

**STATEMENT OF WORK
TO DEVELOP AND EVALUATE
RESIDENTIAL RANGE CONTROL TECHNOLOGY INTENDED TO REDUCE THE
INCIDENCE OF IGNITION OF FOOD IN A COOKING UTENSIL
July 2008**

1. Description of Services

The contractor shall demonstrate technology that will help to reduce the incidence of unattended cooking fires resulting from ignition of food in a pan on a cooktop/range. The contractor shall design and construct prototype residential range control systems for gas, electric, and glass ceramic cooktops/ranges capable of detecting pre-ignition conditions and shutting off power/gas to the cooktop/range. The design and construction shall take advantage of and build upon previous research and development performed and sponsored by CPSC staff. In addition, the prototype range control systems shall meet or exceed the Technical Feasibility Performance Goals¹ to establish feasibility for the residential market.

2. Contract Type

This procurement is a firm-fixed price performance-based contract.

3. Background

From 2002 to 2004, CPSC staff estimates that ignition of food in a cooking vessel while on a cooktop caused an annual average of 31,200 fires, 160 deaths, 1980 injuries, and \$274 million in property loss. U.S. Consumer Product Safety Commission (CPSC) staff has conducted or sponsored several studies aimed at reducing fires involving ignition of cooking materials on cooktops. The research demonstrated that food temperatures and pan-bottom temperatures are reliable indicators of pending ignition that can be exploited to initiate automatic corrective actions to prevent food ignition.

CPSC staff conducted and sponsored research to develop experimental range control systems for three types of residential cooktops/ranges: electric coil-type, gas, and electric glass/ceramic. Each of these experimental control systems showed promise in preventing cooktop fires. The results of this research were presented to an ANSI/Underwriters Laboratories (UL) 858 Standards Technical Panel (STP) to help establish performance requirements for any range or cooktop to meet to reduce the incidence of cooking fires. An STP working group developed a list of Technical Feasibility Performance Goals (TFPG) to establish a baseline against which candidate systems could be designed and tested.

This contract will be awarded to provide engineering services to further develop residential range fire control systems (for electric, gas, and electric glass/ceramic cooktops) and evaluate their performance with respect to the TFPGs. The range control systems being demonstrated shall be applied to production-model residential ranges and must meet or exceed the TFPGs.

¹ Underwriters Laboratories (UL) STP Document 858-04-01

4. Description of Work

- a. Independently, and not as an agent of the Government, the contractor shall furnish all necessary personnel, materials, services, and facilities to perform the work set forth below, except as provided in Section 8, "Government Furnished Materials."
- b. Using the results and information from all previous research and development (for electric, gas, and electric glass ceramic cooktops) conducted and sponsored by CPSC staff as a basis, the contractor shall design and construct prototype range control systems that are capable of detecting pre-ignition conditions and shutting off electric power/gas to the heating element such that ignition does not occur, while meeting the TFPG. The prototype range control systems shall be integrated with current-model production residential cooktop/ranges that are commonly found in homes in order to demonstrate the feasibility and performance of each design.
- c. The contractor shall provide a list of all parts used in modifying the baseline production-model ranges to meet the TFPG and provide the cost and supplier for each functional component.
- d. The contractor shall conduct testing to measure, characterize, and document the performance of the three (modified) prototype temperature control systems including the following cooking processes:
 1. Blacken meat or fish in a skillet
 2. Stir fry vegetables or meat in a wok
 3. Boil 1,2, and 4 quarts of water in appropriately sized sauce pans
 4. Heat and simmer sauces in 1- and 2-quart pans
 5. Deep fry (repeatedly)
 6. Put a kettle on to boil
 7. Prepare a 'flambe' wherein the alcohol poured into a pan is burned off.

Additional cooking processes that will help characterize system performance will be developed and conducted by the contractor in consultation with the CPSC Project Officer. In addition, the performance of the three (modified) prototype temperature control systems shall be verified for conformance to the TFPGs.

- e. The contractor shall estimate incremental production and consumer cost increases associated with any modifications and identify ways to reduce design and manufacturing costs for the modified units.
- f. The contractor shall conduct demonstration tests of the final prototype units to CPSC staff at the end of the contract period.
- g. The contractor shall provide a data analysis report focusing on the primary objectives of this contract: 1) development of prototype range control systems to detect pre-ignition conditions as a means of reducing the risk of unattended cooking fires, and 2) evaluation of the prototypes to the TFPGs to establish feasibility for the residential market. The evaluation shall include the results of testing to measure, characterize, and document the performance of the three

(modified) prototype temperature control systems, anticipated costs, as well as a discussion of the feasibility for the residential market. This analysis shall be included in the draft and final reports.

- h. The contractor shall provide recommendations that may be directed toward improvements to the voluntary standards, identifying potential future work, and/or other avenues to achieve implementation of such safety systems in residential range cooktop/ranges. Recommendations shall be included in the draft and final reports.

5. Period of Performance

Performance of work shall begin on the effective date of this contract and shall not extend beyond 450 calendar days after award of this contract. The date may be adjusted by mutual agreement between the Government and contractor.

6. Reporting Requirements

The contractor shall submit the following reports to the Project Officer:

- a. Biweekly Status Reports
 - (1) Format – the report shall be e-mailed to CPSC
 - (2) Content – the report must contain the following:
 - (a) Status of project and new developments
 - (b) Problems, if any, and proposed solutions
- b. Prototype Design Meeting
 - (1) Format – Meeting with contractor and CPSC Project Officer
 - (2) Content – The contractor shall provide a briefing on the proposed prototype designs for CPSC Project Officer approval
- c. Draft Report
 - (1) Format - The draft final report shall be prepared in Microsoft Word 2003 or 2007. The report shall be furnished in electronic format and may be e-mailed to: rkhanna@cpsc.gov or mailed to the following address:
 - Rohit Khanna
 - Fire Protection Engineer
 - U.S. Consumer Product Safety Commission
 - Division of Combustion and Fire Sciences
 - 4330 East-West Highway, Suite 611
 - Bethesda, MD 20814
 - (2) Content - The draft written report must address all of the issues and objectives set forth in the Statement of Work.
- d. Final Report
 - (1) Format - The final report shall be prepared in Microsoft Word 2003 or 2007. The report shall be furnished in electronic format and may be e-mailed to rkhanna@cpsc.gov or mailed to the following address:
 - Rohit Khanna
 - Fire Protection Engineer
 - U.S. Consumer Product Safety Commission

Division of Combustion and Fire Sciences
4330 East-West Highway, Suite 611
Bethesda, MD 20814

- (2) Content - The final report must address all of the issues and objectives set forth in the Statement of Work as well as comments received from the CPSC Project Officer on the draft report.

e. Preliminary Test Data

- (1) Format – The preliminary test data from the cooking tests and testing to the TFPG shall be furnished in electronic or hard copy format and may be e-mailed to rkhanna@cpsc.gov or mailed to the following address:

Rohit Khanna
Fire Protection Engineer
U.S. Consumer Product Safety Commission
Division of Combustion and Fire Sciences
4330 East-West Highway, Suite 611
Bethesda, MD 20814

- (2) Content - The preliminary test data shall include all measurements taken during the cooking tests and testing to the TFPG.

f. Final Test Data

- (1) Format – All test data from the cooking tests and testing to the TFPG shall be furnished in electronic format. The data may be e-mailed to rkhanna@cpsc.gov or mailed to the following address:

Rohit Khanna
Fire Protection Engineer
U.S. Consumer Product Safety Commission
Division of Combustion and Fire Sciences
4330 East-West Highway, Suite 611
Bethesda, MD 20814

- (2) Content - The test data shall include all the raw and processed data taken during the cooking tests and testing to the TFPG.

7. Performance and Delivery

The following deliverable items must be performed or delivered in accordance with the following schedule:

a. Bi-weekly Status Report

Every two weeks during the performance period, to be submitted by the contractor to the Government within seven calendar days after the bi-weekly period.

b. Draft Report

To be submitted by the contractor to the Government on or before 365 calendar days after award of this contract.

c. Final Report

To be submitted by the contractor to the Government on or before 450 calendar days after award of this contract.

d. Preliminary Test Data

To be submitted by the contractor to the Government on or before 30 days after the tests specified in Section 4 (d).

e. Final Test Data

All test data to be submitted by the contractor to the Government on or before 450 calendar days after award of this contract.

f. The Contractor must deliver all hardware, software programs and computer code that were purchased or developed under this contract to the CPSC staff before the end of the contract.

8. Government-Furnished Materials

CPSC staff will provide the contractor with all related studies, reports, hardware and information relevant to this contract.