

ANNEX NO. 6
BETWEEN
THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
LANGLEY RESEARCH CENTER
AND
NATIONAL INSTITUTE OF AEROSPACE
UNDER REIMBURSABLE SPACE ACT UMBRELLA AGREEMENT SAA1-31764
FOR
Q-ALPHA

ARTICLE 1. PURPOSE

This Annex is the follow-on work of Annex 3 under Umbrella SAA1-21594, and shall be for the purpose of the research and testing of a preliminary display design in the NASA Langley Research Center Flight Simulation Facilities (FSF) Integration Flight Deck (IFD) simulator. NASA Langley Research Center (LaRC) and the National Institute of Aerospace (NIA) plan to evaluate the causal effects of approach and landing accidents (ALA) and loss of control -- In Flight (LoC-1) accidents that resulted in the design of the Q-Alpha display system. The Q-Alpha system will offer the potential to save lives while also effectively reducing airline operational costs. The NASA LaRC FSF IFD simulator operating with the Boeing 737-800W research simulation will be used to conduct an evaluation of the Q-Alpha system.

This Agreement supports NASA's 2022 Strategic Plan and Strategic Objective 3.2: Drive Efficient and Sustainable Aviation.

The legal authority for this Annex, consistent with the Umbrella Agreement, is in accordance with the Space Act, Other Transactions Authority (OTA), 51 U.S.C. § 20113(e).

ARTICLE 2. RESPONSIBILITIES

A. NASA LaRC will use reasonable efforts to:

1. Facilitate a high fidelity 737-800W flight simulation in the LaRC IFD simulator to conduct the evaluation of the Partner provided Q-Alpha system.
2. Integrate Partner's Q-Alpha system with the LaRC IFD simulator for conducting human-in-the-loop evaluation of the Q-Alpha system.
2. Provide simulator for operating the real-time human-in-the-loop simulation to test various scenarios.
3. Provide recorded data to Partner for testing analysis.

B. Partner will use reasonable efforts to:

1. Utilize the NASA LaRC IFD simulator to conduct pilot evaluation of the Q-Alpha display system.
2. Provide data requirement and test scenarios describing the specific flight simulation test conditions for setting up the IFD to conduct pilot evaluation of the Q-Alpha system.
3. Provide confirmation to NASA that a separate agreement between NIA and each of its Related Entities (including, but not limited to, contractors and subcontractors at any tier, grantees, investigators, customers, users, and their contractors and subcontractors, at any tier) has been executed that binds NIA to comply with the terms and conditions set forth below:
 - i) The trademark "Boeing" and other Boeing trademarks shall not be used in any publications presenting data output from the NASA Langley Boeing 737-800W research flight simulation.
 - ii) Any publications presenting data output from the NASA Langley 737-800W research flight simulation shall not make reference to a specific airplane configuration (e.g. 737, B737-800, 737-800 RB211, etc.) on any pages of the publication.
 - iii) Published data output from the NASA 737-800W research flight simulation shall be normalized or non-dimensionalized such that only relative changes in the data with configuration modifications or changes in condition are shown.
 - iv) Any publicly released plots of data produced by the NASA 737-800W research flight simulation shall be presented without engineering units such that only relative percentage changes or trend data may be discerned.
 - v) Any publicly released tabular presentations of data produced by the NASA 737-800W research flight simulation shall be presented in such a manner that only relative percentage changes are discernable.
4. Develop and provide to NASA Langley personnel data requirement and test scenarios describing the specific flight simulation conditions.
5. Assist NASA personnel as necessary to ensure desired test scenarios and conditions are fully understood before and during data collection.

ARTICLE 3. SCHEDULE AND MILESTONES

The planned major milestones for the activities for this Annex defined in the "Responsibilities" Article are as follows:

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| 1. NIA's confirmation to NASA of the separate agreement(s) b/w NIA and each of its Related Entities. | Within one (1) week following the Effective date of Annex |
| 2. Partner shall provide data requirements and test scenarios describing the specific flight simulation test conditions. | Within two (2) weeks following Effective date of Annex |
| 3. NASA will provide the Integration Flight Deck simulator for checking out the flight simulation test scenarios. | Within three (3) weeks following the receipt of required test scenarios and |

	test conditions
4. NASA will provide Partner the Integration Flight Deck simulator for onsite plot data collection with the flight simulation test scenarios.	Within two (2) weeks following the completion of the simulation checkouts
5. NASA will provide recorded data to Partner for testing analysis.	Within one (1) month following the completion of the simulation data collection

ARTICLE 4. FINANCIAL OBLIGATIONS

A. Partner agrees to reimburse NASA an estimated cost of \$18,000 for NASA to carry out its responsibilities under this Annex.

Each payment shall be marked with **Langley Research Center SAA1-31764, Annex 6.**

B. NASA will not provide services or incur costs beyond the current funding. Although NASA has made a good faith effort to accurately estimate its costs, it is understood that NASA provides no assurance that the proposed effort under this Annex will be accomplished for the estimated amount. Should the effort cost more than the estimate, Partner will be advised by NASA as soon as possible. Partner shall pay all costs incurred and have the option of canceling the remaining effort, or providing additional funding in order to continue the proposed effort under the revised estimate. Should this Annex be terminated, or the effort completed at a cost less than the agreed-to estimated cost, NASA shall account for any unspent funds within one (1) year after completion of all effort under this Annex, and promptly thereafter, at Partner's option return any unspent funds to Partner or apply any such unspent funds to other activities under the Umbrella Agreement. Return of unspent funds will be processed via Electronic Funds Transfer (EFT) in accordance with 31 C.F.R. Part 208 and, upon request by NASA, Partner agrees to complete the Automated Clearing House (ACH) Vendor/Miscellaneous Payment Enrollment Form (SF 3881).

ARTICLE 5. INTELLECTUAL PROPERTY RIGHTS - DATA RIGHTS

A. Data produced under this Annex which is subject to paragraph C. of the Intellectual Property Rights - Data Rights Article of the Umbrella Agreement will be protected for the period of one (1) year.

B. Under paragraph H. of the Intellectual Property Rights - Data Rights Article of the Umbrella Agreement, 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 provided.

1. Background Data: *The Disclosing Party's Background Data, if any, will be identified in a separate technical document.*

2. Third Party Proprietary Data: *The Disclosing Party's Third Party Proprietary Data, if any, will be identified in a separate technical document.*
3. Controlled Government Data: *The Disclosing Party's Controlled Government Data, if any, will be identified in a separate technical document.*
4. The following software and related Data will be provided to Partner under a separate Software Usage Agreement: *None.*

ARTICLE 6. TERM OF ANNEX

This Annex becomes effective upon the date of the last signature below ("Effective Date") and shall remain in effect until the completion of all obligations of both Parties hereto, or six (6) months from the Effective Date, whichever comes first, unless such term exceeds the duration of the Umbrella Agreement. The term of this Annex shall not exceed the term of the Umbrella Agreement. The Annex automatically expires upon the expiration of the Umbrella Agreement.

ARTICLE 7. RIGHT TO TERMINATE

Either Party may unilaterally terminate this Annex by providing thirty (30) calendar days written notice to the other Party.

ARTICLE 8. POINTS OF CONTACT

The following personnel are designated as the Points of Contact between the Parties in the performance of this Annex.

Technical Points of Contact

NASA Langley Research Center
Victoria Chung
AST, Theoretical Simulation Techniques
Mail Stop: 125B
Hampton, VA 23681
Phone: 757-864-6406
victoria.i.chung@nasa.gov

National Institute of Aerospace
Carly A. Bosco
Senior Director, Research and Operations
1100 Exploration Way
Hampton, VA 23666-6264
Phone: 757-810-2596
carly.bosco@nianet.org

ARTICLE 9. MODIFICATIONS

Any modification to this Annex shall be executed, in writing, and signed by an authorized representative of NASA and the Partner. Modification of an Annex does not modify the terms of the Umbrella Agreement.

[Remaining page intentionally left blank; signatures to follow on next page.]

ARTICLE 10. SIGNATORY AUTHORITY

The signatories to this Annex covenant and warrant that they have authority to execute this Annex. By signing below, the undersigned agrees to the above terms and conditions.

NATIONAL AERONAUTICS AND
SPACE ADMINISTRATION
LANGLEY RESEARCH CENTER

NATIONAL INSTITUTE OF
AEROSPACE

BY: _____
John H. Koelling
Director, Aeronautics Research
Directorate

BY: _____
Carly A. Bosco
Senior Director, Research and
Operations

DATE: _____

DATE: _____