

ANNEX
BETWEEN
THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
GEORGE C. MARSHALL SPACE FLIGHT CENTER
AND SHELL INTERNATIONAL EXPLORATION AND PRODUCTION, INC
UNDER SPACE ACT UMBRELLA AGREEMENT
NO. SAA8-2338064, DATED 4/19/2023 (ANNEX NUMBER 5).

ARTICLE 1. PURPOSE

This Annex shall be for the purpose of supporting Shell in its development, manufacturing, and test of tank hardware and testing of hydrogen transport systems. NASA will perform fracture toughness testing of material specimens in a combination of environments including liquid hydrogen (LH2), gaseous hydrogen (GH2), liquid nitrogen (LN2), gaseous nitrogen (GN2), and/or air. This testing will be conducted at the Hydrogen Test Facility (Bldg. 4628) at the George C. Marshall Space Flight Center.

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

NASA will use reasonable efforts to:

1. Participate in meetings scheduled by Partner (currently estimated as 8 to 10 meetings with 60 min. duration).
2. Develop Test Plan for Partner's test specimens.
3. Prepare Partner's specimens for testing.
4. Conduct materials testing and characterization of first ten test samples.
5. Provide one (1) Preliminary Test Report to Partner, including sample characterizations, and testing observations. This report shall include raw data from tests (in Excel files) and photographs of fracture surfaces. Photographs shall be supplied at maximum quality and at a high resolution (minimum 1920 x 1080 pixels). Unless otherwise agreed, diagrams and tables shall be supplied as Excel files or in another agreed format suitable for reproduction.
6. Conduct materials testing and characterization of samples 11 to 23.
7. Conduct materials testing and characterization of samples 24 to 30.
8. Complete materials testing and characterization of all samples.
9. Provide one (1) Final Test Report, including sample characterizations, and testing observations. This report shall include raw data from tests (in Excel files) and photographs of fracture surfaces. Photographs shall be supplied at maximum quality and at a high resolution (minimum 1920 x 1080 pixels). Unless otherwise agreed, diagrams and tables shall be supplied as Excel files or in another agreed format suitable for reproduction.
10. Return test specimens to Partner (upon request).

Partner will use reasonable efforts to:

1. Schedule meetings for exchange of technical data and activity status.
2. Provide test requirements and acceptance criteria.
3. Review and approve Test Plan.
4. Provide sample materials to NASA MSFC.
5. Review Preliminary Test Report and provide comments to NASA MSFC.
6. Determine how many spare Computed Tomography (CT) tests to perform, including which samples and test conditions.

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. Partner provides test requirements and acceptance criteria to NASA MSFC | Effective Date plus 1 week. |
| 2. NASA MSFC develops Test Plan for Partner's test specimens. | Effective Date plus 2 weeks. |
| 3. Partner reviews and approves Test Plan. | Milestone 2 plus 2 weeks. |
| 4. Partner provides sample materials to NASA MSFC. | Effective Date plus 4 weeks. |
| 5. NASA MSFC prepares Partner's specimens for testing. | Milestone 4 plus 4 weeks |
| 6. NASA MSFC conducts materials testing and characterization of first 10 test samples | Milestone 5 plus 14 weeks |
| 7. NASA MSFC provides one (1) Preliminary Test Report to Partner, including sample characterizations, and testing observations. This report shall include raw data from tests (in Excel files) and photographs of fracture surfaces. Photographs shall be supplied at maximum quality and at a high resolution (minimum 1920 x 1080 pixels). Unless otherwise agreed, diagrams and tables shall be supplied as Excel files or in another agreed format suitable for reproduction. | Milestone 6 plus 4 weeks |
| 8. Partner reviews Preliminary Test Report and provides comments to NASA MSFC. | Milestone 7 plus 3 weeks |
| 9. Partner determines how many spare CT tests to perform (incl. which samples and test conditions) | Milestone 8 plus 9 weeks |
| 10. NASA MSFC completes materials testing and characterization of samples 11 to 23 | Milestone 9 plus 4 weeks |

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|---|----------------------------|
| 11. NASA MSFC completes materials testing and characterization of samples 24 to 30 | Milestone 10 plus 4 weeks |
| 12. NASA MSFC completes materials testing and characterization of all samples. | Completion of Milestone 11 |
| 13. NASA provides one (1) Final Test Report to Partner, including sample characterizations, and testing observations. This report shall include raw data from tests (in Excel files) and photographs of fracture surfaces. Photographs shall be supplied at maximum quality and at a high resolution (minimum 1920 x 1080 pixels). Unless otherwise agreed, diagrams and tables shall be supplied as Excel files or in another agreed format suitable for reproduction. | Milestone 12 plus 6 weeks |
| 14. NASA returns test specimens to Partner (upon request). | Milestone 12 plus 6 weeks |

ARTICLE 4. FINANCIAL OBLIGATIONS

A. Partner agrees to reimburse NASA an estimated cost of \$280,444.86 for NASA to carry out its responsibilities under this Annex.

Each payment shall be marked with SAA8-2338064 Annex 5.

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 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. LIABILITY

For the responsibilities and activities conducted under this Annex, and any claims arising thereunder, the following sentence shall be added to the end of Paragraph C, Article 8 (titled "Liability") of the Umbrella Agreement:

Partner's liability for such repair and restoration shall not exceed \$100,000.00.

ARTICLE 6. 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 2 years.

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:

None

2. Third Party Proprietary Data:

None

3. Controlled Government Data:

None

4. The following software and related Data will be provided to Partner under a separate Software Usage Agreement:

None

ARTICLE 7. 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 one year 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 8. TERMINATION

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

ARTICLE 9. 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 George C. Marshall Space Flight
Center
Eric King

SHELL INTERNATIONAL
EXPLORATION AND PRODUCTION,
INC

Team Lead
Marshall Space Flight Center, AL 35812
Phone: 256-544-7402
eric.g.king@nasa.gov

Ed Holgate
Commercial Partner Manager
150 North Dairy Ashford
Houston, TX 77079-1116
Phone: 281-544-9620
Ed.Holgate@shell.com

ARTICLE 10. 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.

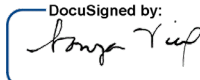
ARTICLE 11. SIGNATORY AUTHORITY

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
GEORGE C. MARSHALL SPACE
FLIGHT CENTER

SHELL INTERNATIONAL
EXPLORATION AND
PRODUCTION, INC

BY: _____
Lisa Bates
Director Engineering Directorate

BY:  _____
3B5FDF6D7F0640F...
Sonya Vial
GM Process Development

DATE: _____

Dec 13, 2024
DATE: _____

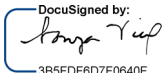
Certificate Of Completion

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Source Envelope:		
Document Pages: 5	Signatures: 1	Envelope Originator:
Certificate Pages: 4	Initials: 0	Ed Holgate
AutoNav: Enabled		Carel van Bylandtlaan 30
Envelopeld Stamping: Enabled		Den Haag, NL 2596 HR
Time Zone: (UTC) Dublin, Edinburgh, Lisbon, London		ed.holgate@shell.com
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Notary Events	Signature	Timestamp
Envelope Summary Events	Status	Timestamps
Envelope Sent	Hashed/Encrypted	Dec 13, 2024 17:56
Certified Delivered	Security Checked	Dec 13, 2024 22:45
Signing Complete	Security Checked	Dec 13, 2024 22:46
Completed	Security Checked	Dec 13, 2024 22:46
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