

## EXHIBIT 1D - PATENT RIGHTS (ADVANCE WAIVER) (12-93)

(a) **Definitions.** (1) "Subject Invention" means any invention or discovery of the Seller conceived or first actually reduced to practice in the course of or under this subcontract, and includes any art, method, process, machine, manufacture, design, or composition of matter, or any new and useful improvement thereof, or any variety of plants, whether patented or unpatented under the Patent Laws of the United States of America or any foreign country.

(2) "Subcontract" means any subcontract, grant, agreement, understanding, or other arrangement, which includes research, development, or demonstration work, and includes any assignment or substitution of parties.

(3) "Government agency" includes an executive department, independent commission, board, office, agency, administration, authority, Government corporation, or other Government establishment of the Executive Branch of the Government of the United States of America.

(4) "To the point of practical application" means to manufacture in the case of a composition or product, to practice in the case of a process, or to operate in the case of a machine and under such conditions as to establish that the invention is being worked and that its benefits are reasonably accessible to the public.

(5) "Patent Counsel" means the DOE Patent Counsel assisting the procuring activity.

(b) **Allocation of Principal Rights.** (1) **Assignment to the Government.** The Seller agrees to assign to the Government the entire right, title, and interest throughout the world in and to each Subject Invention, except to the extent that rights are waived to and retained by the Seller under paragraphs (b)(2) and (c) of this clause.

(2) **Greater Rights Determinations.** The Seller or the employee-inventor with authorization of the Seller may request greater rights than the domestic and foreign patent rights provided in paragraph (c) of this clause on identified inventions in accordance with 41 CFR 9-9.109-6. Such requests must be submitted to Patent Counsel (with notification by Patent Counsel to the Company) at the time of the first disclosure pursuant to paragraph (e)(2) of this clause, or not later than nine months after conception or first actual reduction to practice, whichever occurs first, or such longer period as may be authorized by Patent Counsel (with notification by Patent Counsel to the Company) for good cause shown in writing by the Seller.

(c) **Rights to the Seller.** (1) **Minimum Seller License.** The Seller reserves an irrevocable, nonexclusive, paid-up license in each patent application filed in any country on a Subject Invention and any resulting patent in which the Government acquires title. The license shall extend to the Seller's domestic subsidiaries and affiliates, if any, within the corporate structure of which the Seller is a part and shall include the right to grant sublicenses of the same scope to the extent the Seller was legally obligated to do so at the time the subcontract was awarded. The license shall be transferable only with approval of DOE except when transferred to the successor of that part of the Seller's business to which the invention pertains.

(2) **Election to Retain Waived Rights.** (i) Subject to the provisions of paragraph (c)(3) and paragraph (d) of this clause, with respect only to a Subject Invention reported in accordance with paragraph (e)(2)(i) of this clause and with the written report of which is included an election as to whether the Seller will retain the rights in the invention waived herein, the Seller reserves the entire domestic right, title, and interest in any United States patent application on the Subject Invention filed and any resulting United States patent secured by the Seller.

(ii) Subject to the provisions of paragraph (c)(3) and paragraph (d) of this clause, with respect only to a Subject Invention reported in accordance with paragraph (e)(2)(i) of this clause and with the written report of which is included an election as to whether the Seller will retain the rights in the invention waived herein and a statement specifying those foreign countries in which such rights will be retained, and subject to DOE security regulations and requirements, the Seller reserves the entire right, title, and interest in any foreign patent application on the Subject Invention filed and any resulting foreign patent secured by the Seller in those foreign countries specified.

(3) **Terms and Conditions of Waived Rights.** (i) Subject to the rights granted in paragraph (c)(1) of this clause, the Seller agrees to convey to the Government, upon request, the entire domestic right, title, and interest in any Subject Invention when the Seller:

(A) Does not elect pursuant to paragraph (c)(2)(i) of this clause to retain such rights;

(B) Fails to have a United States patent application filed on the invention in accordance with paragraph (d)(1) of this clause, or decides not to continue prosecution of such application; or

(C) At any time, no longer desires to retain title.

(ii) Subject to the rights granted in paragraph (c)(1) of this clause, the Seller agrees to convey to the Government, upon request, the entire right, title, and interest in any Subject Invention in any foreign country if the Seller:

(A) Does not elect pursuant to paragraph (c)(2)(ii) of this clause to retain such rights in the country; or

(B) Fails to have a patent application filed in the country on the Subject Invention in accordance with paragraph (d)(3) of this clause, or decides not to continue prosecution or to pay any maintenance fees covering the invention. To avoid forfeiture of the patent application or patent, the Seller shall notify the Patent Counsel not less than 60 days before the expiration period for any action required by the foreign Patent Office.

(iii) Conveyances requested pursuant to paragraphs (c)(3)(i) and (c)(3)(ii) of this clause shall be made by delivering to the Patent Counsel duly executed instruments and such other papers as are deemed necessary to vest in the Government the entire right, title, and interest in the invention to enable the Government to apply for and prosecute patent applications covering the invention in this or the foreign country, respectively, or otherwise establish its ownership of the invention.

(iv) For each invention in which the Seller initially elects pursuant to (c)(2)(i) and (c)(2)(ii) of this clause not to retain the rights waived, the Seller shall inform the Patent Counsel promptly in writing of the date and identity of any on sale, public use, or public disclosure of the invention which may constitute a statutory bar under 35 USC 102, which was authorized by or known to the Seller, or any contemplated action of this nature.

(v) **Government License.** With respect to any Subject Invention in which the Seller retains title, the Federal Government shall have a nonexclusive, nontransferable, irrevocable, paid-up license to practice or have practiced for or on behalf of the United States the Subject Invention throughout the world.

(vi) **Reporting on Utilization of Subject Inventions.** The Seller agrees to submit on request periodic reports no more frequently

than annually on the utilization of a Subject Invention or on efforts at obtaining such utilization that are being made by the Seller or its licensees or assignees. Such reports shall include information regarding the status of development, date of first commercial sale or use, gross royalties received by the Seller, and such other data and information as DOE may reasonably specify. The Seller also agrees to provide additional reports as may be requested by DOE in connection with any march-in proceeding undertaken by DOE in accordance with paragraph (c)(3)(viii) of this clause. To the extent data or information supplied under this paragraph is considered by the Seller, its licensee or assignee to be privileged and confidential and is so marked, DOE agrees that, to the extent permitted by 35 USC 202(c)(5), it will not disclose such information to persons outside the Government.

(vii) **Preference for United States Industry.** Notwithstanding any other provision of this clause, the Seller agrees that neither it nor any assignee will grant to any person the exclusive right to use or sell any Subject Invention in the United States unless such person agrees that any products embodying the Subject Invention or produced through the use of the Subject Invention will be manufactured substantially in the United States. However, in individual cases, the requirement for such an agreement may be waived by DOE upon a showing by the Seller or its assignee that reasonable but unsuccessful efforts have been made to grant licenses on similar terms to potential licensees that would be likely to manufacture substantially in the United States or that under the circumstances domestic manufacture is not commercially feasible.

(viii) **March-In Rights.** The Seller agrees that with respect to any Subject Invention in which it has acquired title, DOE has the right in accordance with the procedures in OMB Circular A-124 to require the Seller, an assignee or exclusive licensee of a Subject Invention to grant a nonexclusive, partially exclusive, or exclusive license in any field of use to a responsible applicant or applicants, upon terms that are reasonable under the circumstances, and if the Seller, assignee, or exclusive licensee refuses such a request, DOE has the right to grant such a license itself if DOE determines that:

(A) Such action is necessary because the Seller or assignee has not taken, or is not expected to take within a reasonable time, effective steps to achieve practical application of the Subject Invention in such field of use;

(B) Such action is necessary to alleviate health or safety needs which are not reasonably satisfied by the Seller, assignee, or their licensees;

(C) Such action is necessary to meet requirements for public use specified by federal regulations and such requirements are not reasonably satisfied by the Seller, assignee, or licensees; or

(D) Such action is necessary because the agreement required by paragraph (c)(3)(vii) of this clause has not been obtained or waived or because a licensee of the exclusive right to use or sell any Subject Invention in the United States is in breach of such agreement.

(4) **Terminations.** (i) Any waiver or retention of rights by the Seller under paragraphs (b)(2), (c)(1), or (c)(2) of this clause may be terminated at the discretion of the Secretary or his designee, in whole or in part, if the request for waiver or retention of rights by the Seller is found to contain false material statements or nondisclosure of material facts, and such were specifically relied upon in reaching the waiver determination or the agreement to the retention of rights by the Seller.

(ii) Any waiver of the rights retained in accordance with paragraph (c)(2), as applied to particular inventions, may be terminated at the discretion of the Secretary or his designee, in whole or in part, if the Seller fails to comply with the provisions set forth in paragraph (c)(3) and paragraph (d) of this clause, and such failure is determined by the Secretary or his designee to be material and detrimental to the interests of the United States and the general public.

(iii) Prior to terminating any waiver of rights under paragraph (c)(4)(i) or (c)(4)(ii) of this clause, the Seller will be given written notice of the intention to terminate the waiver of rights, the extent of such proposed termination and the reasons therefor, and a period of 30 days, or such longer period as the Secretary or his designee shall determine for good cause shown in writing, to show cause why the waiver of rights should not be so terminated.

(iv) All terminations of waivers of rights under paragraph (c)(4)(ii) shall be subject to the rights granted in paragraph (c)(1) of this clause, and termination shall normally be partial in nature, requiring the Seller to grant nonexclusive or partially exclusive licenses to responsible applicants upon terms reasonable under the circumstances.

(5) **Effective Date of Waivers.** The waiver of rights in a Subject Invention shall be effective on the following dates:

(i) For advance waivers of identified inventions, i.e., inventions conceived prior to the effective date of the subcontract, on the effective date of the subcontract even though the advance waiver may have been requested after that date;

(ii) For identified inventions under advance waivers, i.e., inventions conceived or first actually reduced to practice after the effective date of the subcontract, on the date the invention is reported with the election to retain the waived rights in that invention; and

(iii) For waivers of identified inventions (other than under an advance waiver), on the date of the letter notifying the requestor that the waiver has been granted.

(d) **Filing of Patent Applications.** (1) With respect to each Subject Invention in which the Seller elects to retain domestic rights pursuant to paragraph (c)(2)(i) of this clause, the Seller shall have a domestic patent application filed on the invention within six months after submission of the invention disclosure pursuant to paragraph (e)(2)(i) of this clause, or such longer period of time as may be approved by the Patent Counsel for good cause shown in writing by the Seller. For each identified invention, the rights in which are waived to the Seller, the Seller shall have a domestic patent application filed on the invention within six months after the waiver has become effective. With respect to the invention, the Seller shall promptly notify the Patent Counsel of any decision not to file an application.

(2) For each Subject Invention on which a domestic patent application is filed by the Seller, the Seller shall:

(i) Within two months after the filing or within two months after submission of the invention disclosure if the patent application previously has been filed, deliver to Patent Counsel a copy of the application as filed including the filing date and serial number;

(ii) Within six months after filing the application or within six months after submitting the invention disclosure if the application has been filed previously, deliver to the Patent Counsel a duly executed and approved instrument fully confirmatory of all rights to which the Government is entitled, and provide DOE an irrevocable power to inspect and make copies of the patent application filed;

(iii) Provide the Patent Counsel with a copy of the patent within two months after a patent is issued on the application;

(iv) Not less than 30 days before the expiration of the response period for any action required by the Patent and Trademark

Office, notify the Patent Counsel of any decision not to continue prosecution of the application and deliver to the Patent Counsel executed instruments granting the Government a power of attorney; and

(v) Include the following statement in the second paragraph of the specification of the application and any patents issued on a Subject Invention: "The Government of the United States of America has rights in this invention pursuant to Subcontract No. \_\_\_\_\_ awarded by or for the U.S. Department of Energy."

(3) With respect to each Subject Invention in which the Seller has elected pursuant to paragraph (c)(2)(ii) of this clause to retain the patent rights waived in specified foreign countries, or in which the Seller has obtained a waiver of foreign rights on an identified invention:

(i) The Seller shall file a patent application on the invention in each specified foreign country in accordance with applicable statutes and regulations and within one of the following periods:

(A) Eight months from the date of filing a corresponding United States application, or if such an application is not filed, six months from the date the invention is submitted in a disclosure pursuant to paragraph (e)(2)(i) of this clause;

(B) Six months from the date a license is granted by the Commissioner of Patents and Trademarks to file the foreign patent application where such filing has been prohibited by security reasons; or

(C) Such longer period as may be approved by the Patent Counsel for good cause shown in writing by the Seller.

(ii) The Seller shall notify the Patent Counsel promptly of each foreign application filed and upon written request shall furnish an English version of the application without additional compensation.

(e) **Invention Identification, Disclosures, and Reports.** (1) The Seller shall establish and maintain active and effective procedures to ensure that Subject Inventions are promptly identified and timely disclosed. Those procedures shall include the maintenance of laboratory notebooks or equivalent records and any other records that are reasonably necessary to document the conception and/or the first actual reduction to practice of Subject Inventions, and records which show that the procedures for identifying and disclosing the inventions are followed. Upon request, the Seller shall furnish the Company a description of these procedures so that it may evaluate and determine their effectiveness.

(2) The Seller shall furnish, through the Company, the Patent Counsel on a DOE-approved form:

(i) A written report containing full and complete technical information concerning each Subject Invention within six months after conception or first actual reduction to practice whichever occurs first in the course of or under this subcontract, but in any event prior to any on sale, public use, or public disclosure of such invention known to the Seller. The report shall identify the subcontract and inventor and shall be sufficiently complete in technical detail and appropriately illustrated by sketch or diagram to convey to one skilled in the art to which the invention pertains a clear understanding of the nature, purpose, operation, and to the extent known, the physical, chemical, biological, or electrical characteristics of the invention. The report should also include any election of foreign patent rights under paragraph (c)(2)(ii) of this clause and any election of rights under paragraph (c)(2)(i) of this clause. Any requests for greater rights shall be made within the period set forth in paragraph (b)(2) of this clause. When an invention is reported under this paragraph (e)(2)(i), it shall be presumed to have been made in the manner specified in Section (a)(1) and (2) of 42 USC 5908 unless the Seller contends it was not so made in accordance with paragraph (g)(2)(ii) of this clause.

(ii) Upon request, but not more than annually, interim reports on a DOE-approved form listing Subject Inventions and subcontracts awarded containing a Patent Rights clause for that period and certifying that:

(A) The Seller's procedures for identifying and disclosing Subject Inventions as required by this paragraph (e) have been followed throughout the reporting period;

(B) All Subject Inventions have been disclosed or that there are no such inventions;

(C) All subcontracts containing a Patent Rights clause have been reported or that no such subcontracts have been awarded; and

(iii) A final report on a DOE-approved form within three months after completion of the subcontract work listing all Subject Inventions and all subcontracts awarded containing a Patent Rights clause and certifying that:

(A) All Subject Inventions have been disclosed or that there were no such inventions; and

(B) All subcontracts containing a Patent Rights clause have been reported or that no such subcontracts have been awarded.

(3) The Seller shall obtain patent agreements to effectuate the provisions of this clause from all persons in its employ who perform any part of the work under this subcontract except nontechnical personnel, such as clerical employees and manual laborers.

(4) The Seller agrees that the Government may duplicate and disclose Subject Invention disclosures and all other reports and papers furnished or required to be furnished pursuant to this clause. If the Seller is to file a foreign patent application on a Subject Invention, the Government agrees, upon written request, to use its best efforts to withhold publication of such invention disclosures until the expiration of the time period specified in paragraph (d)(1) of this clause, but in no event shall the Government or its employees be liable for any publication thereof.

(f) **Publication.** It is recognized that during the course of the work under this subcontract, the Seller or its employees may from time to time desire to release or publish information regarding scientific or technical developments conceived or first actually reduced to practice in the course of or under this subcontract. In order that public disclosure of such information will not adversely affect the patent interests of DOE or the Seller, patent approval for release or publication shall be secured from Patent Counsel prior to any such release or publication.

(g) **Forfeiture of Rights in Unreported Subject Inventions.** (1) The Seller shall forfeit to the Government, at the request of the Secretary or his designee, all rights in any Subject Invention which the Seller fails to report to Patent Counsel within six months after the time the Seller:

(i) Files or causes to be filed a United States or foreign patent application thereon; or

(ii) Submits the final report required by paragraph (e)(2)(iii) of this clause, whichever is later.

(2) However, the Seller shall not forfeit rights in a Subject Invention if, within the time specified in (1)(i) or (1)(ii) of this paragraph (g), the Seller:

(i) Prepared a written decision based upon a review of the record that the invention was neither conceived nor first actually reduced to practice in the course of or under the subcontract and delivers the same to Patent Counsel; or

(ii) Contending that the invention is not a Subject Invention the Seller nevertheless discloses the invention and all facts pertinent to this contention to the Patent Counsel; or

(iii) Establishes that the failure to disclose did not result from the Seller's fault or negligence.

(3) Pending written assignment of the patent applications and patents on a Subject Invention determined by the Secretary or his designee to be forfeited, the Seller shall be deemed to hold the invention and the patent applications and patents pertaining thereto in trust for the Government. The forfeiture provision of this paragraph (g) shall be in addition to and shall not supersede other rights and remedies which the Government may have with respect to Subject Inventions.

(h) **Examination of Records Relating to Inventions.** (1) DOE or its authorized representative, until the expiration of three years after final payment under this subcontract, shall have the right to examine any books (including laboratory notebooks), records, documents, and other supporting data of the Seller which DOE or its authorized representative reasonably deem pertinent to the discovery or identification of Subject Inventions or to determine compliance with the requirements of this clause.

(2) DOE or its authorized representative shall have the right to examine all books (including laboratory notebooks), records, and documents of the Seller relating to the conception or first actual reduction to practice of inventions in the same field of technology as the work under this subcontract to determine whether any such inventions are Subject Inventions, if the Seller refuses or fails to:

(i) Establish the procedures of paragraph (e)(1) of this clause; or

(ii) Maintain and follow such procedures; or

(iii) Correct or eliminate any material deficiency in the procedures within thirty (30) days after DOE or its authorized representative notifies the Seller of such a deficiency.

(i) **Withholding of Payment.** (1) Any time before final payment of the amount of this subcontract, the Company may, if it deems such action warranted, withhold payment until a reserve not exceeding \$50,000 or five percent of the amount of this subcontract, whichever is less, shall have been set aside if in its opinion the Seller fails to:

(i) Establish, maintain, and follow effective procedures for identifying and disclosing Subject Inventions pursuant to paragraph (e)(1) of this clause; or

(ii) Disclose any Subject Invention pursuant to paragraph (e)(2)(i) of this clause; or

(iii) Deliver the interim reports pursuant to paragraph (e)(2)(ii) of this clause; or

(iv) Provide the information regarding subcontracts pursuant to paragraph (j)(5) of this clause; or

(v) Convey to the Government in a DOE-approved form the title and/or rights of the Government in each Subject Invention as required by this clause.

(2) The reserve or balance shall be withheld until the Company has determined that the Seller has rectified whatever deficiencies exist and has delivered all reports, disclosures, and other information required by this clause.

(3) Final payment under this subcontract shall not be made by the Company before the Seller delivers to Patent Counsel all disclosures of Subject Inventions and other information required by (e)(2)(i) of this clause, the final report required by (e)(2)(iii) of this clause, and Patent Counsel has issued a patent clearance certification to the Company.

(4) The Company may, in its discretion, decrease or increase the sums withheld up to the maximum authorized above. If the Seller is a nonprofit organization, the maximum amount that may be withheld under this paragraph shall not exceed \$50,000 or one percent of the amount of this subcontract, whichever is less. No amount shall be withheld under this paragraph while the amount specified by this paragraph is being withheld under other provisions of the subcontract. The withholding of any amount or subsequent payment thereof shall not be construed as a waiver of any rights accruing to the Government under this subcontract.

(j) **Subcontracts.** (1) For the purpose of this paragraph, the term "Seller" means the party awarding a subcontract and the term "Subcontractor" means the party being awarded a subcontract, regardless of tier.

(2) The Seller will include the Patent Rights clause of DEAR 952.227-71 suitably modified to identify the parties in all subcontracts, regardless of tier, for experimental, developmental, or research work to be performed by a small business or a domestic nonprofit organization. In all other subcontracts, regardless of tier, for experimental, developmental demonstration, or research work, the Seller shall include the Patent Rights article of 41 CFR 9-9.107-5(a) or 41 CFR 9-9.107-6 as appropriate, modified to identify the parties.

(3) Except as may be otherwise provided in this clause, the Seller shall not, in any subcontract or by using a subcontract as consideration therefor, acquire any rights in its Subcontractor's Subject Invention for the Seller's own use (as distinguished from such rights as may be required solely to fulfill the Seller's obligations to the Company or the Government in the performance of this subcontract).

(4) All invention disclosures, reports, instruments, and other information required to be furnished by the Subcontractor to DOE, under the provisions of a Patent Rights clause in any subcontract hereunder may, in the discretion of the Company, be furnished to the Seller for transmission to DOE.

(5) The Seller shall promptly notify the Company in writing upon the award of any subcontract containing a Patent Rights clause by identifying the Subcontractor, the work to be performed under the subcontract, and the dates of award, and estimated completion. Upon the request of the Company, the Seller shall furnish it a copy of the subcontract.

(6) The Seller shall identify all Subject Inventions of the Subcontractor of which it acquires knowledge in the performance of this subcontract and shall notify the Company promptly upon the identification of the inventions.

(7) It is understood that the Government is a third party beneficiary of any subcontract clause granting rights to the Government in Subject Inventions, and the Seller hereby assigns to the Government all rights that the Seller would have to enforce the Subcontractor's obligations for the benefit of the Government with respect to Subject Inventions. The Seller shall not be obligated to enforce the

agreements of any Subcontractor hereunder relating to the obligations of the Subcontractor to the Government regarding Subject Inventions.

(k) **Background Patents.** (1) "Background Patent" means a domestic patent covering an invention or discovery which is not a Subject Invention and which is owned or controlled by the Seller at any time through the completion of this subcontract:

(i) Which the Seller, but not the Government, has the right to license to others without obligation to pay royalties thereon, and  
(ii) Infringement of which cannot reasonably be avoided upon the practice of any specific process, method, machine, manufacture, or composition of matter (including relatively minor modifications thereof) which is a subject of the research, development, or demonstration work performed under this subcontract.

(2) The Seller agrees to and does hereby grant to the Government a royalty-free, nonexclusive license under any Background Patent for purposes of practicing a subject of this subcontract by or for the Government in research, development, and demonstration work only.

(3) The Seller also agrees that upon written application by DOE, it will grant to responsible parties for purposes of practicing a subject of this subcontract nonexclusive licenses under any Background Patent on terms that are reasonable under the circumstances. If, however, the Seller believes that exclusive or partially exclusive rights are necessary to achieve expeditious commercial development or utilization, then a request may be made to DOE for DOE approval of such licensing by the Seller.

(4) Notwithstanding the foregoing paragraph (k)(3), the Seller shall not be obligated to license any Background Patent if the Seller demonstrates to the satisfaction of the Secretary or his designee that:

(i) A competitive alternative to the subject matter covered by said Background Patent is commercially available or readily introducible from one or more other sources; or  
(ii) The Seller or its licensees are supplying the subject matter covered by said Background Patent in sufficient quantity and at reasonable prices to satisfy market needs, or have taken effective steps or within a reasonable time are expected to take effective steps to so supply the subject matter.

(l) **Atomic Energy.** (1) No claim for pecuniary award or compensation under the provisions of the Atomic Energy Act of 1954, as amended, shall be asserted by the Seller or its employees with respect to any invention or discovery made or conceived in the course of or under this subcontract.

(2) Except as otherwise authorized in writing by the Company, the Seller will obtain patent agreements to effectuate the provisions of paragraph (l)(1) of this clause from all persons who perform any part of the work under this subcontract, except nontechnical personnel, such as clerical employees and manual laborers.

(m) **Limitation of Rights.** Nothing contained in this Patent Rights clause shall be deemed to give the Government any rights with respect to any invention other than a subject invention except as set forth in the Patent Rights clause of this subcontract with respect to Background Patents.

(n) **Limitation on Alienation of Waived Rights.** Except for the license reserved to the Seller in (c)(1), the Seller agrees that any alienation of rights in waived subject inventions by assignment, license or otherwise is subject to written approval of DOE; and further that in the event a controlling interest is to be acquired by a foreign entity in the Seller or to any assignee or licensee of a waived invention, then in that case any rights in the waived invention to be acquired by the foreign entity will be subject to written approval of DOE.

(o) **U.S. Competitiveness.** The Seller agrees that any product, process, or service using a U.S. patent resulting from a subject invention or any other intellectual property used in performing work under this subcontract shall be manufactured or practiced substantially in the United States.