MEMORANDUM OF AGREEMENT
BETWEEN
NASA JOHNSON SPACE CENTER (NASA JSC)
AND
AIR FORCE RESEARCH LABORATORY
711TH HUMAN PERFORMANCE WING
HUMAN EFFECTIVENESS DIRECTORATE
AIR AND SPACE BIOSCIENCES DIVISION (711 HPW/RHB)

AGREEMENT NUMBER: 26-0000039-AFRL/711 HPW/RHB -MOA

This is a new Memorandum of Agreement (MOA) between NASA JSC and the 711th Human Performance Wing, Human Effectiveness Directorate (711 HPW/RH) (hereinafter referred to as (711 HPW/RHB). When referred to collectively, NASA JSC and the 711 HPW/RHB are referred to as the "Parties".

1. BACKGROUND: NASA JSC is interested in utilizing the 711 HPW/RHB human altitude exposure data and Altitude Decompression Sickness Risk Assessment (ADRAC) model for the development of an enhanced decompression sickness model which would accommodate the higher metabolic loads experienced by astronauts during lunar and planetary landings. The enhanced NASA JSC model would be developed under a NASA contract(s). The enhanced model would be shared with the US Air Force, and would be invaluable for use in missions where similar increased metabolic loads are experienced.

The 711 HPW/RHB exposure data and ADRAC model are housed within the Collaborative Biomechanics Data Bank (CBDN) located at Wright-Patterson AFB and maintained by the Biomedical Impact of Flight Branch (RHBF). The data consist of approximately 3,000 human exposures conducted at the Brooks City Base altitude chambers which were used to construct the USAF Altitude and Decompression Sickness Model (ADRAC), widely used by the US Air Force and other government agencies.

The exposure data and the ADRAC model have been cleared for public release and are available through the CBDN. Clearance numbers are AFRL-WS-07-0684 for the exposure data and test parameters, and Brooks STINFO 03-185 for the ADRAC model publication.

2. AUTHORITIES: This MOA is entered into under DoDI 4000.19, Support Agreements, AFI 25-201, Intra-Service, Intra-Agency, and Inter-Agency Support Agreements Procedures, and AFRLI 25-201, Formulation and Oversight of Domestic Alliances. The legal authority for this MOA is in accordance with the Space Act, Other Transactions Authority (OTA), 51 U.S.C. § 20113(e).

3. PURPOSE: The purpose of this MOA is to define the roles and scope of responsibility for each party in providing access and data rights to their respective decompression sickness models and altitude exposure data.

4. RESPONSIBILITIES OF THE PARTIES:

4.1. NASA JSC will—

4.1.2. Provide to 711 HPW/RHB access and use of the NASA JSC enhanced altitude decompression sickness model, including the programming code and equations used to operate the model.

4.1.3. Provide to 711 HPW/RHB the associated de-identified exposure data used to develop and validate the enhanced model, and associated exposure parameters (e.g. altitude, time of exposure, pre-breathe time, etc.) of the data. Portions of the exposure data sets may be unavailable to 711 HPW/RHB, including due to one or more of the NASA JSC contractor partners imposing restrictions on use of their data.

4.1 711 HPW/RHB will—

4.1.1 Provide to NASA JSC and/or their contractors unlimited access and use of the US Air Force ADRAC model, as well as the exposure data (approximately 3,000 records) used to develop and validate the model.

4.1.2 Ensure that the altitude exposure data will be available for NASA JSC and/or their contractors to download through the CBDN. ADRAC programming code (written in VB.Net) may be made available on request to NASA JSC and/or their contractors through a secure site such as DoD SAFE. Provide input to questions from NASA and/or NASA contractors on data sets.

4.1.3 Altitude exposure training data may be made available to NASA JSC and/or their contractors upon request, as well as 711 HPW/RHB decompression sickness and CBDN subject matter experts for consultation.

4.2 Both parties will—

4.2.1 Hold discussions on the progress of the altitude exposure data compilation and development of the enhanced DCS model.

4.2.2 Hold discussions on feasibility/viability of procuring additional training or other non-research oriented exposure data.

4.2.3 Publish a joint technical report or other publication (optional).

4.2.4 Ensure that all data provided pursuant to the paragraphs above is de-identified.

5. PERSONNEL: Each Party is responsible for all costs of its personnel, including pay and benefits, support, and travel. Each Party is responsible for supervision and management of its personnel**.**

6. GENERAL PROVISIONS:

6.1. POINTS OF CONTACT: The following points of contact (POC) will be used by the Parties to communicate in the implementation of this MOA. Each Party may change its point of contact upon reasonable notice to the other Party.

6.1.1. For NASA JSC—
6.1.1.1 Laura Bollweg - Element Manager, Human Research Program, NASA JSC-SA211, (281) 702-6586, laura.j.bollweg@nasa.gov.
6.1.1.2. Edna Smith - Agreement Manager and Integrator for Human Research Program (HRP), (281) 244-7618.

6.1.2. For the 711 HPW/RHB —
6.1.2.1. Ms. Molly Wade – Chief, Biomedical Impact of Flight Branch, 711 HPW/RHBF, (385) 636-1371, molly.wade.1@us.af.mil.
6.1.2.2. John Buhrman - Research Consultant Contractor, 711 HPW/RHBFD, (385) 633-3899.
6.1.2.3. Capt Joanna Montanari - Biomedical Impact of Air & Space Program Manager, 711 HPW/RHBFD, (385) 635-0759.

6.2. CORRESPONDENCE: All correspondence to be sent and notices to be given pursuant to this MOA will be addressed, if to NASA JSC, to—

6.2.1. Lyndon B. Johnson Space Center, 2101 E NASA Pkwy, Blg 21, Houston, TX 77058.

and, if to the HPW, to—

6.2.2. 711 HPW/RHBFD, 2800 Ascani Street, Area B, Blg 824, Wright-Patterson AFB OH 45433.

or as may from time to time otherwise be directed by the Parties.

6.3. REVIEW OF AGREEMENT: This MOA will be reviewed no less often than the mid-point on or around the anniversary of its effective date in its entirety.

6.4. MODIFICATION OF AGREEMENT: This MOA may only be modified by the written agreement of the Parties, duly signed by their authorized representatives.

6.5. DISPUTES: Any disputes relating to this MOA will, subject to any applicable law, Executive Order, Directive, or Instruction, be resolved by consultation between the Parties or in accordance with DoDI 4000.19.

6.6. TERMINATION OF AGREEMENT: This MOA may be terminated by either Party by giving at least 180 days' notice. The MOA may also be terminated at any time upon the mutual written consent of the Parties.

6.7. TRANSFERABILITY: This Agreement is not transferable except with the written consent of the Parties.

6.8. ENTIRE AGREEMENT: It is expressly understood and agreed that this MOA embodies the entire agreement between the Parties regarding the MOA's subject matter.

6.9. EFFECTIVE DATE: This MOA takes effect beginning on the day after the last Party signs.

6.10. EXPIRATION DATE: This Agreement expires 60 months after the effective date.

6.11. CANCELLATION OF PREVIOUS AGREEMENT: N/A

6.12. NO THIRD PARTY BENEFICIARIES. Nothing in this MOA, express or implied, is intended to give to, or will be construed to confer upon, any person or entity not a party any remedy or claim under or by reason of this MOA and this MOA will be for the sole and exclusive benefit of the Parties.

6.13. SEVERABILITY. If any term, provision, or condition of this MOA is held to be invalid, void, or unenforceable by a governmental authority and such holding is not or cannot be appealed further, then such invalid, void, or unenforceable term, provision, or condition shall be deemed severed from this MOA and all remaining terms, provisions, and conditions of this MOA shall continue in full force and effect. The Parties shall endeavor in good faith to replace such invalid, void, or unenforceable term, provision, or condition with valid and enforceable terms, provisions, or conditions which achieve the purpose intended by the Parties to the greatest extent permitted by law.

6.14. OTHER FEDERAL AGENCIES. This MOA does not bind any federal agency, other than the Parties, nor waive required compliance with any law or regulation.

6.15. INTELLECTUAL PROPERTY RIGHTS – DATA RIGHTS.
NASA and 711 HPW/RHB agree that the information and data exchanged in furtherance of the activities under this MOA will be exchanged without use and disclosure restrictions unless required by national security regulations (e.g., classified information) or as otherwise provided in this MOA or agreed to by NASA and 711 HPW/RHB for specifically identified information or data (e.g., information or data specifically marked with a restrictive notice).

6.16. INTELLECTUAL PROPERTY RIGHTS - HANDLING OF DATA.

1. In the performance of this Agreement, NASA or 711 HPW/RHB (as "Disclosing Party") may provide the other Party (as "Receiving Party") with:
   1.1. Data of third parties that the Disclosing Party has agreed to handle under protective arrangements or is required to protect under the Trade Secrets Act (18 U.S.C. § 1905) ("Third Party Proprietary Data"), or
   1.2. Government data, including software, the use and dissemination of which, the Disclosing Party intends to control ("Controlled Government Data").

2. All Third-Party Proprietary Data and Controlled Government Data provided by Disclosing Party to Receiving Party shall be marked by Disclosing Party with a restrictive notice and protected by Receiving Party in accordance with this Article and the restrictive notice.

3. Disclosing Party provides the following Data to Receiving Party. The lists below may not be comprehensive, are subject to change, and do not supersede any restrictive notice on the Data.
   3.1. Third Party Proprietary Data: The Disclosing Party's Third-Party Proprietary Data, if any, will be identified in a separate technical document.
   3.2. Controlled Government Data: The Disclosing Party's Controlled Government Data, if any, will be identified in a separate technical document.
   3.3. NASA software and related Data will be provided to 711 HPW/RHB under a separate Software Usage Agreement (SUA). 711 HPW/RHB shall use and protect the related data in accordance with this Article: None.

4. For Data bearing a restrictive notice and Data identified in this Agreement or an accompanying funding document, Receiving Party shall:
   4.1. Use, disclose, or reproduce the Data only as necessary under this Agreement;
   4.2. Safeguard the Data from unauthorized use and disclosure;
   4.3. Allow access to the Data only to its employees and any Related Entity requiring access under this Agreement;
   4.4. Except as otherwise indicated in 4.3., preclude disclosure outside Receiving Party's organization;
   4.5. Notify its employees with access about their obligations under this Article and ensure their compliance, and notify any Related Entity with access about their obligations under this Article; and
   4.6. Dispose of the Data as Disclosing Party directs.

5. If the Parties exchange Data having a notice deemed ambiguous or unauthorized by the receiving Party, it should notify the providing Party. If the notice indicates a restriction, the receiving Party must protect the Data under this Article unless otherwise directed in writing by the providing Party.

6. Notwithstanding any restrictions provided in this Article, the Parties are not restricted in the use, disclosure, or reproduction of Data provided under this Agreement that is:
   6.1. known or available from other sources without restriction;
   6.2. known, possessed, or developed independently, and without reference to the Proprietary Data;
   6.3. made available by the owners to others without restriction; or
   6.4. required by law or court order to be disclosed.

If a Party believes that any exceptions apply, it shall notify the other Party before any unrestricted use, disclosure, or reproduction of the Data.

6.17. INTELLECTUAL PROPERTY RIGHTS – INVENTION AND PATENT RIGHTS.
Unless otherwise agreed upon by NASA and 711 HPW/RHB, custody and administration of inventions made (conceived or first actually reduced to practice) under this MOA will remain with the respective inventing Party. In the event an invention is made jointly by employees of the Parties (including by employees of a Party's contractors or subcontractors for which the U.S. Government has ownership), the Parties will consult and agree as to future actions toward establishment of patent protection for the invention.

6.18. RELEASE OF GENERAL INFORMATION TO THE PUBLIC AND MEDIA.
NASA or 711 HPW/RHB may, consistent with Federal law and this Agreement, release general information regarding its own participation in this MOA as desired. Insofar as participation of the other Party in this MOA is included in a public release, NASA and 711 HPW/RHB will seek to consult with each other prior to any such release, consistent with the Parties' respective policies.

Pursuant to Section 841(d) of the NASA Transition Authorization Act of 2017, Public Law 115-10 (the "NTAA"), NASA is obligated to publicly disclose copies of all agreements conducted pursuant to NASA's 51 U.S.C. §20113(e) authority in a searchable format on the NASA website within 60 days after the agreement is signed by the Parties. The Parties acknowledge that, if this MOA is entered into pursuant to NASA's 51 U.S.C. §20113(e) authority, this MOA will be disclosed, without redaction, in accordance with the NTAA.

6.19. LIABILITY. Each Party agrees to assume liability for its own risks arising from or related to activities conducted under this MOA.

7. FINANCIAL DETAILS. There will be no transfer of funds between the Parties under this Agreement and each Party will fund its own participation. All activities under or pursuant to this Agreement are subject to the availability of funds, and no provision of this Agreement shall be interpreted to require obligation or payment of funds in violation of the Anti-Deficiency Act (31 U.S.C. § 1341).

AGREED:

In witness whereof, each Party has caused this agreement to be executed by its duly authorized representative on the dates indicated below:

APPROVED AND ACCEPTED
FOR **NASA JSC**

DAVID BAUMANN

DIRECTOR OF HUMAN RESEARCH PROGRAM

DAVID BAUMANN Digitally signed by DAVID BAUMANN Date: 2026.06.30 12:20:03 -05'00'

Signature

30 June 2026

(Date)

APPROVED AND ACCEPTED
FOR THE **711 HPW/RH**

MELINDA EATON, COL, USAF, BSC

DIRECTOR, HUMAN EFFECTIVENESS DIRECTORATE
711 HUMAN PERFORMANCE WING

EATON.MELINDA.1232383417 Digitally signed by EATON.MELINDA.1232383417 Date: 2026.06.25 07:33:17 -04'00'

Signature

25 Jun 2026

(Date)