

# COOPERATIVE RESEARCH AND DEVELOPMENT AGREEMENT

No. 05-CRADA-RDC-001

Fire Risk Management, Inc.

And

U.S. Coast Guard Research and Development Center

This Cooperative Research and Development Agreement ("CRADA"), dated [ ], is entered into by and between Fire Risk Management, Inc. hereinafter referred to as "FRM" and the United States of America, as represented by the U.S. Coast Guard Research and Development Center hereinafter referred to as "R&D Center".

## A. BACKGROUND

Refer to Statement of Work (Appendix A)

## B. OBJECTIVE AND PLAN

Refer to Statement of Work (Appendix A)

## C. AGREEMENT

A. Whereas, the Congress in enacting the Federal Technology Transfer Act of 1986, Public Law No. 99-502, October 20, 1986, has found that Federal laboratories' developments should be made accessible to private industry, State and local Governments, and has declared that one of the purposes of such Act is to improve the economic, environmental, and social well being of the United States by stimulating the utilization of Federally-funded technology developments by such parties; and

B. Whereas, the Federal Technology Transfer Act of 1986 and Executive Order 12591, April 10, 1987, 52 F.R. 13414, as amended Ex. Ord. No. 12618, Dec. 22, 1987, 52 F.R. 48611, "Facilitating Access to Science and Technology", among other technology transfer innovations (See Title 15, Chapter 63, United States Code), have provided each Federal agency with the authority to permit the Director of Government-operated Federal laboratories to enter into CRADAs with Federal or non-Federal entities, including private firms and organizations, for the purpose of providing to collaborating parties personnel, property, facilities, equipment, intellectual property or other resources (EXCEPT FUNDS), or obtaining from collaborating parties personnel, services, property, facilities, equipment, intellectual property or other resources (INCLUDING FUNDS) toward the conduct of specified research and development efforts which may include the disposition of patent rights in the inventions which may result from such collaboration and

C. Whereas, the R&D Center has recently performed and is now performing substantial research and development with respect to fire resistant structures/components and fire suppression systems (known hereafter as "the Technology"), and

D. Whereas, the R&D Center possesses certain advanced scientific skills, facilities, personnel, special equipment, information, computer software and know-how pertaining to the Technology; and

E. Whereas, the R&D Center desires to pursue the further development of the Technology; and

F. Whereas, FRM is also interested in the further development of the Technology; and

G. Whereas, FRM desires to provide resources for the further development of the Technology; and

H. Whereas, the R&D Center views its cooperation through this CRADA with FRM to develop the Technology to be in the furtherance of the public interest; and

I. Whereas, upon the successful completion of testing, FRM's client(s) desires to carry out a plan for incorporating the use of such technology into their product(s) and subsequently marketing the use of this new technology-infused product(s); and

J. Whereas, the R&D Center views the commitment of FRM to undertake its product development and marketing plan to be in the furtherance of the public interest; and

K. Whereas, FRM will contribute expertise in the research and development of fire resistive materials and alternative marine fire protection designs that are in the consumer's best interest.

## **NOW, THEREFORE, THE PARTIES HEREBY AGREE AS FOLLOWS:**

### **Article 1. Definitions**

As used in this AGREEMENT, the following terms shall have the following meanings and such meanings shall be equally applicable to both the singular and plural forms of the terms defined:

1.0 The term "AGREEMENT" means this Cooperative Research and Development Agreement, or CRADA.

1.1 The term "Cooperative Research and Development Program" means the research and development work as defined in the Obligation of the Parties (OP) in Article 2, paragraph 2.1.

1.2 The term "invention" means any invention or discovery (including software-related invention), which is or may be patentable or otherwise protected under Title 35 of the United States Code or any novel variety of plant which is or may be protectable under the Plant Variety Protection Act (7 U.S.C. 7321 et seq.).

1.3 The term "made" in relation to any invention means the conception or first actual reduction to practice of such invention.

1.4 The term "effective date" means the date stamped on the first page of this AGREEMENT. This date shall be 32 days following the date on which the Director (Commanding Officer) of the R&D Center signs the AGREEMENT. This delay allows 30 days (plus 2 days for mail) for the disapproval or modification of this AGREEMENT within the Coast Guard Chain of Command.

1.5 The term "proprietary information" means information which could provide a competitive advantage to the party possessing such information and which either embodies trade secrets developed at private expense and outside of any Government contract or is confidential technical, business, or financial information provided that such information:

- i) is not generally known, or is not available from other sources without obligations concerning its confidentiality;
- ii) has not been made available by the owners to others without obligations concerning its confidentiality; or,
- iii) is not already available to the public without obligations concerning its confidentiality.

1.6 "Subject invention" means any invention conceived or first actually reduced to practice in the performance of work under this AGREEMENT.

1.7 The term "Work Plan" means a detailed description of how the research objectives of this AGREEMENT are going to be met, including, but not limited to, background, scope, place of performance, and tasks to be accomplished.

1.8 The term "created" in relation to any copyrightable software work means when the work is fixed in any tangible medium of expression for the first time, as provided for at 17 U.S.C. 101.

## Article 2. Cooperative Research and Development Program

2.1 Obligation of the Parties (OP). The cooperative research and development program performed under this AGREEMENT shall be performed in accordance with the OP attached hereto as Appendix A. The utilization of R&D Center's personnel, resources, facilities, equipment, skills, know-how, computer software and information (**but not funds**) will be consistent with its own policies, missions, and requirements. It is understood that the nature of this cooperative research is such that completion within the period of performance specified, or within the limits of financial support allocated, cannot be guaranteed. Accordingly, it is agreed that all cooperative research is to be performed on a best efforts basis. Any modifications of the OP shall be by mutual AGREEMENT between the parties and shall be incorporated herein by a formally executed written amendment to this AGREEMENT.

2.2 Review of Work. Periodic conferences may be held, when deemed necessary by both parties, between personnel of the R&D Center and FRM for the purpose of reviewing the progress of work defined in the OP of paragraph 2.1.

2.3 Principal Investigator. The R&D Center agrees to assign a substantial portion of the work to be performed pursuant to the OP to the Marine Fire and Safety Research group. The work will be performed under the supervision of Mr. Dave Beene who, as principal investigator, has the responsibility for the scientific and technical conduct of this project.

2.4 Scope Change. If at any time the Principal Investigator R&D Center determines that the research data dictates a substantial change in the direction of the work, the R&D Center shall promptly notify FRM and the parties shall make a good faith effort to agree on any necessary change to the Obligation of the Parties. Any substantial change in the direction of work will be formalized by a written mutual AGREEMENT and a written change to the OBLIGATION OF THE PARTIES that specifies the new work to be performed.

## Article 3. Reports

FRM shall prepare the test plans and final reports. Copies of all reports shall be forwarded to the addresses listed in Article 19. The final report shall be prepared within four (4) months after completing the work called for in the Obligation of the Parties.

## Article 4. Financial Obligation

The performance of research by the R&D Center under this AGREEMENT will begin upon receipt of funds from FRM.

## Article 5. Term

The term of this AGREEMENT is for a period of 24 months commencing on the effective date of this AGREEMENT, unless otherwise modified pursuant to Article 13.

## Article 6. Title to Property

6.1 Capital Equipment. All capital equipment developed, acquired, and funded under this AGREEMENT by the R&D Center shall be the property of the R&D Center, except that title to capital equipment provided to the R&D Center by FRM or acquired by the R&D Center with funds supplied by FRM shall remain or vest in FRM. The R&D Center makes no express or implied warranty as to any capital equipment that remains or vests in FRM.

6.2 Software. Title to software developed by FRM exclusively at private expense shall remain in FRM. Except to the extent that such software may be patentable, the Government acquires no additional rights to software developed by FRM in the course of participating in this AGREEMENT. Rights acquired in patentable software are set out in Article 9.

## Article 7. Publicity, Use of Name, and Endorsement

7.1 FRM shall not use the name of the R&D Center or the United States Coast Guard on any product or service which is directly or indirectly related to either this AGREEMENT or any patent license or assignment Agreement which implements this AGREEMENT without the prior approval of the Commandant, United States Coast Guard.

7.2 By entering into this AGREEMENT, neither the R&D Center nor the United States Coast Guard directly or indirectly endorse any product or service provided, or to be provided by FRM, its successors, assignees, or licensees. FRM shall not in any way imply that this AGREEMENT is an endorsement by the R&D Center or the United States Coast Guard of any such product or service.

## Article 8. Publication

The R&D Center and FRM agree to confer and consult with each other prior to publication or other public disclosure of the results of work under this AGREEMENT to ensure that no proprietary information or military critical technology is released. Furthermore, prior to submitting a manuscript for publication or before any other public disclosure, each party will offer the other party ample opportunity to review such proposed publication or disclosure, to submit objections, and to file applications for letters patent in a timely manner.

## Article 9. Patents

9.1 Reporting. The R&D Center shall promptly report to FRM each subject invention reported to the R&D Center by its employees. FRM shall promptly disclose to the R&D Center each subject invention reported to FRM by any of its employees. Each party shall provide the other party with copies of the patent applications it files on any subject invention along with the power to inspect and make copies of all documents retained in the official patent application files by the applicable patent office, except as may be prohibited by 35 U.S.C. 181, relating to inventions affecting the national security.

9.2 Inventions by Employees of FRM (or its Clients). The R&D Center, on behalf of the U.S. Government, waives any ownership rights the U.S. Government may have in subject inventions made by FRM employees, or the Client(s) it represents in developing the new technology, and agrees that FRM shall have the option to retain title to any such employee subject invention. FRM shall notify the R&D Center promptly upon making this election and agrees to file timely patent applications on such subject invention at its own expense in such countries which FRM, in its own discretion, deems expedient. FRM agrees to grant to the U.S. Government a worldwide, non-exclusive, irrevocable, paid-up license to practice, or to have practiced on behalf of the U.S. Government, the patents covering its employee's subject inventions. This patent license shall be evidenced by a confirmatory license AGREEMENT prepared by FRM in a form satisfactory to the R&D Center. Nothing in this AGREEMENT shall be interpreted to require FRM to continue the prosecution of such patents, nor to maintain them in force. Should FRM choose to abandon an application once filed or decide not to pay any maintenance fee when due, FRM shall immediately grant title to such application or patent to the Government of the United States.

9.3 Inventions by Government Employees and Joint Inventions. The R&D Center, on behalf of the U.S. Government shall have the initial option to retain title to each subject invention made by its employees and in each subject invention made jointly by FRM and R&D Center employees. In the event that the R&D Center informs FRM that it elects to retain title to such joint subject invention, FRM agrees to assign to the Government whatever right, title and interest FRM has in and to such joint subject invention.

9.4 Filing of Patent Application. The party having the right to retain title and file patent applications on a specific subject invention may elect not to file patent applications thereon provided it so advises the other party within sixty (60) days from the date it discloses the subject invention to the other party. Thereafter, the other party may elect to file patent applications on such subject invention and the party initially reporting such subject invention agrees to assign its right, title and interest in such subject invention to the other party and cooperate with such party in the preparation and filing of patent applications thereon. The assignment of the entire right, title, and interest to the other party pursuant to this paragraph shall be subject to the retention by the party assigning title of a non-exclusive, irrevocable, paid-up license to practice, or have practiced on its behalf, the subject invention throughout the world. In the event neither of the parties to this AGREEMENT elect to file a patent application on a subject invention, either or both (if a joint invention) may, at their sole discretion and subject to reasonable conditions, release the right to file to the inventor(s) with a license in each party of the same scope as set forth in the immediately preceding sentence.

9.5 Patent Expenses. The expenses attendant to the filing of patent applications as specified in 9.4 above, and all maintenance fees, shall be borne by the party filing the patent application. Any party having an obligation to pay a maintenance fee who decides not to pay such maintenance fee, shall so notify the other party of that decision in sufficient time to permit the other party to act to preserve its interest in the patent.

9.6 Nonexclusive License. The R&D Center, on behalf of the U.S. Government, agrees to grant to FRM, for reasonable compensation, a nonexclusive license in any invention made under this AGREEMENT, in whole or in part, by a Government employee.

9.7 Exclusive License. The R&D Center on behalf of the U.S. Government, hereby agrees to grant to FRM, for reasonable compensation, a limited term exclusive license in any invention made under this AGREEMENT, in whole or in part, by a Government employee in the specific field of use of TECHNOLOGY; subject to the reservation of a nonexclusive, nontransferable, irrevocable, paid-up license to practice, and to have practiced throughout the world, by or on behalf of the U.S. Government, the subject invention and such other terms and conditions as are specified by the R&D Center in such exclusive license.

#### 9.8 Retention of Government Rights in Inventions Made Under this AGREEMENT

9.8.1 Government License. FRM agrees to grant to the U.S. Government a nonexclusive, nontransferable, irrevocable, paid-up license to practice or have practiced throughout the world by or on behalf of the Government each invention made in whole or in part by its employees under this AGREEMENT. This license shall be evidenced by a confirmatory license agreement prepared by FRM in a form satisfactory to the R&D Center.

9.8.2 March-in Rights. In the event the R&D Center assigns title or grants an exclusive license to subject invention made in whole or in part by a Government employee, the Government shall retain the right:

- a. to require the collaborating party to grant to a responsible applicant a nonexclusive, partially exclusive, or exclusive license to use the invention in the applicant's licensed field of use, on terms that are reasonable under the circumstances; or
- b. if the collaborating party fails to grant such a license, to grant the license itself. See 15 U.S.C. 3710a(b)(1)(B).

9.8.3 Government Exercise of March-in Rights. The Government may exercise its rights under Article 9.8.2 only in exceptional circumstances and only if the Government determines that:

- a. the action is necessary to meet health or safety needs that are not reasonably satisfied by the collaborating party;
- b. the action is necessary to meet requirements for public use specified by Federal regulations, and such requirements are not reasonably satisfied by the collaborating party; or
- c. the collaborating party has failed to comply with an agreement containing provisions described at 15 U.S.C. 3710a(c)(4)(B) pertaining to domestic manufacture of products embodying subject inventions. See 15 U.S.C. 3710a(b)(1)(C) and Article 15.1.3 of this AGREEMENT.

9.9 Rights in Inventions Made by Third Parties. FRM shall have no rights in any inventions made by third parties to this AGREEMENT, except as provided by separate AGREEMENT between FRM and such third party. Such separate AGREEMENT regarding rights in inventions shall not denigrate any rights allocated by this AGREEMENT between FRM and the U.S. Government. Should an invention be made jointly by an employee of the U.S. Government, and one or more third parties to this AGREEMENT, and not by any employee of FRM, FRM shall have no rights in any such invention, except as provided by separate AGREEMENT among all inventors or their assignees. Should an invention be made jointly by employees of the U.S. Government, FRM, and any third parties to this AGREEMENT, all joint inventors, or their assignees, agree to negotiate such cross licenses as may be necessary to effect the maximum commercialization of the invention.

9.10 Prior Patents of FRM. This AGREEMENT does not grant to the Government any rights in any invention conceived of, and actually reduced to practice, by FRM prior to the date of the AGREEMENT.

## Article 10. Copyrights.

10.1 Ownership of Copyright. FRM shall have the option to own the copyright in all software (including modifications and enhancements thereto), documentation, and other works created in whole or in part by FRM under this AGREEMENT, which is subject to being copyrighted under Title 17, United States Code. FRM shall mark any such works with a copyright notice showing FRM as the author or co-author and shall in its reasonable discretion determine whether to file applications for registration of copyright. Should FRM choose not to own the copyright in any such software, it will execute an assignment of the copyright to the U.S. Government.

10.2 Copyright Notice. FRM will clearly mark all copyrighted software or other works provided to the U.S. Government with appropriate notices on it.

## Article 11. Copyright Royalties

11.1 Royalties for Preexisting Copyrighted Material. FRM shall grant to the R&D Center a non-exclusive, royalty free license for material that is copyrighted by FRM, and is necessary for the completion of this AGREEMENT. Such license shall be for the duration of this AGREEMENT.

11.2 Royalties for Material Copyrighted as Part of this AGREEMENT FRM shall grant to the R&D Center, as representative for the U.S. Government, a non-exclusive, royalty free license for material copyrighted by FRM in accordance with paragraph 10.1. This license shall include third parties when they are acting in the U.S. Government's interest. The U.S. Government, as represented by the R&D Center, agrees to license to FRM any material for which the U.S. Government can claim copyright in accordance with paragraph 10.1 on terms acceptable to the parties.

## Article 12. Proprietary Information

12.1 Ownership of Proprietary Information. Subject to Articles 9 and 10, any proprietary information developed solely by a party under this AGREEMENT shall be owned by the party that developed it. When proprietary information (except for computer software) is developed solely by FRM, FRM agrees to grant the U.S. Government a non-exclusive, irrevocable, royalty-free license to use, duplicate, and disclose in confidence, such proprietary information. The R&D Center and FRM shall jointly own any jointly developed proprietary information. With respect to any such jointly-owned proprietary information or proprietary information developed solely by the R&D Center, FRM shall have the option to obtain from the U.S. Government an exclusive royalty-free license with respect to the U.S. Government's interest in the proprietary information, provided, however, that FRM shall exercise its option within twenty-four (24) months after termination or expiration of the AGREEMENT. This license is subject to reservation by the U.S. Government of a royalty-free right to use, duplicate, and disclose in confidence, the licensed proprietary information for Governmental purposes, and to permit others to do so on behalf of the U.S. Government and on behalf of any foreign Government or international organization pursuant to any existing or future treaty or AGREEMENT with the United States. The terms of any license respecting proprietary information developed solely by the R&D Center, under the AGREEMENT, shall be limited in accordance with 15 U.S.C. 3710a(c)(7)(B) concerning exemptions to the Freedom of Information Act, 5 U.S.C. 552. Computer software developed solely by FRM is covered by Article 6.2 "Software."

12.2 Proprietary Notice. The parties will mutually develop an appropriate proprietary notice(s) for use in connection with this AGREEMENT. The parties agree to cooperate in removing or remarking any information marked as proprietary information which ceases to be proprietary information because the information was publicly disclosed in a patent, copyrighted work, or as may be required by law.

## Article 13. Expiration, Termination, Disputes, and Extensions

13.1 Expiration and Termination. This AGREEMENT shall expire as specified in Article 5 unless both parties hereto agree in writing to extend it further. However, either party may terminate this AGREEMENT upon delivery of written notice at least ninety (90) days prior to such termination. Each party shall bear its own costs resulting from or related to the termination.

13.2 Disputes. FRM and R&D Center recognize that disputes arising under this AGREEMENT are best resolved at the local working level by the parties directly involved. Any dispute arising under this AGREEMENT that is not disposed of by AGREEMENT of the parties shall be submitted jointly to the signatories of this AGREEMENT. A joint decision of the signatories or

their designees shall be the disposition of such dispute. If the parties are unable to jointly reach a good-faith resolution of the issues through negotiation or other forms of nonbinding alternative dispute resolution, either party may terminate this AGREEMENT immediately.

13.3 Continuation of Cooperative Research Pending Resolution. Pending the resolution of any dispute under this Article, work under this AGREEMENT will continue as elsewhere provided herein.

13.4 Obligations Surviving Termination. Termination of this AGREEMENT by either party for any reason shall not affect the rights and obligations of the parties accrued prior to the effective date of termination of this AGREEMENT. No termination of this AGREEMENT, however effectuated, shall release the parties hereto from their rights, duties and obligations under Articles 3, 4, 6, 7, 8, 9, 10, 11, 12, 16, and 18.

13.5 Extensions. Extensions of the term of this AGREEMENT may be made prior to the termination of the AGREEMENT without the need for additional review beyond that of the Director of the R&D Center. If the parties wish to continue the work called for under the OBLIGATION OF THE PARTIES after the termination of this AGREEMENT, they may enter into a new CRADA.

## Article 14. Independent Contractors

The parties to this AGREEMENT are independent contractors and are not agents of each other, joint ventures, partners or joint parties to a formal business organization of any kind. Neither party is authorized or empowered to act on behalf of the other with regard to any contract, warranty nor representation as to any matter, and neither party will be bound by the acts or conduct of the other. Each party will maintain sole and exclusive control over its own personnel and operations.

## Article 15. Representations and Warranties

15.1 Representations and Warranties of the R&D Center. The R&D Center hereby represents and warrants to follows:

15.1.1 Mission. The performance of the activities specified by this AGREEMENT is consistent with the mission of the R&D Center.

15.1.2 Authority. The R&D Center prior to the execution of the AGREEMENT has obtained all prior reviews and approvals required by regulations or law. The R&D Center official executing this AGREEMENT has the requisite authority to do so. Notwithstanding the delegation of authority to execute the AGREEMENT to the Director of the R&D Center, the Chief, Procurement Management Division, U.S. Coast Guard Headquarters (Commandant (G-CPM)), pursuant to 15 U.S.C. 3710a(c)(5)(A), may disapprove or require the modification of these AGREEMENT within 30 days of the date it is presented to him by the R&D Center

15.1.3 Statutory Compliance. The R&D Center, prior to entering into this AGREEMENT, has (1) given special consideration to entering into CRADAs with small business firms and consortia involving small business firms; (2) has given preference to business units located in the United States, which agree that products embodying inventions made under the AGREEMENT or produced through the use of such inventions will be manufactured substantially in the United States and; (3) in the event this AGREEMENT is made with an industrial organization or other person subject to the control of a foreign company or Government, taken into consideration whether or not such foreign Government permits United States agencies, organizations, or other persons to enter into CRADAs and licensing agreements with such foreign country.

15.2 Representations and Warranties of FRM. FRM hereby represents and warrants to the R&D Center as follows:

15.2.1 Corporate Organization. FRM, as of the date hereof, is a Maine corporation duly organized, validly existing and in good standing under the laws of the STATE OF MAINE.

15.2.2 Statement of Ownership. FRM is neither foreign owned nor a subsidiary of a foreign-owned entity and will inform the R&D Center prior to entering into any arrangement for substantial non-domestic manufacture or foreign acquisition or control.

15.2.3 Power and Authority. FRM has the requisite power and authority to enter into this AGREEMENT and to perform according to the terms thereof.

15.2.4 Due Authorization. The Board of Directors and shareholders of FRM have taken all actions required to be taken by law, FRM's Certificate or Articles of Incorporation, its bylaws or otherwise, to authorize the execution and delivery of this AGREEMENT.

15.2.5 No Violation. The execution and delivery of this AGREEMENT does not contravene any material provision of, or constitute a material default under, any material AGREEMENT binding on FRM or any valid order of any court, or any regulatory agency or other body having authority to which FRM is subject.

## Article 16. Liability

16.1 Tort Liability of Government. The U.S. Government shall not, except for gross negligence, fraud, abuse, or misuse, be responsible for any property of FRM consumed, damaged, or destroyed in the performance of this AGREEMENT. Any liability of the U.S. Government is determined pursuant to the Federal Tort Claims Act, 28 U.S.C. 2671 et seq.

16.2 Personal Injury and Damage to Property. FRM agrees to hold and save the U.S. Government, its officers, agents, and employees harmless from liability of any nature or kind, including costs and expenses, for, or on account of, any or all suits or damages of any character whatsoever resulting from injuries or damages sustained by any person or persons or property by virtue of negligence on the part of FRM its officers, agents, and employees in the performance of this AGREEMENT.

16.3 No Warranty. Except as specifically stated in Article 15, the R&D Center makes NO express or implied warranty as to any matter whatsoever, including the conditions of the research or any invention or product, whether tangible or intangible, made or developed under this AGREEMENT, or the ownership, MERCHANTABILITY, or fitness for a particular purpose of the research or any invention or product.

16.4 Indemnification. FRM holds the U.S. Government harmless and indemnifies the Government for all liabilities, demands, damages, expenses and losses arising out of the use by FRM, or any party acting on its behalf or under its authorization, of the R&D Center's research and technical developments or out of any use, sale or other disposition by FRM, or others acting on its behalf or with its authorization, of products made by the use of the R&D Center's technical developments. This provision shall survive termination of this AGREEMENT.

16.5 Disposal of Waste. The amount of waste produced during these tests will be minimal. All cost for waste removal and disposal is the responsibility of FRM and will be included in the cost estimate for the R&D Center to conduct any testing. The R&D Center is responsible for waste removal for all activities conducted at its test site Little Sand Island, Mobile, Alabama and must initiate this action through the local Coast Guard Sector Mobile hazardous waste coordinator to insure that mandatory policies and procedures are followed.

## Article 17. Force Majeure

Neither party shall be liable for any unforeseeable event beyond its reasonable control not caused by the fault or negligence of such party, which causes such party to be unable to perform its obligations under this AGREEMENT (and which it has been unable to overcome by the exercise of due diligence), including, but not limited to, flood, drought, earthquake, storm, fire, pestilence, lightning and other natural catastrophes, epidemic, war, riot, civic disturbance or disobedience, strikes, labor dispute, or failure, threat of failure, or sabotage, or any order or injunction made by a court or public agency. In the event of the occurrence of such a force majeure event, the party unable to perform shall promptly notify the other party. It shall further use its best efforts to resume performance as quickly as possible and shall suspend performance only for such period of time as is necessary as a result of the force majeure event.

## Article 18. Miscellaneous

18.1 No Benefits. No member of, or delegate to the United States Congress, or resident commissioner, shall be admitted to any share or part of this AGREEMENT, nor to any benefit that may arise therefrom; but this provision shall not be construed to extend to this AGREEMENT if made with a corporation for its general benefit.

18.2 Governing Law. The construction, validity, performance, and effect of this AGREEMENT for all purposes shall be governed by the laws applicable to the Government of the United States.



18.3 Entire AGREEMENT. This AGREEMENT constitutes the entire AGREEMENT between the parties concerning the subject matter of this AGREEMENT.

18.4 Headings. Titles and headings of the Sections and Subsections of this AGREEMENT are for the convenience of references only and do not form a part of this AGREEMENT and shall in no way affect the interpretation thereof.

18.5 Waivers. None of the provisions of this AGREEMENT shall be considered waived by any party hereto unless such waiver is given in writing to all other parties. The failure of any party to insist upon strict performance of any of the terms and conditions hereof, or failure or delay to exercise any rights provided herein or by law, shall not be deemed a waiver of any rights of any party hereto.

18.6 Severability. The illegality or invalidity of any provisions of this AGREEMENT shall not impair, affect or invalidate the other provisions of this AGREEMENT.

18.7 Amendments. If either party desires a modification in this AGREEMENT, the parties shall, upon reasonable notice of the proposed modification by the party desiring the change, confer in good faith to determine the desirability of such modification. Such modification shall not be effective until all the parties hereto by their representatives duly authorized to execute such amendment sign a written amendment.

18.8 Assignment. Neither this AGREEMENT nor any rights or obligations of any party hereunder shall be assigned or otherwise transferred by either party without the prior written consent of the other party.

18.9 Export Controls. Information and/or products developed pursuant to this AGREEMENT may contain information for which export is restricted by the Arms Control Act (22 U.S.C 2571 et seq.) or the Export Administration Act (50 U.S.C. 2401 et seq.). Nothing in this AGREEMENT shall be construed to permit any disclosure in violation of those restrictions.

## Article 19. Notices

Notices, communications, and payments hereunder shall be deemed made if given by registered or certified envelope, postage prepaid, and addressed to the party to receive such notice, communication or payment at the address given below, or such other address as may hereafter be designated by notice in writing.

A. Formal notices under this AGREEMENT shall be addressed as follows:

### R&D Center

TITLE: Commanding Officer Tel: (860) 441-2601  
Address: USCG Research & Development Center  
1082 Shennecossett Road  
Groton, CT 06340-6096  
fdutch@rdc.uscg.mil Fax: (860) 441-2792

### FRM

TITLE: W. Mark Cummings, P.E., President / Principal Engineer Tel: (207) 442-7200  
Address: Fire Risk Management, Inc.  
1 Front Street, 2<sup>nd</sup> Floor,  
Bath, ME. 04530  
wmark@fireriskmgmt.com Fax: (207) 442-7272

B. Correspondence relating to technical matters should be addressed as follows:

R&D Center

TITLE: Mr. Dave Beene, Principal Investigator Tel: (860) 441-2759  
Address: USCG Research & Development Center  
1082 Shennecossett Road  
Groton, CT 06340-6096  
dbeene@rdc.uscg.mil Fax: (860) 441-2792

FRM

TITLE: W. Mark Cummings, P.E., President / Principal Engineer Tel: (207) 442-7200  
Address: Fire Risk Management, Inc.  
1 Front Street, 2<sup>nd</sup> Floor,  
Bath, ME 04530  
wmark@fireriskmgmt.com Fax: (207) 442-7272

Article 20. Review and Ratification

20.1 Review of CRADA by Commandant (CG-85). One copy of this document must be forwarded to Commandant (CG-85), United States Coast Guard, for review. Receipt of this document by Commandant (CG-85) will begin a thirty (30) day period during which the AGREEMENT may be disapproved or modification required. If no notice of disapproval or required modification is received from Commandant (CG-85) by the R&D Center during the review period, this AGREEMENT shall enter into effect as of the date stamped on the first page of the AGREEMENT per Article 1.4.

20.2 Ratification by FRM. In the event that Commandant (CG-85) exercises the authority reserved by Article 15.1.2, FRM shall have thirty (30) days from notification of the required modifications to ratify, in writing, the modifications or terminate the AGREEMENT. This AGREEMENT shall enter into effect as of the date of receipt by the R&D Center of such ratification.

IN WITNESS THEREOF, the Parties have caused this AGREEMENT to be executed in duplicate by their duly authorized representatives as follows:

Fire Risk Management, Inc.

U.S. Coast Guard  
Research and Development Center

BY: \_\_\_\_\_

BY: \_\_\_\_\_

TITLE: W. Mark Cummings, P.E.  
President / Principal Engineer

TITLE: Commanding Officer USCG R & D Center

DATE: \_\_\_\_\_

DATE: \_\_\_\_\_

## APPENDIX A

### *OBLIGATION OF THE PARTIES*

#### Cooperative Research And Development Agreement (CRADA)

*U.S. Coast Guard R&D Center / Fire Risk Management, Inc.*

#### **Statement of Work**

Fire Risk Management, Inc. is involved in a number of research, development, and analysis efforts that will require the need to conduct full-scale fire tests. Primarily, these tests will be focused on the fire-resistive performance of alternative (to steel) construction materials and also the use of active systems that are specifically designed to provide additional fire protection for structural components. This research may involve the need to perform a number of individual fire test series, each focused on a particular material of active protection system/scheme. For each test program conducted under this CRADA this statement of work will apply. Fire Risk Management, Inc. (FRM) will contact the Coast Guard's Principal Investigator to coordinate initiating the testing process. This includes:

1. Developing a request for test support, which will further define the scope of the individual tests that are anticipated under this general SOW and will facilitate the development of detailed cost estimates by the Coast Guard for each requisite test evolution.
2. FRM is responsible for the cost of their tests and the expenses that the Coast Guard will incur in support the requirements of these tests. A cost agreement will be signed for all testing evolutions. If appropriate, said cost estimate will include a weekly cost should FRM wish to run a test series over one or more additional weeks.
3. The test plan(s) developed under this SOW must undergo a safety review by the Coast Guard's Maintenance and Logistics Command. The review process takes approximately three weeks and is a standard procedure for all testing conducted at the Fire & Safety Test Detachment
4. Signed copies of the CRADA and the Cost agreement(s) will become effective upon signature by the Director of the R&D Center and its review by the Commandant, as described in Article 20 of the CRADA.

#### **Discussion of Area(s) of Research**

Over the past decade or so, there has been a proliferation of the use of new and/or alternative construction materials, in lieu of steel, within the maritime industry; both Government and Commercial. The primary motivation for use of these alternative materials is a need to reduce both the weight of the vessel (or platform) and also the costs of construction and operation. Most of the current regulations governing the fire protection requirements for these maritime structures were developed specifically to address the fire exposure of steel components. Equally, many of

these regulations were developed to protect a structure in the absence of any other fire protection measures being implemented, whether through automated systems or by a manual response.

Many of the new marine structures/vessels being designed are making use of a variety of construction materials other than steel, such as aluminum and a variety of composites. These materials offer distinct advantages in terms of both the weight of the vessel and also the costs associated with its construction and the operation. The ability to use these new materials is especially advantageous in the design and operation of a variety of new, high-speed craft. Unfortunately, many of these materials do not have the inherent resistance to the effects associated with an exposure to a fire event, as compared to steel. Equally, if it is expected that applying standard fire insulation can only protect these structural materials, most of the initial cost- and weight-savings is lost. A number of research initiatives are underway to investigate both new ways to protect different lightweight structures and also to develop new materials that have greater inherent fire-resistance.

FRM is supporting a number of design and analysis efforts that are specifically targeting both aspects of this issue; new fire-resistive materials and alternative protection measures, each of which has fire test requirements. The fire tests will be used to both evaluate the fire performance of candidate materials and also to assess the performance of new fire protection technologies or applications. To ensure standardization of the resulting test data and to facilitate comparison with other standard fire test results, much of the testing needs to be conducted, whenever possible/practical, using existing standard test protocols, such as those outlined in the IMO FTP Code. The existing test areas, including IMO engine room “mock-up”, located at the USCG’s F&STD represent an ideal facility at which to perform much of the requisite large-scale testing.

This Statement of Work and the Obligation of the Parties contained in this CRADA will support FRM’s research and analysis efforts and provide valuable information for use by the USCG and their ability to evaluate the adequacy of proposed fire protection requirements of future ship and marine platform designs.

## **Objective**

The overall objective for this cooperative research effort is to investigate and evaluate a number of potential alternative ship/marine platform design approaches, with regards to both the use of new or alternative construction materials and also the application of alternative fire protective measures, as compared to those currently addressed by the various prescriptive codes and design guidelines; IMO, CFR, ABS, etc. To accomplish these research objectives, it will be necessary to conduct a number of large-scale fire tests to generate the empirical data needed to evaluate the fire-resistive nature of new or alternative materials and assess the performance of alternative fire protection measures. Also, these data will be used as input to support the development and validation of computer modeling techniques that have the potential to support future, similar evaluations, but without the need for additional fire testing. The intent for this research effort is to make use of existing fire test capabilities, including the simulated 500 m<sup>3</sup> machinery space, on the USCG’s fire test vessel, the STATE OF MAINE.

## **Definitions**

*Safety Officer*: is the Fire & Safety Test Detachment Supervisor or his appointed representative. The Safety Officer has overall responsibility for the safe conduct of the testing. The Safety Officer has the authority to order termination of any and all tests if he observes any dangerous situations.

*USCG Principal Investigator*: is the R&D Center staff member who has the responsibility for the complete oversight of this project. The Principal Investigator will also function as the “*Test Director*” during actual testing.

*Technical Director*: is the person FRM assigns to be responsible for the scientific and technical conduct of this project. The Technical Director shall work with the Coast Guard Test Director during the conduct of the testing.

## **Place of Performance**

Fire testing is to be performed at the USCG Research and Development Center's Fire and Safety Test Detachment in Mobile, Alabama. Other related aspects of this research and development program (likely in the form of small (er)-scale fire testing) may be performed at other locations selected by FRM to provide data that will be used to better define and refine the requirements for the large-scale testing that will be associated with this Statement of Work.

## **Tasks**

1. - Test Planning: A Test Plan(s) shall be developed as part of this effort. It is anticipated that all testing is to be conducted on the USCG F&STD's test vessel, the STATE OF MAINE, located at Little Sand Island in Mobile, AL. Each Test Plan shall reflect the specifics associated with the individual test requirements, including the nature of the test and the location where the test is to be conducted within the Test Vessel (e.g.; the IMO engine room test chamber), and the expected number and duration of each tested fire scenario. FRM shall develop the Test Plan(s) and submit it (them) to the R&D Center at least five weeks prior to the anticipated test commencement date. The R&D Center will review and comment on the Test Plan and obtain the necessary safety reviews. This plan shall include exact information concerning the nature of each test (test series), including; the number of tests, the types of fires; the size of fires, the test fuel and quantity, a description of the fire protection system(s), the instrumentation requirements, a list of procedures and crew responsibilities, and a detailed safety plan.

A Safety Plan will be included as part of each Test Plan associated with these efforts. The Safety Plan shall include specific information concerning; fire safety procedures, required personnel protective equipment, environmental monitoring and safety notifications, and post-test cleanup requirements. This plan shall identify the Test Safety Officer and his/her authority to terminate any and all tests resulting from the onset (actual or perceived) of any dangerous situations.

All parties to this agreement shall attempt to make all necessary preparations so as to allow testing to be scheduled and conducted in a timely manner to support the intent of this agreement as signed.

2. - Equipment Installation and Setup: Installation of equipment and instrumentation shall begin not less than one week prior to the scheduled date for the commencement of the first test. Specific responsibilities for installation and setup are contained in sections II and III of this document. All installations shall be in accordance with the requirements of the detailed Test Plan.

3. - Testing: Testing shall be conducted in accordance with the requirements of the approved Test Plan. No modifications to the Test Plan may be made without the approval of all parties to this agreement. The Safety Officer and the Test Director (both USCG employees) shall be responsible for conducting the tests. The decisions of these individuals concerning the conduct of fire tests shall be final. The FRM Technical Director will provide the necessary technical input/guidance regarding the specific test data requirements.

4. - Data Analysis and Reporting: Electronic copies of all raw and converted (in engineering units) data shall be provided by the Coast Guard R&D Center to FRM. FRM will have the primary responsibility for data reduction and analysis. Depending on the specifics of the test performed, input and support from the USCG R&D Center in developing the final analysis report will be on an "as needed/desired" basis, as cooperatively determined by the USCG R&D Center and FRM. FRM shall maintain primary responsibility for preparing the draft report(s) and providing it (them) to the USCG for review and comments. FRM shall provide the USCG a copy of the final report. The USCG, until further notice, must maintain the confidentiality of this report if/as requested by FRM.

## **Obligations of R&D Center**

Coordinate with FRM to in the development of the Test Plan(s) and the timely scheduling of testing, while also supporting any other needs for Coast Guard testing at the Fire and Safety Test Detachment.

The USCG R&D Center will review and comment on the Test Plan(s) within 4 weeks of receipt and will provide the requisite Safety Plan that is to be incorporated into the Test Plan(s). Additionally, the USCG R&D Center will provide the facilities of the Fire and Safety Test Detachment, including the services of its personnel as described below:

- Provide logistical support and water transportation between Little Sand Island and CG Base Mobile for equipment and personnel,
- Support the installation of the instrumentation and data collection equipment as outlined in the Test Plan(s),
- Provide the services of the requisite Test Director and Test Safety Officer,
- Ensure that a safe test environment is maintained throughout all tests/test series,
- During the post-testing phase, will disassemble and remove all non-essential items, which were installed in the test area(s), and
- Provide technical support in reviewing the draft(s) and a final report(s) of testing submitted by FRM.

### **Obligations of Fire Risk Management, Inc.**

FRM shall contact the USCG R&D Center's Principal Investigator to identify when the Fire and Safety Test Detachment facilities are available to support the requisite testing and develop a proposed schedule for the needed tests/test series. These tests should be scheduled as far in advance of the actual test dates as is practical and must be conducted on a not-to-interfere basis with the USCG uses of the facilities.

FRM shall provide a Technical Director who is responsible for the overall scientific and technical conduct of the research efforts. The Technical Director will prepare each draft Test Plan and submit to the R&D Center for comments. FRM will be responsible for providing and/or supporting the installation requirements for any fire protection systems that may need to be added to the USCG test facilities. Equally, any candidate construction materials/products that are part of the proposed test plan will be provided, along with the requisite installation guidance and support. Any products to be used in this testing will be substantially manufactured in the United States.

FRM shall provide to the Coast Guard a copy (1) of the draft report for review and two (2) copies of the final report upon its completion.

FRM shall provide the Coast Guard the necessary funds to support the estimated costs for each test effort, which will be placed in an account for use by the Coast Guard as these costs are incurred. The estimated costs for the testing efforts will be the results of a mutually agreed upon estimate, based on the scope of each test effort. These costs include; a daily charge for the facility, personnel labor, test fuels, transportation to and from the test ship, and any miscellaneous material costs. The contract amount is to be provided to the Coast Guard prior to start of testing. In the event that the work cannot be completed within the original cost estimate, FRM shall be immediately notified of any anticipated cost short-falls and will reimburse the Coast Guard for any additional, mutually-agreed upon expenses, which will be based on the actual (remaining) needs of the test(s) being conducted.

### **Scope of Changes**

Both parties must agree to any changes to this statement of work.