NACES Maint Review and updates

Warfighter Focused & Cost Conscious

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AECS ISSC
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Topics to discuss

• AECS ISSC
  – Who are we?

• Naval Aircrew Common Ejection Seat (NACES):
  – Maintenance concept
  – Manuals related to NACES and purpose
  – Recent and future seat updates

• Recent NACES maintenance issues
AECS ISSC

- Aircrew Escape and Crashworthy Systems In Service Support Center:
  - Supports US Navy/Marine fleet aviation on Ejection and Crashworthy Seat Issues:
    - Funded by PMA-202 (Human Systems), PMA-265 (F/A-18) and PMA-273 (T-45)
  - AECS ISSC lead located at FRC East Cherry Point
  - AECS ISSC team members located in seven locations in the continental US
  - Supplemented by 3 CSS support at the moment:
    - 2 Martin Baker Reps funded by production team
    - 1 local rep (non MBA) at Lemoore FRC/I level loft

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AECS ISSC

• AECS ISSC Sites:
  – NAWCAD Patuxent River (CW Seats, Survival Kits).
  – FRC East Cherry Point (Core Team, Ejection Seats)
  – FRC SW North Island (Ejection Seats)
  – FRC SE Jacksonville (Ejection Seats)
  – NAWCWD China Lake (Parachutes and Torso Harnesses)
  – NAWCAD Lakehurst (Support Equipment)
  – NSWC Indian Head (CADS/PADS)
Ejection Seat Products

NACES
MK-16
SJU-5/6
GRUEA-7
SJU-4/13/14

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Crashworthy Seating Systems
Survival Kits
AECS ISSC FUNCTIONS

• Fleet support
• Investigation of failed materials (EI’s/HMR’s and mishaps).
• Design improvements and issue TD’s/Bulletins
• Optimize maintenance requirements and manual changes (TMSDR’s or TPDR’s)
• Supply support recommendations.
• Our job is to SUPPORT YOU!
NACES Maint Concept

• Ejection Seat:
  – Organizational and Depot Level maintenance
  – Organizational level:
    • Remove and Install
    • Clean
    • Inspect
    • Check and test
    • Minor repair (if required)

• Parachutes and survival kits:
  – Organizational and I Level maintenance
NACES related pubs and purpose

Organizational Level:

• F/A-18:
  – A1-F18AC-IETM:
    • Legacy F/A-18A/B/C/D acft maint manual.
  – A1-F18EF-IETM:
    • F/A-18E/F and EA-18G acft maint manual.
  – Both IETMS are used only for on ACFT seat maint.
  – Scheduled maintenance and removal (14/28/84/728 days).
  – Periodic Maint Instruction Cards (PMICs).
Organizational Level:

• T-45:
  – A1-T45AB-160-000:
    • Used only for on ACFT seat maint and removal/installation.
    • Checklist
  – A1-T45AB-MRC-SERIES
    • Scheduled maint and removal (Daily/28/140/728 days).
    • Periodic Maint Instruction Cards (PMICs).
NACES related pubs and purpose (F/A-18)

• IETMS:
  – Removal of individual seat components:
    • Bucket and related components
    • Survival Kit
    • WB-55s
    • Main Beam
    • Catapult
    • Parachute
    • Drogue Canister (coming soon)
    • PDRM (coming soon)
NACES related pubs and purpose (F/A-18)

• A1-120-600 series (Checklist):
  – AC (A/B/C/D), SJU-5/6 and NACES
  – AE (A/B/C/D), NACES
  – EA (E/F and G), NACES
  – Removal/Inst by Disassembly/Assembly

• A1-120-650 series (Checklist):
  – AC (A/B/C/D), SJU-5/6 and NACES
  – AE (A/B/C/D), NACES
  – EA (E/F and G), NACES
  – Removal/Inst as a complete unit
NACES related pubs and purpose (F/A-18)

• A1-120-700 series (Checklist):
  – AC (A/B/C/D), SJU-5/6 and NACES
  – AE (A/B/C/D), NACES
  – EA (E/F and G), NACES
  – Removal/Inst of Survival kit and Seat Bucket
NACES related pubs and purpose (F/A-18)

• Purpose of Checklist:
  – Use of Checklist is MANDATORY
  – For -700:
    • To be completed by a two member team:
      – Safety Observer/helper
      – Working member (perform procedures)
  – For -600/-650:
    • To be completed by a three member team:
      – Safety Observer/QA/CDQAR (Controlling Guide)
      – Working member (perform procedures)
      – Tool handler/helper
• Purpose of Checklist (cont):
  – BE PHYSICALLY THERE!
  – All personnel must be qualified/certified
  – Ensures the accomplishment of tasks in the correct sequence
  – Purpose is to eliminate the possibility of error or omission
  – NO INTERRUPTIONS (UNLESS IN AN EMERGENCY)
  – No partial work/checklist allowed
NACES related pubs and purpose

• For on acft individual removal/installation of component or seat maint:
  – Use IETMS (F/A-18) or A1-T45AB-160-000 (T-45)

• NAVAIR 13-600-15-6-3:
  – NACES MRC deck (updated annually)
  – Provides the task/maint to perform the 728 day seat inspection
  – Detail instructions will refer to NAVAIR 13-1-36 (shop Maint)
NACES related pubs and purpose

• NAVAIR 13-1-36:
  – NACES Seat Shop Maintenance and IPB
  – Updated annually
  – Detailed org level maint instructions for the seat removed from the acft
  – Not for seat maint on the acft -> Use IETMS.
NACES related pubs and purpose

• NAVAIR 13-1-37 NACES Dearm/Arm Checklist:
  – Updated annually
  – To be completed by a three member team:
    – Safety Observer/QA/CDQAR (Controlling Guide)
    – Working member (perform procedures)
    – Tool handler/helper
NACES Maint Concept

- **Ejection Seat:**
  - Depot Level maint:
  - NAVAIR 13-1-44:
    - Components Sent to Depot/FRC
      - BRU (16 yrs)
      - Harness Reel (20 yrs)
      - Multi-Purpose Initiator (IMP, 14 yrs)
      - Catapult, Bucket & Main Beam send for cause (corrosion, damage, etc.), BCM

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Recent NACES Mods

• Lanyard Retention Collar (ACC-756):
  – Replaces metallic tape.
  – Strict compliance with assembly instructions.
Recent NACES Mods

Lanyard Retention Collar (ACC-756):

Picture 2. Lanyard Tie and Emergency/O2 Lanyard

Picture 3. Lanyard Retention Collar Assembly
Recent NACES Updates

- Enhanced Sequencer routing Procedures:
Recent Updates

• Time and Altitude Test Set (TATS):
Future Seat Updates

• New ejection Handle (Late 2016):

Current Handle

Current Handle (repaired)

New Handle

• New handle did not meet environmental/operational Acft conditions.
Future Seat Updates

• Digital Inline Timer (DIT) (WB54/55/56/M720):
  – Effort to increase reliability and increase service life over current timers

[DIT images]
Future Seat Updates

• Digital Inline Timer (DIT) (WB54/55/56/M720):
  - Minor installation/routing changes needed for T-45/FA-18 FWD seat

Chafing problem

Tie strap to avoid chafing
Future Seat Updates

• Ejection Seat Sequencer:
  – Enhanced software
  – Detachable leads
  – New test set
Future Seat Updates

• MK-122 (PDRM) Improvement
  – Increase Service Life
Future Seat Updates

• Detachable Risers and UWARS:
  – Includes new packing press
  – Reduce maint (packing and 28 day insp)
Maintenance Issues

• Main Beam Dowel Pin Damage:
  – Pin damaged during Main Beam/Seat installation.
  – Total of 9 main beams damaged in the last 3 years.
  – Damaged caused by non-compliance with seat installation checklist.

CAUTION

To prevent damage to main beam assembly, dowel pin and catapult breech, make sure dowel pin on upper cross beam of main beam assembly is aligned with catapult V-groove before installation.
Maintenance Issues

• Main Beam Dowel Pin Damage:
  – Depot repair in place.

Main Beam Repair
Maintenance Issues

• USRM Pipe discrepancy:
Maintenance Issues
NACES Seat Bucket Trombone Tubes Oil Intrusion

MIMS REQUIRE LUBRICATE O-RINGS WITH GREASE

OIL APPLIED TO TROMBONE TUBES

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Maintenance Issues
MOR Cartridge Firing
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Maintenance Issues
Parachute FOD
**Maintenance Issues**

Expired MW19 installed

<table>
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<th><strong>Component</strong></th>
<th><strong>Part Number</strong></th>
<th><strong>Expiry Date</strong></th>
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<td>MBEU16907</td>
<td>30 Oct 2019</td>
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<td>Parachute Assembly</td>
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<td>PARACHUTE ASSY, AUXILIARY</td>
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Maintenance Issues

USRM pipe damage
Maintenance Issues

Corrosion