CONFIDENTIAL

15 December 1959

ORGANIZATION FOR: Office of Logistics/Procurement Division/Contract Branch

SUBJECT : Request for Initiation of Task XR under Contract KD-26 with [redacted] 25X1

1. It is requested that your office take the appropriate action to establish Task XR under Contract KD-26 with [redacted] 25X1
This task will cover a program for the development of a reduced-size incinerator for the destruction of papers and documents. The work is to be accomplished in accordance with the terms of the contractor's proposal attached hereto. 25X1

2. Funds in the amount of $10,870.00 are to be made available to the contractor for a four months period of performance. Charges are to be made against Allotment Number [redacted]

3. Contract KD-26 is an Agency sterile contract. Task XR should also be Agency sterile. Government interest may be shown. The item per se is unclassified. Agency interest in all work and material under the contract and task is classified secret and may be divulged only on a need-to-know basis to appropriate security approved personnel.

The Contracting Officer is requested to advise the contractor's representative in writing of these security classifications.

In the event there is any variation in classification during the preliminary phases of the work, further guidance will be provided by the project engineer for this program, [redacted], Room 210, West Out-25X1
building, [redacted] 25X1

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[redacted] 25X1

Chief
TSS/Engineering Division

Attachments:
TSS-913-27-1459-63
Proposal dtd 2 Dec 1959

APPROVED FOR THE OBLIGATION OF FUNDS:

Research Director

Distribution:
Orig & 1 - Addressee
1 - Comptroller
1 - TSS/OC
1 - TSS/PASB
1 - TSS/LB
1 - [redacted]
1 - TSS/SRB

1 - ED Chrono
1 - [redacted] 25X1
1 - ED-17th

DO/P/TSS/ED/MF

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In replying please address:

25X1

December 2, 1959

Dear Sir:

As a result of recent discussions with your technical representatives, we are submitting herewith a proposed program of research directed toward the development of a reduced-size experimental incinerator for the destruction of papers and documents normally stored in safes and filing cabinets.

Under Task Order No. Z, an experimental air-film-cooled incinerator (Type 1 Prototype Incinerator) has been developed that provides an average burning capacity of at least 200 pounds of paper per hour for operation under normal every-day conditions, and of approximately 500 pounds per hour for operation under emergency conditions as anticipated. This experimental unit is being evaluated at this time by your technical representatives and their associates under field conditions, and appears to be operating quite satisfactorily. Further efforts under Task Order No. Z and Work Order No. II, Task Order No. KK, have been directed toward the investigation of selected modifications of the experimental incinerator design and toward the incorporation, in a second experimental unit (Type 2 Prototype Incinerator) with a similar burning capacity, of any modifications which are mutually considered meritorious, within the limits of the time and funds provided.

The general design of the above-mentioned experimental air-film-cooled incinerators appears to be sound. Your technical representatives have

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indicated a need for a reduced-size unit which would be generally similar to the Type 2 Prototype Incinerator, but which, of necessity, would provide lower burning capacities than those described above. Further, on the basis of the discussion with your technical representatives, it appears that certain dimensions for the reduced-size unit would be particularly desirable; these are as follows:

(1) An inside diameter for the liner of about 20 inches, in order to accommodate legal-size file folders.

(2) An outside diameter for the outer shell and/or flanges of no more than about 24 inches.

(3) An over-all height for the assembled unit (excluding the stack) that would be no greater than the height of the Type 2 Prototype Incinerator, which is 64 inches high.

(4) A diameter for the stack or flue pipe of about 9 inches.

In addition, your technical representatives are interested in having an aesthetically attractive exterior on such a reduced-size unit. Also, consideration should be given to the possibility of locating the motor and blower within the outer shell and directly below the combustion-chamber compartment, in an attempt to conserve floor space and to maximize the neat appearance of the unit of interest.

A proposed program of research directed toward achieving these aims is described in the following.

Objective

The objective of the proposed program would be to conduct research directed toward the development of a reduced-size experimental paper-burning incinerator which would be based on the design of and would be generally similar to the Task Order No. Z experimental unit, and would incorporate, to the extent practical, the characteristics described above.

General Method of Procedure

The effort under the proposed program would be directed toward the development of an experimental incinerator of reduced size, with as high a burning capacity as can reasonably be obtained within the limitations imposed by the above-described dimensions, and with other operating characteristics similar to those of the Type 2 Prototype Incinerator. The operating characteristics of particular interest include simplicity and reliability of operation; minimal emission of smoke, fumes, and fly ash; and independence relative to the need for auxiliary fuel other than for the initial ignition of the charge. It is not possible to predict accurately the burning capacity of the proposed reduced-size unit; however, it is estimated that a burning rate of between 80 and 130 pounds per hour probably can be achieved in a unit of this size and type.

It is currently contemplated that the design of the proposed reduced-size unit would be essentially the same as that of the Type 2 Prototype Incinerator. Minor changes necessitated by the reduced size, or indicated to be worth while by the recent research under Task Order No. Z and Work Order No. II, Task Order No. KK, or by the field evaluation being conducted by your technical representatives, would be incorporated in the design, wherever

feasible. Also, in the course of designing the proposed unit, continued attention would be directed toward evolving means of increasing the rate of burning during the late stage of the burning cycle, and for minimizing the amount of incompletely burned paper remaining at the end of the incineration period.

The same configuration of horizontally tangent cooling-air louvers would be utilized in the liner of the proposed reduced-size unit. The liner would be prepared from Type 310 stainless steel (25 Cr-20 Ni) in order to benefit from the improved heat resistance over that of the Type 304 utilized previously, and Nichrome 5 wire mesh would again be used for the grid. Also, it is expected that a quick-opening loading door would be provided in the proposed design.

Attempts would be made to evolve a design for an experimental unit that incorporated the motor and blower immediately below the combustion-chamber compartment and within the outer shell. The height dimensions of the outer shell, the liner, and associated components for the proposed reduced-size unit would be selected so as to provide a reasonable amount of latitude for the motor and blower to be located as described above. The flow rate and pressure of the combustion air needed in order to achieve an optimum performance of the proposed reduced-size unit would be determined using the currently available motor and blower of the Type 2 Prototype Unit. Then, a search would be made for commercially available blower equipment which would fit the space provided and would deliver air at the required flow rate and pressure. This arrangement may involve the use of a blower configuration with the impeller rotating on a vertical shaft in the space below the combustion-chamber compartment. However, it is considered prudent to place the primary emphasis in the proposed program on the effort directed toward the design, preparation, and evaluation of a

reduced-size experimental unit which would provide the highest practical burning rate. Thus, it may not be possible, within the limits of the time and funds provided, to incorporate the above-described compact arrangement of the motor and blower in the design of this proposed unit. If not, then it is anticipated that there would be merit in investigating this design feature further, under another contractual arrangement.

In the evolution of a suitable design for the proposed reduced-size unit, our previous experience developed in scaling down combustion equipment would be utilized. The scaling down of combustion and flow equipment usually involves more than simply the consideration of size ratios. Where mixing and turbulence are concerned, as in this case, variables which determine flow momentum, such as jet velocity and mass flow rate of combustion air, are likely to have optimum values. Therefore, in the course of evaluation of the burning characteristics of the proposed unit, the combustion experiments conducted would involve independent changes in the jet velocity and in the mass flow rate of air through the main nozzles, so as to explore the operating conditions which would be conducive to an optimum over-all performance. This method was used previously in developing the Type 2 Prototype Incinerator.

Thus, in the performance of the proposed program, a design of a reduced-size experimental unit would be prepared on the basis of the various considerations described above. The appropriate components would be purchased on the commercial market to the extent possible, or prepared in our laboratory. Subsequently, the components would be assembled, and experiments would be conducted to evaluate the performance of the experimental unit.

In general, it is contemplated that extensive over-all evaluation of the proposed reduced-size unit would not be necessary, since the performance of the smaller experimental unit is expected to be quite similar (except for a

decreased burning rate) to that of the Type 2 Prototype Incinerator. It is estimated that approximately eight combustion experiments would be run at selected mass flow rates of combustion air and jet velocities with intermittent-batch feeding of telephone-book paper and particularly of typical files paper and documents, so as to explore the maximum burning capacity of the experimental unit. Also, a small number of single-batch experiments would be conducted to investigate the completeness of burning of the paper charge.

Where needed, minor modifications stemming from information obtained in the burning experiments would be incorporated in the experimental unit, within the limits of the time and funds provided. At the end of the proposed research period, the experimental unit, with an appropriate stack and minimum instrumentation similar to that provided with the large Task Order No. Z experimental incinerator, would be made available to your technical representatives for field evaluation. In view of the uncertainties anticipated in attempting to incorporate the motor and blower in a position immediately below the combustion chamber, it is believed likely that the experimental unit which is expected to evolve from the effort provided for herein will be equipped with the motor and blower in a conventional side location. If so, it is recommended that, at the conclusion of the proposed research problem, further consideration be given to the merits of an integrally located motor and blower, and that, at that time, a decision be made with regard to further investigation of this design feature. Such additional research would have to be set up under another contractual arrangement.

 December 2, 1959

Reports and Liaison

Monthly letter reports would be submitted to keep your technical representatives informed of the progress of the proposed program. These would be supplemented by meetings and telephone discussions with your technical representatives. At the conclusion of the proposed research period, a summary report describing the results of the effort would be submitted.

Duration and Estimated Costs

It is proposed that the contract provide for a four-month period of research, with an estimated appropriation of $10,070, including the fixed fee. The general breakdown of the estimated costs is attached.

The Contract

The proposed contract would be a period-basis research agreement, consistent with our current contractual arrangements and providing only for a fixed period of research leading toward the objective outlined in this proposal.

If you should have any questions with regard to this proposal, please let us know. Any inquiries of a contractual nature may be directed to [redacted] at Extension 159. 25X1

Very truly yours,

[redacted] 25X1

EES:mlm

In Duplicate