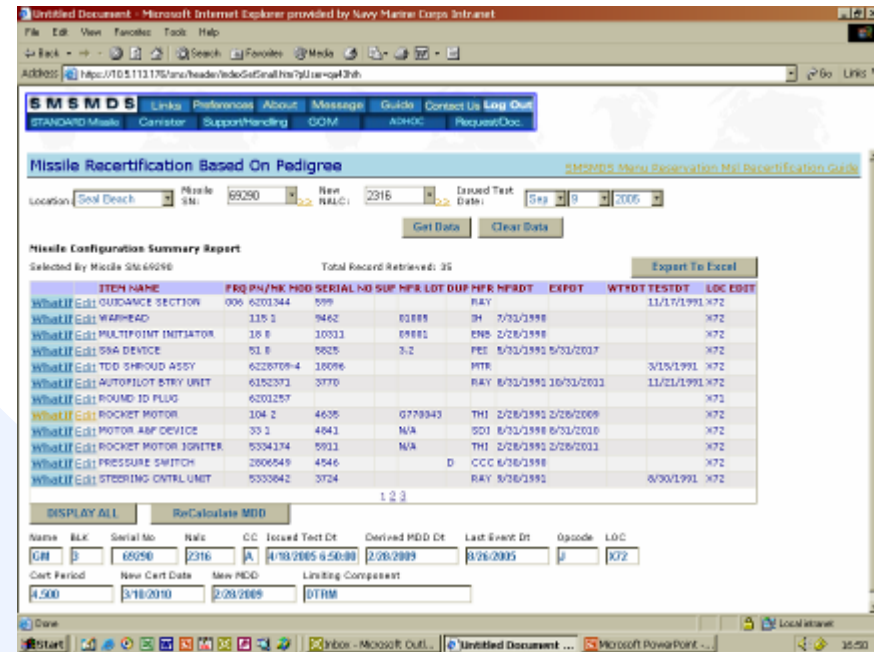


Reliability Based Maintenance

- Maintenance Due Dates Based on Pedigree
- Allows Dynamic Hardware “What ifs”
- Optimization Analysis
 - Maximize Reliability or
 - Maximize Availability or
 - Minimize Cost

- Weapon Spec. Reliability
- Service Life Limited Components



Missile Configuration Summary Report

Selected By Missile S/N: 69290

Total Record Retrieved: 35

ITEM NAME	FRQ	P4	MK	MDD	SERIAL NO	SUP	MFR	LOT	DUP	MFR	MFRDT	EXPDT	WTYDT	TESTDT	LOC
WhatIf Edit: GUIDANCE SECTION	006	6201344	599				RAY							11/17/1991	K72
WhatIf Edit: WARHEAD	115	1	9462		03888		SH			7/31/1998					K72
WhatIf Edit: MULTIPoint INITIATOR	10	8	10033		09881		ENS			2/28/1998					K72
WhatIf Edit: S&A DEVICE	51	8	5825		3-2		PES			5/31/1991	5/31/2007				K72
WhatIf Edit: TDD SHROUD ASSY	6228709-4		18096				MTR							3/15/1991	K72
WhatIf Edit: AUTOPILOT STRY UNIT	6152371		3770				RAY			8/31/1991	10/31/2001			11/21/1991	K72
WhatIf Edit: ROUND ID PLUG	6201257														K71
WhatIf Edit: ROCKET MOTOR	104	2	4635		0779943		TH1			2/28/1991	2/28/2009				K72
WhatIf Edit: MOTOR AMP DEVICE	33	2	4041		N/A		SO1			8/31/1998	6/31/2010				K72
WhatIf Edit: ROCKET MOTOR IGNITER	5334174		5911		N/A		TH1			2/28/1991	2/28/2001				K72
WhatIf Edit: PRESSURE SWITCH	2806549		4546				D			CCC	6/28/1998				K72
WhatIf Edit: STEERING CNTRL UNIT	5333842		3724				RAY			5/28/1991				8/30/1991	K72

DISPLAY ALL ReCalculate MDD

Name: BLK Serial No: N/A C.C. Issued Test Dt: 4/19/2005 6:50:00 Derived MDD Dt: 2/28/2009 Last Event Dt: 3/26/2005 Opcode: K72

GM: 0 69290 2316 A 4/19/2005 6:50:00 2/28/2009

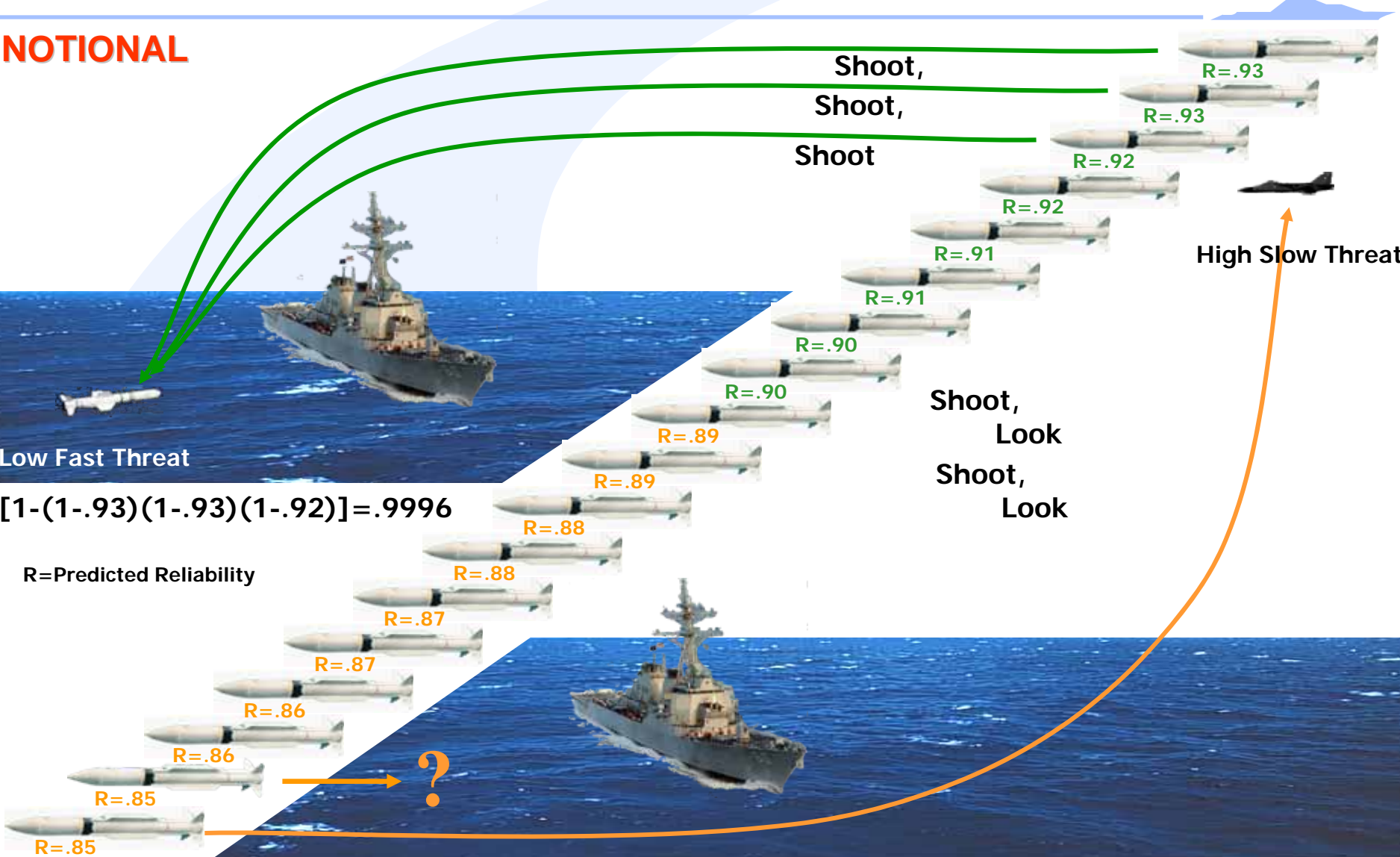
Cart Period: 4.500 New Cart Date: 3/18/2010 New MDD: 2/28/2009 Linking Component: DTRM

UID Benefits

- Dynamic Tactics & Doctrine
- Optimized Asset Allocation
- Reliability Centered Maintenance
 - Advanced Diagnostics
 - Prognostics
 - Vehicle Health Management Systems
- Autonomic Logistics

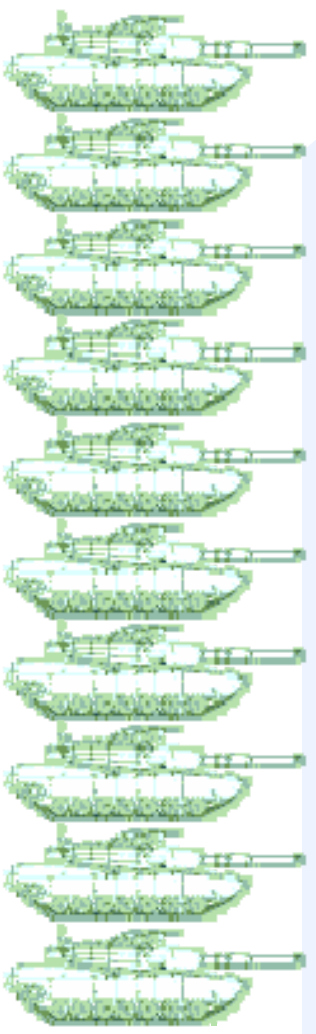
Dynamic Tactics & Doctrine

NOTIONAL



Allocation w/o Reliability Models

M1A1 Main Battle Tanks 100 Available



Average Reliability of Engine/Transmission for each 500Km driven = 0.929



Required Tanks for Mission A = 80
Tanks to Allocate for Mission A = 100

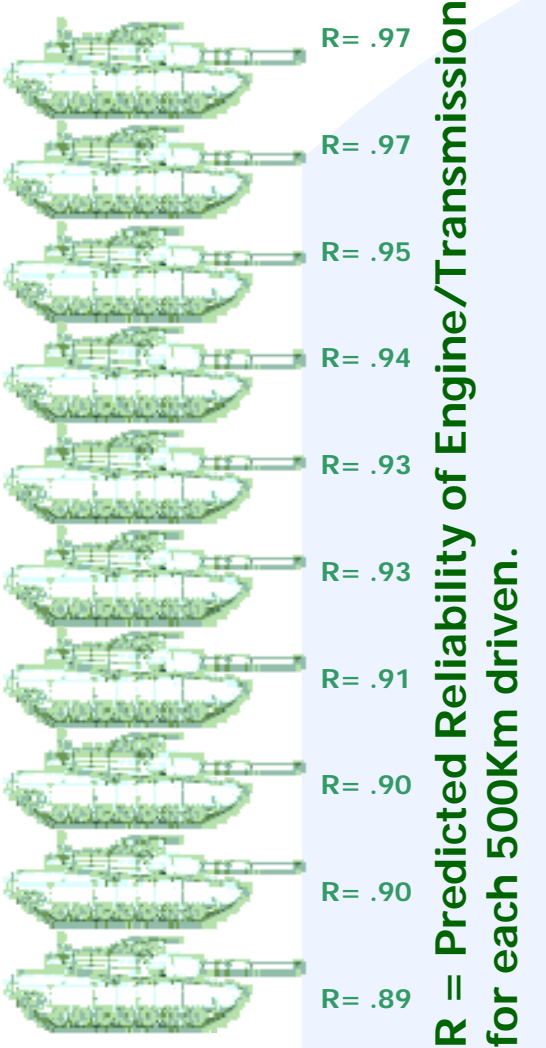
Mission A
"Kick Down the Front Door"
80 Main Battle Tanks Required
Distance to Objective 450Km

Mission B
"Close the Back Door"
10 Main Battle Tanks Required
Distance to Objective 100 Km

Assets Unavailable For Mission B

Intelligent Allocation w/ Reliability Models

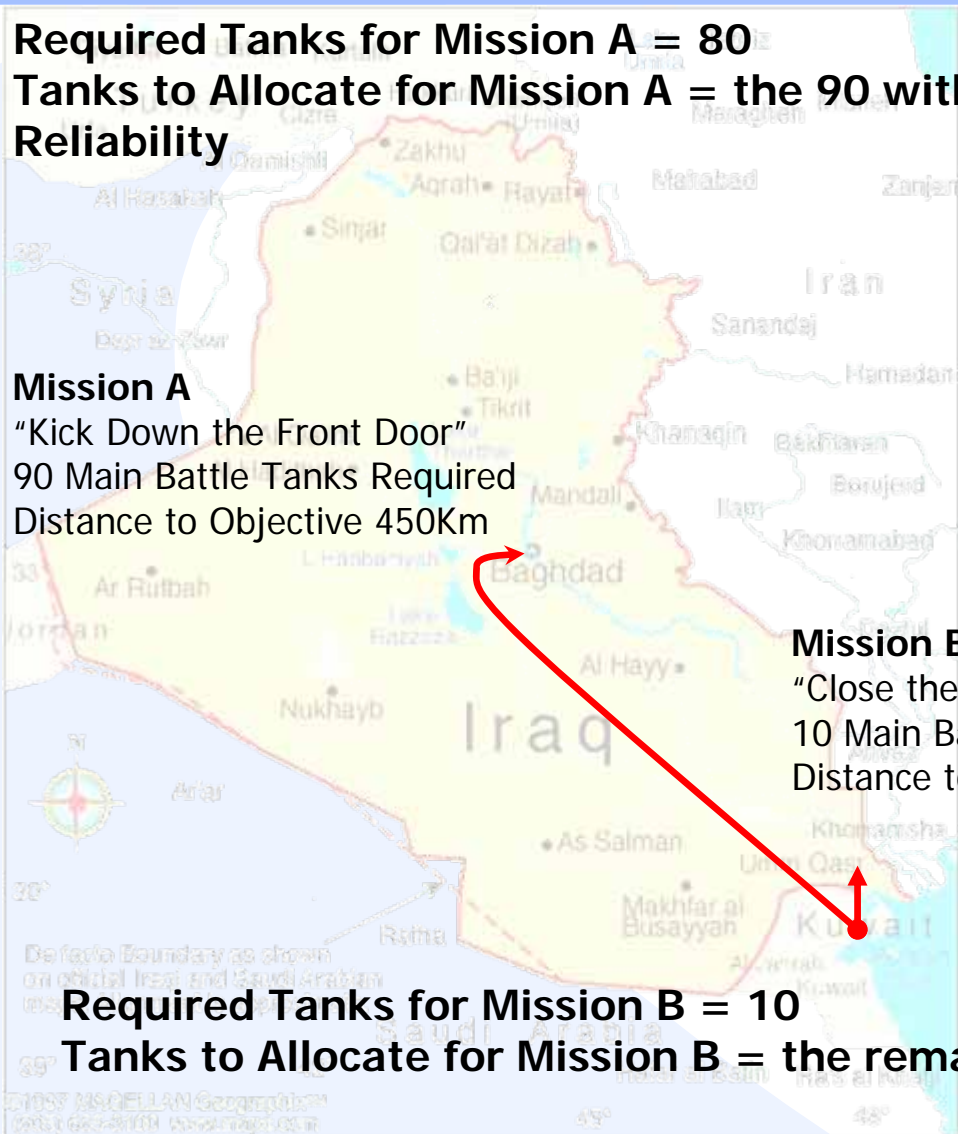
M1A1 Main Battle Tanks 100 Available



R = Predicted Reliability of Engine/Transmission for each 500Km driven.

Required Tanks for Mission A = 80
Tanks to Allocate for Mission A = the 90 with the highest Reliability

Mission A
"Kick Down the Front Door"
90 Main Battle Tanks Required
Distance to Objective 450Km



Mission B
"Close the Back Door"
10 Main Battle Tanks Required
Distance to Objective 10 Km

Required Tanks for Mission B = 10
Tanks to Allocate for Mission B = the remaining 10



**QUESTIONS
&
ANSWERS**

Back Up Slides



BENEFITS OF UID FOR STANDARD Missile

Improvements

- **Automated Data Entry**
 - Data Quality
 - Data Timeliness
- **Document Processing**
- **Old Duplication Problems Resolved**

Program Planning & Program Execution

Find Problems

Root of the problem:

- Hardware
- Test System
- Personnel/Training

Check Processes

- Verify Criteria is Effective
- Feed back into R&D
- Failure Finding Interval (FFI)

SM CORROSION/MOISTURE DAMAGE STUDY

CHECKING PROCESSES

Issue

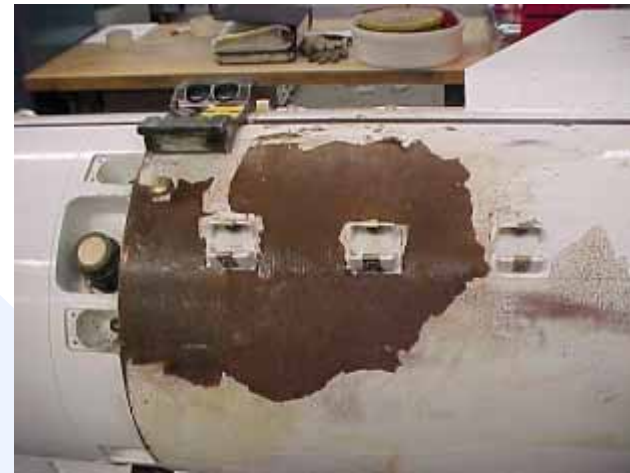
Past moisture damage or corrosion to the missile might affect flight reliability or missile performance.

Action

NSWC Corona Division determined the effect of corrosion/moisture on missile reliability.

Result

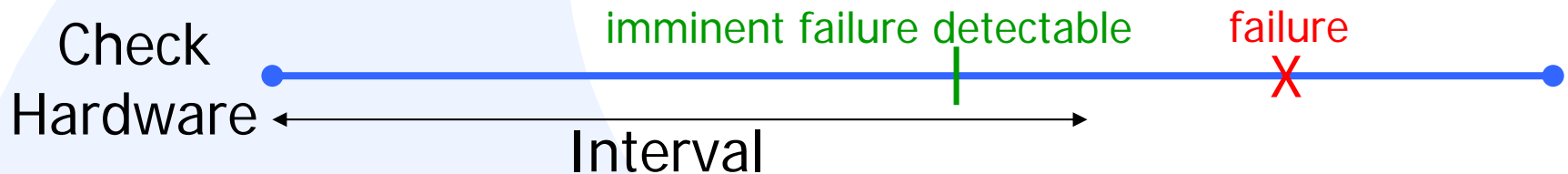
Analysis showed corrosion/moisture damage did not significantly affect missile flight reliability. Concluding the current maintenance procedures in place effectively 'catch' corrosion/moisture related problems before they affect missile flight reliability. Areas for further improvement and prevention of corrosion and its impact help SM-3.



Corrosion/Moisture Study

Failure Finding Interval

NSWC Corona's experience/expertise in determining Missile Recertification Intervals can be used to determine the FFI needed for RCM.



Missile Recertification Intervals are like Failure Finding Intervals (FFI)

- Based on hardware failing at an unknown time
- Trade-offs made between short and long intervals (risk / cost)
- Difficult to determine and justify
(often important effects are non-linear)

ASSET MAINTENANCE AND LOGISTICS INFORMATION FLOW

