EX 437
Multi-Option Fuze for Navy

Chad Finch
Naval Surface Warfare Center Dahlgren

47th Annual Fuze Conference
“Enhancing Weapon Performance”
April 8-10, 2003
5” Conventional Ammo
M762A1 to MK 432 Conversion

M762A1

MK 432 MOD 0
M782 Multi-Option Fuze for Artillery

OperationalModes

Surface Proximity (HOB)

Point Detonating Delay

Electronic Time (ET)

HSMST

Point Detonating (PD)
What is “Navalization”? 

A “Navalized” MOFA must be:

- **Compatible with Navy guns**
  - Changes to fuze’s inductive coil / circuit
  - Changes to fuze’s inductive interface (software)
  - Increased precision in electronic time mode
    - High Speed Maneuvering Surface Target (HSMST)

- **Safe in Navy guns**
  - Changes to S&A to increase arming distance
  - Changes in software to delay charging of firing circuit
Compatible with Navy Guns

- MOFA will not set with MK 34 Fuze Setter
- MOFA inductive coil similar to M762A1
- For M762A1 to MK 432 conversion
  - Replaced M762A1 coil w/ MK 419 MFF coil

M762A1 Coil

MK 432 Coil
Compatible with Navy Guns

- For M782 MOFA to EX 437 conversion
  - MK 419 coil will not fit into MOFA
  - Proximity sensor limits available space
- Promising results from initial testing
  - 575 turns w/ 38 awg wire (fits on MOFA bobbin)
  - Small ferrite core (fits under MOFA bobbin)
  - Series resonant circuit
Compatible with Navy Guns

MK 34 Setter Coil

Fuze Coil
• MOFA uses a 23-bit binary message
  – ET is settable in 0.1 second increments
• Navy requires a 26-bit binary message
  – “We’re kicking it up a notch!”
    to allow setting in 0.01 second increments
  – A must have for engaging HSMST
Safe in Navy Guns

• MOFA uses an M739-type S&A
  – Minimum arming distance of 205 ft in the 5” gun

• Conducted a study to assess hazard for arming distances between 200 and 4800 ft
  – Assuming a fuze function at arming
  – All distances posed a 1-D risk (MIL-STD-882C)

• Selected 400 feet as the minimum arming distance
  – Gets fuze beyond stern of ship
  – Requirement for close in engagement
Safe in Navy Guns

- M739 was modified in early ‘80s in a joint Army-Navy PIP
  - 375 ft no-arm distance verified

- Change Rotor Material to Aluminum
- Increase Moment of Inertia
Program Strategy

• Maximize commonality with MOFA
  – Follow the M762A1 - MK 432 example
• Strong Navy-Army-Industry Team

NSWC Crane          ARDEC

NSWC Dahlgren       Industry
Basic Approach

Π Feasibility / Risk Reduction Effort - 3rd Qtr ‘02
  Π Issued competitive small purchase contracts
  Π ARDEC - began software upgrade
  Π Develop S&A model

Π Issue Competitive RFP - Jan ‘03
  – S&A, inductive set, software development
  – 400 fuze qualification build & test
  – 5,000 fuze production option
## Schedule

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