



CAD/PAD International Logistics Meeting (ILM)

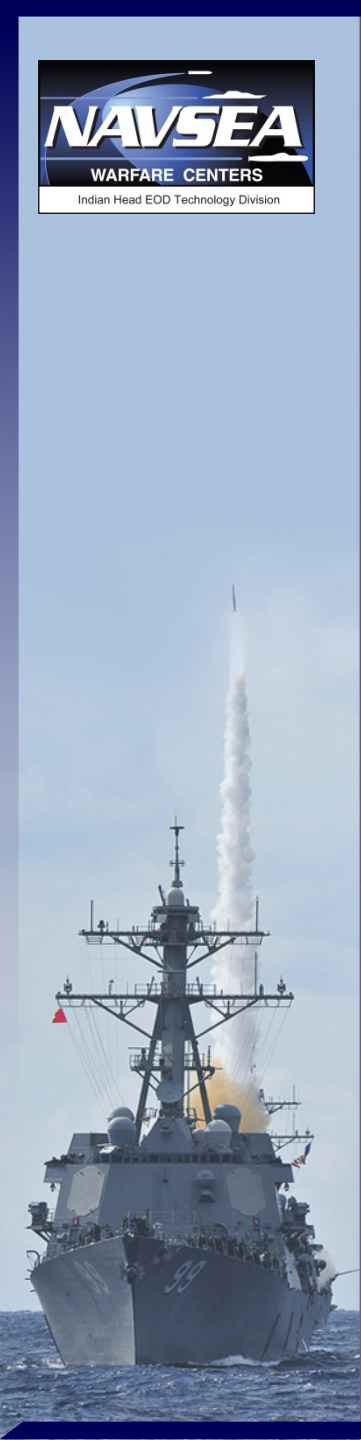
USN and USMC CAD/PAD MIST/EI/CODR

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- 11 June 2019 -

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Abstract

- Provides a summary of recent United States Navy and Marine Corps mishaps, Conventional Ordnance Deficiency Reports (CODR) and Engineering Investigations (EI) that were supported from June 2018 through March 2019. Status and key findings will be provided.



MIST CODR/EER & EI Definition

- What is Mishap Investigation Support Team (MIST), CODR and EI?
- The MIST is managed and funded by NAVAIR
- The team consists of an escape systems engineer, a survival equipment specialist and a CAD/PAD equipment specialist
- The primary mission for MIST is to provide expert level support to the Naval Safety Center and the Aircraft Mishap Board on class “A” mishaps involving the escape systems

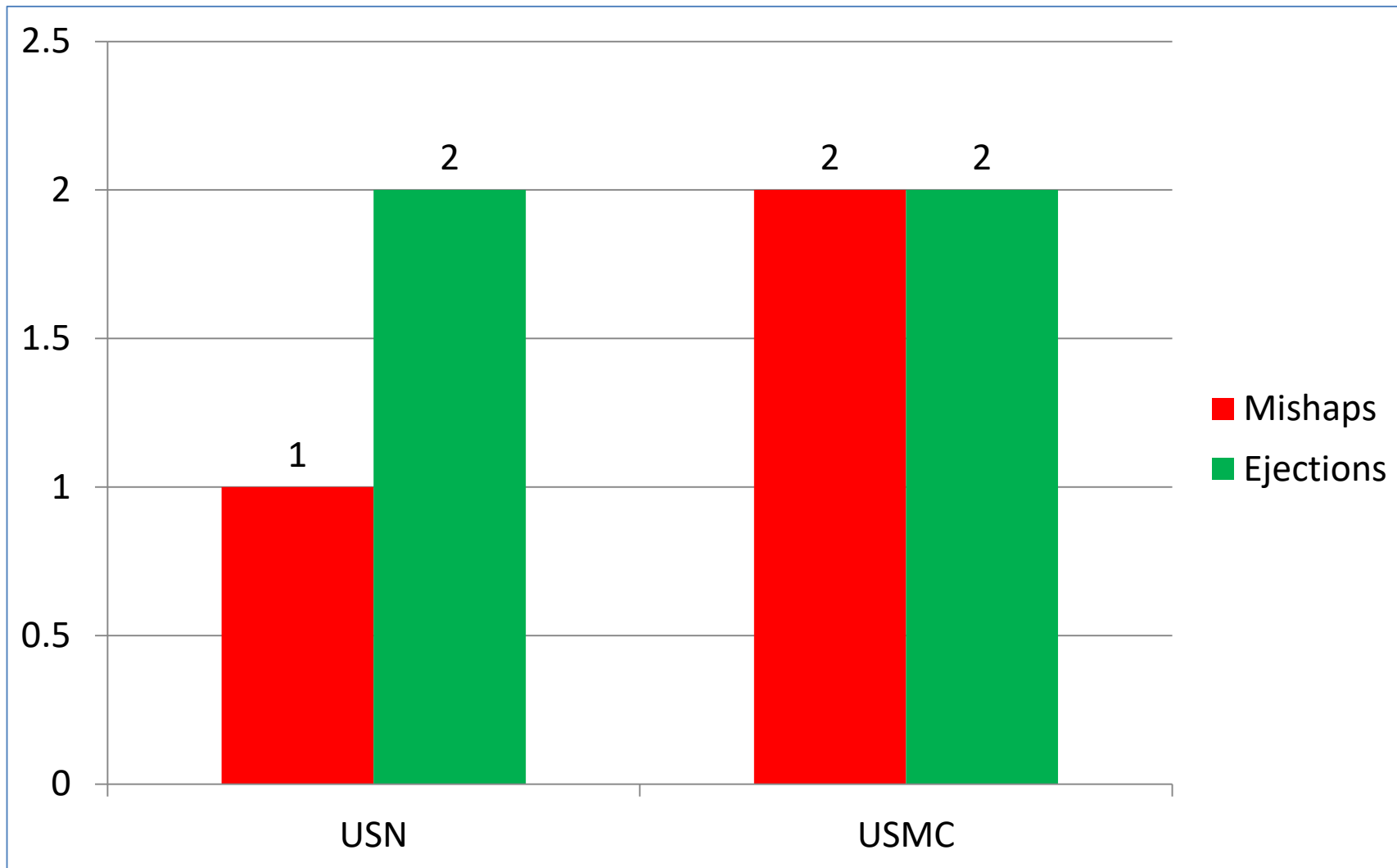


MIST CODR/EER & EI Definition

- A CODR is a naval message drafted by the end user describing fleet deficiencies for CAD/PAD devices
- An EI can be opened on a CODR by the Fleet Support Team if a need is seen for further action and investigation



June 2018 – March 2019 Class “A” Mishaps



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CLASS "A" Mishaps USN/USMC

- 29 Sept. 2018 Beaufort, South Carolina. F-35B was lost during routine training mission. Pilot ejected without injury. **MIST activated**
- 12 Nov. 2018 Philippine Sea. F/A-18F crashed into water during day approach. Pilot and Weapons Systems Officer ejected safely. MIST not activated
- 5 Dec. 2018 Pacific Ocean, Japan. F/A-18D and C-130J collided during night aerial refueling. 1 ejected ok, 1 ejected fatal, 5 C-130 crewmembers lost at sea. MIST not activated, but participating in flight gear investigation



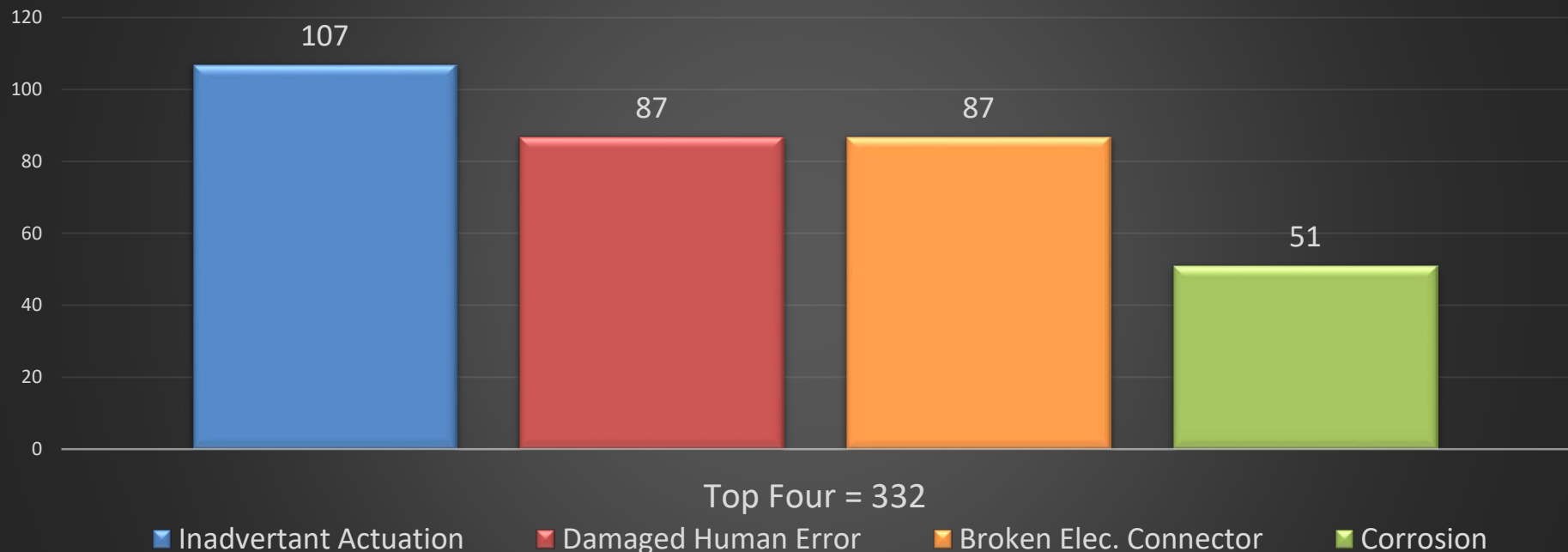
Other MIST Supported CLASS “A” Mishaps

- 22 June 2018 White Sands Missile Range, New Mexico. A-29 crashed during bombing exercise. 1 ejected ok, 1 ejected fatal. **MIST activated**
- 27 April 2018 Gaborone, Botswana. BF-5 crashed during flight demonstration exercise. 1 fatal. **MIST activated** February 2019

CODR Reporting

- From June 2018 to March 2019, there have been almost 500 CAD/PAD devices reported, totaling over one million dollars worth of devices

Most Reported Deficiencies June 2018 to March 2019



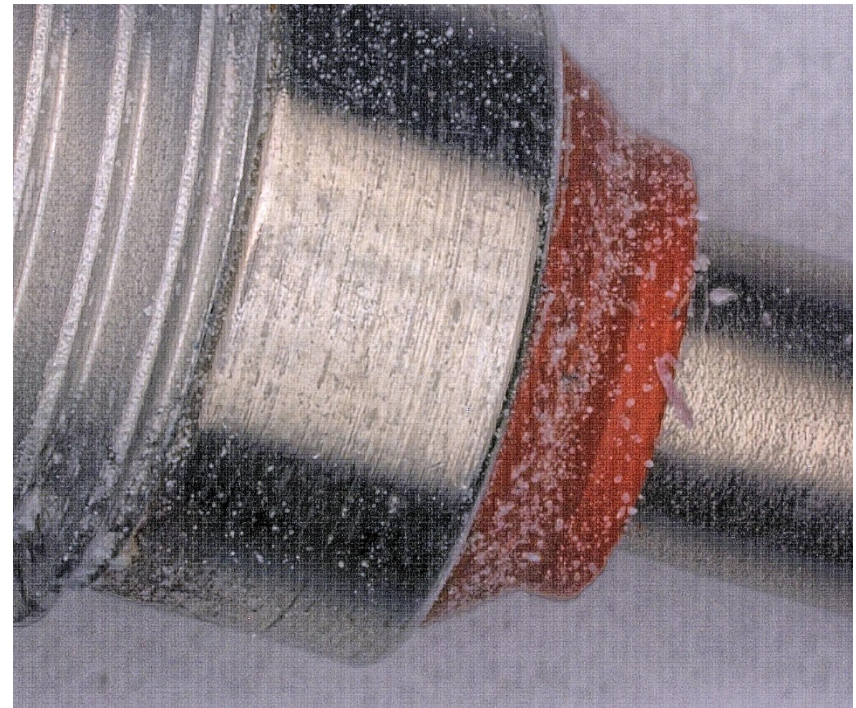


CODR Breakdown

- 107 inadvertent actuations:
 - 39 were from fire extinguishers
 - 13 of them WB53 H-60 Fire Extinguisher Cartridges
 - 19 from a canopy actuation
- 87 broken electrical connectors:
 - 61 were WB53 H-60 Fire Extinguisher Cartridges
- 87 damaged human error:
 - 46 were shielded mild detonating cords (SMDC)
- 51 reported for corrosion:
 - 26 were from V-22 JL01 External Initiator

Open Engineering Investigations

- Open:
 - T-6 SMDC: Corrosion, Seized JL50 to acceptor. At the lab having the corrosion analyzed





Open Engineering Investigations

- Open:
 - T-6 SMDC: Corrosion, Seized JL50 to acceptor continued
 - Lab Analysis:
 - Clear, crystalline-like particles
 - Elements detected from the particles are aluminum and chlorine, silicon, carbon and oxygen
 - Near the thread, grease like material was found
 - More testing of the elements found needed

Open Engineering Investigations

- Open:
 - WB53 H-60 Fire Extinguisher Cartridge x 2: Broken electrical connector. Item has been shipped to Naval Surface Warfare Center Indian Head Explosive Ordnance Disposal Technology Division (NSWC IHEODTD)
 - WB53 H-60 Fire Extinguisher Cartridge: Broken electrical connector. Received with no post/connecting point



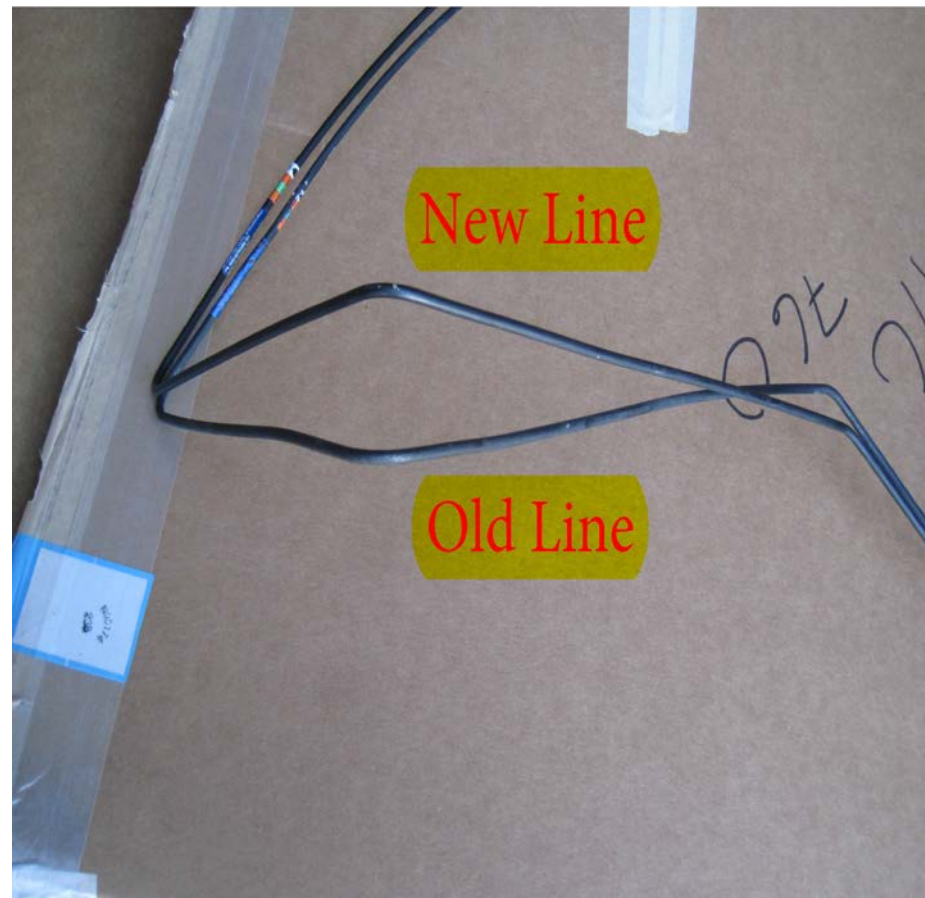
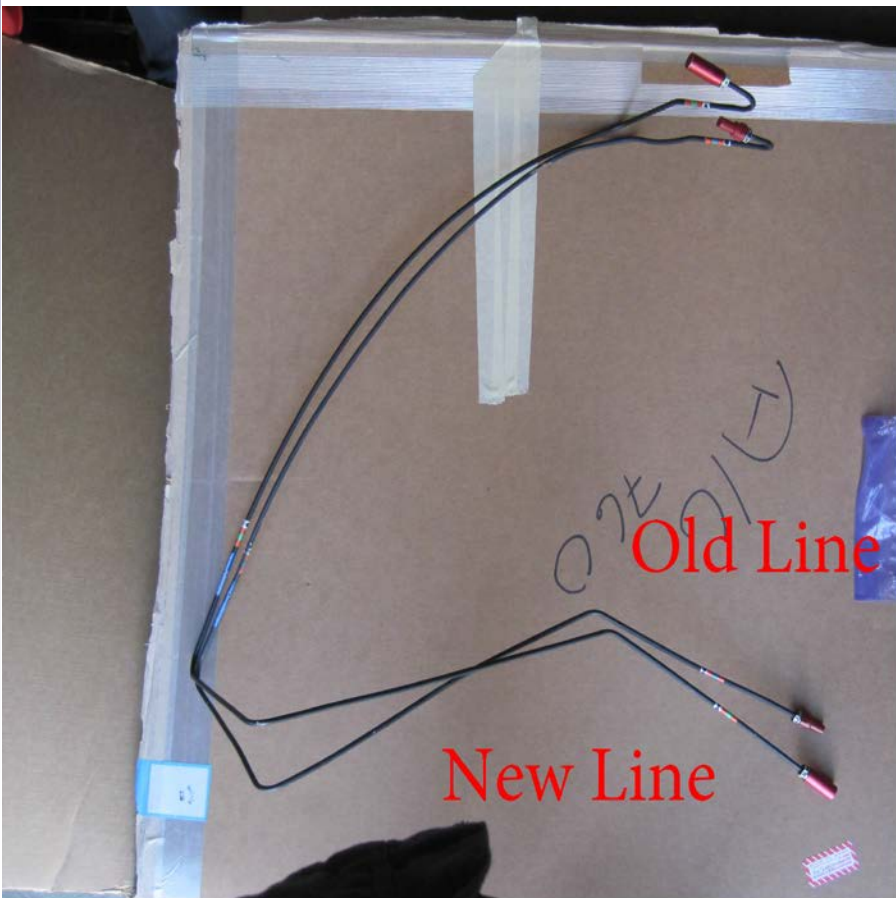


Open Engineering Investigations

- Open (con't):
 - AH-1Z SMDC x4: Bent SMDC line from manufacturer. On-site engineering investigation conducted
 - Four different SMDC lines from the same command all had incorrect bends upon initial install
 - All four devices shipped to NSWC IHEODTD for additional investigation
 - JL50 T-6 SMDC: Bent SMDC line from manufacturer. Received, looking through stock for matching bends
 - JM61 CH-53 Fire Extinguisher Cartridge: Broken Electrical Connector. Newly designed cartridge broken on initial install. Awaiting shipment of device

Open Engineering Investigations

AH-1Z bent SMDC lines





Open Engineering Investigations

- Open (con't):
 - V-22 Rescue Hoist Cartridge: No lot number. Awaiting shipment of device
 - F/A-18 PDRM x4: Corrosion. Awaiting shipment of devices
 - Four PDRM's from the same base, but different commands
 - Corrosion on ignitor upon opening of the barrier bag during initial install
 - All of the PDRM's were reworked from NSWC IHEODTD
 - NSWC IHEODTD is enforcing a more strict inspection criteria for reworked PDRM's

Open Engineering Investigations

- Open (con't):



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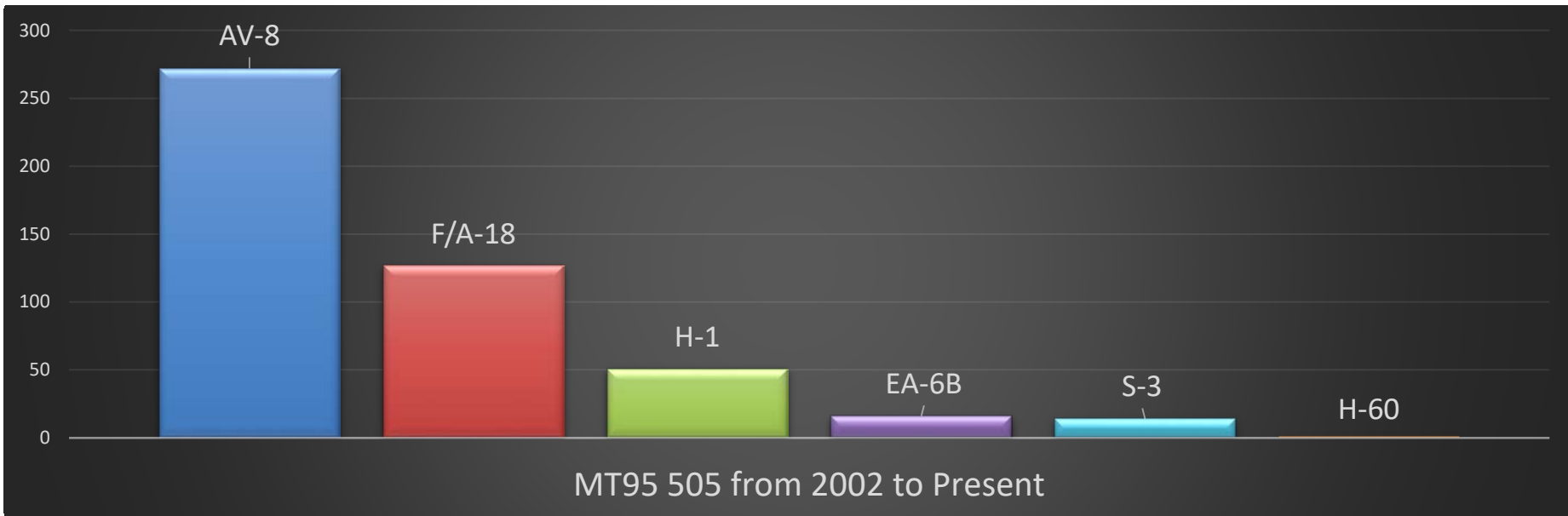
Open Engineering Investigations

- Open (con't):
 - MT95 AV-8 Stores Release Cartridge: Failed to fire. Item has been shipped to NSWC IHEODTD
 - After doing extensive research on all 600 CODRs, it was determined that 95 of them could be eliminated from the list as they were non-applicable to this study. The remaining 505 CODRs are broken down by aircraft platform on the next slide



Open Engineering Investigations

- Open (con't):
 - As seen in the graph, the AV-8 makes up 54% of the total CODRs for the MT95 with 272 dating back to 2002. The F/A-18 comes in second with 127 MT95 CODRs. Since January of 2016, there were 150 MT95 CODRs with 131 of them, 87% originating from the AV-8 platform. Out of those CODRs, 102 or 78% were associated with the BRU-70 or Digital Improved Triple Ejector Rack system



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Engineering Investigations

- Closed:
 - AV-8 Catapult Cartridge: End cap spins. Closed for non-receipt of item
 - MT23 CH-53 Fire Extinguisher Cartridge x 2:
 - Failed to fire. Received device, conducted radiographic, ballistic, torque inspection/test and bridge wire circuit test
 - Device had open circuit and did not fire during testing. It is undetermined how the circuit was damaged
 - PMA-261 is considering changing to a cannon plug style fire extinguisher
- MT95 AV-8 Stores Release Cartridge:
 - Poor performance. Hung store, no release. Cartridge was expended, but left a black oily substance
 - Item not returned to NSWC IHEODTD for engineering investigation



Closed Engineering Investigations

- Closed (con't):
 - WB53 H-60 Fire Extinguisher Cartridge:
 - Broken electrical connector
 - Item not returned to NSWC IHEODTD for engineering investigation
 - E-2D UWARS:
 - Damaged (human error)
 - On-site investigation conducted
 - Long endurance seat modification on certain bureau numbers
 - The device worked as designed, and a suggestion was made to open an EI on the seat, and refer to this investigation



Closed Engineering Investigations

- Closed (con't):
 - MT23 CH-53 Fire Extinguisher Cartridge:
 - Failed to fire
 - Device recalled, subjected to a radiographic inspection, bridge wire check, torque check and ballistic testing
 - Cartridge worked as designed, recommended further troubleshooting of CH-53



Engineering Investigations Take-Away

- Return devices promptly and follow through with Munitions Commands for shipping status
- Make sure all parts and pieces are returned with the device
- Usage of caps and plugs
- Always ask questions. Call, email or technical dialog
- We cannot fix discrepancies without your help



V-22 JL01 External Initiator Special Investigation

- Problem:
 - The external initiator has been plagued with moisture intrusion, corrosion and functional issues that have been attributed to it being made by an all metal casing
 - CAD/PAD stopped procuring the initiator
 - The new initiator has had a few failures
- Testing:
 - Two external initiators that were tested. The center button would not release on one and the other was pulled out passed its detent



V-22 JL01 External Initiator Special Investigation

- Testing:
 - The center housing was cut off of the seized initiator to find root cause
 - After the handle was easily extracted, we observed:
 - Moisture intrusion
 - Over greasing
 - Dirt
 - Severe corrosion
 - Swollen O-rings

V-22 External Initiator Special Investigation

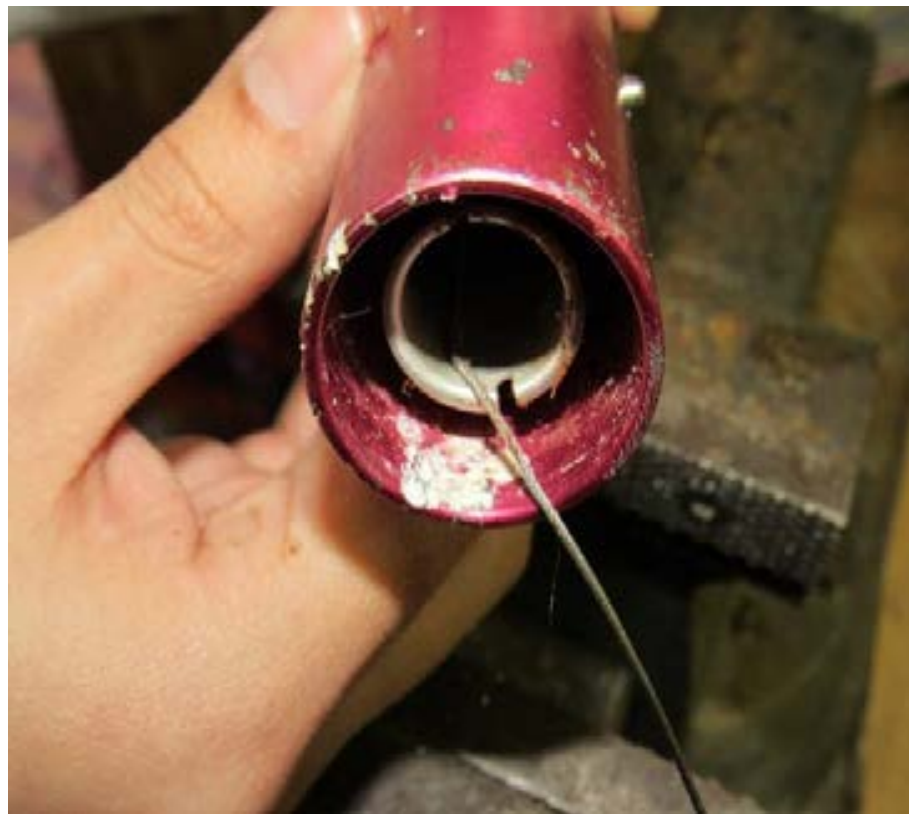
- External Initiator Opened:



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V-22 External Initiator Special Investigation

- External Initiator Opened:
 - After cleaning, the corrosion was much more prominent





V-22 JL01 External Initiator Special Investigation

- External Initiator Test:
 - Pull test was conducted
 - One initiator was recorded at 37 in-lb, and the other at 34 in-lb
 - Inspection of the lanyards and firing pins showed that no moisture was getting into the firing pin assembly and the lanyard was not damaged
- External Initiator Solution:
 - Travel to Tooele Army Munitions Depot to conduct inspection of stock
 - Return initiators to NSWC IHEODTD after passing preliminary inspection

Questions?



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