MEMORANDUM OF COOPERATION
ON INTERNATIONAL COMMERCIAL SPACE TRANSPORTATION

BETWEEN THE
UNITED STATES FEDERAL AVIATION ADMINISTRATION
AND THE
NEW ZEALAND MINISTRY OF BUSINESS, INNOVATION AND EMPLOYMENT

RECOGNIZING the mutual benefit to be gained from working together in the peaceful use of outer space for the welfare of all humankind;

RECOGNIZING the mutual interest in the Federal Aviation Administration (FAA), Department of Transportation, United States of America (U.S.) licensed space launches that take place from New Zealand; and the mission of the FAA includes the protection of public safety and property, and the national security and foreign policy interests of the U.S. during commercial launch or re-entry activities, and encourages, facilitates and promotes U.S. commercial space transportation;

RECOGNIZING that the mission of the space agency within New Zealand's Ministry of Business Innovation and Employment (MBIE) includes the protection of public safety and the national security and foreign policy interests of New Zealand during commercial launch activities and encourages, facilitates and promotes New Zealand commercial space transportation;

CONSIDERING the desirability of enhanced international cooperation between the participants particularly in relation to space launches conducted by FAA licensed entities in New Zealand but also more generally in relation to in space science and evolving commercial space launch licensing activities with potential benefits to all nations;

CONSIDERING that MBIE also issues both commercial space launch and facility licenses under the New Zealand licensing regime;

WHEREAS New Zealand's licensing regime enables the Minister to treat the fact that an applicant for a license to conduct space launches in New Zealand holds a license from the FAA as satisfying some or all of the criteria for a New Zealand license;

WHEREAS the FAA desires to promote and maintain dynamic, safe and efficient domestic and foreign commercial space launch and re-entry operations; and

WHEREAS MBIE desires to promote and maintain dynamic, safe and efficient space launches from New Zealand.

NOW, THEREFORE, the FAA and MBIE (collectively, the "Participants." and individually, a "Participant") mutually decide as follows

PARAGRAPH 1: PURPOSE

A. The mutual and shared purposes of this Arrangement, subject to available resources, are:

1. To establish a shared understanding of the U.S. space licensing system and the way in which the FAA helps ensure and maintain the effectiveness of its space licensing process to facilitate New Zealand recognition of FAA launch licenses;

2. To promote regulatory cooperation in respect of space activities carried out in New Zealand by FAA licensed entities; and

3. To provide a framework for FAA assistance in supporting the building of MBIE's regulatory capability and the possible provision of technical assistance, training, and other activities.

B. Results of this recognition, cooperation and assistance will be to facilitate commercial space operations from New Zealand by FAA licensed entities in a manner that is mutually beneficial, to assist in building MBIE's capability as a regulator of space activities and more generally to advance safety for commercial space transportation concepts, technologies and processes.

PARAGRAPH 2: DEFINITIONS

A. For the purposes of this arrangement:

1. FAA means the Office of Commercial Space Transportation, Federal Aviation Administration, Department of Transportation, United States of America.

2. Minister means the New Zealand Minister responsible for the Outer Space and High Altitude Activities Act 2017.

3. MBIE means the New Zealand Ministry of Business Innovation and Employment, being the Ministry that has responsibility for commercial space activities in New Zealand.

4. New Zealand Licensing regime means the regime established by New Zealand's Outer Space and High Altitude Activities Act 2017 and regulations made under that Act.

5. U.S. licensing regime means the licensing process established under the Commercial Space Act 1984, now codified at Title 51 United States Code (U.S.C.) Sections 50901 - 50921, and 14 Code of Federal Regulations (C.F.R.) Part 400 et sequence (Commercial Space Transportation Regulations.)

PARAGRAPH 3: SCOPE

The scope of this Arrangement relates to commercial space activities governed by the Licensing regime established by New Zealand's Outer Space and High Altitude Activities Act 2017 and regulations made under that Act and the FAA's license and licensing process established under the Commercial Space Act 1984, now codified at Title 51 United States Code (U.S.C.) Sections 50901 - 50921, and 14 Code of Federal Regulations (C.F.R.) Part 400 et sequence (Commercial Space Transport Regulations) and in particular to

1. Launch safety (including to a limited extent launch site safety);
2. The technical capability of persons carrying out launch activities;
3. Requirements for orbital debris mitigation;
4. Calculation of the insurance that will be required; and
5. Payload determinations.

PARAGRAPH 4: ASSURANCE

A. Section 51 of the New Zealand Outer Space and High Altitude Activities Act 2017 (the Act) authorizes the Minister to take into account that an applicant holds a license, permit or other authorization granted in a country other than New Zealand as satisfying some or all of the criteria for granting a launch license under section 9, a payload permit under section 17, an overseas launch license under section 25, an overseas payload permit under section 33 and a facility license under section 40. The FAA provides information about its license and licensing process to assist and facilitate the use by the Minister of section 51 of the Act.

B. Under the FAA licensing regime, the FAA undertakes a comprehensive launch safety analysis and carries out assessments of the technical capability of the prospective licensees, the mitigation of orbital debris and makes a maximum probable loss calculation which forms the basis for the insurance requirements imposed on licensees. Details of the regime are set out in Annex 1 to this document.

C. The FAA monitors its oversight of the effectiveness of its licensing process in the following ways:

1. By using the internal quality assurance standards, systems and processes set out in Annex 2;
2. By using the systems and processes to assess and help ensure the competence of the staff set out in Annex 3; and
3. By independent reviews of its effectiveness such as those carried out by the U.S. Government

Accountability Office as described in Annex 4.

D. To facilitate the Minister's ability to take into account FAA licenses in the manner described in paragraph F, the FAA will as soon as is reasonably practicable:

1. Notify MBIE of any changes to a domestic US license issued for a New Zealand launch;

2. Provide MBIE with copies of any reviews, reports or evaluations into its effectiveness including reviews of effectiveness carried out by the U.S. Government Accountability Office; and its response to any identified shortcomings;

3. Advise MBIE if it makes an exception to any of its licensing requirements or grants a license on the basis of any exception to its licensing regime for a New Zealand launch, and provide the reasons for that exception;

4. Provide MBIE with information about any significant mishaps, launch accidents, near misses or other incident involving FAA licensees for New Zealand launches, including information about what caused that accident, near miss or other incident to occur; and

5. Upon MBIE's written request, provide New Zealand with information about other significant mishaps, launch accidents, near misses or other incidents involving FAA licensees, including information about what caused that accident, near miss or other incident to occur as practicable.

PARAGRAPH 5: <u>INFORMATION EXCHANGE</u>

A. The FAA and MBIE will work closely with each other in ensuring safe and responsible space launches from New Zealand.

B. The Participants will maintain and update from time to time a list of key contact points within each agency.

C. Subject to any requirements of U.S. law, the FAA will consult with MBIE on matters relating to a FAA licensing decision that might be significantly affected by local New Zealand conditions.

D. Subject to any requirements under New Zealand law, MBIE will provide the FAA with any information that would be of assistance to it in reaching licensing decisions, including information about its legal and regulatory environment.

E. Where MBIE receives an application for a New Zealand launch license that seeks to rely on the fact of an FAA license as satisfying some of the requirements of the New Zealand licensing regime, the FAA will upon request from MBIE:

1. Confirm whether or not it has received an application;
2. Advise as soon as practicable after it either grants or declines the application;
3. If the FAA license is granted, advise MBIE whether the license is a Launch License or a Launch Operator License;
4. Advise MBIE of any conditions that are imposed on the license holder by the license and the reasons for those conditions; and
5. Allow New Zealand officials to observe FAA inspections in New Zealand.

F. The Participants will provide each other with information about their ongoing monitoring of launch activities from New Zealand if either Participant has identified serious concerns with the operation of the license.

G. Without limiting paragraph F, FAA will advise MBIE of the matters discussed during the immediate post launch briefings and permit New Zealand to participate in post launch briefings as practicable.

H. The FAA will notify MBIE if a FAA license is varied or revoked or if any enforcement action is taken against the licensee for a New Zealand launch.

I. MBIE will notify the FAA if a New Zealand license is varied or revoked or if any enforcement action is taken against the license.

J. The FAA will upon request of MBIE, and with consent of the Applicant, provide MBIE with any information in its possession to assist MBIE advising Ministers in cases of emergency, risk to public safety, risk to national interest or security, or legitimate public concern in relation to licensing contemplated by this arrangement. Such information will be provided as soon as is reasonably practicable after the request has been made and in any case no longer than 30 days after the request.

K. The Participants will share information and research about the safety of space activities, including those relating to the safety of launch activities and the mitigation of orbital debris;

L. The Participants will encourage mutual participation in space symposia, conferences and technical forums.

PARAGRAPH 6: CONFIDENTIALITY

A. New Zealand recognizes that, depending on the circumstances, information provided by the FAA may contain intellectual property, trade secrets, confidential business data or other data held in confidence. Unless required by law, New Zealand will not copy, release or show information identified as restricted to anyone (other than an employee of MBIE or the Minister and then only where necessary for the purpose of the employee's employment or the Minister's office) unless the FAA and Licensee consent to its release.

PARAGRAPH 8: DESIGNATED OFFICES

A. The designated office at the FAA for the coordination and management of this Arrangement, and to which all requests for information and services under this Arrangement should be made, is:

Federal Aviation Administration

Office of International Affairs

800 Independence Ave., S.W.

Washington, D.C. 20591

Telephone:

+1-202-267-1000

B. The designated office for MBIE is:

New Zealand Space Agency

Labour Science and Enterprise Group

Ministry of Business Innovation and Employment

15 Stout Street

Wellington 6011

Telephone: Facsimile

+644720030

+6449170199

PARAGRAPH 9: AMENDMENTS

The Participants may amend this Arrangement, including its annexes, by written decision signed by both Participants.

PARAGRAPH 10: RESOLUTION OF DIFFERENCES

The Participants will resolve any difference regarding the interpretation or application of this Arrangement, including its annexes, through consultations.

PARAGRAPH 11: ENTRY INTO EFFECT AND TERMINATION

A. This Arrangement will enter into effect on the date of the last signature and will remain in effect until terminated.

B. Either Participant may terminate this Arrangement in its entirety (including its annexes), or alternatively any one of its annexes, at any time by providing sixty (60) days' notice in writing to the other Participant. Termination of this Arrangement also will terminate all annexes concluded by the Participants under this Arrangement.

PARAGRAPH 12: AUTHORITY

The FAA and MBIE accept the provisions of this Arrangement as indicated by the signatures of their duly authorized representatives.

FEDERAL AVIATION ADMINISTRATION
DEPARTMENT OF TRANSPORTATION
UNITED STATES OF AMERICA

BY: _____
George C. Nield

TITLE: Associate Administrator,
Office of Commercial Space
Transportation

DATE: February 7, 2018

PLACE: Washington, D.C.

NEW ZEALAND SPACE AGENCY
MINISTRY OF BUSINESS INNOVATION
AND EMPLOYMENT
NEW ZEALAND

BY: _____
Peter Crabtree

TITLE: General Manager, SCIENCE,
INNOVATION & INTERNATIONAL

DATE: February 27, 2018

PLACE: Wellington, NZ

ANNEX 1: DETAILS OF THE FAA LICENSING REGIME

In the United States of America (U.S.), the Commercial Space Launch Act of 1984 (the Act), codified as amended at 51 U.S.C. §§ 50901 - 50923 (2015), authorizes the Department of Transportation (DOT) and (through DOT's delegation) the Federal Aviation Administration (FAA), to oversee, authorize, and regulate commercial space launches and reentries of launch and reentry vehicles, and the operation of launch and reentry sites when carried out by U.S. citizens or within the U.S. The Act directs that the exercise of this responsibility be consistent with public health and safety, safety of property, and the national security and foreign policy interests of the U.S.

The FAA's Office of Commercial Space Transportation (AST) carries out these responsibilities by regulations located in Title 14 Code of Federal Regulations (C.F.R.) Parts 400 - 460. These regulations establish the U.S. licensing regime for commercial space launch activities carried out by U.S. citizens or within the U.S.

It should be noted, however, that the scope of these regulations for commercial space launches that take place outside of the U.S. differs from the U.S. domestic launches and reentries. One difference is in the definition of when the launch begins. The FAA defines the beginning of launch for U.S. domestic launches as the time the launch vehicle arrives at the launch site. This means considerable pre-flight activities are covered under the ground safety regulations (14 C.F.R. § 417 Subpart E) that are captured within the licence requirements.

In contrast, the beginning of launch for a commercial space launch outside the U.S. that is licensed by the FAA is not defined by regulation. Ground safety requirements in § 417 Subpart E are only applicable to launches that take place from a U.S. launch point. Nevertheless, a significant number of pre-flight processing sections are applicable, even at a non U.S. launch site, including the requirements for commercial space launch site descriptions, launch reporting requirements that include a ground operation element, launch specific updates, requirements for launch personnel qualifications and certification, requirements for launch plans, launch safety rules requiring a ground based command and control system, requirements for rehearsals, requirements relating to safety critical pre-flight operations, requirements for support systems, and flight safety systems that include a ground safety segment.

A brief description of the U.S. commercial space regulations is set out below.

14 C.F.R. part 414 of the regulations establishes procedures for obtaining safety approvals for:-

(1) Launch vehicles, reentry vehicles, safety systems, processes, services, or any identified components of them; and

(2) Qualified and trained personnel, performing processes or functions related to licensed launch activities or vehicles.

Part 415 prescribes the requirements for launch licences. These include provisions for policy reviews and approvals, safety reviews and approvals, payload reviews and determinations and environmental reviews.

Part 417 prescribes the requirements for launch safety including provisions relating to license terms and conditions, launch safety responsibilities, flight safety analysis, flight safety systems and ground safety.

Part 420 prescribes the requirements for a license to operate a launch site including the requirements for obtaining a license, license terms and conditions and the responsibilities of the licensee.

Part 431 prescribes the requirements for launch and reentry of reusable launch vehicles, including requirements for policy review and approval safety review and approval, payload review and determination, post licensing requirements and environmental review.

Part 433 prescribes the requirements for licenses to operate a reentry site including restriction on re-entry sites and environmental requirements.

Part 435 prescribes the requirements for reentry of vehicles other than reusable launch vehicles including provisions for policy review and approval for reentry, safety review and approval for reentry of a reentry vehicle, payload reentry review and reentry, post-licensing requirements and reentry license terms and conditions and environmental review.

Part 437 prescribes the requirements for experimental permits including requirements for a program description, a flight test plan, operational safety documentation, and safety requirements. It also specifies the terms and conditions of an experimental permit.

Part 440 deals with financial responsibility for licensed and permitted activities including provisions relating to the determination of maximum probable loss, insurance requirements, provisions for reciprocal waivers of claims by licensees and their customers and U.S. payment of excess third party liability claims.

Part 460 deals with human space transportation requirements. Subpart A deals with launch and re-entry with crew and includes requirements relating to the qualification and training of crew, requirements on the operator relating to the training of crew, informing crew of the risk, requirements relating to environmental control and life support systems, requirements for a verification programme and provisions for crew waiver of claims against the U.S. government.

Subpart B deals with launch and reentry of a space flight participant and includes requirements on the operator to inform space flight participants of the risks, provisions for space flight participant waiver of claims against the U.S. Government and requirements relating to space flight participant training and security.

ANNEX 2: FAA INTERNAL QUALITY ASSURANCE STANDARDS, SYSTEMS AND PROCESSES

The FAA Office of Commercial Space Transportation (AST) uses an authorization and oversight process that breaks down into three broad phases: Pre-application, Evaluation, and Launch/Reentry Operations. This process is tied to AST's regulatory requirements for commercial space transportation providers under 14 Code of Federal Regulation (CFR) Parts 400-460, which can be found on the FAA website. An overview of this process follows.

Pre-Application Phase

Pre-application is the first step for all applicants whether they are seeking a launch license, reentry license, experimental permit, a launch/reentry site operator's license (for spaceports), or a modification to any of the previously mentioned authorizations. The purpose of this phase is for AST to familiarize itself with the applicant's proposed vehicle, operation, and/or site, and for the applicant to become familiar with the applicable regulations and identify any issues or unique aspects of an applicant's proposal. Essentially, it is a "dry run" before the applicant submits a formal application to AST.

Required environmental reviews, public safety reviews, and airspace integration work typically start during the pre-application phase. An FAA pre-application team is assigned to all license applicants, which will include staff from other lines of business in the FAA, such as the Air Traffic Organization or Office of Airports, as necessary. Pre-application lasts until AST determines that the applicant is able to submit enough information for its application to be deemed "complete enough." The duration of the pre-application phase varies by applicant but it can often take more than a year. In some cases (e.g. spaceports) it can last up to five years.

Evaluation

The evaluation phase begins when an applicant submits a license or permit application, which AST's licensing and analysis team deems "complete enough" to undergo formal evaluation. Once this occurs, AST has 180 days to issue a license determination to an applicant. For experimental permit applications, AST has 120 days to issue a permit determination.

Environmental reviews and public safety reviews are completed during this period. Airspace integration work continues and carries over into the monitoring phase. AST also begins a payload review (for launch licenses) and a policy review (for all applicants). During these reviews, AST works with its interagency partners such as NASA, the Department of Defense, and the Department of State to determine if the payload complies with public safety requirements, U.S. foreign policy obligations, and national security interests. AST also checks to ensure the applicant has other licenses that may be necessary for their operation, such as a Federal Communications Commission (FCC) license if the applicant is broadcasting into the U.S. or a remote sensing license from the National Oceanic and Atmospheric Administration (NOAA). During the evaluation phase, AST analysts also determine an

applicant's financial responsibility requirements to cover damage to third-party individuals and property for the duration of the proposed operation.

The evaluation phase varies somewhat, dependent on the individual and particular variables respective of each individual applicant. Since AST's regulations and philosophy are intended to be performance-based rather than prescriptive, the office uses a forum called a Technical Review Board (TRB) to evaluate unique aspects of an application that may not have been specifically anticipated in the regulations The TRB is made up of the executives and division managers in AST and is chaired by the Associate Administrator for Commercial Space Transportation. Items and issues examined by a TRB can include technical systems (e.g. a new flight termination system) or processes. The licensing team for a given application evaluates the system or issue at hand and presents its findings along with a recommendation to the TRB, which ultimately issues a decision that is included in the final licensing or permit determination.

Final licensing and permit decisions are made via another forum called the Management Review Board (MRB). The MRB uses the same membership and structure as a TRB. However, it reviews the entire evaluation phase for a given application as opposed to a single unique aspect. As with the TRB, the evaluation team presents the results of its evaluation and a recommendation to the MRB, which then makes a decision based on the information presented. If the MRB determines that all licensing or permit requirements have been satisfied during the evaluation process, the appropriate license or permit is issued to the applicant.

Launch/Reentry Operations

Once a license or permit is issued, the applicant can conduct its operation in accordance with the terms of the license or permit. Each applicant must allow FAA to inspect, which includes providing FAA/AST inspectors with a schedule, access to the launch facilities, and means to monitor the operation (such as a console). FAA/AST safety inspectors can carry out their required activities at any time including before a license or permit is issued as well as during and after a launch or reentry. There are also post-licensing and post-launch reporting requirements that a licensee or permit holder must fulfill. These requirements are defined in the regulation under which the license or permit is issued (e.g. 14 CFR Part 417).

ANNEX 3: QUALIFICATIONS AND TRAINING OF TECHNICAL STAFF

The Office of Commercial Space Transportation (AST) Safety Inspection team members must be fully trained and certified before performing license and/or permit inspection activities on behalf of the Federal Aviation Administration (FAA). Many positions within the AST qualification program share common requirements in terms of training courses and/or mission support. Certified status in terms of a position indicates that an individual is qualified in a position and that a certifying official (who is also qualified) has vouched for and confirmed the validity and authenticity of that certification and qualification in writing. These safety inspection training courses are designed around AST's regulations (e.g. Part 420 on Spaceports) and around specific commercial space activity topics, such as explosive siting. The AST certification program typically takes a year or 18 months to complete.

AST licensing evaluation staff participate in many of the same courses as their safety inspection counterparts, but do not have a formal certification requirement. Additionally, the Licensing Evaluation Division has its own internal training program for new employees. The course lasts roughly three days and is designed to familiarize licensing staff with the process of applying AST's regulations to the applications received from industry. New licensing staff then join and become part of established teams devoted to specific applications and/or companies (in the case where multiple applications are underway by a single entity). Licensing teams are made up of senior, mid-level, and new personnel to ensure consistency in the application of AST's regulations and in facilitation of on-the-job training. Additionally, the final evaluations produced by evaluation staff are reviewed by the entire AST management team in a process known as a Management Review Board (MRB). MRBs also allow any AST member to bring up dissentions which provides a feedback mechanism to measure the quality of evaluation and, by extension, the training of the responsible evaluator.

When hiring new inspection or licensing evaluation staff, AST typically seeks out personnel with bachelors or master's degrees in engineering or one of the physical sciences depending on the level of the position. At higher levels, AST generally seeks out those with examples of additional training and experience such as Federal range operations, ground safety, environmental review and compliance, and regulatory analysis. AST makes serious efforts to factor previous technical training and experience with regard to space operations into the development of prospective employees for AST. For example, many current licensing and inspection staff have prior technical training and experience with NASA, the U.S. Air Force, and similar agencies in the U.S. Government, or with the private sector. AST gives inspectors training credit for such prior experience when appropriate. For example, if an inspector has experience with flight safety analysis from a previous position with NASA, that inspector may not have to take all of AST's flight safety analysis courses.

ANNEX 4: OVERSIGHT AND EVALUATION OF FAA/AST PERFORMANCE

The FAA Office of Commercial Space Transportation (AST) is authorized by federal statute under the auspices of committees in the United States (U.S.) House of Representatives and the U.S. Senate, which rely on the U.S. Government Accountability Office (GAO) to evaluate AST's performance and programs.

GAO compiles reports on specific topics that are mandated by legislation, or upon the request of members of Congress. For example, the 2015 Commercial Space Launch Competitiveness Act (CSLCA) required multiple reports by GAO concerning AST programs and activities. Topics covered by these reports included an evaluation of AST's maximum probable loss methodology, launch insurance requirements, regulation of space support vehicles (for aircraft that operate as part of a space launch operation), risk of federal liability, and the challenges faced by AST in keeping pace with increasing industry launch activities and technological innovations. GAO's reports on these and other topics can be found on their website.

If a GAO report includes its recommendations for improvement, AST submits an official response addressing the recommendations and often includes a corrective action plan. Subsequent GAO reports and direct inquiries from Congress may also follow up on the implementation of previous recommendations and corresponding action plans.

In addition, AST is also overseen by the U.S. Department of Transportation, which plays a key role in department goals and objectives. The White House Office of Management and Budget (OMB) also provides fiscal oversight for all departments and agencies in the Executive Branch. OMB assists the President in meeting policy, budget, management, and regulatory objectives to fulfill agency statutory responsibilities. Senior AST leadership also testifies before Congress periodically to update Members on AST's status and answer questions about AST's programs and operations.