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A Survey of Manufacturers' Views on the ETIP Procurement Experiment Volume One: Refrigerator-Freezers

P. Clare Goodman

Product Systems Analysis Division
Center For Consumer Product Technology
National Bureau of Standards
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Final Report

Prepared for
Experimental Technology Incentives Program
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U.S. DEPARTMENT OF COMMERCE, Rogers C.B. Morton, *Secretary*
James A. Baker, III, *Under Secretary*
Dr. Betsy Ancker-Johnson, *Assistant Secretary for Science and Technology*

NATIONAL BUREAU OF STANDARDS, Ernest Ambler, *Acting Director*

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A SURVEY OF MANUFACTURERS' VIEWS ON THE ETIP PROCUREMENT EXPERIMENT VOLUME ONE: REFRIGERATOR-FREEZERS

P. Clare Goodman

Abstract

This report describes the findings of a survey of six refrigerator-freezer manufacturers by the Center for Consumer Product Technology. The survey was conducted for the Experimental Technology Incentives Program (ETIP) as part of its evaluation of a Federal Supply Service (FSS) procurement of refrigerator-freezers. Survey questions were designed to obtain manufacturers' views on the use of Government procurement policies as a means of increasing the rate of introduction of new technologies into the consumer market place. The questions covered the following areas: (1) reasons for participation or non-participation of a manufacturer in the ETIP experiment; (2) problems that a manufacturer encountered with existing Federal procurement practices; (3) acceptability of using life-cycle costing in the bidding procedure; and (4) effect of the most recent Government procurement on present and future company operations, including support for engineering and investment in research, types of themes used in advertising campaigns, etc. Results of the survey are reported, and implications are drawn for future ETIP involvement in Government procurement activities.

Key words: Energy-efficient products; Experimental Technology Incentives Program; life-cycle costing; procurement experiments; refrigerator-freezers.

A Survey of Manufacturers' Views on the ETIP Procurement Experiment
Volume One: Refrigerator Freezers

1. Introduction

1.1 Background

The Experimental Technology Incentives Program (ETIP) of the National Bureau of Standards (NBS) is one part of the Federal Government's efforts to determine what steps can be taken to increase the rate at which new technologies are introduced into the marketplace. The ETIP is part of a continuing effort by the Federal Government to "work as a more effective partner with the private sector in the development and application of science and technology to strengthen the nation's economy and improve the quality of life." 1/

ETIP has selected Federal procurement practices as one of the areas in which it is performing special studies. Five procurement experiments currently underway are designed to determine whether it is feasible to stimulate development, production, and marketing of energy-efficient products through the use of Government purchasing practices. Each experiment is planned to last three years in order to allow sufficient time for industry to introduce technological innovations.

These experiments, all of which were performed in conjunction with the Federal Supply Service (FSS) a part of the General Services Administration (GSA), are intended to determine if modifications in procurements, such as by the use of a modified life-cycle cost formula in a bidding procedure, could increase the availability and recognition of efficient appliances in the market place. The September, 1974 Invitation for Bid (sometimes referred to as a Request for Proposal (RFP)) for refrigerator-freezers, 2/ which is the subject of this evaluation, was a step in one of the five experiments performed jointly by ETIP and FSS.

1/ President's Science and Technology Message of March 16, 1972.

2/ "Two-Step Formal Advertising for FSC-4110 -- No Frost Combination Refrigerator-Freezers" Solicitation No: FPGA-Z-55489-1-A1-9-19-74. This document can be obtained by writing to: General Services Administration, Federal Supply Service, IFB/RFP FPGA-Z-55489-1A1-9-19-74, Washington, D. C. 20406.

1.2 Factors to be Evaluated

The Product Systems Analysis Division (PSAD) of NBS was asked by ETIP Personnel to assist in the evaluation of the refrigerator-freezer procurement. PSAD was specifically requested to conduct a survey of firms that manufacture refrigerator-freezers. The survey was to include a portion of all known firms in the industry rather than just companies that bid on ETIP experiments. Information concerning the following was sought.

(A) Reasons for participation or non-participation of a manufacturer in the ETIP experiment.

(B) Problems that a manufacturer encountered with existing Federal procurement practices.

(C) Acceptability of using life-cycle costing in the bidding procedure.

(D) The effect of the most recent Government procurement on present and future company operations, including support for engineering and investment in research, types of themes used in advertising campaigns, etc.

A primary task of this analysis was to evaluate the success of the completed ETIP experiment as determined by the manufacturers responses and new product development in refrigerator-freezers. The author was not involved in the design of the experiment and the particular life-cycle cost formula used. No attempt was made to evaluate whether the particular experimental design and life-cycle cost formula utilized are the most effective mechanisms for bringing about increases in the energy efficiency of refrigerator-freezers.

2. Methodology

2.1 Questionnaire Development

A preliminary set of questions for the survey was derived from discussions with ETIP personnel on the desired areas of investigation, and from the experience gained from a previous ETIP evaluation on procurement of Window Air Conditioners. 3/ Meetings were held with the Appliance Labeling Section of PSAD as well as representatives of the Federal Supply Service (FSS) to obtain their suggestions for questions that they felt should be included. Advice was also obtained from representatives of the Association of Home Appliance Manufacturers (AHAM) and the Gas Appliance

3/ Unpublished manuscript, Charles Fried, Fran Bents and Ted Fody, "Survey of Window Air Conditioner Manufacturers," June 1975.

Manufacturers Association (GAMA), who reviewed and concurred with all of the survey questions. A final draft based on the results of these meetings was reviewed by ETIP. The final version of the questionnaire is shown in Appendix A.

2.2 Sample Selection

Companies considered for participation in the survey were selected from a listing of all known domestic refrigerator-freezer manufacturers. Lists of such firms were provided by AHAM and FSS. The final list excluded companies that brand labeled a product manufactured by another company. Selection of companies to be surveyed were based on a desire to include a representation from both bidders and non-bidders on the ETIP experiment, as well as large and small manufacturers.

Six of the refrigerator-freezer manufacturers met the above criteria and were available during the survey period, August and September 1975. (See Appendix B for a list of these manufacturers.)

2.3 Data Collection

Prior to the first actual contact by a survey team member, each of the companies scheduled to be visited was sent the letter shown in Appendix C. The company official to whom the letter was addressed was designated by AHAM as the appropriate contact. Shortly after the letters were sent to the companies, telephone calls were placed to each of the officials to whom the letters had been addressed. The caller further described the purpose of the meeting. A request was made to have company representatives attend the meeting who were familiar with the original Invitation for Bid (IFB). In addition, officials that represented marketing and engineering were asked to attend, if possible. The number of executives interviewed at a session ranged from one to five individuals, depending on the complexity of the company's organization.

The interviews began with a brief re-explanation of the ETIP experiment and the purpose of the survey. A standard explanatory paragraph was read to all participants (Appendix D). Participants were told that they would receive a copy of the final report after it was published.

The interviews were conducted in an open ended fashion generally lasting from two to three hours. The interviewer read each question aloud to all officials at the same time. One PSAD representative interviewed five of the companies, while another person interviewed the sixth company. All companies surveyed were cooperative and helpful.

3. Survey Results

The first ETIP experiment was completed by the FSS for no frost combination refrigerator-freezers. Manual defrost and cycle defrost refrigerators are acquired under separate procurements that will not be discussed in this report. Previous FSS procurements of refrigerator-freezers had been awarded solely on the basis of meeting specifications at lowest bid price, without regard to the total cost of ownership. For this experiment a modified form of life-cycle costing was applied to the bid price.

3.1 Background: The Refrigerator-Freezer Industry

There are approximately ten refrigerator-freezer manufacturers in the United States. One reason for the small number of manufacturers is the requirement for large plants that offer production economies. Most of these firms not only sell under their own name, but they also sell to firms that market the product under a private brand label. There are hundreds of refrigerator models available in the consumer market.

The industry does a considerable amount of self policing. All of the companies interviewed were active members of AHAM, which collects data from all manufacturers on the performance and efficiency of their models. Companies have obligated themselves to providing their trade association (AHAM) with accurate data on each model. This information is then summarized by AHAM and industry-wide totals are published. In addition, AHAM develops, tests, and approves standards for refrigerator-freezers.

Most refrigerators are manufactured on inflexible production lines, where every effort is made to reduce costs. Any change to the production line involves not only retooling costs but engineering and development costs as well. Most firms indicated an unwillingness to raise capital to meet such costs.

Refrigerator sales fell from 1973 to 1975. Table 1 shows the shipments of refrigerators for 1973 to 1974, as well as forecasted shipments for 1975 and 1976.

All companies interviewed indicated that currently the large majority of refrigerator sales are for the replacement of existing refrigerators. One firm said that approximately 25 percent of the total volume of their sales went to builders, while another firm said that only 15 percent of their output was sold to builders.

Table 1. AHAM Data on Shipments of Refrigerators.**

Year	Number of Units
1973	6,774,000
1974	5,982,000
*1975	4,550,000
*1976	5,230,000

*Forecasts as of July 1, 1975

Source: AHAM

**The number of units shipped includes all types of refrigerators and refrigerator-freezers, but not freezers.

The estimated number of no frost refrigerator-freezers to be purchased by the FSS was 15, 000 in 1974 and 10,080 in 1975. In procurements of this type, the FSS does not purchase the items directly from the successful bidder, but only identifies the contractor and the item in an FSS supply schedule. In the latest procurement, bids were requested for 13 different models, ranging from 0.36 m^3 to 0.72 m^3 (12 ft^3 to 24 ft^3) in each of 10 different regions. Individual awards were given for each model. Top mount freezers were specified for nine of the models, and side by side refrigerator-freezers for the remaining four models. A top freezer, size 14, (minimum 0.405 m^3 or 13.5 ft^3) was the most common model requested in the solicitation.

Two firms supplied bids on practically all models requested for the 1974 Invitation for Bid (IFB). During 1972 and 1973 several more firms had competed for the awards, with as many as six firms competing on one particular model.

Based on discussions with the refrigerator manufacturers, it appears that a definite interest in Government business exists.

Table 2. Do you actively seek Government business?

	Number of Responses
Yes	5
No	1

As shown in Table 3, Government purchases do not represent a large market share for any of the surveyed manufacturers.

Table 3. What percentage of your overall operation is Federal Government business?

	Number of Responses
None (or practically none)	1
Less than 1%	2
1 - 2%	2
Slightly over 2%	1

The percentages given above include all Federal Government sales and are not limited to FSS procurements. FSS is not the only purchaser of Government refrigerators since Housing and Urban Development (HUD) has its own procurement mechanism. An attempt was made to determine what percentage of Federal refrigerator purchases are represented by the FSS procurement, but this information was not available.

All of the firms interviewed obtained information about Government procurements through mailing lists, such as the FSS Bidders List. The Commerce Business Daily was not reported as a source of information by the companies. All of the interviewees were at least partially familiar with the last procurement issued jointly by FSS and ETIP.

3.2 The Government Procurement Mechanism

3.2.1 Problems with Government Purchasing Procedures

All six companies indicated that there were difficulties in doing business with the Government that were attributable to the Government's purchasing procedures. Table 4 summarizes these problems.

It was generally reported by companies that they felt the Government gains very little if anything in the way of better performance or quality by requiring additional procurement specifications for their refrigerators which differ from available "standard" ("off the shelf") production models. Bids for procurements with non-standard specifications require excessive amounts of engineering and administrative manpower. This is felt to be an unnecessary loss if the company's bid does not win.

Out of the six companies interviewed, four felt that their current standard models could not meet Federal specifications. None of these four firms indicated any interest in bidding until the specifications conformed more closely to industry specifications. This is further indicated by the answers to the question in Table 5.

Reduction in the amount of product testing required by the Government in its procurements was mentioned by one respondent as a method to increase the number of bidders. Several more comments were brought out when additional questions were asked on the topic of testing, as shown in Table 6. Four firms stated that the testing costs might restrict future bids. All six firms felt that the Government has no need for a separate testing program.

Table 4.

Do you think Government purchasing procedures make it difficult, or actually discourage, doing business with the Government? All respondents replied "yes," so they were asked for details and an account of their past experiences.

	Number of Responses*
(1) Non-standard or outdated specifications	6
(2) Time or manpower required in bid preparation	
Too much paperwork (sheer amount of man-hours required)	5
Engineering man-hours required	1
Shop drawings required	1
"Government inspectors that have no idea what they are looking at" - takes up their time	2
Special markings or sealings required	2
Penalities that are possible if procedures are not followed carefully	1
Lot inspection is different	1
References to other specifications not included in RFP (IFB)	1
(3) Requirements in order to participate	
Open-ended contract with no guarantee on amount of units to be purchased (estimated quantities are difficult to deal with)	2
Language of the RFP (IFB) is difficult to follow (One person is probably not qualified to read and understand the whole RFP.)	2
Quantity to be purchased is not large enough to justify the extra time and manpower needed	1
Shipping procedures (should be shipped F.O.B. (Freight on Board) plant location rather than F.O.B. destination)	1
Shipping of very small numbers should not be required	1
Government insists upon pre-product samples	1

*When the total number of replies exceeds six, then one or more companies provided more than one response.

Table 5.

What do you think the Government could do to increase the number of responses to its RFPs?

		Number of Responses*
(1)	Simplify bidding process	
	Reduce paperwork involved	2
	Ship only in reasonable numbers plus change shipping method so that items are shipped F.O.B. plant location rather than destination	1
	Organize the bidders list more carefully	1
	Make specifications readable	1
(2)	Improve standards	
	Use standard specifications, generalize the standards, accept standard units, etc.	5
	Accept AHAM, AGA and/or UL standards	3
	Use standard tests; reduce testing requirements	2
(3)	Reduce product requirements	
	Do not ask for a product that is different from what is offered to the consumer	3
	Do not require industry to supply both left and right door openings	2
(4)	Improve communications between FSS and Industry	1

*When the total number of replies exceeds six, then one or more companies provided more than one response.

Table 6. Suggestions for reducing costs of testing products.

	Number of Responses
Use AHAM tests or standards	2
Have third party review the companies own test data	1
No suggestions other than to remove tests	3

Despite the above problems and past experiences that industry has had with Government procurements, the ETIP experiment has attracted attention. Three of the respondents indicated that, if future procurements followed the ETIP format, their company would actively seek Government business. There was a general interest in the new procedure for bidding as indicated by the answers to the question in Table 7.

Table 7. If the type of procurement used in the ETIP experiment continues to be used, will it change your policies vis-a-vis government business?

	Number of Responses
Yes, may become interested in bidding	3
Will continue to bid	2
Can't answer till government changes specifications	1

3.2.2 Factors in the Decision to Bid on an IFB.

The reported decision as to whether or not to respond to an IFB was based on one or more of the factors listed in Table 8.

Table 8. If you bid on a given contract, what are the prime factors in the decision? (What made you bid on this contract -- if applicable.)

	Number of Responses*
Confidence in meeting the specifications	3
Company needs the business	3
Making an acceptable profit	2
The quantity requested	1
The method of delivery	1
Do they think the company can win the contract?	2

*When the total number of replies exceeds six, then one or more companies provided more than one response.

All the firms produced Government products as part of their regular production lines. No company had an engineering department exclusively for Federal purchases. Several firms had one or more persons who dealt with Government bids. One company indicated that the nature of Federal procurements with their special requirements necessitated separate treatment.

All firms surveyed were asked to state what criteria they would recommend that FSS use in the selection of refrigerator-freezers in future procurements.

Table 9. If you were in Federal Procurement, how would you purchase refrigerator-freezers? What factors would you use?

	Number of Responses*
Life-cycle costs	4
Energy efficiency or power consumption	2
Price	1
Performance (quality)	2
Serviceability	2
Method of delivery (Use F.O.B. plant location)	1
"Features" of the refrigerator	1
Up-to-date specifications	1
Standard models	2
Improve communication	1

*When the total number of replies exceeds six, then one or more companies provided more than one response.

3.3 Life-cycle Costing (LCC)

3.3.1 The LCC Formula

The life-cycle cost (LCC) of an item is the total cost of the items' inital cost, operation, maintenance, and disposal.

An LCC program has been implemented by the Federal Supply Service. To date, procurements for five products have included some partial form of LCC in their bid price. None of these LCC formulas considered all ownership costs, but they have attempted to include some life time costs.

The determination of the life-cycle cost for refrigerator-freezers was computed by the following formula and distributed as part of the IFB. This formula was designed to be part of the ETIP experiment and was not meant to represent a complete formula including all ownership costs. As stated in the IFB, the LCC formula is LCC = A+R where:

> A = Acquistion cost (inital cost) of refrigerator-freezer, the price at which manufacturer (or supplier) will sell his product to the Government. The acquisition cost shall be the manufacturer's option.
>
> R = Recurring cost (operating cost), cost incurred in connection with operation of the product. "R" as used herein shall equal the total cost of electrical energy required by the refrigerator-freezer during an expected life span of 15 years. "R" shall be computed by the relation:
>
> $$R = (P) \times (C) \times (T) \times (d).$$
>
> Where P, C, T, and d are defined as follows:
>
> P = Computed electrical energy (in kilo-watt hours) [sic] required during 24 hours (one day) of operation. "P" shall be computed by the formula $P = \frac{V}{E.F.}$ (For explanation see Appendix E).
>
> C = Cost of one kilo-watt hour [sic] of electrical energy. For the purpose of computation, "C" shall be a constant equal to $.04 (4 cents) per kilo-watt hour [sic].
>
> T = Annual (yearly) operating time in days. For purposes of computation "T" shall be a constant equal to 365 days; and shall be construed as first year operating time.

d = Total discount factor, as computed for a period of 15 years at a discount rate of 8 percent (.08). For purposes of computation the total discount factor "d" in the above recurring cost formula shall be a constant equal to 8.87. 4/

Four companies indicated an interest in having FSS give a presentation on the LCC formula. The other two thought that such a presentation would be unnecessary.

Most firms were pleased with the present LCC formula, which includes initial cost and operating costs. One firm felt that eventually the formula should include service and warranty costs as well as operating costs. Two firms felt that eventually the formula should include maintenance costs. The other three firms indicated a preference for leaving LCC as it now stands.

Table 10. How would you like to see the Government construct a LCC formula?

	Number of Responses
Initial Cost and Operating Costs	3
Initial Cost, Operating Costs, and Maintenance Costs when possible	2
Initial Cost, Operating Costs, Service or Failure rates, and Warranty	1

3.3.2 Maintenance Data

If FSS were to include some form of maintenance or service costs in the LCC formula, it would need more data than is currently available. The next two questions (Tables 11 and 12) attempted to find out if such data could be made available to FSS.

4/ "Two Step Formal Advertising for FSC-4110 -- No Frost Combination Refrigerator-Freezers" Solicitation No.: FPGA-Z-55489-1-1A-9-19-74 (September 19, 1974).

Table 11. Does your company determine maintenance cost data for refrigerators?

		Number of Responses
Yes:	Warranty data mostly (some additional data, such as number of parts sold)	4
Yes:	Warranty data plus service data beyond warranty period	2

Table 12. Is this data available to the Government?

	Number of Responses
Yes	2
No	1
Unsure	3

At present it appears that FSS and ETIP will have to continue to use an LCC formula that includes only initial cost and operating cost because of the unavailability of maintenance data from all refrigerator-freezer manufacturers.

3.3.3 Warranty Information

All six companies indicated that, for a price, the Government could obtain whatever warranty it desired. In most cases, the warranties provided the Government were similar to the ones offered to the private consumer.

When asked if the Government makes use of its warranty, 3 companies indicated that it did, while 3 said they did not know. Most companies had no way of comparing consumer warranty usage data with Government data. One company did state that there were fewer "nuisance calls" for products sold to the Government.

The percentage of total refrigerator cost that is used to pay for warranty expenses depends on: (1) the model, (2) replacement parts, (3) labor costs, and (4) number of years of warranty coverage. As a result, the warranty cost may vary from one to ten percent. When asked if the company would lower its bid price, if the Government waived the warranty, 5 out of 6 companies said they would, while one said it probably would not.

3.4 Bidders Conferences

A Pre-bidding Conference was convened for the first ETIP experiment. The purpose of this type of meeting was to discuss the required specifications, to answer industry's questions, and to explain the bidding process and the LCC formula.

All of the companies that were interviewed felt that industry would not openly discuss its ideas at such a conference. Several interviewees indicated that they would be very hesitant as to what they said in front of their competitors. Everyone preferred individual sessions to group meetings.

When asked if their firm would consider attending a bidders meeting, two said they would not under any condition, while the remaining firms showed some interest in attending. Of those firms one qualified its answer by stating that meetings with industry and FSS should be held only for extremely large bids. Two other firms that said they might attend, expressed reservation as to how effective such a meeting would be since everyone would be careful as to what they said.

3.5 Advertising

The discussion on advertising elicited a variety of responses. Several firms were unsure of their answers or changed them as the discussion progressed. At present, a GSA regulation (given in Appendix F) prohibits a firm from advertising a Government procurement if it suggests that the Government endorses, or prefers the product, or considers it to be superior to other products.

Table 13. If a successful bidder were able to advertise an ETIP experiment, would this be an added incentive to bid?

	Number of Responses
No	4
Yes	1
Possibly, if government could back up testing	1

The firms who answered "no" to the question in Table 13 were clearly certain of their responses. The remaining two companies who answered "yes" tended to qualify their answers.

Table 14. If you were awarded a contract by the government for a product containing new technology, would you want the Government to advertise this fact?

	Number of Responses
Yes, under certain predetermined conditions (see discussion below)	4
No	2

The two companies who argued against Government advertising felt that it would be unfair to those manufacturers who chose not to bid. One firm stated that such advertising would probably get "muddled." All the other firms felt that the Government should be cautious in its advertised claims. One company said that any advertising by the Government should be limited to statements on new technologies. Another company maintained that technical data should not be included in any Government advertising.

3.6 Engineering Considerations

All of the companies said that they felt that they have the capability to produce a more energy-efficient appliance. Most firms felt that more efficient refrigerators would soon be on the market. Some models, have been retooled and anti-sweat switches have been added. Other models are expected to be retooled within the next year. One company said they had already made every change possible that would result in a more energy-efficient refrigerator while adding little or nothing to the price. They felt that a much more energy-efficient refrigerator would require a major retooling effort with a large amount of capital, and therefore the price of such a model would be considerably higher and probably prohibitive to the consumer.

In the past, there has been a strong trend towards increased power consumption by refrigerators. This trend reflects increased power consumption per cubic foot of refrigerated space as well as increased size of the refrigerator. The increase in power consumed per cubic foot is due in part to the additional power required by the automatic defrost models.

There are several methods for designing refrigerators to be more efficient. During the discussions with the manufacturers the following energy saving methods were suggested.

Table 15. Technological Improvement

	Number of Responses*
Increase thickness of insulation	4
Change type of insulation	2
Improve compressor motor efficiency	4
Elimination of heater wires or addition of energy saving switches	4
Installation of a free of frost frost system	1
Develop "uniform heat leakage"	1

*When the total number of replies exceeds six, then one or more companies provided more than one response.

Five firms said that their engineering staff was of sufficient size and competence to respond to any engineering efficiency programs, while one firm did not answer. Actual available engineering time may have been reduced due to staff cuts in the past few years. A few firms indicated their intention to increase their engineering staff.

Each of the manufacturers was engaged in a research and development (R&D) effort with some engineers assigned to R&D work. Research and development was divided into different departments in at least two of the companies. A parent company was available for needed engineering assistance in two cases.

None of the firms had a separate engineering effort for Government contracts. Two firms did state that testing for FSS contracts was, of necessity, a separate effort. Two other firms also mentioned that their engineers would have to consider further tests if they decided to bid on future RFP's.

The engineering departments appeared to be responding to energy conservation efforts. Most companies have spent considerable time studying energy programs.

Table 16. What do you think can be done to encourage the industry as a whole to adopt a new energy conscious ethic in its design philosophy?

		Number of Responses*
1.	Voluntary labeling program	3
2.	Consumer education, encourage the public to be energy conscious	4
3.	Communication on research done by industry and government. Possible Government assistance of research	1
4.	Study the possibilities of solar energy	1
5.	Tax incentives and tax credits to stimulate sales of more expensive energy efficient models	1
6.	More joint action and cooperation of AHAM and the Government in energy programs	1

*When the total number of replies exceeds six, then one or more companies provided more than one response.

4. Conclusion and Discussion

The Experimental Technology Incentives Program has attracted attention to the Government procurement technique. The refrigerator-freezer industry appears to have a positive view toward the new features in the procurement. For example, life-cycle costing (LCC), the major new feature, has definitely created an interest in the industry. Some firms wanted to include even more factors in the proposed formula. Many objections to such features as non-standard specifications and special markings still exist. These are the areas that FSS and ETIP must continue to work on if they hope to encourage increased response to IFB's.

The primary goal of ETIP was not achieved in this experimental procurement since the companies did not respond with any innovative engineering. The models proposed by the companies responding to the IFB were all appliances that were already available in the private consumer market place. This situation is unlikely to change in the near future since the firms did not indicate any interest in developing and producing a different refrigerator for the Government. They felt that Government business is not large enough to provide the incentive for such changes. Firms are also uncertain that they could make a reasonable profit by supplying the Government with a separate model. New models are developed for the consumer market, and then offered to the Government.

In order to determine the overall effect of the ETIP experiment on the refrigerator-freezer industry the following question was asked of all six firms that were surveyed. "What company policies, if any, will be affected by the procedures used in the ETIP experiment? What effect? How, if at all, will the following areas be affected?"

Research and Development	Design and Marketing
Marketing	Advertising
Related Product Lines	Other

The answers were not encouraging. Every firm stated that none of their major policies was affected by the ETIP. Several companies did indicate that the current interest in energy conservation has changed some company policies. At least three companies have had advertising programs that stress the energy-saving aspects of their refrigerators. There appears to be a tendency for manufacturers to produce a more efficient product. This trend will probably continue for some time. Some firms stated that they had always been energy conscious and that now their efforts were being rewarded.

APPENDIX A

ETIP Evaluation Questionnaire - Refrigerator-Freezers

Date _____ Interviewer _____

Name of Firm _____

Address _____

_____

Persons Interviewed: Name Title

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

Total Length of Interview _____

Comments of Interviewee(s):

Comments of Interviewer:

I. Sales and Market

1. What is the total sales of refrigerator-freezers (in units) in the U.S.? Do you have it for this year and the two previous years? If not, where can I obtain this data? (Note: only ask this question of one company.)

2. To what market is your sales effort mainly directed?

3. What percentage of your overall operation is Government business?

4. Do you actively seek Government business? Why/Why not?

5. Would you be interested in Government business during the expansion phase of the business cycle?

6. How do you find out about specific Government procurements? i.e., Commerce Business Daily; trade association newsletters, etc.

7. Do you read the Commerce Business Daily regularly?

8. WINNING BIDDERS ONLY: Will the appliance produced in fulfillment of this contract get into the consumer market?
   IF NO: Why not?
   IF YES: Will an advertising campaign accompany it, calling attention to its energy-saving qualities.

   NON-WINNING BIDDERS ONLY: Did you intend to enter the appliance which would have satisfied the contract into the consumer market?

9. WINNING BIDDERS ONLY: Do you have U.S. sales figures for three years for each unit sold to the Federal Government?

II. Procurement Mechanism

1. Have you previously bid on a Government contract?
   IF YES: What product?

2. Do you think Government purchasing procedures make it difficult, or actually discourage, doing business with the Government?
   IF YES, ASK FOR DETAILS AND SPECIFIC PAST EXPERIENCES.

3. If you do bid on a given contract, what are the prime factors in the decision.

4. If you don't bid, what factor usually dissuades you from bidding?
   IF ANSWER IS PAPERWORK: What specifically about the paperwork: number of copies? Specific forms? etc. ASK FOR DETAILS.

5. What made you bid or not bid on this contract?

6. What do you think the Government could do to increase the number of responses to its RFP's?

7. Does your company treat Government business as a separate market from consumer business? How? In what way?

8. If the type of procurement used in this RFP continues to be used, will it change your policies vis-a-vis Government business?

9. Do you feel that the cost of testing your product has hindered submission of a bid?

10. What suggestions do you have for reducing the cost of testing refrigerator-freezers?

11. What company policies, if any will be effected by the procurement procedures used in the ETIP experiment? What effect? How, if at all will the following areas be affected?

    R&D
    Design and Marketing
    Marketing
    Advertising
    Related Product Lines
    Other

12. If you were in Federal Procurement, how would you purchase refrigerator-freezers? What factors would you use?

13. How would you like to see the Government construct a life-cycle cost formula?

14. Would you be interested in receiving a Government presentation on LCC?

15. What is the life expentancy of refrigerator-freezers?

16. Does your company determine maintenance cost data for its products? IF YES, ASK FOR DETAILS.

17. Is this data available to the Government?

18. If you were dealing with the Government, would they get the same warranty as the consumer?

19. What percentage of your Government business makes use of its warranty?

20. How does this compare with your consumer business?

21. What percentage of your unit cost represents a warranty?

22. If the Government didn't want a warranty, would this be reflected as a lower initial bid?

III. Pre-Bid Discussion

1. How successful do you think Bidders Conferences would be to obtain industry inputs regarding Government specifications?

2. Would your company attend? IF NO: Why Not?

3. Do you think industry would openly discuss its ideas at such a conference? What are your ideas on the topic of Bidders Conferences in general?

IV. Advertising

1. If you were awarded a contract by the Government for a product containing new technology, would you want the Government to advertise this fact? IF YES: How would you prefer it to be done? IF NO: Why not?

2. If a successful bidder were able to advertise an ETIP/FSS Procurement, would this be an added incentive to bid?

3. Can you suggest other ways in which the Government might advertise its new procurements?

V. Engineering

1. Do you think the concern for energy efficiency implicit in the RFP (IFB) was sufficient? (i.e., in terms of what could be done) Should other performance factors have been used?

2. Do you feel that the capability exists now to produce a more energy-efficient appliance without the need for major engineering innovations?

   IF YES, what do you think is holding it back?

   IF NO, do you think there is an adequate industry-wide engineering effort toward that end? IF NO, what do you think is the reason?

3. How can refrigerator-freezers be made more energy-efficient?

4. Is your engineering staff of sufficient size and professional level to be able to respond to efficiency programs utilizing current state-of-the-art technology?

5. Is there a separate engineering effort for Government contracts?

6. Are you engaged in any R&D effort? IF YES, do you have a separate R&D staff? How large? Or is R&D an additional duty of the engineering staff?

7. What do you think can be done to encourage the industry as a whole to adopt a new energy-conscious ethic in its design philosophy?

APPENDIX B

The following firms participated in this survey effort.

Admiral Corporation
1701 East Woodfield Road
Schaumburg, Illinois 60172

Amana Refrigeration, Inc.
Amana, Iowa 52203

Frigidaire Division
General Motors Corporation
300 Taylor Street
Dayton, Ohio 45401

General Electric Company
Appliance Park
Louisville, Kentucky 40225

Aeronutronic Ford Corporation
Union Meeting Road
Blue Bell, Pennsylvania 19422

White Westinghouse
Fort Duquesne Blvd.
Pittsburgh, Pennsylvania 15222

APPENDIX C

August 7, 1975

Dear :

In August of last year, the Federal Supply Service requested technical proposals and bids for refrigerators. This procurement was initiated under the Experimental Technology Incentives Program (ETIP), and was one of several experiments designed to investigate the efficacy of stimulating the rate of entry of new technology into the marketplace via Government procurement procedures.

These experimental procurements conducted by the Federal Supply Service have not yet been evaluated to determine their effect on future product development; consequently, ETIP and the Federal Supply Service are seeking to collect information to help evaluate the program. Specifically, we would like to visit your firm and speak with one or more people in order to collect basic information.

The type of information we are concerned with relates to the reasons your firm did or did not participate in this procurement. Your organization's views on the suitability and utility of achieving accelerated product development through this experimental mechanism will also be discussed. More sensitive information, such as your firm's future design and production plans, current R&D effort, or marketing and advertising strategies may be discussed if it appears that this information might provide quantifiable evidence or program impact. Because of the range of topics, discussions with a member of both engineering and market research departments would probably be desirable.

All information collected from participating firms will be controlled by the National Bureau of Standards and not released in its basic form within NBS or elsewhere. The information will be summarized and presented in a form that will not disclose the views, opinions or market profile of individual participants. Participating organizations will receive copies of the report after printing.

I hope that your firm will be able to participate in the evaluative phase of this program. A minimum of time should be involved and the results on the analysis could be of value to all of us. I would appreciate hearing from you at your convenience concerning who should be contacted in regard to the data collection aspect of the evaluation.

Sincerely,

Theodore J. Fody
Chief, Procurement Policy Area
Experimental Technology Incentives Program

APPENDIX D

The Federal Supply Service is currently involved in a number of experiments to determine whether the rate of entry of new technologies into the consumer marketplace can be stimulated by means of Government procurements. As part of these experiments, bids for refrigerator-freezers were recently solicited. (Show copy of RFP/IFB.)

The National Bureau of Standards has been asked to evaluate these procurement experiments. As part of this evaluation, we are speaking with people from a number of firms in the industry. We are interested in finding out whether the procurement approach taken by the ETIP is practical and effective, and are particularly interested in learning industry's viewpoints on the matter. Your answers to the following questions will help us in the program evaluation. All the information you provide us will be controlled at NBS, and will remain anonymous as to company identification. The report generated by this evaluation will be in summary form, without individual companies being specifically identified; of course, your firm will receive a copy.

APPENDIX E

The following description is included as part of the "Two-Step Formal Advertising for FSC-4110 -- No Fromst Combination Refrigerator-Freezers."

COMPUTATION OF REFRIGERATOR-FREEZER ELECTRICAL ENERGY CONSUMPTION "P".

Electrical energy required (P) during 24 hours of refrigerator-freezer operation shall be computed by the following formula:

$$P = \frac{V}{E.F.}$$, where V and E.F. are defined below.

Definition and Determination of "V". "V" shall be construed as the net refrigerated volume of refrigerator-freezer being offered the Government. This volume, consisting of the general food and frozen food compartment volumes, shall be as defined in section 2.23.3 and determined in section 3 of American National Standards Institute (ANSI) Standard B38.1-1970. The volume (V) must equal or exceed the "Total storage" volume specified for the appropriate size refrigeraotr-freezer in Table I of the Statement of Requirements.

Definition and Determination of "E.F.". "E.F." shall be construed as Energy Factor, a facotr that relates refrigerated volume and electrical energy consumed to maintain said refrigerated volume at temperatures indicated in AHAM Standard HRF-2-ECFT (see paragraph 2.2.3 of this Appendix). Energy Factor (E.F.) shall be given by the relation:

$$E.F. = \frac{(\text{Volume of Frozen}) \times (\text{Correction}) + (\text{Volume of General})}{(\text{Kilo-watt hours of electrical energy consumed in 24 hours of operation})}$$

Volumes of General and Frozen Food Compartments. The volumes of the General Food and Frozen Food Compartments, in above E.F. formula, shall be as defined in sections 2.23.1 and 2.23.2, respectively, and determined in accordance with section 3 of ANSI Standard B38.1-1970. The sum of the Freezer and General Food Compartment volumes equals the net refrigerated volume discussed in 2.1 above.

Correction Factor. The correction factor in the above E.F. formula shall be a constant equal to 1.73.

Kilo-watts hours consumption of electrical energy. The electrical energy consumption, per 24 hours of refrigerator-freezer operation, to maintain refrigerated volumes shall be determined in accordance with appropriate portions of the Association of Home Appliance Manufacturers (AHAM) Standard HRF-2-ECFT, that apply to combination Household-Refrigerator-Freezers. Refer to AHAM Standard HRF-2-ECFT.

APPENDIX F

Current Clause 44 of Form 1424: Advertising of Award

"44. The Contractor agrees not to refer to awards in commercial advertising in such a manner as to state or imply that the product or service provided is endorsed or preferred by the Federal Government or is considered by the Government to be superior to other products or services."

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National Bureau of Standards
Washington, D. C. 20234

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15. SUPPLEMENTARY NOTES

16. ABSTRACT *(A 200-word or less factual summary of most significant information. If document includes a significant bibliography or literature survey, mention it here.)*

This report describes the findings of a survey of six refrigerator-freezer manufacturers by the Center for Consumer Product Technology. The survey was conducted for the Experimental Technology Incentives Program (ETIP) as part of its evaluation of a Federal Supply Service (FSS) procurement of refrigerator-freezers. Survey questions were designed to obtain manufacturers' views on the use of Government procurement policies as a means of increasing the rate of introduction of new technologies into the consumer market place. The questions covered the following areas: (1) reasons for participation or non-participation of a manufacturer in the ETIP experiment; (2) problems that a manufacturer encountered with existing Federal procurement practices; (3) acceptability of using life-cycle costing in the bidding procedure; and (4) effect of the most recent Government procurement on present and future company operations, including support for engineering and investment in research, types of themes used in advertising campaigns, etc. Results of the survey are reported, and implications are drawn for future ETIP involvement in Government procurement activities.

17. KEY WORDS *(six to twelve entries; alphabetical order; capitalize only the first letter of the first key word unless a proper name; separated by semicolons)*

Energy-efficient products; Experimental Technology Incentives Program; life-cycle costing; procurement experiments; refrigerator-freezers.

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