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~~CONFIDENTIAL~~

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Office Memorandum • UNITED STATES GOVERNMENT

: S. R. Sapirie, Manager,
Oak Ridge Operations Office

DATE: JAN 4 1957

: F. H. Belcher, Area Manager,
St. Louis Area Office

: AGREEMENT BETWEEN MALLINCKRODT CHEMICAL WORKS AND DOW CHEMICAL
COMPANY FOR EXPERIMENTAL EXTRUSION WORK

: MC:HBR

Attentions: John R. Moore

By teletype of August 31, 1956, this office requested authorization for MCW to negotiate a cost-plus-a-fixed-fee subcontract with Dow Chemical Company, Madison, Illinois, for the purchase of experimental work in gamma extrusion. By memorandum of September 7, 1956, we received your approval. After considerable negotiation, MCW was unable to secure agreement with Dow to perform this work on a CPFF basis. Further discussion and investigation by the parties resulted in the belief that a fixed-price subcontract would be feasible and, upon this basis, the attached subcontract was negotiated between MCW and Dow. As you will note from the subcontract, the fixed consideration to be paid Dow is set up on a "per cycle" basis with a total monetary limit of \$86,400.00. Additional costs, such as subcontracting for installation work necessary for the conversion of the press, certain health requirements, and MCW purchase of equipment, will bring the total cost to an estimated \$100,000.00 and, therefore, monetarily within the contracting authority of this office. However, prior to the approval of this subcontract, it was brought to the attention of OROO that the subcontract contained an indemnity provision against atomic hazards with a limitation of \$5,000,000.00. OROO felt that this indemnity provision should be considered a part of the subcontract commitment and, therefore, outside the authority of both this Area and OROO.

MCW and the Commission talked with Dow in an effort to devise some satisfactory substitute sufficient to afford the protection to Dow that they insisted they must have from atomic hazards. Dow was agreeable to Mallinckrodt insuring against this liability or, if possible and without too great a risk to Dow's other insurance programs, direct insurance in favor of Dow (MCW paying the premium costs) if such insurance could be obtained. Every means available to MCW and the Commission has been exhausted without success in attempting to procure insurance to cover this particular hazard in the name of Dow. In discussions with agents and directly with liability representatives of insurance companies in the St. Louis Area we found that the insurance companies were not prepared to insure against the type of risk contemplated by the indemnity provision. Discussions between members of your

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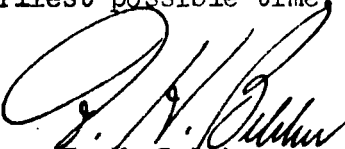
staff and this office led to the conclusion that protection to Dow by straight indemnity was preferable to having MCW insure against their contractual liability as raised by the indemnity provision in the subcontract.

We realize that the straight indemnity provision involves certain problems and disadvantages to the Commission; however, we feel the advantages to having Dow perform this work as outlined in prior correspondence, justification for negotiation, and selection of Dow over other companies considered, copies of the foregoing attached, are still valid and outweigh such contingent disadvantages as may be present in the indemnity provision.

The subcontract, prior to execution, will be changed in the following respects:

1. The limits on the indemnity will not exceed \$3,000,000.00 (possibly \$2,000,000.00).
2. A suitable provision for notice to MCW and the Commission of any claim under this indemnity clause will be provided in the subcontract.

Authority to approve this subcontract in the present form with the changes noted above is requested. As you know, it is imperative that this work be performed at the earliest possible time.


F. H. Belcher

Enclosures:

1. Subcontract (in dup.)
2. Ltr fm Dow to MCW dtd 6-11-56
3. Memo, Fellows to Thayer, dtd 6-27-56
4. Memo, Fellows to Belcher, dtd 8-7-56 (C-RD) w/Table I (C)
5. Memo, Fellows to Brownfield, dtd 9-24-56
6. Ltr, MCW to Dow, dtd 9-25-56
7. Negotiation Data dtd 9-25-56
8. Ltr, Dow to MCW, dtd 10-2-56

NOTE - Please return Enclosures 2 through 8 to this office.

Returned - 4/16/57

Pulled from
MALLINCKRODT
CONTRACT FILE

Partial Contract 11,26

A G R E E M E N T

SUBCONTRACT NO. 25034-M

THIS AGREEMENT, entered into this 15th day of March, 1957, by and between Mallinckrodt Chemical Works, hereinafter called Mallinckrodt, a Missouri Corporation having its principal office in the City of St. Louis, State of Missouri, and Dow Chemical Company, hereinafter called Dow, a corporation having its Madison Division Office in the City of Madison, State of Illinois;

WITNESSETH THAT:

WHEREAS, Mallinckrodt is performing certain work under Contract No. W-14-108-ENG-8, (Amendment No. 115), hereinafter called "Principal Contract", for the United States of America, hereinafter called the "Government", represented by the United States Atomic Energy Commission, hereinafter called the "Commission"; and

WHEREAS, Mallinckrodt desires Dow to perform certain research and developmental work in gamma phase extrusion of Uranium metal, the said work to be done at Dow's Madison, Illinois plant; and

WHEREAS, Dow is willing to undertake the work in accordance with the provisions of this Agreement; and

WHEREAS, the work to be performed by Dow must be commenced prior to the development of adequate data upon which bids might be solicited by formal advertising in order to complete Commission production facilities within the time established by Commission program requirements under the Principal Contract; and

WHEREAS, the Commission certifies that this negotiated Agreement is authorized by and executed under the Atomic Energy Act of 1954 in the interests of the Common Defense and Security;

NOW THEREFORE, in consideration of the mutual agreements and undertakings of the Parties, the Parties hereto do hereby agree as follows:

ARTICLE I

DEFINITIONS

1. As used in this Agreement:

(a) The term "Mallinckrodt" means the Uranium Division of Mallinckrodt Chemical Works.

(b) The term "Dow" means the Madison Division of Dow Chemical Company.

(c) The term "Commission" means the United States Atomic Energy Commission or any duly authorized representative thereof.

(d) The term "work cycle" means the services and facilities hereby contracted for (and more fully described in ARTICLE II - SCOPE OF THE RESEARCH AND DEVELOPMENT WORK), and which shall be supplied by Dow in stated periods of time. A work cycle shall consist of a period of twenty-eight (28) hours of which the first six (6) hours shall be set-up time; the middle sixteen (16) hours shall be experimentation (extrusion) time; and the final six (6) hours shall be clean-up time.

In the event the experimentation (extrusion) time is interrupted due to causes attributable to the services or facilities supplied by Dow, then such time shall be extended to the extent necessary to compensate for the hours lost, until a total of sixteen (16) hours experimentation (extrusion) time shall have been provided. Such extended time, by mutual agreement of the Parties, may be provided in a later work cycle.

If the interruption to the experimentation (extrusion) time is due to causes attributable to the auxiliary equipment procured and installed by Mallinckrodt, repairs thereof shall be made by Dow with due diligence and the time required for such repairs shall be counted as experimentation (extrusion) time.

ARTICLE II

SCOPE OF THE RESEARCH AND DEVELOPMENT WORK

1. Objectives. The objectives of the research and development work to be performed under this Agreement are to determine factors in the extrusion of uranium metal which will effect the final selection and purchase of tools and auxiliary supplies for use with an extrusion press to be located at production facilities of the Commission. Such objectives include, but shall not be confined to, the following:

(a) The testing and screening of die metals of various compositions including chromium carbide inserts, alloy dies faced with hard surfacing weld deposits, chromium-plated dies, and austenitic steel materials.

(b) The choice of contour of the die cavity including the entrant cone angle, the entrant radius and the length of the "land".

(c) The nature of the "lubricant" applied to the uranium metal billet and tools.

(d) The testing of a "follower block" inserted as a disc between the uranium billet and the hardened dummy block against which the ram presses.

(e) Studies of ram speed versus surface quality and die life, effects of liner and die temperatures, and of correlation of thrust requirements with billet temperature.

2. Responsibilities. The accomplishment of the objectives of this Agreement contemplates and requires the cooperation and best efforts of Dow and Mallinckrodt. The responsibilities of the Parties shall include, but shall not be confined to, the following:

(a) Dow shall:

(i) Design auxiliary equipment for its press, including installation and adaptation of an induction heating unit or billet pre-heat, a transfer mechanism to convey the billet from the heater to the liner, the incorporation of a lubricant (such as a "glassing table") with the transfer device and handling equipment to receive the bar as it emerges from the die (with advice and assistance from Mallinckrodt in establishing basic assumptions).

(ii) Design dies, liners, containers, dummy blocks, etc., (with advice and assistance from Mallinckrodt where desirable to cope with special properties of uranium).

(iii) Design auxiliary equipment necessary to tie in and adapt dust collecting equipment to the dimensions and configurations of the extrusion press and the surrounding work area.

(iv) Supply the use of its press, labor, and plant facilities necessary to the performance of the work cycle(s) provided for herein.

(b) Mallinckrodt shall:

(i) a. Procure the auxiliary equipment (on the basis of design information prepared by Dow) required to adapt the Dow press and facilities for the special purposes of this research and development program.

b. Contract for the installation of such auxiliary equipment by an independent equipment contractor, which contractor shall be acceptable to Dow.

(ii) Procure for delivery to Dow, all tools, materials, supplies and articles such as "follower blocks", glass for lubrication, salt for surface protection and helium gas for controlled atmospheres during heating and cooling, required for the special purposes of this research and development program.

(iii) a. Design, for approval by Dow, dust arresting and other protective equipment.

b. Procure and contract for the installation of such equipment by an independent equipment contractor, which contractor shall be acceptable to Dow.

(iv) a. Arrange for complete survey of breathing zone air quality to be conducted periodically by the Health and Safety Laboratory of the Atomic Energy Commission, or as the Commission may direct.

b. Establish a program for area clearance after each cycle.

(v) Procure and contract for such modifications and additions to the dust arresting and other protective equipment required by plant area surveys made from time to time during the course of the work.

(vi) Supply to Dow the uranium billets allocated for a work cycle(s) (tentatively determined as twenty (20) billets), and pick up the billets or extruded metal at the conclusion of a work cycle.

(vii) Be accountable for the uranium metal during the work cycle.

(viii) Take full responsibility for the quality of the extruded metal.

(c) Mallinckrodt and Dow shall:

(i) Meet at suitable times to schedule design and development work; to determine the time and date of the work cycles, with due regard to Dow's operating schedule; to resolve such problems as may be involved in working with uranium metal; and to conclude the acquisition by Dow, or the removal or disposition by Mallinckrodt, of the auxiliary equipment, tools and supplies installed or used during the course of this program, in accordance with ARTICLE V hereof.

ARTICLE III

CONSIDERATION

1. Payment(s) to Dow shall be in accordance with the work cycle prices set forth in Paragraph 2 below. Such work cycle payment(s) shall constitute full compensation for all services and facilities supplied pursuant to this Agreement. The first work cycle payment includes such engineering and other costs and expenses as shall be incurred in the design of auxiliary equipment, and in the planning and programming of the work cycle(s).

2. The work cycle price shall be:

(a) For the first work cycle \$ 11,050.00

A G R E E M E N T

THIS AGREEMENT, entered into this _____ day of _____, 1956, by and between Mallinckrodt Chemical Works, hereinafter called Mallinckrodt, a Missouri Corporation having its principal office in the City of St. Louis, State of Missouri, and Dow Chemical Company, hereinafter called Dow, a Corporation having its Madison Division Office in the City of Madison, State of Illinois;

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WHEREAS, Dow is willing to undertake the work in accordance with the provisions of this Agreement; and

WHEREAS, the work to be performed by Dow must be commenced prior to the development of adequate data upon which bids might be solicited by formal advertising in order to complete Commission production facilities within the time established by Commission program requirements under the Principal Contract; and

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- (a) The testing and screening of die metals of various compositions including chromium carbide inserts, alloy dies faced with hard surfacing weld deposits, chromium-plated dies, and austenitic steel materials.
- (b) The choice of contour of the die cavity including the entrant cone angle, the entrant radius and the length of the "land".
- (c) The nature of the "lubricant" applied to the uranium metal billet and tools.
- (d) The testing of a "follower block" inserted as a disc between the uranium billet and the hardened dummy block against which the ram presses.

(e) Studies of ram speed versus surface quality and die life, effects of liner and die temperatures, and of correlation of thrust requirements with billet temperature.

2. Responsibilities. The accomplishment of the objectives of this Agreement contemplates and requires the cooperation and best efforts of Dow and Mallinckrodt. The responsibilities of the Parties shall include, but shall not be confined to, the following:

(a) Dow shall:

i. Design auxiliary equipment for its press including an induction heating unit or billet preheat, a transfer mechanism to convey the billet from the heater to the liner, the incorporation of a lubricant (such as a "glassing table") with the transfer device and handling equipment to receive the bar as it emerges from the die (with advice and assistance from Mallinckrodt in establishing basic assumptions).

ii. Design dies, liners, containers, dummy blocks, etc., (with advice and assistance from Mallinckrodt where desirable to cope with special properties of uranium).

iii. Design auxiliary equipment necessary to tie in and adapt dust collecting equipment to the dimensions and configurations of the extrusion press and the surrounding work area.

iv. Supply the use of its press, labor, and plant facilities necessary to the performance of the work cycles(s) provided for herein.

(b) Mallinckrodt shall:

i. (a) Procure the auxiliary equipment (on the basis of design information prepared by Dow) required to adapt the Dow press and facilities for the special purposes of this research and development program.

(b) Contract for the installation of such auxiliary equipment by an independent equipment contractor, which contractor shall be acceptable to Dow.

ii. Procure for delivery to Dow all tools, materials, supplies and articles such as "follower blocks", glass for lubrication, salt for surface protection and helium gas for controlled atmospheres during heating and cooling, required for the special purposes of this research and development program.

iii. (a) Design, for approval by Dow, dust arresting and other protective equipment.

(b) Procure and contract for the installation of such equipment by an independent equipment contractor, which contractor shall be acceptable to Dow.

iv. (a) Arrange for complete survey of breathing zone air quality to be conducted periodically by the Health and Safety Laboratory of the Atomic Energy Commission, or as the Commission may direct.

(b) Establish a program for area clearance after each cycle.

v. Procure and contract for such modifications and additions to the dust arresting and other protective equipment required by plant area surveys made from time to time during the course of the work.

vi. Supply to Dow the uranium billets allocated for a work cycle(s) (tentatively determined as twenty (20) billets), and pick up the billets or extruded metal at the conclusion of a work cycle.

vii. Be accountable for the uranium metal during the work cycle.

viii. Take full responsibility for the quality of the extruded metal.

(c) Mallinckrodt and Dow shall:

i. Meet at suitable times to schedule design and development work; to determine the time and date of the work cycles, with due regard to Dow's operating schedule; to resolve such problems as may be involved in working with uranium metal; and to conclude the acquisition by Dow, or the removal or disposition by Mallinckrodt, of the auxiliary equipment, tools and supplies installed or used during the course of this program, in accordance with Article V hereof.

ARTICLE III

CONSIDERATION

1. Payment(s) to Dow shall be in accordance with the work cycle prices forth in Paragraph 2 below. Such work cycle payment(s) shall constitute

full compensation for all services and facilities supplied pursuant to this Agreement. The first work cycle payment includes such engineering and other costs and expenses as shall be incurred in the design of auxiliary equipment, and in the planning and programming of the work cycle(s).

2. The work cycle price shall be:

- (a) For the first work cycle \$ 11,050.00
- (b) For each of eleven (11)
 successive work cycles \$ 6,850.00

The total work cycle prices shall not exceed \$ 86,400.00

ARTICLE IV

TERM AND TERMINATION

1. The term of this Agreement shall commence on the date of its execution by the Parties and shall continue through twelve work cycles to be provided by Dow. A work cycle shall take place once each month for twelve successive months, or otherwise at such time (s) as may be determined by mutual agreement of the parties.

2. Either party may terminate this Agreement by giving thirty (30) days written notice to the other.

ARTICLE V

OPTION TO PURCHASE AUXILIARY
EQUIPMENT, TOOLS AND SUPPLIES

The auxiliary equipment, tools and supplies procured by Mallinckrodt and installed or used at Dow's plant for the special purposes of this research and development program shall be the property of and title in the Government unless and until disposed of in accordance with the terms of this article. When authorized in writing by the Commission during the progress of this program, or upon completion or termination of this Agreement, Dow may, upon such terms and conditions as the Commission may approve, acquire such property at a price agreed upon by Mallinckrodt and Dow as the fair value thereof.

In the event Dow declines to exercise its option to acquire such property, or the Commission refuses to authorize its acquisition by Dow, then Mallinckrodt shall dismantle and remove such property or otherwise arrange for its disposition with due diligence, and with due regard to Dow's operating schedule.

ARTICLE VI

DIFFERENCE OR DISAGREEMENT

1. This Agreement shall be regarded by the Parties as a cooperative engagement requiring the cooperation and best efforts of the Parties hereto. If a difference or disagreement covering a question of fact under this Agreement shall arise between the Parties, and the Parties are unable to reconcile such difference or disagreement, the matter shall be in dispute and shall be settled in accordance with the provisions of Paragraph Two below entitled, "Disputes".

2. Disputes. Except as otherwise provided herein, whenever Mallinckrodt and Dow are unable to agree on any question of fact arising under this Agreement, the dispute shall be submitted for arbitration and determination to the Manager, Oak Ridge Operations Office, United States Atomic Energy Commission, whose decision, or that of his designated representative, representatives, or board, duly authorized to decide such dispute, shall be final and conclusive upon the Parties hereto, unless such decision is determined by a court of competent jurisdiction to have been fraudulent or capricious or arbitrary or so grossly erroneous as necessarily to imply bad faith or not to be supported by substantial evidence. Pending final decision of a dispute, hereunder, and if performance has not been completed, Dow shall proceed diligently with the performance of the Agreement in accordance with the Commission's instructions.

ARTICLE VII

INDEMNITY

1. Mallinckrodt shall indemnify and hold harmless Dow against any losses, claims, damages, or liabilities to which Dow may become subject insofar as such losses, claims, damages or liabilities (or actions in respect thereof) arise out of or result from auxiliary equipment, tools, or supplies procured, or from work performed, by Mallinckrodt.

2. Dow shall indemnify and hold harmless Mallinckrodt against any losses, claims, damages, or liabilities to which Mallinckrodt may become subject insofar as such losses, claims, damages, or liabilities (or actions in respect thereof) arise out of or result from services and facilities supplied by Dow.

3. It is the intent of the parties that each shall indemnify and hold harmless the other against any losses, claims, damages or liabilities (or actions in respect thereof) arising out of or resulting from its own act or actions except that Mallinckrodt shall indemnify and hold harmless Dow against atomic energy hazards in accordance with Paragraph Four (4) below.