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*Dominant Air Power: Design For Tomorrow...Deliver Today*

*Rapidly delivering war-winning capability*



NDIA Conference  
March 7-9, 2006

Joint Service  
Aircrew Mask  
(JSAM)

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# CONTRACTED DEVELOPER



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## AVOX Systems

225 Erie St. Lancaster, NY 14086

Contracting: Mr. Ken Wild, 716.686.1616



# Human Systems Group (HSG)



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JSAM PMs report directly to JPM-IP Mr. Jim Nelson/Mr. Brooks

HSG Commander (HSG/CC)  
Col Donahue

CBRN Defense Sys Division  
(TB)  
LTC H. Tran

Lead Engr  
Lan Ninh

IS/Colpro/Med  
Maj (Sel) Stewart

Individual Protection  
Mrs. B. Haass

Decontamination  
Maj Tullier

Contamination Avoidance  
Mr. Stermer

- JEM
- JOEF +
- JWARN
- JCPE
- CP-SSS/EMEDS\*
- JBAIDS +
- JECP +

- JSAM \*  
*Capt Hanks*  
*Capt Blumke*
- JSGPM +
- JSCESM +
- JSMLT
- JPACE
- JSLIST
- MCU-2P 2<sup>ND</sup> Skin\*

- JSSSED
- JPID \*
- M100 Support
- MDS Support
- JSPDS
- JSTDS

- JCAD +
- JSLNBCRS +
- JSLSCAD
- JBPDS
- ARTEMIS
- JBSDS

\* USAF is System Manager  
+ IPT Assignments



# JSAM Team

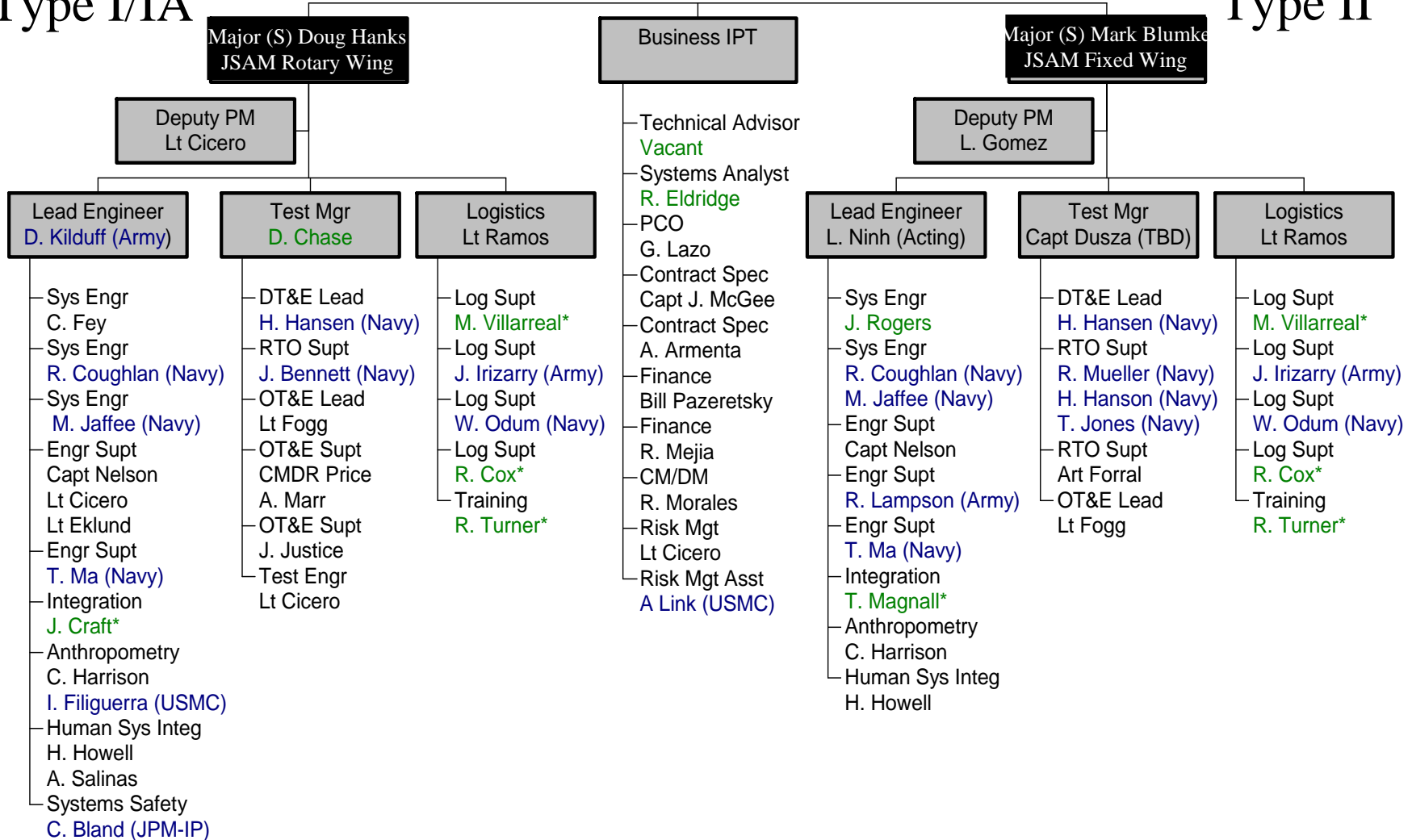


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## Type I/IA

## Type II



**Black = Gov't/USAF Blue = Other Service Green = Contractor Red = Vacant**

PM: Capt Hanks  
HSG/TBI, DSN 240-6364



# What is JSAM?



- **The Joint Service Aircrew Mask (JSAM) is a lightweight , aircrew respirator that provides head, eye, and respiratory protection in both fixed and rotary wing aircraft.**
- **JSAM will be compatible with below the neck CB ensembles, it will provide flame and thermal protection, and will reduce heat stress imposed by existing CB protection masks.**
- **For Type II, JSAM will incorporate both CB protection and Anti-G (9+G)**



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# Key Features



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- **Detachable faceplate**
- **Man-mounted system**
- **Improved CB filter**
- **No neck dam**
- **Compact lightweight blower**
- **Replaceable lens**
- **Commonality with JSAM designs for application in other platforms**





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# Advantages



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- Improved Comfort - Detachable faceplate means that full protection need only be worn when faced with a hazard and NOT the threat of a hazard
- Improved CB protection
- Improved FOV
- Compact man-mounted supply system – no aircraft/LSE modifications
- Can be worn un-helmeted
- Commonality in design approach, materials and manufacture processes with JSAM for other platforms





# JSAM Types



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- Type-IA IHADSS



Type I



Type II



Currently in  
Source  
Selection



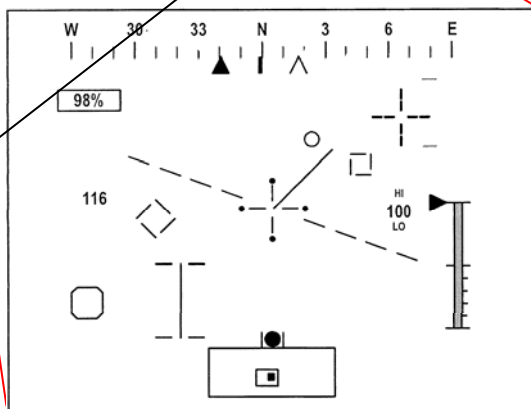


# JSAM Type IA – IHADSS Apache



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# JSAM Type I – Rotary Wing



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# Aircraft Types



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## Helicopters

AH-1W\*, UH-1N

UH-1N, HH-1N

AH/MH-6

CH-46E, MH-47D/E

CH-47D\*/E/F\*

CH-53D/E\*, MH-53E

MH-53\* J/M

OH-58D\*

MH-60K/L

HH-60G, HH-60L/M

HH-60H

SH-60B/F

MH-60R\*/S\*

UH-60A/L\*/M/Q

AH-64A/D\* IHADSS

LRA, LUH

AH-1Z\*, UH-1Y, H-53X, MV-22\*

## Agile (fast movers)

A/OA-10

AV-8B\*

EA-6B\*

F-15A/B/C/D/E\*

F-16A/B/C\*/D\*

F-16CG/CJ

F/A-18A/B/C/D/E/F\*

EA-18G JHMCS

F/A-22

F-117A

Top Owl

## Others

B-1B, B-2A, B-52H, C-2A,

E-2C, EP-3E, P-3C, E-3B/C

E-4B, C-5B/C, E-6B, E-8C

E-10A/B/C, C-9A, C-9, KC-10A

C-12, C-12, RC-12, C-17A\*

C-20, C-20, C-21, CV-22

C-23A/B/C C-26B, C-26B,

C-26B, C-32A, C/UC-35

C-37, C-40, C-130E/H/J/J-30

C-130T, AC-130\*H/U

EC-130E/H/J, HC-130N/P

KC-130J/R/T, LC-130H

MC-130\*E/H/P, WC-130E/H/J

KC-135E/R, OC-135B

RC-135S/U/V/W, KC-XXX



USAF



USA



USN/ USMC



JOINT

\* Indicates DT/OT test platform



# JSAM Aircraft Priority List



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**Priority 1**  
**USA**  
 AH-64A/D  
 CH-47D/E/F  
 MH-47D/E  
 UH-60A/L/M/Q  
 MH-60K/L  
 HH-60L/M

**USAF**  
 MH-53J/M  
 CV-22  
 UH-1N  
 HH-60G

**USMC**  
 CH-53D/E  
 CH-46E  
 MV-22B  
 UH-1N/Y  
 AH-1W/Z

**USN**  
 MH-53E  
 MH-60R/S  
 SH-60 B/F  
 HH-60H

**Priority 2**  
**USA**  
 OH-58D  
 AH/MH-6, LRA, LUH

**USAF**  
 MC-130E/H/P  
 F-22A

**USMC**  
 AV-8B

**Priority 3**  
**USN**  
 C-130T

**USAF**  
 AC-130H/U  
 C-130E/H/J/J-30  
 EC-130E/H/J  
 LC-130H  
 HC-130N/P  
 WC-130E/H/J  
 F-35A

**USMC**  
 KC130/R/J/T  
 F-35

**Priority 4**  
**USN**  
 F/A-18A/B/C/D/E/F

**USAF**  
 F16A/B/C/D/CG/CJ  
 O/A-10/A

**USMC**  
 F/A-18A/B/C/D

**Priority 5**  
**USAF**  
 C-17A  
 F15A/B/C/D/E

**Priority 6**  
**USN**  
 EA-6B  
 EA-18G  
 P-3C  
 EP-3E

**USMC**  
 EA-6B

**Priority 7**  
**USAF**  
 F-117  
 B-52H  
 B-2A  
 B-1B

**Priority 8**  
**USAF**  
 KC-135E/R  
 OC-135B  
 RC-135S/U/V/W  
 E-10A/B/C  
 C-5B/C

E-8C  
 E-3B/C  
 KC-10A  
 KC 767

**Priority 9**  
**USA**  
 C-20/D/G  
 C-23A/B/C  
 C26B  
 RC-12D2-U  
 RC-12D-Q  
 UC-35A/B

**USN/USMC**  
 C-2A  
 C-9  
 C-12  
 C-20  
 C35

**USAF**  
 C-9A  
 E4-B  
 C-12C/D/F/J  
 C21A  
 C26B  
 C32A

**Priority 10**  
**USN**  
 HH-1N  
 E-2C  
 E-6B

**USAF**  
 Aeromedical  
**USMC**  
 HH-1N



# Key Performance Parameters Type I, IA, and II



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	Challenge (O) Protection (O)	Challenge (T) Protection (T)	Duration O=24hrs T=16hrs
<b>Chem Vapor Protection</b>			
(HD Mustard)	20,000Ct	5,000Ct	24/16
(GB, nerve)	50,000Ct Miosis<1Ct	20,000Ct Miosis<1Ct	24/16
<b>Chem Liquid Protection</b>			
(HD Mustard)	10g/m2	10g/m2	24/16
<b>Quantitative Fit Factor</b>			
(QFF Blown mode)-Chem	120,000	20,000	Verification via Corn Oil, tested Blown&Unblown
(QFF Blown mode)-Bio	120,000	50,000	

(9G sustained for 15 seconds with 6G per second onset for Type II)



# Technical Performance Results to Date



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**Initial SMARTMAN configurations only produced 11-13 hours of HD and GB protection...**

**Current SMARTMAN New blend of materials now exceed 24 hour KPP objective requirement for both HD and GB permeation**

**AND**

**at the 10g/m<sup>2</sup> challenge level!**



# Technical Performance Results to Date



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- **Quantitative Fit Factor**
  - **Blown protection factor (PF) KPP results exceeded expectations**
    - 100% passed threshold requirement of 50K
    - 88.8% met objective requirement of 100K
  - **Unblown PF results also exceeded expectations**
    - 93.8% passed threshold requirement of 6,667
    - 93.8% passed objective requirement of 10K
    - 89.6% exceeded 50K





# Technical Performance Results to Date



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- **Breathing Resistance- pass**
  - Meet dynamic breathing requirement based Air Standardization Coordinating Committee (ASCC) Air Standard 61/112/2B, both blown and unblown
- **Crash Survivability- pass**
  - Crash deceleration testing conducted at QinetiQ shows no adverse impact of JSAM
- **Ability to Valsalva- pass**
  - Effective one-handed capability demonstrated in altitude chamber
  - Demonstrated no adverse impact to CB seal







# Technical Performance Results to Date



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- **Accommodation-**
  - Demonstrated accommodation of 98% male aircrew population with current sizes
  - Accommodated all tested females with current sizes
- **Comfort-**
  - Preliminary results indicate that there were no undue “hotspots” or other severe discomfort as compared to M48
- **Thermal burden-**
  - Preliminary results indicate that thermal burden may be higher than M48 due to less blower flow required to meet CB filter restrictions





# Success Stories



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- G** QFF
- G** BREATHING
- G** THERMAL
- G** FILTER QUALIFICATION
- G** SMARTMAN GB (VAPOR)
- G** CRASH/DECEL
- G** SMARTMAN HD\* (LIQUID PERMEATION)
- Y** LENS DISTORTION
  - Evaluating Critical Viewing Area



# Current Program Status



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- **Type IA and Type I completed CDR**
- **Type IA Design Validation Testing (DVT) completed - results favorable**
- **Type I DVT currently in progress**
- **Planning for DTRR in May 06 (Type I and IA)**
- **Expect DT start in June/July time period (I and IA)**
- **Type II Source Selection in progress**
- **Expect fielding for Type I and Type IA to occur 2Q/3Q FY08**



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Q & A



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# Backups

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# Key Features

- **Detachable faceplate**
- **Man-mounted system**
- **Improved CB filter**
- **No neck dam**
- **Compact lightweight blower**
- **Replaceable lens**
- **Commonality with JSAM designs for application in other platforms**

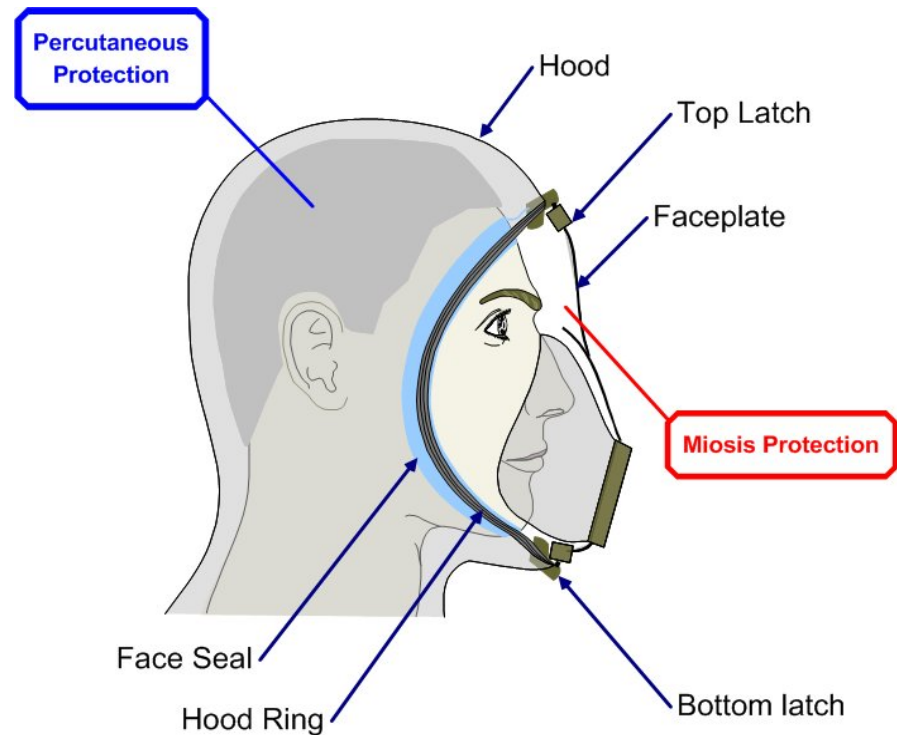




# Cornerstones of Design

## CB Protection & Physiological Burden

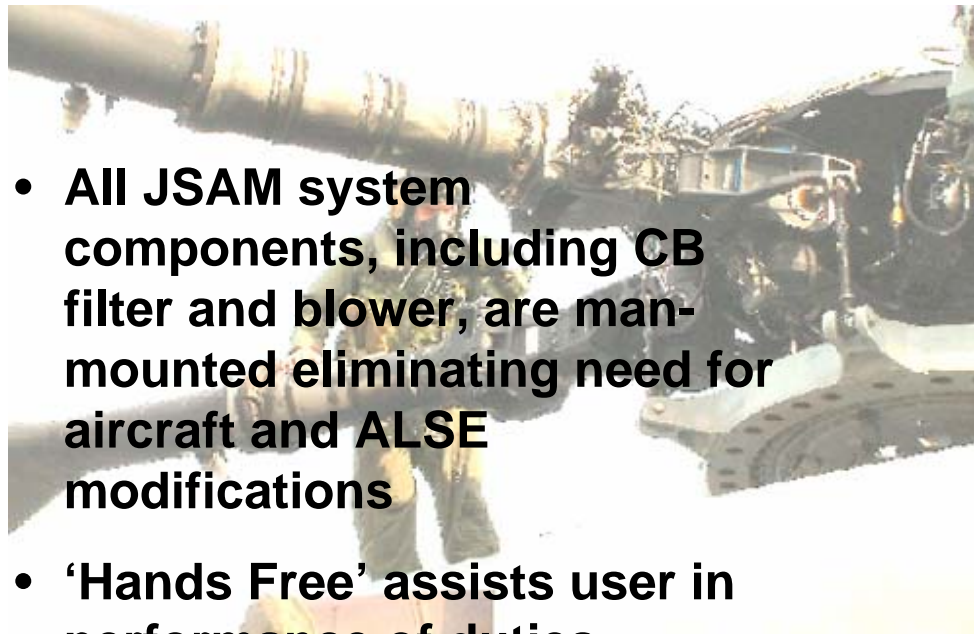
- **Minimize burden by minimizing time that full protection has to be worn**
- **Achieved by a detachable faceplate**
- **Separation of eyes and respiratory tract from skin of head & neck removes the need for a neck dam**





# Cornerstones of Design

## No aircraft or ALSE modifications



- All JSAM system components, including CB filter and blower, are man-mounted eliminating need for aircraft and ALSE modifications
- 'Hands Free' assists user in performance of duties







# JSAM Types

- **Type-IA IHADSS**
  - Non-oxygen
  - AH-64A/D only
- **Type I**
  - Non-oxygen (HOS capable)
  - Rotary Wing (exc. Apache)





# Advantages

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- Improved Comfort - Detachable faceplate means that full protection need only be worn when faced with a hazard and NOT the threat of a hazard
- Improved CB protection
- Improved FOV
- Compact man-mounted supply system – no aircraft/LSE modifications
- Can be worn unhelmeted
- Commonality in design approach, materials and manufacture processes with JSAM for other platforms







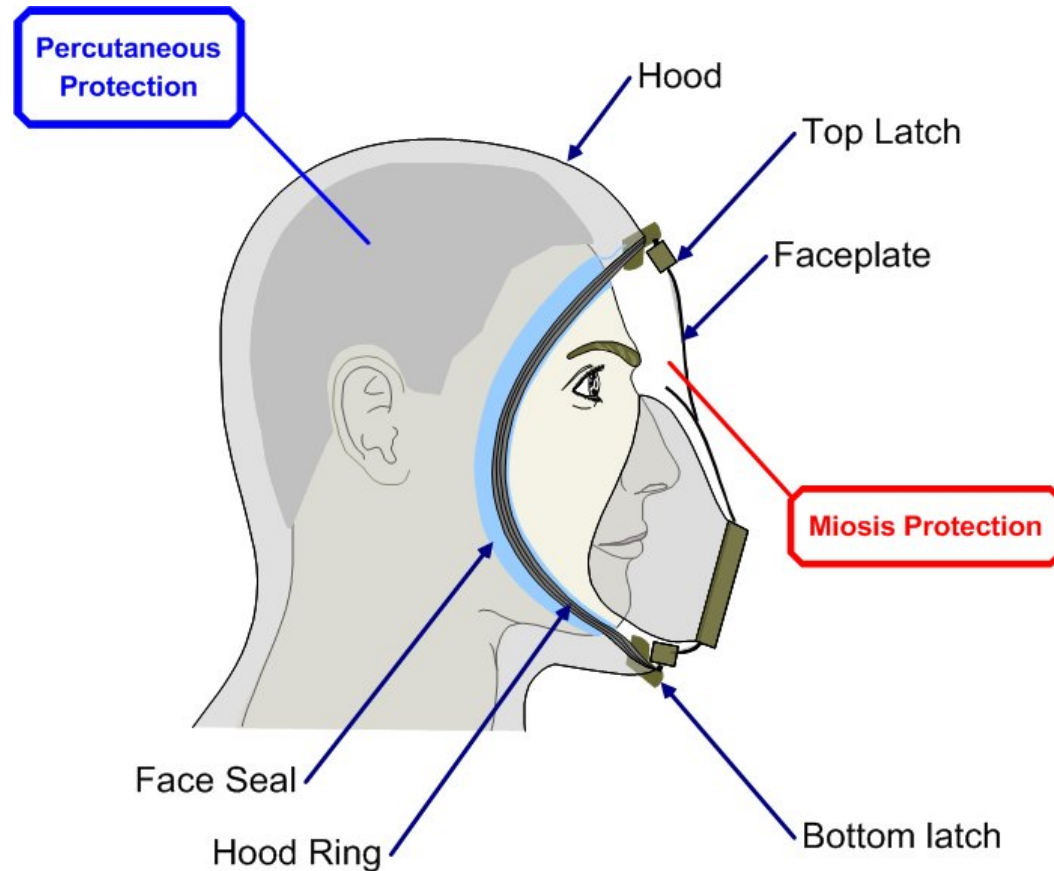
# JSAM Design Cornerstones

*CB Protection & Reduced Physiological Burden*



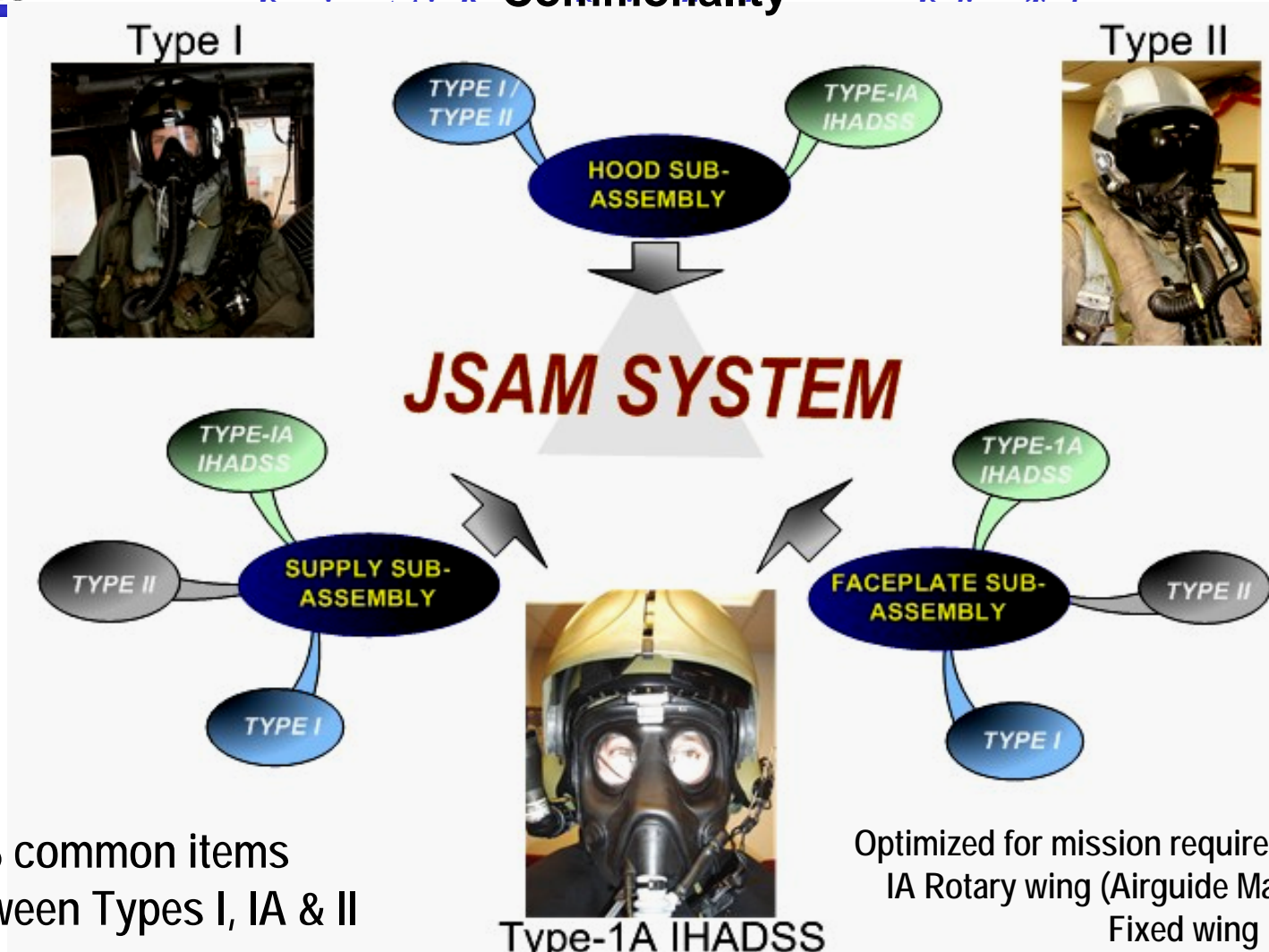
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- Improved CB protection over legacy systems (miosis levels)
- Minimize wear burden by minimizing time that full protection has to be worn
- Achieved by a detachable faceplate
- Sealed around facial cavity versus neck dam





# Commonality



70% common items between Types I, IA & II

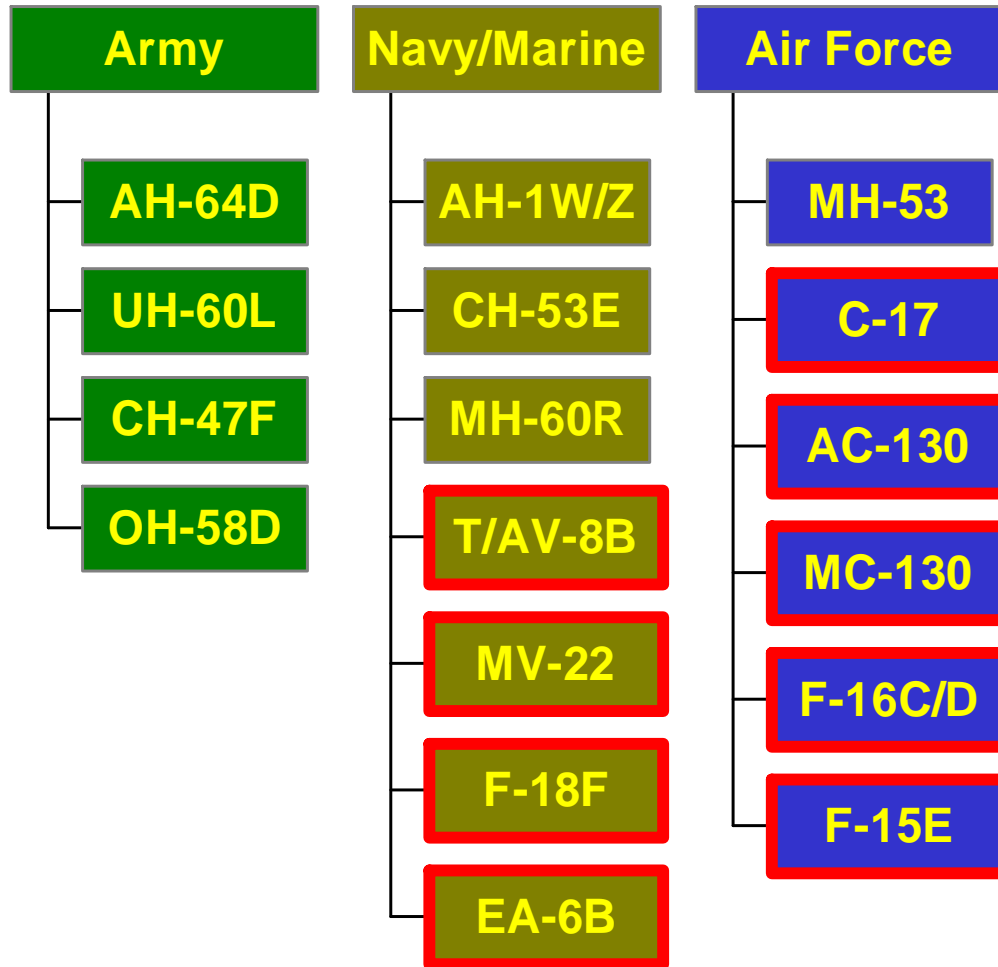
Optimized for mission requirements of Type I & IA Rotary wing (Airguide Mask) and Type II Fixed wing (Oronasal Mask)



# JSAM Test Program Review Flight Test



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— Fixed Wing