MEMORANDUM OF UNDERSTANDING

BETWEEN

THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

AND

THE U.S. NUCLEAR REGULATORY COMMISSION

CONCERNING

COLLABORATIVE ACTIVITIES IN SAFETY, RELIABILITY, AND RISK ANALYSIS METHODS AND APPLICATIONS

I. PURPOSE

This Memorandum of Understanding (MOU) establishes a collaborative agreement between the National Aeronautics and Space Administration (NASA) Office of Safety and Mission Assurance (OSMA) and the U.S. Nuclear Regulatory Commission (NRC) Office of Nuclear Regulatory Research (RES).

Fundamental to this agreement is the understanding that NASA/OSMA and NRC/RES will define and execute their own focused programs incorporating, as appropriate, common activities covered by this MOU. The general intent of this MOU is to share relevant technical information, reliability data, and software technology generated by NASA and NRC programs.

II. AUTHORITY

This MOU is authorized pursuant to 51 U.S.C section 20113; Section 31 of the Atomic Energy Act, and Section 205 of the Energy Reorganization Act.

The roles, responsibilities, terms, and conditions of this MOU will not be interpreted in a manner inconsistent with, and will not supersede, applicable Federal laws and regulations.

III. BACKGROUND

NASA/OSMA is engaged in activities in the interest of safety and the success of all NASA activities, including innovation and rapid transfer of Safety, Reliability, Maintainability, and Quality Assurance Technologies, processes, and techniques to improve safety and reliability and to reduce the cost of space missions.

NRC/RES conducts independent research in all areas regulated by NRC, including ongoing and potential safety issues, risk-informed and performance-based regulation, and operating experience analysis.

NASA and NRC develop and apply safety and risk models in safety-related activities. Because these models are intended to support risk-informed decisions, both agencies need to ensure that risk models are technically sound and robust and are applied appropriately to decision processes. Accordingly, NASA/OSMA and NRC/RES are motivated to develop advanced risk analysis techniques and tools to support risk-informed decision-making.

Although the safety-related activities of NASA and NRC may be conducted for different purposes, the underlying data and the results obtained have common value to both agencies. In a 2004 meeting, the NASA administrator and NRC chairman recognized the potential benefits in sharing pertinent information between agencies in support of Probabilistic Risk Assessment (PRA) applications. Accordingly, to conserve resources and to avoid unnecessary duplication of effort, both NASA/OSMA and NRC/RES agree to cooperate in selected activities and to share information related to such activities whenever such cooperation is appropriate and mutually beneficial.

This MOU updates an almost identical MOU between NASA/OSMA and NRC/RES that expired at the end of 2013. Over the past five years, numerous exchanges of information, training, data, and software were made under the MOU. Based on this prior experience, NASA/OSMA and NRC/RES agree that continued collaboration in areas of safety, reliability, and risk is beneficial to both agencies.

IV. OBJECTIVES

The overall objective of this collaborative effort is to enable and expedite the development of risk and reliability analysis methods, tools, data, and applications as well as technical information that are useful to NASA/OSMA and NRC/RES and to avoid unnecessary duplication of tasks between agencies.

Provided below are potential areas of collaborative activities and specific objectives of the MOU.

A. Technical Areas. Both organizations are supporting a number of activities aimed at improving risk and reliability analysis methods and applications. Technical areas for collaboration may include:

- Advanced risk and reliability analysis techniques.
- New generation of risk and reliability software tools and data standards.
- Software (digital instrumentation and control systems) reliability analysis.
- Reliability data collection and analysis.
- Human performance and reliability data collection and analysis.
- Accident precursor analysis and applications.

- Risk-informed decision-making techniques and applications.
- Risk-informed audits and inspections.
- Risk-informed performance management.
- Uncertainty and safety margin analyses and applications.
- Risk-analysis applications in design processes.
- Fire-risk analysis and application.
- Risk-related knowledge management.

B. Specific Objectives. This MOU has the following specific objectives:

1. Timely exchange of information (e.g., objectives, milestones) on planned and ongoing activities.
2. Share reliability and human error data needed by NASA/OSMA and NRC/RES programs.
3. Share risk and reliability analysis methods, tools, and/or data needed to support risk-informed applications.
4. Assess the capabilities of current and advanced risk and reliability analysis methods and tools.

Detailed agreements between NASA and NRC may be established for specific collaborative activities in the future as the need arises. These agreements will address issues such as technical objectives and personnel. To the extent that any activities require NASA or the NRC to provide funding to the other Party, any such arrangements will be provided for under a separate agreement and funding instrument.

V. DECISIONAL AUTHORITY

The following personnel ("Principals") will provide the executive direction and oversight of the NASA/OSMA and NRC/RES collaborative activities under this MOU.

Dr. Frank J. Groen
Director, Safety and Assurance Requirements Division
Office of Safety and Mission Assurance
National Aeronautics and Space Administration
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Richard Correia
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VI. SCOPE AND PLAN

This MOU may include a variety of collaborative activities (including information exchange meetings, support of expert panels, establishment of an advisory group composed of government civil servants, and jointly sponsored activities) aimed at achieving the preceding objectives from Article IV above. The potential means for collaboration include:

A. Methods and Techniques for Risk-Analysis Applications. Participate in collaborative activities to develop practicable and technically sound methods and techniques for risk-analysis applications in the technical areas identified in Article IV.

B. Programmatic Information Exchange. Exchange information concerning the objectives, milestones, and planned approaches in ongoing activities.

C. Technical Information Exchange. Facilitate the exchange of technical information between technical staff and project managers. This technical exchange is particularly important in cases where, to avoid unnecessary duplication of effort, NASA/OSMA and NRC/RES agree to a division of effort on the basis of complete exchange results. It also includes support of working meetings between staff (on an agreed-upon as-needed basis).

D. Workshops/Training/Seminars. Provide opportunities to attend workshops, training classes, and technical seminars on relevant topics of interest. NASA/OSMA and NRC/RES may collaborate in the development of new training materials and courses on topics of mutual interest.

E. Formal Reviews. Provide independent reviews of the other agency's draft technical reports, policies, guidance, and plans, where appropriate. These reviews may be provided on an agreed-upon as-needed basis involving relevant topics of interest.

F. Advisory Group. NASA/OSMA and NRC/RES will establish an advisory group to provide advice and assistance in:

- Fostering an effective NASA/NRC collaboration in mutual activities.
- Ensuring that planning is coordinated, when appropriate.
- Monitoring progress toward the objectives as described in Article IV above and proposing adjustments in the organizations' plans, as necessary.
- Proposing changes to program goals and plans based on changing organizations' requirements.

Any necessary executive actions required to implement recommendations from the advisory group will be assigned by authority of the respective Principal. Actions of the advisory group are intended to support, not supplant, existing strategic planning activities in each organization.

G. Working-Level Organization and Contacts. The Principals of this MOU will select one individual from each party to this MOU to co-chair the advisory group and to designate members of the committee from their respective organizations. In addition, the advisory group may identify coordination contacts ("Coordination Contacts") from each organization for each technical area as described in Article IV above. Coordination Contacts are to serve as primary interfaces for routine interactions between NASA and NRC for their respective technical area.

H. Meetings and Recommendations. The advisory group will confer, either via conference call or in meetings, as needed, to review the status of ongoing collaborative activities; identify opportunities, if any, for additional collaborative areas; and suggest any expansion, modification, or completion of existing collaborative activities. Each co-chair will keep their Principal informed of the outcomes of these meetings and specific recommendations provided for decision by the Principals. The Coordination Contacts and appropriate personnel may meet more frequently as necessary to evaluate specific collaborative activities.

VII. FUNDING

There will be no transfer of funds or other obligations between NASA/OSMA and NRC/RES in connection with the MOU. Each will fund its own participation. All activities under or pursuant to this MOU are subject to the availability of appropriated funds and the agencies' respective funding procedures.

VIII. LIABILITY

NASA/OSMA and NRC/RES agree to assume liability for its own risks arising from or related to activities under this MOU.

IX. PRIORITY OF USE

Any schedule or milestones in the MOU is estimated based on the Parties' current understanding of the projected availability of their personnel, facilities and equipment. In the event that either Party's projected availability changes, the other Party shall be given reasonable notice of that change, so that the schedule and milestones may be adjusted accordingly. The Parties agree that its own usage of any facilities, equipment, and personnel shall have priority over the usage planned in this MOU. Should a conflict arise, the responsible Federal entity, in its sole discretion shall determine whether to exercise that priority.

X. USE AND RELEASE OF TECHNICAL DATA, RESULTS, AND TOOLS; PROTECTION AND SECURITY OF INFORMATION

A. Information and Data Exchange. The information and data exchanged in furtherance of the activities under this MOU will be exchanged without use and disclosure restrictions. All final data and results produced by joint activities carried out under this MOU will be shared by all participants, and each agency will be free to disseminate them to whomever they choose.

NASA and NRC will not restrict each other's rights to use the information and data unless required by national security regulations (e.g., classified information) or otherwise agreed to by the agencies for specifically identified information or data (e.g., proprietary data marked with a restrictive notice).

B. Sensitive Information and Data. NASA and NRC agree to take appropriate measures to protect proprietary, privileged, classified, or otherwise restricted information and data that may come into their possession as a result of this MOU provided such information is marked with a restrictive notice so it may be specifically identified.

C. Government Computer Codes. NRC agrees that NRC use of NASA software will be undertaken pursuant to a NASA Software Usage Agreement. NASA agrees that NASA use of NRC software will be undertaken pursuant to a NRC Non-disclosure Agreement for a computer code. NASA and NRC agree to take appropriate measures to ensure that Government-owned, agency-controlled computer codes provided by the other agency ("Agency Provider") are not released to any third party (e.g., government contractors, academic institutions, commercial enterprises, international organizations) without obtaining prior written permission from the Agency Provider, and the third party must also obtain in advance written permission from the Agency Provider.

D. Publications. Written approval by each Signatory or designee will be required for public release or publication in journals or conference proceedings by any party or contractor of joint works that include data or results that are identified as proprietary or government restricted.

E. Public Meetings. NRC anticipates that public meetings with the Commission or the Advisory Committee on Reactor Safeguards may be held relating to activities conducted under this MOU. In the event of such meetings, NRC and NASA will endeavor to share all pertinent information relating to these meetings with the public consistent with all applicable laws and regulations.

F. Public Information Coordination. Freedom of Information Act requests, or other requests for documents, will be handled in accordance with the applicable statutes (e.g., Freedom of Information Act), rules, regulations, policies, and procedures. The Parties recognize that Federal law may require the release of this data.

XI. INTELLECTUAL PROPERTY RIGHTS

Unless otherwise agreed by NASA and the NRC, custody and administration of inventions made (conceived or first actually reduced to practice) as a consequence of, or in direct relation to, the performance of activities under this MOU will remain with the respective inventing Party. In the event an invention is made jointly by employees the Parties (including by employees of a Party's contractors or subcontractors for which the U.S. Government has ownership), NASA and the NRC will consult and agree as to future actions toward establishment of patent protection for the invention.

XII. APPLICABLE LAW

U.S. Federal law governs this MOU for all purposes, including, but not limited to, determining the validity of the Agreement, the meaning of its provisions, and the rights, obligations and remedies of the Parties.

XIII. MODIFICATIONS

This MOU may be modified upon the mutual written agreement of NASA/OSMA and NRC/RES. Modifications must be signed by the original signatories to the MOU or their designees or successors.

XIV. TERMINATION

Either Party may unilaterally terminate this MOU by providing 30 calendar days written notice to the other Party.

XV. CONTINUING OBLIGATIONS

The rights and obligations of the Parties, that by their nature, would continue beyond the expiration or termination of this MOU, e.g., "Liability" and "Intellectual Property Rights" shall survive such expiration or termination of this MOU.

XVI. DISPUTE RESOLUTION

Except as otherwise provided in the Article IX, "Priority of Use," Article XI, "Intellectual Property Rights," (for those activities governed by 37 C.F.R. Part 404), and those situations where a pre-existing statutory or regulatory system exists (e.g. under the Freedom of Information Act, 5 U.S.C. § 552), all disputes concerning questions of fact or law arising under this Agreement shall be referred by the claimant in writing to the appropriate person identified in Article V, "Decisional Authority." The persons identified as the "Decisional Authority" for NASA and the NRC will consult and attempt to resolve all issues arising from the implementation of this Agreement. If they are unable to come to agreement on any issue, the dispute will be referred to the signing officials, or their designees, for joint resolution after the Parties have separately documented in writing clear reasons for the dispute. As applicable, disputes will be resolved pursuant to Section VII (Resolving Intragovernmental Disputes and Major Differences) of the Intragovernmental Business Rules (Treasury Financial Manual, Vol. 1, Part 2, Chapter 4700, Appendix 10), which refers to Section 2.4.2 of the Intragovernmental Transaction Guide using the Fiscal Service to help resolve any dispute.

XVII. PERIOD OF PERFORMANCE

This MOU becomes effective upon the date of the last signature below and will remain in effect for 5 years unless terminated by the written request of either Party.

XVIII. EXECUTION

Approved and Authorized on Behalf of Each Party by:

Terrence W. Wilcutt
Chief, Safety and Mission Assurance
National Aeronautics and Space Administration

Date 8/18/2014

Brian W. Sheron
Director, Office of Nuclear Regulatory Research
U.S. Nuclear Regulatory Commission

Date 9/2/14