### Personnel Protection & Performance Sustainment

#### Aircrew Systems Roadmap Conventions
- **Bold green font entries** represent current baseline states.
- **Black dashed lines with regular black font** show funded advanced research & technology development activities; **Grey dashed lines italic font** = Unfunded.
- **Solid lines and font** represent funded capability enhancements.
- **Blue** = Naval; **(Purple = Joint)**.
- **Red dotted lines with italic red font** represent unfunded potential capability developments.

#### Aircrew Systems Capability Evolution Roadmaps 2018

#### Capability Area Elements - attributes or functionalities

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<th>FY</th>
<th>Passive clothing layers</th>
<th>Head &amp; Spine Protection</th>
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<td>Improved E-2D helmet vibration study</td>
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#### Capabilities Overview

- **CAPABILITIES OVERVIEW**: The diagram illustrates the evolution of capabilities over fiscal years (FY) 2017 to 2026, focusing on personnel protection and performance sustainment. It highlights key developments such as improvements in head and spine protection, hearing protection, and comms intelligibility, with a focus on both funded and unfunded initiatives.

#### Key Points
- **Optimum Human System Performance, Protection & Persistence**: The diagram emphasizes the importance of optimizing human system performance while ensuring protection and persistence in various aircraft environments.
- **Exposure Protection**: This section details advancements in protecting aircrews from environmental stressors, including improved thermal regulation, cold weather protection, and fire protection.
- **Head & Spine Protection**: Highlights include the development of improved helmets and cranials, enhanced flight deck face-to-face communications, and maintainability improvements in fixed-wing helmets.
- **Hearing Protection & Comms Intelligence**: Focuses on advancements in hearing protection, including improved in-ear/on-person noise exposure dosimetry and wirefree comms earplugs.

#### Roadmap Conventions
- **Desired future capability state**: The roadmap provides a visual representation of desired future capability states, with funded and unfunded potential capability developments clearly marked.
- **Capability Development**: The roadmap outlines funded and unfunded capability enhancements, with specific mentions of development initiatives and technologies.

#### Notes
- **Personnel Protection & Performance Sustainment Capability Elements**: The diagram includes a key to the personnel protection and performance sustainment capability elements, providing a comprehensive overview of the technical and logistical aspects involved in achieving optimal human system performance, protection, and persistence.
Personnel Protection & Performance Sustainment

Capability Elements
Exposure Protection

Head & Spine Protection

Hearing Protection & Comms Intelligibility

Passive clothing layers

- Touch-Screen flight gloves
- Cold weather gloves
- Improved Undergarment thermal regulation (b)

Legacy helmets & cranials

- Improved flight deck personnel & maintainer head protection (g)
- Improved Fixed Wing helmet fit, Helmet Mounted Device (HMD) stability & maintainability (e,f,g,h,i)

Passive attenuation products

- Improved JSF flight deck & aviation maintainer Hearing Protection (DHP)
- Improved Passive Hearing Protection (k,l)
- Imp Flt Dk & Mntn Hrg (k,l)
- ANR for FW.Jets Improved Earcup material (l)
- Non-invasive ear canal mapping (m)
- Improved E-2D Hrg Prot (f,k,r)
- Improved flight deck face-to-face communications (o)
- On-site custom earplug provision (n)
- ANR for Rotary Wing (q,s)

Effective FY:

17 18 19 20 21 22 23 24 25 26

- Adv Research
- Or Tech Dev
- Funded
- Unfunded
- Unfunded Potential
- Joint Initiative
Visual Situational Awareness & Heads Up Cueing/Targeting

Capability Elements

Night Vision

- Gen 3 Image Intensification (I^2) technology Night Vision Devices (NVD)
  - Improved visual quality (tube NVGs (e))
  - Improved Rotary Wing digital night vision EVA (Enhanced Visual Acuity) Increment 1: enhanced low-light sensitivity, reduced scintillation, reduced halo effect, lighter weight, improved fit, digital symbology overlay (a-d)

Heads Up Flight Parameter Display

- Day/night (either or) capable helmet mounted Heads Up Display
  - Improved Rotary Wing digital night vision EVA (Enhanced Visual Acuity) Increment 1: enhanced low-light sensitivity, reduced scintillation, reduced halo effect, lighter weight, improved fit, digital symbology overlay (a-d)

Heads Up Cueing & Targeting

- Day/night (either or) helmet mounted cueing
  - 360° spherical electro-optical SA (JSF Distributed Aperture System)
  - Next generation day/night tactical helmet: high resolution, all-weather multi-spectral display with tactical data overlay (a-d,f-k)

Aircrew Systems Capability Evolution Roadmaps 2018

Optimum Day/Night Operations Safety & Maximum Tactical SA / Warfighting Effectiveness

Capability Baseline

Adv Research
Or Tech Dev
Funded
Unfunded
Funded Capability Enhancement
Unfunded Potential Capability Development
Joint Initiative
Capability Elements

Hazard Detection
- Passive paper sensors
- a. Chemical agent detection system

Skin Exposure Protection
- Legacy protective clothing
  - Lighter weight, lower bulk, improved protection coveralls
- Uniform Integrated Protection Ensemble (UIPE) products [gloves, booties, socks, future garment solutions]

Respiratory Exposure Protection
- Legacy Chem Bio masks & filters
  - Improved common respiration protection (Joint Service Aircrew Mask – JSAM) for Rotary Wing (JSAM RW) and Strategic Aircraft (JSAM SA)
  - Improved common respiration protection for Tactical Aircraft (JSAM TA)

Exposed Personnel, Equipment & Aircraft Care
- Skin wipes; Soap & water aircraft decontamination
  - Joint Service Equipment Wipes (JSEW)
  - Multi-platform and Equipment Recovery Force System (MERFS)

Aircrew Systems Capability Evolution Roadmaps 2018

Chemical Biological Defense Exposure Protection & Persistence

Full Aircrew Protection and Persistent, Effective Air Combat Operations in a Chem Bio Environment

Capability Baseline
Adv Research Or Tech Dev Funded Unfunded
Funded Capability Enhancement
Unfunded Potential Capability Development
Joint Initiative