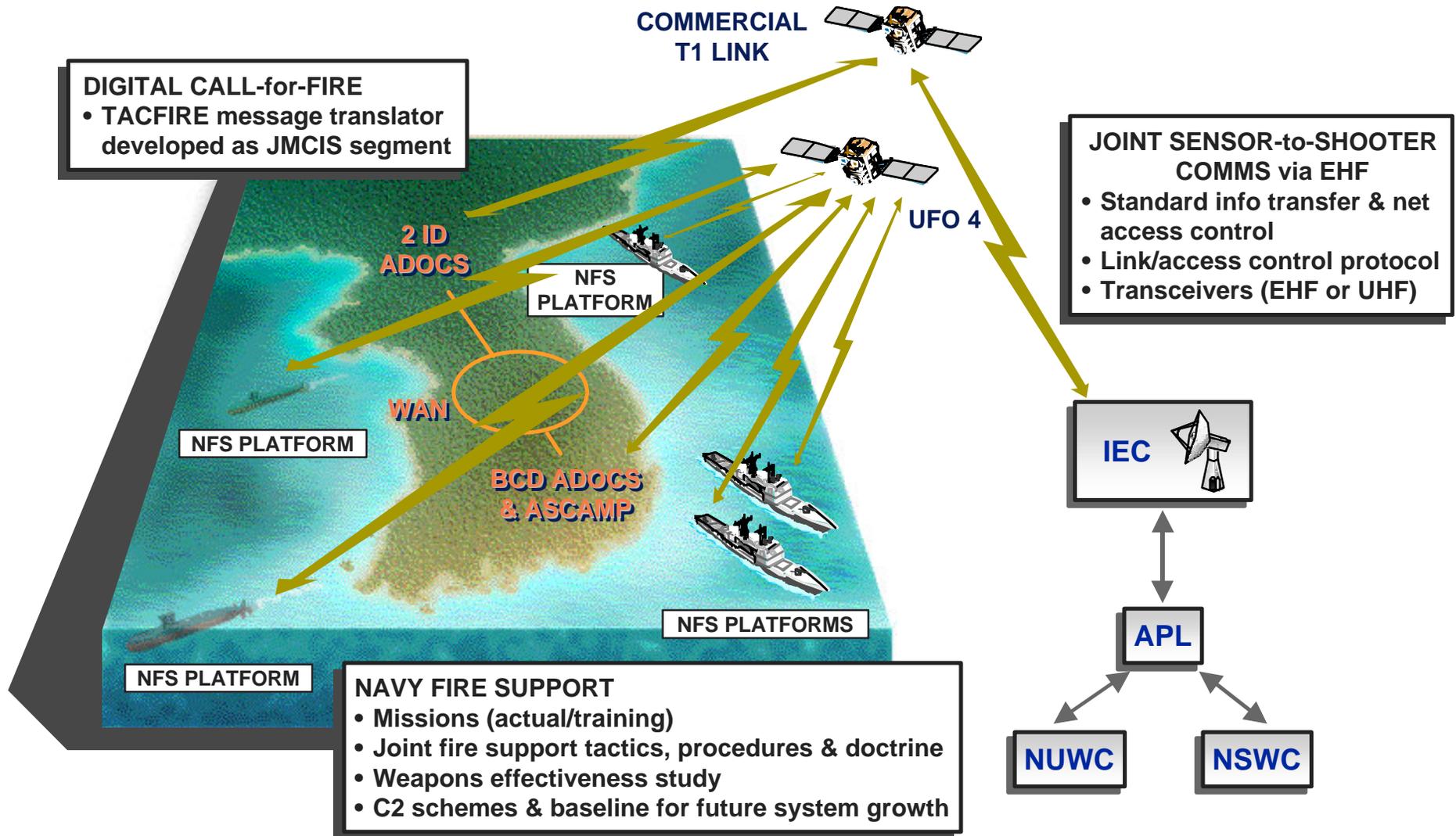
## LAY A FOUNDATION FOR NAVAL FIRE SUPPORT (NFS) AND THE FUNCTIONALITY REQUIRED FOR NFS WEAPONS CONTROL

- EVOLVE TRADITIONAL STRATEGIC WEAPONS AND SYSTEMS INTO A MORE TACTICAL ROLE FOR SUPPORT OF FORCES ASHORE
- APPLICABLE TO ALL WEAPONS CONTROLLABLE UNDER UPGRADED ATWCS FUNCTIONALITY
  - TOMAHAWK
  - SEA SLAM
  - HARPOON BLK II
  - MARINIZED ATACMS
  - SM-2 STRIKE
  - SCRAMSHELL
  - ERGM
  - VGAS
  - FAST HAWK
  - 5"/54
- LAY THE GROUNDWORK FOR FUTURE SHIPS (SC-21 AND ARSENAL SHIP)

**PROVIDE A JOINT SOLUTION**



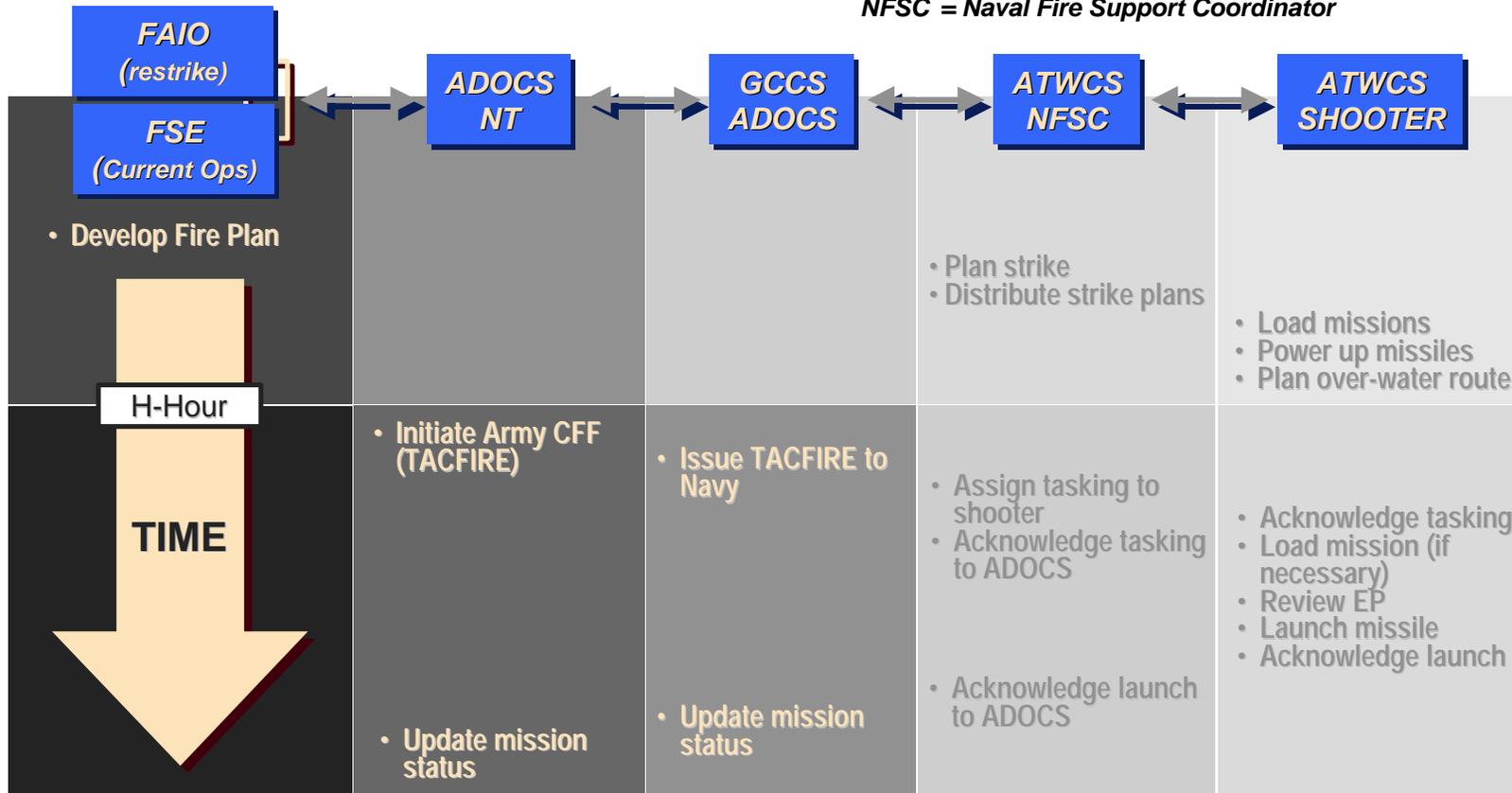
# JPSD 96 NAVY CAPABILITIES





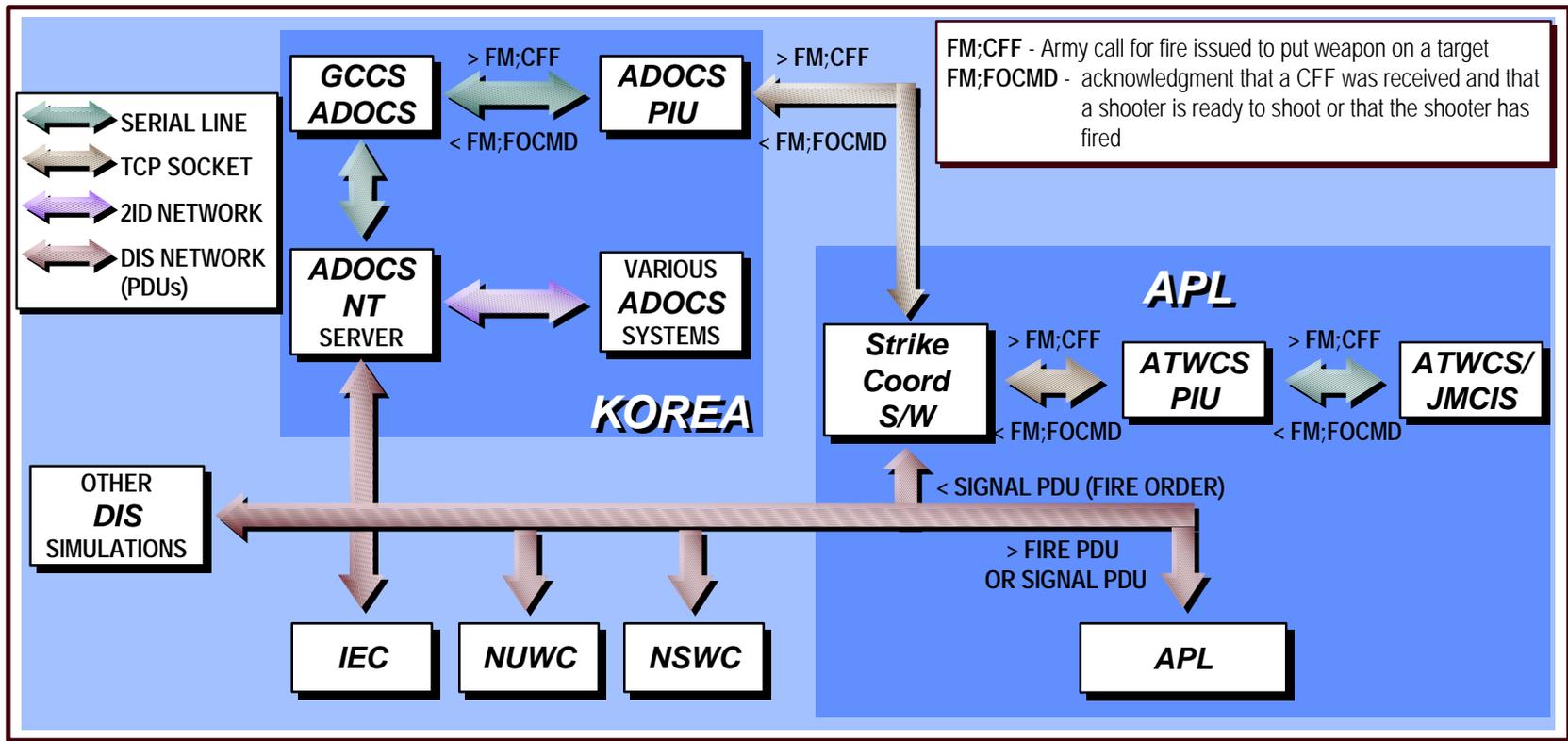
# TTPS FOR ON-CALL JOINT FIRE SUPPORT

**FSE** = Fire Support Element  
**FAIO** = Field Artillery Intelligence Officer  
**NFSC** = Naval Fire Support Coordinator





# JPSD SIMULATION DATA FLOW





# SIMULATION ARCHITECTURE DESCRIPTION

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- ADOCS (KOREA) TO ATWCS (JHU/APL) LINK VIA NETWORK T1 LINE
  - “PIUS” ENABLE CONNECTION OF SYSTEMS TO THE SIMULATION ENVIRONMENT
- STRIKE COORDINATION PROTOTYPE SOFTWARE
  - PROVIDES PROTOTYPE FORCE STRIKE COORDINATION CAPABILITY NOT YET AVAILABLE IN ATWCS
  - BRIDGES OPERATIONAL FORCE COMMUNICATIONS TO SIMULATED ENTITIES (SHOOTERS AND MISSILES)
    - TACFIRE MESSAGES IN OPERATIONAL ENVIRONMENT
    - DISTRIBUTED INTERACTIVE SIMULATION PDUS IN SIMULATED ENVIRONMENT
    - SIMULATED SHOOTERS AT NAVY LABS (JHU/APL, NSWC, NUWC)



# CONCLUSION

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- JPSD 96
  - FACILITATED ADVANCE SYSTEM APPLICATIONS IN A SIMULATED BATTLEFIELD
  - EXPLORED AND VALIDATED FUTURE OPERATIONAL CONCEPTS
- LAYING THE FOUNDATION FOR THE FUTURE
  - STRIKE WARFARE SYSTEM INTEGRATION LAB (SWSIL)
    - A CERTIFIED “END TO END” CAPABILITY TO ACCURATELY TEST TOMAHAWK WEAPON CONTROL SYSTEMS
  - VIRTUAL DEVELOPMENT LAB (VDL)
    - DISTRIBUTED SOFTWARE DEVELOPMENT THAT ALLOWS IMMEDIATE INTEGRATION, TESTING AND CUSTOMER FEED BACK
    - ACQUISITION CENTER OF EXCELLENCE (ACE) INTEREST

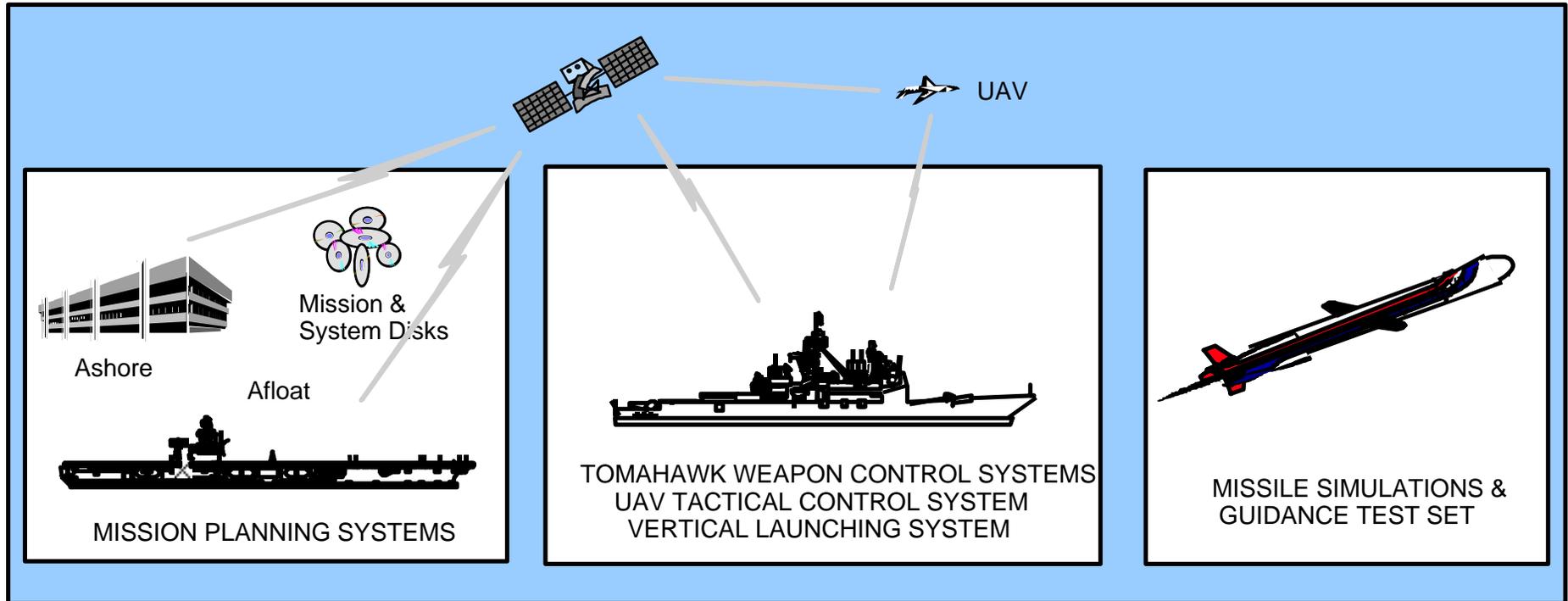


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# **STRIKE WARFARE SYSTEM INTEGRATION LAB**



# STRIKE WARFARE SYSTEM INTEGRATION LAB



- **CERTIFIED SYSTEM FOR TESTING TOMAHAWK WEAPON CONTROL SYSTEM**
  - **USES ACTUAL EQUIPMENT AND IS SUPPORTED BY ACCURATE MODELS AND SIMULATIONS**
  - **AS TOMAHAWK BECOMES “SMARTER”, SWSIL FACILITATES ROBUST DYNAMIC TESTING WHILE LOWERING COSTS.**

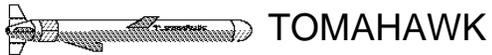


# ATWCS TCG-R OPERATIONAL EVALUATION

## LIVE SHOTS VS SIMULATED SHOTS



CHASE AIRCRAFT



TOMAHAWK

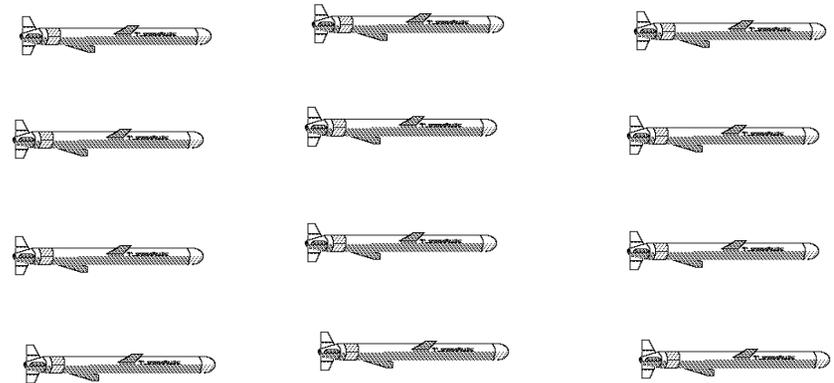
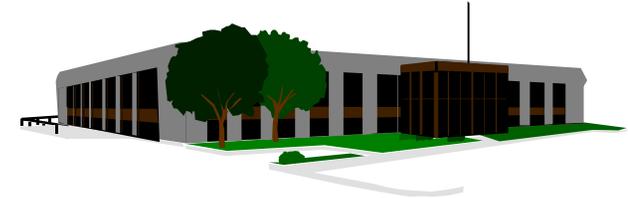


LAUNCH PLATFORM



TEST RANGE

LAB



1 MISSILE IN 1 DAY

12 MISSILES IN 3 DAYS



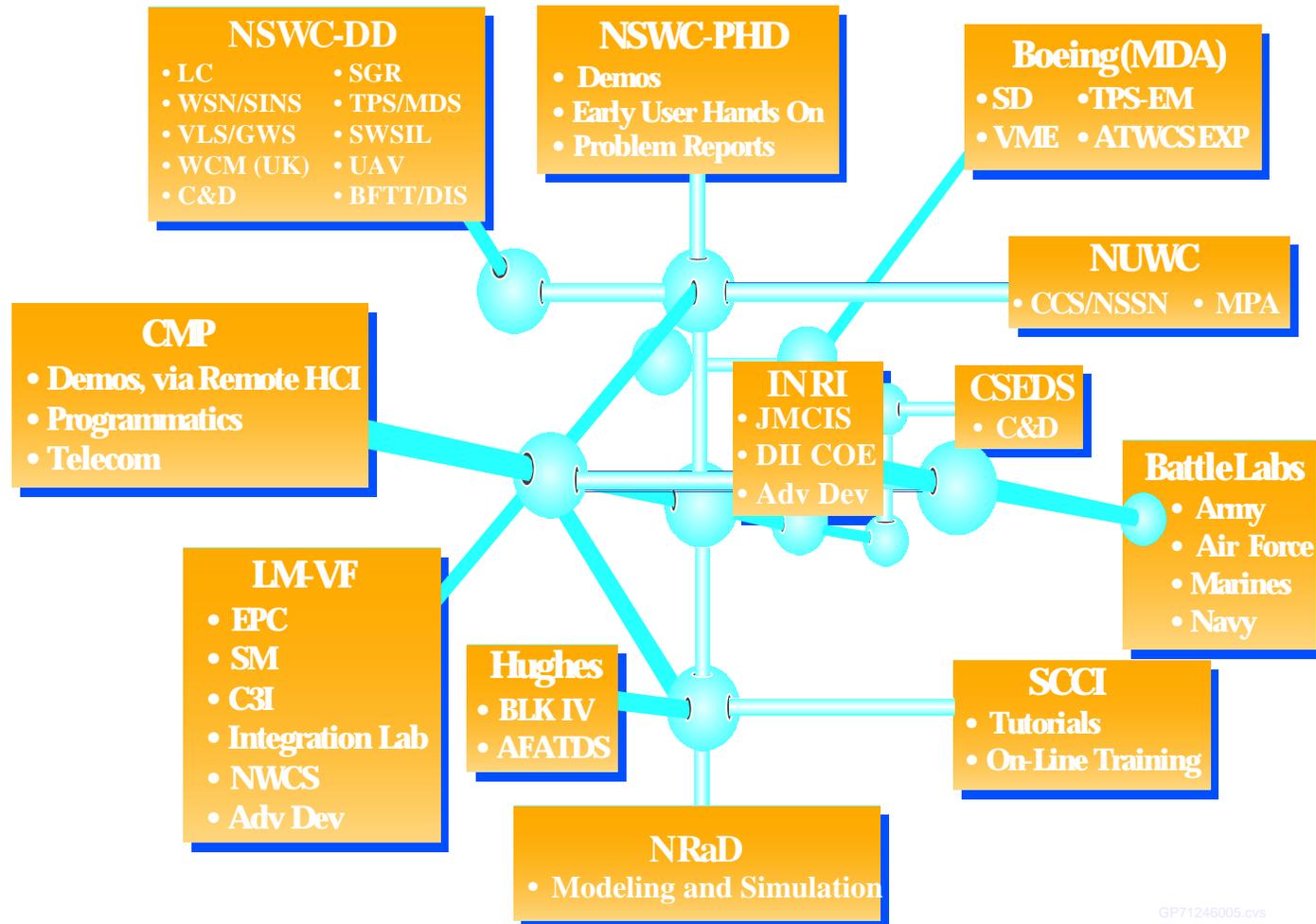
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# VIRTUAL DEVELOPMENT LAB

*AN IDEA FOR THE FUTURE*



# Objective Virtual Development Environment





# VIRTUAL DEVELOPMENT

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- THE VIRTUAL DEVELOPMENT ENVIRONMENT SHOULD:
  - ALLOW NEW TECHNOLOGY DEVELOPMENT, DEMONSTRATION AND INTEGRATION
  - REDUCE LIFE CYCLE COST, RISK AND SYSTEM UPGRADE CYCLE TIME
  - ACCELERATE TECHNOLOGY TRANSITION INTO FLEET PRODUCTS



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# QUESTIONS